

Derry Road, Durrow.

Design Report

for

Stage 2 Application

September 2023

23071-01-005



Tionscadal Éireann
Project Ireland
2040



Bonneagar Iompair Éireann
Transport Infrastructure Ireland



An Ghníomhaireacht
Tithíochta
The Housing Agency

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1. INTRODUCTION

This report describes the preliminary design of a Local Improvement Scheme in Durrow, County Laois. A residential development has been proposed at the junction between the national road N77 and the local road Derry Road in Durrow. This development extends south and east of the junction along Derry Road and requires modifications to a section of the N77 national road on approach to and its junction with Derry Road. The road improvements continue along Derry road to reach the proposed residential development access. Figures 1.1 and 1.2 demonstrate the site location.

This design report has been prepared primarily with consideration of the national road and addresses the TII design requirements such as TII DN-GEO-03030 (April 2021) 'Design Phase Procedure for Road Safety Improvement Schemes, Urban Renewal Schemes and Local Improvement Schemes'.

The local and internal roads of this scheme have been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) and with coordination with the DMURS design principles.

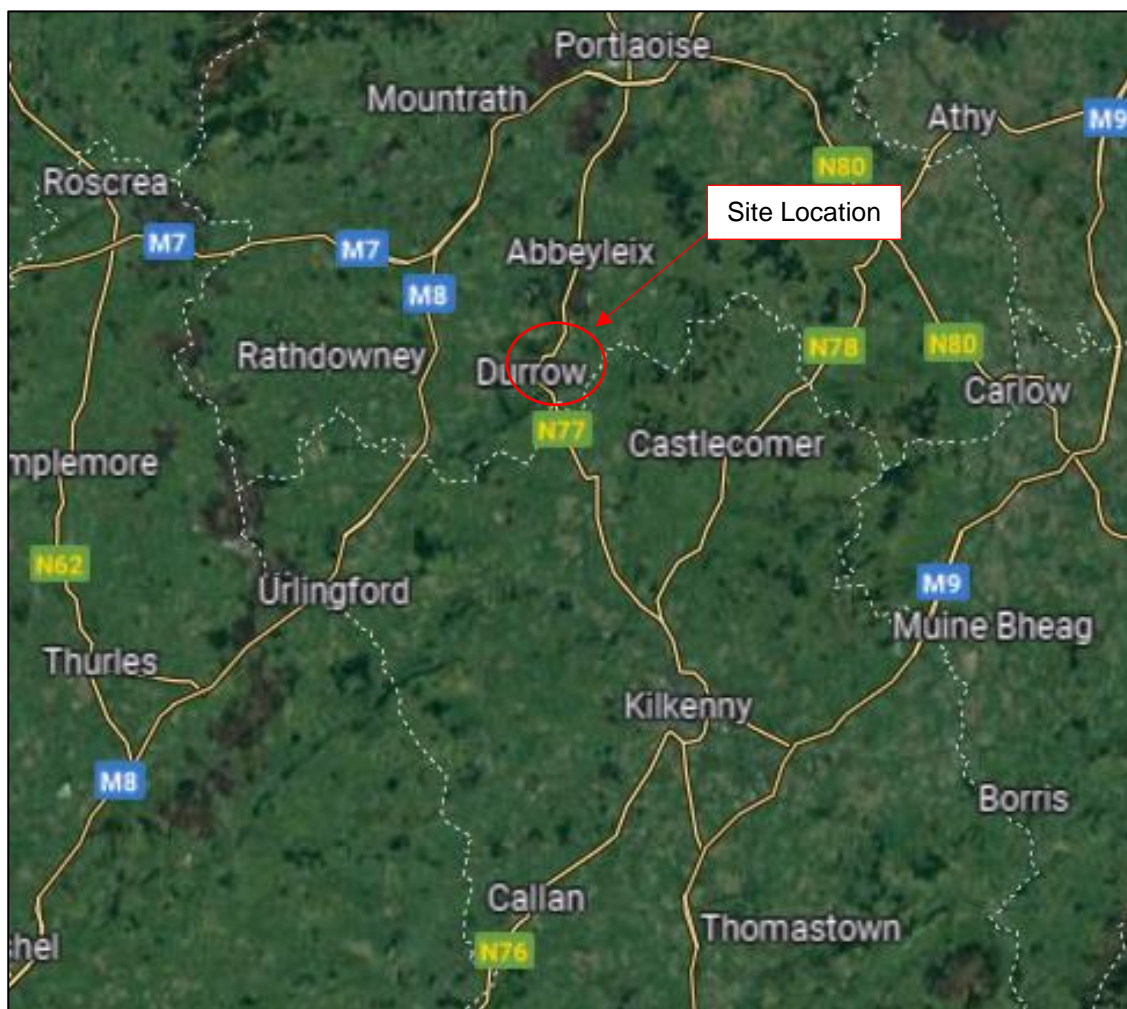


Figure 1.1: Site Location Map

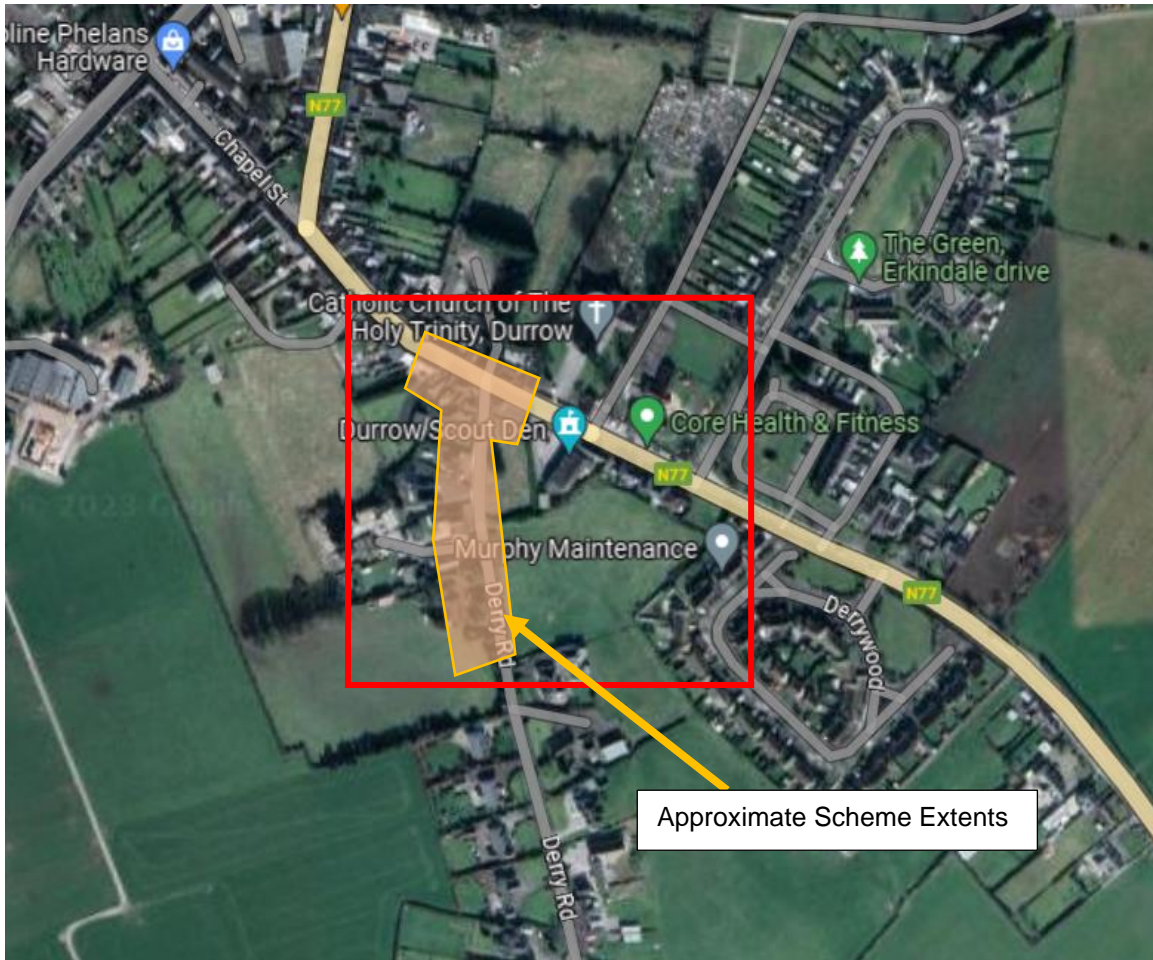


Figure 1.2: Site Location

The proposed scheme aims to improve safety on the N77 and at the N77 / Derry Road junction by increasing the carriageway widths to align with widths along the approaches to the junction, and by providing pedestrian crossing Draft 2 facilities at the junction.

The preliminary design of the scheme is shown on the following drawings which are included at Appendix A:

Table 1.1: List of Preliminary Design Drawings

Drawing number	Drawing Title
23071-01-0000	Cover Sheet
23071-01-0001	Site Location Drawing
23071-01-0002 -0006	General Layout
23071-01-0009	Existing Services
23071-01-0117 - 0120	Longitudinal Sections
23071-01-0125	Cross Sections
23071-01-0500 - 0504	Proposed Drainage
23071-01-1100-1104	Kerbs, Footpaths and Paved Areas
23071-01-1200-1204	Proposed Signs & Roadmarkings

2. COLLISION HISTORY

Information on road collisions was taken from TII Collision Data records dated between 2018 and 2020.

One collision was recorded with material damage in January 2018, to the west of the junction.

2.1. Collision Rate

The Collision Rate (collisions per 10^8 veh-km) is:

$$\frac{1 \text{ (collisions)} \times 10^8}{365 \text{ (days /yr)} \times 7,724 \text{ (veh/day)} \times 5 \text{ (yr)} \times 1 \text{ km}}$$

$$11.82 = \text{collisions per } 10^8 \text{ veh-km}$$

Typical collision rates for the network are provided by TII per the table below indicating that the typical rate for an Urban Two-Lane Road is 20.221 collisions per 10^8 veh-km.

The collision rate for the section of road under consideration over the three-year period is below that figure. It is acknowledged that the rate varies depending on the period of assessment.

Table 2.1: TII Collision Rates

Collision Rates (All Injury Severities) by Reference Population			
Reference Population	Average Collision Rate 2015-2017		Average Collision Rate 2014-2016
Motorway	1.959	per 100 Million km of Travel	2.060 per 100 Million km of Travel
Rural Dual Carriageway	2.843	per 100 Million km of Travel	3.531 per 100 Million km of Travel
Urban Dual Carriageway	8.067	per 100 Million km of Travel	8.437 per 100 Million km of Travel
Rural Two Lane	7.984	per 100 Million km of Travel	8.439 per 100 Million km of Travel
Urban Two Lane	18.367	per 100 Million km of Travel	20.221 per 100 Million km of Travel

3. SCHEME / SAFETY OBJECTIVES

The main objective of this scheme is to improve safety for all road users by focusing on junction improvement, accessible, and safe routes for pedestrians in travelling through the junction and connecting the town centre to the proposed residential development.

The main objectives of this scheme include:

- The provision of junction improvement works at the N77 Derry Road Junction.
- Design of traffic signs, road markings, and other minor ancillary works.

This report should be read in conjunction with the scheme's Preliminary Design Drawings which can be found in *Appendix A* to this Report.

4. EXISTING CONDITION

4.1. Traffic Volumes

A traffic count was undertaken on the 26th of July 2022 along the N77.

The data shows that there is a consistent traffic flow throughout the day, between 7am and 7pm, with flows during peak hours not rising significantly. There is a slight instance of greater traffic travelling eastbound in the early part of the day, with a corresponding greater flow westbound in the evenings, however the data shows that hourly volumes in each direction are generally in the same range during.

The traffic flows during the AM and PM peak hours were abstracted from the surveyed data and are shown in the following table:

Table 4.1: Traffic Survey Summary

Time Period	Eastbound	Westbound	Total
AM Peak (8-9am)	274	233	507
PM Peak (5-6pm)	330	340	670
24-Hour Total	3893	3831	7724

4.2. Speed

The speed limit is 50km/h throughout the scheme.

The traffic count measured 85th percentile speed of 45.78km/h and it is noted that the 85th percentile speed in either direction is within 1 percentile point of the other.

4.3. Horizontal Alignment

The existing horizontal alignment for N77 within scheme extents is 92m long straight with no horizontal curves.

The existing horizontal alignment for Derry Road within scheme extent is around 180m long and consists of a right-hand curve of radius 110m with straights on either side and connects to N77 at the northern end.

4.4. Vertical Alignment

The N77 existing vertical profile within scheme extents has an uphill gradient of around 4% to the West of the junction with and a crest curve followed by an uphill gradient of around 1% till the site extend, East of the junction.

The Derry Road profile has a downhill gradient travelling in northbound with multiple crest and sag curves in between. It has a maximum gradient of around 7.75% and a minimum gradient of 1.5% within the scheme extents.

4.5. Cross Section Crossfall & Superelevation

4.5.1. Cross Section

N77 has an existing carriageway width of 5m with footway of varying width on either side of the road with a minimum footway width of around 0.67m on the southern edge of the road. The westbound lane is widened to about 4.25m tapering down to 2.5m to allow space for vehicles connecting from Derry Road to N77.

The cross section of Derry Road has a carriageway width of between 4.5m to 5m with a footway of varying width along the northbound lane of the road with a minimum width of 1.4m.

4.5.2. Crossfall

Crossfall along both N77 and Derry Road within scheme extent varies from standard 2.5% camber with a normal crown to almost flat surface.

4.5.3. Superelevation

Existing roads are not superelevated within the scheme extents.

4.6. Junctions & Accesses

The N77 has one junction and four access within the site extents.

Derry Road has a number of direct accesses to residential dwellings within the site extents. All junctions and accesses are listed below and shown in Figure 4.2 below.

Local road junctions:

1. Derry Road

Accesses:

2. Private Access 1
3. Private Access 2
4. Catholic Church of The Holy Trinity, Durrow
5. Durrow Scout Den
6. Private Access 3
7. Private Access 8
8. Private Access 9

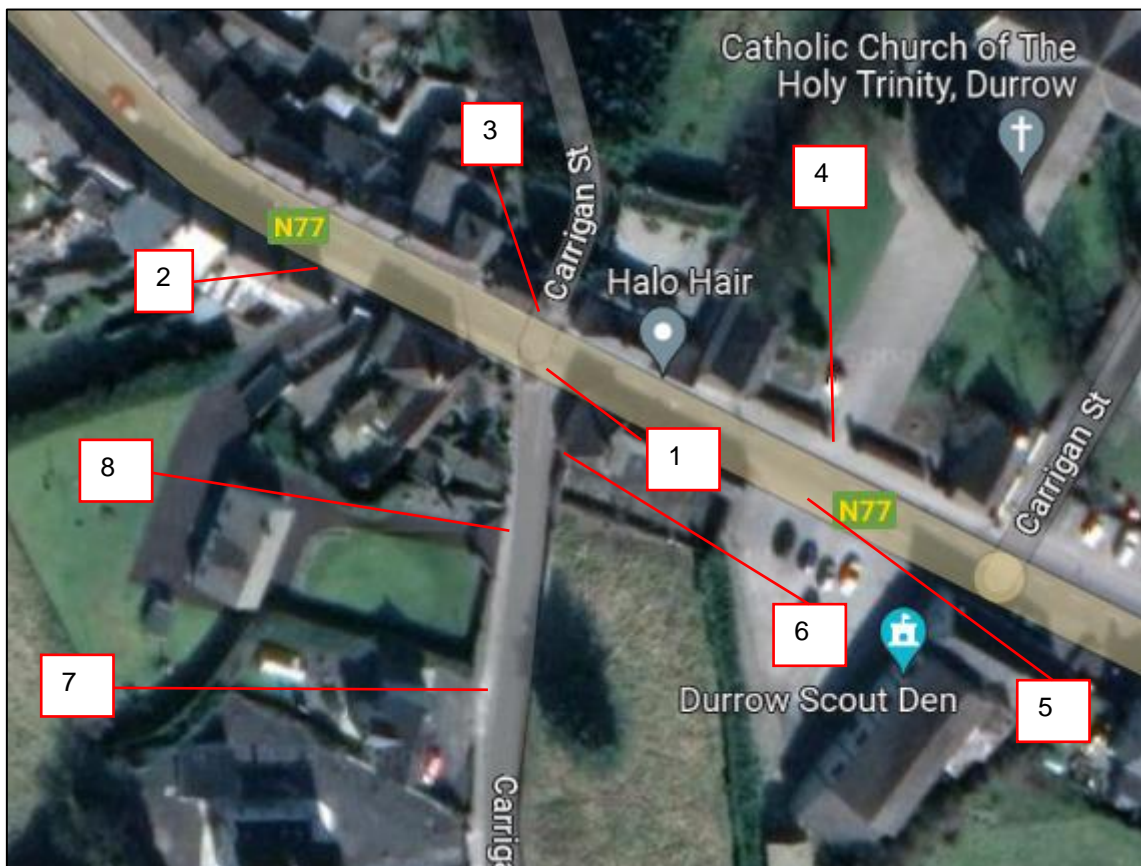


Figure 4.1: Existing junctions and accesses

4.7. Facilities for Vulnerable Road Users (VRUs)

As this is an urban area, the presence and quality of facilities for VRUs are poor.

Along the N77 there are footpaths on each side of the road. However, the width of the footpaths range from 0.67 meters to 3.13 meters with the majority of the footpaths below DMURS standard width of 1.8 meters. There are also a number of telephone pole in the footpaths, reducing the quality of the facility further.

Along Derry Road, there is one footpath on the western side of the road. The width of the footpath range from 1.4 meters to 3.66 meters There is no footpath facilities on the eastern side of the road.

There are no pedestrian crossing facilities within the scheme extents.

There are also no cycle facilities within the scheme extents.

4.8. Visibility & Sightlines

For a speed of 50km/h the required visibility splays at junctions should, in accordance with the 'Design Manual for Urban Roads and Streets', be 45m (measured from 2.4m back from the road edge). This is not currently achieved at the Derry Road junction in respect of sightlines towards the eastern N77 arm of the junction.

4.9. Utilities

There are existing public utilities within the scheme extents that will have to be considered. These include:

- E-Net
- EIR
- Water mains
- Stormwater and Foul
- Gas
- ESB

Further details and service locations are included in the existing services drawings attached in Appendix A.

5. ENVIRONMENTAL, ARCHAEOLOGICAL AND OTHER CONSTRAINTS

5.1. Appropriate Assessment

A report for the purposes of Appropriate Assessment Screening is being carried out for the project by Laois County Council and impacts on the surrounding environment will be identified therein.

Modifications to the design required as a result of the AA Screening will be incorporated in coordination with Laois County Council.

5.2. Ecological Assessment

The following information was sourced from Geohive database <https://webapps.geohive.ie/mapviewer/index.html>

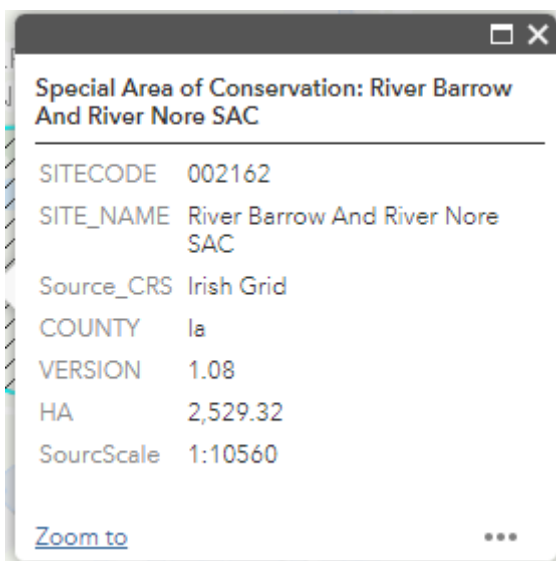
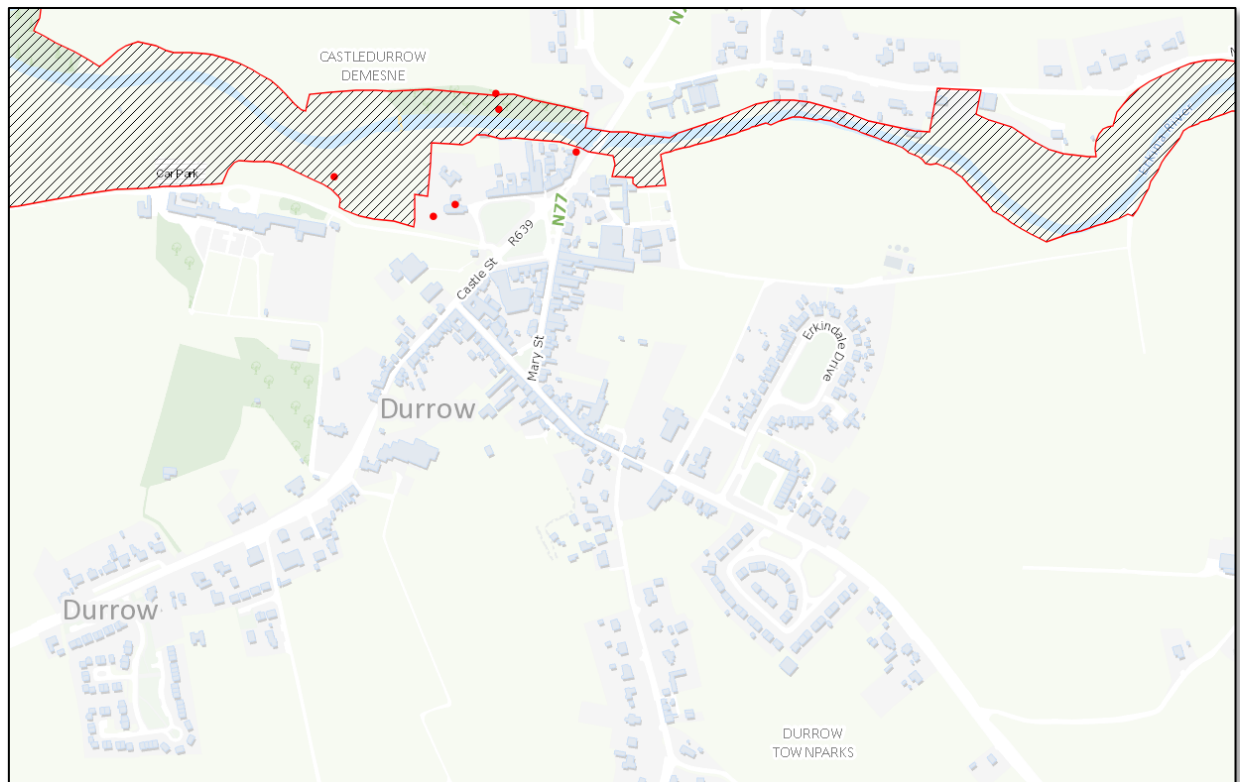


Figure 5.1: Ecological Constraints

The ecological site shown in the image above is the Special Area of Conservation: River Barrow and River Nore SAC, Site Code 002162. This site is located approximately 420m north of the scheme.

There are no Natural Heritage Areas or Special Protection Areas within the site extents nor in its vicinity.

Refer to section 5.1 regarding assessment of potential impacts of the scheme on the SAC.

5.3. Flood Risk Assessment

A preliminary flood risk assessment was conducted by the Housing Agency. The report found the proposed development is appropriate for the level of flood risk subject to mitigation measures being implemented to account for the pluvial flooding risk.

The report can be found in Appendix D of this report.

5.4. Other Environmental Surveys

n/a

5.5. Archaeological Constraints

A Cultural Heritage Impact Assessment was undertaken in respect of the proposed works by Moore Group in August 2023. The report included the following statements:

- *There are no World Heritage Site or potential World Heritage Site contained in the Tentative List of Candidate Sites within 5km of the study area.*
- *There are no National Monuments within 3km of the subject site.*
- *There are no recorded monuments within 200m of the subject site. The nearest recorded monument is LA029-045---, St. Fintan's Church, and associated graveyard located roughly 400m to the northwest of the subject site.*
- *It is the authors opinion that the proposed development will not significantly affect the visual amenity of any of these sites/features.*

In addition, an Architectural Planning Review was undertaken by the Housing Agency having specific regard to the proposed demolition of an existing property which is classed as an Architectural Conservation Area (ACA) and a stone pillar at the N77/Derry Road Junction. This review concluded as follows:

Conclusion

The demolition of the existing building will improve the road safety and provide footpaths and safe crossing points for pedestrians in this town centre location. The new building has been designed to respect the vernacular architectural style of the village.

Taking into consideration the road traffic safety concerns outlined above, the low architectural merit of the existing structure, the sensitive design of the new structure and the greatly enhanced road safety and public realm achievable with the proposal, it is considered appropriate to demolish this structure and provide the proposed new dwellings as indicated in the architect's drawings.

Figure 5.2: Architectural Planning Review Conclusion

6. PROPOSED DESIGN

6.1. General

The proposed scheme has been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS). The DMURS provides guidance relating to the design of urban roads and streets.

The following changes are being made to the existing N77 and Derry Road within the scheme extents:

- Road widening along the N77 and Derry Road.
- Footpath improvements on the N77.
- Incorporation of Zebra Crossing on the N77 with zig zag road markings and yield lines provided on approaches.
- Belisha beacon pole and lighting provided on traffic side of each side of crossing.
- Incorporation of eastern footpath and uncontrolled crossings with tactile paving on Derry Road.

6.2. Land Acquisition

No additional land acquisition is required for the scheme. However, the existing ACA house and associated stone pillar will be demolished.

6.3. Horizontal Alignment

The proposed horizontal alignment for both N77 and Derry Road has been designed to maintain the existing route as much as possible.

N77 horizontal alignment is a 92m long straight within the scheme extents while the alignment for Derry Road is 178m long and has straights on either side of a 110m radius right hand curve.

6.4. Vertical Alignment

The proposed vertical alignment for N77 has been designed to match with existing profile. The profile is uphill with maximum gradient of 3.97% and minimum gradient of 0.51%. There are 2 vertical crest curves with a minimum k value of 4.7 conforming to DMURS.

Derry Road has a downhill profile with the lowest point at the junction with N77. The maximum gradient along this road is 7.72% which is provided to match with the existing ground profile. The minimum k value used for sag curve is 6.4 and for the crest curve is 4.7.

6.5. Cross Section Crossfall & Superelevation

6.5.1. Cross Section

The carriageways throughout have been designed in accordance with the DMURS.

In accordance with section 3.2 of the DMURS, the N77 is considered to be an Arterial Street with a low to moderate design speed. Figure 4.55 (carriageway widths) indicates that the standard carriageway width for an Arterial Street ranges from 5.5m to 6.5m.

Derry Road is considered to be a Local Street. Figure 4.55 (carriageway widths) indicate that the standard carriageway width for a Local Street ranges from 5m to 5.5m.

6.5.2. Crossfall

A normal camber of 2.5% will be provided on the on all roads except where deviations are required on approach to tie ins.

6.5.3. Superelevation

No superelevation is required on either N77 or Derry Road in the proposed design as the curves provided in the horizontal alignment are as per DMURS confirming the requirement for radius with adverse camber.

6.6. Facilities for Vulnerable Road Users

A zebra crossing with belisha beacons and lighting is proposed along the N77. The layout and road marking details will be in accordance with CC-SCD-05125.

The need for a crossing of the N77 at this location was assessed in terms of the existing and proposed conditions and potential pedestrian crossing options at this location. The methodology followed included the following:

- 24-hour manually classified vehicle and pedestrian counts data, date 26-July-2022 was assessed.
- Mapping of the area was provided by Laois County Council.
- The current pedestrian facilities were reviewed against the traffic data and issues were identified.
- The need for a controlled pedestrian crossing was evaluated in accordance with chapter 7 of DN-GEO-03084
- Suitable crossing locations and design options were identified, addressing the specific issues present.
- A preferred solution was determined.
- The proposed design was outlined including works required to affected footpaths, lighting, drainage, services, roadmarking and signage.
- Throughout, relevant policies and design guidelines including future proposals in relation to development of the area as well as the most up to date County Development Plan, were taken into consideration.

