Drainage Philosophy

21T2034 – Cleator Moor Innovation Quarter Phase 2
LUF – Unit 9 & 12

Report Reference: LUF-BGP-09-XX-T-C-0001

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Drainage Philosophy

Project: Cleator Moor Innovation Quarter Phase 2 LUF – Unit 9 & 12

Client: Cumberland Council

LLFA: Cumberland Council

BGP Job No: 21T2034

Document Checking:

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Checked By: J Conway – Director *BSc CEng MICE*

Issue	Date	Status	Checked for Issue
P01	22/09/2023	Planning	JC
P02	23/11/2023	Planning	JC
P03	09/01/2025	Planning	JC
P04	13/09/2025	Planning	JC
P05	01/10/2025	Planning	JC
P06	07/11/2025	Planning	JC
P07	28/11/2025	Planning	JC

This document has been prepared solely as a Drainage Strategy for Cumberland Council regarding the proposed scheme on land off Leconfield Street, Cleator Moor. Billinghurst George & Partners accepts no responsibility or liability for any use that is made of this document other than by the Client for which it was originally commissioned and prepared.

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1. Executive Summary / Project Background

1.1. This Drainage Philosophy has been prepared to supplement the Proposed Drainage Scheme for planning for the proposed development on land off Leconfield Street, Cleator Moor. See Appendix A for the site location plan.

1.2. The proposals are to construct two new industrial start up units for business accommodation on the brownfield site that previously comprised an industrial unit, this is now demolished with the existing floor slab remaining insitu. The adjacent parcel of greenfield land is located to the southeast of the existing slab.

1.3. The Flexible Start-Up units have been deliberately located to provide a close link with the new future Hub amenity building to be located directly to the west. Good access to the Hub will provide important shared social and administration facilities to support these small start-up businesses.

1.4. United Utilities (UU) records have been obtained and the Cumberland SuDS Design Guidance has been followed.

1.5. A hierarchy for the appropriate disposal of surface water is included within Building Regulations Part H3 which states the following:

> *"Rainwater from a system provided … shall discharge to one of the following, listed in order of priority:*
>
> *1) An adequate soakaway or some other adequate infiltration system; or, where this is not reasonably practicable,*
> *2) A watercourse; or, where that is not reasonably practicable,*
> *3) A surface water sewer.*
> *4) A combined sewer.*

1.6. The following Drainage Philosophy addresses each element of the above hierarchy and details how the surface water and foul water will be discharged from site.

1.7. BGP have prepared this report based on the current information available. This report is subject to change should new information be presented.

2. Existing Site & Drainage

2.1. Site Location

2.1.1 Site Name: Leconfield Industrial Estate

2.1.2 Site Address: Land off Leconfield Street, Cleator Moor

2.1.3 OS Grid Reference: E: 301649, N: 515500

2.1.4 National Grid Reference: NY016155

2.2. Site Description

2.2.1 Site Area: 3.17 Ha

2.2.2 Site Area to be developed: 1.487 Ha

2.2.3 Existing Land Use: Industrial Building (now demolished)

2.2.4 Proposed Land Use: Industrial Units/Yard and Car Parking

2.2.5 Local Planning Authority: Cumberland Council

2.2.6 Sewer Undertaker: United Utilities (UU)

2.2.7 At approximately 3.17 Ha in size the Brownfield site is located approximately 5.15km southeast of Whitehaven and approximately 18km southwest of Cockermouth. The site currently comprises existing service yards, old building footprints and part soft landscaping. The site is bound by woodland and grass to the northern, eastern and southern boundary, existing industrial buildings and demolished building footprints to the west. See Appendix C for topographic survey.

2.3. Site Levels

2.3.1 A topographical survey was carried out by White Young Green in November 2019. This can be viewed in Appendix C.

The existing site hardstanding area is relatively flat at an approximate level of between 83.1m and 82.9m AOD, falls existing within the existing access road to provide drainage falls to gullies. The existing greenfield area level varies between 83.1m AOD and 82.2m AOD.

2.4. Existing Watercourses

2.4.1 The nearest named watercourse is Nor Beck, which where open is located 100m north of the site. Through CCTV investigation it is evident that it is culverted at a point northeast of site and runs southeast into Leconfield Industrial Estate and through to Leconfield Street. Nor Beck culvert continues southeast through Norbeck Park and adjacent fields ultimately converging with the River Keekle.

2.4.2 There are no other named or unnamed watercourses within close proximity to site.

2.5. Existing Public and Private Drainage

2.5.1 See Appendix D for locations of existing United Utilities public drains.

2.5.2 There are several United Utilities combined drains and manholes located toward the primary access of Leconfield Industrial Estate. The 225-300mm diameter combined sewers drain from southeast to northwest along Leconfield Street in keeping with the topography of the highway.

2.5.3 A United Utilities 675mm diameter combined sewer is located just beyond the wider sites north western boundary, which drains southwest to the perimeter of the wider site.

2.5.4 The site is currently served by wastewater systems through an existing network of separate private sewers. The surface water run-off from the site currently discharges to the culverted Nor Beck watercourse as mentioned previously. The foul water flows from the site currently discharge to the existing 675mm diameter United Utilities sewer located to the northwest of site.

2.6. Existing Ground Conditions

2.6.1. A 'Phase 2 Site Investigation' have been carried out by Solmek dated March 2024. (Report No. S240720).

2.6.2. The Phase 2 Site Investigation reveals that ground conditions comprises:

- Made ground was generally encountered to depths of between 1.50mbgl and 9.00mbgl. In the northwest of the site, the made ground varied between just 0.32 and 0.54m.
- Firm to stiff (locally soft) sandy gravelly medium to high strength clay was encountered (1.90-6.30m thick)
- Locally, bands of dense to very dense granular material were encountered (0.30-5.60m thick).
- Rockhead between 6.80 & 12.30mbgl, generally comprising sandstones and mudstones.
- Groundwater was encountered locally, with shallow perched strikes within the made ground at 0.45-1.95mbgl, localised strikes within the drift between 5,00 and 9.10mbgl, and localised strikes at depth within the solid geology, between 22.00 and 35.50mbgl.

2.7. Existing Flood Risk Assessment

2.6.1 A site-specific 'Flood Risk Assessment' (21T2034 – Flood Risk Assessment Revision P06) has been carried out by Billinghurst George & Partners and is to be provided separately to support this planning application.

2.6.2 The report states that the site is within Flood Zone 1 and is at low risk of flooding from all sources of flood risk post development. Therefore, the proposed site is suitable for 'Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in "more vulnerable", and assembly and leisure' in accordance with the National Planning Policy Framework.

2.6.3 See Appendix H for Flood Maps for planning.

3. Proposed Site Description

3.1. Development Proposals

3.1.1. The proposals are to construct two new industrial start up units for business accommodation on the brownfield site that previously comprised an industrial unit, this is now demolished with the existing floor slab remaining insitu. The adjacent parcel of greenfield land is located to the southeast of the existing slab.

3.1.2. The Flexible Start-Up units have been deliberately located to provide a close link with the new future Hub amenity building to be located directly to the west. Good access to the Hub will provide important shared social and administration facilities to support these small start-up businesses.

3.1.3. The proposed site layout within Appendix B shows the extents of the industrial units, access road and car parking. The car parking and units will be accessible via existing Leconfield Industrial Estate access road.

4. Review of Surface Water Discharge Hierarchy

4.1. Existing Drainage Regime

4.1.1. Several United Utilities combined drains and manholes are located toward to primary access of Leconfield Industrial Estate. The 225-300mm diameter combined sewers drain from southeast to northwest along Leconfield Street in keeping with the topography of the highway.

4.1.2. A United Utilities 600mm diameter combined sewer is located just beyond the north western boundary, which drains southwest.

4.1.3. The site is currently served by wastewater systems through an existing network of separate private sewers. The surface water run off from the site currently discharges to the culverted Nor Beck watercourse as mentioned previously. The foul water flows from the site currently discharge to the existing 675mm diameter United Utilities sewer located to the northwest of site.

4.2. Current Guidelines

4.2.1. In accordance with Building Regulations and NPPF the disposal of surface water has been considered in the following order of priority; discharge to ground, where not reasonably practicable, a watercourse, or where not reasonably practicable a sewer.

4.3. Discharge to Ground

4.3.1. Discharge of the surface water to ground via infiltration is suited to sites which have ground conditions made up of gravel, sand or a mixture of the two. Sands and gravels permit rapid dispersion and infiltration of surface water which is necessary to ensure that overland flooding does not occur during intense rainfall periods.

4.3.2. A 'Phase 2 Site Investigation' have been carried out by Solmek dated March 2024. (Report No. S240720). See Appendix G for Borehole Records.

4.3.3. The Phase 2 Site Investigation reveals that ground conditions comprised:

- Made ground was generally encountered to depths of between 1.50mbgl and 9.00mbgl. In the northwest of the site, the made ground varied between just 0.32 and 0.54m.
- Firm to stiff (locally soft) sandy gravelly medium to high strength clay was encountered (1.90-6.30m thick)
- Locally, bands of dense to very dense granular material were encountered (0.30-5.60m thick).
- Rockhead between 6.80 & 12.30mbgl, generally comprising sandstones and mudstones.
- Groundwater was encountered locally, with shallow perched strikes within the made ground at 0.45-1.95mbgl, localised strikes within the drift between 5,00 and 9.10mbgl, and localised strikes at depth within the solid geology, between 22.00 and 35.50mbgl.

4.3.4. Infiltration testing was carried out in three locations, the results of which returned infiltration rates of between 4.50 to 7020 x 10-6 m/sec.

4.3.5. Due to the above findings it is confirmed that it would not be feasible to discharge the sites surface water to the ground via infiltration due to unsuitable infiltration rates.

4.4. Discharge to a Watercourse

4.4.1. The nearest named watercourse is Nor Beck, which where open is located 100m north of the site. Through CCTV investigation it is evident that it is culverted at a point northwest of site and runs southwest into Leconfield Industrial Estate and through to Leconfield Street. Nor Beck culvert continues southwest through Norbeck Park and adjacent fields ultimately converging with the River Keekle.

4.4.2. The watercourse is within close proximity to the site and accessible via an existing connection therefore, as per the hierarchy within Building Regulations Part H3, it is deemed necessary to discharge the surface water to a nearby watercourse.

4.5. Discharge to a Surface Water Sewer

4.5.1. Not required as discharging to a watercourse.

4.6. Discharge to a Combined Sewer

4.6.1. Not required as discharging to a watercourse.

5. Proposed Surface Water Drainage Strategy

5.1.1. It is expected that surface water discharge rates will be restricted to as close to Brownfield rates as per the Cumberland Council SuDS Adoption Guidance for Major Developments.

5.1.2. It is noted that this development forms part of a wider masterplan strategy for the redevelopment of Leconfield Industrial Estate. The brownfield surface water discharge rate figures and distribution for the development are to be agreed through planning consultation.

5.1.3. The brownfield discharge rate is derived from the hardstanding areas due for re-development. This particular development is within the eastern area of site as detailed on BGP drawing CMIQ-BGP-01-ZZ-DR-C-52-01901, with the eastern area of development allocated a total brownfield discharge rate of **87.0 l/s**. The brownfield surface water discharge rate noted is to serve the two new start up units and a future hub building development.

5.1.4. See Appendix F for the Proposed Drainage Philosophy Plans and Impermeable areas.

5.1.5. The two new industrial units propose to discharge surface water flows to the Nor Beck culverted watercourse passing through the wider Leconfield site via an existing connection. Surface water flows are to be restricted to a brownfield run off rate of **87.0l/s**, this rate is to be agreed with the Lead Local Flood Authority and Environment Agency.

5.1.6. To provide flexibility within this area for development a stub connection has been allowed for through to the future hub development site to the east. The final surface water discharge offsite is restricted to the brownfield discharge rate of **87.0l/s**.

5.1.7. Where the proposed industrial units are restricted to 87.0l/s a surface water storage volume of 960m^3 is required. It is proposed that volumes will be stored within a 1.6m deep attenuation tank.

5.1.8. The proposed site (within Appendix B) has no available space to incorporate open SuDS features such as basins or ponds.

5.1.9. Due to the nature of the site and absence of green open available space onsite it is deemed a suitable solution to provide the attenuation volume to retain the 1 in 100 year + 50% climate change flood event below ground within an attenuation tank.

5.1.10. The surface water system consists of a network of pipes which are located throughout the service yards, car parks and to the perimeter of new industrial units. The networks within each plot of development will drain via gravity to the respective flow control manhole, surface water will back up and utilise the attenuation structure when storm events exceed the brownfield design discharge rate of 87.0l/s. The final connection to Nor Beck watercourse will be made indirectly through existing surface water sewers via gravity.

5.1.11. The Microdrainage Calculations for the attenuation volumes are included within Appendix E.

5.1.12. It is recommended that permeable paving be utilised within the car parking to treat all surface water flows from this area. Highway gullies are to be fitted with Naylor smart gully filters with smart sponge to treat surface water flows from elsewhere.

5.1.13. A Downstream Defender Select Advanced Vortex is located downstream of the final flow control manhole to provide a form of surface water treatment.

5.1.14. The proposed surface water system has been designed in line with good practice which ensures each are separate from the foul.

5.1.15. The above surface water discharge rate is to be agreed with the Lead Local Flood Authority and the Environment Agency.

5.1.16. A review of the proposed drainage system has been carried out in line with the simple index matrix found in the CIRCA C737 SUDS manual. This can be seen in Table 1. As per the SUDS manual where two components are used in series a factor of 0.5 will be used for the second component to account for the reduced performance of secondary or tertiary components associated with already reduced inflow pollutant concentrations.

5.1.17. The results can be found in Table 1(over page), which shows that the proposed measures in place are sufficient for mitigating the pollutants from the proposed commercial yard, commercial roofing and low traffic roads.

Table 1 – Summary of SUDS mitigation Index Results

Land Use	**Total Pollutants**	**Total SuDs Mitigation Indices**	**Aggregated Mitigation Index**	**+ or - Total**
Standard commercial yard or delivery area	Total Suspended Pollutants + 0.7 Metals + 0.6 Hydro-Carbons + 0.7 **Total = + 2.0**	**Permeable Paving** Total Suspended Pollutants + 0.7 Metals + 0.6 Hydro-Carbons + 0.7 **Total = + 2.0** **Hydro International Downstream Defender Select (Advanced Vortex)** Total Suspended Pollutants + 0.5 (0.25) Metals + 0.4 (0.2) Hydro-Carbons + 0.5 (0.25) **Total = + 1.4**	Total Suspended Pollutants + 0.95 Metals + 0.8 Hydro-Carbons + 0.95	Total Suspended Pollutants = **+ 0.25** Metals = **+ 0.2** Hydro-Carbons = **+ 0.25** **Total = + 0.65**
Commercial/Industrial roofing: Low potential for metal leaching	Total Suspended Pollutants + 0.3 Metals + 0.2 Hydro-Carbons + 0.05 **Total = + 0.55**	**Hydro International Downstream Defender Select (Advanced Vortex)** Total Suspended Pollutants + 0.5 Metals + 0.4 Hydro-Carbons + 0.5 **Total = + 1.4**		Total Suspended Pollutants = **+ 0.2** Metals = **+ 0.2** Hydro-Carbons = **+ 0.45** **Total = + 0.85**
Low traffic roads (e.g. residential roads and general access roads, <300 traffic movements a day)	Total Suspended Pollutants + 0.5 Metals + 0.4 Hydro-Carbons + 0.4 **Total = + 1.3**	**Hydro International Downstream Defender Select (Advanced Vortex)** Total Suspended Pollutants + 0.5 Metals + 0.4 Hydro-Carbons + 0.5 **Total = + 1.4**		Total Suspended Pollutants = **+ 0** Metals = **+ 0** Hydro-Carbons = **+ 0.1** **Total = + 0.1**

5.2. Controlling Site Run off and Rainwater

5.2.1. The following measures should be considered for implementation by the contractor where required as part of the construction phase plan and surface water management plan to control the site run off and rainwater during construction.

5.2.2. Temporary use of steel manhole covers to all manholes to ensure that no sure runoff or debris will enter the proposed drainage system. If implemented these should remain in place until the external surfacing works are being carried out in the area.

5.2.3. The management of groundwater and surface water should include sump pumping out of excavations and should be managed through the installation of temporary silt trap manholes and ditches. Any settlement features should be located at strategic points across the site with the bases cleared of sediment at regular intervals to prevent possible contaminants entering the surface water system.

5.2.4. Filters should be implemented within existing gullies or linear drains to separate any suspended solids from the water to ensure any water that enters the surface water system has been treated at the entry point. A terram geotextile may be installed in the outlet pipe of any existing road gullies to capture sediment/suspended solids as the water passed through the filter.

5.2.5. A silt trap catch pit should be installed to the proposed surface water system upstream of the attenuation features and should be monitored, cleaned or emptied when required. This will ensure that should any silt or debris be present this is caught before entering the attenuation system and flow control device chamber.

5.2.6. Prior to final connections being made the full drainage network should be jetted, cleaned and a full CCTV survey carried out documented within the Operation and Maintenance Manual.

6. Proposed Foul Water Drainage Strategy

6.1. See Appendix F for the 'Proposed Drainage Philosophy Drawings'.

6.2. The proposed foul drainage will remain private within site. The foul sewers are to drain via gravity to existing foul sewers within the adjacent existing access road. The flows thereafter will pass through the private network ultimately discharging to the existing United Utilities 675mm diameter combined sewer to the northwest of site.

6.3. The British Water Flows and Loads tables for 'Office / Factory without canteen' advise a flow rate of 50 litres per person, per day.

6.4. The peak foul flow rate has been calculated and determined based on a total staff number of 77 (Plot 9 with 63 Staff and Plot 12 with 14 Staff). This equates to 0.044 l/s. (77 (p) x 50 l/d = 3850 l/d therefore X / 24 / 60 / 60 = 0.044 l/s.

6.5. The foul water connection location has been agreed with United Utilities through return of a pre-development enquiry during development of the masterplan application, see Appendix I for details. The foul water discharge rate is to be determined during detailed design stage.

7. Conclusion

7.1. It is not possible or practicable to discharge the surface water to the ground via infiltration. Therefore, as per the hierarchy within Building Regulations Part H3, it is deemed necessary to discharge the surface water to a watercourse.

7.2. The proposals are to construct two industrial units with associated yards and car parking on the brownfield site that was previously used for industrial purposes.

7.3. Underground attenuation volume is sufficient to provide storage for rainfall events up to and including the 1 in 100 year + 50% climate change.

