MetroLink Oral Hearing

List of Additional Mitigation Measures

This document presents a Work in Progress (WIP) list of additional mitigation measures to be provided over and above those listed in the Environmental Impact Assessment, Natura Impact Assessment and associated documents.

Black = Included to provide more specificity where required to those measures in the EIAR

Blue = Measures added to Schedule during the Oral Hearing

1. Chapter 5 Construction Phase

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Hertz. Swords Business Park	To monitor impacts during the construction phase	Monitoring instrumentation/equipment to be deployed at their location (to address concerns re sensitive computer equipment and telephone service facilities on site)
Hertz. Swords Business Park	To manage impacts during the construction phase taking cognisance of the use of the building at the time of construction.	Preparation of a Trigger Action Plan for this Location
Charlemont Intervention Tunnel	Chapter states (in section 5.5.4) that blasting could be used in Charlemont Intervention Tunnel	Commitment that blasting will not be used in the Charlemont Intervention tunnel
Route Wide	To manage impacts during the construction phase (reference Appendix 5.13, section 6.4)	Commitment to not use trains or wagons in the transport of materials in the tunnel.
Route Wide	Working Hours	An update and clarification to the proposed working hours in the document entitled “Update to Chapter 5 MetroLink Construction Phase: Working Hours” presented to the Board on 28/02/24. The working hours presented in

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		this document supersedes the working hours presented in the relevant sections of the EIAR Chapter 5 section 5.2.4 and Tables 5.3, 5.4 and 5.5.
Route Wide	Update to Section 5.3.1 in relation to the Reinstatement of Construction Compounds	Construction compounds, including any areas used for access, will be returned to the most appropriate use after completion of the works (apart from areas used for permanent land-take
Route Wide	Update to Section 5.4.4 and 5.12.4.3	Archaeological investigation and resolution of archaeological constraints in greenfield areas and parklands will be undertaken at locations identified in Table 25.9 of the EIAR and in line with the specific requirements outlined therein.
Route Wide	Update to Section 5.4.4	Licences or consents and required approvals will be applied for in line with the requirements of Chapter 26, Section 25.6.1.1 Ministerial Consent and Section 25.6.1.2 Archaeological Licence Requirements.
Route Wide	Update to Section 5.4.6	Mains electricity will be provided at the construction compounds during the site setup stage, in preference to the extended usage of electricity generated by diesel power in the early stages of construction. To avoid any unnecessary wastage, permanent power supplies will be brought on-site to supply the construction works at the level of supply required for permanent operations.
Route Wide	Update to Section 5.4.7	Methods of collecting (harvesting) rainwater, recycling and treatment of wastewater for general site use will be used at construction compounds.
Charlemont	Update to 5.5.5	Sprayed concrete lining (SCL) tunnel construction will not be used during the construction of the evacuation/ ventilation tunnel south of Charlemont.
Route Wide	Update to 5.5.9	Controlled blasting will only be used to excavate rock where it can be demonstrated through extensive trials that the groundborne vibration and air overpressure limits set to control disturbance and avoid any building damage, will be comfortably met.
Ballymun	Update to 5.5.17.3	Concrete batching will take place 24 hours, 7 days, with the exception of Ballymun which will operate during standard hours only.

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Update to 5.4.1.12.2	Minimisation of the use of water will be considered during planning for each stage of the works, incorporated into relevant procedures and method statements, and with steps to eliminate or minimise water usage incorporated and utilised. Mains water connections will be fitted with meters such that potable water usage is monitored and managed. Water will be reused on-site. Construction activities on the proposed Project identified as having the potential for high water use should be specifically targeted against opportunities to reduce water use, utilising the hierarchy of objectives listed above. For more detailed information on minimisation of water consumption and specific examples for the construction of piling and diaphragm walls, tunnelling and dust suppression
5.12.9	Update to 5.12.9 Construction Site Lighting	The aquatic environment; direct lighting of watercourses shall be avoided, , to avoid inhibiting movements of photophobic species such as eel.

