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1. Should any of the key project personnel details change before or during the project these changes shall be notified to and agreed in writing with the Road Authority.

2. Licence Applicant organisation details. The organisation with the relevant powers required to excavate a public road.

3. The Licence Applicant must complete the **Designer Declaration** showing previous experience of similar HDD projects under public roads with references.

4. The Licence Applicant must complete **Designer's Geotechnical Advisor Declaration** showing previous experience of similar HDD projects under public roads with references.
The **Designer's Geotechnical Advisor (DGA)** is: The individual employed by the Designer as Geotechnical Lead, to oversee and act as the focal point for the planning, procurement, interpretation, and implementation of the geotechnical aspects of a project.

5. The Licence Applicant must complete **Licence Applicant's Site Supervisor Declaration** showing previous experience of similar HDD projects under public roads with references.
The **Licence Applicant's Site Supervisor** shall be employed by the Licence Applicant to supervise the HDD works and shall be fully independent from the Contractor.

6. The Licence Applicant shall ensure that the works are always adequately supervised. The level of supervision provided shall be proportionate to the scale, complexity and risk profile of the works and shall be sufficient to ensure compliance with the approved design, licence conditions and any requirements of the Road Authority.

7. The Licence Applicant must complete the **Contractor Declaration** showing previous experience of similar HDD projects under public roads with references.

8. The Licence Applicant shall provide justification for selecting HDD in preference to open-cut trenching. This information supports engagement with stakeholders, residents, and public representatives by clearly explaining the reasons for the chosen construction methodology. It also assists the Road Authority in communicating and justifying the proposed works locally by demonstrating the technical, environmental, safety, traffic management, asset protection, and other engineering considerations that support the selection of HDD over open-cut trenching.

9. Minimum depth of cover is a critical parameter in HDD design to ensure structural integrity, avoid surface settlement, and prevent inadvertent returns (mud breakouts).
Minimum depth of cover shall be:

- Subject to design and assessed critically on a case-by-case basis.
- Established based on assessment of the predicted settlement and the heave and frac out risk.
- In compliance with the specific utility organisations minimum depth requirements.
- Agreed with the Road Authority.
- Conform with the vertical/horizontal clearances required from existing services/assets outlined in Note 10 below.

Where there is demonstrable uncertainty, elevated risk, or insufficient verification data regarding the location and depth of the installed pipeline, the Road Authority may require the Applicant to undertake trial hole excavations to expose the pipeline and confirm its position and depth. Such works shall be carried out at the Applicant's expense and in accordance with all applicable health and safety, road opening, and traffic management requirements.

10. Minimum vertical/horizontal clearance of bore from any existing services/assets
Existing services along the path of the HDD shall be accurately located during site investigation. All asset owners whose services are within 3 times the outside bore diameter from the outside diameter of the proposed HDD shall be consulted and minimum clearance distances agreed.
- Notwithstanding the above the absolute minimum clearance distances shall be as ***Table 1*** below:

Minimum Horizontal Clearance (mm)	**Minimum Vertical Clearance**

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	(mm)
≥ 300	≥ 500

Table 1: Minimum Allowable Clearance Distance from any existing services/assets

- The clearances above are **minimum**, and all clearances should be assessed critically on a case-by-case basis and with the agreement of the asset owners.
- In exceptional, site-specific circumstances where the Applicant proposes an HDD alignment that does not achieve the minimum clearance distances specified in this section, the Applicant shall obtain the prior written agreement of the relevant asset owner. Evidence of that agreement, together with the proposed risk assessment and mitigation measures, shall be submitted to the Road Authority for consideration and agreement before the works commence.
- The clearances outlined in ***Table 1*** are minimum requirements and shall be assessed on a project-specific basis in consultation with the relevant asset owners. Additional clearance distances may be required where HDD works are proposed in proximity to critical infrastructure, including, but not limited to, strategic gas distribution pipelines, all gas transmission pipelines, water trunk mains strategic water mains, strategic sewers, high-voltage electrical cables and other major utility assets. Any additional clearance requirements specified by the asset owner shall be incorporated into the HDD design.

