MetroLink

Transport Infrastructure Ireland

EIAR Addendum: Leinster Street Pumping Station

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Project Manager:	Paul Brown
Author:	Shannon Byrne
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Jacobs Engineering Ireland Limited

Merrion House
Merrion Road
Dublin 4, D04 R2C5
Ireland
T +353 1 269 5666
F +353 1 269 5497
www.jacobs.com

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Contents

1. Introduction and Background

The purpose of this addendum to the EIAR is to describe the potential for additional environmental effects not captured in the EIAR resulting from the provision of an additional pumping station along the tunnel alignment underneath Leinster Street South. This document will include:

- Reference information considered in assessing the impact of the design change;
- A technical description of the proposed amendment;
- A description of the construction works required for the proposed amendment;
- Details of the assessment methodology used;
- A review and assessment of potential environmental effects arising from this design change; and
- Conclusions of the review.

2. Reference Information

The information reviewed and taken account of in the development of this technical note includes the following information:

2.1 Figures

- ML1-JAI-ARD-ROUT_XX-DR-Y-03091
- ML1-JAI-ARD-ROUT_XX-DR-Y-03092

3. Technical Description of the Proposed Alignment

As there is a low point in the tunnel along this section of the alignment at Chainage (Ch.) 17+947, a pumping station is required to facilitate drainage at this location. As a result, a pumping station is proposed at Ch.17+947. This location has been chosen to locate the pumping station away from any buildings under Leinster Street South. This is to minimize potential construction settlement and noise impacts on properties. Figure 3.1 below outlines the location of the pumping station.

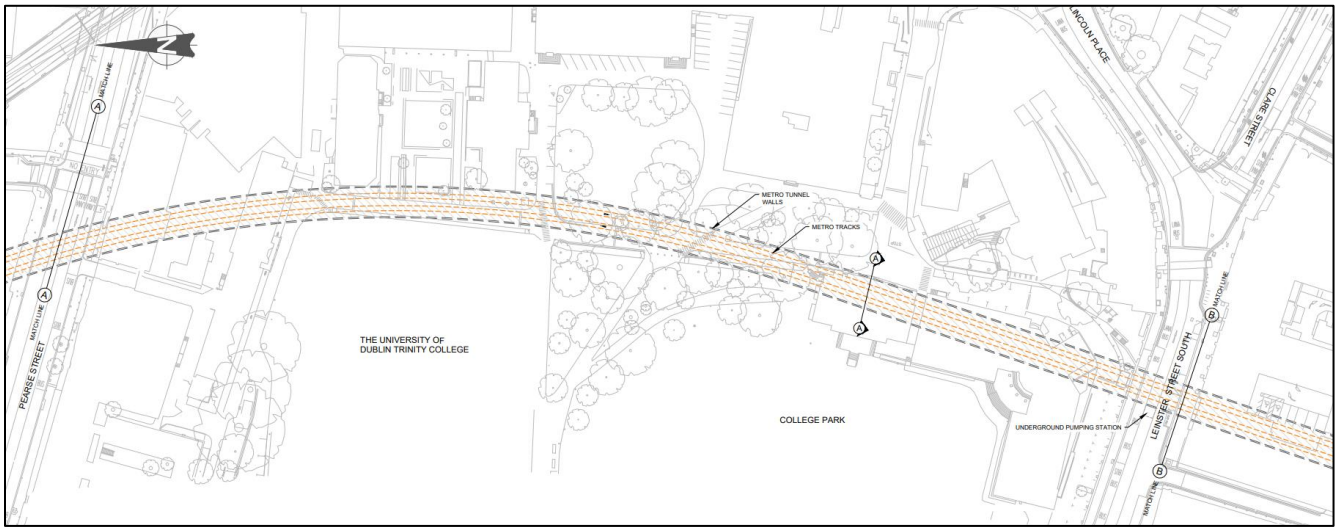

Figure 3.1: Horizontal Alignment Showing Proposed Pumping Station

4. Description of the Construction Works

The construction methodology for the proposed pumping station is described and assessed in EIAR Appendix A5.13. The pumping station passages will be constructed using Sprayed Concrete Lining (SCL) techniques from the main tunnel after the TBM has finished. The sequence of works will be:

- Install survey monitoring points in the main tunnel;
- Divert any in tunnel services;
- Provide fissure grouting to reduce in situ permeability following drilling and testing;
- Install in tunnel props;
- Pull or break out top section of tunnel lining rings or remove the top half of the segmental open set;
- Excavate top heading of 1st advance of passage using rock saws or other low noise and vibration generating methods;
- Spray SCL to support top heading;
- Pull or break out lower section of tunnel rings;
- Excavate using rock saws or other low noise and vibration generating methods and shotcrete bottom section;
- Continue advancing passage until end chainage; and
- Construct internal concrete finishes.

Prior to any works on the pumping station passage, monitoring points will be established in the main tunnel and background readings taken to establish baseline values. These monitoring points will be surveyed daily while the works are carried out to ensure no movement in the main tunnel. The monitoring points will be installed shortly after the TBM passes, which would give plenty of time to obtain a stable baseline.

Any services that will still be required will be diverted around the proposed opening before breaking out the tunnel rings and excavating the initial advances of the eye of the passage.

The top section of the passage will be excavated and sprayed concrete applied before the lower section of tunnel rings are broken out. The passage will then be advanced by top heading and invert to the location of the pumping station in advances typically 1m to 1.3m long. All inverts will be closed with sprayed concrete to provide a stable tunnel. Once the passage is at the end chainage, a timber shutter will be set up and a reinforced concrete slab cast.

All SCL works will be controlled by a Required Excavation and Support Sheet (RESS) which will be produced by a Senior SCL Engineer as described in Appendix A.13, Section 4.8 of the EIAR

5. Assessment Methodology

An analysis of the Proposed Works has been undertaken to determine the environmental effects of the proposed change and to identify whether there is potential for additional significant environmental effects over and above that identified in the MetroLink EIAR. This assessment consisted of a two-stage process:

- **Stage 1 Assessment of Potential for Environmental Effects:** A review of the potential for additional environmental effects not previously considered by the MetroLink EIAR as a result of the Proposed Works.

- **Stage 2 Assessment of Significance of Environmental Effects:** A review of the potential environmental effects identified to determine significance of effects, the required mitigation measures and residual effects.

This environmental review has had regard to the following key issues:

- Potential for impacts as a result of the construction of the proposed pumping station.

6. Environmental Assessment

6.1 Introduction

This section summarises the environmental review, undertaken in accordance with the two-stage methodology described by Section 5 to determine if there will or will not be additional impacts on the receiving environment over and above those assessed in the MetroLink EIAR.

6.2 Stage 1 – Assessment of Potential for Environmental Effects

Table 6.1 summarises the results of the environmental assessment exercise undertaken, identifying the environmental effects that have the potential for additional environmental effects above those already assessed in the EIAR that should be taken forward for Stage 2 Assessment.

Table 6.1: Environmental Assessment

Environmental Effects	Potential for additional Significant Effects	Rationale
Traffic and Transport	Yes	Potential for additional vehicles required to support the construction of the pumping station.
Planning Policy	No	No additional impact on planning policy.
Human Health	Yes	Potential for human health effects in the event of exceedances of relevant criteria arising from other environmental assessments.
Population and Land Use	No	There is no discernible impact on Population and Land Use from this adjustment as all works are below ground. The proposed pumping station is located under the public road and so will not affect any potential for future oversite development.
Electromagnetic Compatibility and Stray Current	No	The construction of the pumping station has no impact on electromagnetic compatibility and stray current.
Airborne Noise & Vibration	No	Potential for impacts during the construction of the pumping station.
Groundborne Noise & Vibration	Yes	Potential for short-term effects during the construction of the pumping station.
Biodiversity	No	There is no potential for impacts on biodiversity during construction or operation of the pumping station.
Air Quality	Yes	Potential for emissions to air due to additional traffic generation.
Climate	No	There are no additional works above what was assessed within the EIAR as a result of the construction of the pumping station.
Hydrology	No	There are no additional works above what was assessed within the EIAR as a result of the construction of the pumping station. It will result in no overall change in the natural hydrological