Issues identified in respect of the existing conditions related to footpath conditions on both sides of the road, roadside conditions and visibility between vehicles and pedestrians, the presence of the parking area and church assess and associated vehicle turning movements, lighting column positions potentially creating visibility issues outside daylight hours.

It was determined that that the existing conditions provide an unsafe environment for pedestrians seeking to cross from one side of the road to the other and leaves the onus with the pedestrians as to where and when is suitable to cross. Following improvement to the N77 as part of the proposed scheme, many of these issues would persist in the absence of a formal crossing location.

A pedestrian crossing needs assessment was carried out in accordance with DN-GEO-03084, and while the calculation does not indicate that a controlled crossing is necessary at the subject location based on the criteria assessed, when factors are taken into consideration such as the approach alignments and speeds, and the inconspicuous nature of the proposed location relative to the adjacent buildings, all of which may lead to delayed recognition of an uncontrolled crossing, the provision of a zebra crossing is recommended.

6.7. Junctions & Accesses

6.7.1. N77/ Derry Road junction:

1. N77 / Derry Road

The junction shall be maintained at the existing location. The easter corner radius has been increased to 6m to accommodate regular movements by a Refuse Truck swept path.

6.7.2. Other accesses:

The following accesses are to be maintained:

2. Private Access 1

3. Private Access 2
4. Catholic Church of The Holy Trinity, Durrow
5. Durrow Scout Den
6. Private Access 3
7. Private Access 8
8. Private Access 9

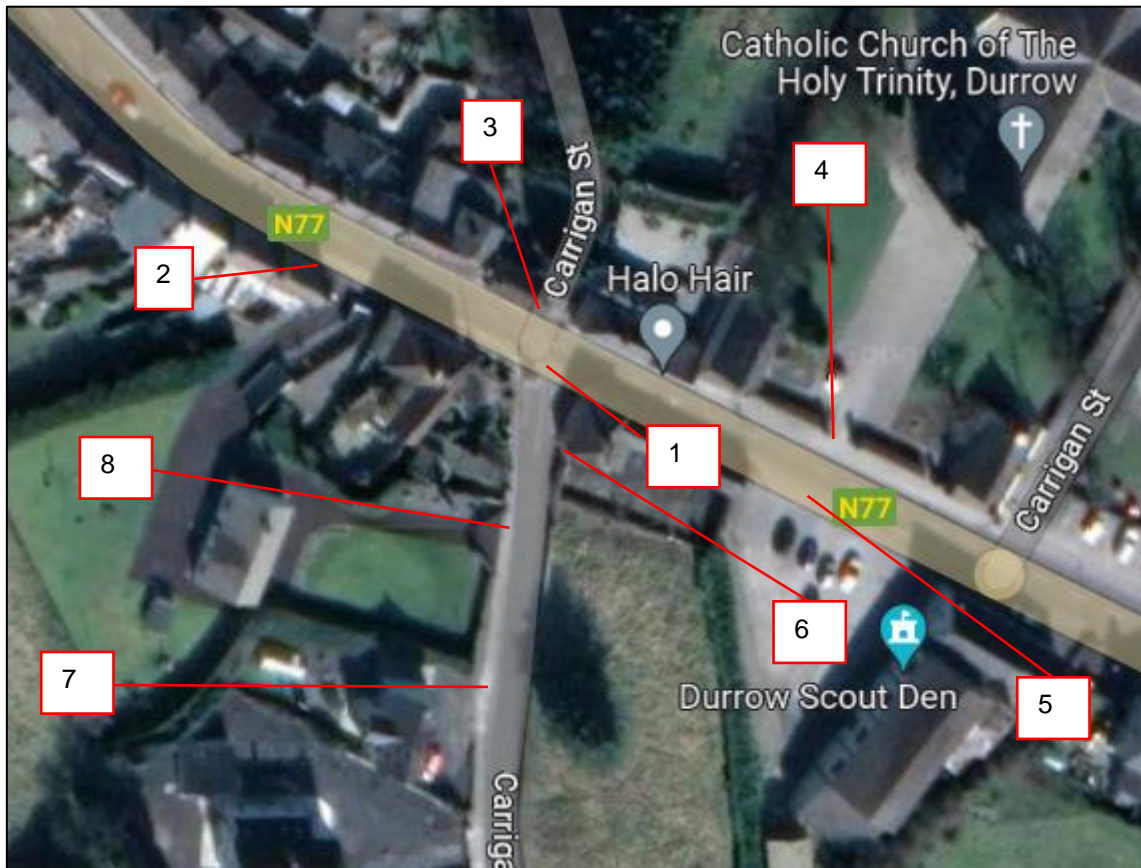


Figure 6.1: Proposed junctions and accesses

6.8. Visibility and Sightlines

45m visibility splays are accommodated at all junctions and accesses, in line with DMURS requirements for a design speed of 50km/h.

6.9. Drainage

The existing roadside gullies and carrier pipe system along the extents of the scheme will be utilised to drain the proposed scheme, with existing gullies removed and new gullies provided to suit the revised kerb lines. No new carriageway drainage systems are proposed.

6.10. Pavement

The road surface throughout the scheme is proposed to be replaced as part of this project. As the alignment of the various roads generally corresponds with existing alignments, the existing foundation layers will be retained with the surface planned to and a new layer of regulating applied beneath the surface.

6.11. Safety Barrier Risk Assessment and Provision

There are no existing safety barriers within the scheme extents which is in an urban area. In accordance with TII DN-REQ-03079, as there are no exceptional or third-party risks barriers are not preferred and a formal vehicle restraint risk assessment has not therefore been carried out.

6.12. Traffic Signs and Road Markings

Traffic signs (i.e. regulatory, warning and directional) and road markings have been prepared in accordance with the relevant TII Publications and the Department of Transport, Tourism and Sport Traffic Signs Manual (TSM).

6.13. Accommodation Works

Property adjustments are required to the property adjacent (Durrow Scout Den) to the site on the N77. The adjustments include the removal of a stone pillar and relocation of utilities. This accommodation works are required to eliminate a pinch point along the N77, providing consistency for road users and allowing the continuity of a footpath.

Additional Property Adjustments may be required at other accesses to tie into the proposed carriageway.

Damaged Kerbs and Footpaths will be replaced within the site extents.

6.14. Lighting

Additional lighting will be incorporated into the design at the proposed zebra crossing as part of the belisha beacons in accordance with CC-SCD-05138 Belisha Beacon Pole Detail. Illumination of the Belisha Becons shall be in accordance with DN-LHT-03038 Design of Road Lighting for the National Road Network.

6.15. Departures from Standard

This scheme has been designed in accordance with the DMURS and there are no Relaxations or Departures from the DMURS standard associated with the design.

7. ROAD SAFETY AUDIT

A Stage 1 Road Safety Audit was carried out in accordance with the GE-STY-01024 and the recommendations of the audit have been implemented into the design. A copy of the Road Safety Audit is contained in Appendix B.

8. TOTAL SCHEME BUDGET

A cost estimate of the N77 and associated works has been prepared and a breakdown of the estimate is provided in Appendix C of this report. The current cost estimate is **€169,544** including VAT.

A full scheme cost estimate shall be provided by the project Quantity Surveyor.

9. PROJECT APPRAISAL BALANCE SHEET

A project appraisal balance sheet is not required for this scheme in accordance with the guidance set out in DN-GEO-03030.

APPENDICES

APPENDIX A – Design Drawings

DERRY ROAD, DURROW

STAGE 2 APPLICATION, ROAD DESIGN DRAWINGS

DRAWINGS

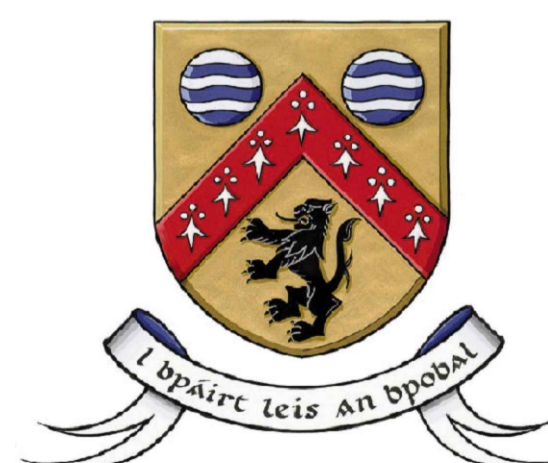
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23071-01-0009	EXISTING SERVICES
23071-01-0117 TO 0120	LONGITUDINAL SECTIONS
23071-01-0125	CROSS SECTIONS
23071-01-0500-0504	PROPOSED DRAINAGE
23071-01-1100 TO 1104	KERBS FOOTPATHS & PAVED AREAS
23071-01-1200 TO 1204	SIGNS & ROADMARKINGS



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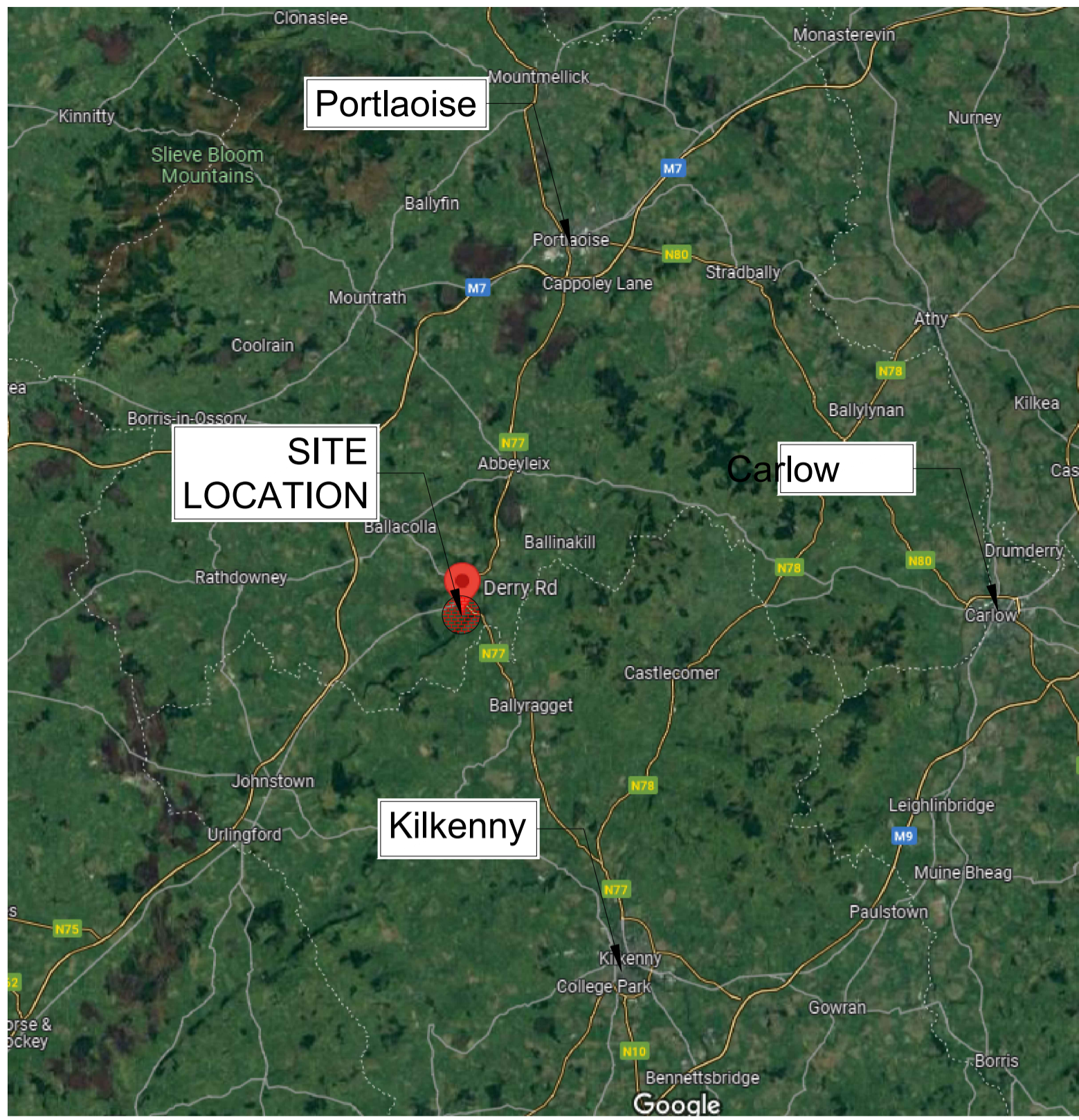


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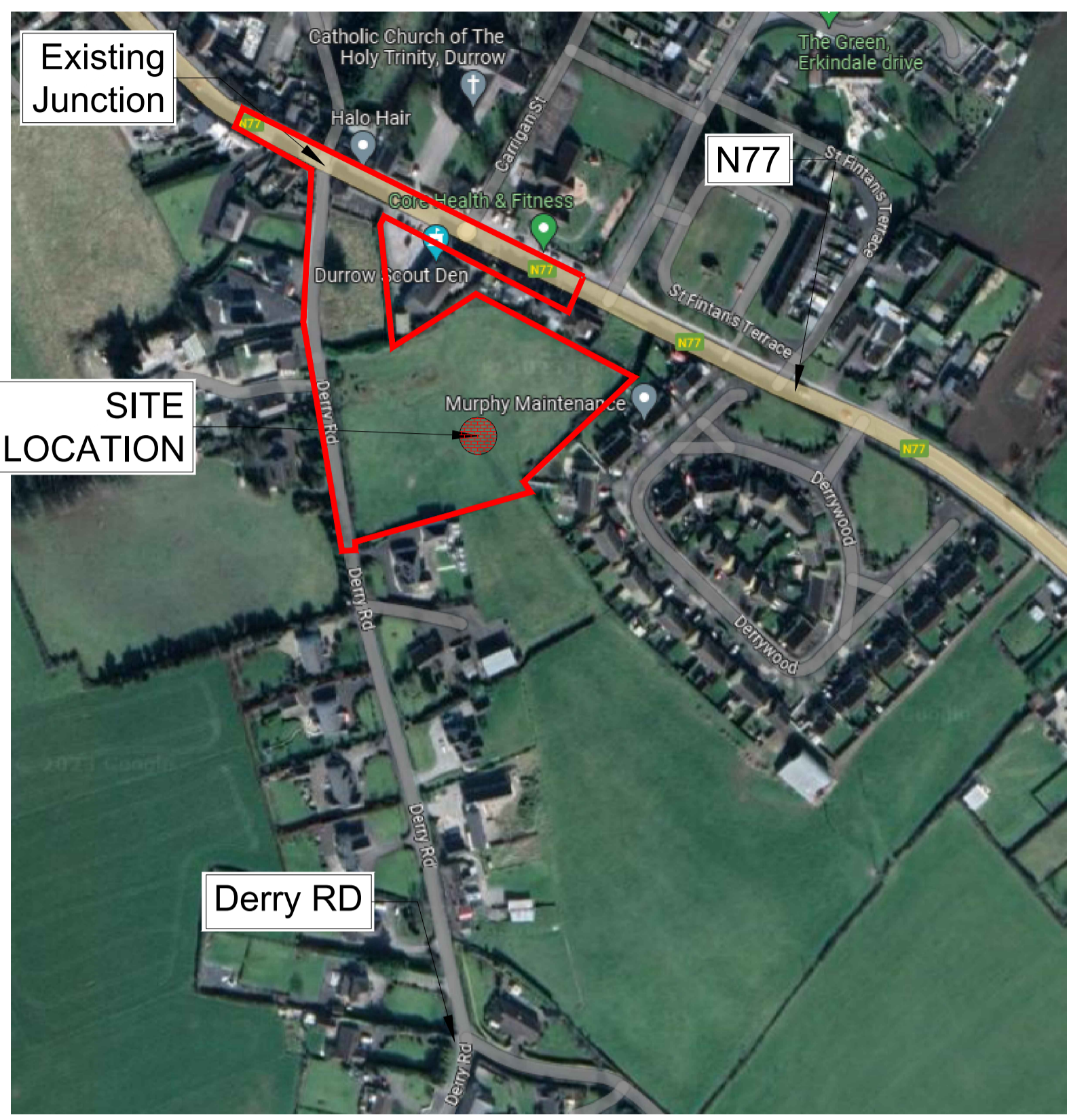


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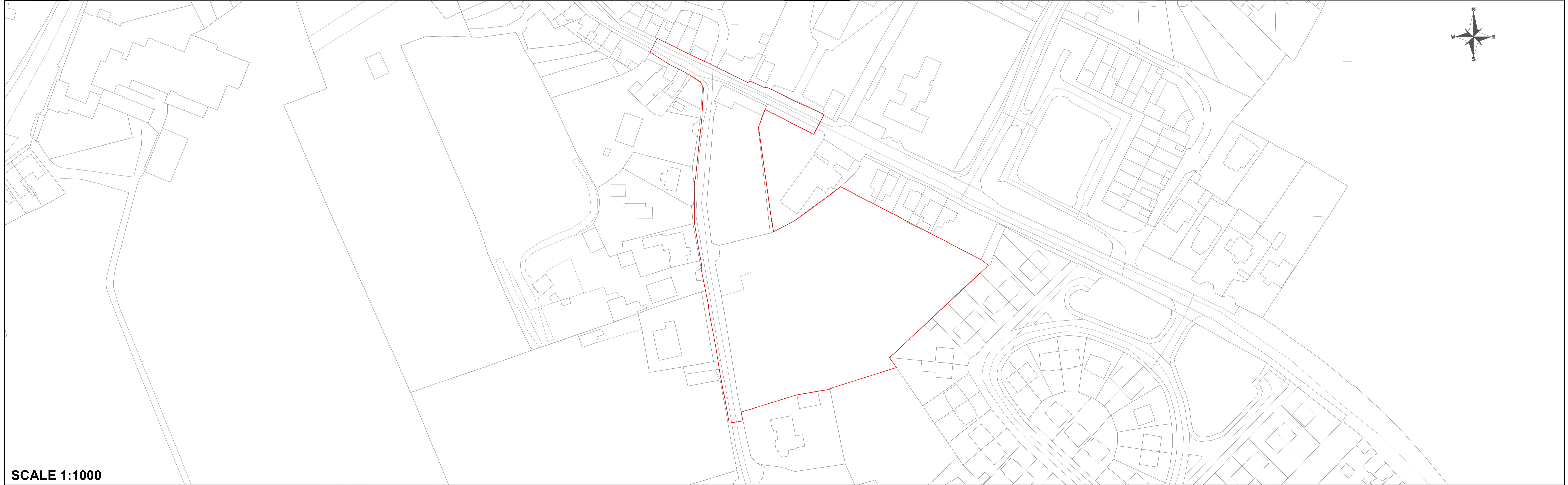
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LEGEND

	Site Extents
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No.	Revision	Date	By	Chk'd	App'd

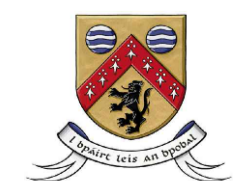
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PROJECT TITLE		DERRY ROAD, DURROW	
Drawing Title:		SITE LOCATION DRAWING	
Drawn by: EH	Sheet Size: A1	Scale: 1:1000	Date: July '23
Drawing Number: 23071-01-0001		Revision: -	



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LEGEND

--- LMA

No.	Revision	Date	By	Chk'd	App'd
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **GENERAL LAYOUT -OVERVIEW**

Drawn by: EH Sheet Size: A1 Scale: 1:500 Date: September '23

Drawing Number: 23071-01-0002 Revision: -

Designed: EH Checked: AC Approved: AC



5.5M CARRIAGEWAY

FOOTPATH LINK TO N77

UNCONTROLLED PEDESTRIAN CROSSINGS

2M WIDE FOOTPATH

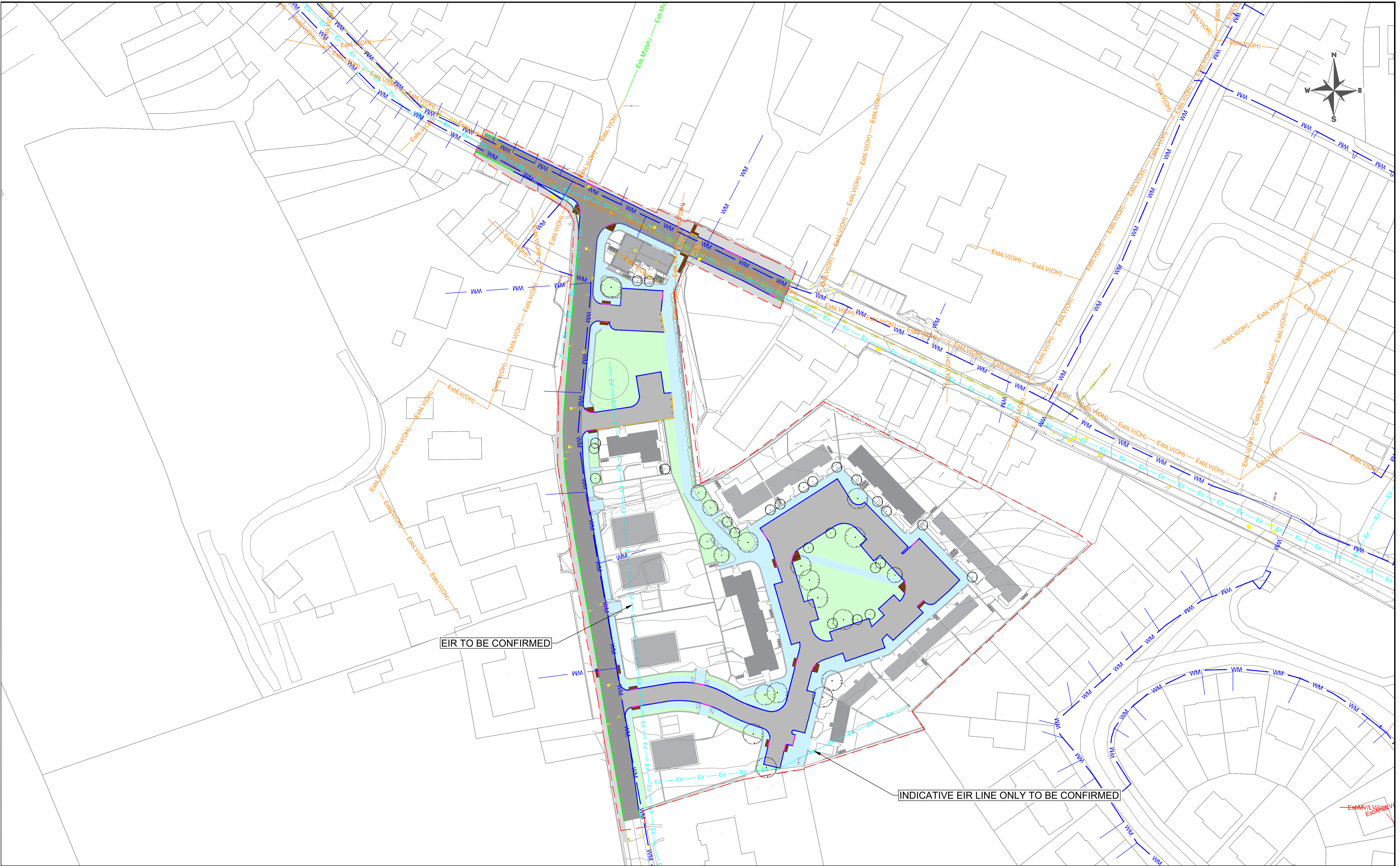
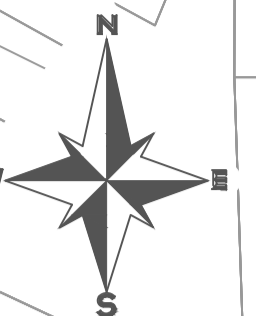
4.5M CARRIAGEWAY

LEGEND

- PROPOSED ROAD SURFACE
- EXISTING ROAD SURFACE
- PROPOSED FOOTPATH / PUBLIC REALM
- EXISTING FOOTPATH / PUBLIC REALM
- PROPOSED SUDS / LANDSCAPING
- PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
- PROPOSED KERB
- DROPPED KERB
- FLUSH KERB
- EXISTING KERB TO BE RETAINED
- EXISTING KERB TO BE REMOVED
- SIGNPOST

No.	Revision	Date	By	Chk'd	App'd

Project Title: DERRY ROAD, DURROW			
Drawing Title: GENERAL LAYOUT -SHEET 4 OF 4			
Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-0006		Revision: -	



EIR TO BE CONFIRMED

INDICATIVE EIR LINE ONLY TO BE CONFIRMED

LEGEND

	WM	Water mains
	GM	Gravity mains
	Eir	Eircom
	EsblV(OH)	Light voltage (400V/230V) overhead routes
	EsbMV(OH)	Medium voltage (10kV/20kV) overhead lines
	LMA	



ROADPLAN
CONSULTING

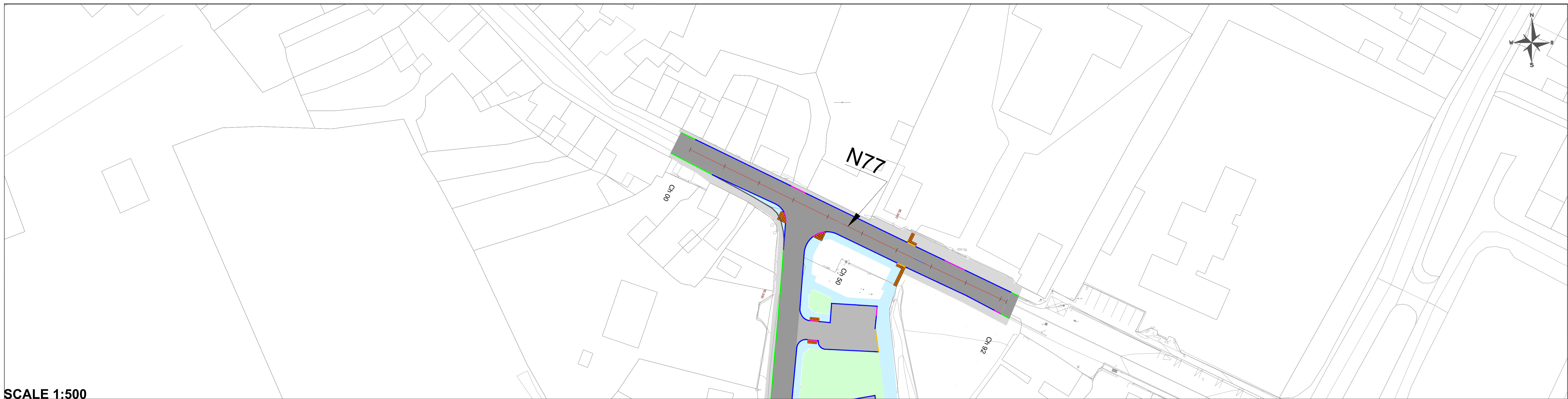
Monde Road,
Kilkenny
Tel: +353(0)567795800
e-mail: info@roadplan.ie



Laois County Council
Áras an Chontae,
James Fintan Lalor Ave,
Portlaoise, Co. Laois,
R32 EHP9

