

Ecological Impact Assessment Report

N17 Milltown to
Gortnagunne Road
Realignment





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1.

INTRODUCTION

McCarthy Keville O’Sullivan Ltd. (MKO) has been instructed by Galway County Council (GCC) to complete an Ecological Impact Assessment (EcIA) screening exercise of proposed road realignment works on the N17 between Milltown and Gortnagunned, Co. Galway.

The aim of this Ecological Impact Assessment (EcIA) is to ensure that elements of the proposed project that may potentially affect protected sites, habitats or species are adequately assessed. This assessment quantifies any potential impacts relating to flora/fauna and identifies the mitigation or design measures required to avoid, reduce and mitigate any potential impacts. Where potential for impact was identified at an early stage in the project, alterations to the project layout have been incorporated. Where potential for residual impact remains, mitigation has been derived following a collaborative approach working with a multi-disciplinary team including project engineers, hydrologists and ecologists.

The information provided in this assessment describes the baseline ecological environment; provides a prediction of the likely ecological impacts of the proposed development; prescribes mitigation as necessary; and, describes the residual ecological impacts.

1.1

Relevant Legislation and Policy

National Legislation

The Wildlife Act, 1976–2021 (S.I. No. 166 of 2017), is the principle mechanism for the legislative protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act protects species from injury, disturbance and damage to breeding and resting sites. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis and have no statutory protection. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2018).

The Flora (Protection) Order, 2015 provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order, it is illegal to cut, uproot or damage species listed in any way or to alter, damage or interfere in any way with their habitats.

National Policy

The National Biodiversity Action Plan 2017-2021 is a framework for the conservation and protection of biodiversity in Ireland. The main objective of the plan is to conserve and restore biodiversity and ecosystem services. Objective 1 of the National Biodiversity Action Plan identifies the following relevant measures in relation to future developments:

- “Mainstreaming biodiversity into decision-making across all sectors”.
- “All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure”.

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

European Legislation

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The EU Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC), which were transposed into Irish law as S.I. No. 94/1997 European Communities (Birds and Natural Habitats) Regulations 1997, recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011- European Communities (Birds and Natural Habitats) Regulations 2011. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV.

Council Directive 2009/147/EC (the Birds Directive) on the conservation of wild birds instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species have been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment.

1.2

Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). These standard guidelines are recognised survey methodologies that ensure good practice.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment;

- *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal* (CIEEM, 2018, updated 2021).
- *Advice Notes on Current Practice (in preparation of Environmental Impact Statements)* (Environmental Protection Agency (EPA), 2003).
- *Guidelines on the information to be contained in Environmental Impact Statements* (EPA, 2002).
- *Draft Revised guidelines on the information to be contained in Environmental Impact Statements* (EPA, 2017).
- *Environmental Impact Assessment of National Road Schemes – A Practical Guide* (NRA, 2009).
- *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009).
- *Environmental Assessment and Construction Guidelines* (NRA, 2006).

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Galway County Council. Galway County Development Plan 2015 – 2021.
- Natura Impact Report of Galway County Development Plan 2015 – 2021, Galway County Council, (2015);

1.3

Statement of Authority

Field surveys were undertaken by Julie O’Sullivan (B.Sc., M.Sc.), Aoife Joyce (B.Sc., M.Sc.) and Claire Stephens (B.Sc.) on the 11th of July 2019, the 28th of August 2019 and on the 14th of October 2021. Aoife is an experienced ecologist with over two years’ experience. Claire has over three years’ experience in ecological consultancy. This report has been prepared by Julie O’Sullivan. Julie is an experienced ecologist with over five years professional experience. This report has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM) who has over ten years’ experience in ecological consultancy and Pat Roberts (B.Sc., MCIEEM), who has over fifteen years’ experience in ecological consultancy.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

Galway County Council is currently planning a 3km (approx.) upgrade of the N17 National Primary Route, between the townlands of Milltown and Gortnagunned, located immediately north-west of Milltown, Co. Galway (grid reference: M 40235 63265).

The project is located along N17 from Milltown to Gortnagunned and consists of both online and offline realignment of the existing road. The scheme commences north at Gortnagunned and extends approximately 3.0km south where it ties in at Milltown.

The realignment will take place in the townlands of Milltown, Cartron, Gortnaloura, Cloonnacross, Drum and Gortnagunned. The project will remove a number of substantially deficient bends on this section of the route and in so doing, will improve aspects such as safety, sight distance, cross sectional width and drainage.

The proposed scheme will tie-in on the Northern end with an existing section of the N17 that has already been upgraded and is of a higher standard and on the Southern end will tie in with the town of Milltown.

The project location is provided in Figure 2.1.

2.2 Development Description

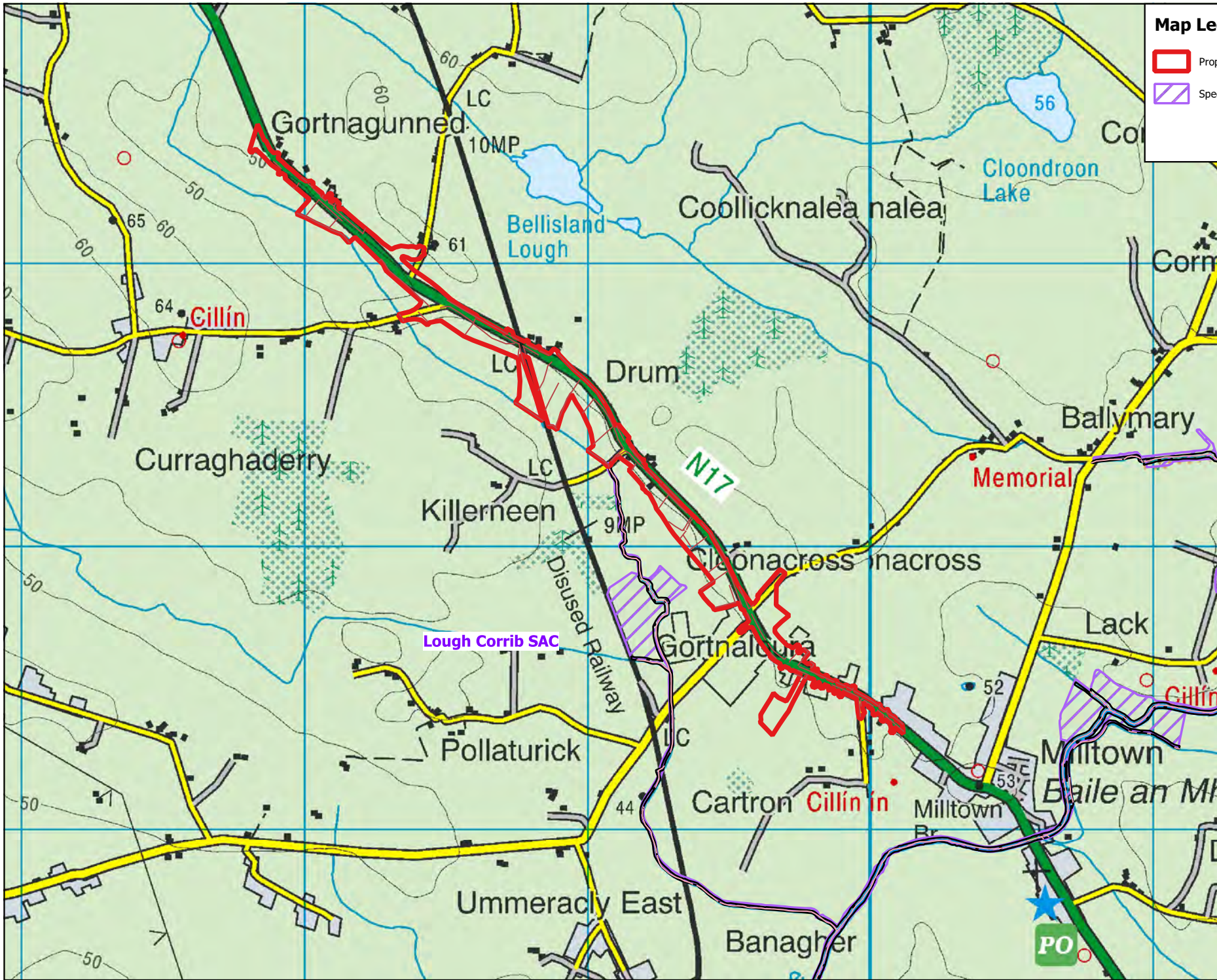
The project will remove a number of substantially deficient bends on this section of the route and in so doing, will improve aspects such as safety, sight distance, cross sectional width and drainage. The road type proposed for the project corresponds to a Type 1 Single Carriageway arrangement. The site layout is shown in Drawings SE01-SE04 in the Design Drawings submitted with the planning application and also included in Appendix 1 of this report.

The scheme includes the upgrade of 3km of the N17 North of Milltown, Co Galway. The realignment consists of both online on offline construction. The route consists of a Type 1 single carriageway and is designed in accordance with TII TD9. The road will consist of two lanes of 3.65m, a hard shoulder for each carriageway of 2.5m and verges of 3m, this cross section shall extend from Ch + 0 to Ch 2 + 560 of the scheme. Ch 2 + 560 to the end of the scheme is a Single Carriageway Urban Road with footway and cycleway on both sides of the carriageway. The design speeds for the proposed scheme are listed below, which is consistent and designed in accordance with TII DMRB's and DMURS.

- The design speed is 100km CH +0 to CH 2+180
- The design speed is 85km CH 2+180 to CH 2+560
- The design speed is 60km CH 2+560 to CH 2+945

The project will entail:

- Circa 3km of Realignment to the existing N17 National Primary Route (c. 1550m online and c.1450m offline);
- Junction Improvements including:
 - 7 no. Simple T Junctions, including one Right/Left Staggered T Junction;
 - Circa 0.775km of realignment to the existing local road network (tie-in works);



Map Legend

- Proposed Development Site
- Special Area of Conservation (SAC)



Drawing Title	
Site Location	
Project Title	
GCC N17 Milltown to Gortnagunned	
Drawn By	Checked By
CS	SM
Project No.	Drawing No.
190540	Figure 2.1
Scale: 1:7500	Date
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- 34 no. Direct Access connections to the National Primary network (including 17 no. agricultural and 17 no. residential); Where the new road has been realigned away from the original N17, the number of local access points have been rationalised to provide one access point onto the main carriageway from a number of access points. This will improve the safety of the route by reducing the number of possible conflicts.
- Where direct vehicular access to local properties and farmland has to be provided to the realigned road and cannot be mitigated, the minimum SSD will be maintained at all access points, particularly those that agricultural machinery will use.
- It is proposed to provide a footway/cycleway on the Left Hand Side (LHS) from Ch + 0 to Ch 2 + 560, 3m wide with a 2% slope falling towards the carriageway, with a reduced width of 2m from Ch 0 + 120 to Ch 0 + 200. The footway/cycleway is designed in accordance with DN – GEO – 03047 Rural Cycleway Design (Offline). Also, it is proposed to extend the footway/cycleway on both sides of the alignment from an approximate chainage of Ch 2 + 560 to Ch 2 + 945. The footway/cycleway is proposed to be 4.5m wide. This footway/cycleway is then extended on the western side of the alignment and goes offline from Ch 2 + 560 to Ch 2 + 310 utilising the old road corridor providing connectivity to the N17 Store. The footway/cycleway is designed in accordance with TD300/14 of the TII DMRBs.
- The proposed road drainage system will replace the current one where the road run-off is discharging directly to the receiving water courses and groundwater. The proposed system has been designed to ensure the speedy removal of surface water in order to provide safe driving conditions and to minimise the impact of runoff on the receiving environment. The drainage proposals have been developed in accordance with the TII Design Manual for Roads and Bridges and the principles of SuDS (Sustainable Drainage Systems) will be applied throughout. The proposed drainage system includes petrol interceptors and attenuation/sediment ponds, all of which ensure that run off is attenuated and treated before being discharged.
 - Runoff from the road will be collected via filter drainage pipes, concrete channels and gullies at various chainages.
 - The proposed drainage system will be installed in the verge of the carriageway and drain to 4 no. outfalls positioned at low points in the alignment adjacent to existing watercourses.
 - Water will be discharged to attenuation ponds prior to discharging to reaching the outfalls. Upstream of all outfalls, runoff will be detained and treated in the ponds.
 - Downstream of all outfalls, an oil/petrol interceptor will be provided prior to water entering a watercourse at the outfall.
 - Attenuation ponds have been designed using a 1 in 100 storm event plus 20% for climate change.
 - The drainage system discharges via all outfalls either directly or indirectly to the Drum stream to the south of the proposed development, which flows south before eventually connecting into the River Clare approximately 1.5 km downstream. The River Clare is included within the Lough Corrib SAC.
 - The drainage layout, including the location of attenuation ponds and outfalls is show on Drawings DR-01 to DR-04 and OD-01 to OD-04 of the design drawings submitted with the planning application (and also included in Appendix 1 of this report).
- The new scheme intercepts various utility services along its mainline, link roads and side roads. The works required to protect/divert existing services shall be developed further during detailed design. Affected utilities include the following
 - Low and Medium Voltage Electricity Lines
 - Water Supply
 - Telecommunications
 - Irish Rail
- Earthworks operations; Data gained from the ground investigation will be interpreted and utilized during detailed design for the design of the earthworks required in the construction of the scheme. It is expected that the majority of materials required in construction will be imported as it is expected from that there are low volumes of acceptable material available within the site extents.

There will be 2 no. Spoil Repository/Borrow Pits. A set back of 25m is provided at the spoil area which is adjacent to the tributary stream of the Clare River.

- As the scheme has sections of work that are both on-line and offline and as such the Contractor shall be responsible to undertake the works in a manner that will cause the least amount of traffic disruption. The haulage of materials to and from the site will create a significant temporary impact to both road users and to residents living this section of the N17. To minimize these impacts, only authorized site access roads, as directed by the Local Authority, will be used by construction vehicles. The construction process will be planned to accommodate existing traffic flows and the daily construction operations adjacent to the scheme.

2.2.1 Outline Erosion and Sediment Control Plan (OESC)

An Outline Erosion and Sediment Control Plan (OESC), accompanies this application, and has been prepared as a method of water quality preservation to offset potential construction stage pollution impacts from the N17 project to adjacent watercourses including various tributaries of the River Clare which is protected under Lough Corrib SAC (000297).

The Principal mitigation Measures included in the OESC are summarised below:

General

- The site will be fenced off, prior to works commencing.
- Before earthworks commence on site - drainage, erosion control and sediment control measures will be in place and functioning.
- Silt Fences will be erected in accordance with the manufacturer's recommendations and in compliance with the Design Criteria outlined in CIRIA C648 Control of Water Pollution from Linear Construction Projects:
 - a) At all sections of road construction where the works are at or above existing ground level
 - b) Along any other identified surface pathways for sediment laden runoff;
- Where land drains intersect the site boundary or where the adjacent land falls towards the construction site – temporary cut-off drains will be provided to intercept this clean runoff water and divert to the nearest watercourse. Small check dams will be constructed in these cut-off drains to trap any sediment and prevent erosion. Silt fences will be provided immediately before the outfall to existing watercourses as a precaution and to allow a response time in the event of an emergency. Trapped sediment will be removed regularly from behind the check dams, deposited >25m from any watercourse and reseeded with grass seed or alternatively removed to licenced waste facility.
- All watercourses will be fenced off with double silt fences located at least 10m back from the watercourse bank until such time as the road crossing is constructed.
- All silt fences at watercourse crossings will be inspected on a daily basis and repairs or replacements carried out as required.
- Dewatering and surface water runoff discharges from the construction site will be controlled, collected and routed via appropriate treatment measures. The measures will include appropriately sized settlement ponds as shown in Drawings DR01 to DR04 of the design drawings submitted with the planning application. Each pond will be provided with a double silt curtain at the outfall from the pond and a further double silt fence located before the discharge point. These facilities will be inspected/ maintained at least on a daily basis.
- Check dams and sediment traps shall be placed along constructed drains to reduce the velocity of concentrated runoff.
- Direct connections between the settlement pond outfalls and the watercourse will not be allowed. Instead, the outfall will be allowed to disperse across at least 3m of undisturbed vegetated ground, covered with a coir mesh or similar matting prior to reaching the watercourse;

- Where these ponds cannot be constructed in the dry, then they shall be formed by constructing bunds and placing an appropriate geotextile liner on top. Any/ all materials arising from the construction of the temporary settlement ponds shall be removed offsite to a licensed facility or used elsewhere in the works if deemed appropriate.
- Landscaping of the constructed road will be carried out in stages as the works progress and will commence as soon as is practicable in each of the outfall catchment areas;
- The requirement for reseeding will be determined by the final land use (i.e. agricultural, amenity etc.). If seeding of cut/fill slopes is not practical, the use of roughened slope surfaces shall be considered by the contractor which will encourage water infiltration, and decrease runoff velocity;
- Silt fencing shall remain in place until ground vegetation has recovered. Any accumulated silt will then be removed and disposed of to a licensed facility.
- Ensure that control measures are correctly installed and adequately sized prior to commencing site clearance and earthworks;
- Develop a maintenance checklist for control measures and inspect controls measures regularly throughout the project, particularly after heavy rainfall;
- Maintain controls through project such as removing sediment in silt traps once half full.
- Where excavated spoil is temporarily stockpiled on site, it will be stockpiled >25m from any watercourse and surrounded by a silt fence.

Earthworks - Cuts and Embankment Excavation

- The excavation of peat and other soft materials (if required) will be carried out in a manner that minimises the amount of water entering the face of the works. This will be achieved by placing fill in the excavated area as soon as is practicable (generally the same day).
- All excavators working in soft ground conditions, including peat, will be operated from a solid stone base and peat removed from the site in sealed containers to a designated storage location.
- The area of the earthworks operation will be kept to an absolute minimum at any one time.
- Where pumping out of the excavation is necessary, this will be carried out using appropriately sized pumps. A clean stone filled perforated pipe (or similar) will be used as a sump for the pump intake. The pumped out water will be directed to the earthworks drainage system and to the settlement pond (or other) treatment system. The outlet from the pump shall be designed so as not to mobilise additional sediment.
- A secondary pump will be kept on site to replace the primary pump in case of operational breakdown.

Earthworks - Subsoil Stabilisation

Subsoil Stabilisation is an activity which involves spreading powdered lime evenly over the surface of thin loose lifts (150-350 mm) of the Class U1 material, mixing it with the clay by rotavating, and then allowing the mix to dry or cure over a short period of time prior to compaction. Should this activity be proposed to be used by the contractor, the following controls will be applied:

- The activity shall only be carried out under calm dry metrological conditions. Lime application shall not be exposed to wind and where any risk occurs will be misted/sprayed down immediately;
- The activity will not take place within 100m of any watercourse;
- Following mixing (which should take place generally within 15 minutes of spreading the lime on the surface) the material shall be compacted within 1 hour and appropriately sealed. In no case will this material be allowed to be left unsealed overnight;

Transportation

- Road cleaning will be carried out at least daily to ensure that there is no build-up of sediment on the public road;
- In the event of a substantial quantity of spoil material being required to be exported offsite then a proprietary mobile truck wheel wash system shall be installed at the relevant locations.

Stockpiles

- Topsoil stripping over large areas in advance of main excavation works will not be permitted. It will be restricted to the minimum required for efficient earthworks operations and will only be carried out in construction area units where earthworks is on-going.
- Each construction area unit will be topsoiled as the works proceeds thus limiting both the amount and the length of time for which materials have to be stockpiled.
- Stockpiles will not be located within 25m of a watercourse and shall be surrounded with a continuous silt fence.
- Runoff from a stockpile will be collected via a shallow toe drain, located outside the silt fence, which will have check dams at regular intervals and will be designed to have a retention time of at least 5 hours. Prior to outfall straw wrapped in geotextile bags and inset into the base of the drain by at least 100mm shall be provided followed by a silt fence upstream of the outlet.
- Stockpiles of non-granular materials shall be limited in height to not more than 2.5m.
- Where stockpiling of peat or organic clays is required they shall be limited in height to 1m (with 1V:5H side slopes) or fully contained within an appropriately designed bund.

Waterbodies and Sensitive Habitats

- All works in proximity to watercourses shall follow the best practice guidance outlined in the following documents:
 - a) TII/NRA 'Guidelines for the crossing of Watercourses During Construction of National Road Schemes (2008);
 - b) Inland Fisheries Ireland, Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters, 2016;
- Preserve natural vegetation near watercourses and along the perimeter of the site as much as practically possible.
- Leave a 5m grassed strip next to river banks when stripping topsoil or place grassed soil bunds along river banks to prevent site runoff directly entering watercourses.
- Place straw bales or sand bags along the sides of temporary or existing bridges to prevent runoff entering the watercourse.
- Any watercourse crossings will be replaced by piped (or box) crossings of at least 900mm diameter;
- The works will be programmed so that where watercourses are dry for a portion of the year then the crossing will be constructed "in the dry" during that period.
- Crossings in wet watercourses will be provided with a silt trap and a sediment immediately downstream of the crossing point.
- The silt trap shall be left in place for at least 6 weeks following completion of the work and shall be inspected and maintained at least 3 times per week.
- The area of disturbance of the watercourse bed and bank shall be the absolute minimum required for the installation of the crossing.
- Only precast Concrete pipes/ units will be used in the installation of these crossings.

- Where some of these minor watercourses require diversion, cut-off drains will be constructed to divert water away from the construction site. Small check dams will be constructed in these cut-off drains to trap any sediment and silt fences will be provided immediately before the outfall to existing watercourses.

Concrete Works

Where the use of concrete near watercourses cannot be avoided the following control measures will be employed:

- Hydrophilic grout and quick-setting mixes or rapid hardener additives shall be used to promote the early set of concrete surfaces exposed to water.
- When working in or near the surface water and the application of in-situ materials cannot be avoided, the use of alternative materials such as biodegradable shutter oils shall be used.
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials. Such spills shall be contained immediately, and runoff prevented from entering the watercourse.
- Concrete waste shall be disposed of in accordance with the site-specific Construction & Demolition Waste Management Plan which accompanies this application;
 - a) No batching of wet-cement products will occur on site;
 - b) Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;
 - c) No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
 - d) Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
 - e) Use weather forecasting to plan dry days for pouring concrete;

Construction Compounds

- Construction compounds shall be located on dry land and set back a minimum of 25m from lakes, river and stream channels, ecological sensitive areas (internationally and nationally important habitats, wet areas such as wetland habitats, marshes and fens, etc.) and away from potential floodplain areas.
- Construction compounds shall not be located in European Sites or within 50m of the boundary of same.
- Construction compounds shall not be located within other designated environmental sites or other ecologically sensitive sites.
- The storage of fuels, other hydrocarbons, and other chemicals within the construction compounds will not be permitted within 30m of any sensitive watercourse.
- Surface runoff from compounds will be minimised by ensuring that the paved/ impervious area is minimised. All surface water runoff will be intercepted and directed to appropriate treatment systems for the removal of pollutants prior to discharge
- All site compounds will be fenced off and a silt fence erected and maintained on the site boundary.
- Wastewater drainage from all site offices and construction facilities will be contained and disposed of in an appropriate manner to prevent water pollution and in accordance with the relevant statutory requirements.

The storage of fuels, other hydrocarbons and other chemicals within the construction compounds shall be in accordance with relevant legislation and with best practice. In particular:

- All fuel/ Hydrocarbon/ Chemical (fluid) storage areas shall be banded to 110% of storage capacity.
- Storage of these materials within a compound shall be organised so as to be as far away from all water bodies as is practicable.
- The Emergency Response Plan shall include arrangements for dealing with accidental spillage and relevant staff shall be trained in these procedures.

Environmental Monitoring

- The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.
- An Environmental Manager, Environmental Clerk of Works (EcoW) and suitably qualified Project Ecologist will be appointed by the contractor to monitor the construction work.
- Prior to the commencement of works the Environmental Manager, Environmental Clerk of Works (EcoW) and Project Ecologist shall provide a Toolbox Talk to all operatives on site, making them aware of any ecological sensitivities.
- A pre-commencement otter survey and invasive species survey will be undertaken by the Project Ecologist.
- The Project Ecologist will also undertake periodic surveys of the site during the construction phase for signs of otter activity.

3. ASSESSMENT METHODOLOGY

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

The following sections outline the methodologies utilised to establish the baseline ecological condition of the proposed development site.

3.1 Establishing the Zone of Influence

As described in the CIEEM, 2018 (updated 2021) 'Guidelines for Ecological Impact Assessment in The UK and Ireland', 'the 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities'. The zone of influence will vary with different ecological features, depending on their sensitivities to an environmental change. This may extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The assessment of the development site began with a desk study of available published data on sites designated for nature conservation, other ecologically sensitive sites, habitats and species of interest in the vicinity of the proposed development. A review of OSI mapping, online environmental web-mappers and ortho-photography was also undertaken. The baseline information obtained from the desk study was the first stage in defining a zone of influence of the proposed development. The variables for determining potential for effect include;

- The physical distance between the proposed development and the ecological receptors identified during the desk and field surveys, and
- The sensitivity of the ecological receptors to physical change in the area (CIEEM, 2018).

The zone of likely influence for the proposed development varied depending on the ecological receptors identified on site. For example, designated sites for nature conservation were assessed for potential surface water connectivity and this may exceed 15km in some instances. Potential for direct effect on species such as badger will have a smaller zone of influence given the nature and scale of the project. For this reason, the zone of influence was assessed at a local scale in close proximity to proposed infrastructure.

3.2 Desk Study

The desk study undertaken for this assessment included a thorough review of the available ecological data associated with the study area of the proposed development. Sources of data included the following:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Teagasc, Environmental Protection Agency (EPA), Water Framework Directive (WFD), Office of Public Works (OPW) flood Mapping,
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons *et al.*, 1993; Balmer *et al.*, 2013),
- Review of the Bat Conservation Ireland (BCI) database,
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper,
- Data on potential occurrence of protected bryophytes in the NPWS; recently launched Flora Protection Order Map Viewer – Bryophytes
- Inland Fisheries Ireland (IFI) reports, where relevant/available,
- Review of NPWS Article 17 metadata and GIS database files.

3.3 Consultation

An informal scoping exercise was undertaken during preparation of this report.

Table 3-1 provides a list of the organisations consulted with regard to Biodiversity during the scoping process, and notes where scoping responses were received.

Table 3-1 Details of consultation undertaken and responses received

Consultee	Date	Response
Birdwatch Ireland	02/12/20	No response to date (17/12/2020)
Bat Conservation Ireland	02/12/20	BCI advised that they do not have capacity to provide comment on planning applications (15/12/2020)
Inland Fisheries Ireland	02/12/20	No response to date (17/12/2020)
Environment Protection Area	02/12/2020	No response to date (17/12/2020)
Office of Public Works	02/12/2020	No response to date (17/12/2020)
National Parks and Wildlife Service	October 2019	No response to date (17/12/2020)

3.4 Methodology for Assessment of Effects

3.4.1 Ecological Evaluation

Ecological evaluation and impact assessment within this chapter follows a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009) and CIEEM, 2016 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal'. These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular site is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The (NRA 2009) Ecological Impact Guidelines, clearly sets out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna.

All habitats and species within the development site were assigned a level of significance on the above basis and the Zone of Influence (ZOI) and sensitive ecological receptors were established and classified on this basis.

3.4.2 Assessment of Effects

As per the EPA, 2017 document 'Guidelines on the information to be contained in environmental impact assessment reports', specifically Table 3.3 of the guidelines, the below paragraphs outline the methodology used to assess the effects of the project on the receiving environment. Reference is made to the following parameters wherever appropriate when characterising effects:

- Magnitude relates to the quantum of effect, for example the number of individuals affected by an activity;
- Extent should also be predicted in a quantified manner and relates to the area over which the effect occurs;
- Duration is intended to refer to the time during which the effect is predicted to continue, until recovery or re-instatement;
- Reversibility should be addressed by identifying whether an effect is ecologically reversible either spontaneously or through specific action; and,
- Timing/frequency of effects in relation to important seasonal and/or life-cycle constraints should be evaluated. Similarly, the frequency with which activities (and associated effects) would take place can be an important determinant of the effect on receptors.

It is necessary to ensure that any assessment of effect takes account of construction and operational phases; direct, indirect and synergistic effects; and, those that are temporary, reversible and irreversible. The criteria for assessment of effect magnitude, type and significance are given in Table 3.1 and 3.2. The following terms are defined when quantifying duration (EPA, 2017):

- Momentary effects - Effects lasting from seconds to minutes
- Brief effects - Effects lasting less than a day
- Temporary effects - Effects lasting less than a year
- Short-term – 1 to 7 years
- Medium term – 7 to 15 years
- Long term – 15 to 60 years
- Permanent – over 60 years
- Reversible effects - Effects that can be undone, for example through remediation or restoration.

Table 3-2 Criteria for assessing significance of effect, based on (EPA, 2017) guidelines

Effect Magnitude	Definition
No change	No discernible change in the ecology of the affected feature.
Imperceptible effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound effect	An effect which obliterates sensitive characteristics.

Table 3-3 Criteria for assessing effect quality based on (EPA, 2017)

Effect Magnitude	Definition
Positive	A change which improves the quality of the environment e.g. increasing species diversity, improving reproductive capacity of an ecosystem or removing nuisances.
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment e.g. lessening species diversity or reducing the reproductive capacity of an ecosystem or by causing nuisance.

3.4.3 Incorporation of Mitigation

The proposed development layout has been designed through an iterative design process to ensure that the proposal avoids potential effects on sensitive ecological receptors. Section 5 of this report assesses the potential effects of the proposal to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid potential for significant residual effects, post mitigation.

3.5 Field Surveys

A comprehensive survey of the fauna and flora of the site of the proposed road development was undertaken between July and August 2019.

The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

3.5.1 Multi-disciplinary Walkover Surveys

Multidisciplinary ecological walkover survey of the proposed development site and surrounding areas were undertaken on the 11th of July 2019, 28th of August 2019 and on the 14th October 2021 by Julie O'Sullivan, Aoife Joyce and Claire Stephens. The majority of the survey timing falls within the recognised optimum period for vegetation surveys/habitat mapping, i.e., April to September (Smith et al., 2011).

Habitats were classified in accordance with the Heritage Council's '*Guide to Habitats in Ireland*' (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith et al., 2011). Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010), while mosses and liverworts nomenclature follows '*Mosses and Liverworts of Britain and Ireland - a field guide*' (British Bryological Society, 2010).

The multi-disciplinary walkover survey was designed to detect the presence, or likely presence, of a range of protected habitats and species. Incidental sighting/observations of birds and additional fauna were noted during the site visit. Surveys were undertaken in accordance best practice guidance (TII, 2008: *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*). During the multi-disciplinary ecological walkover surveys the potential for the study area to support protected mammals listed in the Wildlife Acts, 1976–2021, such as pine marten, red squirrel, Irish hare, pygmy shrew, Irish stoat etc. was assessed.