2. Chapter 9 Traffic and Transport

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Update to 9.7.1.2	The remedial measures proposed will include: Wheel wash facilities will be provided at each of the main construction compounds.
Route Wide	Update to 9.7.1.2	Transporting workers to site via min-buses from designated collection points (such as Luas and DART stations or other appropriate locations) in line with the mobility management plan.
Fosterstown	Section 9.7.2 Table 9.148	Placement of street furniture to maximise available width, monitor to determine if footway width needs increased in future years- possibility of reallocation of space at this location. (By agreement with Local Authority)

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Collins Avenue	Section 9.7.2 Table 9.148	Placement of street furniture to maximise available width. Monitor impacts to determine if further width is required. (By agreement with Local Authority)
Glasnevin	Section 9.7.2 Table 9.148	Widen pedestrian crossing to 4m. The crossing will then operate with sufficient comfort levels for the anticipated demand.
Mater Station	Section 9.7.2 Table 9.148	Placement of street furniture to maximise available width. Monitor impacts to determine if further width is required. TII will work with the relevant authorities to ensure the placement of street furniture to maximise available width. Impacts on pedestrian comfort will be monitored to determine if further width is required.
O'Connell Street	Section 9.7.2 Table 9.148	Reallocation of road space to widen the pedestrian area TII will work with the relevant authorities to ensure the placement of street furniture to maximise available width. Impacts on pedestrian comfort will be monitored to determine if further width is required. .
Tara Station	Section 9.7.2 Table 9.148	Placement of street furniture to maximise available width. Monitor impacts to determine if further width is required. TII will work with the relevant authorities to ensure the placement of street furniture to maximise available width. Impacts on pedestrian comfort will be monitored to determine if further width is required.
Townsend Street	Section 9.7.2 Table 9.148	The provision of additional crossings at Townsend Street/Tara Street will provide sufficient capacity to accommodate the anticipated demand. TII will work with the relevant authorities to ensure the placement of street furniture to maximise available width. Impacts on pedestrian comfort will be monitored to determine if further width is required.
Charlemont	Section 9.7.2 Table 9.148	Placement of street furniture to maximise available width. Monitor impacts to determine if further width is required. TII will work with the relevant authorities to ensure the placement of street furniture to maximise available width. Impacts on pedestrian comfort will be monitored to determine if further width is required.

3. Human Health

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Charlemont	Improved access for PRMs to Charlemont Station	Provision of drop off facility at Charlemont for PRMs

4. Population and Land Use

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Seatown Villas, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Seatown Villas
Estuary Court, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Estuary Court
Ashley Avenue, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Ashley Avenue

5. Electromagnetic Compatibility and Stray Current

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Trinity College Dublin	To mitigate the effects of MetroLink operations on highly sensitive equipment	Installation of Active Cancellation Systems at TCD Equipment

6. Airborne Noise and Vibration

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Mater Hospital		Trigger Noise Action Plan for the Mater Hospital
Route Wide	Update to Section 13.6.1.2.1	The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. Plant will be selected (e.g. plant items with sound attenuation incorporated) to assist in the mitigation of noise effects. Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative. The contractor(s) will evaluate the choice of piling, excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment that would economically achieve, in the given ground conditions, equivalent structural / excavation / breaking results, these will be selected to control noise emissions

7. Ground-borne Noise and Vibration

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Trinity College Dublin	To prepare an advance plan with TCD for the management of noise due to the advancement of the TBM to minimise effects.	Trigger Action Plan for TCD
The Abbey Theatre	To prepare an advance plan with the Abbey Theatre for the management of	Trigger Noise Action Plan for the Abbey theatre

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
	noise due to the advancement of the TBM to minimise effects.	
Rotunda Hospital, Ch 16+050 to Ch 16+400	To manage potential future effects on the operation of future proposed hospital operations at this site.	Extended Floating Slab track underneath the Rotunda Hospital
Gate Theatre and Ambassador Theatre	To prepare an advance plan with the Gate Theatre and the Ambassador for the management of noise due to the advancement of the TBM to minimise effects.	Trigger Noise Action Plan for the Gate theatre/Ambassador
Rotunda Hospital	To manage potential future effects on the operation of future proposed hospital operations at this site.	Trigger Noise Action Plan for the Rotunda Hospital
Mater Hospital	To prepare an advance plan with the Mater Hospital for the management of noise due to the advancement of the TBM and other construction works to minimise effects.	Trigger Noise Action Plan for the Mater Hospital
Airside Business Park, Ch 3+920 to Ch. 4+080	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track as presented to the Board on 28/02/24
Grove Commercials, Ch 5+180 to Ch. 5+360	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track as presented to the Board on 28/02/24
Botanic Avenue & Daneswell Road Ch 13+910 to Ch. 14+230	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track as presented to the Board on 28/02/24

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Milton Fields, CH. 4+350 to Ch. 4+570	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track as presented to the Board on 28/02/24
National Museums & National Gallery, Ch 17+980 to Ch. 18+400	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track as presented to the Board on 28/02/24

8. Air Quality

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Dust from HGV deliveries to/from the site	HGV traffic leaving the main construction compounds will pass through a wheel wash.
Route Wide	Dust from HGV deliveries to/from the site	Public roads outside the site will be regularly inspected for cleanliness and cleaned regularly. If public roads are deemed to require additional cleaning, a suction device for road cleaning will be utilised should access spaces around cars and other street furniture more effectively.

