Galway Council

N6 Galway City Ring Road

Schedule of Additional Environmental Commitments Updated 20 October 13 March 2020

GCOB-4.04-019

Issue 1 Issue 2 | 13 March 2020 | 20 October 2020

NOTE: - Updates to this Schedule of Additional Environmental Commitments are in red text or red strikethrough and highlighted in grey

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21 Schedule of Additional Environmental Commitments (Updated 13 March 20 October 2020)

Note:

The following are new environmental commitments since the publication of the EIAR in October 2018. Those in red which are not highlighted in yellow were submitted at the Oral Hearing to An Bord Pleanála on the 21 February 2020. Those in red and highlighted in yellow are new commitments since the 21 February 2020 to 13 March 2020. Those in red and highlighted in grey are the new commitments since the 14th March 2020 to 20th October 2020.

21.1 General

| Ref No. | Stage | Commitments |
|---------|-------|---|
| 1.22 | С | A Pest Control Plan (PCP) has been developed to implement pest control measures during construction of the proposed road development and this will be incorporated into the CEMP. A summary of the measures included in the PCP are outlined in the Statement of Evidence – Responses to Engineering, Need for the Project, Alternatives Considered and Material Assets Non-Agriculture Objection/Submissions as read into the record on day one of the oral hearing on 18 February 2020. |
| 1.23 | O | A 2m cycle track will be provided from Gort na Bró Roundabout to Gael Scoil Mhic Amhlaigh on both sides as shown on Drawing GCRR-SK-OH-054 included in Appendix A.21.1. |
| 1.24 | 0 | A two-way cycle track will be provided from Gael Scoil Mhic Amhlaigh to Rahoon Road on the eastern verge of Gort Na Bró Road. |
| 1.25 | O | Galway County Council propose that plots 583a.209, 583c.201, 583c.202; 583c.203 and 583a.208 are temporary plots, required only for the duration of the construction period for use as a part of the overall construction compound and to enable construction of the proposed road development. A right of way will be provided over Access Road AR 11/01 in favour of McHugh Properties to provide access to these lands. |
| 1.26 | О | A 10m wide right of way will be registered by Galway County Council in favour of the landowner in Plot 570 to facilitate access between the northern and southern land parcels under Menlo Viaduct. |
| 1.27 | O | Galway County Council propose that plot 717a.201 is removed from the N6 Galway City Ring Road Motorway Order. |
| 1.28 | | A 10m wide right of way will be registered by Galway County Council in favour of the owner of lands bounded by Folios GY123020F, GY21502F and GY109981F to facilitate access to/from those lands to/from Menlo Castle Boithrin across Plot 765c.201 |

21.3 Human Beings, Population and Health

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 18.5 | С | Provide for alternative access along the bank of the River Corrib, along with prior advice for walkers, if access restrictions apply due to construction of the overhead bridge crossing. |
| | | Safe access across the construction site within NUIG Sporting Campus will be maintained for the duration of the construction contract. |
| 18.15 | C | A pedestrian crossing will be installed at the entrance to Lackagh Quarry prior to the commencement of construction works to maintain the greenway. This pedestrian crossing will be maintained by the contractor for the duration of the works. |
| | | There will be a speed restriction of 15kph on the access road into the site compound at Lackagh Quarry for the duration of the works. |

21.4 Material Assets Non-Agriculture

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 15.5 | €O | Alternative pitch facilities will be provided to replace the existing pitches directly impacted by the proposed road development. The facilities include a floodlit 3G GAA pitch and a floodlit 3G training area and associated site infrastructure for the drainage of these pitches and furniture such as ball stop netting. The proposed road development also intercepts the existing sports pavilion resulting in direct impacts to its western end and the building will be modified as follows: |
| | | The existing western plant room, 1 no. changing room, 1 no. storage area, 1 no. weights area and associated access hallways on both ground floor and upper levels will be demolished. |
| | | The western plant room and its associated plant will be relocated. |
| | | Construction and reconfiguration of the internal and external walls, roof, windows and door locations. |
| 15.11 | O | The mitigation strategy at the NUIG Sporting Campus has been amended to reflect the following: |
| | | The southern existing grass-based GAA pitch immediately adjacent to River Corrib is no longer required for the mitigation strategy in NUIG |
| | | The northern existing grass-based GAA pitch immediately adjacent to River Corrib, which is being temporarily acquired by Galway County Council will be reinstated as a grass training area, with appropriate sand base and drainage in line with its current use post construction and returned to NUIG |
| | | To ensure interconnection for NUIG post completion of the construction, Galway County Council will be providing a right of way for NUIG to use the lands under the proposed viaduct for sporting/athletic purposes by way of a long lease. |
| 15.13 | О | Galway County Council will notify Ob_521_O_517.14_02 of any upcoming day or night time closures near their property. |
| 15.14 | C | The existing decorative historic gates at the entrance to the Aughnacurra Estate will be removed, stored and erected at the front entrance upon |

| Ref No. | Stage | Commitments |
|---------|-------|---|
| | | completion, noting that they currently do not close and that they will not close and span the new entrance width when reinstated. |
| 15.15 | C | The existing signage at property 668 on the N83 Tuam Road will be removed, stored and erected at the property upon completion. |
| 15.16 | C | The residual lands at property 539 and 540 will be sloped from the rear of the retained exiting estate wall up to the embankment of the proposed road development. |
| 15.17 | C | The modifications to the Sports Pavilion at NUIG Sporting Campus will be undertaken as enabling works during the summer period prior to commencement of the construction of the proposed road development. |
| 15.18 | C | Welfare facilities at the Sports Pavilion at NUIG Sporting Campus will be maintained throughout the construction works. |
| 15.19 | C | There will be no parking permitted at the NUIG Sporting Campus carpark for the personnel employed for the construction works. |
| 15.20 | C | Additional commitments given to landowners in respect of accesses and boundary treatments including those set out in the Statement of Evidence of Ms. McCarthy all of which are depicted in the amended drawings entitled "Amended Appendix A.9.1 Landowner Accommodation Works Details_I2" appended hereto and the amended drawings entitled "Amended Appendix A.1.9 Boundary Treatment_I2" appended hereto, which replaces those drawings in Appendix A.9.1 and A.1.9 that were attached to the Request for Further Information (RFI) Response. |
| 15.21 | C | "Table 9.3: Private Access Roads (updated Table 15.5 of the EIAR)" that was included in the Request for Further Information Response has been updated with additional commitments given to landowners in respect of private access roads including those set out in the Statement of Evidence of Ms. McCarthy, and Updated Table 9.3 is included hereto as Appendix A.21.7 of this Schedule of Commitments. The updates are included in red in this table. |
| 15.22 | C | Plot 207 – Construction of a new boundary wall for along the existing Aille Road (L5384) for the full extent of the property with the height being that of the existing boundary wall |
| 15.23 | C | Plot 607 – Construction of a new stone faced boundary wall at the front of the property along the existing N84 to a height of 1.8m, piers to the entrance, the inclusion of noise reflective gates and regrading of driveway |
| 15.24 | C | Plot 666 – Construction of a new domestic entrance at the front of the property along the existing N83 on a like for like basis set back 5m from the edge of the carriageway |

21.5 Material Assets – Agriculture

| Ref No. | Stage | Commitments |
|---------|-------|---|
| 14.9 | С | Galway County Council will employ an equine expert or veterinary practitioner for the duration of the construction contract |
| 14.10 | C | The design and construction of the temporary stables and permanent stables proposed for Galway Racecourse will be carried out in consultation with the Irish Horseracing Regulatory Board (IHRB). |

| Ref No. | Stage | Commitments |
|---------|-------|--|
| | | The British Horse Racing Association guidelines will be used as a benchmark in the design in the absence of any specific IHRB guidelines. |
| 14.11 | C | Galway County Council will continue to liaise with Galway Race Committee in relation to the implementation of any approval granted in so far as it relates to Galway Racecourse. |

21.6 Air Quality and Climate

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 16.12 | С | The Contractor shall use reinforced concrete with an emission factor of no greater than 0.0949 KgCO ₂ e/Kg. |

21.7 Noise and Vibration

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 17.20 | С | The location of potentially vibration sensitive activities have been identified for manufacturing facilities within the Parkmore and Racecourse Business Parks. This location is in proximity to an area where blasting will take place as part of the proposed tunnel at Ballybrit. The most effective form of mitigation for this type of sensitive process is through on-going consultation with the property owners as the design and construction of the proposed road development progresses. This will involve baseline vibration monitoring and the use of trial blasts using an initial low level charge with simultaneously vibration measurements undertaken at the building. This information will be used to determine acceptable vibration levels for the facility relating to the sensitivity of the operating equipment. The results of this trial assessment will then set appropriate agreed limits values at the facility in question which will be monitored during subsequent blasts or other excavation methodologies. Where no safe limit is determined, the timing and scheduling of blasts will be undertaken in consultation with the facility when no sensitive operations are taking place. Given the short time period over which an individual blast takes place (i.e. a number of seconds), this approach is deemed to be feasible. M&M Qualtech will be included in the list of property owners to be consulted with as the design and construction of the proposed road development progresses, in particular in respect of the dates of rock breaking and blasting and the detailed traffic management plan for their |
| | | area. Vibration monitoring will be undertaken at their property in Parkmore. |
| 17.23 | O | Noise barrier NB12/05 will be extended west to Chainage 12+550 to reduce noise levels at assessment location R188 below the TII design goal taking account of the RFI sensitivity analysis. |
| 17.24 | C | The residents in the Menlo-Coolough-Ballinfoile-Ballindooley area will be informed of any proposed blasting in advance of blasting been undertaken, as set out in Section 13.1 of the CEMP in Appendix A.7.5 of the EIAR and Appendix C of the NIS. |
| 17.25 | C | A property condition survey will be carried out at the thatched cottage in Coolough Village, Menlough and at M&M Qualtech, Parkmore Business Park. |

| Ref No. | Stage | Commitments |
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| 17.26 | C | The Contractor shall liaise with the operator for Twomileditch Quarry in relation to the blasting schedule for the N6 GCRR and the blasting schedule for the quarry. The Contractor shall ensure that blasting between the School Road and N84 does not take place at the same time (concurrently) as blasting in Twomileditch Quarry. |

21.8 Landscape and Visual

| Ref No. | Stage | Commitments |
|---------|-------|---|
| 12.40 | O | It is proposed to extend the proposed of 3m wide mixed screen planting belt along the property side of the proposed road development west from Ch. 1+760 back to Ch. 1+580 as indicated on Figure 12.1.14 of EIAR, as amended |
| 12.41 | C | A grass verge with birch tree planting will be established to either side of the new entrance avenue into Aughnacurra Estate to match the character of the existing entrance. |
| 12.42 | C | Except Unless where the existing wall is retained, a new stone wall will be constructed to the front of properties 539 and 540 (west of proposed road development) along the side of the existing / realigned avenue within Aughnacurra Estate to match the character of existing stone walls within the estate. |
| 12.43 | C | Ground levels within the residual lands at properties 539 and 540 shall will be raised back towards the proposed road development and planted with 1000 no. trees of between 1.0 and 2.0m in height in accordance with the details set out on Figure GCRR-SK-OH-652 in Appendix A.21.2. The soil grading and planting shall not interfere with the proposed Bat Roost Structure in property 540 |
| 12.44 | O | It is agreed to consult with the landowner of Plot 195 in relation to the planting proposals to be established along their property boundary. |

21.10 Archaeology, Architectural and Cultural Heritage

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 13.12 | C | The Cultural Heritage Specialist and Project Archaeologist will meet with the representative of the Menlo-Coolough-Ballinfoile-Ballindooley residents to inspect unrecorded features of possible cultural heritage interest associated with the old village of Coolough, Menlo. A report on the site inspection will be made available to residents and uploaded to a dedicated project website. |

21.11 Soils and Geology

| Ref No. | Stage | Commitments |
|------------|-------|---|
| 9.3 | С | A construction earthworks programme will be implemented as part of the CEMP included in Appendix A.7.5 of the EIAR , which will be finalised by the Contractor, for the proposed road development which categorises the |

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|------------|-------|---|--|--------------------|---------------------|
| | | source of material for each fill section. During the finalisation of this programme, the fill limitations outlined below will be incorporated. To prevent impact to the local peatland habitats, the following fill limitations will be incorporated at the locations identified in the table below. Table 9.18 of Chapter 9, Soils and Geology. Only pavement and capping layers protected from surface water runoff and groundwater movements are permitted to be derived from non-native material All other acceptable fill material will be derived from native material or other pH compatible material Note: This table below replaces Table 9.18 in Section 9.6.2.1 of Chapter 9 of the EIAR (page 788). | | | |
| | | Table 21.1:F | ill Limitation Areas Annex I Habitat / Fossitt (2000) ID Codes* | Fill Lin Chaina | nitation ge area |
| | | | | From | To |
| | | 1 | 4030 mosaic | 0+620 | 0+775 |
| | | 2 | *7130/4010 mosaic, 4010 and PF2 | 1+150 | 1+475 |
| | | 3 | 4010 | 1+830 | 2+050 |
| | | 4 | 4010 | 2+200 | 2+325 |
| | | 5 | 4010 and PF2 | 2+875 | 3+175 |
| | | 6 | 4010 | 3+450 | 3+550 |
| | | 7 | 4030/4010 and 4010 | 3+595 | 3+890 |
| | | 8 | 4030 mosaic and 4010 | 4+650 | 5+150 |
| | | 9 | 4010 and PF2 | 7+750 | 7+900 |
| 9.20 | C | Where the design, including environmental mitigation measures, safety requirements and engineering constraints, permit significant bedrock cuttings will be designed to remain visible. Where this cannot be provided digital photographic records of significant new excavations will be recorded or visits from Geological Survey Ireland will be facilitated. | | | |
| 9.21 | C | Where the design environmental mitigation measures, safety requirements and engineering constraints permit, significant bedrock cuttings will be designed to remain visible. Where this cannot be done, then digital photographic records of significant new excavations will be recorded by the Contractor and/or visits from Geological Survey Ireland will be facilitated by the Contractor. The Contractor shall notify the Geological Survey Ireland of bedrock cuttings to facilitate a site visit prior to any backfilling. | | | |
| 9.22 | C | Where an area of habitat planting has a requirement for a free draining layer beneath the surface and it corresponds with a proposed Material Deposition Area where peat may be placed, a free draining layer will be placed by the Contractor between the peat placement layer and the habitat to be created layer. The free drainage material will be contained within a filter separator layer (e.g. geotextile), above and below to prevent the migration of fines sediment therefore ensuring the functionality of the layer. For material deposition areas within Lackagh Quarry, where calcareous grassland is required, a contained drainage layer with a minimum depth of 350mm depth will be provided to ensure free drainage of surface water from the calcareous grassland. This layer will be provided between the calcareous grassland and the material deposition area. | | | |

| Ref No. | Stage | Commitments |
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| 9.23 | C | Construction will adhere to all requirements outlined in Lackagh Quarry: Material Deposition Assessment Report (GCRR-4.0-03-4.23), in particular Section 6.4 Particular Commitments. This report is available in Appendix 1.11 of Volume 2 of the RFI Response Report . |
| 9.24 | C | Construction will adhere to all requirements outlined in Material Deposition Areas – Baseline Report (GCOB-4.03.4.2.1_001). This report is available in Appendix 1.11 of Volume 2 of the RFI Response Report . |
| 9.25 | C | The composition of the mixed peat in material deposition areas with calcareous grassland will ensure that the magnitude of immediate, primary and secondary consolidation will not exceed 250mm. |

21.12 Hydrogeology

| Ref No. | Stage | Commitments |
|---------|-------|--|
| 10.10 | С | Nine Five wells (W50-10, W50-12, W50-13, W50-14 and W50-15, W50-16, W50-19, W50-17, W50-18) will be lost during the construction of the proposed road development. These will each be mitigated by providing a replacement well, connecting to mains supply where available or by financial compensation. Where wells have to be abandoned as part of the proposed road development they will be sealed and abandoned in general accordance with Well Drilling Guidelines produced by the Institute of Geologists of Ireland (IGI 2007). |
| 10.20 | C | In the unlikely event of significant flow paths (fault or fracture zones) being encountered in the Galway Granite Batholith during construction, measures set out in the Karst Protocol included in the CEMP in Appendix A.7.5 of the EIAR and Appendix C of the NIS will be implemented. |

21.13 Hydrology

| Ref No. | Stage | Commitments |
|---------|-------|---|
| 11.1 | С | The CEMP included in Appendix A.7.5 will be finalised by the Contractor in advance of the commencement of construction and the following will be implemented as part this plan: |
| | | An Incident Response Plan detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident, including flood risks. |
| | | A Sediment Erosion and Pollution Control Plan (Refer to Section 8 of the CEMP in Appendix A.7.5). This shall include water quality monitoring and method statements to ensure compliance with environmental quality standards specified in the relevant legislation. |
| | | All necessary permits and licenses for instream construction works associated with the provision of culverts, bridges and outfalls. OPW Section 50 consent has been received for all culverts and bridges proposed in the EIAR. Changes to these structures as part of the detailed design and construction stage will require new Section 50 consent to be obtained. |
| | | Inform and consult with OPW Western Arterial Drainage Section who have responsibility for the Corrib-Mask Arterial Drainage scheme and |

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| | | the ongoing control of river and lake levels at the Salmon Weir Barrage in Galway City. |
| | | Continue to inform and consult with Inland Fisheries Ireland (IFI). |
| | | Continue to inform and consult with National Parks and Wildlife Service (NPWS). |
| | | All construction works will be carried out in accordance with best practice construction guidance and as such will eliminate the risk of spillage to the River Corrib. |
| | | All works will also be carried out in accordance with Irish Water Standards and Specifications, in line with standard processes and procedures for obtaining connection consent and build over agreements with the utility provider. |
| | | • Future proofing sleeves in the vicinity of Ardaun can be easily accommodated and their location will be agreed with Irish Water prior to commencement of construction. |
| | | • Irish Water (IW) will be consulted in the updating of the CEMP and specifically the and the incident response plan (IRP) for construction and operation stages |
| | | Provision will be made for Irish Water Staff to visit the construction site if deemed necessary by Irish Water |
| | | Ongoing liaison with Irish Water will be provided at construction stage and procedures for regular project dates will be established during the construction stage in a timely manner so as to enable Irish Water to assess potential increased risk to the water quality of their potable water supply source |
| 11.10 | C/O | Throughout the project construction and operation phases Galway County Council will continue to consult and inform with Irish Water in respect to water quality and pollution risk to their potable water supply source |

21.14 Biodiversity

| Ref No. | Stage | Commitments |
|---------|-------|--|
| General | • | |
| 8.69 | C/O | Galway County Council (GCoC) will ensure that the results of monitoring will be used to inform the long-term ecological mitigation programme and any necessary timely corrective action. During construction, monitoring and any required corrective action, will be Galway County Council's responsibility. During operation, GCoC will engage the services of a suitable contractor to monitor the ecological mitigation measures for the lifetime of the project. All the relevant requirements set out below, in relation to monitoring and maintenance of the ecological mitigation measures over the lifetime of the project, will be included as conditions in the contract(s) entered into with the appointed contractor. GCoC shall ensure that provision is made, in the contract(s) entered into with the appointed contractor, for corrective action to be undertaken if any aspects of the implementation of the ecological mitigation measures and monitoring commitments proposals are not effective. These provisions shall include a requirement for a suitably qualified ecologist/biodiversity expert to review the efficacy of any corrective actions required. |
| 8.70 | C/O | A GIS mapping system will be developed, to allow the Project Ecologist to track the progress, completion and monitoring of the ecological mitigation measures At the end of each month, any mapping relating to ecological mitigation measures, including results of pre-construction surveys (e.g. locations of badger setts) or design changes for mitigation measures (e.g. change in location of artificial Badger sett), will be uploaded to the dedicated project website. In addition, at the end of each month any ecological monitoring reports will be uploaded to a dedicated project website Notwithstanding the point above ecological monitoring reports will be submitted to the Planning Authority and copied to the NPWS The Project Ecologist in conjunction with 'permits to work' will sign off the correct completion and functioning of the measures, where works are in ecologically sensitive locations and/or are ecologically sensitive activities, which are likely to include, but may not be limited to, the following: works involving installation of site fencing works involving installation of site fencing works in or adjacent to the Lough Corrib cSAC, works in or adjacent to any watercourses works in or adjacent to any known breeding, resting or hibernating locations of any species protected under either the Birds and Habitats Regulations 2011 or Wildlife Act, in particular bats and otter works in areas where mitigation measures (including either habitat creation/mitigation or provision of nest and bat boxes) are proposed works in or adjacent to donor and receptor sites identified for the creation of habitats, until such time as any donor material required for the receptor sites has been transported |

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| | | Once ecological mitigation measures have been implemented and installed, GIS mapping files of their final as-built locations will be sent to the Project Ecologist to be uploaded into the Local Authority's GIS and planning systems Interactive or real-time/live mapping systems would be onerous to provide and manage. It is not deemed either necessary or appropriate to provide such systems given the above proposals which together will achieve the same function, purpose and results as a real-time/live mapping system |
| 8.71 | C | Excavated blocks of limestone pavement will be retained for reuse for general wildlife and habitat creation within those lands along the east bank of the River Corrib in Menlough which are proposed for habitat retention, enhancement and creation. |
| Designated Ar | eas for Na | ture Conservation |
| 8.3 | C/O | The environmental commitments that are required to ensure that the proposed road development will not significantly affect Moycullen Bogs NHA are as follows: Avoid/reduce the disturbance/displacement effects of blasting on wintering birds using Ballindooley Lough (Refer to wintering birds section below). Measures to control dust emissions during construction to prevent impacts to vegetation/habitats within Moycullen Bogs NHA at Tonabrocky – see Air Quality and Climate section below. These include control measures such as spraying of exposed earthwork activities and site haul roads during dry weather, wheel washes, control of site vehicle speeds, road sweeping and dust screens. Measures to avoid the introduction or spread of non-native invasive species to Moycullen Bogs NHA during construction or operation. These are detailed in the Non-Native Invasive Species Management Plan which forms part of the CEMP in Appendix A.7.5. Measures to control surface water runoff from the construction site to prevent an accidental pollution event affecting peatland habitats within Moycullen Bogs NHA at Tonabrocky – see Hydrology section below. In the unlikely event of significant flow paths (fault or fracture zones) being encountered in the Galway Granite Batholith during construction, measures set out in the Karst Protocol included in the CEMP in Appendix A.7.5 of the EIAR and Appendix C of the NIS will be implemented. |
| Habitats | | |
| 8.1 <mark>9 8</mark> | C/O | Areas of compensatory habitat will be created, managed and monitored as set out in the Compensatory Habitat Management Plan in Appendix A.8.26 with locations of donor and receptors sites shown on Figures 1-9 in Appendix A.21.3 to this Schedule of Additional Environmental Commitments (these figures are the final updated figures which replace, updated from the figures included in |

¹ This commitment has been struck through as it is already included in Chapter 21 (Commitment No 8.2)

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| | | A.8.26 of the EIAR and those in Appendix B to the Biodiversity EIA Statement of Evidence of Aebhín Cawley). |
| 8.19 | С | Given the changing baseline environment, the Compensatory Habitat Management Plans (CHMPs) set out in A.8.26 of the EIAR are live documents which will need to be updated by the appointed contractor by way of pre-construction surveys. |
| | | Ecology Site Management Plans for compensatory habitats will be prepared by the contractor prior to the commencement of works, in accordance with the principles set out in Appendix A.8.26 of the EIAR. |
| | | In addition, the specific measures below will be incorporated into the Ecology Site Management Plans: |
| | | Soils and plant material (including turves) from all 4030 donor sites will be the primary method used for dry heath habitat translocation and creation. The locations of all 4030 donor and receptor sites are presented in the appendix to this Schedule of Environmental Commitments. |
| | | Monitoring immediately after the turves are placed in the receptor sites will be undertaken every three weeks and after a heavy rainfall event until such time as the Dry heath is established, with an adaptive corrective plan put in place if evidence shows that it is not successful. |
| | | A minimum 100m translocated soils/turve depth will be provided at each 4030 receptor site. |
| | | • The pH of the top 400mm layer of material in MDAs, where it directly underlies areas proposed for dry heath habitat creation, will be below 6.5. |
| | | • The preferred method of habitat translocation is for direct translocation of turves and soil/peat from donor to receptor sites. However, the construction phasing may not facilitate this in every instance. Where direct translocation of turves to receptor sites is not possible, they will be handled and stored based on documented best practice and proven case studies for peatland turve translocation which include: |
| | | Ensuring turves are as large in size and depth as possible |
| | | If necessary, use of specially designed digger buckets suitable for the purpose |
| | | Use of low ground pressure vehicles for turve removal, especially for wetter donor sites such as the 4010 and *7130 donor sites, and if necessary operating on bog mats |
| | | Storage of turves for the minimum time possible and placement at receptor sites at the earliest possible opportunity |
| | | Storage of turves in a single layer to avoid crushing and to maintain their integrity |

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| | | Storage of turves on a flat surface placed on top of either a |
| | | geotextile membrane, on bog mats or similar |
| | | Regular watering (with rainwater) and monitoring of the turves for the duration of the storage time |
| | | |
| | | Storing turves end to end (i.e. with no gaps) to avoid edges drying out and if necessary using silt fencing or geotextile |
| | | membranes along any vertical exposed edges of turves |
| | | • In the case of some of the dry heath receptor sites the nature of the ericaceous vegetation, shallow soils and outcropping granite, may make intact turve removal difficult. In these situations, trimming the ericaceous vegetation (and retaining this cut material for use as brash and a source of seed to assist in vegetation regeneration at the receptor sites) may assist in extracting intact turves. Where turves cannot be extracted intact in these areas then the scraw (mixture of soils, root stock, seed bank etc) will still be valuable for use as soils to be translocated to the receptor sites |
| | | • Similarly, where direct translocation of soil/peat to receptor sites is not possible, it will be handled and stored in the following manner to ensure it is protected: |
| | | Use of low ground pressure vehicles for soil removal, especially for wetter donor sites such as the 4010 and *7130 donor sites, and if necessary operating on bog mats |
| | | All wet peaty soils (e.g. this will be likely from the 4010 and *7130 donor sites) will be transported in sealed trucks to avoid loss of wet peat in transit |
| | | Storage of soil/peat for the minimum time possible and placement at receptor sites at the earliest possible opportunity |
| | | Storage of soils/peat from donor sites in dedicated area(s) within construction compounds for the proposed road development west of the River Corrib, on top of a geotextile layer, no higher than 1.5m to avoid compaction |
| | | Turves from donor sites will be 'thatched' on top of the stored soil/peat areas to seal and protect it for the duration of the storage period |
| | | Turves will be placed end to end with no gaps. Where necessary receptor sites will be protected from erosion, and vegetation regeneration will be encouraged through the following means: |
| | | Use of geocoir (on flat surface) or geojute (on sloped areas) on areas of bare soil, pinned down with 0.5m steel pegs or similar |
| | | Spreading heather clippings which have been harvested from donor sites on bare soil |
| | | Re-seeding, preferably with seeds collected from donor sites prior to turves/soil being removed, or if necessary with |

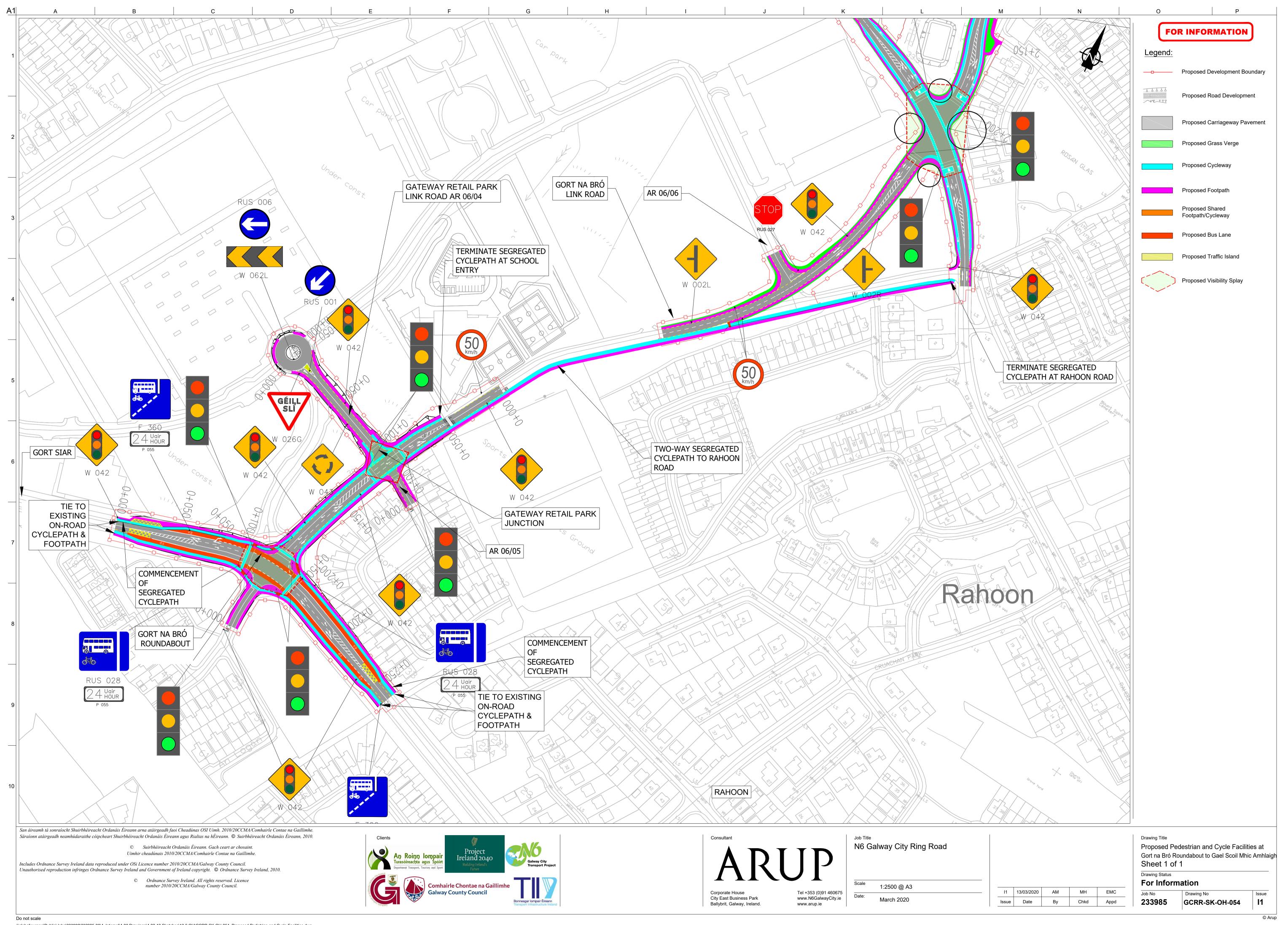
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| | | additional dry heath native seed material from a reputable supplier such as http://www.wildflowers.ie/ . Where seeds are collected from donor sites prior to turves/soil being removed, they will be collected a minimum of one summer/autumn season prior to construction works commencing, during warm, dry conditions. Until such time as they are required to be planted at the receptor sites, seeds will be stored in suitable conditions to ensure their survival. These will be used for inclusion in the seed mix for planting later at the appropriate time of year at dry heath receptor sites. |
| | | O Minimising risks of erosion or escape of translocated soil/peat by: |
| | | Undertaking all translocation works and handling of turves and soils/peats during dry weather conditions |
| | | Undertaking these activities during dry conditions at the start of the vegetation growing season (i.e. spring) to encourage rapid establishment of plant growth prior to the winter season |
| | | O Implement the measures set out in the Sediment, Erosion and Pollution Control Plan (SEPCP) which summarises the procedures and technical practices for implementing effective sediment, erosion and pollution control through a variety of delivery methods for the construction phase of the proposed road development is presented in Section 8 of the CEMP in Appendix A.7.5 of the EIAR and Appendix C of the NIS |
| | | All wet peaty soils (e.g. this will be likely from the 4010 and *7130 donor sites) will be transported in sealed trucks to avoid loss of wet peat in transit |
| | | • The following measures will be implemented as part of the habitat translocation and creation measures to ensure that <i>Daboecia cantabrica</i> becomes established at the dry heath receptor sites: |
| | | Seeds from mature plants of <i>Daboecia cantabrica</i> will be collected from the sites within the proposed development boundary where it has been recorded, from August/September onwards (in a year prior to construction works commencing), during warm, dry conditions. Seeds will be stored in suitable conditions to ensure their survival. These will be used for inclusion in the seed mix for planting later at the appropriate time of year at dry heath receptor sites |
| | | Where it is possible to translocate turves from dry heath donor sites containing <i>Daboecia cantabrica</i>, all specimens <i>Daboecia cantabrica</i> will be located in the centre of turves to ensure their successful translocation |
| | | O All existing soils/peat at dry heath donor sites will be translocated for placement as the substrate at the dry heath receptor sites, thereby retaining the seedbank, including for <i>Daboecia cantabrica</i> , to allow natural regeneration of the species at the receptor site |

| Ref No. | Stage | Commitments | | |
|--|-------|--|--|--|
| | 3 | Heather clippings will be harvested at all dry heath donor sites and this material will include clippings from Daboecia cantabrica specimens. | | |
| | | The calcareous grassland ecological recreation areas at Lackagh Quarry will be managed in perpetuity by GCC, are not accessible to the public and will be fenced off. There will be a minimum of two maintenance visits each year as set out in A.8.26 (Compensatory Habitat Management Plans) (CHMPs) of the EIAR. | | |
| Otters | | | | |
| 8.21 | 0 | Otter passage facilities will be provided at all watercourses used by Otter (e.g. raised ledges within structures, or separate dry 600mm pipes installed adjacent to culverts). Mammal underpasses will be constructed in accordance with the <i>Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes</i> (National Roads Authority, 2008). The locations where Otter passage facilities will be provided are listed in Table 8.36 of Chapter 8 , Biodiversity and shown on Figures 8.23.1 to 8.23.14 . | | |
| | | The Otter passage facilities at structures C04/01 and C04/02, will comprise of a raised mammal ledge, sited above flood water levels, incorporated into the structure. | | |
| 8.72 | C | Otter passage facilities will be checked prior to the operation of the proposed road development to ensure they are constructed in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008). | | |
| Bats | | | | |
| 8.27 | 0 | The proposed planting design associated with the Castlegar Wildlife Overpass comprises of a central narrow grass path bounded on either side by a double hedgerow in the middle section of the overpass (to mimic a 4m wide bóithrín). Each of the hedgerows will then diverge out to create a "mouth" at the entrance to the overpass on both sides of the proposed road development to funnel bats in to the centre of the overpass. Planting to tie-in to proposed planting leading east and west on upper slopes of cuttings on both sides of the proposed road development. Plate 8.32, of Chapter 8, Biodiversity, shows the schematic design and location of the proposed overpass. | | |
| 8.73 (depicted as 8.31 on 21 February 2020 Version) | С | The structures provided for the passage of bats will be checked prior to the operation of the proposed road development to ensure they are constructed in accordance with the design requirements set out in Section 8.6.7.2 and Section 8.9.2 of the EIAR. | | |
| Badgers | | | | |
| 8.74 (depicted as 8.42 on 21 February 2020 Version) | С | Badger passage facilities will be checked prior to the operation of the proposed road development to ensure they are constructed in accordance with the <i>Guidelines for the Treatment of Badgers during the Construction of National Road Schemes</i> (National Roads Authority, 2006). | | |
| Invertebrates | | | | |