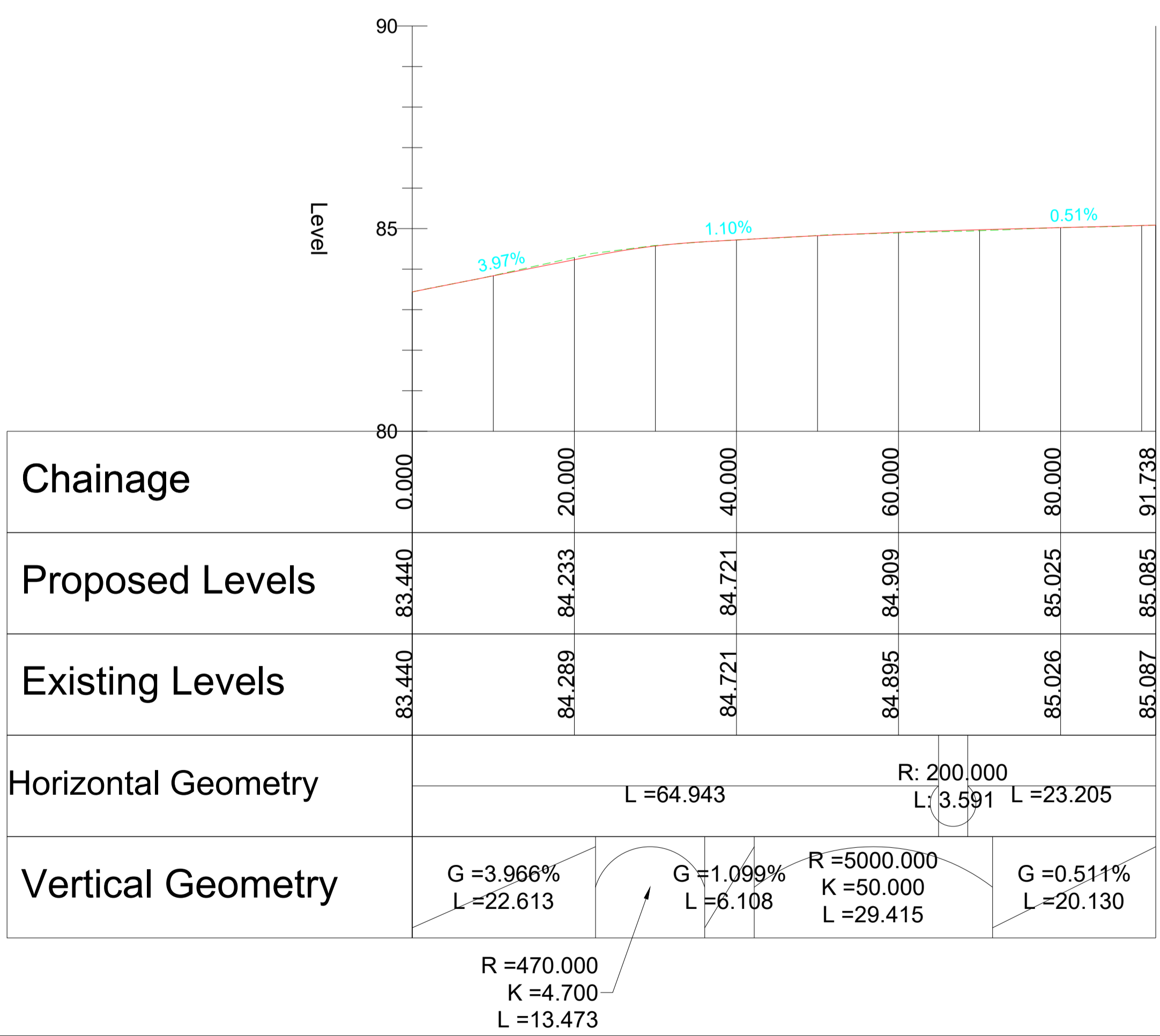
No.	Revision	Date	By	Chk'd	App'd
Designed:	FH	Checked:	APC	Approved:	AC

Project Title: DERRY ROAD, DURROW			
Drawing Title: EXISTING SERVICES - SHEET 1 OF 1			
Drawn by: FH	Sheet Size: A1	Scale: 1:500	Date: September '23
Drawing Number: 23071-01-0009		Revision: -	



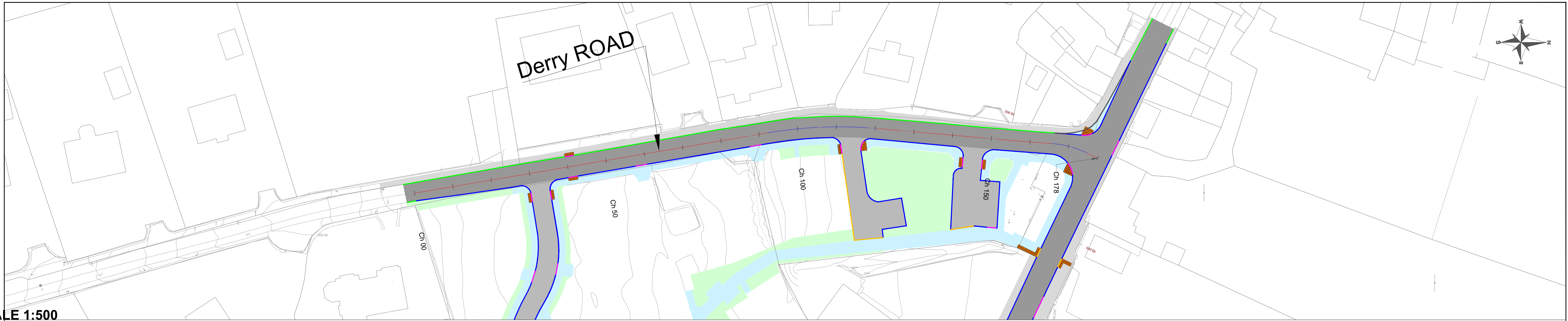
SCALE 1:500

H_N77_CL_01 - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 80.000

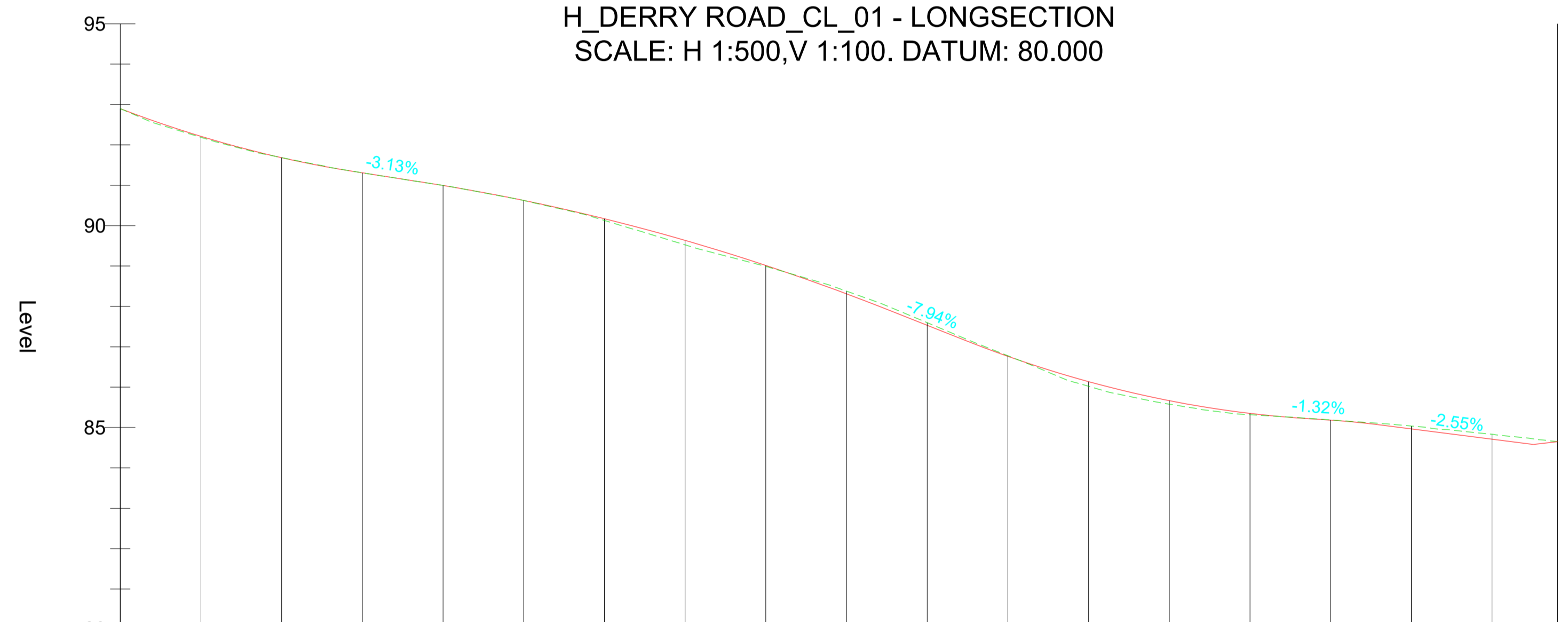


SCALE 1:500

<p>7 Ormonde Road, Kilkenny Tel: +353(0)567795800 e-mail: info@roadplan.ie</p> <p>Laois County Council Áras an Chontae, James Fintan Lalor Ave, Portlaoise, Co. Laois, R32 EHP9</p>	LEGEND PROPOSED SCHEME LAYOUT CHAINAGE LINES	NOTES 	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>No.</td> <td>Revision</td> <td>Date</td> <td>By</td> <td>Chk'd</td> <td>App'd</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	No.	Revision	Date	By	Chk'd	App'd							PROJECT TITLE DERRY ROAD, DURROW Drawing Title: LONGITUDINAL SECTIONS- SHEET 1 OF 5 (N77) Drawn by: EH Sheet Size: A1 Scale: 1:500 Date: September '23 Drawing Number: 23071-01-0117 Revision: -
No.	Revision	Date	By	Chk'd	App'd											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Designed: DS</td> <td>Checked: AC</td> <td>Approved:</td> </tr> </table>				Designed: DS	Checked: AC	Approved:										
Designed: DS	Checked: AC	Approved:														



H_DERRY ROAD_CL_01 - LONGSECTION
SCALE: H 1:500, V 1:100. DATUM: 80.000



Chainage	0.000	20.000	40.000	60.000	80.000	100.000	120.000	140.000	160.000	178.128
Proposed Levels	92.897	91.683	90.995	90.171	89.014	87.531	86.136	85.350	84.965	84.649
Existing Levels	92.897	91.685	90.996	90.128	88.990	87.597	86.022	85.317	85.037	84.649
Horizontal Geometry	L = 94.792		R: 112.630 L: 24.054		L = 39.308		L = 7.445	L = 3.098		
Vertical Geometry	R = 640.000 K = 6.400 L = 28.841	R = 1200.000 K = 12.000 L = 57.709		G = -7.937% L = 8.501	R = 640.000 K = 6.400 L = 42.341	G = -2.546% L = 19.271	R = 470.000 K = 4.700 L = 5.753	R: 25.000 L: 9.432		
	G = -3.128% L = 9.292				G = -1.322% L = 3.408					

SCALE 1:500



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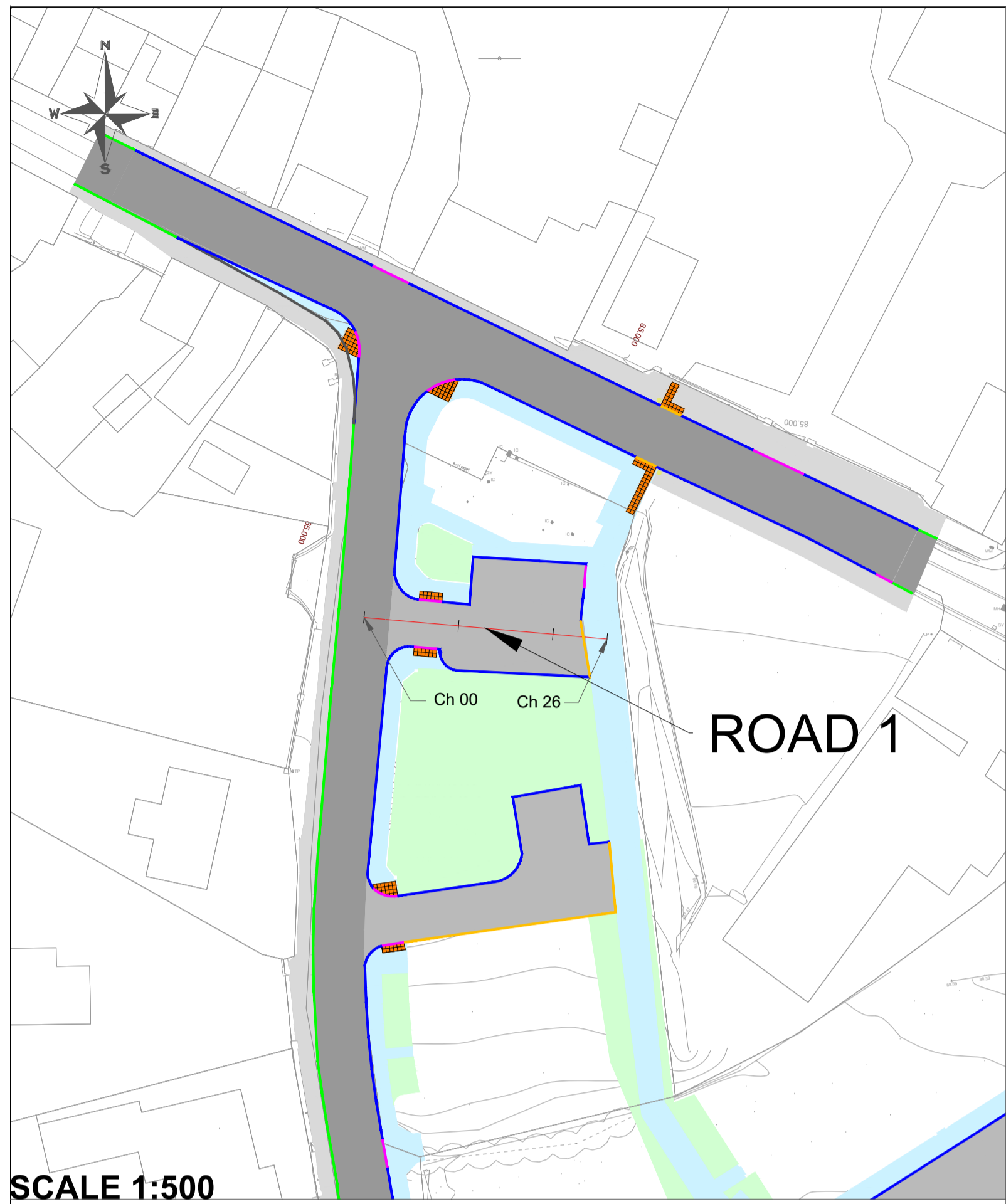
Laois County Council
Áras an Chontae,
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Portlaoise, Co. Laois,
R32 EHP9

LEGEND

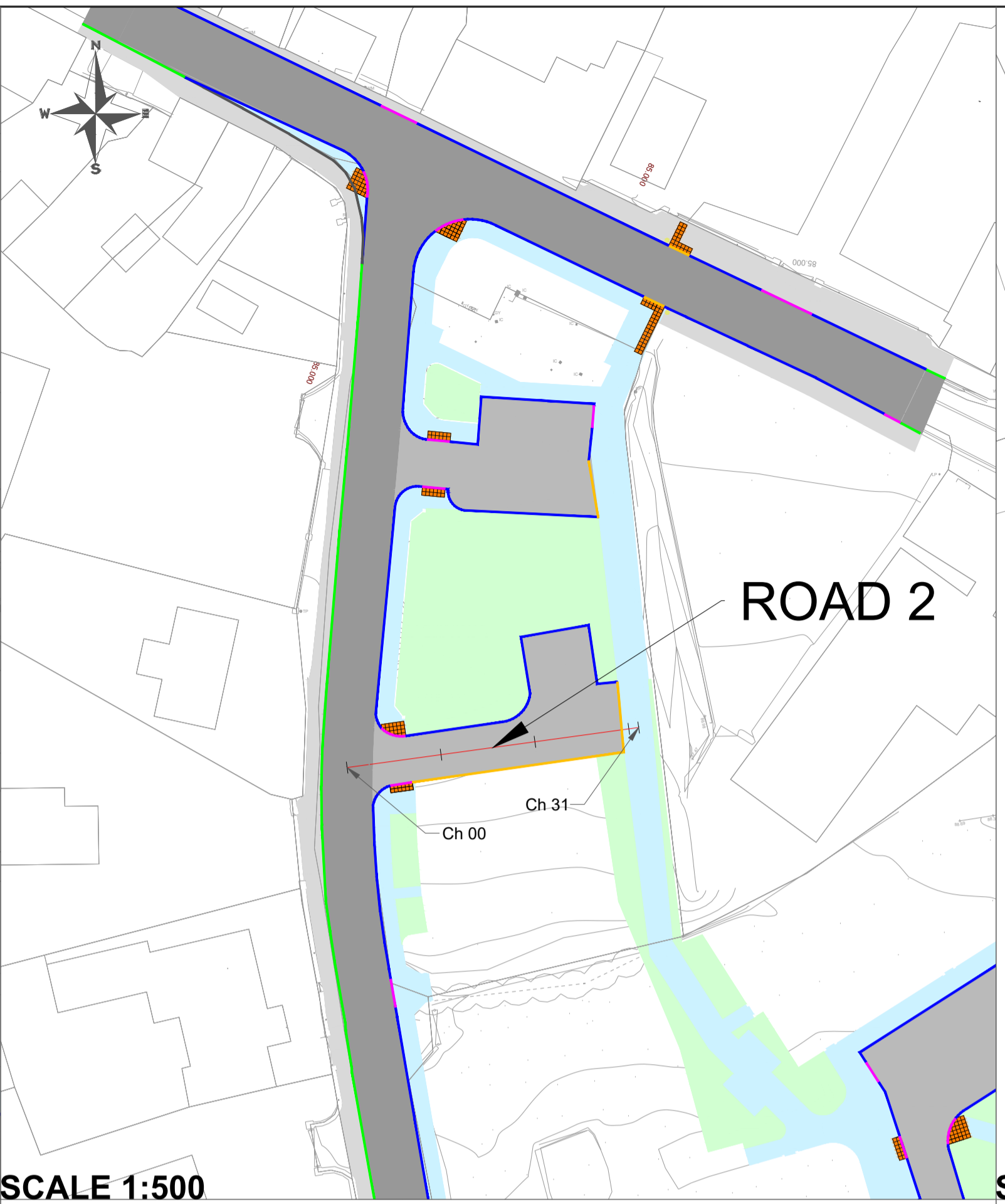
- EXISTING GROUND (GREEN)
- PROPOSED CENTRELINE (RED)

No.	Revision	Date	By	Chk'd	App'd
Designed: DS	Checked: AC	Approved:			

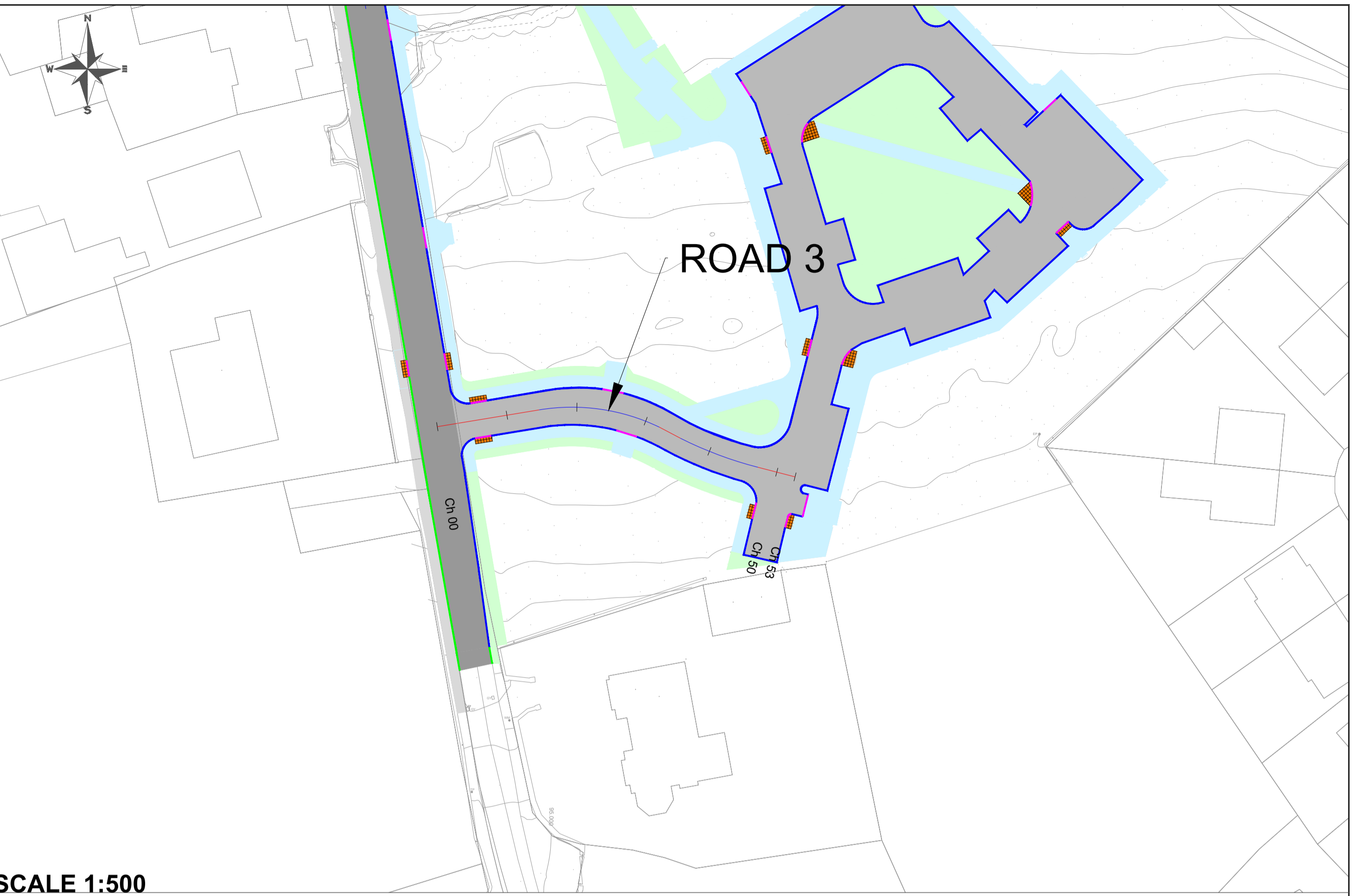
Project Title: DERRY ROAD, DURROW			
Drawing Title: LONGITUDINAL SECTIONS- SHEET 2 OF 5 (DERRY ROAD)			
Drawn by: EH	Sheet Size: A1	Scale: 1:500	Date: September '23
Drawing Number: 23071-01-0118		Revision:	



SCALE 1:500

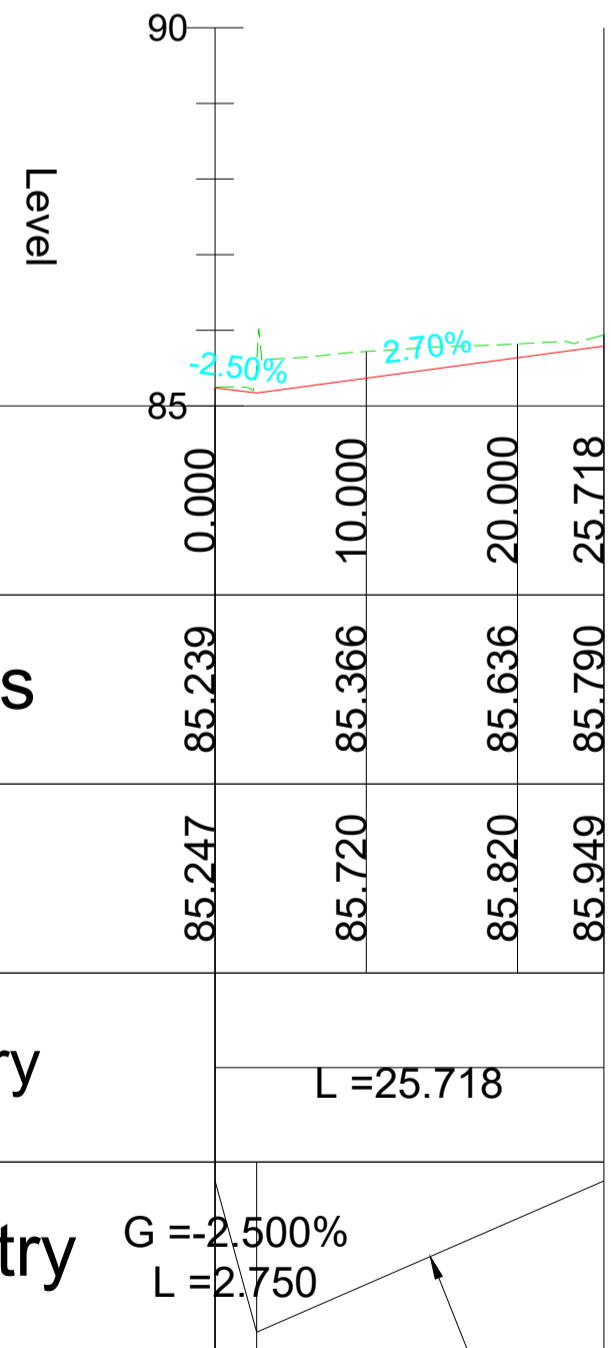


SCALE 1:500



SCALE 1:500

H_ROAD 1_CL_01 - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 85.000

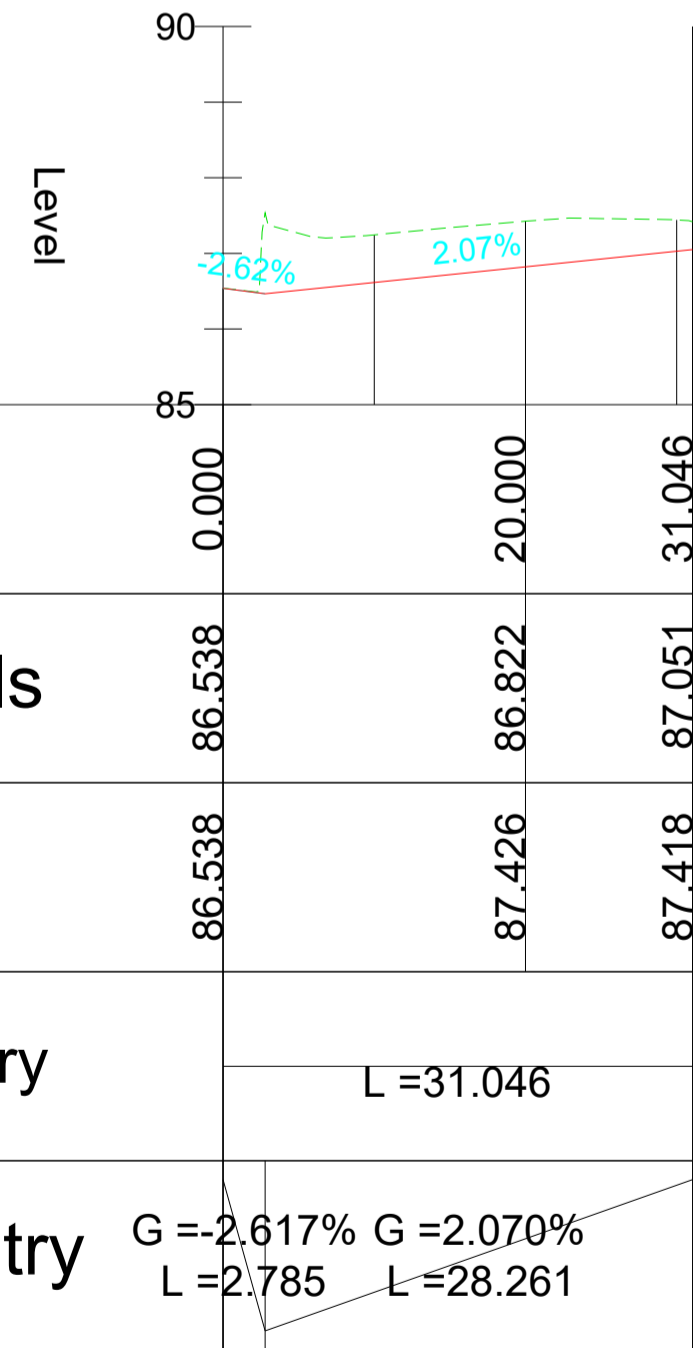


Chainage	0.000	10.000	20.000	25.718
Proposed Levels	85.239	85.366	85.636	85.790
Existing Levels	85.247	85.720	85.820	85.949
Horizontal Geometry	L = 25.718			
Vertical Geometry	G = -2.500% L = 2.750			

