

The background is a vibrant red color. It features several abstract geometric shapes: a large teal semi-circle in the top-left corner, a blue semi-circle in the top-right corner containing a white circle, a dark blue horizontal bar in the top-right corner, a teal semi-circle in the bottom-right corner, and a blue semi-circle in the bottom-left corner containing a white circle. There are also smaller white circles and shapes in the bottom-left and bottom-right corners.

Appendix J4
Preliminary Design Report
- Sign Gantries

National Transport Authority
**Blanchardstown to City Centre
Core Bus Corridor Scheme**
Preliminary Design Report - Sign
Gantries

Issue | 25 April 2022

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 268401

Ove Arup & Partners Ireland Ltd

Arup
50 Ringsend Road
Dublin D04 T6X0
Ireland
www.arup.com

ARUP

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Overview of Gantries

1 Introduction

1.1 Design Brief

Arup has been appointed by the National Transport Authority (NTA) to undertake a preliminary design of the proposed Blanchardstown to City Centre Core Bus Corridor (CBC) Scheme (hereinafter referred to as the 'Proposed Scheme') of the BusConnects CBC network. Arup's appointment includes the preliminary design of structures including modifications, on this Proposed Scheme.

This report includes the considerations and assumptions made during the preparation of the preliminary design of the gantry structures on the Blanchardstown to City Centre Core Bus Corridor.

1.2 Project Background

The BusConnects Dublin Programme is a plan to transform Dublin's bus system, with the Core Bus Corridor (CBC) project providing 230 km of dedicated bus lanes and 200 km of cycle tracks across sixteen of the busiest bus corridors in and out of the city centre. The project is fundamental to addressing the congestion issues in the Dublin region with the population due to grow by 25 % by 2040. In June 2018 the National Transport Authority (NTA) published the Core Bus Corridors Project Report, which sets out the vision for the provision of bus lanes and cycle tracks on sixteen key bus corridors.

The Blanchardstown to City Centre CBC is identified in this document as forming part of the radial Core Bus Network. The BusConnects Dublin Core Bus Network is shown in Figure 1.

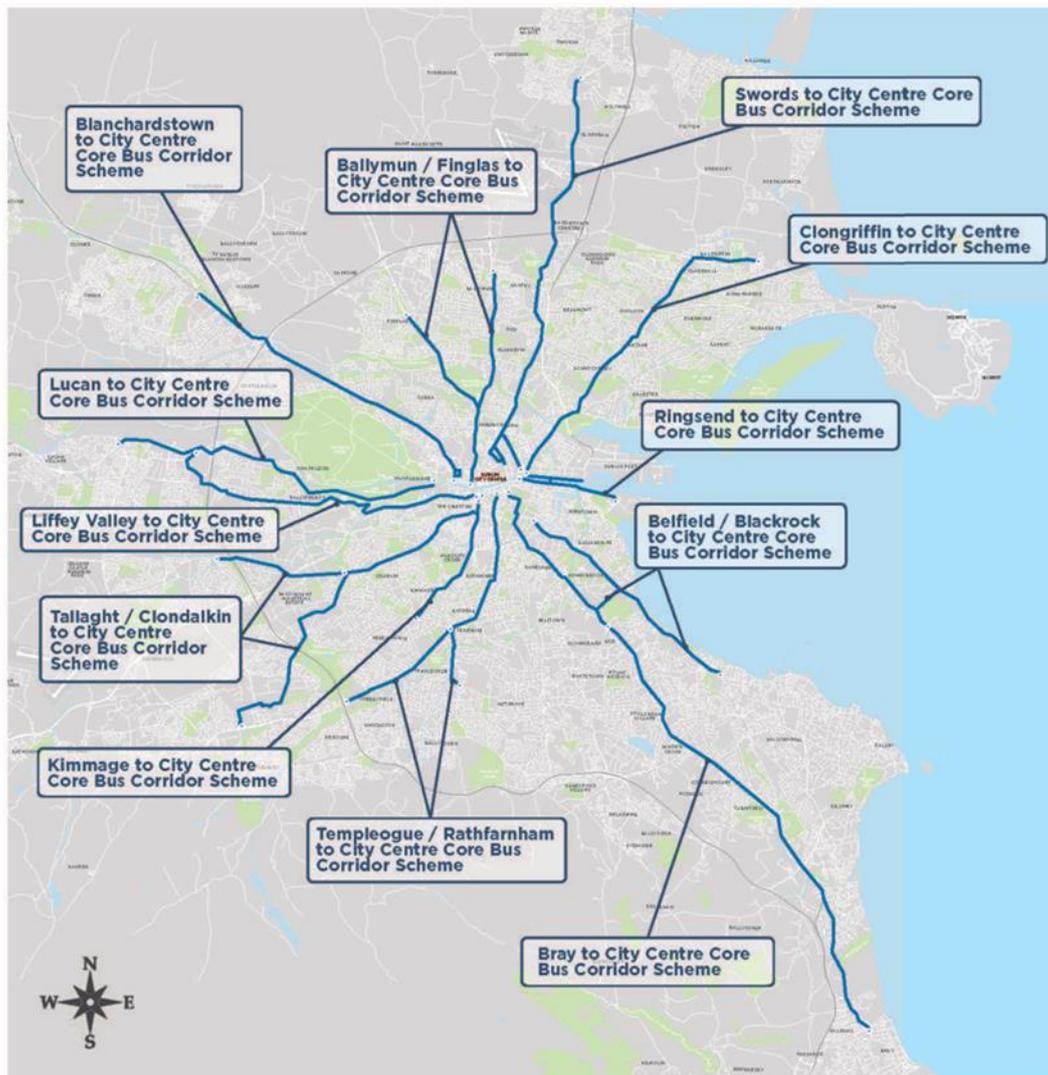


Figure 1: BusConnects Dublin Radial CBC Network

The Proposed Scheme commences at Junction 3 (Blanchardstown / Mulhuddart) southbound off-slip from the N3. The Proposed Scheme proceeds along the R121 Blanchardstown Road South into the Blanchardstown Shopping Centre.

From a new terminus to the north-west of Blanchardstown Shopping Centre the Proposed Scheme is routed onto the N3 Navan Road via the Snugborough Road junction and follows the N3 and Navan Road as far as the junction with the Old Cabra Road. From here, the Proposed Scheme is routed along Old Cabra Road, Prussia Street, Manor Street and Stoneybatter to the junction with King Street North. The core bus corridor is then routed via Blackhall Place as far as the junction with Ellis Quay, where it joins the prevailing traffic management regime on the North Quays. At the Stoneybatter / Brunswick Street North junction, cyclists proceed along Brunswick Street North, George's Lane and Queen Street as far as Ellis Quay/Arran Quay.

1.3 Previous Studies

The first non-statutory public consultation on the BusConnects CBCs took place on a phased basis between November 2018 to May 2019. The second round of public consultations occurred between March 2020 to April 2020. A third round of public consultations then followed between November 2020 and December 2020.

Consultation with the principal project stakeholders (i.e. Dublin City Council, Fingal County Council, Transport Infrastructure Ireland, An Garda, Utility companies and the National Transport Authority) has also taken place.

A desktop study was undertaken to identify the existing structures within the project extents, with site inspections undertaken where information was limited.

2 Site & function

2.1 Site Location

Refer to Figure 2 below for the location of the gantries.

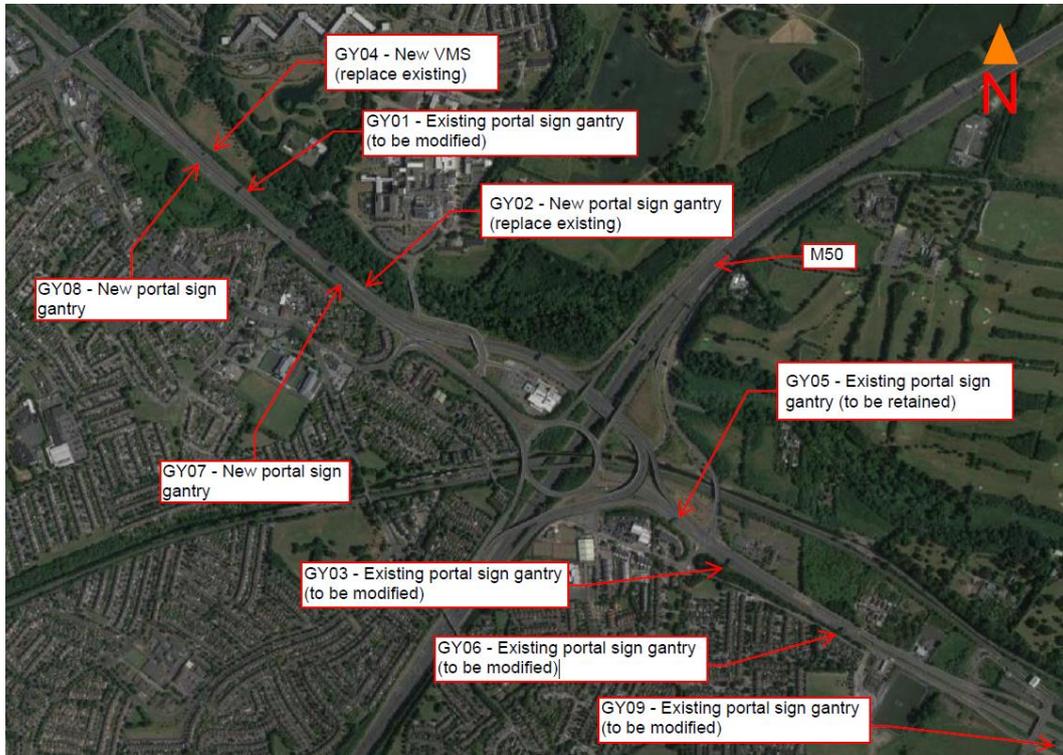


Figure 2: Gantry Locations

Table 1 below provides a summary of the gantries along the scheme, both existing and proposed.

Table 1: Summary of Gantry Structures

Gantry Name	Gantry Type	Existing / New	Carriageway & Span Length
GY01	Group 6 Sign Gantry	Modify/Replace existing	N3 Eastbound – 19.0 m
GY02	Group 6 Sign Gantry	New (replace existing)	N3 Eastbound – 23.3 m
GY03	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 22.6 m
GY04	VMS	New (replace existing)	N3 Eastbound – 9.5 m
GY05	Group 6 Sign Gantry	Existing – retain	N3 Diverge – 21.6 m
GY06	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 18.1 m
GY07	Group 6 Sign Gantry	New	N3 Westbound – 22.4 m
GY08	Group 6 Sign Gantry	New	N3 Westbound – 20.8 m
GY09	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 20.0 m

2.2 Function of Structure and Obstacles Crossed

These gantries will support the provision of fixed signs or Variable Message Signs (VMS) over the N3 and R147 outbound.

Where the carriageway is being adjusted such that the lanes beneath the existing gantry are shifting relative to the LCS indicator bay above (as is the case for GY01, GY03, GY06 & GY09), a new gantry is proposed with the option of retaining the existing foundation, subject to verification by the D&B contractor. It is assumed that the proposed configuration and functional performance of the modified gantry will be the same as the existing.

Where new gantries are replacing existing gantries (GY02 & GY04), it is assumed that these new gantries will have the same configuration and functional performance as the gantries being replaced.

Where new gantries are proposed (GY07 & GY08), it is assumed that the configuration and functional requirements are similar to existing overhead gantries on the N3.

Where existing gantries are being retained (GY05), it is assumed that the configuration and functional requirements remain the same.

Refer to Appendix C for an overview of the gantries across the scheme.

2.3 Choice of Location

The structure locations were chosen based on the sign strategy for the scheme.

2.4 Site Description and Topography

The gantries are located along the existing N3 and the R147 outbound. The site location and topography comprise of an existing road through an urban setting, with the gantries spanning the carriageways.

2.5 Vertical and Horizontal Alignments

Refer to the road design drawings for the proposed vertical and horizontal road alignments along the scheme.

2.6 Existing Underground and Overground Services

Existing services are summarised in Table 2 below.

Table 2: Existing Services

Gantry	Utility Provider	Service	Comment
GY01	ESB County Council	MV electricity (UG) Stormwater	Verge – Retained Verge (DN225) – Retained Median (DN300) – Retained
GY02	County Council	Stormwater	Verge – Retained
GY03	County Council County Council ESB	Stormwater Foul Water MV electricity (UG)	Verge – Retained Road (DN600) – Retained Verge – Retained Verge – Retained
GY04	ESB County Council	MV electricity (UG) Stormwater	Verge – Retained Verge (DN225) – Retained
GY05	None in proximity of existing gantry foundation		
GY06	County Council	Stormwater	Verge (DN225) – Retained Median (DN300) – Retained
GY07	ESB Irish Water County Council	MV electricity (UG) LV electricity (UG & OH) Water Stormwater	Verge – Retained Verge – Retained Verge – Retained Verge – Retained
GY08	County Council County Council	Stormwater Combined	Verge (DN225) – Retained Median (DN300) – Retained Median (DN1200) – Retained
GY09	County Council EIR GNI Telco	Stormwater Watermain Comms Telco Duct	Verge (DN300) – Retained Median (DN300) – Retained Verge – Retained Verge – Retained Verge – Retained