9. Climate

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Reduction in GHG emissions to achieve compliance with CAP23/24	Corporate Power Purchase Agreement (CPPA) to use electricity generated from renewables for 100% of construction stage power which includes the energy to power the tunnel boring machine;
Route Wide	Reduction in GHG emissions to achieve compliance with CAP23/24	CPPA to use electricity generated from renewables for 100% of operational power (the EIAR committed to 90%);

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Route Wide	Reduction in GHG emissions to achieve compliance with CAP23/24	The use, where practicable, during construction of low carbon concrete with an embodied carbon equivalent to a 50% GGBS replacement;
Route Wide	Reduction in GHG emissions to achieve compliance with CAP23/24	The use in construction plant and equipment of sustainably sourced Hydrotreated Vegetable Oil (HVO) as a 100% replacement of fossil fuels;
Route Wide	Reduction in GHG emissions to achieve compliance with CAP23/24	Procurement only from suppliers that meet the industry reduction requirements within the CAP for 10% reduction in embodied carbon by 2025.
Route Wide	Climate Change Vulnerability Mitigation	Wind speeds are taken into account when setting the max distance between posts and foundations. In addition, the OHLE system are subject to regular maintenance and replacement cycles in accordance with European Design standards (Design Life for new civil engineering structures (IE Standard CCE-TMS-410 (2019)). Wind loads on bridge structures will be determined as defined in I.S. EN 1991: Eurocode 1, Action on structures, Part 1-4 General actions – Wind actions, and the associated Irish National Annex, or otherwise as detailed in the TII Standards. Buildings are designed to be robustly assembled, using building techniques designed to withstand wind loading, with reduced vulnerability to building elements becoming detached from facades in extreme wind events.
Route Wide	Climate Change Vulnerability Mitigation	Increased temperatures have the potential to cause the temperature of materials, such as tracks / OHLE / asphalt / bitumen, to increase resulting in thermal movements. The design of these elements includes an allowance for expansion/thermal movements. The inclusion of the thermal joints prevents track buckling during extreme heat events.

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Route Wide	Climate Change Vulnerability Mitigation	The overhead line equipment will be designed to take into account a range of minimum and maximum temperatures (-20oC to +40oC) and loads under current and future climate conditions. The contact and messenger overhead wires will be automatically tensioned which will adjust for additional loading from ice, snow or wind. Ice loading has been considered within the design and a 9.5 mm radial thickness of ice coating has been applied for protection. The mechanical tension in the contact and messenger wires will be maintained within the system design parameters.
Route Wide	Maintenance Phase Embodied Carbon Mitigation	The maintenance phase GHG emissions will primarily consist of replacement of bitumen, cables, fence posts and lighting columns containing material as these materials have a lifespan that is shorter than the 80-year lifespan assessed for the Operational Phase. In addition, there are other consumables that require replacement for the MetroLink rail stock parts such as steel tyres, windows, seats, bogie parts. These materials will be sourced based on the IEMA GHG Management Hierarchy principles (IEMA 2020b) and old parts will be reused or recycled, in as far as practicable reducing the amount of waste which will be disposed of to landfill.

10. Hydrogeology

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Drawdown Effects and ZOI	Additional monitoring wells will be installed around deep station sites. These will be installed up to 1 year ahead of station works commencement to facilitate local groundwater level monitoring pre, during and post construction.

