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MetroLink

DART+ West in Advance of Metrolink

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Contents

1. Introduction and Background

At Glasnevin there is an interface between the DART+ West SET (Signalling, Electrical (HV/OHLE + LVP) and Telecommunications) and MetroLink projects, where the proposed works of each project overlap the same geographic area (see section 3 for further detail).

Following submission of the MetroLink Railway Order (RO) application on 30th September 2022, TII received further information in 2023 from Iarnród Eireann (IE) with regard to the Dart+ West SET design. This information has been reviewed by JI and included the following key documents:

- MAY-MDC-SET-RS04-RP-Y-0001 describes the DART+ West SET designs in the area with neither Metrolink nor Rail station built at Glasnevin.
- MAY-MDC-SET-RS04-RP-Y-0002 describes the DART+ West SET designs in the area that have interfaces with the Metrolink project.

This information was not available prior to the MetroLink RO application but has now been reviewed by the MetroLink project. The key point of note is that both projects in their respective RO applications have assumed they will be on site first and that the other project will follow. However, both projects recognise that there is uncertainty around the timing of both projects, and in fact the duration of the planning process for both schemes will have a significant impact on which scheme proceeds to construction first. Nonetheless, TII recognise there is a possibility DART+ West may commence construction in advance of MetroLink.

The purpose of this technical note is to assess what impact the DART+ West project will have on the MetroLink RO application if the DART+ West project was either completed at the interface of the proposed MetroLink works at Glasnevin before MetroLink construction commenced or was constructed concurrently with MetroLink. With this in mind, the key items addressed by this technical note are:

- Reference information considered in assessing the impact of DART+ West being constructed before or concurrently with MetroLink – section 2
- A summary of the geographic interface between DART+ and MetroLink at Glasnevin – section 3
- Key assumptions that have informed the assessment – section 4
- The applied assessment methodology – section 5
- A comparison of the MetroLink and DART+ West schedule of works to inform the review of the MetroLink EIAR submitted as part of the MetroLink RO application – section 6
- A review and assessment of the changes to the MetroLink environmental assessment should DART+ West construction be completed in the area of the proposed MetroLink works in advance of MetroLink construction – section 7
- A review of the impacts on documentation included in the published MetroLink RO application – section 8
- Consideration of the implications on the MetroLink EIAR submitted as part of the RO application should both projects be constructed concurrently in the same geographic area – section 9
- Conclusions of the review – section 10

2. Reference Information

The information reviewed and taken account of in the development of this technical note includes the information provided by Iarnród Eireann (IE) listed under section 1 above, and:

DART+ West Railway Order Application, EIAR Chapters:

- 4: Description of the Proposed Development,
- 5: Construction Strategy, and
- 18: Material Assets Utilities.

MetroLink RO Application, EIAR Chapters:

- First Schedule
- Railway Order drawings
- 5 Construction Phase, including Appendix A5.5 Glasnevin Construction Report,
- 9: Traffic and Transport, including Appendix A9.5 Scheme Traffic Management Plan,
- 10: Human Health,
- 11: Population and Land Use,
- 13: Airborne Noise and Vibration,
- 16: Air Quality,
- 22: Infrastructure and Utilities,
- 24: Materials & Waste Management, and
- 28: Risk of Major Accidents and Disasters.

3. DART+ and MetroLink Geographic Interface

3.1 DART+ West

Figure 1 shows the geographic overlap of the DART+ West and MetroLink projects ('Glasnevin MetroLink extents'). The extent of overlap in worksites is approximately 1300m for the MGWR and 900m for the GSWR lines. The proposed DART+ West development provides for the electrification of existing heavy rail track while the MetroLink project will provide a new underground metro line, which includes a station at Glasnevin that will also provide an interchange with Iarnród Eireann (IE) services.

Detailed information for both projects can be found in their respective railway order applications. Section 6 provides details of the works of both projects that will overlap at Glasnevin.

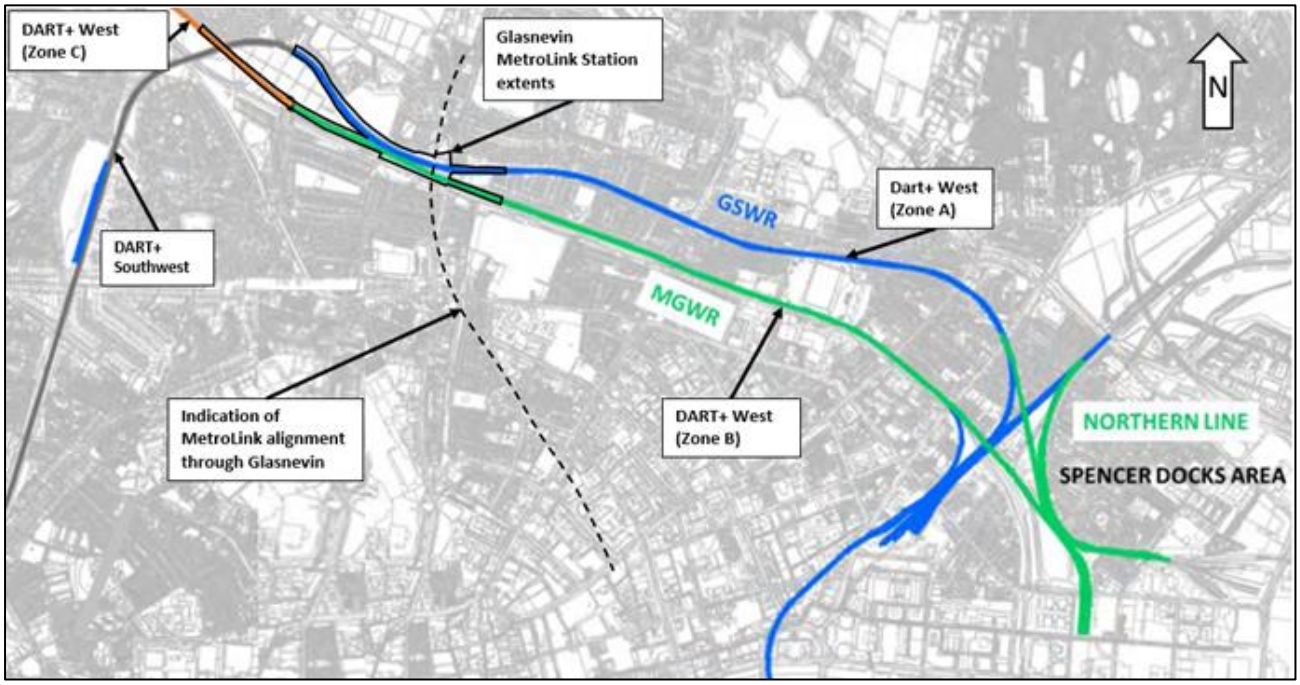

Figure 1: DART+ West and MetroLink Geographic Interface at Glasnevin

3.2 DART+ Southwest impacts

Due to the relatively close proximity of the MetroLink works at Glasnevin to DART+ Southwest works, a review of the potential impact of these works on MetroLink has also been undertaken.

