

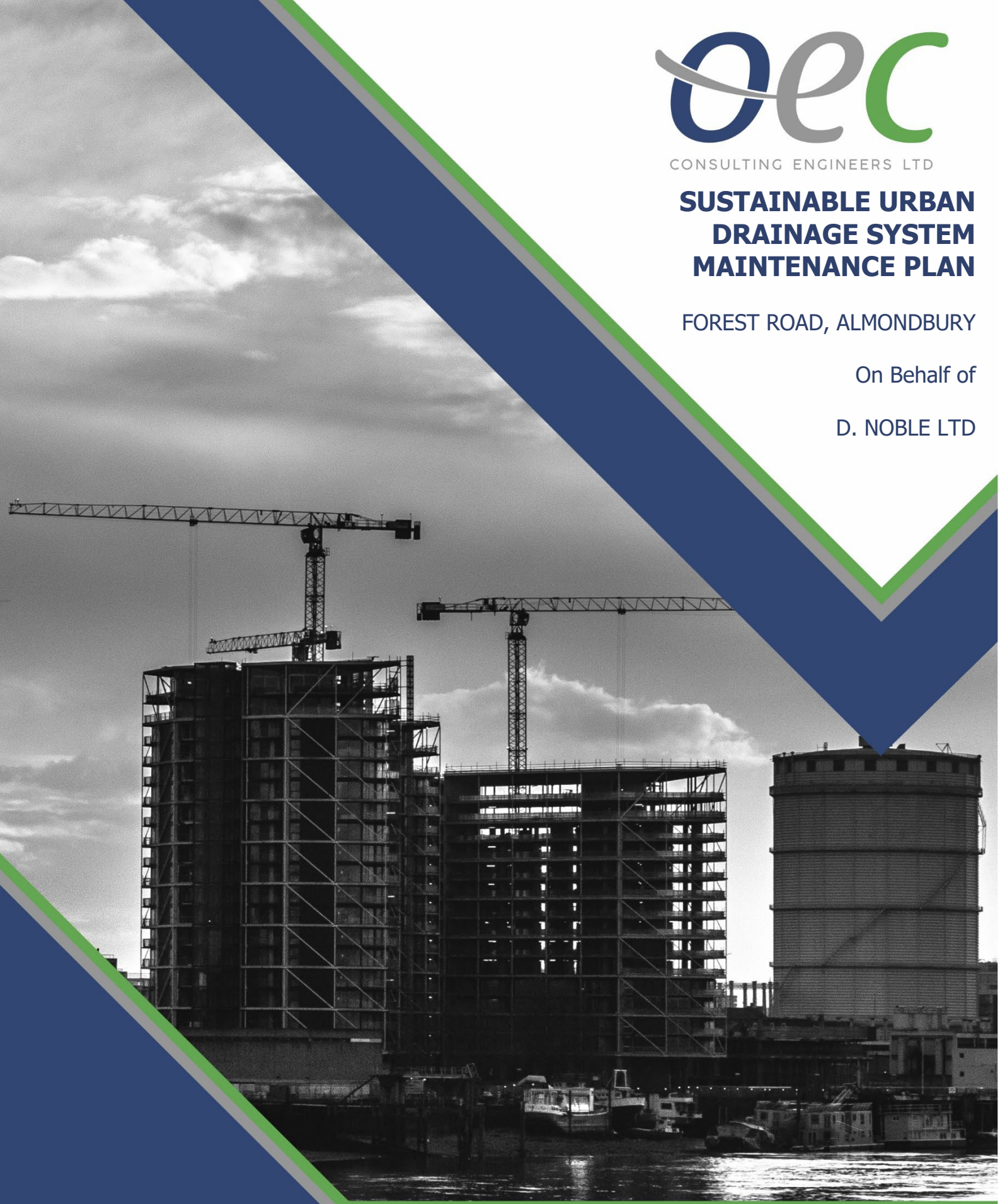


CONSULTING ENGINEERS LTD

SUSTAINABLE URBAN DRAINAGE SYSTEM MAINTENANCE PLAN

FOREST ROAD, ALMONDBURY

On Behalf of
D. NOBLE LTD



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QUALITY MANAGEMENT

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Date	31 July 2023			
Reviewed By	W Walker			
Date	31 July 2023			