11. A Road Authority may designate an individual structure or discrete area as a **Special Engineering Difficulty (SED).**
It is important to note that if damage occurs near or to an SED there are potentially very serious implications. E.g. collapse of a structure or major loss of a utility service supply.
SEDs are described in more detail in *Section 4.4.3 of the Guidelines for Managing Openings in Public Roads (The Purple Book)*.
SEDs may include:

- Structures such as retaining walls, quay walls, piers or isolated structures including HT electricity pylons.
- Embankments or cuttings where risk of collapse is significant.
- Known areas of cellars.
- Railway crossings and excavations adjacent to light railways.

12. Bridges and Culverts – requirements are described in more detail in *Section 4.4.4 of the Guidelines for Managing Openings in Public Roads (The Purple Book).*

13. Where the proposed HDD installation is unsuccessful, the Licence Applicant will consider an alternative installation methodology to be adopted and will be required to provide details of any potential impacts on the road pavement, traffic management arrangements, existing utilities, structures, and other road assets.
The applicant shall discuss and agree the proposed alternative installation methodology with the relevant Road Authority in advance of a new road opening licence being submitted for revised change in scope of the works.

14. Drawings shall be to an appropriate standard engineering scale and shall be clear and legible.

15. Project-specific ground risks have been incorporated into the Project Risk Register and will be developed by the Licence Applicant as a tool for documenting ground risks and actions to mitigate such risks.

16. Settlement prediction shall use established methods for calculation, for example O'Reilly and New 1982 (Settlement above tunnels in the United Kingdom – their magnitude and prediction).

17. The Licence Applicant shall undertake sufficient calculations to demonstrate that heave and the risk of frac-out are acceptably low. Established methods for these calculations such as those presented in NEN 3650-1: 2020 - Requirements for pipeline systems – Part1: General requirements (as referenced in I.S. EN 1295-1:2019 - Structural design of buried pipelines under various conditions of loading – Part 1:

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General requirements) shall be used, calculating a minimum and maximum pressure with the application of suitable safety factors.

18. Trigger Events and Trigger Values

- During construction, the monitoring of key parameters is critical to assessing HDD performance and identifying any potential defects, adverse trends, or exceedances before damage occurs.
- To facilitate effective monitoring, baseline or design values shall be established in advance of the works. Trigger events and trigger values shall also be defined and made available to the construction team to enable comparison against live monitoring data.
- Trigger events and trigger values shall be monitored by the Contractor. The trigger events and trigger values requiring notification to the Road Authority shall be agreed on a project-by-project basis prior to the commencement of the works.
- If these agreed trigger levels are reached, or an agreed trigger event occurs, the Road Authority shall be notified immediately. The HDD contractor will assess the situation and propose mitigation measures in line with the project Contingency Plan and works shall continue only after consultation with, and agreement from, with the Licence Applicant Site Supervisor and the Road Authority.
- Appropriate additional monitoring (e.g., electronic distance measurement (EDM) and visual settlement checks) shall remain in place until the installation phase has been completed.
- Typical **Trigger events** notifiable to the Road Authority are as follows:
    - Surface settlement – Visual or where measured settlement reaches predicted settlement or 5mm (whichever is less).
    - Surface heave/frac-out.
    - Unexplained loss of drilling fluid.
    - Utility strike.
    - Abandoning a bore.
    - Environmental incident.
- Typical **Trigger values** notifiable to the Road Authority are set out ***Table 2*** below:

Parameter	Notifiable Trigger Value	Stop Value
Deviation from the planned drilling profile in any direction relative to the maximum lateral position and depth (%) [Excluding entry & exit point]	5	10
Deviation of the actual bore hole radius from the intended design radius.	5	10
Deviations at the entry point.	May equal the pipe's diameter multiplied by a factor of 0.5 but must not be greater than 0.15m.	May equal the pipe's diameter multiplied by a factor of one but must not be greater than 0.3m.
Deviations at the exit point.	May equal 1% of the drilling length but must not be greater than 2.5m.	May equal 2% of the drilling length but must not be greater than 5m.

Table 2: - Trigger values notifiable to the Road Authority

19. Minimum requirements of the project-specific **Drilling Fluid Management Plan:**

- Project Overview.
- Drilling Fluid Composition.
- Fluid Circulation Plan.
- Volume Estimation.
- Spill Prevention and Response.

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- Environmental Protection.
- Equipment and Monitoring.
- Reporting and Documentation.