The DART+ Southwest proposed works extents, as outlined in the DART + Southwest EIAR Volume 2 Chapter 4 Project Description, sit outside the DART+ West footprint and will have no direct impact on MetroLink. There will be some level of interface at the OHLE electrification break point at which the likes of a tensioning system and other electrical items may be installed, but this will not have a significant environmental impact.

4. Key Assumptions

The proposed MetroLink construction methodology at Glasnevin is set out by the MetroLink EIAR Volume 5, Appendix 5.5 – Glasnevin Station Construction Report, Interface with Iarnród Eireann (IE) works. Details of the stages referred to below can be found within this document.

The MetroLink RO application is based on MetroLink works being completed at Glasnevin in advance of DART+ West:

- *It has been assumed that Diesel rolling stock will be used from construction Stage 4 (North Top-Down Construction and Excavation and Demolition (South)) onwards and will remain operational until the new OHLE system is ready for use.*

In the event DART+ West is completed in the area of the proposed MetroLink works at Glasnevin in advance of MetroLink construction, it has been reasonably assumed:

- The overhead line equipment (OHLE) installed by DART+ West will be removed from within the Glasnevin Metrolink site extents and that either diesel or battery powered rolling stock will be used from Stage 2 onwards and will remain operational until the OHLE system is re-established through the MetroLink station platforms and approaches and is ready for use. Any delay to the implementation of the diesel or battery power rolling stock beyond Stage 2 has not been considered in this review but would have significant duration (programme) and environmental impacts due to the requirement for additional rail possessions.
- The OHLE equipment is decommissioned and removed during the planned possession scheduled in Stage 2, transported via rail to an agreed Iarnród Eireann (IE) railhead and stored there until it is required to be reinstalled and commissioned, i.e., no additional road traffic movements are anticipated in the completion of these works.
- The piles that will support the OHLE installed by DART + West are steel hollow section piles. This is important as should DART+ West be constructed first it will be necessary to cut these piles down to the MetroLink track formation level. The cutting of steel piles will generate less disturbance and nuisance than cutting and breaking out reinforced concrete piles.
- The signalling building (SEB), Traction Sub Station (TSS) and other buildings associated with the DART+ West project will not affect the worksites for MetroLink construction.
- The plant and equipment proposed for the installation of the OHLE structure, as outlined in the MetroLink EIAR, is also used for the OHLE removal.

5. Assessment Methodology

A qualitative assessment has been undertaken by comparing the Schedule of Works (SoW) for the DART+ West project to the Glasnevin MetroLink proposal to understand the differences between the two project's construction phases to identify any additional compatible work or incompatible work:

- **Compatible work** refers to the DART+ West works MetroLink is able to absorb and integrate (reuse or adopt) into MetroLink construction, however additional time beyond the MetroLink Railway Order baseline schedule may be necessary.
- **Incompatible work** refers to DART+ West works that cannot form part of the MetroLink construction and may result in supplementary work and additional time beyond the MetroLink Railway Order baseline schedule.

A comparison of the differences between the DART+ West works and MetroLink works proposed at Glasnevin have been captured in an assessment matrix (see Appendix A) to determine any impacts on the MetroLink Baseline RO schedule and to identify if there is potential for additional significant effects not captured in the MetroLink EIAR.

Once the differences between the two project's construction phases at Glasnevin is understood, a two-stage environmental review will be undertaken to identify any potential for significant environmental effects not already assessed in the MetroLink EIAR:

- **Stage 1 Scoping:** As a result of DART+ West being constructed first in the area of Glasnevin, a review of the potential for additional environmental effects not previously considered by the MetroLink EIAR.
- **Stage 2 Assessment:** A review of the potential environmental effects in the area of Glasnevin to determine whether these are significant or not.

This environmental review (see section 7) has had regard to the following key issues:

- Potential increased construction activity in terms of duration,
- Additional works required in terms of the potential for the generation of additional emissions, material or waste not considered in the MetroLink EIAR, and
- An increase in emissions resulting from works at new locations with reference to sensitive receptors (over and above those assessed in the MetroLink EIAR.

6. DART+ West and MetroLink Construction Comparison

6.1 DART+ West and MetroLink Works Scope Comparison at Glasnevin

Figure 2 shows the extent of the DART+ West works that fall within the MetroLink works footprint that will be in place at Glasnevin in the event DART+ West construction is completed before MetroLink.

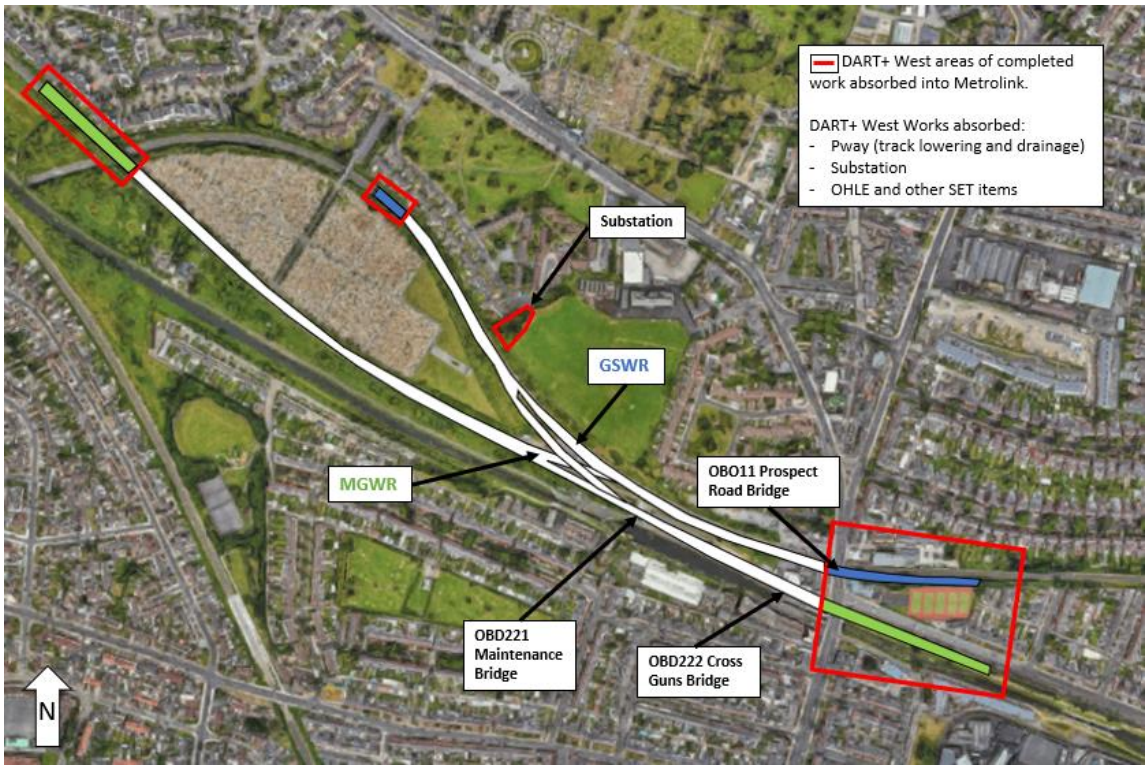

Figure 2: DART+ West areas of completed work absorbed into MetroLink at Glasnevin

Appendix A provides a detailed comparison of the differences between the DART+ West and MetroLink works proposed at Glasnevin. Table 6.1 summarises the key points drawn from this detailed comparison.