G = 2.700%
L = 22.968

SCALE 1:500

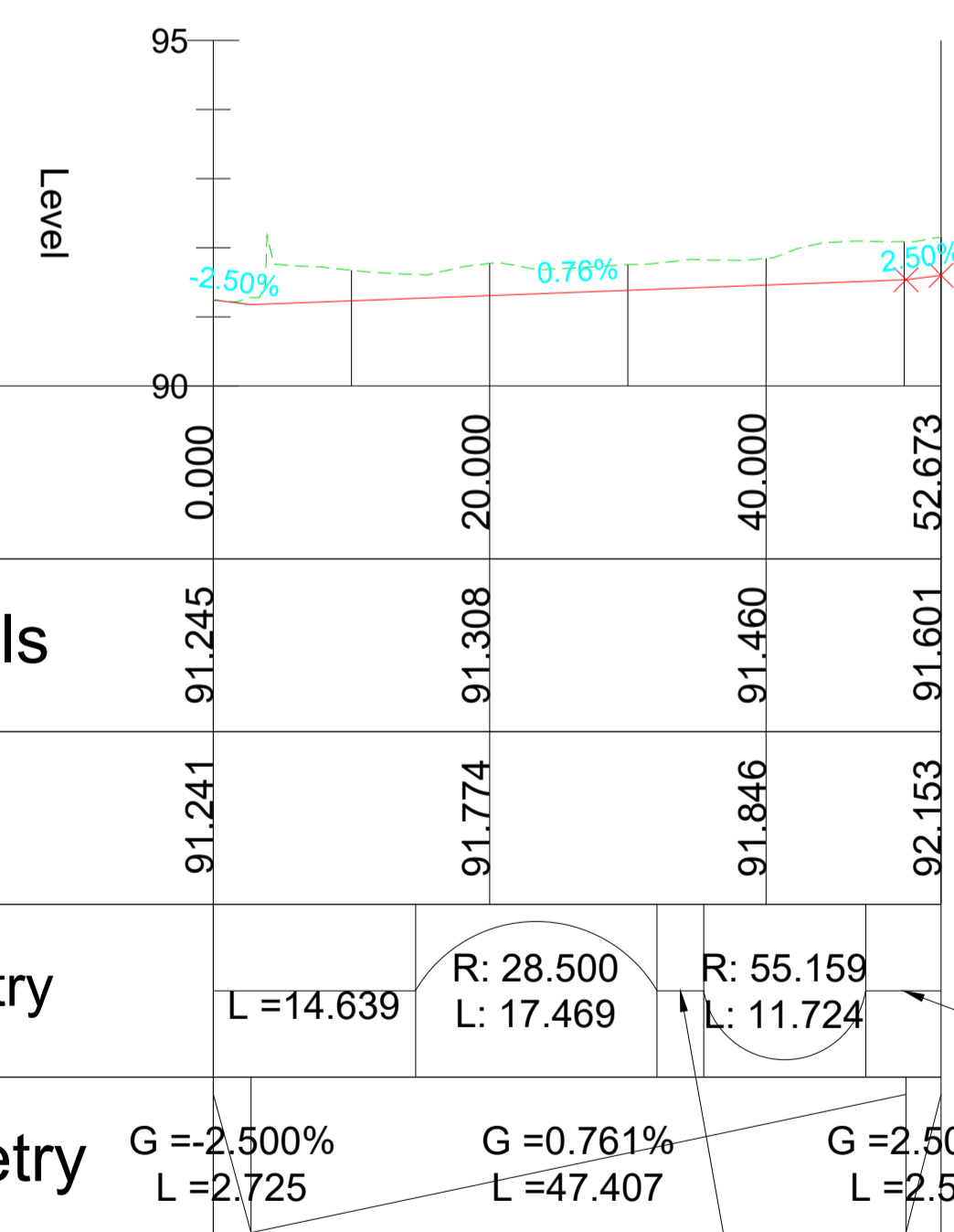
H_ROAD 2_CL_01 - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 85.000



Chainage	0.000	20.000	31.046
Proposed Levels	86.538	86.822	87.051
Existing Levels	86.538	87.426	87.418
Horizontal Geometry	L = 31.046		
Vertical Geometry	G = -2.617% G = 2.070% L = 2.785 L = 28.261		

SCALE 1:500

H_ROAD 3_CL_01 - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 90.000



Chainage	0.000	20.000	40.000	52.673
Proposed Levels	91.245	91.308	91.460	91.601
Existing Levels	91.241	91.774	91.846	92.153
Horizontal Geometry	L = 14.639		R: 28.500 L: 17.469	R: 55.159 L: 11.724
Vertical Geometry	G = -2.500% L = 2.725		G = 0.761% L = 47.407	G = 2.500% L = 2.541

L = 3.388

SCALE 1:500

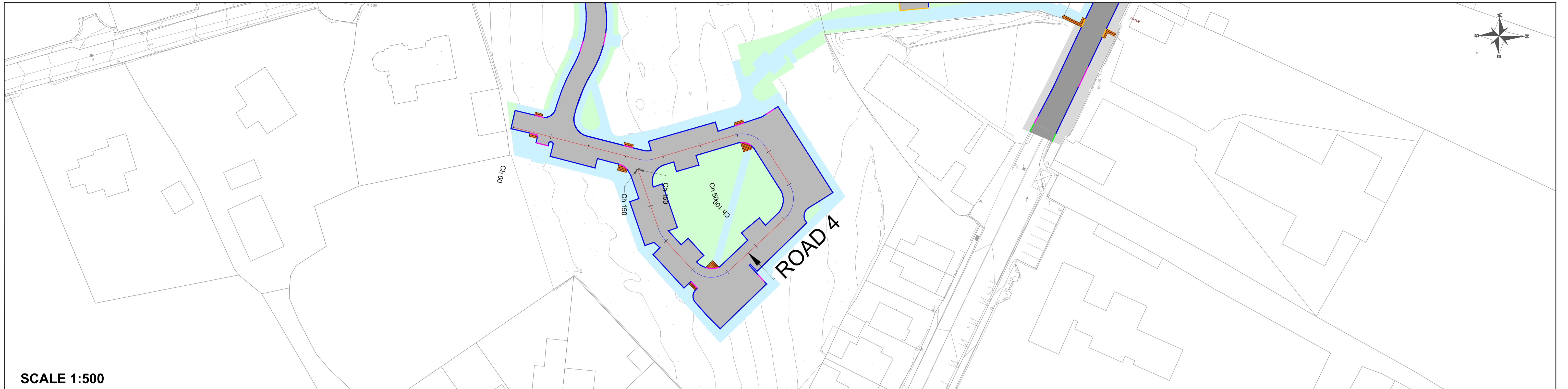
An Ghníomhaireacht
Tithíochta
The Housing Agency

7 Ormonde Road,
Kilkenny
Tel: +353(0)567795800
e-mail: info@roadplan.ie

Tionscadal Éireann
Project Ireland
2040

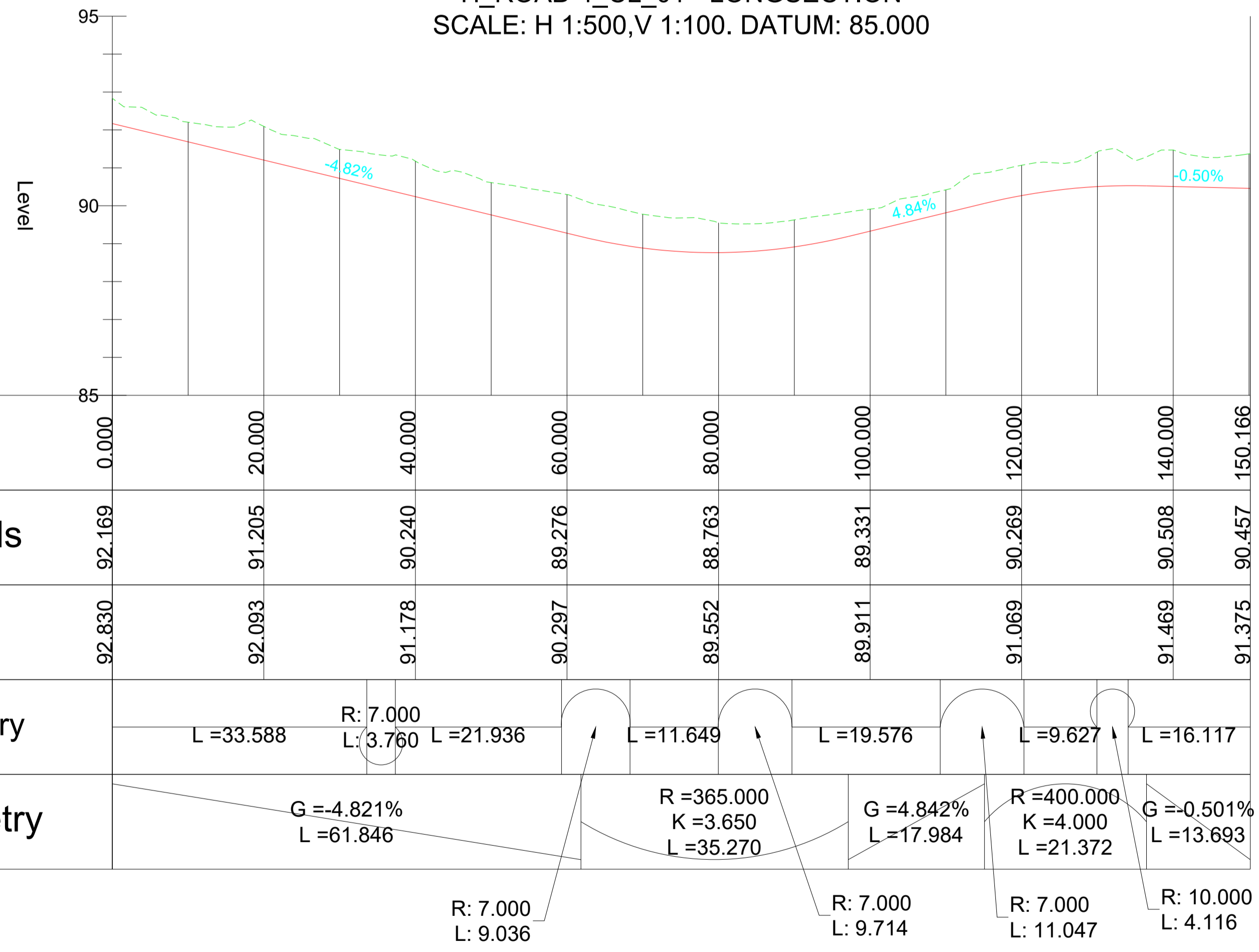
Laois County Council
Áras an Chonraithe,
James Fintan Lalor Ave,
Portlaoise, Co. Laois,
R32 EHP9

Project Title:			
LONGITUDINAL SECTIONS- SHEET 3 OF 5 (INTERNAL ROAD 1,2,3)			
Drawn by: EH	Sheet Size:	Scale:	Date:
No. Designed: DS	Revision Checked: AC	Date Approved:	By Chk'd App'd



SCALE 1:500

H_ROAD 4_CL_01 - LONGSECTION
SCALE: H 1:500,V 1:100. DATUM: 85.000



Chainage	Proposed Levels	Existing Levels	Horizontal Geometry	Vertical Geometry
0.000	92.169	92.830	L=33.588	G = -4.821% L = 61.846
20.000	91.205	92.093		
40.000	90.240	91.178	R: 7.000 L: 3.760	R = 365.000 K = 3.650 L = 35.270
60.000	89.276	90.297	L = 21.936	
80.000	88.763	89.552	L = 11.649	G = 4.842% L = 17.984
100.000	89.331	89.911	L = 19.576	
120.000	90.269	91.069	L = 9.627	R = 400.000 K = 4.000 L = 21.372
140.000	90.508	91.469	L = 16.117	G = -0.501% L = 13.693
150.166	90.457	91.375		

SCALE 1:500

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The Housing Agency

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Áras an Chontae,
James Finlan Lalor Ave,
Portlaoise, Co. Laois,
R32 EHP9

LEGEND

- EXISTING GROUND (GREEN)
- PROPOSED CENTRELINE (RED)

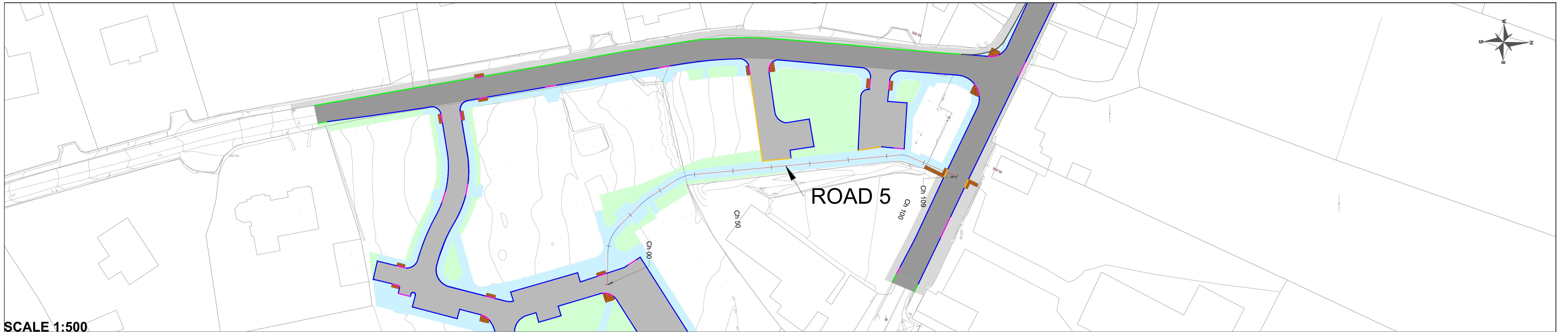
No.	Revision	Date	By	Chk'd	App'd

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **LONGITUDINAL SECTIONS- SHEET 4 OF 5 (INTERNAL ROAD 4)**

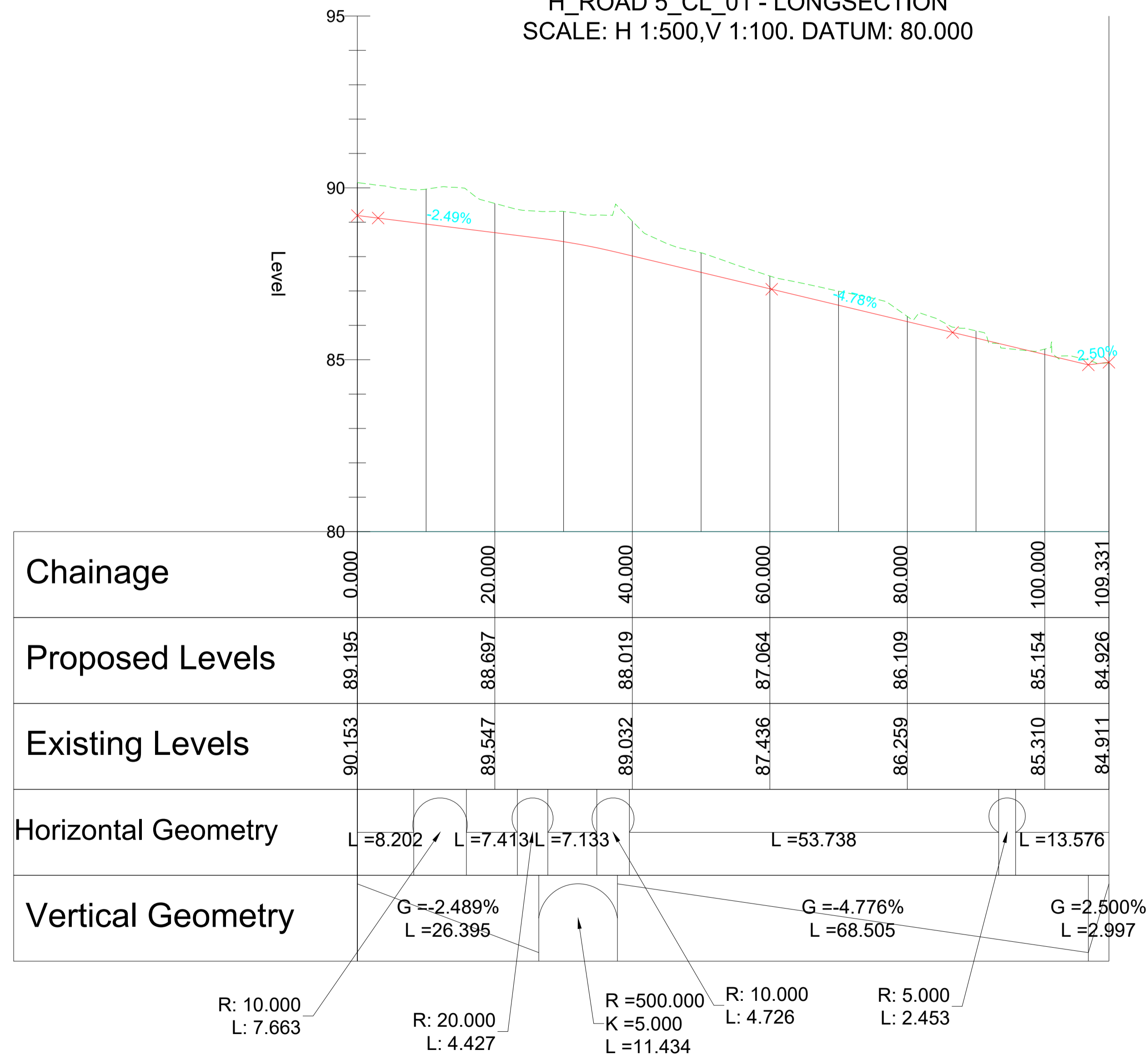
Drawn by: EH | Sheet Size: A1 | Scale: 1:500 | Date: September '23

Drawing Number: 23047-01-0120 | Revision:



SCALE 1:500

H_ROAD 5_CL_01 - LONGSECTION
SCALE: H 1:500, V 1:100. DATUM: 80.000



SCALE 1:500



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2040



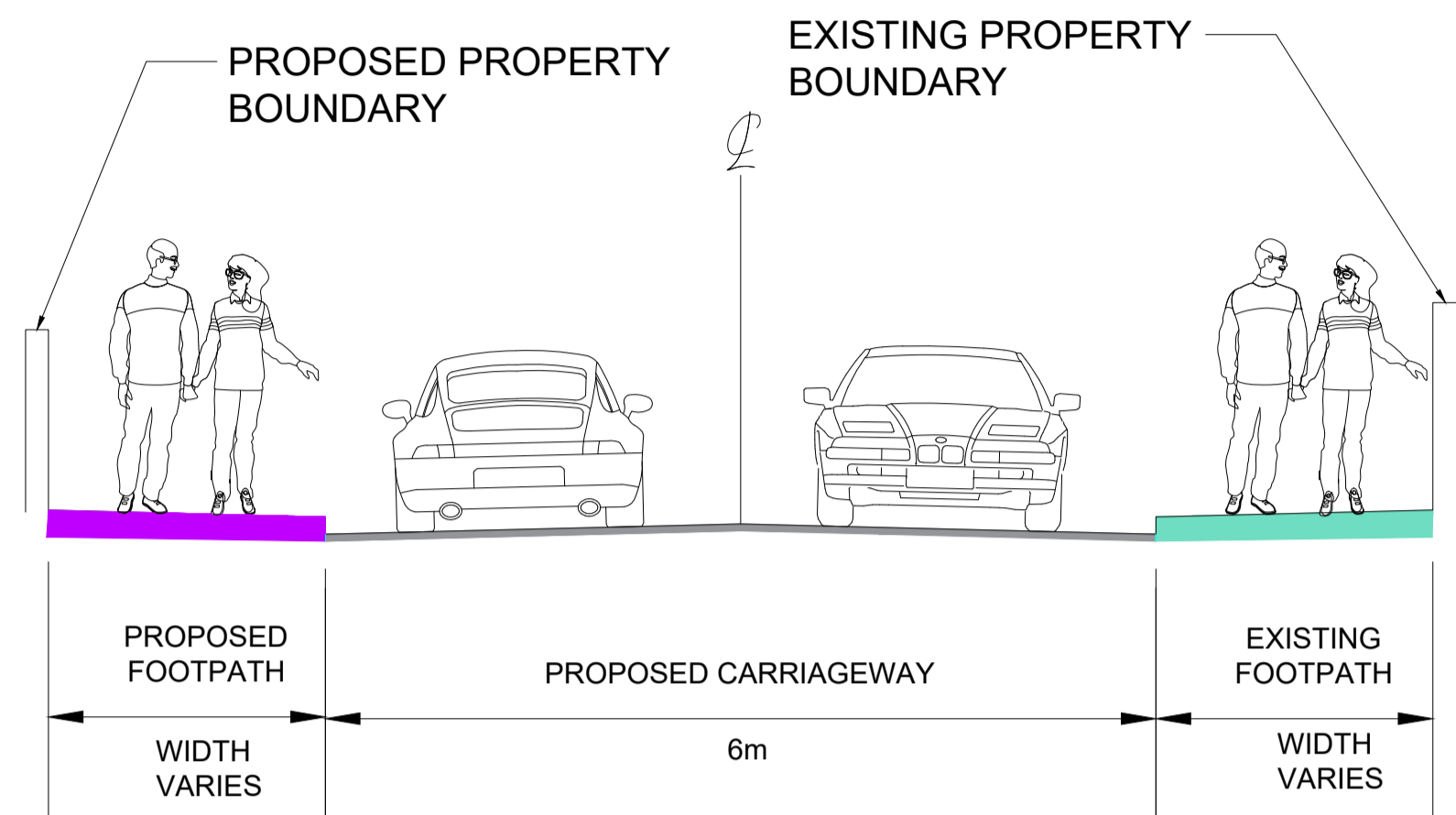
Laois County Council
Áras an Chontae,
James Finlan Lalor Ave,
Portlaoise, Co. Laois,
R32 EHP9

LEGEND

- EXISTING GROUND (GREEN)
- PROPOSED CENTRELINE (RED)

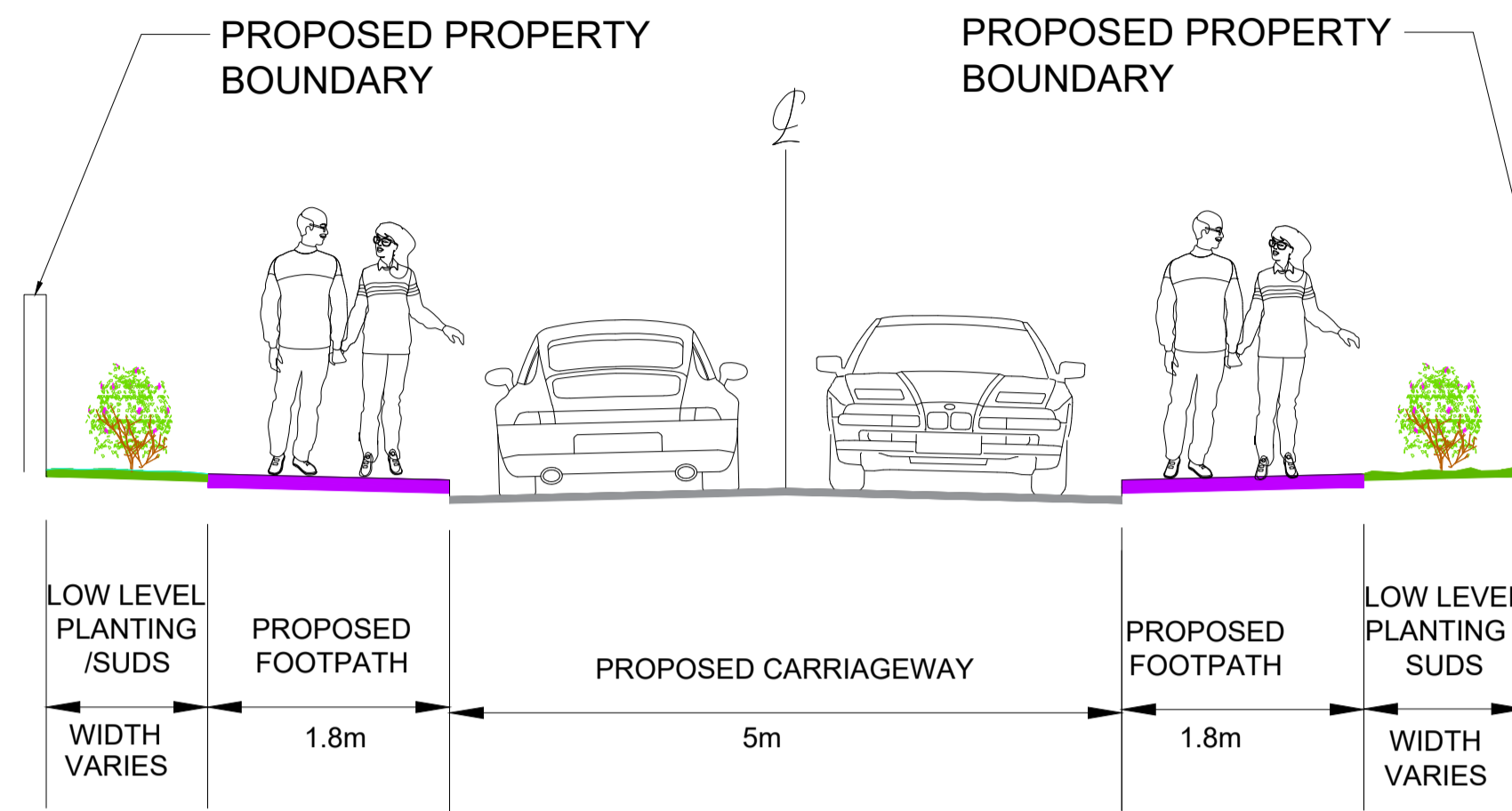
No.	Revision	Date	By	Chk'd	App'd

Project Title: DERRY ROAD, DURROW	
Drawing Title: LONGITUDINAL SECTIONS- SHEET 5 OF 5 (ACTIVE TRAVEL CONNECTION)	
Drawn by: EH	Date: September '23
Sheet Size: A1	Scale: 1:500
Drawing Number: 23047-01-0121	Revision:



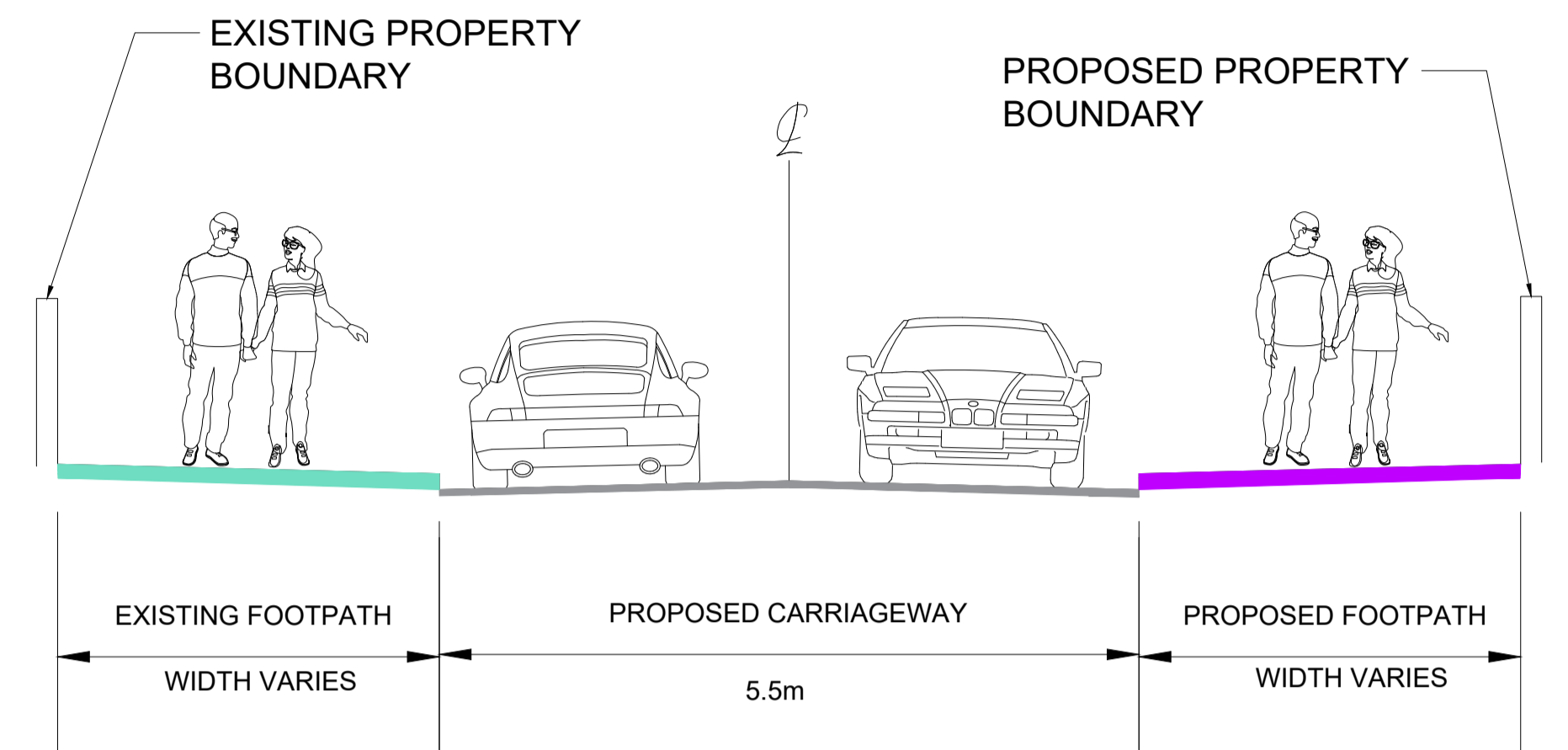
SECTION 1: N77 CH. 55 (N.T.S.)