20. Drilling fluid disposal shall be catered for in the project specific **Waste/Spoil Disposal Plan**.
Minimum requirements are as follows**:**

- Project Overview.
- Waste identification.
- Waste Characterisation.
- Collection and Containment.
- Transport and Disposal.
- Reuse and Recycling.
- Environmental Protection.
- Monitoring and Reporting.
- Regulatory Compliance.

21. The occurrence of an **unused or abandoned bore** must be notified to the Road Authority immediately. They must be satisfactorily filled to avoid the risk of structural, settlement, or environmental issues arising.
The Licence Applicant shall submit a detailed plan specifying the materials and methods proposed for the grouting of unused or abandoned bores. If it is determined that grouting of the annular space between pipe and bore is required, this should also be detailed in the plan.

22. Locating/Tracking the accuracy of an HDD installation is crucial to ensure the bore path follows the designed alignment and avoids underground utilities or sensitive zones.
Types of equipment used for **locating/tracking** and guidance include:

- Walkover Locating Systems.
- Gyroscopic Guidance Systems.
- Wireline Magnetic Guidance Systems.
- Surface Tracking Systems.
- Data Logging and Visualization Software.

Regardless of the type of locating/tracking equipment used it should be calibrated and during operation sufficient care needs to be taken to ensure that there is no interference from adjacent site characteristics or obstructions.

23. Surveying and Monitoring:
The following surveying/monitoring is required:

1. An accurate pre-works level survey shall be completed and submitted to the Road Authority in advance of the works.
    - For longitudinal alignments, defined survey points shall be taken at 10m intervals along the centreline of the proposed HDD to achieve necessary control and verification.
    - For transverse crossings, the following locations shall, at a minimum, be surveyed along the centre line of the proposed crossing and at all the required offsets:
        - edge of carriageway, edge of hard-shoulder, lane lines, median line, edges of footpaths, footways, cycle paths (where applicable for each specific location);
2. Monitoring as described in **Section 18 - Trigger Events/Values** shall be carried out during the works to ensure there is no excessive movement caused by the trenchless construction technique. The Licence Holder shall ensure that appropriate monitoring is undertaken throughout the drilling works to verify compliance with the trigger events and trigger values agreed with the Road Authority. The type, extent and frequency of monitoring shall be proportionate to the nature, scale and risks associated with the works. Any exceedance of an

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agreed trigger value shall be notified to the Road Authority and managed in accordance with the agreed monitoring and mitigation measures.

3. Two further surveys at the same locations as for the pre-works survey shall be completed and submitted to the authority:
    - immediately post works and
    - approximately 3 weeks post works.
4. Where deflection of the surface **(≥5mm)** is observed the authority shall be notified immediately, and the required remediation shall be carried out by the Licence Holder as soon as practically possible.

24. The Licence Applicant shall set out the designed deviation vertical/horizontal tolerances. If there is a requirement to deviate from this bore path, they must get the prior approval of the Road Authority. The designed minimum clearance distances and bore depth must always be achieved.
In general, the following tolerances apply for pilot drilling:

- Except for the entry and exit point, deviations from the planned drilling profile in every direction must not exceed 10% of the maximum lateral position and depth.
- Deviation of the actual bore hole radius from the intended design radius must not exceed 10%.
- Deviations at the entry point may equal the pipe's diameter multiplied by a factor of one but must not be greater than 0.3m.
- Deviations at the exit point may equal 2% of the drilling length but must not be greater than 5m.
- Assessing the tolerances should consider the measurement and calculation accuracy of the applied navigation and calculation method.

25. The Licence Applicant shall set out their procedure for ensuring that **site records** are taken and maintained including the key parameters of:

- Dates and times of commencement/completion of each drilling/reaming/pulling.
- Thrust and pull forces.
- Drilling/reaming/pulling rate of progress.
- Obstructions and issues.
- Design depth vs actual depth.
- Pitch.

26. Photographs shall be in digital format and geo-referenced.
As per Section 6.3 of the Guidelines for Managing Openings in Public Roads - At its discretion, the Road Authority prior to construction, may request a set of high-definition digital photographs/video be provided, and geo referenced every 20m along the roadway.