Table 6.1: DART+ West Proposed Developments Review Summary Findings

Schedule of Works (SoW) items	Compatible Works	Incompatible Work
Site establishment – site clearance (including vegetation clearance), construction compounds, OHLE.	Minor duplication of compound area. DART+ West mobilised then demobilise compound area on completion of works.	None
	Glasnevin substation location (SET technical building) characteristics, and previous feeding points at the OHLE do not vary – to stay in place.	None
Utility Diversions	None	None
Permanent Way (trackwork, including track drainage)	The combined (MGWR & GSWR) 1955m of twin track lowering detailed within the DART+ West RO when completed will benefit MetroLink with an overall reduction of 12% in overall spoil removal and associated vehicle movements currently assessed within the MetroLink EIAR.	Removal of 190m (to each bridge abutment foundation – 380m in total) of ground improvement works and 'L wall' retainment at Cross Guns and Maintenance bridge locations (MGWR). Work required to remove this would form part of the MetroLink site clearance and demolition.

Schedule of Works (SoW) items	Compatible Works	Incompatible Work
Cable Management System (signalling, comms an LV)	Glasnevin substation location (SET technical building), characteristics, and previous feeding points at the OHLE do not vary – to stay in place.	None
Bridges including parapets	Considered minor works and can be absorbed	None
OHLE Support Structure	Not possible (due to MetroLink level differences) to fully utilise the DART+ OHLE structure, however the superstructure can be removed, stored and reinstalled at a later date. There is additional work to isolate the OHLE and remove and store the existing superstructure.	Potentially an incompatible OHLE foundation design that may not accommodate both the lowered track and sheet pile / anchor installation for retaining the existing embankment. (there is an opportunity to design this incompatibility out through coordination with IE)
Cable Management System (signalling, comms an LV)	The Cable Management System (CMS) for Signalling, Electrical and Telecoms (SET) works will be provided.	Minor alterations to accommodate the track lowering / MetroLink design. Renewing of some existing connections.
Signalling, Electricity and Telecommunications (SET) systems (includes HV Power and OHLE systems)	The existing signalling system will need to be adapted to the new interim connection between GSWR and East Wall lines. The new signalling system will be commissioned whilst an interim connection is in service.	Minor works to modify the signalling to the final track configuration in this area. 1. Relocation of signals and axle counters. 2. Removal of two pairs of locations cases (LOC + TPS LOC). 3. Change in the trackside elements controlled by the Glasnevin SEB. 4. Software update of the DART+ West CBI due to configuration changes described by 1 – 3 above. 5. Update of the TMS software due to configuration changes described by 1 – 4 above. Other – LOCs/TPS LOCs DW4/46P and DW3/00 are decommissioned in the new configuration (closer to Glasnevin SEB).

6.2 Potential Schedule Impact of DART+ West Being Constructed First

This section describes the additional work durations identified based on both the compatible and incompatible works summarised by Table 6.1.

6.2.1 Compatible Work – Estimated Additional Work Durations

The compatible works identified have no overall impact on the MetroLink schedule:

- **OHLE (superstructure)** – removal of a circa 1600m length of dual track OHLE structure installed by DART+ West due to the level differences post track lowering. The 1600m includes both GSWR & MGWR (including junction) length of track not absorbed into MetroLink, see figure 2. The calculation is based on the start and end points in which the tracks notably transition from the existing levels to the proposed lowered track levels.

The removal of the OHLE superstructure is estimated to take two 48-hour weekend possessions. There are existing rail possessions already in place for the Stage 2 site establishment works as detailed in the MetroLink EIAR Appendix A5.5 Glasnevin Station Construction Report. The site establishment works can be managed independently of the OHLE removal and therefore the works can run simultaneously within the same possession periods not impacting the MetroLink Schedule.

These OHLE dismantling/removal works would typically include isolating the power, removing the wire, cantilever disassembly, mast and pile foundation reduction and modification if the pile foundation is reused. The end sections of the remaining OHLE structure are likely to include tensioning systems with isolation of components alongside other electrical items for maintaining power at the break points.

6.2.2 Incompatible Work – Estimated Additional Work Durations

The incompatible works identified will have no overall impact on the MetroLink schedule:

- Permanent way (to facilitate track lowering) at tunnel locations under the MGWR along with the ground improvement and L-wall retaining structure will be removed as part of the MetroLink planned demolition and track lowering (see Figure 3).
- The earth removed as part of the DART+ West track lowering will have a positive impact on the MetroLink schedule (circa 12% reduction of material to be removed by MetroLink).
- There will be a requirement for close coordination between the projects to ensure the DART+ West OHLE foundation design can accommodate the MetroLink lowered track and sheet pile / anchor installation for retaining the existing embankment.
- Installation of new SET items are accounted for within the baseline MetroLink schedule.