The multi-disciplinary walkover surveys comprehensively covered the entire study area and based on the survey findings, further detailed targeted surveys were carried out for habitats, features and locations of ecological significance. These surveys were carried out in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009).

During the multi-disciplinary walkover survey, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed. All plants were readily identifiable, and it is considered that a comprehensive and accurate assessment of the habitats was achieved.

3.5.2 Faunal Surveys

The results of the desk study, scoping replies and multidisciplinary walkover survey were utilised to inform the scope of targeted ecological surveys required. The non-volant mammal surveys covered the entire study area.

3.5.2.1 Otter Survey

Following the results of the multi-disciplinary walkover survey; areas identified as providing potential habitat for Otter were subject to specialist targeted survey. Tributary streams of the River Clare and drainage ditches in the works area were subject to a dedicated otter survey on the 11th of July 2019 and 14th October 2021. All potential supporting habitat for the species within the study area was surveyed.

The Otter survey was conducted as per NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all Otter signs e.g., spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the Otter habitat (NPWS 2009, Threat Response Plan: Otter (2009-2011)). The dedicated Otter survey also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes'.

3.5.2.2 Badger Survey

Areas identified as providing potential habitat for Badger were subject to specialist targeted survey. The badger surveys covered the entire study area and was conducted on the 11th of July 2019, 28th of August 2019 and 14th October 2021.

The Badger survey was conducted to determine the presence or absence of Badger signs within and outside (areas of identified suitable habitat) the proposed road development footprint and study area. This involved a search for all potential Badger signs as per NRA (2009) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in NRA (2009) (i.e., Main, Annex, Subsidiary, Outlier).

The Badger surveys were conducted adhering to best practice guidance (NRA, 2009) and were cognisant of 'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes' (NRA, 2006a).

3.5.2.3 Bat Survey

Dedicated surveys were conducted with specific reference to the recommended survey periods outlined in NRA (2006) and BCT (2016). The Appendix II of the NRA Guidelines state that activity surveys can be undertaken between March and September, but the most effective detector survey period is June, July and August. Structural surveys for potential roosts and surveys of potential tree roosts can be conducted at any time of the year. The NRA Guidelines recommend 2-4 survey rounds during the active season to confirm species presence and activity in an area. The number of rounds required depends on the habitat type. Based on the habitats in the study area, two rounds of activity surveys were conducted during the 2019 survey period; July and August.

Targeted night-time detection surveys were conducted along the entire route corridor but focused on areas where high quality bat habitats were identified in the multi-disciplinary walkover survey. These surveys were conducted over two nights (i.e., dusk) and the study areas were divided and systematically surveyed. A dawn survey was carried out in addition to the dusk survey carried out in August. A combination of driven and walked transects were utilised to cover the large extent of the study area. Batlogger real time expansion bat detectors and Petterson Ultrasound D200 heterodyne bat detectors were used by the surveyors to pick up the echolocation calls of any bats on the site. Heterodyne detectors were set to 45KHz to pick up the majority of bat calls and varied to suit where contacts were made.

Dusk surveys commenced 30 minutes before sunset and continued for approximately 2.5 – 3 hours. The survey then recommenced between 1.5 and 2 hours before sunrise and continued until sunrise.

Each contact with a bat was recorded. Where possible, a positive identification to species level was made. Information on the behaviour, derived from visual observation, was also recorded where available.

Table 3-4 Summary of Bat Survey Periods and Conditions

Date	Period	Temperature	Rain	Wind	Cloud
11 th July 2019	Dusk	17° C	Dry	Light Breeze	Clear (5%)
28 th August 2019	Dusk	14° C	Dry	Light Breeze	Overcast (41%)
29 th August 2019	Dawn	13° C	Light Drizzle	Calm/Slight breeze	Overcast (90%)

Five Buildings are earmarked for demolition along existing N17 route. These buildings were surveyed on the 28th of August 2019, by Claire Stephens (B.Sc.), Aoife Joyce (B.Sc., M.Sc.) and Aoife Crowe (B.Sc.). Bat roost surveys were undertaken in accordance with ‘*Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists: good practice Guidelines (3rd edition)*’, (Collins, J (ed.), 2016). BCT guidance was also used for the classification of roosting/foraging features within the site.

A detailed bat suitability assessment of the buildings was undertaken during daylight hours. The aim was to survey for potential access points and potential bat roosting locations. Close-focusing binoculars were used to inspect the outside of buildings from the ground. The search included the ground, windows and accessible windowsills, walls, eaves, and the rooves of the buildings. Signs of bat activity that were searched for included: droppings, live and dead specimens, feeding remains and fur oil staining at potential roost entrances and features that may lend themselves to use by bats.

A systematic search of all accessible interiors within each of the buildings was also undertaken. Searches were carried out with the aid of binoculars, torches and a ladder and focused on walls, floors, roof beams, windowsills, lintels, shelves, tops of large equipment and furniture.

A dusk emergence survey and dawn re-entry was undertaken on the evening of the 28th and the morning of the 29th of August 2019 at the buildings identified as having the potential to support roosting bats. The purpose was to observe, listen and record any bats exiting or entering potential roost sites identified during daytime inspections. In addition, any bats using the site for foraging or commuting were noted. Surveyors, equipped with Batlogger M bat detectors (Elekon AG, Lucerne, Switzerland), were positioned at building, with particular focus given to potential access points and roost locations noted during the roost inspections.

The roost emergence surveys commenced 30 minutes before sunset and finished 3 hours after sunset. The dawn re-entry survey commenced 2 hour before sunrise and finished 30 minutes after sunrise. Conditions were highly suitable for bat surveying. The roost emergence/re-entry surveys on the 28th/29th of August 2019 were following by a walked transect on the 28th and a driven transect on the 29th of August.

Hedgerows and treelines within the site were assessed for their suitability or commuting bat species and mature trees within the site were assessed for suitability to provide roosting locations for bat species following Collins, J. (ed.) (2016) ‘*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*’. Trees of suitable height and age were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential tree roost features identified by Andrews (2013). Evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises were searched for.

Suitability was assessed, according to Collins (2016), which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low* and *Negligible* in this document.

3.5.2.4 Survey Limitations

The information provided in this report accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the proposed development; prescribes mitigation as necessary; and, describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

No significant limitations in the scope, scale or context of the assessment have been identified.

4. ESTABLISHING THE ECOLOGICAL BASELINE

4.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology of the existing environment. Material reviewed includes the Site Synopses for designated sites for their conservation importance compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht (DCHG), bird and plant distribution atlases and other research publications.

4.1.1 Designated Areas

4.1.1.1 European Sites

Potential for effects on European sites is summarised in this report and is fully addressed in the Natura Impact Statement submitted as part of the statutory consent process. The European sites in the likely zone of impact are presented in Table 4.1.

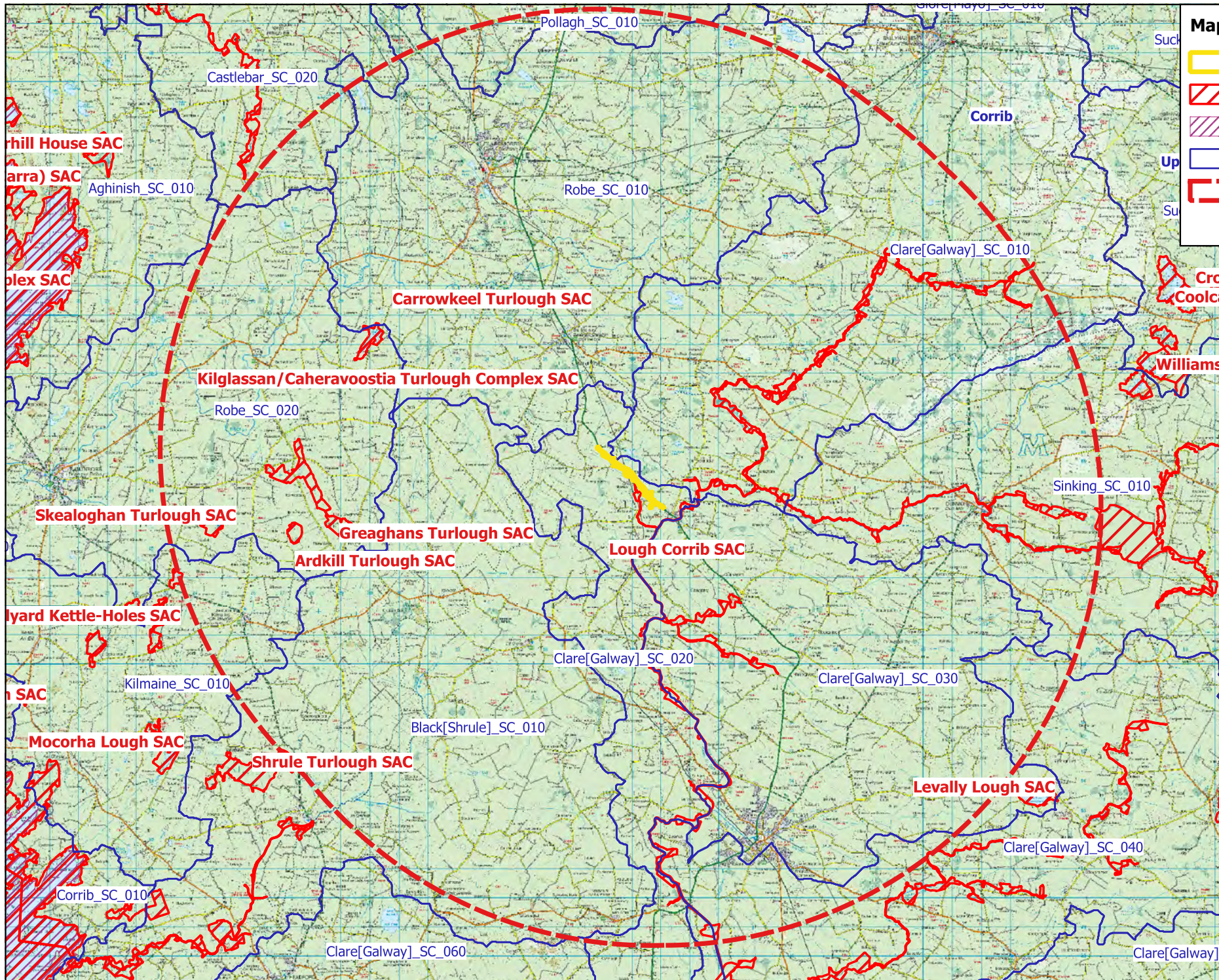
4.1.1.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are heritage sites that were designated for the protection of flora, fauna, habitats and geological sites under the Wildlife (Amendment) Act 2000. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. These sites do not form part of the Natura 2000 network and the Appropriate Assessment process, or screening for same, does not apply to NHAs or pNHAs. Nationally Designated Sites are listed in Table 4.2.





4.1.1.3 Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Development

Using the GIS software, MapInfo (Version 10.0), European and nationally designated sites within the likely zone of influence were identified. Initially, sites within a 15km radius of the proposed development were identified (as per the DoEHLG Guidance (2010)). In addition, using the precautionary principle, designated sites located outside the 15km buffer zone were also considered and assessed. In this case, potential for effects on sites located outside the 15km zone was identified, as the works area has hydrological connectivity with Lough Corrib SPA and Lough Corrib pNHA, in excess of 56.3km downstream, via the River Clare.

EU designated sites are shown in Figure 4.1 and nationally designated sites are shown in Figure 4.2.



Map Legend

-  Site Location
-  Special Area of Conservation (SAC)
-  Special Protection Area (SPA)
-  WFD Hydrological Sub-catchment
-  15km Buffer



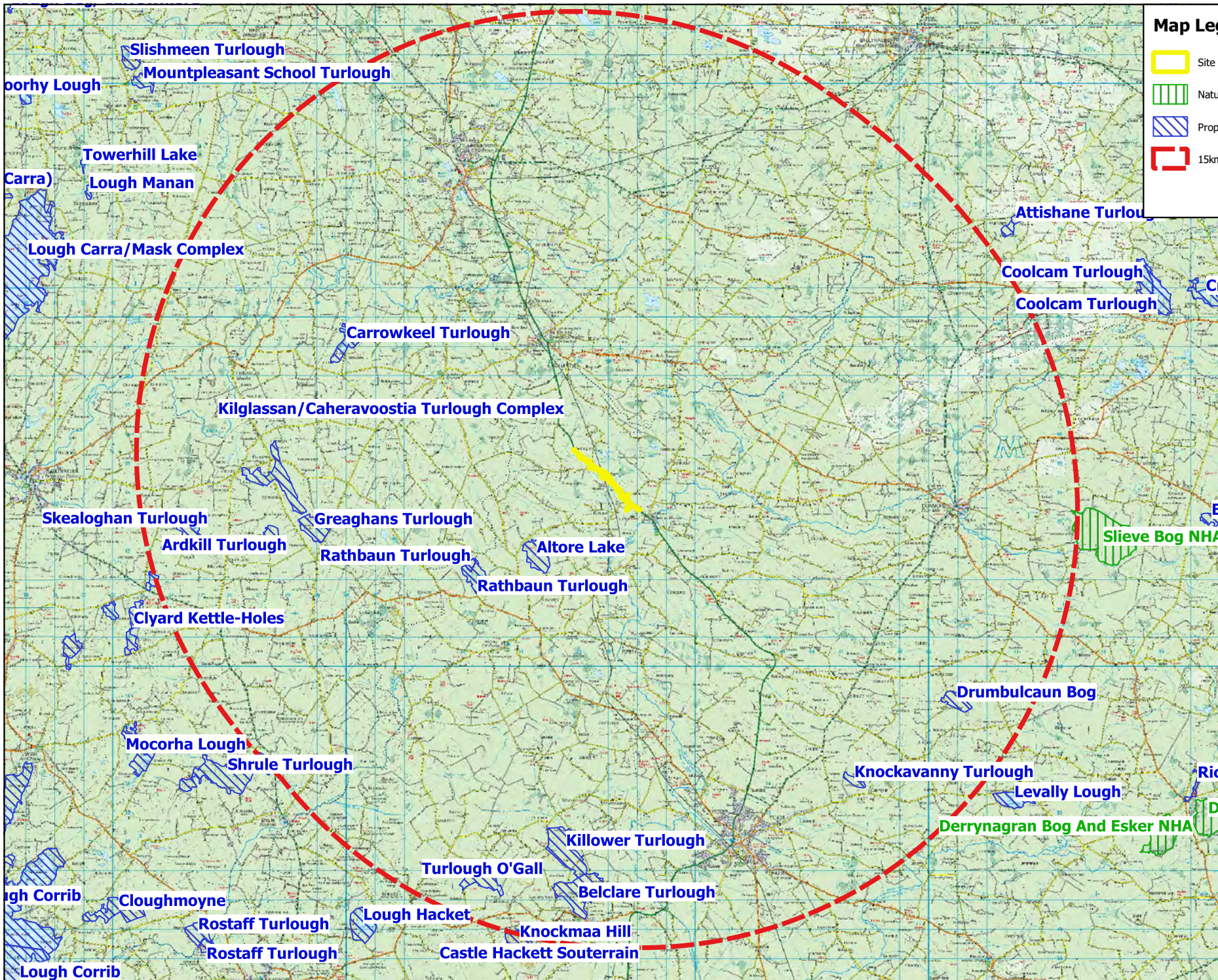
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Drawing Title
European Designated Sites within 15km

Project Title
N17 Milltown to Gortnagunned

Drawn By CS	Checked By SM
Project No. 190540	Drawing No. Figure 4-1
Scale 1:170000	Date 2021-11-08

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Drawing Title
Nationally Designated Sites within 15km

Project Title
N17 Milltown to Gortnagunned

Drawn By CS	Checked By SM
Project No. 190540	Drawing No. Figure 4-2
Scale 1:170000	Date 2021-11-08

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Table 4-1 EU Designated Sites in the likely zone of impact

Designated Site	Qualifying interest	Conservation Objectives
Special Area of Conservation (SAC)		
<p>Lough Corrib SAC</p> <p>Distance: 0m - works are adjacent to the SAC boundary.</p>	<ul style="list-style-type: none"> ➤ Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] ➤ Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130] ➤ Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara spp.</i> [3140] ➤ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] ➤ Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] ➤ <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] ➤ Active raised bogs [7110] ➤ Degraded raised bogs still capable of natural regeneration [7120] ➤ Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] ➤ Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] ➤ Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220] ➤ Alkaline fens [7230] ➤ Limestone pavements [8240] ➤ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] ➤ Bog woodland [91D0] ➤ <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] ➤ <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] ➤ <i>Petromyzon marinus</i> (Sea Lamprey) [1095] ➤ <i>Lampetra planeri</i> (Brook Lamprey) [1096] ➤ <i>Salmo salar</i> (Salmon) [1106] ➤ <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303] ➤ <i>Lutra lutra</i> (Otter) [1355] ➤ <i>Drepanocladus vernicosus</i> (Slender Green Feather-moss) [1393] 	<p>Detailed conservation objectives for this site (Version 1, April 2017) were reviewed as part of the assessment and are available at www.npws.ie</p>

Designated Site	Qualifying interest	Conservation Objectives
	<ul style="list-style-type: none"> ➤ <i>Najas flexilis</i> (Slender Naiad) [1833] 	
Carrowkeel Turlough SAC Distance: 8.3km	<ul style="list-style-type: none"> ➤ Turloughs 	Detailed conservation objectives for this site (Version 1, January 2021) were reviewed as part of the assessment and are available at www.npws.ie
Greaghans Turlough SAC Distance: 8.8km	<ul style="list-style-type: none"> ➤ Turloughs [3180] 	Detailed conservation objectives for this site (Version 1, January 2021) were reviewed as part of the assessment and are available at www.npws.ie
Kilglassan/Caheravoostia Turlough Complex SAC Distance: 9.5km	<ul style="list-style-type: none"> ➤ Turloughs [3180] 	Detailed conservation objectives for this site (Version 1, January 2021) were reviewed as part of the assessment and are available at www.npws.ie
Ardkill Turlough SAC Distance: 10.5km	<ul style="list-style-type: none"> ➤ Turloughs [3180] 	Detailed conservation objectives for this site (Version 1, December 2020) were reviewed as part of the assessment and are available at www.npws.ie
Skealaghan Turlough SAC Distance: 13.1km	<ul style="list-style-type: none"> ➤ Turloughs [3180] 	Detailed conservation objectives for this site (Version 1, January 2021) were reviewed as part of the assessment and are available at www.npws.ie
Shrule Turlough SAC Distance: 14.6km	<ul style="list-style-type: none"> ➤ Turloughs [3180] 	Detailed conservation objectives for this site (Version 1, January 2021) were reviewed as part of the assessment and are available at www.npws.ie

Designated Site	Qualifying interest	Conservation Objectives
<p>Clyard Kettle-Holes SAC</p> <p>Distance: 14.9km</p>	<ul style="list-style-type: none"> ➤ Turloughs [3180] ➤ Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] 	<p>Detailed conservation objectives for this site (Version 1, October 2021) were reviewed as part of the assessment and are available at www.npws.ie</p>
Special Protection Area (SPA)		
<p>Lough Corrib SPA</p> <p>Distance: 56.3km (via surface water connectivity)</p>	<ul style="list-style-type: none"> ➤ Gadwall (<i>Anas strepera</i>) ➤ Shoveler (<i>Anas clypeata</i>) ➤ Pochard (<i>Aythya ferina</i>) ➤ Tufted Duck (<i>Aythya fuligula</i>) ➤ Common Scoter (<i>Melanitta nigra</i>) ➤ Hen Harrier (<i>Circus cyaneus</i>) ➤ Coot (<i>Fulica atra</i>) ➤ Golden Plover (<i>Pluvialis apricaria</i>) ➤ Black-headed Gull (<i>Chroicocephalus ridibundus</i>) ➤ Common Gull (<i>Larus canus</i>) ➤ Common Tern (<i>Sterna hirundo</i>) ➤ Arctic Tern (<i>Sterna paradisaea</i>) ➤ Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) ➤ Wetland and Waterbirds 	<p>This site has the generic conservation objective:</p> <p><i>‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA’</i></p> <p>This site has a second conservation objective:</p> <p><i>‘To maintain or restore the favourable conservation condition of the wetland habitat at Lough Corrib SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.’</i> (NPWS Generic version 8.0, 2021)</p>

Table 4-2 Nationally Designated Sites within the Likely Zone of Impact

Natural Heritage Areas (NHA)
Slieve Bog NHA, Distance: 14.8km
Proposed Natural Heritage Areas (pNHA)
Altore Lake pNHA, Distance: 3.2km
Rathbaun Turlough pNHA, Distance: 5km
Carrowkeel Turlough pNHA, Distance: 5km
Greaghans Turlough pNHA, Distance: 8.8km
Kilglassan/Caheravoostia Turlough Complex pNHA, Distance: 9.4km
Ardkill Turlough pNHA, Distance: 10.5km
Killower Turlough pNHA, Distance: 11.2km
Knockavanny Turlough pNHA, Distance: 11.4km
Drumbulcaun Bog pNHA, Distance: 12.2km
Belclare Turlough pNHA, Distance: 12.6km
Turlough O'Gall pNHA, Distance: 13.2km
Skealaghan Turlough pNHA, Distance: 13.1km
Shrulle Turlough pNHA, Distance: 14.9km
Clyard Kettle-Holes pNHA, Distance: 14.9km
Knockmaa Hill pNHA, Distance: 15km
Lough Corrib pNHA, Distance: 56.3km (via surface water connectivity)

4.1.2 New Flora Atlas

A search was made in the New Atlas of the British & Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km squares in which the study site is situated (M36). Each hectad contains 100 whole one kilometre squares. The results of the Atlas search are provided in Table 4.3 below.

Table 4-3 Plant species of conservation concern in hectad M36

Species	Conservation Status
Tubular Water Dropwort (<i>Oenanthe fistulosa</i>)	Red list: Near threatened

4.1.3 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS 2018a) was also undertaken. No protected bryophytes have been recorded within or adjacent to the proposed development site.

The Bryophytes of Ireland Database was consulted regarding records of species that are listed in Ireland Red List No 8. *Bryophytes* (Lockhart et al 2012¹). The dataset comprises the data that is published in the Atlas of British & Irish Bryophytes (Blockeel et al. 2014). In total, 2 species listed in the red data book have been recorded from hectads M36 (listed in Table 4.4)

Table 4-4 Bryophytes of Ireland database records for hectad M36

Species	Conservation Status
Acute-leaved Bog-moss (<i>Sphagnum capillifolium</i>)	Red list: Near threatened
Large White-moss (<i>Leucobryum glaucum</i>)	EU Habitats Directive, Annex IV

4.1.4 Habitats

A review of available NPWS Article 17 habitats datasets and the National Survey of Native Woodlands 2003-2008, Ancient and Long-Established Woodland, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets were reviewed along with data received from the NPWS scientific data unit, following a formal data request. Shapefile data were downloaded from NPWS and overlain onto the study area. There were no records for EU Annex I habitats recorded within or immediately adjacent to the proposed development site. The lands within the site have not been mapped as part of any NPWS Article 17 assessment.

4.1.5 Birds

A number of sources were assessed to determine the likely usage of the site by both breeding and wintering bird species, including Bird Atlases, National Biodiversity Data Centre (NBDC), BirdWatch Ireland and Conservation Objectives Supporting Documents from the National Parks and Wildlife Service (NPWS) for nearby Special Protection Areas (SPAs). The following sub sections provide a breakdown of the sources used and results obtained.

¹ Lockhart, N., Hodgetts, N.& Holyoak, D. (2012) Ireland Red List No.8: Bryophytes. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

4.1.5.1 Breeding and Wintering Bird Atlases

The Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland (Balmer et al., 2013) provides the most up-to-date information regarding the distribution and relative abundance of bird species in Britain and Ireland, based on surveys carried out between 2007 and 2011.

The atlases show data for breeding and wintering birds respectively in individual 10 km x 10 km squares (hectads). Table 4.3 shows those species found in the relevant hectads (R65), which are recorded as breeding in the most recent atlas. It also provided species that have been recorded within the relevant hectad on National Biodiversity Data Centre (NBDC) datasets as well as those listed in Annex I of the EU Birds Directive recorded on the BoCCI Red List. Birds listed under Annex I are offered special protection by the EU Birds Directive. Those listed on the Birds of Conservation Concern in Ireland (BoCCI) Red List meet one or more of the following criteria:

- IUCN: Global conservation status (Critically Endangered (CE), Endangered (E) or Vulnerable (V), but not Near Threatened. These species are recognised as the highest priorities for action at a global scale and are thus priorities at an all-Ireland level.
- European conservation status. The conservation status of all European species was assessed most recently by Birdlife International (2004), one of the main changes in the revision being to include the IUCN criteria. These species are those of global conservation concern (including those classified as Near Threatened) and are Red-listed.
- The Irish breeding population has undergone significant historical decline since 1800.
- The Irish breeding population or range has declined by 50% or more in the thirteen years from 1998-2011 (BDp1) or the 25 years from 1980-2013 (BDp2).
- The Irish non-breeding population has undergone a significant decline of 50% in the last 25 years.
- The Irish breeding range has undergone a decline of 70% or more in the last 25 years.

Species listed under Annex I of the EU Birds Directive and red-listed birds of conservation concern that have been recorded within the relevant hectad (M36) are listed in Table 4.5.

Table 4.5 Bird Atlas data for hectad M36

Common Name	Latin Name	Conservation Status
Dunlin	<i>Calidris alpina</i>	EU Birds Directive Annex I
Hen Harrier	<i>Circus cyaneus</i>	
Merlin	<i>Falco columbarius</i>	
Peregrine Falcon	<i>Falco peregrinus</i>	
Whooper Swan	<i>Cygnus cygnus</i>	
Corn Crane **	<i>Crex crex</i>	EU Birds Directive Annex I; BoCCI Red List
European Golden Plover	<i>Pluvialis apricaria</i>	
Barn Owl*	<i>Tyto alba</i>	BoCCI Red List
Black-headed Gull	<i>Larus ridibundus</i>	
Common Redshank	<i>Tringa totanus</i>	
Eurasian Curlew	<i>Numenius arquata</i>	
Grey Partridge*	<i>Perdix perdix</i>	
Northern Lapwing	<i>Vanellus vanellus</i>	
Northern Shoveler	<i>Anas clypeata</i>	
Yellowhammer **	<i>Emberiza citrinella</i>	

BD = EU Birds Directive Annex I; RL = BoCCI Red List. *Date of last record 1972. **Date of last record 1991.

4.1.6 Biodiversity Ireland Database

A search of the National Biodiversity Data Centre (NBDC) website was conducted with a focus on records of protected fauna recorded from hectads M36. The results of the database search are provided below in Table 4.6. Species reported in the preceding sections are not included in this Table. Table 4.7

includes records of high impact non-native invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011).

Table 4-6 NBDC records for protected species records for hectad M36.

Species	Conservation status
Common Frog (<i>Rana temporaria</i>)	HD, WA
Freshwater White-clawed Crayfish (<i>Austropotamobius pallipes</i>)	HD, WA
Marsh Fritillary (<i>Euphydryas aurinia</i>)	HD
Large White-moss (<i>Leucobryum glaucum</i>)	HD, WA
European Otter (<i>Lutra lutra</i>)	HD, WA
Pine Marten (<i>Martes martes</i>)	HD, WA
Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)	HD, WA
Lesser Noctule (<i>Nyctalus leisleri</i>)	HD, WA
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	HD, WA
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	HD, WA
Eurasian Badger (<i>Meles meles</i>)	WA
West European Hedgehog (<i>Erinaceus europaeus</i>)	WA

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland).

Table 4-7 NBDC invasive species records.

Common Name	Latin name
Canadian Waterweed	<i>Elodea canadensis</i>
Japanese Knotweed	<i>Fallopia japonica</i>
Rhododendron	<i>Rhododendron ponticum</i>
American Mink	<i>Mustela vison</i>
Brown Rat	<i>Rattus norvegicus</i>

4.1.7 NPWS Data

An information request was sent to the NPWS requesting records from the NPWS Rare and Protected Species data set. Data was received from NPWS on the 4th of October 2019. Records for species of conservation concern within a 5km buffer of the proposed road development site are provided below in Table 4.8.

Table 4-8 NPWS records for protected species records for hectad M36.

Species	Conservation status
Freshwater Crayfish (<i>Austropotamobius pallipes</i>)	HD
Common Frog (<i>Rana temporaria</i>)	WA
West European Hedgehog (<i>Erinaceus europaeus</i>)	WA
Irish Hare (<i>Lepus timidus</i> subsp. <i>hibernicus</i>)	HD; WA
Otter (<i>Lutra lutra</i>)	HD; WA
Pine Marten (<i>Martes martes</i>)	HD; WA
Badger (<i>Meles meles</i>)	WA
Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)	HD; WA
Black-Headed Gull (<i>Larus ridibundus</i>)	BoCCI Red List
Curlew (<i>Numenius arquata</i>)	BD: Annex I, BoCCI Red List
Golden Plover (<i>Pluvialis apricaria</i>)	BD: Annex I, BoCCI Red List
Lapwing (<i>Vanellus vanellus</i>)	BD: Annex I, BoCCI Red List
Green-winged Orchid (<i>Orchis morio</i>)	Red list: Vulnerable

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland). BD = EU Birds Directive Annex I; RL = BoCCI Red List.

4.1.8 EPA Water Quality

The EPA Envision map viewer was consulted on 01st of October 2021 regarding the water quality status of the watercourses in the study area.

The 3km road is located entirely within the River Clare Catchment. This river is a primary tributary of the Corrib, discharging to Lough Corrib west of the N84 Headford Road and the Carrowbrowne in the townlands of Coarsefield and Angilham.

The River Clare passes through Milltown Village to the Southwest of the project area. Almost the entire project area drains southwest to Carrownageeha Stream (EPA code IE_WE_30C010300). This stream flows in a southerly direction to the west of the proposed development and discharges to the River Clare, 2.3km downstream of the proposed development, in the townland of Cartron 400m downstream of Milltown GAA Grounds. The Carrownageeha Stream is designated as part of Lough Corrib SAC.

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

There is one Environmental Protection Agency (EPA) Q-value monitoring site in close proximity to the proposed development. The relevant up to date station for the Clare River near Milltown is located at a road bridge 1.5km upstream of Milltown (RS30C010100). The latest published Q-rating for 2018 gives a

Q-rating of 3-4 representing moderate ecological status. No Q values were available for the portion of Clare River through Milltown and its downstream tributaries including the subject streams of the Drum and Carrownageeha.

The closest Q-value monitoring site downstream of the proposed development is located on the River Clare at Liskeevy Bridge (sample station: RS30C010200), approximately 3.9km downstream of the site. The latest Q-Value at this location has been recorded as “Q3 - Poor”, surveyed in 1993. Further downstream the River Clare near Tuam the latest published Q-Rating is “Q4 – Good”. The EPA Q values provide a baseline against which any water quality changes occurring in the future can be measured.