27. An HDD-specific **Communication Plan** shall be prepared by the Licence Applicant for the project to inform all stakeholders of HDD works in accordance with the installing organisations and project requirements.
Minimum requirements are as follows:

- Stakeholder Identification and Engagement
- Pre-Construction Communication
- Emergency and Incident Communication
- Daily and Weekly Updates
- Environmental and Regulatory Compliance
- Documentation and Record-Keeping
- Post-Construction Communication

28. A project specific **Contingency Plan** shall be prepared by the Licence Applicant setting out their actions and response including but not limited to the following scenarios:

- Loss of drilling fluid or loss of circulation (flow).

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• HDD meets an obstruction (rock, cobbles, debris, foundations, etc...) and is unable to progress. • Hydro-lock. • Line and grade problems. • Bore hole collapse. • Failure of drill rods or downhole tooling. • Surface collapse or heaving. • Inadvertent drilling fluid returns (surface, waterways, ...). • Striking or damaging existing underground service/asset. • Product pipe failure or damage. • Product pipe stuck in bore hole.
29. A **Temporary Traffic Management Plan** shall be prepared by the Licence Applicant setting out how they intend to satisfy the following: • Road Authority requirements in relation to the control of traffic in the vicinity of the works. • Meet the standards set out in Chapter 8 of the Traffic Signs Manual.
30. **As-Constructed Drawings** shall be provided to the Road Authority in PDF and CAD format. The PDF version shall be uploaded by the licence holder through the MRL system at T5 stage with a drawing schedule. As-constructed drawings shall show the location and depth of all product pipes installed and be in accordance with the utility owners' requirements.
31. **Tracer wire** may be installed with the product pipe. Where a tracer wire is not installed, **marker posts** and/or **kerb plates** must be installed to clearly mark the utility description, offset and depth of the installed asset, unless otherwise agreed by the Road Authority. The marker type and location must be agreed with the Road Authority to ensure adequate marking. Particularly in urban areas, markers may be required at closer spacings. Marker spacing should generally not exceed 50 metres.
32. **Post-works photographs** shall be in digital format and geo-referenced. Photographs of all reinstatements and defect repairs shall be uploaded to MRL at T5 stage.
33. **Designer - Engineering Qualification(s):** CEng (Engineers Ireland), CEng (Institution of Civil Engineers), MIStructE or equivalent.
34. The Designer must have a minimum of 5 years' experience in design of HDD works and have designed several successful HDD projects under public roads of comparable scale and complexity.
35. **Designer's Geotechnical Advisor – Engineering, Geotechnical or Geological Qualification(s):** CEng (Engineers Ireland), CEng (Institution of Civil Engineers), MIStructE, CGeol (Geological Society of London), Chartered member of Institute of Materials, Minerals & Mining (IOM3) or equivalent.
36. The Designer's Geotechnical Advisor must be a Chartered Engineer/Professional Geologist with geotechnical expertise and experience appropriate to the project being undertaken, including a minimum of 5 years' experience.
37. The Licence Applicant shall ensure that the **Site Supervisor** is competent to undertake the role and has appropriate training, knowledge and demonstrable experience of supervising HDD works of a comparable nature, scale and complexity.
38. The Licence Applicant's named **Site Supervisor** must have previous experience of supervising successful HDD projects under public roads of comparable scale and complexity.
39. The **HDD Contractor's Agent** declares they are a suitably authorised and competent representative of the Contractor who possesses a relevant third-level qualification or an equivalent combination of appropriate training and demonstrable experience in HDD works.
40. The **HDD Contractor** must have a minimum of 5 years' experience in the installation of HDD works and have completed several successful HDD projects under public roads of comparable scale and complexity.

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41. All **HDD site personnel** shall be competent, appropriately trained, and possess a minimum of three (3) years' experience operating HDD rigs on projects of comparable size and scope. The Contractor shall provide detailed information for each key drilling personnel, including but not limited to: ▪ Training: Specify whether training was conducted in-house or by an external provider. ▪ Experience: List relevant projects completed, highlighting scope and role. ▪ Qualifications: Include formal relevant certifications (e.g. City & Guilds Level 2 NVQ Diploma in Directional Drilling Operations (Construction)) where held, as supporting evidence of competence. **Key personnel** to be detailed include (but not limited to): ▪ HDD Driller (Drill Rig Operator). ▪ HDD Locator (Tracker). ▪ Mud Engineer (Drilling Fluids Specialist).