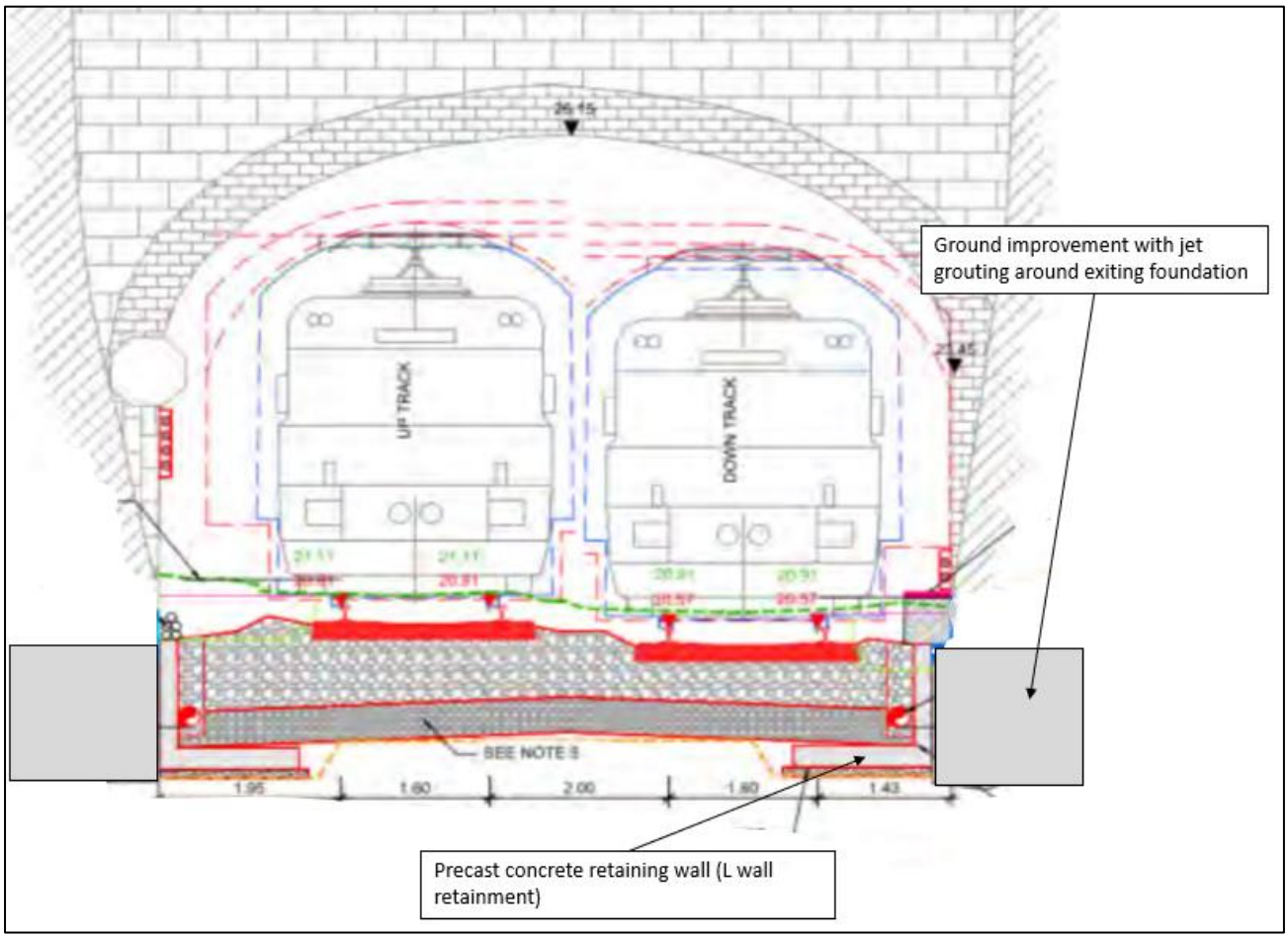

Figure 3: Section at OBD 222 Showing Proposed L-Form Retaining Wall and Ground Improvement

6.3 DART+ West and MetroLink Construction Comparison Conclusions

In summary, should DART+ West construction be completed at Glasnevin before MetroLink construction, the following can be concluded:

- There will be no change to the MetroLink programme assumed by the MetroLink RO application i.e., all works can be absorbed in to the current proposed MetroLink programme.

- No additional track possessions or line closures are required above that already allowed for by the MetroLink programme (Stage 2 of Glasnevin Construction Stages), EIAR and RO application.
- An approximate 1600m length of dual track OHLE structure (800m for each GSWR and MGWR line) installed by the DART+ West project will need to be removed. These works are not allowed for by the MetroLink EIAR and RO application, but noting they do not extend the MetroLink programme as they will utilise possessions already allowed for in Stage 2 of the MetroLink Glasnevin construction methodology, and that the installation of the OHLE is already allowed for within the MetroLink EIAR and RO application.
- DART+ West will lower an approximate 905m length of track by 380mm that MetroLink will lower by a further 1620mm to accommodate the design and construction of Glasnevin Station. These track lowering works are already allowed for by the MetroLink EIAR and RO application but will involve a reduced volume of excavation (circa 12%) and associated traffic movements due to DART+ West having undertaken some lowering of the track as well.

  There will also be a reduction in risk of encountering contaminated materials during the MetroLink track lowering works as the existing track bed (track ballast and formation) will be removed by the DART+ West track lowering process.
- Demolition of a 190m length of ground stabilisation and ‘L’ retaining wall (390m in total) to the existing Cross Guns (OBD222) and maintenance Bridge (OBD221) MGWR that is not allowed for by the MetroLink EIAR and RO application.
- The piles installed by the DART+ West to support the OHLE will need to be cut down to the MetroLink formation level.

7. Environmental Assessment

7.1 Introduction

This section summarises the environmental review, undertaken in accordance with the two stage methodology described by section 5 of the additional work MetroLink will need to undertake if DART+ West is constructed first in the area of Glasnevin (see section 6) to determine if there will or will not be additional impacts on the receiving environment over and above those assessed in the MetroLink EIAR that assumes MetroLink is constructed first.

7.2 Stage 1 – Environmental Effects Scoping

Table 7.1 summarises the results of the environmental scoping exercise undertaken, identifying the environmental effects that have the potential for additional Significant Effects above those already assessed in the EIAR that should be taken forward for Stage 2 Assessment.

Table 7.1: Environmental Scoping Summary

Environmental Effects	Potential for additional Significant Effects	Rationale
Traffic and Transport	Yes	Included in the review owing to the inter relationship between planned possessions included in the EIAR and proposed works to remove OHLE in advance of MetroLink and a reduction in the quantum of excavation.
Human Health	Yes	Potential for additional noise and emissions to air arising during the planned two 48-hour weekend possessions during the dismantling of the OHLE installed by DART+ West and cutting down of the piles to MetroLink formation level.
Population and Land Use	No	No additional effects anticipated over those already assessed by the MetroLink EIAR.
Electromagnetic Compatibility and Stray Current	No	No additional effects over that already assessed by the MetroLink EIAR.
Airborne Noise & Vibration	Yes	There is potential for some additional impact as a result of noise and vibration arising from the removal of the OHLE during the two 48hr possessions already planned in Stage 2 and assessed in the MetroLink EIAR and cutting down of the piles to MetroLink formation level.
Groundborne Noise & Vibration	No	The additional works will not entail any subsurface works in close proximity to sensitive receptors.
Biodiversity	No	The additional works will not have any additional significant impacts to ecological receptors.