Environmental Effects	Potential for additional Significant Effects	Rationale
		regime and will not impact the assessment outcomes presented in the EIAR.
Hydrogeology	Yes	Potential for additional impacts in relation to hydrogeology as a result of the construction of the pumping station.
Soils & Geology	Yes	Potential for impacts on soils & geology generated by the excavation of the pumping station.
Settlement	Yes	Potential for additional settlement impacts.
Land Take	Yes	Potential for additional land-take impacts.
Infrastructure & Utilities	Yes	Potential for addition impacts on infrastructure & utilities due to the inclusion of the pumping station.
Agronomy	No	This location is in an urban environment and therefore there is no potential for impacts on agricultural lands, as all the works are below ground.
Material and Waste Management	Yes	Potential for additional waste generation due to the proposed changes.
Archaeology and Cultural Heritage	No	No impacts on the archaeological or cultural heritage resources, in addition to those already assessed as part of the EIAR.
Architectural Heritage	Yes	Potential impacts due to the potential for settlement changes.
Landscape & Visual	No	No impacts as all works are below ground.
Risk of Major Accidents and Disasters	No	There is no additional risk of major accidents and disasters due to the nature of the design changes.
Interactions	No	No additional interactions are predicted due to the nature of the design changes.
Cumulative Impacts	No	No additional cumulative impacts are predicted due to the nature of the design changes.

6.3 Stage 2 – Environmental Assessment

6.3.1 Traffic & Transport

Due to the construction of the pumping station, there is a potential for additional vehicles required to manage the additional waste generated through the Construction Phase. This change will result in 8-10 additional truckloads of excavated material over the lifetime of the Construction Phase. There are no additional construction compounds required to facilitate this work as it will be carried out at Charlemont Construction Compound and therefore there

is no additional impacts on haul routes. Excavation of the pumping station will not result in any additional impacts on traffic and transport during the Construction Phase.

Therefore, there are no additional significant effects above what was assessed within the EIAR as a result of this change.

6.3.2 Airborne Noise & Vibration

There is no additional impact on airborne noise and vibration from the Proposed Works as all works are below ground. Any support works required at surface level for the SCL construction will be within the existing enclosed compound at Charlemont. There is no additional plant or equipment required within the construction compound. The same criteria and controls will be in place for this compound and impacts are within the assessment criteria in the EIAR. The pumping station is fully underground and, hence, there are no airborne noise emissions during the Operational Phase. SCL batching will be fully mitigated as it will be within the noise enclosure at the proposed Charlemont Construction Compound.

Therefore, there are no additional significant effects above what was assessed within the EIAR as a result of this change.

6.3.3 Air Quality

There is no additional potential for dust effects due to the Proposed Works. Traffic numbers are considered to be imperceptible over the lifetime of the Construction Phase. This results in no additional air quality impacts due to traffic emissions.

Therefore, there is no potential for likely additional, significant effects as a result of the Proposed Works.

6.3.4 Hydrogeology

The construction of the pumping station will be carried out within competent rock. This will result in no change in the natural groundwater regime and the scale of variation within the LOD will not impact the assessment outcomes presented in the EIAR. Fissure grouting will ensure that the water table is not lowered outside of the structure.

Therefore, there is no significant additional impacts as a result of the Proposed Works

6.3.5 Soils & Geology

The Proposed Works are entirely within the sub-surface and will not alter the assessment of impact on near surface attributes (such as soils and land contamination).

Therefore, there are no significant additional impacts as a result of the Proposed Works.

6.3.6 Land Take

The substratum land take has been generated by creating a LOD ranging from 5m vertically upwards and 10m downwards to 15m laterally for the tunnel alignment. The lateral extent of the land take required as a result of the pumping station remains unchanged.