These services are illustrated in the figures below

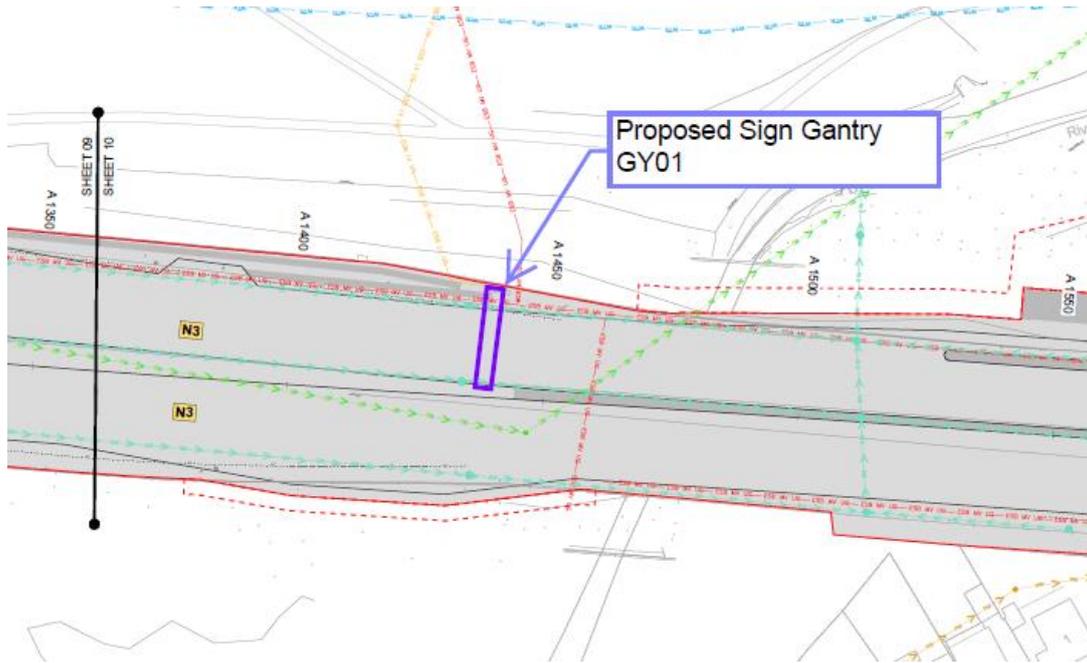


Figure 3:GY01 existing services

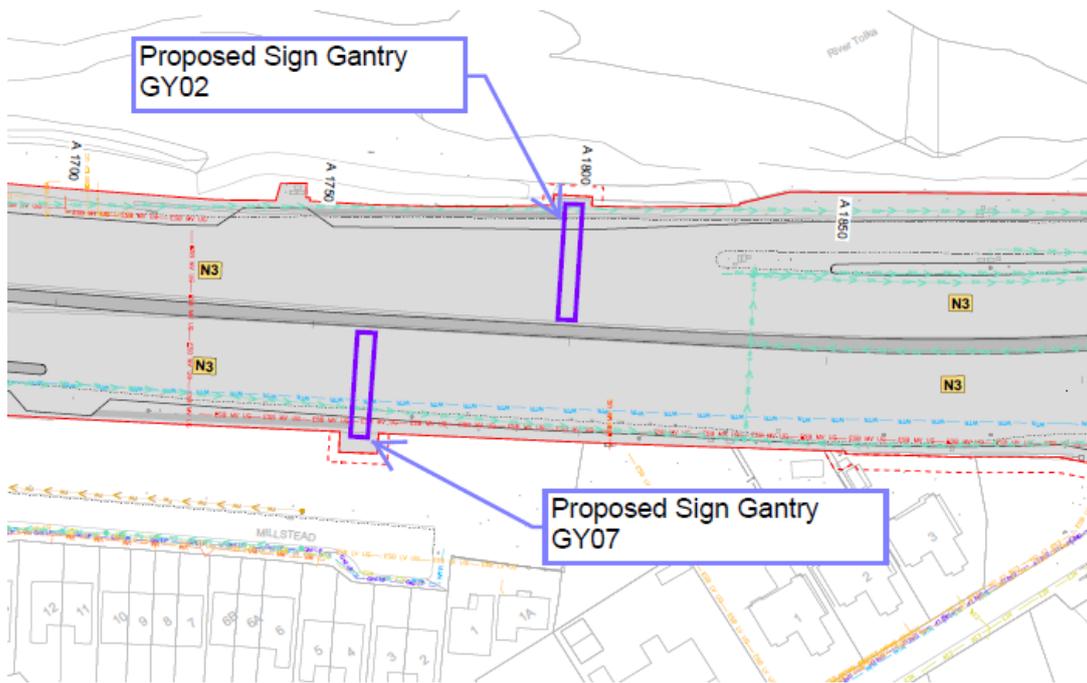


Figure 4: GY02 & GY07 existing services

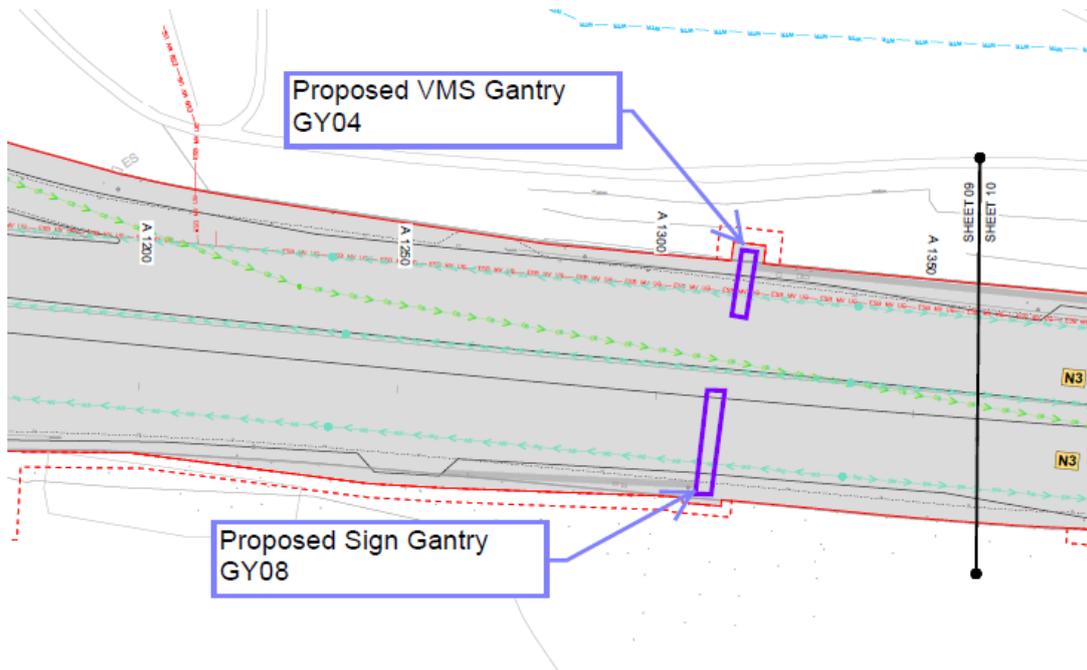


Figure 5: GY04 & GY08 existing services

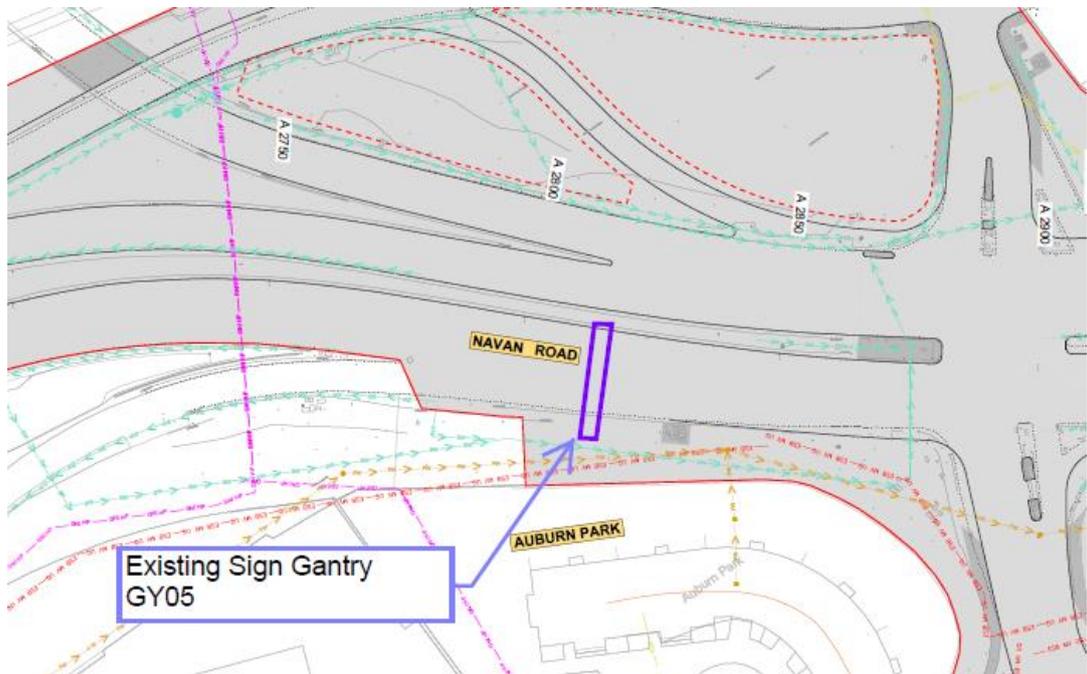


Figure 6: GY05 existing services

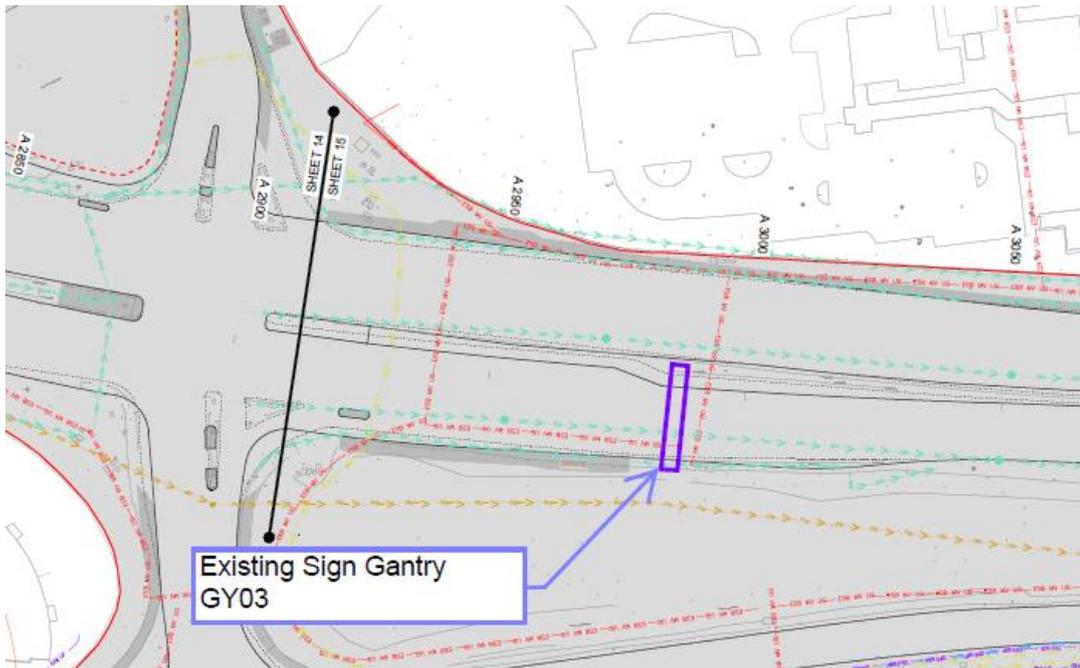


Figure 7: GY03 existing services

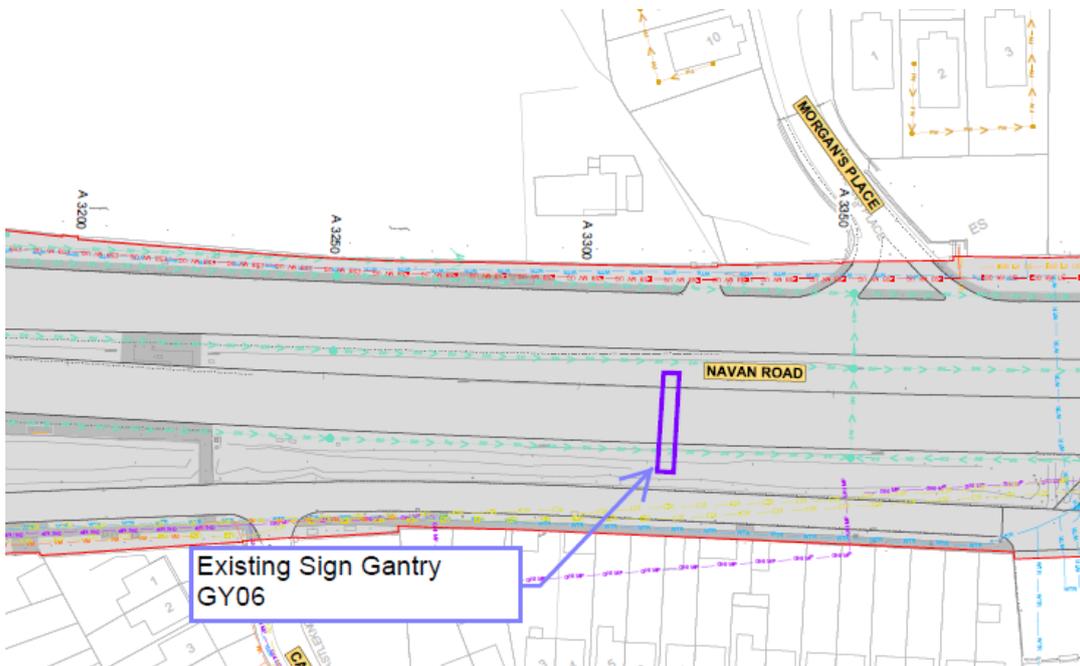


Figure 8: GY06 existing services

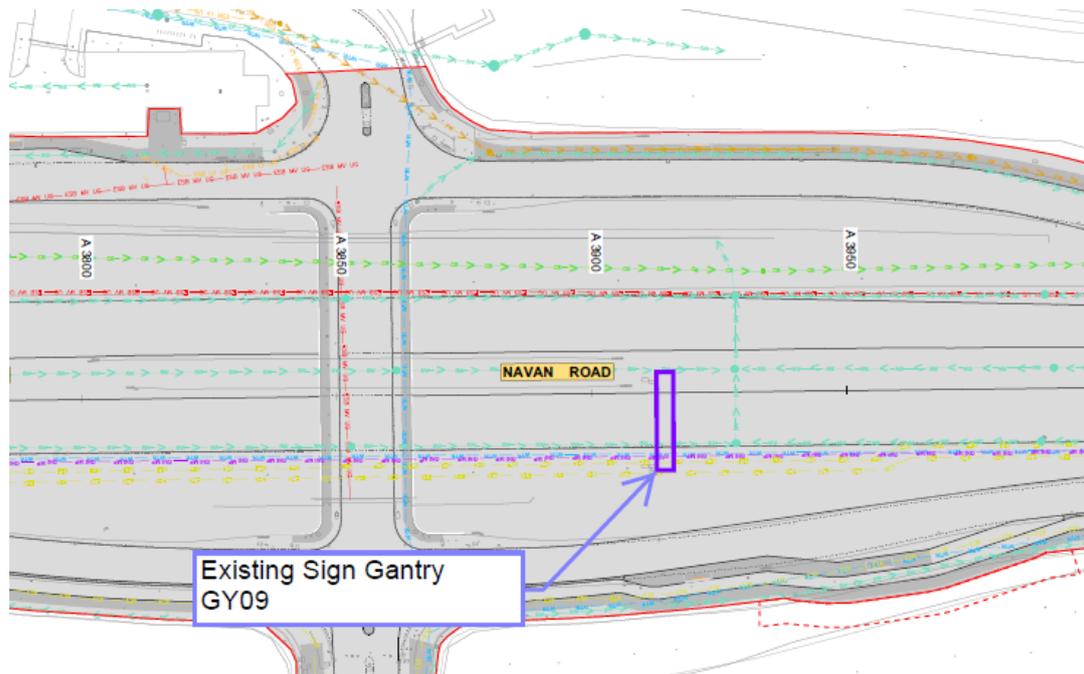


Figure 9: GY09 existing services

Foundation design to be coordinated with unities/services at detailed design stage.

2.7 Geotechnical Summary

No site-specific geotechnical investigation works were undertaken at the location of the proposed gantries. For the purposes of the preliminary design, it is assumed that the ground conditions are suitable for pad foundations. This assumption is based on the available GI across the site and a review of foundations used for the existing gantries on this section of the N3, which comprise pad footings.

Supplementary GI will be required to confirm the ground conditions at the gantry locations for detailed design.

2.8 Hydrology and Hydraulic Summary

The proposed structures are not expected to affect the local hydrology or have a hydraulic impact.

2.9 Archaeological Summary

There is no impact envisaged from these structures.

2.10 Environmental Summary

An Environmental Impact Assessment (EIA) is currently being prepared for this project. Outcomes from this EIA will be reviewed and incorporated once determined.

3 Structure and Aesthetics

3.1 General Description of Recommended Structure

The proposed structures will comprise reinforced concrete foundations and steel gantry superstructures for the provision of road signs. The bases will be in situ reinforced concrete foundation slabs with a bolted, fully fixed moment connection for the gantries' superstructure. The superstructure will be steel frames designed with reference to TII standard details.

There is one cantilever sign gantry, which will comprise a steel cantilever frame supporting the variable message sign. This will be in accordance with the UK Highways Agency Highway Construction Details MCX 583 and DN-STR-03010.

The remaining gantries will comprise Group 6 portal gantry systems, which will be designed with reference to the standard TII construction drawings and DN-STR-03010.

3.2 Aesthetic Considerations

The gantries will be detailed in accordance with the standard TII details for the gantry types selected.

3.3 Proposals for the Recommended Structure

3.3.1 Proposed Category

All the Group 6 portal gantries have a span which exceeds 20 m. Hence these sign gantries are classified as Category 2 structures according to DN-STR-03001.

The VMS gantry will have a cantilever arm extending greater than 9.0 m from centre of the support post, hence it is classified as a Category 2 structure.

3.3.2 Span Arrangements

Refer to Table 3 below for a summary of the gantry spans.

Table 3: Gantry Spans and Structure Category

Gantry	New / Existing	Span	Category
GY01	New/Modified – Portal Gantry	19.0 m	Cat. 2
GY02	New – Portal Gantry	23.3 m	Cat. 2
GY03	New/Modified – Portal Gantry	22.6 m	Cat. 2
GY04	New VMS Cantilever	9.5 m	Cat. 2
GY05	Existing – retained	-	-
GY06	New/Modified – Portal Gantry	18.1 m	Cat. 2
GY07	New – Portal Gantry	22.4 m	Cat. 2
GY08	New – Portal Gantry	20.8 m	Cat. 2
GY09	New/Modified – Portal Gantry	20.0 m	Cat. 2

3.3.3 Minimum Headroom Provided

A minimum vertical clearance of 5.80 m will be provided in accordance with TII Publication DN-STR-03010 *Portal and Cantilever Sign/Signal Gantries*.

3.3.4 Approaches including run-on Arrangements

N/A

3.3.5 Foundation Type

The gantries are to be supported on reinforced concrete pad foundations. All foundations to be founded on competent identified natural strata at the level indicated in the General Arrangement drawings. Site testing and inspections will be carried out to ensure the suitability of the formation.

3.3.6 Substructure

The substructure shall comprise of an in situ reinforced concrete plinth with cast-in holding down bolts to support the gantry elements.

3.3.7 Superstructure

The VMS cantilever gantry will comprise a welded steel box structure.

The portal sign gantries will comprise the standard TII details for Group 6 gantries.

3.3.8 Articulation Arrangement, Joints & Bearings

None.

3.3.9 Vehicle Restraint System

The vehicle restraint systems vary along the length of the scheme depending on the spatial constraints and traffic barrier restraint philosophy used on the project. These comprise H2 VRS barriers, with a mixture of steel and more rigid concrete barriers where required. Support plinths for the gantries have been set back to ensure the minimum working widths and vehicle intrusion widths are achieved for the barrier type at that location.

3.3.10 Drainage

Drainage will be detailed to avoid the gantry bases where practicable. Further coordination will be required at the detailed design stage.

3.3.11 Durability

The foundations will comprise concrete, which is a highly durable material. The concrete elements of this structure are expected to require minimal maintenance during its design life.

To improve its durability, the steelwork will be painted with a system complying with TII Specification CC-SPW-01900 (final colour to be approved by TII).

3.3.12 Sustainability

Recycled GGBS will be used in the design and construction of some of the concrete elements of the structure leading to a more sustainable structure overall.

3.3.13 Inspection and Maintenance

Inspections and maintenance of the completed gantries can be achieved via the integrated ladder and walkways. The gantry foundations are located behind the vehicle restraint system and can therefore be inspected without the need for traffic management. Parking bays have been incorporated into the scheme layout to allow for suitable access to the gantries by maintenance staff.

The working design life for the gantries will be 60 years in accordance with DN-STR-03010.

4 Safety

4.1 Traffic Management During Construction including Land for Temporary Diversions

To be developed at a further stage of the design.

4.2 Safety During Construction

The Designer will take account of the General Principles of Prevention, as specified in the Schedule 3 of the Safety, Health and Welfare at Work Act 2005, liaise with the Project Supervisor appointed by the Client for the Design Process and the Project Supervisor appointed for the Construction Stage and carry out all other duties as required by Clause 15 of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013).

4.3 Safety In Use

Safety barriers in accordance with TII Publication DN-REQ-03034 will be used to protect vehicles from the gantry structures. The safety barrier will be located within the verge in front of the gantry. The final minimum clear height under the gantry and any sign attachments will be 5.80 m to minimise the risk of vehicular strikes.

4.4 Lighting

There are no lighting requirements for these structures.

5 Design Assessment Criteria

5.1 Actions

The gantries shall be designed for loading in accordance with Eurocode and as modified by DN-STR-03010.

5.2 Permanent Actions

Permanent Actions shall be in accordance with IS EN 1991-1-1:2002 and DN-STR-03010.

5.3 Snow, Wind and Thermal Actions

Characteristic snow action is to be calculated in accordance with IS EN 1991-1-3 and DN-STR-03010.

Wind actions shall be in accordance with IS EN 1991-1-4 and DN-STR-03010.

Thermal actions shall be in accordance with IS EN 1991-1-5 and DN-STR-03010.

5.4 Actions relating to Normal Traffic

Not Applicable

5.5 Actions relating to Abnormal Traffic

Not Applicable.

5.6 Footway or Footbridge Live Loading

Not Applicable.

5.7 Provision for Exceptional Abnormal Loads

Not applicable.

5.8 Accidental Actions

Gantry supports within 4.5 m of the carriageway will be design for accidental collision loads as outlined in DN-STR-03010.

5.9 Actions During Construction

Not applicable.

5.10 Any Special Loading not Covered Above

None.

6 Ground Conditions

The recent site-specific GI (undertaken by GII, 2021) did not include any exploratory SI works at the proposed gantry locations. The assessment of the ground stratigraphy at these locations was undertaken via a desktop study using the nearby historic GI (where available) and the closest exploratory records (drilled/excavated) which were carried out as part of the recent GI. In many cases the closest GI used to predict the ground conditions is far away from the proposed gantry location. Furthermore, many of the gantries will be founded on national road embankments where the ground conditions might be different from those recorded in the exploratory locations (thicker layer of Engineering Fill, absence of soft/loose layers, etc).

Hence, another round of GI will be required to confirm the ground conditions at the gantry locations for detailed design.

Refer to Appendix B for the developed stratigraphy at the proposed gantry locations, using the existing information as described above.

7 Drawings and Documents

7.1 List of All Documents Accompanying the Submission

Relevant documents are included as appendices to this report.

Appendix A - Drawings

The following drawings are included as part of this submission.

Table 4: Drawing List

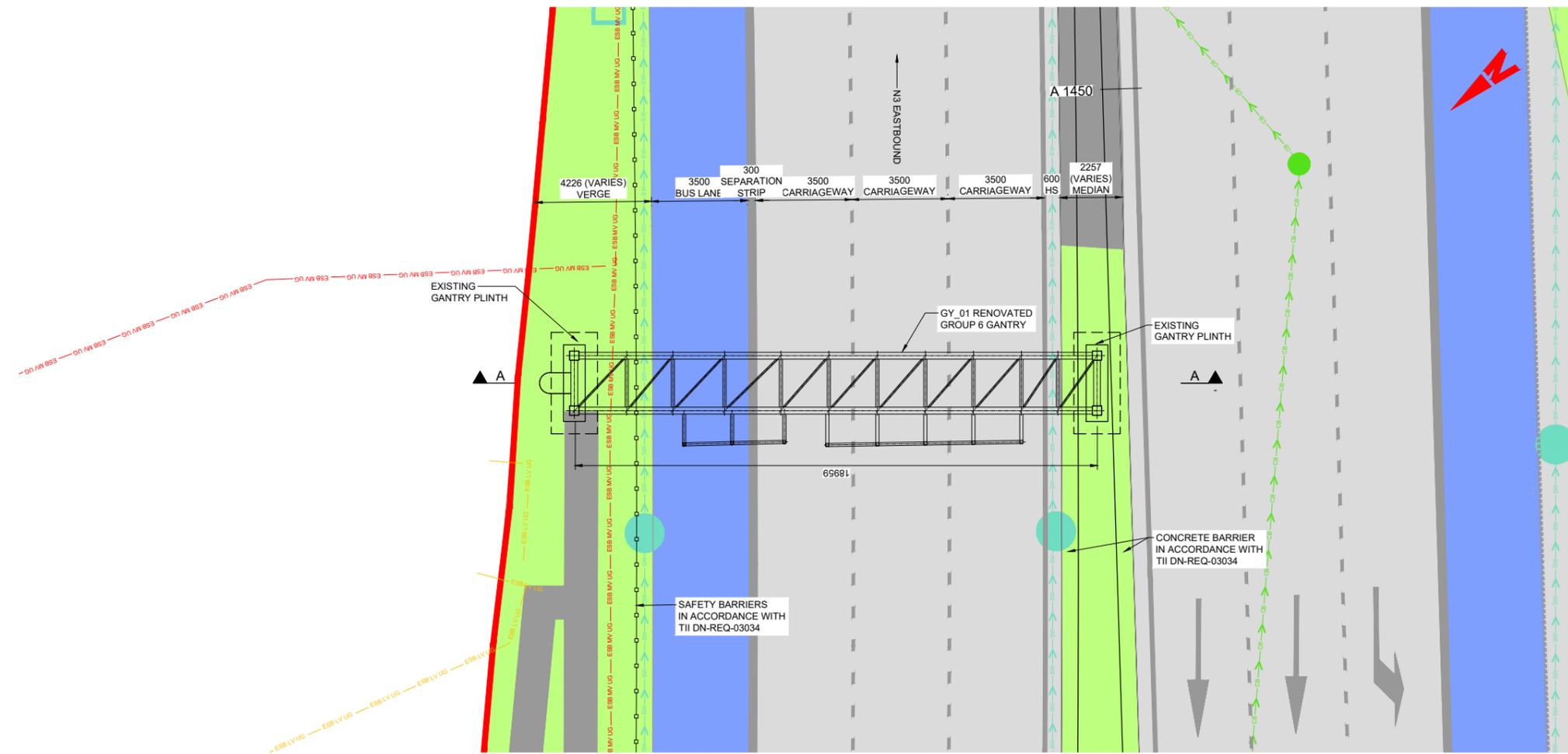
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BCIDC-ARP-STR_GA-0005_GY_02-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_03-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_04-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_06-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_07-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_08-DR-CB-0002	General Arrangement
BCIDC-ARP-STR_GA-0005_GY_09-DR-CB-0002	General Arrangement