Environmental Effects	Potential for additional Significant Effects	Rationale
Air Quality	No	There is limited to no additional impact to Air Quality as little dust generation arising from the removal of the OHLE is anticipated during the existing two 48hr possessions already planned in Stage 2 and assessed in the MetroLink EIAR.
Climate	No	No significant additional greenhouse gas emissions that have not already been assessed by the MetroLink EIAR Climate chapter.
Hydrology	No	No potential for additional significant impacts on hydrology as a result of the additional works.
Hydrogeology	No	No potential for additional significant impacts on hydrogeology as a result of the additional works.
Soils & Geology	No	No potential for additional significant impacts on soils and geology as a result of the additional works.
Land Take	No	No additional land take is required.
Infrastructure & Utilities	No	All works will be undertaken within the existing planned possessions already assessed in the EIAR.
Agronomy	No	Proposed works are in an urban area with no agricultural enterprises impacted.
Material and Waste Management	Yes	There is a slight potential for additional waste material to be generated during the removal of the OHLE, particularly overhead cable and miscellaneous fixtures and fittings within the existing tunnel areas. There will be a reduction in excavated material and possibly the disposal of contaminated materials.
Archaeology and Cultural Heritage	No	No potential for impacts not already described in the MetroLink EIAR chapter as the area of construction remains the same as that assessed previously.
Architectural Heritage	No	No potential for impacts not already described in the MetroLink EIAR chapter as the area of construction remains the same as that assessed previously.
Landscape & Visual	No	No potential for impacts not already described in the MetroLink EIAR chapter as the area of construction remains the same as that assessed previously.
Risk of Major Accidents and Disasters	No	There is no potential for additional impacts arising from the proposed works.

Environmental Effects	Potential for additional Significant Effects	Rationale
Interactions	No	No additional effects over that already assessed by the MetroLink EIAR.
Cumulative Impacts	No	No additional effects over that already assessed by the MetroLink EIAR.

7.3 Stage 2 – Environmental Assessment

The potential environmental effects identified as result of the additional works required by MetroLink if DART+ West is constructed first in the area of Glasnevin are assessed below to determine whether they are significant.

7.3.1 Traffic and Transport

7.3.1.1 Potential for Traffic and Transport Impact

Elements of the potential works that have the potential to have an impact on traffic and transport movements are:

- The removal and subsequent re-installation of the OHLE;
- The two 48-hour weekend possessions; and
- The reduced volume of track lowering excavation.

7.3.1.1.1 Removal and Re-Installation of the OHLE

As noted by section 4, it is assumed that when the OHLE elements are dismantled they would be taken to storage via train movements to the Iarnród Eireann (IE) railhead site and therefore for these works no additional traffic impact is anticipated. The potential for traffic impact as part of the re-installation of the OHLE elements falls under two scenarios:

- The reuse of the DART+ West foundations for OHLE reinstallation, which would result in a reduction in traffic already assessed in the EIAR; or
- New OHLE foundations, already assessed in the MetroLink EIAR.

A reduction in traffic impact can be achieved if the DART+ West OHLE foundations (assumed steel hollow section) are reused by MetroLink. This would remove the following scope and traffic volumes associated with these works that have already been assessed and allowed for by the MetroLink EIAR and RO application:

Lorry movements for Steel Hollow Section methodology:

- Delivery = 1600m (length of track renewal) / 40m (mast spacings) x 2 (up / down lines) = 80 No./6 (number per lorry) = 27 No. articulated flatbed lorry movements.

Therefore, in the case that foundations from DART+ West are reused, this would lead to a reduction in impact assessed in the EIAR by an estimated 27 No. total lorry movements.

7.3.1.1.2 Impacts of Weekend Possessions

MetroLink EIAR Appendix A9.5 Scheme Traffic Management Plan (STMP) outlines the assessment methodology in relation to local area assessments. Table 2.2 of the STMP notes that *"night-time and weekend"* works are considered to be a slight magnitude of impacts due to their minimal nature of duration in the context of the overall project programme.

The two 48-hour weekend possessions, already planned within the existing works stages for Glasnevin and assessed by the MetroLink EIAR will be utilised to carry out the proposed works to remove the OHLE. Therefore, there is no significant change to the EIAR and RO application as a consequence.

7.3.1.1.3 MetroLink Track Lowering Works

Section 7.3.4 below sets out the potential for a reduction in excavation quantities as a consequence of DART+ West Works being completed in advance of MetroLink.

This reduction of around 5000m^3 of material for disposal would lead to an overall reduction in traffic movements assessed in the EIAR by 1000 No. 20t total lorry movements.

7.3.1.2 Overall impact on Traffic and Transport

No increase in Traffic and Transport impacts are anticipated above those assessed by the MetroLink EIAR and RO application. There will be a reduction in Traffic and Transport impacts as a result of the reduced MetroLink excavation quantities and an opportunity to further reduce impacts by reusing the OHLE foundations installed by DAT+ West.

7.3.2 Human Health

7.3.2.1 Potential for Human Health Impact

Should DART+ West be completed in advance of MetroLink in the area of Glasnevin, the potential for impacts on human health is driven by the potential for airborne noise & vibration and air quality impacts.

Chapter 13 Airborne Noise & Vibration of the MetroLink EIAR has assessed the impacts of track lowering works and the installation of the OHLE. If DART+ West works were completed ahead of MetroLink, the impacts on sensitive receptors as a result of the track lowering works would be reduced when compared to that presented in the MetroLink EIAR as some of this work will have already been completed by DART+ West.

Similarly, the installation of the OHLE has also been assessed as part of MetroLink EIAR Chapter 13 so the impacts would not change from what was assessed within the MetroLink EIAR submitted as part of the MetroLink RO application. The removal of the OHLE installed by the DART+ West project is not considered to be significant works in the context of the overall construction phase at this site. In addition, the works required will use the same plant and equipment for removal as that already assessed in the EIAR for installation.

In relation to air quality impacts which are assessed as part of Chapter 16 of the MetroLink EIAR, as the works involve the removal of above ground structures there is limited potential for any additional dust generation as part of the works and thus there is no potential for additional significant effects.

7.3.2.2 Overall impact to Human Health

It is concluded there would be no additional significant effects on human health should DART+ West works be completed in the area of the proposed MetroLink works in advance of MetroLink construction.

7.3.3 Airborne Noise & Vibration

7.3.3.1 Potential Airborne Noise & Vibration Impact

Elements of the potential works that might lead to additional Airborne Noise & Vibration impact are:

- Track lowering works;
- The removal of the OHLE Elements; and
- Cutting down of the OHLE steel hollow section piles to MetroLink formation level.

7.3.3.1.1 Track Lowering Works

Track lowering works were assessed as part of MetroLink EIAR Chapter 13 Airborne Noise & Vibration. If DART+ West works are completed in the area of the proposed Glasnevin MetroLink works in advance of

MetroLink construction, the impacts would be lower than those assessed in the MetroLink EIAR as c.380mm of the 2000mm required excavation will have already been undertaken as part of the Dart+ West project. Therefore, there will be no additional significant effects and a slight environmental benefit for the MetroLink project as a result of this reduced excavation.

7.3.3.1.2 Removal of OHLE Elements

The installation of OHLE elements has already been assessed as part of Chapter 13 of the EIAR. Should DART+ West progress in advance of MetroLink in the area of Glasnevin, then removal of the OHLE installed by DART+ West will be necessary by MetroLink. While this is additional work compared to that allowed for by the MetroLink EIAR and RO application, these impacts have been sufficiently covered within the MetroLink RO as the same plant and equipment will be utilised for both the removal of the DART+ West OHLE and its subsequent installation that has already been assessed by the MetroLink EIAR. While these activities take place at different times on the programme of works, the impacts of both are the same. Therefore, only a slight increase in the overall impact is anticipated as the works to remove the OHLE take place within the two 48-hour weekend possessions already allowed for by the MetroLink RO application.