Therefore, there are no significant additional impacts as a result of the Proposed Works.

6.3.7 Materials & Waste Management

The construction of the proposed pumping station would require small additional quantities of materials including 52m^3 of concrete. Arising from the excavation there is predicted to be 173m^3 of material generated. The volume

of additional materials required for this construction is insignificant in the context of the overall project materials required for the Metrolink project. The management of material and waste will be managed as outlined in Chapter 24 of the EIAR.

Therefore, there are no significant additional impacts as a result of the Proposed Works.

6.3.8 Settlement

A Phase 2 building assessment has been undertaken on four buildings as outlined in Appendix A1 Update to Appendix A5.17 Building Damage Report. Two of these buildings have been identified within the settlement assessment within the EIAR (B-22 & B-23) and two additional buildings have been identified for the purposes of this assessment (AB-36 & AB-52). These buildings have been assessed for potential settlement impacts as a result of the construction of the pumping station. The Phase 2 assessment shows the potential settlement impacts fall within Category 0 (Negligible) or below.

Therefore, there is no potential for additional settlement impacts as a result of the Proposed Works.

6.3.9 Architectural Heritage

As there is no potential settlement impacts, there are no significant additional impacts as a result of the Proposed Works.

6.3.10 Groundborne Noise & Vibration

The works associated with the construction of the pumping station have the potential to give rise to significant construction groundborne noise and vibration effects on the nearby sensitive receptors.

Groundborne noise levels of 39 dB $L_{Amax,S}$ are predicted to occur for a period of up to four weeks in the Moyne Institute building located within the Trinity College Dublin (TCD) campus during mechanical excavation for the formation of the niche and the installation of the pumping station. This is the closest building to the works. According to information provided by Trinity College Dublin, there is no sensitive equipment used within the Moyne Institute itself. Equipment located within the Chemistry building (~105m away from the proposed pumping station), the Panoz building (~150m from the pumping station) and the Lloyd Institute (~230m away from the pumping station) are potentially susceptible to effects from construction groundborne vibration associated with the works.

At these distances it is expected that groundborne vibration magnitudes during mechanical excavation can be controlled to achieve VC-D for the Chemistry and Panoz buildings, and VC- E for the Lloyd Institute without the need for additional mitigation.

The sub-surface tunnel and pumping station construction works in the vicinity of the TCD campus will be managed carefully and in accordance with the Trigger Action Plan (TAP) that will be developed with TCD prior to commencing works. The TAP will focus on advance stakeholder communications and, where practicable, the scheduling of construction works and the TCD research activities to avoid any significant residual adverse groundborne noise and vibration effects on the occupants and the vibration sensitive equipment undertaken at TCD.

The operation of the pumping station will not give rise to any significant operational groundborne noise and vibration effects at nearby sensitive receptors. It is expected that groundborne vibration can be controlled to achieve VC-E at the nearest building within the TCD campus, using enhanced anti-vibration mounting systems fitted to the pump and pipework installed within the pumping station.

No other receptors in the vicinity of the works are expected to be significantly affected either by the construction or operation of the pumping station.

6.3.11 Human Health

On the basis that there are no significant emissions, noise and dust impacts over a prolonged period, there is no additional significant impacts on human health within this area resulting from the Proposed Works.

6.4 Environmental Conclusions

The assessment has identified that there are no potential significant environmental effects as a result of the additional works required for the proposed design change once mitigation measures are implemented.

A.1 Updated Tables for Appendix A5.17 Building Damage Assessment

Table 5-2: Result of Phase 2a building damage assessment – Representative Buildings

Ref	Chainage	Description	Height (m)	Number of Floors	Length (m)	Depth of basement (m)	Refined Phase 2a Assessment Damage Category	Updated Damage Category	RPS, NIAH, RMP or other heritage (Y/N/unknown)	Continue to next assessment phase? (Y/N)	Comments
B-22	17980	Trinity Point	17.5	5	9.4	0	0 (Negligible)	0 (Negligible)	N	N	Damage Category 2 or Below
B-23	18020	Trinity Point	21.0	6	28.8	0	0 (Negligible)	0 (Negligible)	N	N	Damage Category 2 or Below

Table 5-4: Result of Refined Phase 2a Building Damage Assessment – 'additional' buildings.