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APPENDICES

APPENDIX A PRIVATE DRAINAGE LAYOUT

1.0 INTRODUCTION & OVERVIEW

- 1.1. This document details the inspection and maintenance specification for sustainable urban drainage systems (SUDS) maintained by a private management company.
- 1.2. The document is laid out detailing:
 - A description of the SUDS components and its uses
 - Operation and maintenance requirements and frequencies
- 1.3. The activities listed are specific to the SUDS on the Forest Road, Almondbury development and represent the minimum maintenance and inspection requirements; however, additional tasks, or varied maintenance frequency may be instructed as required. This may include:
 - Measurement and recording of sediment levels.
 - Photographic recording of problem areas.
 - Increased frequency of litter removal in areas identified as litter hotspots.
- 1.4. This specification has been based upon latest technical information from the CIRIA SUDS Manual and OEC's knowledge of landscape management.
- 1.5. The cost of the maintenance and management activities of the SUDS features to be carried out are to be covered by the residents.
- 1.6. The sustainable drainage system locations for the site are shown in Appendix A and comprise of surface water sewers located beneath the access road, attenuation tank and flow control manhole.
- 1.7. The SUDS features are located in shared areas, with the primary role of providing surface water conveyance, attenuation and flow control restriction for all storm events up to and including the 1 in 100 year plus 30% climate change event. The SUDS receive surface water runoff from the roofs, roads and hardstanding areas of the development, with runoff being conveyed to the attenuation tank via a private drainage network.

- 1.8. A private management company will be responsible for the maintenance of the SUDS features.

2.0 SURFACE WATER SEWERS & FLOW CONTROL

Description

- 2.1 Surface Water sewers are designed to convey runoff from impermeable surfaces to the ultimate outfall from the site. Due to current guidelines and regulations and to improve flood risk to downstream catchments, flow rates from sites are restricted to a nominal rate using a flow control device.

Maintenance Activities & Frequency

- 2.2 Please note, the private management company will only monitor, manage and maintain the surface water sewers located in shared areas.

Maintenance Category	Maintenance Activity	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Jet all drain runs and remove any sediment from the system that may have built up.	Monthly for 3 months, then every 5 years
Occasional Maintenance	Remove sediment from flow control sump	Annually
	Check flow control device for erosion and blockages. Inspect fixing bolts and add grease to by-pass door to prevent seizing	Annually
	Inspect all manholes to ensure the system is working effectively	Annually
Remedial Actions	Repair any defects identified.	As required

3.0 ATTENUATION TANK

Description

- 3.1 Attenuation tanks are predominantly concrete units with a high porosity (generally around 97%), that can be used to efficiently create a below-ground structure for the temporary storage of surface water before controlled release.

Maintenance Activities & Frequency

- 3.2 Please note, the private management company will monitor, manage and maintain all associated infrastructure including shuttle pipe work.

Maintenance Category	Maintenance Activity	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Jet tank and remove any sediment from the system that may have built up.	Monthly for 3 months, then every 5 years
Occasional Maintenance	Inspect/check all inlets to ensure that they are in good condition and operating as designed.	Annually
	CCTV survey the tank for sediment build-up	Every 5 years or as required
Remedial Actions	Repair any defects identified.	As required

A P P E N D I X A: PRIVATE DRAINAGE LAYOUT

1. This drawing is to be read in conjunction with all relevant OEC and Architects drawings and project specifications.

2. All drainage works shall be carried out in accordance with the relevant parts of BSEN 752 Drains and Sewer Systems Outside Buildings', the current Building Regulations and the Local Authority Building Control specifications and requirements.
3. The location, size and depth of all existing drains/sewers and services shall be established by the contractor prior to commencement of works on site. Any discrepancies from the information indicated on these drawings shall immediately be brought to the attention of the engineers.

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| 4. All levels and dimensions shall be verified on site prior to commencement of any works. Any discrepancies shall immediately be brought to the attention of the engineers. | 21. All works within the public highway to be reinstated to the highway authority requirements. All drainage connections onto adoptable drainage systems shall be carried out to the water authority's approval. |
| 5. All pipes shall be laid with soffits level. All manhole/inspection chamber invert levels shown are for the outlet pipe (unless specified otherwise). All pipe runs shall be laid to the levels indicated. | 22. The contractor must allow for any fee's required for road and sewer opening permits, sewer connections and make the appropriate applications. |
| 6. All private foul and surface water pipes to be 100mm Ø unless stated otherwise. | 23. All insitu and precast concrete products shall comply with class DSI requirements for sulphate exposure in accordance with the BRE Special Digest 1, Concrete in Aggressive Ground (2001) Part 1: Table. |
| 7. All connections to public sewers to be a minimum of 150mm Ø. | |