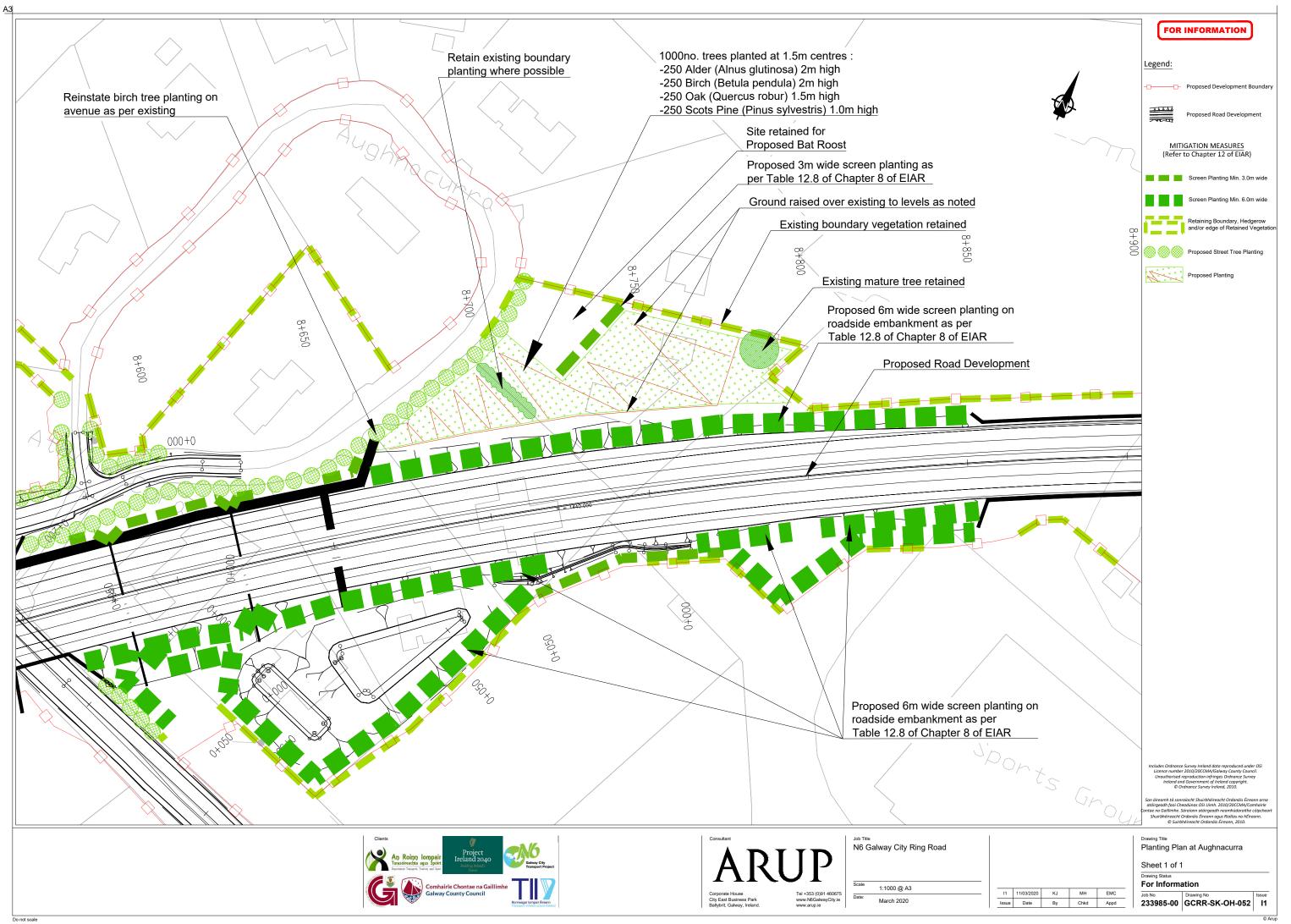
| Ref No. | Stage | Commitments |
|---------|-------|---|
| 8.41 | С | To avoid the destruction of Marsh fritillary eggs or the mortality of Marsh fritillary caterpillars, the following mitigation strategy will be implemented in relation to the site clearance works: |
| | | All areas within the proposed development boundary, which have been identified as suitable habitat to support the Marsh fritillary butterfly, will be subject to a pre-construction larval web survey. This will be undertaken during the mid-August to the end of September window immediately preceding site clearance works. |
| | | • If larval webs are present, they will be translocated to another area of suitable habitat; either outside of the proposed development boundary or, if within, to an area of suitable habitat that will remain unaffected by construction works for the duration. |
| | | If larval webs are present, tThe larval webs will be moved by translocating vegetation turves which contain the host plant species (Succisa pratensis) with larval webs present. |
| | | • The vegetation turves will be moved to the receptor site(s) immediately following excavation to ensure they do not dry out. The translocated turves will be set into existing vegetation immediately adjacent to the area of <i>Molinia</i> meadow and/or Wet heath habitat being retained (locations described below) and will be fenced off to prevent any accidental damage from construction works. Care will be taken to ensure that any specimens of <i>Succisa pratensis</i> with larval webs present will be at the centre of the turves. Turves will be fully bedded in at the receptor site(s) to ensure there are no exposed edges vulnerable to drying out. |
| | | The first location is at Ch. 0+900, an area of wet grassland (GS4)/Annex I <i>Molinia</i> meadow [6410] habitat that is being retained within the proposed development boundary (Figure 8.23.1 of the EIAR). The second location is at is at Ch. 3+000, a mosaic of Annex I Wet heath [4010], wet grassland (GS4) and Annex I Dry heath [4030] habitat that is being retained within the proposed development boundary (Figure 8.23.3 of the EIAR). Once all larval webs have been removed from the affected areas, or if |
| | | no larval webs were recorded, the vegetation will be immediately cleared or cut to ground level to render the area unsuitable for the species to recolonise. The vegetation shall be maintained in this state until such time as the topsoil is removed. |
| Birds | | |
| 8.49 | Ō | An unmanaged grass margin (at least 1m in width) will be retained along all field boundaries in the area of habitat to be retained that lies to the north west of the proposed road carriageway at Menlo Castle. (Note: depicted as commitment 8.52 on 21 February 2020 Version) |
| | | To establish and maintain rough grassland habitat for barn owl, lands to the west of the proposed road development at Menlo Castle (see Figure 1 in Appendix A.21.4 of this Schedule of Environmental Commitments) will be grazed annually by cattle for a three month period between July and October at a stocking rate of 0.35 livestock units/ha. |

| Ref No. | Stage | Commitments |
|---------|-------|--|
| | | Annual monitoring of the grassland habitat will be undertaken for a period of 5 years post-implementation with the objective of recording the establishment of suitable rough grassland habitat and adjustment of the stocking density, if required. |
| 8.54 | C | The former Peregrine falcon nest sites in the north east corner of Lackagh Quarry will be retained. The precise locations have not been divulged in the EIAR due to the risk of persecution to the species. Galway County Council and/or BirdWatch will need to be consulted to ascertain their precise locations to ensure their retention and protection from works. To minimise the potential for construction works near Lackagh Quarry to disturb the Peregrine falcon nest site, works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. The installation of rock bolts on the cliff faces in the vicinity of the nest site will be undertaken in a sensitive manner (as advised by a suitably experienced ecologist) so as to minimise any potential disturbance to the nest site during the breeding season, particularly if the nest site is occupied. Rock-bolts will not be installed in the immediate vicinity of an active peregrine falcon nest site during the breeding bird season (1st March to 31st August). An alternative nest site for Peregrine falcon will be provided on Galway City Council owned lands to the south-east of Lackagh Quarry as indicated on drawing GCRR-SK-PP-067 (Appendix A.21.5 of this Schedule of Environmental Commitments A-to-Aebhin Cawley's statement of evidence at the oral hearing). This artificial nest site will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine falcon in Lackagh Quarry. The alternative nest site will be provided in accordance with the design requirements set out in the report prepared by BirdWatch Ireland contained in Appendix C-to-Aebhin Cawley's statement of evidence at the oral hearingin Appendix A.21.6 of this Schedule of Environmental Commitments. An artificial peregrine falcon nest box will be installed at each of the two former nest sites in Lackagh Quarry. Remediation works will be carried out at the two ledges to create a level and stable substrate for the nest boxes. The artificial ne |
| 8.58 | O | Nest boxes will be monitored annually by an ecologist, and the results reported to Galway County Council, to record their usage by breeding birds for a period of three years post-construction. |

Pedestrian and Cycling Facilities from Gort na Bró Roundabout to Scoil Mhic Amhlaigh



Planting Plan at Aughnacurra Estate



Habitat Donor and Receptor Sites

Figure 1

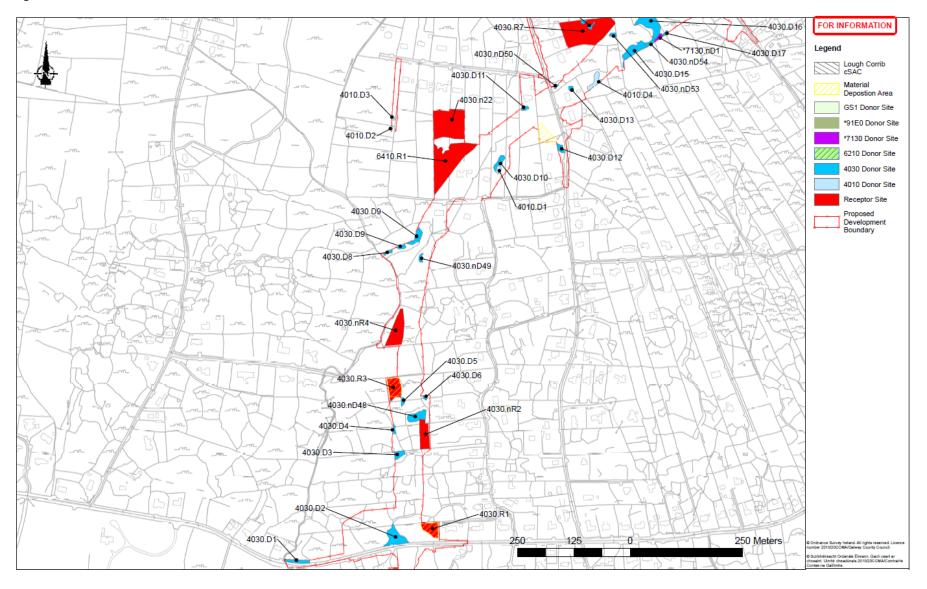


Figure 2

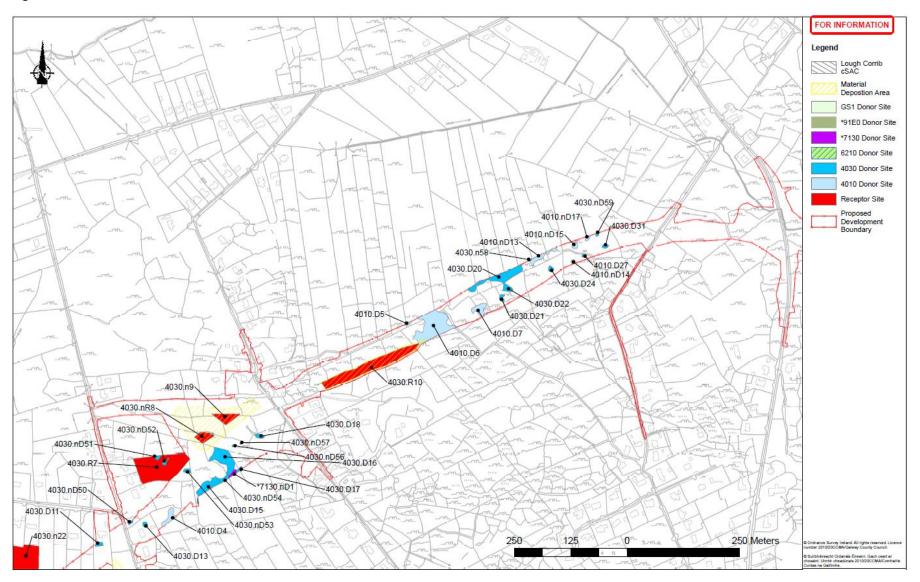


Figure 3

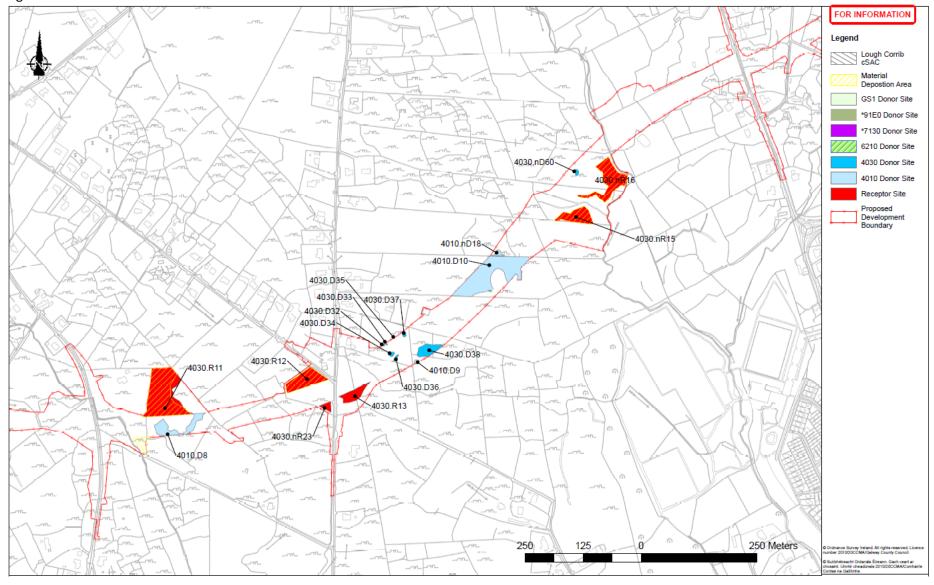


Figure 4

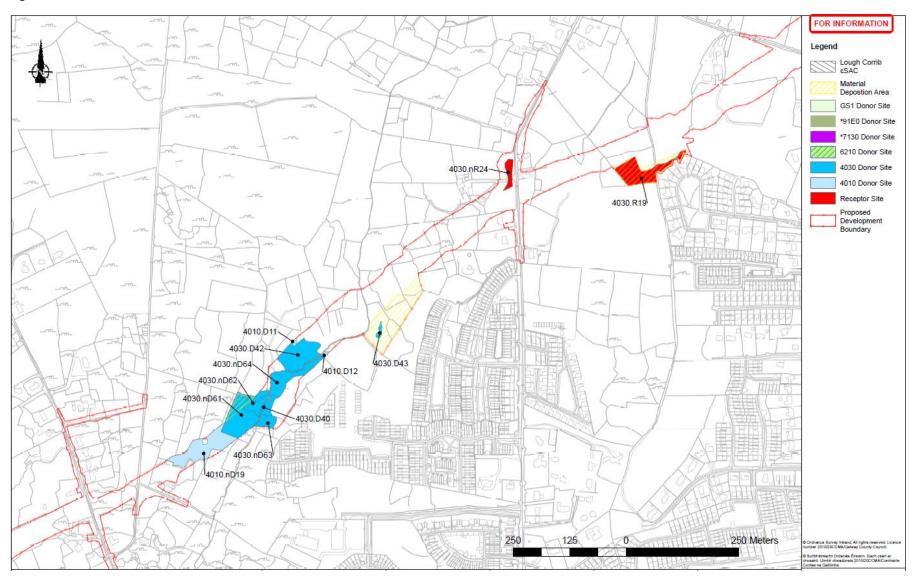


Figure 5

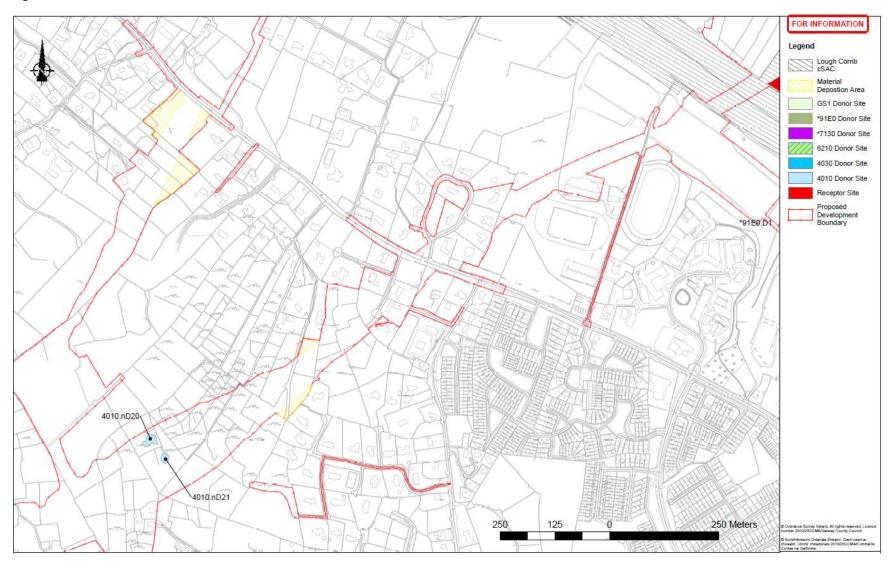


Figure 6



Figure 7

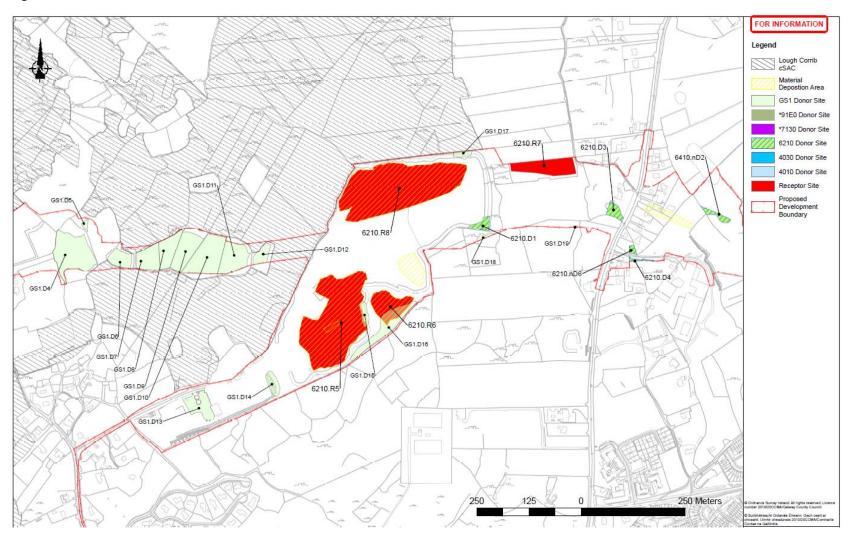


Figure 8

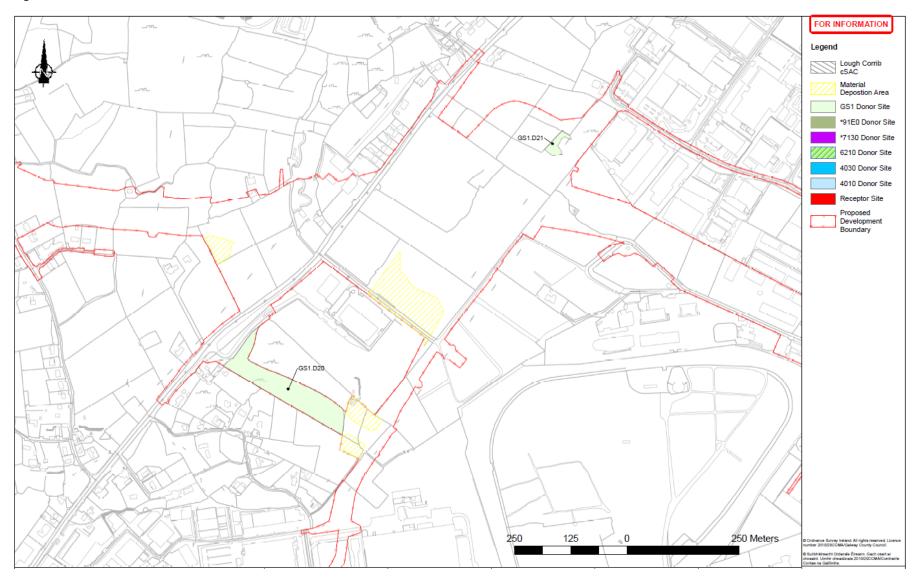
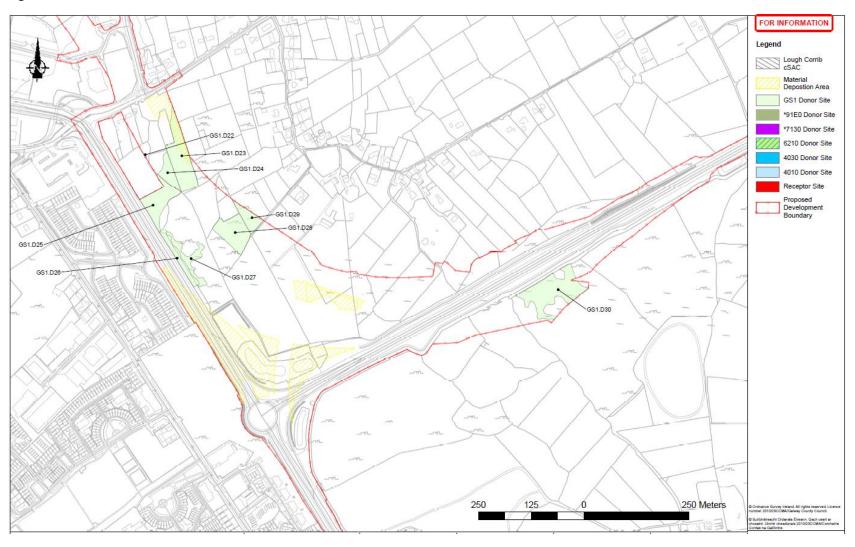


Figure 9

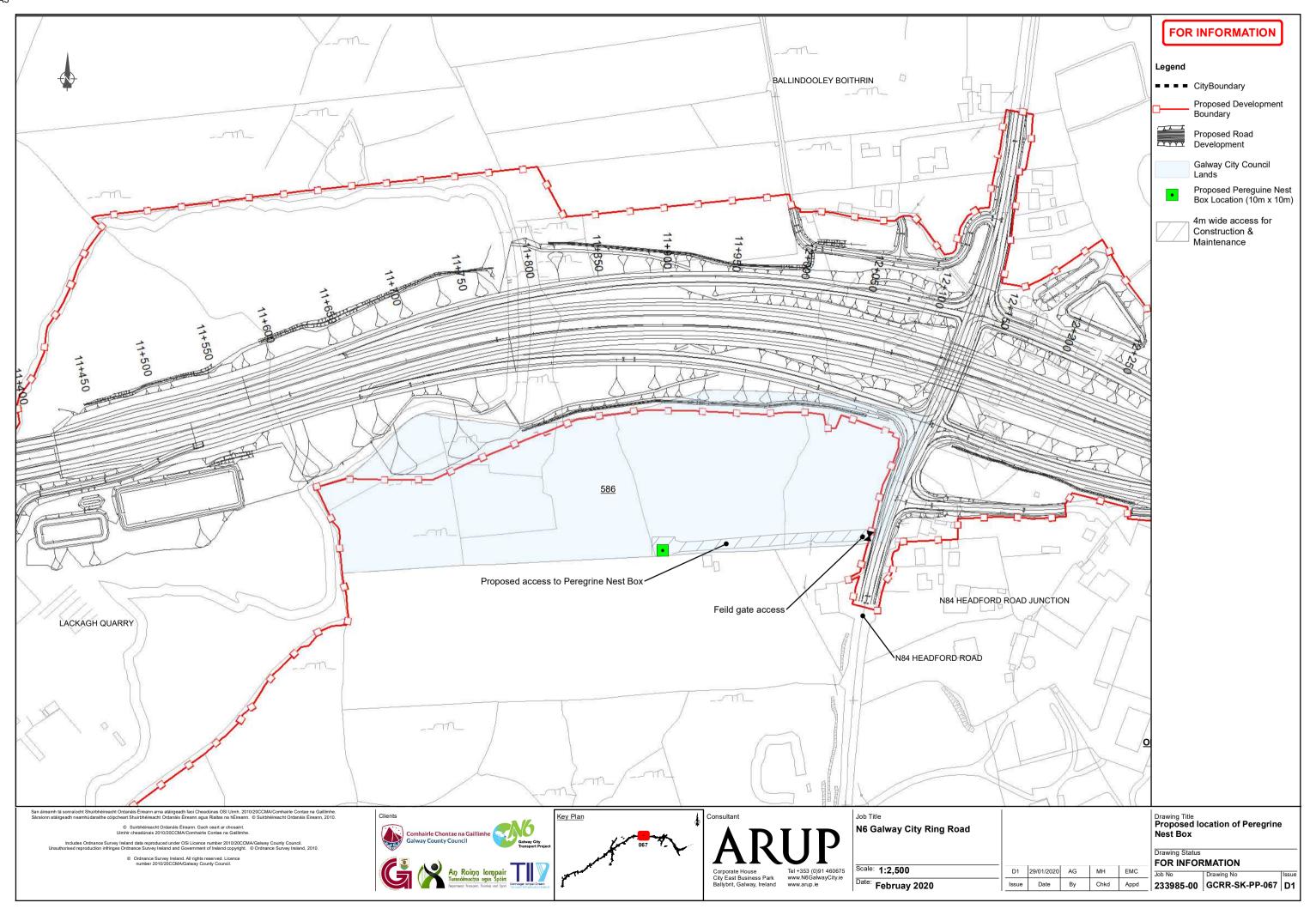


Barn Owl habitat enhancement

Figure 1: Area proposed for Barn Owl Habitat Enhancement



Peregrine Nest Box location



Bird Watch Ireland Peregrine Report



Recommendations for mitigation to minimise the impacts of the proposed N6 Galway City Ring Road on breeding Peregrine Falcon (Falco peregrinus) in Lackagh Quarry



Prepared for Scott Cawley

By John Lusby

BirdWatch Ireland

SUMMARY

The Peregrine Falcon Falco peregrinus is an Annex I species listed on the EU Birds Directive (2009/147/EEC) and is protected nationally under the Wildlife Act 1976 and Amendment Act 2000. Lackagh Quarry, on the outskirts of Galway City is a traditional nesting site for Peregrine and the results of the ecological surveys undertaken for the N6 Galway City Ring Road (GCRR) identify that a breeding pair has occupied the site in each year between 2016 to 2019. The route for the proposed N6 GCRR traverses Lackagh Quarry and is therefore likely to reduce the suitability of the site for breeding Peregrine due to the existing nesting ledges becoming unsuitable and/or direct disturbance associated with construction or operation of the proposed road development. To minimise the potential impacts of the proposed road development of the N6 GCRR on breeding Peregrine in Lackagh Quarry, mitigation measures are included in the Environmental Impact Assessment Report (EIAR) for the N6 GCRR to reduce disturbance to breeding Peregrine during the nesting cycle. A seasonal constraint on construction works near Lackagh Quarry will be implemented, whereby works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. This will ensure that if its magnitude displaces Peregrine from the quarry, any construction related disturbance will be initiated prior to nesting and can influence nest site selection, which is targeted to reduce the likelihood of nest desertion and will not impact upon an incubating female in the nest. The installation of rock bolts on the cliff faces in the vicinity of the nest site will be undertaken in a sensitive manner (as advised by a suitably experience ecologist) so as to minimise any potential disturbance to the nest site during the breeding season. The mitigation strategy also includes for the retention of one of the two ledges previously used by breeding Peregrine (in 2016 and 2017) in Lackagh Quarry. However, there remains a risk that breeding Peregrine will be temporarily or permanently displaced from Lackagh Quarry as a result of the proximity of the road carriageway to the existing nest ledge which will be retained and due to the lack of suitable alternative ledges in the quarry post-construction as identified in the EIAR. The displacement of breeding Peregrine from Lackagh Quarry would likely result in a reduction in the breeding population of Peregrine in the survey area for the N6 GCRR, as there are no other suitable nesting opportunities available in this area which are not already occupied by breeding Peregrine. The loss of Lackagh Quarry as a breeding site for Peregrine has the potential to have long-term effects on the local population and is significant at the county geographic scale.

As identified in the EIAR for the N6 GCRR, the proposed road development will result in a significant residual impact on Peregrine falcon. In response to the submission made by the Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála on the 21 December 2018 (see Appendix 1) and in an effort to reduce this residual impact, it is proposed to implement additional mitigation in the form of the provision of an alternative nest site for Peregrine at a suitable location in close proximity to Lackagh Quarry. The objective of this mitigation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. An artificial nest site will be provided in a suitable location and will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. Three locations which are suitable for the placement of an artificial nest site for Peregrine are identified. Although it is not possible to guarantee uptake of this artificial nest site, the provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale as a result of the construction of the proposed N6 GCRR.

1. INTRODUCTION

The Peregrine Falcon Falco peregrinus is an Annex I species listed on the EU Birds Directive (2009/147/EEC) and is protected nationally under the Wildlife Act 1976 and Amendment Act 2000. The conservation status of the Peregrine in Ireland is currently considered to be favourable and as such they are green-listed on the Birds of Conservation Concern in Ireland (Colhoun & Cummins 2013).

The breeding population of Peregrine in Ireland is continuing to recover after a period of extensive declines during the 1950s and 1960s, which was primarily due to secondary poisoning by organochlorine pesticides that resulted in reduced breeding productivity and adult mortality (Ratcliffe 1993, Crick & Ratcliffe 1995). In 1970, only fourteen breeding pairs of Peregrine were recorded in Ireland (Temple-Lang 1970), with similar population declines documented in the UK, where direct persecution to reduce the threat posed by Peregrines to homing Pigeons during the war also contributed to the population declines (Ratcliffe 1993). After restrictions on the use of organochlorine pesticides, the Peregrine population has slowly recovered with an expansion in range and increase in numbers since the early 1970s. The Breeding Bird Atlases of 2007–11 (Balmer et al. 2013) shows a marked range expansion over this period, with 'confirmed' or 'probable' breeding for Peregrine recorded in 217 10km squares in Ireland in 2007-11 (Balmer et al. 2013), which represents an increase of 343% since 1968-1972 (Sharrock 1976). The breeding population of Peregrine in Ireland has been surveyed at intervals of approximately ten years or more since 1981, which shows a gradual increase in the population size over this period. The first national survey of Peregrine in the Republic of Ireland in 1981 recorded a total of 225 occupied territories (based on approximately 50% coverage of the breeding range in 15 representative areas) (Norriss et al. 1983). The third national survey of breeding Peregrine in the Republic of Ireland in 2002 estimated 390 occupied breeding territories (Madden et al. 2009). The fourth and most recent survey of Peregrine in the Republic of Ireland in 2017 shows a further increase to an estimated minimum population estimate of 425 occupied territories (IRSG, unpublished data).

DISTRIBUTION AND NEST SITE SELECTION

Peregrines have traditionally used a range of natural nest sites including coastal cliffs, rock faces and rocky outcrops which provide suitable ledges for nesting (Ratcliffe 1993, Norriss et al. 1983, Hardey et al. 2009). Alongside the increase in range and numbers in recent decades in Ireland (Balmer et al. 2013) there has been a documented increase in the use of quarries and man-made structures for nesting. The national survey of Peregrines in the Republic of Ireland in 2002 demonstrated that the number of occupied territories on natural cliff sites remained virtually stable over the previous ten years, however the number of pairs nesting in quarries increased over the same period with almost one quarter of the recorded occupied breeding territories in quarries in 2002 (Madden et al. 2009). Recent evidence indicates that use of buildings and other man-made structures by Peregrine in Ireland has also increased, with associated increases in Peregrine numbers in lowland areas away from the more traditional coastal and upland areas, which has included nesting within urban areas in cities and towns (J. Lusby pers comm.). The 2002 national survey recorded breeding pairs on 11 buildings (Madden et al. 2009), however the number of breeding sites on man-made structures is now substantially higher (J. Lusby pers comm, NPWS 2013). A similar trend has been recorded in the UK, in 2014 the breeding population of Peregrines in the UK, Isle of Man and Channel Islands was estimated at 1,769 pairs. This is 22% larger than the population estimate from the previous survey in 2002 (Wilson et al. 2017). Most of this increase is accounted for by increases in lowland England, whereas populations in some upland areas declined. Peregrines now breed in many towns and cities throughout the UK, using buildings, such as churches, warehouses, tall chimneys, and tower blocks; on industrial plants such as power stations, chemical processing plants and cooling towers; and in open country on pylons, radio masts, viaducts and bridges (Dixon & Shawyer, Drewitt 2014, Wilson et al. 2017). In North America, Peregrine populations have also increased in urban areas which has been attributed to an increase in the availability

of potential nest sites compared to those in natural and historical cliff habitats (Venu 2018). In the Eastern United States, the carrying capacity of Peregrine populations increased with an increase in urban nest sites (Gahbauer et al. 2015). In the Mid-west the Peregrine population is now predominantly concentrated in urban areas (Wakamiya & Roy 2009) constituting about 80% of nests on anthropogenic sites (Redig & Tordoff 1997).