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The WFD River Waterbody Status 2013-2018 of the River Clare in the vicinity of the proposed development is unassigned. The River Clare has been scored as ‘not at risk’.

The proposed development is located within the Clare (Galway) hydrological sub catchment and the Clare-Corrib groundwater body. The flow regime is noted as “Karstic”. The groundwater vulnerability is noted as ‘Low’ within the works area.

4.1.9 Water Frameworks Direct Fish Sampling (IFI)

There are no fish sampling points located within the watercourses within or adjacent to the proposed development site.

In 2010, Inland Fisheries Ireland (IFI) conducted fish sampling on the River Clare at Corofin Bridge approximately 29km downstream of the proposed development. The species assemblage in this river included brown trout, nine-spined stickleback, perch, pike, roach, salmon, stone loach and three-spined stickleback. This site was resurveyed in 2014, with species including brown trout (*Salmo trutta*), perch (*Perca fluviatilis*), pike (*Esox lucius*), roach (*Rutilus rutilus*), salmon (*Salmo salar*) and stone loach (*Barbatula barbatula*). The results give an indication of the species richness in the Clare catchment.

4.1.10 Bat Records

A search of the Bat Conservation Ireland (BCI) Database for all bat records for the area within and surrounding the proposed development site was conducted on the 2nd of October 2019. The BCI database can be searched in relation to identified roosts, survey transects and other observations. Searches can be conducted for refined areas e.g. 1km buffer of a specific location or for wider areas including hectads and entire grid squares. Roost data details identified roosts and bat species recorded utilising the roost sites. Transect survey data include results of the BCI Car Based Bat Monitoring Scheme, All Ireland Daubenton’s Bat Waterways Survey and additional surveys completed by private organisations and individuals.

A search of a 1km buffer from the proposed development site returned one record of a lesser horseshoe roost, 380m south west of the proposed development site. A search of a 10km buffer from the proposed development site resulted in the following records; 7 roost record, 6 transect records and 11 ad hoc observations for bat species. Roosts were found to contain Daubenton’s bat (*Myotis daubentoni*), Natterer’s bat (*Myotis nattereri*), brown long-eared bats (*Plecotus auritus*), lesser horseshoe bat (*Rhinolophus hipposideros*), whiskered bat (*Myotis mystacinus*) and soprano pipistrelle (*Pipistrellus pygmaeus*).

Six transect records included the species Daubenton’s bat (*Myotis daubentoni*), Leisler’s bat (*Nyctalus leisleri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bats (*Plecotus auritus*). Ad-hoc records included the species Daubenton’s bat (*Myotis*

daubentoni), *Myotis* species, Leisler’s bat (*Nyctalus leisleri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Natterer’s bat (*Myotis nattereri*) and brown long-eared bats (*Plecotus auritus*). The information provides for a good baseline understanding of bat species in the area and indicates that the region has been previously surveyed for bats.

4.1.11 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in hectad M36, within which the proposed development site is located. The development site is adjacent to Lough Corrib SAC. The proposed road development site has hydrological connectivity with Lough Corrib SPA and Lough Corrib pNHA, in excess of 56.3km downstream, via the River Clare.

The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland (Marnell et al 2009 and NBDC, 2016) and are likely to be recorded frequently throughout Ireland. A review of bat roost records for the area did not identify any roosts within or immediately adjacent to the proposal. A number of bird and plant species of conservation interest were also identified for the wider area surrounding the site during the desk study. The desk study did not indicate any EU Annex I habitats occurring within the development site. The species recorded during the desk study informed the survey methodologies undertaken during the site visit. The desk study also provided useful information to identify potential pathways for impact on sensitive ecological receptors.

4.2 Ecological Walkover Survey Results

4.2.1 Description of Habitats and Flora within the Ecological Survey Area

A dedicated habitat surveys of the area within and in the vicinity of the proposed road development were undertaken on the 11th of July 2019, 28th of August 2019 and 14th October 2021.

Habitats recorded during the surveys are listed in Table 4.9 below. The habitat classifications and codes correspond to those described in ‘A Guide to Habitats in Ireland’ (Fossitt, 2000). A map of the habitats within the development site is provided in Figure 4.3.

Table 4-9 Habitats within the development site.








Habitat	Code
Improved Agricultural Grassland	GA1
Buildings and Artificial Surfaces	BL3
Amenity Grassland	GA2
Dry Meadows and Grassy verges	GS2
Wet Grassland	GS4
Scattered Trees and Parkland	WD5
Scrub	WS1
Depositing/ Lowland River	FW2
Drainage Ditches	FW4
Hedgerows	WL1
Treelines	WL2









Map Legend

 Site Boundary

Habitat Map

-  Amenity grassland (GA2)
-  Buildings and Artificial surfaces (BL3)
-  Dry meadows and grassy verges (GS2)
-  Improved agricultural grassland (GA1)
-  Scrub (WS1)
-  Wet grassland (GS4)
-  Conifer plantation (WD4)

Linear habitats

-  Stonewalls (BL1)
-  Buildings and artificial surfaces (BL3)
-  Lowland River (FW2)
-  Drain (FW4)
-  Hedgerow (WL1)
-  Treeline (WL2)



Microsoft product screen
shots reprinted with
permission from
Microsoft Corporation

Drawing Title

Habitat map

Project Title

GCC N17 Milltown to Gortnagunned

Drawn By

JOS

Checked By

JH

Project No.

190540

Drawing No.

Fig. 4.3

Scale

1:10500

Date

16.11.2020

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The route is described from the south-eastern tie-in in the townlands of Milltown and Gortnaloura to the north-western tie-in with the existing N17 road in the townland of Gortnagunnad.

Initially the Proposed Road Development follows the route of the existing N17, through the village of Milltown. The road was classified as **Buildings and artificial surfaces (BL3)** (Plate 4.1).

This section of the proposed road will be widened along its northern extent and will incorporate habitats including **Dry meadows and Grassy Verges (GS2)**, **Stonewalls and Other Stonework (BL1)**, **Hedgerows (WL1)**, **Amenity Grassland (GA2)**, **Improved Agricultural Grassland (GA1)** and **Buildings and Artificial Surfaces (BL3)**.

The existing roadside verge is dominated by **Dry meadows and Grassy Verges (GS2)** (Plate 4.1). Species recorded in this habitat included sweet vernal-grass (*Anthoxanthum odoratum*), Cocks foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), willowherb (*Epilobium* spp.), common knapweed (*Centaurea nigra*), wild carrot (*Daucus carota*), white clover (*Trifolium repens*), ribwort plantain (*Plantago lanceolata*), broadleaved dock (*Rumex obtusifolius*), tufted vetch (*Vicia cracca*), meadow vetchling (*Lathyrus pratensis*), silverweed (*Potentilla anserina*), creeping thistle (*Cirsium arvense*), creeping bent (*Agrostis stolonifera*), nettle (*Urtica dioica*), bindweed (*Convolvulus arvensis*) and marsh thistle (*Cirsium palustre*).

Land boundaries are dominated by a mixture of stonewalls, classified as **Stonewalls and Other Stonework (BL1)** and **Hedgerows (WL1)** of coppiced hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and bramble (*Rubus fruticosus*).

After approximately 375m, in the townland of Gortnaloura, the route diverges from the existing N17 through existing dwelling houses and yards, that will be demolished and are classified as **Buildings and Artificial Surfaces (BL3)** and **Amenity Grassland (GA2)** (Plate 4.2 – Plate 4.3).

This section of the route also traverses fields classified as **Improved Agricultural Grassland (GA1)** habitat and a mosaic of **Wet Grassland GS4/ Agricultural Grassland (GA1)** (Plate 4.4), grazed by cattle and sheep. Species recorded in the improved agricultural grassland habitat include perennial rye-grass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*), annual meadow grass (*Poa annua*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), broadleaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum* spp.), creeping thistle (*Cirsium arvense*), and daisy (*Bellis perennis*). The Wet Grassland (GS4)/ Agricultural Grassland (GA1) mosaic habitat has a similar species composition but soft rush (*Juncus effusus*) and marsh thistle (*Cirsium palustre*) and creeping buttercup (*Ranunculus repens*), become more dominant in the vegetation.

After approximately 660m, the route crosses the existing N17 route, and continues along the south west of the existing route between the townlands of Gortnaloura and Drum.

This section of the route traverses **Improved Agricultural Grassland (GA1)** habitat and **Treelines (WL2)** and **Hedgerows (WL1)** that delineate the existing field boundaries in this section (Plate 4.4). Species recorded in the treelines include Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*), Sycamore (*Acer pseudoplatanus*), elder (*Sambucus nigra*), crab apple (*Malus sylvestris*) and alder (*Alnus glutinosa*). **Improved Agricultural Grassland (GA1)** habitat in this section had a similar species composition to the aforementioned example of this habitat.

This section of the route also crosses a network of **Drainage Ditches (FW4)** that have connectivity with the Drum Stream, a tributary of the Carrownageeha stream (EPA Code: IE_WE_30C010300), that occurs to the south west of the works area, after approximately 1.4km (Plate 4.5). The lower reaches of the Drum stream and the Carrownageeha stream, a tributary of the River Clare, are designated as part of Lough Corrib SAC downstream of this location, and outside of the works area.

The Drum stream, Carrownageeha Stream and River Clare have undergone Arterial drainage works in the 1960's by the OPW and are maintained channels. These watercourses are heavily modified

watercourses with maintenance works are carried out on the Carrownageeha typically every 5 to 7 years, including sediment and vegetation removal and vegetation cutback using an excavator.

The Drum Stream is reminiscent of a drainage ditch and has been highly modified and channelised and is classified as a **Lowland/Depositing River (FW2)** (Plate 4.5). The river is approximately 1.5 - 2m wide, and was heavily vegetated, with a very low flow at the time of survey. In stream vegetation was dominated by fool's water-cress (*Apium nodiflorum*) and water-cress (*Nasturtium officinale*).

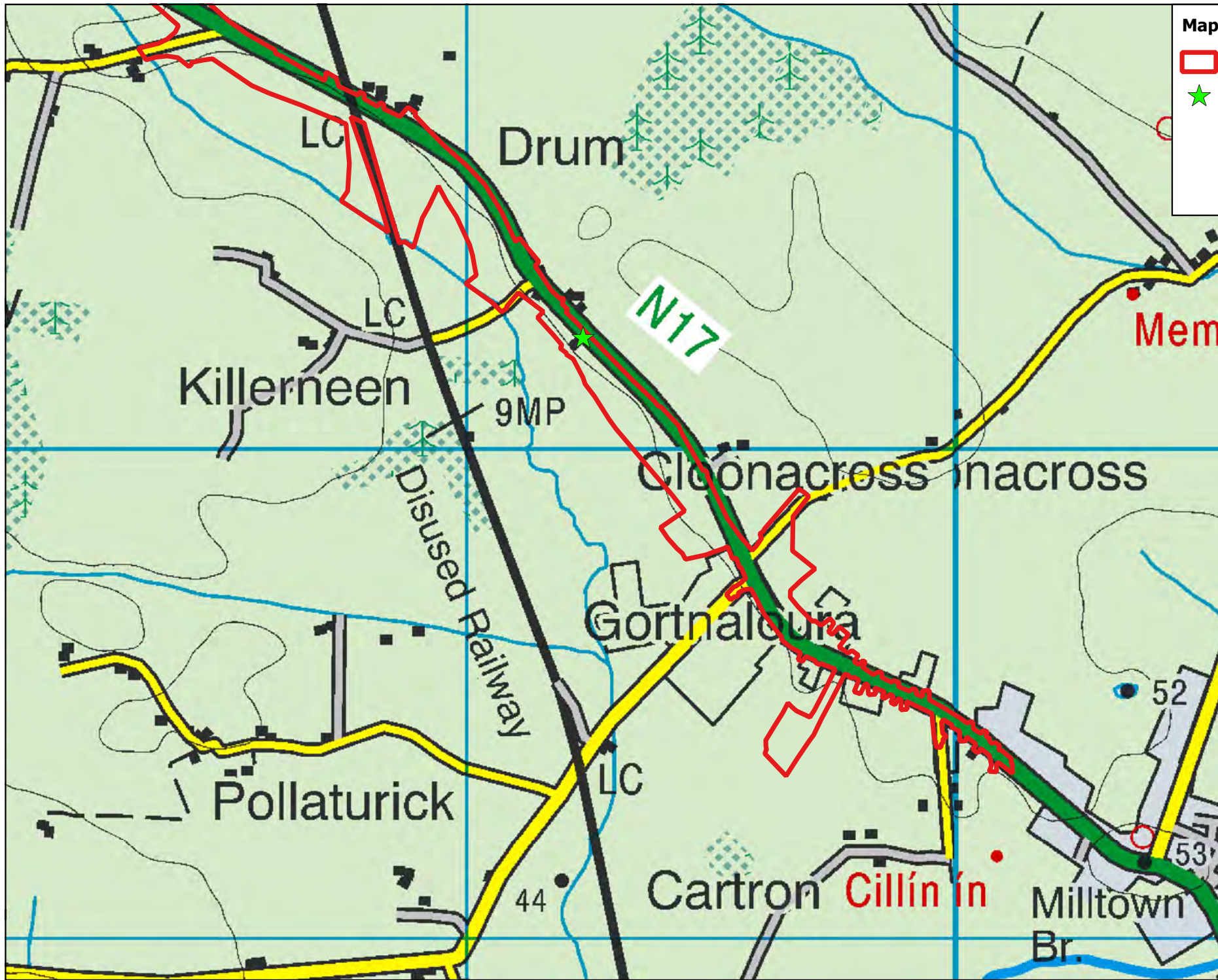
Marginal and bankside vegetation included bramble (*Rubus fruticosus*), bindweed (*Convolvulus arvensis*), nettle (*Urtica dioica*), false oat-grass (*Arrhenatherum elatius*), fool's water-cress (*Apium nodiflorum*), willowherb (*Epilobium spp.*), tufted vetch (*Vicia cracca*), marsh valerian (*Valeriana dioica*), yellow iris (*Iris pseudacorus*) and meadowsweet (*Filipendula ulmaria*). This watercourse also falls within the study area approximately 1.1km upstream and at this location is densely shaded by willows and bramble (Plate 4.6).

Moving north-west the route traverses **Wet Grassland (GS4)** and **Scrub (WS1)** habitats located in fields adjacent to the decommissioned railway line (Plate 4.6 & Plate 4.7). Species recorded in the wet grassland habitat included marsh thistle (*Cirsium palustre*), creeping bent (*Agrostis stolonifera*), meadowsweet (*Filipendula ulmaria*), Yorkshire fog (*Holcus lanatus*), soft rush (*Juncus effusus*), bramble (*Rubus fruticosus*), nettle (*Urtica dioica*), marsh valerian (*Valeriana dioica*), meadow buttercup (*Ranunculus acris*), ash saplings (*Fraxinus excelsior*), angelica (*Angelica sylvestris*), hard fern (*Blechnum spicant*), horsetails (*Equisetum spp.*) and herb Robert (*Geranium robertianum*). The old railway line is fringed with **Dry Meadows and Grassy Verges (GS2)** and **Treeline (WL1)**, dominated by ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and bramble (*Rubus fruticosus*) (Plate 4.8).

Moving north-west of the disused railway towards Gortnagunnad the route continues through Agricultural Grassland (GA1) and Drainage Ditches (FW4) then veers slightly north to following the existing N17 route. Approaching the northern terminus of the proposed road development the roadside verges are dominated by Dry meadow and grassy verges (GS2) and the land boundaries are demarcated by fences. Habitats through which the route traverses include Agricultural Grassland (GA1), Dry Meadows and Grassy Verges (GS2), Wet Grassland (GS4) and Drainage ditches (FW4). These habitats had a similar species composition to other examples of these habitats along the route.

The lower reaches of the Drum stream and the Carrownageeha stream are designated as part of Lough Corrib SAC, outside of the works area. No Annex I Qualifying Interests of this SAC were recorded in the study area. No Annex I habitats were recorded within or adjacent to the development site boundary. The terrestrial and freshwater habitats recorded have no links to any habitats listed on Annex I of the EU habitats Directive. Flora protected under the Flora Protection Order 2015 or those listed in the Irish Red Data Book were not recorded during the site visit. No rare or protected flora identified in the desk study were recorded during the field surveys.

No non-native invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) were recorded during the site visit. However, the non-native invasive species winter heliotrope (*Petasites fragrans*), was recorded in amenity grassland habitat in the front garden of a house earmarked for development. A map of its location is provided as Figure 4.4.



Map Legend

- Proposed Development Boundary
- ★ Location of Winter Heliotrope



Drawing Title	
Invasive Species Locations	
Project Title	
N17 Milltown to Gortnagunned	
Drawn By	Checked By
CS	SM
Project No.	Drawing No.
190540	Figure 4.4
Scale	Date
1:10110	2021-11-08

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Plate 4-1 The existing N17 Road at the northern extent of the road development, fringed with Dry Meadows and Grassy verge habitat, with Improved Agricultural Grassland (GA1) in the wider surroundings.



Plate 4-2 Dwelling house to be demolished at Gortaloura, classified as Buildings and Artificial Surfaces (BL3)



Plate 4-3 Dwelling house to be demolished at Gortnaloura, classified as Buildings and Artificial Surfaces (BL3)



Plate 4-4 Improved Agricultural Grassland (GA1) and Treeline (WL2) habitats, in the townland of Kilerneen, which the route will traverse.



Plate 4-5 A small watercourse classified as a Depositing/Lowland River (FW2), occurs within the works area, in the townland of Kilerneen, and is surrounded by Improved Agricultural Grassland (GA1).



Plate 4-6 Watercourse classified as Depositing/Lowland River (FW2) at the northern extent of the works area.



Plate 4-7 Wet Grassland (GS4)/ Improved Agricultural Grassland (GA1) mosaic habitat in the townland of Drum, which the route will traverse.



Plate 4-8 Wet Grassland (GS4) adjacent to the decommissioned railway, in the townland of Drum, which the route will traverse.



Plate 4-9 Dry Meadows and Grassy Verge Habitat along the decommissioned railway line, fringed by ash dominated Treeline (WL2).

4.2.2 Significance of Habitats and Flora

Ecological evaluation within this Section follows a methodology that is set out in Chapter three of the ‘*Guidelines for Assessment of Ecological Impacts of National Roads Schemes*’ (NRA, 2009)

The habitats within and adjacent to the proposed road development site were evaluated in accordance with the criteria developed by the National Roads Authority (NRA) – outlined in *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) which classifies sites in terms of their ecological importance, *i.e.*, International Importance, National Importance, County Importance, Local Importance (Higher Value) or Local Importance (Lower Value). The evaluation methodology also took cognisance of the geological context evaluation criteria outlined in chapter 4 of CIEEM 2018. None of the habitats within the proposed road development footprint correspond to habitats listed on Annex I of the EU Habitats Directive.

There are no Annex I habitats listed under the EU Habitats Directive present within the site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All species recorded are common in the Irish landscape.

The Treelines (WL2) and Hedgerows (WL1) are all classified as being of **Local Importance (higher value)**. The hedgerows/treelines provide potential habitat for a range of protected fauna including those listed on IV of the EU Habitat Directive and those protected under the Wildlife Acts 1976-2021. Hedgerows and Treelines in the study area are classified as Key Ecological Receptors.

The Depositing/Lowland River (FW4) within the study area, is designated as part of Lough Corrib SAC, downstream of Drum. This watercourse has been categorised as of **International Importance** and has been identified as a Key Ecological Receptor. The watercourse provides potential habitat for a range of protected fauna including those listed on Annex II and IV of the EU Habitat Directive.

The remaining terrestrial habitats within the study area were assigned **Local Importance (Lower Value)** and are not classified as Key Ecological Receptors.

Improved Agricultural Grassland (GA1), Wet Grassland (GS4), Dry Meadows and Grassy Verges (GS2), Drainage ditch (FW3), Buildings and Artificial Surfaces (BL3), Amenity Grassland (GA2), Dry Meadows and Grassy verges (GS2), Scrub (WS1), Scattered Trees and Parkland (WD5) habitats, have all been categorised as **Local Importance (Lower value)**. These habitats are subject to regular maintenance and disturbance from routine agricultural activities and similar habitat is widespread in the region. For this reason, these habitats have not been identified as a sensitive ecological receptor. A summary of key ecological receptors is provided in Table 4.10.

Table 4-10 Summary of KERs

Habitat	Receptor Importance. Ecological evaluation (NRA 2009)	KER Yes/No
Depositing/ Lowland River (FW2)	International importance	Yes
Hedgerows (WL1)	Local Importance (higher value)	Yes
Treelines (WL2)	Local Importance (higher value)	Yes
Improved Agricultural Grassland (GA1)	Local Importance (lower value)	No
Buildings and Artificial Surfaces (BL3)	Local Importance (lower value)	No
Amenity Grassland (GA2)	Local Importance (lower value)	No

Habitat	Receptor Importance, Ecological evaluation (NRA 2009)	KER Yes/No
Dry Meadows and Grassy verges (GS2)	Local Importance (lower value)	No
Wet Grassland (GS4)	Local Importance (lower value)	No
Scattered Trees and Parkland (WD5)	Local Importance (lower value)	No
Scrub (WS1)	Local Importance (lower value)	No
Drainage Ditches (FW4)	Local Importance (lower value)	No

4.2.3 Faunal Survey

4.2.3.1 Bats

4.2.3.1.1 Activity Survey

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts, 1976-2021.

In total, two dusk and one dawn car/walked transect surveys, covering nine hours were completed between July and August 2019. In additional landscape suitability surveys were conducted during the multidisciplinary surveys. Monthly survey results are presented in Table 4.11 and on Figure 4.5 and Figure 4.6.

In order of dominance the following species were recorded during the bat surveys:

- > Common pipistrelle - 80
- > Soprano pipistrelle - 57
- > Leisler's bat - 41
- > Daubenton's bat - 13
- > *Pipistrellus* species - 6
- > Whiskered bat - 3

Table 4-11 Results of July and August Bat Surveys

Species	Number of Passes
July	
Daubenton's Bat (<i>Myotis daubentonii</i>)	4
Leisler's bat (<i>Nyctalus leisleri</i>)	37
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	43
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	17
August	
Daubenton's Bat (<i>Myotis daubentonii</i>)	9
Whiskered Bat (<i>Myotis mystacinus</i>)	3
Leisler's bat (<i>Nyctalus leisleri</i>)	4
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	37
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	40

<i>Pipistrellus</i> Species	6
-----------------------------	---

The entire length of the proposed road development was assessed for its potential as bat habitat during both desktop and field assessments followed by targeted transect surveys. Bat activity was highest along the south-eastern extent of the proposed road development area in the village of Milltown and in the townlands of Gortnaloura and along the mid-section of the route in the townland of Drum.

Bat activity throughout the remainder of the study area had a constant but patchy distribution and where recorded, activity was positively associated with treelines and mature hedgerows.

Treelines, uncoppiced hedgerows, the stream and its associated riparian habitat were assessed as *Moderate* suitability for foraging and commuting bats. Vegetated drains and areas of scrub were assessed as *Low* suitability, agricultural grassland habitats which dominate the study area were considered to offer *Negligible* suitability.

4.2.3.1.2 **Roost surveys**

Five buildings within the study area are earmarked for demolition (plates 4.10 – 4.12, and plates 4.2 & 4.3 above). The locations of these buildings are shown on Figure 4.7. These buildings were subject to an internal inspection and a roost emergence survey.

The buildings to be demolished at within the study area do not currently support roosting Bats. No evidence of roosting bats was recorded during the internal roost inspection survey. No evidence of emergence or dawn swarming activities at any of the buildings was recorded during the surveys. The buildings were assigned *Low* suitability regarding supporting roosting bats.

No tree roosts were identified within the study area.



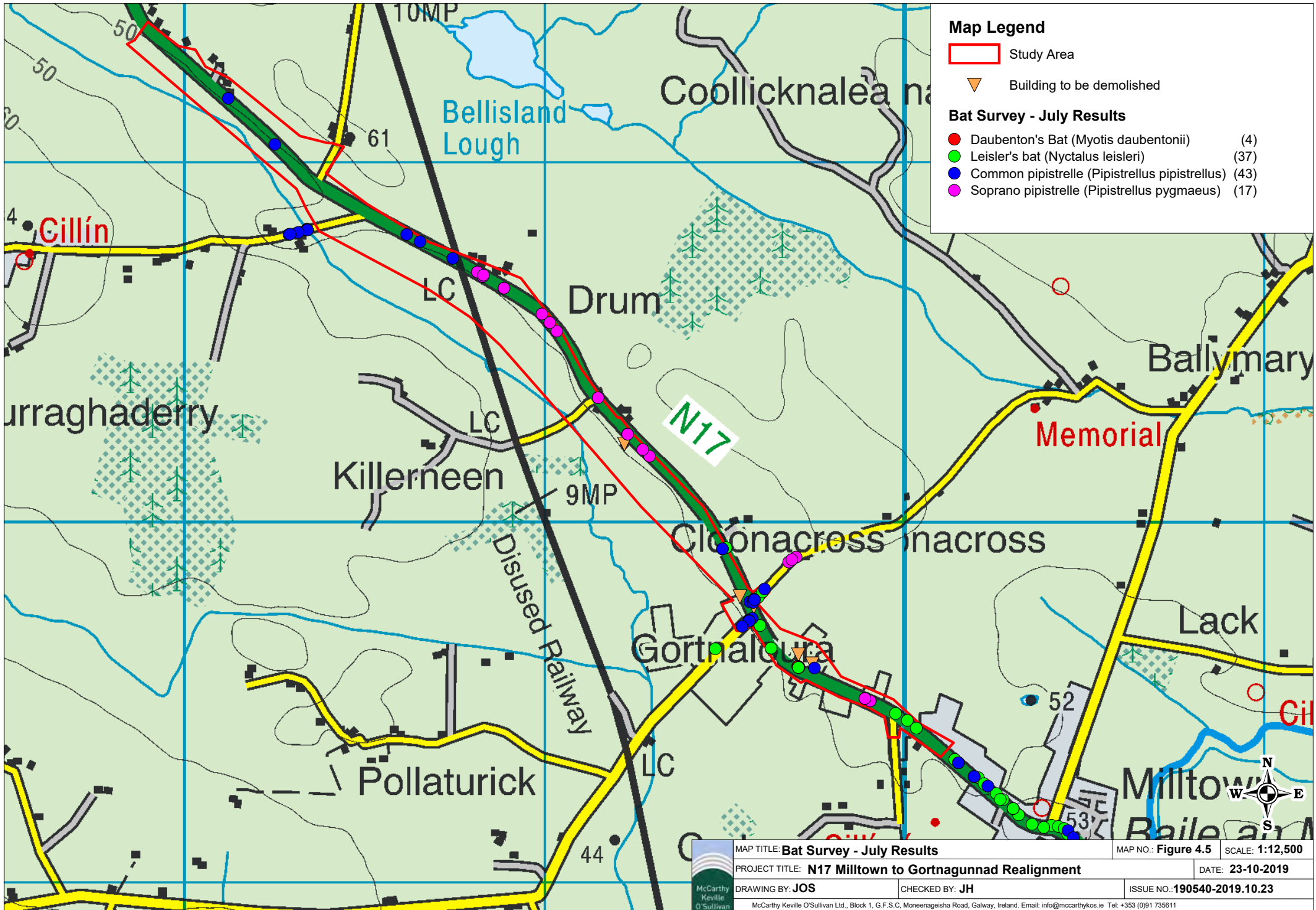
Plate 4-10 Ruined building to be demolished at Gortnaloura, classified as Buildings and Artificial Surfaces (BL3)

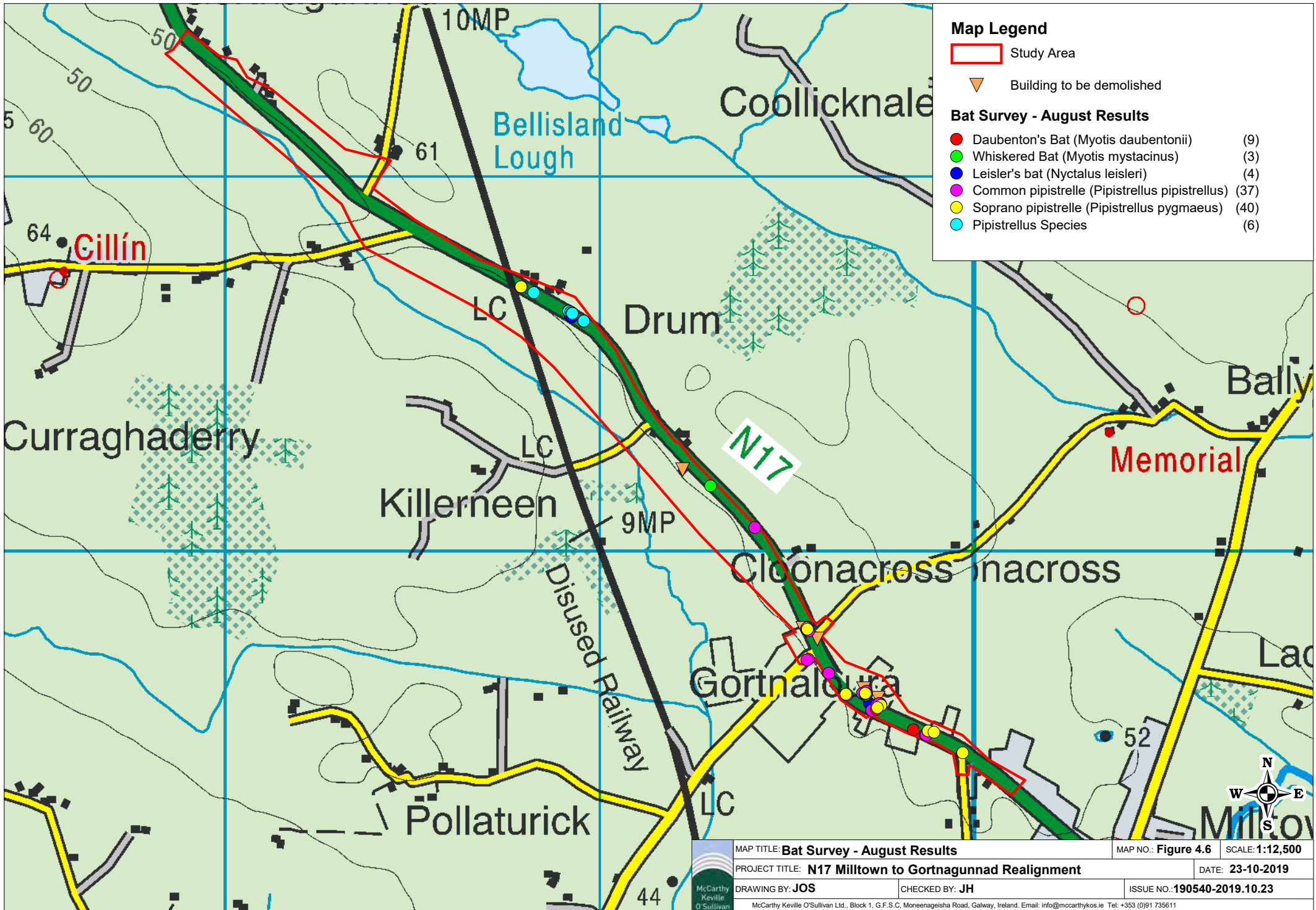


Plate 4-11 Old farm building at Gortnaloura, classified as Buildings and Artificial Surfaces (BL3)

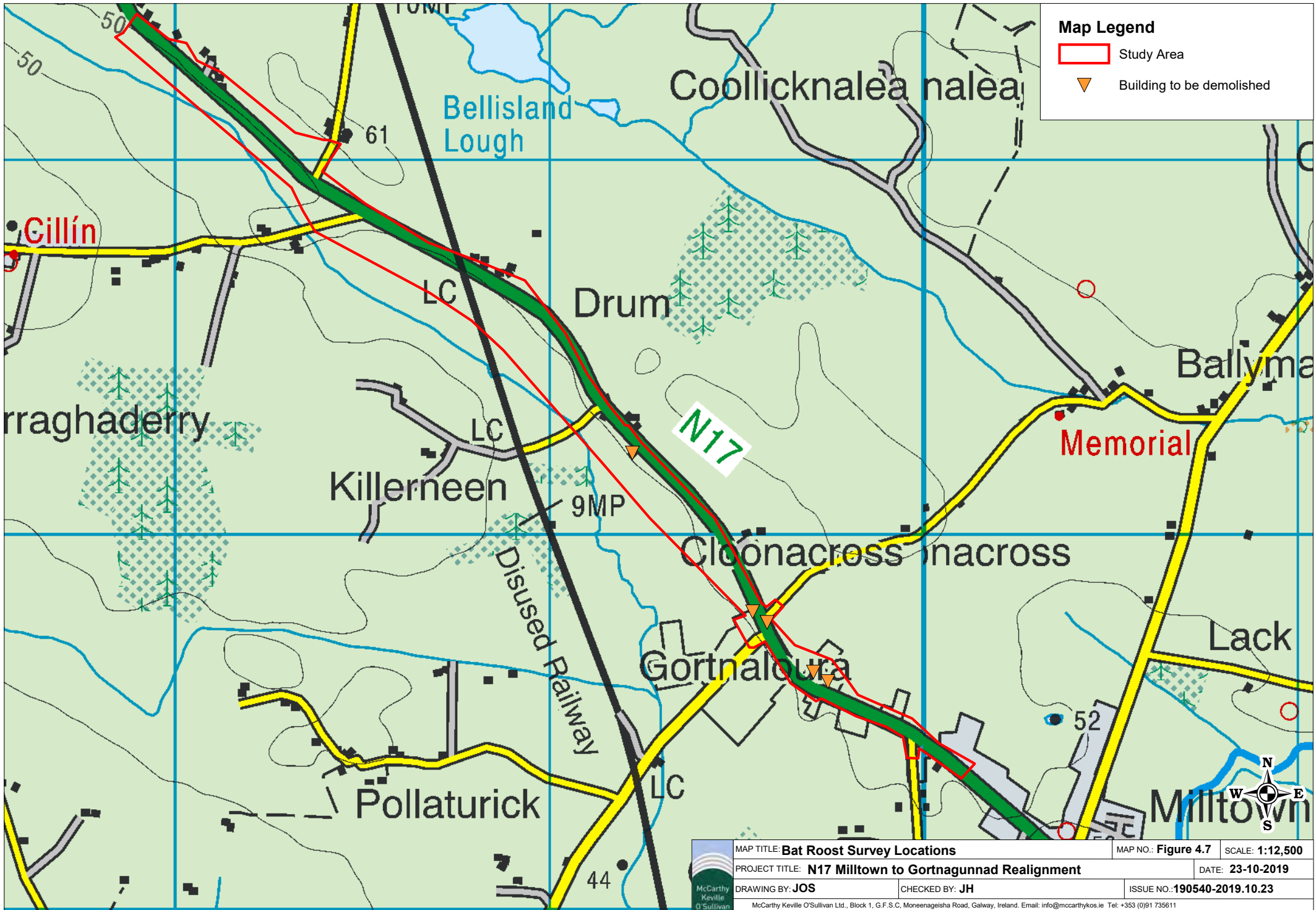


Plate 4-12 Dwelling house in Kileerreen, to be demolished.