7.4. A proposed drainage scheme has been included within Appendix F, with supporting calculations provided within Appendix E.

7.5. This statement has been prepared with reference to the information available at the time of writing. The details of the report may be revised upon receipt of additional or further information.

Report No: LUF-BGP-09-XX-T-C-0001

Report Title: Drainage Philosophy – Cleator Moor Innovation Quarter Phase 2 LUF – Unit 9 & 12

James Herbert – Associate Director *BEng (Hons) IEng MICE*
Date: 28/11/2025

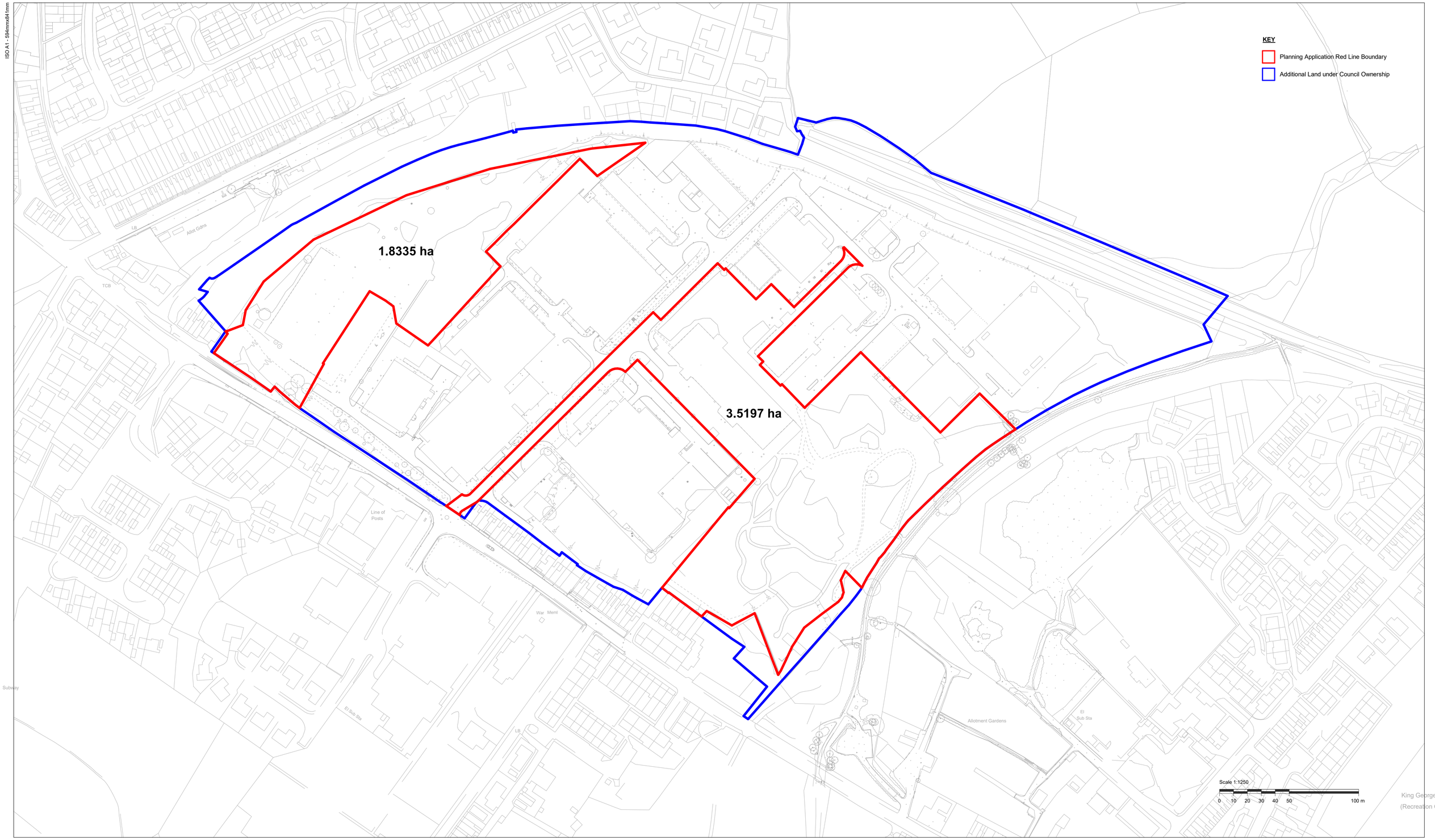
Jim Conway – Director *BSc CEng MICE*
Date: 28/11/2025

For and on behalf of Billinghurst George & Partners

Appendix A

Site Location Plan

ISO A1 - 594mmx841mm



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Constructors must only work to figured dimensions which are to be checked on site. Do not scale from hard copy drawings.

DATE	REVISION	REV	DR	CH
14.02.25	PLANNING ISSUE	P01	LC	PB
03.09.25	PLANNING ISSUE	P02	ST	PB
26.11.25	PLANNING ISSUE	P03	ST	PB

Keyplan

North Arrow

True North

NORR
NORR Consultants Limited.
An Ingenium International Company

Percy House, 8th Floor Percy Street,
Newcastle NE1 4PW
England, UK
norr.com

Cumberland Council

MORGAN SINDALL

AVISON YOUNG

Project: CUMBERLAND COUNCIL	Drawing Title: SITE - LOCATION PLAN
Project: CLEATOR MOOR INNOVATION QUARTER LECONFIELD SITE - PLOTS 9 & 12	
Drawn: LC — Date: 10.02.25	Sheet Status: PL - PLANNING
Checked: PB — Date: 10.02.25	Project No.: IANC23-0025
Scale: As indicated @ A1	Drawing No.: LUF-NOR-ZZ-ZZ-D-A-90000 (P) — Rev.: P03

Appendix B

Proposed Site Layout

©One-Environments Ltd. This drawing is not to be scaled. All dimensions to be verified on site prior to commencement of works. Discrepancies, ambiguities and/or omissions between this drawing & information supplied by others must be reported immediately for clarification before proceeding

NOTES

- Redline Boundary
- Ornamental Planting
- Hedgerow
- Wildflower Meadow/ Species Rich Grassland
- Native Woodland Mix
- Pollinators Mix
- Existing Vegetation to be retained
- Proposed Trees
- Vehicular Grade Asphalt
- Pedestrian Grade Asphalt
- Building Edge Concrete Block Paving
- Gravel
- Concrete Hardstand
- Permeable Concrete Paving Type 1
- Permeable Concrete Paving Type 2
- Tactile Blister Paving
- Tactile Corduroy Paving
- 6no. Cycle Stands
- Door Guards
- EV Charger Kiosk
- Active EV Bays
- Passive EV Bays
- Street Lights
- Bin Store
- MCCB
- Substation
- Cycle Storage
- Edge of road works

REVISION | P22	DATE | 25.11.25	BY | KJ	CHECKED | PA
Additional passive EV parking symbols to bays					
REVISION | P21	DATE | 22.10.25	BY | KJ	CHECKED | PA
Sub-stations and EV charging kiosks positions updated. Tree's repositioned to inline with drainage strategy. Gravel around buildings added.					
REVISION | P20	DATE | 29.09.25	BY | KJ	CHECKED | PA
Updated for Planning Issue					
REVISION | P19	DATE | 24.06.25	BY | KJ	CHECKED | JE
Plot 9 building updated					
REVISION | P18	DATE | 09.06.25	BY | HAN	CHECKED | JE
Red Line Boundary (Plot 09 only) updated					
REVISION | P17	DATE | 09.04.25	BY | HAN	CHECKED | PA
Soft landscape around Plot 09 relocated					

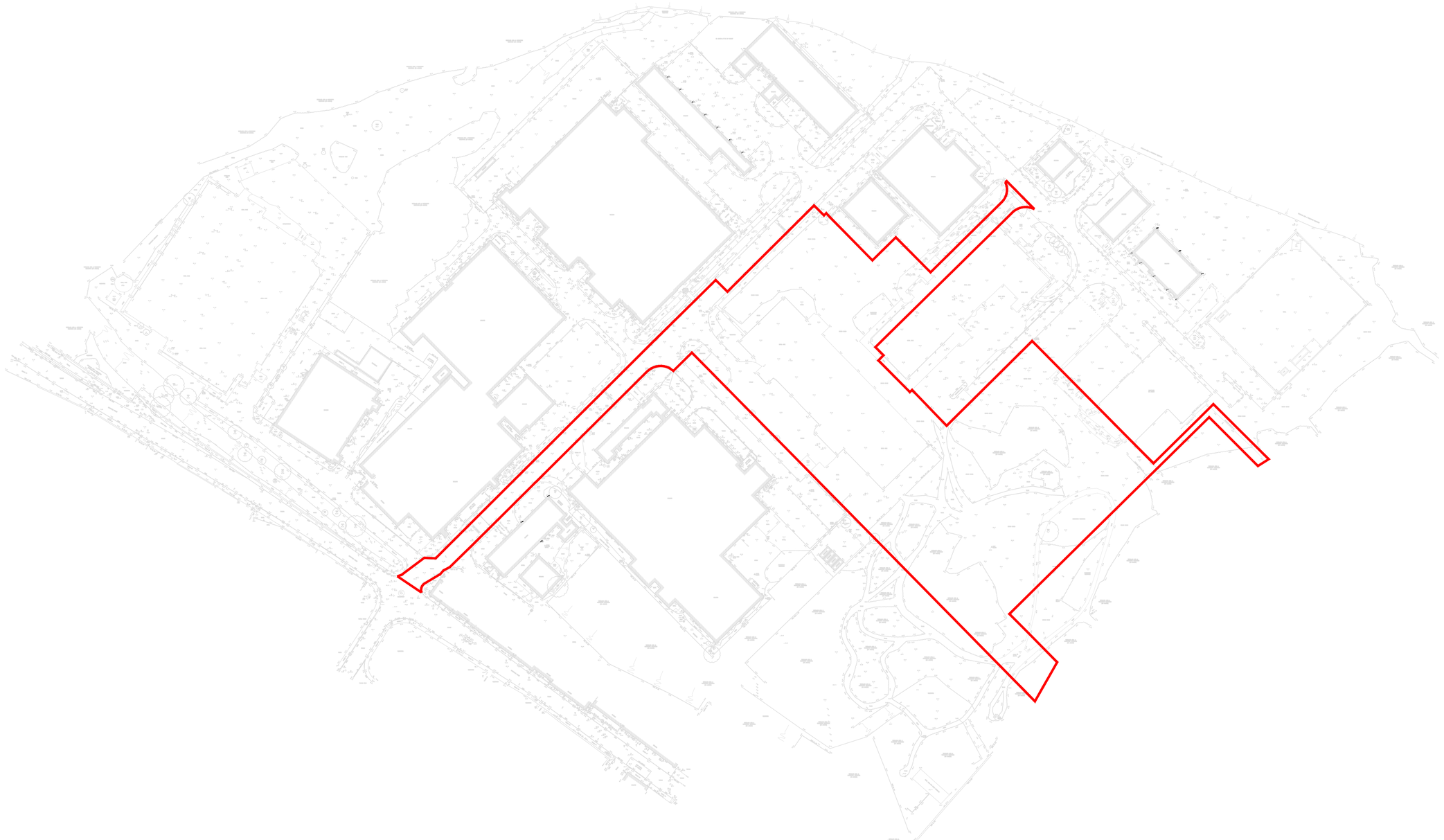
CLIENT	Cumberland County Council			
PROJECT	**CMIQ Phase 2 LUF**			
TITLE	Landscape Site Plan			
DWG No.	LUF-ONE-ZZ-XX-D-L-0001	REV	P22	
STATUS	PRELIMINARY			
SCALE	1:500 @ A1	DATE	08.11.24	DRN BY HAN

0 5 10 20
metres 1:500

ONE-ENVIRONMENTS

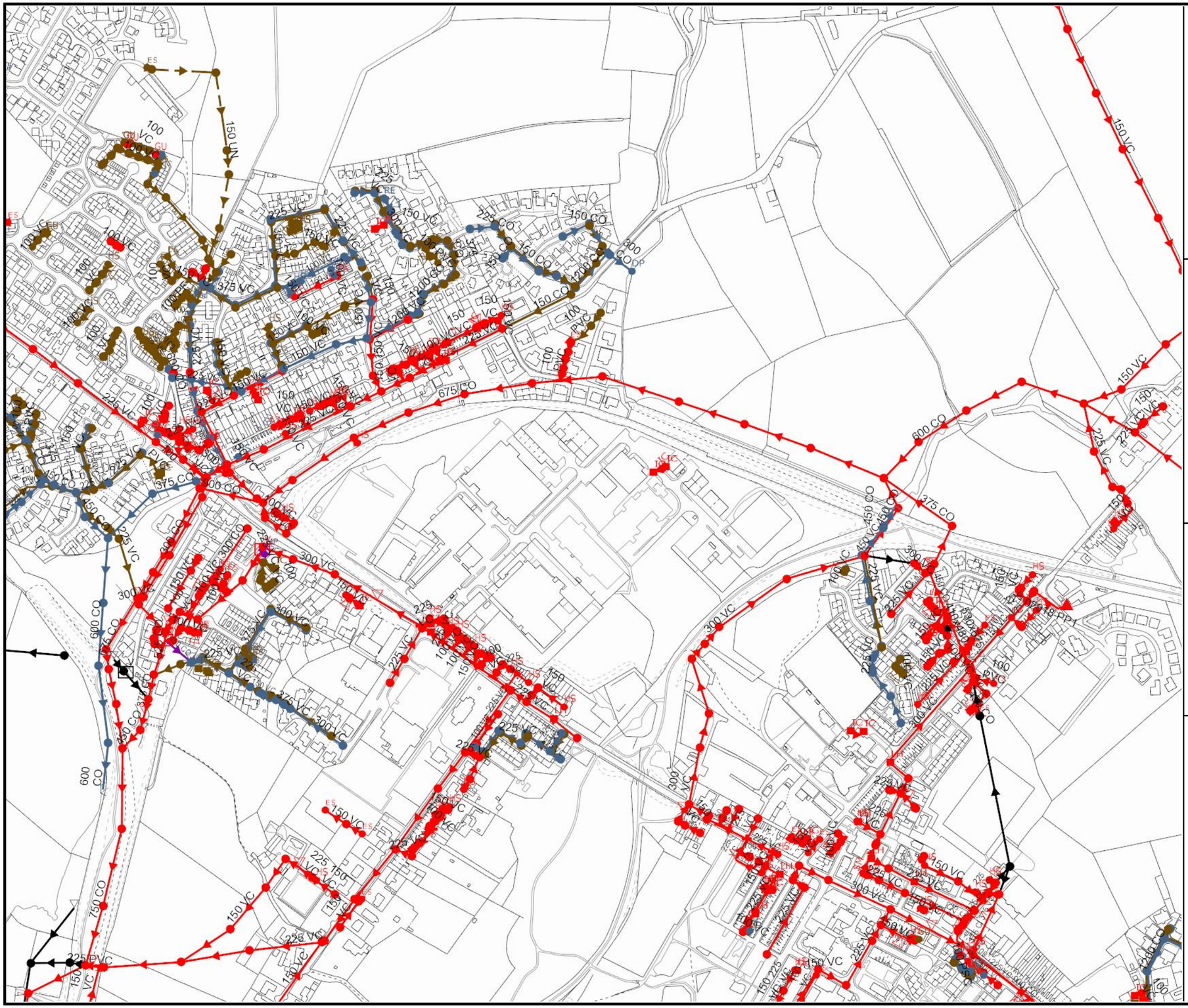
Appendix C

Topographical Survey



Appendix D

United Utilities Sewer Records



United Utilities

Water for the North West

SEWER RECORDS

Address or Site Reference

CAPITAL ALUMINIUM EXTRUSIONS LTD LECONFIELD INDUSTRIAL ESTATE, CLEATOR MOOR, CA25 5QB

Scale: 1:5000

Date: 21/09/2021

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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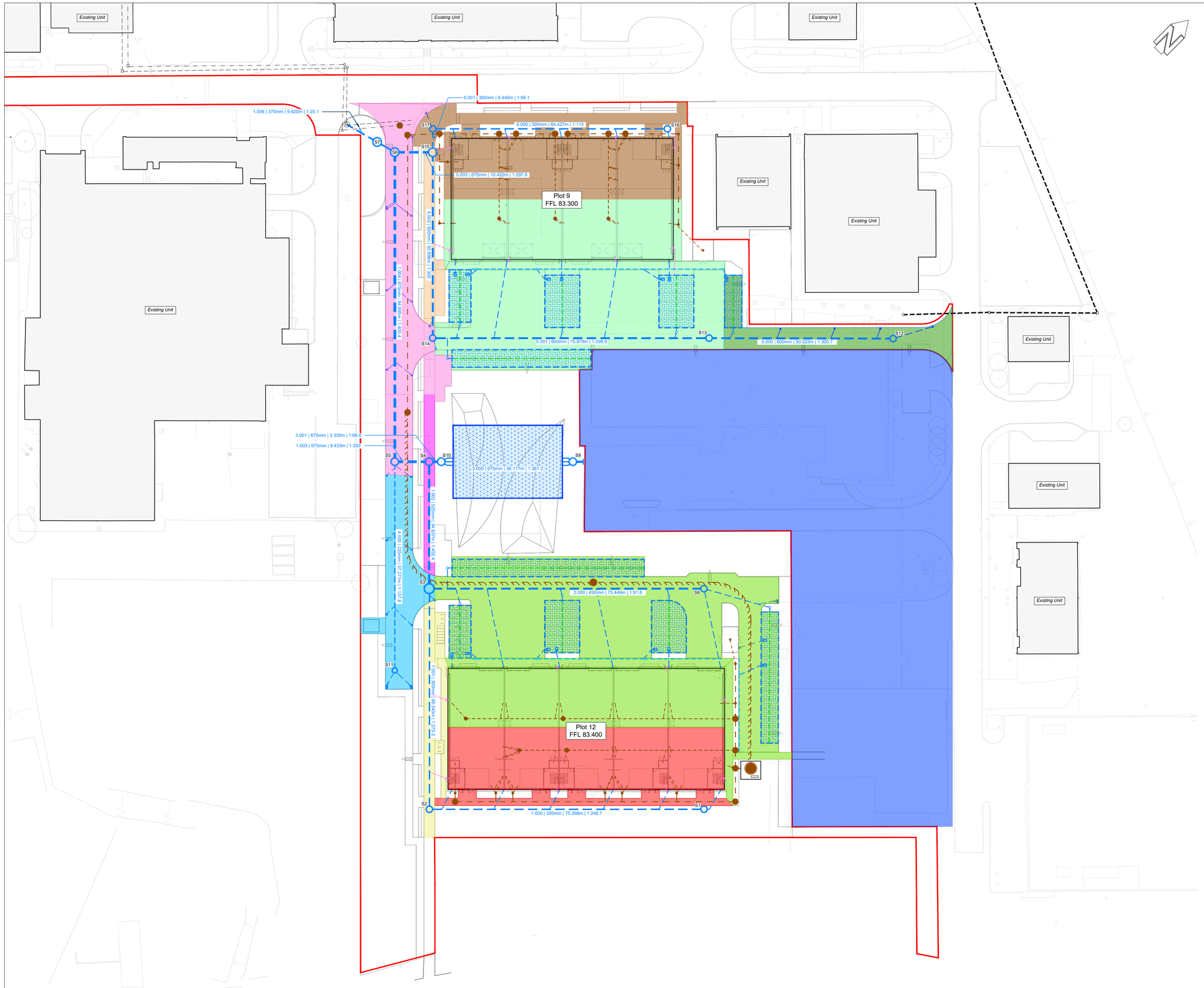
Appendix E