PROVISION OF ARTIFICIAL NEST SITES

The provision of artificial nesting sites has also aided the population recovery of Peregrines and their colonisation of urban areas. Natural nest sites are typically located on cliffs, rocky outcrops or crags with ledges or cavities where the eggs are laid on a flat surface containing enough gravel or soil substrate for the birds to make a scrape or depression, while in the urban setting, artificial nest sites with gravel substrates located on structures serve the same purpose (Venu 2018). Artificial nesting sites are particularly beneficial in situations where traditional or existing nest sites are no longer suitable or where birds are present but where there are no suitable nesting sites (Dixon & Shawyer). The provision of artificial nest sites has facilitated a population increase and improved breeding for Peregrines in urban areas such as Cape Town, South Africa (Altwegg et al. 2014) and in the San Francisco Bay Area in the United States (Venu 2018). Several studies have recorded higher breeding productivity of Peregrines using artificial nest sites compared to natural sites, for example, Gahbauer et al. (2015) showed that nests with overhead cover had higher productivity than those without, as did nests in trays or boxes compared to sites without any human-provided nesting aids.

The most common artificial nest sites for Peregrine are large, open-fronted nest boxes made of wood or metal which are fitted to the exterior of buildings and other man-made structures including bridges, pylons and road infrastructures. There are several designs of nest boxes and the type of nest box and dimensions can be tailored to the specific requirements of the site, provided the nest box is sufficiently large, sheltered and protected from disturbance, with a suitable substrate for nesting and safe space or ledge for juveniles to move prior to fledging. In situations where there are no existing or suitable structures available, purpose-built towers fitted with a nest box can be erected. For example, a disused four-sided tower crane fitted with a nest box was installed at Battersea in the UK to provide a nest site for Peregrines which had previously nested on an adjacent building and resulted in the successful relocation of the pair (Nick Dixon pers comm). In addition to nest boxes, open trays can also be used where there is an existing sheltered ledge or within a structure which is protected from the elements (Dixon & Shawyer). The modification of existing ledges within quarries can also provide new or improved nesting opportunities for Peregrine. Such enhancement works have been carried out at quarries in the United States to improve sites for breeding Peregrine, including adding substrate and removing sharp objects from existing ledges. Explosives were used to increase the size and nesting potential of a traditional Peregrine eyrie in northern California, which was subsequently successfully used by breeding Peregrine (Pagel 1989). Specific cliff features to encourage nesting Peregrine have been incorporated within a quarry re-habilitation project in Hong Kong (CSI Quarry Rehabilitation Guidelines).

2. BREEDING PEREGRINE AND THE PROPOSED N6 GALWAY CITY RING ROAD

The distribution and breeding status of Peregrine Falcon in Galway City was assessed in the years between 2016 and 2018 to inform the Environmental Impact Assessment Report (EIAR) for the N6 Galway City Ring Road (GRCC). Potentially suitable nesting sites for Peregrine were identified within a 5km radius of the proposed N6 GCRR. These sites were monitored between May to July 2016 to determine the presence of Peregrine. Breeding Peregrine were confirmed at three sites within the survey area, all of which were quarries (Lusby 2017). The three quarries,

namely Angliham, Twomileditch and Lackagh were confirmed to be traditional nesting sites for Peregrine based on records of occupation in previous years, in addition to the confirmation of the presence of breeding Peregrine in these sites between 2016 to 2019 (Lusby 2018, Aonghus O'Donaill, Pers comm).

Of the three breeding sites confirmed within the survey area for the N6 GCRR, the Peregrine occupying Lackagh Quarry are considered to be at risk of impact from the proposed road development. The route for the proposed N6 GCRR traverses through Lackagh Quarry and is likely to reduce the suitability of the site for breeding Peregrine due to the existing nesting ledges becoming unsuitable and/or direct disturbance associated with construction or operation of the proposed road development.

BREEDING PEREGRINE IN LACKAGH QUARRY

In 2017 and 2018 additional monitoring was undertaken in Lackagh Quarry to determine the breeding status and nest location, and to assess the nest site availability to inform the impact assessments of the proposed road development on breeding Peregrine and the mitigation measures required to minimise the predicted adverse impacts.

In 2017, the Peregrine nested on a ledge close to the north corner of the east wall of Lackagh Quarry (Lusby 2017). This nest location is located less than 40m from the proposed road development. In 2018, the Peregrine nested on a ledge, over 100m to the west of the previous nest site, close to the top of the northern quarry wall (Lusby 2018). This nest site was also used in 2019 (J Lusby pers comm.) and is approximately 50m from the proposed road development.

Assessment of the available nesting opportunities for Peregrine in Lackagh Quarry indicated a limited availability of alternative suitable nesting ledges. The limited availability of nesting sites is also highlighted by the fact both of the ledges which have been used by breeding Peregrine in Lackagh Quarry are regarded as poor quality nest sites. The nest ledge used in 2016 and 2017 is prone to flooding (Aonghus O'Donaill pers comm), and the nest site used in 2018 and 2019 is situated less than one meter below the top of the quarry wall, which is not a typical nesting location for Peregrines (Ruddock & Whitfield 2007) and is considered vulnerable to human disturbance and predation (J. Lusby pers comm).

POTENTIAL IMPACTS OF THE N6 GALWAY CITY RING ROAD ON BREEDING PEREGRINE IN LACKAGH QUARRY

The legislative framework under the Wildlife (Amendment) Act, 2000 provides for the protection of all wild birds and their nests, eggs and young (www.npws.ie/legislation). It is an offence to intentionally cause disturbance at a nest site or to breeding Peregrine.

Peregrines are sensitive to a range of activities and can desert their nests in response to disturbances (Newton 1979), however the response to disturbance can vary between individuals and in relation to the nature, extent and timing of disturbance activities. Birds which are frequently exposed to human activities may become more accustomed and tolerant of such disturbances compared to those which do not regularly encounter human activities (Newton 1979). Peregrines nest in densely populated urban areas throughout their range (Wilson et al. 2014, Drewitt 2014, Venu 2018), in close proximity to human activities in active quarries (Moore et al. 1997, Lusby 2017) and on major road infrastructures (Venu 2018). In a survey of Peregrines in quarries in nine eastern counties in the Republic of Ireland, Moore et al. (1997) showed that Peregrines were equally likely to nest in active or disused quarries, and Ratcliffe (1993) observed quarry nesting Peregrines which ignored frequent rock blasting. One of the three breeding pairs of Peregrine within the survey area for the N6 GCRR nest in an active quarry (Lusby 2017). Peregrines have also been recorded nesting in close proximity to major roads in Ireland, including an active quarry which held a breeding pair located approximately 300m from the M6 motorway in 2016 (Lusby 2017). There are many examples of

Peregrines using artificial nest sites fitted to major road infrastructures such as bridges throughout their breeding range (e.g. https://www.newnybridge.com/peregrine-falcons/).

Although Peregrines can tolerate and successfully nest in proximity to human activity and associated disturbances, certain types of disturbances are tolerated over others. The impact of disturbance will vary according to many factors including the level and type of disturbance, the tolerance of an individual or pair, the stage of breeding cycle in which the disturbance occurs and the proximity of the disturbance to the nest. Breeding Peregrines are more likely to be disturbed by activities taking place above their nest (Herbert & Herbert 1969). Ratcliffe (1972) suggested Peregrines could tolerate any number of people in the nesting haunt, provided the eyrie was safe and inaccessible. The stage of the breeding cycle in which the disturbance occurs is also likely to be important, for example a pair may become accustomed to regular disturbance events over time (Ratcliffe 1993), whereas sporadic disturbance or disturbance which is initiated during a sensitive stage of the breeding cycle (e.g. laying, incubation) may be detrimental and cause desertion of the nest. Displacement to alternative nest sites can occur due to disturbance although this may be temporary depending on the disturbance source, or birds may be become reconciled to the disturbance and return to the disturbed nest site (Ratcliffe 1962).

It is not possible to determine the specific response of breeding Peregrine in Lackagh Quarry to the construction and operation of the proposed N6 GCRR, however, based on the proximity of the proposed road development to the previously used nesting ledges, the level of disturbance during the construction and operation, the fact that similar disturbance events have not recently occurred in Lackagh Quarry, and the lack of suitable alternative ledges in the quarry post-construction, it is likely that Peregrines will be temporarily or permanently displaced from Lackagh Quarry and its surrounds. To minimise the potential impacts of the proposed road development of the N6 GCRR on breeding Peregrine in Lackagh Quarry, mitigation measures are included in the EIAR for the N6 GCRR to reduce disturbance to breeding Peregrine during the nesting cycle. A seasonal constraint on construction works near Lackagh Quarry will be implemented, whereby works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. The seasonal constraint on construction works near Lackagh Quarry will ensure that any construction related disturbance will be initiated prior to nesting and can influence nest site selection, which is targeted to reduce the likelihood of nest desertion and impacts on an incubating female in the nest. The installation of rock bolts on the cliff faces in the vicinity of the nest site will be undertaken in a sensitive manner (as advised by a suitably experience ecologist) so as to minimise any potential disturbance to the nest site during the breeding season. The mitigation strategy also includes for the retention of one of the two ledges previously used by breeding Peregrine (in 2016 and 2017) in Lackagh Quarry. However, there remains a risk that breeding Peregrine will be temporarily or permanently displaced from Lackagh Quarry as a result of the proximity of the road carriageway to the existing nest ledge which will be retained and due to the lack of suitable alternative ledges in the quarry post-construction as identified in the EIAR. The displacement of breeding Peregrine from Lackagh Quarry would likely result in a reduction in the breeding population of Peregrine in the survey area for the N6 GCRR, as there are no other suitable nesting opportunities available in this area which are not already occupied by breeding Peregrine. The loss of Lackagh Quarry as a breeding site for Peregrine has the potential to have long-term effects on the local population and is significant at the county geographic scale.

3. **RECOMMENDATIONS**

As identified in the EIAR for the N6 GCRR, the proposed road development will result in a significant residual impact on Peregrine Falcon. In response to the submission made by the

Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála on the 21 December 2018 (see Appendix 1) and in an effort to reduce this residual impact, it is proposed to implement additional mitigation in the form of the provision of an alternative nest site for Peregrine at a suitable location in close proximity to Lackagh Quarry. The provision of a suitable, alternative nest site, alongside the mitigation measures outlined in the EIAR, namely the seasonal constraint on the commencement of construction works at Lackagh Quarry and retention of one of previously used nest ledges, would reduce the risk of construction related disturbance effects to breeding Peregrine in the short-term (during the construction period) and reduce the risk of displacement of breeding Peregrine from Lackagh Quarry and surrounds in the long-term (during the operation of the proposed road development). Furthermore, given that the previously used nest ledges in Lackagh Quarry are deemed to be of poor quality, the provision of a suitable and safe nesting site could help to secure the future of Peregrine in this area. An artificial nest site of appropriate design will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. Although it is not possible to guarantee uptake of this artificial nest site, the provision of this site will increase the likelihood of the continued occupation of breeding Peregrine in Lackagh Quarry and its surrounds which would mitigate the significant negative residual effect on Peregrine at the local and county geographic scale as a result of the construction of the proposed N6 GCRR. Should the artificial nest site be taken up by the resident pair of Peregrine (as confirmed by monitoring as outlined below) then the seasonal constraint on the commencement of construction works at Lackagh Quarry should be lifted, as this would not result in effects to breeding Peregrine.

Provision of an alternative nest site for Peregrine

It is recommended that an alternative nest site, consisting of a nest box fitted to a suitable structure is provided in close proximity to Lackagh Quarry (<1km) prior to the commencement of works which have the potential to disturb or displace breeding Peregrine. The objective of this mitigation recommendation is to ensure that Peregrines, if displaced from the previously used nesting ledges in the quarry, can remain and breed in the area. Three options are outlined as suitable locations for the installation of the artificial nest site as detailed, one of which is fitting a nest box to an existing structure and two are installing a purpose-built structure to accommodate a nest box. The nest box should be open-fronted with a sheltered cavity, containing a substrate (a mix of gravel or pea shingle and compost or woodchips) and sufficient space to allow the young to exercise in safety as they develop (Dixon & Shawyer). The nest box should be fitted with a raised edge to help retain the substrate and the juveniles as they become more active. The nest box should not be placed in locations facing full sun throughout the day (Ratcliffe 1995). The design and specifications of a nest box for Peregrine is detailed here: http://www.schwegler-natur.de/portfolio_1408366639/schweglerwanderfalkennistkasten/?lang=en and included in Appendix 2 to this report. Two possible locations for this nest site are discussed below.

1: Communications tower

The communications tower (ITM 530660 728015) located approximately 500m to the south of the previously used nest ledges in Lackagh Quarry, and approximately 450m to the south of the proposed road development provides a suitable location and is the preference site for the provision of a nest box for Peregrine. The tower is located within sight and sufficiently close to Lackagh Quarry to increase the potential of uptake by breeding Peregrine if displaced from the quarry, while also located at a sufficient distance from the proposed road development to avoid disturbance associated with the construction and operation of the proposed road development. The nest box should be fitted close to the top of the tower (the top third of the tower) and should be in place prior to the initiation of works in Lackagh Quarry.

There are several aspects which need to be considered prior to the installation of a nest box on the communications mast. Firstly, as it is an offence to cause intentional disturbance to breeding Peregrine or their nest, this may impose a restriction on maintenance work (e.g. repairs) or other activities in close proximity to the nest site (a distance which could cause disturbance) during the nesting season, should the nest site be occupied. Secondly, it is typical for the ground level surrounding an active nest to be littered with feathers and bones of prey consumed by Peregrine.

If it is not possible to install a nest box to the existing structure, a purpose-built tower (as detailed below) could be installed in close proximity.

The location of the communications tower in relation to Lackagh Quarry is shown below in Figure 1.



Figure 1: The location of the communications tower (ITM 530660 728015) which would be suitable for the placement of a nest box for Peregrine (shown by the red pin).

2: Purpose-built tower

A purpose-built tower fitted with a nest box can be installed at either of the two locations proposed below. The purpose-built tower and nest box should be in place prior to construction activities in the quarry. The tower can be constructed from suitable materials provided it is safe, secure and long-lasting to accommodate a nest box of approximately 260kg (empty nest box). The tower can be of similar design to a pylon or tower crane, with four supporting bases, narrow four-sided tower with supporting girders. The nest box will be positioned at a minimum height of 25m above ground level. The nest box should be accessible to licensed professionals to allow maintenance and monitoring of the nest as required. A perimeter fence should be installed around the base of the tower to restrict access to the general public and to and reduce the potential for disturbance.

One example of a purpose-built tower for Peregrine which has been used to inform the design of the proposed tower at Lackagh Quarry is a disused four-sided crane tower with a nest box installed at Battersea in the UK to provide a suitable nest for Peregrine to encourage their relocation from nesting on a nearby building. The nest box in this situation was installed at 30m above ground level which was a similar height to the existing nest site on the building (Nick Dixon pers comm.) Images of this structure can be viewed here:

<u>http://parliamentperegrinediary.blogspot.com/</u>, other examples of purpose built towers for Peregrine are included in Appendix 3.

Location 1 for purpose-built tower:

The Galway City Council owned lands to the south of the N6 GCRR and south east of Lackagh Quarry would provide a suitable location for an artificial nest site for Peregrine. The purpose-built tower should be sited at a minimum distance of 100m from the proposed road development, in the south west corner of the plot 586d.403 at approximately ITM 530736 728267 as shown in Figure 2 below.



Figure 2: The proposed location for a purpose-built tower to accommodate a nest box for Peregrine (ITM 530736 728267 (shown by the red pin)).

Location 2 for purpose-built tower:

The area within the proposed development boundary for the proposed road development to the north of the nest site used in 2016/2017, in the north east corner of the quarry would provide a suitable location for the purpose-built tower, as shown in Figure 3 below.

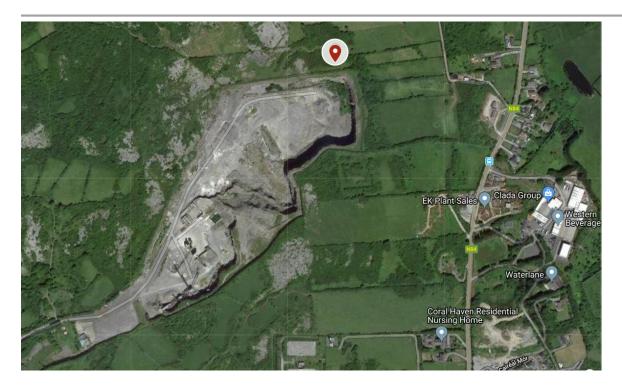


Figure 3: The proposed location for a purpose-built tower to accommodate a nest box for Peregrine (shown by the red pin)).

Mitigation recommendation:

Provide alternative nest sites for Peregrine

Objective:

Minimise the potential that Peregrine are temporarily or permanently displaced from Lackagh Quarry and surrounds as a result of the construction of the N6 Galway City Ring Road

Mitigation measures (step by step approach):

- An artificial nest sites of appropriate design for Peregrine to be provided in close proximity to Lackagh Quarry (<1km)
- Examples of appropriate designs of nest boxes for Peregrine are detailed here: http://www.schwegler-natur.de/portfolio_1408366639/schwegler-wanderfalkennistkasten/?lang=en
- The nest box should be open-fronted with a sheltered cavity, containing a substrate (a mix of gravel or pea shingle and compost or woodchips) and sufficient space to allow the young to exercise in safety as they develop (Dixon & Shawyer). The nest box should also be fitted with a raised edge to help retain the substrate and the juveniles as they become more active.
- The nest box should not be placed in locations facing full sun throughout the day (Ratcliffe 1995)
- The first option is for the nest box to be fitted to the communications tower (ITM 530660 728015). The nest box should be in place prior to the initiation of works which have the potential to cause disturbance to Peregrine in Lackagh Quarry. The nest box should be

- secured close to the top of the tower (the top third of the tower) in a suitable location which provides a clear flight line to the nest box.
- Should it not be possible to install a nest box on the communications tower, a purpose-built tower should be installed: 1) to the south of the N6 GCRR on Galway City Council owned lands to the south-east of Lackagh Quarry, or 2) within the proposed development boundary for the proposed road development to the north of the nest site used in 2016/2017 in the north-east corner of the quarry. The purpose-built tower should be sited at a minimum height of 25m above ground level and should be in place prior to construction activities in the quarry.

Monitoring

Monitoring should be undertaken by a suitably qualified ecologist to determine the response of Peregrine to the disturbances associated with the construction of the proposed road development and to the mitigation measures implemented to determine their success. Monitoring should be carried out during March to July over a minimum of three visits as per the methods outlined in Lusby (2018) and Hardey et al. (2009) to identify the nest location and outcome of breeding including determining use of the artificial nest site, during the construction phase and for a period of three years once the proposed road development is in operation.

Altwegg, R., Jenkins, A. & Abadi, F. (2014) Nestboxes and immigration drive the growth of an urban Peregrine Falcon Falco peregrinus population. Ibis 156:107–115.

Balmer, D., Gillings, S., Caffrey, B., Swan, B., Downie, I. & Fuller, R. (2013) Bird Atlas 2007-11. The breeding and wintering birds of Britain and Ireland. British Trust for Ornithology.

Colhoun, K. and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014-2019. Irish Birds, Vol 9, No. 4, pp. 523-544.

Crick, H.Q.P. and Ratcliffe, D. (1995). The Peregrine Falco peregrinus breeding population of the United Kingdom in 1991, Bird Study, 42:1, 1-19

CSI Quarry re-habilitation guidelines – case study. Nesting sites for Peregrine Falcons in Shek O quarry, Hong Kong.

http://www.wbcsdcement.org/pdf/TF5%20-

%20Quarry%20Rehab%20Guidelines_case%20study_HeidelbergCement_Nesting%20sites%20for%20peregrine%20falcons%20in%20Shek%20O%20quarry,%20Honk%20Kong.pdf

Drewitt, E. 2014. Urban Peregrines. Pelagic Publishing, Exeter.

Dixon and Shawyer. Peregrine Falcons: provision of artificial nest sites on built structures. Advice note for conservation organisations, local authorities and developers. The Hawk and Owl Trust.

Gahbauer, M.M., Bird, D. M., Clark, K.E., French, T., Brauning, D.W., McMorriss, A.F. (2015) Productivity, mortality, and management of urban peregrine falcons in northeastern North America. Wildlife Management. Volume 79, Issue 1 pg. 10-19.

Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. 2009. Raptors: a field guide for surveys and monitoring. Stationery Office, Edinburgh.

Herbert R.A., Herbert K.,G.,S. 1965. Behaviour of Peregrine Falcons in the New York City region. Auk, 82: 62-94.

Lusby, J. 2017. The occupancy and breeding status of Peregrine Falcon within the survey area for the proposed N6 Galway City Ring Road. Final Report (2017).

Lusby, J. 2018. The occupancy and breeding status of Peregrine Falcon in Lackagh Quarry for the proposed N6 Galway City Ring Road. Final Report (2018).

Madden, B., Hunt, J, & Norriss. (2009). The 2002 survey of Peregrine Falco peregrinus breeding population in the Republic of Ireland. Irish Birds 8: 543-548 (2009).

Moore, N., P. Kelly and F. Lang. 1997. Quarry-nesting by peregrine falcons in Ireland. Irish Birds 4:519-524.

Pagel, J.E. 1989. Use of explosives to enhance a Peregrine Falcon Eyrie. Journal of Raptor Research. 23(4): 176-178.

Newton, I. 1979. Population ecology of raptors. Berkhamstead, Poyser.

Norriss, D. W. & Wilson, H.J. 1983. Survey of the Peregrine Falco peregrinus breeding population in the Republic of Ireland in 1981. Bird Study 30: 91-101.

NPWS. 2013. The status and trends of Irelands birds species.

https://www.npws.ie/status-and-trends-ireland%E2%80%99s-bird-species-%E2%80%93-article-12-reporting

Ratcliffe, D.A. 1963. The status of the Peregrine in Great Britain. Bird Study 10: 56–90. Ratcliffe, D.A. 1972. The Peregrine population of Great Britain in 1971. Bird Study 19: 117–156.

Ratcliffe, D. 1993. The Peregrine Falcon. 2nd Edition. Poyser, London.

Redig, P. T., & Tordoff, H. B. (1997). Midwest Peregrine Falcon Demography, 1982-1995. The Raptor Research Foundation, 31(4), 339–346.

Ruddock, M., Whitfield, D.P., (2007). A review of disturbance distances in selected bird species. Report from Natural Research (Projects) Ltd. to Scottish Natural Heritage. Natural Research, Banchory, UK.

Sharrock, J.T.R. (1976) The Atlas of Breeding Birds in Britain and Ireland. T. & A.D. Poyser, Berkamsted

Temple-Lang, J. 1970. Peregrine survey — fourth year. Report of the Irish Wildbird Conservancy

Venu, P. (2018). Assessment of Peregrine Falcon (Falco peregrinus anatum) Nesting Habitat in the San Francisco Bay Area". Master's Theses. 4989. DOI: https://doi.org/10.31979/etd.64d6-6c69

Wakamiya, S. M., & Roy, C. L. (2009). Use of monitoring data and population viability analysis to inform reintroduction decisions: Peregrine falcons in the Midwestern United States. Biological Conservation, 142(8), 1767–1776.

Wilson, M.W., Balmer, D.E., Jones, K., King, V.A., Raw, D., Rollie, C.J., Rooney, E., Ruddock, M., Smith, G.D., Stevenson, A., Stirling-Aird, P.K., Wernham, C.V., Weston J.M., & Noble, D.G. (2018). The breeding population of Peregrine Falcon *Falco peregrinus* in the United Kingdom, Isle of Man and Channel Islands in 2014, Bird Study, 65:1, 1-19.

APPENDIX 1.

Submission by the Department of Culture, Heritage and the Gaeltacht to An Bord Pleanála

In the EIAR, there is a degree of uncertainty as to whether Lackagh Quarry will remain a suitable breeding site for Peregrine during and post-construction. No alternative breeding site for the Peregrine pair associated with this nest site is known locally. To counterbalance the potential loss of this breeding resource, a suitable alternative nest site(s) needs to be created, noting that the most recent National Peregrine Survey did not record any urban nesting pairs from Galway City. There may be opportunities to install artificial nesting platforms or boxes on other suitable features or buildings. Failing that, a bespoke nesting structure in an appropriate area should be constructed.

The EIAR could benefit from more clarity as to the efficacy of the mitigation measure to temporarily dissuade active breeding of Peregrine at Lackagh Quarry by commencing works from the Lackagh Tunnel to the N84 Headford Road Junction prior to mid-February. The appropriateness of potentially working in the vicinity of, and disturbing an active nest site to install rock bolts on the cliff face may be challenging. If an alternative suitable Peregrine nesting resource was created prior to any road development works being undertaken then the possibility of temporarily rendering the nesting ledges at Lackagh Quarry unavailable for Peregrine during the construction period as a mitigation measure to avoid the disruption of a breeding attempt could be considered.

APPENDIX 2.

Peregrine Falcon Nest Box

(extracted from http://www.schwegler-natur.de/portfolio_1408366639/schwegler-wanderfalkennistkasten/?lang=en)

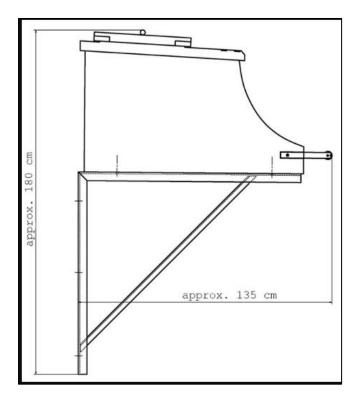
Installation height: Generally, in heights above 25 – 30 m. North- or east-facing sites have proved to be most effective. The "balcony" with its perch should be placed so that there is a clear area directly below. The box can be attached directly to a building using screws (e.g. on flat roof sections) or, by means of a mounting rack and wall plugs, onto an outside wall. Recommended litter/ bedding: Place some gravel or other loose material in the box. Peregrines do not construct nests, instead the female scrapes a hollow in which to hatch the eggs. The breeding period starts any time between mid-March and the beginning of April.

Material: Special, high-strength, reinforced lightweight concrete. This ensures that the box is very long-lasting (decades) and allows a proper and structurally correct manner of installation. The naturally grey, smooth concrete can be painted individually during installation to match the building, if required.

External dimensions: W 80 x H 73 x D 130 cm.

Nesting chamber: W 67 x H 54 x D 72 cm.

Weight: approx. 260 kg (empty box).



APPENDIX 3.

Examples of purpose-built towers which have been fitted with a nest box for Peregrines are shown below:

http://parliamentperegrinediary.blogspot.com/

http://www.friendsofcamas.org/projects/peregrine-tower-webcam-project

https://images.app.goo.gl/FsmGBHSdBwjNW1a86

https://www.gettyimages.de/detail/nachrichtenfoto/the-newly-erected-nesting-tower-

designed-to-house-a-nachrichtenfoto/828929510

http://www.conservewildlifenj.org/blog/2018/02/09/photo-from-the-field-new-falcon-tower-on-bonnet-island-lbi/

Appendix A.21.7

Updated Table 9.3: Private Access Roads (updated Table 15.5 of the EIAR)

Updated Table 9.3: Private Access Roads (Updated Table 15.5 of the EIAR)

| Location | | Plot ID / | Comments |
|--|---------------------------------------|--|---|
| Approx. Chainage | Description | Landowner Reference | |
| Ch. 0+000 | 80m access road AR 0/01 Width 6m | 102, 103 | Provides access to houses and land parcels both via single field gates as current access is onto the existing R336 |
| Ch. 0+000 to Ch. 0+250 | 320m access road AR 0/02 Width 4m | 106, 107, 108, 109, 112 | Provides access to attenuation ponds and land parcels via single field gates as current access is severed by the proposed road development |
| Ch. 0+650 to Ch. 0+700 | 65m access road AR 0/03 Width 4m | - | Provides access to attenuation ponds |
| Ch. 0+850 to Ch. 0+950 | 160m access road AR 0/04 Width 4m | 114, 117, 236 | Provides access to land parcels |
| Ch. 0+990 | 30m access road AR 0/05 Width 4m | - | Provides access to attenuation ponds |
| Ch. 1+100 (Troscaigh Road L5387) | 35m access road AR 01/01 Width 4m | 130, 131, 7891 | Re-graded entrance to houses and land parcels as current access via Foraí Maola Road is severed by the proposed road development |
| Ch. 1+300 (Troscaigh Road L5387) | 30m access road AR 01/03 Width 4m | 144, 145 | Provides access (via the proposed Na Foraí Maola to Troscaigh link road) to land parcels as current access arrangement is impacted by the proposed road development |
| Ch. 1+500 | 15m access road AR 01/04 Width 4m | 156, 157 Folio GY71569F, Folio GY99412F | Proposed access to tie-in to existing access to houses, and existing property currently accessing off existing access track. Current access arrangement via Troscaigh Road L5387 is impacted by the proposed road development |
| Ch. 1+550 | 25m access road AR 01/05 Width 4m | 154 | Provides access to land parcel as current access arrangement via Troscaigh Road L5387 is severed by the proposed road development |
| Ch. 1+550 to Ch. 1+675 (Troscaigh Road L5387) | 215m access road AR 01/06 Width 6m | 149, 150, 151, 152, 153 | Access to houses and land parcels but also provides access to attenuation ponds |
| Ch. 2+475 to Ch. 2+550 | 65m access road AR 02/01 Width 4m | 176 | Provides access to land parcel via Ann Gibbons Road L13215 as land |

| Location | | Plot ID / | Comments |
|---|---------------------------------------|--|---|
| Approx. Chainage | Description | Landowner Reference | |
| | | | parcel is being severed by proposed development |
| Ch. 1+750 to Ch. 2+550 | 830m access road AR 02/02 Width 4m | 171, 147, 174, 173, 172, 170, 169, 167, 166, 146, 165, 168, 164, | Provides multiple accesses to houses and land parcels as current access via Ann Gibbons Road L13215 is severed by the proposed road development |
| Ch. 3+275 | 10m access road AR 03/01 Width 4m | 199 | Provides access to land as current access via Aille road is altered by the proposed road development (located north of proposed Aille Overbridge S03/01) |
| Ch. 3+325 to Ch. 3+900 | 620m access road AR 03/02 Width 4m | 207, 197, 205, 208, 209, 210 | Provides access to land parcels via Aille Road L5384 as current access is severed by the proposed road development. Also provides access to attenuation ponds |
| Ch. 4+025 to Ch. 4+050 | 75m access road AR 04/01 Width 4m | - | Provides access to attenuation ponds |
| Ch. 4+240 to Ch. 4+360 | 140m access road AR 04/02 Width 4m | - | Provides access to attenuation ponds |
| Ch. 4+450 (South of Cappagh Road Junction) | 20m access road AR 04/03 Width 4m | 213 | Access re-alignment required due to the proximity with the proposed Cappagh Road signalised Junction |
| Ch. 4+450 (North of Cappagh Road Junction) | 10m access road AR 04/04 Width 4m | 215 | Access re-alignment required due to the proximity with the proposed Cappagh Road signalised Junction |
| Ch. 4+450 to Ch. 4+675 (North of Cappagh Road Junction) | 185m access road AR 04/05 Width 4m | 216, 217, 223, 226 | Provides access onto land parcels as current access via Boleybeg Bóthrín is severed by the proposed road development |

| Location | | Plot ID / | Comments |
|---|---------------------------------------|---|--|
| Approx. Chainage | Description | Landowner Reference | |
| | | Folio GY27430F, Folio GY49098, Folio GY104075F, Folio GY40009, Folio GY33928F, Folio GY34114F, Folio GY40058, Folio GY40052, Folio GY45883, Folio GY113505F, Folio GY76735F, | |
| Ch. 4+525 to Ch. 4+650 | 145m access road AR 04/06 Width 4m | Folio GY40054 223, 224, | Re-alignment of Boleybeg Bóthrín as currently being severed by the proposed road development. |
| Ch. 4+950 to Ch. 4+990 | 60m access road AR 04/07 Width 4m | 226, 227 | Provides access onto land parcels Provide access from mainline to attenuation ponds. Pond access gate to be provided adjacent to the carriageway |
| Ch. 5+360 to Ch. 5+660 North of Ballymoneen Road Junction | 345m access road AR 05/01 Width 6m | 223, 230, 261 | Provide access to farmyard and land parcels as current access is directly onto the existing Ballymoneen Road |
| Ch. 5+600 to Ch. 5+625 South of Ballymoneen Road Junction | 30m access road AR 05/02 Width 4m | 232 | Access already provided to houses located directly onto Ballymoneen Road, but re-alignment needed due to the proximity with the proposed signalised Junction |
| Ch. 6+375 to Ch. 6+475 | 110m access road AR 06/01 Width 4m | 243 | Provide access to land parcel as existing access via Clybaun Road is severed by the proposed road development |

| Location | | Plot ID / | Comments |
|--|---------------------------------------|--|--|
| Approx. Chainage | Description | Landowner Reference | |
| Ch. 6+525 to Ch. 6+560 | 45m access road AR 06/02 Width 6m | 312, 260 | Provides access to farmyard. Access provided as part of Clybaun Road re-alignment |
| Ch. 6+600 to Ch. 6+960 | 370m access road AR 06/03 Width 4m | 241, 239, 247, 245 | Provide access to land parcels as being severed by the proposed road development |
| N59 Link Road South Ch. 1+900 | 50m access road AR 07/01 Width 6m | 480 481 | Provides access to land parcels as part of the proposed road development |
| Ch. 7+225 to Ch. 7+300 | 60m access road AR 07/04 Width 4m | 250/466 | Located just off Letteragh Road L1323. Provides access to land parcel as current access is severed by the proposed road development |
| Ch. 7+260 to Ch. 7+450 | 200m access road AR 07/05 Width 4m | 272/462, 259_463 | Located just off Letteragh Road L1323. Provides access to land parcel as current access is severed by the proposed road development. Also access to attenuation ponds |
| N59 Link Road South Ch. 1+500 | 60m access road AR 07/06 Width 4m | 486 | Located just off Letteragh Road L1323, near the at-grade Letteragh Road junction. Provides access to house as current access is impacted by the provision of the junction |
| N59 Link Road South Ch. 1+350 to Ch. 1+400 | 80m access road AR 07/07 Width 4m | 486, 272/462 | Provide access to land parcels as current access is severed by the proposed road development |
| N59 Link Road South Ch. 1+140 to Ch. 1+190 | 70m access road AR 07/08 Width 4m | 457 | Provides access to agricultural lands as current access is severed by proposed road development and acquired severed lands |
| N59 Link Road Ch. 0+700 to Ch. 0+860 | 210m access road AR 07/09 Width 4m | 457, 502, 505, 501, 468 | Provides access to land parcels as current access is severed by the proposed road development |
| Ch. 7+800 to Ch. 7+850. Access from local road network | 160m access road AR 07/10 Width 4m | 506 504, Folio GY86696F, Folio GY35103F, Folio GY118263F, | Located off Circular Road and consists of the existing access road to the Heath. Provides access to land parcel as current access is severed by the proposed road development. Access is to tie-in with the remainder of the existing access to existing homes |