MAP TITLE: Bat Survey - August Results	MAP NO.: Figure 4.6	SCALE: 1:12,500
PROJECT TITLE: N17 Milltown to Gortnagunnad Realignment	DATE: 23-10-2019	
DRAWING BY: JOS	CHECKED BY: JH	ISSUE NO.: 190540-2019.10.23



Map Legend

- Study Area
- ▼ Building to be demolished

N17

MAP TITLE: Bat Roost Survey Locations	MAP NO.: Figure 4.7	SCALE: 1:12,500
PROJECT TITLE: N17 Milltown to Gortnagunnad Realignment		
DATE: 23-10-2019		
DRAWING BY: JOS	CHECKED BY: JH	ISSUE NO.: 190540-2019.10.23
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4.2.3.2 Otter

Otter surveys were carried out along all watercourses and drainage ditches within the study area. These watercourses were surveyed 150m upstream and downstream of the works area, as well as a 10m riparian buffer (NRA, 2008 and Reid, et al 2013). No evidence of otter usage was recorded within the proposed development boundary. A potential otter spraint was recorded on the railway bridge outside of the study area. No breeding or resting sites of Otter were observed during the site visits. However, the watercourses may be utilised on occasion for commuting. The desk study indicated that otter have been recorded as roadkill within the development site boundary, and also have been recorded in the wider surroundings of the proposed development.

4.2.3.3 Badger

A thorough survey of the study area for evidence of badger activity was conducted in accordance with NRA guidance. Evidence of potential badger tracks and snuffle holes were recorded within the study area and along the railway line which lies outside of the study area. However, no badger setts occur within the footprint of the Proposed Road Development. The desk study indicated that badgers have been recorded as roadkill along the roadside adjacent to the decommissioned railway line, suggesting that they cross the road at this point.

4.2.3.4 Additional Fauna

A fox burrow was found within an earth bank, along a field boundary in the townland of Cloonacross, outside of the study area. Fox droppings were recorded at a number of locations long the railway line.

No evidence of additional fauna was recorded. No evidence of Red squirrel, Irish stoat, Pine marten, Irish Hare or other protected fauna was recorded. However suitable habitat areas exist within and outside the study area.

4.2.3.5 Fisheries & White clawed crayfish

AS per NRA guidance it is “*only appropriate to undertake detailed surveys where significant impacts are anticipated on potentially valuable assemblages of fish, or important populations of a particular species*”. Based on the results of the desk study and walkover surveys and taking into consideration the nature of the watercourses in the study area; no potential for significant impact on valuable assemblages of fish or aquatic invertebrates was identified. Therefore, the results of the walkover surveys were utilised to provide an assessment with regard to the fisheries potential of the watercourses in the study area.

The Drum Stream, a tributary of the Carrownageeha stream (EPA Waterbody Code: IE_WE_30C010300), will not be traversed by the proposed project. However, the road development crosses drainage ditches that have connectivity with this watercourse.

The watercourse is reminiscent of a drainage ditch where it occurs within the study area and is heavily vegetated with little perceivable flow. It had a silty substrate, was typical of a highly managed lowland stream, and did not support suitable spawning habitat for salmon or other fish species. The watercourse has connectivity to potential supporting habitat for Annex II species including lamprey, crayfish and salmonids, downstream in the Clare catchment and provides connectivity to the aquatic features of interest for which the Lough Corrib SAC has been designated.

4.2.3.6 Terrestrial Invertebrates

The desk study revealed records for Marsh Fritillary Butterfly; however, no potential supporting habitat for this species occurs within the study area.

4.2.3.7 Birds

Bird species recorded during the field visit included an assemblage of common birds typical of the improved agricultural grassland habitat that dominates the area. Eleven of the bird species observed are green-listed and are common in Ireland. None of the birds recorded within the development site are protected under Annex I of the EU Birds Directive or Red listed under the Birds of Conservation Concern in Ireland (BoCCI).

Three of the species observed are amber listed. Species recorded are presented in Table 4.12.

Table 4-12 Bird species recorded during the survey and their conservation status.

Bird species	Conservation Status
Swallow (<i>Hirundo rustica</i>)	Amber Listed
Robin (<i>Erithacus rubecula</i>)	Amber Listed (Breeding)
Starling (<i>Sturnus vulgaris</i>)	Amber Listed
Wren (<i>Troglodytes troglodytes</i>)	Green Listed
Rook (<i>Corvus frugilegus</i>)	Green Listed
Jackdaw (<i>Corvus monedula</i>)	Green Listed
Hooded Crow (<i>Corvus cornix</i>)	Green Listed
Blackbird (<i>Turdus merula</i>)	Green Listed
Stonechat (<i>Saxicola torquata</i>)	Green Listed
Eurasian Blue Tit (<i>Parus caeruleus</i>)	Green Listed
Great Tit (<i>Parus major</i>)	Green Listed
Dunnock (<i>Prunella modularis</i>)	Green Listed
Blackbird (<i>Turdus merula</i>)	Green Listed
Chaffinch (<i>Fringilla coelebs</i>)	Green Listed

The development site is dominated by improved agricultural grassland, grazed by cattle and horses, and is intensively drained and disturbed by anthropogenic activities (farming), and no significant habitat for bird species of conservation concern will be lost as part of the proposed development. The banks of the watercourse within the study area are densely vegetated and do not provide suitable nesting habitat (vertical earthen banks) for the Annex I species Kingfisher (*Alcedo atthis*).

4.2.4 Significance of Fauna

Ecological evaluation and within this Section follows a methodology that is set out in Chapter three of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976-2021. Bats as an Ecological Receptor have been assigned **Local Importance (Higher value)** on the basis that the habitats within the land acquisition boundary are likely to be utilised by a regularly occurring bat population of Local Importance. Bat species are identified as a key ecological receptor.

Otter is listed under Annex II and Annex IV of the EU Habitats Directive and is also protected under the Irish Wildlife Acts 1976-2021 and is evaluated as being 'Near Threatened' in the most recent Red Data list for mammals (Kingston, 2012). No evidence of Otter was recorded within the study area. Whilst not providing optimum habitat for Otter it is considered likely that the watercourse and land drains located within the study area may be utilised, on occasion, as commuting corridors between larger watercourses. This watercourse is a tributary of the River Clare and is designated as part of Lough Corrib SAC. Otter is listed as a qualifying interest of Lough Corrib SAC and has therefore been identified as of **International Importance** and is a key ecological receptor.

Badger is protected under the Wildlife Acts 1976-2021. No evidence of badger was recorded in the within the study area and no evidence of activity was noted. However, the results of the desk study indicate that badger have been recorded, as roadkill, crossing the existing N17, at the intersection with the decommissioned trainline. Badger is considered a key ecological receptor.

The Drum stream within the study area is a tributary of the River Clare and is designated as part of Lough Corrib SAC. This SAC is designated for the following aquatic species that are known to occur in the wider area:

- White-clawed Crayfish (*Austropotamobius pallipes*)
- Brook Lamprey (*Lampetra planeri*)
- Salmon (*Salmo salar*)

Faunal species and aquatic ecological receptors designated as qualifying interests of Lough Corrib SAC have been assessed as of **International Importance** on the basis that the habitats downstream of the study area are suitable to support a locally important, regularly occurring population of the protected species. Fish and aquatic invertebrates are classified as a key ecological receptor. These aquatic species are considered sensitive ecological receptors and impacts of the development are assessed under impacts on downstream water quality/aquatic fauna.

Terrestrial invertebrate populations of conservation importance were not recorded within the study area.

None of the birds recorded within the development site are protected under Annex I of the EU Birds Directive or Red listed under the Birds of Conservation Concern in Ireland (BoCCI). Bird species recorded were an assemblage of common birds, likely to be common and widespread in the area. The species recorded within the site are typical of the agricultural habitats in the area and no significant habitat for bird species will be lost as part of the proposed development.

The desk study did not suggest that the site is of importance for whooper swan or wintering wildfowl suggesting that the site is not of significance for these species. Thus, bird species have been assessed as of **Local Importance (Lower Value)**.

A summary of faunal evaluation and KER identification is provided in Table 4.13

Table 4-13 Summary of faunal evaluation and KER identification

Habitat	Conservation listing	Receptor Importance. Ecological evaluation (NRA 2009)	KER Yes/No
Bat Species	Habitats Directive Annex IV species, Wildlife Acts 1976-2021	Local Importance (Higher value)	Yes - The treelines/hedgerows within the site may be used by commuting and foraging bats as they provide connectivity with the wider landscape. A pathway for impact was identified in the form of habitat loss and lighting disturbance. Therefore, bat species are considered a KER.
Otter	Habitats Directive Annex II & IV species, Wildlife Acts 1976-2021	International Importance	Yes - a pathway for impact has been identified in the form of habitat deterioration, disturbance, displacement and collision mortality.
Badger	Wildlife Acts 1976-2021	Local Importance (Higher value)	Yes - a pathway for impact has been identified in the form of disturbance, habitat loss and collision mortality.
Terrestrial Invertebrates of conservation significance	-	None Recorded	No
Fish and Aquatic invertebrates	Habitats Directive Annex II species, Wildlife Acts 1976-2021	International Importance	Yes - a pathway for impact has been identified in the form of Habitat Loss/ Water Pollution and accidental kills.
Breeding Birds (General assemblage)	Wildlife Acts 1976-2021 (no Annex I species recorded)	Local Importance Lower Value	Yes - Bird species recorded using the habitats within the site were an assemblage of common birds that are typical of the agricultural grassland, treeline and hedgerow habitats in the wider area. Treeline and hedgerow habitats within the site may potentially be used by nesting birds and bird species are considered a KER.

5. ECOLOGICAL IMPACT ASSESSMENT

This section of the report considers the potential for effects on the ecological receptors that were identified during the desk and field studies. The effect on ecological receptors is considered during all stages of the proposed development, namely; construction and operation. Assessment of effects within this chapter follows a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). The assessment of effects also follows the guidance outlined in EPA 2017.

5.1 Do Nothing Effect

If the proposed road development were not to go ahead, it is likely that the site would continue to exist as a national road (N17) situated in pastoral setting with no significant changes anticipated.

5.1.1 Effects on Designated Areas

The location of the proposed road development in relation to EU designated sites and nationally designated sites is shown on Figure 4.1 and Figure 4.2 respectively.

5.1.1.1 European Sites

In relation to European sites, an Appropriate Assessment Screening Assessment and Natura Impact Statement have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the proposed road development in compliance with Article 6(3) of the Habitats Directive.

As per EPA draft Guidance 2017, "a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement" but should "incorporate their key findings as available and appropriate".

The impact assessment provided in the NIS and associated Screening Report identified a pathway for direct effects on Otter a QI of Lough Corrib SAC, in the form of disturbance, displacement and collision mortality. Specific measures to offset potential impacts relating to Otter are outlined in the NIS and in section 5.1.2.4 below.

The NIS also identified a pathway for indirect effects on the surface and ground-water dependent Qualifying Interests/SCIs of Lough Corrib SAC and Lough Corrib SPA in the form of deterioration of surface water quality resulting from pollution, associated with the construction and operational phases of the development. The pathway that would allow potentially adverse impacts to occur was considered in the design of the project elements. An Outline Erosion and Sediment Control Plan (OESC), accompanying this application, sets out the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. The principal mitigation measures included in the OESC are summarised in section 2.2.1 of this report.

Specific measures to offset potential impacts relating to surface water runoff, during the operation of the road, have been incorporated into the design of the proposed road development. These include the use of attenuation systems and hydrocarbon interceptors. Full details are included in the Outline Erosion and Sediment Control Plan (OESC).

The NIS concludes,

‘Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, and operation of the proposed development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site’.

5.1.1.2 Nationally Designated Sites

There are no Natural Heritage Areas in close proximity to the Proposed Road Development. Only one pNHA was identified as having connectivity with the proposed development. Lough Corrib pNHA, is located 56.3km downstream and has surface water connectivity with the site via the River Clare and its tributaries.

None of the remaining NHAs or pNHAs within the ZOI were considered as KERs in their own right due to the lack of any identifiable pathway for direct or indirect effects.

A potential pathway for indirect effect was identified in the form of pollution of surface and ground water, associated with the construction and operational phases of the development. The pathway that would allow potentially adverse impacts to occur was considered in the design of the project elements. An Outline Erosion and Sediment Control Plan (OESC), accompanying this application, sets out the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. The principal mitigation measures included in the OESC are summarised in section 2.2.1 of this report.

No significant effects on nationally designated sites are anticipated.

5.1.2 Effects on Key Ecological Receptors

The following sections provide the impact assessment regarding the Identified Key Ecological Receptors. Effects associated with construction, operation and decommissioning are assessed in accordance with EPA 2017 criteria and utilising the geographical scale described in NRA 2009.

5.1.2.1 Treelines, Hedgerows and Scrub

Table 5-1: Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Loss/ degradation	<p>Felling associated with the proposed road development will result in the loss of 3.64km of hedgerow/treeline habitat. The road has been designed to minimise impacts to hedgerows/treelines where possible and the loss will not result in any significant impacts to the linear landscape features in the area. Post construction, the hedgerow/treelines will be reinstated (replanted to an equal length along the road corridor) with native hedge/tree species which are indigenous to the local area. A total of 4.1km of hedgerow/treeline will be replanted, therefore there will be no net loss of this habitat.</p> <p>Indirect effects during construction are not anticipated.</p>	<p>Habitat loss is assessed as a Permanent Slight Negative effect on a receptor of Local Importance higher value, in the absence of mitigation.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Operational Phase		
Habitat Loss/ degradation	No effects are anticipated	No significant effect on this KER is anticipated at any geographical scale.
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.2 Watercourses

Table 5-2 Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009).
Construction Phase		
Habitat Loss/ degradation	<p>The Drum stream within the development site is classified as a Depositing/Lowland River (FW2) and is designated as part of Lough Corrib SAC, downstream of Drum, and just outside of the works area. Therefore, this watercourse has been categorised as of <i>International Importance</i> and has been identified as a Key Ecological Receptor. The watercourse provides potential habitat for a range of protected fauna including those listed on Annex II and IV of the EU Habitat Directive.</p> <p>The proposed development will cross a network of drainage ditches, classified as <i>Local Importance (Lower value)</i>, that discharge into the Drum stream.</p> <p>Potential Impacts Include:</p> <ul style="list-style-type: none"> ➤ Indirect effects may include the runoff of silt and other pollutants during the construction phase of the development from the construction site to the river. This could result in loss of habitat for aquatic species. This could potentially reduce the ability of the watercourses to maintain fish stocks and the macroinvertebrate populations that support them. This could affect QIs of Lough Corrib SAC including salmonid, lamprey species, white -clawed crayfish and otter. 	<p>Indirect water pollution and the associated habitat loss/degradation is assessed as a Temporary Moderate-Significant Negative effect on a receptor of International Importance, in the absence of mitigation.</p> <p>The effects are reversible and can be remediated through appropriate design and mitigation.</p>
Operational Phase		
Habitat Loss/ degradation	<p>There will be no direct loss of habitat associated with the operational phase of the development. Potential indirect impacts include habitat degradation/habitat loss due to the runoff of silt and discharge of pollutants from road drainage during the operation of the road.</p> <p>This could result in loss of habitat for aquatic species. This could potentially reduce the ability of the watercourses to maintain fish stocks and the macroinvertebrate populations that support them, potentially affecting the aquatic QIs of Lough Corrib SAC including salmonid, lamprey species, white -clawed crayfish and otter.</p>	<p>Indirect water pollution and the associated habitat loss/degradation is assessed as a Permanent Moderate-Significant Negative effect on a receptor of International Importance, in the absence of mitigation.</p>

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009).
		The effect is reversible and can be remediated through appropriate design and mitigation.
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.3 Bat Species

Table 5-3 Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Loss & Fragmentation	<p>The entire length of the proposed road development was assessed for its potential as bat habitat during both desktop and field assessments followed by targeted transect surveys.</p> <p>Activity Bat activity was highest along the south-eastern extent of the proposed road development area in the village of Milltown and in the townlands of Gortnaloura and along the mid-section of the route in the townland of Drum. Bat activity throughout the remainder of the study area had a patchy distribution and where recorded, activity was positively associated with treelines and mature hedgerows.</p> <p>Felling associated with the proposed road development will result in the loss of 3.64km of hedgerow/treeline habitat.</p> <p>The proposed road development has the potential to result in the loss of commuting and foraging habitat for bat species. Further indirect effects are likely to include barrier effect and fragmentation of habitat, with the removal of treeline and hedgerow habitat.</p> <p>Bat Roosts The dwelling houses and agricultural buildings to be demolished within the development site do not currently support roosting bats and no evidence of emergence or dawn swarming activities at the buildings was recorded during the 2019 roost surveys. No evidence of roosting bats was recorded during the internal roost inspection survey. The buildings were assigned Low suitability regarding supporting roosting bats.</p> <p>No tree roosts were specifically identified. It is not anticipated that large bat roosts are present in trees given that no trees with highly suitable features for roosting bats were recorded. Nonetheless, all trees will be the subject of a pre-commencement survey (As per TII/NRA 2005b).</p>	<p>Habitat loss is assessed as a Permanent Slight- Moderate Negative effect on a receptor of Local Importance higher value, in the absence of mitigation.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Operational Phase		

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Habitat Loss & Fragmentation	<p>There will be no additional habitat loss associated with the operational phase of the road development.</p> <p>Ongoing indirect effects are likely to include barrier effect and fragmentation of habitat.</p>	<p>Habitat fragmentation is assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Displacement as a results of Lighting proposals	<p>Lighting is proposed at the southern tie in. A total of 17 new streetlights are proposed as part of the project.</p> <p>Species recorded at this location included pipistrelles and Leisler's bat. As per BCT guidance note (08/18) <i>Bats and artificial Lighting in the UK</i>, pipistrelles and Leisler's bat can congregate around street lights feeding on insects attracted to the light. Therefore, no significant displacement of pipistrelles or Leisler's bat is anticipated as a result of the lighting proposals.</p> <p>The BCT guidance note acknowledges that congregation behaviour is not true for all species and states that Myotis and Brown long-eared bat (<i>Plecotus</i> spp.) generally avoid all street lights. However, neither species were recorded utilising habitats at the proposed lighting location and potential for impact on Myotis and Brown Long-eared bat as a result of the lighting proposal are not anticipated.</p> <p>No potential for significant impact on bats as a result of the lighting proposal was identified.</p>	<p>Displacement as a result of lighting proposals is assessed as a Permanent Imperceptible Negative effect on a receptor of Local Importance higher value.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.4 Otter

Potential for effects on Otter has been considered with regard to NPWS Threat Response Plan² (TRP) which identifies four significant threats facing Otter in an Irish context:

- > Habitat destruction (including fragmentation)
- > Water pollution
- > Disturbance (Recreational sources)
- > Accidental death/persecution

Table 5-4: Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Destruction (including fragmentation)	<p>No evidence of Otter was recorded during the field survey. No breeding or resting sites were recorded, and no breeding or resting sites will be lost as part of the <i>Proposed Road Development</i>. No significant effects regarding habitat destruction are anticipated.</p> <p>Otter is a QI of Lough Corrib SAC and is assessed as a receptor of <i>International Importance</i>. Whilst not providing optimum habitat for Otter it is considered likely that the Drum stream, occurring within the development site boundary may be used, on occasion, as commuting corridor to the River Clare. This stream is designated as part of Lough Corrib SAC, south of Drum, just outside of the development site boundary.</p> <p>There will be no habitat fragmentation or barrier effect as a result of the development.</p>	<p>Habitat destruction is assessed as a Permanent Moderate Negative effect on a receptor of <i>International Importance</i>, in the absence of mitigation.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Water Pollution	<p>Potential indirect effects to Otter were identified in the form of Emissions to surface water, resulting in deterioration of supporting habitat for Otter.</p>	<p>Indirect water pollution effects are assessed as a Short-term Moderate Negative effect on a receptor of <i>International Importance</i>.</p>

² NPWS (2009)Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
		<p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No potential for significant effect is anticipated at any geographical scale.</p>
Disturbance	<p>Otter are predominantly crepuscular in nature and construction work will be confined to daytime hours, thus minimizing disturbance related impacts to the species.</p> <p>Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey & Rochford, 2006).</p> <p>Based on the above it can be concluded that no significant disturbance effects to Otter are likely.</p>	<p>The potential for disturbance is considered to constitute a potential indirect Short-term Slight Negative effect on a receptor of <i>International Importance</i>.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Accidental death/persecution	<p>No Otter breeding or resting sites were recorded during the dedicated Otter surveys. Direct effects on the species are not anticipated during the construction phase.</p>	<p>No significant effect on this KER is anticipated at any geographical scale.</p>
Operational Phase		
Habitat Destruction	<p>There will be no destruction of habitat associated with the operational phase of the <i>Proposed Road Development</i>.</p> <p>There will be no fragmentation or barrier effects during the operational phase.</p>	<p>No significant effect on this KER is anticipated at any geographical scale.</p>
Water Pollution	<p>Emissions to surface water, with the potential to result in a deterioration of supporting habitat for Otter, was identified as a potential ongoing indirect effect.</p>	<p>Indirect water pollution effect is assessed as a Permanent Moderate Negative effect on a receptor of <i>International Importance</i>.</p>

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
		<p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No potential for significant effect is anticipated at the county, national, or international geographical scale.</p>
Disturbance	Following construction, no increase in traffic volume is anticipated and no potential for significant effect with regard to disturbance was identified.	No significant effect on this KER is anticipated at any geographical scale.
Accidental death/persecution	The desk study indicated that otter have been recorded as roadkill within the development site boundary. Accidental death by collision was identified as a potential direct effect and is applicable where the proposed road development is in proximity to watercourses.	<p>Death by collision is assessed as a Permanent-Moderate-Significant Negative effect on a receptor of <i>International Importance</i>.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p>
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.5 Badger

Table 5-5 Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Loss (including fragmentation)	<p>No badger activity was recorded within the zone of influence, however the results of the desk study indicates that badger have been recorded within the development site boundary, as roadkill on the existing N17 road, adjacent to the railway line, near the townland of Drum. This suggests there is a commuting route along the railway line and that badgers are active in the area. As per NRA Guidance, construction of roads may result in loss of foraging habitat or dissection of their foraging areas (TII/NRA 2006).</p> <p>There is potential for loss of foraging habitat and dissection of foraging areas.</p>	<p>Habitat loss and fragmentation are assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Disturbance	<p>There are no badger setts within the development site area. Badger are predominantly crepuscular in nature and construction work will be confined to daytime hours, thus minimizing disturbance related impacts to the species.</p>	<p>The potential for disturbance is considered to constitute a potential indirect Short-term Slight Negative effect on a receptor of Local Importance higher value.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Accidental death/persecution	<p>No badger setts will be affected by the proposed works. Therefore, direct effects on this species are not anticipated during the construction phase.</p>	<p>No significant effect on this KER is anticipated at any geographical scale.</p>
Operational Phase		
Habitat Loss (including fragmentation)	<p>There will be no destruction of habitat associated with the operational phase of the <i>Proposed Road Development</i>.</p> <p>Fragmentation and barrier effect are potential ongoing effects during the operational phase.</p>	<p>Habitat fragmentation is assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p>

		No significant effect on this KER is anticipated at any geographical scale.
Disturbance	Following construction, no increase in traffic is anticipated and no potential for significant effect with regard to disturbance was identified.	No significant effect on this KER is anticipated at any geographical scale.
Accidental death/persecution	Accidental death by collision was identified as a potential direct effect and is applicable where the proposed road development crosses traditional/potential commuting routes (i.e., along the decommissioned trainline near the townland of Drum)	Death by collision is assessed as a Permanent-Moderate-Significant Negative effect on a receptor of Local Importance higher value. The effect is reversible and can be remediated through appropriate design and mitigation.
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.6 Fish and Aquatic Invertebrates

Table 5-6 Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Loss/ Water Pollution	<p>The Drum stream within the development site is classified as a Depositing/Lowland River (FW2) and is designated as part of Lough Corrib SAC, downstream of Drum, outside of the development footprint. Therefore, this watercourse has been categorised as of <i>International Importance</i> and has been identified as a Key Ecological Receptor. The watercourse provides potential habitat for a range of protected fauna including those listed on Annex II and IV of the EU Habitat Directive, including salmonids, lamprey species and white-clawed freshwater crayfish.</p> <p>The proposed development will cross a network of drainage ditches, classified as <i>Local Importance (Lower value)</i>, that discharge into the Drum stream.</p> <p>Potential Impacts Include:</p> <ul style="list-style-type: none"> ➤ Indirect effects may include the run off of silt and other pollutants during the construction phase of the development from the construction site to the river. This could result in loss of habitat for aquatic species. This could potentially reduce the ability of the watercourses to maintain fish stocks and the macroinvertebrate populations that support them. This could affect QIs of Lough Corrib SAC including salmonid, lamprey species, white -clawed crayfish and otter. 	<p>The potential for habitat loss is assessed as a potential Temporary Moderate-Significant Negative effect on receptors of <i>International Importance</i>.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p>
Fragmentation	There is no potential for fragmentation or barrier effect.	No significant effect on this KER is anticipated at any geographical scale.
Accidental Kills	The proposed development will cross a network of drainage ditches, classified as <i>Local Importance (Lower value)</i> , that discharge into the Drum stream. Accidental Kills was identified as a potential	The potential for accidental Kills is assessed as a Short Term -Moderate-Significant Negative effect on receptors of International Importance.

	indirect effect and is applicable where the proposed road development is adjacent to the Drum stream.	The effect is reversible and can be remediated through appropriate design and mitigation.
Operational Phase		
Habitat Loss/ Water Pollution	Emissions to surface water, with the potential to result in a deterioration of supporting aquatic habitat, was identified as a potential ongoing indirect effect.	Indirect water pollution/habitat loss is assessed as a Permanent moderate-significant negative effect on receptors of International Importance. The effect is reversible and can be remediated through appropriate design and mitigation. No significant effect on this KER is anticipated at any geographical scale.
Fragmentation	There is no potential for fragmentation or barrier effect during the operational phase.	No significant effect on this KER is anticipated at any geographical scale.
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.1.2.7 Bird Species

Table 5-7 Impact Characterisation for Ecological Receptor based on EPA (2017)

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
Construction Phase		
Habitat Loss	The proposed development site contains scattered trees, treeline and hedgerow habitat which may be used by nesting bird species. Felling associated with the proposed road development will result in the loss of 3.64km of hedgerow/treeline habitat.	Habitat loss is assessed as a Permanent Slight Negative effect on a receptor of Local Importance

Analysis of potential effects during construction, operation and decommissioning phases of the proposed development		Significance of potential effect in the absence of mitigation (EPA 2017). Geographical context as per NRA (2009)
		<p>higher value, in the absence of mitigation.</p> <p>The effect is reversible and can be remediated through appropriate design and mitigation.</p> <p>No significant effect on this KER is anticipated at any geographical scale.</p>
Operational Phase		
Habitat Loss	There will be no additional habitat loss associated with the operational phase of the development. There is no potential for impact.	No significant effect on this KER is anticipated at any geographical scale.
Decommissioning Phase		
No effects are anticipated given that the proposed road is anticipated to be a permanent development.		

