

An Bord Pleanála Oral Hearing

Irish Water

Greater Dublin Drainage

Brief of Evidence

Material Assets

Damien Grehan

**GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence**

Qualifications and Role on the Proposed Project

- 1 My name is Damien Grehan. I am a Chartered Engineer and I hold an Honours Degree in Engineering (1992) and a Masters Degree in Engineering Science (1994) from University College Dublin. I joined TOBIN Consulting Engineers as an Environmental Engineer in January 1995. I have over 24 years' experience in the planning, detailed design and project management of large infrastructural and utilities projects primarily in the fields of waste management, energy, extractive industries and water services schemes. I have been an expert witness at a number of EPA and An Bord Pleanála Oral Hearings and also have led the multidisciplinary teams of experts at these hearings.
- 2 I am the TOBIN Consulting Engineers Project Director for the purpose of the preparation of the TOBIN elements of the Planning Application and Environmental Impact Assessment Report for the Greater Dublin Drainage Project. The purpose of this Brief of Evidence is to address the matter of material assets impacted by the Proposed Project.

Summary of Likely Significant Impacts & Mitigation Measures

- 3 The potential environmental impacts on material assets from both the Construction and Operational Phases of the Proposed Project are described and discussed in Chapter 21 in Volume 3 Part A of the Environmental Impact Assessment Report (EIAR). The Construction Phase of the Proposed Project will last approximately 3 years.
- 4 During the pipeline routing process, major utilities and natural features were considered as major constraints and were avoided to the greatest extent possible. Nonetheless, material assets that will be crossed by the proposed orbital sewer route and/or the proposed outfall pipeline route (land based and marine based sections) include gas pipelines, high power transmission lines, rail infrastructure, motorways and roads, water and wastewater infrastructure, communications infrastructure, Connolly Hospital and natural features. The numbers of crossings of each of these material assets is given below:
 - Gas pipelines 3 crossings
 - High voltage power transmission lines 23 crossings
 - Railway (existing Dublin – Belfast line) 1 crossing
 - Railway (proposed Metro Link) 3 crossings
 - M1 Motorway 1 crossing
 - N2 National Road 1 crossing
 - Other Roads 14 crossings
 - Water Supply trunk mains 9 crossings
 - Wastewater collection – large diameter 3 crossings
 - Communications (fibre optic cable) 1 crossing
 - Connolly Hospital 1 crossing
 - Natural features (rivers and streams) 6 crossings
 - Baldoyle Bay and Portmarnock Beach 1 crossing
- 5 The main types of raw materials that will be required during the Construction Phase of the Proposed Project include:
 - Aggregates for pipe bedding and surround;
 - Various pressure and gravity pipes for the proposed orbital sewer route and the proposed outfall pipeline route (land based section and marine section);

GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence

- Materials for chamber and manhole construction;
- Concrete: precast elements, concrete blocks and ready-mix concrete;
- Structural steel;
- Insulation materials;
- Glass, roof slates and other building materials; and
- Mechanical and electrical equipment.

6 Materials required during the Construction Phase of the Proposed Project will be sourced from local suppliers, where possible. This will include the use of bedding material from local quarries and general construction materials.

Predicted Potential Impacts

7 The predicted potential impacts in relation to major utilities and natural features usage have been outlined in Section 21.2.5 of the EIAR. As set out in the Engineering Design Report which was submitted with the planning application, trenchless methods, such as pipe jacking and microtunnelling, will be used at crossings of physical, natural and manmade obstructions, such as significant watercourses, significant topographical features, major roads, railways and major infrastructure. The resulting predicted impact of the Proposed Project on major utilities and natural features will be moderate, negative and short-term. The use of trenchless construction methods will undoubtedly result in a lower order of magnitude of potential impacts than would have been caused by the use of non-trenchless construction methods.