Microdrainage Calculations



- DO NOT SCALE -

Legend - LUF2

Pipe 1.000
Area = 1520m² = (0.152ha)
Fall = 0.302m / Length = 75.398m

Pipe 1.001
Area = 310m² = (0.031ha)
Fall = 0.220m / Length = 60.543m

Pipe 1.002
Area = 0m² = (0.0ha)
Fall = 0.077m / Length = 34.837m

Pipe 1.003
Area = 150m² = (0.015ha)
Fall = 0.024m / Length = 9.433m

Pipe 1.004
Area = 970m² = (0.097ha)
Fall = 0.212m / Length = 84.895m

Pipe 1.005
Area = 0m² = (0.0ha)
Fall = 0.056m / Length = 5.605m

Pipe 1.006
Area = 0m² = (0.0ha)
Fall = 0.383m / Length = 9.620m

Pipe 2.000
Area = 4080m² = (0.408ha)
Fall = 0.822m / Length = 75.449m

Pipe 3.000
Area = 8620m² = (0.862ha)
Fall = 0.100m / Length = 36.117m

Pipe 3.001
Area = 0m² = (0.0ha)
Fall = 0.050m / Length = 3.330m

Pipe 4.000
Area = 530m² = (0.053ha)
Fall = 0.363m / Length = 57.271m

Pipe 5.000
Area = 470m² = (0.047ha)
Fall = 0.0.168m / Length = 50.523m

Pipe 5.001
Area = 3190m² = (0.319ha)
Fall = 0.253m / Length = 75.879m

Pipe 5.002
Area = 190m² = (0.019ha)
Fall = 0.170m / Length = 50.998m

Pipe 5.003
Area = 0m² = (0.0ha)
Fall = 0.035m / Length = 10.422m

Pipe 6.000
Area = 1500m² = (0.150ha)
Fall = 0.560m / Length = 64.427m

Pipe 6.001
Area = 0m² = (0.0ha)
Fall = 0.065m / Length = 6.440m

Impermeable Areas Total = 21,525m² = (2.153ha)

NOT FOR CONSTRUCTION

AMENDMENT	BY	REV	CHK	DATE
Stage 4 Issue	JJH	C03	JC	28.11.2025
Stage 4 Issue	JJH	C02	JC	07.11.2025
Stage 4 Issue	JJH	C01	JC	24.10.2025
Stage 3 Issue	JJH	P06	JC	01.10.2025
Stage 3 Issue	JJH	P05	JC	13.09.2025
Stage 3 Issue	JJH	P04	JC	09.01.2025
Draft Stage 3 Issue	JJH	P03	JC	12.12.2024
Issued for Planning	JJH	P02	JC	23.11.2023
Issued for Planning	JJH	P01	JC	22.09.2023

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Client Cumberland Council
Project CMIQ Phase 2 LUF - Unit 9 & 12
BGP Project No. 21T2034
Drawing Title Impermeable Areas Plan

Drawn	Date	Checked	Date	Size	Scale	Rev.
JJH	Aug '23	JC	Aug '23	A1	1:500	C03

Location	Originator	Volume	Level	Form	Role	Unique No.
LUF	BGP	09	XX	D	C	09101

File Reference
LUF-BGP-09-XX-D-C-09101

In instances where this drawing completes or partly completes a contract, Billinghurst George & Partners will consider that it's product has been validated, unless in a period not exceeding 90 working days, the client advises to the contrary.

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	45
Ratio R	0.260	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.083	4-8	1.063	8-12	0.007

Total Area Contributing (ha) = 2.153

Total Pipe Volume (m³) = 139.877

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	75.398	0.302	249.7	0.152	4.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	60.543	0.220	275.2	0.031	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	75.449	0.822	91.8	0.408	4.00	0.0	0.600	o	450	Pipe/Conduit	
S1.002	34.837	0.077	452.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
S3.000	36.117	0.100	361.2	0.862	4.00	0.0	0.600	o	675	Pipe/Conduit	
S3.001	3.330	0.050	66.6	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.27	81.950	0.152	0.0	0.0	12.3	0.99	70.0	39.8
S1.001	50.00	6.34	81.648	0.183	0.0	0.0	14.9	0.94	66.6	47.9
S2.000	50.00	4.59	82.100	0.408	0.0	0.0	33.1	2.12	337.6	106.8
S1.002	50.00	6.89	81.203	0.591	0.0	0.0	48.0	1.05	226.5	154.7
S3.000	50.00	4.44	81.126	0.862	0.0	0.0	70.0	1.37	491.4	225.7
S3.001	50.00	4.46	81.026	0.862	0.0	0.0	70.0	3.21	1150.4	225.7

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.003	9.433	0.024	393.0	0.015	0.00	0.0	0.600	o	675	Pipe/Conduit	
S4.000	57.271	0.363	157.8	0.053	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	84.895	0.212	400.4	0.097	0.00	0.0	0.600	o	675	Pipe/Conduit	
S5.000	50.523	0.168	300.7	0.047	4.00	0.0	0.600	o	600	Pipe/Conduit	
S5.001	75.879	0.253	299.9	0.319	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.002	50.998	0.170	300.0	0.019	0.00	0.0	0.600	o	600	Pipe/Conduit	
S6.000	64.427	0.560	115.0	0.150	4.00	0.0	0.600	o	300	Pipe/Conduit	
S6.001	6.440	0.065	99.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.003	10.422	0.035	297.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
S1.005	5.605	0.056	100.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	9.620	0.383	25.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	7.01	80.976	1.468	0.0	0.0	119.3	1.32	470.9	384.3
S4.000	50.00	4.92	81.765	0.053	0.0	0.0	4.3	1.04	41.3	13.9
S1.004	50.00	8.10	80.952	1.618	0.0	0.0	131.5	1.30	466.5	423.6
S5.000	50.00	4.60	81.516	0.047	0.0	0.0	3.8	1.40	395.6	12.3
S5.001	50.00	5.50	81.348	0.366	0.0	0.0	29.7	1.40	396.1	95.8
S5.002	50.00	6.11	81.095	0.385	0.0	0.0	31.3	1.40	396.0	100.8
S6.000	50.00	4.73	81.850	0.150	0.0	0.0	12.2	1.46	103.6	39.3
S6.001	50.00	4.80	81.290	0.150	0.0	0.0	12.2	1.58	111.7	39.3
S5.003	50.00	6.23	80.850	0.535	0.0	0.0	43.5	1.51	541.6	140.1
S1.005	50.00	8.15	80.740	2.153	0.0	0.0	174.9	1.81	200.0«	563.7
S1.006	50.00	8.19	80.684	2.153	0.0	0.0	174.9	3.63	400.7«	563.7

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS1	83.150	1.200	Open Manhole	1200	S1.000	81.950	300				
SS2	83.180	1.532	Open Manhole	1200	S1.001	81.648	300	S1.000	81.648	300	
SS8	83.750	1.650	Open Manhole	1500	S2.000	82.100	450				
SS3	83.680	2.477	Open Manhole	1800	S1.002	81.203	525	S1.001	81.428	300	
								S2.000	81.278	450	
SS9	83.680	2.554	Open Manhole	1800	S3.000	81.126	675				
SS10	83.680	2.654	Open Manhole	1800	S3.001	81.026	675	S3.000	81.026	675	
SS4	83.680	2.704	Open Manhole	2100	S1.003	80.976	675	S1.002	81.126	525	
								S3.001	80.976	675	
SS11	83.190	1.425	Open Manhole	1200	S4.000	81.765	225				
SS5	83.520	2.568	Open Manhole	1800	S1.004	80.952	675	S1.003	80.952	675	
								S4.000	81.402	225	
SS12	83.020	1.504	Open Manhole	1500	S5.000	81.516	600				
SS13	83.420	2.072	Open Manhole	1500	S5.001	81.348	600	S5.000	81.348	600	
SS14	83.350	2.255	Open Manhole	1500	S5.002	81.095	600	S5.001	81.095	600	
SS16	83.200	1.350	Open Manhole	1200	S6.000	81.850	300				
SS17	83.100	1.810	Open Manhole	1200	S6.001	81.290	300	S6.000	81.290	300	
SS15	83.150	2.300	Open Manhole	2100	S5.003	80.850	675	S5.002	80.925	600	
								S6.001	81.225	300	
SS6	83.100	2.360	Open Manhole	2100	S1.005	80.740	375	S1.004	80.740	675	
								S5.003	80.815	675	375
SS7	83.100	2.416	Open Manhole	2100	S1.006	80.684	375	S1.005	80.684	375	
SOutfall	83.040	2.739	Open Manhole	0		OUTFALL		S1.006	80.301	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SS1	301763.353	515452.576	301763.353	515452.576	Required	
SS2	301709.613	515399.691	301709.613	515399.691	Required	
SS8	301720.901	515495.717	301720.901	515495.717	Required	
SS3	301667.112	515442.808	301667.112	515442.808	Required	
SS9	301670.813	515495.298	301670.813	515495.298	Required	
SS10	301645.057	515469.979	301645.057	515469.979	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SS4	301642.683	515467.644	301642.683	515467.644	Required	
SS11	301676.119	515420.200	301676.119	515420.200	Required	
SS5	301635.958	515461.029	301635.958	515461.029	Required	
SS12	301709.813	515581.056	301709.813	515581.056	Required	
SS13	301673.712	515545.711	301673.712	515545.711	Required	
SS14	301619.617	515492.501	301619.617	515492.501	Required	
SS16	301625.270	515578.630	301625.270	515578.630	Required	
SS17	301579.339	515533.450	301579.339	515533.450	Required	
SS15	301583.855	515528.859	301583.855	515528.859	Required	
SS6	301576.425	515521.551	301576.425	515521.551	Required	
SS7	301570.994	515520.164	301570.994	515520.164	Required	
SOutfall	301561.672	515517.787			No Entry	

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.152	0.152	0.152
1.001	-	-	100	0.031	0.031	0.031
2.000	-	-	100	0.408	0.408	0.408
1.002	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.862	0.862	0.862
3.001	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.015	0.015	0.015
4.000	-	-	100	0.053	0.053	0.053
1.004	-	-	100	0.097	0.097	0.097
5.000	-	-	100	0.047	0.047	0.047
5.001	-	-	100	0.319	0.319	0.319
5.002	-	-	100	0.019	0.019	0.019
6.000	-	-	100	0.150	0.150	0.150
6.001	-	-	100	0.000	0.000	0.000
5.003	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.153	2.153	2.153

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.006	SOutfall	83.040	80.301	80.301	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 301616 515503 NY 01616 15503	Cv (Winter)	1.000
Data Type	Point	Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SS6, DS/PN: S1.005, Volume (m³): 40.8

Unit Reference	MD-SHE-0361-8700-1935-8700
Design Head (m)	1.935
Design Flow (l/s)	87.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	361
Invert Level (m)	80.740
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.935	86.9	Kick-Flo®	1.365	73.4
Flush-Flo™	0.646	86.7	Mean Flow over Head Range	-	73.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.3	0.800	86.1	2.000	88.3	4.000	123.7	7.000	162.6
0.200	36.3	1.000	84.1	2.200	92.5	4.500	131.1	7.500	168.2
0.300	67.6	1.200	80.4	2.400	96.5	5.000	138.0	8.000	173.6
0.400	83.4	1.400	74.3	2.600	100.3	5.500	144.5	8.500	178.8
0.500	85.7	1.600	79.3	3.000	107.6	6.000	150.8	9.000	183.9
0.600	86.6	1.800	83.9	3.500	115.9	6.500	156.8	9.500	188.9

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Storage Structures for Storm

Tank or Pond Manhole: SS10, DS/PN: S3.001

Invert Level (m) 81.075

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.600	600.0	1.601	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 301616 515503 NY 01616 15503	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 50

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	SS1	15 Summer	2	+0%	100/15 Summer	100/15 Summer			82.089	-0.161	0.000
S1.001	SS2	15 Summer	2	+0%	100/15 Summer				81.795	-0.153	0.000
S2.000	SS8	15 Summer	2	+0%	100/15 Summer				82.253	-0.297	0.000
S1.002	SS3	15 Summer	2	+0%	100/15 Summer				81.477	-0.251	0.000
S3.000	SS9	15 Summer	2	+0%	100/15 Summer				81.430	-0.371	0.000
S3.001	SS10	120 Summer	2	+0%	100/15 Summer				81.274	-0.427	0.000
S1.003	SS4	30 Summer	2	+0%	100/15 Summer				81.329	-0.322	0.000
S4.000	SS11	15 Summer	2	+0%	100/15 Summer				81.843	-0.147	0.000
S1.004	SS5	30 Summer	2	+0%	100/15 Summer				81.328	-0.299	0.000
S5.000	SS12	15 Summer	2	+0%	100/15 Summer				81.587	-0.529	0.000
S5.001	SS13	15 Summer	2	+0%	100/15 Summer				81.505	-0.443	0.000
S5.002	SS14	30 Summer	2	+0%	30/30 Summer				81.335	-0.360	0.000
S6.000	SS16	15 Summer	2	+0%	100/15 Summer	100/30 Summer			81.961	-0.189	0.000
S6.001	SS17	15 Summer	2	+0%	30/15 Summer				81.431	-0.159	0.000
S5.003	SS15	30 Summer	2	+0%	30/15 Summer				81.299	-0.226	0.000
S1.005	SS6	30 Summer	2	+0%	2/15 Summer				81.286	0.171	0.000
S1.006	SS7	30 Summer	2	+0%					80.836	-0.223	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	0.40			26.7	OK	3
S1.001	SS2	0.46			29.4	OK	
S2.000	SS8	0.25			78.2	OK	
S1.002	SS3	0.52			100.1	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.000	SS9	0.41			166.5	OK	
S3.001	SS10	0.11			48.2	OK	
S1.003	SS4	0.28			69.0	OK	
S4.000	SS11	0.26			10.4	OK	
S1.004	SS5	0.20			84.1	OK	
S5.000	SS12	0.03			8.9	OK	
S5.001	SS13	0.14			52.2	OK	
S5.002	SS14	0.14			47.6	OK	
S6.000	SS16	0.29			28.3	OK	1
S6.001	SS17	0.44			28.1	OK	
S5.003	SS15	0.14			47.6	OK	
S1.005	SS6	0.78			84.0	SURCHARGED	
S1.006	SS7	0.35			84.0	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 301616 515503 NY 01616 15503	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 50

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	SS1	15 Summer	30	+0%	100/15 Summer	100/15 Summer			82.174	-0.076	0.000
S1.001	SS2	15 Summer	30	+0%	100/15 Summer				81.894	-0.054	0.000
S2.000	SS8	15 Summer	30	+0%	100/15 Summer				82.330	-0.220	0.000
S1.002	SS3	15 Summer	30	+0%	100/15 Summer				81.665	-0.063	0.000
S3.000	SS9	120 Summer	30	+0%	100/15 Summer				81.664	-0.137	0.000
S3.001	SS10	120 Summer	30	+0%	100/15 Summer				81.599	-0.102	0.000
S1.003	SS4	120 Summer	30	+0%	100/15 Summer				81.596	-0.055	0.000
S4.000	SS11	15 Summer	30	+0%	100/15 Summer				81.882	-0.108	0.000
S1.004	SS5	120 Summer	30	+0%	100/15 Summer				81.591	-0.036	0.000
S5.000	SS12	30 Summer	30	+0%	100/15 Summer				81.763	-0.353	0.000
S5.001	SS13	30 Summer	30	+0%	100/15 Summer				81.761	-0.187	0.000
S5.002	SS14	30 Summer	30	+0%	30/30 Summer				81.698	0.003	0.000
S6.000	SS16	15 Summer	30	+0%	100/15 Summer	100/30 Summer			82.020	-0.130	0.000
S6.001	SS17	30 Summer	30	+0%	30/15 Summer				81.676	0.086	0.000
S5.003	SS15	30 Summer	30	+0%	30/15 Summer				81.621	0.096	0.000
S1.005	SS6	30 Summer	30	+0%	2/15 Summer				81.613	0.498	0.000
S1.006	SS7	30 Winter	30	+0%					80.839	-0.220	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	0.82			55.0	OK	3
S1.001	SS2	0.95			60.3	OK	
S2.000	SS8	0.51			160.7	OK	
S1.002	SS3	0.98			190.3	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.000	SS9	0.41			164.5	OK	
S3.001	SS10	0.15			66.9	OK	
S1.003	SS4	0.36			86.2	OK	
S4.000	SS11	0.53			21.2	OK	
S1.004	SS5	0.18			76.7	OK	
S5.000	SS12	0.05			17.0	OK	
S5.001	SS13	0.35			125.5	OK	
S5.002	SS14	0.22			76.9	SURCHARGED	
S6.000	SS16	0.59			58.2	OK	1
S6.001	SS17	0.84			53.9	SURCHARGED	
S5.003	SS15	0.25			83.9	SURCHARGED	
S1.005	SS6	0.81			86.6	SURCHARGED	
S1.006	SS7	0.36			86.6	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 301616 515503 NY 01616 15503	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 50

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	SS1	30 Summer	100	+50%	100/15 Summer	100/15 Summer			83.153	0.903	3.419
S1.001	SS2	15 Summer	100	+50%	100/15 Summer				82.927	0.979	0.000
S2.000	SS8	30 Summer	100	+50%	100/15 Summer				82.986	0.436	0.000
S1.002	SS3	120 Winter	100	+50%	100/15 Summer				82.537	0.809	0.000
S3.000	SS9	120 Winter	100	+50%	100/15 Summer				82.536	0.735	0.000
S3.001	SS10	120 Winter	100	+50%	100/15 Summer				82.530	0.829	0.000
S1.003	SS4	120 Winter	100	+50%	100/15 Summer				82.529	0.878	0.000
S4.000	SS11	15 Summer	100	+50%	100/15 Summer				82.563	0.573	0.000
S1.004	SS5	120 Winter	100	+50%	100/15 Summer				82.525	0.898	0.000
S5.000	SS12	15 Summer	100	+50%	100/15 Summer				82.853	0.737	0.000
S5.001	SS13	15 Summer	100	+50%	100/15 Summer				82.840	0.892	0.000
S5.002	SS14	15 Summer	100	+50%	30/30 Summer				82.725	1.030	0.000
S6.000	SS16	30 Summer	100	+50%	100/15 Summer	100/30 Summer			83.200	1.050	0.066
S6.001	SS17	15 Summer	100	+50%	30/15 Summer				82.766	1.176	0.000
S5.003	SS15	15 Summer	100	+50%	30/15 Summer				82.631	1.106	0.000
S1.005	SS6	15 Summer	100	+50%	2/15 Summer				82.580	1.465	0.000
S1.006	SS7	360 Summer	100	+50%					80.839	-0.220	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SS1	1.32			88.9	FLOOD	3
S1.001	SS2	1.49			94.3	FLOOD RISK	
S2.000	SS8	0.90			283.1	SURCHARGED	
S1.002	SS3	0.69			132.9	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.000	SS9	0.54			217.6	SURCHARGED	
S3.001	SS10	0.16			71.2	SURCHARGED	
S1.003	SS4	0.32			77.7	SURCHARGED	
S4.000	SS11	0.97			38.4	SURCHARGED	
S1.004	SS5	0.18			78.2	SURCHARGED	
S5.000	SS12	0.09			32.2	FLOOD RISK	
S5.001	SS13	0.60			217.5	SURCHARGED	
S5.002	SS14	0.52			180.7	SURCHARGED	
S6.000	SS16	0.98			96.5	FLOOD	1
S6.001	SS17	1.44			92.0	SURCHARGED	
S5.003	SS15	0.92			302.5	SURCHARGED	
S1.005	SS6	0.81			86.6	SURCHARGED	
S1.006	SS7	0.36			86.6	OK	

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DO NOT SCALE

Notes:

1. Drawing is based on topographical survey prepared by White Young Green dated 28/11/2019 and CCTV drain survey prepared by EDS.
2. Brownfield discharge rates have been based on current Cumbria LLFA standards (50% reduction on existing discharge rate).