5.2 Mitigation Measures

This section describes the measures that are in place to mitigate any potentially harmful or negative effects associated with the proposed road development and the identified KERs as described in the preceding sections. General avoidance and mitigation measures included within the design of the proposed road development are described first, with more specific measures to prevent or minimise effects on the individual receptors provided subsequently.

5.2.1 Construction Stage

5.2.1.1 Mitigation by Avoidance

The proposed road development has been designed to avoid ecologically sensitive areas and has been constraint led from the initial design phase.

The project design has followed the basic principles outlined below to eliminate the potential for ecological effects on KERs where possible and to minimise such effects where total elimination is not possible.

The proposed road development has been designed to:

- avoid any direct, indirect or residual adverse effects on the integrity of European sites or other designated sites for nature conservation;
- to avoid/minimise effects on Annex listed species of the EU Habitats Directive where they occur outside of the European designated sites;
- minimise direct or indirect effects on any habitats or species that were classified as being of National, County or Local Importance (Higher Value) in the design of the Proposed Road Development.

Through careful planning and design, direct or indirect effects on receptors of International Importance have been avoided at the design stage. In addition, the proposed road development layout minimises the potential for effects on receptors of Local Importance (Higher Value).

5.2.1.2 Mitigation by Design

The proposed road development has been progressed having regard to all relevant TII/NRA guidelines, for the planning and construction of National Road Schemes, and National and European legislation. The guidelines for the planning and construction of national roads provide, within the design, for the protection of the environment. The following is an overview of the design measures that will be employed throughout the entire length of the proposed road development to minimise and avoid significant negative impacts on the ecological receptors within the zone of influence.

- Landscaping associated with the proposed road development will involve the planting of native hedgerow and woodland to mitigate for losses associated with the proposed road development;
- An Outline Erosion and Sediment Control (OESC) Plan has been prepared as a method of water quality preservation to offset potential construction stage pollution impacts from the Proposed Road Development to the adjacent watercourse and drainage ditches. The potential for run off pollutants during the construction phase of the development will be fully managed with impacts on significant receptors avoided. Mitigation measures during the construction phase are fully described in section 2.2.1 of this report.
- The proposed operational road drainage has been designed to avoid the potential for ongoing pollution of the wider environment during the lifetime of the road and is likely to lead to a

positive impact. Mitigation measures during the operational phase are fully described in section 2.2.1 of this report.

All works in proximity to watercourses shall follow the specific protection and mitigation measures described in the Outline Erosion and Sediment Control Plan and the best practice guidance outlined in the following documents:

- TII/NRA ‘Guidelines for the crossing of Watercourses During Construction of National Road Schemes (2008);
- Shannon Regional Fisheries Board (SRFB) Protection and Conservation of Fisheries Habitat with Particular reference to Road Construction (2009);
- Inland Fisheries Ireland requirements publication” Guidelines on protection of fisheries during construction works in and adjacent to waters” (2016)

5.2.1.2.1 **Tree Felling and Hedgerow**

The hedgerows and treelines with the site are of local importance (higher value) as they comprise semi natural habitat and provide commuting and foraging corridors for a variety of species. Hedgerows/treeline will be retained where possible, however the proposed development will require the loss of 3.64km of hedgerow/treeline habitat.

The removal of vegetation shall be undertaken in line with the provisions and exemptions described in the Wildlife Act 1976-2019.

The Landscape mitigation proposals associated with the proposed road development will involve the planting of native hedgerow as well as native trees to mitigate for losses associated with the proposed road development. Details of the planting scheme are provided in the Proposed Planting Area drawings PP01 – PP04 (included in appendix 1). Tree and hedgerow planting will comprise native species and will include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), mountain ash (*Sorbus acuparia*), alder (*Alnus glutinosa*), downy birch (*Betula pubescens*), silver birch (*Betula pendula*), ash (*Fraxinus excelsior*), wild cherry (*Prunus avium*) and sessile oak (*Quercus petraea*).

A network of vegetation will be created around the proposed road development that in many sections of the study corridor will provide additional biodiversity within the landscape. A total of 4.1km of hedgerow/treeline will be replanted, therefore there will be no net loss of this habitat.

The planting of native species will benefit local wildlife by providing additional feeding and breeding habitat. Species such as oak, hawthorn and bird cherry will provide berries/ fruit that will support a wide variety of wintering birds and small mammals. The use of native species and pollinators within the replanting plan will enhance the biodiversity value of the completed development.

5.2.1.3 **Flora and Fauna Mitigation**

5.2.1.3.1 **Badger**

Pre-construction Badger survey

A walkover survey for badger will be undertaken in advance of construction to ensure that any mammal species that may have taken up residence in the period between the grant of planning permission and the construction of the scheme can be appropriately considered and treated should they be encountered. The pre-commencement walkover survey will be undertaken in line with the *Guidelines for the treatment of badgers prior to the construction of National Road Schemes* (TII, 2006).

Mammal ramps will be placed in excavations to allow any mammals which may become trapped to escape. Any pipes within the development site will not be allowed to become a hazard for mammals.

5.2.1.3.2 Otter

No evidence of Otter was recorded within the proposed development site. The drainage ditches within the site offer sub optimal foraging habitat. Otter are likely to use the Drum stream within the study area for foraging and commuting. No breeding or resting sites were recorded and direct impact on the species is not anticipated.

Pre-construction Otter survey

Prior to any works being carried out, a pre-construction Otter survey will be undertaken by an ecologist to ensure that Otter has not taken up residence within or close to the road footprint. The Ecologist will also undertake periodic surveys of the site during the construction phase for signs of otter activity.

In addition, mammal ramps will be placed in excavations to allow any mammals which may become trapped to escape. Any pipes within the development site will not be allowed to become a hazard for mammals.

5.2.1.3.3 Bats

Landscape Features

Mature tree-lines and hedgerows provide good potential for foraging, commuting and individual trees may have the potential to support smaller roosts (i.e., single Bats). The proposed road development involves specific prescriptions for hedgerow and tree planting to ensure that habitat connectivity is not severed by the proposed road development. Proposals include:

- Hedgerow planting and planting of trees to provide commuting habitat along the proposed road development and to guide bats to other linking treelines/hedges and woodland that may be used to cross the road. A network of vegetation will be created around the proposed road development that in many sections of the study corridor will provide additional biodiversity within the landscape. A total of 4.1km of hedgerow/treeline will be replanted, therefore there will be no net loss of this habitat. Details of the planting scheme are provided in the planting area drawings PP01 – PP04 (appendix 1).
- Planting will utilise native species as these have a greater range of insects associated with them that provide an additional source of food for bat species.

A pre-construction Bat survey will be required by suitably qualified Bat ecologists prior to any felling being undertaken. If the presence of roosting Bats in a tree is suspected, a close-up inspection by a suitably trained ecologist is required prior to felling.

Felling of mature broadleaved trees during winter months (November – March) should be avoided as this increases risk to hibernating Bats. If there is a requirement to fell trees in these sensitive areas during this period, any trees with significant roosting features will be subject to a detailed inspection undertaken by a suitably qualified professional.

Buildings

The buildings to be demolished within the development area do not currently support roosting Bats. These buildings will be subject to pre-construction survey (as per TII/NRA, 2005b) prior to demolition to ensure Bats have not taken up residence. If bats are found to be present, exclusion measures will be followed under licence from the NPWS.

5.2.1.3.4 **Birds**

The proposed development site does not provide significant foraging or roosting habitat for protected bird species. Given the lack of significant bird assemblages recorded within or adjacent to the site, significant impacts as a result of disturbance or displacement are not anticipated on bird species at any geographic scale. The proposed development site contains treeline and hedgerow habitat which may be used by nesting bird species.

The proposed road development involves specific prescriptions for hedgerow and tree planting to ensure that there will be no net loss of habitat connectivity. A network of vegetation will be created around the proposed road development that in many sections of the study corridor will provide additional biodiversity within the landscape. Such measures will maintain nesting hedgerow habitat for bird species. Therefore, there will be no potential for significant impacts as a result of habitat loss to the bird populations

The planting of native species will benefit local bird species by providing additional feeding and breeding habitat. Species such as oak, hawthorn and bird cherry will provide berries/ fruit that will support a wide variety of wintering birds and small mammals. The use of native species and pollinators within the proposed planting plan will enhance the biodiversity value of the completed development.

Best practice

Vegetation clearance will be undertaken outside of the nesting bird season. The protection of bird breeding habitats during the breeding season (1st March to 31st August, inclusive), is set out in the Wildlife Acts (As Amended), 1976-2021. If there is a requirement to clear vegetation during the nesting bird season, standard best practice measures will be followed, with a nesting bird survey undertaken by a suitably qualified ecologist.

5.2.1.4 **Mitigation through Best Practice**

The following best practice control measures will be implemented in the prevention of ecological impacts. In addition, the measures outlined below will limit artificial lighting and noise emanation during the construction phase.

5.2.1.4.1 **Site Set Up**

- Construction compounds shall be located on dry land and set back from watercourses and stream channels, ecological sensitive areas and away from potential floodplain areas.
- Construction compounds shall not be located in European Sites or within 50m of the boundary of same.
- The storage of fuels, other hydrocarbons, and other chemicals within the construction compounds will not be permitted within 30m of any sensitive watercourse.
- Surface runoff from compounds will be minimised by ensuring that the paved/ impervious area is minimised. All surface water runoff will be intercepted and directed to appropriate treatment systems for the removal of pollutants prior to discharge
- All site compounds will be fenced off and a silt fence erected and maintained on the site boundary.
- Wastewater drainage from all site offices and construction facilities will be contained and disposed of in an appropriate manner to prevent water pollution and in accordance with the relevant statutory requirements.

The storage of fuels, other hydrocarbons and other chemicals within the construction compounds shall be in accordance with relevant legislation and with best practice. In particular:

- All fuel/ Hydrocarbon/ Chemical (fluid) storage areas shall be bunded to 110% of storage capacity.

- Storage of these materials within a compound shall be organised so as to be as far away from all water bodies as is practicable.
- The Emergency Response Plan shall include arrangements for dealing with accidental spillage and relevant staff shall be trained in these procedures.

5.2.1.4.2 **Disturbance Limitation Measures**

Details of the disturbance limitation measures, relevant to biodiversity, to be employed to minimise noise and vibration during the construction and operational phases are described below:

- During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of animals.
- All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1998, and any subsequent amendments.
- Plant machinery will be turned off when not in use. Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Operating machinery will be restricted to the proposed development site boundary.
- Construction works will be limited to daylight hours.
- Reduced illumination of the site will be used where possible to prevent disturbance to local fauna that may potentially occur in the wider area. Light spills during construction works will be minimised where possible thus reducing the effect on areas outside the proposed development, and consequently on fauna of conservation value including otter.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).

5.2.1.5 **Pollution Prevention Measures**

This project has potential to cause pollution of the surrounding environment. Pollution could take a number of forms and could occur during a number of the operations involved in the construction process. Listed below are the activities during which pollution may arise and the type of pollution that may occur along with prescribed best practice construction measures.

The construction phase of the proposed road development involves temporary and permanent works in the vicinity of and within watercourses, generally associated with the construction of culverts and outfalls, realignment of drainage channels.

Construction activities pose a significant risk to watercourses and groundwater particularly from contaminated surface water runoff from construction activities entering nearby watercourses and accidental spillages of hydrocarbons, chemicals and concrete.

Construction activities within and alongside surface waters associated road construction and its road drainage facilities and outfalls can contribute to the deterioration of water quality and can physically alter the stream/river bed and bank morphology with the potential to alter erosion and deposition rates locally and downstream. Activities within or close to the watercourse channels can lead to increased turbidity through re-suspension of bed sediments and release of new sediments from earthworks. Consequently in-stream works can potentially represent a severe disruption to aquatic ecology.

The main contaminants arising from construction runoff include:

- Elevated silt/sediment loading in construction site runoff. Elevated silt loading can lead to long-term damage to aquatic ecosystems by smothering spawning grounds and gravel beds and clogging the gills of fish. Increased silt load in receiving watercourses stunts aquatic plant growth, limits dissolved oxygen capacity and overall reduces the ecological quality with the most critical period associated

with low flow conditions. Chemical contaminants in the watercourse can bind to silt which can lead to increased bioavailability of these contaminants

- Spillage of concrete, grout and other cement based products. These cement based products are highly alkaline (releasing fine highly alkaline silt) and extremely corrosive and can result in significant impact to watercourses altering the pH, smothering the stream bed and physically damaging fish through burning and clogging by the fine silt of gills
- Accidental spillage of hydrocarbons from construction plant and at storage depots / construction compounds
- Faecal contamination arising from inadequate treatment of on-site toilets and washing facilities
- The construction of the proposed road development will result in excess material which is not suitable as construction material and is in excess of the landscaping requirement. This material is to be deposited on site within an engineered material deposit area. The transport and deposition of this material if not suitably controlled could, given the proximity to watercourses and field drains enter the Drum Stream and the downstream SAC waters including the River Clare.

An Outline Erosion and Sediment Control Plan (OESC), accompanies this application, and sets out the environmental management framework to be adhered to during the pre-commencement and construction phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. The Principal mitigation Measures included in the OESC are summarised in section 2.2.1 of this report.

5.2.1.6 Mitigation to Prevent the Spread of Invasive Species

Due to the legislative requirements to control the spread of noxious weeds and non-native invasive plant species, it is important that any activities associated with the planning, construction and operation of national road schemes comply with the requirements of the Wildlife Acts, 1976-2021. Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the dispersal and introduction of Invasive Alien Species (IAS), which are listed in the Third Schedule of the regulations.

Regulation 49 deals with the Prohibition on introduction and dispersal of certain species while Regulation 50 relates to Prohibition on dealing in and keeping certain species (Regulation 50 has not yet been commenced). Invasive species are listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011).

The introduction and/or spread of invasive species such as Himalayan Balsam, Giant Rhubarb or Rhododendron for example, could result in the establishment of invasive alien species and this may have negative impacts on the surrounding environs.

No non-native invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) were recorded during the site visit. However, the non-native invasive species winter heliotrope (*Petasites fragrans*), was recorded in amenity grassland habitat in the front garden of a house earmarked for development. This plant is mentioned in the Transport Infrastructure Ireland – Invasive Alien Plant Species on National Roads – Technical Guidance (TII 2020). The spread of this species is deemed to be a long-term slight negative effect.

The following will be adhered to in order to avoid the spread of Winter Heliotrope and to prevent the introduction of other invasive species to the site:

- A pre-construction survey for invasive species will be conducted to determine if there has been introduction of any invasive species post the undertaking of this EcIA.

- Winter Heliotrope will be clearly marked with hazard tape prior to works commencing and will be avoided throughout the proposed works, where possible.
- Where winter heliotrope cannot be avoided, it will be treated in accordance with Transport Infrastructure Ireland – Invasive Alien Plant Species on National Roads – Technical Guidance (TII 2020).
- All machinery will be thoroughly cleaned and disinfected prior to arrival to the site to prevent the spread of invasive species from elsewhere.

General appropriate spread prevention measures are outlined below.

Control measures for the management of Invasive Species

The following measures address potential impacts associated with the construction phase of the project:

- Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Himalayan Balsam, Japanese Knotweed etc.) by thoroughly washing vehicles prior to leaving any site.
- All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species and to ensure no spread of aquatic invasive species or crayfish plague.
- All plant and equipment employed during the instream works element of the project will be thoroughly disinfected using virkon aquatic on site to prevent the spread of crayfish plague.
- All washing must be undertaken in areas with no potential to result in the spread of invasive species. This process will be detailed in the contractor's method statement.
- Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- All planting and landscaping associated with the proposed development shall avoid the use on invasive shrubs such as Rhododendron.

The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – Transport Infrastructure Ireland – Invasive Alien Plant Species on National Roads – Technical Guidance (TII 2020).

5.2.1.7 Monitoring

The construction works will be monitored at several levels to ensure that the environmental best practice prescribed in this document is fully adhered to and is effective. The following system will be put in place to ensure compliance.

- The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. A checklist will be filled in on a weekly basis to show how the measures above have been complied with. Any environmental incidents or non-compliance issues will immediately be reported to the project team;
- The project managers (client representatives) will be continuously monitoring the works and will be fully briefed and aware of the environmental constraints and protection measures to be employed.

The works will be periodically monitored, as required by the Employers' Representative, during the construction phase by a suitably qualified ecologist. Following completion of the works, the ecologist will complete a final audit report to show how the works complied with the environmental provisions described in this Chapter.

5.2.2 Operational Phase

5.2.2.1 Emissions associated with the operation of the Proposed Road Development

Specific measures to offset potential impacts relating to surface water runoff, during the operation of the road, have been incorporated into the design of the Proposed Road Development including the following measures:

- Attenuation Ponds have been designed both for storm water attenuation and first flush water quality detention
- Upstream of all outfalls and downstream of the drainage ponds an oil/petrol interceptor is to be provided suitably sized for the drainage pavement area

- A shut off penstock at the pond outlet is to be provided which in the event of a serious pollution incident the pond can be closed off from the outfall and used to contain the spillage for appropriate removal and treatment.

The drainage design has incorporated best practice in respect to drainage collection system which is sealed and avoids infiltration to a regionally important karst aquifer within the high , extreme and extreme with outcrop/sub-crop vulnerability section of the Road alignment from 2450 to 3950 which protects the groundwater aquifer from pollution.

Road pavement drainage is to be collected and isolated from the natural land drainage passing it through water attenuation and water quality detention ponds before outfalling to the existing drainage channels downstream of the road (southwest). These facilitates are part of the road design and meet the TII guidance in respect to Road Drainage and the environment and Drainage systems for National Roads. The drainage design protects the receiving watercourses and the downstream sensitive receptors including the Lough Corrib SAC. As part of the drainage design the outflow from the ponds will be passed through an oil/petrol interceptor to prevent contamination of the surface waters from hydrocarbon contamination.

According to the hydrology report accompanying this application the proposed modern road drainage system is an improvement over the existing situation on the N17 which is non-existent, being uncontrolled over the edge discharges. The proposed road represents a safer road and therefore reduces the potential for serious accidental spillage. Full details of the measures to be included are provided in the OESC and the Hydrology report accompanying this application.

5.2.2.2 Faunal Mortality, Habitat Fragmentation and Disturbance

5.2.2.2.1 Mammal Resistant Fencing

Fencing is required to prevent badgers from crossing road points other than at underpasses. The fencing must extend sufficient distance to ensure that badgers will not find an easy way around. Underpass entrances should be recessed in fence lines, thereby guiding animals to them.

The extent of fencing has been determined by the locations at which badgers are likely to encounter it and the frequency with which they may attempt to cross the proposed road development. Fencing will be installed in areas identified in the desk study that indicate are used by badgers as a crossing point on the existing N17 road (i.e., the decommissioned railway line near Drum).

Badger-proof fencing will not be installed asymmetrically and will be installed in parallel on both sides of the road and care will be taken to avoid any gaps or weaknesses even at awkward features such as undulating ground or streams.

The welfare of Otters will be ensured primarily through the provision of continued safe access for Otters to their ranges and foraging habitats. Adequate provision for Otters at affected watercourse crossings is required to allow the species to retain continued access to their foraging areas. No requirement for Otter underpasses were identified given that no natural watercourses are to be crossed by the proposed development.

Otters may cross roads some distance from watercourses. Taking a precautionary approach mammal resistant fencing has been incorporated into the design of the project. This fencing will be extended along the length of the scheme that is adjacent to the river.

Mammal proof fencing will be in accordance with TII specification CC-SCD-00324. The locations of mammal proof fencing are shown on Drawings AC-01, AC-02, AC-03 and AC-04 (Appendix 1).

5.2.2.2.2 **Badger Underpasses**

Badger underpasses significantly reduce the number of Badger casualties and mortalities associated with proposed road developments and should be installed where Badger pathways cross a proposed road development. Although no signs of badger were recorded during the field survey, the desk study indicates that badgers use the area near the decommissioned railway as a crossing point on the existing N17 road.

Badger/mammal underpasses are included in areas of identified badger activity and will be installed in areas identified in the desk study that indicate are used by badgers as a crossing point on the existing N17 road (i.e., the decommissioned railway line near Drum). The underpasses will reduce impacts on Badger communities in the area as a result of the operational phase of the proposed road development.

The locations of underpasses are shown on in drawing MC01, (included in Appendix 1).

They shall be constructed in accordance with TII Standard Construction Detail (SCD) CC-SCD-02504 and CC-SCD-02505. Mammals will be guided into the underpass by mesh fencing. This will prevent Badgers and other fauna from entering the road carriageway. The fencing design will correspond to CC-SCD-00319. The fencing shall be installed in such a manner as to prevent Badgers and other animals from digging under the fence. Badger underpasses will be sited as close as possible to the existing Badger paths. The underpasses and fencing will be installed at the earliest stage possible during the construction phase so as to encourage Badger use. Where it is unfeasible to create a Badger underpass due to engineering constraints, it will be moved to a more suitable location not more than 250 metres from the original location and guide planting and fencing will be provided. As per SCDs the following measures, as per TII/NRA (2006) will be adhered to when constructing the prescribed Badger underpasses:

- Exit and Entrance to tunnels will be flush with badger-proof fencing;
- Drainage will be adequate to prevent waterlogging at entrances and within the underpass;
- Where stream culverts are being installed, structures greater than one metre diameter will be fitted with a raised mammal ledge. The ledge will be elevated above normal flood levels. Alternatively, a separate pipe culvert (600mm) can be set above flood level adjacent to stream culvert; and
- The entrances to the underpass will be planted with appropriate hedgerow planting to encourage Badger use though this will not obscure the entrances.

5.2.2.2.3 **Bats and Lighting**

Lighting is proposed at the southern tie in. A total of 17 new streetlights are proposed as part of the project. The lighting location was not considered to be of significance for bat species and the species recorded in the area are not susceptible to disturbance from street lighting. However, taking a precautionary approach the proposed lighting has been designed to approved standards that minimise light spillage outside the intended target area.

All external lighting will utilize directional accessories e.g. through the use of light shields (Stone, 2013) and/or the use of LED lighting. The lighting will be low intensity to minimize any disruption to commuting and foraging bat species. The use of such directional lighting will avoid light spillage onto adjacent hedgerow habitats.

5.3

Residual Effects

The following habitats and species were identified as KERs and were subject to detailed impact assessment:

- > Treelines, Hedgerows and Scrub
- > Watercourses
- > Bat Species
- > Otter
- > Badger
- > Fish and Aquatic Invertebrates

Taking into consideration the effect significance levels identified and the proposed best practice and mitigation; significant residual effects on KERs with regard to habitat loss/degradation, species disturbance/displacement or collision mortality are not anticipated.

Table 5-8 Assessment of Residual Impact and Scale and Significance based on EPA (2017) and TII/NRA (2009)

Key Ecological Receptor	Pre-Mitigation Effects	Post mitigation Effect
Treelines, Hedgerows and Scrub	Habitat loss is assessed as a Permanent Slight Negative effect on a receptor of Local Importance higher value, during the construction and operational phase of the development.	With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.
Watercourses	Indirect water pollution and the associated habitat loss/degradation is assessed as a Temporary Moderate-Significant Negative effect on a receptor of International Importance, during the construction phase Indirect water pollution and the associated habitat loss/degradation is assessed as a Permanent Moderate-Significant Negative effect on a receptor of International Importance, during the operational phase.	With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.
Bat Species	Habitat loss is assessed as a Permanent Slight- Moderate Negative effect on a receptor of Local Importance higher value, in the construction phase. Habitat fragmentation is assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value, in the operational phase of the development. Displacement as a result of lighting proposals is assessed as a Permanent Imperceptible Negative effect on a receptor of Local Importance higher value, in the operational phase of the development.	With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.
Otter	Habitat destruction is assessed as a Permanent Moderate Negative effect on a receptor of <i>International Importance</i> , during the construction phase. Indirect water pollution effects are assessed as a Short-term Moderate Negative effect on a receptor of <i>International Importance</i> , during the construction phase. The potential for disturbance is considered to constitute a potential indirect Short-term Slight Negative effect on a receptor of <i>International Importance</i> , during the construction phase. Indirect water pollution effect is assessed as a Permanent Moderate Negative effect on a receptor of <i>International Importance</i> , during the operational phase.	With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.

Key Ecological Receptor	Pre-Mitigation Effects	Post mitigation Effect
	<p>Death by collision is assessed as a Permanent-Moderate-Significant Negative effect on a receptor of <i>International Importance</i>, during the operational phase.</p>	
Badger	<p>Habitat loss and fragmentation are assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value, during the construction phase.</p> <p>The potential for disturbance is considered to constitute a potential indirect Short-term Slight Negative effect on a receptor of Local Importance higher value, during the construction phase.</p> <p>Habitat fragmentation is assessed as a Permanent Slight-Moderate Negative effect on a receptor of Local Importance higher value, during the operational phase.</p> <p>Death by collision is assessed as a Permanent-Moderate-Significant Negative effect on a receptor of Local Importance higher value, during the operational phase.</p>	<p>With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.</p>
Fish and Aquatic Invertebrates	<p>The potential for habitat loss is assessed as a potential Temporary Moderate-Significant Negative effect on a receptor of International Importance, during the construction phase.</p> <p>The potential for accidental Kills is assessed as a Short Term -Moderate-Significant Negative effect on a receptor of International Importance, during the construction phase.</p> <p>Indirect water pollution/habitat loss is assessed as a Permanent moderate-significant negative effect on receptors of International Importance.</p>	<p>With mitigation and best practice in place no potential for significant residual effect on this KER is anticipated at any geographical scale.</p>

5.4 Cumulative impact

A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on European Sites was conducted. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

The following sources of information were consulted to establish if there are any *...existing and/or approved projects^[1]...* in proximity to the proposed road development, which are likely to result in cumulative effects:

- Galway County Council Planning Register;
- Galway County Development Plan, 2015 - 2021;
- An Bord Pleanála website;
- EU Biodiversity Strategy 2011;
- Irish National Biodiversity Action Plan 2017-2021

5.4.1 Plans

The following development plans been reviewed and taken into consideration as part of this assessment:

- Galway County Development Plan 2015-2021

The review focused on policies and objectives that relate to Natura 2000 sites and natural heritage. Policies and objectives relating to sustainable land use were also reviewed.

^[1] Terminology used in the amended EIA Directive.

Table 5-9 Assessment of plans

Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
Land use and Spatial Plans		
<p>Galway County Development Plan 2015 - 2021</p>	<p>Policy NHB 1 – Natural Heritage and Biodiversity It is the policy of Galway County Council to support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries and Connemara National Park (and other designated sites including any future designations) and the promotion of the development of a green/ecological network within the plan area, in order to support ecological functioning and connectivity, create opportunities in suitable locations for active and passive recreation and to structure and provide visual relief from the built environment.</p> <p>Objective NHB 1 – Protected Habitats and Species Support the protection of habitats and species listed in the Annexes to and/or covered by the <i>EU Habitats Directive (92/43/EEC) (as amended)</i> and the <i>Birds Directive (2009/147/EC)</i>, and regularly occurring-migratory birds and their habitats and species protected under the <i>Wildlife Acts 1976-2021</i> and the <i>Flora Protection Order</i>.</p> <p>Objective NHB 2 – Biodiversity and Ecological Networks Support the protection and enhancement of biodiversity and ecological connectivity within the plan area, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, stone walls, geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of <i>Article 10</i> of the <i>Habitats Directive</i>.</p>	<p>The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and water quality. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites as a result of the proposal.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on ground water quality, as outlined in the accompanying OESC and the Hydrology report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p> <p>There will be no barriers to connectivity or habitat fragmentation as a result of the proposal and ecological corridors will be maintained. Native hedgerow and treeline habitat will be replanted to mitigate for losses associated with the Proposed Road Development, thus maintaining connectivity with the wider landscape for commuting bat species.</p> <p>No natural watercourses will be traversed by the development, and there will be no barrier effect/habitat fragmentation for otter. An underpass will be used along known badger commuting paths thus retaining connectivity with the wider landscape.</p>

Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
<p>Variation No.1 to the County Development Plan 2015 - 2021</p>	<p>Objective DS 6 – Natura 2000 Network and Habitats Directive Assessment Protect European sites that form part of the Natura 2000 network (Including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No.477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated or subsequent guidance). A plan or project (e.g., proposed development) within the plan area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and/or a Habitats Directive Assessment where necessary, that:</p> <p>a) The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or</p> <p>b) The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or</p> <p>c) The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.</p> <p>Objective DS 10 – Impacts of Developments on Protected Sites Have regard to any impacts of development on or near existing and proposed Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation, Nature Reserves, Ramsar Sites, Wildfowl</p>	<p>The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and water quality. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites as a result of the proposal.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on ground water quality, as outlined in the accompanying OESC and the Hydrology report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p> <p>The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and water quality. No potential for cumulative</p>

Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Sanctuaries, Salmonoid Waters, Refuges for Flora and Fauna, Conamara National Park, shellfish waters, freshwater pearl mussel catchments and any other designated sites including future designations.</p>	<p>impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites as a result of the proposal.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on ground water quality, as outlined in the accompanying OESC and the Hydrology report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p>

5.4.2

Other projects considered in the wider area

The proposed development was considered in-combination with other plans and projects in the area that could result in cumulative impacts on designated Sites. The online planning system for Galway County Council as well as the An Bord Pleanála Website (planning searches), was consulted for the townlands within the development site area including Milltown, Cartron, Gortnaloura, Cloonnacross, Drum, Killeerdeen and Gortnagunned. Each of these developments has been subject to the local authority's appropriate assessment procedure prior to granting consent. Additional projects identified in the area include;

- Permission for a) Retention of commercial kitchen over open basement to rear of existing restaurant b) Retention of ground floor residential extension to rear of existing dwelling (Previously exempted development) c) Permission to construct single storey residential extension to side of existing dwelling d) permission to construct first floor residential extension to rear of existing dwelling e) Re-positioning & Widening of existing vehicular entrance to rear garden to accommodate c) above f) Permission to construct canopy/covered smoking area to front of existing bar/Restaurant. Gross floor space of proposed works Residential 71sqm, Gross floor space of work to be retained Commercial 57sqm, Residential 33sqm (planning reference: 171196).
- Permission for development at the Bar/Retail & residential premises and adjacent yard formerly known as Glynn's Milltown. The development will consist of: The renovation and alteration of the existing building and yard such that they will provide 7 no. 2 bed town houses, parking for 7 cars along with all necessary siteworks and services. (Gross floor space of existing buildings: 772 sqm., gross floor space of demolition works: 144 sqm.) (Planning reference: 17552).
- Permission to demolish existing dwelling house, and permission to construct a dwelling house and a garage with treatment plant and percolation area (gross floor space demolish 58.2sqm house 253.2sqm garage 60sqm) (Planning reference: 1123).
- Permission to construct a dwelling house, domestic garage and all ancillary site works and services (gross floor space 271.1sqm; garage 47.4sqm) (Planning reference:1566).
- Permission for the construction of 4 two-storey detached dwelling houses and associated domestic garages and a nursing home development, comprised as follows: (1) The provision of a two-storey residential nursing home to HIQA standards containing 55 en-suite bedrooms (Planning reference: 151268).
- Permission to (a) construct new spectator stand with storage to the rear and (b) construct a new gym (gross floor space (a) 201sqm; (b) 80sqm) (planning reference: 121188).
- Permission for the construction of a serviced dwelling with domestic garage and effluent treatment system (375sqm house, 60sqm garage) (planning reference: 121035).
- Permission for the construction of a dwelling house, domestic garage and for all ancillary site works and services. Gross floor space of proposed works 138.3sqm (planning reference: 171566).
- Permission to construct a workshop repair garage including office accommodation & pump house, together with all ancillary site works and services (gross floor space 900.1sqm) (planning reference: 16610).
- Permission to construct serviced dwelling house. Gross floor space of proposed works: 230 sqm. (Planning reference: 191078).
- Permission to construct domestic garage with all necessary site works (gross floor space 97.21sqm) (planning reference: 151402).
- Permission to construct a new serviced dwelling house with proprietary treatment plant and domestic garage together with all ancillary site development works (previous planning reference number 08/1881) (Gross floor area House 270 sqm Garage 53 sqm). (Planning reference: 1434)
- Permission for an private house changes include a) garage converted to gym &/boiler house with chimney, garage door replaced with sliding glass doors and larger window to the front elevation of the garage also additional window on side wall of garage, b) conversion of attic to

storage/study space with Velux roof window on rear of roof also walk in attic space, c) porch to front of house, d) additional internal en-suite bathroom, e) some windows style and sizes changed, f) retention also for outbuildings including garden tool store, garage, closed fuel store and open fuel store (Planning reference: 19792).