| Location | | Plot ID / | Comments |
|-------------------------------------|---------------------------------------|------------------------|--|
| Approx. Chainage | Description | Landowner Reference | |
| | | Folio GY41823F, | |
| | | Folio | |
| | | GY42106F, Folio | |
| | | GY36701F, | |
| | | Folio GY36702F, | |
| | | Folio GY35496F, | |
| | | Folio GY43487F, | |
| | | Folio GY45453F, | |
| | | Folio GY40760F, | |
| | | Folio GY41001F, | |
| | | Folio GY35497F, | |
| | | Folio GY47703F, | |
| | | Folio GY35104F, | |
| | | Folio GY45455F, | |
| | | Folio GY45454F, | |
| | | Folio GY41735F, | |
| | | Folio GY45416F, | |
| | | Folio GY36705F, | |
| | | Folio GY39148F, | |
| | | Folio GY36703F, | |
| | | Folio GY5454F, | |
| | | Folio GY36704F | |
| N59 Link Road South Ch. 1+760 | 10m access road AR 07/11 Width 6m | 484 | Provides access to land parcel as current access is severed by the proposed road development |
| Ch. 8+360 to Ch. 8+500 | 115m access road AR 08/01 Width 6m | 517, 518, | Located just off the N59. Provides access to house and ties-in to existing housing development access (517). Current access is |

| Location | | Plot ID / | Comments |
|---------------------------|---------------------------------------|--|--|
| Approx. Chainage | Description | Landowner Reference | |
| | | (Folio GY72504F), Folio GY61252F Folio GY79016F Folio GY106159F Folio GY61254F Folio GY95973F Folio GY61253F | severed by the proposed road development. Also provides access to attenuation ponds |
| Ch. 8+375 to Ch. 8+450 | 165m access road AR 08/02 Width 4m | 515, 522 | Provides access to house as current access is severed by the proposed road development. Access connected to Circular Road L1020 |
| Ch. 8+525 to Ch. 8+625 | 100m access road AR 08/03 Width 6m | 531, 532, 533, 534, & Folio GY26414F, Folio GY28597F, Folio GY23431F, Folio GY23250F, Folio GY20148F, Folio GY26176F | Located just off the N59. Provides access to Aughnacurra Estate (houses and land parcels) as current access is severed by the proposed road development. Access is to tie-in with the remainder of the existing access to existing homes |
| Ch. 8+500 | 640m access road AR 08/05 Width 4m | 451 , 489 | Provides access to attenuation ponds and unhindered access along it to 489 |
| Ch. 9+090 to Ch. 9+160 | 110m access road AR 09/01 Width 4m | 528, 543, 557 | Provides access to NUIG Sporting Campus as current access is severed by the proposed road development. Also provides access to an attenuation pond located near-by |
| Ch. 9+710 | 120m access road AR 09/02 Width 6m | 553, 551, | This access road will form part of the existing Menlo Castle Bóithrín and as such it must be noted that all |

| Location | | Plot ID / | Comments |
|---------------------------|---------------------------------------|------------------------|--|
| Approx. Chainage | Description | Landowner Reference | |
| | | 562, | landowner's rights of way on this |
| | | 564, | bóithrín will remain unaffected. |
| | | 500, | Also provides access to AR 09/03 |
| | | 552, | & AR 09/04 |
| | | 663, | |
| | | 461, | |
| | | 559, | |
| | | 471, | |
| | | 733, | |
| | | 580, | |
| | | Folio | |
| | | GY21502F, | |
| | | Folio | |
| | | GY100171F, | |
| | | Folio | |
| | | GY105725F, | |
| | | Folio | |
| | | GY50959F, | |
| | | Folio | |
| | | GY7047F, | |
| | | Folio | |
| | | GY105725F, | |
| | | Folio | |
| | | GY21502F | |
| | | Folio | |
| | | GY109981F | |
| | | GY123020F | |
| | | Lands | |
| | | bounded by | |
| | | Folios GY21502F; | |
| | | GY109981F; | |
| | | and | |
| | | GY123020F | |
| Ch. 9+560 to Ch. 9+710 | 145m access road AR 09/03 Width 4m | - | Provides access to attenuation ponds. Accessed from AR 09/02 |
| Ch. 9+710 to | 160m access road AR 09/04 | 500 | Provides access to land parcel as |
| Ch. 9+850 | Width 4m | | current access is severed by the |
| | ** IGGI TIII | | proposed road development. |
| | | | Accessed from AR 09/02 |
| Ch. 9+550 | 120m access road AR 09/05 | 648 | Provides access to land parcel as |
| | Width 4m | | current access is severed by the |
| | | | proposed road development |
| Ch. 9+500 | 120m access road AR 09/06 | 649 | Provides access to land parcel as |
| | Width 4m | | current access is severed by the |
| | | | proposed road development |

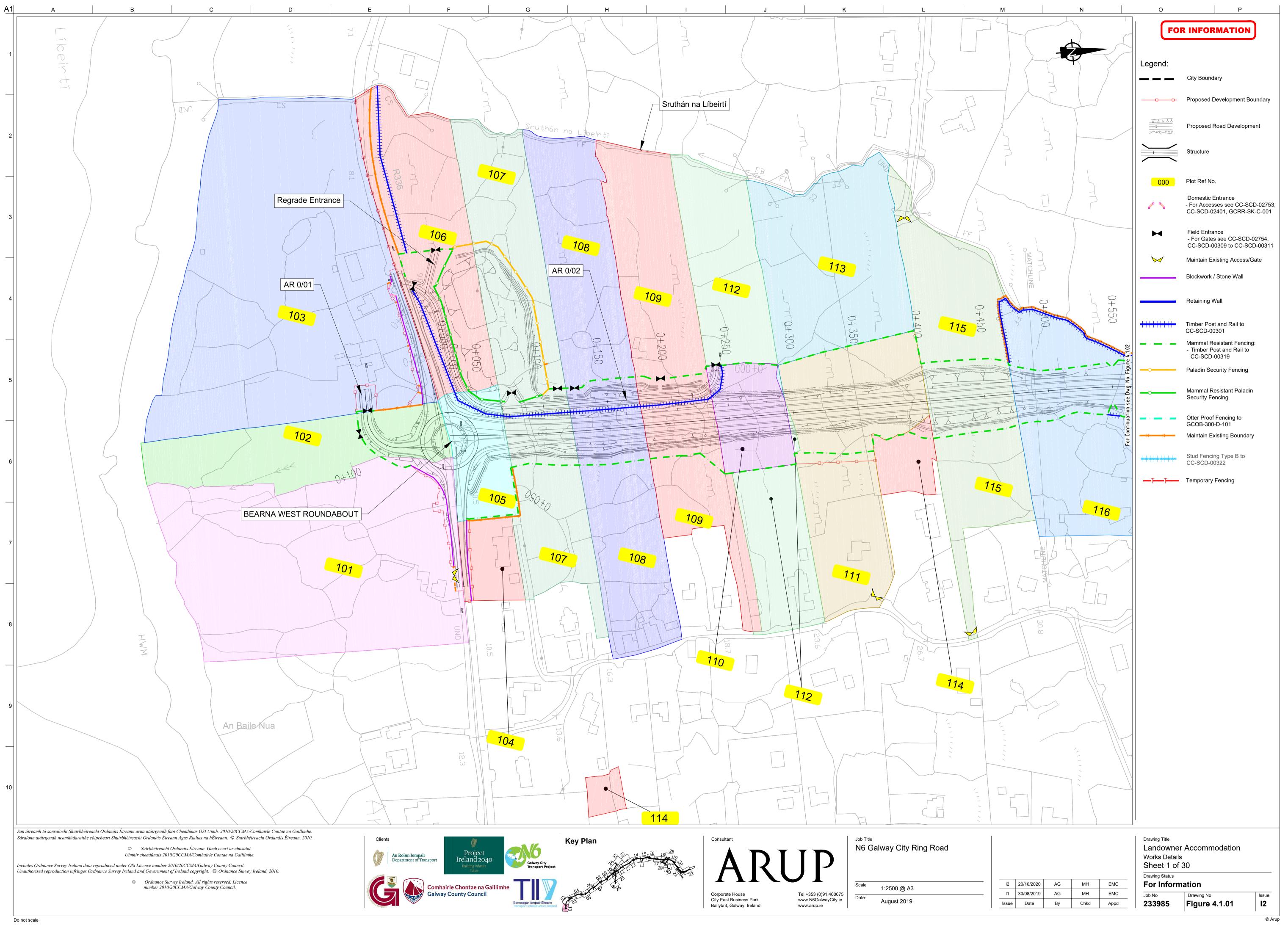
| Location | | Plot ID / | Comments |
|-----------------------------|---------------------------------------|--|--|
| Approx. Chainage | Description | Landowner Reference | |
| Ch. 10+050 to Ch. 10+140 | 85m access road AR 10/01 Width 4m | 563, 568, 564 | Located off Bóthar Nua, provides access to land parcels as current access is severed by the proposed road development |
| Ch. 10+475 to Ch. 10+890 | 420m access road AR 10/02 Width 4m | 553, 563, 572, 580, 581, 591 | Provides access to land parcels as current access is severed by the proposed road development; but also provides access to attenuation ponds - via AR 10/03, AR 10/04, AR 10/05, AR 10/06, or AR 10/07 |
| Ch. 10+625 | 100m access road AR 10/03 Width 4m | 563 | Provides access to land parcel as current access is severed by the proposed road development. Also provides access to attenuation pond. Ties-in to AR 10/02, AR 10/04 & AR 10/07 |
| Ch. 10+625 to Ch. 10+670 | 65m access road AR 10/04 Width 4m | 553 | Provides access to land. Ties-in to AR 10/03 & AR 10/05 |
| Ch. 10+625 to Ch. 10+725 | 125m access road AR 10/05 Width 4m | 553 | Ties-in to AR 10/02 and AR 10/03. Loop around attenuation pond and land access |
| Ch. 12+110 to Ch. 12+240 | 130m access road AR 12/01 Width 6m | 602/698/699 /704 | Provides access to commercial premises. Slight Re-alignment of the existing access as located in close proximity with the proposed N84 grade separated junction |
| Ch. 12+290 to Ch. 13+090 | 100m access road AR 12/03 Width 4m | 602/698/699 /704 | Provides access to land parcel of the commercial premises. Work required to realign existing access as it is located in close proximity with a proposed retaining wall |
| Ch. 12+540 to Ch. 13+100 | 630m access road AR 12/04 Width 4m | 626, 627, 631, Folio GY96107F, Folio GY51237 | Provides access to land parcels via School Road, as current access is severed by the proposed road development. Also provides access to attenuation ponds. Maintains access to the northern portion of Hynes' Bóithrín |
| Ch. 13+140 to Ch. 13+290 | 180m access road AR 13/02 Width 4m | 705, 651, 627 | Provides access via School Road to land parcels as current access is severed by the proposed road development |
| Ch. 13+390 to Ch. 13+425 | 45m access road AR 13/03 Width 4m | 705, 658 | Provides access to land parcels as current access is severed by the proposed road development. Located on an existing access road that connects with School Road. |

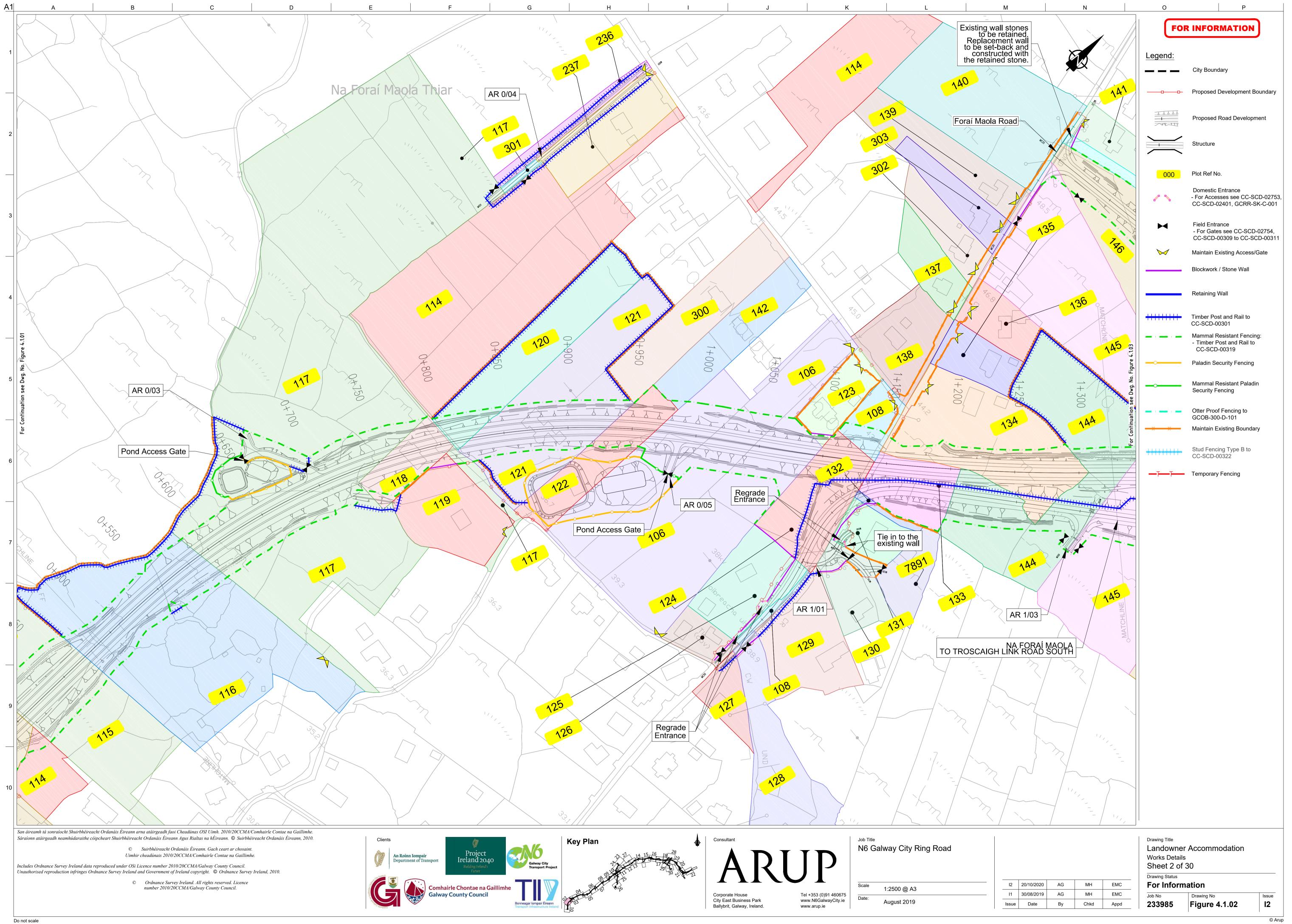
| Location | | Plot ID / | Comments |
|---|---|--|--|
| Approx. Chainage | Description | Landowner Reference | |
| | | | This access road will stem from the existing Castlegar Nursing Home Access Road and as such it must be noted that all landowner's rights of way on this access road will remain unaffected. The landowners affected include but are not limited to the following: 625, 654, 656, 658 |
| Ch. 13+725 (Off the N83 Tuam Road) | 25m access road AR 13/05 Width 4m | - | Provides access to attenuation ponds |
| Ch. 13+825 to Ch. 14+175 (Off the N83 Tuam Road) | 470m access road AR 13/06 Width 6m | 682, 681, 680, 679, 678, 677, 676, 675, 674, 673, | Provides a new access to individual houses and land parcels which are currently accessed directly from the N83 Tuam Road. Access road will be segregated from N83 Tuam Road |
| Parkmore Link Road | 50m access road AR 13/07 Width 6m | 695, 696 | Re-alignment of the existing access to commercial premises (Ballybrit Business Park) so as to accommodate the proposed Parkmore Link Road |
| Parkmore Link Road | 35m access road AR 13/08 Varies to tie to existing | 695 | Re-alignment of the existing access to commercial premises (Ballybrit Business Park) so as to accommodate the proposed Parkmore Link Road |
| Parkmore Link Road | 50m access road AR 13/09 Width 6m | 695 | Re-alignment of the existing access to commercial premises (Ballybrit Business Park) so as to accommodate the proposed Parkmore Link Road |
| Parkmore Link Road | 20m access road AR 14/04 Width 4m | 701 | Provides access to land parcel as current access is severed by the proposed road development |
| Parkmore Link Road | 75m access road AR 14/07 Varies to tie to existing | 691 | Provides access to Galway Racecourse |
| Parkmore Link Road | 20m access road AR 14/08 Width 6m | 691 | Provides access to Galway Racecourse (Taxi Entrance) |

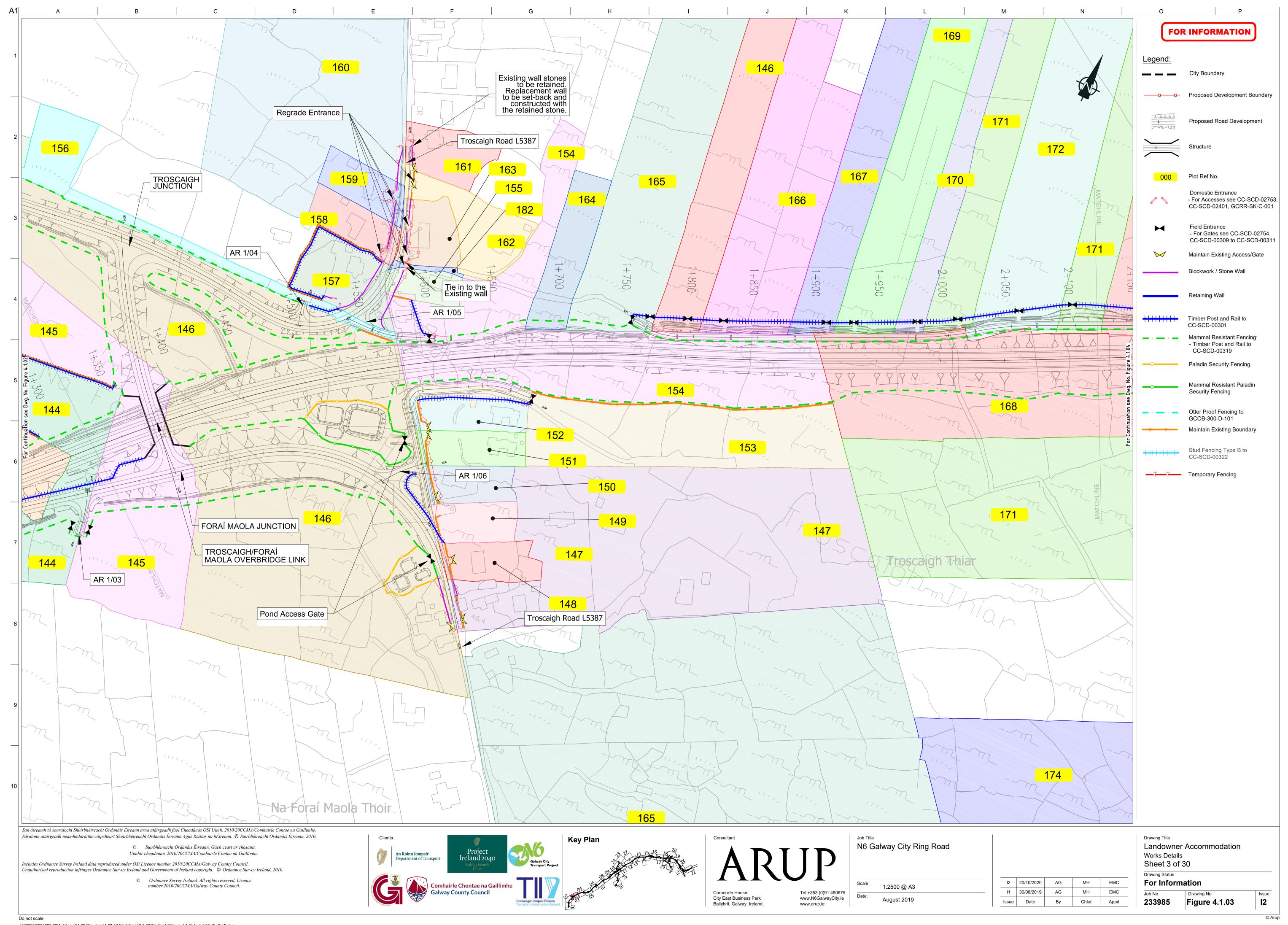
| Location | | Plot ID / | Comments |
|--|---------------------------------------|--------------------------------------|---|
| Approx. Chainage | Description | Landowner Reference | |
| Ch. 15+690 to Ch. 15+720 | 30 m access road AR 15/04 Width 6m | 720, 719 | Slight re-alignment of the current access to a commercial premise (from proposed AR 15/03) as it is in close proximity with the proposed S15/02 Underbridge |
| City East Business Park Junction | 55m access road AR 15/05 Width 7m | 729, 691 | Re-alignment of the existing access road to the Galway Racecourse as part of the near-by junction's upgrade |
| Briarhill Link | 55m access road AR 16/01 Width 6m | 724 | Provides access to land parcel as current access is severed by the proposed road development and to attenuation ponds |
| Ch. 16+800 to Ch. 16+830 | 30m access road AR 16/02 Width 4m | 756, | Upgrade/slight re-alignment of an existing access road to serve land parcel severed by proposed development boundary |
| Ch. 16+950 to Ch. 17+475 | 560m access road AR 17/01 Width 4m | 754, 751, 752 | Provides access to land parcels as current access is severed by the proposed road development. Connects to existing access road |

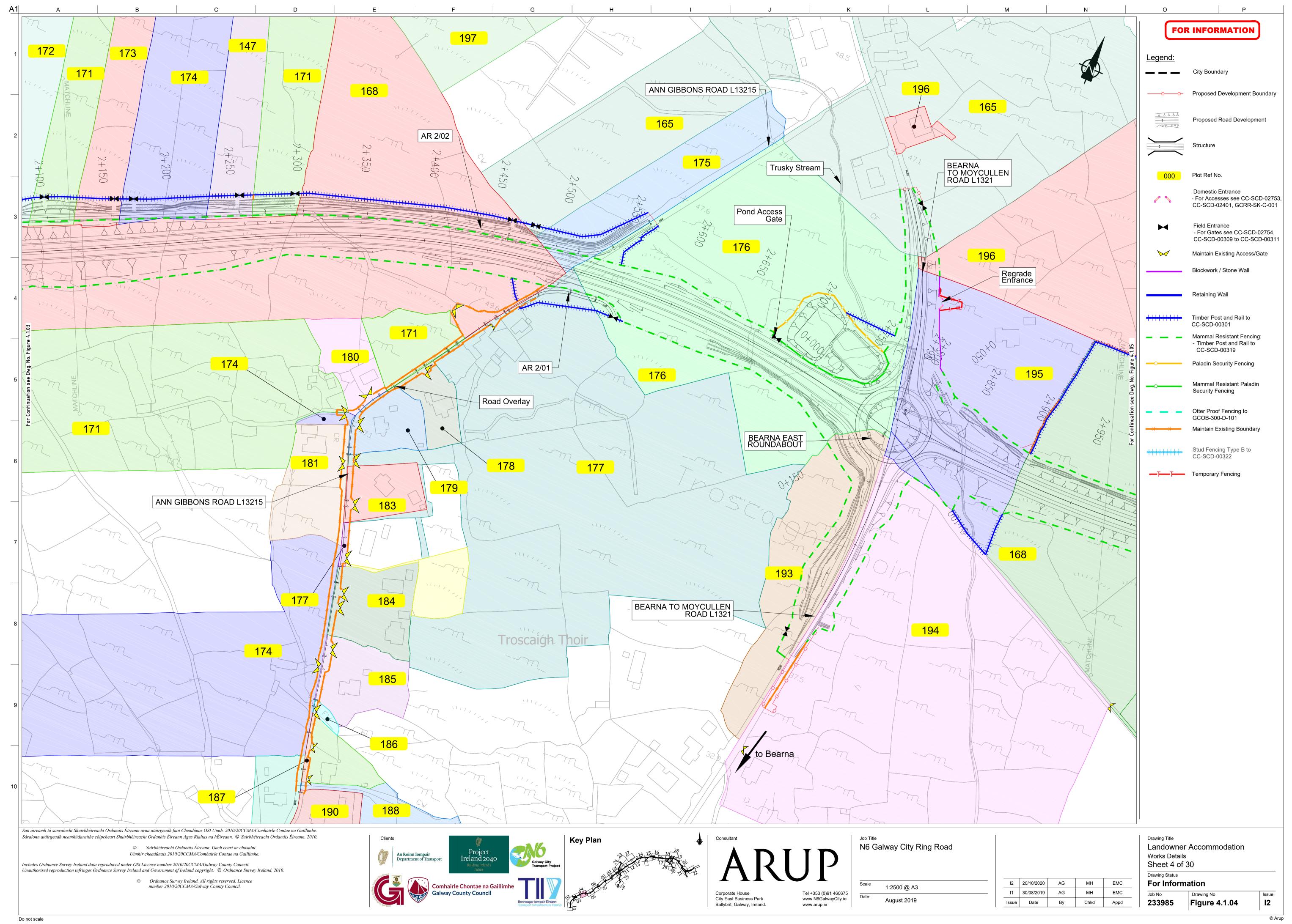
Amended Appendix A.9.1

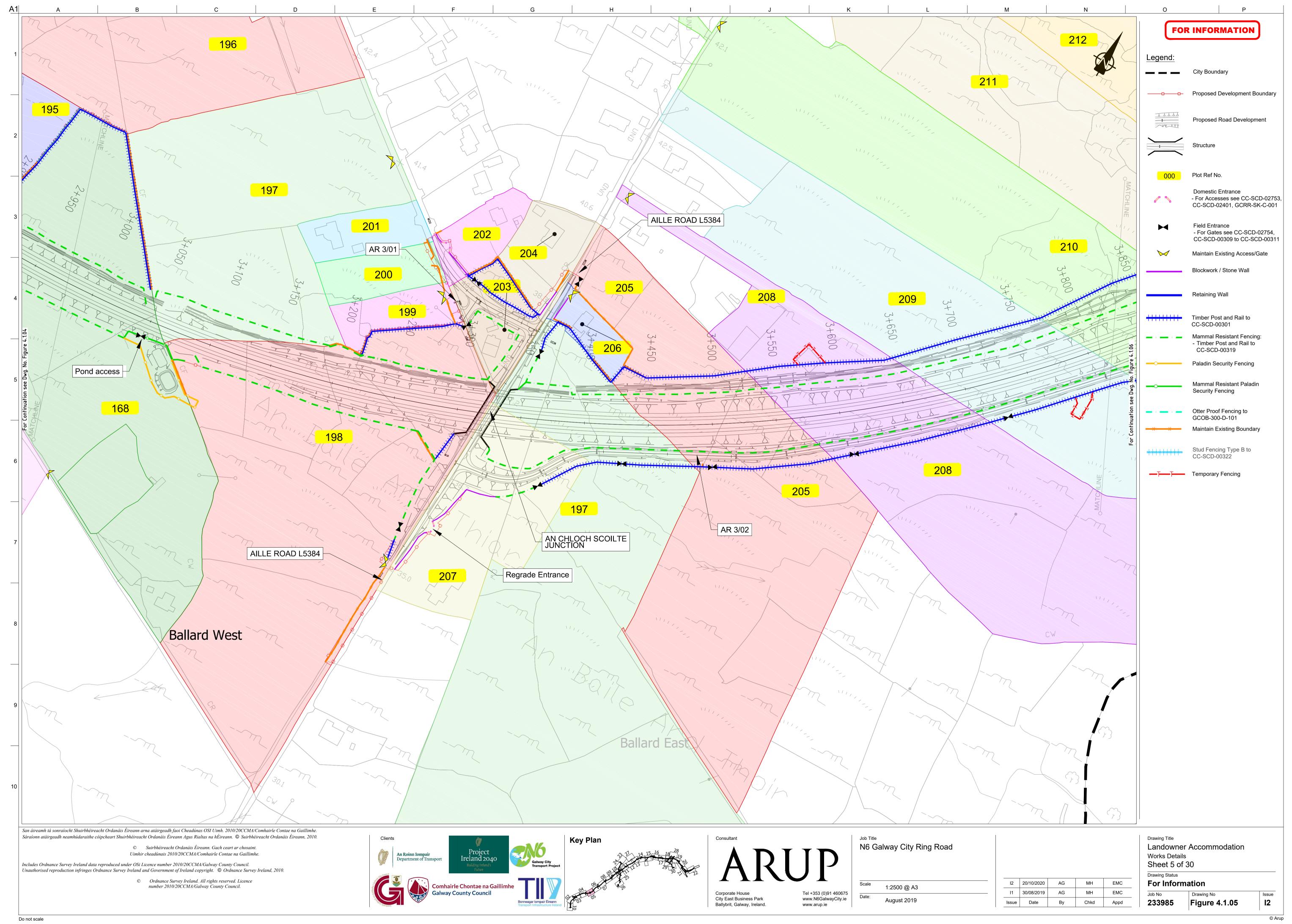
Landowner Accommodation Works Details_I2