8 The predicted potential impacts in relation to raw material usage have been outlined in Section 21.3.4 of the EIAR. Approximately 84,200m³ of material will be sourced from quarries in the region to be used for pipe bedding and surround as well as to construct temporary access roads, temporary working areas and compounds. The sourcing of materials during the construction of the Proposed Project on raw materials will have an imperceptible impact on the existing natural resources and other resources available. The quantities of raw material required will be reduced where possible through the reuse of suitable materials generated during the Construction Phase. The resulting predicted impact of the use of raw materials in the Proposed Project will be imperceptible, negative and permanent.

9 The predicted potential impacts have been provided for the 'Do Nothing' Scenario, the 'Do Something' Scenario and the Worst Case Scenario.

Mitigation Measures

10 The mitigation measures in relation to major utilities and natural features have been outlined in Section 21.2.6 of the EIAR. Some of the main mitigation measures outlined therein include the following:

- Initial routing sought where possible to avoid major utilities;
- Discussions have taken place with asset owners and operators to agree mitigation measures;
- The design of the proposed pipeline routes takes account of the requirement to cross these assets without interfering with them during the Construction Phase or the Operational Phase;
- The proposed pipeline routes are designed to agreed vertical separation distances from the crown of the proposed pipeline route to the underside of the specific utility at the crossing locations;
- Crossings will be carried out by means of trenchless techniques to minimise disruption to the services;
- The construction corridor has been narrowed at some locations;

**GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence**

- Affected land drains will be redirected in a manner that maintains existing land drainage, and these drains shall be reinstated appropriately; and,
- Trenchless construction techniques will be utilised at crossings of watercourses.

11 A significant body of work has been put into the consideration of the crossings of major utilities and natural features as detailed in the Engineering Specialists Report for Crossings included in AppendixA4.2 of the EIAR and as further elaborated on in the Outline CEMP. Drawing Nos. 32102902 - 2100 to 32102902 - 2113 indicate locations where trenchless construction of the orbital sewer and outfall pipeline will be necessary. The following figures taken from the Outline CEMP illustrate the tunnel jacking method proposed for the crossings. For ease of reference the figure numbers used in the Outline CEMP are retained herein.



Figure 16: Tunnel Jacking Launch Shaft

(North Leixlip Sewerage Scheme – 1500mm diameter crossing of Dublin Sligo rail-line and Royal Canal)

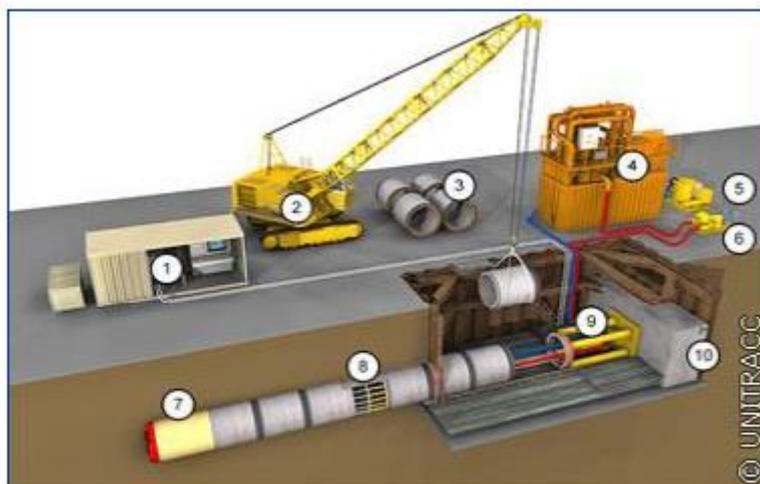


Figure 17: Schematic presentation of micro tunnelling/pipe jacking [Image: S&P GmbH]

GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence

- 12 The mitigation measures in relation to raw material usage have been outlined in Section 21.3.5 of the EIAR. Some of the main mitigation measures outlined therein are as follows:
- Materials arising from the excavation of the open cut and trenchless methods will be reused where possible;
 - The sustainable sourcing of all materials;
 - Bentonite used for the tunnelling process will be recycled within a closed system during tunnelling, thereby minimising the quantity required;
 - Design is optimised to minimise the requirements for raw materials;
 - Materials will be reused where possible (such as excavated rock);
 - Raw materials will be sourced locally where possible; and
 - Raw materials will be managed in accordance with the Outline CEMP for construction.