- Permission for the construction of a dwelling house, garage, wastewater treatment system and all ancillary works. Gross floor space of proposed works: House - 236.7 sqm, Garage - 41.25 sqm (Planning reference: 191652)
- Permission to alter front extension and construct new rear extension to existing dwelling house and all ancillary works. Gross floor space of proposed works: 73.34 sqm (Planning reference: 191399)
- Retention permission for subdivision of commercial unit (1 unit into 2 units) as previously granted planning permission under 06/508, all as per drawing documentation submitted together with all ancillary site works and services. (Planning reference 2081)
- Permission to construct a private dwelling house, proprietary effluent treatment system, percolation area and domestic garage along with all associated services. Gross floor space of proposed works: 263.29 msq (Planning ref.: 201969)
- Retention permission of a) a Maintenance Shed, b) For the erection of 8 No. 20m high Pitch floodlighting Columns to the Main Pitch and c) For the erection of 8 No. 18m high Pitch floodlighting Columns to the Second Pitch and all associated works. Gross floor space of work to be retained: 32 sqm (Planning reference: 21104)
- Permission to a) demolish sub-standard vacant dwelling house, and b) construct a new dwelling house, domestic garage, effluent treatment system, percolation area, and all associated works. Gross floor space of proposed works: House: 261 sqm, Garage: 60 sqm. Gross floor space of any demolition: 95.5 sqm (Planning reference: 21370)
- Permission for works to existing dwelling house including construction of a new roof with higher ridge and eaves levels, a single-story extension to the side and rear and associated works. Gross floor space of proposed works: 236 sqm. Gross floor space of any demolition: 10 sqm (Planning reference: 21372)
- Extension of duration permission for the construction of 4 two-storey detached dwelling houses and associated domestic garages and a nursing home development, comprised as follows: (1) The provision of a two-storey residential nursing home to HIQA standards containing 55 en-suite bedrooms. The building will also have all ancillary dayrooms, dining areas, kitchen, staff facilities, circulation, nurse's stations, sluice rooms and all ancillary rooms associated with a nursing home. The building encloses a secure open space amenity area. (2) The construction of a separate plant room to service the proposed nursing home. (3) An access junction, internal roads, footpaths, car-parking, public open spaces and all ancillary hard and soft landscaping. The development will be connected to the public sewer (gross floor space 3883.6sqm) (Planning reference: 21617)
- Permission for Change of Use of a vacant shop unit to a one-bedroom apartment and all associated works (Planning reference: 21968)

5.4.3 Assessment of Cumulative Effects

No potentially significant cumulative disturbance, displacement or habitat loss effects on any of the KERs has been identified regarding the current proposal. The development proposal includes robust mitigation and best practice to ensure that there will be no significant adverse effects on surface water quality, watercourses, riparian habitat and associated flora and fauna.

Given that there are no existing plans or projects that could result in a cumulative effect and the predicted effects with the current proposal, no residual cumulative effects have been identified regarding any KER.

The proposed development will not result in any significant residual effects on any ecological receptors or Designated Sites. Therefore, there is no potential for the proposal to contribute to any potential for cumulative impacts in this regard when considered in-combination with other plans and projects.

In the review of the projects that was undertaken, no connection between the proposed road development and any of the plans or projects that were reviewed, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development. Taking into consideration the reported residual effects from other plans and projects in the area and the predicted effects with the current proposal, no residual cumulative effects have been identified.

6. CONCLUSION

Following consideration of the residual effects (post-mitigation) it is noted that the proposed road development on its own, will not result in any significant effects on any of the identified KERs. No significant residual effects on receptors of International, National or County or Local Importance were identified.

The potential for effects on the European designated sites are fully described in the Natura Impact Statement that accompanies this application. The NIS concludes that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

No potential for significant effect on nationally designated sites or any ecological receptor exists given that all identified pathways for impact are robustly blocked by the project design and mitigation contained in OESC and in the hydrology report.

The proposed road development will be constructed and operated in strict accordance with the design, best practice and mitigation that is described within this report and as such, significant effects on ecology are not anticipated at any geographical scale on any of the identified KERs.

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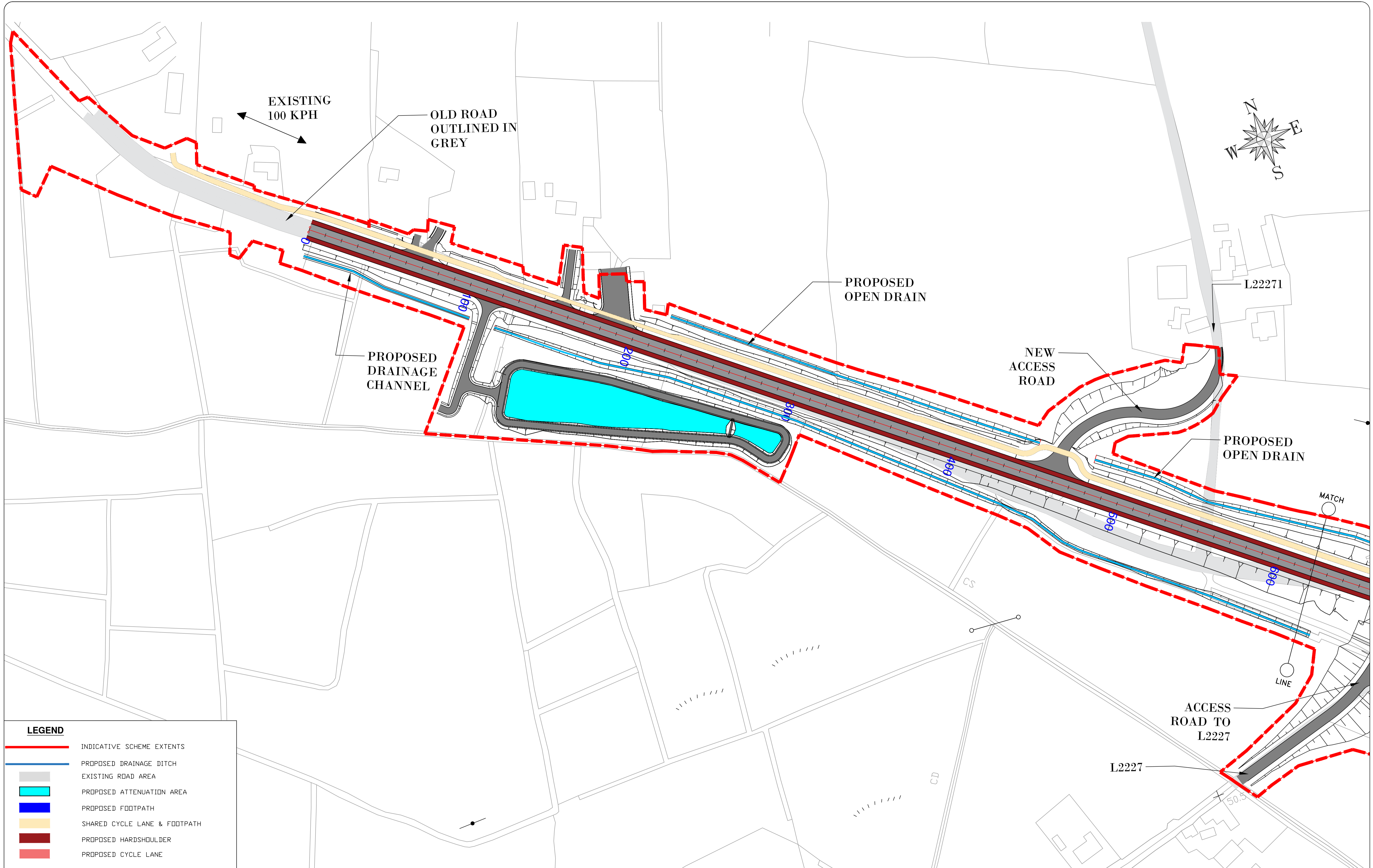
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APPENDIX 1

DESIGN DRAWINGS



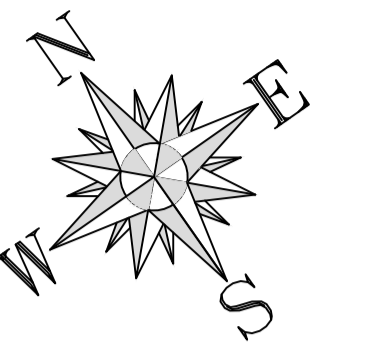
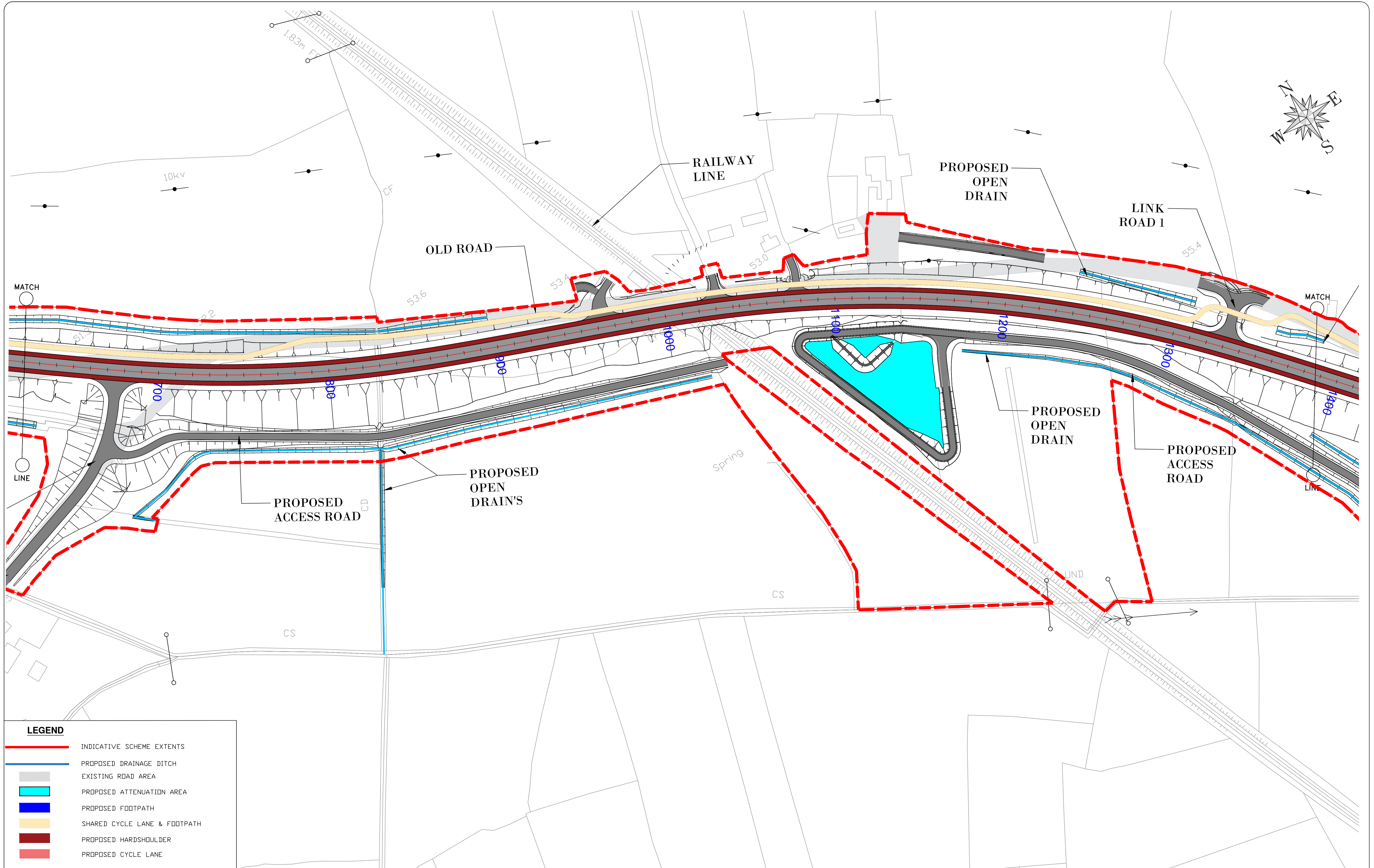
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	PROPOSED ATTENUATION AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE



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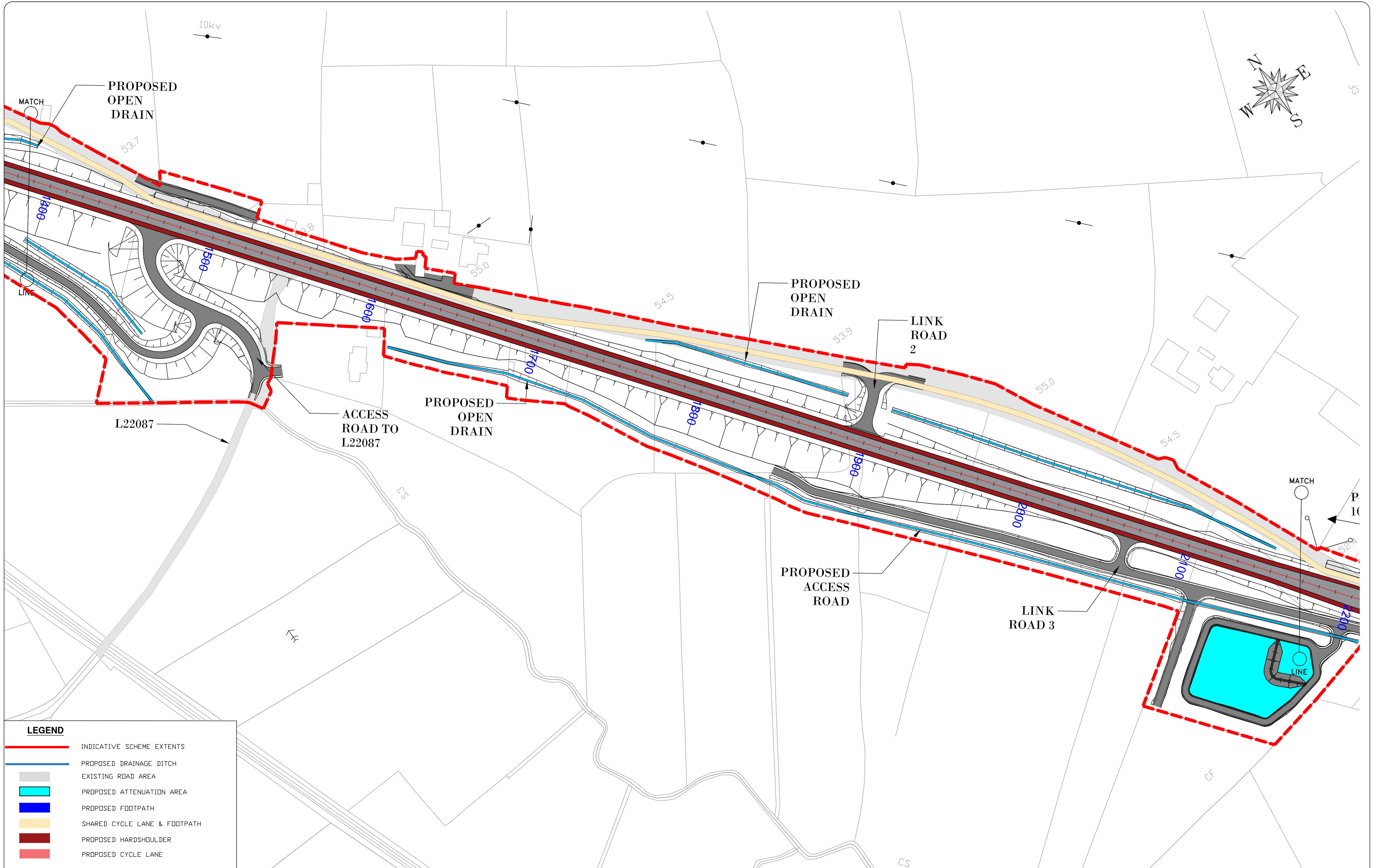
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	SHARED CYCLE LANE & FOOTPATH
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE

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PROJECT:	N17 Milltown to Gortnagunned		
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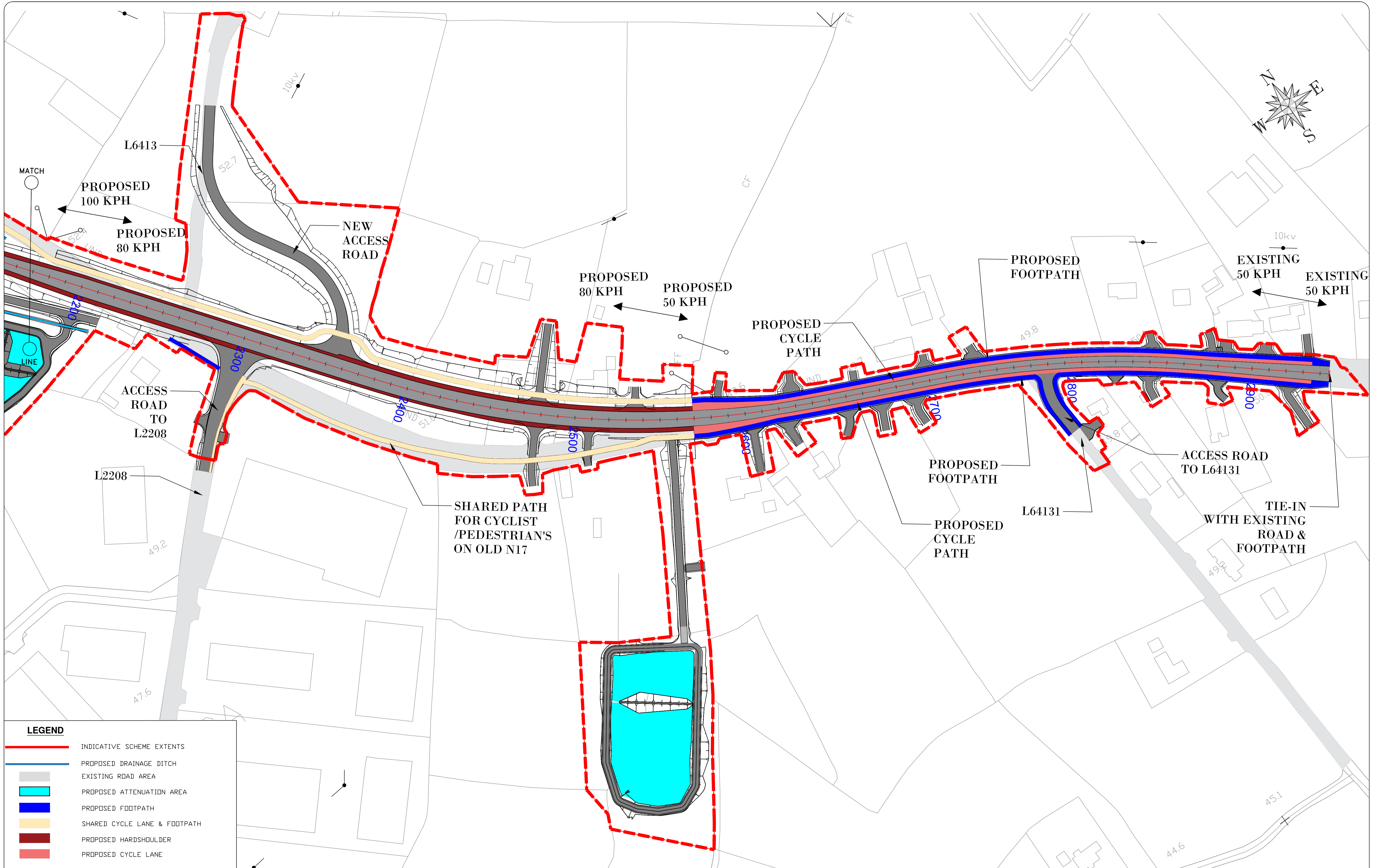
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	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE



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- PROPOSED DRAINAGE DITCH
- EXISTING ROAD AREA
- PROPOSED ATTENUATION AREA
- PROPOSED FOOTPATH
- SHARED CYCLE LANE & FOOTPATH
- PROPOSED HARDSHOULDER
- PROPOSED CYCLE LANE



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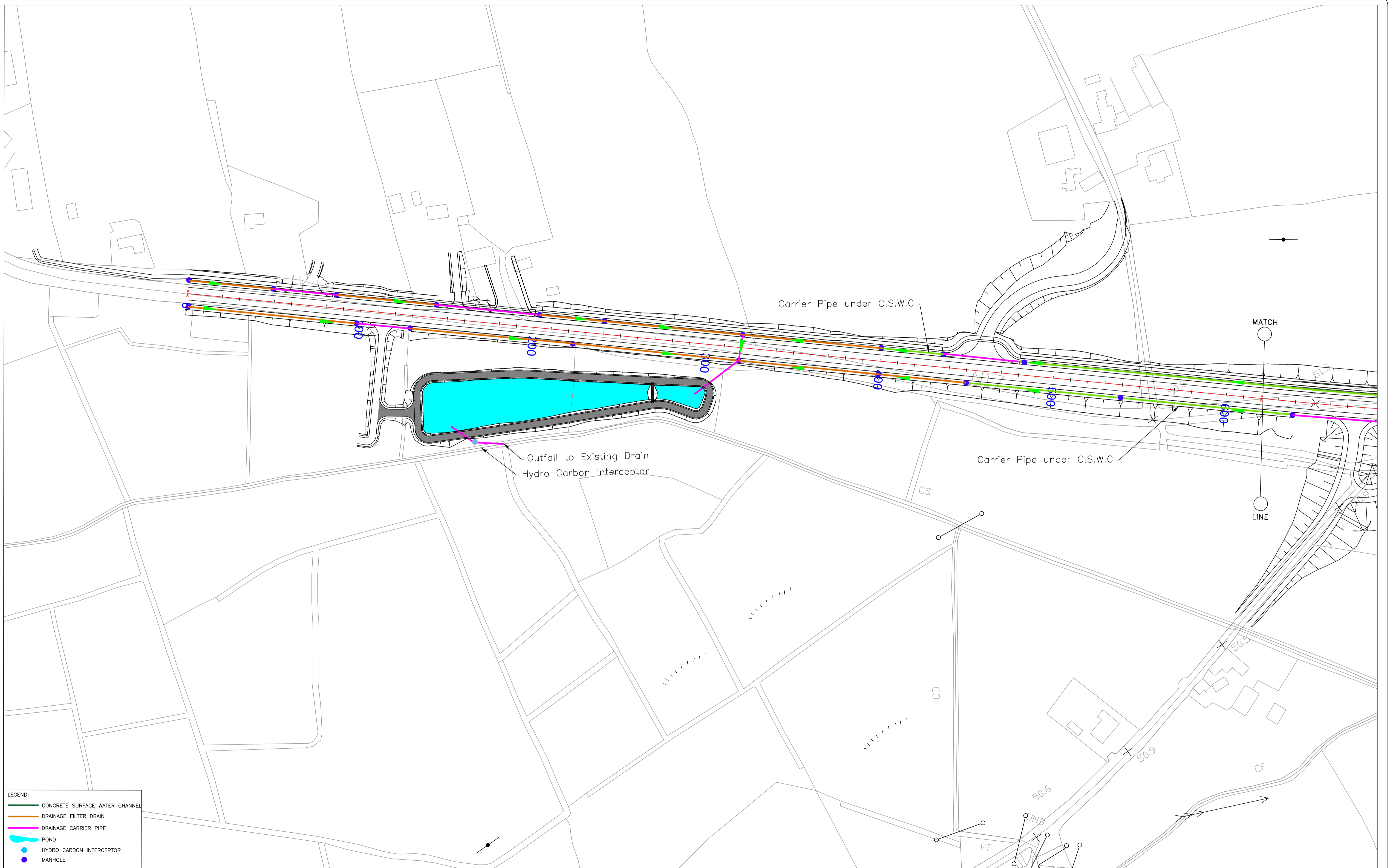