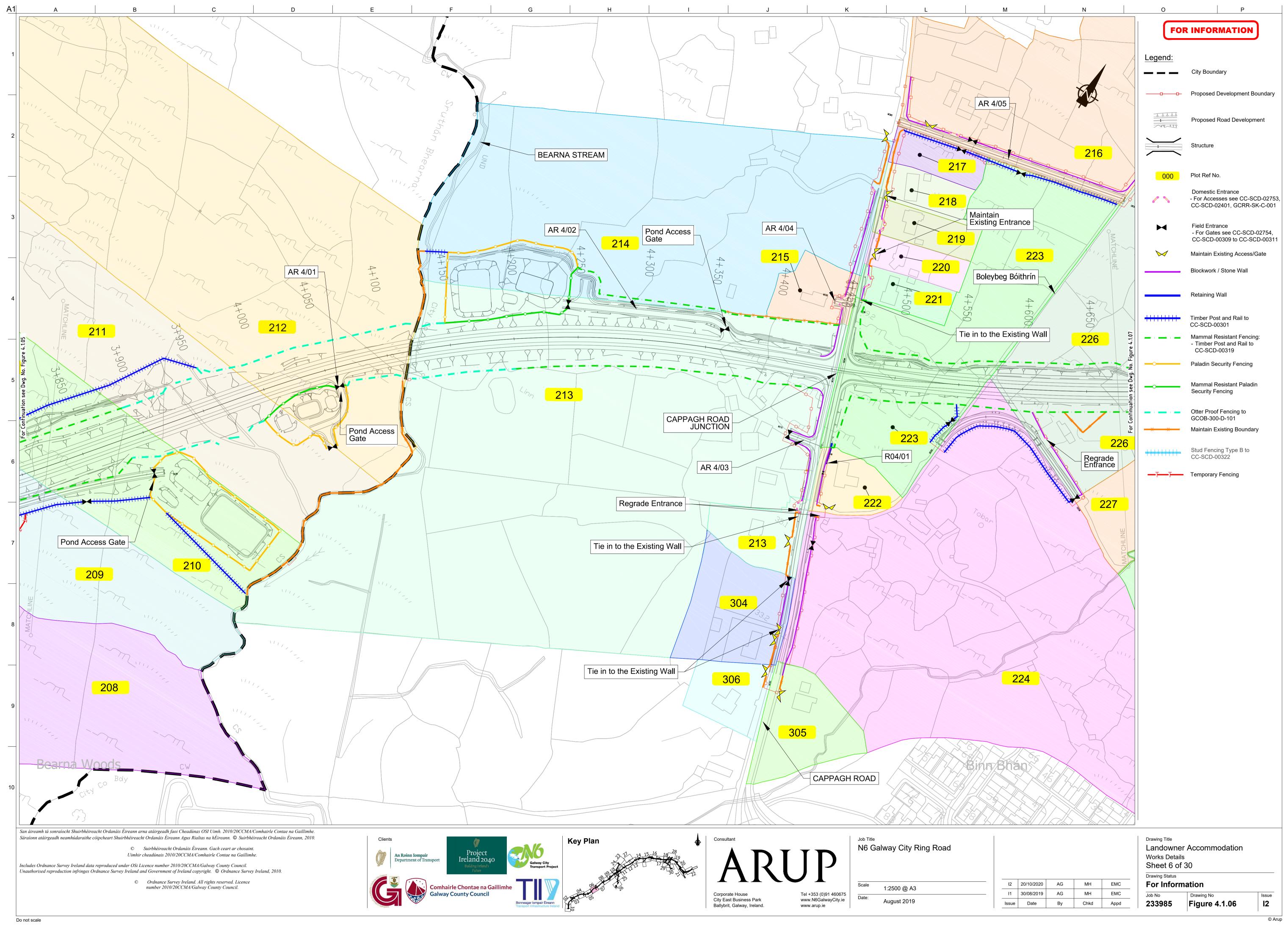


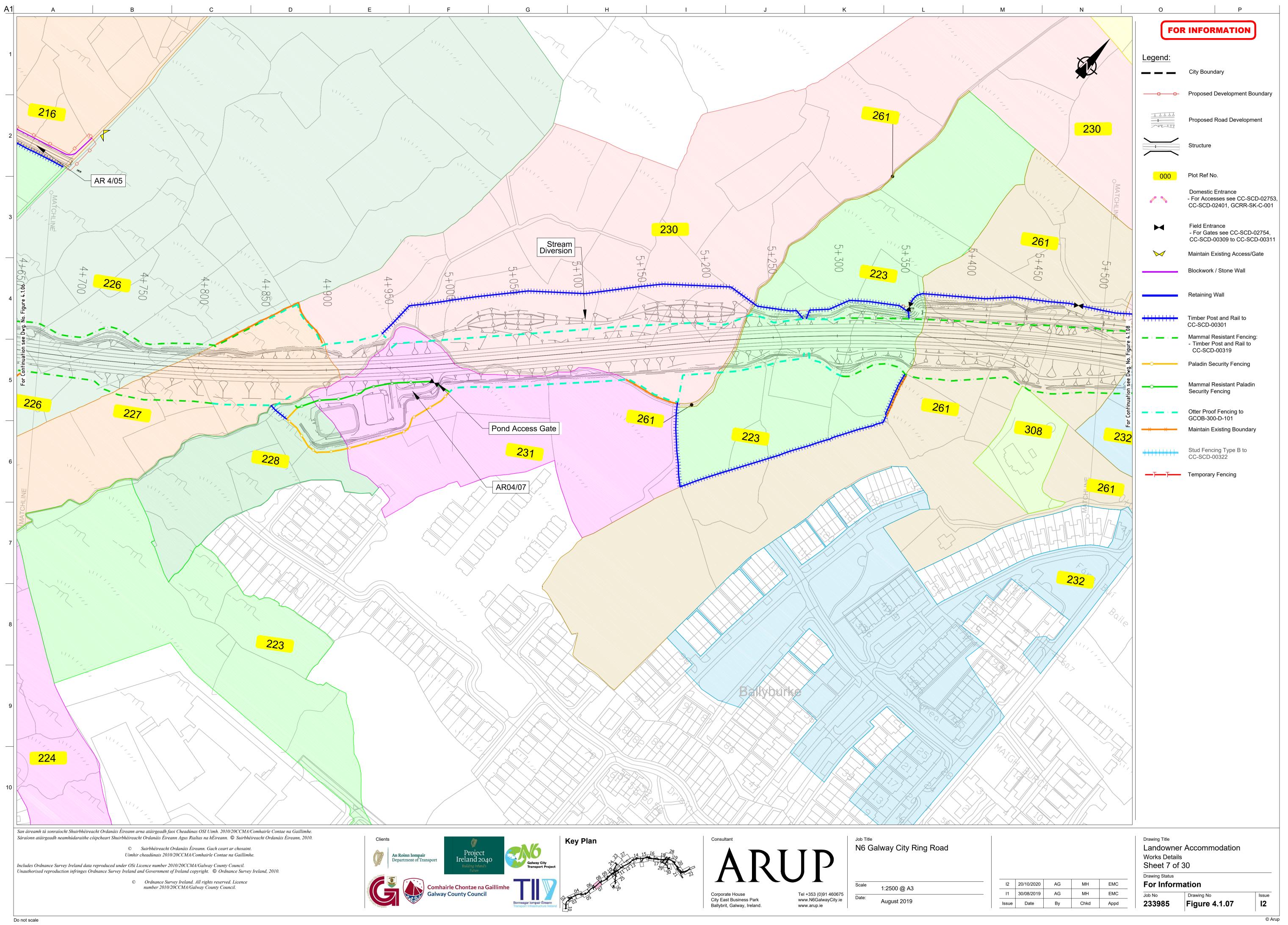


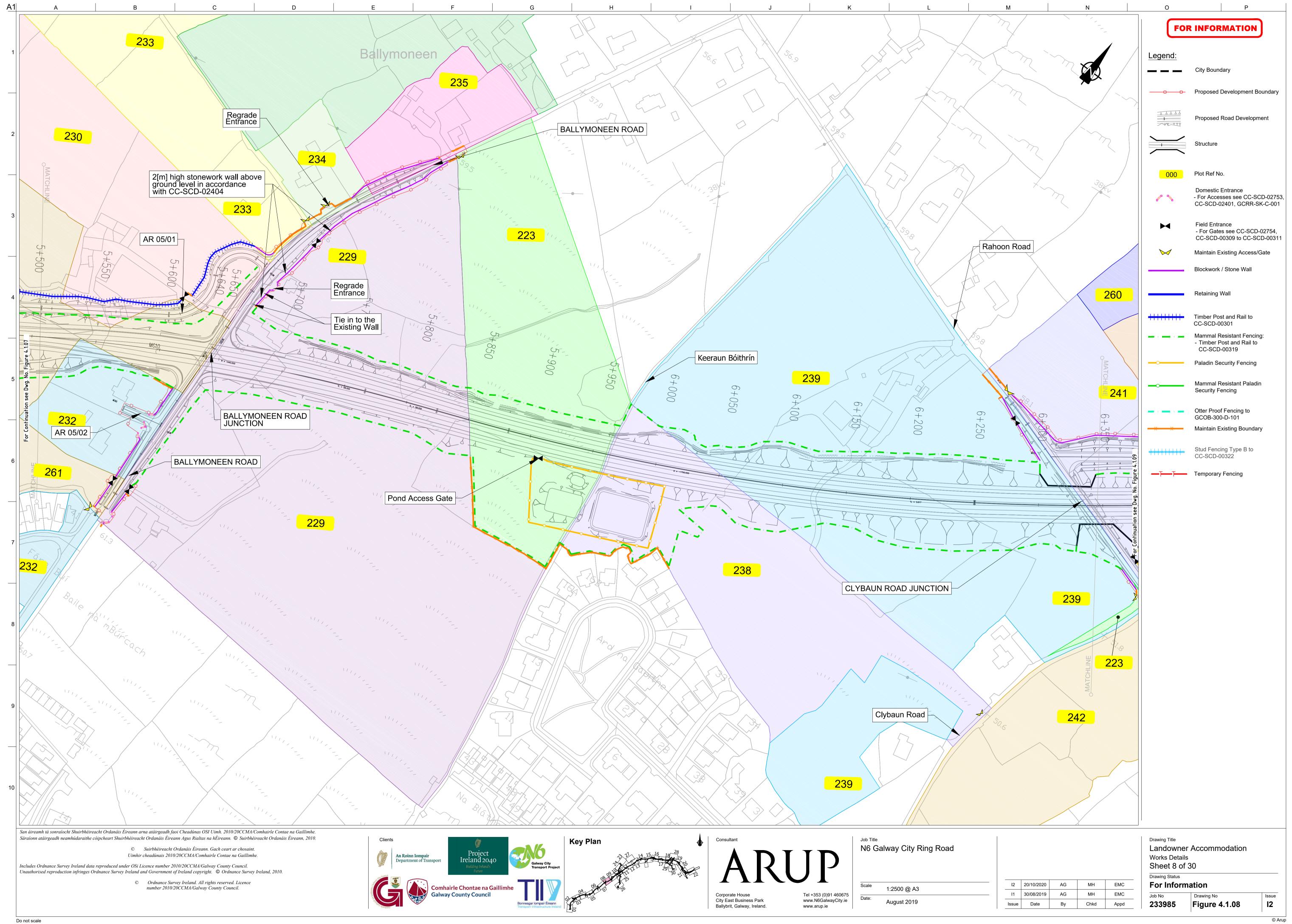


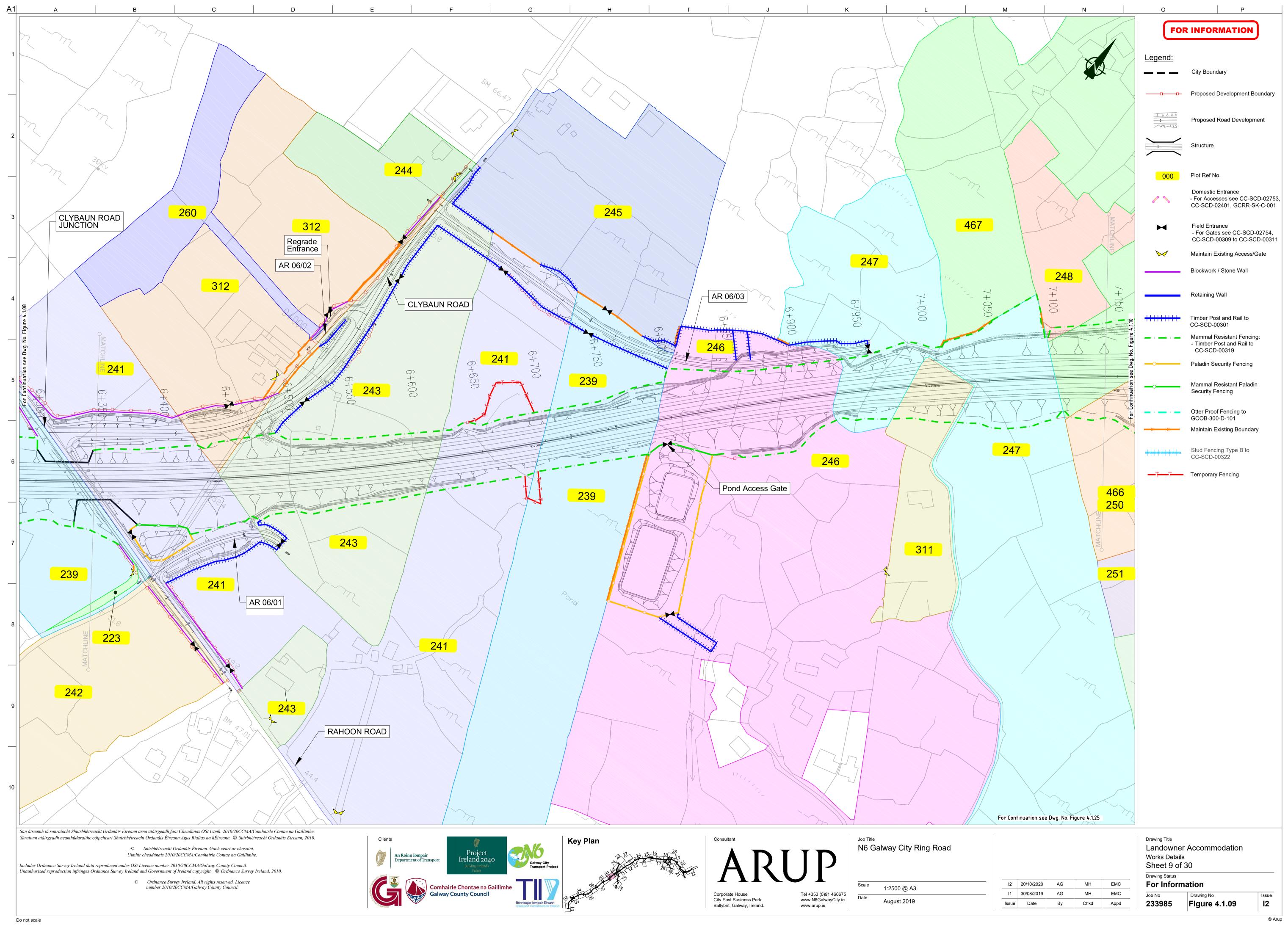


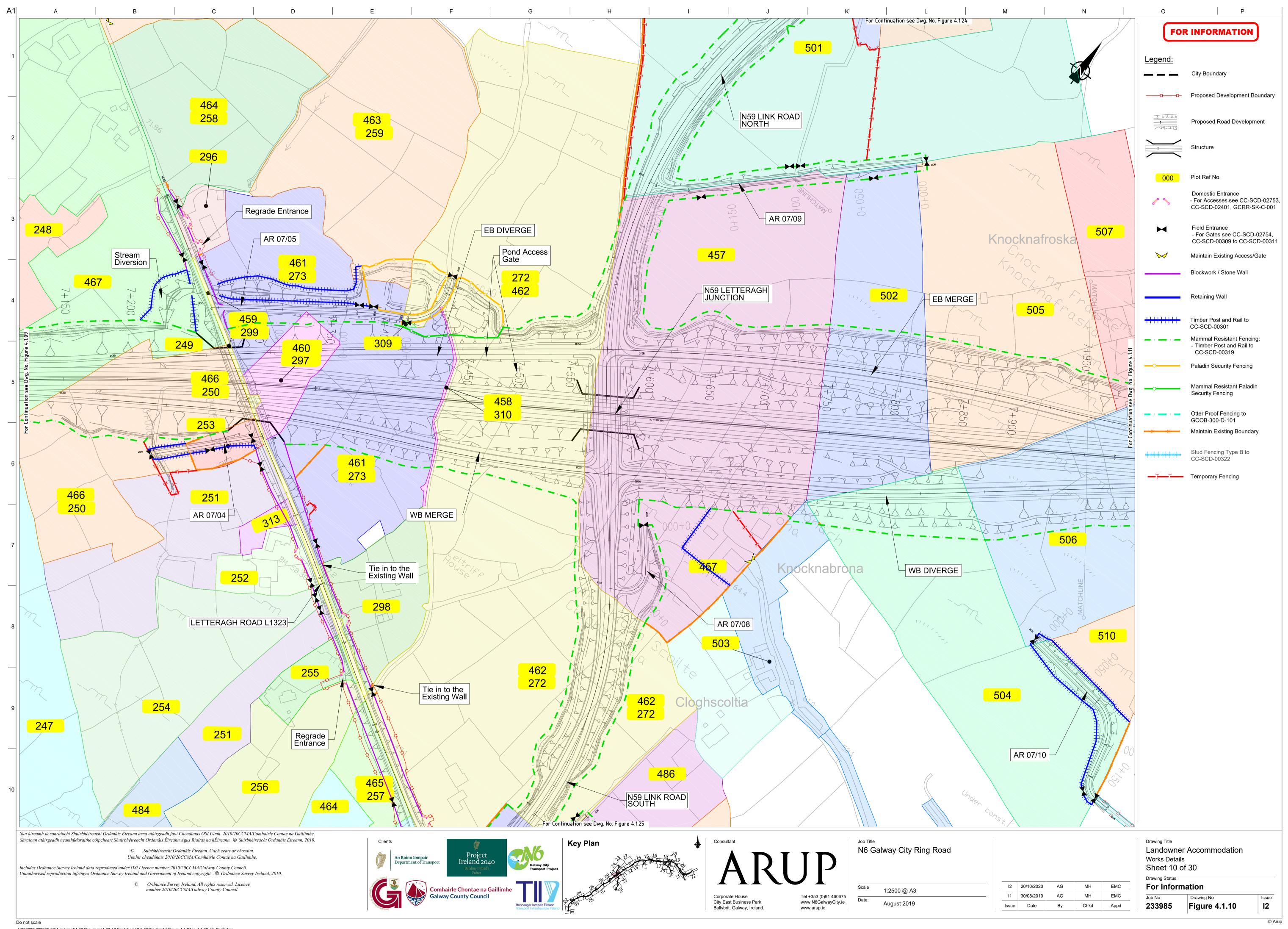


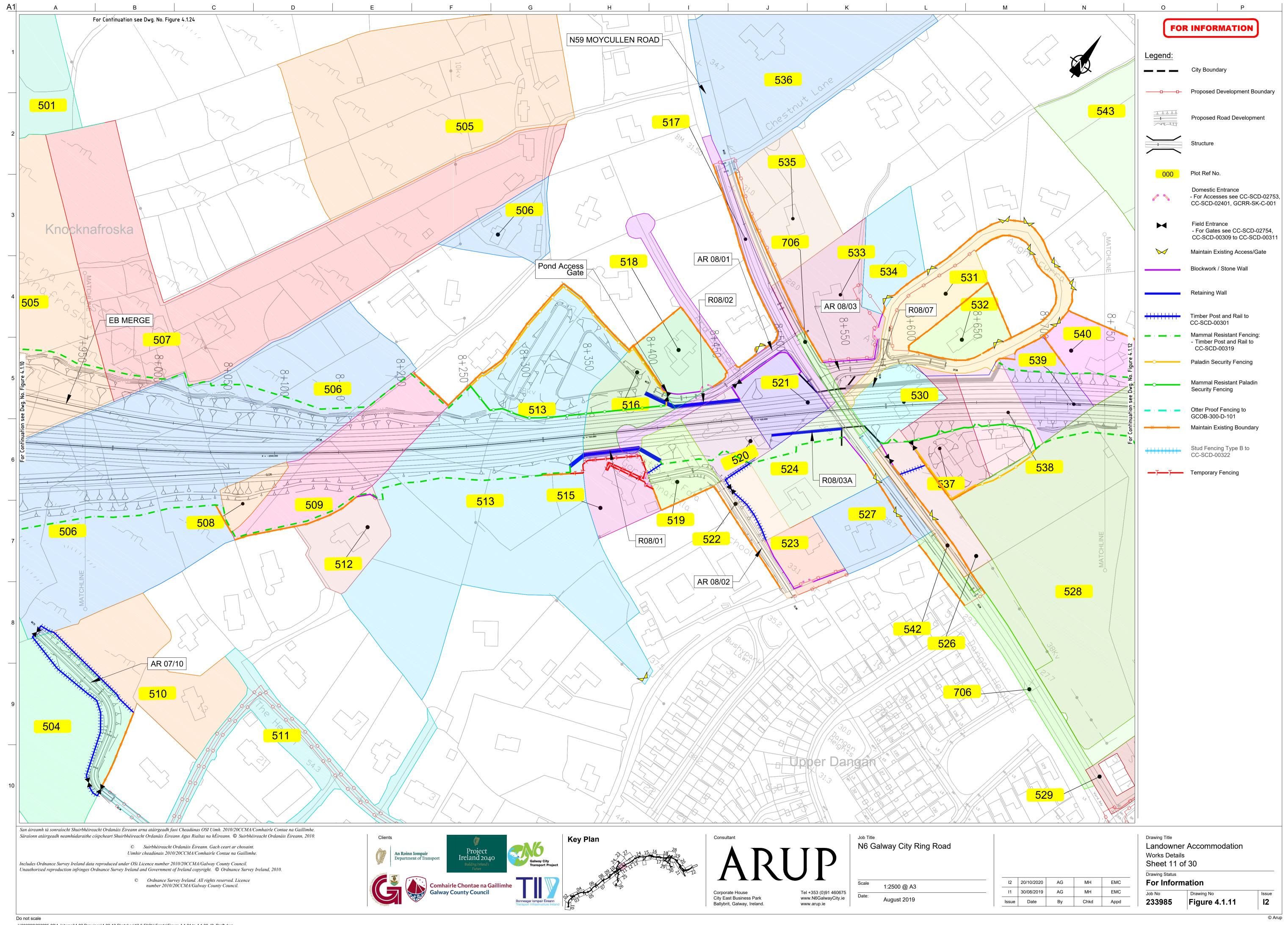


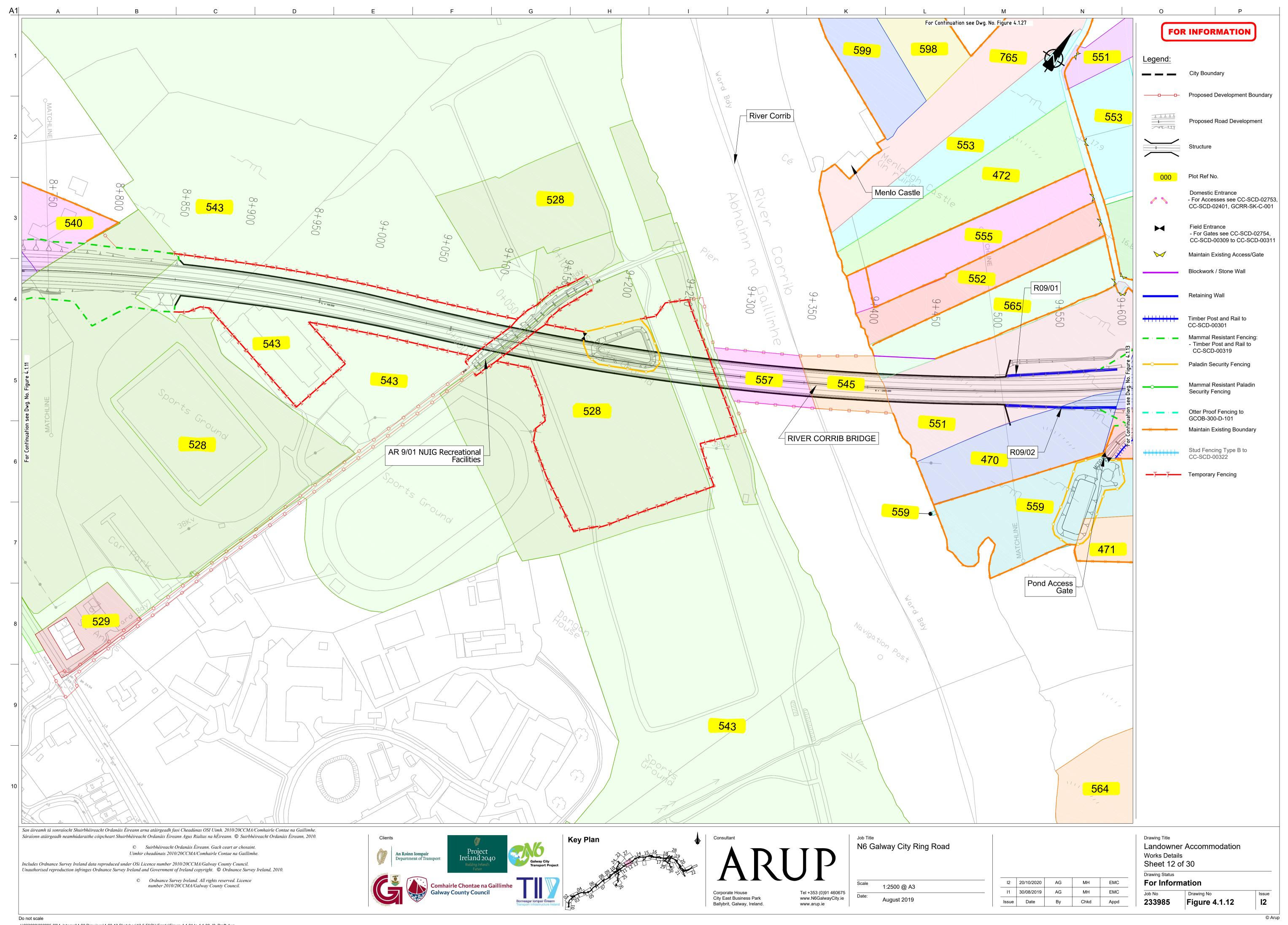


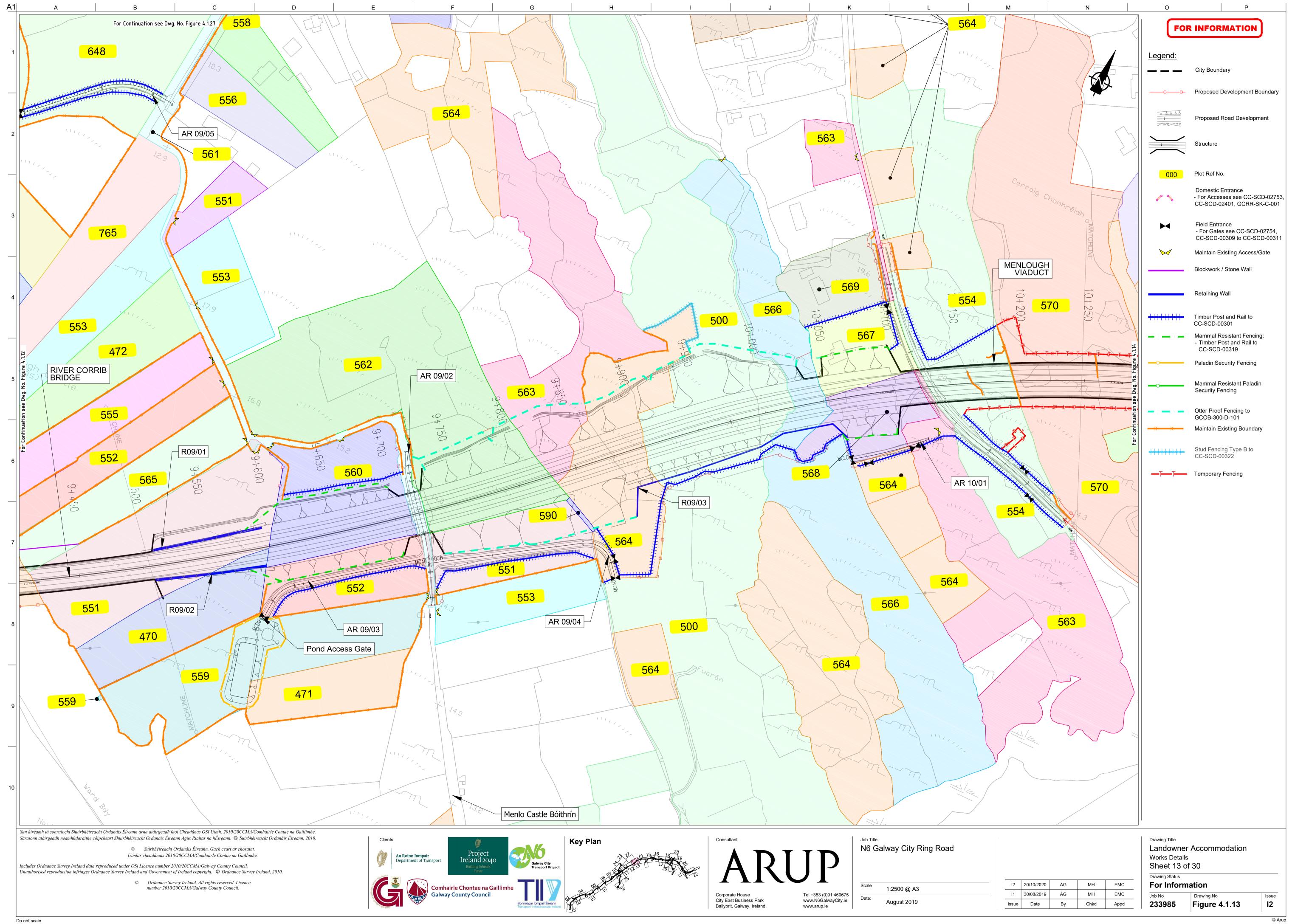


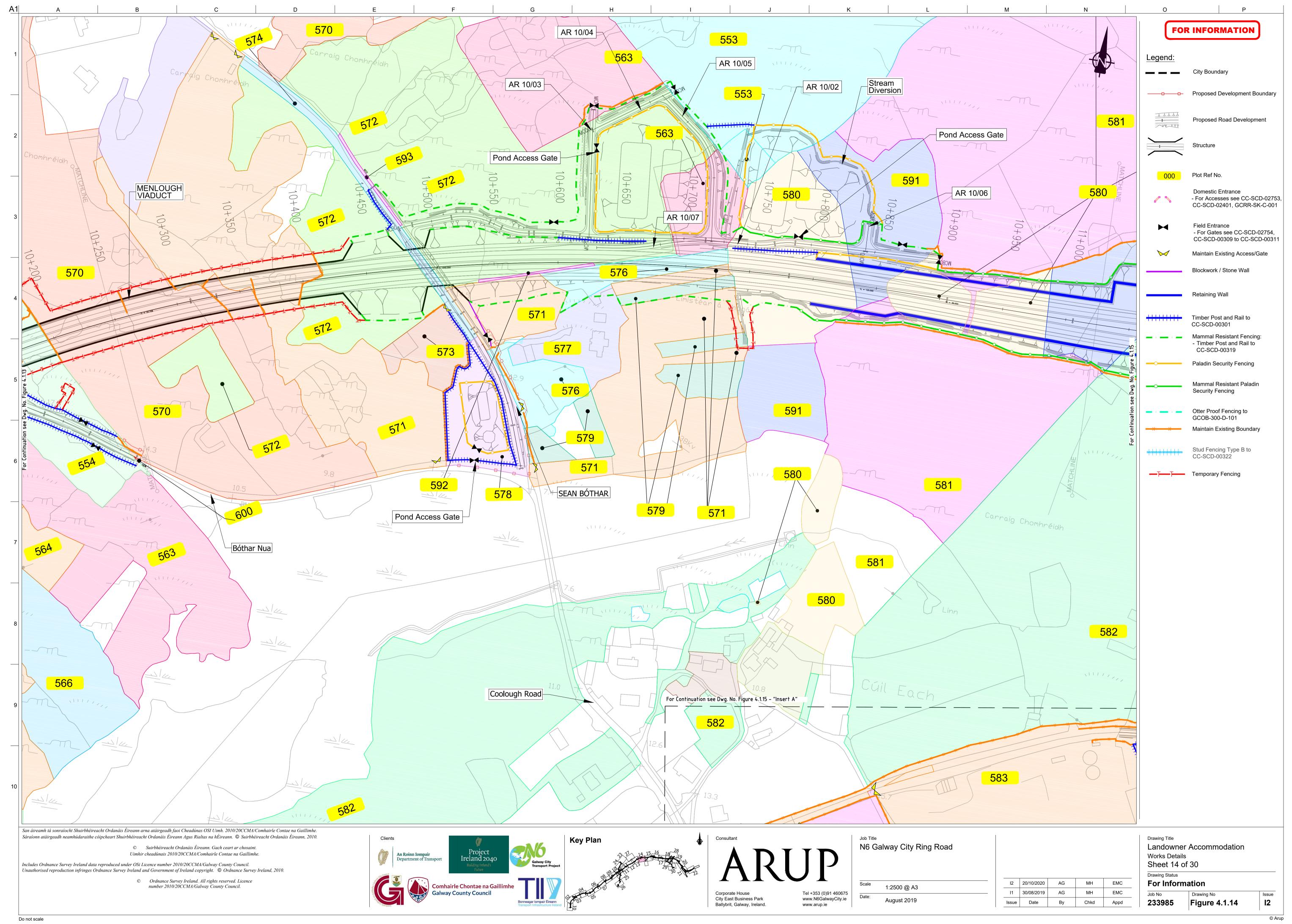


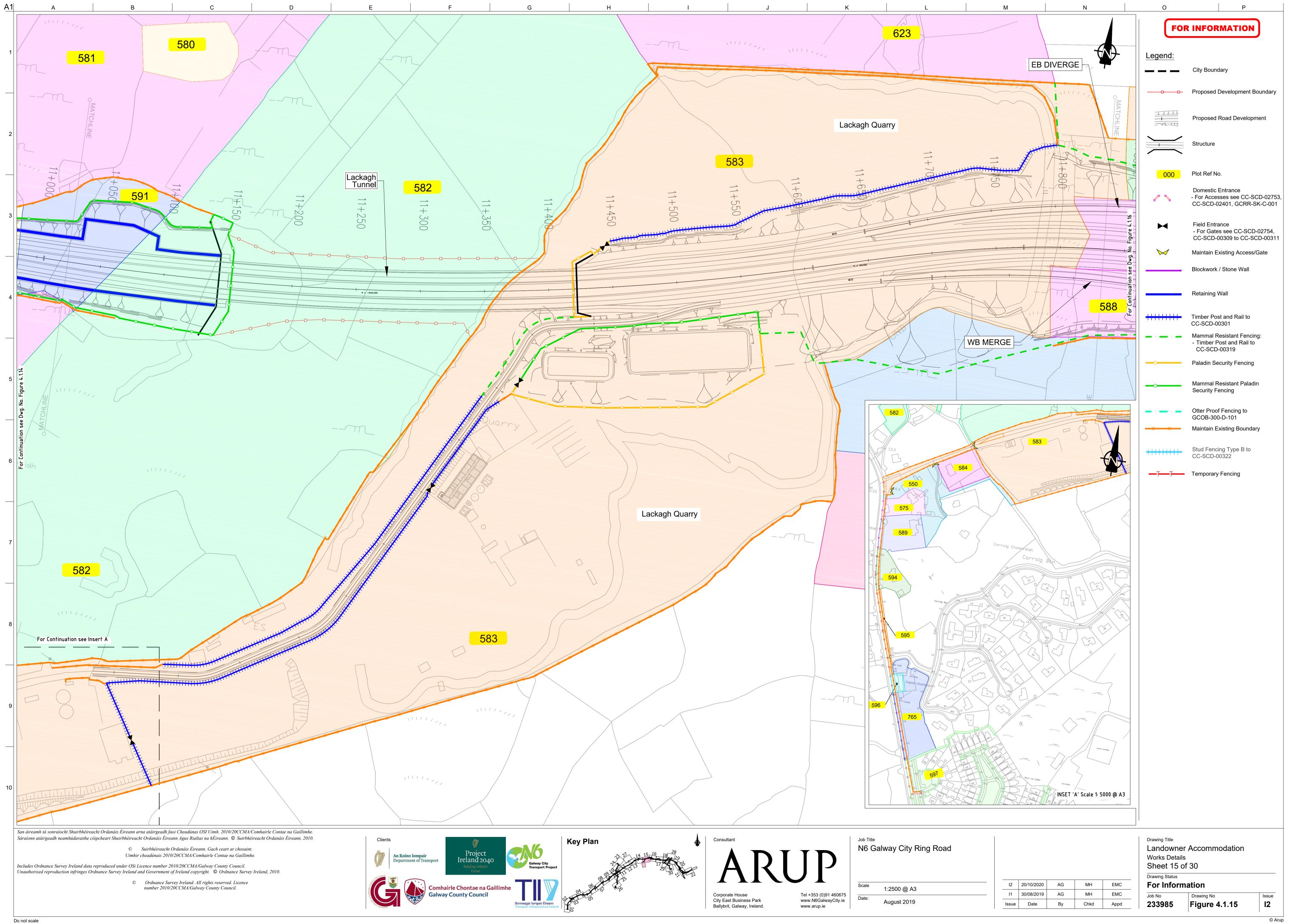


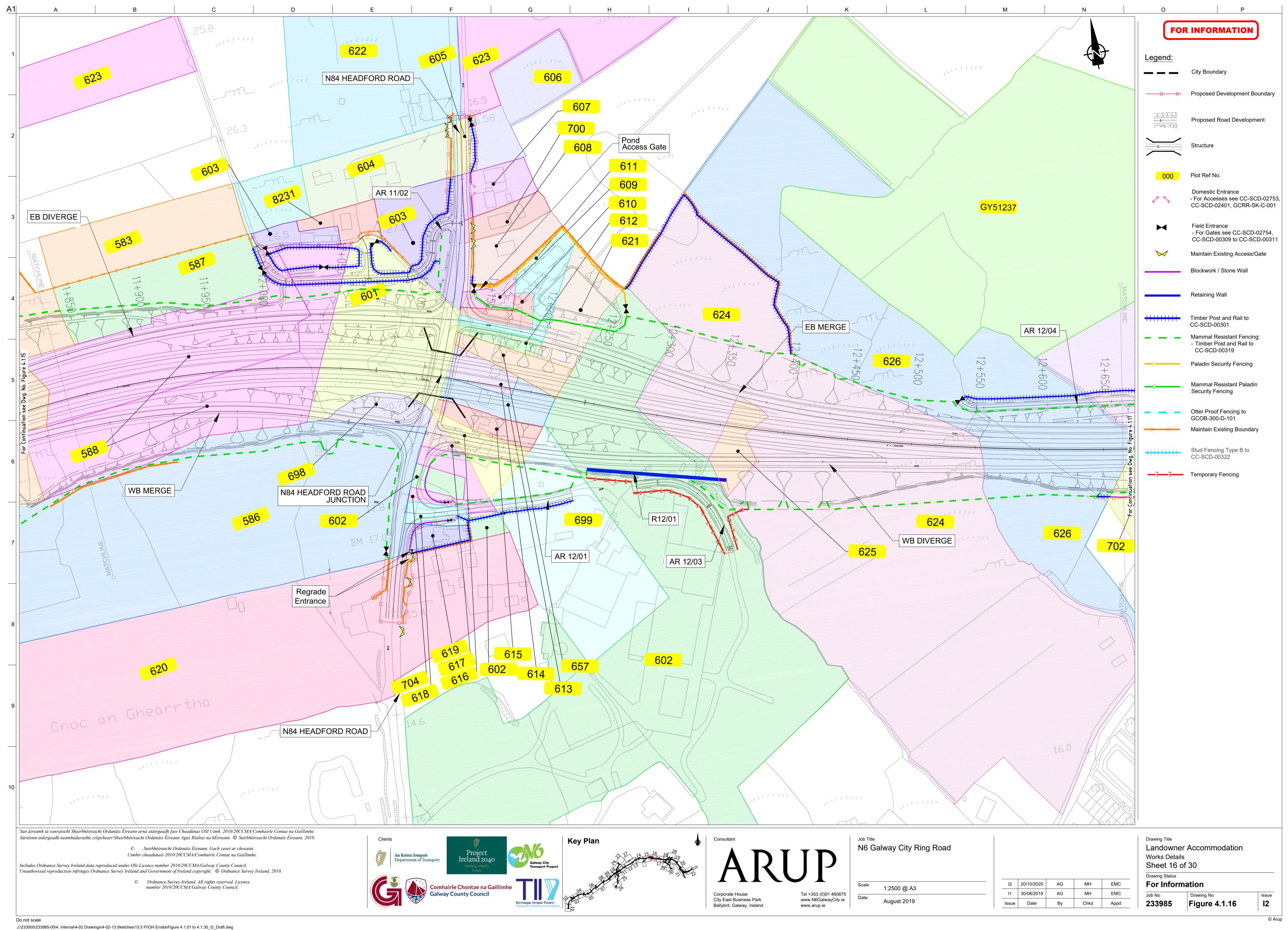


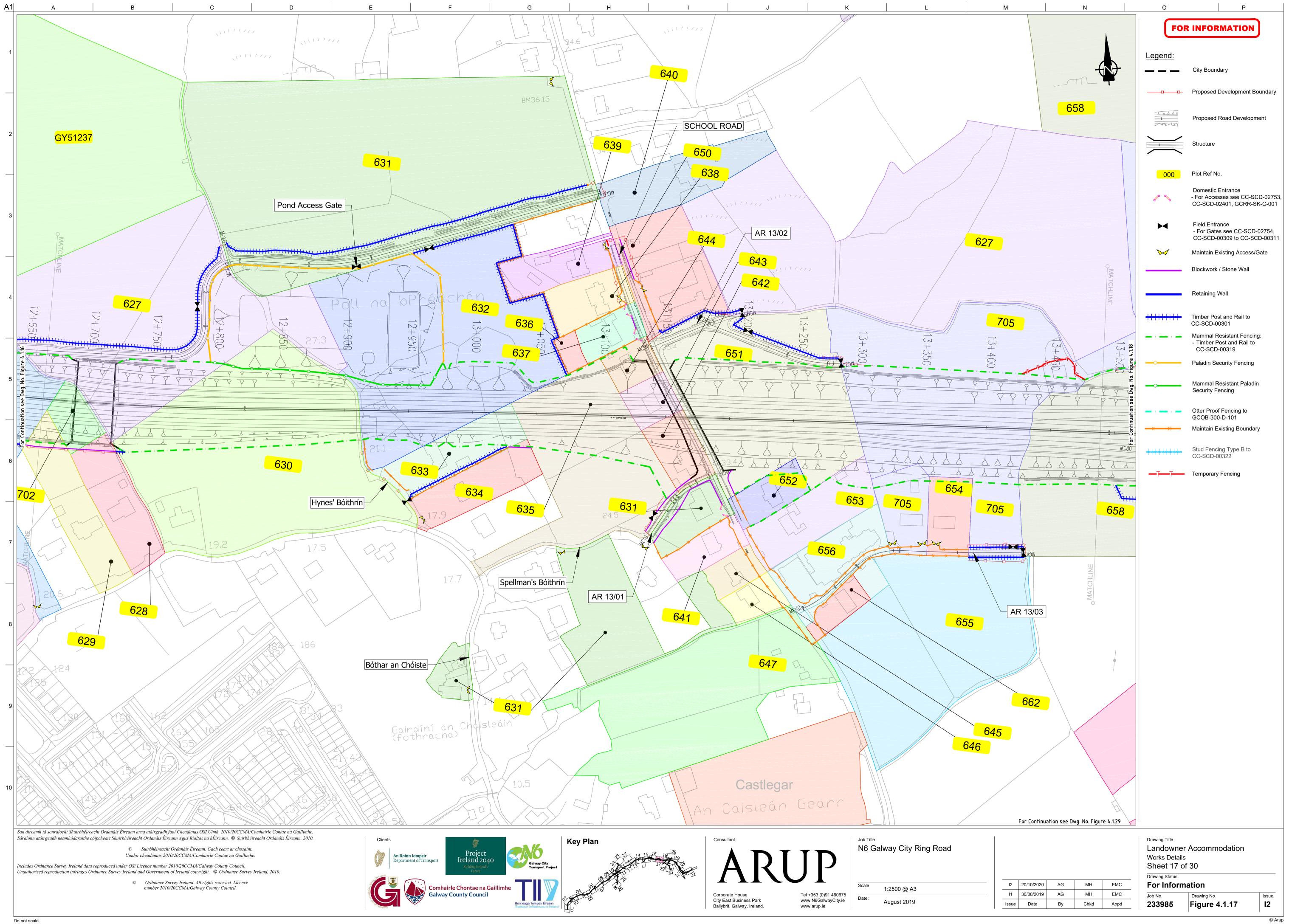


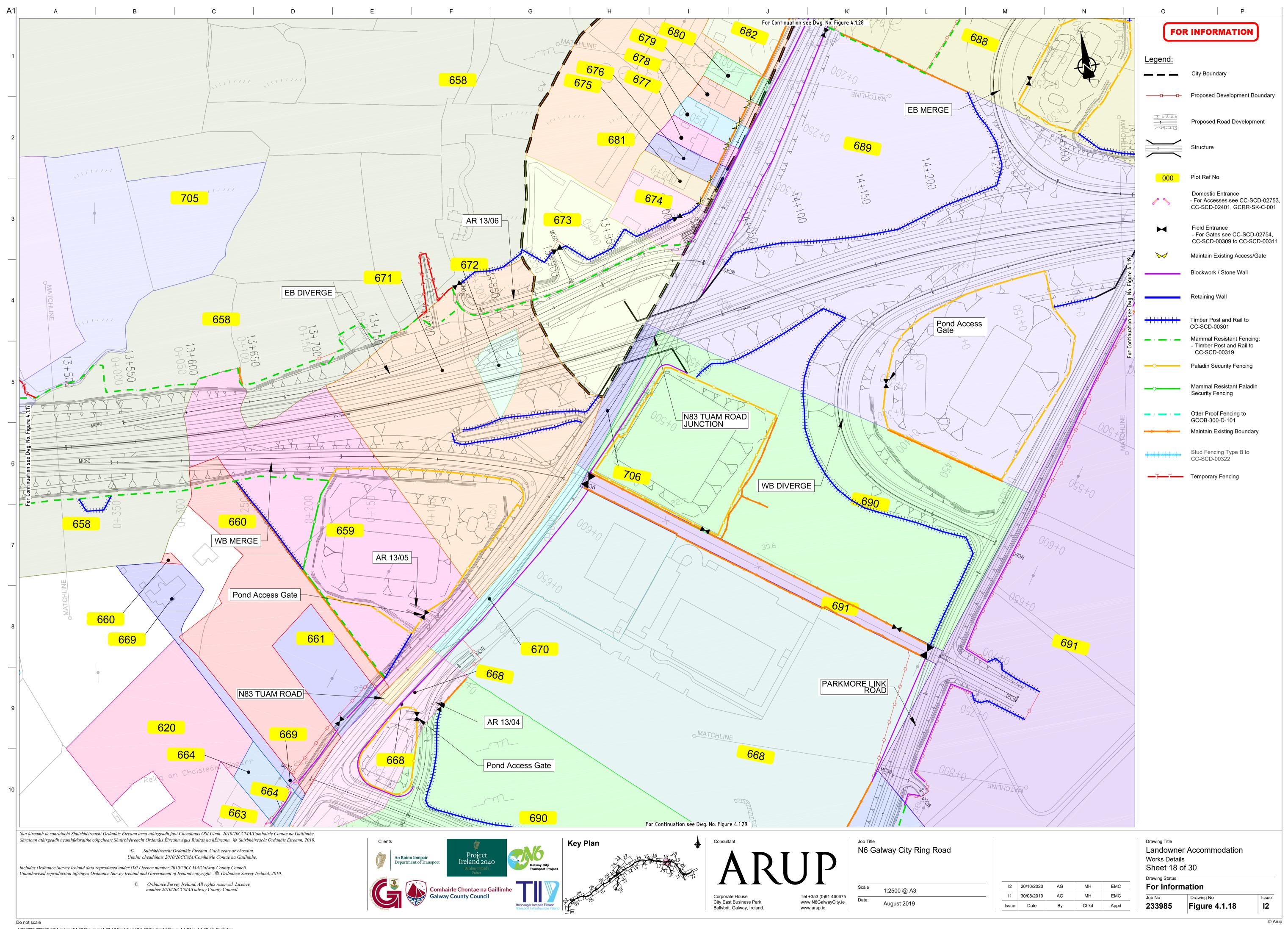


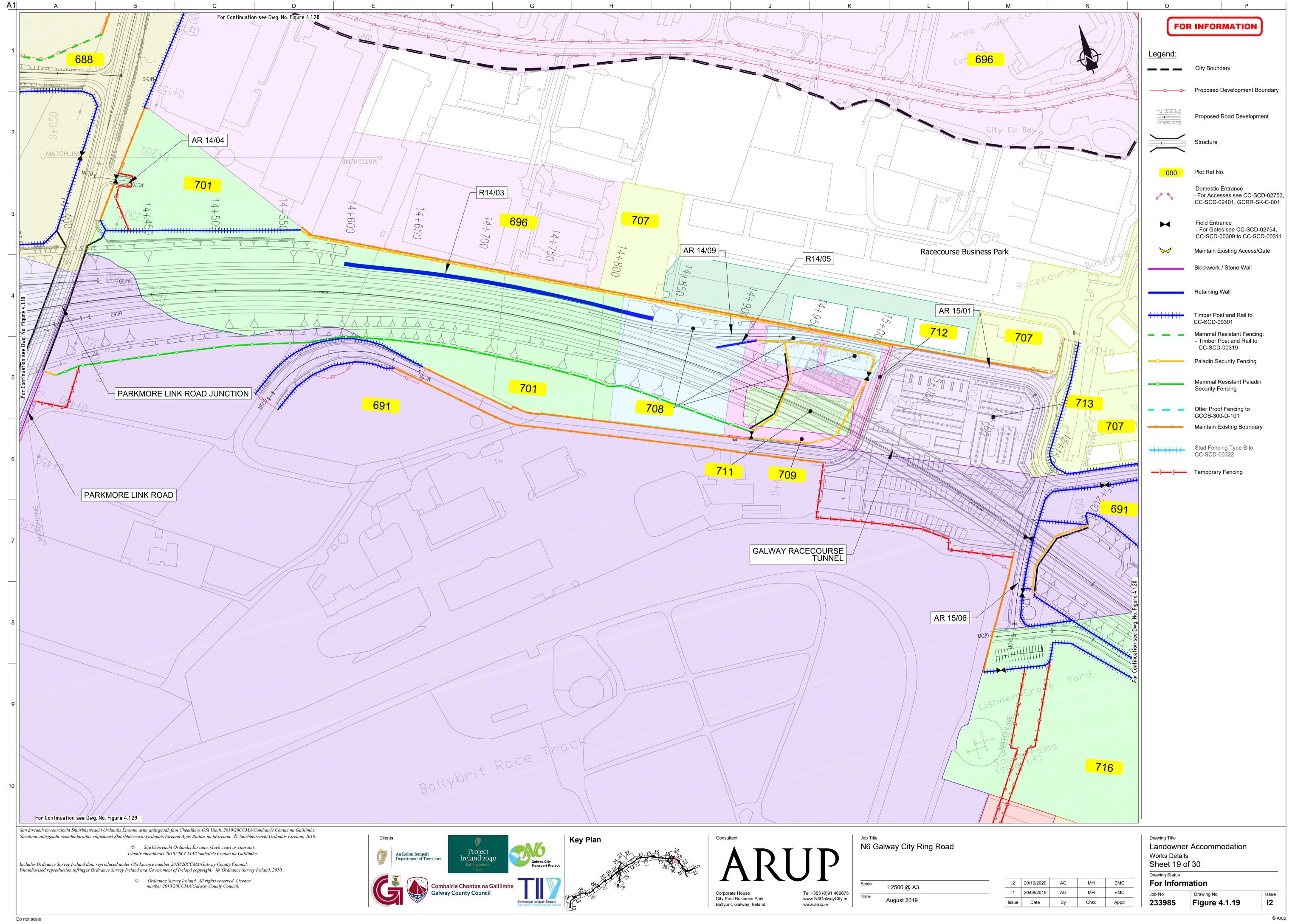


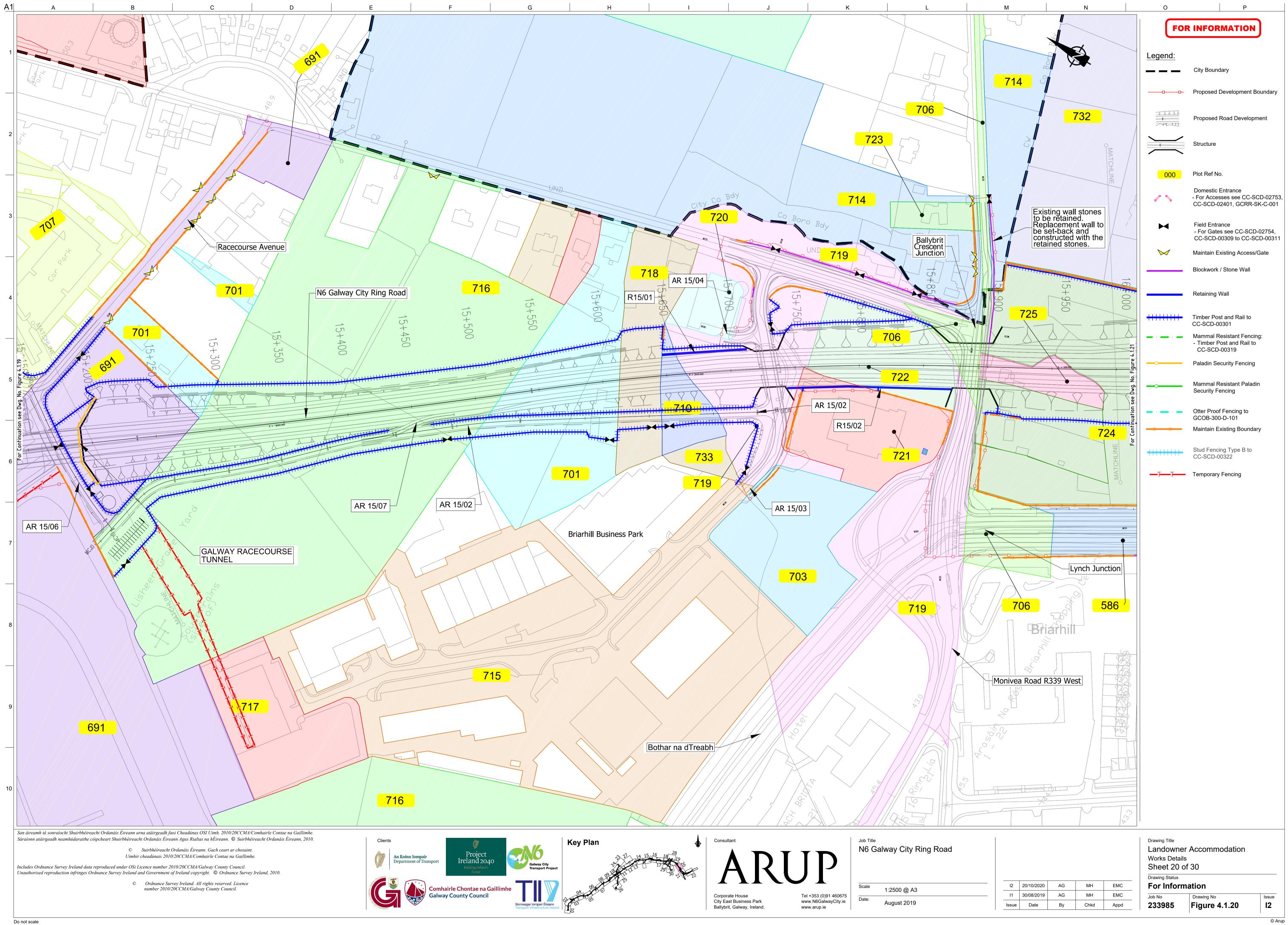


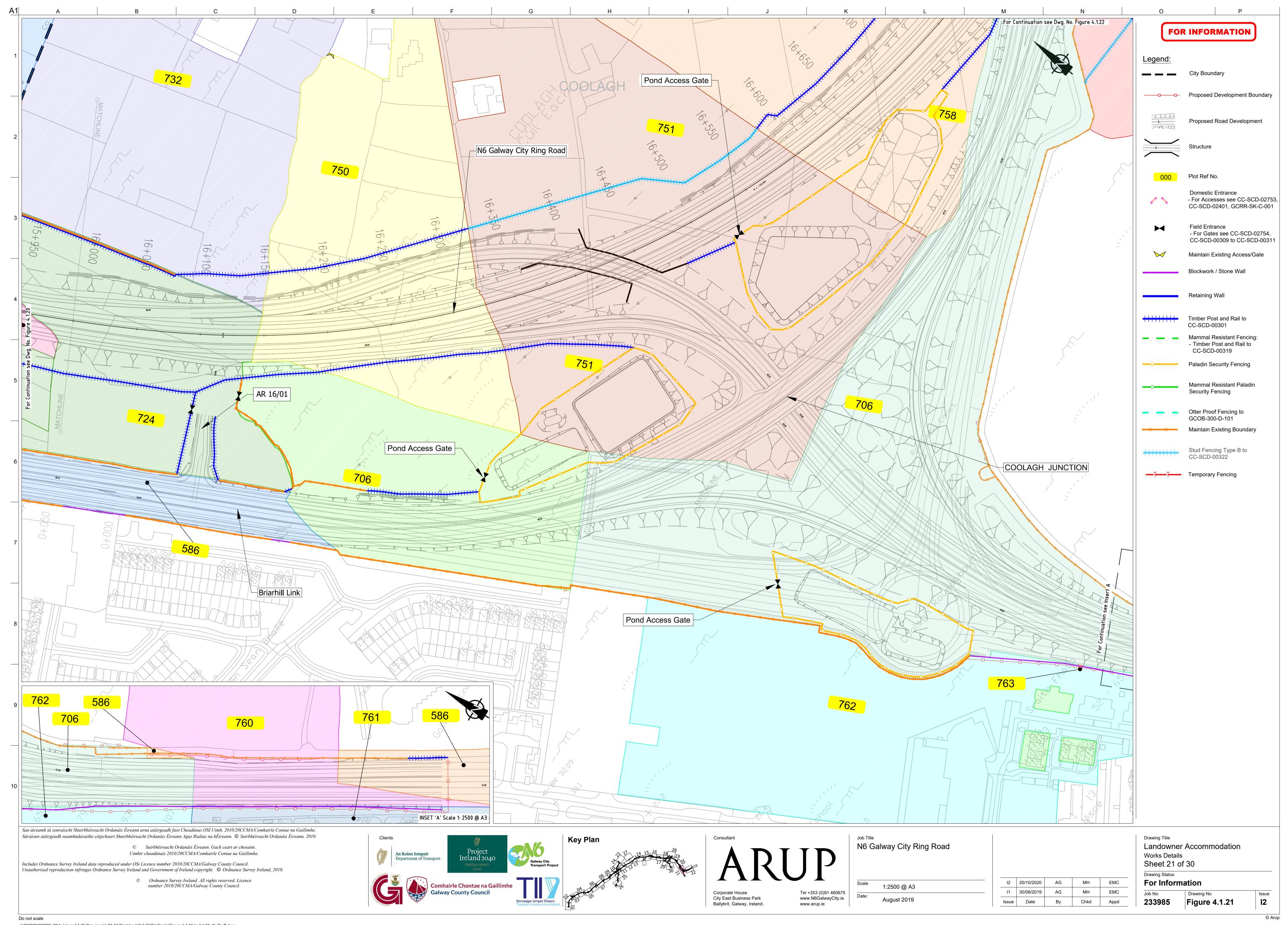


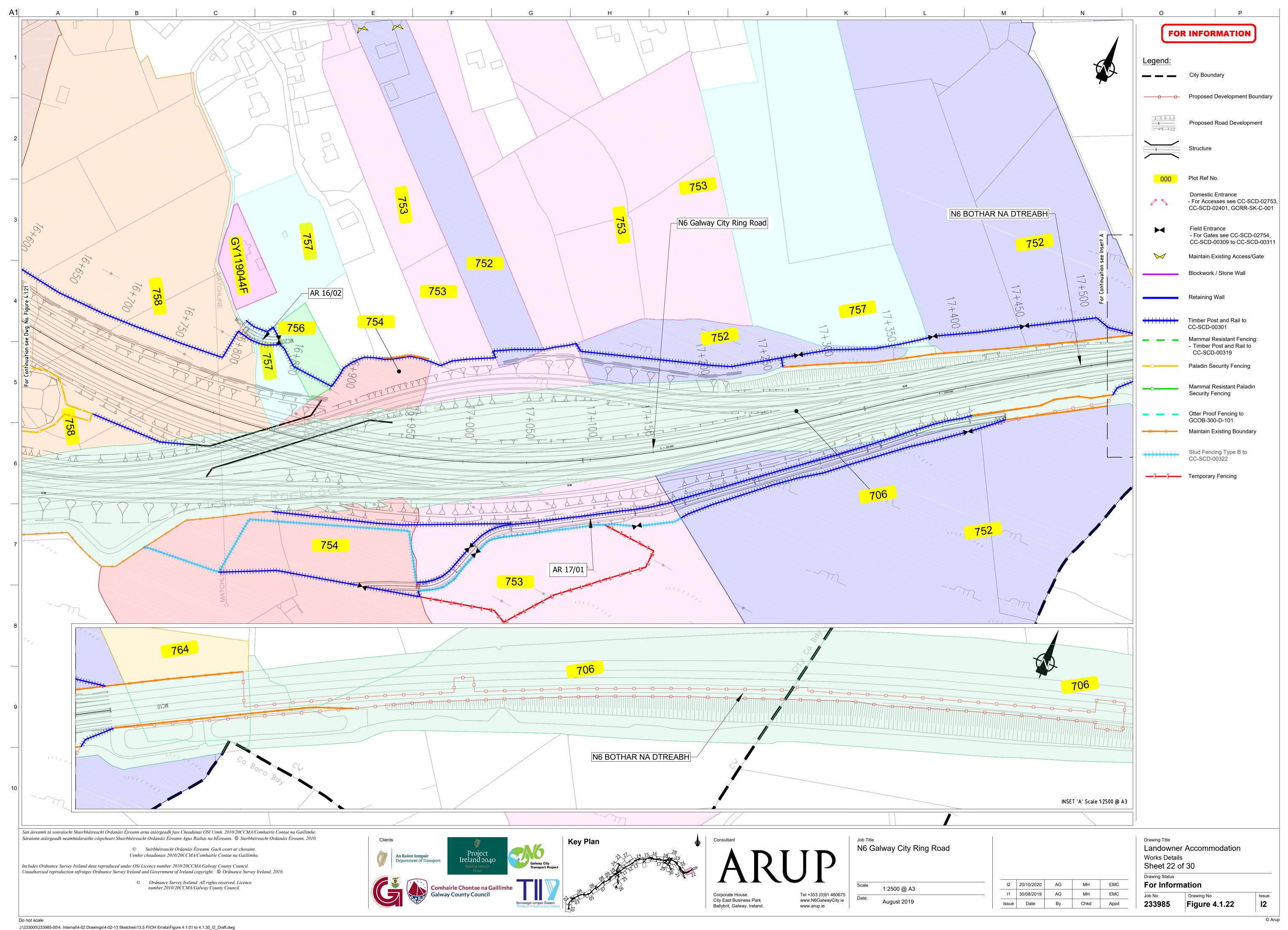


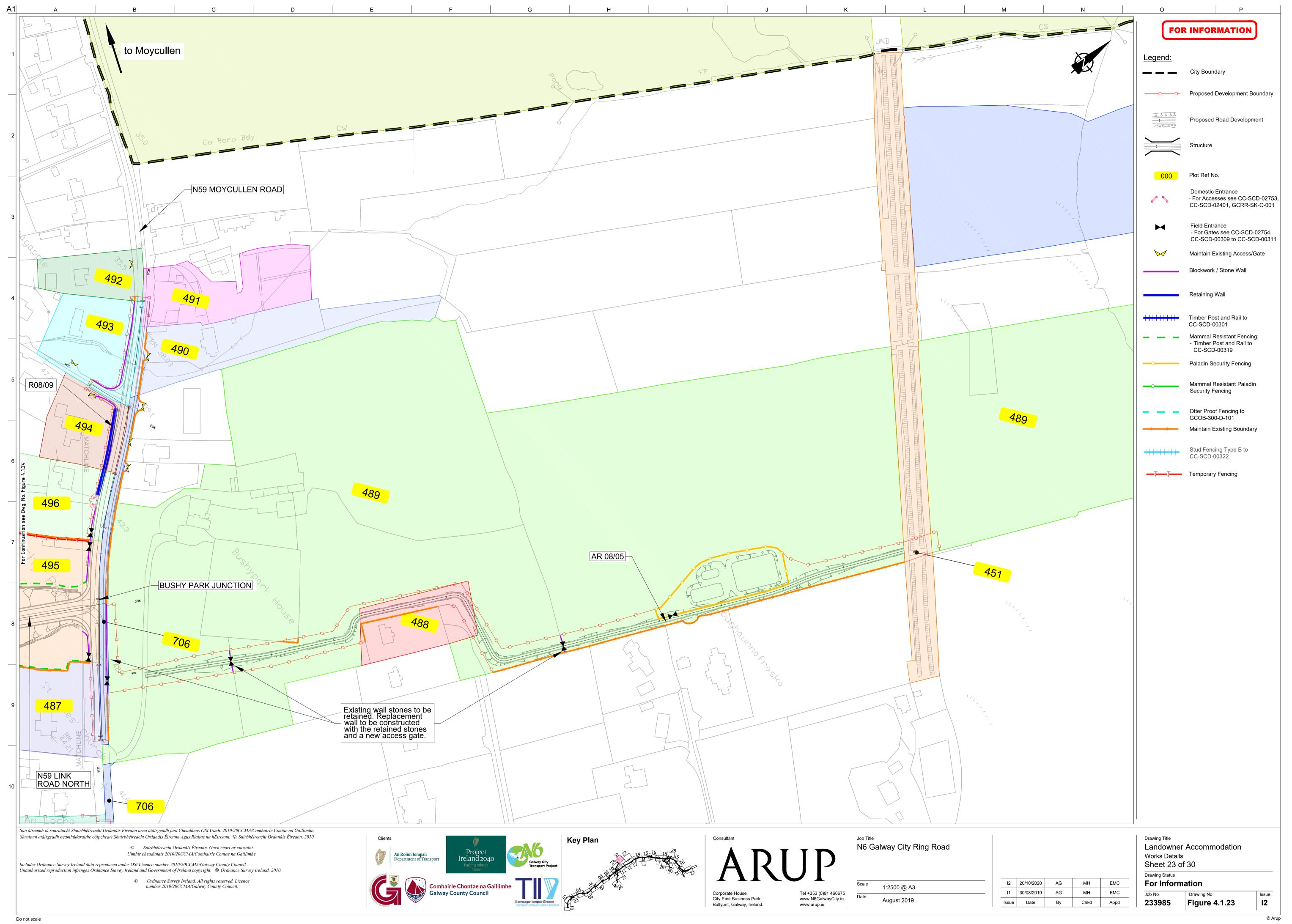


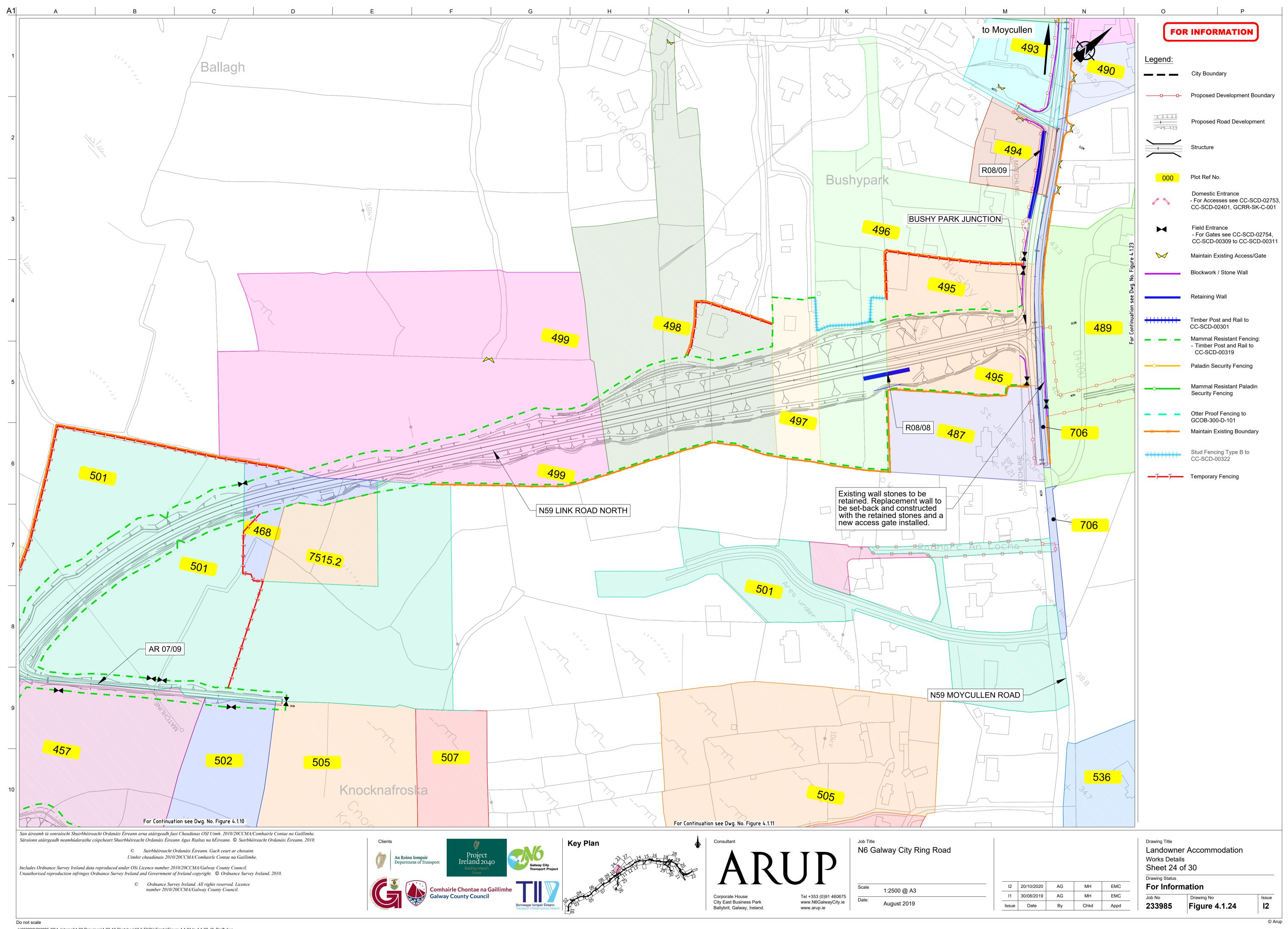