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Route Wide	Water Quality Management	A Sediment Erosion and Pollution Control Plan will be implemented for all Construction Phase works. This includes measures to manage soil and silt-laden water on site, accidental leaks/spills to ground and water quality monitoring to ensure compliance with environmental quality standards specified in the relevant legislation cited under Section 20.2.1 of the EIAR with regard to groundwater and surface waters.
Route Wide	Mitigation of the Barrier Effect	Where a barrier effect has been identified, we will install drainage wells on each side of the cut section and station box locations with a by-pass system. For example, within AZ1 Northern Section, modelling of the potential interaction between natural groundwater flow patterns and the proposed piled-walls within the Seatown - Fosterstown area (i.e. between chainage: 2+800 and chainage: 4+800) indicates there is a possibility of the barrier effect occurring which will require mitigation with drainage wells spaced 100 m apart. The pipe will rest on the intermediate slab or be set into the bottom slab. Assuming the placement of a by-pass through a 200mm diameter pipe placed every 100m, then a pipe flow equal to 1.13 x 10-3 m3/s will be considered for the section calculation
Route Wide	Wells Intercepted by/ or in Vicinity of the Tunnel Excavation	All identified operational wells within 150m of the proposed Project boundary will be monitored for water level on a monthly basis for 12 months before construction, during construction and for a nominal period of 12 months after construction is completed. If the level of monitoring indicates that the proposed Project has impacted on a supply or geothermal well (refer Section 19.4.7) then appropriate mitigation will be applied which will entail a new water supply or replacement well installation or deepening of wells as appropriate.
Route wide	Wells Intercepted by/ or in Vicinity of the Tunnel Excavation	With regard to known groundwater well locations, where these are intercepted by the proposed Project they will be duly recorded by an experienced Hydrogeologist in advance of being decommissioned which will follow good practice IGI guidelines as mentioned. Where operational, yield testing will be undertaken and, a replacement supply well will be sited accordingly, designed, drilled, installed and tested prior to follow-on commissioning or the supply replaced by a connection to public supply.

11. Soils and Geology

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Soils and Superficial Geology – Construction Environmental Management Plan	Options for beneficial reuse of clean, suitable soil and stone material in accordance with Article 27 of the Waste Management Act will be sought. Alternatively compliant materials will be sent to Soil Recovery Facilities (SRF). This will prevent the need to classify all of the 2.9 million m3 of excess excavated material as a waste. Locations and projects which identify a deficit of soil and stone material will be identified. Where it is deemed that the clean excavated material from the proposed Project is suitable for use in another identified project (i.e. complies with the Article 27 criteria), agreements will be put in place for a defined amount of by-product material to be sent to that project and a notification will be made to the EPA. Material not included within the A27 application or suitable for SRF would be classified as waste and require disposal

12. Materials and Waste Management

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	By-Product Material/Soil Recovery Facility	It is proposed to use soil recovery facilities to manage surplus excavated material in the event Article 27 notification is not successful. It is predicted that 80% of the excavated material could be classified as suitable for SRF and the remaining 20% would be classified as waste (inert, non-hazardous or hazardous).
Route Wide	By-Product Material/Soil Recovery Facility	Options for beneficial reuse of the clean, suitable soil and stone material in accordance with Article 27 or suitable for SRF of the Waste Management Act is being progressed. This will prevent the need to classify all of the 2.9 million m3 of excavated material as a waste. It has been predicted that approximately 80%-90% of the excavated

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		material could be classified under Article 27 and the remaining 10%-20% would be classified as waste (inert, non-hazardous or hazardous).
Route Wide	Construction and Demolition Waste Management Plan	Waste arising from the demolition of buildings and structures will be a mixture of different materials. This material shall be sorted and segregated on site in so far as is practical. The majority of the demolition waste will be concrete and mixed C&D waste. It is anticipated that where possible a soft strip approach to demolition activities would be undertaken which means demolition waste such as concrete, steel and bricks would have a higher potential to be recycled and that any wood generated through demolition activities would be recoverable for reuse.

13. Architectural Heritage

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Santry Lodge	To minimise impacts on Santry Lodge	Enhanced planting between Santry Lodge and the alignment including both native tree species planting and some screening trees
Santry Lodge	To minimise impacts on Santry Lodge	Re-establishment of elements of the existing gates and supporting piers at the entrance to the property.
Santry Lodge	To minimise impacts on Santry Lodge	Establishment of a property wall design in agreement with FCC to include elements of the existing wall i.e capping
Santry Lodge	To minimise impacts on Santry Lodge	Use of black colour mesh fencing surrounding ponds.

14. Landscape & Visual

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Route Wide	Deterioration in landscape quality and views due to the construction works, demolition of built features and loss of existing planting.	Identification and retention of existing mature trees of good quality, through further minor adjustment of the proposed Project construction areas; Comprehensive proposals for hard and soft landscape works, including tree and hedgerow planting to offset the effects tree and vegetation loss due to the proposed Project;