Appendix B – Geotechnical Information

Appendix C – Overview of Gantries

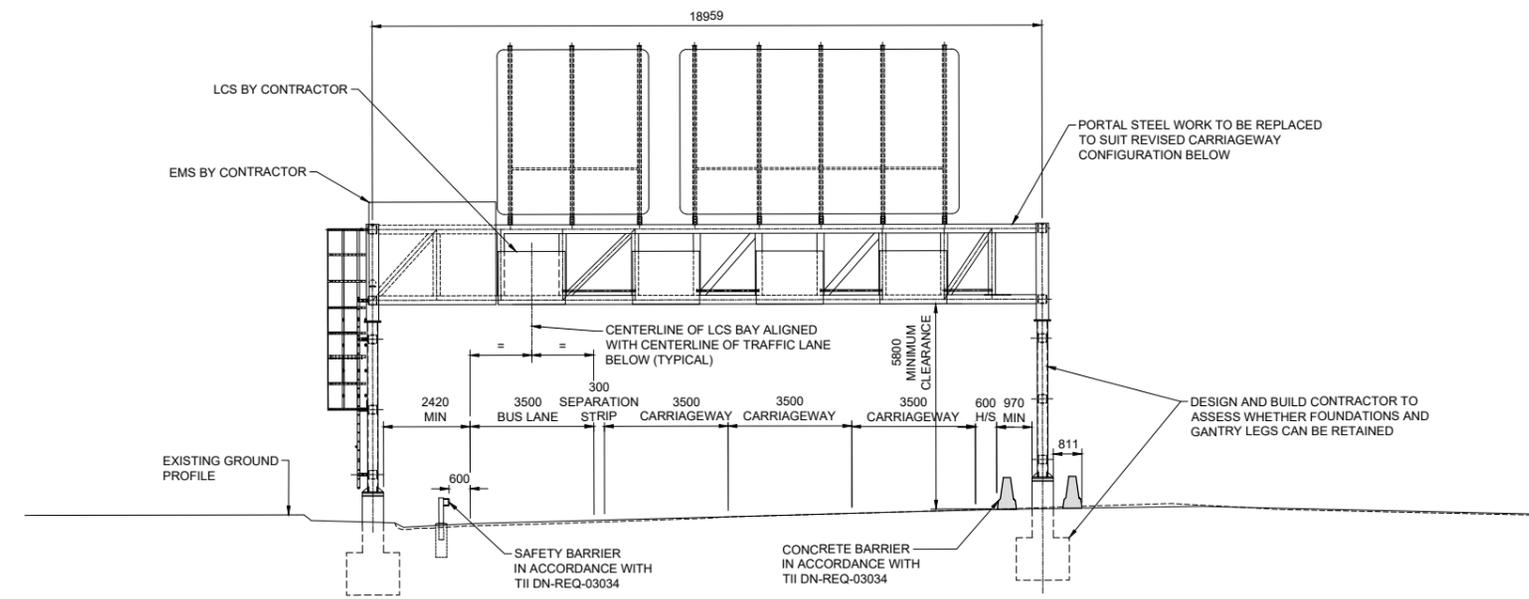
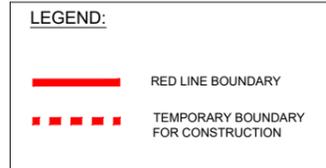
Appendix A

Drawings



PLAN ON RENOVATED GANTRY
SCALE: 1:100

- NOTES:**
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDNANCE DATUM.
 - GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.



SECTION A-A
SCALE: 1:100

\\global\europa\dublin\cbs\268000\268401\000513 STR\Drawings\DR\BCIDC-ARP-STR_GA-0005_GY_01-DR-CB-0002.dwg

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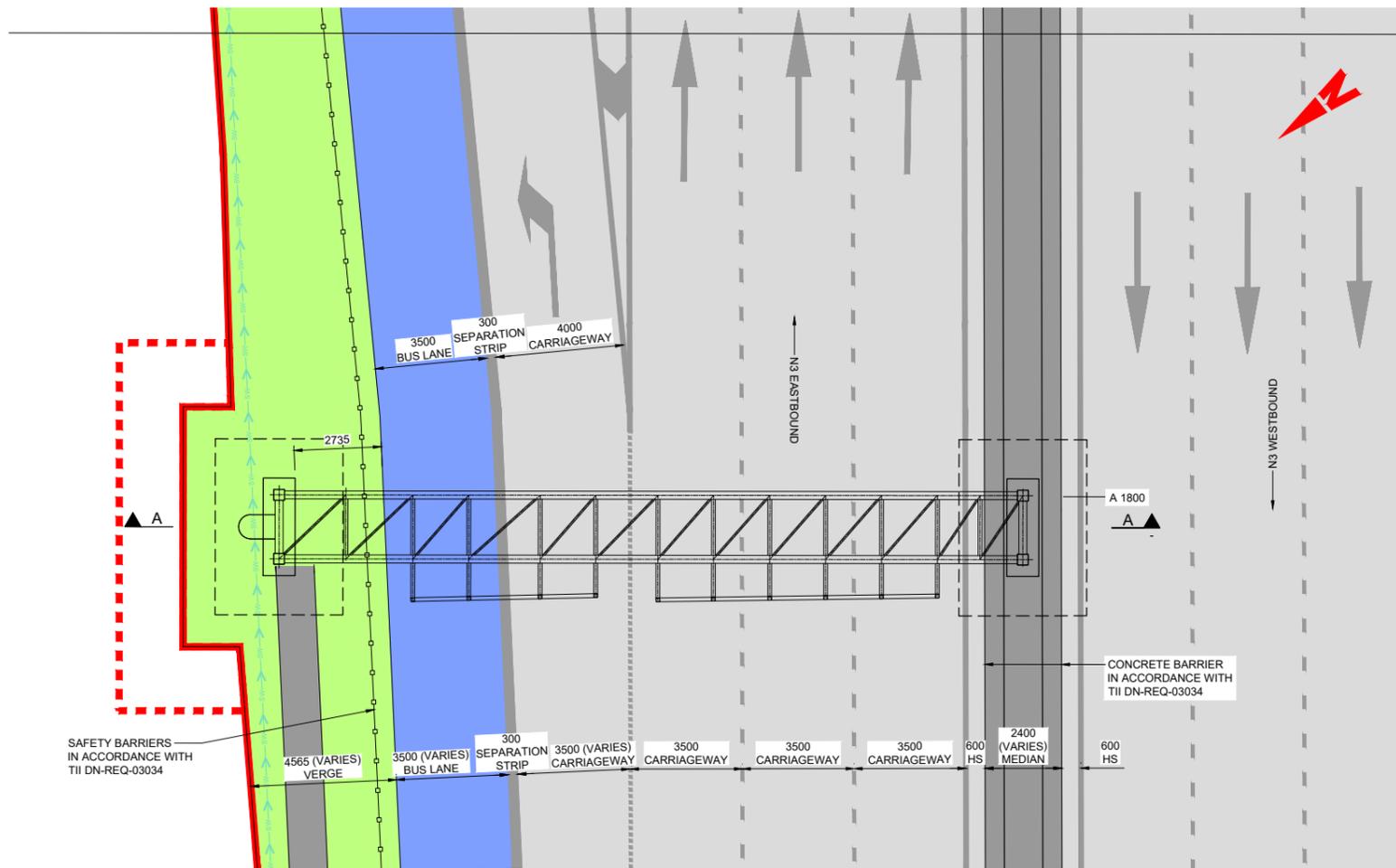
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Rev	Date	Drn	Chk'd	App'd	Description
M01	04/04/2022	BM	CG	BD	ISSUE FOR PHASE 4: PLANNING

Date	04/04/2022	Scale	As Shown @ A1 As Shown @ A3
Drawn	BM	Checked	CG
Approved	BD	OMS Code: 268401-00	

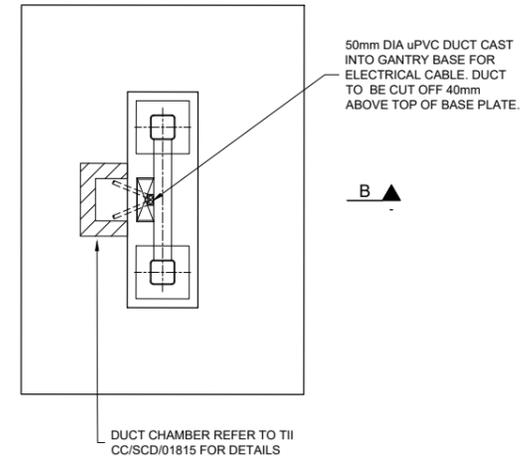
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Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_01 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1			
Drawing File Name	BCIDC-ARP-STR_GA-0005_GY_01-DR-CB-0002	Sheet Number	01 of 01
Status	A	Rev	M01

DO NOT SCALE USE FIGURED DIMENSIONS ONLY



PLAN ON PROPOSED GANTRY
SCALE: 1:100

PLAN ON GANTRY FOUNDATION
SCALE: 1:50

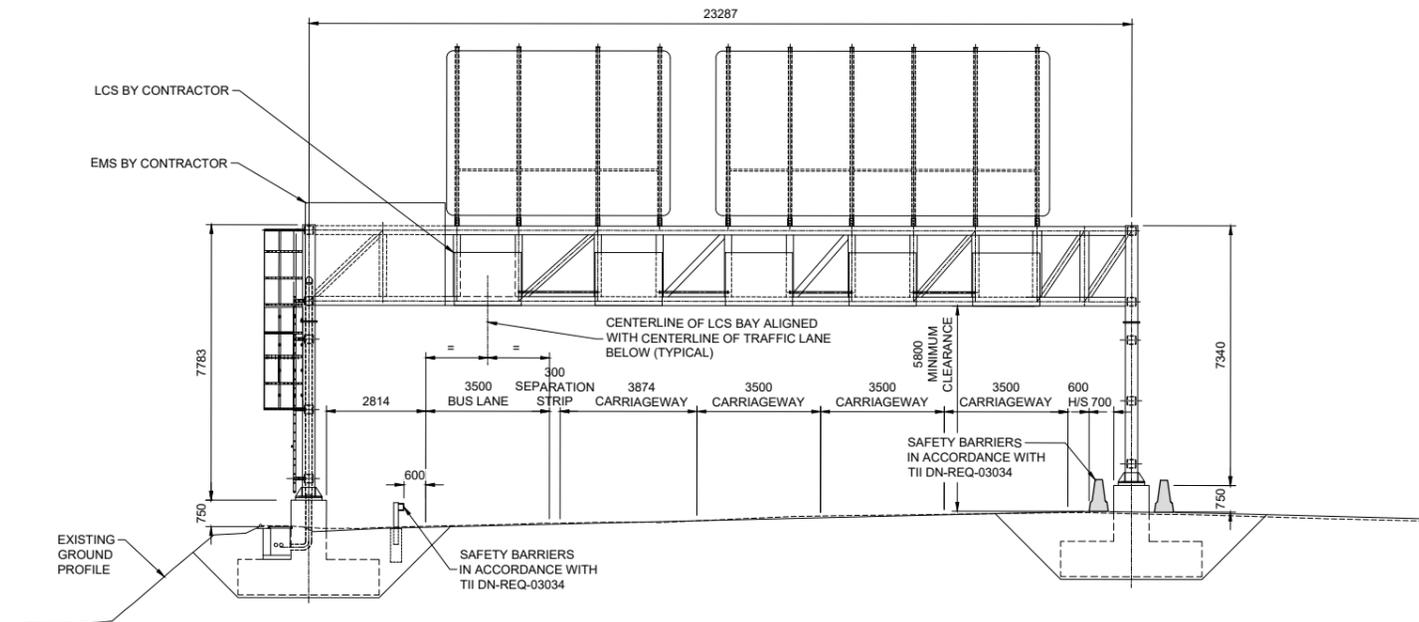


NOTES:

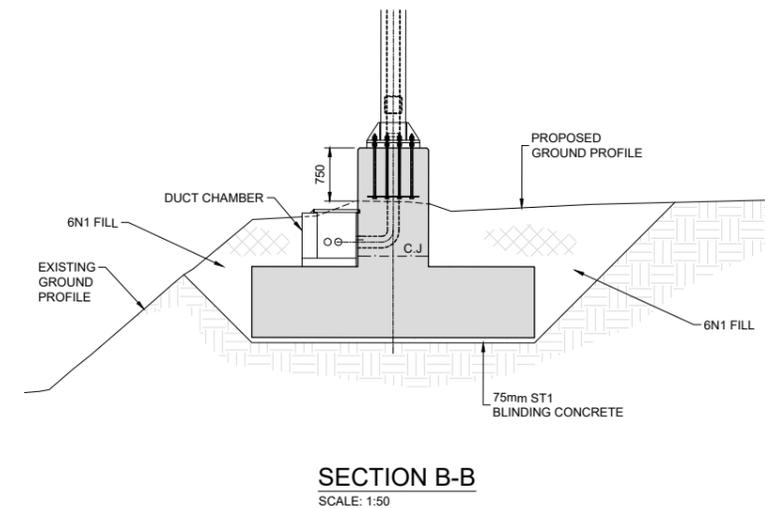
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDINANCE DATUM.
 - FINISHES:
 - ALL EXPOSED FORMED SURFACES - F4
 - ALL EXPOSED UNFORMED SURFACES - U3
 - ALL BURIED/HIDDEN FORMED SURFACES - F1
 - ALL BURIED/HIDDEN UNFORMED SURFACES - U1
 - MATERIALS:
 - STRUCTURAL CONCRETE:
 - LOCATION: GANTRY BASE
 - CONCRETE GRADE: - C40/50 (50% GGBS)
 - NON-STRUCTURAL CONCRETE:
 - LOCATION: CONCRETE FOR BLINDING
 - CONCRETE GRADE: - ST1
 - STEEL:
 - LOCATION: FABRICATED STEEL PLANTED ELEMENTS
 - STEEL GRADE: - S355J2G3
 - STEEL HOLLOW SECTIONS - S355J2H
- NOTE: AREAS WITHIN 'SPASH ZONE' HAVE A MINIMUM CONCRETE GRADE C40/50 WITH A MINIMUM 50% GROUND GRANULATED BLAST FURNACE SLAG (GGBS).
- BURIED CONCRETE SURFACES SHALL BE TREATED WITH TWO COATS OF EPOXY RESIN WATERPROOFING PAINT IN ACCORDANCE WITH TII MCDRW SERIES 2000.
 - ALL EXPOSED CONCRETE SHALL BE IMPREGNATED WITH A HYDROPHOBIC PORE LINER IN ACCORDANCE WITH THE TII MCDRW SERIES 1700.
 - EXTERNAL CONCRETE ARISES TO BE CHAMFERED 25x25 UNO.
 - LOCALISED SOFT SPOTS, IF PRESENT, TO BE EXCAVATED AND REPLACED WITH 6N2.
 - GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.

LEGEND:

- RED LINE BOUNDARY
- TEMPORARY BOUNDARY FOR CONSTRUCTION



SECTION A-A
SCALE: 1:100



SECTION B-B
SCALE: 1:50

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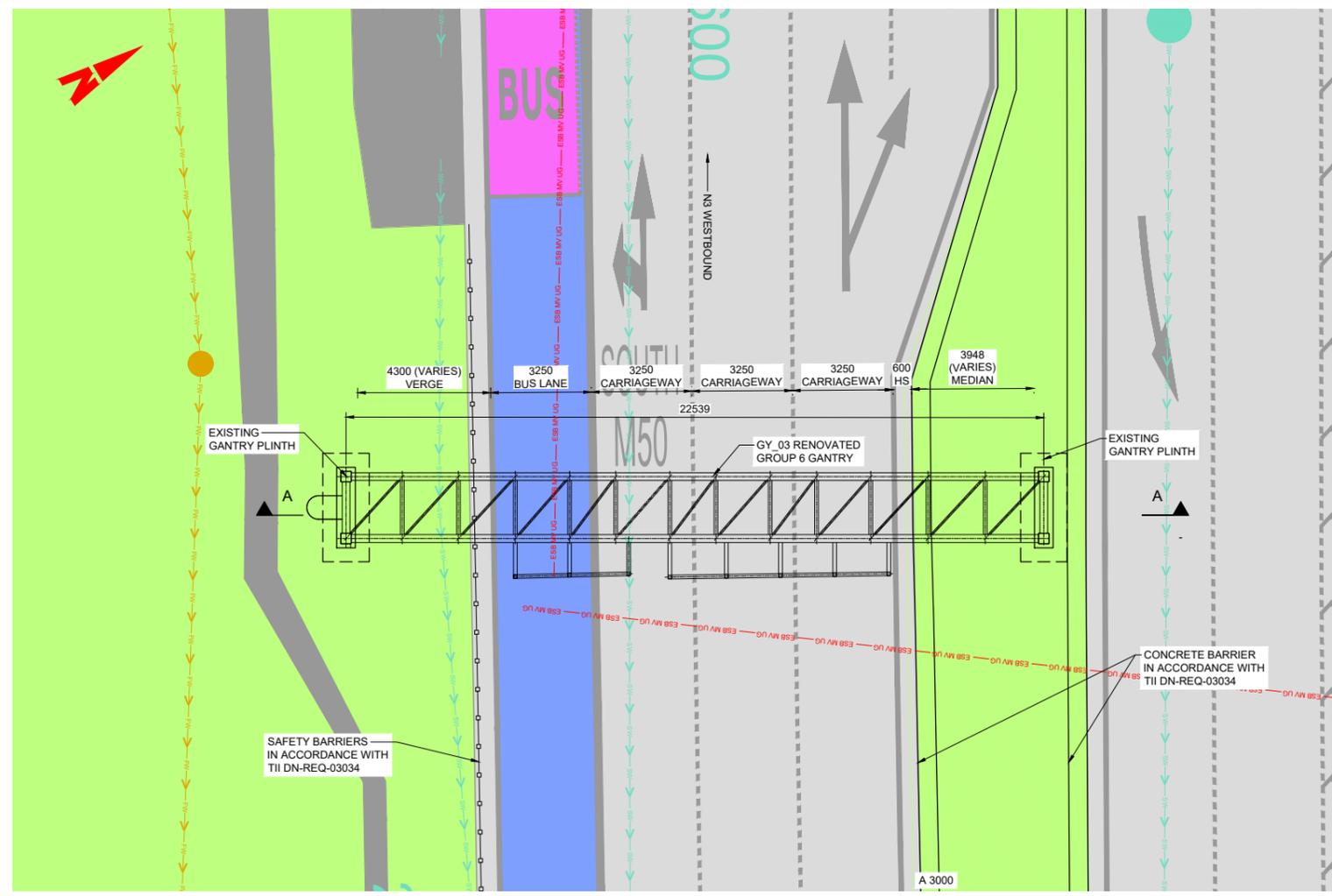
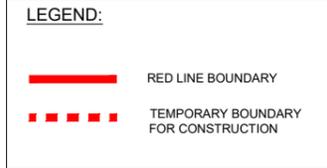
Rev	Date	Drn	Chk'd	App'd	Description
M01	04/04/2022	BM	CG	BD	ISSUE FOR PHASE 4: PLANNING

Client NTA Udarás Náisiúnta Iompair National Transport Authority		Engineering Designer ARUP		
Date 04/04/2022	Scale As Shown @ A1 As Shown @ A3	Drawn BM	Checked CG	Approved BD
Project Code BCIDC	Originator Code ARP	OMS Code 268401-00		