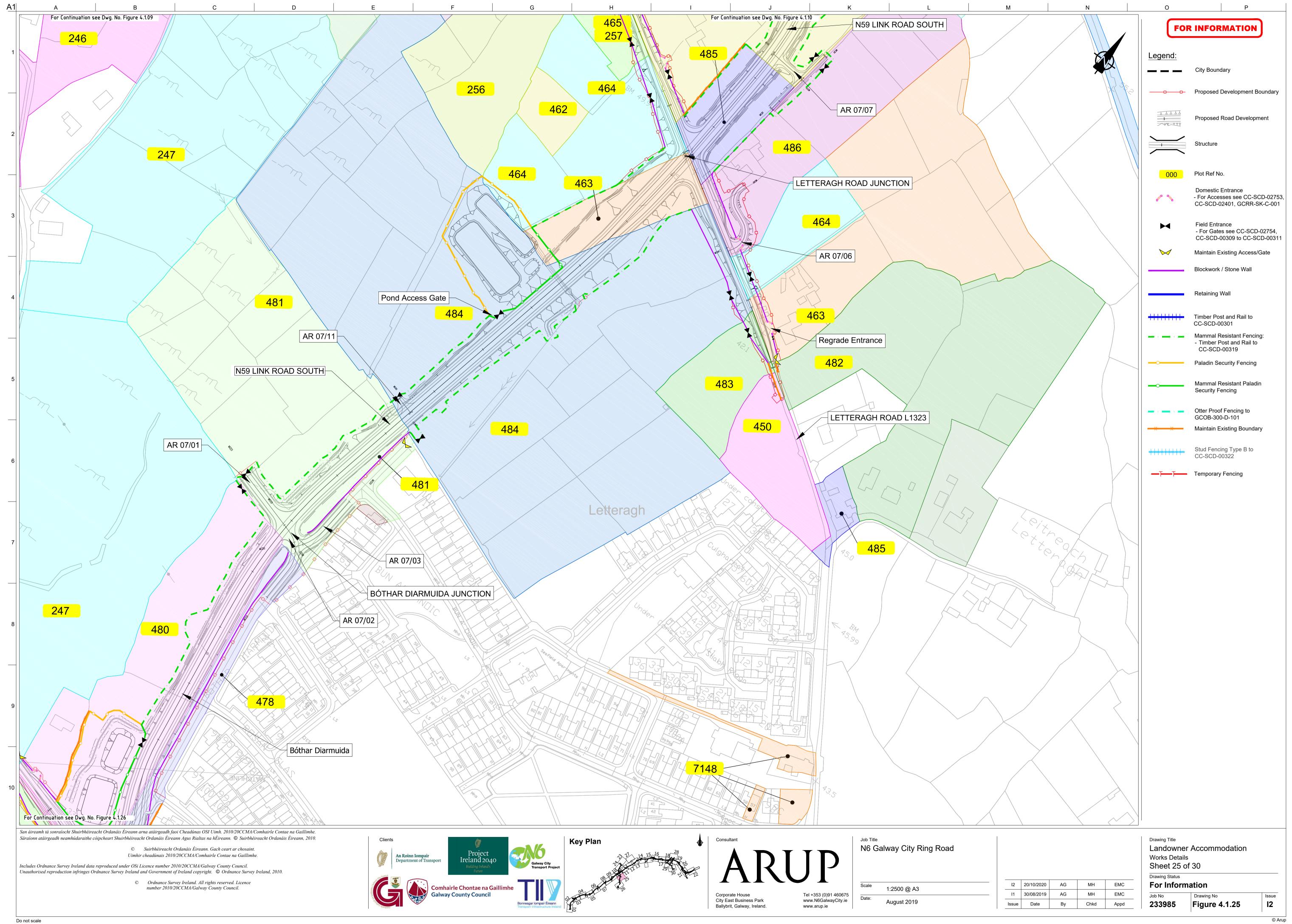


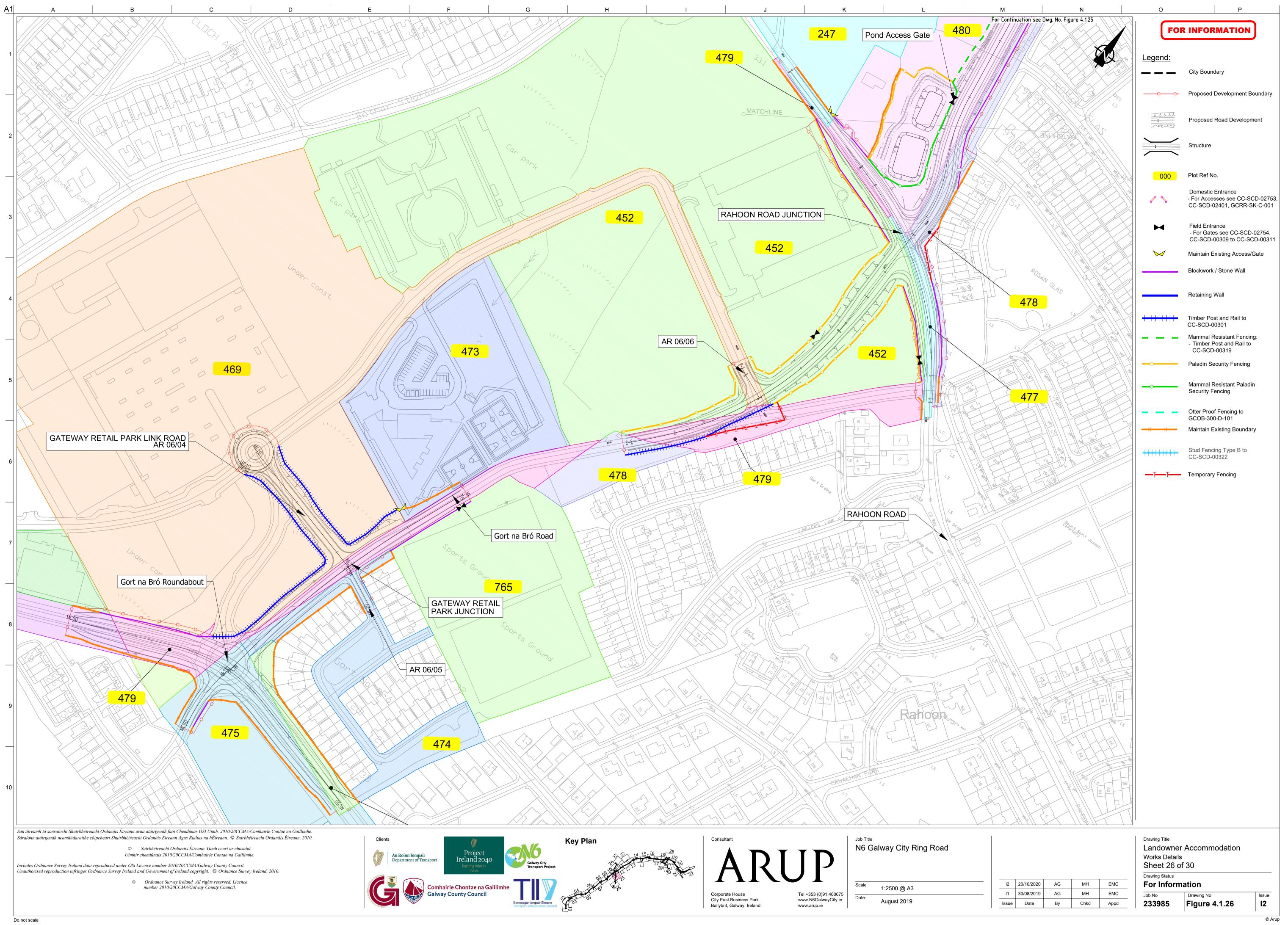


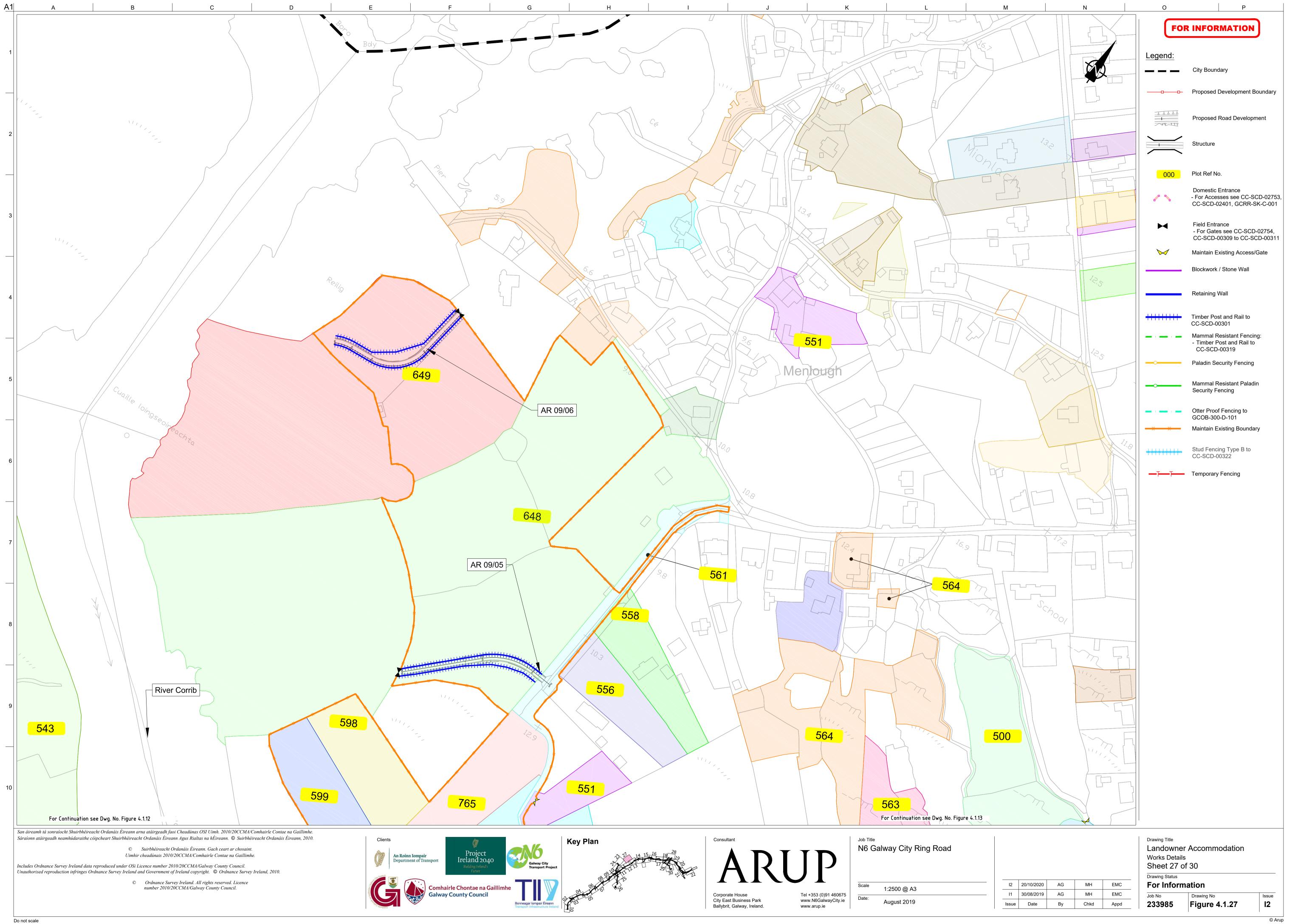


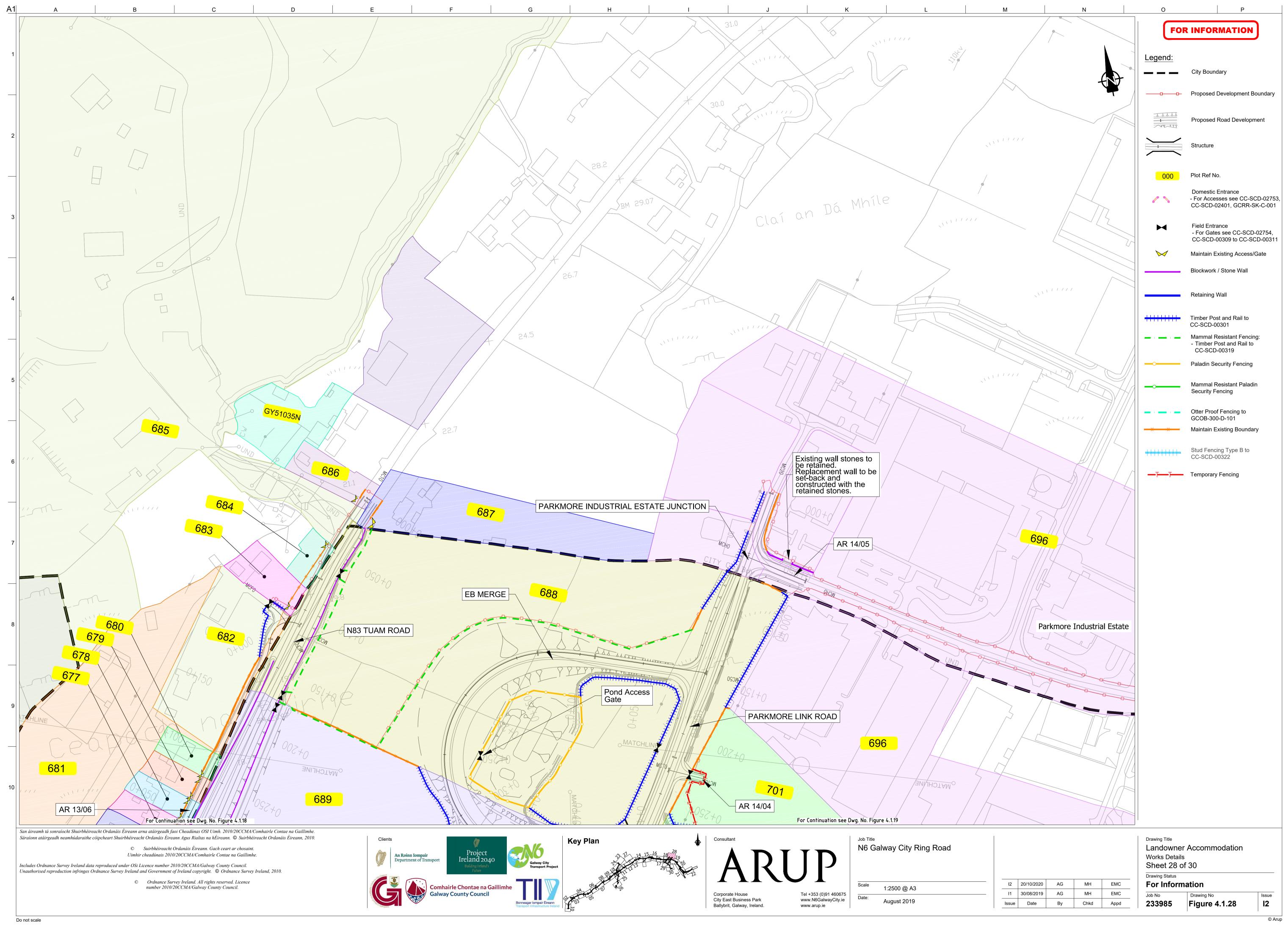


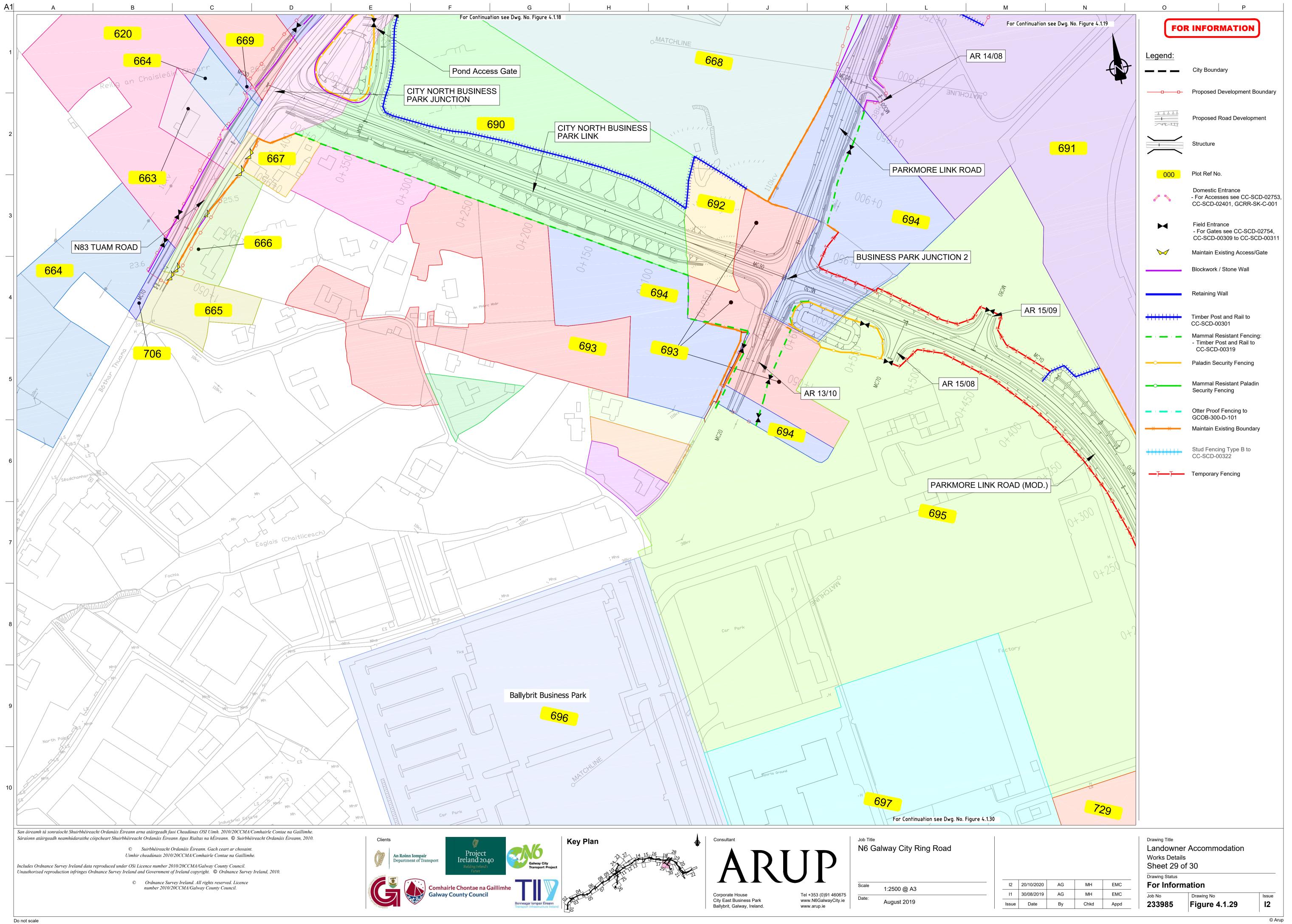


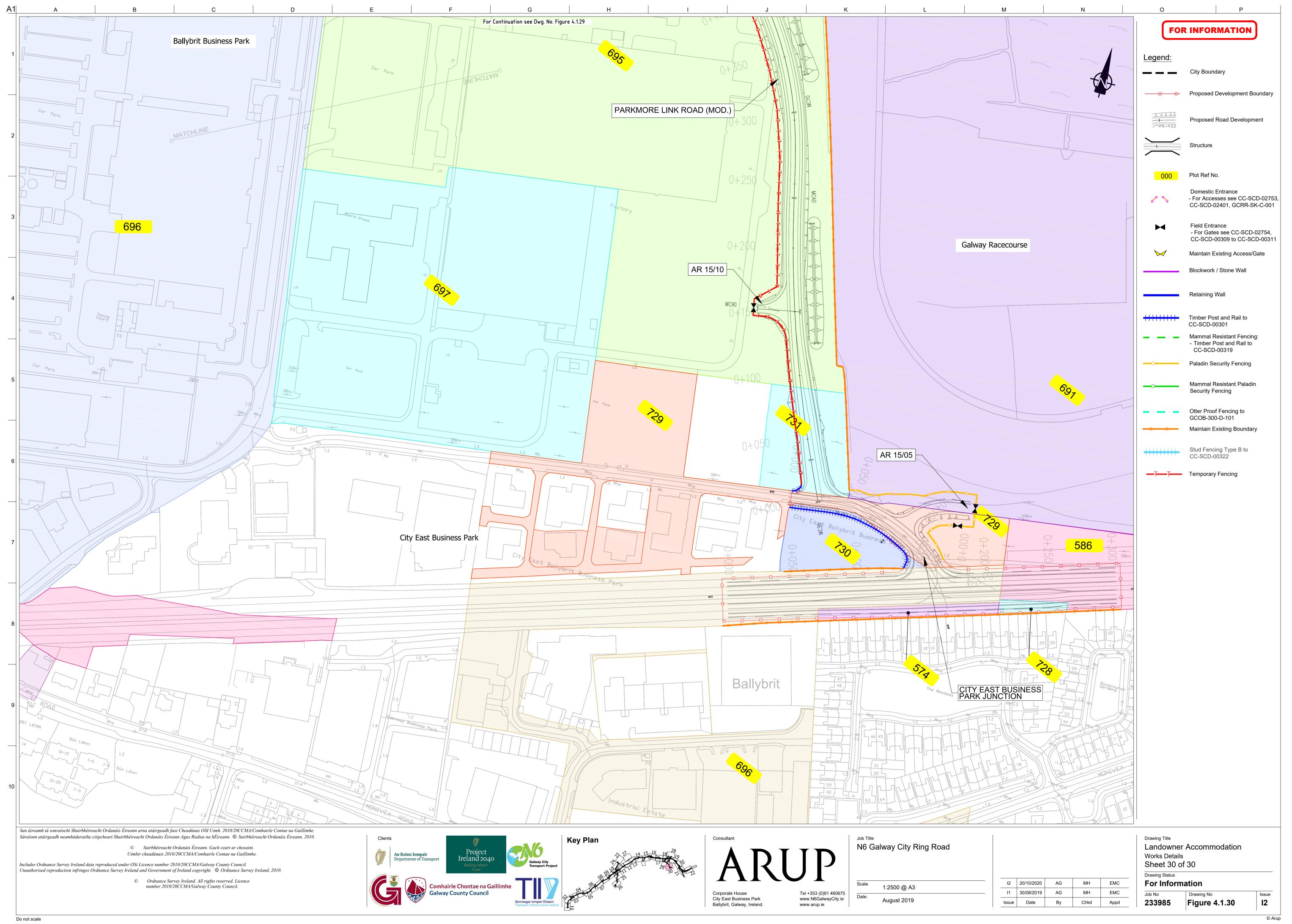






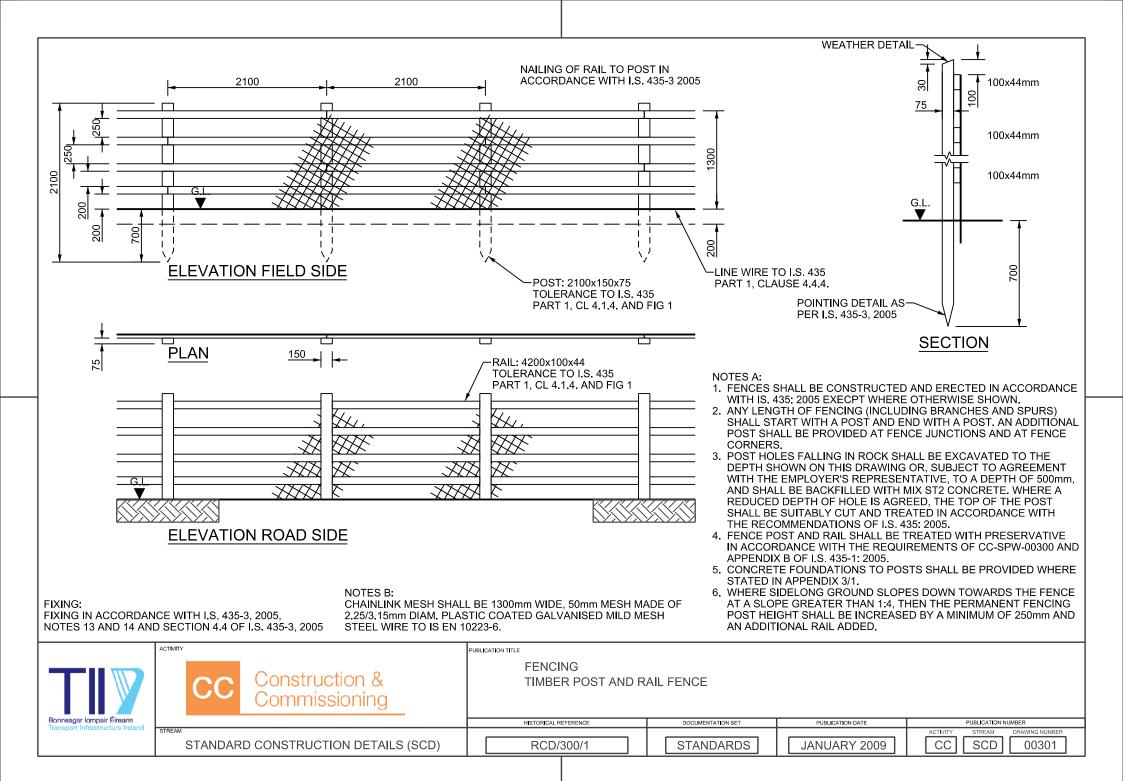


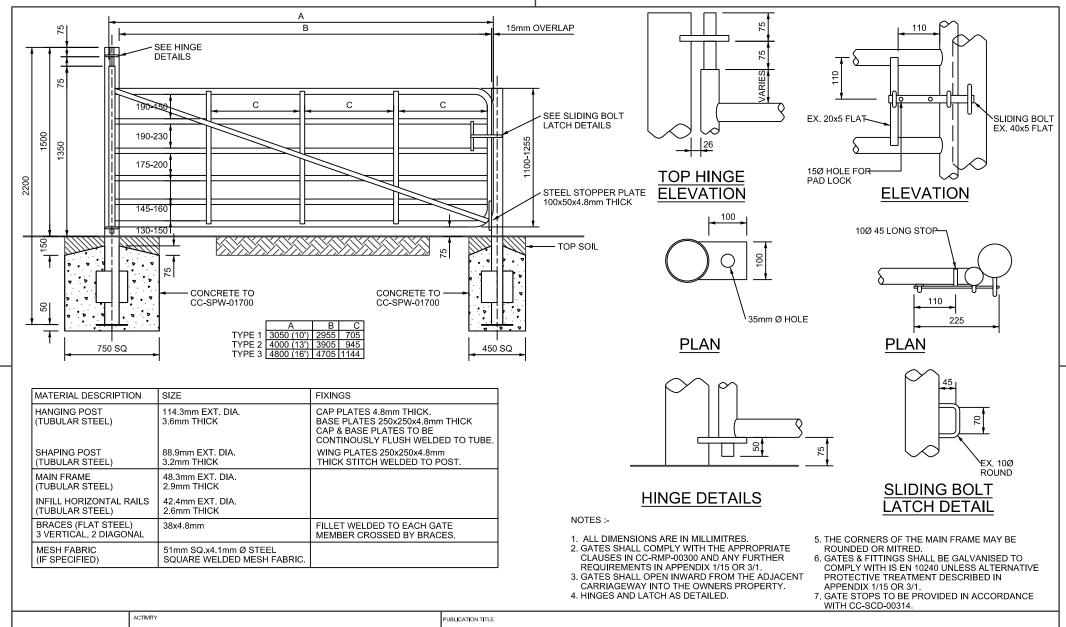




Amended Appendix A.1.9

Boundary Treatment_I2









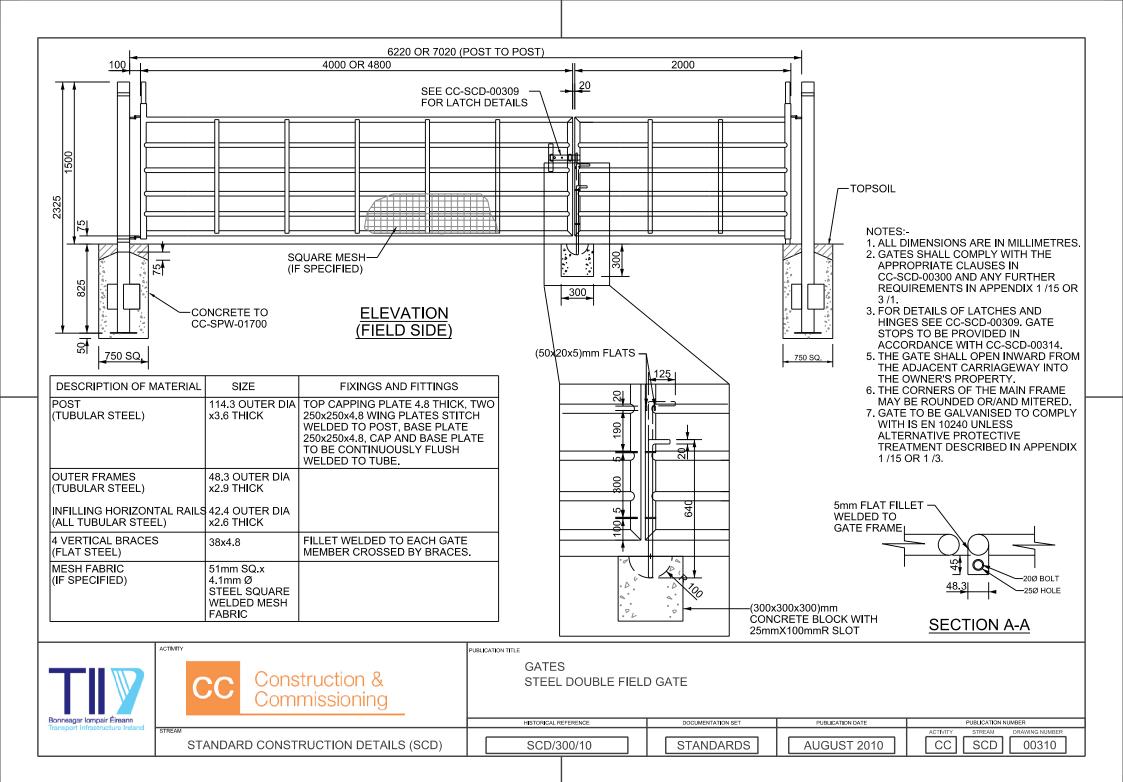
STANDARD CONSTRUCTION DETAILS (SCD)

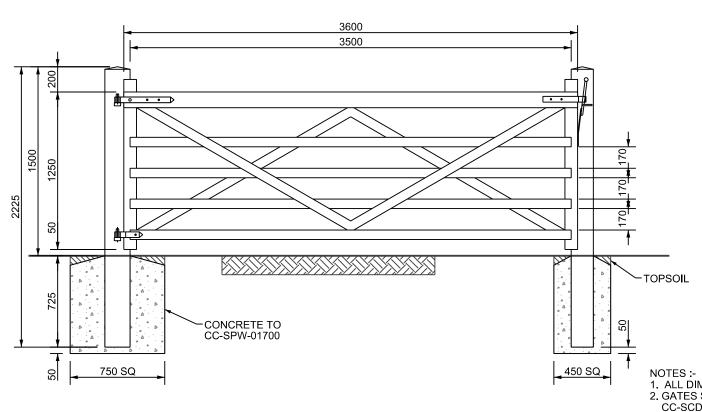
GATES
STEEL SINGLE FIELD GATE

HISTORICAL REFERENCE DOCUMENTATION SET PUBLICATION DATE

RCD/300/9 STANDARDS JANUARY 2007 CC SCD 00309

PUBLICATION NUMBER





| DESCRIPTION OF TIMBER MATERIALS | SIZES | | |
|------------------------------------|-------------------|--|--|