Response to Issues Raised in Submissions/Observations

- 13 Three submissions have been received by An Bord Pleanála in relation to material assets.

Response to Specific Issues Raised by Prescribed Bodies

Transport Infrastructure Ireland

- 14 In its submission, Transport Infrastructure Ireland [TII] raised the issue of pipeline crossings of motorways (M1) and national roads (N2) and the requirements of section 53 of the Roads Act 1993. This issue is specifically addressed in Section 21.2.6 of Chapter 21 in Volume 3 Part A of the EIAR. Meetings have been held between the Project team and Transport Infrastructure Ireland to discuss the issues around these road crossings and formal applications under section 53 of the Roads Act 1993 have been made. In the event that consent is granted, the individual design proposals for the crossings, as indicated in the longitudinal sections of the pipelines contained in the planning drawings, will be finalised to detail design level and sent to Transport Infrastructure Ireland for consideration. The detailed design of each crossing will follow the indicative design principles set out in the documentation submitted to the Board in respect of the application for permission.

Fingal County Council

- 15 Fingal County Council submitted that no details were provided for the crossing of the Dublin to Southport Fibre Optic Cable by the proposed outfall pipeline route (marine section). Discussions have been held between the Project team and GTT Communications (formerly Hibernia Atlantic Ltd.) in relation to this material asset. A proposed methodology for crossing the Fibre Optic cable is detailed and illustrated in Section 8.5 of the Outline Construction Environmental Management Plan, which forms part of the planning application documentation submitted as part of the Proposed Project planning application.
- 16 As outlined in the Outline CEMP, a sub-sea fibre optic cable crosses the route of the outfall pipeline at approx. ch 4,500m. This cable has to be protected in-situ while the dredging and pipelaying operations progress. The cable will be protected using interlocking sheet piles and installing the outfall pipeline under it. Interlocking sheet piles will be installed either side of the fibre optic cable to support the sides of pipeline trench. This will enable the width of trench to be kept to a minimum and allow the cable to be supported during the installation of the outfall pipe. Once supported, the cable can be shielded with a suitable conduit to provide additional protection and to allow for the careful excavation below the supported cable. Following excavation of a suitable trench, an appropriate length of PE pipeline can be pulled in to the trench beneath the cable. This short length of PE pipeline is then connected to the overall outfall, by means of subsea

**GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence**

connections. The following figures taken from the Outline CEMP illustrate the proposed construction methodology. For ease of reference the figure numbers used in the Outline CEMP are retained herein.