Legend:

- Existing FW Sewer
- Existing SW Drain
- Development Zones within Area 1
- Area 1 Site Boundary

West Development

Existing Drained Roof Impermeable Area
Area = 0m² = (0.0ha)

Existing Drained Road/Paving Impermeable Area
Area = 7865m² = (0.7865ha)

Establishing Discharge Rate: West Development

Area highlighted is the hardstanding area which is proposed to be redeveloped as part of Area 1 West, Cleator Moor Industrial Estate. Based on Cumbria standard, any brownfield site must be limited to 140l/s/ha with a 50% reduction. Therefore based on this principal;

140l/s x 0.7865Ha = 110.11 l/s

Reduce 110.11 l/s by 50% to provide proposed discharge rate for West = 55.0 l/s

East Development

Existing Drained Roof Impermeable Area
Area = 0m² = (0.0ha)

Existing Drained Road/Paving Impermeable Area
Area = 12430m² = (1.2430ha)

Establishing Discharge Rate: East Development

Area highlighted is the hardstanding area which is proposed to be redeveloped as part of Area 1 East, Cleator Moor Industrial Estate. Based on Cumbria standard, any brownfield site must be limited to 140l/s/ha with a 50% reduction. Therefore based on this principal;

140l/s x 1.2430Ha = 174.0 l/s

Reduce 174.0 l/s by 50% to provide proposed discharge rate for East = 87.0 l/s

Issued for Planning	JJH	P03	JC	07.11.2025
Issued for Planning	JJH	P02	JC	23.03.2022
Issued for Information	JJH	P01	JC	05.11.2021
AMENDMENT	BY	REV	CHK	DATE

Rev P = Preliminary T = Tender C = Construction LCI = Last Construction Issue

In instances where this drawing completes or partly completes a contract, Billinghurst George & Partners will consider that it's product has been validated, unless in a period not exceeding 90 working days, the client advises to the contrary.

Billinghurst George & Partners
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Client
Copeland Borough Council

Project
Leconfield Industrial Estate

Project No.
21T2034

Drawing Title
Area 1 - Brownfield Discharge Rate

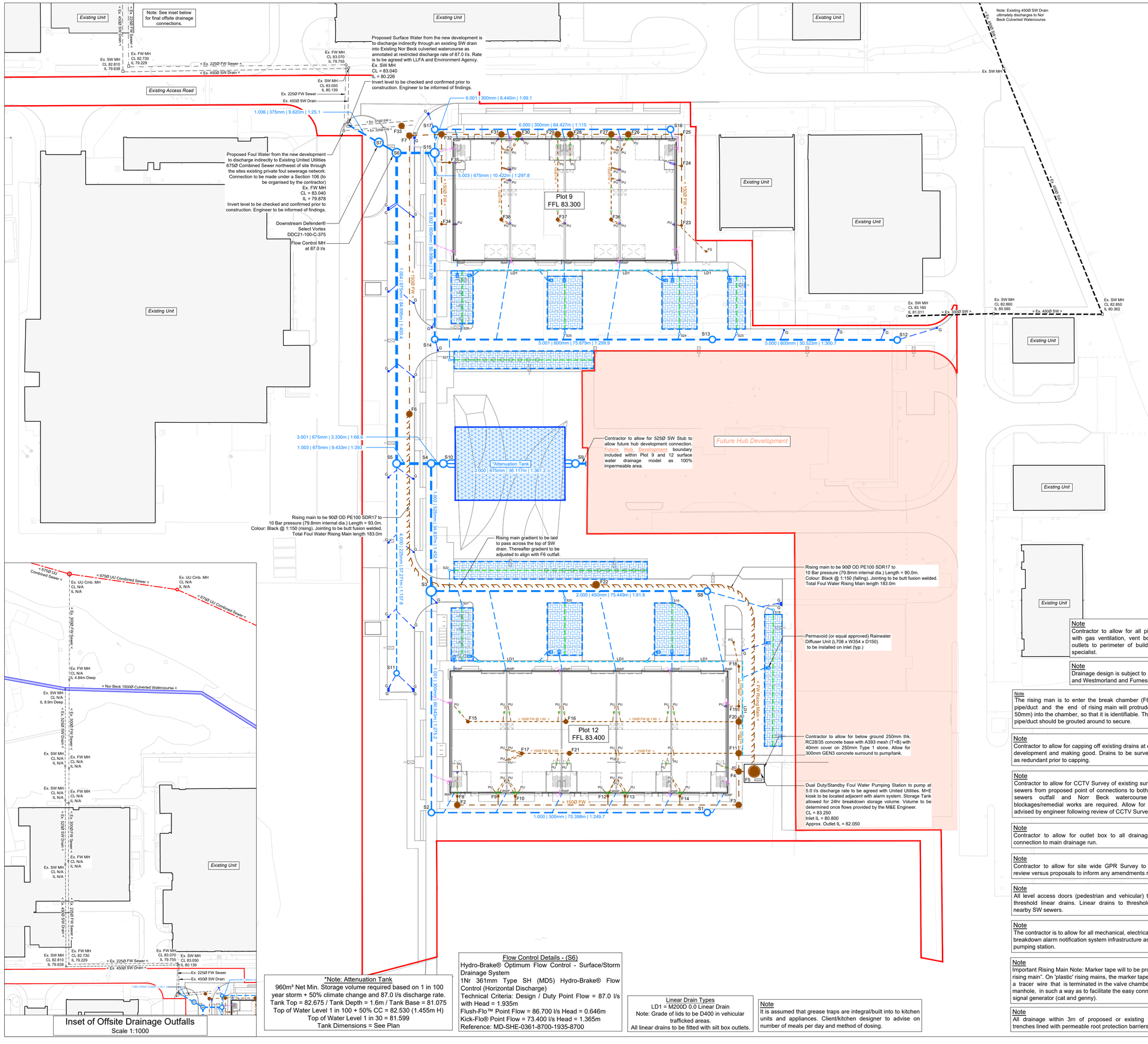
Drawn	Date	Checked	Date	Size	Scale	Class.	Rev.
JJH	Nov 2021	JC	Nov 2021	A1	1:1000	52	P03

Location	Originator	Volume	Level	Type	Role	Unique No.
CMIQ	BGP	01	XX	DR	C	01901

File Reference
CMIQ-BGP-01-ZZ-DR-C-52-01901

Appendix F

Proposed Drainage Philosophy Plans


Existing Unit
Note: See inset below for final offsite drainage connections.
< Ex. 450Ø SW Drain <
< Ex. 225Ø FW Sewer <
Ex. FW MH
CL 82.730
IL 79.229
Ex. SW MH
CL 82.810
IL 79.638
< Ex. 225Ø FW Sewer <
< Ex. 450Ø SW Drain <
Existing Access Road
Ex. FW MH
CL 83.070
IL 79.755
Proposed Surface Water from the new development is to discharge indirectly through an existing SW drain into Existing Nor Beck culverted watercourse as annotated at restricted discharge rate of 87.0 l/s. Rate is to be agreed with LLFA and Environment Agency.
Ex. SW MH
CL = 83.040
IL = 80.226
Invert level to be checked and confirmed prior to construction. Engineer to be informed of findings.
Ex. SW MH
CL 83.050
IL 80.139
Ex. 225Ø FW Sewer
Ex. 450Ø SW Drain
6.001 | 300mm | 6.440m | 1:99.1
1.006 | 375mm | 9.620m | 1:25.1
< Ex. 375Ø SW >
< Ex. 225Ø FW >
S17
S16
F33
F32
F31
F30
F29
F28
F27
F26
F25
S15
S6
S7
F35
F24
5.003 | 675mm | 10.422m | 1:297.8
Plot 9
FFL 83.300
F34
F38
F37
F36
F23
FG
Proposed Foul Water from the new development to discharge indirectly to Existing United Utilities 675Ø Combined Sewer northwest of site through the sites existing private foul sewerage network. Connection to be made under a Section 106 (to be organised by the contractor)
Ex. FW MH
CL = 83.040
IL = 79.878
Invert level to be checked and confirmed prior to construction. Engineer to be informed of findings.
Downstream Defender®
Select Vortex
DDC21-100-C-375
Flow Control MH
at 87.0 l/s
< 150Ø FW >
6.002 | 1200mm | 20.998m | 1:300
LD1
S5
S4
S10
S9
S13
S12
S14
5.000 | 600mm | 75.879m | 1:299.9
5.000 | 600mm | 50.523m | 1:300.7
Ex. SW MH
CL 83.160
IL 81.011
> Ex. 300Ø SW >
Ex. SW MH
CL 82.860
IL 80.585
> Ex. 450Ø SW >
Ex. SW MH
CL 82.850
IL 80.362
Existing Unit
Future Hub Development
3.001 | 675mm | 3.330m | 1:66.6
1.003 | 675mm | 9.433m | 1:393
*Attenuation Tank
4.000 | 675mm | 36.117m | 1:361.2
Contractor to allow for 525Ø SW Stub to allow future hub development connection. Future Hub Development boundary included within Plot 9 and 12 surface water drainage model as 100% impermeable area.
Rising main to be 90Ø OD PE100 SDR17 to 10 Bar pressure (79.8mm internal dia.) Length = 93.0m. Colour: Black @ 1:150 (rising). Jointing to be butt fusion welded. Total Foul Water Rising Main length 183.0m
Rising main gradient to be laid to pass across the top of SW drain. Thereafter gradient to be adjusted to align with F6 outfall.
1.003 | 1500mm | 34.937m | 1:1452
1.001 | 1500mm | 5.627m | 1:1439
1.001 | 1500mm | 30.934m | 1:1274
S3
S8
S11
S2
S1
2.000 | 450mm | 75.449m | 1:91.8
F22
Rising main to be 90Ø OD PE100 SDR17 to 10 Bar pressure (79.8mm internal dia.) Length = 90.0m. Colour: Black @ 1:150 (falling). Jointing to be butt fusion welded. Total Foul Water Rising Main length 183.0m
Permavoid (or equal approved) Rainwater Diffuser Unit (L708 x W354 x D150) to be installed on inlet (typ.)
Plot 12
FFL 83.400
F15
F16
F17
F21
F18
F10
F11
F20
F4
F5
F9
F8
F2
F12
F13
F14
F3
> 150Ø FW @ 1:60 >
> 150Ø FW @ 1:80 >
> 150Ø FW >
Contractor to allow for below ground 250mm thk. RC28/35 concrete base with A393 mesh (T+B) with 40mm cover on 250mm Type 1 stone. Allow for 300mm GEN3 concrete surround to pump/tank.
Dual Duty/Standby Foul Water Pumping Station to pump at 5.0 l/s discharge rate to be agreed with United Utilities. M+E kiosk to be located adjacent with alarm system. Storage Tank allowed for 24hr breakdown storage volume. Volume to be determined once flows provided by the M&E Engineer.
CL = 83.250
Inlet IL = 80.800
Approx. Outlet IL = 82.050
1.000 | 300mm | 75.398m | 1:249.7
Note: Existing 450Ø SW Drain ultimately discharges to Nor Beck Culverted Watercourse.
Ex. 450Ø SW
Ex. SW MH
Ex. 450Ø SW
Existing Unit
Existing Unit
Existing Unit

- DO NOT SCALE -

1. Cover levels are approximate only and may vary on site. Covers to suit finished levels.
2. Contractor is responsible for positioning MHs so they do not compromise line or level of kerbing or other delineation at the juncture of two surface materials.
3. PPIC manhole diameters may vary and are dependant on manufactures specification and diameter of incoming / outgoing pipes.
4. Concrete manhole diameters are dependant on nominal internal diameter of largest pipe in manhole. See Table A on Typical Manhole Details drawing.

Surface Water Drainage Manhole Schedule - LUF2

MH Ref.	Cover Level	Invert Level	MH Type	MH Dia. (m)	Cover Type	D/S Pipe Length	Depth to Invert	Pipe Size (m)	Depth to Soffit	Gradient	Comments
S1	83.150	81.950	Conc.	1.200	D400	75.398	1.200	0.300	0.900	1:249.7	
S2	83.180	81.648	Conc.	1.200	D400	60.543	1.532	0.300	1.232	1:275.2	
S3	83.680	81.203	Conc.	1.800	D400	34.837	2.477	0.525	1.952	1:452.4	
S4	83.680	80.976	Conc.	2.100	D400	9.433	2.704	0.675	2.029	1:393.0	
S5	83.520	80.952	Conc.	1.800	D400	84.895	2.568	0.675	1.893	1:400.4	
S6	83.100	80.740	Conc.	2.100	D400	5.605	2.360	0.375	1.985	1:100.1	Hydrobrake @ 87.0l/s
S7	83.100	80.684	Conc.	2.100	D400	9.620	2.416	0.375	2.041	1:25.1	
S8	83.750	82.100	Conc.	1.500	D400	75.449	1.650	0.450	1.200	1:91.8	
S9	83.680	81.126	Conc.	1.800	D400	36.117	2.554	0.675	1.879	1:361.2	300mm Silt Trap Sump | 3 no. 225mm Outlets
S10	83.680	81.026	Conc.	1.800	D400	3.330	2.654	0.675	1.979	1:66.6	300mm Silt Trap Sump | 3 no. 225mm Outlets
S11	83.190	81.765	Conc.	1.200	D400	57.271	1.425	0.225	1.200	1:157.8	
S12	83.020	81.516	Conc.	1.500	D400	50.523	1.504	0.600	0.904	1:300.7	
S13	83.420	81.348	Conc.	1.500	D400	75.879	2.072	0.600	1.472	1:299.9	
S14	83.350	81.095	Conc.	1.500	D400	50.998	2.255	0.600	1.655	1:300.0	
S15	83.150	80.850	Conc.	2.100	D400	10.422	2.300	0.675	1.625	1:297.8	
S16	83.200	81.850	Conc.	1.200	D400	64.427	1.350	0.300	1.050	1:115.0	
S17	83.100	81.290	Conc.	1.200	D400	6.440	1.810	0.300	1.510	1:99.1	

1. Cover levels are approximate only and may vary on site. Covers to suit finished levels.
2. Contractor is responsible for positioning MHs so they do not compromise line or level of kerbing or other delineation at the juncture of two surface materials.
3. PPIC manhole diameters may vary and are dependant on manufactures specification and diameter of incoming / outgoing pipes.
4. Concrete manhole diameters are dependant on nominal internal diameter of largest pipe in manhole. See Table A on Typical Manhole Details drawing.

Surface Water Drainage Silt Trap Manhole Schedule - LUF2

MH Ref.	Cover Level	Inlet Invert Level	MH Type	MH Dia. (m)	Cover Type	Comments
S18	83.750	83.050	PPIC	0.600	D400	300mm Silt Trap
S19	83.700	83.000	PPIC	0.600	D400	300mm Silt Trap
S20	83.550	82.850	PPIC	0.600	D400	300mm Silt Trap
S21	83.450	82.750	PPIC	0.600	D400	300mm Silt Trap
S22	83.480	82.780	PPIC	0.600	D400	300mm Silt Trap
S23	83.340	82.640	PPIC	0.600	D400	300mm Silt Trap
S24	83.460	82.760	PPIC	0.600	D400	300mm Silt Trap
S25	83.550	82.850	PPIC	0.600	D400	300mm Silt Trap
S26	83.450	82.750	PPIC	0.600	D400	300mm Silt Trap
S27	83.500	82.800	PPIC	0.600	D400	300mm Silt Trap

1. Cover levels are approximate only and may vary on site. Covers to suit finished levels.
2. Contractor is responsible for positioning MHs so they do not compromise line or level of kerbing or other delineation at the juncture of two surface materials.
3. PPIC manhole diameters may vary and are dependant on manufactures specification and diameter of incoming / outgoing pipes.
4. Concrete manhole diameters are dependant on nominal internal diameter of largest pipe in manhole. See Table A on Typical Manhole Details drawing.