| HANGING POST | 200x200x2225 LONG | | |
| SHUTTING POST | 175x175x2225 LONG | | |
| HANGING STILE | 100x100 | | |
| SHUTTING STILE | 100x100 | | |
| TOP RAIL | 100x125 | | |
| UNDER RAILS | 75x38 | | |
| BRACES HOUSED IN TOP RAIL | 75x25 | | |

- 1. ALL DIMENSIONS ARE IN MILLIMITRES UNLESS OTHERWISE STATED.
- 2. GATES SHALL COMPLY WITH THE APPROPRIATE CLAUSES IN CC-SCD-00300 AND ANY FURTHER REQUIREMENTS IN APPENDIX 1/15 OR 3/1.
- 3. ALL THROUGH TENONS SHALL BE PEGGED WITH 13Ø OAK DOWELS.
- 4. FOR DETAILS OF FITTINGS FOR HANGING AND FASTENING SEE CC-SCD-00313 AND CC-SCD-00314.
- 5. THE GATE SHALL BE HUNG AS SHOWN FOR SELF CLOSING WITH SELF LATCHING STOP POST AS SHOWN ON CC-SCD-00314.
- THE GATE SHALL OPEN INWARD FROM THE ADJACENT CARRIAGEWAY INTO THE OWNER'S PROPERTY.
- 7. TIMBER TO BE TREATED IN ACCORDANCE WITH I.S. 435.