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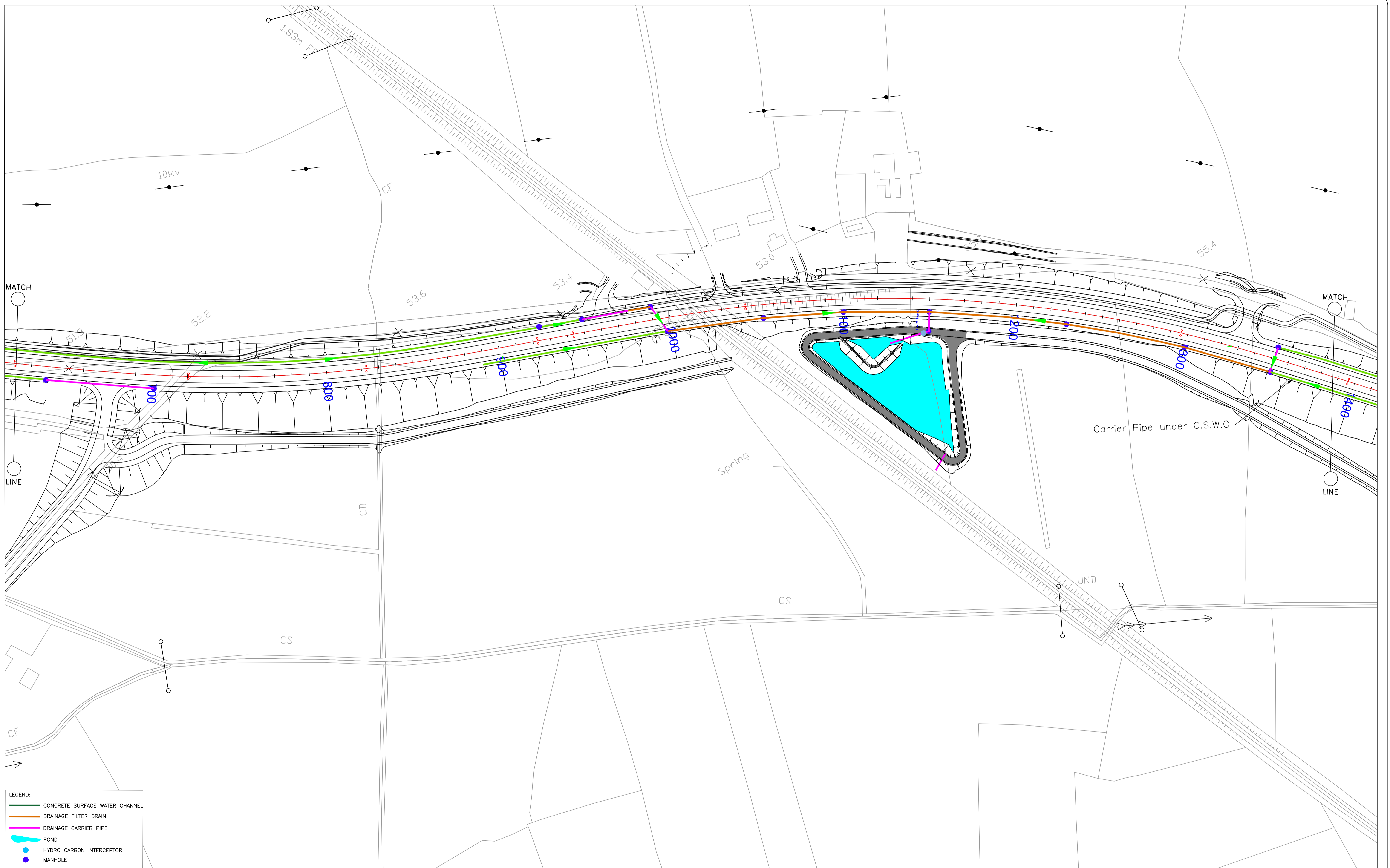
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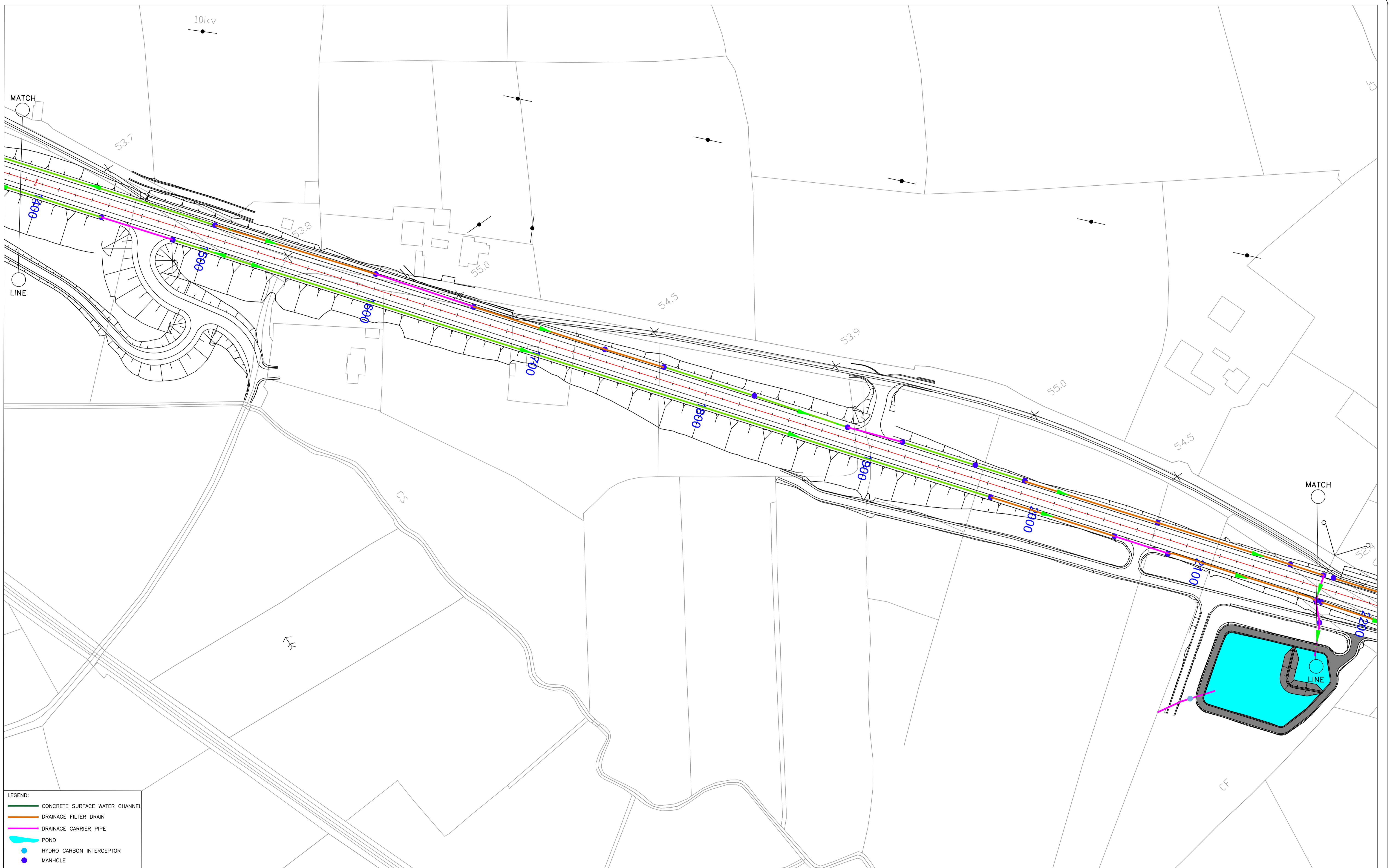
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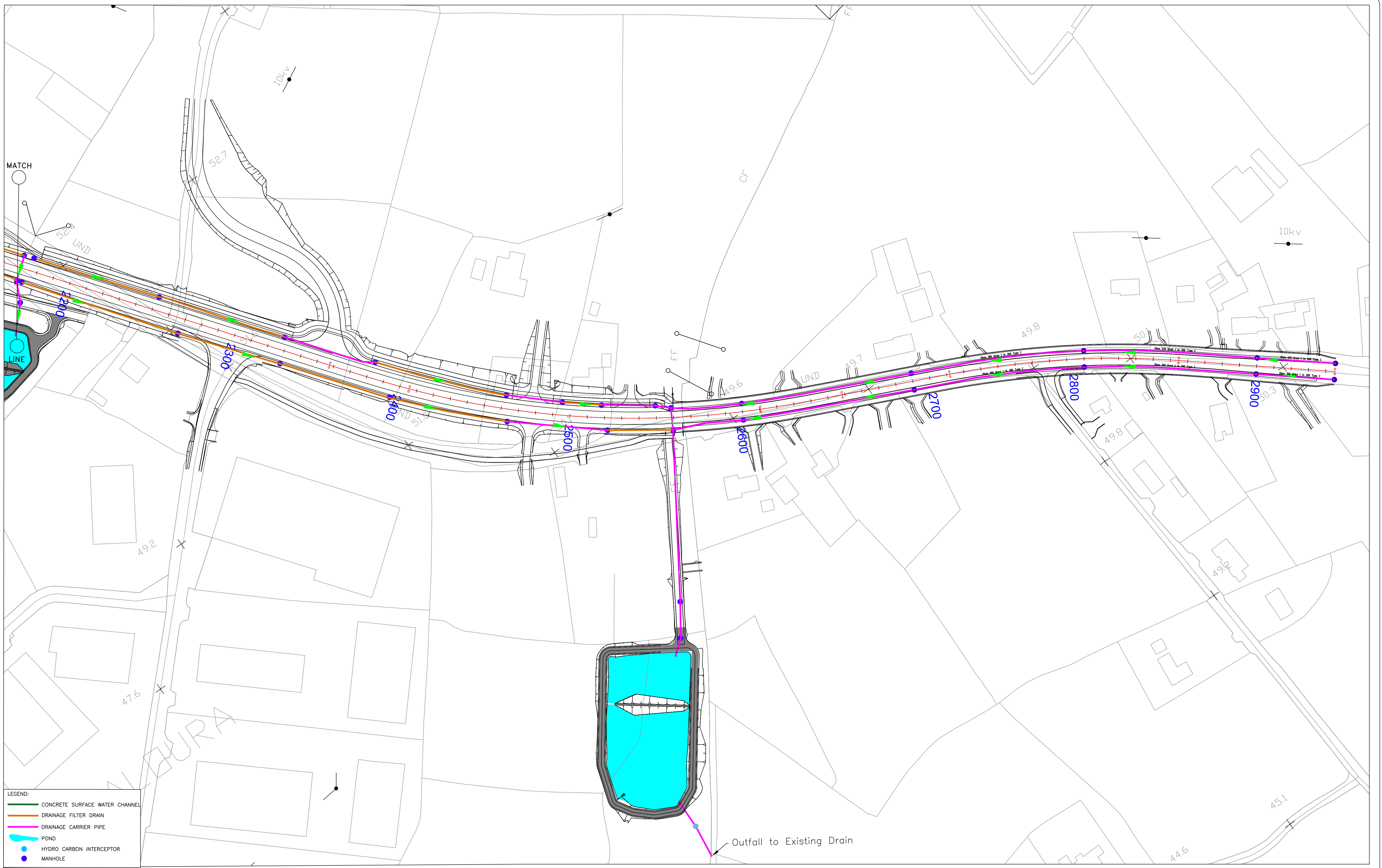


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 - POND
 - HYDRO CARBON INTERCEPTOR
 - MANHOLE



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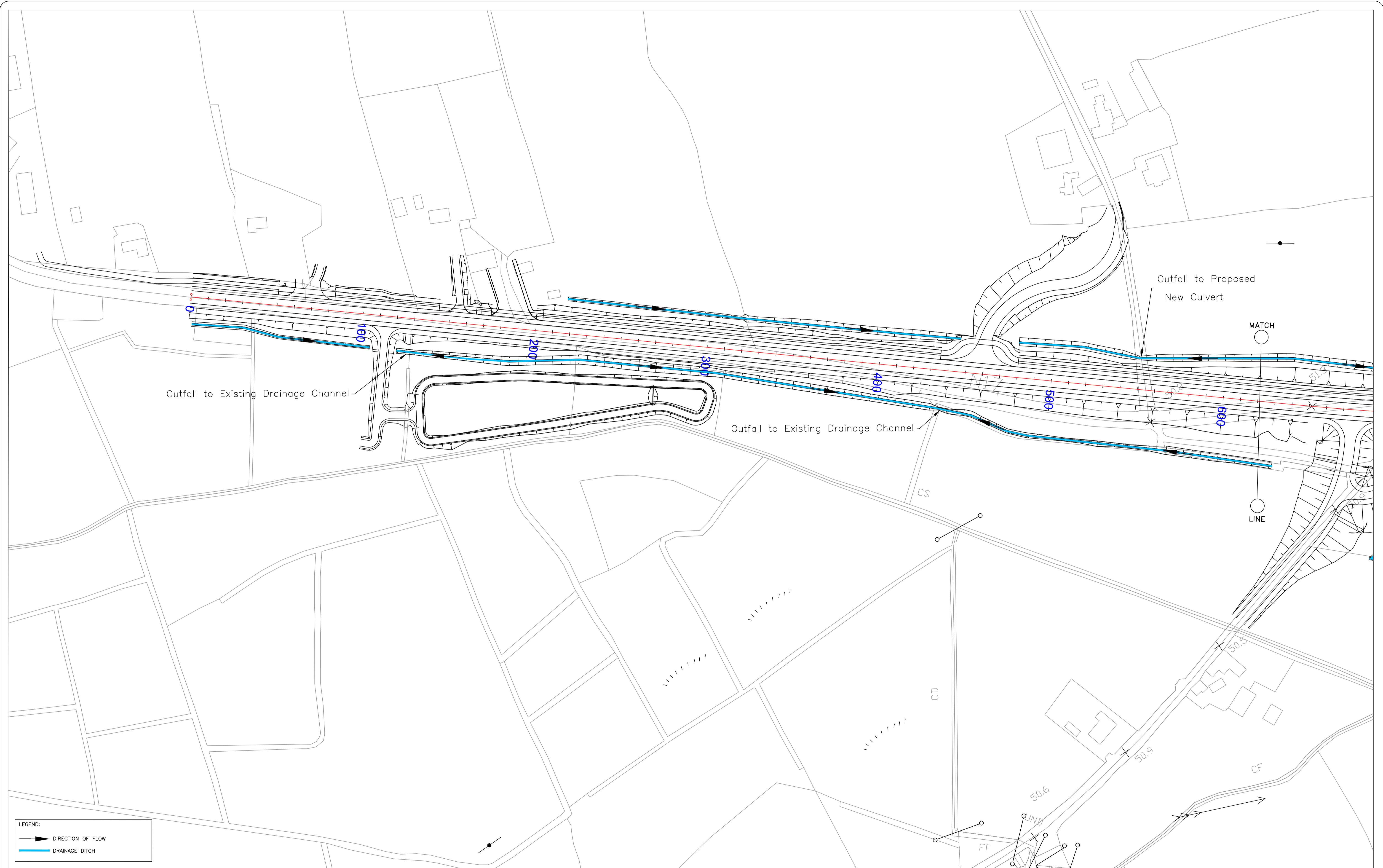


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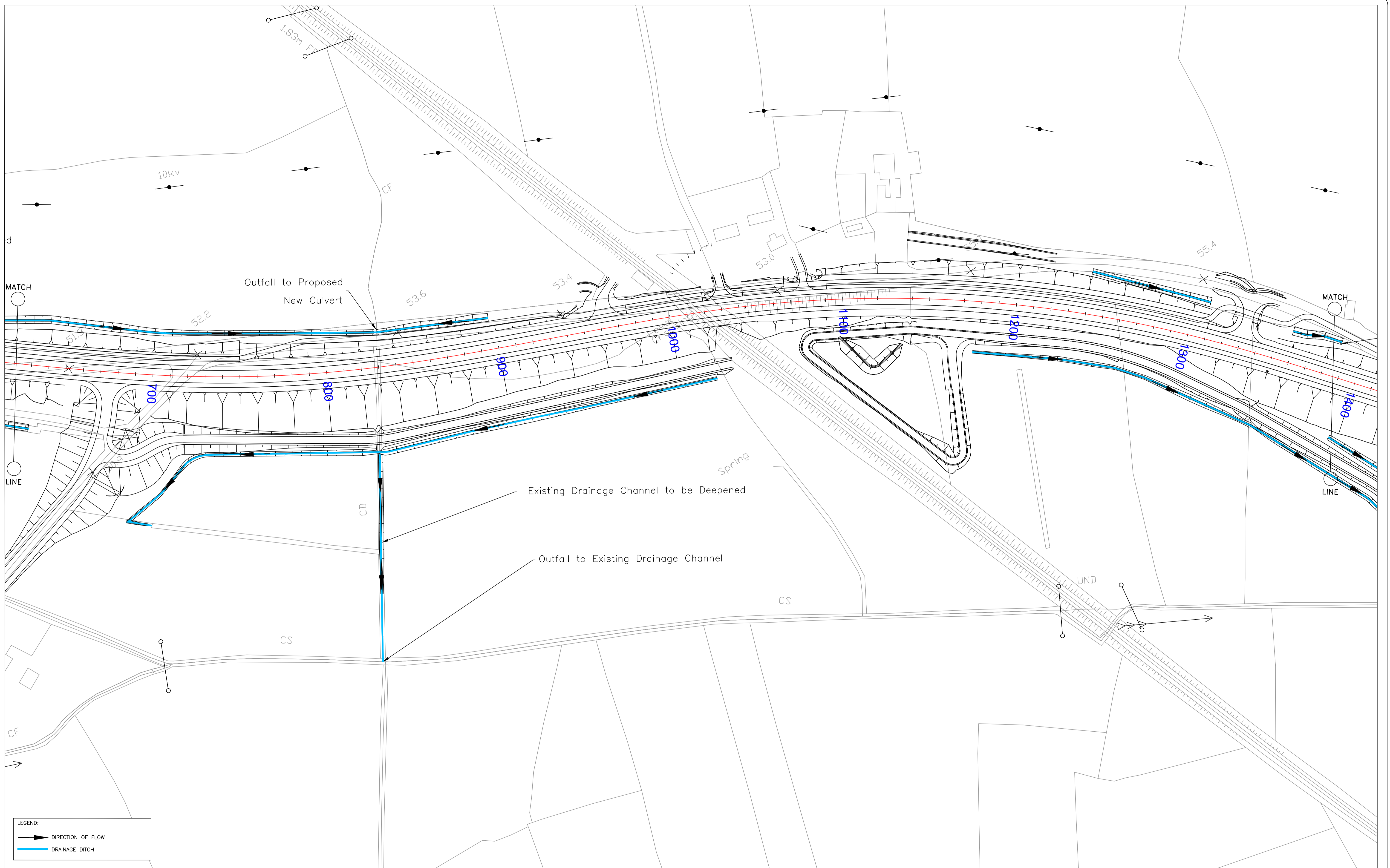


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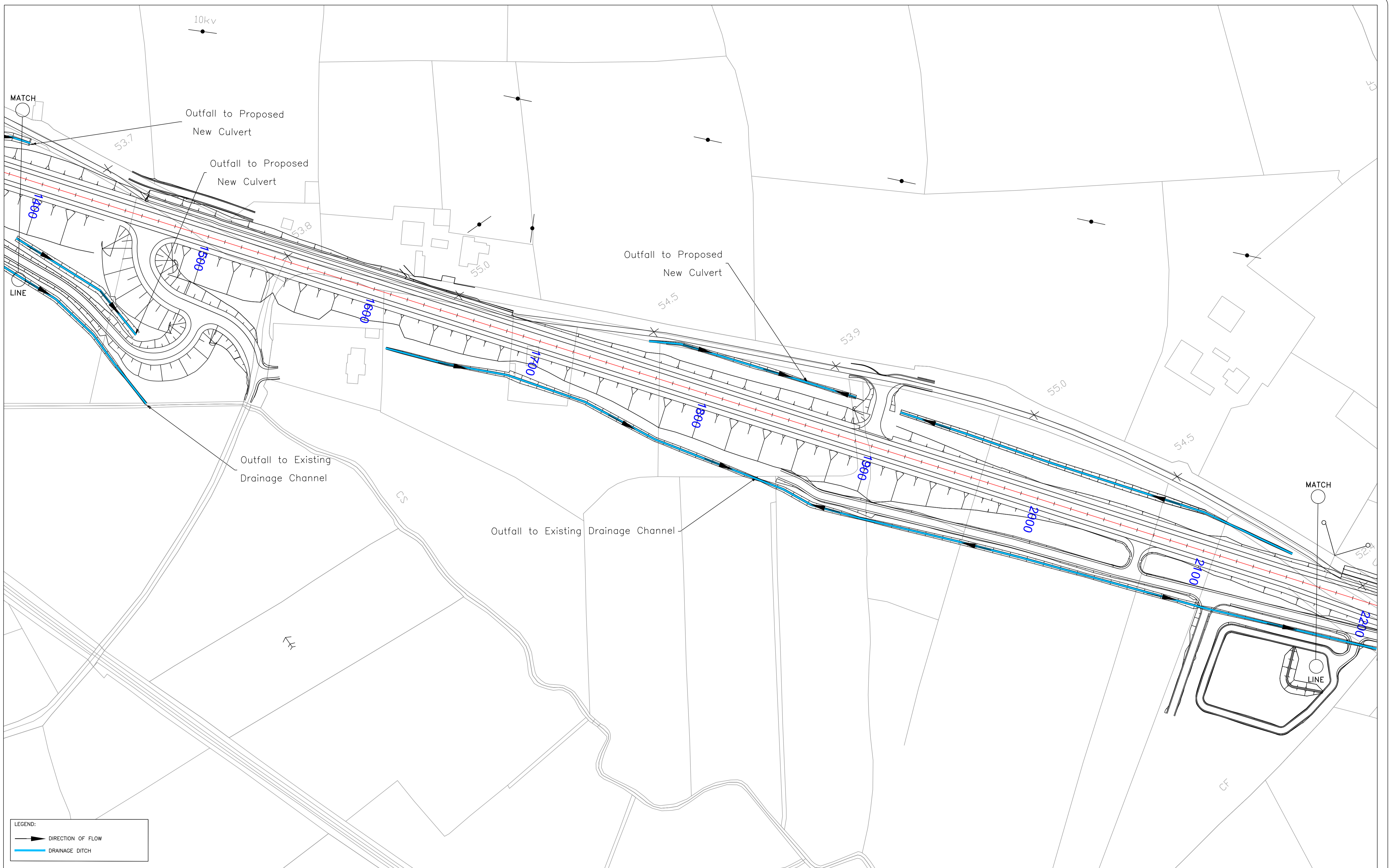
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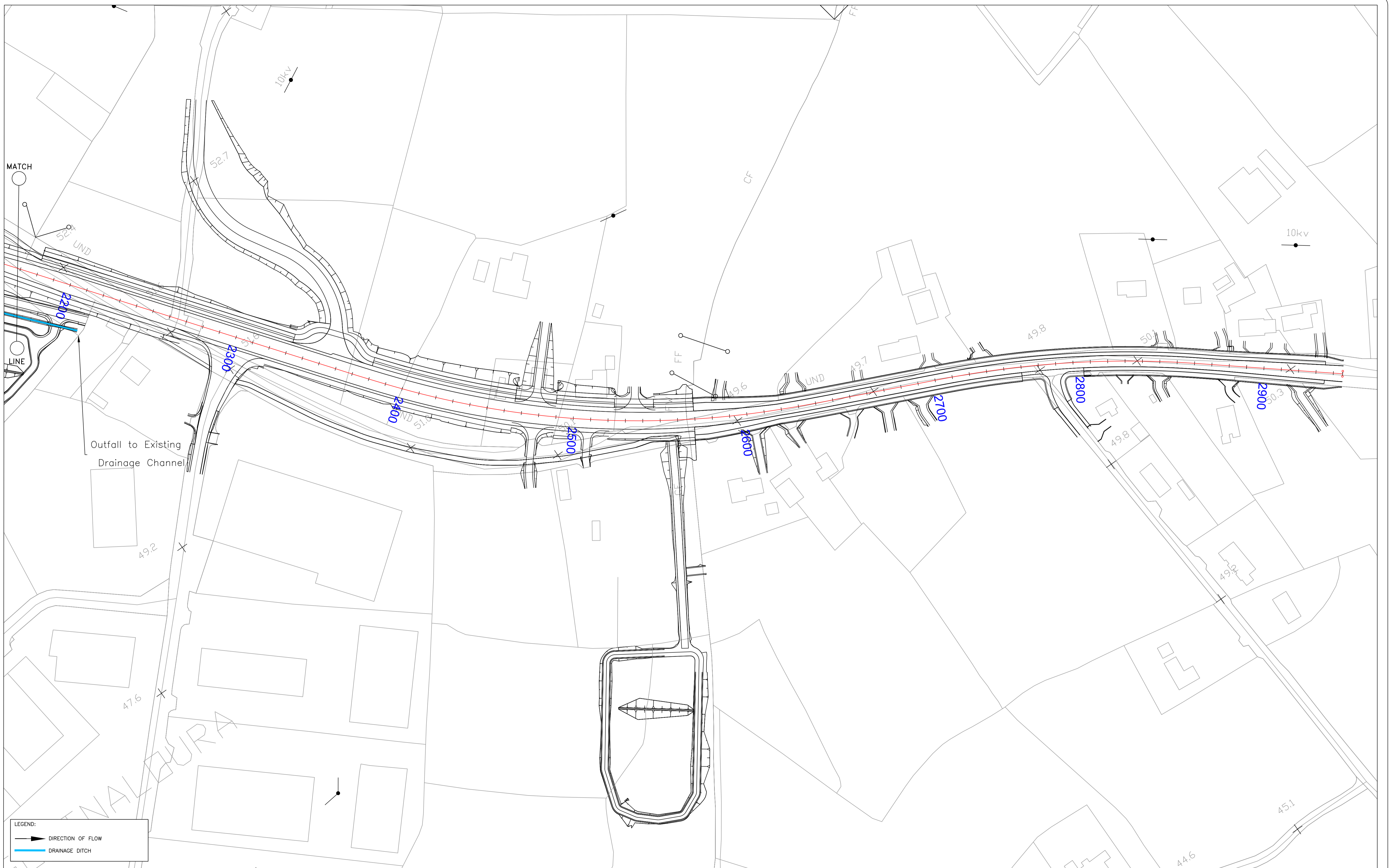


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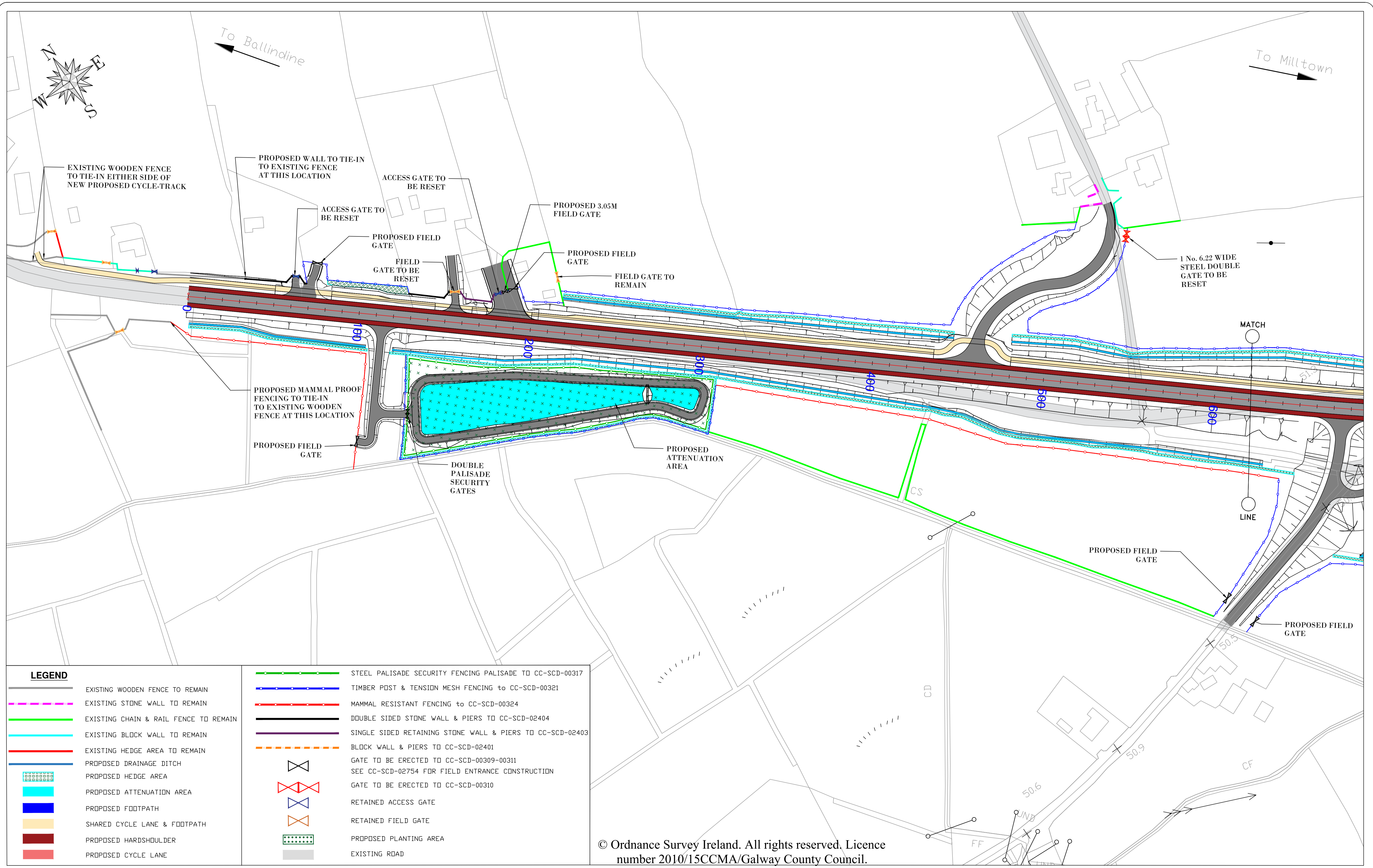
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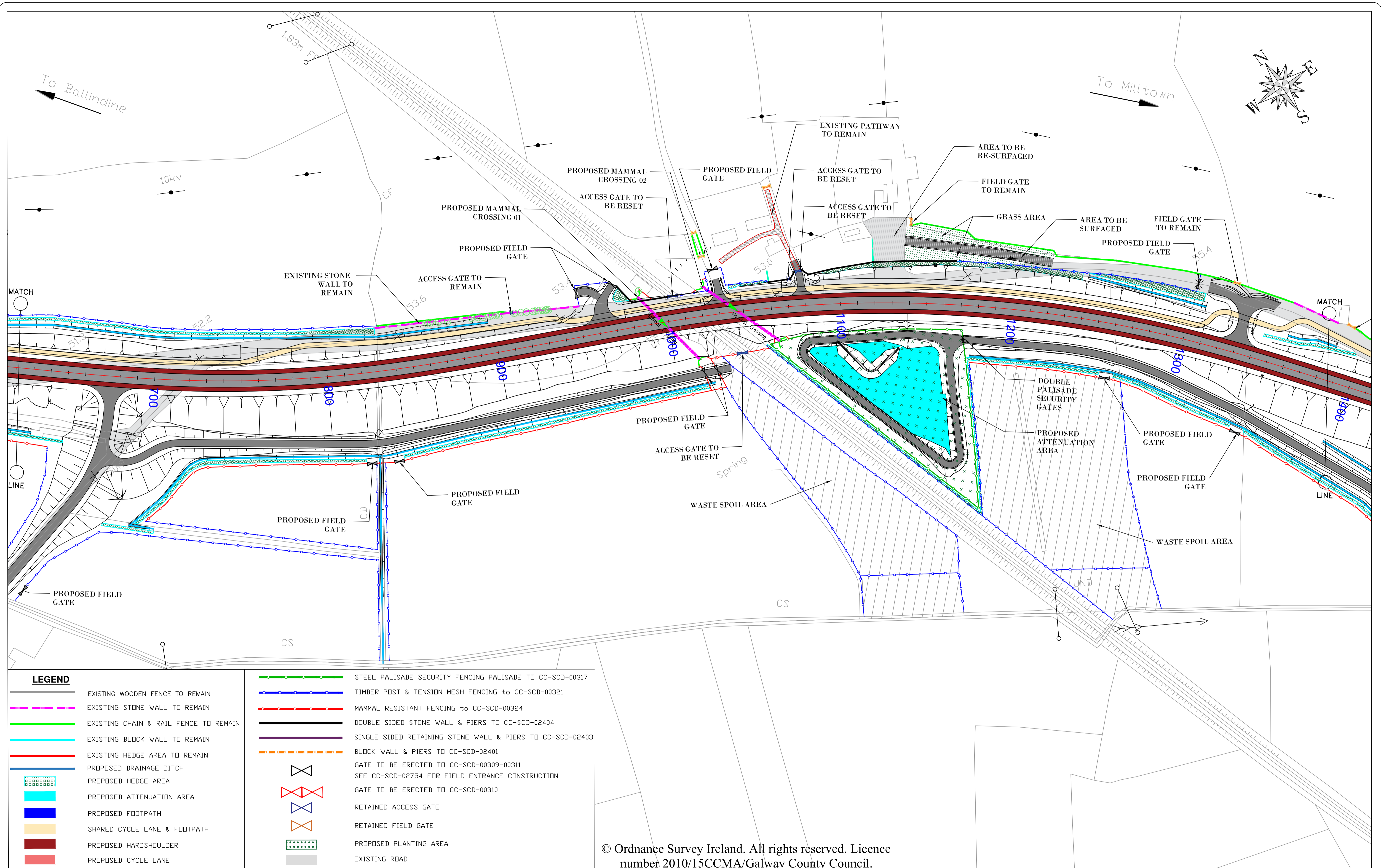
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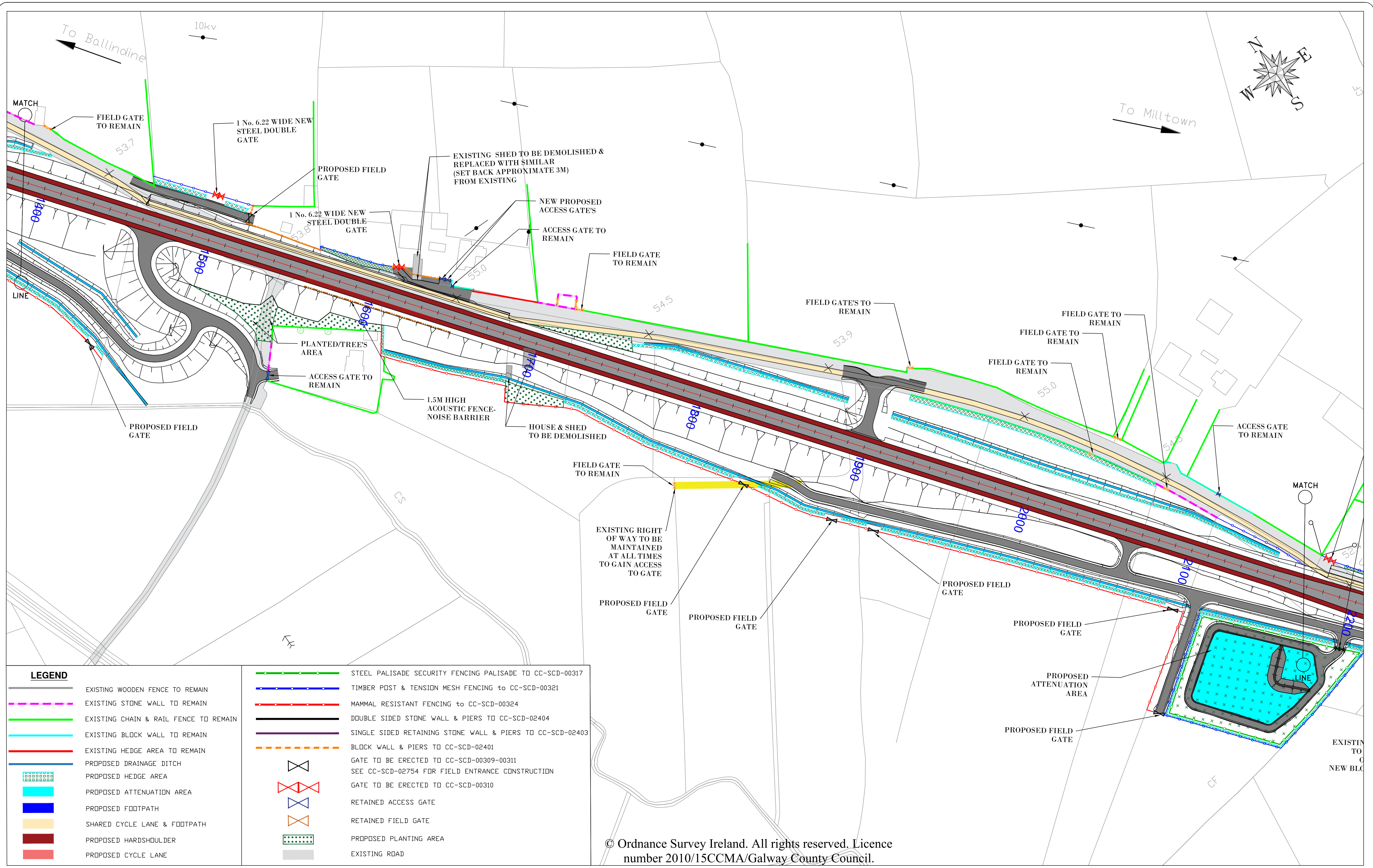
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SEE CC-SCD-02754 FOR FIELD ENTRANCE CONSTRUCTION GATE TO BE ERECTED TO CC-SCD-00310 RETAINED ACCESS GATE RETAINED FIELD GATE PROPOSED PLANTING AREA EXISTING ROAD |
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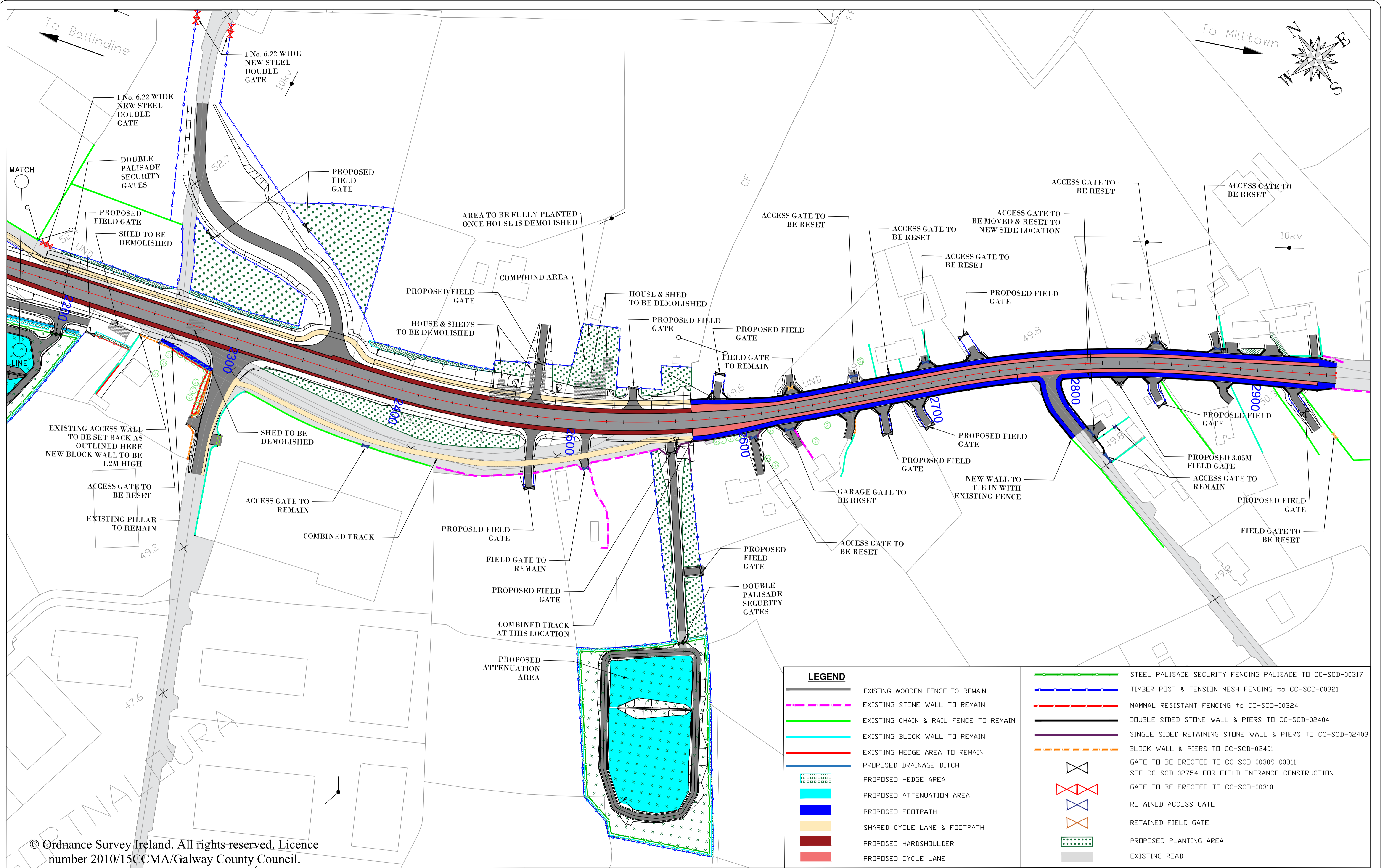
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	PROPOSED DRAINAGE DITCH
	PROPOSED HEDGE AREA
	PROPOSED ATTENUATION AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
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	EXISTING ROAD