7.3.3.1.3 Cutting Down of OHLE Steel Hollow Section Piles

For the reasons noted by section 4 it is assumed that the piles that will support the OHLE will be steel hollow section piles so they can be cut down by burning equipment to MetroLink formation level without having a significant noise or vibration impact.

7.3.3.2 Overall Impact Airborne Noise & Vibration

Taking account of the reduced level of excavation works for track lowering but offset with the impacts of removing the OHLE during possessions already allowed for by the MetroLink RO application, the overall additional impact to Airborne Noise & Vibration currently assessed in the MetroLink EIAR is not considered to be significant.

7.3.4 Material & Waste Management

7.3.4.1 Potential Material & Waste Management Impact

If DART+ West construction is completed in the area of Glasnevin before MetroLink, then the partial lowering of the tracks required by MetroLink at Glasnevin (approximately 380mm of the total 2m depth required by MetroLink) will have been completed which presents a saving in excavated material for the MetroLink project.

The comparison of quantities is shown by Table 7.2. In summary, in the event DART+ West works are completed in advance of MetroLink construction there will be a 12% reduction in excavated material for the MetroLink project.

Table 7.2: Quantification of Excavated Material

Jacobs Enabling Works design - 13/02/20	Total cut (m^3)
Preferred Route GSWR UP	5,138
Preferred Route GSWR DOWN	11,504
Preferred Route MGWR UP	10,329
Preferred Route MGWR DOWN	14,459
Total MetroLink	**41,430**
Total MetroLink (Less 12% when adjusted for Dart +)	**36,515**

The OHLE system that will have been installed as part of the DART+ West project will be dismantled and removed to storage so its main elements can be reused and reinstated on completion of the MetroLink works.

7.3.4.2 Overall Impact Material & Waste Management

The volume of waste generated by elements that cannot be re-used is negligible in the context of the overall waste assessment presented by MetroLink EIAR Chapter 24. It is therefore concluded there are no additional impacts on materials and waste management should DART+ West works be completed at Glasnevin before MetroLink commences construction.

7.4 Environmental Review Summary Conclusions

In summary, should DART+ West construction be completed at Glasnevin before MetroLink construction commences, the following can be concluded:

- Traffic & Transport:
  - No increase in Traffic and Transport impacts is anticipated above those presented by the MetroLink EIAR and RO application.
  - There will be a reduction in Traffic and Transport impacts as a result of the reduced MetroLink excavation quantities and an opportunity to further reduce impacts by reusing the OHLE foundations installed by DART+ West.
- Human Health:
  - There would be no additional significant effects on Human Health should DART+ West works be completed in the area of Glasnevin in advance of MetroLink construction.
- Noise & Vibration:
  - The overall impact to Airborne Noise & Vibration currently assessed by the MetroLink EIAR will not be significantly impacted by the completion of the DART+ West works in advance of MetroLink construction.
- Materials & Waste Management:
  - There are no additional impacts on materials and waste management should DART+ West works be completed in the area of Glasnevin in advance of MetroLink construction.

8. Impact on Published Railway Order Documentation

Table 8.1Table schedules the documentation provided with the MetroLink RO application that would require changes to be made to it to reflect that the DART+ West works are completed at Glasnevin in advance of MetroLink construction commencing in this area. The changes are not considered to be significant and can readily incorporated should it be confirmed that DART+ West construction is completed at Glasnevin before MetroLink construction commences at Glasnevin.

Table 8.1: Changes to MetroLink RO Documentation if DART+ West was Constructed First

Railway Order Document	Section	Updates Required
First Schedule	Works No. 380 through to 407	Text would need to be updated to include for the removal and reinstallation of OHLE and equipment, including updates to relevant drawings, ML1-JAI-ARD-ROUT_XX-DR-Y-03076 to 03081.
Railway Order Plans\Drawings	Alignment Drawings, Alignment Details Book 2 of 2 Dublin City Council, sheets 23 to 28.	As above, updates required to drawings: ML1-JAI-ARD-ROUT_XX-DR-Y-03076 to 03081.
Chapter 5: MetroLink Construction Phase	5.10.6 Glasnevin Station and Interchange	Text would need to be updated to include the removal of the OHLE as part of the Enabling Works, including last paragraph *'installation of OHLE for future electrification'*
	Drawing Reference ML1-JAI-EIA-ROUT_XX-DR-Y-05022, Figure 5.1 Construction Compound Sheet 20 of 26	Would need to be updated to reflect Dart + Works not impacted by MetroLink Works.
Appendix 5.5 – Glasnevin Station Construction Report	4. Enabling works	Add to list of works - Isolate and remove OHLE
		Add section 4.8 and expand to the above works.
	5. Construction, Table 5-1 Summary of Main Activities for High-Level Staged Construction Sequence	Update table stage 2 - Site Establishment to include OHLE isolation and removal works (utilised 2 of the 3 possessions)
	5.2 Site Establishments and MGWR Railway Closure	update text - include OHLE removal
	Figure 5.5	Update text within figure to include OHLE removal and diesel or battery powered rolling stock operating
	5.5 MGWR and GSWR Track Lowering	Update assumption
	5,6 Stage 3 D-wall and piling - Phase 1	Update text to include that Dart + has lowered the tracks already.
	5.7 Stage 4 to 5.11 Stage 7	Update Tables 5-5 to 5-9 for: Northern: GSWR power isolated and OHLE removed from extent of worksite with IR services maintained with 'diesel or battery powered rolling stock operating (From Stage 2)' Southern: 'MGWR is closed with power isolated and OHLE removed from the extent of the worksite (From Stage 2)'.

Railway Order Document	Section	Updates Required
	5.12 Stage 8: Top Down (North) on hold – Full Track lowering west of CH 850 – Commence GSWR bridge deck pre-casting.	First paragraph - separating tunnel structure to include track foundation from its connection with Prospect Bridge
	Figure 5.13: D-wall and Piling Phase 1	Update text within figure to include diesel or battery powered rolling stock operating
	7. Interface with Iarnród Eireann works	Review section - items 11, 13
Chapter 09: Traffic and Transport	No changes required.	No updates required.
Chapter 10: Human Health	No changes required.	No updates required.
Chapter 11: Population and Land Use	No changes required.	No updates required.
Chapter 13: Airborne Noise and Vibration	No changes required.	No updates required.
Chapter 16: Air Quality	No changes required.	No updates required.
Chapter 22: infrastructure and Utilities	No changes required.	No updates required.
Chapter 24: Materials & Waste Management	No changes required.	No updates required.
Chapter 28: Risk of Major Accidents and Disasters	No changes required.	No updates required.