SCALE 1:50



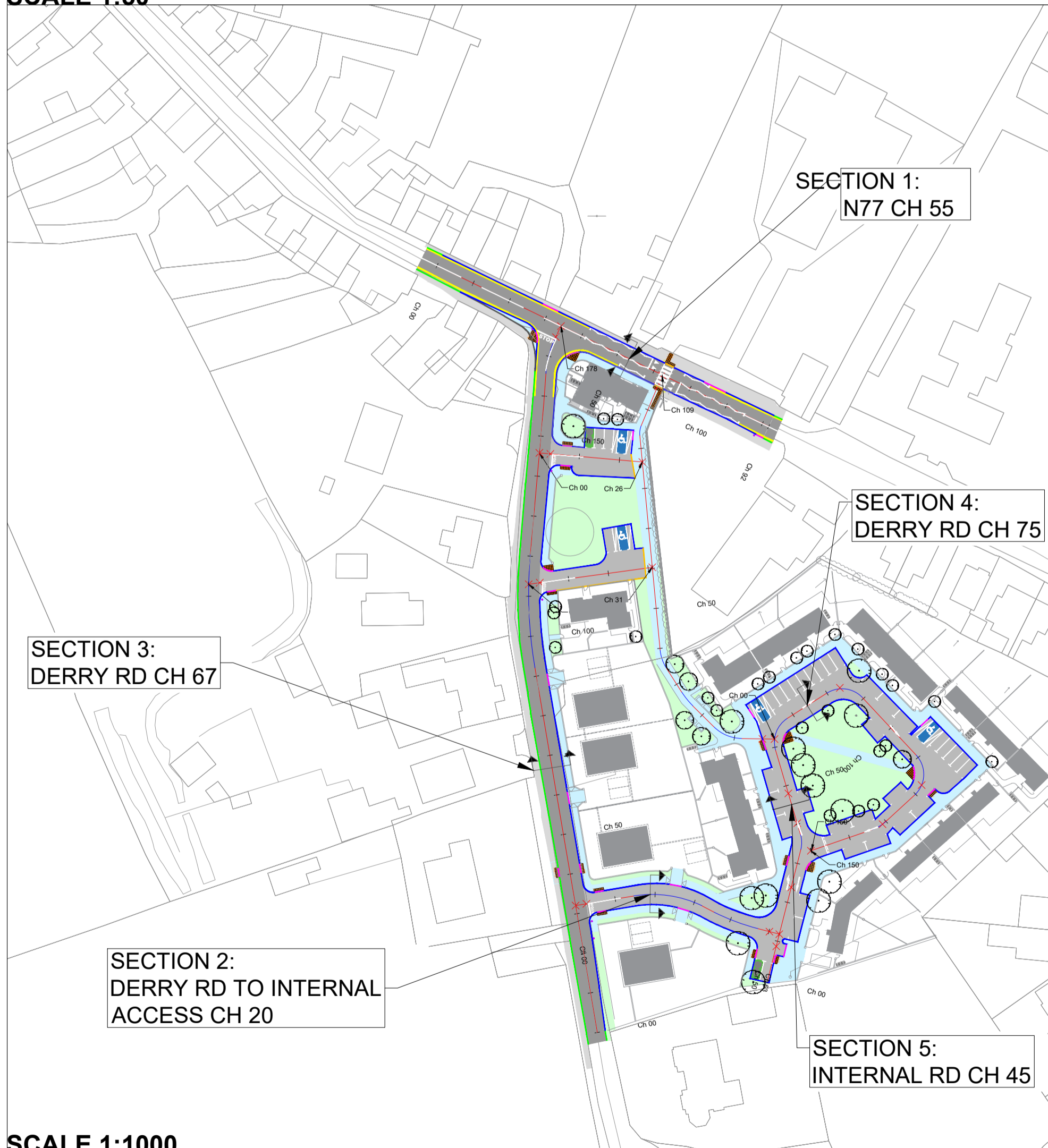
SECTION 2: DERRY ROAD TO INTERNAL ACCESS CH. 20 (N.T.S.)

SCALE 1:50

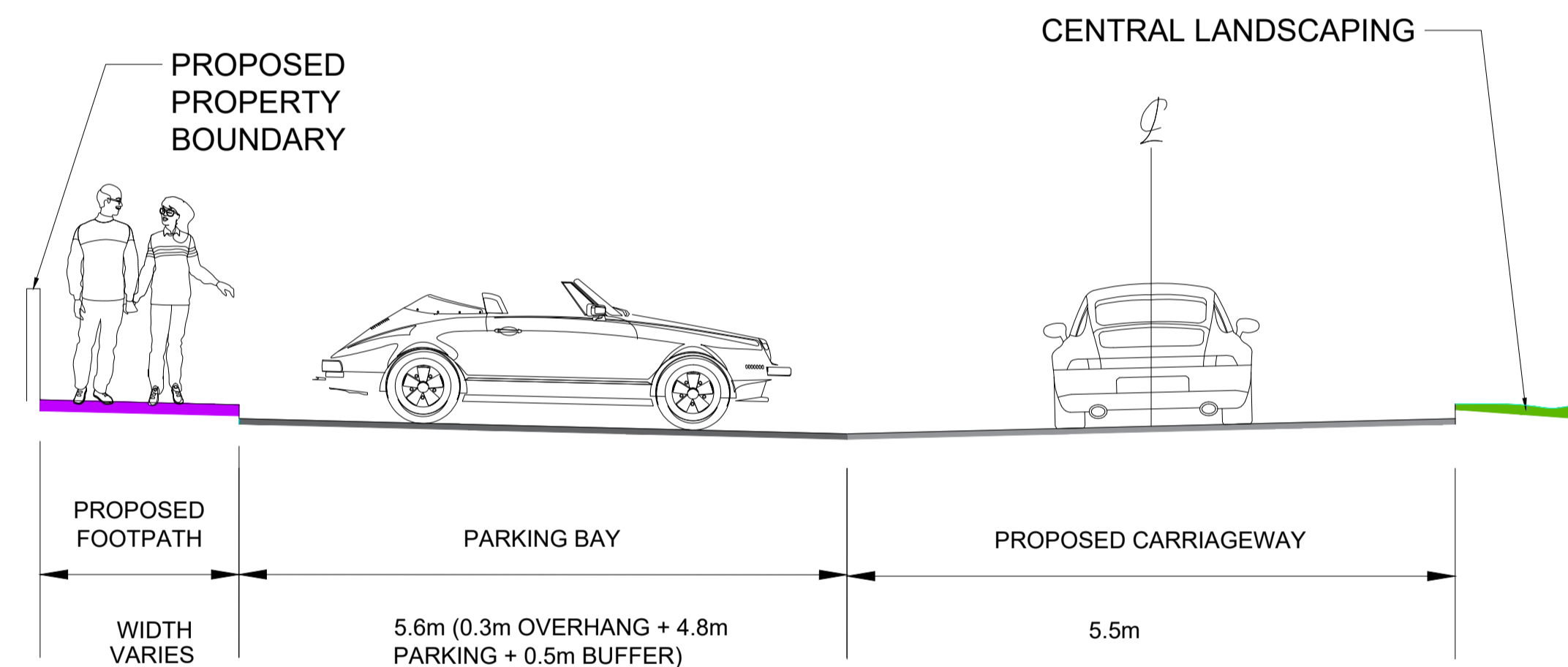


SECTION 3: DERRY ROAD CH. 67 (N.T.S.)

SCALE 1:50

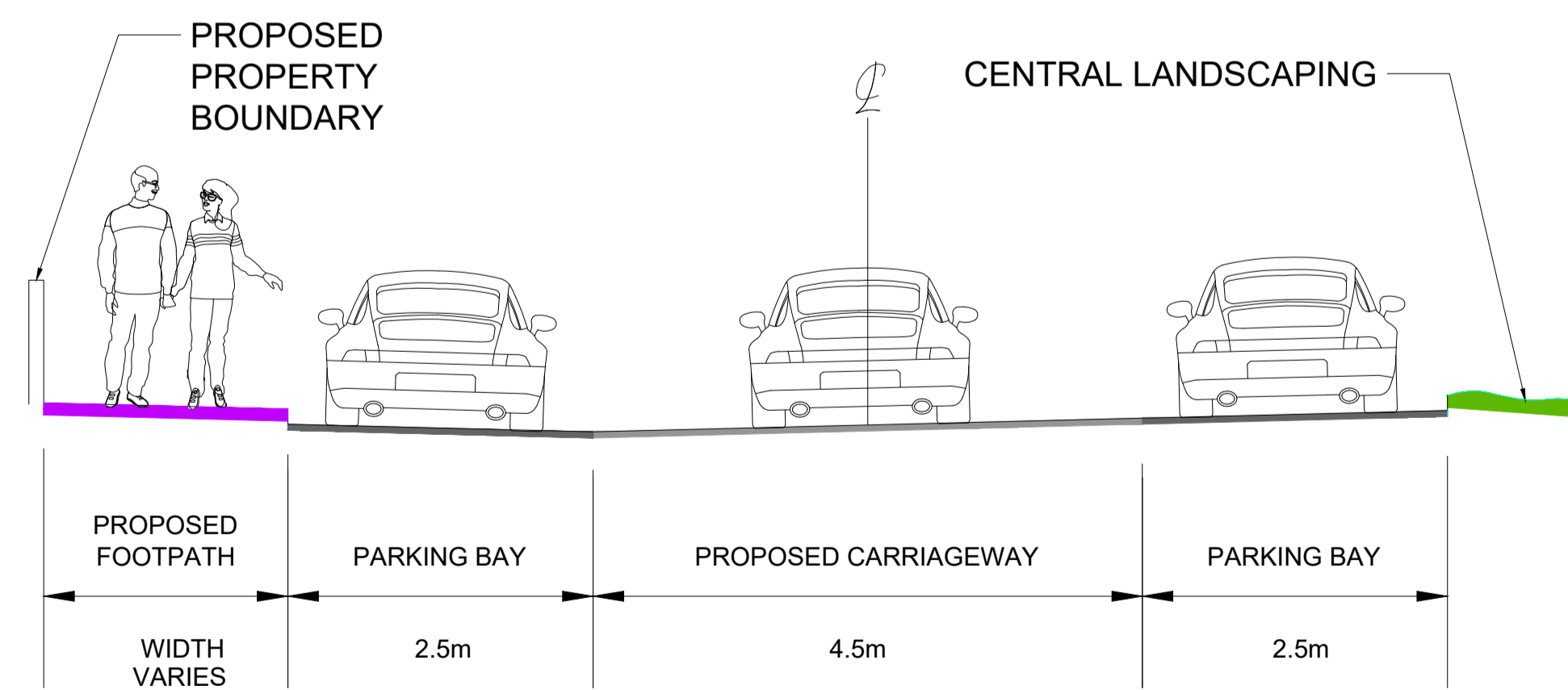


SCALE 1:1000



SECTION 4: INTERNAL ROADWAY CH. 75 (N.T.S.)

SCALE 1:50



SECTION 5: INTERNAL ROADWAY CH. 45 (N.T.S.)

SCALE 1:50

LEGEND



An Ghníomhaireacht Tithíochta The Housing Agency



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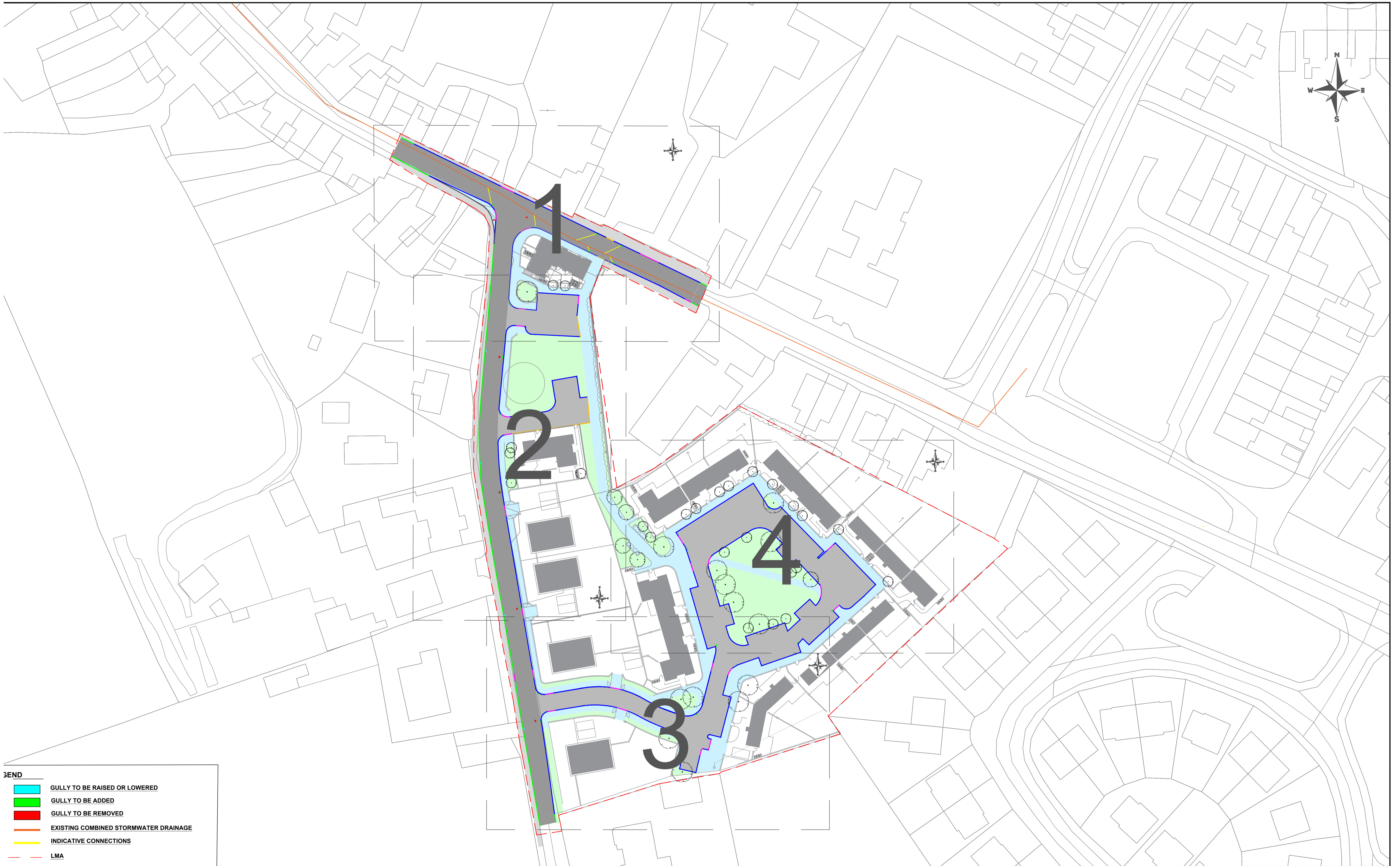


Tionscadal Éireann Project Ireland 2040



Laois County Council
Áras an Chiontae, James Fintan Lalor Ave, Portlaoise, Co. Laois, R32 EHP9

Project Title: DERRY ROAD, DURROW			
Drawing Title: CROSS SECTIONS - SHEET 1 OF 1			
Drawn by: TON	Sheet Size: A1	Scale: As Shown	Date: September '23
Designed: TON		Checked: AC	Approved: _____
Drawing Number: 23071-01-0125		Revision: -	



3END

- GULLY TO BE RAISED OR LOWERED
- GULLY TO BE ADDED
- GULLY TO BE REMOVED
- EXISTING COMBINED STORMWATER DRAINAGE
- INDICATIVE CONNECTIONS
- LMA

- NOTES**
1. The contractor shall establish the location of the existing surface water sewers and combined sewers to ensure optimum connection points are determined.
 2. The locations of ironwork, identified in the topographical survey to be raised or lowered to proposed levels are shown on the drawing.
 3. In his inspection of the site the contractor should check for additional ironwork and should assume that it too will be required to be raised or lowered.
 4. The covers should be set to match the level of adjacent road, footpath, paved areas and verge as appropriate.
 5. All proposed and modified gullies along the N77 and Derry Road are to be connected to the existing drainage network. New gullies within the proposed development are to be connected to the drainage network to be provided by others.

No.	Revision	Date	By	Chk'd	App'd

Designed: DS Checked: AC Approved: AC

Project Title: **DERRY ROAD, DURROW**

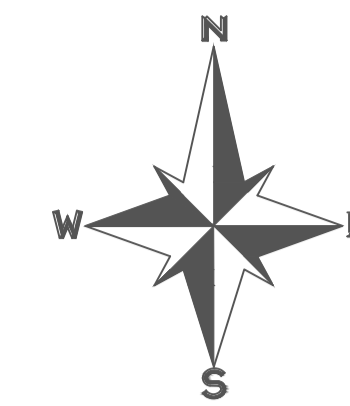
Drawing Title: **PROPOSED DRAINAGE - OVERVIEW**

Drawn by: EH	Sheet Size: A1	Scale: 1:500	Date: September '23
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Drawing Number: 23071-01-0500 Revision: -

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LEGEND

- GULLY TO BE RAISED OR LOWERED
- GULLY TO BE ADDED
- GULLY TO BE REMOVED
- EXISTING COMBINED STORMWATER DRAINAGE
- INDICATIVE CONNECTIONS
- LMA

NOTES

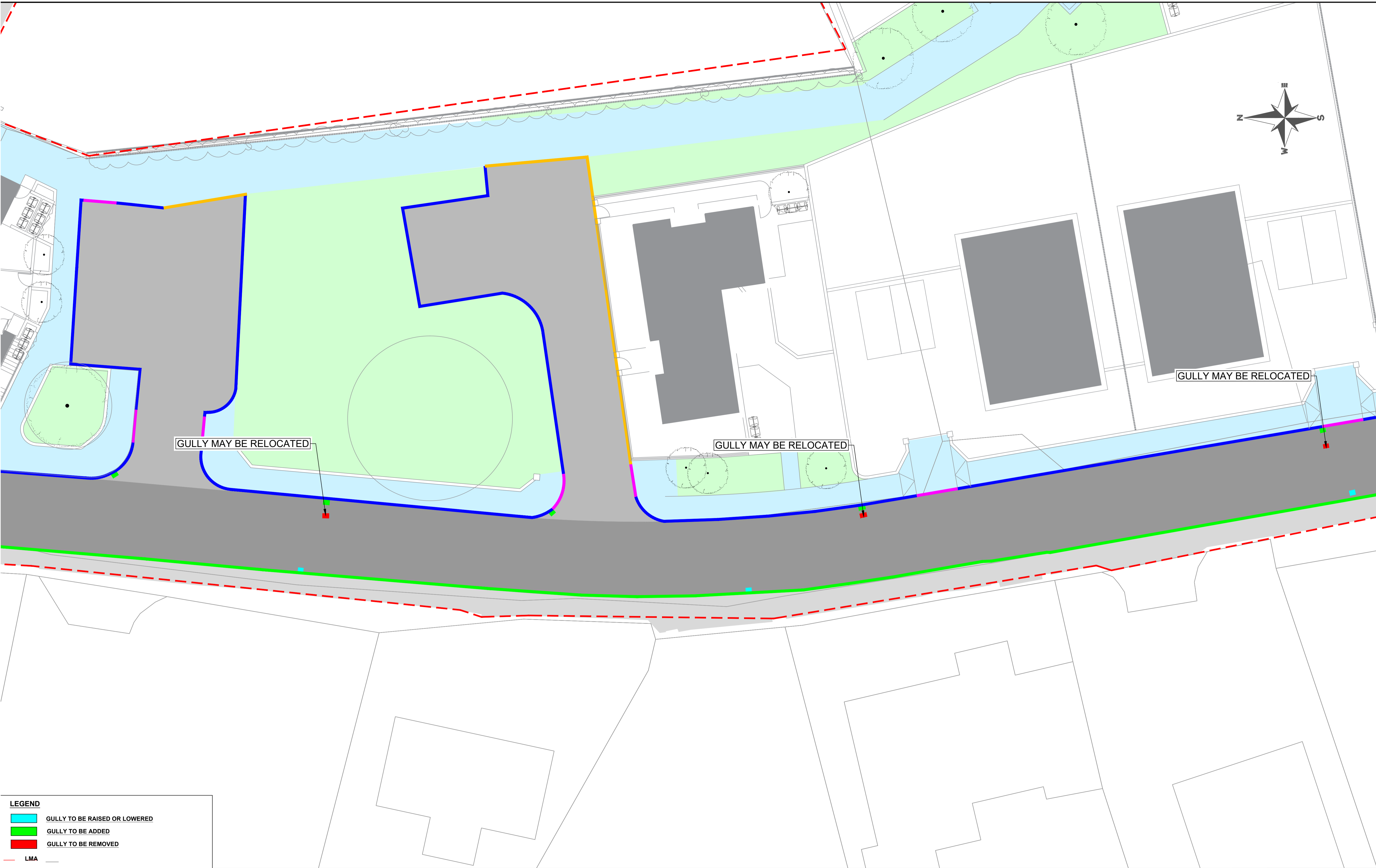
1. The contractor shall establish the location of the existing surface water sewers and combined sewers to ensure optimum connection points are determined.
2. The locations of ironwork, identified in the topographical survey to be raised or lowered to proposed levels are shown on the drawing.
3. In his inspection of the site the contractor should check for additional ironwork and should assume that it too will be required to be raised or lowered.
4. The covers should be set to match the level of adjacent road, footpath, paved areas and verge as appropriate.
5. All proposed and modified gullies along the N77 and Derry Road are to be connected to the existing drainage network. New gullies within the proposed development are to be connected to the drainage network to be provided by others.

No.	Revision	Date	By	Chk'd	App'd

Project Title: DERRY ROAD, DURROW

Drawing Title: PROPOSED DRAINAGE - SHEET 1 OF 4

Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-0501		Revision: -	



LEGEND

- GULLY TO BE RAISED OR LOWERED
- GULLY TO BE ADDED
- GULLY TO BE REMOVED

— LMA

NOTES

1. The contractor shall establish the location of the existing surface water sewers and combined sewers to ensure optimum connection points are determined.
2. The locations of ironwork, identified in the topographical survey to be raised or lowered to proposed levels are shown on the drawing.
3. In his inspection of the site the contractor should check for additional ironwork and should assume that it too will be required to be raised or lowered.
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5. All proposed and modified gullies along the N77 and Derry Road are to be connected to the existing drainage network. New gullies within the proposed development are to be connected to the drainage network to be provided by others.

No.	Revision	Date	By	Chk'd	App'd

Project Title: DERRY ROAD, DURROW

Drawing Title: PROPOSED DRAINAGE - SHEET 2 OF 4

Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-0502		Revision: -	




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Project Ireland
2040



Laois County Council
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Portlaoise, Co. Laois,
R32 EHP9



GULLY MAY BE RELOCATED

GULLY MAY BE RELOCATED

LEGEND

- GULLY TO BE RAISED OR LOWERED
- GULLY TO BE ADDED
- GULLY TO BE REMOVED
- LMA

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2040
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 Project Ireland

Laois County Council
 Áras an Chonlae,
 James Finlan Lator Ave,
 Portlaoise, Co. Laois,
 R32 EHP9

- NOTES**
- The contractor shall establish the location of the existing surface water sewers and combined sewers to ensure optimum connection points are determined.
 - The locations of ironwork, identified in the topographical survey to be raised or lowered to proposed levels are shown on the drawing.
 - In his inspection of the site the contractor should check for additional ironwork and should assume that it too will be required to be raised or lowered.
 - The covers should be set to match the level of adjacent road, footpath, paved areas and verge as appropriate.
 - All proposed and modified gullies along the N77 and Derry Road are to be connected to the existing drainage network. New gullies within the proposed development are to be connected to the drainage network to be provided by others.