CC Construction & Commissioning

STREAM
STANDARD CONSTRUCTION DETAILS (SCD)

GATES
TIMBER SINGLE FIELD GATE

PUBLICATION TITLE

HISTORICAL REFERENCE DOCUMENTATION SET PUBLICATION DATE

RCD/300/11 STANDARDS JAN

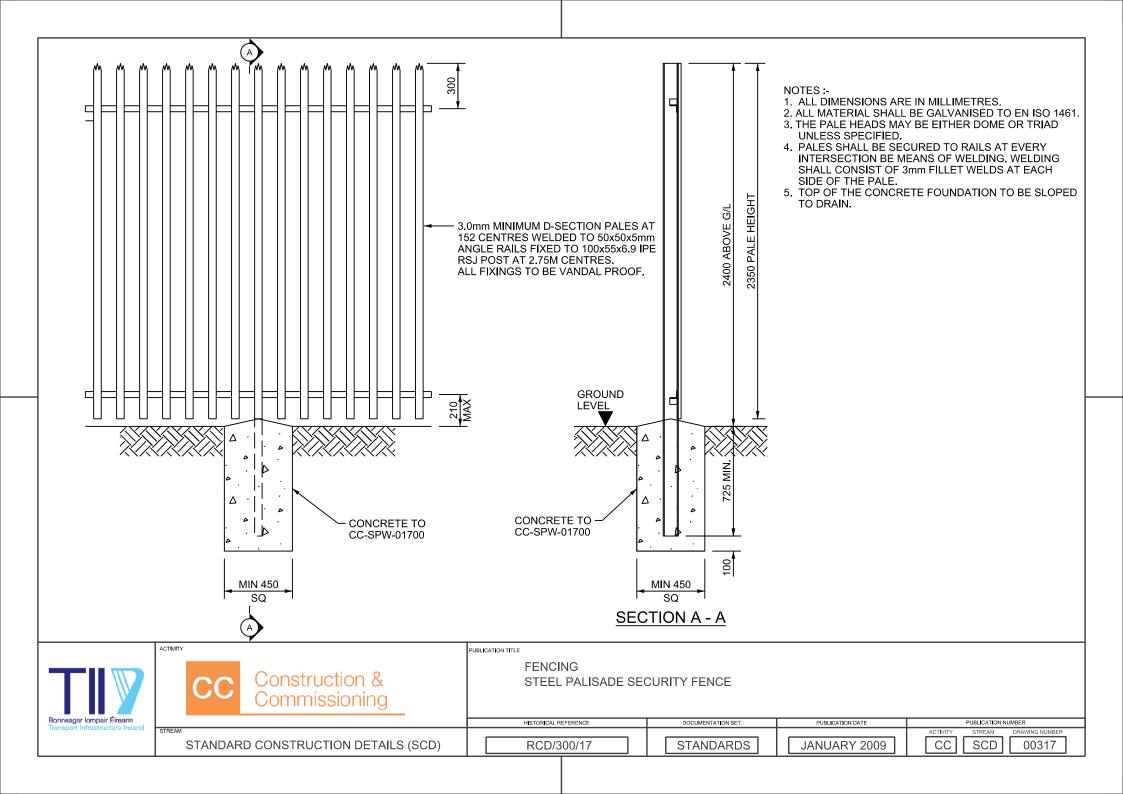
JANUARY 2007

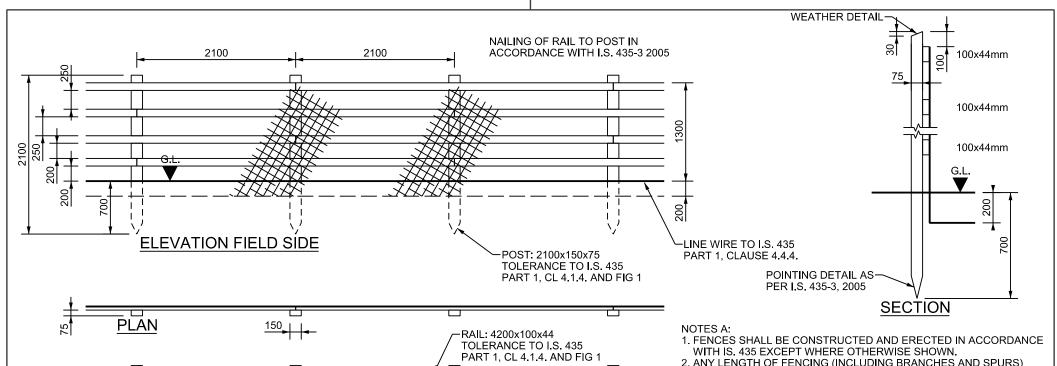
SCD

ACTIVITY

CC

DRAWING NUMBER





- ANY LENGTH OF FENCING (INCLUDING BRANCHES AND SPURS) SHALL START WITH A POST AND END WITH A POST. AN ADDITIONAL POST SHALL BE PROVIDED AT FENCE JUNCTIONS AND AT FENCE CORNERS.
- 3. POST HOLES FALLING IN ROCK SHALL BE EXCAVATED TO THE DEPTH SHOWN ON THIS DRAWING OR, WITH THE ENGINEER'S APPROVAL, TO A DEPTH OF 500mm, AND SHALL BE BACKFILLED WITH MIX ST2 CONCRETE. WHERE A REDUCED DEPTH OF HOLE IS ACCEPTED BY THE ENGINEER, THE TOP OF THE POST SHALL BE SUITABLY CUT AND TREATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF I.S. 435.
- 4. FENCE POST AND RAIL SHALL BE PRESSURE TREATED WITH CREOSOTE PRESERVATIVE IN ACCORDANCE WITH THE REQUIREMENTS OF CC-SCD-00300 AND APPENDIX B OF I.S. 435-1.
- 5. CONCRETE FOUNDATIONS TO POSTS SHALL BE PROVIDED WHERE STATED IN APPENDIX 1/3 OR AS DIRECTED BY THE ENGINEER.
- STUD FENCE (CC-SCD-00302) CONSTRUCTED ON LAND-TAKE LINE WHERE ADDITIONAL LAND HAS NOT BEEN PROVIDED.
- 7. WHERE SIDELONG GROUND SLOPES DOWN TOWARDS THE FENCE AT A SLOPE GREATER THAN 1:4, THEN THE PERMANENT FENCING POST HEIGHT SHALL BE INCREASED BE A MINIMUM OF 250mm AND AN ADDITIONAL RAIL ADDED.

FIXING: FIXING IN ACCORDANCE WITH I.S. 435-3, 2005, NOTES 13 AND 14 AND SECTION 4.4 OF I.S. 435-1, 2005

NOTES B: CHAINLINK MESH SHALL BE 1800mm WIDE, 50mm MESH MADE OF 2,25/3,15mm Ø. PLASTIC COATED GALVANISED MILD MESH STEEL WIRE TO IS EN 10223-6.

PUBLICATION TITLE



CC Construction & Commissioning

STRIANDARD CONSTRUCTION DETAILS (SCD)

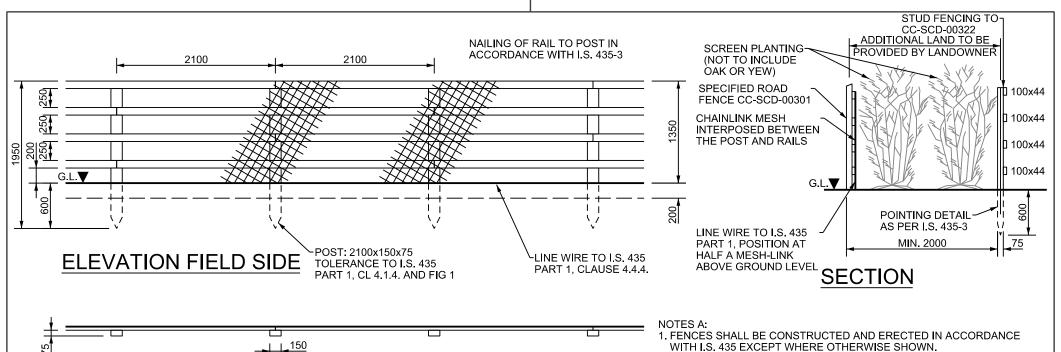
ELEVATION ROAD SIDE

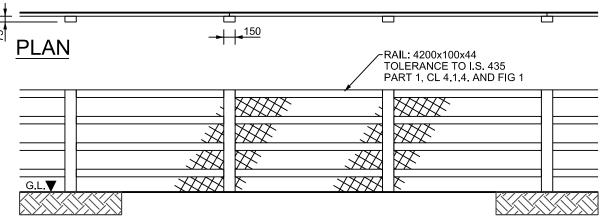
FENCING
MAMMAL RESISTANT FENCE

HISTORICAL REFERENCE DOCUMENTATION SET PUBLICATION DATE PUBLICATION DATE PUBLICATION NUMBER

ACTIVITY STREAM DRAWING NUMBER

RCD/300/19 STANDARDS FEBRUARY 2007 CC SCD 00319





ELEVATION ROAD SIDE

FIXING: FIXING IN ACCORDANCE WITH I.S. 435-3, NOTES 13 AND 14 AND SECTION 4.4 OF I.S. 435-3.

NOTES B: CHAINLINK MESH SHALL BE 1300mm WIDE, 50mm MESH MADE OF 2.25/3.15mm DIAM. PLASTIC COATED GALVANISED MILD MESH STEEL WIRE TO IS EN 10223-6.

- 2. ANY LENGTH OF FENCING (INCLUDING BRANCHES AND SPURS) SHALL START WITH A POST AND END WITH A POST. AN ADDITIONAL POST SHALL BE PROVIDED AT FENCE JUNCTIONS AND AT FENCE CORNERS,
- 3. POST HOLES FALLING IN ROCK SHALL BE EXCAVATED TO THE DEPTH SHOWN ON THIS DRAWING OR, SUBJECT TO AGREEMENT WITH THE EMPLOYER'S REPRESENTATIVE, TO A DEPTH OF 500mm, AND SHALL BE BACKFILLED WITH MIX ST2 CONCRETE, WHERE A REDUCED DEPTH OF HOLE IS AGREED, THE TOP OF THE POST SHALL BE SUITABLY CUT AND TREATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF I.S. 435.
- 4. FENCE POST AND RAIL SHALL BE TREATED WITH PRESERVATIVE IN ACCORDANCE WITH THE REQUIREMENTS OF CC-SCD-00322 AND APPENDIX B OF I.S. 435-1.
- 5. CONCRETE FOUNDATIONS TO POSTS SHALL BE PROVIDED WHERE STATED IN APPENDIX 1/3.
- 6. STUD FENCE (CC-SCD-00322) TO BE CONSTRUCTED PARALLEL TO ROAD SIDÈ TIMBER POST AND RAIL FENCE (CC-SCD-00301). FENCE TO BE CONSTRUCTED 2m APART WITH ADDITIONAL LAND TO BE SUPPLIED BY LAND OWNER (AS INDICATED ON CROSS SECTION).
- 7. WHERE SIDELONG GROUND SLOPES DOWN TOWARDS THE FENCE AT A SLOPE GREATER THAN 1:4. THEN THE PERMANENT FENCING POST HEIGHT SHALL BE INCREASED BY A MINIMUM OF 250mm AND AN ADDITIONAL RAIL ADDED.



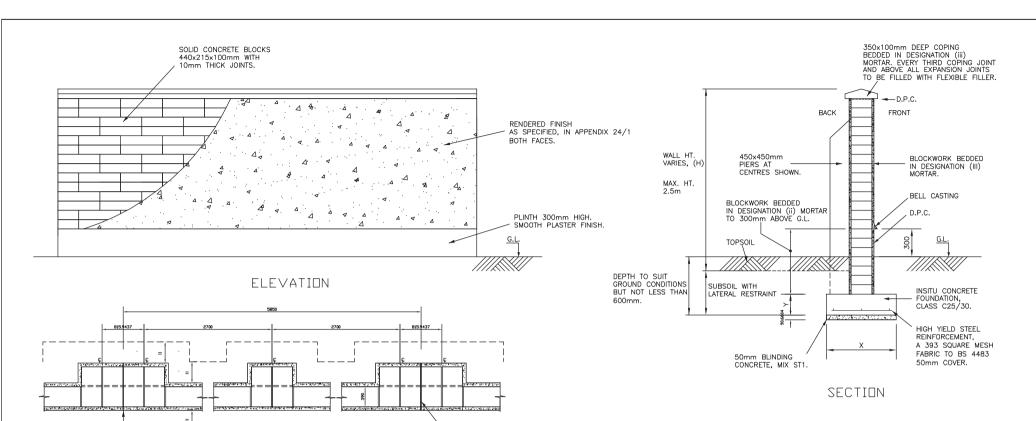


TABLE 1

WALL HT, (H) X Y PIER CTRS. (mm) (mm) (mm) (mm)

UP TO 1200 700 225 NO PIERS

1200 TO 1800 700 225 2700

250

2700

800

TABLE 2

FINISH TYPE

1 FAIRFACED
2 ROUGHCAST
3 NAPPED PLASTER
4 TYROLENE

EXPANSION JOINT.

10mm THICK COMPRESSIBLE FILLER.

10mm POLYSULPHIDE SEAL.

- NTES: 1. THIS RCD IS ONLY TO BE USED IN ASSOCIATION WITH A UNIQUE STRUCTURAL DESIGN CARRIED OUT FOR THE WALLS ON A PROJECT IN ACCORDANCE WITH RELEVANT DESIGN CODES FOR BLOCKWORK, MASONRY AND LOADING.
 - BLOCKS TO COMPLY WITH I.S. E.N. 771-3.
 MORTAR TO COMPLY WITH I.S. E.N. 998.
 MASONRY TO COMPLY WITH I.S. E.N. 1996
 FULL ADHESION OF BLOCKWORK TO MORTAR AT ALL INTERFACES.
 - 3. RENDERED FINISHES TO BE IN ACCORDANCE WITH BS 5262 CODE OF PRACTICE FOR EXTERNAL RENDERINGS.
 - 4. PIERS AT ENDS AND CHANGES OF DIRECTION. ENDS OF WALLS TO RETURN BY H/3.
 - MINIMUM ALLOWABLE BEARING CAPACITY OF FORMATION 1S 25 kN/m² (UNIFORMLY DISTRIBUTED) OR 50 KN/m² (TRIANGULARLY DISTRIBUTED).

TII PUBLICATION NUMBER: CC-SCD-02401

NATIONAL ROADS AUTHORITY

EXPANSION JOINT -

1800 TO 2500

ROAD CONSTRUCTION
DETAILS

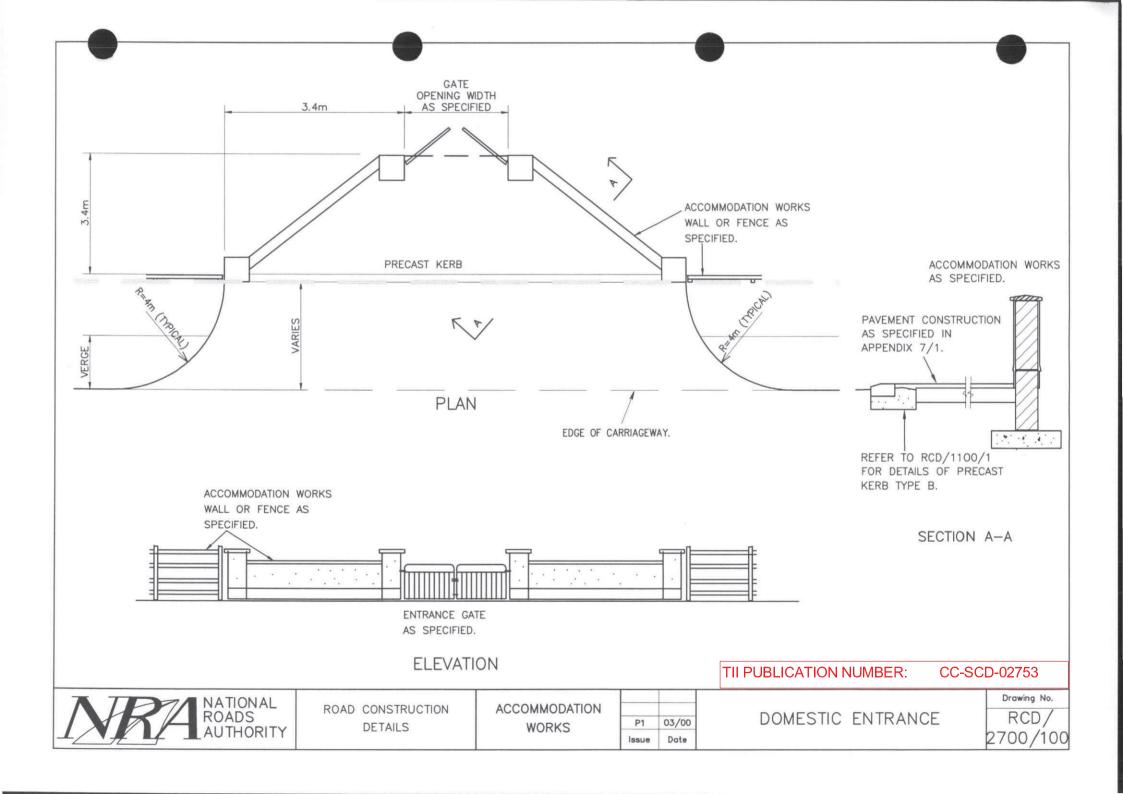
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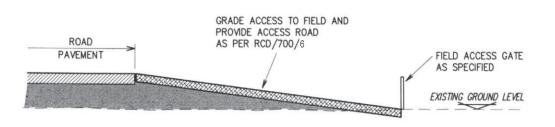
WALLS

P2 11/10 P1 03/00 Issue Date

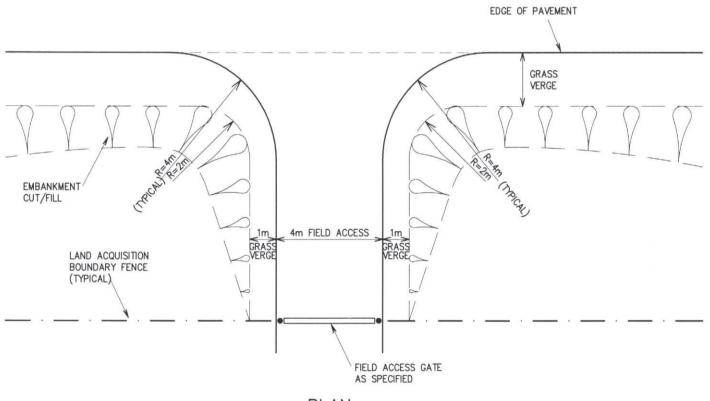
TYPICAL BLOCKWORK WALL

Prawing No.





SECTIONAL ELEVATION



PLAN

TII PUBLICATION NUMBER:

CC-SCD-02754

NATIONAL ROADS AUTHORITY

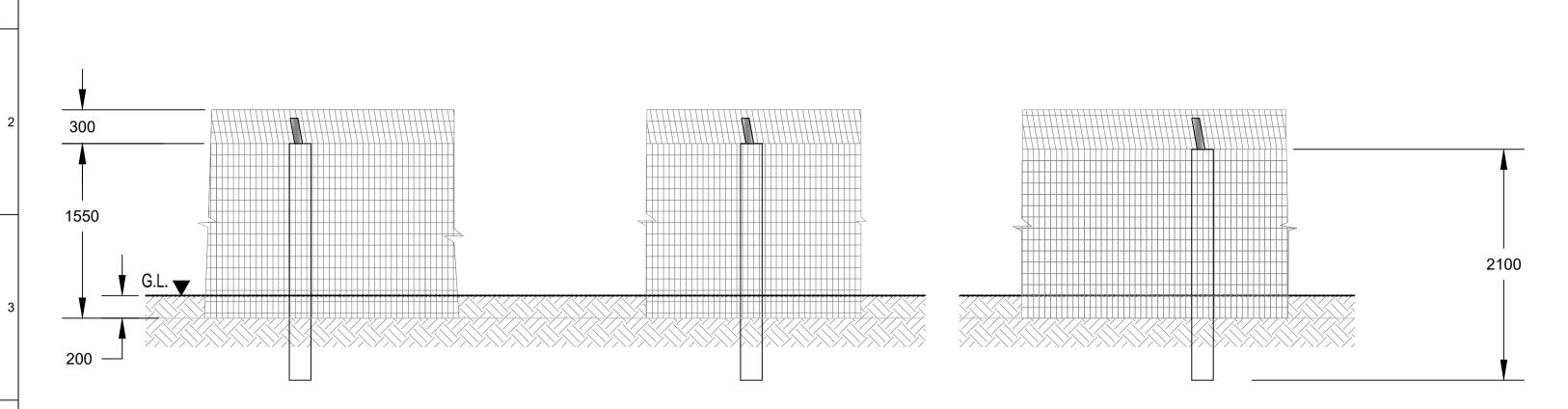
ROAD CONSTRUCTION DETAILS

ACCOMMODATION WORKS

P2 06/I3 P1 03/00 Issue Date

FIELD ACCESS

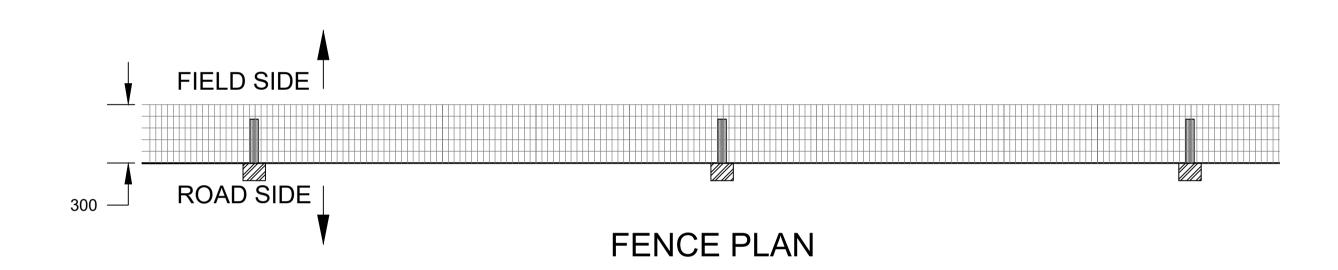
Prowing No. RCD/ 2700/101

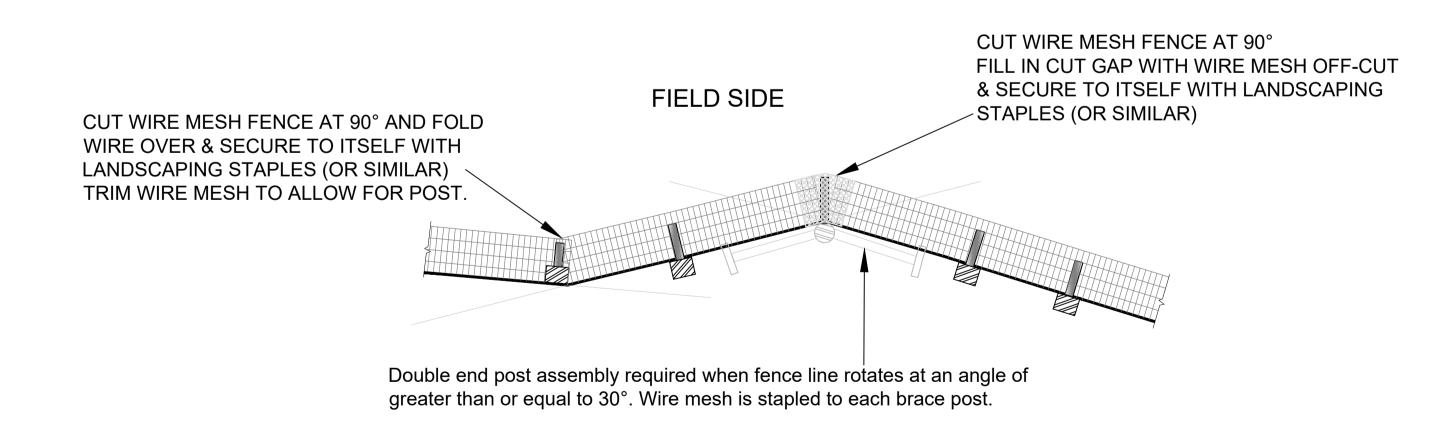


TIMBER POST AND TENSIONED WIRE MESH FENCING (AS PER CC-SCD-00320)

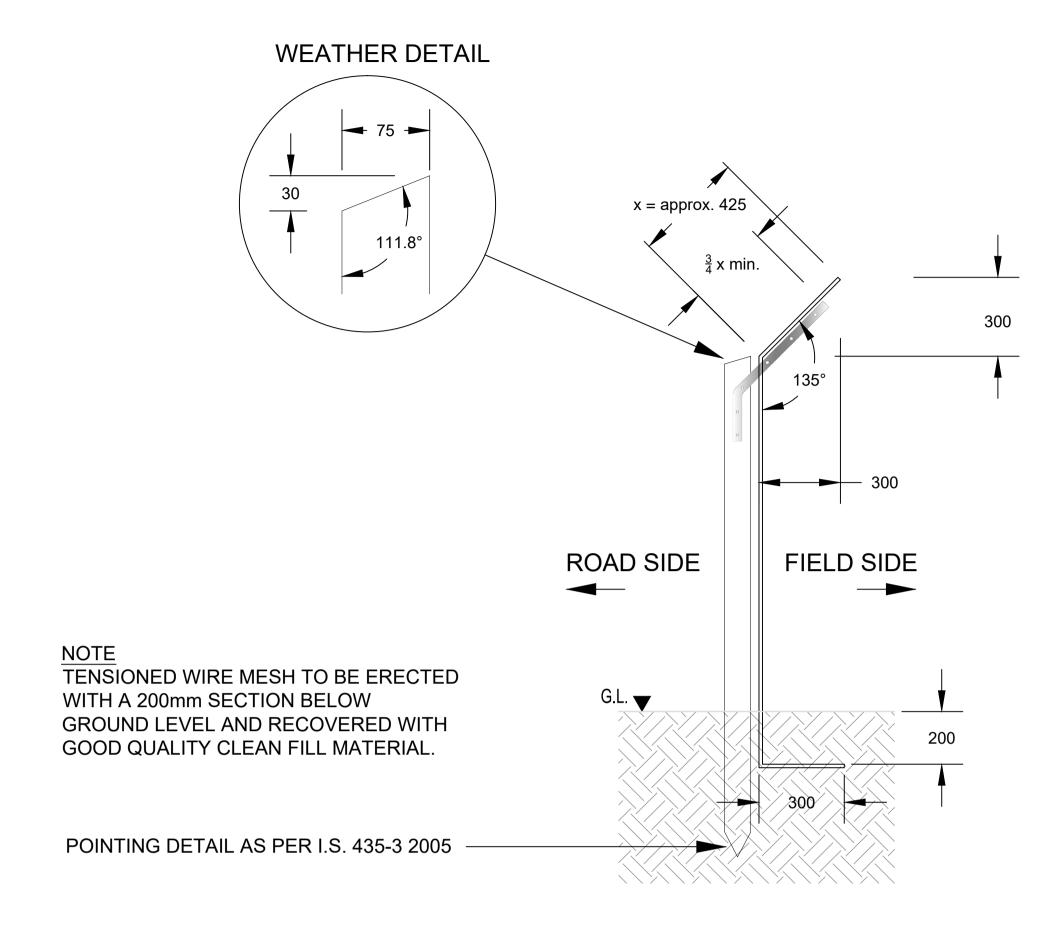
+ MAMMAL FENCING GROUND PROTRUSION (AS PER CC-SCD-00319) + OTTER FENCING 'OVERHANG'

FENCE ELEVATION





MAMMAL RESISTANT FENCING AT CHANGE IN DIRECTION



NOTES:

- 1. TO BE READ IN CONJUNCTION WITH CC-SCD-00304, CC-SCD-00319, & CC-SCD-00320
- 2. GENERAL NOTES AS PER CC-SCD-00320 APPLY
- 3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED

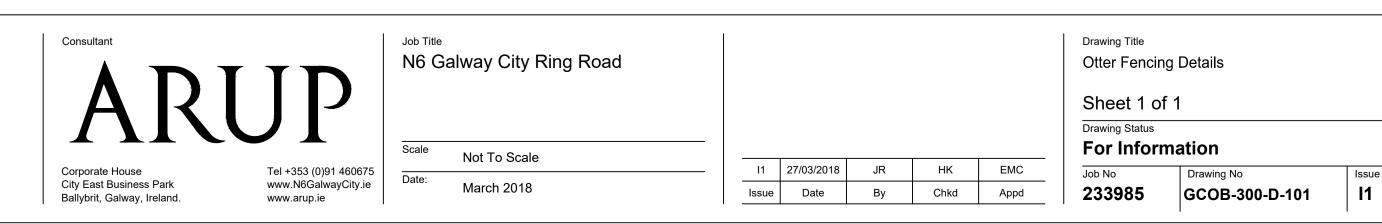
ADDITIONAL NOTES

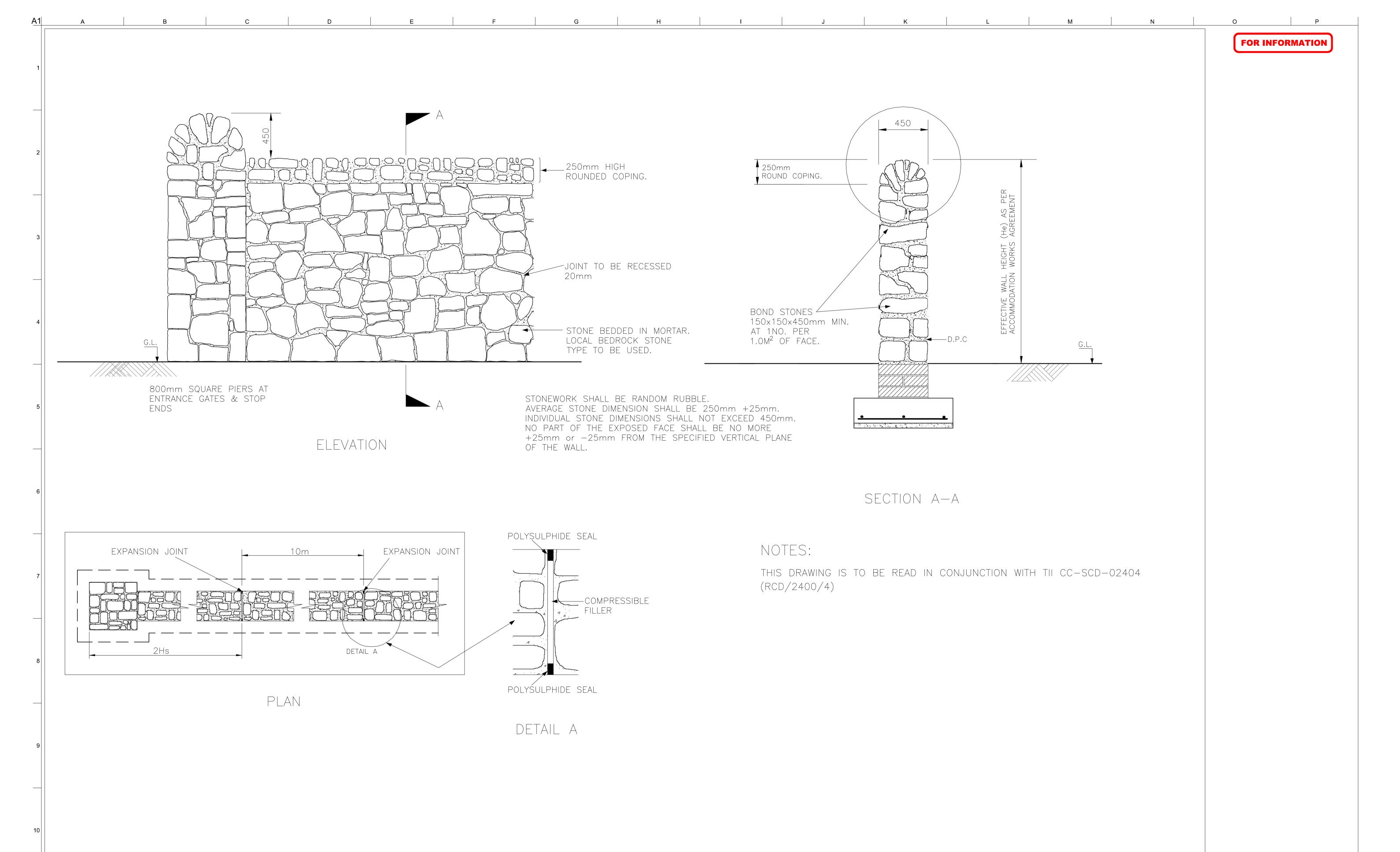
- 4. TENSIONED WIRE MESH WIDTHS SHALL BE:
- 4.1. 1550mm WIDE & 300mm MAMMAL RESISTANT FLAP SECTION FOR REGULAR TIMBER POST AND TENSIONED WIRE MESH FENCE
- 4.2. AN ADDITIONAL 425mm WIDE OVERHANG SECTION TO BE LAID INCLINED AT A 135° ANGLE FROM THE VERTICAL FENCE (45° ANGLE FROM AN HORIZONTAL PLANE) AND FIXED WITH A STEEL BRACKET (COMPLYING WITH RELEVANT PROTECTIVE COATING REQUIREMENTS TO FIGHT CORROSION)

SECTION

- 5. WHERE MAMMAL RESISTANT FLAP IS REQUIRED ON THE SAME SIDE OF THE FENCING AS A POST THE WIRE MESH IS TO BE CUT TO FACILITATE POSTS. ANY GAPS IN THE MAMMAL RESISTANT FENCING RESULTING FROM REQUIRED CUTS ARE TO BE FILLED WITH WIRE MESH OFF-CUTS AND SECURED WITH LANDSCAPING STAPLES (OR SIMILAR).
- 6. CUTTING OF WIRE MESH FENCING IS TO BE KEPT TO A MINIMUM AND SHOULD ONLY OCCUR WHERE NO OTHER OPTION EXISTS.
- 7. ALL TENSIONED WIRE MESH FENCING FORMING PART OF MAMMAL RESISTANT FENCING IS TO BE COATED WITH ADDITIONAL ZINC ALUMINUM ALLOY AS PER SERIES NG 300 SPECIFICATION.
- 8. STRAINING POSTS ARE TO BE EXTENDED 200mm BELOW GROUND LEVEL OR TO BE BACKFILLED WITH MIX ST2 CONCRETE WHERE MAMMAL RESISTANT FENCING IS REQUIRED TO ENSURE FULL PERFORMANCE OF FENCE.
- WHERE MAMMAL RESISTANT FENCING IS REQUIRED AT THE LOCATION OF AN END POST ASSEMBLY THE BED LOG ELEMENT IS TO BE INSTALLED AN ADDITIONAL 100mm BELOW GROUND LEVEL TO ACCOMMODATE THE MAMMAL RESISTANT FLAP. WIRE MESH IS TO BE CUT AS REQUIRED TO FIT WITH CROSS MEMBER ELEMENT OF ARRANGEMENT.
- 10. AT END POST ASSEMBLIES, WHEREVER POSSIBLE, THE BED LOG AND CROSS MEMBER ELEMENTS ARE TO BE LOCATED ON THE OPPOSITE SIDE OF THE TENSIONED WIRE MESH FENCE TO THE MAMMAL FLAP TO AVOID CONFLICT BETWEEN THE TWO ELEMENTS.













| Scale Date: | NTS April 2019 | D2 | 08/04/2019 | | |
|-------------|----------------|------|------------|------------|--|
| | | | D1 | 22/03/2019 | |
| | | ssue | Date | | |
| | | | | | |

Typical Stone Wall Detail
Sheet 1 of 1

| Drawing Status | | | | | | | |
|-----------------|---------------|-------|--|--|--|--|--|
| For Information | | | | | | | |
| Job No | Drawing No | Issue | | | | | |
| 233985 | GCRR-SK-C-001 | D2 | | | | | |

GCC

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