9. DART+ West and MetroLink Constructed Concurrently

In the event that both the DART+ West and MetroLink projects are constructed concurrently in the area of Glasnevin then each project will occupy its own site, with DART+ West interfacing with MetroLink at its east and west site track boundaries. MetroLink will construct the works as set out by the MetroLink EIAR and RO application that includes the installation of the OHLE to facilitate the DART+ West project.

The key potential environmental cumulative effects from both projects being constructed concurrently are Traffic & Transport, and Airborne Noise & Vibration. MetroLink EIAR Chapter 30, Appendix A30.2 considers these cumulative effects and concluded the following for the construction phase:

- Traffic and Transport – "*Negative and Slight impact during the Construction Phase.*"
- Airborne Noise and Vibration – *"Potential for minor to major cumulative temporary construction noise and impacts depending on timing and location of works"*

Since the MetroLink EIAR was published as part of the MetroLink RO application, the further information that has been made available by IE and subsequent follow-up discussions has allowed this cumulative impact assessment to be refined and the following is now concluded:

- Airborne Noise and Vibration – With the implementation of mitigation measures including the application of the TII Airborne and Groundborne Noise Mitigation Policy, there will be no potential significant effects.
- Traffic and transport – The IE methodology is based on plant and materials being moved by rail, while the MetroLink construction methodology will utilise roads. It is however noted that as a result of the blockades proposed by the MetroLink RO application (21 months for the MGWR line and 5 months for the GSWR line) it will only be possible for IE to access their DART+ West site to the east of the MetroLink Glasnevin site from the city centre while the respective blockade is in place. DART+ West will need to review their construction logistics planning to determine whether this generates any additional impacts or extends the duration of their project. For MetroLink there are no additional traffic and transport impacts above those already assessed by the MetroLink RO application.

It is therefore concluded that no significant additional environmental impacts will arise from the MetroLink project should both projects be constructed concurrently, however IE will need to examine the implications and possible impacts of not being able to directly access their DART+ West site to the east of Glasnevin during the blockades proposed by the MetroLink RO application.

10. Review Conclusions

10.1 DART+ West Construction Completed in Advance of MetroLink at Glasnevin

This review has identified positive impacts and additional works (noting the assumptions listed under section 4) for the MetroLink project as a consequence of the DART+ West project being constructed and completed in the area of Glasnevin before MetroLink.

Positive Impacts:

- No change to the MetroLink programme set out by the MetroLink RO application.
- The additional work associated with dismantling and removing the OHLE installed by DART+ West can be undertaken within the two 48-hour possessions already allowed for by the MetroLink RO application.
- There is a reduction in MetroLink work scope as a result of DART+ West:
  - Lowering the track as part of their works by 380mm, resulting in a reduction in excavated materials and disposal volumes of circa 12%/5000m^3 along with a reduction in associated traffic movements.
  - Constructing the St Vincent substation including certain signalling, electrical and telecoms (SET) items.
- A reduction in waste by reusing the OHLE structures installed by DART+ West.
- A reduced risk of encountering contaminated materials during the MetroLink track lowering works as the existing track bed (track ballast and formation) will be removed by DART+ West.

Additional works:

- Advance work to isolate (de energise) and remove the OHLE superstructure.
- An approximate 1600m length of dual track OHLE structure (800m for each GSWR and MGWR line) installed by the DART+ West project will need to be removed.
- Demolition of a 190m length of ground stabilisation and ‘L’ retaining wall (390m in total) to the existing Cross Guns (OBD222) and maintenance Bridge (OBD221) MGWR that is not allowed for by the MetroLink EIAR and RO application.
- The piles installed by the DART+ West to support the OHLE will need to be cut down to the MetroLink track formation level and the waste removed from site.
- Cable, fixtures, and fittings from the DART+ West installed OHLE will need to be removed and disposed of.

The environmental impact of the above has been assessed and it is concluded there will be no significant environmental impacts above those already assessed by the MetroLink RO application whilst also noting the positive impacts identified above. There is also an opportunity through close coordination with IE to design the OHLE piled foundations so that they can be reduced to MetroLink formation level and reused by MetroLink, thus further reducing waste and the work to be undertaken by the MetroLink. The OHLE foundation design should also consider the interface between the MetroLink installation of sheet piles and anchors west of the station preventing any potential clash throughout installation.

A review of the submitted MetroLink RO documentation shows any changes required to reflect DART+ West construction being completed at Glasnevin before MetroLink construction commences at Glasnevin are not significant.

10.2 DART+ West and MetroLink Constructed Concurrently

In the event that both the DART+ West and MetroLink projects are constructed concurrently in the area of Glasnevin then each project will occupy its own site, with DART+ West interfacing with MetroLink at its east and west site boundaries. MetroLink will construct the works as set out by the MetroLink EIAR and RO application that includes the installation of the OHLE to facilitate the DART+ West project.

The key potential environmental cumulative effects from both projects being constructed concurrently are Airborne Noise & Vibration, and Traffic & Transport. For Airborne Noise and Vibration, with the implementation of mitigation measures including the application of the TII Airborne and Groundborne Noise Mitigation Policy, there will be no potential significant effects. No significant additional traffic and transport environmental impacts will arise from the MetroLink project should both projects be constructed concurrently, however IE will need to examine the implications and possible impacts of not being able to directly access their DART+ West site to the east of Glasnevin during the blockades proposed by the MetroLink RO application.

Appendix A. Assessment Matrix Comparing DART+ West and MetroLink Works

- **Compatible work** – refers to the DART+ West works MetroLink is able to absorb and integrate (reuse or adopt) into MetroLink construction, however additional time beyond the MetroLink Railway Order baseline schedule may be necessary.

  Incompatible work – refers to DART+ West works that cannot form part of the MetroLink construction and may result in supplementary work and additional time beyond the MetroLink Railway Order baseline schedule.

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
Site establishment - site clearance (including vegetation clearance) for construction compounds.	Compound and temporary hoarding to area CC-PW-S3-33340-B (988m^2) (substation compound) outside Metrolink site extents.	DART+ West allocated area required to facilitate the construction of the substation.	None
	Compound and temporary hoarding to area CC-PW-S4-43200-B (248m^2) within Metrolink site extents.	Negligible duplication of compound areas (mob / demob)	None
	Area for Vincent's Substation SUB area 450m^2 total area - (circa 1500m^2)	Glasnevin substation location (SET technical building), characteristics, and previous feeding points at the OHLE do not vary – to stay in place.	None
Utility Diversions	Track Lowering - No utility diversions are foreseen as a result of the track lowering (modification to existing track drainage into Royal Canal)	None	None
	Vincent's Substation - Diversion required - Medium / Low Voltage, underground duct ESB	None	None
Pway (trackworks, including track drainage)	Zone A - Track Lowering @ OBO11 Prospect Rd Bridge to achieve OHLE clearances. GSWR line at 2+1459 mileage, in Dublin city (Ch 33+000) Depth of lowering = 325mm Length = 330m Case 2 = soil improvement + lowered	The track lowering solution that has been proposed to achieve a sufficient vertical clearance for OHLE installation at Prospect Bridge including the approach east of prospect bridge.	None