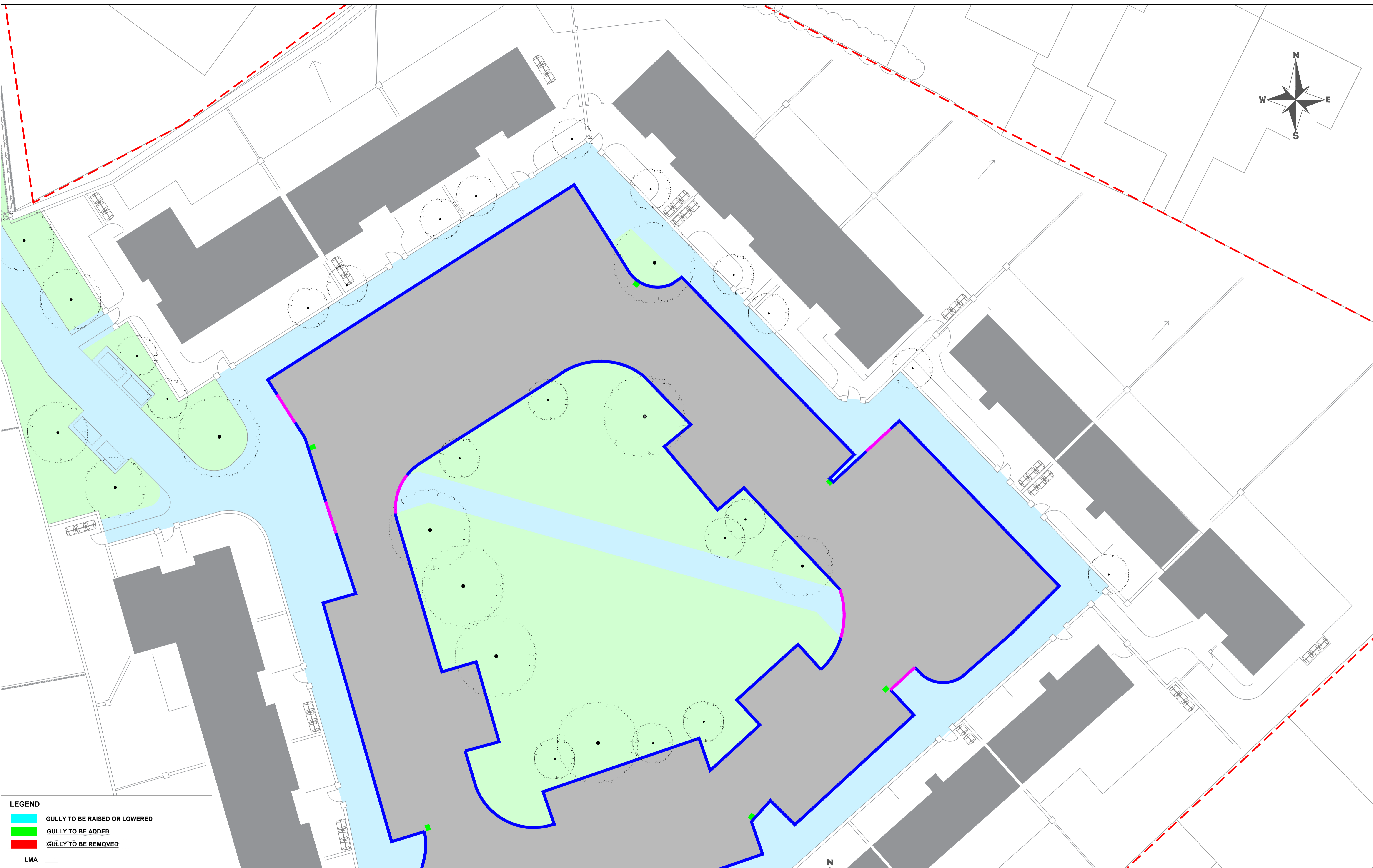
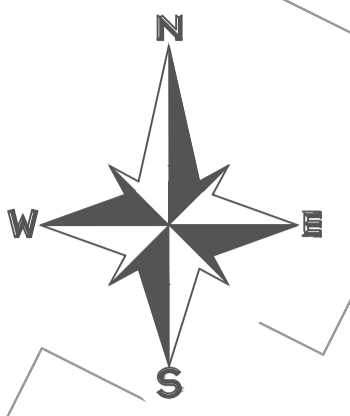
No.	Revision	Date	By	Chk'd	App'd

Designed: EH Checked: AC Approved: AC

Project Title: DERRY ROAD, DURROW

Drawing Title: PROPOSED DRAINAGE - SHEET 3 OF 4

Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-0503	Revision: -		



LEGEND

	GULLY TO BE RAISED OR LOWERED
	GULLY TO BE ADDED
	GULLY TO BE REMOVED
	LMA

- NOTES**
- The contractor shall establish the location of the existing surface water sewers and combined sewers to ensure optimum connection points are determined.
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 - In his inspection of the site the contractor should check for additional ironwork and should assume that it too will be required to be raised or lowered.
 - The covers should be set to match the level of adjacent road, footpath, paved areas and verge as appropriate.
 - All proposed and modified gullies along the N77 and Derry Road are to be connected to the existing drainage network. New gullies within the proposed development are to be connected to the drainage network to be provided by others.

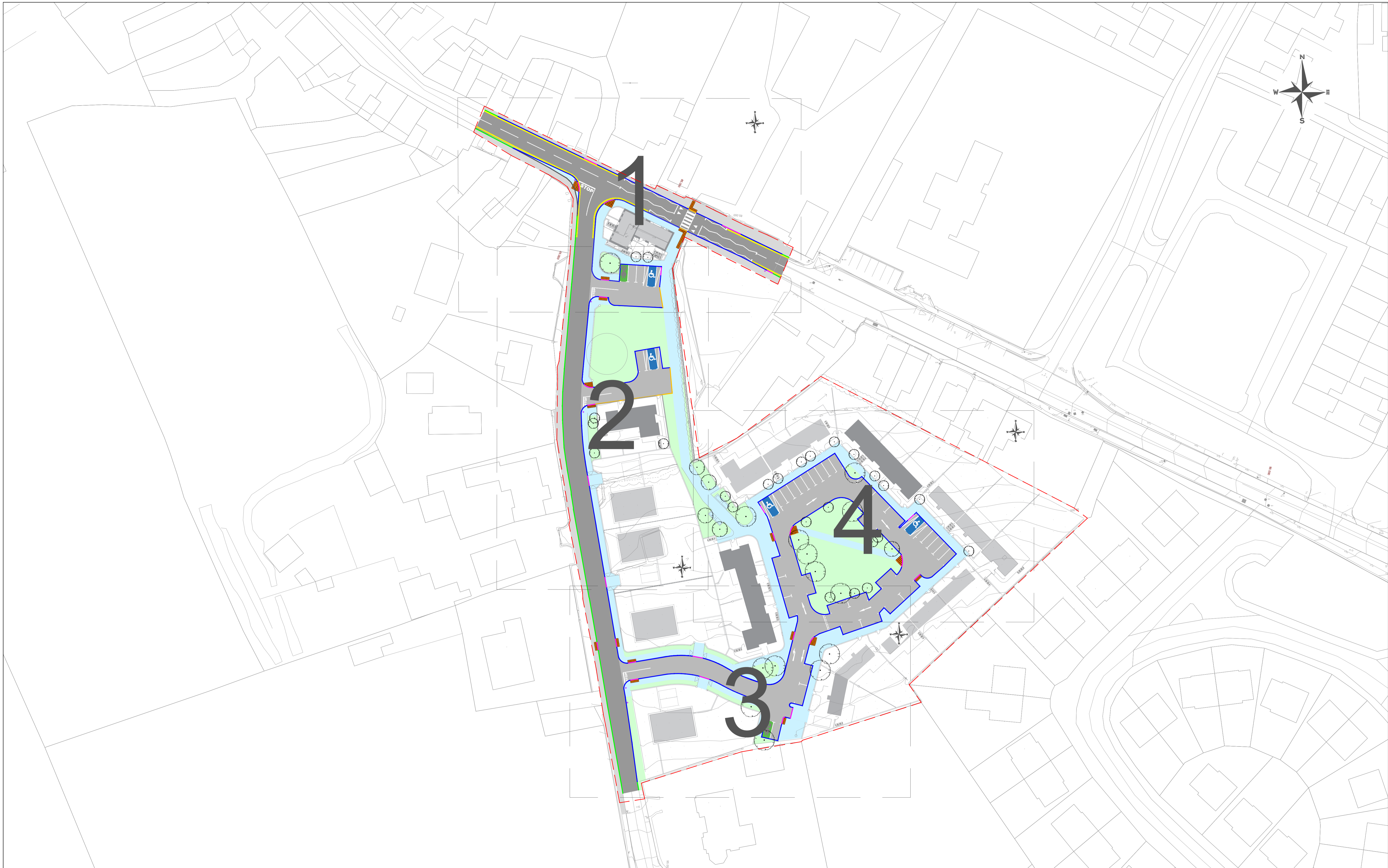
No.	Revision	Date	By	Chk'd	App'd

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **PROPOSED DRAINAGE - SHEET 4 OF 4**

Drawn by: EH	Sheet Size: A1	Scale: 1:500	Date: September '23
Drawing Number: 23071-01-0504	Revision: -		

<p>ROADPLAN CONSULTING</p>	<p>7 Ormonde Road, Kilkenny Tel: +353(0)567795800 e-mail: info@roadplan.ie</p>		<p>Laois County Council Áras an Chonlae, James Finlan Lator Ave, Portlaoise, Co. Laois, R32 EHP9</p>
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LEGEND

PROPOSED ROAD SURFACE	PROPOSED KERB
EXISTING ROAD SURFACE	DROPPED KERB
PROPOSED FOOTPATH / PUBLIC REALM	FLUSH KERB
EXISTING FOOTPATH / PUBLIC REALM	EXISTING KERB TO BE RETAINED
PROPOSED SUDS / LANDSCAPING	EXISTING KERB TO BE REMOVED
PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING	LMA

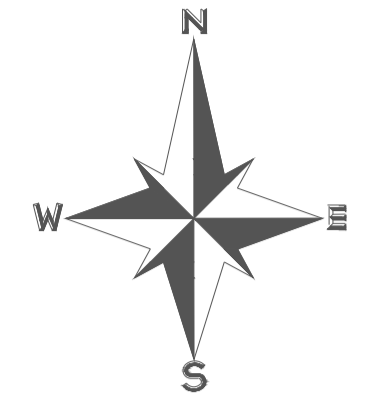
No.	Revision	Date	By	Chk'd	App'd

Designed: EH Checked: AC Approved: AC

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **KERBS FOOTPATHS & PAVED AREAS -Overview**

Drawn by: EH	Sheet Size: A1	Scale: 1:500	Date: September '23
Drawing Number: 23071-01-1100			Revision: -



TIE INTO EXISTING PAVEMENT

4.5M CORNER RADII

2.4M WIDE RAISED ZEBRA CROSSING WITH BELISHA BEACON

RETAIN EXISTING FOOTPATH

WIDEN N77 TO 6M CARRIAGEWAY

UNCONTROLLED CROSSING

STOP

85'000

85'000

6M CORNER RADII

5.5M NEW CARRIAGEWAY

No. 2 PARKING SPACES

1.8M WIDE NEW FOOTPATH

TIE INTO EXISTING FOOTPATH

85'000

RETAIN EXISTING FOOTPATH

1 No Disabled Parking bay RRM015
6m x 2.4m . 1.2m Buffer zones

SHARED SPACE

TIE INTO EXISTING PAVEMENT

STOP

1 No Electric Vehicle Recharging Bay RRM 034
5m x 2.4m each

LEGEND	
	PROPOSED ROAD SURFACE
	EXISTING ROAD SURFACE
	PROPOSED FOOTPATH / PUBLIC REALM
	EXISTING FOOTPATH / PUBLIC REALM
	PROPOSED SUDS / LANDSCAPING
	PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
	PROPOSED KERB
	DROPPED KERB
	FLUSH KERB
	EXISTING KERB TO BE RETAINED
	EXISTING KERB TO BE REMOVED
	LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: EH	Checked: AC	Approved: AC
--------------	-------------	--------------

Project Title: DERRY ROAD, DURROW			
Drawing Title: KERBS FOOTPATHS & PAVED AREAS -SHEET 1 OF 4			
Drawn by: EH	Sheet Size: A1	Scale: 1:25	Date: September '23
Drawing Number: 23071-01-1101	Revision: -		



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Títhíochta
The Housing Agency



7 Ormonde Road,
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e-mail: info@roadplan.ie



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Laois County Council
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Portlaoise, Co. Laois,
R32 EHP9

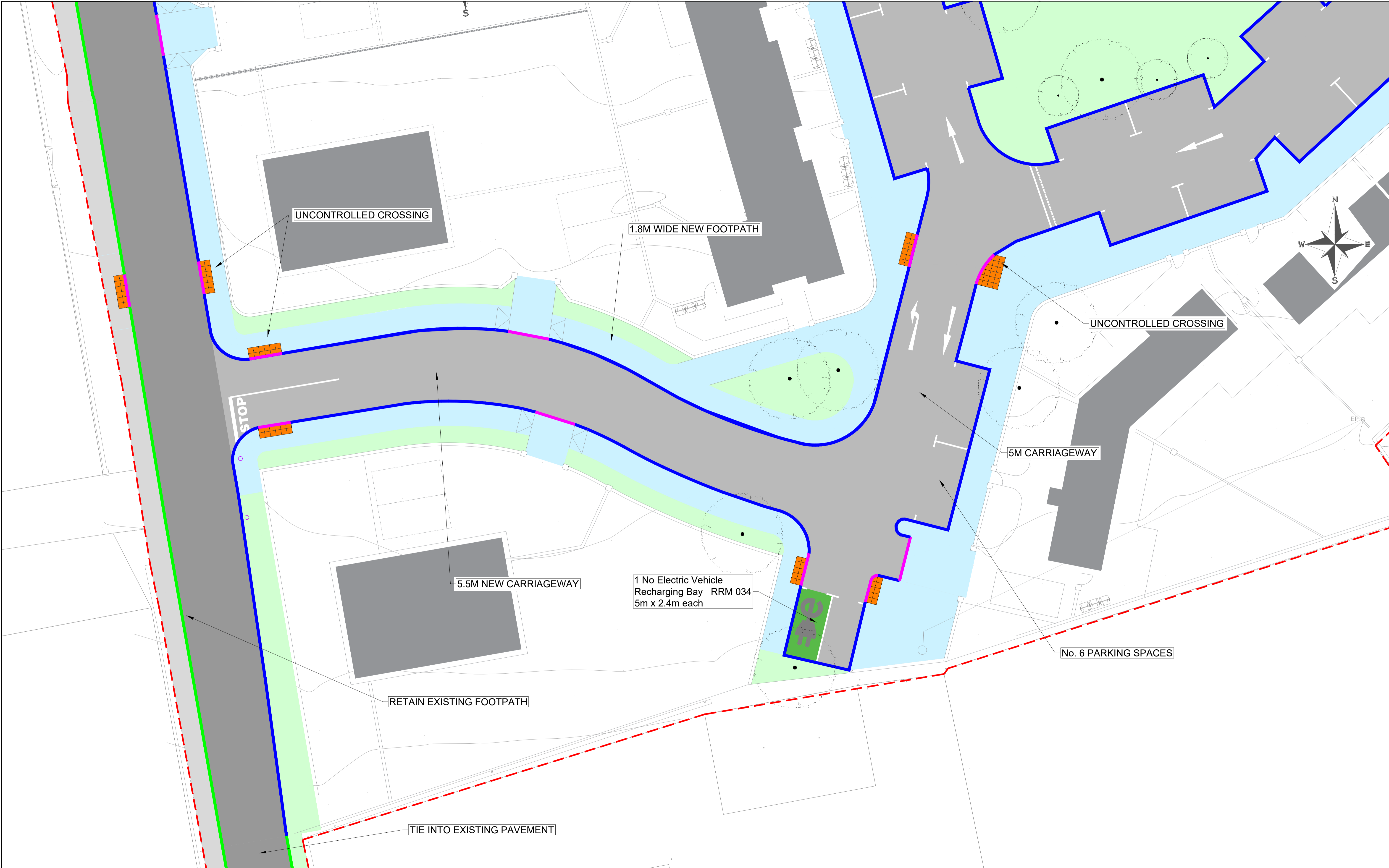
LEGEND

- PROPOSED ROAD SURFACE
- EXISTING ROAD SURFACE
- PROPOSED FOOTPATH / PUBLIC REALM
- EXISTING FOOTPATH / PUBLIC REALM
- PROPOSED SUDS / LANDSCAPING
- PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
- PROPOSED KERB
- DROPPED KERB
- FLUSH KERB
- EXISTING KERB TO BE RETAINED
- EXISTING KERB TO BE REMOVED
- LMA

No.	Revision	Date	By	Chk'd	App'd

Project Title: DERRY ROAD, DURROW			
Drawing Title: KERBS FOOTPATHS & PAVED AREAS -SHEET 2 OF 4			
Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-1102		Revision: -	

Designed: EH Checked: AC Approved: AC



UNCONTROLLED CROSSING

1.8M WIDE NEW FOOTPATH

UNCONTROLLED CROSSING

5M CARRIAGEWAY

5.5M NEW CARRIAGEWAY

1 No Electric Vehicle Recharging Bay RRM 034 5m x 2.4m each

No. 6 PARKING SPACES




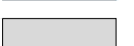
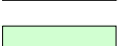







RETAIN EXISTING FOOTPATH

TIE INTO EXISTING PAVEMENT

STOP



LEGEND

-  PROPOSED ROAD SURFACE
-  EXISTING ROAD SURFACE
-  PROPOSED FOOTPATH / PUBLIC REALM
-  EXISTING FOOTPATH / PUBLIC REALM
-  PROPOSED SUDS / LANDSCAPING
-  PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
-  PROPOSED KERB
-  DROPPED KERB
-  FLUSH KERB
-  EXISTING KERB TO BE RETAINED
-  EXISTING KERB TO BE REMOVED
-  LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: EH Checked: AC Approved: AC

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **KERBS FOOTPATHS & PAVED AREAS -SHEET 3 OF 4**

Drawn by: EH Sheet Size: A1 Scale: 1:125 Date: September '23

Drawing Number: 23071-01-1103 Revision: -



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The Housing Agency



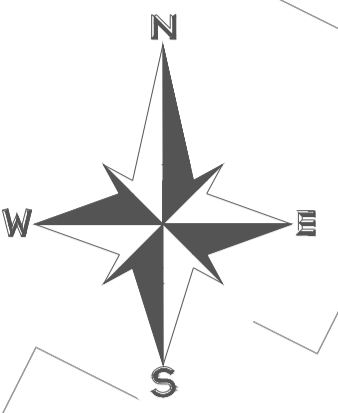
7 Ormonde Road,
Kilkenny
Tel: +353(0)567795800
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 Portlaoise, Co. Laois,
 R32 EHP9

LEGEND

PROPOSED ROAD SURFACE	PROPOSED KERB
EXISTING ROAD SURFACE	DROPPED KERB
PROPOSED FOOTPATH / PUBLIC REALM	FLUSH KERB
EXISTING FOOTPATH / PUBLIC REALM	EXISTING KERB TO BE RETAINED
PROPOSED SUDS / LANDSCAPING	EXISTING KERB TO BE REMOVED
PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING	LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: EH Checked: AC Approved: AC

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **KERBS FOOTPATHS & PAVED AREAS -SHEET 4 OF 4**

Drawn by: EH	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-1104	Revision: -		



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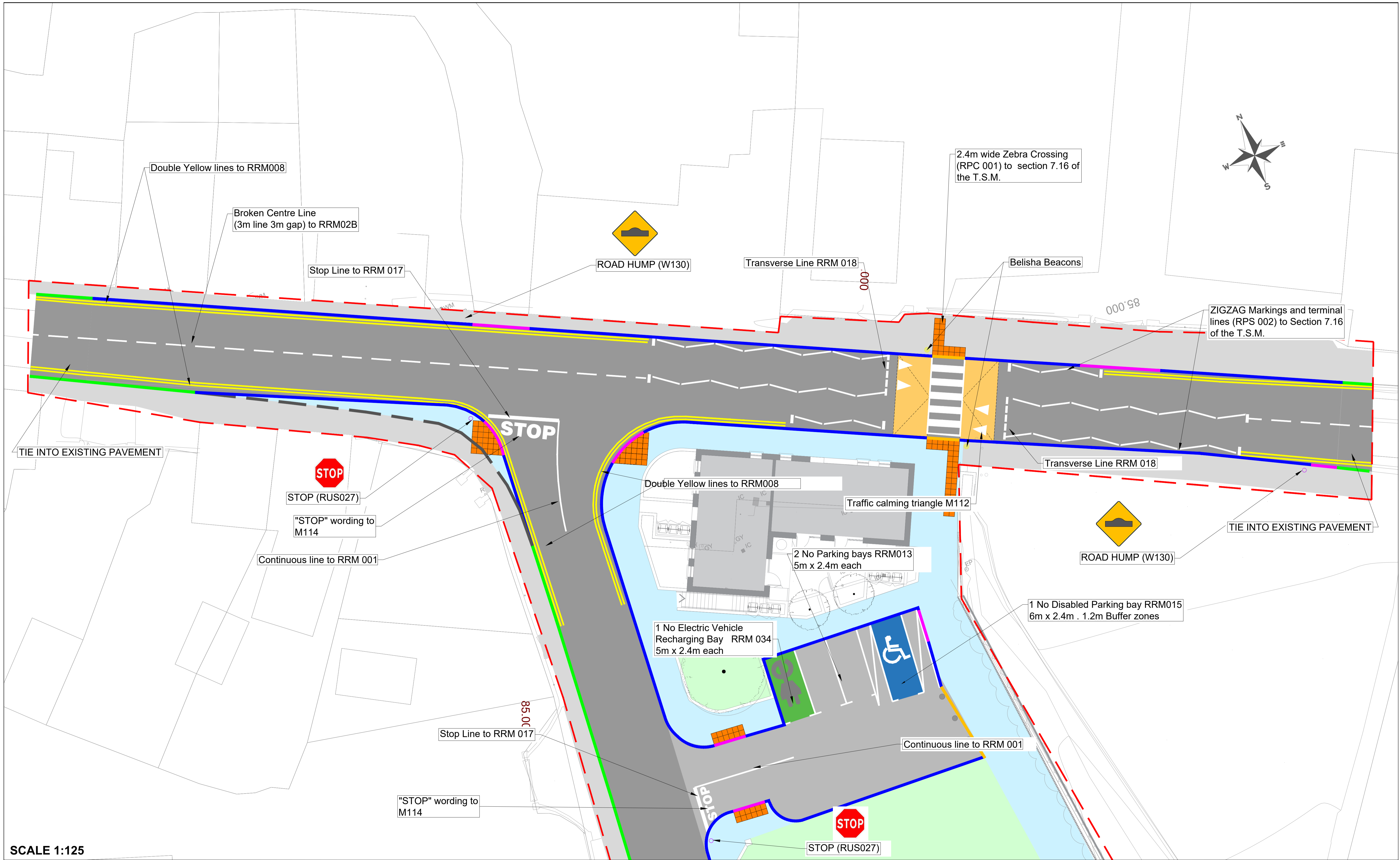
LEGEND

- PROPOSED SIGN POST
- PROPOSED ROAD SURFACE
- PROPOSED RAMP
- PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
- LMA

No.	Revision	Date	By	Chk'd	App'd

PROJECT TITLE DERRY ROAD, DURROW			
Drawing Title: PROPOSED SIGNS & ROADMARKINGS-Overview			
Drawn by: TON	Sheet Size: A1	Scale: 1:500	Date: September '23
Drawing Number: 23071-01-1200		Revision: -	

Designed: DS	Checked: AC	Approved: AC
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SCALE 1:125

		7 Ormonde Road, Kilkenny Tel: +353(0)567795800 e-mail: info@roadplan.ie			Laois County Council Áras an Chontae, James Finlan Lalor Ave, Portlaoise, Co. Laois, R32 EHP9
--	--	--	--	--	---

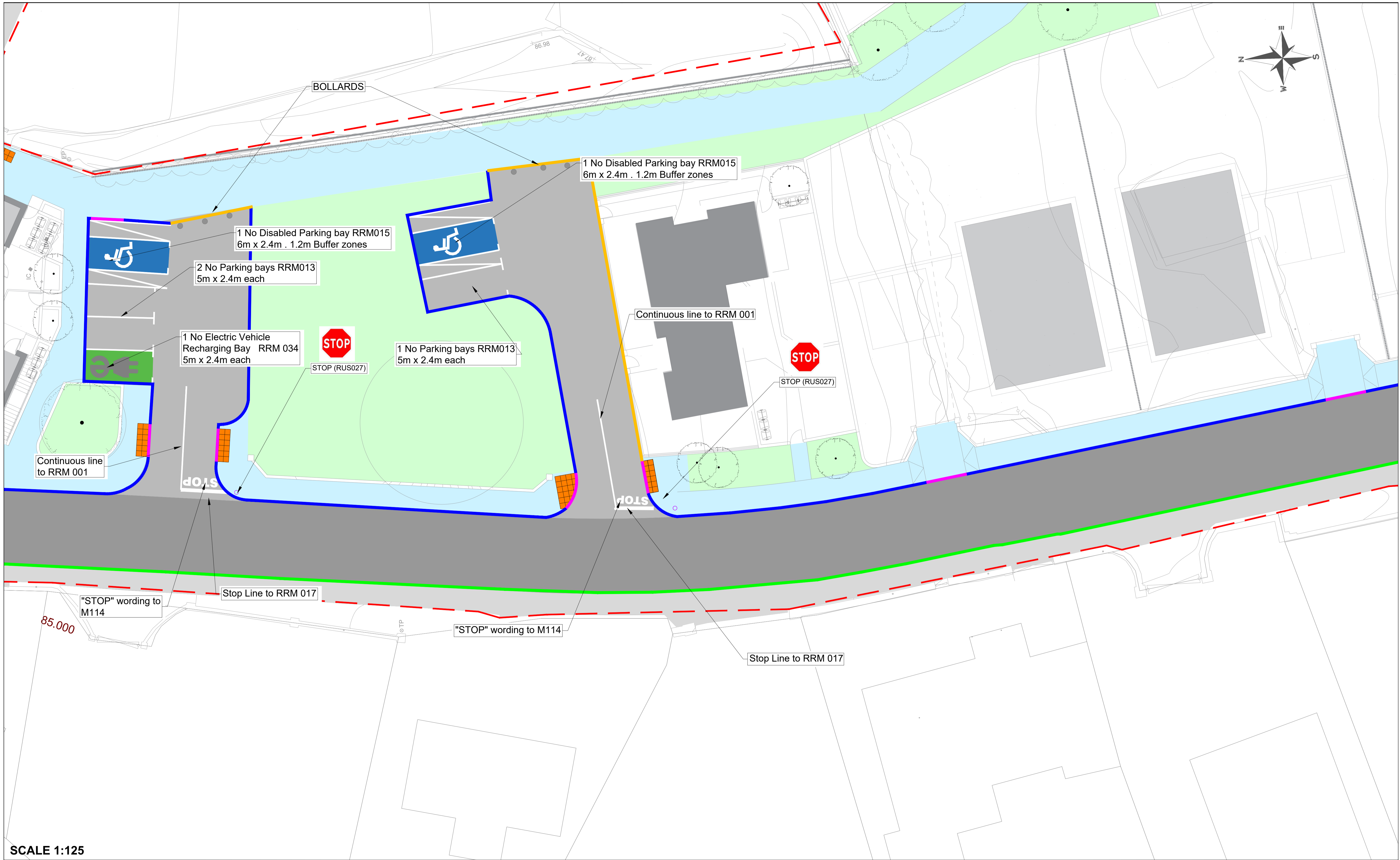
LEGEND

	PROPOSED SIGN POST
	PROPOSED ROAD SURFACE
	PROPOSED RAMP
	PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
	LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: DS	Checked: AC	Approved: AC
--------------	-------------	--------------

PROJECT TITLE DERRY ROAD, DURROW			
Drawing Title: PROPOSED SIGNS & ROADMARKINGS Sheet 1 of 4			
Drawn by: TON	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-1201		Revision: -	



SCALE 1:125

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LEGEND

- PROPOSED SIGN POST
- PROPOSED ROAD SURFACE
- PROPOSED RAMP
- PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
- LMA