Ref	Associated Building	Chainage	Description	Estimated Height (m)	Number of Floors	Length (m)	Category of Damage	Listed/Sensitive Structure (Y/N)	Continue to next assessment phase? (Y/N)	Comments
AB-36	B-30a	17940	Residential/Retail	12	4	8.8	0 (Negligible)	N	N	Damage Category 2 or Below
AB-52	B-32a	17900	Sports Facility	6.0	2	51.3	0 (Negligible)	N	N	Damage Category 2 or Below

Selected updates to Table F1: Building Damage Assessment Results for 'Representative' and 'Additional' Buildings – Critical Segments within Each Building (18 March 2024) (Vl=0.5%, K=0.4 for Rock)

Specific Building	Parameter	Critical Segment	Start [m]	End [m]	Curvature	Max Slope	Max Settlement [mm]	Max Tensile Strain [%]	Min Radius of Curvature (Hogging) [m]	Min Radius of Curvature (Sagging) [m]	Damage Category
B-22	Max Slope	1	0	7.9022	None	5.40E-04	11.276	0.0026069	-	-	0 (Negligible)
	Max Settlement	1	0	7.9022	None	5.40E-04	11.276	0.0026069	-	-	0 (Negligible)
	Max Tensile Strain	2	7.9022	29.251	Hogging	5.40E-04	7.5148	0.015514	35244	-	0 (Negligible)
	Min Radius of Curvature (Hogging)	2	7.9022	29.251	Hogging	5.40E-04	7.5148	0.015514	35244	-	0 (Negligible)
	Min Radius of Curvature (Sagging)	-	-	-	-	-	-	-	-	-	-
B-23	Max Slope	1	0	3.5583	None	6.08E-04	7.085	0.0065791	-	-	0 (Negligible)
	Max Settlement	2	3.5583	19.856	Sagging	6.08E-04	11.65	0.0095093	-	11516	0 (Negligible)
	Max Tensile Strain	2	3.5583	19.856	Sagging	6.08E-04	11.65	0.0095093	-	11516	0 (Negligible)
	Min Radius of Curvature (Hogging)	-	-	-	-	-	-	-	-	-	-
	Min Radius of Curvature (Sagging)	2	3.5583	19.856	Sagging	6.08E-04	11.65	0.0095093	-	11516	0 (Negligible)
AB-36	Max Slope	1	0	7.4901	None	1.65E-04	0.72551	0.0089994	-	-	0 (Negligible)
	Max Settlement	1	0	7.4901	None	1.65E-04	0.72551	0.0089994	-	-	0 (Negligible)
	Max Tensile Strain	1	0	7.4901	None	1.65E-04	0.72551	0.0089994	-	-	0 (Negligible)
	Min Radius of Curvature (Hogging)	-	-	-	-	-	-	-	-	-	-
	Min Radius of Curvature (Sagging)	-	-	-	-	-	-	-	-	-	-
AB-52	Max Slope	1	0	19.489	Sagging	7.62E-04	13.263	0.0074225	-	8313.3	0 (Negligible)
	Max Settlement	1	0	19.489	Sagging	7.62E-04	13.263	0.0074225	-	8313.3	0 (Negligible)
	Max Tensile Strain	2	19.489	43.636	Hogging	7.62E-04	8.1014	0.029682	18855	-	0 (Negligible)
	Min Radius of Curvature (Hogging)	2	19.489	43.636	Hogging	7.62E-04	8.1014	0.029682	18855	-	0 (Negligible)
	Min Radius of Curvature (Sagging)	1	0	19.489	Sagging	7.62E-04	13.263	0.0074225	-	8313.3	0 (Negligible)