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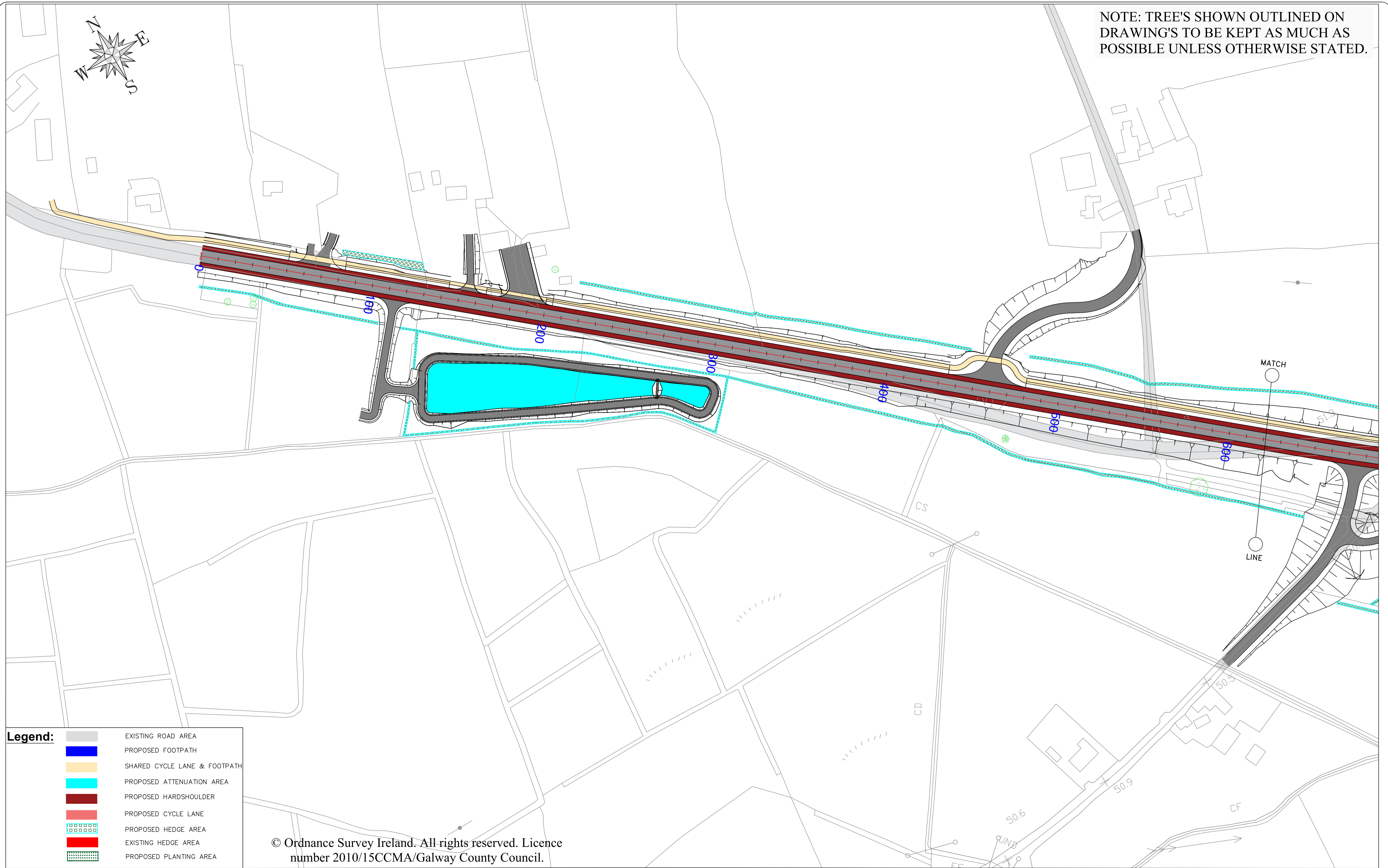
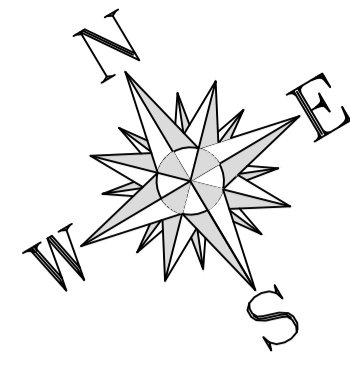


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DRAWING NO.:			AC-04

NOTE: TREE'S SHOWN OUTLINED ON DRAWING'S TO BE KEPT AS MUCH AS POSSIBLE UNLESS OTHERWISE STATED.



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Legend:

	EXISTING ROAD AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
	PROPOSED ATTENUATION AREA
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE
	PROPOSED HEDGE AREA
	EXISTING HEDGE AREA
	PROPOSED PLANTING AREA



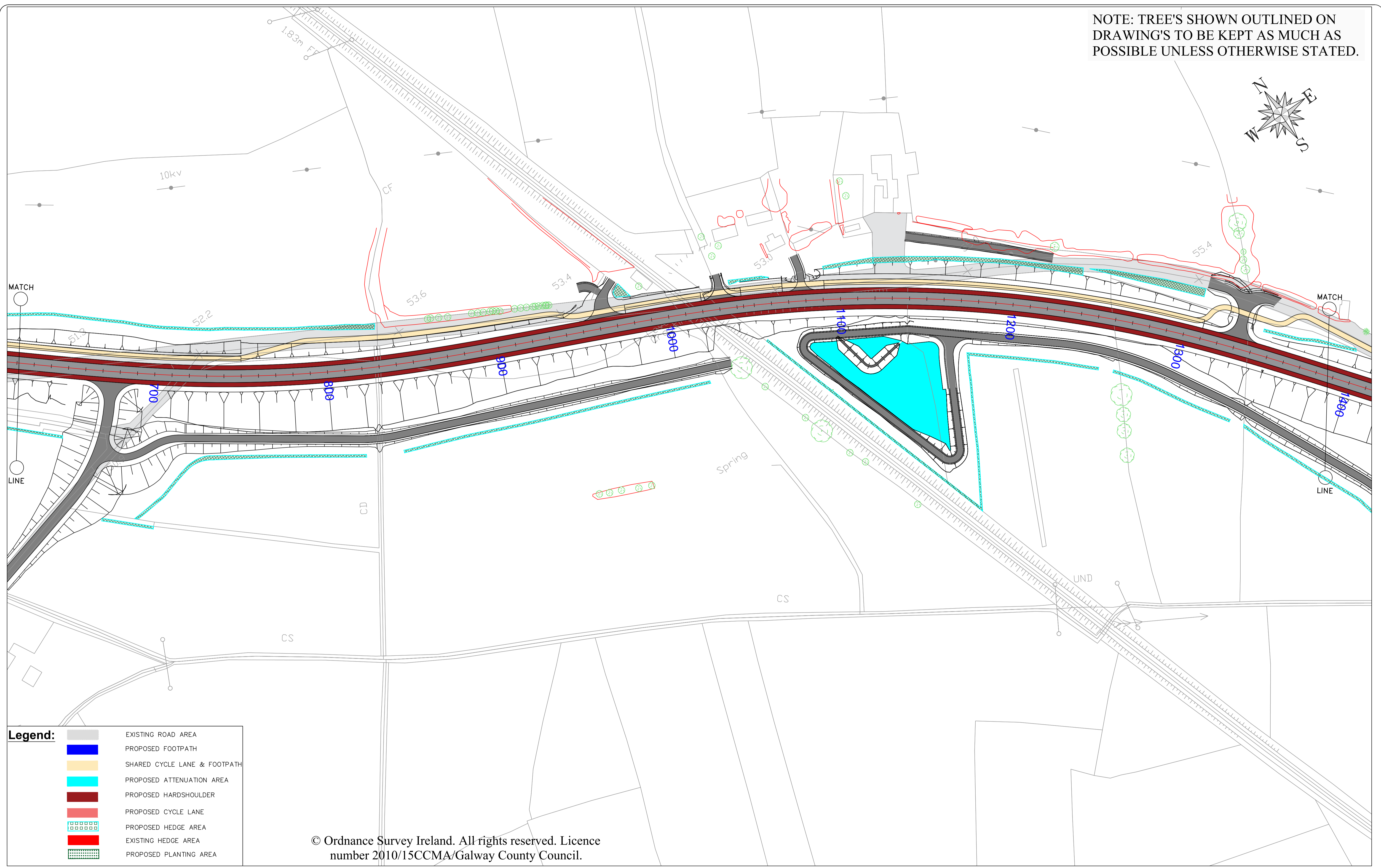
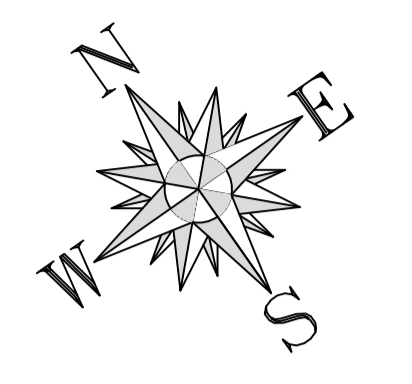
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Galway.

REVISION:	MADE BY:	DATE:

PROJECT: N17 Miltown to Gortnagunned	
COMPONENT: Proposed & Existing Planting/Hedging Area's	
TITLE: Design Drawings	
DESIGNED BY: S.B.	FILE NO.:
DRAWN BY: A.M.	SCALES: 1:1000
CHECKED BY: S.B.	DATE: September 2021
DRAWING NO.: PP - 01	

NOTE: TREE'S SHOWN OUTLINED ON DRAWING'S TO BE KEPT AS MUCH AS POSSIBLE UNLESS OTHERWISE STATED.



Legend:

	EXISTING ROAD AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
	PROPOSED ATTENUATION AREA
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE
	PROPOSED HEDGE AREA
	EXISTING HEDGE AREA
	PROPOSED PLANTING AREA

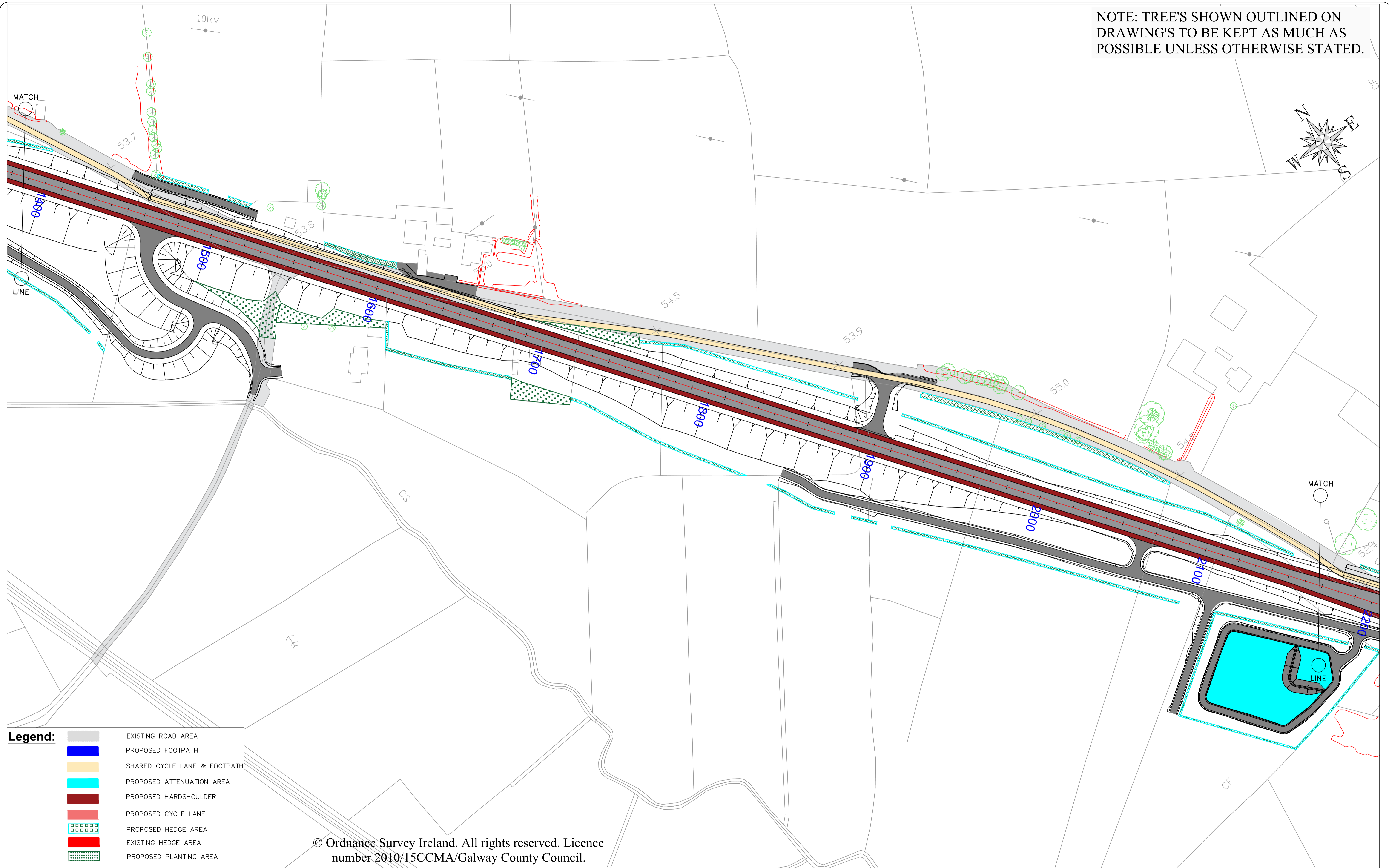
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REVISION:	MADE BY:	DATE:

PROJECT: N17 Miltown to Gortnagunned	
COMPONENT: Proposed & Existing Planting/Hedging Area's	
TITLE: Design Drawings	
DESIGNED BY: S.B.	FILE NO.:
DRAWN BY: A.M.	SCALES: 1:1000
CHECKED BY: S.B.	DATE: September 2021
DRAWING NO.: PP - 02	

NOTE: TREE'S SHOWN OUTLINED ON DRAWING'S TO BE KEPT AS MUCH AS POSSIBLE UNLESS OTHERWISE STATED.



Legend:

	EXISTING ROAD AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
	PROPOSED ATTENUATION AREA
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE
	PROPOSED HEDGE AREA
	EXISTING HEDGE AREA
	PROPOSED PLANTING AREA

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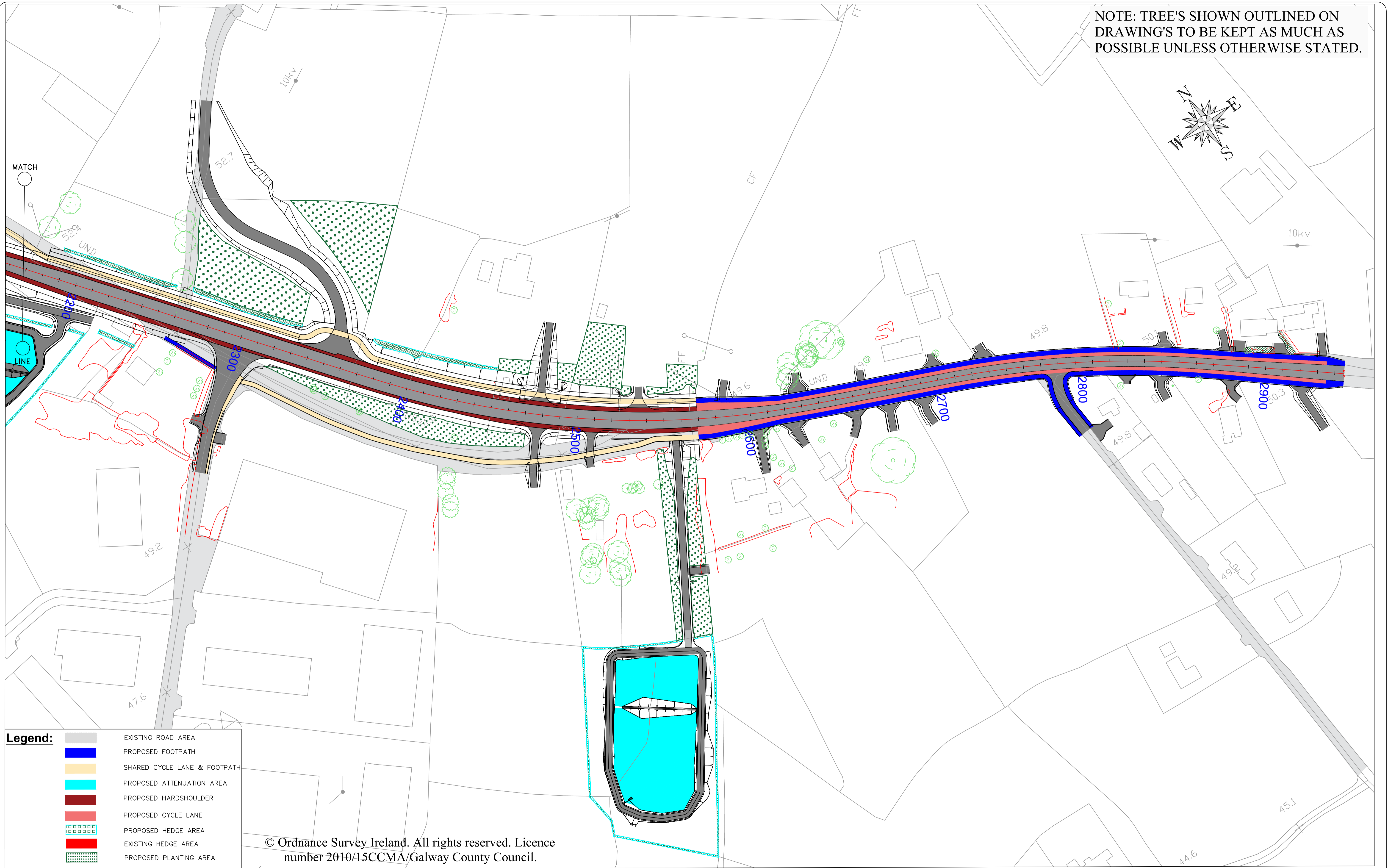
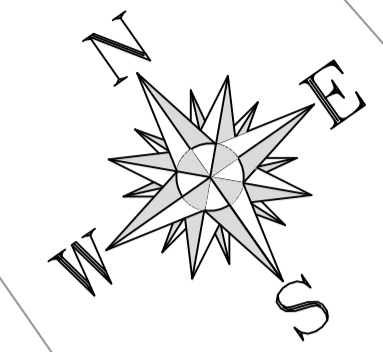
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Galway.

REVISION:	MADE BY:	DATE:

PROJECT: N17 Miltown to Gortnagunned	
COMPONENT: Proposed & Existing Planting/Hedging Area's	
TITLE: Design Drawings	
DESIGNED BY: S.B.	FILE NO.:
DRAWN BY: A.M.	SCALES: 1:1000
CHECKED BY: S.B.	DATE: September 2021
DRAWING NO.: PP - 03	

NOTE: TREE'S SHOWN OUTLINED ON DRAWING'S TO BE KEPT AS MUCH AS POSSIBLE UNLESS OTHERWISE STATED.



Legend:

	EXISTING ROAD AREA
	PROPOSED FOOTPATH
	SHARED CYCLE LANE & FOOTPATH
	PROPOSED ATTENUATION AREA
	PROPOSED HARDSHOULDER
	PROPOSED CYCLE LANE
	PROPOSED HEDGE AREA
	EXISTING HEDGE AREA
	PROPOSED PLANTING AREA

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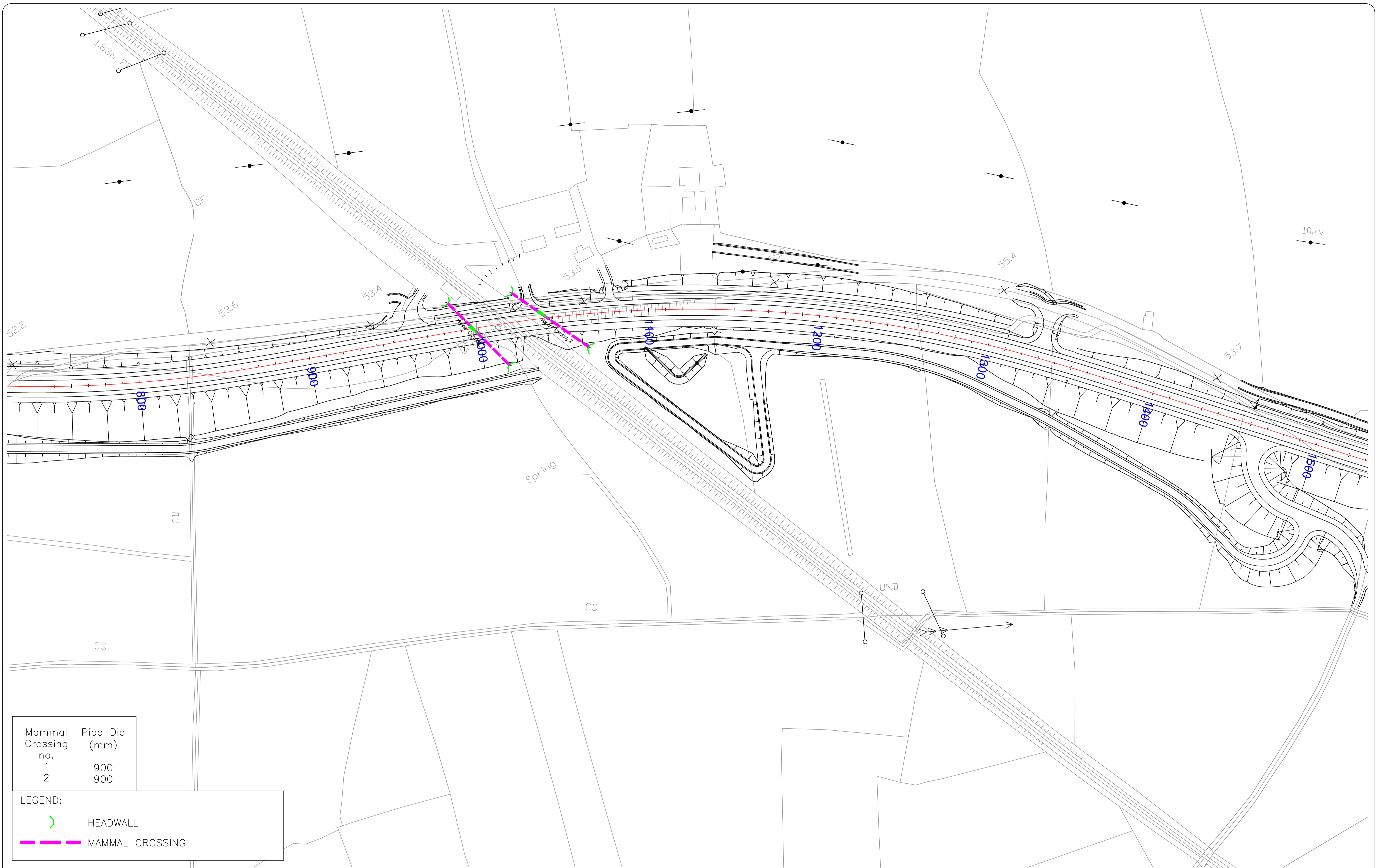


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REVISION:	MADE BY:	DATE:

PROJECT: N17 Miltown to Gortnagunned	
COMPONENT: Proposed & Existing Planting/Hedging Area's	
TITLE: Design Drawings	
DESIGNED BY: S.B.	FILE NO.:
DRAWN BY: A.M.	SCALES: 1:1000
CHECKED BY: S.B.	DATE: September 2021
DRAWING NO.: PP - 04	



Mammal Crossing no.	Pipe Dia (mm)
1	900
2	900

LEGEND:

 HEADWALL

 MAMMAL CROSSING

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REVISION:	MADE BY:	DATE:

PROJECT	N17 Milltown to Gortnagunnd Realignment Scheme		
COMPONENT:	Preliminary Design		
TITLE:	Mammal Crossings		
DESIGNED BY:	M.K.	FILE NO.:	
DRAWN BY:	M.K.	SCALES:	1:1000 @ A1, 1:2000 @ A3
CHECKED BY:	S.B.	DATE:	September 2021
DRAWING NO.:			MC-01