No.	Revision	Date	By	Chk'd	App'd

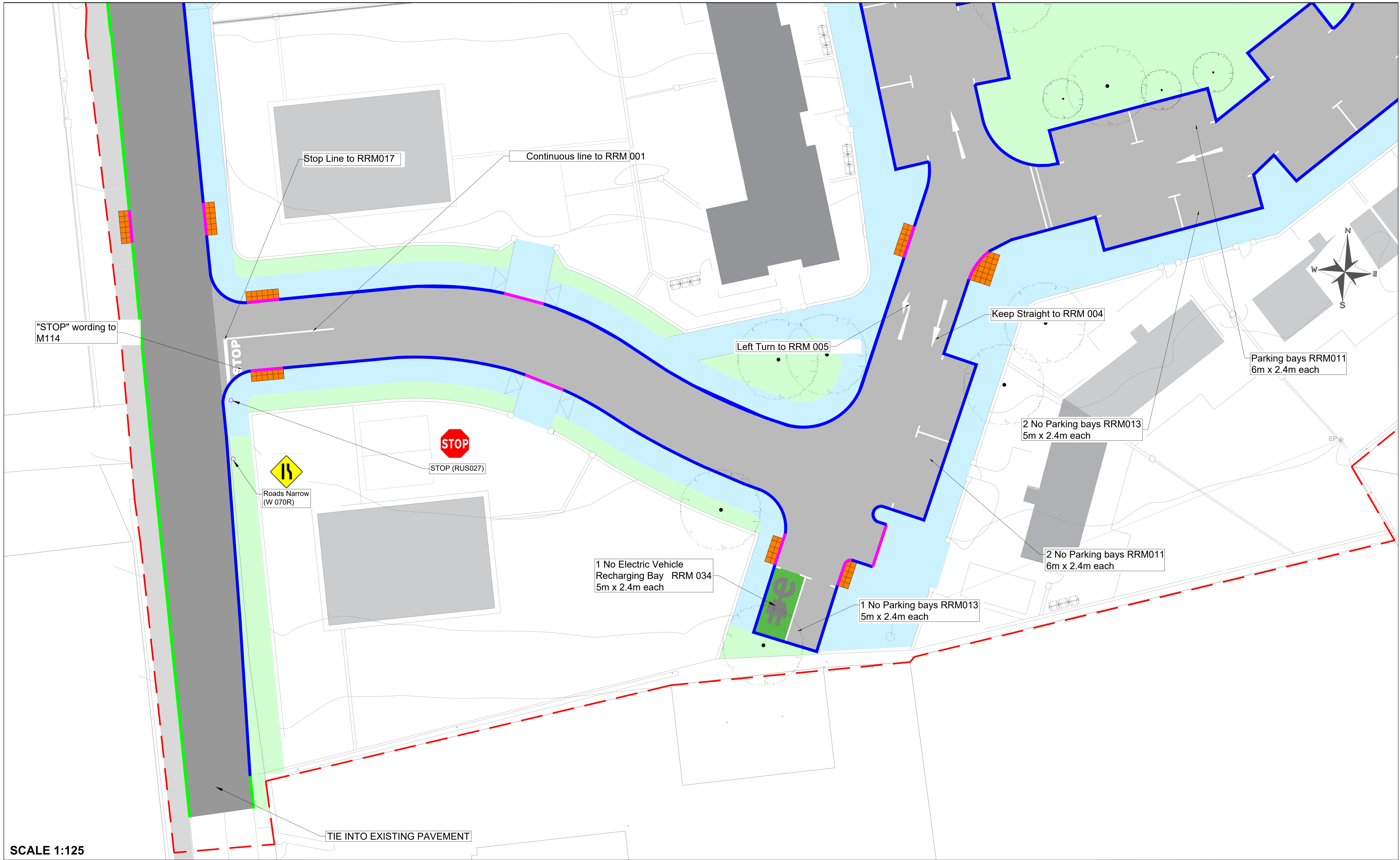
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PROJECT TITLE DERRY ROAD, DURROW

Drawing Title: PROPOSED SIGNS & ROADMARKINGS Sheet 2 of 4

Drawn by: TON Sheet Size: A1 Scale: 1:125 Date: September '23

Drawing Number: 23071-01-1202 Revision: -



SCALE 1:125

TIE INTO EXISTING PAVEMENT



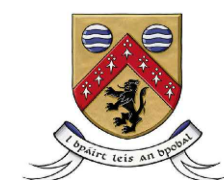
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Tithíochta
The Housing Agency



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LEGEND

- PROPOSED SIGN POST
- PROPOSED ROAD SURFACE
- PROPOSED RAMP
- PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
- LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: DS	Checked: AC	Approved: AC
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PROJECT TITLE DERRY ROAD, DURROW			
Drawing Title: PROPOSED SIGNS & ROADMARKINGS Sheet 3 of 4			
Drawn by: TON	Sheet Size: A1	Scale: 1:125	Date: September '23
Drawing Number: 23071-01-1203		Revision: -	



SCALE 1:125








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LEGEND

-  PROPOSED SIGN POST
-  PROPOSED ROAD SURFACE
-  PROPOSED RAMP
-  PROPOSED TACTILE PAVING - UNCONTROLLED CROSSING
-  LMA

No.	Revision	Date	By	Chk'd	App'd

Designed: DS Checked: AC Approved: AC

PROJECT TITLE DERRY ROAD, DURROW

Drawing Title: PROPOSED SIGNS & ROADMARKINGS Sheet 4 of 4

Drawn by: TON Sheet Size: A1 Scale: 1:125 Date: September '23
 Drawing Number: 23071-01-1204 Revision:

APPENDIX B – Road Safety Audit

2023-23071-01-001

**Derry Road Durrow
ROAD SAFETY AUDIT STAGE 1**

August 2023

**Ray Butler
Consultant
087 261 6252
raybut51@gmail.com**

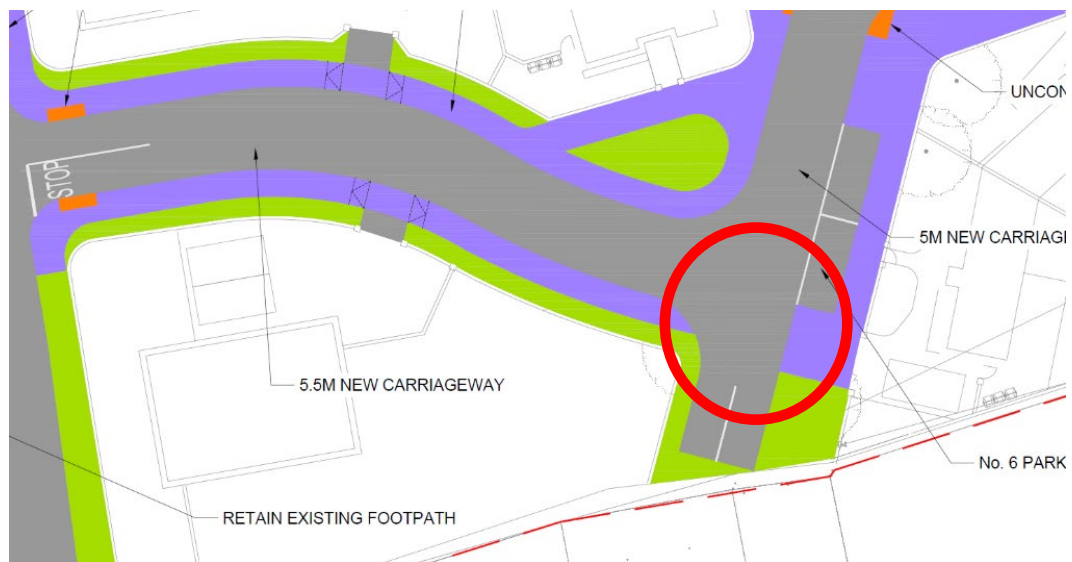
1. INTRODUCTION

- 1.1 This report describes a Stage 1 Road Safety Audit carried out on a Housing Road Access Scheme at Derry Road, Durrow, County Laois, on behalf of Roadplan Consulting. The audit was carried out on the 14th of August 2023.
- 1.2 The audit team members were as follows:
 - Ray Butler, BE CEng MIEI
Auditor Number RB210538
 - Patrick Brennan, BEng MIEI.
Auditor Number PB1321187
- 1.3 Both audit team members visited the site on the 8th August 2023. The audit comprised an examination of the drawings relating to the scheme supplied by Roadplan Consulting and an examination of the site.
- 1.4 The speed limit on Derry Road at the site is 50 km/h.
- 1.5 This Stage 1 / 2 Audit has been carried out in accordance with the relevant sections of TII GE-STY-01024. The team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.
- 1.6 All problems described in this report are considered by the audit team to require action in order to improve the safety of the scheme and minimise accident occurrence.
- 1.7 Appendix A describes the audited drawings.

2. STAGE 1 / 2 AUDIT

2.1 Problem

Dropped kerbs and tactile paving are not provided at the two parking spaces on the corner on the south access road. Wheelchair users or the visually impaired may have difficulty crossing at this location increasing their exposure to motor vehicles and risk of injury due to collisions.



Recommendation

Provide facilities for vulnerable road users.

2.2 Problem

Dropped kerbs, to allow people in wheelchairs access to the path leading to the controlled pedestrian crossing on the N77, are not provided. Wheelchair users will have a circuitous route to the crossing increasing their risk of collision with motor vehicles.



Recommendation

Provide facilities for vulnerable road users.

2.3 Problem

A disability parking bay is not provided for the houses at area 1 or area 2. This may lead to vulnerable pedestrians having to travel an increased distance to access their dwelling with an increased risk of collision with motor vehicles.



Recommendation

Provide a disability parking bay in this area with connectivity both houses.

2.4 Problem

Ramps are not provided to allow wheelchair users access the footpath from the disability bays. This may put them at risk of injury from collision with motor vehicles if they travel along the carriageway to access the footpath at the nearest dropped kerb.

**Recommendation**

Provide access ramps at the disability parking bays.

3. AUDIT TEAM STATEMENT

3.1 We certify that we have examined the drawings listed in Appendix A and have inspected the site. This examination has been carried out with the sole purpose of identifying any features of the scheme that could be removed or modified to improve the safety of the scheme.

Signed..... Ray Butler

Date14th August 2023.....

Signed..... Patrick Brennan

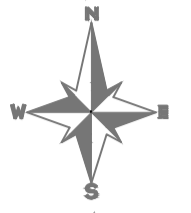
Date 14th August 2023.....

APPENDIX A

List of Drawings Examined

The following drawings have been provided electronically in PDF format by Roadplan:

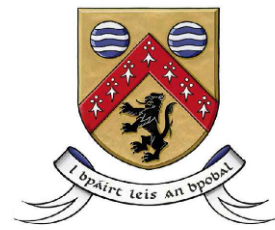
Drawing number	Drawing title
23071-01-0001	PROPOSED GENERAL LAYOUT - OVERVIEW
23071-01-0002	PROPOSED GENERAL LAYOUT - SHEET 1 OF 4
23071-01-0003	PROPOSED GENERAL LAYOUT - SHEET 2 OF 4
23071-01-0004	PROPOSED GENERAL LAYOUT - SHEET 3 OF 4
23071-01-0005	PROPOSED GENERAL LAYOUT - SHEET 4 OF 4



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LEGEND

- PROPOSED CARRIAGEWAY
- PROPOSED FOOTPATH
- EXISTING FOOTPATH
- TACTILE PAVING
- PROPOSED LANDSCAPING
- PROPOSED RAMP / DROPPED KERB
- LMA
- ROAD MARKINGS
- DISABLED PARKING
- COLOURED SURFACE
- SHEET BOUNDARY

DRAFT 1

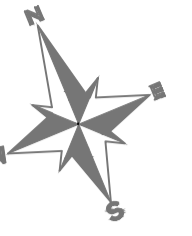
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Drawing Title: **PROPOSED GENERAL LAYOUT - OVERVIEW**

Drawn by: **AC** Sheet Size: **A1** Scale: **1:400** Date: **JULY '23**

Drawing Number: **23071-01-0001** Revision: **-**

No.	Revision	Date	By	Chk'd	App'd
Designed:	APC	Checked:	AC	Approved:	GF



TIE INTO EXISTING PAVEMENT

4.5M CORNER RADII

RETAIN EXISTING FOOTPATH

2.4M WIDE RAISED ZEBRA CROSSING WITH BELISHA BEACON

WIDEN N77 TO 6M CARRIAGEWAY

UNCONTROLLED CROSSING

5.5M NEW CARRIAGEWAY

STOP

6M CORNER RADII

1.8M WIDE NEW FOOTPATH

TIE INTO EXISTING FOOTPATH

TIE INTO EXISTING PAVEMENT

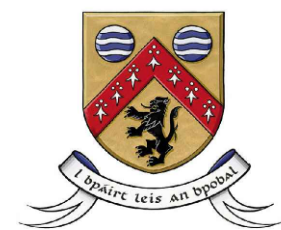
RETAIN EXISTING FOOTPATH

No. 4 PARKING SPACES

SHARED SPACE



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e-mail: info@roadplan.ie



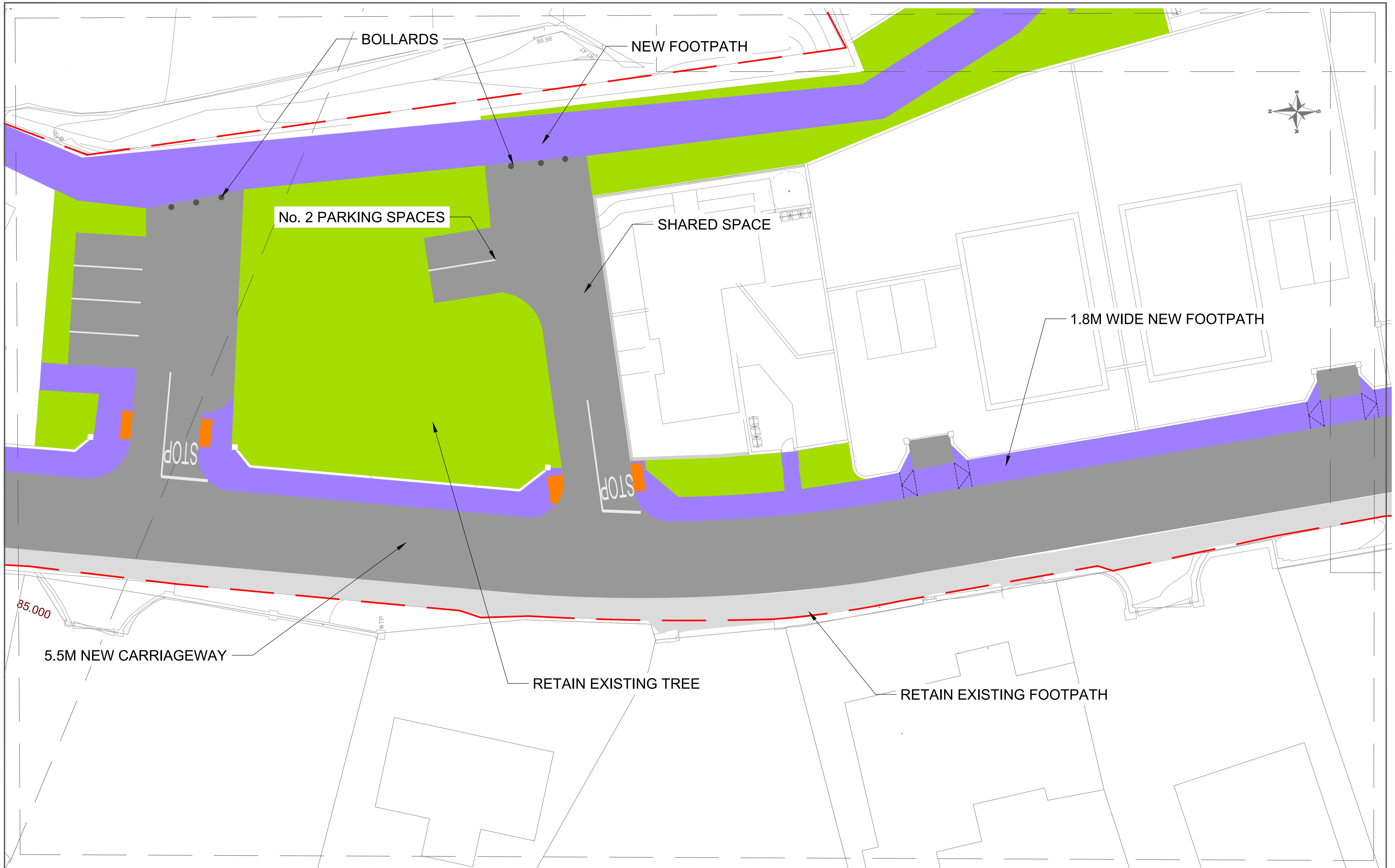
Laos County Council
Áras an Chontae,
James Fintan Lalor Ave,
Portlaoise, Co. Laois,
R32 EHP9

LEGEND	
	PROPOSED CARRIAGEWAY
	PROPOSED FOOTPATH
	EXISTING FOOTPATH
	TACTILE PAVING
	PROPOSED LANDSCAPING
	PROPOSED RAMP / DROPPED KERB
	LMA
	ROAD MARKINGS
	DISABLED PARKING COLOURED SURFACE
	SHEET BOUNDARY

DRAFT 1

Project Title: DERRY ROAD, DURROW			
Drawing Title: PROPOSED GENERAL LAYOUT - SHEET 1 OF 4			
Drawn by: AC	Sheet Size: A1	Scale: 1:100	Date: JULY '23
Drawing Number: 23071-01-0002		Revision: -	

No.	Revision	Date	By	Chk'd	App'd
Designed:	APC	Checked:	AC	Approved:	GF



No. 2 PARKING SPACES

SHARED SPACE

1.8M WIDE NEW FOOTPATH

5.5M NEW CARRIAGEWAY

RETAIN EXISTING TREE

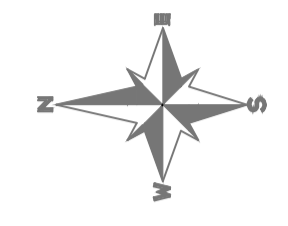
RETAIN EXISTING FOOTPATH

BOLLARDS

NEW FOOTPATH

STOP

STOP



LEGEND

- PROPOSED CARRIAGEWAY
- PROPOSED FOOTPATH
- EXISTING FOOTPATH
- TACTILE PAVING
- PROPOSED LANDSCAPING
- PROPOSED RAMP / DROPPED KERB
- LMA
- ROAD MARKINGS
- DISABLED PARKING
- COLOURED SURFACE
- SHEET BOUNDARY

DRAFT 1

Project Title: DERRY ROAD, DURROW			
Drawing Title: PROPOSED GENERAL LAYOUT - SHEET 2 OF 4			
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Drawing Number: 23071-01-0003		Revision: -	

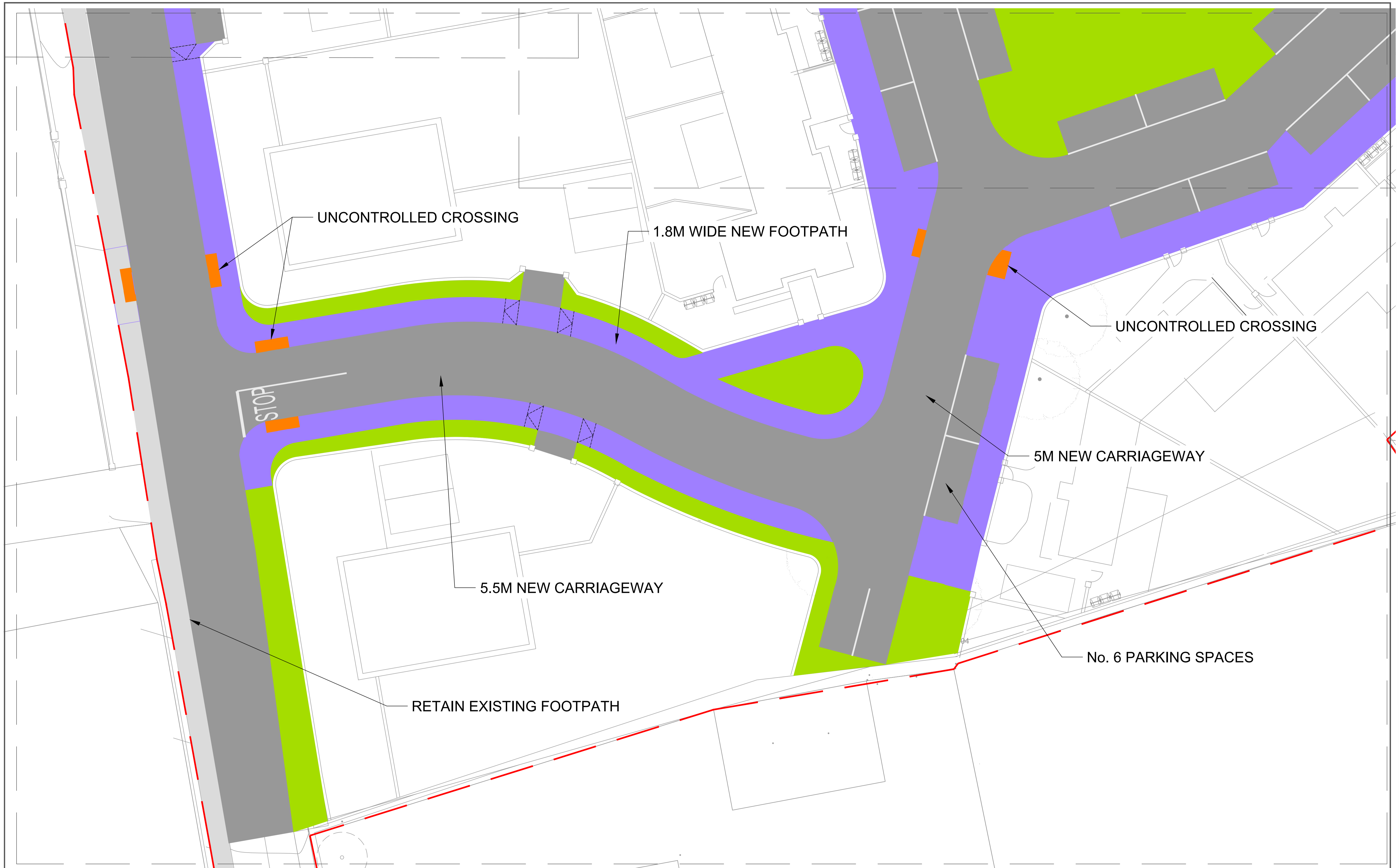


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Kilkenny
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e-mail: info@roadplan.ie



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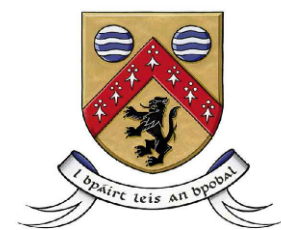
Designed: APC	Checked: AC	Date	By	Chk'd	App'd
			GF		



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LEGEND	
	PROPOSED CARRIAGEWAY
	PROPOSED FOOTPATH
	EXISTING FOOTPATH
	TACTILE PAVING
	PROPOSED LANDSCAPING
	PROPOSED RAMP / DROPPED KERB
	LMA
	ROAD MARKINGS
	DISABLED PARKING COLOURED SURFACE
	SHEET BOUNDARY

DRAFT 1

Project Title: DERRY ROAD, DURROW			
Drawing Title: PROPOSED GENERAL LAYOUT - SHEET 3 OF 4			
Drawn by: AC	Sheet Size: A1	Scale: 1:100	Date: JULY '23
Drawing Number: 23071-01-0004		Revision: -	

No.	Revision	Date	By	Chk'd	App'd
Designed:	APC	Checked:	AC	Approved:	GF



5.5M NEW CARRIAGEWAY

NEW FOOTPATH

No. 2 DISABLED PARKING BAYS

UNCONTROLLED PEDESTRIAN CROSSINGS

2M WIDE NEW FOOTPATH

No. 30 PARKING SPACES

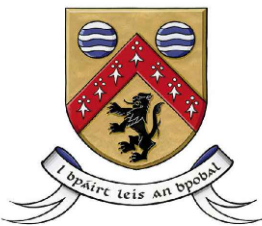
4.5M NEW CARRIAGEWAY



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Kilkenny
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LEGEND

- PROPOSED CARRIAGEWAY
- PROPOSED FOOTPATH
- EXISTING FOOTPATH
- TACTILE PAVING
- PROPOSED LANDSCAPING
- PROPOSED RAMP / DROPPED KERB
- LMA
- ROAD MARKINGS
- DISABLED PARKING COLOURED SURFACE
- SHEET BOUNDARY

DRAFT 1

Project Title: **DERRY ROAD, DURROW**

Drawing Title: **PROPOSED GENERAL LAYOUT - SHEET 4 OF 4**

Designed: APC	Checked: AC	Approved: GF	Date: JULY '23	Drawing Number: 23071-01-0005	Revision: -
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SAFETY AUDIT FEEDBACK FORM

Scheme: Derry Road Durrow

Document Number: 2023-23071-01-001

Audit Stage: Stage 1 RSA


Date Audit Completed: 14 August 2023

Paragraph No. in Safety Audit Report	To Be Completed By Designer			To Be Completed by Audit Team Leader
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.	Alternative measures or reasons accepted by auditors (yes/no)
2.1	Yes	Yes	-----	-----
2.2	Yes	Yes	-----	-----
2.3	Yes	Yes	-----	-----
2.4	Yes	Yes	-----	-----

Safety Audit Signed off  Design Team Leader


Print Name Aoidin Curran

Date 16-Aug-2023

Safety Audit Signed off  Employer

Print Name PAT TREACY

Date 21/08/23

Safety Audit Signed off  Audit Team Leader

Print Name Ray Butler

Date 21/8/23

Please complete and return to: Ray Butler Consultant,
55 Barraglas,
Tramore,
Co. Waterford.
E-mail: raybut51@gmail.com

APPENDIX C – Cost Estimate

TII Level 3 Estimate Summary Template

Insert Scheme Title:	Derry Road, Durrow	
Insert Date of Estimate:	11/08/2023	
Insert Current Phase:	Phase 3	
Insert Consultants Name:	Roadplan Consultancy	
Insert Name of Estimator:	Ehsan Saadi	
Insert Base Date for Rates:	Jun-23	
1	Main Construction Contract (MCC) - See Back up Summary Sheet for further breakdown	Total (€)
Series 100	Preliminaries	€12,851
Series 200	Site Clearance	€1,640
Series 300	Fencing and Environmental Noise Barriers	€0
Series 400	Road Restraint Systems (Vehicles and Pedestrian)	€0
Series 500	Drainage and Service Ducts	€11,875
Series 600	Earthworks	€5,840
Series 700	Pavements	€29,058
Series 1100	Kerbs, Footways and Paved Areas	€16,180
Series 1200	Traffic Signs and Road Markings	€8,540
Series 1300	Road Lighting Columns and Brackets	€1,000
Series 1400	Electrical Work for Road Lighting and Traffic Signs	€7,540
Series 1500	Motorway Communications	€0
Series 1600 - 2300	Structures	€0
Series 2500	Special Structures	€0
Series 2700	Watermains Utilities and Accommodation Works	€0
-	Landscaping	€0
-	Utilities Cost Estimates (Statutory Undertakers and Associated Civil Works)	€4,000
-	Other Costs	
-	Other Costs	
Total Base Cost for Main Construction Contract (Excluding VAT)		€98,524
Add Project Specific Risk Contingency	5 %	
Sub-Total exclusive of VAT		€103,450
Add VAT at	13.5 %	
Total MCC Base Cost plus Project Specific Risk Contingency and VAT		€117,416
2	Land and Property	
Base Cost Total from attached summary (to be compiled as per Appendix F Template)		€0
Add Project Specific Risk Contingency		€0
Total L&P Base Cost plus Project Specific Risk Contingency		€0
3	Planning and Design	
Base Cost Total from attached summary (to be compiled based on Level 3 breakdown)		€7,881.92
Add Project Specific Risk Contingency		1182.2874
Total P&D Base Cost plus Project Specific Risk Contingency		€9,064
4	Archaeology	
Base Cost Total from attached summary (to be compiled based on Level 3 breakdown)		20000
Add Project Specific Risk Contingency		3000
Total Archaeology Base Cost plus Project Specific Risk Contingency		€23,000
5	Advance Works and Other Contracts	
Base Cost Total from attached summary (to be compiled based on Level 3 breakdown)		0
Add Project Specific Risk Contingency		0
Total Advance Works and Other Contracts Base Cost plus Project Specific Risk Contingency		€0
6	Main Contract Supervision (Employer's Costs)	
Base Cost Total from attached summary (to be compiled based on Level 3 breakdown)		€7,881.92
Add Project Specific Risk Contingency		1182.2874
Total MC Supervision (Employer's Costs) Base Cost plus Project Specific Risk Contingency		€9,064
7	Residual Network (Provision to be subject to the approval of the TII Regional Manager)	
Base Cost Total from attached summary (to be compiled based on Level 3 breakdown)		10000
Add Project Specific Risk Contingency		1000
Total Residual Network Base Cost plus Project Specific Risk Contingency		€11,000
TOTAL LEVEL 3 ESTIMATE INCLUSIVE OF VAT		€169,544
Mainline Length	0.117 km	Rate per km €1,449,097
N.B.	<p>Figures above are INCLUSIVE of VAT unless otherwise specified.</p> <p>Figures above are EXCLUSIVE of provision for Inflation - base date to be stated if different from date of estimate.</p> <p>Total base costs to include for ALL qualifying costs under each cost heading.</p> <p>Refer to the TII Cost Management Manual and TII Requirements for Measurement and Pricing (RMP) for information on coverage and format of back-up.</p> <p>See attached Back up to Summary Sheet for Further Scheme Information.</p>	

APPENDIX D – Flood Risk Assessment



An Ghníomhaireacht
Tithíochta
The Housing Agency

Residential Development at Derry Road, Durrow Laois County Council

40-05-ZZ-ZZ-RP-CS-001-REV 02

Stage 1 Flood Risk Assessment

August 2023

Document Control

Project Title:	Residential Development at Derry Road Durrow
Project Number:	40-05
Report Title:	Stage 1 Flood Risk Assessment
Document Number:	05-111 – HA – ZZ – ZZ – RP – CS – 001-Rev 02

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Revision	Date	Author	Reviewed	Authorised	Purpose description
01	11/05/21	FF	NS	NJ	Draft Issue
02	24/08/23	FF	NS	NJ	Site Extent and layout revised

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1.0 Introduction

1.1 Scope

The following report outlines the findings of a preliminary flood risk assessment for a development site at Derry Road, Durrow, County Laois. The study is divided into 2 parts.