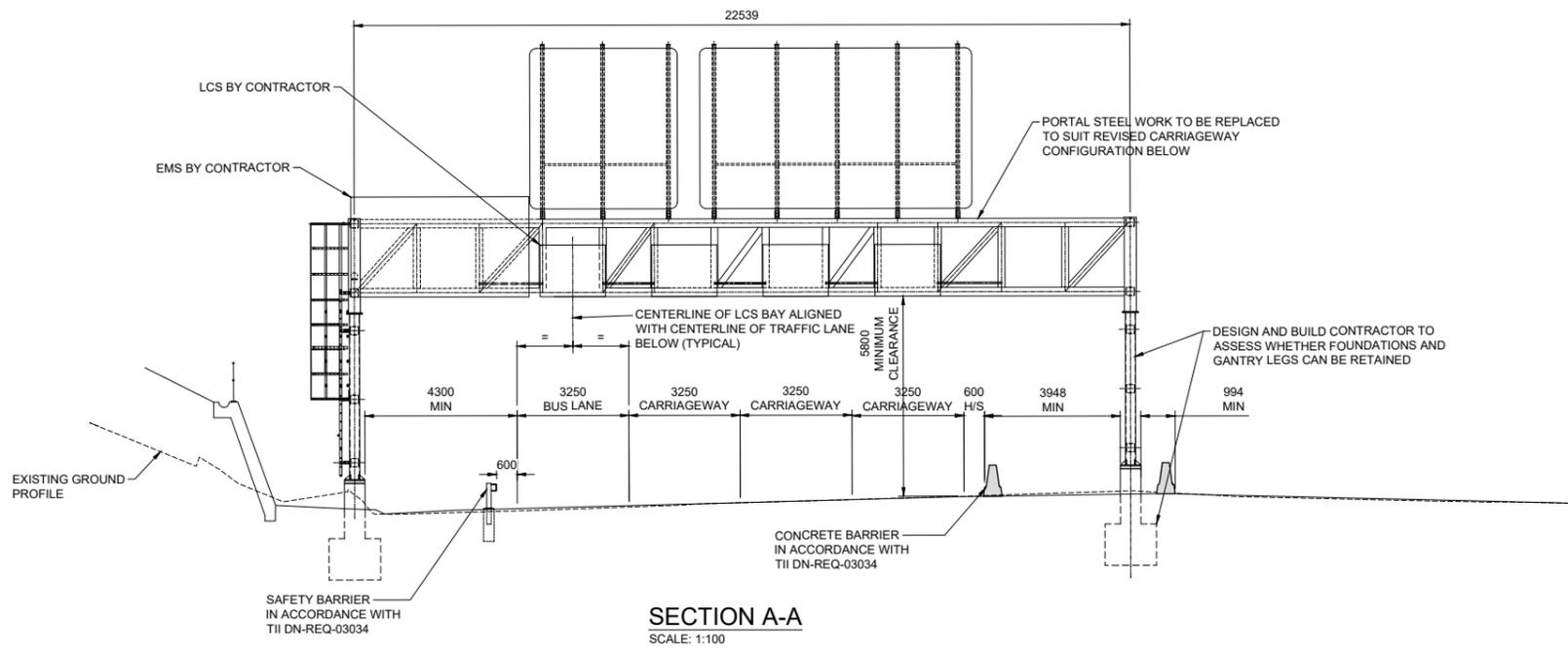
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Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_02 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1				
Drawing File Name BCIDC-ARP-STR_GA-0005_GY_02-DR-CB-0002	Sheet Number 01 of 01	Status A	Rev M01	

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

- NOTES:**
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDNANCE DATUM.
 - GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.



PLAN ON RENOVATED GANTRY
 SCALE: 1:100



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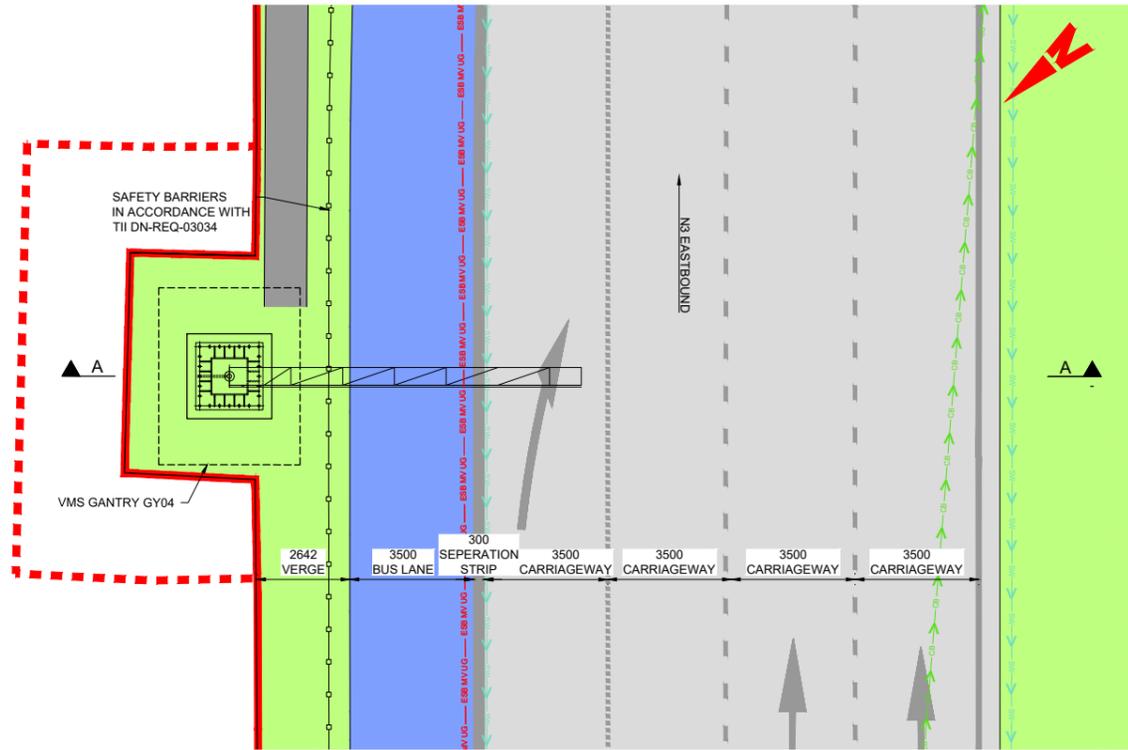
Client

Engineering Designer

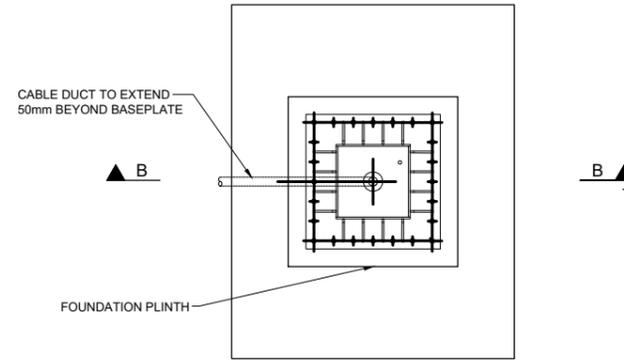
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		CORE BUS CORRIDORS INFRASTRUCTURE WORKS	
Drawing Title		BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME	
		GY_03 GROUP 6 GANTRY	
		GENERAL ARRANGEMENT SHEET 1	
Drawing File Name	Sheet Number	Status	Rev
BCIDC-ARP-STR_GA-0005_GY_03-DR-CB-0002	01 of 01	A	M01

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

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PLAN ON PROPOSED GANTRY
SCALE: 1:100



PLAN ON GANTRY FOUNDATION
SCALE: 1:50

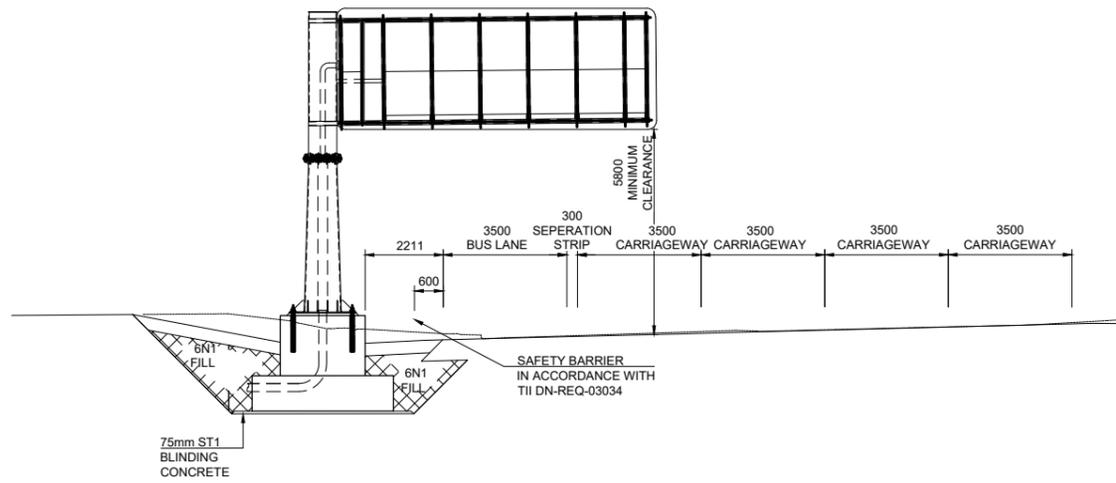
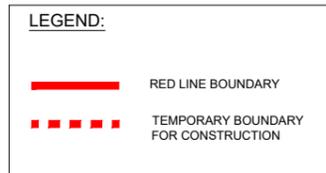
- NOTES:**
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDNANCE DATUM.
 - FINISHES:

ALL EXPOSED FORMED SURFACES	- F4
ALL EXPOSED UNFORMED SURFACES	- U3
ALL BURRIED/HIDDEN FORMED SURFACES	- F1
ALL BURRIED/HIDDEN UNFORMED SURFACES	- U1
 - MATERIALS:

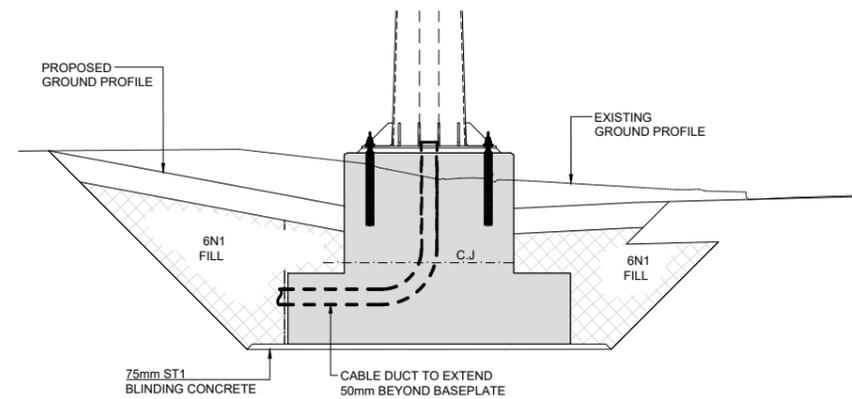
STRUCTURAL CONCRETE:		CONCRETE GRADE:	
LOCATION:		- C40/50 (50% GGBS)	
GANTRY BASE		- C40/50 (50% GGBS)	
GANTRY PLINTH			
NON-STRUCTURAL CONCRETE:		CONCRETE GRADE:	
LOCATION:		- ST1	
CONCRETE FOR BLINDING			

NOTE: AREAS WITHIN 'SPASH ZONE' HAVE A MINIMUM CONCRETE GRADE C40/50 WITH A MINIMUM 50% GROUND GRANULATED BLAST FURNACE SLAG (GGBS).

STEEL:		STEEL GRADE:	
LOCATION:		- S355J2G3	
FABRICATED STEEL PLATED ELEMENTS		- S355J2H	
STEEL HOLLOW SECTIONS			
 - BURIED CONCRETE SURFACES SHALL BE TREATED WITH TWO COATS OF EPOXY RESIN WATERPROOFING PAINT IN ACCORDANCE WITH TII MCDRW SERIES 2000.
 - ALL EXPOSED CONCRETE SHALL BE IMPREGNATED WITH A HYDROPHOBIC PORE LINER IN ACCORDANCE WITH THE TII MCDRW SERIES 1700.
 - EXTERNAL CONCRETE ARISING TO BE CHAMFERED 25x25 UNO.
 - THE DUCTING, CHAMBER AND CABINET ARRANGEMENT FOR THE DISTRIBUTION OF ESB POWER SUPPLIES, FEEDER PILLARS AND COMMUNICATION CABLING SHALL BE IN ACCORDANCE WITH TII SPECIFICATIONS.
 - LOCALISED SOFT SPOTS, IF PRESENT, TO BE EXCAVATED AND REPLACED WITH 6N2.



SECTION A-A
SCALE: 1:100



SECTION B-B
SCALE: 1:50

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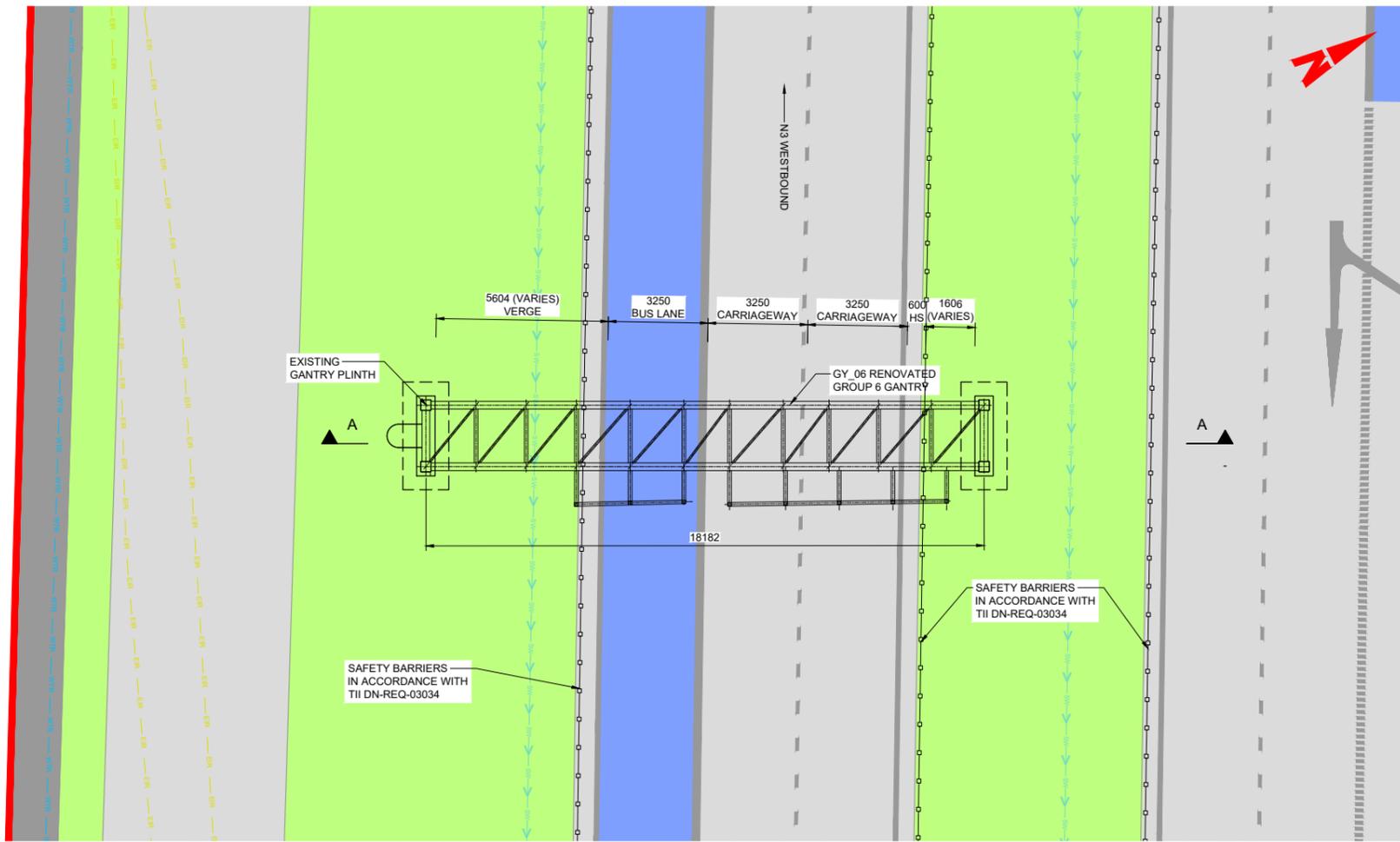


Rev	Date	Drn	Chk'd	App'd	Description
M01	04/04/2022	BM	CG	DC	ISSUE FOR PHASE 4: PLANNING

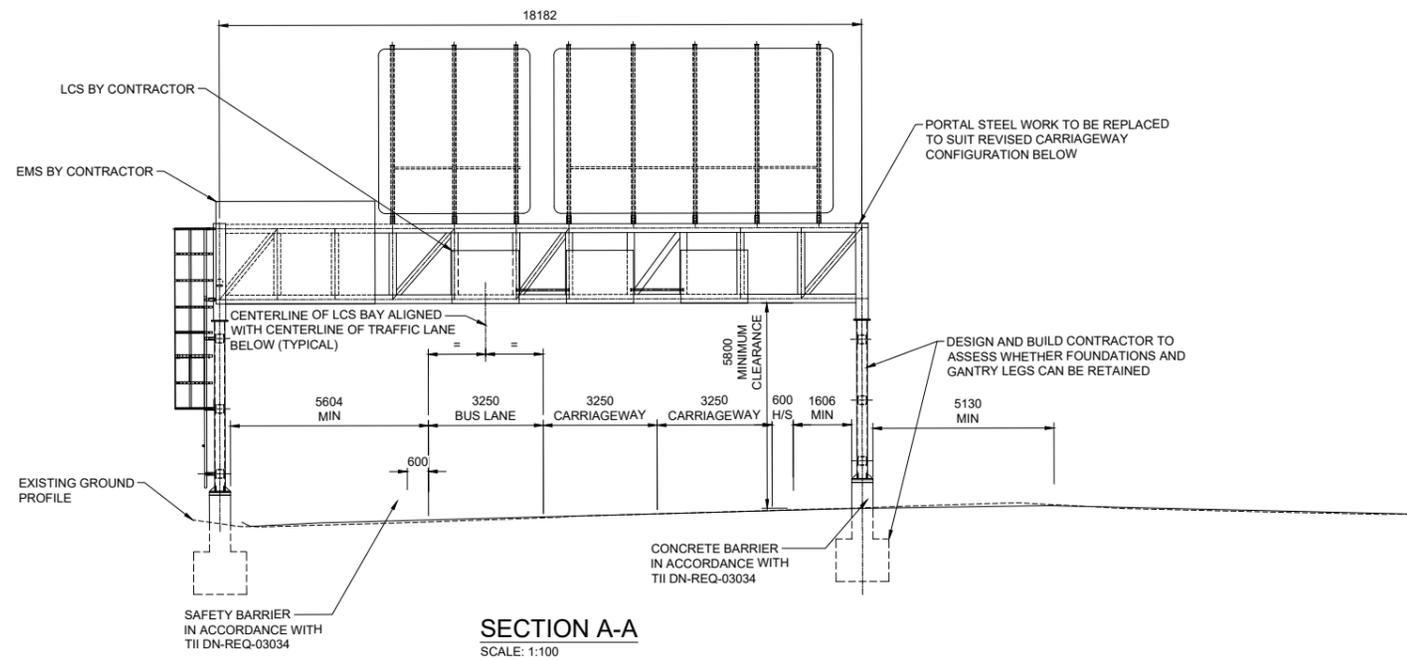
<p>Udarás Náisiúnta Iompair National Transport Authority</p>				
Date	Scale	Drawn	Checked	Approved
04/04/2022	A.S. @ A1 AS SHOWN @ A3	BM	CG	DC
Project Code	Originator Code	OMS Code		
BCIDC	ARP	268401-00		

Programme Title BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS			
Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_04 VMS GANTRY GENERAL ARRANGEMENT SHEET 1			
Drawing File Name	Sheet Number	Status	Rev
BCIDC-ARP-STR_GA-0005_GY_04-DR-CB-0002	01 of 01	A	M01

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PLAN ON RENOVATED GANTRY
SCALE: 1:100



SECTION A-A
SCALE: 1:100

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE SHOWN IN METERS ABOVE ORDINANCE DATUM.
3. GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.