Foul Water Drainage Manhole Schedule - LUF2

MH Ref.	Cover Level	Invert Level	MH Type	MH Dia. (m)	Cover Type	D/S Pipe Length	Depth to Invert	Pipe Size (m)	Depth to Soffit	Comments
~~F1~~	~~83.850~~	~~82.550~~	~~PPIC~~	~~0.450~~	~~B125~~	~~87.000~~	~~0.700~~	~~0.150~~	~~0.550~~	
F2	83.250	82.000	Conc.	1.200	B125	77.000	1.250	0.150	1.100	
F3	83.250	81.000	Conc.	1.200	B125	9.145	2.250	0.150	2.100	
F4	83.250	80.900	Conc.	1.200	B125	4.250	2.350	0.225	2.125	Backdrop = 82.000
△ F5	83.250	80.800 (Inlet)	Specialist	2.600	D400	183.000	N/A	0.09 OD HDPE Pipework	N/A	Dual Standby/Duty FW Pumping Station at 5.0 l/s with 24hr breakdown storage.
F6	83.450	82.100	Conc.	1.200	D400	76.000	1.350	0.150	1.200	
F7	83.000	80.100	Conc.	1.200	D400	3.500	2.900	0.225	2.675	Backdrop = 81.200
F8	83.375	82.100	PPIC	0.600	B125	3.000	1.275	0.150	1.125	
F9	83.375	82.100	PPIC	0.600	B125	3.000	1.275	0.150	1.125	
F10	83.375	82.000	PPIC	0.600	B125	3.000	1.375	0.150	1.225	
F11	83.375	80.960	Conc.	1.200	B125	5.000	2.415	0.150	2.265	
F12	83.375	82.000	PPIC	0.600	B125	3.000	1.375	0.150	1.225	
F13	83.375	82.000	PPIC	0.600	B125	3.000	1.375	0.150	1.225	
F14	83.375	82.000	PPIC	0.600	B125	3.000	1.375	0.150	1.225	
F15	83.400	82.100	Conc.	0.900	D400	26.750	1.300	0.150	1.150	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F16	83.400	81.655	Conc.	1.200	D400	47.270	1.745	0.150	1.595	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F17	83.400	82.315	Conc.	0.900	D400	13.000	1.085	0.150	0.935	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F18	83.350	82.650	PPIC	0.450	B125	10.850	0.700	0.150	0.550	
F19	83.350	82.375	PPIC	0.600	B125	4.250	0.975	0.150	0.825	
F20	83.350	81.065	Conc.	1.200	B125	8.640	2.285	0.150	2.135	Backdrop = 82.260
F21	83.400	82.100	Conc.	0.900	D400	46.285	1.300	0.150	1.150	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F22	83.650	81.450 (Inlet)	Conc.	1.500	D400	See F5 for total rising main length. Rising Main positioned at mid-point.	N/A	0.09 OD HDPE Pipework	N/A	Foul Water Rising Main Wash Out Chamber
F23	83.250	82.550	PPIC	0.450	B125	16.250	0.700	0.150	0.550	
F24	83.250	82.280	PPIC	0.600	B125	8.275	0.970	0.150	0.820	
F25	83.250	82.140	PPIC	0.600	B125	14.500	1.110	0.150	0.960	
F26	83.250	81.955	Conc.	1.200	B125	6.450	1.295	0.150	1.145	
F27	83.250	81.895	Conc.	1.200	B125	11.180	1.355	0.150	1.205	
F28	83.250	81.750	Conc.	1.200	B125	3.440	1.500	0.150	1.350	
F29	83.250	81.700	Conc.	1.200	B125	10.800	1.550	0.150	1.400	
F30	83.250	81.565	Conc.	1.200	B125	4.600	1.685	0.150	1.535	
F31	83.250	81.500	Conc.	1.200	B125	16.370	1.750	0.150	1.600	
F32	83.150	81.330	Conc.	1.200	B125	8.800	1.820	0.150	1.670	
F33	83.200	80.000	Conc.	1.350	D400	N/A	3.200	0.225	2.975	Manhole to be constructed on line of existing 225mm diameter sewer. Invert level to be investigated and confirmed to the engineer prior to any site works.
F34	83.250	82.550	PPIC	0.450	B125	19.700	0.700	0.150	0.550	
F35	83.250	82.550	PPIC	0.450	B125	2.500	0.700	0.150	0.550	
F36	83.300	82.200	Conc.	0.900	D400	23.000	1.100	0.150	0.950	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F37	83.300	82.200	Conc.	0.900	D400	23.000	1.100	0.150	0.950	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.
F38	83.300	82.200	Conc.	0.900	D400	23.000	1.100	0.150	0.950	Stainless steel, double sealed, lockable internal recessed cover. Peter Savage 4500 series heavy duty cover or similar approved. 350mm reducer to prevent man entry to be installed on deep PPIC chamber.

△ All Pumping Station information is subject to change upon detailed design stage. The pumping station is to be designed to accommodate 24hr breakdown storage.

Flow Control Details - (S6)

Hydro-Brake® Optimum Flow Control - Surface/Storm Drainage System
1Nr 361mm Type SH (MD5) Hydro-Brake® Flow Control (Horizontal Discharge)
Technical Criteria: Design / Duty Point Flow = 87.0 l/s with Head = 1.935m
Flush-Flo™ Point Flow = 86.700 l/s Head = 0.646m
Kick-Flo® Point Flow = 73.400 l/s Head = 1.365m
Reference: MD-SHE-0361-8700-1935-8700

NOT FOR CONSTRUCTION

AMENDMENT	BY	REV	CHK	DATE
Stage 4 Issue	JJH	C03	JC	28.11.2025
Stage 4 Issue	JJH	C02	JC	07.11.2025
Stage 4 Issue	JJH	C01	JC	24.10.2025
Stage 3 Issue	JJH	P06	JC	01.10.2025
Stage 3 Issue	JJH	P05	JC	13.09.2025
Stage 3 Issue	JJH	P04	JC	09.01.2025
Draft Stage 3 Issue	JJH	P03	JC	12.12.2024
Issued for Planning	JJH	P02	JC	23.11.2023
Issued for Planning	JJH	P01	JC	22.09.2023

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Client Cumberland Council
Project CMIQ Phase 2 LUF - Unit 9 & 12
BGP Project No. 21T2034
Drawing Title Manhole Schedule

Drawn	Date	Checked	Date	Size	Scale	Rev.
JJH	Aug '23	JC	Aug '23	A1	1:500	C03

Location	Originator	Volume	Level	Form	Role	Unique No.
LUF	BGP	09	XX	D	C	09131

File Reference
LUF-BGP-09-XX-D-C-09131

In instances where this drawing completes or partly completes a contract, Billinghurst George & Partners will consider that it's product has been validated, unless in a period not exceeding 90 working days, the client advises to the contrary.

- DO NOT SCALE -

Legend

- Proposed SW Sewer
- Proposed FW Sewer
- Nor Beck (Culverted)
- Existing SW Sewer
- Existing FW Sewer
- Existing UU Combined Sewer
- Site Boundary
- Linear Drain
- Proposed Attenuation Tank
- Permeable Paved Paving with perf. pipe (Tanked)

G — Highway Gully fitted with Naylor Smart Gully Adapter (or similar approved by LLFA)

Note

This drawing is to be read in conjunction with BGP SuDS Management and Maintenance document reference: LUF-BGP-09-XX-T-C-0003 current revision for Management and Maintenance requirements of elements not included within tables on the drawing.

Note

All flow control devices, pumping stations and petrol interceptors are to be managed and maintained by the contractor until the end of defect period. Client appointed private management company to maintain thereafter.

The flow control devices, pumping stations and petrol interceptors are to be maintained in accordance with the respective manufacturers recommendations and guidance.

Maintenance Requirements

Attenuation Tank	To be managed by the contractor until end of defect period. Client appointed private management company to maintain thereafter	
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Maintain vegetation to designed limits, within the vicinity of below ground drainage pipes and tanks to avoid damage to system	Annually or as required
	Remove sediment from pre-treatment structures and/or internal fore bays	Annually or as required
Remedial Actions	Repair physical damage if necessary	As Required
Monitoring	Inspect check/ all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of the pipe runs for sediment build up and remove if necessary	Every 5 years or as required

Maintenance Requirements

FW Sewers and Manholes	To be managed by the contractor until end of defect period. Client appointed private management company to maintain thereafter	
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually.
Occasional Maintenance	Survey inside of outlet pipes to check for sediment build up and remove if necessary.	Every 5 years or as required.
Remedial Actions	Repair physical damage if necessary.	As Required.

SW Drains and Manholes	To be managed by the contractor until end of defect period. Client appointed private management company to maintain thereafter	
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually.
Occasional Maintenance	Survey inside of outlet pipes to check for sediment build up and remove if necessary.	Every 5 years or as required.
Remedial Actions	Repair physical damage if necessary.	As Required.

Gullies / Linear Drains	To be managed by the contractor until end of defect period. Client appointed private management company to maintain thereafter	
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect access points for silt accumulation to establish silt removal frequencies.	Monthly for 3 months then annually.
	Inspect for ponding on road channel, may be caused by obstruction within gully. Remove by rodding/jetting from access point.	Annually or as required.
Occasional Maintenance	Survey inside of outlet pipes to check for sediment build up and remove if necessary.	Every 5 years or as required.
Remedial Actions	Repair physical damage if necessary.	As Required.

Permeable Car Parking	To be managed by the contractor until end of defect period. Client appointed private management company to maintain thereafter	
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and Vacuuming (standard cosmetic sweep over whole surface).	Yearly, ideally after autumn leaf fall.
Occasional Maintenance	Stabilize and mow contributing and adjacent areas.	As required.
	Removal/management of weeds using glyphospate applied directly into the weeds by an applicator rather than spraying.	As required, once per year on infrequently used pavements.
Remedial Actions	Remediate any landscaping which has been raised to within 50mm of the level of the paving.	As Required.
	Remedial work to any depressions, rutting and cracked/broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material.	As Required.
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10-15 years or as required.

Note: See inset below for final offsite drainage connections.

Proposed Surface Water from the new development is to discharge indirectly through an existing SW drain into Existing Nor Beck culverted watercourse as annotated at restricted discharge rate of 87.0 l/s. Rate is to be agreed with LLFA and Environment Agency.
Ex. SW MH
CL = 83.040
IL = 80.226
Invert level to be checked and confirmed prior to construction. Engineer to be informed of findings.

Proposed Foul Water from the new development to discharge indirectly to Existing United Utilities 675Ø Combined Sewer northwest of site through the sites existing private foul sewerage network. Connection to be made under a Section 106 (to be organised by the contractor)
Ex. FW MH
CL = 83.040
IL = 79.678
Invert level to be checked and confirmed prior to construction. Engineer to be informed of findings.

Downstream Defender®
Select Vortex
DDC21-100-C-375
Flow Control MH
at 87.0 l/s

Note: Existing 450Ø SW Drain ultimately discharges to Nor Beck Culverted Watercourse.

Plot 9
FFL 83.300

Plot 12
FFL 83.400

Contractor to allow for 525Ø SW Stub to allow future hub development connection. Future Hub Development boundary included within Plot 9 and 12 surface water drainage model as 100% impermeable area.

Rising main to be 90Ø OD PE100 SDR17 to 10 Bar pressure (79.8mm internal dia.) Length = 93.0m. Colour: Black @ 1:150 (rising). Jointing to be butt fusion welded. Total Foul Water Rising Main length 183.0m

Rising main gradient to be laid to pass across the top of SW drain. Thereafter gradient to be adjusted to align with F6 outfall.

Permavoid (or equal approved) Rainwater Diffuser Unit (L708 x W354 x D150) to be installed on inlet (typ.)

Dual Duty/Standby Foul Water Pumping Station to pump at 5.0 l/s discharge rate to be agreed with United Utilities. M+E kiosk to be located adjacent with alarm system. Storage Tank allowed for 24hr breakdown storage volume. Volume to be determined once flows provided by the M&E Engineer.
CL = 83.250
Inlet IL = 80.800
Approx. Outlet IL = 82.050

Inset of Offsite Drainage Outfalls
Scale 1:1000

NOT FOR CONSTRUCTION

Stage 4 Issue	JJH	C03	JC	28.11.2025
Stage 4 Issue	JJH	C02	JC	07.11.2025
Stage 4 Issue	JJH	C01	JC	24.10.2025
Stage 3 Issue	JJH	P04	JC	01.10.2025
Stage 3 Issue	JJH	P03	JC	13.09.2025
Stage 3 Issue	JJH	P02	JC	09.01.2025
Draft Stage 3 Issue	JJH	P01	JC	18.12.2024
AMENDMENT	BY	REV	CHK	DATE

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Client	Cumberland Council
Project	CMIQ Phase 2 LUF - Unit 9 & 12
BGP Project No.	21T2034
Drawing Title	SuDS Maintenance Plan

Drawn	Date	Checked	Date	Size	Scale	Rev.
JJH	Dec '24	JC	Dec '24	A1	1:500	C03

Location	Originator	Volume	Level	Form	Role	Unique No.
LUF	BGP	09	XX	D	C	09150

File Reference LUF-BGP-09-XX-D-C-09150

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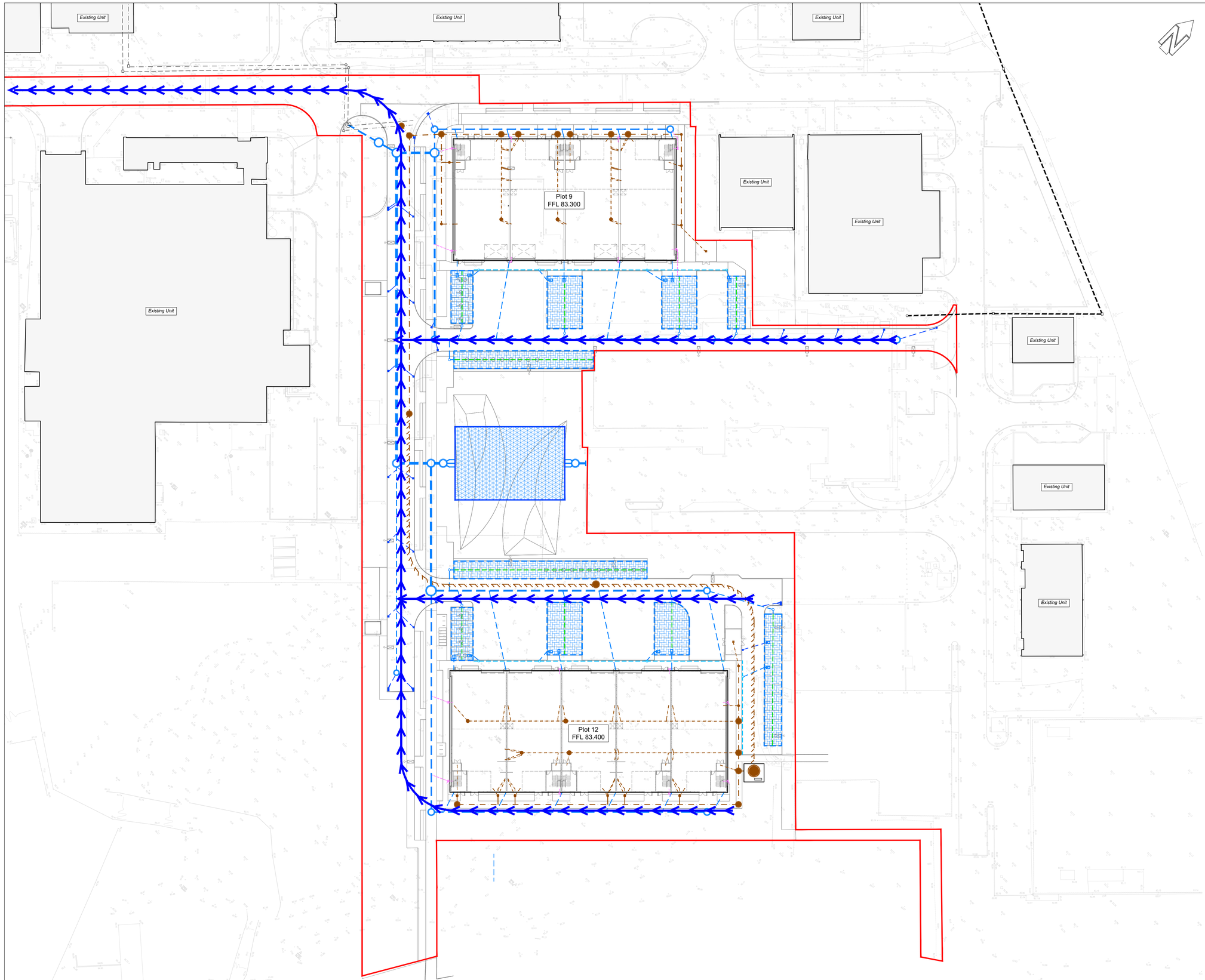

- DO NOT SCALE -

Notes

1. Routes shown are based on White Young Green topographic survey.
2. Overland flood exceedance flow routes indicate the proposed route of surface water when a rainfall event exceeds the designed capacity of the proposed drainage network or when blockages occur. It is intended that where flow paths are located falls are designed to direct surface water away from property. Final routes and proposal subject to agreement with the LLFA at Cumbria County Council.

S.H.E.
Do not excavate until all underground services have been identified and marked out. Refer to service providers drawings and to the utilities survey drawings. Unknown underground services may exist. Check for services by carrying out a scan with a cable avoidance tool.