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| 7. All connections to public sewers to be a minimum of 150mm v. | 24. Manhole covers and frames shall comply with the relevant provisions of BSEN 1241, have 600x600mm clear openings and be of a non-racking design without cushion inserts and be kitemarked. Load class D400 in trafficked areas and load class B125 in footways, landscaped and pedestrian areas. Where required, covers shall be recessed to receive the Architects specified finish. |
| 8. All private manholes within drives to have B125 covers with concrete collar, all others to be A15. | 25. The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate the connections and bends. |
| 9. All private backdrop manholes to be 900mm ϕ PCC chambers unless stated otherwise. | 26. All u-PVC pipes and fittings shall comply with WS 4–35–01 and shall be kitemarked. |
| 10. 450mm ϕ chambers for depths greater than 1.2m, restricted access opening to 150mm is required for safety reasons. | |
| 11. All RWP's & SVP's connections to be 100mm dia (unless specified otherwise by | |

12. All RWP's, SVP's and connections are shown indicatively or to the latest Architects drawings. Position of down pipes must be confirmed from Architects drawing before laying underground pipework.
13. All private drainage laid within 1m from tree canopies and hedges to have concrete bed and surround.
14. Filled ground or soft spots must be excavated, backfilled and consolidated before any drainage works are carried out.
27. Pipes to be laid in Class "S" bedding (150mm granular bed and surround). Where depth of cover to the pipe barrel is less than 1.2m under vehicular trafficked areas and 0.9m under footpaths/gardens then a concrete slab protection should be provided above the granular bed and surround.
28. Plastic channel sections in manholes are not acceptable and clayware is to be used. Plastic channels are difficult to set in concrete and a satisfactory finish cannot be obtained on the benching.
29. The strength of vitrified clay pipes (if used) to be 40kN/m for 1000, 40kN/m

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| <p>15. All excavations in areas of high water tables and granular materials with high sand/silt contents shall be wrapped with a suitable geotextile filter membrane to prevent migration of sands/silts. Full height clay stacks across trenches and/or at manhole locations at 25m intervals to restrict water movement along the excavation shall be provided.</p> | <p>for 1500, 45kN/m for 225^o and 72kN/m for 300^o. All concrete products to be Class 102.</p> |
| <p>16. No water should be allowed to discharge from any private drives onto the adoptable highways. All private gullies and channel drainage positions shown may vary to suit on site working conditions.</p> | <p>Yorkshire Water is not obliged to accept filter drain/land drainage runoff into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage runoff will therefore be required and liaison with the Land Drainage Authority with regard to the disposal of the filter drain/land drainage runoff is required.</p> |

17. Position, size, depth, capacity, condition & status of existing drainage systems are not known. The design of the foul and surface water drainage assumed that no pumping, storage, modification, diversion, abandoning or improvement works are required on the existing systems.
18. The design assumes a gravity connection for foul and surface water systems is possible. If the existing sewers are not deep enough then pump stations will be required.
19. Design assumes that all works are not to be adopted.