LEGEND:

- RED LINE BOUNDARY
- - - - - TEMPORARY BOUNDARY FOR CONSTRUCTION

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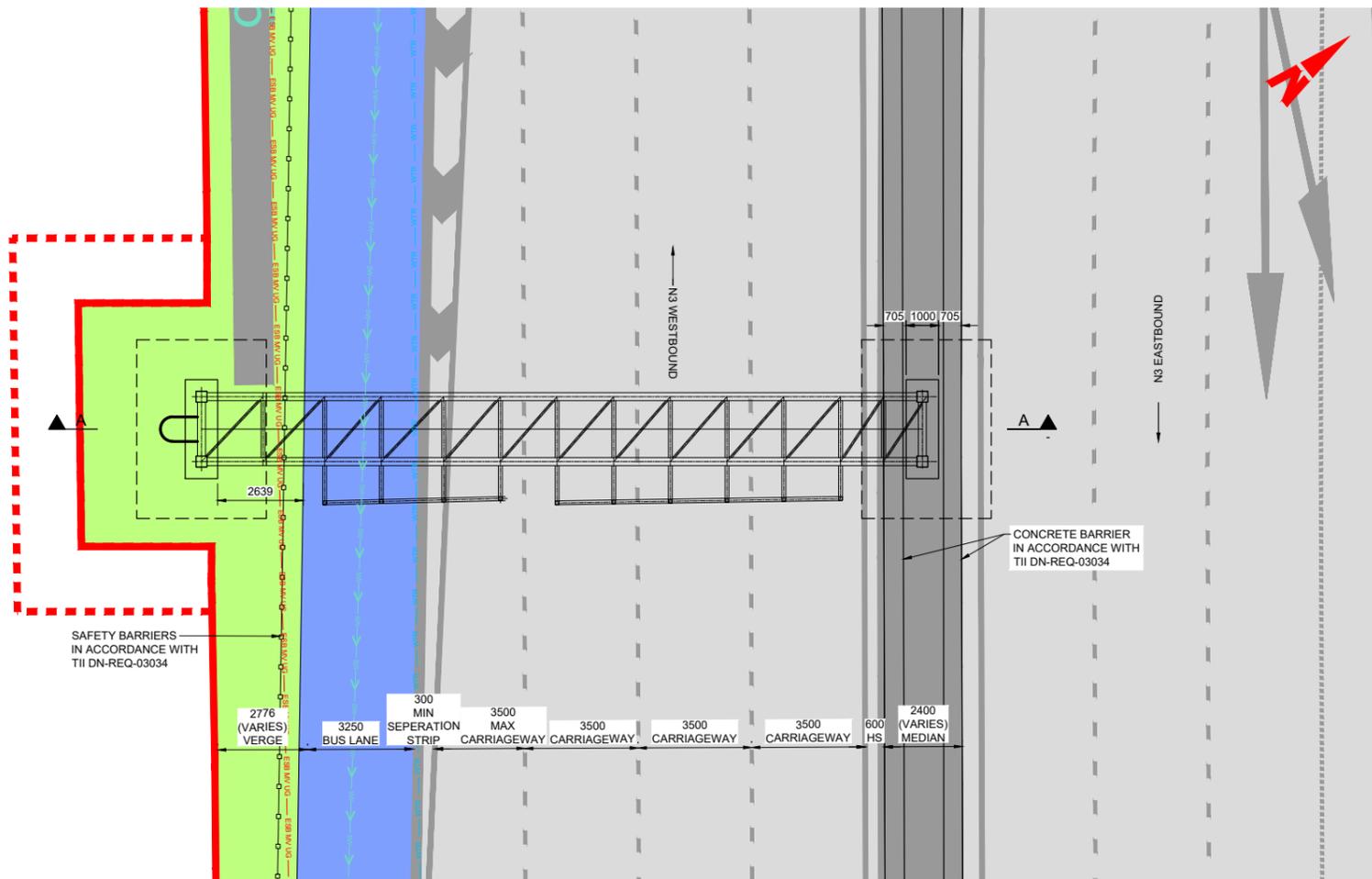
Client

 Údarás Náisiúnta Iompair
 National Transport Authority

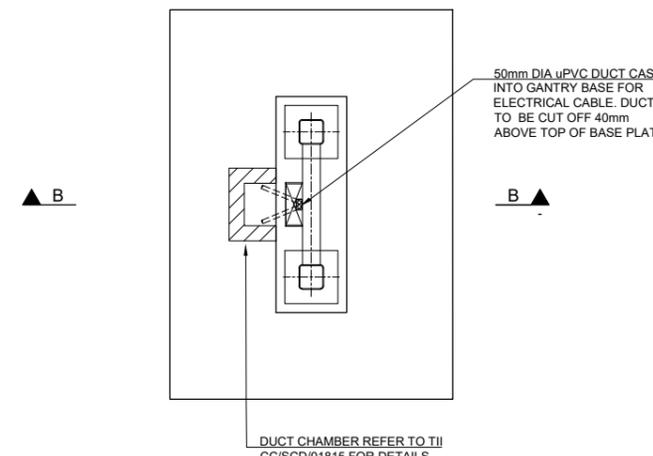
Engineering Designer

Programme Title BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS	
Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_06 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1	
Date 04/04/2022	Scale As Shown @ A1 As Shown @ A3
Drawn BM	Checked CG
Approved BD	
Project Code BCIDC	Originator Code ARP
OMS Code 268401-00	
Drawing File Name BCIDC-ARP-STR_GA-0005_GY_06-DR-CB-0002	Sheet Number 01 of 01
Status A	Rev M01

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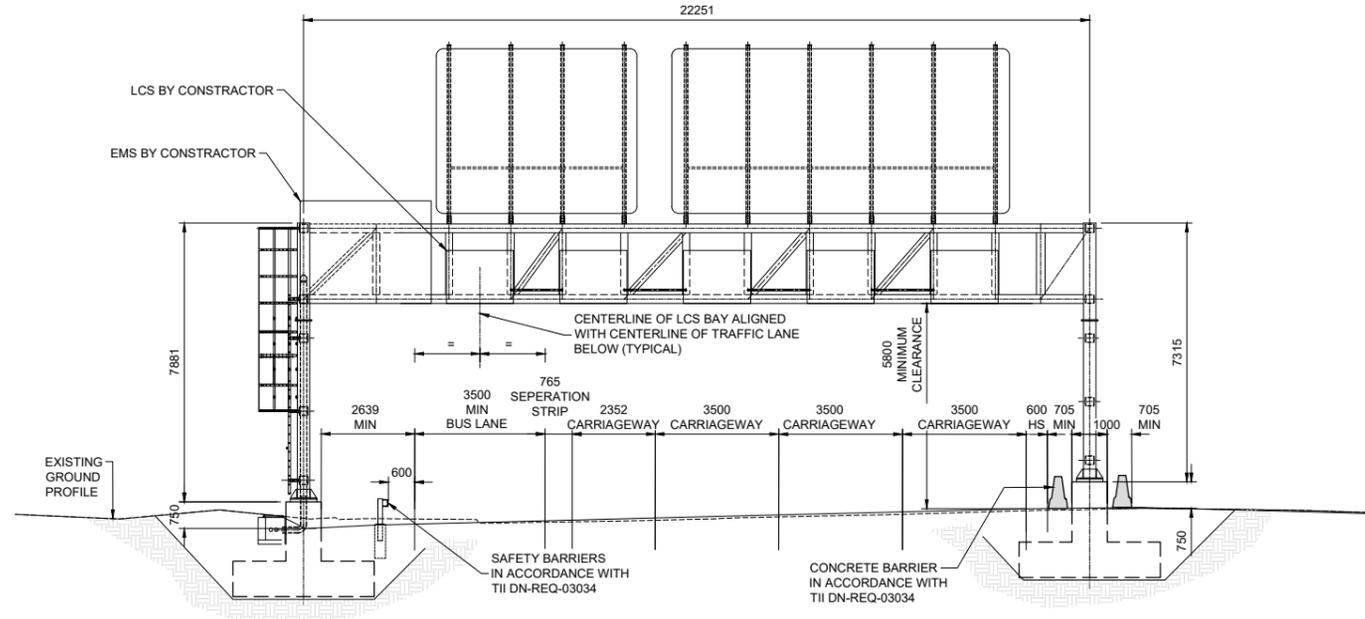
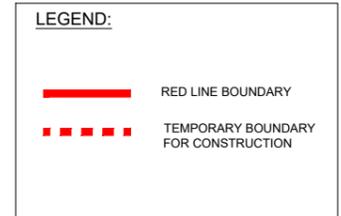


PLAN ON PROPOSED GANTRY
SCALE: 1:100

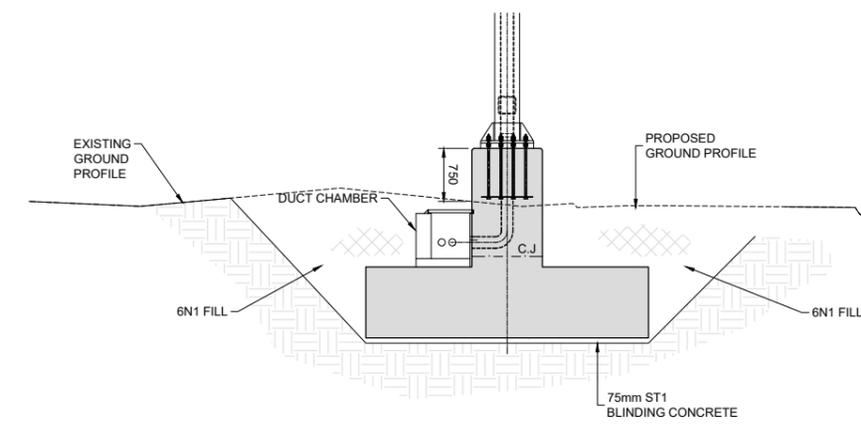


PLAN ON GANTRY FOUNDATION
SCALE: 1:50

- NOTES:**
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDANCE DATUM.
 - FINISHES:
 - ALL EXPOSED FORMED SURFACES - F4
 - ALL EXPOSED UNFORMED SURFACES - U3
 - ALL BURIED/HIDDEN FORMED SURFACES - F1
 - ALL BURIED/HIDDEN UNFORMED SURFACES - U1
 - MATERIALS:
 - STRUCTURAL CONCRETE:
 - LOCATION: GANTRY BASE
 - CONCRETE GRADE: - C40/50 (50% GGBS)
 - NON-STRUCTURAL CONCRETE:
 - LOCATION: CONCRETE FOR BLINDING
 - CONCRETE GRADE: - ST1
 - STEEL:
 - LOCATION: FABRICATED STEEL PLANTED ELEMENTS
 - STEEL GRADE: - S355J2G3
 - STEEL HOLLOW SECTIONS - S355J2H
- NOTE: AREAS WITHIN 'SPASH ZONE' HAVE A MINIMUM CONCRETE GRADE C40/50 WITH A MINIMUM 50% GROUND GRANULATED BLAST FURNACE SLAG (GGBS).
- BURIED CONCRETE SURFACES SHALL BE TREATED WITH TWO COATS OF EPOXY RESIN WATERPROOFING PAINT IN ACCORDANCE WITH TII MCDRW SERIES 2000.
 - ALL EXPOSED CONCRETE SHALL BE IMPREGNATED WITH A HYDROPHOBIC PORE LINER IN ACCORDANCE WITH THE TII MCDRW SERIES 1700.
 - EXTERNAL CONCRETE ARISES TO BE CHAMFERED 25x25 UNO.
 - LOCALISED SOFT SPOTS, IF PRESENT, TO BE EXCAVATED AND REPLACED WITH 6N2.
 - GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.



SECTION A-A
SCALE: 1:100



SECTION B-B
SCALE: 1:50

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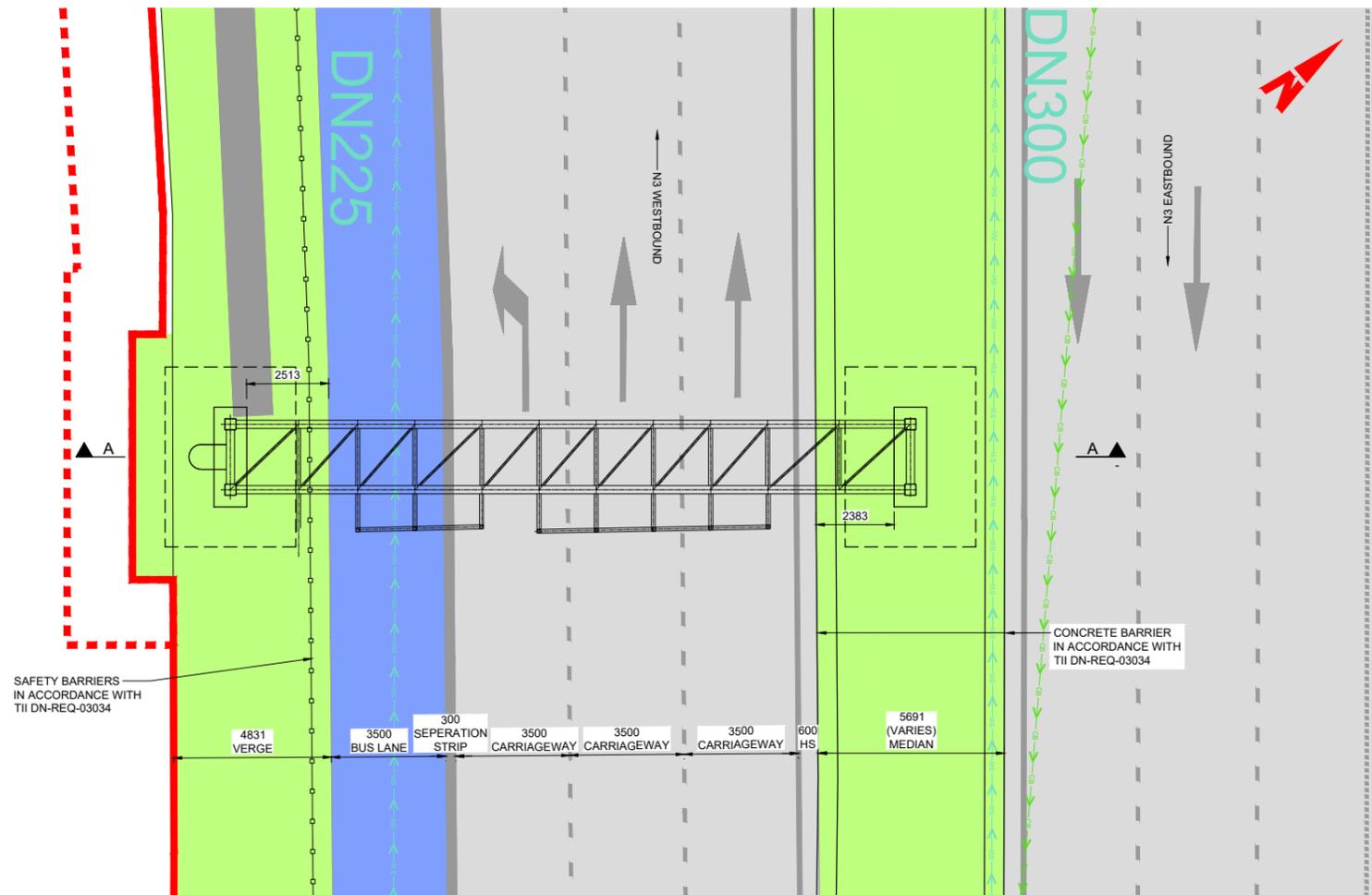
Rev	Date	Drn	Chk'd	App'd	Description
M01	04/04/2022	BM	CG	BD	ISSUE FOR PHASE 4: PLANNING

Client NTA Udarás Náisiúnta Iompair National Transport Authority		Engineering Designer ARUP		
Date 04/04/2022	Scale As Shown @ A1 As Shown @ A3	Drawn BM	Checked CG	Approved BD
Project Code BCIDC	Originator Code ARP	OMS Code 268401-00		

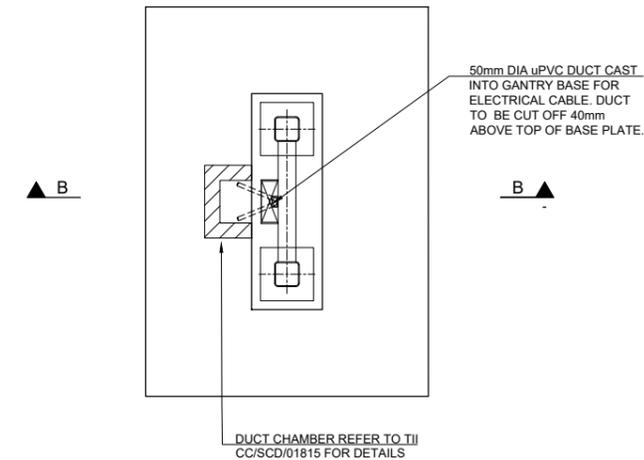
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Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_07 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1				
Drawing File Name BCIDC-ARP-STR_GA-0005_GY_07-DR-CB-0002	Sheet Number 01 of 01	Status A	Rev M01	

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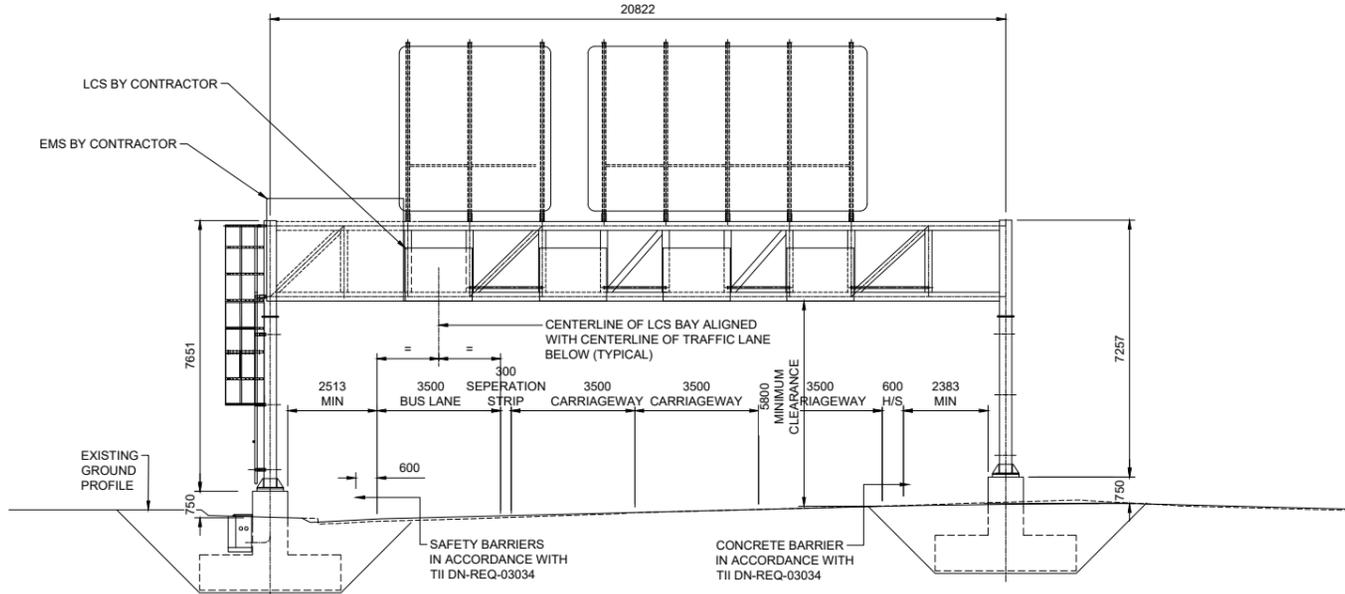
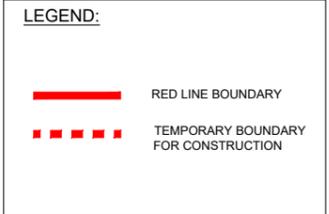


PLAN ON PROPOSED GANTRY
SCALE: 1:100

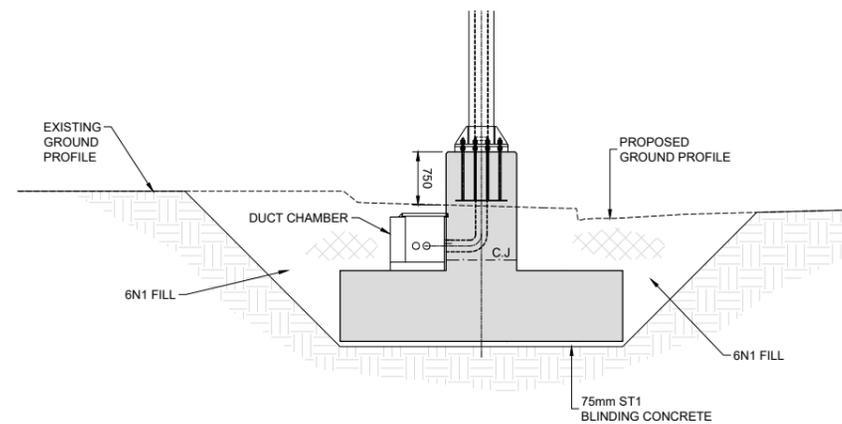


PLAN ON GANTRY FOUNDATION
SCALE: 1:50

- NOTES:**
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - ALL LEVELS ARE SHOWN IN METERS ABOVE ORDANCE DATUM.
 - FINISHES:
 - ALL EXPOSED FORMED SURFACES - F4
 - ALL EXPOSED UNFORMED SURFACES - U3
 - ALL BURIED/HIDDEN FORMED SURFACES - F1
 - ALL BURIED/HIDDEN UNFORMED SURFACES - U1
 - MATERIALS:
 - STRUCTURAL CONCRETE:
 - LOCATION: GANTRY BASE
 - CONCRETE GRADE: - C40/50 (50% GGBS)
 - NON-STRUCTURAL CONCRETE:
 - LOCATION: CONCRETE FOR BLINDING
 - CONCRETE GRADE: - ST1
 - STEEL:
 - LOCATION: FABRICATED STEEL PLATED ELEMENTS
 - STEEL GRADE: - S355J2G3
 - STEEL HOLLOW SECTIONS - S355J2H
 - NOTE: AREAS WITHIN 'SPASH ZONE' HAVE A MINIMUM CONCRETE GRADE C40/50 WITH A MINIMUM 50% GROUND GRANULATED BLAST FURNACE SLAG (GGBS).
 - BURIED CONCRETE SURFACES SHALL BE TREATED WITH TWO COATS OF EPOXY RESIN WATERPROOFING PAINT IN ACCORDANCE WITH TII MCDRW SERIES 2000.
 - ALL EXPOSED CONCRETE SHALL BE IMPREGNATED WITH A HYDROPHOBIC PORE LINER IN ACCORDANCE WITH THE TII MCDRW SERIES 1700.
 - EXTERNAL CONCRETE RISES TO BE CHAMFERED 25x25 UNO.
 - LOCALISED SOFT SPOTS, IF PRESENT, TO BE EXCAVATED AND REPLACED WITH 6N2.
 - GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC/SCD-01814 TO CC-SCD-01817.