Legend

- Proposed SW Sewer
- Proposed FW Sewer
- Nor Beck (Culverted)
- Existing SW Sewer
- Existing FW Sewer
- Existing UU Combined Sewer
- Hub Redline Boundary
- Proposed Attenuation Tank
- Tanked Permeable Paved Parking Bays with perf. pipe
- Flood Exceedance Flow Path (Based on a Complete Drainage System Failure) — FLOOD EXCEEDANCE FLOW ROUTE

NOT FOR CONSTRUCTION

Stage 4 Issue	JJH	C03	JC	28.11.2025
Stage 4 Issue	JJH	C02	JC	07.11.2025
Stage 4 Issue	JJH	C01	JC	24.10.2025
Stage 3 Issue	JJH	P06	JC	01.10.2025
Stage 3 Issue	JJH	P05	JC	13.09.2025
Stage 3 Issue	JJH	P04	JC	09.01.2025
Draft Stage 3 Issue	JJH	P03	JC	12.12.2024
Issued for Planning	JJH	P02	JC	23.11.2023
Issued for Planning	JJH	P01	JC	22.09.2023
AMENDMENT	BY	REV	CHK	DATE

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Client	Cumberland Council
Project	CMIQ Phase 2 LUF - Unit 9 & 12
BGP Project No.	21T2034
Drawing Title	Flood Exceedance Plan

Drawn	Date	Checked	Date	Size	Scale	Rev.
JJH	Aug '23	JC	Aug '23	A1	1:500	C03

Location	Originator	Volume	Level	Form	Role	Unique No.
LUF	BGP	09	XX	D	C	09102

File Reference
LUF-BGP-09-XX-D-C-09102

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Appendix G

Borehole Logs

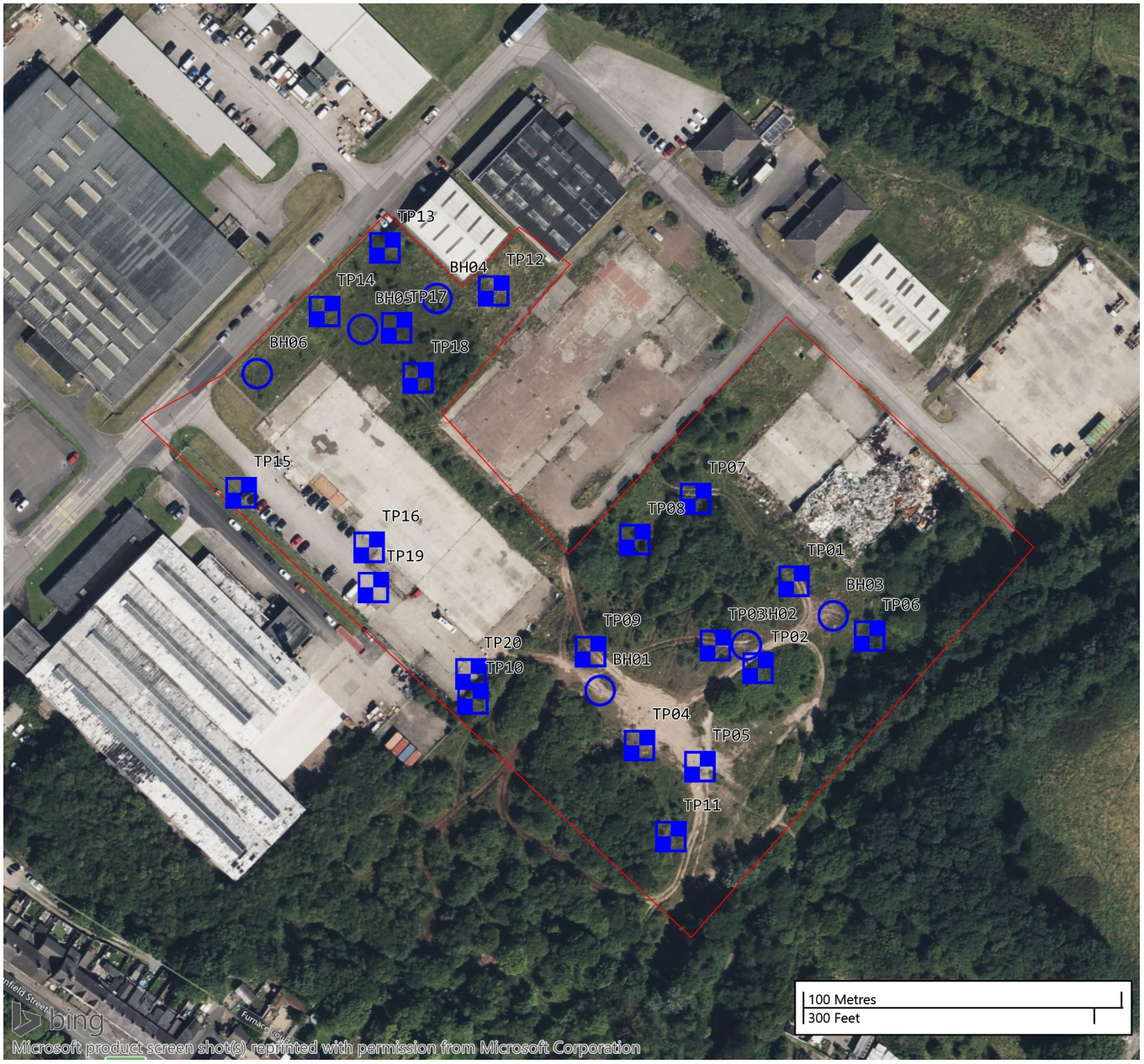

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Figure Title

Exploratory Hole Location Plan

Project Number

S240720

Project Name

Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria

Client

Morgan Sindall

Date

September 2024

DRG Number

Figure 2

Scale

1:2000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - RO
- Locations By Type - TP
- Project Bounds - Project Bounds

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Trial Pit Log

TrialPit No
TP01
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301758E - 515473N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.20	2.60 × 1.00
Client:	Morgan Sindall		Date 12/08/2024 Scale 1:26 Logged SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10 0.10 - 0.60	B+ES B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.60 - 1.00	B+ES		0.60			MADE GROUND: Soft to firm dark reddish brown slightly sandy, slightly gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, sandstone, mudstone, siltstone and quartz. Cobbles are sub-angular to sub-rounded of slag like material, sandstone and siltstone.
	1.00 - 1.50	B+ES					MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
	2.00	B					
	3.00	B					
	3.20	B		3.20			End of Pit at 3.200m

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP02
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301746E - 515446N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 4.10	2.00 × 1.00
Client:	Morgan Sindall		

Date: 12/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10 0.10 - 0.60	B+ES B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
▼							MADE GROUND: Firm dark reddish brown slightly sandy, slightly gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, sandstone, mudstone, siltstone and quartz. Cobbles are sub-angular to sub-rounded of slag like material, sandstone and siltstone.
	1.80 - 2.00	B		1.80			MADE GROUND: Black, dark grey slightly clayey, gravelly Sand with a low-medium cobble content. Sand is fine to coarse grained of ash. Gravel is angular to sub-rounded, fine to coarse of slag like material, mudstone and sandstone. Cobbles are angular to sub-angular of slag like material.
	2.10 2.20	B B		2.10			Stiff dark reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone. Thin silt lenses noted from 3.00mbgl.
	2.50	HV	65kPa				
	3.00	HV	80kPa				
	4.00	B					
				4.10			End of Pit at 4.100m

1
2
3
4
5

Remarks: Groundwater encountered at 0.60m.

Stability: Pit open with instability from 3.00m.

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Trial Pit Log

TrialPit No
TP03
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301732E - 515453N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 0.10	2.00 / 2.00
Client:	Morgan Sindall		

Date: 12/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10 0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
							MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
							End of Pit at 0.100m

1
2
3
4
5

Remarks: Groundwater from surface level, ground saturated.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No: TP04
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301708E - 515423N Level:
Plant Used:	JCB 3CX	Dimensions (m):	Depth 4.00
Client:	Morgan Sindall	2.00 × 1.00	Logged SM

Date: 12/08/2024
Scale: 1:26

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10 0.10 - 0.60	B+ES B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
▼	1.00	B+ES					MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
	1.85 - 2.30	B+ES		1.85			MADE GROUND: Black, dark grey slightly clayey, gravelly Sand with a low-medium cobble content. Sand is fine to coarse grained of ash. Gravel is angular to sub-rounded, fine to coarse of slag like material, mudstone and sandstone. Cobbles are angular to sub-angular of slag like material.
	2.30	B+ES		2.30			Stiff dark reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	3.00 3.00	B HV	70kPa				
	4.00 4.00	B HV	80kPa	4.00			End of Pit at 4.000m

Remarks: Groundwater seepage from 0.55m.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP05
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301727E - 515415N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 4.00	2.00 × 1.00
Client:	Morgan Sindall		

Date: 12/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10 0.10 - 0.60	B+ES B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	1.00	B+ES					MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
	2.00	B					
	2.30	B+ES		2.30			Stiff dark reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	3.00	HV	68kPa				
	4.00 4.00	B HV	85kPa	4.00			End of Pit at 4.000m

Remarks: Groundwater encountered at 1.30m.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP06
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301781E - 515455N Level:
Plant Used:	JCB 3CX	Dimensions (m):	2.90 × 1.20 Depth 3.20
Client:	Morgan Sindall		

Date: 12/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10 0.10 - 0.60	B+ES B+ES					MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
				0.60			MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
▼	1.00	B+ES					
				1.45			MADE GROUND: Greyish white sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
				1.85			
	2.00	B		2.05			MADE GROUND (RE-WORKED): Soft to firm dark greyish black, slightly sandy, gravelly, low strength silty Clay, with a strong hydrocarbon odour noted and reflective sheen coating gravels. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of of mudstone, siltstone and sandstone.
	2.30	B+ES					Stiff dark reddish brown, slightly sandy, slightly gravelly high strength CLAY of intermediate plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	3.00	HV	85kPa				
				3.20			End of Pit at 3.200m

1
2
3
4
5

Remarks: Groundwater encountered at 1.30m.

Stability: Pit open and stable on completion.

SOLMEK
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Trial Pit Log

TrialPit No
TP07
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301727E - 515500N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.20	3.20 × 1.80
Client:	Morgan Sindall		

Date: 13/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10 - 0.20	B+ES		0.15			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.60	B+ES					MADE GROUND: Dark reddish brown, slightly sandy, gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, red-brick, dolomite, breeze block, mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone and slag like material.
	1.00	B+ES		0.95			MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
	2.00	B					
				2.75			MADE GROUND: Reddish brown and grey very sandy Gravel with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material and dolomite.
	3.00	B		3.05			
	3.10	B		3.20			MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
							End of Pit at 3.200m

1 2 3 4 5

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP08
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301708E - 515487N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.20	3.20 × 1.60
Client:	Morgan Sindall		

Date: 14/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10 - 0.20	B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.60	B+ES					MADE GROUND: Firm dark reddish brown, slightly sandy, gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, red-brick, dolomite, breeze block, mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone and slag like material.
	1.00	B+ES					
	2.00	B		2.00			MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation. Material here appears more intact, rate of penetration with pecker much reduced.
	3.00	B					
				3.20			End of Pit at 3.200m

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP09
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301693E - 515452N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.20	3.20 × 1.60
Client:	Morgan Sindall		

Date: 14/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10 - 0.20	B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.60	B+ES		0.60			MADE GROUND: Soft to firm dark reddish brown, slightly sandy, gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, red-brick, dolomite, breeze block, mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone and slag like material.
							MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
				3.20			End of Pit at 3.200m

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Remarks: Groundwater ingress due to weather conditions, wider site area saturated.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP10
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301655E - 515438N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.00	Date 20/08/2024 Scale 1:26
Client:	Morgan Sindall		Logged SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00	B+ES		0.10			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.50	B+ES					Firm to stiff brown slightly sandy, slightly gravelly CLAY, with a low-cobble content. Sand is fine to coarse grained. Gravel is subangular to sub-rounded, fine to coarse of mudstone and sandstone. Cobbles are subangular of sandstone.
	1.00	B+ES		0.80			Very stiff reddish brown, slightly sandy, gravelly CLAY, with a medium cobble content. Sand is fine to coarse grained. Gravel is subangular to sub-rounded, fine to coarse of mudstone and sandstone. Cobbles are angular of sandstone
	1.50	HV	95kPa				
	2.00	B					
	3.00	B		3.00			End of Pit at 3.000m

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Remarks: Groundwater ingress due to weather conditions, wider site area saturated.

Stability:

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Trial Pit Log

TrialPit No
TP11
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301717E - 515394N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.60	2.60 × 1.40
Client:	Morgan Sindall		

Date: 12/08/2024
Scale: 1:26
Logged: SM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B+ES		0.15			MADE GROUND: Reddish brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.20 - 0.30	B+ES					MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
▼	1.00	B+ES					
	2.00	B		2.30			MADE GROUND (RE-WORKED): Soft to firm dark greyish black, slightly sandy, gravelly, low strength silty Clay, with a strong hydrocarbon odour noted and reflective sheen coating gravels. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material.
	2.80	ES		2.90			Stiff dark reddish brown, slightly sandy, slightly gravelly high strength CLAY of low plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	3.00	B					
	3.30	HV	90kPa	3.60			End of Pit at 3.600m

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Remarks: Groundwater encountered at 0.45m.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP12
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301665E - 515567N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 1.80	Date 20/08/2024 Scale 1:26
Client:	Morgan Sindall		Logged DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B+ES		0.15			MADE GROUND: Dark brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with frequent rootl. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.40	B+ES		0.45			MADE GROUND: Brown sandy gravel with occasional angular cobble of slag. Gravel is angular to subrounded, fine to coarse of slag and red brick.
	0.90	B+ES		0.96			MADE GROUND: Grey very sandy gravel with frequent subangular cobbles of slag.
	1.40	B		1.80			MADE GROUND: Stiff to firm brown mottled sandy slightly gravel clay. Gravel is angular to subrounded, fine of sandstone, slag and red brick.
							End of Pit at 1.800m

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Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP13
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301630E - 515581N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.00	2.00 × 1.00
Client:	Morgan Sindall		

Date: 22/08/2024
Scale: 1:26
Logged: DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	B+ES		0.30			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.50	B+ES		0.60			MADE GROUND: Soft brown, sandy, slightly gravelly clay, with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, sandstone and slag like material. Cobbles are angular of sandstone.
	1.00	B+ES					MADE GROUND: Brown slightly clayey sandy Gravel with a medium cobble and low boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material.
▽	1.50	B		1.50			Stiff dark reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	2.00	HV	70kPa				
	2.50	B					
	3.00	HV	90kPa	3.00			End of Pit at 3.000m

Remarks: Groundwater encountered at 1.53m.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP14
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301611E - 515562N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 4.00	2.90 × 1.20
Client:	Morgan Sindall		Date 22/08/2024 Scale 1:26 Logged DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B+ES		0.20			MADE GROUND: Dark grey sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.60	B+ES		0.80			MADE GROUND (RE-WORKED): Brown gravelly sandy, silty Clay, Sand is fine to coarse grained. Gravel is angular to subrounded fine to coarse of sandstone, slag like material and mudstone.
	1.10	B+ES		1.50			MADE GROUND: Brown and grey gravelly ashy Sand with a low cobble and low boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material, sandstone and redbrick. Cobbles are angular of slag like material and redbrick. Boulders are angular of slag like material.
	1.60	B+ES					MADE GROUND: Grey gravelly ashy Sand with a medium cobble and low boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material
	2.10	B					
	2.60	B		2.70			MADE GROUND: Blue and brown sandy Gravel with a high cobble and high boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation
	3.10	B+ES					
	3.60	B		4.00			End of Pit at 4.000m

1 2 3 4 5

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP15
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301583E - 515505N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 2.50	3.20 × 1.80
Client:	Morgan Sindall		Date 19/08/2024 Scale 1:26 Logged DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B+ES		0.15			MADE GROUND: Black Tarmac.
	0.50	B+ES		0.54			MADE GROUND: Brown slightly silty sandy Gravel with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material and dolomite. Cobbles are angular of slag like material and dolomite.
	1.00 1.00	B+ES HV	70kPa				Stiff reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low cobble content. Sand is fine to coarse grained. Gravel is subangular to sub-rounded, fine to coarse of mudstone and sandstone. Cobbles are subangular of sandstone.
	2.00 2.10	B HV	85kPa				
				2.50			End of Pit at 2.500m

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Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP16
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301624E - 515487N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.00	3.20 × 1.60
Client:	Morgan Sindall		Date 19/08/2024 Scale 1:26 Logged DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.11			MADE GROUND: Black Tarmac.
	0.30	B+ES		0.32			MADE GROUND: Brown slightly silty very sandy Gravel with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material and red brick. Cobbles are angular of slag like material.
	0.80	B+ES					Stiff reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low cobble content. Sand is fine to coarse grained. Gravel is subangular to sub-rounded, fine to coarse of mudstone and sandstone. Cobbles are subangular of sandstone.
	1.00	HV	55kPa				
	1.80	B					
	2.00	HV	86kPa				
	2.80	B					
	3.00	HV	95kPa	3.00			End of Pit at 3.000m

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Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP17
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301634E - 515556N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 2.30	3.20 × 1.60
Client:	Morgan Sindall		

Date: 22/08/2024
Scale: 1:26
Logged: DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B+ES		0.15			MADE GROUND: Brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.30	B+ES		0.35			MADE GROUND: Brown grey very gravelly Sand with a medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material.
	0.80	B+ES		0.91			MADE GROUND: Firm brown, sandy, gravelly Clay, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, red-brick, mudstone and sandstone. Cobbles are angular of sandstone and slag like material.
	1.30	B+ES					MADE GROUND: White and grey slightly sandy Gravel with a high cobble and high boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. Fused slag like material. Soil description based on methodology of excavation.
	1.80	B+ES					
	2.30	B+ES		2.30			End of Pit at 2.300m

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP18
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301640E - 515540N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.40	2.60 × 1.40
Client:	Morgan Sindall		

Date: 20/08/2024
Scale: 1:26
Logged: DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00	B+ES					MADE GROUND: Dark brown, locally dark brown slightly sandy, slightly gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite, mudstone and quartz.
	0.20	B+ES		0.30			MADE GROUND (RE-WORKED): Firm reddish brown sandy, gravelly Clay. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, sandstone, mudstone.
	0.70	B+ES					
	1.20	B+ES		1.10			MADE GROUND: White and grey slightly sandy Gravel with a high cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material. (Fused slag like material). Soil description based on methodology of excavation.
	2.20	B+ES					
				3.40			End of Pit at 3.400m

Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP19
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301625E - 515474N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.00	2.00 × 1.00
Client:	Morgan Sindall		

Date: 19/08/2024
Scale: 1:26
Logged: DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.11			MADE GROUND: Black Tarmac.
	0.30	B+ES		0.32			MADE GROUND: Bluish grey slightly sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material.
	0.80	B+ES					Stiff reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of low plasticity, with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	1.00	HV	90kPa				
	1.80	B					
	2.00	HV	70kPa				
	2.80	B					
	3.00	HV	100kPa	3.00			End of Pit at 3.000m

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Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Trial Pit Log

TrialPit No
TP20
Sheet 1 of 1

Project Name:	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	Project No. S240720	Co-ords: 301655E - 515446N Level:
Plant Used:	JCB 3CX	Dimensions (m): Depth 3.00	2.90 × 1.20
Client:	Morgan Sindall		Date 20/08/2024 Scale 1:26 Logged DL

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15			MADE GROUND: Concrete Slab.
	0.50	B+ES		0.63			MADE GROUND: Brown slightly clayey sandy Gravel with a medium cobble and medium boulder content. Sand is fine to coarse grained. Gravel is angular to sub-angular of slag like material. Cobbles are angular of slag like material. Boulders are angular of slag like material.
	1.00 1.00	B+ES HV	70kPa				Stiff dark reddish brown, slightly sandy, slightly gravelly medium to high strength CLAY of intermediate plasticity, with a low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mudstone, siltstone and sandstone. Cobbles are angular of siltstone and sandstone.
	2.00 2.00	B HV	85kPa				
	3.00 3.00	B HV	90kPa	3.00			End of Pit at 3.000m

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Remarks: No groundwater encountered.