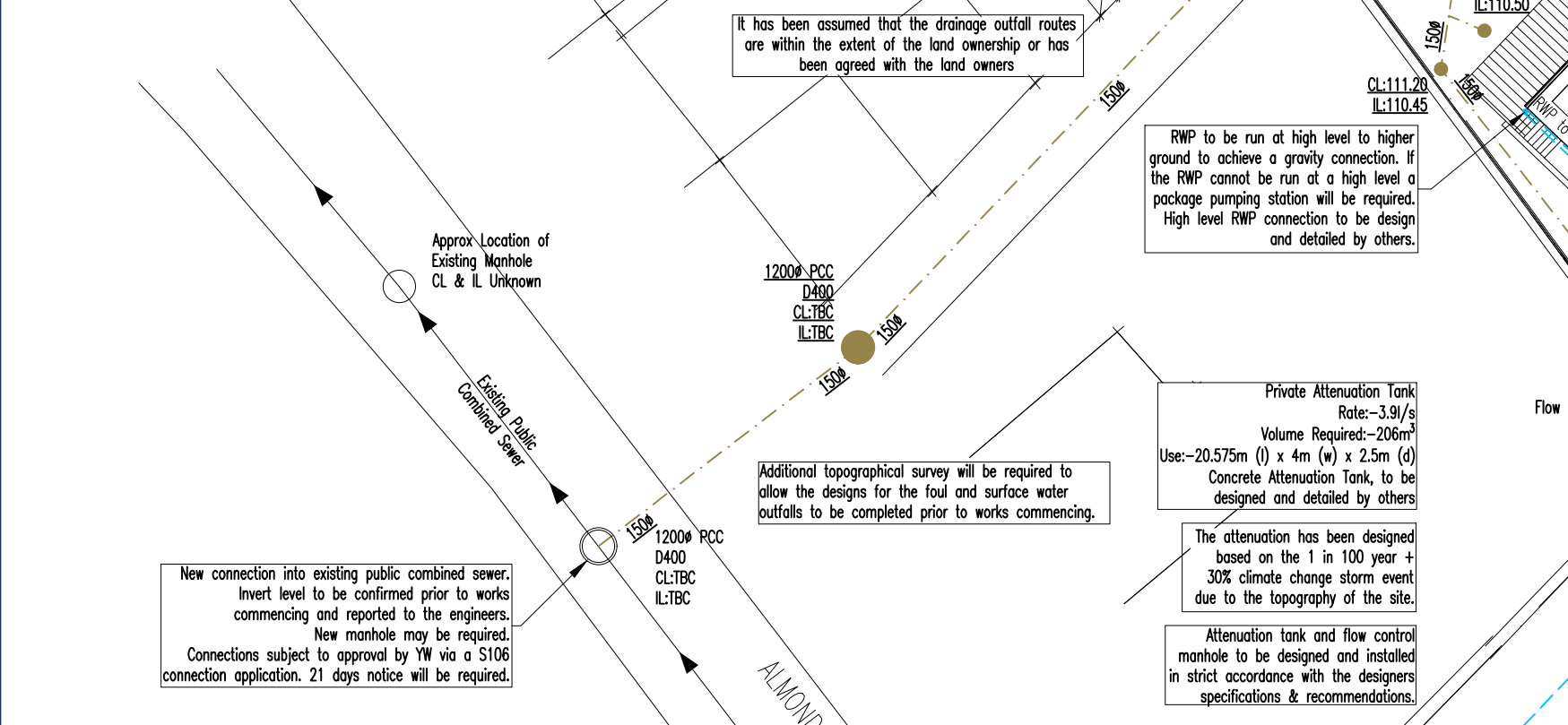
20. All works are assumed to be within public highway or within the land owners lands & no works are required on third party land owners property.
21. All works within the public highway to be reinstated to the highway authority requirements. All drainage connections onto adoptable drainage systems shall be carried out to the water authority's approval.
22. The contractor must allow for any fee's required for road and sewer opening permits, sewer connections and make the appropriate applications.

23. All insitu and precast concrete products shall comply with class DSI requirements for sulphate exposure in accordance with the BRE Special Digest 1, Concrete in Aggressive Ground (2001) Part 1: Table.
24. Manhole covers and frames shall comply with the relevant provisions of BS EN 124, have 600x600mm clear openings and be of a non-racking design without cushion insitu and be kitemarked. Load class D400 in trafficked areas and load class B125 in footways, landscaped and pedestrian areas. Where required, covers shall be recessed to receive the Architects specified finish.
25. The chamber size of manholes with more than one connection in them may need

26. All u-PVC pipes and fittings shall comply with MS 4-35-01 and shall be kitemarked.
27. Pipes to be laid in Class "S" bedding (150mm granular bed and surround). Where depth of cover to the pipe barrel is less than 1.2m under vehicular trafficked areas and 0.9m under footways/gardens then a concrete slab protection should be provided above the granular bed and surround.
28. Plastic channel sections in manholes are not acceptable and clayware is to be used. Plastic channels are difficult to set in concrete, and a satisfactory finish

29. The strength of vitrified clay pipes (if used) to be 40kN/m for 1000, 40kN/m for 1500, 45kN/m for 2250 and 72kN/m for 3000. All concrete products to be Class 120.
30. Yorkshire Water is not obliged to accept filter drain/land drainage runoff into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage runoff will therefore be required and liaison with the Land Drainage Authority with regard to the disposal

- of the inter-brain/brain drainage channel is required.



SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

DO NOT SCALE	ORIGINAL DRAWING SIZE A1
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??? ??? Finished Floor Level

-  Surface Water Manhole
 Foul Water Manhole
 Surface Water Inspection Chamber
 Foul Water Inspection Chamber
 Surface Water Sewer
 Foul Water Sewer
 Existing Public Combined Sewer
 Existing Public Surface Water Sewer
 Existing Public Foul Water Sewer
 Rainwater Pipe
 Soil Vent Pipe
 Rodding Eye
 Channel Drain
 Channel Drain (Min cover grade B125 unless noted otherwise)

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Project	FOREST ROAD, ALMONDBURY
Title	PRIVATE DRAINAGE LAYOUT