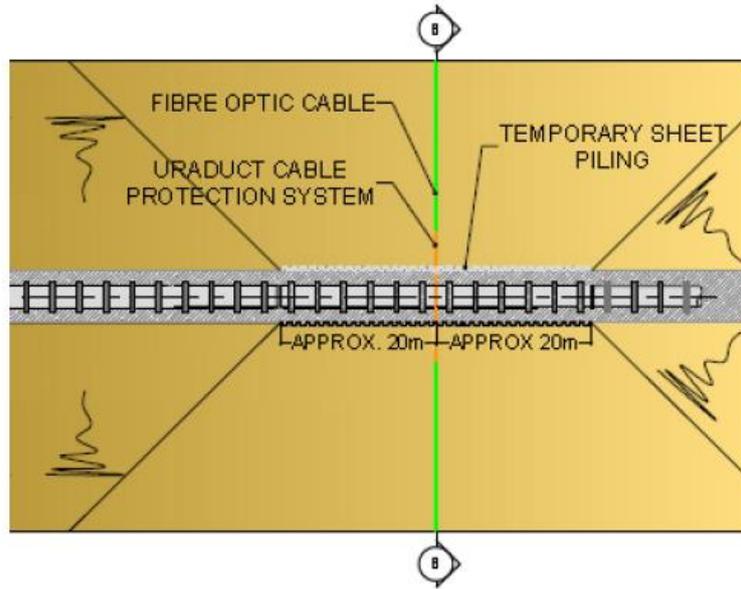


Figure 44: Fibre Optic Cable Crossing

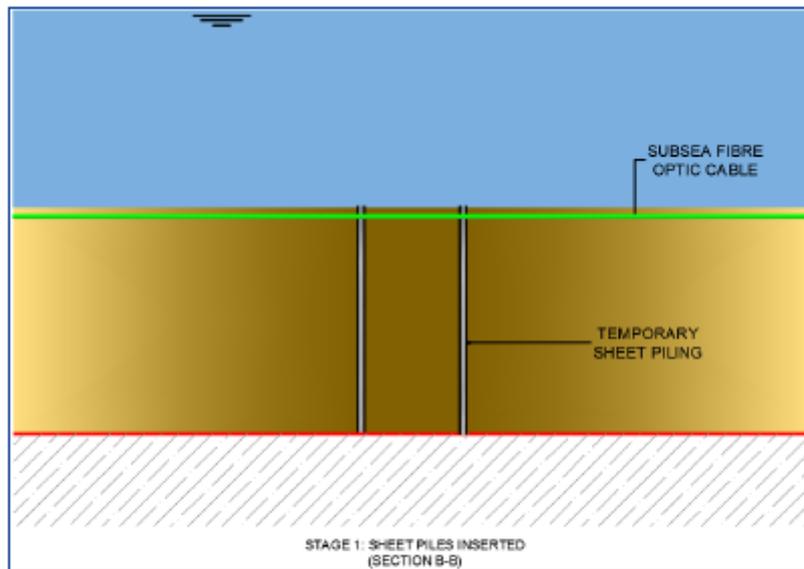


Figure 45: Fibre Optic Cable Crossing – Stage 1 – Install Sheet Piles

GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence

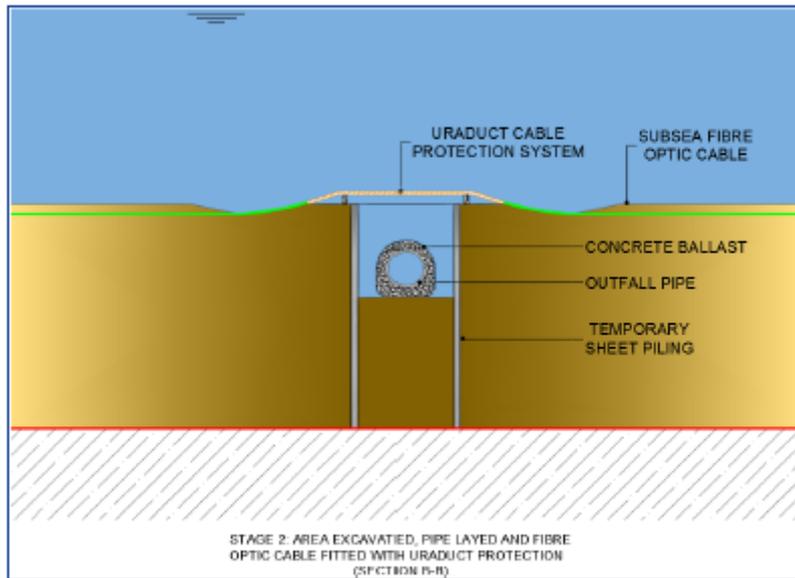


Figure 46: Fibre Optic Cable Crossing – Stage 2- Install Outfall Section