- (i) Justification Test
- (ii) Flood Risk Assessment

1.2 Project Overview

The proposed project consists of the construction of 24 No. one and two storey houses, and 4 No. serviced sites for a total of 28 No. dwellings. A new junction with Derry Road as well as a circulation road within the site will also be required. An existing junction of Derry Road and the N77 will also be modified. An existing building at the northern corner of the site will be demolished as part of the project in an enabling works contract prior to the main construction phase.

1.3 Site Location and description

The site is located along Derry Road, near the junction with the N77 in Durrow, County Laois. Lands in the immediate vicinity of the site are generally used for housing, local commerce, and education. The site is accessed via a gate at the northwest corner of the site.

Figure 1.1 - Subject Site Location



The southern part of the site is a greenfield site that is used periodically for cattle grazing. There is an existing building at northern part of the site. The south-eastern boundary of the site is made up a blockwork wall for the portion adjacent to the Derrywood Estate and a fence and the gable wall of the house for the remainder. The boundary with Derry Road is a dry-stone wall and hedgerow. The north-eastern boundary with houses along the N77 is generally made up of concrete and masonry walls and light weight fence. There is a level difference between the subject site and the rear gardens of these houses. A retaining wall is required to form this portion of the north-western boundary.

1.4 Topography

The existing site slopes from the southwest corner down towards the north-eastern corner. The proposed site levels will generally follow the current slope directions, but levels will be reduced to allow for shallow road gradients along the new internal roads. Thus, floor levels will generally be lower than existing ground levels. Garden levels may be higher than floor level in order to maintain existing levels along the boundaries. Gardens will incorporate flat sections directly to the rear of the houses and then a raised terrace towards the rear with a retaining wall or bank as needed. Refer to preliminary drawings.

2.0 Justification Test

2.1 Justification Test Requirements

The extract below from the Planning System and Flood Risk Management (PSFRM) guidelines indicates the parameters for defining the Flood Zone for a site.

Figure 1.2 – Flood Zone Definition per PSFRM Guidelines

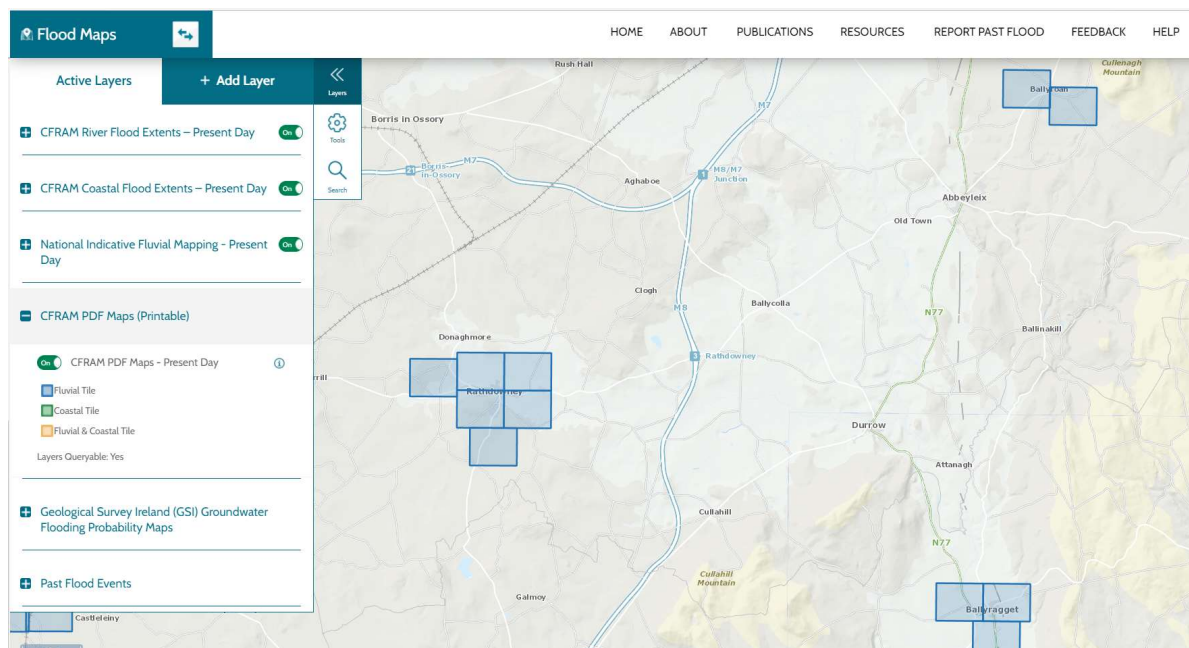
Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

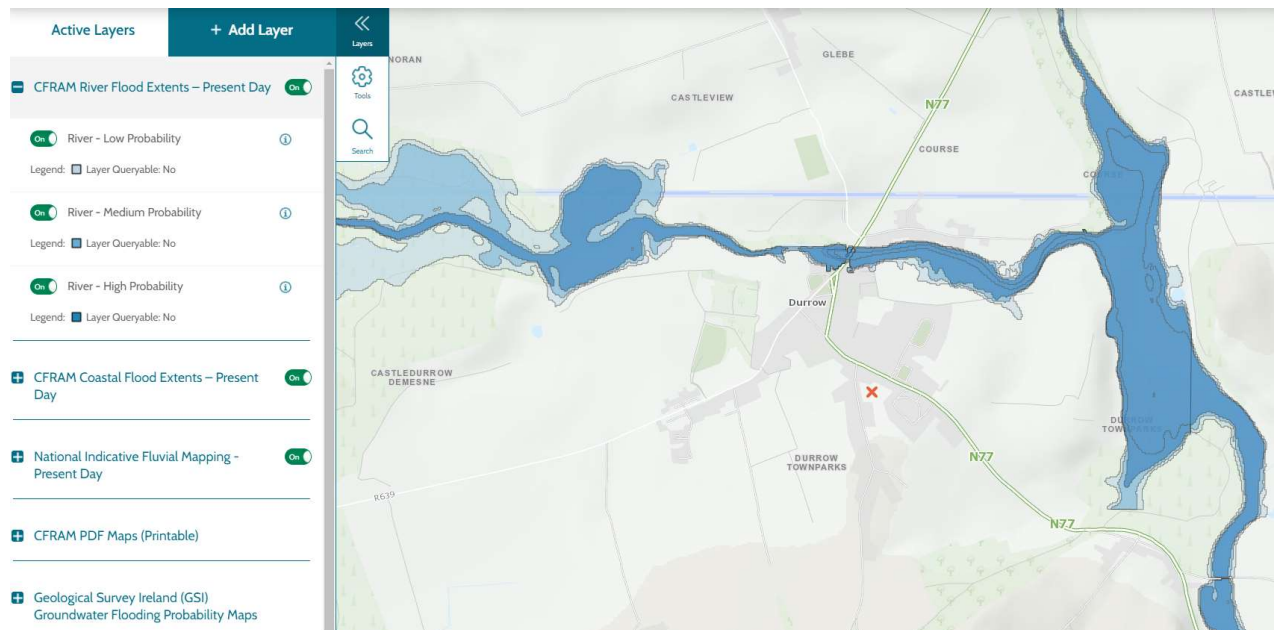
There are currently no CFRAMs map available for the subject which would allow the fluvial flood risk probability to be assessed in detail. The nearest available CFRAMs mapping are for Ballyragget, Rathdowney and Ballyroan which are between 8 and 14km from Durrow.

Figure 1.3 – Available CFRAMs Data for Site



The preliminary flood extents information available for the Erkina River flood extents is indicated in Figure 1.4. This does not provide detailed information regarding depths. The flood extent does not cover the subject site.

Figure 1.4 – Erkina River Fluvial Flood Extents



Due to the inland location, it is assumed that there is no coastal flood risk. Thus, the site will be assumed to be Flood Zone C or B. The proposed development is categorised as being highly vulnerable due to the possibility that the residences may be designed/adapted for the elderly or for people with special needs or impaired mobility. A justification test will be carried out as a conservative approach.

Figure 1.4 – PSFRM Guidelines

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Section 5 of the 2009 DEHLG/OPW Guidelines sets out the recommended criteria to be applied as a “Justification Test” in development management in zoned areas which may be subject to risk of flooding in extreme conditions. There are five criteria set out as part of the justification for development, namely

- Section 2.2 The subject lands have been zoned taking account of the guidelines
- Section 2.3 No increase in flood risk down stream
- Section 2.4 Incorporate measures to minimize flood risk to people and property
- Section 2.5 Include measures to ensure that residual risk can be managed
- Section 2.6 The permitted development addresses the above while maintaining wider planning objectives and good urban design

2.2 Zoning and Laois County Council Development Plan

The subject site is zoned RES – to provide for new residential communities in accordance with approved area plans.

2.3 No increase in Flood Risk Downstream of Development

The subject site is a greenfield site. The existing paved area is less than that of the proposed development. It is required to limit surface water run-off from the development to that of the greenfield site. It is generally required to ensure surface water discharge from the site is limited to the relevant QBAR for the site – approximately 6 l/s in this instance. It is proposed to attenuate run off from the site before discharging into this drain. SUDs measures will also be employed throughout the development to reduce run off to the minimum. There is an existing surface water drain in the N77 – separate surface water drains from the subject will discharge to this. There is a separate foul/combined sewer in Derry Road. A Preconnection enquiry to Irish Water was made and Confirmation of Feasibility of Connection to this infrastructure has been confirmed. Therefore, run-off from the site will not be more that it is currently.

The site slopes from the southwest corner down towards the north-eastern corner. Existing levels will be maintained insofar as possible however to achieve a gravity connection to the existing sewer in Derry Road, while maintain a minimum of 900mm cover to pipes it will be necessary to raise the ground level at the north-eastern part of the site by up to 1m locally. Retaining walls of minimum height will be required around the boundaries of the site to deal with the level difference and provide screening to the existing dwellings along the N77.

The attenuation tank will provide adequate storage for the 0.01% AEP. Any flood waters from the 0.001AEP which would have drained to the northeast corner of the site will instead fall towards the open space area at centre of the site. This area will be landscaped to provide overland flow routes and areas where flood waters can be stored.

Therefore, there is no material increase in flood risk downstream of the proposed development.

2.4 Measures to minimise flood risk to people and property.

Road levels in front of each shall be a minimum of 150mm below finished floor level. 125mm high kerbs are to be provided along each road edge and driveways will slope upward to the floor levels. Drainage channels should be provided across all door thresholds.

Road gullies should be provided every 160m² minimum and these should be located a low point along the roads and at any sharp changes in direction. Additional storage capacity can be provided at the base of embankments in the form of filter drains or shallow swales.

2.5 Residual Risk to the Development Area

There is a residual risk to the development area during extreme rainfall events. This residual risk should be mitigated by the proper design of site levels and finishes. Flood resilient urban and building design and construction should be fully utilised.

2.6 Summary of Justification Test

The Justification Test in accordance with the OPW guidelines has been applied to the site and the findings confirm that the proposed development on this site is appropriate.

3.0 Flood Risk Assessment

3.1 Flood Risk Assessment Methodology

The following Flood Risk Assessment has been carried out in accordance with the OPW Guidelines on the Planning Process and Flood Risk Management. The objectives are to:

- Identify potential sources of flood risk
- Confirm the level of flood risk and identify key hydraulic features
- Assess the impact the proposed development has on flood risk
- Develop appropriate flood risk mitigation and management measures which will allow for the long-term development of the site.

The following studies and publications were consulted as part of the Flood Risk Assessment.

- Historical Flooding – Floodmaps.ie (1965)
- Catchment Flood Risk Assessment and Management Study (CFRAM) (2016)
- Laois County Council Development Plan 2016-2022 PFRA (2016)
- OPW Preliminary Flood Risk Assessment (2011)

Sources of possible flooding include coastal, fluvial, and pluvial (direct heavy rain) and groundwater. The components to be considered in the identification and assessment of flood risk are listed below,

- i) Tidal – Flooding from high sea levels
- ii) Sewer surcharging
- iii) Fluvial – Flooding from water courses
- iv) Pluvial – Flooding from rainfall/surface water
- v) Ground water – flooding from springs/ raised ground water
- vi) Human/mechanical error – flooding to human or mechanical error such as failure of pumps or other drainage and water infrastructure

The likelihood of flooding falls into three categories of low, moderate, and high, which are described in the OPW guidelines and indicated in Figure 3.1.

Figure 3.1 – PSFRM Guidelines

Likelihood	Low	Moderate	High
Tidal	Where probability < 0.1% change of occurring in a year	Where probability < 0.1% but < 0.5% change of occurring in a year	Where probability > 0.5% change of occurring in a year
Fluvial	Where probability < 0.1% change of occurring in a year	Where probability < 0.1% but < 1 % change of occurring in a year	Where probability > 1% change of occurring in a year
Pluvial	Where probability < 0.1% change of occurring in a year	Where probability < 0.1% but < 1% change of occurring in a year	Where probability > 1% change of occurring in a year

There may be difficulty in defining the risk of flooding due to items iv) and v). However, mitigation measures based on judgment and good practice should be adopted.

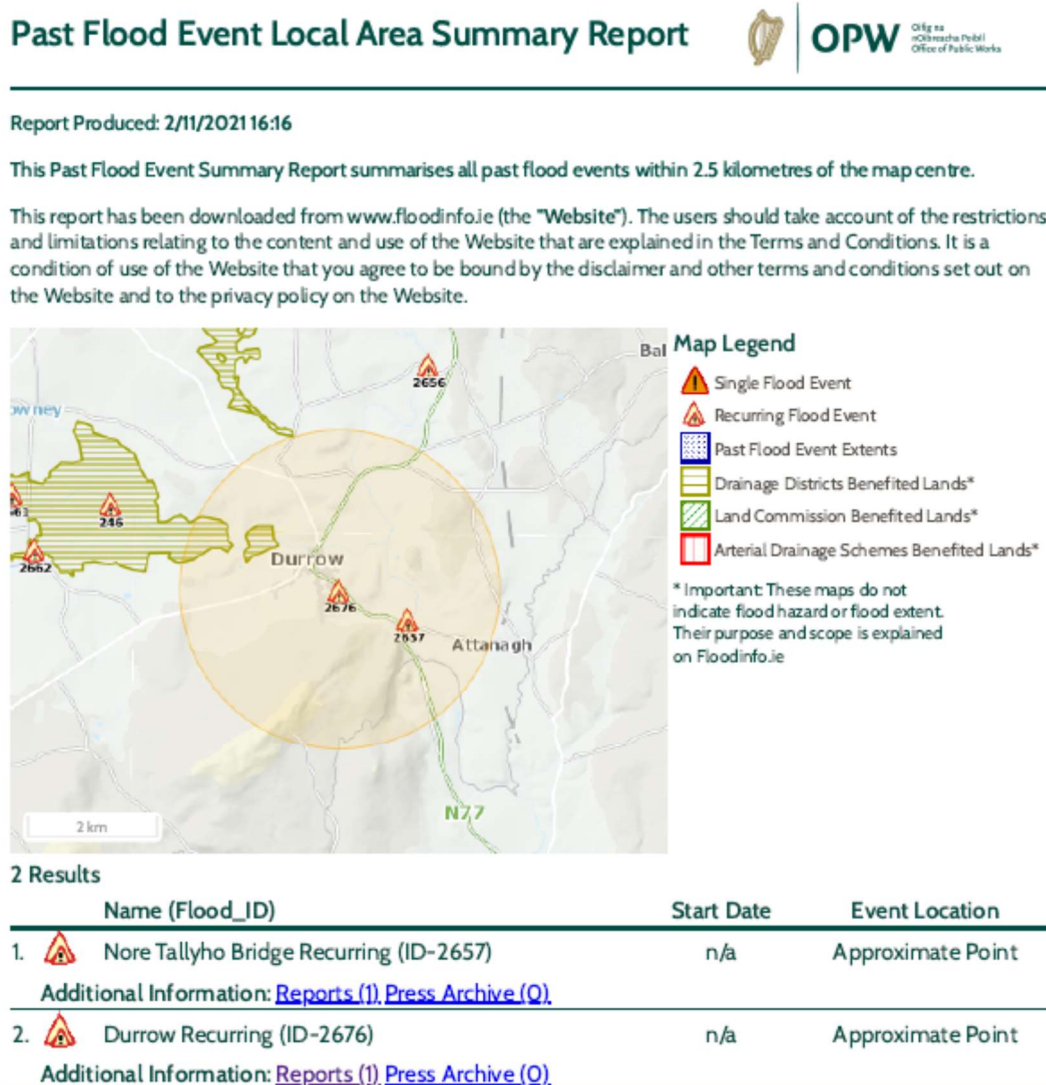
3.2 Catchment Flood Risk Assessment and Management Study (CFRAM) (2016)

Records for Historical flooding events in the area were reviewed. An extract from the relevant flood history map is indicated in Figure 3.1 The nearest recorded flood events are listed below

- N77, Durrow – Laois County Council Minutes – Report 2676 by Area Engineer into areas prone to flooding in Western Laois Area. Extract below

W25. N77, Durrow – Low lying land floods after heavy rainfall every year. The flooding has been exacerbated by recent development. The road is liable to flood and 1 property is affected. Water gushes into property from the road
Flood Id = 2676

Figure 3.1 – Local Historical Flood Maps



Report 2676 indicates that the flooding occurs at a low-lying section on the road. The reduced level of the road at this location is approximately 81mOD. The longitudinal section of the road in Figure 3.3 shows that the road rises sharply to either side of this location. The road crests again at a point near the entrance to Derrywood before falling towards to the junction with Derry Road.

Figure 3.2 – Satellite Image of N77 – Low point circled



Figure 3.3 – Longitudinal Section Along the N77



3.3 Catchment Flood Risk Assessment and Management Study (CFRAM) (2016)

The National CFRAM study involved detailed hydraulic modelling of river bodies and coastal areas and is the most detailed flood mapping undertaken to date in Ireland. The CFRAM flood maps do not cover the area of the site and as such do not identify any flood risk for the site. The nearest available map is for the town of Ballyragget where limited fluvial and no coastal flooding is indicated.

3.4 Sewer Surcharging

Information – local knowledge of sewer surcharging

3.5 Tidal Flooding

- **Source**

The site is inland and thus coastal flooding is not considered.

- **Likelihood**

There is less than 0.1% probability of coastal flooding at the site

- **Consequences**

The consequences of tidal flooding could be medium to severe damage to road and properties.

- **Risk**

The risk of tidal flooding is low.

- **Flood Risk Management**

The risk of tidal flooding is low. This can be further minimised by overland flow routing and setting finished floor levels at a safe distance above adjacent road levels. Maintenance of all drainage system should be carried out regularly.

- **Residual Risk**

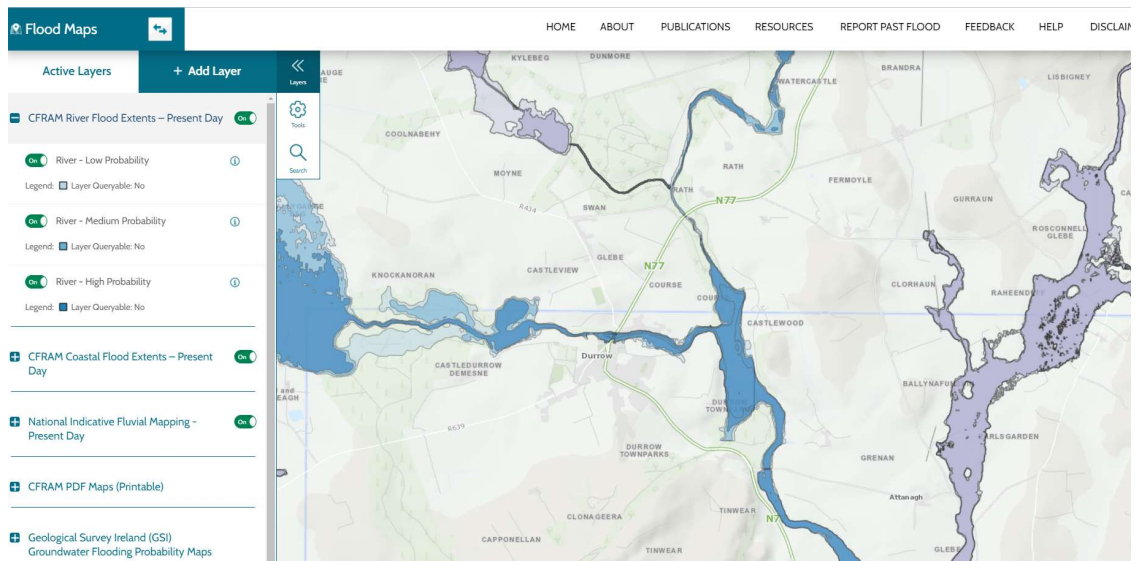
Coastal flooding is not considered.

3.6 Fluvial Flooding

- **Source**

The site is located within the Erkina/Nore catchment. The site is approximately 600m to the south of the Erkina. The Nore is approximately 1km to the east.

Figure 3.4 – GGSDS – Catchment Map



Likelihood

The site is located in Flood Zone C according to the local fluvial flood zone mapping. There is low likelihood of flooding occurring on the subject site if the fluvial flood levels exceed 0.1% AEP. The likelihood of fluvial flooding is therefore low.

- **Consequences**

The consequences of tidal flooding could be medium to severe damage to road and properties.

- **Risk**

The risk of tidal flooding is low.

- **Flood Risk Management**

The risk of tidal flooding is low. This can be further minimised by overland flow routing and setting finished floor levels at a safe distance above adjacent road levels. Maintenance of all drainage system should be carried out regularly.

- **Residual Risk**

There is a low residual risk of fluvial flooding.

3.7 Pluvial Flooding

- **Source**

The source of pluvial flooding is from heavy rainfall.

- **Pathways and Receptors**

During periods of extreme prolonged rainfall, pluvial flooding may occur through the following pathways.

	Pathway	Receptor
1	Surcharging of the proposed internal drainage systems during heavy rain leading to internal flooding	Proposed development – properties and roads
2	Surcharging from the existing surrounding drainage system leading to flooding within the subject site by surcharging surface water pipes	Proposed development – properties and roads
3	Surface water discharging from the subject site to the existing drainage network leading to the downstream flooding	Downstream properties and roads
4	Overland flooding from surrounding areas flowing onto the subject site	Proposed development – properties and roads
5	Overland flooding from the subject site flowing onto surrounding stie	Downstream properties and roads

It is proposed to discharge surface water from the proposed site to the existing surface water outfall to the southeast of the site.

- **Likelihood**

The site located outside of the 1% and 0.1% AEP flood extents zone on the local pluvial flood risk map.

Item 1

The proposed surface water drainage system has been designed to accommodate flows from the proposed development and discharge to the existing drainage system. The proposed attenuation tank has sufficient free board to accommodate the 1 in 100-year rainfall event with an additional allowance of 20% for climate change. The outfall level is circa 4m below the lowest ground level on the site and thus the proposed system has sufficient fall to discharge to the outfall. The likelihood of flooding in this scenario is low.

Item 2

As above

Item 3

Surface water runoff from the site will be attenuated and control via various measures and thus limited to the current greenfield run-off. The likelihood of surface water discharge from the site leading to downstream flooding is low.

Item 4

The OPW records for predictive and historic flood maps have been consulted in relation to flood in the vicinity of the site. The nearest historic flood events are approximately 2km. The site is not in a high or medium probability pluvial flood risk area. The likelihood of overland flooding from the surrounding areas onto the site is low.

Item 5

As above.

- **Consequences**

The consequences of pluvial flooding could be medium to severe damage to road and properties.

- **Risk**

The risk of pluvial flooding is low.

- **Flood Risk Management**

The risk of pluvial flooding is low. This can be further minimised by overland flow routing and setting finished floor levels at a safe distance above adjacent road levels. Maintenance of all drainage system should be carried out regularly.

- **Residual Risk**

There is low residual risk of pluvial flooding.

3.8 Ground Water Flooding

- **Source**

During periods of prolonged rainfall ground water may rise. This may reduce the effectiveness of soakaways and other infiltration drains.

- **Likelihood/Risk**

Geotechnical Investigations did not note a high ground water table. However, infiltration characteristics of the site are poor therefore levels may rise in prolonged wet periods.

- **Consequences**

The consequences of groundwater flooding would be ineffective infiltration where soakaways are used and damage to external landscaping.

- **Flood Risk Management**

Overflows from land drains to the to the drainage systems could be incorporated into the design.

- **Residual Risk**

There is a low residual risk of groundwater flooding.

3.9 Human/Mechanical Error

- **Source**

Inadequate construction and/or maintenance of drainage infrastructure within the site may result in uncontrolled discharge within the site. Similarly, poor maintenance of receptors downstream of the site may result in surcharging of sewers and flooding on the site.

- **Likelihood**

This may depend on external factors such as maintenance by third parties.

- **Consequences**

The consequences of flooding due to human/mechanical failure could be medium to severe damage to road and properties.

- **Risk**

The risk of tidal flooding due to human/mechanical failure is medium to high.

- **Flood Risk Management**

Overflow tanks should be provided for pumped systems with 3-4 days storage volume. Pump systems should have a duty and stand-by pump. A suitable development management and maintenance plan should be implemented.

- **Residual Risk**

There is a low to medium residual risk of groundwater flooding.

3.10 Flood Risk Summary

In accordance with the Department of Environment, Heritage and Local Government and the Office of Public Work's jointly published Guidance Document for Planning Authorities - The Planning System and Flood Risk Management – the site is located within Flood Zone B/c and thus Justification Test is required. As such the proposed development for the site is appropriate for the level of flood risk subject to mitigation measures being implemented to

account for the pluvial flooding risk. It is recommended that site levels and house finished floor levels are revised to ensure that floor levels are set at least 150mm above adjacent road levels and that gradients achieve compliance with Part M of the Building Regulations.

Based on the information detailed above the site is at low risk of flooding from coastal, fluvial, pluvial and groundwater sources. There is a medium to high risk of flooding due to human error or mechanical failure. This should be managed via a suitable inspection and maintenance regimen.