Stability: Pit open and stable on completion.

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Rotary Open Hole Log

Scale 1:50 Sheet 1 of 4

RBH01

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	06/08/2024
Client:	Morgan Sindall			**Ended:**	08/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	08/08/2024

GL (AOD):	
Easting:	301695.64
Northing:	515440.04
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.10		MADE GROUND: Brown sandy, gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite and sandstone.	0.05 - 0.10	B+ES					
				MADE GROUND: Bluish grey sandy Gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material. (Recovered as due to drilling methodology)	1.20 - 1.65	SPT (S)	N=50+ (11,13/17,22,11)				
					1.20 - 1.65	D					
		1.70		MADE GROUND: Black gravelly Sand. Sand is fine to coarse grained of ash. Gravel is angular to sub-rounded, fine to medium of slag like material and red-brick.	1.95	EW					
		2.30		Firm to stiff dark reddish brown slightly sandy, gravelly medium to high strength CLAY of low plasticity, with an inferred low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded fine to coarse of mudstone, siltstone and sandstone.	2.70 - 3.15	SPT (S)	N=19 (11,7/4,4,6,5)				
					2.70 - 3.15	D					
					4.20 - 4.65	SPT (S)	N=22 (3,4/5,5,6,6)				
					4.20 - 4.65	D					
					5.70 - 6.15	SPT (S)	N=40 (1,3/8,9,13,10)				
					5.70 - 6.15	D					
					7.20 - 7.65	SPT (S)	N=50+ (11,14/20,30)				
					7.20 - 7.65	D					
		8.50		Very dense light organish brown very gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.	8.70 - 9.15	SPT (S)	N=50+ (25/50)				
					8.70 - 9.15	D					
		9.70		Stiff dark reddish brown slightly sandy, gravelly medium to high							

Hole Diameter

Depth Base (m)	Diameter (mm)
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 1.95m, 29.50m, 30.20m & 35.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.50	22.00	Water	100
22.00	23.00	Water	100
23.00	24.30	Water	100
24.30	27.45	Water	100
27.45	30.00	Water	100
30.00	36.70	Water	100
36.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
1.95	1.90	4.20	20	1.55
29.50	15.00			
30.20				
35.50				

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Rotary Open Hole Log

Scale 1:50 | Sheet 2 of 4

RBH01

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client:	Morgan Sindall		
Method:	Rotary Core with Rotary open Hole		

Driller:	L&A Drilling Ltd	**GL (AOD):**	
Plant used:	Beretta T46	**Easting:**	301695.64
Started:	06/08/2024	**Northing:**	515440.04
Ended:	08/08/2024	**Logged:**	SM
Backfilled:	08/08/2024	**Status:**	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Stiff dark reddish brown slightly sandy, gravelly medium to high strength CLAY. Sand is fine to coarse grained. Gravel is sub-angular to sub-rounded, fine to coarse of mixed lithologies.	10.20 - 10.65	SPT (S)	N=28 (4,6/6,7,7,8)				
					10.20 - 10.65	D					
					11.70 - 12.15	SPT (S)	N=45 (4,7/9,10,12,14)				
					11.70 - 12.00	B					
					11.70 - 12.15	D					
					12.00 - 12.30	D					
					12.30 - 12.50	B					
		12.00		Light organish brown very gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.							
		12.30		Extremely weak dark greyish brown argillaceous MUDSTONE (WHITEHAVEN SANDSTONE FORMATION).	12.50 - 12.95	SPT (S)	N=50+ (8,12/14,17,19)				
					12.50 - 12.95	D					
					14.00 - 14.45	SPT (S)	N=50+ (6,8/11,15,15,9)				
					14.00 - 14.45	D					
		15.50		Extremely weak dark greyish brown argillaceous MUDSTONE (WHITEHAVEN SANDSTONE FORMATION). Weathering: Distinctly weathered - residual Fractures: Fractures are very closely spaced, planar smooth, open, with occasional orange brown staining on fracture surfaces.	15.50 - 15.95	SPT (S)	N=50+ (6,10/13,16,21)	35	35	35	NI 120 400
					15.50 - 15.95	D					
		17.00		Dark greyish brown MUDSTONE.	17.00 - 17.45	SPT (S)	N=40 (5,9/9,10,11,10)				
					17.00 - 17.45	D					
					18.50 - 18.95	SPT (S)	N=50+ (10,15/23,27)				
					18.50 - 18.95	D					

Hole Diameter

Depth Base (m)	Diameter (mm)
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 1.95m, 29.50m, 30.20m & 35.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.50	22.00	Water	100
22.00	23.00	Water	100
23.00	24.30	Water	100
24.30	27.45	Water	100
27.45	30.00	Water	100
30.00	36.70	Water	100
36.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
1.95	1.90	4.20	20	1.55
29.50	15.00			
30.20				
35.50				

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Scale 1:50 | Sheet 3 of 4

RBH01

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	06/08/2024
Client:	Morgan Sindall			**Ended:**	08/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	08/08/2024

GL (AOD):	
Easting:	301695.64
Northing:	515440.04
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Dark greyish brown MUDSTONE.							
		22.00		Dark purplish MUDSTONE/SILTSTONE.							
		23.00		Light grey MUDSTONE.							
		24.30		Dark grey interbedded MUDSTONE AND SILTSTONE.							
		27.45		Light grey MUDSTONE.							
		30.00									

Hole Diameter

Depth Base (m)	Diameter (mm)
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 1.95m, 29.50m, 30.20m & 35.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.50	22.00	Water	100
22.00	23.00	Water	100
23.00	24.30	Water	100
24.30	27.45	Water	100
27.45	30.00	Water	100
30.00	36.70	Water	100
36.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
1.95	1.90	4.20	20	1.55
29.50	15.00			
30.20				
35.50				

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Rotary Open Hole Log

Scale 1:50 Sheet 4 of 4

RBH01

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	06/08/2024
Client:	Morgan Sindall			**Ended:**	08/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	08/08/2024

GL (AOD):	
Easting:	301695.64
Northing:	515440.04
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light greyish white SANDSTONE.							
		36.70		Dark grey MUDSTONE.							
		40.00		End of Borehole at 40.000m							

Hole Diameter

Depth Base (m)	Diameter (mm)
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 1.95m, 29.50m, 30.20m & 35.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.50	22.00	Water	100
22.00	23.00	Water	100
23.00	24.30	Water	100
24.30	27.45	Water	100
27.45	30.00	Water	100
30.00	36.70	Water	100
36.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
1.95	1.90	4.20	20	1.55
29.50	15.00			
30.20				
35.50				

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Rotary Open Hole Log

Scale 1:50 Sheet 1 of 4

RBH02

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client:	Morgan Sindall		
Method:	Rotary Core with Rotary open Hole		

Driller:	L&A Drilling Ltd
Plant used:	Beretta T46
Started:	13/08/2024
Ended:	14/08/2024
Backfilled:	14/08/2024

GL (AOD):	
Easting:	301742.16
Northing:	515453.39
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.20		MADE GROUND: Brown sandy, gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite and sandstone.							
				MADE GROUND: Bluish grey sandy Gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material. (Recovered as due to drilling methodology)	1.20 - 1.65 1.20 - 1.65	SPT (S) D	N=36 (4,5/8,8,10,10)				
					2.70 - 3.15 2.70 - 3.15	SPT (S) D	N=38 (7,9/6,10,10,12)				
		3.70		Soft to firm dark greyish black, slightly sandy, slightly gravelly low strength silty CLAY. Sand is fine to coarse grained. Gravel is sub-angular to sub-rounded, fine to medium of mudstone and sandstone.							
		4.00		Firm to stiff dark reddish brown slightly sandy, gravelly medium to high strength CLAY, with an inferred low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded fine to coarse of mudstone, siltstone and sandstone.	4.30 - 4.75 4.30 - 4.75	SPT (S) D	N=14 (1,2/3,3,4,4)				
		5.60		Light organish brown very gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.	5.70 - 6.15 5.70 - 6.15	SPT (S) D	N=36 (5,6/6,6,10,14)				
					7.20 - 7.65 7.20 - 7.65	SPT (S) D	N=49 (18,7/14,18,10,7)				
		7.70		Dense reddish brown, slightly clayey, gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.							
					8.70 - 9.15 8.70 - 9.15	SPT (S) D	N=31 (5,7/7,8,7,9)				

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.60m, 9.10m and 29.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.20	22.80	Water	100
22.80	30.20	Water	100
30.20	34.40	Water	100
34.40	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.60			20	5.20
9.10			20	8.65
29.50				

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Rotary Open Hole Log

RBH02

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	13/08/2024
Client:	Morgan Sindall			**Ended:**	14/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	14/08/2024

GL (AOD):	
Easting:	301742.16
Northing:	515453.39
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Dense reddish brown, slightly clayey, gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.	10.20 - 10.65	SPT (S)	N=38 (6,7/10,9,10,9)				
					10.20 - 10.65	D					
		11.20		Extremely weak dark greyish brown argillaceous MUDSTONE. (WHITEHAVEN SANDSTONE FORMATION).	11.70 - 12.15	SPT (S)	N=50+ (8,12/21,29)				
					11.70 - 12.15	D					
					13.20 - 13.65	SPT (C)	N=50+ (17,8/44,6)				
					14.70 - 15.15	SPT (C)	N=50+ (20,5/33,17)				
					16.20 - 16.65	SPT (C)	N=50+ (25/50)				
		18.20		Light grey MUDSTONE.							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.60m, 9.10m and 29.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.20	22.80	Water	100
22.80	30.20	Water	100
30.20	34.40	Water	100
34.40	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.60			20	5.20
9.10			20	8.65
29.50				

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Rotary Open Hole Log

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RBH02

Contract no: S240720
Site: Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client: Morgan Sindall
Method: Rotary Core with Rotary open Hole

Driller: L&A Drilling Ltd
Plant used: Beretta T46
Started: 13/08/2024
Ended: 14/08/2024
Backfilled: 14/08/2024

GL (AOD):
Easting: 301742.16
Northing: 515453.39
Logged: SM
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light grey MUDSTONE.							
		22.80		Light greyish white SANDSTONE.							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.60m, 9.10m and 29.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.20	22.80	Water	100
22.80	30.20	Water	100
30.20	34.40	Water	100
34.40	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.60			20	5.20
9.10			20	8.65
29.50				

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Rotary Open Hole Log

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RBH02

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	13/08/2024
Client:	Morgan Sindall			**Ended:**	14/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	14/08/2024

GL (AOD):		
Easting:	301742.16	
Northing:	515453.39	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light greyish white SANDSTONE.							
		30.20		Dark grey thinly interbedded MUDSTONE AND SILTSTONE.							
		34.40		Light greyish white SANDSTONE.							
		40.00		End of Borehole at 40.000m							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.60m, 9.10m and 29.50m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
18.20	22.80	Water	100
22.80	30.20	Water	100
30.20	34.40	Water	100
34.40	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.60			20	5.20
9.10			20	8.65
29.50				

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Rotary Open Hole Log

Scale 1:50 Sheet 1 of 4

RBH03

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	08/08/2024
Client:	Morgan Sindall			**Ended:**	12/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	12/08/2024

GL (AOD):	
Easting:	301769.92
Northing:	515462.03
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
		0.10		MADE GROUND: Brown sandy, gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite and sandstone.							
		0.70		MADE GROUND: Dark reddish brown slightly sandy, gravelly Clay with some fine to medium plant rootlets, a low-medium cobble content and a low boulder content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, sandstone and mudstone. Cobbles are sub-angular of slag like material. Boulders are sub-angular of slag like material.	1.20 - 1.65 1.20 - 1.65	SPT (S) D	N=45 (4,5/8,8,12,17)				
				MADE GROUND: Bluish grey sandy Gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material. (Recovered as due to drilling methodology)							
G					2.70 - 3.15 2.70 - 3.15	SPT (S) D	N=20 (7,14/7,6,4,3)				
		3.10		Soft to firm dark greyish black, slightly sandy, slightly gravelly low strength silty CLAY. Sand is fine to coarse grained. Gravel is sub-angular to sub-rounded, fine to medium of mudstone and sandstone.							
		3.70		Firm to stiff dark reddish brown slightly sandy, gravelly medium to high strength CLAY, with an inferred low-medium cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded fine to coarse of mudstone, siltstone and sandstone.	4.20 - 4.65 4.20 - 4.65	SPT (S) D	N=26 (3,4/6,7,7,6)				
		4.50		Light brown very gravelly SAND, with an inferred low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.							
		4.80		Firm dark reddish brown very sandy, slightly gravelly medium strength CLAY. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of sandstone, mudstone and quartz.	5.70 - 6.15 5.70 - 6.15	SPT (S) D	N=30 (5,4/6,7,8,9)				
		7.20		Extremely weak Light greyish brown arenaceous SANDSTONE. (WHITEHAVEN SANDSTONE FORMATION). Weathering: Residual/destructured.	7.20 - 7.65 7.20 - 7.65	SPT (S) D	N=50+ (7,16/50)				
		8.00		Medium strong greyish white very thinly bedded, fine to medium grained micaceous SANDSTONE (WHITEHAVEN SANDSTONE FORMATION) with 2-5mm haematite veins noted throughout. Weathering: Distinctly weathered becoming partially unweathered at 13.20m Fractures: Fracture sub-set 1: Fractures are closely spaced parallel to bedding (sub-horizontal) planar, rough, open, with occasional haematite deposition noted on fracture surfaces. Fracture sub-set 2: Fractures are closely spaced perpendicular to bedding (sub-vertical) stepped, rough, open, with haematite deposition noted on fracture surfaces.	8.70 - 9.15 8.70 - 9.15	SPT (S) D	N=50+ (25/50)				

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.05m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
14.70	30.30	Water	100
30.30	33.70	Water	100
33.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.05	3.00			

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Rotary Open Hole Log

Scale 1:50 Sheet 2 of 4

RBH03

Contract no: S240720
Site: Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client: Morgan Sindall
Method: Rotary Core with Rotary open Hole

Driller: L&A Drilling Ltd
Plant used: Beretta T46
Started: 08/08/2024
Ended: 12/08/2024
Backfilled: 12/08/2024

GL (AOD):
Easting: 301769.92
Northing: 515462.03
Logged: SM
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Medium strong greyish white very thinly bedded, fine to medium grained micaceous SANDSTONE (WHITEHAVEN SANDSTONE FORMATION) with 2-5mm haematite veins noted throughout. Weathering: Distinctly weathered becoming partially unweathered at 13.20m Fractures: Fracture sub-set 1: Fractures are closely spaced parallel to bedding (sub-horizontal) planar, rough, open, with occasional haematite deposition noted on fracture surfaces. Fracture sub-set 2: Fractures are closely spaced perpendicular to bedding (sub-vertical) stepped, rough, open, with haematite deposition noted on fracture surfaces.	10.20 - 10.65 10.20 - 10.65	SPT (S) D	N=50+ (25/50)				
					11.70 - 12.15 11.70 - 12.15	SPT (S) D	N=50+ (25/50)				
		14.70		Light greyish white SANDSTONE.							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.05m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
14.70	30.30	Water	100
30.30	33.70	Water	100
33.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.05	3.00			

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Rotary Open Hole Log

Scale 1:50 Sheet 3 of 4

RBH03

Contract no: S240720
Site: Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client: Morgan Sindall
Method: Rotary Core with Rotary open Hole

Driller: L&A Drilling Ltd
Plant used: Beretta T46
Started: 08/08/2024
Ended: 12/08/2024
Backfilled: 12/08/2024

GL (AOD):
Easting: 301769.92
Northing: 515462.03
Logged: SM
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light greyish white SANDSTONE.							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.05m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
14.70	30.30	Water	100
30.30	33.70	Water	100
33.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.05	3.00			

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Rotary Open Hole Log

Scale 1:50 Sheet 4 of 4

RBH03

Contract no: S240720
Site: Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client: Morgan Sindall
Method: Rotary Core with Rotary open Hole

Driller: L&A Drilling Ltd
Plant used: Beretta T46
Started: 08/08/2024
Ended: 12/08/2024
Backfilled: 12/08/2024

GL (AOD):
Easting: 301769.92
Northing: 515462.03
Logged: SM
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light greyish white SANDSTONE.							
		30.30		Dark grey interbedded MUDSTONE AND SILTSTONE.							
		33.70		Light greyish white SANDSTONE.							
		40.00		End of Borehole at 40.000m							

Hole Diameter

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152
40.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
11.70	152
15.00	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.05m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
14.70	30.30	Water	100
30.30	33.70	Water	100
33.70	40.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.05	3.00			

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Rotary Open Hole Log

Scale 1:50 Sheet 1 of 4

RBH04

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	15/08/2024
Client:	Morgan Sindall			**Ended:**	15/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	15/08/2024

GL (AOD):	
Easting:	301646.67
Northing:	515564.77
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.20		MADE GROUND: Dark brown sandy, slightly gravelly Clay Topsoil, with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, sandstone, mudstone and dolomite.							
		0.50		MADE GROUND: Dark orangish brown, very gravelly Sand, with a low cobble content. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of mixed lithologies.							
				MADE GROUND: Bluish grey sandy Gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material. (Recovered as due to drilling methodology)	1.20 - 1.65	SPT (S)	N=50+ (25/50)				
				Rate of penetration increased, indicating potentially looser material							
					2.70 - 3.15	SPT (S)	N=50+ (3,5/5,12,33)				
					4.20 - 4.65	SPT (S)	N=50+ (5,8/10,13,14,13)				
					5.70 - 6.15	SPT (S)	N=50+ (9,15/16,16,18)				
					7.20 - 7.65	SPT (S)	N=50+ (25/50)				
					8.70 - 9.15	SPT (S)	N=50+ (7,13/18,32)				
G		9.00		Extremely weak reddish purple micaceous SILTSTONE. (WHITEHAVEN SANDSTONE FORMATION). (Assumed bedrock)							

Hole Diameter

Depth Base (m)	Diameter (mm)
16.20	152
36.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
10.20	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
16.65	27.20	Water	100
27.20	30.60	Water	100
30.60	36.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20	6.10			

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Rotary Open Hole Log

Scale 1:50 Sheet 2 of 4

RBH04

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	15/08/2024
Client:	Morgan Sindall			**Ended:**	15/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	15/08/2024

GL (AOD):	
Easting:	301646.67
Northing:	515564.77
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Extremely weak reddish purple micaceous SILTSTONE. (WHITEHAVEN SANDSTONE FORMATION). (Assumed bedrock)	10.20 - 10.65	SPT (S)	N=50+ (20,5/47,3)				
					11.70 - 12.15	SPT (C)	N=50+ (7,13/12,15,20,3)				
		13.20		Weak dark grey thinly laminated MUDSTONE (WHITEHAVEN SANDSTONE FORMATION). Recovered as fine to coarse sub-angular to sub-rounded, Gravel of MUDSTONE.	13.20 - 13.65	SPT (C)	N=50+ (9,13/17,22,11)				
					14.70 - 15.15	SPT (C)	N=50+ (14,11/27,23)				
					16.20 - 16.65	SPT (C)	N=50+ (11,11/15,20,15)				
		16.65		Light grey MUDSTONE							

Hole Diameter

Depth Base (m)	Diameter (mm)
16.20	152
36.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
10.20	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
16.65	27.20	Water	100
27.20	30.60	Water	100
30.60	36.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20	6.10			

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Rotary Open Hole Log

Scale 1:50 Sheet 3 of 4

RBH04

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	15/08/2024
Client:	Morgan Sindall			**Ended:**	15/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	15/08/2024

GL (AOD):		
Easting:	301646.67	
Northing:	515564.77	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Light grey MUDSTONE							
		27.20		White/ light grey SANDSTONE.							