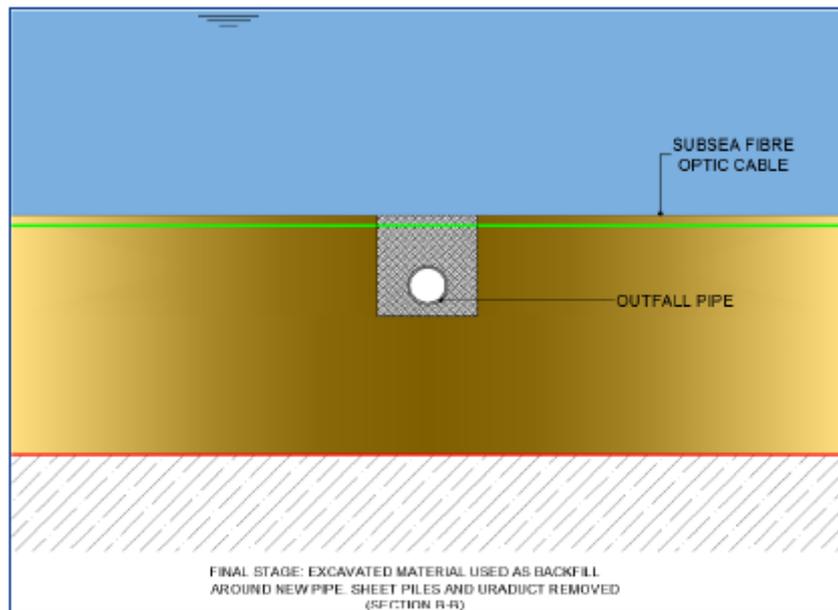


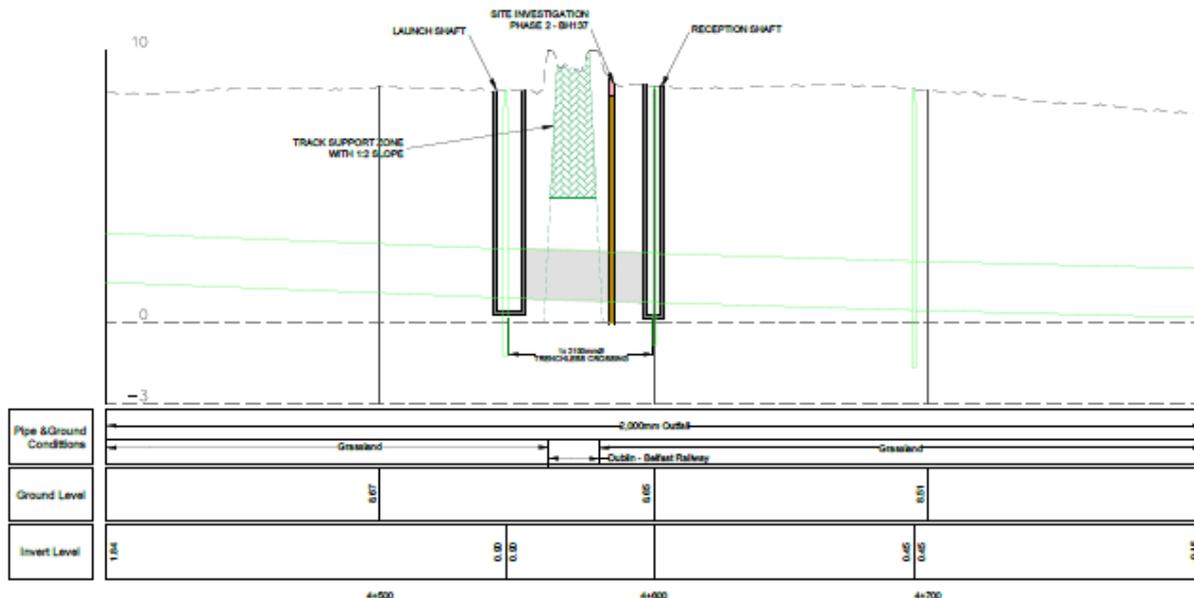
Figure 47: Fibre Optic Cable Crossing – Stage 3 – Backfill Trench

- 17 In the event that consent is granted, the design of the crossing will be finalised to detail design level and sent to the operator of the Fibre Optic Cable prior to the start of construction of the proposed outfall pipeline route (marine section).

**GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence**

Commission for Railway Regulation

- 18 The Commission for Railway Regulation, in its submission, suggested that Iarnród Éireann should be consulted to ensure risks associated with railway trespass are not increased in the vicinity of the railway line during the construction and operation of the Proposed Project. The submission also suggested that Iarnród Éireann should be consulted with, in accordance with RSC Guideline (RSC-G-010-A), Third Party Guidance on Railway Risk: Volume 1 Planning and Development, in relation to all works which can affect the safe operation of the railway, in particular where the proposed outfall pipeline route (land based section) will cross under the Dublin-Belfast line.
- 19 The Project team have consulted with Iarnród Éireann during the preliminary design stage and the preparation of the planning application. Iarnród Éireann have indicated that they have no objection in principle to the crossing at the location shown on Drawing No. 32102902-2112 submitted with the Planning Drawings, once the following requirements have been met:
- Crossings shall be a minimum of 4.7m from the crown of the pipe to track bed level;
 - Crossings shall be perpendicular where possible;
 - If two (or more) crossings are required, they shall be in a single conduit or there should be a separation between them (of the order of 5m);
 - Crossings shall not be at track joint positions;
 - Crossings shall take account of stanchion locations for Overhead Lines associated with DART trains running on this line; and
 - A survey of track position and level will be required.
- 20 The crossing, as presented in Drawing No. 32102902-2112 meets the requirements of Iarnród Éireann and incorporates a trenchless construction method with a minimum 4.7m cover from the crown of the pipe to the rail track level. Pursuant to best practice, during the detailed design phase of the Proposed Project, Iarnród Éireann will be consulted and any further requirements from Iarnród Éireann will be incorporated into the contract documents, which will fully comply with the details of the crossing as presented in Drawing No. 32102902-2112. A screenshot taken from Drawing No. 32102902-2112 showing the longitudinal section at the proposed trenchless crossing of the Dublin-Belfast railway is shown below.



GDD Oral Hearing
Material Assets – Damien Grehan Brief of Evidence

Conclusion

- 21 With regard to the three submissions made to An Bord Pleanála in relation to material assets, all three relate to the need for consultation on certain elements of the Proposed Project, between the Project team and Iarnród Éireann, Transport Infrastructure Ireland and Fingal County Council and GTT Communications (formerly Atlantic Hibernia Ltd.). Irish Water have indicated their willingness to have such further consultations. As such, the submissions do not raise any issues that would lead to a revision of the conclusions reached regarding impacts of the Proposed Project on Material Assets as outlined in Chapter 21 of the EIAR.
- 22 Material assets are resources that are valued and that are intrinsic to specific places. The material assets related to the Proposed Project can be split into two main sections:
- Major utilities and natural features; and
 - Raw materials.
- 23 The potential for the Proposed Project to impact natural and other resources has been assessed. Mitigation measures have been identified and will be adhered to. These measures include the use of surplus excavated material as landscaping material or sub-bases for the site roads and hardstanding or the crushing and screening of rock for use as aggregate. This approach will result in a significantly reduced requirement for the import of raw materials for the Construction Phase of the Proposed Project. No additional impacts are expected during the Operational Phase which have not already been considered as part of the Construction Phase. Whilst the resulting residual impact will be negative and permanent upon raw materials near the Proposed Project, it will however be imperceptible.
- 24 All utility services near the Proposed Project have been identified and include transport infrastructure and natural features. Locations where the proposed pipeline routes cross existing infrastructure have been identified. Discussions have been held with all asset owners and their requirements have been identified and incorporated into the design. While there is interaction between the Proposed Project and existing infrastructure, the locations of interaction have been identified and planned for, and therefore, the potential for interruption is limited. No additional impacts are expected during the Operational Phase which have not already been considered as part of the Construction Phase. As such, it is considered that the resulting predicted impacts to major utilities and natural features will be moderate, negative and short-term, as a result of the Proposed Project.