SECTION A-A
SCALE: 1:100



SECTION B-B
SCALE: 1:50

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Client NTA Udarás Náisiúnta Iompair National Transport Authority		Engineering Designer ARUP		
Date 04/04/2022	Scale As Shown @ A1 As Shown @ A3	Drawn BM	Checked CG	Approved BD
Project Code BCIDC	Originator Code ARP	OMS Code 268401-00		

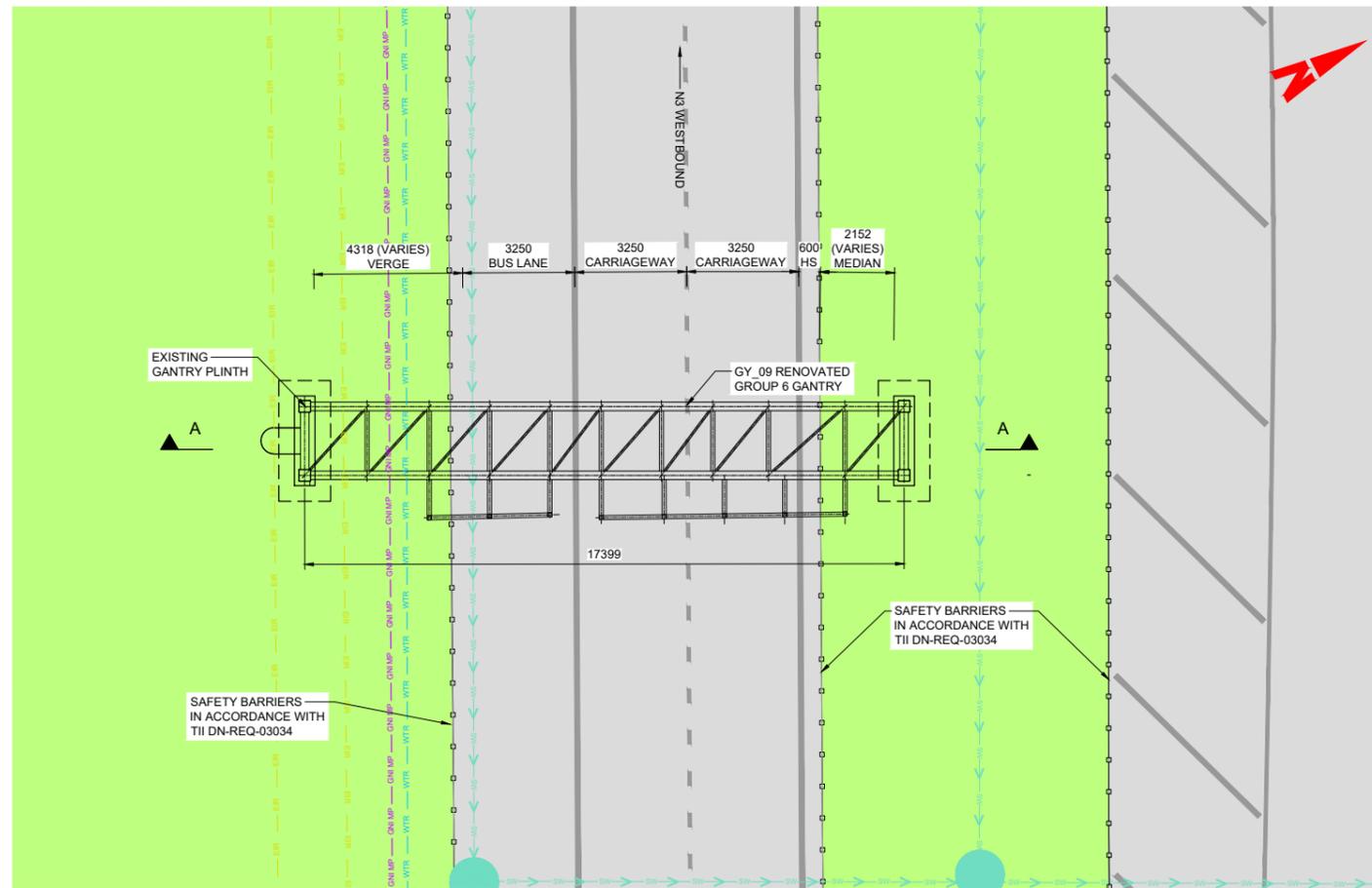
Programme Title BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS				
Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_08 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1				
Drawing File Name BCIDC-ARP-STR_GA-0005_GY_08-DR-CB-0002	Sheet Number 01 of 01	Status A	Rev M01	

NOTES:

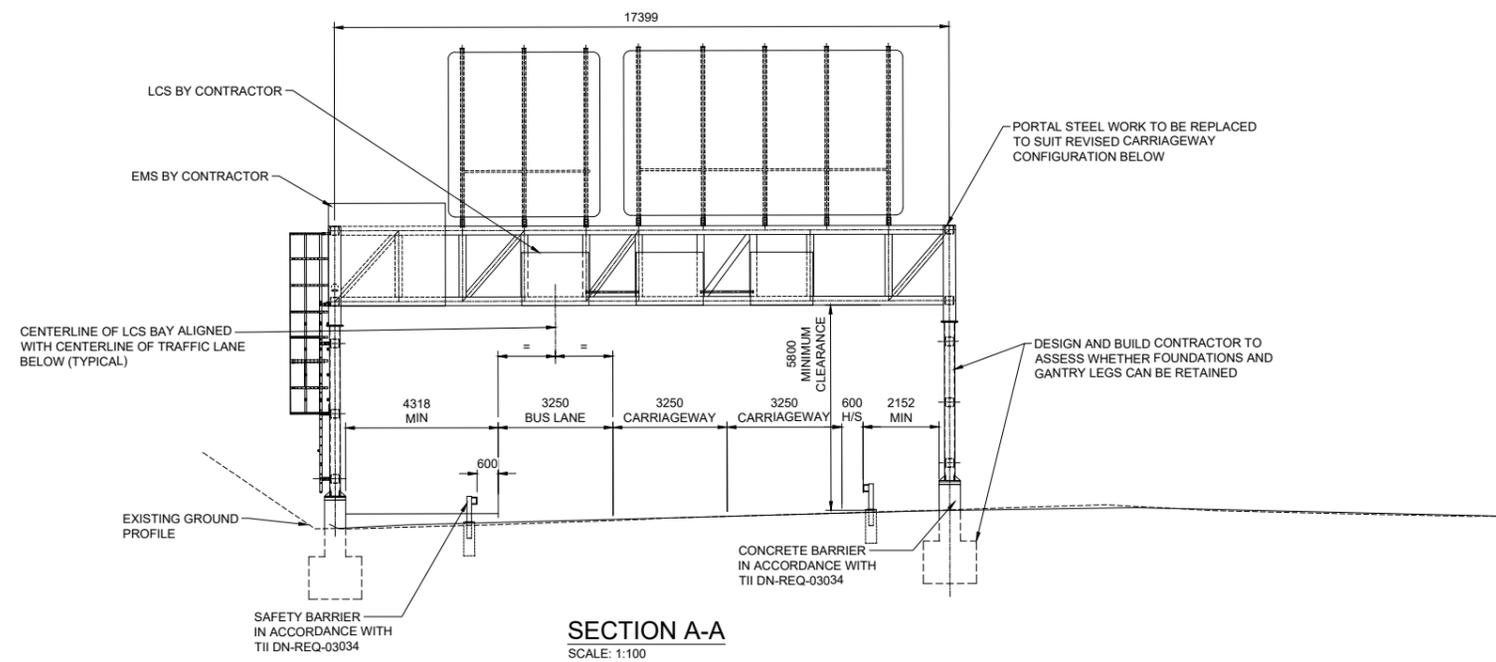
1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE SHOWN IN METERS ABOVE ORDNANCE DATUM.
3. GROUP 6 GANTRY STEEL SUPERSTRUCTURE TO BE IN ACCORDANCE WITH TII CC-SCD-01814 TO CC-SCD-01817.

LEGEND:

- RED LINE BOUNDARY
- - - - TEMPORARY BOUNDARY FOR CONSTRUCTION



PLAN ON RENOVATED GANTRY
SCALE: 1:100



SECTION A-A
SCALE: 1:100

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 d. Information concerning the position of apparatus shown on this drawing is based on drawings supplied by the utility owners and/or the utility works contractor, whilst every care has been taken in the preparation of this drawing, positions should be taken as approximate and are intended for general guidance only and no representation is made by the NTA as to the accuracy, completeness, sufficiency or otherwise of this drawing and the position of the apparatus. The information contained herein does not purport to be comprehensive or final as the apparatus is subject to being altered and/or superceded. Recipients should not rely on this information. Any liabilities are hereby expressly disclaimed.
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Rev	Date	Drn	Chk'd	App'd	Description
M01	04/04/2022	BM	CG	BD	ISSUE FOR PHASE 4: PLANNING

Client NTA Udarás Náisiúnta Iompair National Transport Authority		Engineering Designer ARUP		
Date 04/04/2022	Scale As Shown @ A1 As Shown @ A3	Drawn BM	Checked CG	Approved BD
Project Code BCIDC	Originator Code ARP	OMS Code 268401-00		

Programme Title BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS				
Drawing Title BLANCHARDSTOWN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GY_09 GROUP 6 GANTRY GENERAL ARRANGEMENT SHEET 1				
Drawing File Name BCIDC-ARP-STR_GA-0005_GY_09-DR-CB-0002	Sheet Number 01 of 01	Status A	Rev M01	

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

\\global\europa\dublin\cbs\268000\268401-0014_Internal\402 Drawings\4-02 BCIDC\BCIDC\0005113 STR\Drawings\DR\BCIDC-ARP-STR_GA-0005_GY_09-DR-CB-0002.dwg

Appendix B

Geotechnical Information

Blanchardstown to City Centre CBC

A preliminary stratigraphy was needed for the concept and preliminary design of the proposed gantries.

The proposed gantries locations were reviewed.

The site specific GI (GII, 2021) did not include any exploratory location adjacent to most of the proposed gantries locations.

Another round of GI will be required at some stage in the future.

The stratigraphy presented in the following pages is based on 1) the findings of the desk study, 2) the nearby historic GI (where available) and 3) the closest exploratory locations drilled/excavated as part of the 2021 GI.

Please note that in many cases the closest nearby is far away from the proposed gantry location.

Please note that most of the gantries will be founded at the National Road where the ground conditions might be different from those recorded in the exploratory locations. (for instance thicker layer of Engineering Fill, absence of soft/loose layers, *etc*).

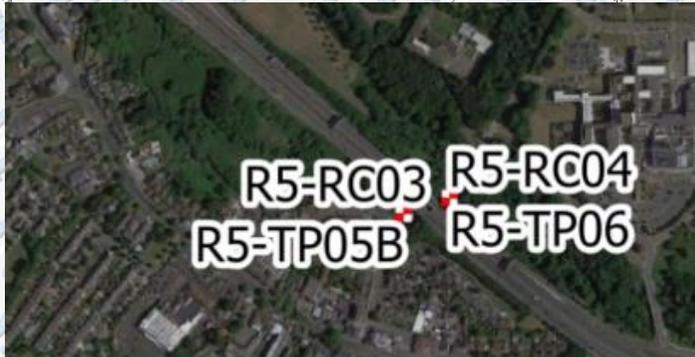


Desk study:

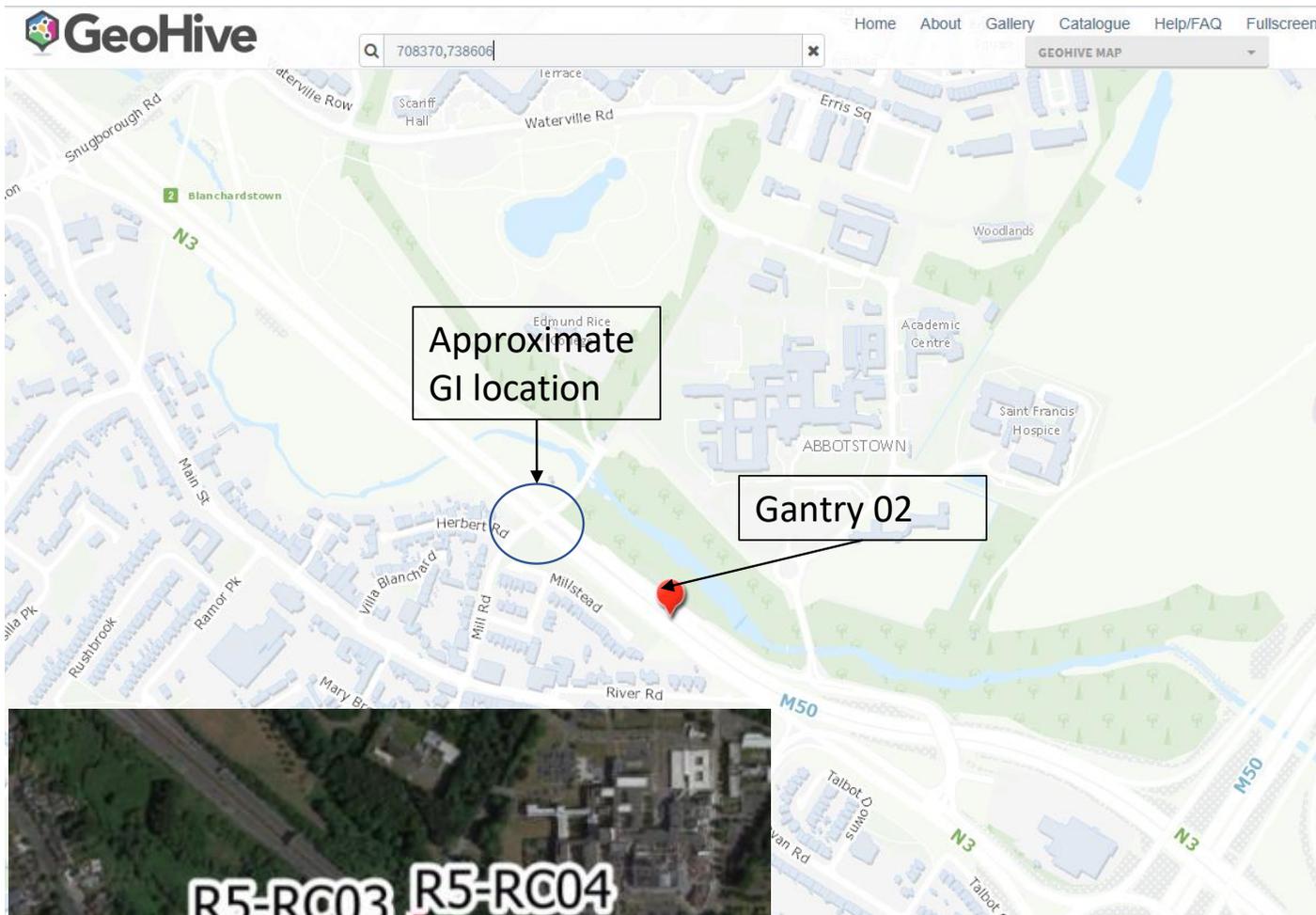
Made Ground, Alluvium, Glacial Gravel, Till derived from Limestone (Boulder Clay), shallow rock (Calcareous Shale). A meltwater channel also noted in the vicinity.

R5-RC03 & 4 are the closest boreholes. They verified the rock type and that rockhead is close to the surface, between 46.3 and 44.7m OD.

A historic GI (TP) was completed at shallow depth (1.9m BGL).



Stratum	Thickness	Comments
Made Ground	1	
Glacial Gravel	1	Dense
Boulder Clay	1	Stiff
Limestone	N/A	Fault passing nearby



Stratum	Thickness	Comments
Made Ground	0.5	
Boulder Clay	1.5	
Calcareous Shale	N/A	Meltwater channel noted in the vicinity

Desk study:

Made Ground, Till derived from Limestone (Boulder Clay), shallow rock (Calcareous Shale). A meltwater channel also noted in the vicinity.

R5-RC03 & 4 are the closest boreholes. They verified the rock type and that rockhead is close to the surface, between 46.3 and 44.7m OD.

No historic GI close to the proposed location.



Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	2	Stiff
Calcareous Shale	N/A	

Desk study:

Made Ground over Till derived from Limestone (Boulder Clay) over bedrock (Calcareous Shale). Bedrock expected to be shallow.

R05TP08A verified the overburden.

Stiff BC at c. 52.4m OD

(R05-TP09 completed within reworked BC, at c. 51m OD)



Approximate GI location

Gantry 04

Desk study:

Made Ground, Alluvium, Glacial Gravel, Till derived from Limestone (Boulder Clay), shallow rock (Limestone and Calcareous Shale). A fault and a meltwater channel also noted.