Hole Diameter

Depth Base (m)	Diameter (mm)
16.20	152
36.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
10.20	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
16.65	27.20	Water	100
27.20	30.60	Water	100
30.60	36.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20	6.10			

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Rotary Open Hole Log

Scale 1:50 Sheet 4 of 4

RBH04

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	15/08/2024
Client:	Morgan Sindall			**Ended:**	15/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	15/08/2024

GL (AOD):		
Easting:	301646.67	
Northing:	515564.77	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				White/ light grey SANDSTONE.							
		30.60		Interbedded dark grey siltstone and reddish brown MUDSTONE.							
		36.00		End of Borehole at 36.000m							

Hole Diameter

Depth Base (m)	Diameter (mm)
16.20	152
36.00	100

Casing Depths

Depth Base (m)	Diameter (mm)
10.20	152

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)
16.65	27.20	Water	100
27.20	30.60	Water	100
30.60	36.00	Water	100

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20	6.10			

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Rotary Open Hole Log

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RBH05

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	20/08/2024

GL (AOD):	
Easting:	301622.90
Northing:	515555.59
Logged:	DL
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
		0.10		MADE GROUND: Brown sandy, gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material, dolomite and sandstone.	0.50 - 0.60	B+ES					
				MADE GROUND: Bluish grey sandy Gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag like material. (Recovered as due to drilling methodology)	1.20 - 1.22 1.20 - 1.65	SPT (S) B + D	N=50+ (25 for 10mm/50 for 10mm)				
					2.70 - 2.73 2.70 - 3.15	SPT (S) B + D	N=50+ (25 for 10mm/50 for 20mm)				
		3.10		Firm dark reddish brown very sandy, slightly gravelly medium strength CLAY of low to intermediate plasticity. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of sandstone, mudstone and quartz.	3.10 - 3.50	B					
					4.20 - 4.65 4.20 - 4.65 4.20 - 5.70	SPT (S) B + D C	N=18 (3,3/4,4,5,5)				
					5.70 - 6.15 5.70 - 6.15 5.70 - 6.25 5.70 - 7.20	SPT (S) B C D	N=18 (3,4/4,5,4,5)				
		6.80		Extremely weak dark greyish brown argillaceous MUDSTONE (WHITEHAVEN SANDSTONE FORMATION).	7.20 - 7.52 7.20 - 7.65	SPT (S) B + D	N=50+ (12,13 for 60mm/15,17,18 for 40mm)	48	28	11	NI 0 160
					8.70 - 8.98 8.70 - 9.15	SPT (S) D	N=50+ (14,11 for 40mm/17,17,16 for 20mm)	73	25	15	NI 0 120

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
40.00	152			1.2m Hand excavated inspection pit dug. Groundwater encountered at 5.00m & 22.00m.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.00 22.00	5.00 7.20	5.70	20	4.50

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Rotary Open Hole Log

Scale 1:50 Sheet 2 of 4

RBH05

Contract no: S240720
Site: Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria
Client: Morgan Sindall
Method: Rotary Core with Rotary open hole

Driller: L&A Drilling Ltd
Plant used: Beretta T46
Started: 21/08/2024
Ended: 22/08/2024
Backfilled: 20/08/2024

GL (AOD):
Easting: 301622.90
Northing: 515555.59
Logged: DL
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Extremely weak dark greyish brown argillaceous MUDSTONE (WHITEHAVEN SANDSTONE FORMATION).	10.20 - 10.38 10.20 - 10.65	SPT (S) D	N=50+ (12,13 for 20mm/41,9 for 5mm)				
								73	31	0	NI 0 90
					11.70 - 11.82 11.70 - 12.15	SPT (S) D	N=50+ (20,5 for 0mm/50 for 40mm)				
								73	66	0	NI 0 85
					13.20 - 13.27 13.20 - 13.65	SPT (S) D	N=50+ (25 for 30mm/50 for 40mm)				

Hole Diameter

Depth Base (m)	Diameter (mm)
40.00	152

Casing Depths

Depth Base (m)	Diameter (mm)

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.00m & 22.00m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.00 22.00	5.00 7.20	5.70	20	4.50

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Rotary Open Hole Log

Scale 1:50 | Sheet 3 of 4

RBH05

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	20/08/2024

GL (AOD):		
Easting:	301622.90	
Northing:	515555.59	
Logged:	DL	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Extremely weak dark greyish brown argillaceous MUDSTONE (WHITEHAVEN SANDSTONE FORMATION).							
		22.00		COAL							
		22.70		MUDSTONE							
		26.40		SANDSTONE							
		29.60		MUDSTONE							

Hole Diameter

Depth Base (m)	Diameter (mm)
40.00	152

Casing Depths

Depth Base (m)	Diameter (mm)

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 5.00m & 22.00m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.00 22.00	5.00 7.20	5.70	20	4.50

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Rotary Open Hole Log

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RBH05

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open hole			**Backfilled:**	20/08/2024

GL (AOD):		
Easting:	301622.90	
Northing:	515555.59	
Logged:	DL	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				MUDSTONE							
		40.00		End of Borehole at 40.000m							

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
40.00	152			1.2m Hand excavated inspection pit dug. Groundwater encountered at 5.00m & 22.00m.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
5.00 22.00	5.00 7.20	5.70	20	4.50

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Rotary Open Hole Log

Scale 1:50 Sheet 1 of 4

RBH06

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	22/08/2024

GL (AOD):	
Easting:	301589.21
Northing:	515542.30
Logged:	DL
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				MADE GROUND: Brown sandy, gravelly Clay (Topsoil) with some fine to medium plant rootlets. Sand is fine to coarse of slag like material dolomite and sandstone.	0.10 - 0.20	B+ES					
		0.25		MADE GROUND: Blueish grey sandy gravel. Sand is fine to coarse grained. Gravel is angular to sub-rounded, fine to coarse of slag-like material.	0.50 - 0.60	B+ES					
					1.20 - 1.24	SPT (S)	N=50+ (25 for 20mm/50 for 20mm)				
					1.20 - 1.65	B + D					
		2.20		Firm dark reddish brown very sandy, slightly gravelly medium strength CLAY of low to intermediate plasticity. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of sandstone, mudstone and quartz.	2.40 - 2.70	B					
					2.70 - 3.15	SPT (S)	N=18 (7,5/4,5,5,4)				
					2.70 - 3.15	B					
					2.70 - 3.15	C					
					2.70 - 4.20	D					
					4.20 - 4.65	SPT (S)	N=17 (4,4/4,5,4,4)				
					4.20 - 4.65	C					
					4.20 - 5.70	D					
					5.70 - 6.15	SPT (S)	N=43 (10,7/10,12,9,12)				
					5.70 - 6.15	B					
					5.70 - 6.15	C					
					5.70 - 6.70	D					
		6.70		Weak light greyish brown arenaceous SANDSTONE (WHITEHAVEN SANDSTONE FORMATION)	7.20 - 7.29	SPT (S)	N=50+ (25 for 50mm/50 for 40mm)				
					7.20 - 7.65	D					
								100	89	71	NI 100 330
		8.53		Extremely weak dark greyish brown argellacious MUDSTONE (WHITEHAVEN SANDSTONE FORMATION)							
								80	56	7	NI 40 100

Hole Diameter

Depth Base (m)	Diameter (mm)
36.00	152

Casing Depths

Depth Base (m)	Diameter (mm)

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20				

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Rotary Open Hole Log

Scale 1:50 Sheet 2 of 4

RBH06

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	22/08/2024

GL (AOD):		
Easting:	301589.21	
Northing:	515542.30	
Logged:	DL	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
		10.20		Extremely weak dark greyish brown argellacious MUDSTONE (WHITEHAVEN SANDSTONE FORMATION)							
				Extremely weak reddish brown argellacious MUDSTONE (WHITEHAVEN SANDSTONE FORMATION)				81	61	27	NI 50 200
								100	91	59	NI 90 220

Hole Diameter

Depth Base (m)	Diameter (mm)
36.00	152

Casing Depths

Depth Base (m)	Diameter (mm)

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.20m.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20				

SOLMEK
12-16 Yarm Road
Stockton on Tees
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info@solmek.com

Rotary Open Hole Log

Scale 1:50 Sheet 3 of 4

RBH06

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	22/08/2024

GL (AOD):		
Easting:	301589.21	
Northing:	515542.30	
Logged:	DL	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Extremely weak reddish brown argellacious MUDSTONE (WHITEHAVEN SANDSTONE FORMATION)							
		22.20		MUDSTONE							

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. Groundwater encountered at 6.20m.
36.00	152			

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20				

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Rotary Open Hole Log

Scale 1:50 Sheet 4 of 4

RBH06

Contract no:	S240720	**Site:**	Plots 9 & 12 Leconfield Ind Est, Cleator Moor, Cumbria	**Driller:**	L&A Drilling Ltd
				Plant used:	Beretta T46
				Started:	21/08/2024
Client:	Morgan Sindall			**Ended:**	22/08/2024
Method:	Rotary Core with Rotary open Hole			**Backfilled:**	22/08/2024

GL (AOD):		
Easting:	301589.21	
Northing:	515542.30	
Logged:	DL	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				MUDSTONE							
		36.00		End of Borehole at 36.000m							

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. Groundwater encountered at 6.20m.
36.00	152			

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20				

Appendix H

Flood Maps for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
LUF2	**301624/515483**	**9 Jan 2025 17:09**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2024 OS AC0000807064. https://flood-map-for-planning.service.gov.uk/os-terms

Environment Agency

Flood map for planning

Your reference
LUF2

Location (easting/northing)
301624/515483

Scale
1:2500

Created
9 Jan 2025 17:09

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

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Appendix I

United Utilities, LLFA and EA Predevelopment Correspondence

James Herbert

From: NWNorthPlanning <CLPlanning@environment-agency.gov.uk>
Sent: 18 October 2021 17:27
To: James Herbert
Subject: {Disarmed} RE: New Development : Leconfield Industrial Estate, Cleator-Moor (Site B)

Dear Sir,

Thank you for your email.

In order for us to provide comprehensive answers to your questions, I would normally suggest that you use our Charged Advice service. Following the preparation and acceptance of a quote setting out what we could provide, we would expect to provide advice from the relevant technical teams at a rate of £100/hour plus VAT.
This service is provided to complement our statutory planning duty to provide comment on planning consultations.

However, due to staff shortages I regret that we are currently unable to provide any non-statutory support for planning applications, and hence unable to answer your questions in detail.

In the absence of more detailed advice I have sought some brief guidance from the relevant flood risk management team, and can provide the following comments – added in red text to your email below, that I hope will go some way in answering your questions.

Regards,

Liz Locke
Planning Advisor Sustainable Places, Cumbria and Lancashire.
Environment Agency | Ghyll Mount, Penrith 40 Business Park, Penrith, Cumbria, CA11 9BP

Liz.locke@environment-agency.gov.uk

External: | Mobile: 07795 968515
Working days: Monday to Thursday

From: James Herbert [mailto:James.Herbert@bgp-teesside.co.uk]
Sent: 05 October 2021 16:25
To: NWNorthPlanning <CLPlanning@environment-agency.gov.uk>
Subject: New Development : Leconfield Industrial Estate, Cleator-Moor (Site B)

FAO Flood Risk Department

SCHEME: Re-development of Leconfield Industrial Estate and new development of surrounding sites.

James Herbert

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 28 October 2021 15:41
To: James Herbert
Cc: Wastewater Developer Services
Subject: {Disarmed} Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

Good afternoon James,

Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

For Site A : Our preferred point of discharge would be to the 675mm diameter public combined sewer within the vicinity of the site located to the North of your proposed development at an unrestricted rate.
For Site B : Our preferred point of discharge would be to the 600mm diameter public combined sewer within the vicinity of the site located to the West of your proposed development at an unrestricted rate.
For Site C : Our preferred point of discharge would be to the 300mm diameter public combined sewer within the site boundery located to the North of your proposed development at an unrestricted rate.

Please ensure all proposed manhole chambers cover levels and finished floor levels are higher than the receiving public sewer.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the open ordinary watercourse Norbeck (with onward flow) located in the site boundary of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, For site C, United Utilities will consider a connection to the 300mm diameter public combined sewer within the site boundery located North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

SuDS

If your development proposal incorporates any SuDS component(s) which interact with a sewer network you plan on offering for adoption to United Utilities; contact should be made with our technical team at your earliest convenience, please complete the 'Section 104 pre-application form : ' and include as much relevant detail as you can. These discussions can help prevent delays later in the development process.

Section 104 Pre application form (1b)

As per the sewerage sector guidance, all SuDS should be designed in accordance with the standards within the Design & construction guidance & the CIRIA SuDS manual (C753)

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: **DeveloperServicesWater@uuplc.co.uk**. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

United Utilities
Water for the North West

Mohammed Aljafarawi
Developer Engineer
Developer Services & Metering
Customer Services
Email: Mohammed.Aljafarawi@uuplc.co.uk
unitedutilities.com

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James Herbert

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 19 December 2024 14:54
To: James Herbert
Subject: {Disarmed} RE: 06750766 Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you requested the link from the sender and **know** the content is safe.

Good Afternoon James,

Thank you for getting in touch.

In short, yes I am happy to confirm the proposals for surface water to drain to Norr Beck watercourse and foul to drain to the 675mm combined sewer are still acceptable to United Utilities.

Please feel free to give me a call if you wish to discuss further

Kind regards,

Tom

Thomas Bethell
Developer Engineer
Developer Services & Metering
Customer Services
01925 429088
unitedutilities.com

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---------- Original Message ----------
From: James Herbert [james.herbert@bgp-consulting.co.uk]
Sent: 11/12/2024 08:47
To: wastewaterdeveloperservices@uuplc.co.uk
Subject: RE: Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

Good Morning

Please can the validity of this response be renewed with regard to Site A?

The proposed surface water strategy remains the same, discharging to Norr Beck watercourse.

The proposed foul water strategy remains the same, discharging to the 675mm diameter combined sewer to the north of site.

This is for the purposes of the construction of Plot 1.1 (Hub Building) – Planning Reference: 4/24/2403/DOC

If you need anything further, please let me know.

Kind Regards

James Herbert BEng (Hons) IEng MICE

Associate Director

Billinghurst George & Partners

Civil & Structural Consulting Engineers

Teesside Office
t: 01642 876 470 | e: james.herbert@bgp-consulting.co.uk | **Our Email Filter (Filter1) has detected a possible fraud attempt from "urldefense.com" claiming to be** www.bgp-consulting.co.uk | @BGPconsulting

a: 1st Floor, Wellington House, Wellington Court, Stockton on Tees, TS18 3TA

Billinghurst George & Partners is the trading name for BGP Consulting Limited, Registered in England and Wales. Company No.08935889

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 28 October 2021 15:41
To: James Herbert <James.Herbert@bgp-teesside.co.uk>
Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: {Disarmed} Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

Good afternoon James,

Pre Development Enquiry for: Leconfield Industrial Estate UU Reference Number : 4200044472

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

For Site A : Our preferred point of discharge would be to the 675mm diameter public combined sewer within the vicinity of the site located to the North of your proposed development at an unrestricted rate.

For Site B : Our preferred point of discharge would be to the 600mm diameter public combined sewer within the vicinity of the site located to the West of your proposed development at an unrestricted rate.

For Site C : Our preferred point of discharge would be to the 300mm diameter public combined sewer within the site boundery located to the North of your proposed development at an unrestricted rate.

Please ensure all proposed manhole chambers cover levels and finished floor levels are higher than the receiving public sewer.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

Our Email Filter (Filter1) has detected a possible fraud attempt from "urldefense.com" claiming to be https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

Our Email Filter (Filter1) has detected a possible fraud attempt from "urldefense.com" claiming to be https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the open ordinary watercourse Norbeck (with onward flow) located in the site boundary of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, For site C, United Utilities will consider a connection to the 300mm diameter public combined sewer within the site boundery located North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

SuDS

If your development proposal incorporates any SuDS component(s) which interact with a sewer network you plan on offering for adoption to United Utilities; contact should be made with our technical team at your earliest convenience, please complete the 'Section 104 pre-application form : ' and include as much relevant detail as you can. These discussions can help prevent delays later in the development process.

Section 104 Pre application form (1b)

As per the sewerage sector guidance, all SuDS should be designed in accordance with the standards within the Design & construction guidance & the CIRIA SuDS manual (C753)

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: **DeveloperServicesWater@uuplc.co.uk**. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Mohammed Aljafarawi
Developer Engineer

Developer Services & Metering

Customer Services

Email:
Mohammed.Aljafarawi@uuplc.co.uk

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From: James Herbert [mailto:James.Herbert@bgp-teesside.co.uk]
Sent: 19 October 2021 10:20
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: RE: Wastewater Pre-development Enquiry - Leconfield Industrial Estate

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