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
	Zone B - Track Lowering @ OBD222 Cross Guns Bridge to achieve OHLE clearances. MGWR line at 0+1412 mileage. (Ch 43+080 - 43+240) Depth of lowering = 410mm Length = 575m Case 3 = soil improvement + L wall retainment - lowered	The combined (MGWR & GSWR) 1955m of twin track lowering detailed with the DART+ West RO would benefit Metrolink with an 12% reduction in overall spoil removal and associated vehicle movements.	Removal of 190m (to each bridge abutment foundation – 380m in total) of ground improvement works and L wall retainment at Cross Guns and Maintenance bridge locations (MGWR). Work required to remove this would forms part of the Metrolink site clearance and demolition.
Bridges including parapets	Zone A - Track Lowering @ OBO11 Prospect Rd Bridge to achieve OHLE clearances. GSWR line at 2+1459 mileage, in Dublin city (Ch 33+000) Existing parapet=1.50m Proposed parapet=1.80m	Considered minor alterations works and can be absorbed.	None
	Zone B - Track Lowering @ OBD222 Cross Guns Bridge to achieve OHLE clearances. MGWR line at 0+1412 mileage. (Ch 43+080 - 43+240) Existing parapet=1.40m Proposed parapet=1.80m	Considered minor alterations works and can be absorbed.	None
OHLE Support Structure	GSWR length of structure (Note: within extents of MetroLink) = 865m	Not possible (due to Metrolink level differences) to fully utilise the DART+ OHLE structure, however the superstructure can be removed, stored, and reinstalled at a later date. There is additional work to isolate the OHLE and remove and store the existing superstructure.	Potentially an incompatible OHLE foundation design that may not accommodate both the lowered track and sheet pile / anchor installation for retaining the existing embankment.

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
	MGWR length of structure (Note: within extents of MetroLink) = 1280m	Not possible (due to Metrolink level differences) to fully utilise the DART+ OHLE structure, however the superstructure can be removed, stored, and reinstalled at a later date. There is additional work to isolate the OHLE and remove and store the existing superstructure.	Potentially an incompatible OHLE foundation design that may not accommodate both the lowered track and sheet pile / anchor installation for retaining the existing embankment.
	Existing Glasnevin Junction = 150m	Not possible (due to Metrolink level differences) to fully utilise the DART+ OHLE structure, however the superstructure can be removed, stored, and reinstalled at a later date. There is additional work to isolate the OHLE and remove and store the existing superstructure.	Potentially an incompatible OHLE foundation design that may not accommodate both the lowered track and sheet pile / anchor installation for retaining the existing embankment.
Cable Management System (signalling, comms an LV)	Within Zone A, the Cable Management System (CMS) for Signalling, Electrical and Telecoms (SET) works will be provided. Also, a new CMS is required from the viaduct above the Royal Canal (located north of Connolly) to Glasnevin Junction along the GSWR line.	Yes, however some minor alterations to accommodate the track lowering / MetroLink design.	None
	Glasnevin **L**V Removal of the existing connection from existing DNO/DC to the existing PHCCs. The existing PHCCs will be connected to the new DNO/DC. All of the existing PHCCs and Points heaters are going to be reused in this area.	Yes, however there will be some minor alterations to accommodate the track lowering / MetroLink design.	None

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
Signalling, Electricity and Telecommunications (SET) systems (includes HV Power and OHLE systems) Zone A (GSWR)	St Vincent's Substation (civils (12-18wks) and equipment installation (12wks))	Glasnevin substation location, characteristics, and previous feeding points at the OHLE do not vary from the SEB. Glasnevin SEB to stay in place. The main changes in the trackside elements controlled from the SEB are summarised below: • 4 more signals with its associated balises and LEUs • Same number of junction indicators • 2 more detection points Same number of point machines (8). The train protection system (TPS) that shall be in place when constructing the new station is ETCS SCADA/HV. There are no changes in the previous 8 feeding points from the TFB (traction feeder breaker) from Glasnevin to the OHLE substation except for a new TFB to feed the diamond crossing, and substantial changes in the sectioning of the area due to the new track alignment and switches & crossings.	None

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
	Signalling – The existing signalling system will need to be adapted to the new interim connection between GSWR and East Wall lines. The new signalling system will be commissioned while this interim connection is in service. The new signalling system will be modified to the final track configuration of this area.	however, there will be modifications and relocations 1. Relocation of signals and axle counters 2. Removal of two pairs of locations cases (LOC + TPS LOC) 3. Change in the trackside elements controlled by the Glasnevin SEB 4. Software update of the DART+ West CBI due to configuration changes described by 1-3 above. 5. Update of the TMS software due to configuration changes described by 1-4 above. Other - LOCs/TPS LOCs DW4/46P and DW3/00 are to be decommissioned in the new configuration (closer to Glasnevin SEB)	None
	Telecoms - The new trunk cables will be connected to the new DART+ West nodes/buildings in this area, detailed in Section 5.3.9.1 of the DART+ West RO Construction Strategy. (i.e., Connolly TER, Connolly SEB, Glasnevin SEB, and Glasnevin substation). The cabling will also be connected to the new DART+ West trackside LOCs and cabinets in this zone (OHLE, Signalling and LV cabinets) and other buildings (PSP).	SCADA/HV. There are no changes in the previous 8 feeding points from the TFB (traction feeder breaker) from Glasnevin to the OHLE **substation except for a new TFB to feed the diamond crossing**, and substantial changes in the sectioning of the area due to the new track alignment and switches & crossings.	None
	Points heating - Removal of the existing connection from existing DNO/DC to the existing PHCCs. The existing PHCCs will be connected to the new DNO/DC. All of the existing PHCCs and Points heaters are going to be reused in this area.	As per telecoms (Diamond crossing)	None

Construction Activity	Proposed developments (DART RO and IR SET Design)	Compatible Works	Incompatible Works
	Electrification - Installation of elastic bridge arms/OHLE supports to support the OHLE, insulators to support the feeder wires and earth wire clamps at, OBD222,221, OHLE feeding connections and MOS installation from Glasnevin substations, and mainline OHLE MOS. General electrification works for the OHLE installation (Overhead Line Equipment (OHLE)) that will generally comprise single track cantilever structures (including twin track cantilevers, portals and wall fixings in some particular locations).	The updated OHLE design for Glasnevin has the exact same principles as for the DART+ West design (further details refer to MAY-MDC-SET-RS04-RP-Y-0001). However, due the new switches and crossings (and the subsequent points opening for the OHLE), the track lowering and the re-alignment, it is not possible to re-utilise the OHLE structures that will be in place in the DART+ West design situation.	None
Fencing and boundary treatment.	Parapets at bridge location (already measured) and areas at St Vincent Substation (both already included above).	none	None