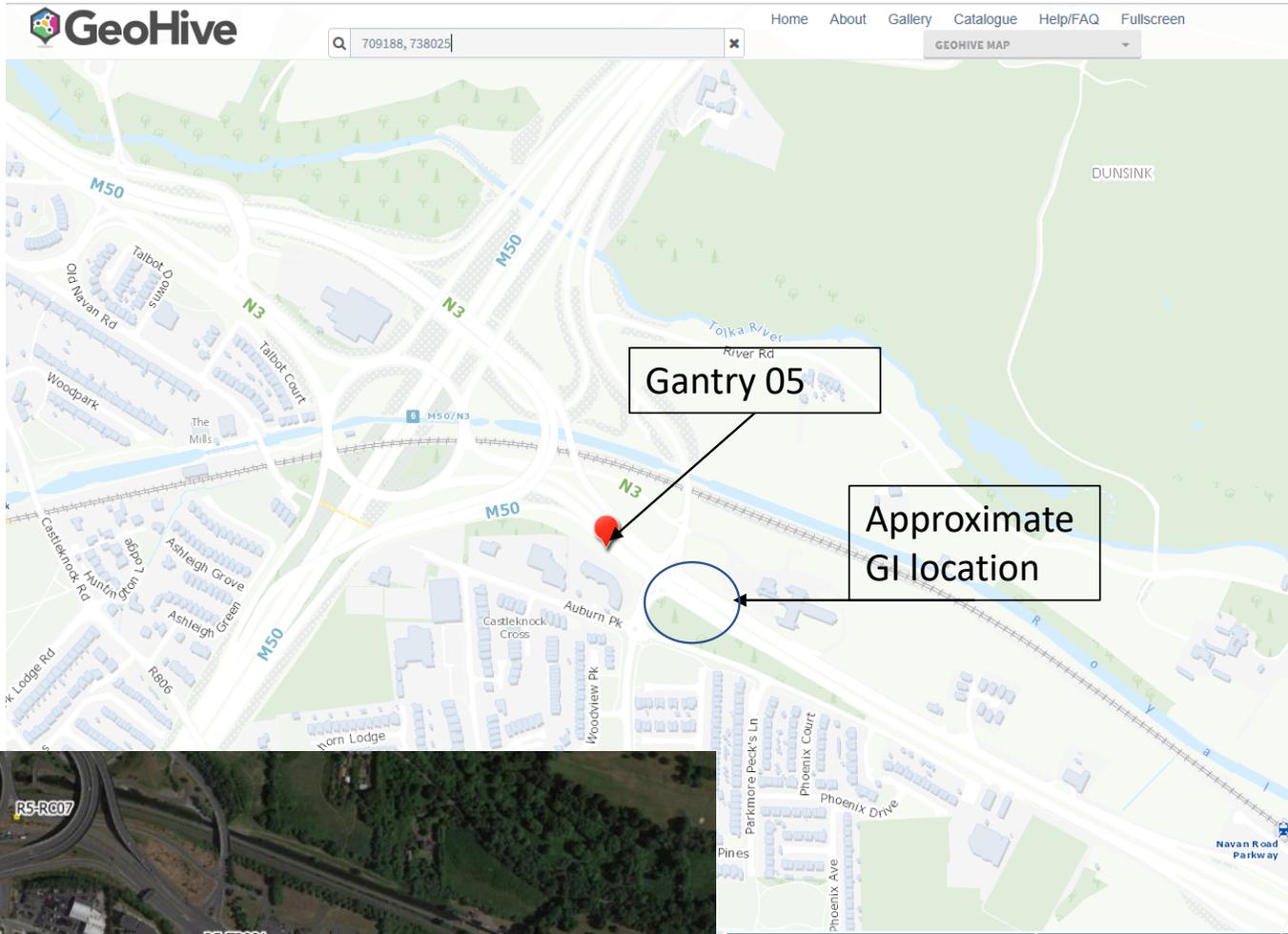
R5-C05 is the closest exploratory location. It recorded soft clay, Glacial Gravel, Till derived from Limestone (Boulder Clay). Bedrock not encountered completion depth was c. 35m BGL.

No historic GI close to the proposed location.



R5-CP05

Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	1	Stiff
Limestone and/or Calcareous Shale	N/A	A fault and a meltwater channel noted nearby



Desk study:

Made Ground over Till derived from Limestone (Boulder Clay) over bedrock (Calcareous Shale). Bedrock expected to be shallow.

R05TP08A verified the overburden.

Stiff BC at c. 52.43m OD

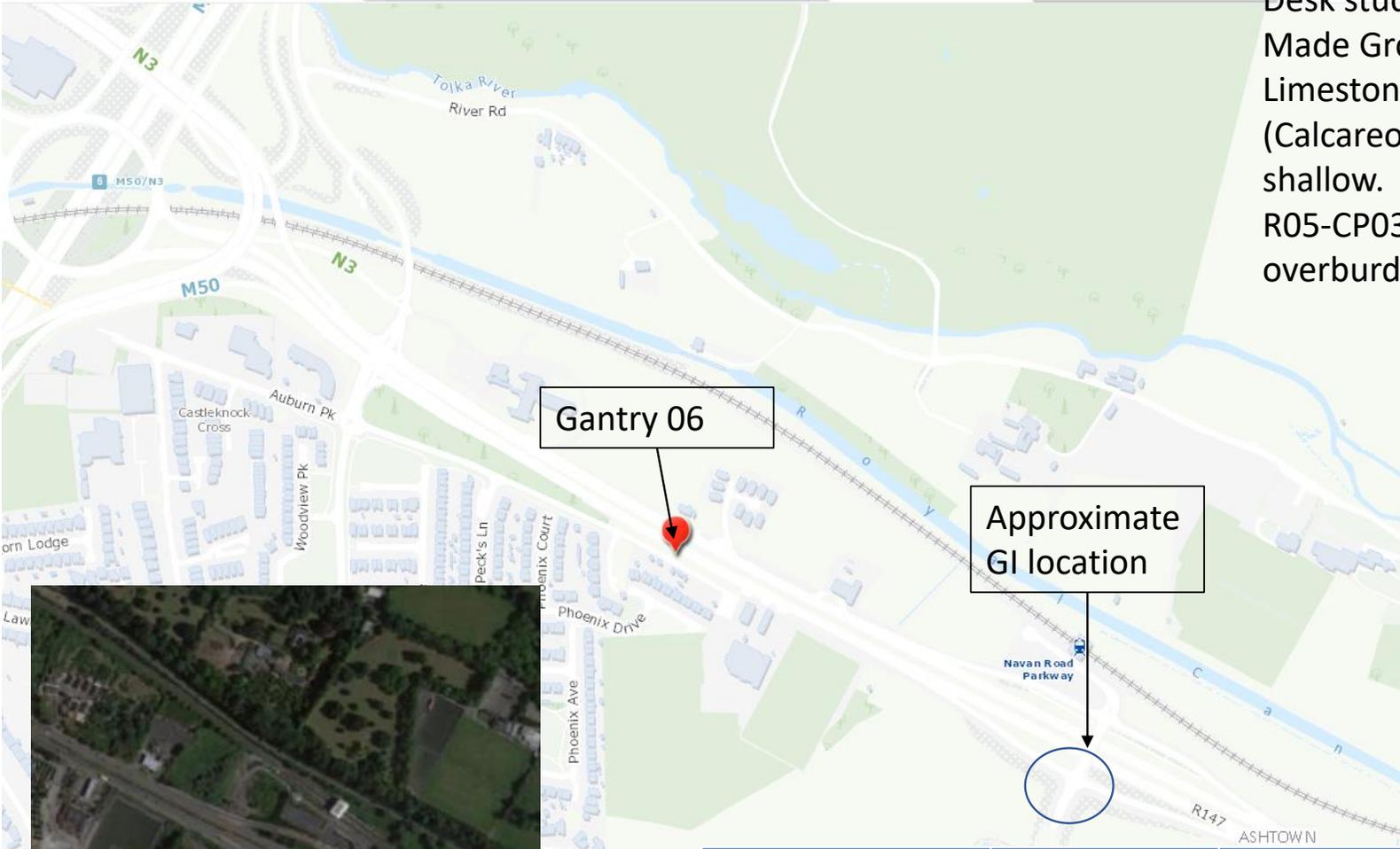


Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	2	Stiff
Calcareous Shale	N/A	

Desk study:

Made Ground over Till derived from Limestone (Boulder Clay) over bedrock (Calcareous Shale). Bedrock expected to be shallow.

R05-CP03 is the closest BH. It verified the overburden.



Gantry 06

Approximate GI location



R5-CP03

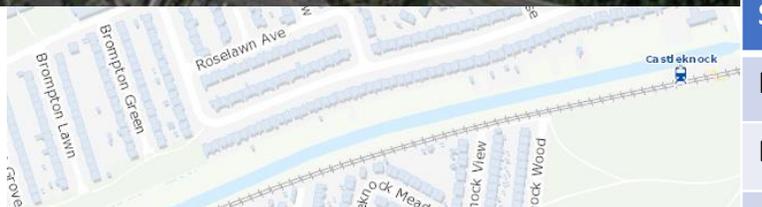
Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	1.5	
Calcareous Shale	N/A	



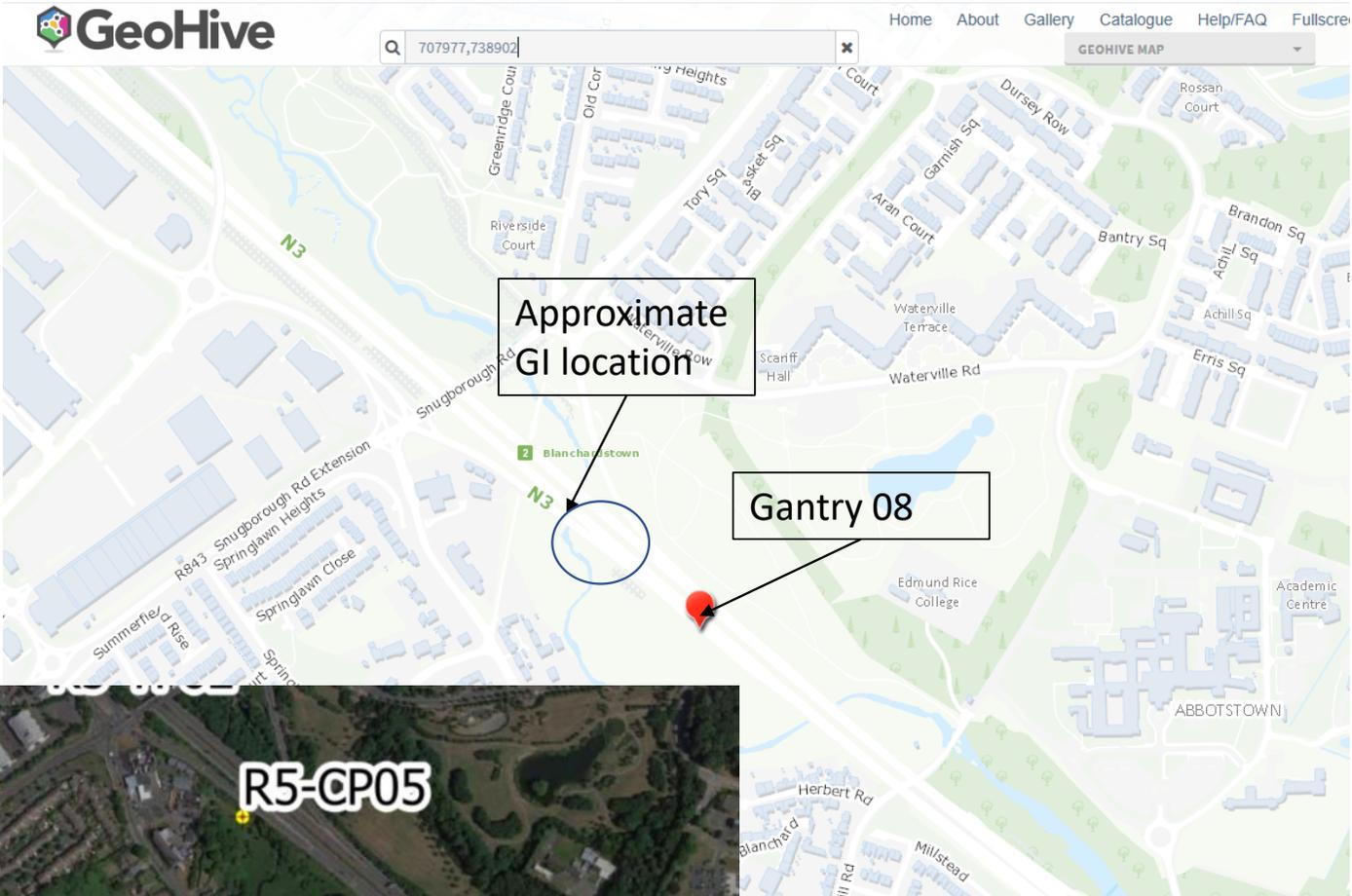
Desk study:

Made Ground, Till derived from Limestone (Boulder Clay), shallow rock (Calcareous Shale). A meltwater channel also noted in the vicinity.

R5-RC03 & 4 are the closest boreholes. They verified the rock type and that rockhead is close to the surface, between 46.3 and 44.7m OD



Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	1	Stiff
Calcareous Shale	N/A	



Desk study:
 Made Ground, Alluvium, Glacial Gravel, Till derived from Limestone (Boulder Clay), shallow rock (Limestone and Calcareous Shale). A fault and a meltwater channel also noted.
 R05-CP05 is the closest exploratory location. It recorded soft clay, Glacial Gravel, Till derived from Limestone (Boulder Clay). Bedrock not encountered completion depth was c. 35m BGL.
 No historic GI close to the proposed location.

Stratum	Thickness	Comments
Made Ground	1	
Boulder Clay	1	Stiff
Limestone and/or Calcareous Shale	N/A	A fault and a meltwater channel noted nearby

Appendix C

Overview of Gantries

Blanchardstown to City Centre CBC – Gantries

24 June 2021

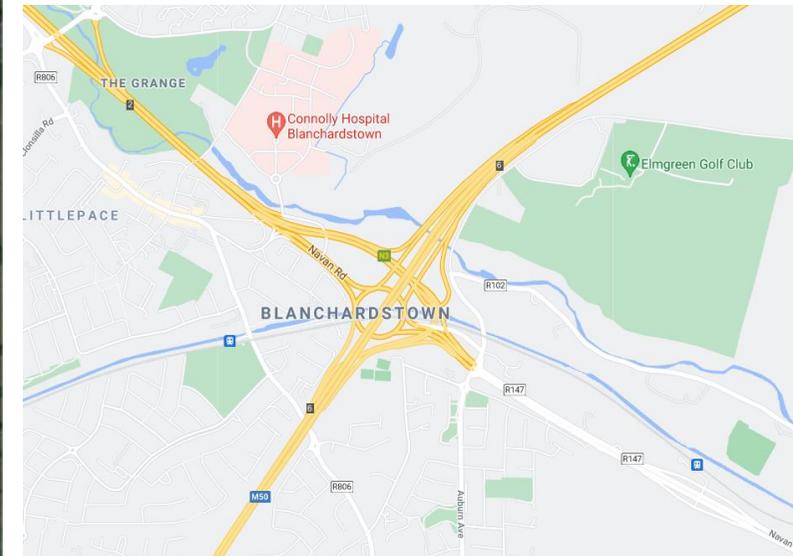


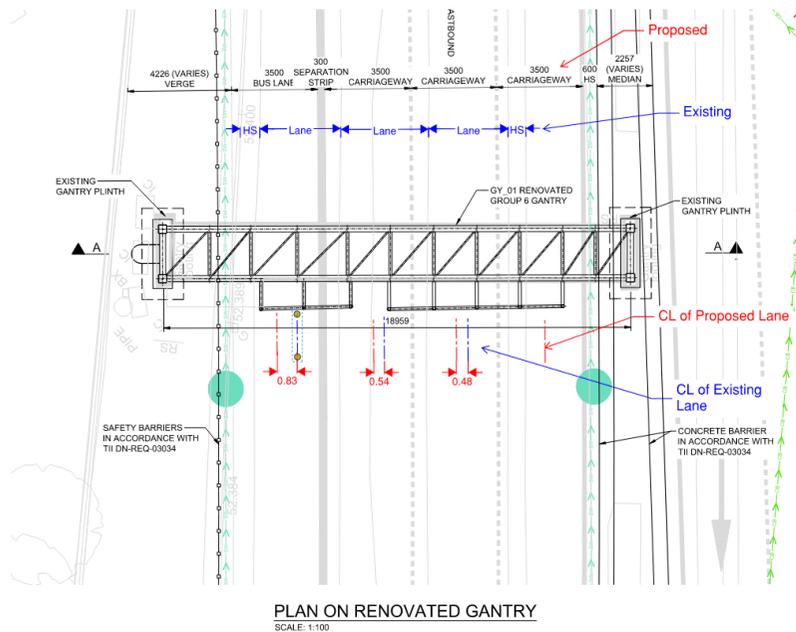
Table 1: Summary of Gantry Structures

Gantry Name	Gantry Type	Existing / New	Carriageway & Span Length
GY01	Group 6 Sign Gantry	Modify/Replace existing	N3 Eastbound – 19.0 m
GY02	Group 6 Sign Gantry	New (replace existing)	N3 Eastbound – 23.3 m
GY03	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 22.6 m
GY04	VMS	New (replace existing)	N3 Eastbound – 9.5 m
GY05	Group 6 Sign Gantry	Existing – retain	R147 Outbound – 21.6 m
GY06	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 18.1 m
GY07	Group 6 Sign Gantry	New	N3 Westbound – 22.4 m
GY08	Group 6 Sign Gantry	New	N3 Westbound – 20.8 m
GY09	Group 6 Sign Gantry	Modify/Replace existing	R147 Outbound – 20.0 m

GY01 – Group 6 Portal Gantry

- Existing gantry to be replaced / modified
- New gantry at same location as existing.
- N3 Eastbound
- Span 19.0 m

Lane configuration beneath gantry:



Gantry location:

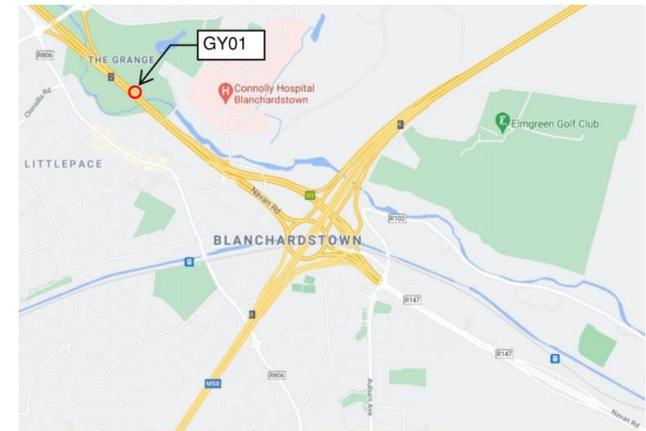


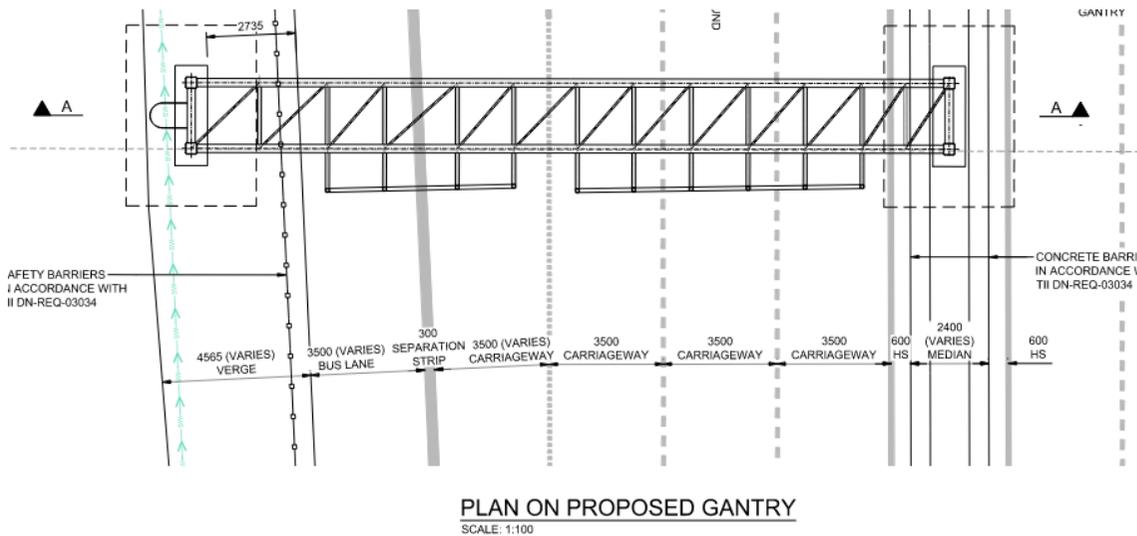
Photo of existing gantry:



GY02 – Group 6 Portal Gantry

- Existing gantry to be demolished and reconstructed
- New gantry location approx. 50m east of existing.
- N3 Eastbound
- Span 23.3 m

Lane configuration beneath gantry:



Gantry location:

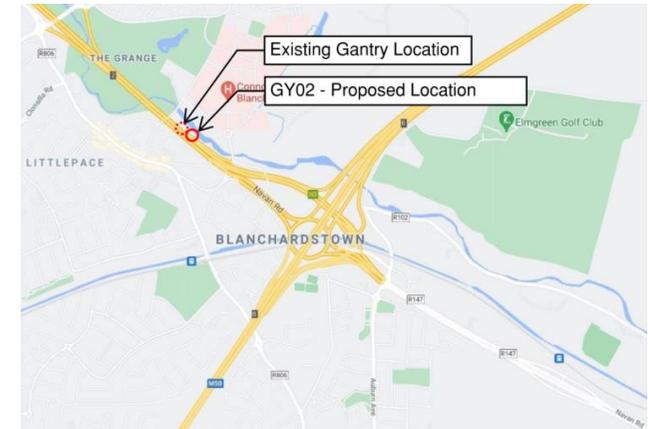


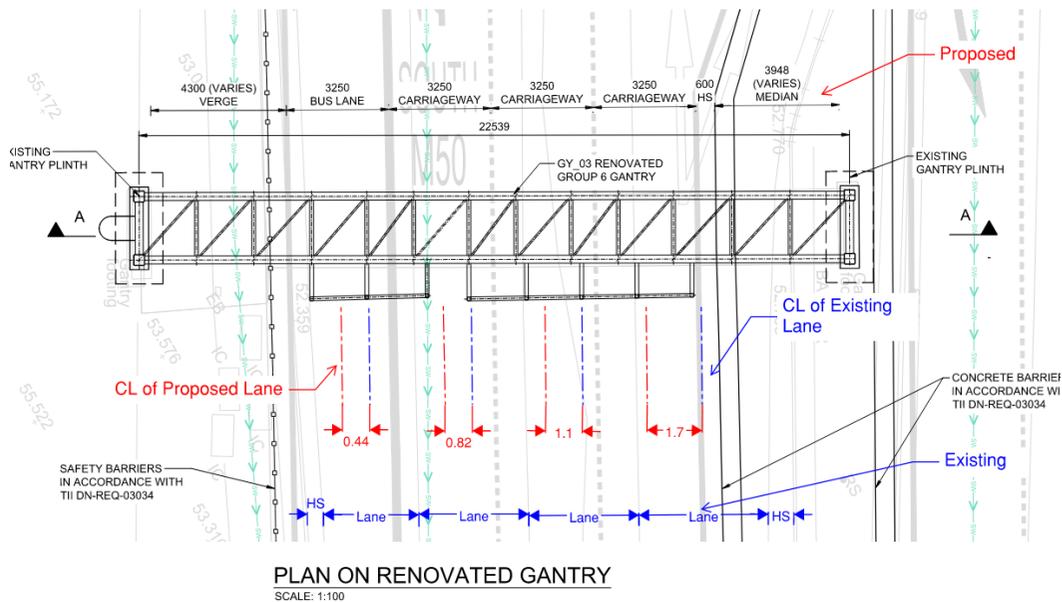
Photo of existing gantry:



GY03 – Group 6 Portal Gantry

- Existing gantry to be replaced / modified
- New gantry at same location as existing.
- R147 Outbound
- Span 22.5 m

Lane configuration beneath gantry:



Gantry location:

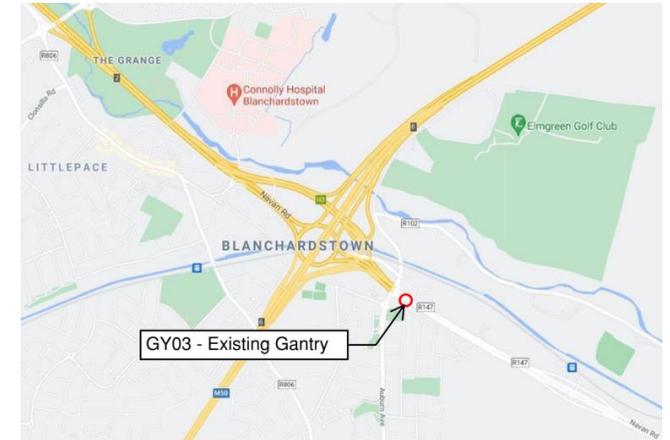


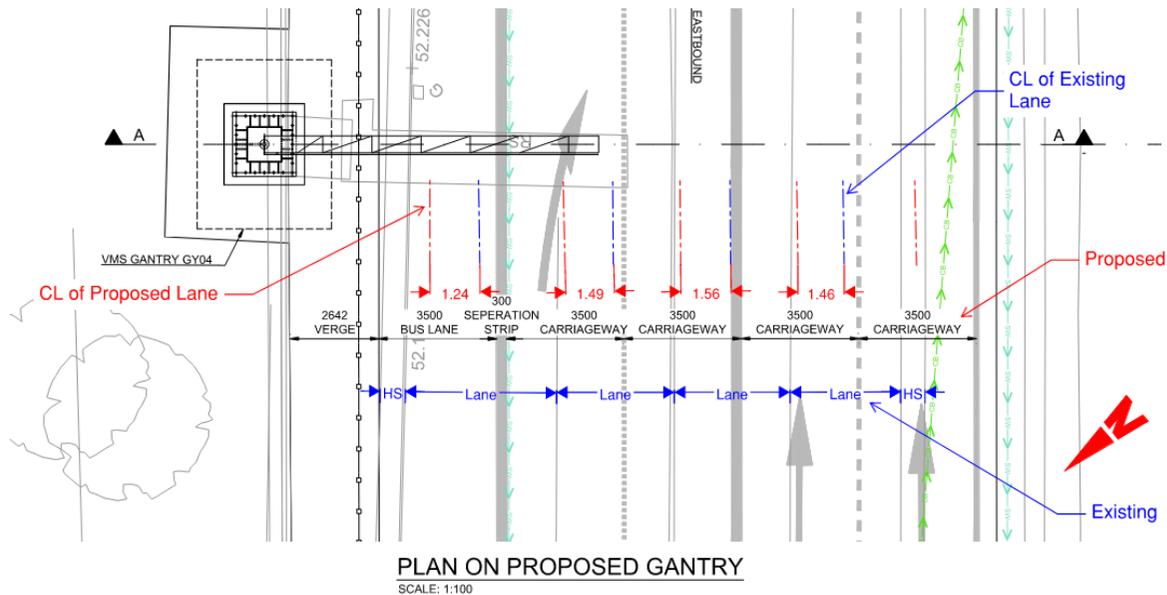
Photo of existing gantry:



GY04 – VMS Gantry

- Existing gantry to be demolished and reconstructed
- New gantry positioned approximately 1.6m back into verge from existing.
- N3 Eastbound
- Span 9.5 m

Lane configuration beneath gantry:



Gantry location:

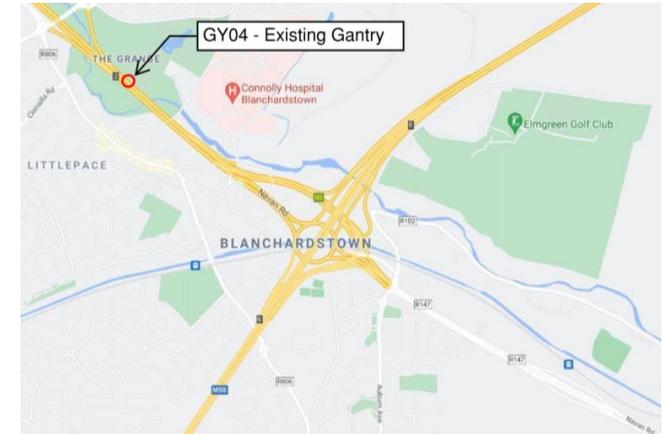


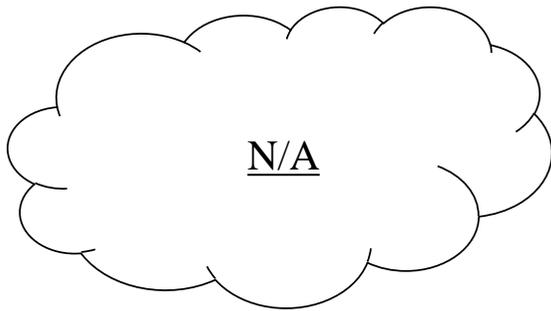
Photo of existing gantry:



GY05 – Group 6 Portal Gantry

- Existing gantry to be retained – no change to gantry.
- N3 Diverge
- Span 21.6 m

Lane configuration beneath gantry:



Gantry location:

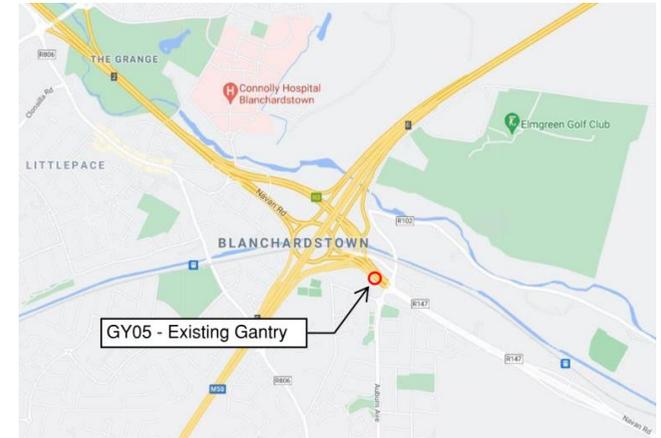


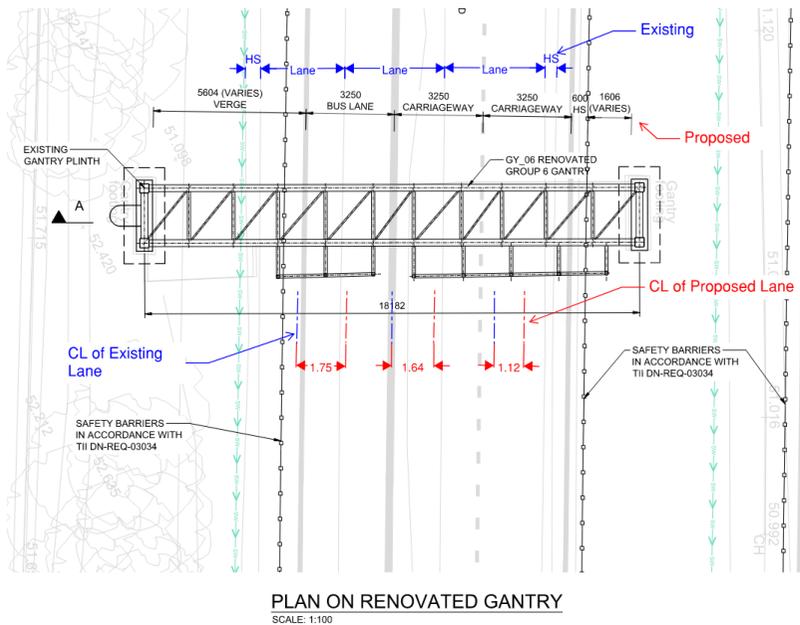
Photo of existing gantry:



GY06 – Group 6 Portal Gantry

- Existing gantry to be replaced / modified
- New gantry at same location as existing.
- R147 Outbound
- Span 18.1 m

Lane configuration beneath gantry:



Gantry location:



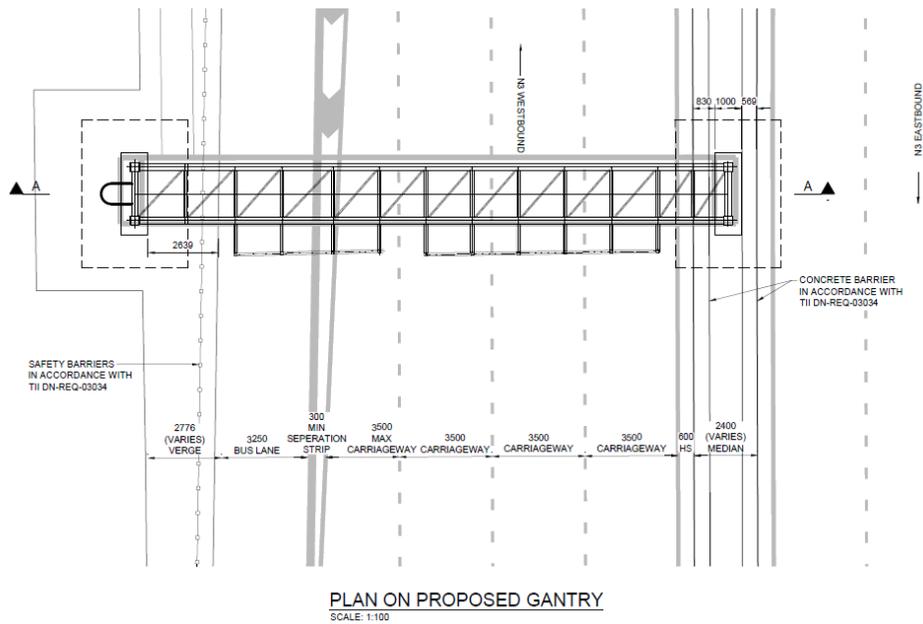
Photo of existing gantry:



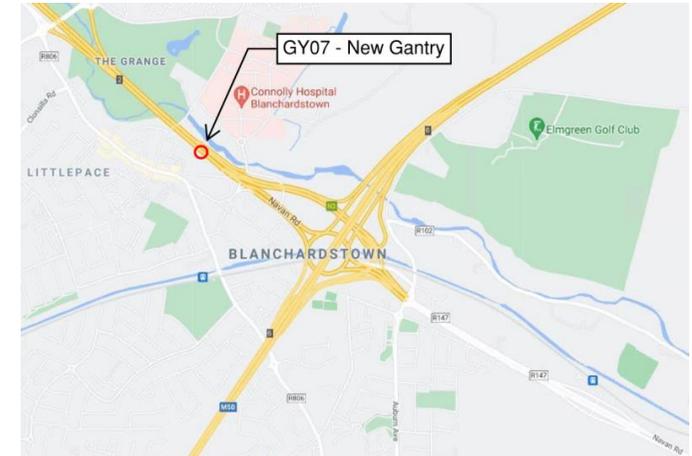
GY07 – Group 6 Portal Gantry

- New gantry
- N3 Westbound
- Span 22.4 m

Lane configuration beneath gantry:



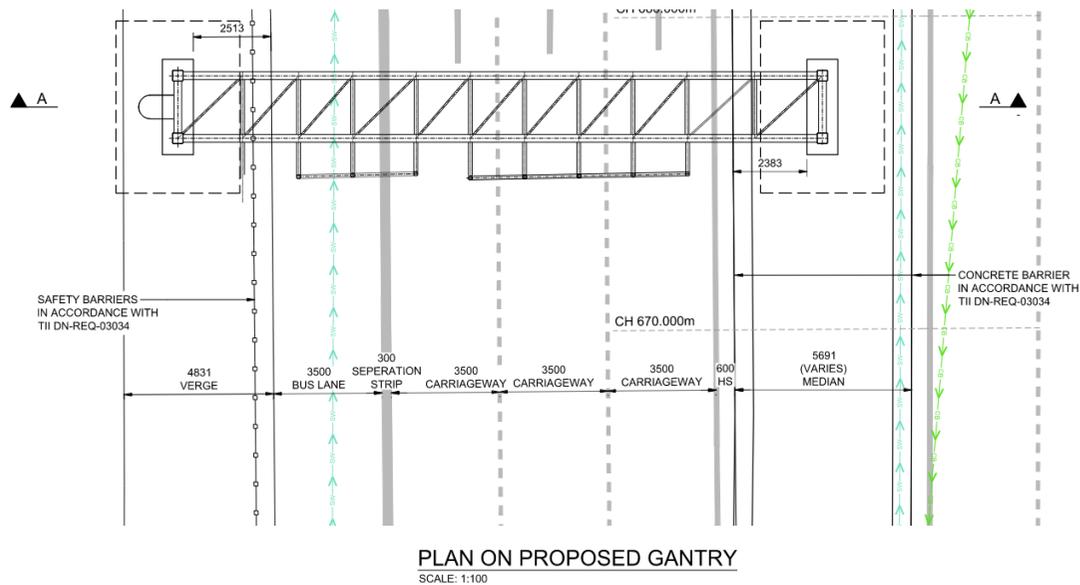
Gantry location:



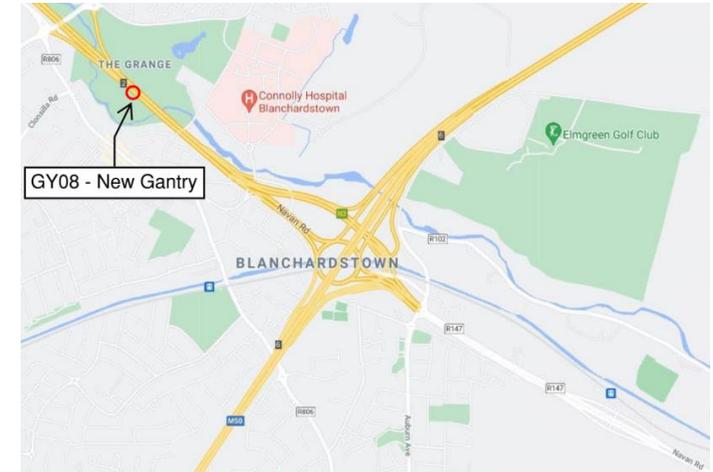
GY08 – Group 6 Portal Gantry

- New gantry
- N3 Westbound
- Span 20.8 m

Lane configuration beneath gantry:



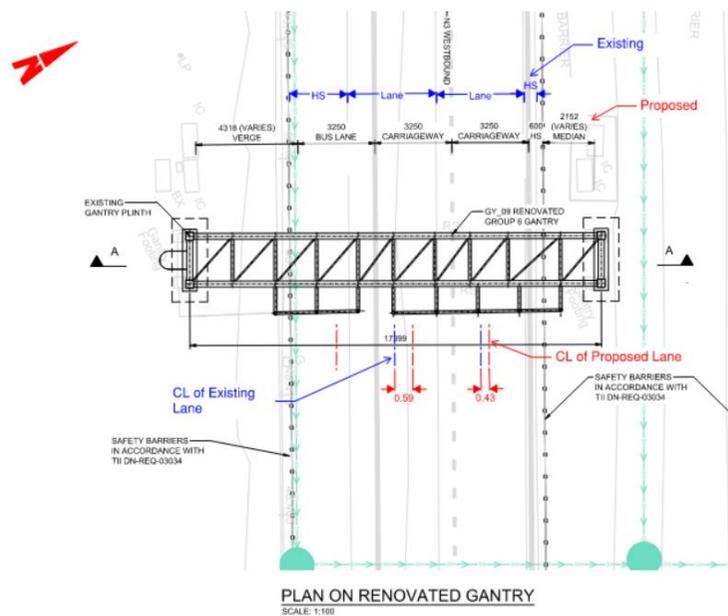
Gantry location:



GY09 – Group 6 Portal Gantry

- Existing gantry to be replaced / modified
- New gantry at same location as existing.
- R147 Outbound
- Span 20.0 m

Lane configuration beneath gantry:



Gantry location:

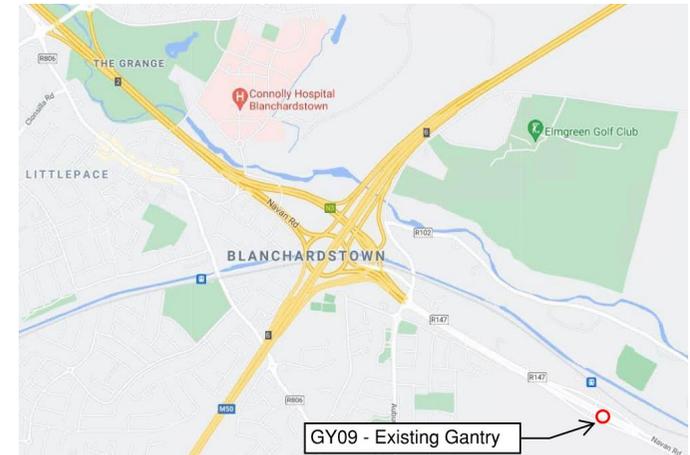


Photo of existing gantry:

