Drainage Philosophy

21T2034 – Cleator Moor Innovation Quarter - BOC Yard

CMIQ-BGP-04-XX-RP-C-DP004

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Drainage Philosophy

Project: Cleator Moor Innovation Quarter - BOC Yard

Client: Copeland Borough Council

LLFA: Cumbria County Council

BGP Job No: 21T2034

Document Checking:

Prepared By: J Herbert – Design Engineer

Checked By: J Conway – Director

Issue	Date	Status	Checked for Issue
001	11/01/2022	First Draft	JC
002	04/03/2022	Planning	JC

This document has been prepared solely as a Drainage Strategy for Copeland Borough 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 a concrete yard for storage and distribution purposes with an access road on the brownfield site that was previously used as a concrete yard.

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

1.4. 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.*

1.5. 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.

1.6. 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: 301400, N: 515601

2.1.4 National Grid Reference: NY013155

2.2. Site Description

2.2.1 Site Area: 0.670 Ha

2.2.2 Site Area to be developed: 0.447 Ha

2.2.3 Existing Land Use: Service Yard

2.2.4 Proposed Land Use: Concrete yard used for storage and distribution.

2.2.5 Local Planning Authority: Copeland Borough Council

2.2.6 Sewer Undertaker: United Utilities (UU)

2.2.7 At approximately 0.670 Ha in size the Brownfield site is located approximately 5.15km southeast of Whitehaven and approximately 18km southwest of Cockermouth. The site is currently part historic service yard and part soft landscaping. The site is bound by woodland and grass to the northern boundary, existing industrial buildings to the east and south and a demolished building footprint to the west.

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.

2.3.2 The site is relatively flat at an approximate level of between 80.6m and 81.0m AOD, falls existing within the existing adjacent service yard to provide drainage falls to gullies. The site falls from southeast to northwest at an approximate gradient of 1 in 280 from 81.0m to 80.8m AOD. The lowest point of the site is the location in which gullies are sited within the existing service yard at 80.60m AOD.

2.4. Existing Watercourses

2.4.1 The nearest named watercourse is Nor Beck, which where open is located 275m northeast of the site. Through CCTV investigation it is evident that it is culverted from the northeast point mentioned and runs southeast into Leconfield Industrial Estate and through the development site. 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 Several United Utilities combined drains and manholes are located toward to primary access of Leconfield Industrial Estate. The 300mm diameter combined sewer drains 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 north western boundary, which drains southwest.

2.5.4 The site is currently served by wastewater systems through an existing network of private sewers. It is assumed that the private sewers ultimately discharge to the United Utilities sewers located adjacent the development site.

2.6. Existing Ground Conditions

2.6.1 A 'Phase 1 Desk Study' and 'Phase 2 Site Investigation' have been carried out by White Young Green dated November 2020. (Report No. A114312-1). This has been carried out as part of the wider Leconfield Industrial Estate development. Exploratory locations TP102, WS102 and CP101 were investigated within the proposed yards site boundary.

2.6.2 The Phase 2 Site Investigation exploratory locations reveal that the ground is made up of approximately 9.0m BGL of made ground, generally comprising slag. This overlaid silty/sandy clay up to 15m BGL and thereafter mudstone. Groundwater was encountered within 6 of the 23 overall exploratory locations. It was noted within 2 of the 3 noted exploratory locations local to site noting groundwater strikes were seepage.

2.7. Existing Flood Risk Assessment

2.6.1 A site-specific 'Flood Risk Assessment' (21T2034 – Flood Risk Assessment 004 March 2022) 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 a concrete yard for storage and distribution purposes on the brownfield site that was previously used as a service yard. See Appendix A for site location plan.

3.1.2. The proposed site layout within Appendix B shows the extents of the yard. The yard will be accessible via existing Leconfield Industrial Estate access roads.

3.1.3. Minor highway works are proposed to the existing private access roads to form an access. These works will be in accordance with the Civil Engineers details.

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 300mm diameter combined sewer drains from southeast to northwest along Leconfield Street in keeping with the topography of the highway.

4.1.2. A United Utilities 675mm 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 private sewers. The private foul sewers ultimately discharge to the United Utilities sewers located adjacent the development site. The private surface water sewers ultimately discharge into the Nor Beck watercourse culvert.

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 1 Desk Study' and 'Phase 2 Site Investigation' have been carried out by White Young Green dated November 2020. (Report No. A114312-1). This has been carried out as part of the wider Leconfield Industrial Estate development. Exploratory locations TP102, WS102 and CP101 were investigated within the proposed yards site boundary.

4.3.3. The Phase 2 Site Investigation exploratory locations reveal that the ground is made up of approximately 9.0m BGL of made ground, generally comprising slag. This overlaid silty/sandy clay up to 15m BGL and thereafter mudstone. Groundwater was encountered within 6 of the 23 overall exploratory locations. It was noted within 2 of the 3 noted exploratory locations local to site noting groundwater strikes were seepage.

4.3.4. It is anticipated that given the ground conditions infiltration rates returned would be poor.

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.

4.4. Discharge to a Watercourse

4.4.1. The nearest named watercourse is Nor Beck, which where open is located 275m northeast of the site. Through CCTV investigation it is evident that it is culverted from the northeast point mentioned and runs southeast into Leconfield Industrial Estate and through the development site. Nor Beck culvert continues southeast through Norbeck Park and adjacent fields ultimately converging with the River Keekle. To note an existing surface water connection to Nor Beck culvert is evident.

4.4.2. The watercourse is within 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 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 Cumbria County Council SuDS Adoption Guidance for Major Developments.

5.1.2. The proposed external yard forms part of a wider plan to re-develop the Leconfield Industrial Estate. A Brownfield discharge rate has been calculated for the re-developed area the new external yard is within and is determined as 55.0 l/s. The Brownfield run off rate allocated for the proposed external yard is **15.0 l/s**, this leaves 40.0 l/s for the other area which is covered under a separate planning application.

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

5.1.4. The new yard proposes to discharge surface water flows to the Nor Beck culverted watercourse which passes through site. Surface water flows are to be restricted to a brownfield run off rate of 15.0 l/s, this rate is to be agreed with the Lead Local Flood Authority and Environment Agency.

5.1.5. The attenuation is to provide storage for approximately 180m^3, this volume is based on the total impermeable surface area and restricted discharge rate of 15.0 l/s. It is proposed that volumes will be stored within a 2.0m deep attenuation tank.

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

5.1.7. Due to the 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 + 40% climate change flood event below ground within an attenuation tank.

5.1.8. The surface water system consists of a network of pipes which are located throughout the service yard. The networks will drain via gravity to the Flow Control Unit located within the yard, surface water will back up and utilise the attenuation structure when storm events exceeds the 15.0 l/s discharge rate noted above. The final connection to Nor Beck watercourse will be made indirectly through existing surface water sewers via gravity.

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

5.1.10. It is recommended that a petrol interceptor is installed to treat all surface water flows from the service yard.

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

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

6. Proposed Foul Water Drainage Strategy

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

6.2. The foul drainage within yard and site will remain private. The foul sewers are to drain via gravity to the central area of the yard where a proposed connection to an existing private foul water sewer is to be made. Thereafter the existing private sewer drains northwest ultimately discharging into the existing United Utilities 675mm diameter combined sewer.

6.3. The foul water connection location is to be agreed with United Utilities. The foul water discharge rate is to be unrestricted draining two Portakabins, one an office and the other a canteen.

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 an external yard for storage and distribution purposes 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 + 40% 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: CMIQ-BGP-04-XX-RP-C-DP004

Report Title: Drainage Philosophy – Cleator Moor Innovation Quarter - BOC Yard

James Herbert – Design Engineer
Date: 04/03/2022

Jim Conway – Director
Date: 04/03/2022

For and on behalf of Billinghurst George & Partners

Appendix A

Site Location Plan

- DO NOT SCALE -

Issued for Planning	JJH	P01	JC	04.03.2022
AMENDMENT	BY	REV	CHK	DATE

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

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Client
Copeland Borough Council

Project
Cleator Moor Innovation Quarter - BOC Yard

Project No.
21T2034

Drawing Title
Site Location Plan

Drawn	Date	Checked	Date	Size	Scale	Class.	Rev.
JJH	March 2022	JC	March 2022	A3	1:5000	90.4	P01

Location	Originator	Volume	Level	Type	Role	Unique No.
CMIQ	BGP	04	XX	DR	C	04100

File Reference
CMIQ-BGP-04-XX-DR-C-90.4-04100

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Appendix B

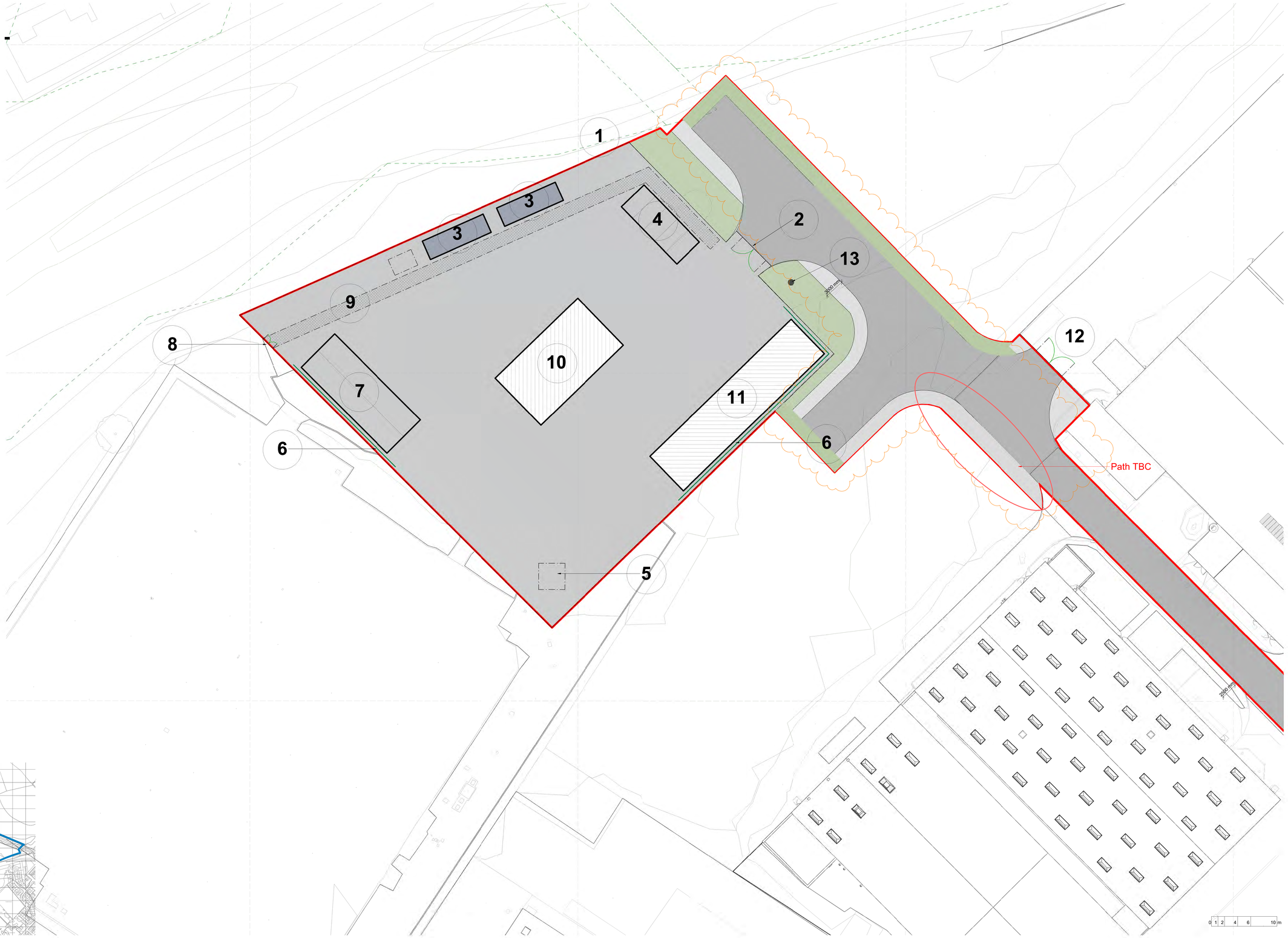
Proposed Site Layout

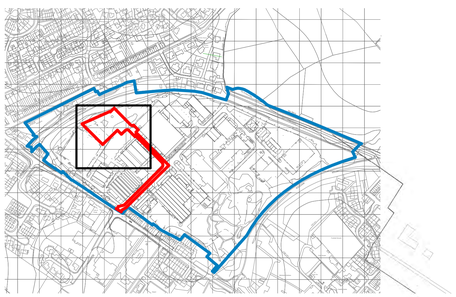
ISO A0 - A4 Inline 1:100mm

GENERAL ARRANGEMNT PLAN - BOC YARD

- APPLICATION BOUNDARY
- ADDITIONAL LAND UNDER COUNCIL OWNERSHIP
- GRASS
- HARDSTANDING / FOOTPATH
- ROAD

1. Perimeter Fencing -
2.4m high Lochrin Bain Combi Palisade Fencing with 3mm 'D' section Single Pointed Tops Galvanised Fencing
2. Main Gates -
2.4m high, Double Leaf Vehicle Gate
3. New Portakabins -
(32ftx10ft) to be provided by BOC
4. **Car Parking -**
Showing 5 car parking spaces
5. Gas Cylinder Location
6. Rubberised Kerb
7. Lorry Parking -
Showing 2 lorry parking spaces
8. Emergency Access Gate
9. Pedestrian Walkway
10. Loading area
11. Cylinder sorting and Storage area
12. Relocated Existing Gate -
fence to be re-positioned to sit next to the building.
13. Totem Sign Location





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DATE	REVISION	REV	DR	CH
01/02/22	AMENDED FORTH ENTRANCE	P01	JS	DS
02/97/22	AMENDED RED LINE	P02	JS	DS
14/02/22	UPDATE FOR SIGNAGE	P03	JS	DK
16/02/22	AMENDED FOR TETRATECH COMMENTS	P04	JS	DK
22/02/22	AMENDED RED LINE TO INCLUDE TURNING HEAD & MORE SOFT LANDSCAPING	P05	JS	DK
25/02/22	AMENDED PATHS/VERGES	P06	JS	DK

Keyplan

North Arrow: True North

Consultants

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SET OFFICE INFORMATION

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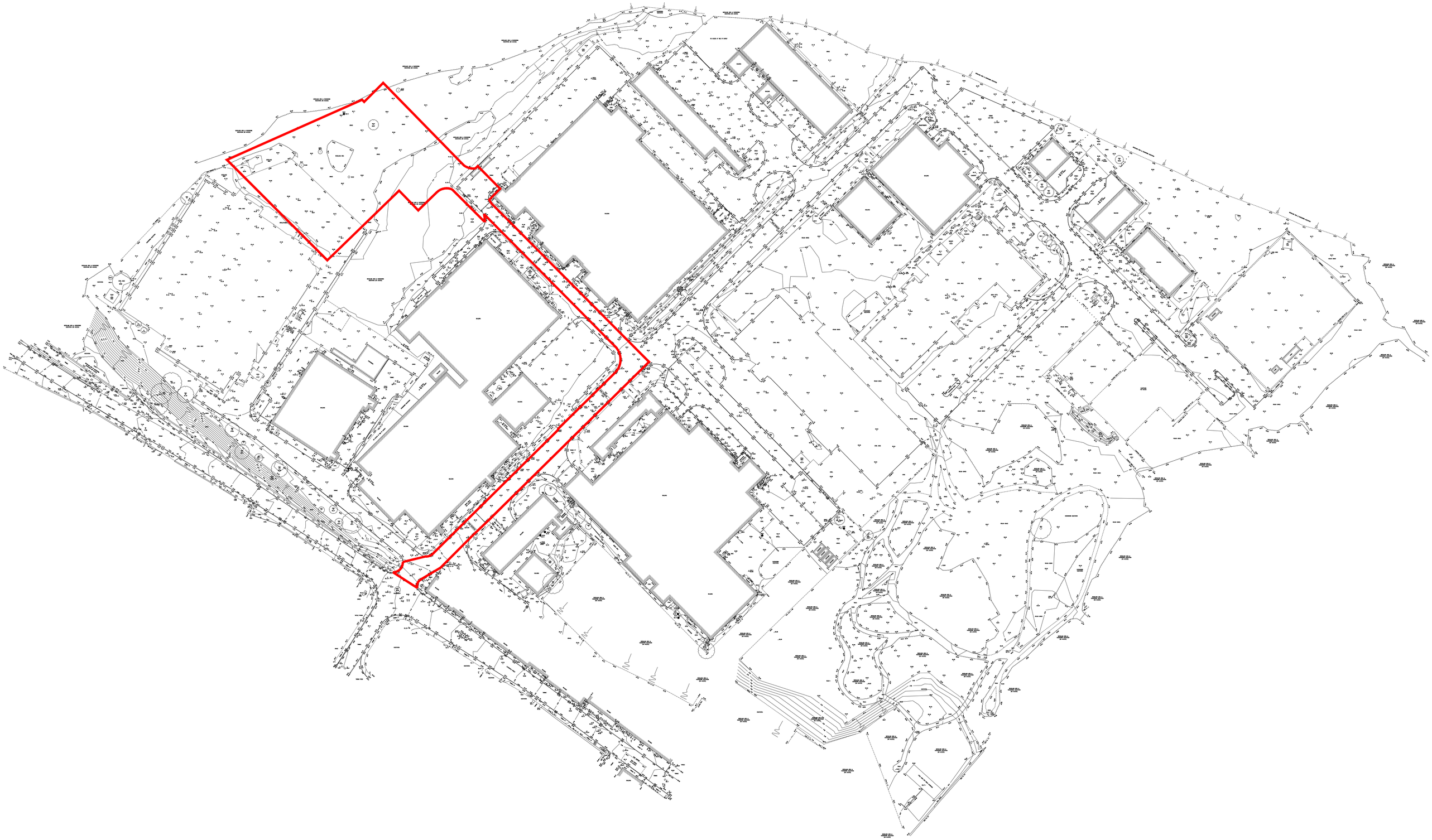
Client Name: COPELAND BOROUGH COUNCIL	Drawing Title: SITE - PROPOSED PLAN
Project: CLEATOR MOOR INNOVATION QUARTER (BOC SERVICE YARD)	
Drawn: JS / Date: 21-12-21	Sheet Status: S3 - FOR REVIEW
Checked: DS / Date: 21-12-21	Project No.: IANC21-0043
Scale: As indicated @ A0	Drawing No.: CMIQ-NOR-BOC00-DR-A-90002 / Rev: P06

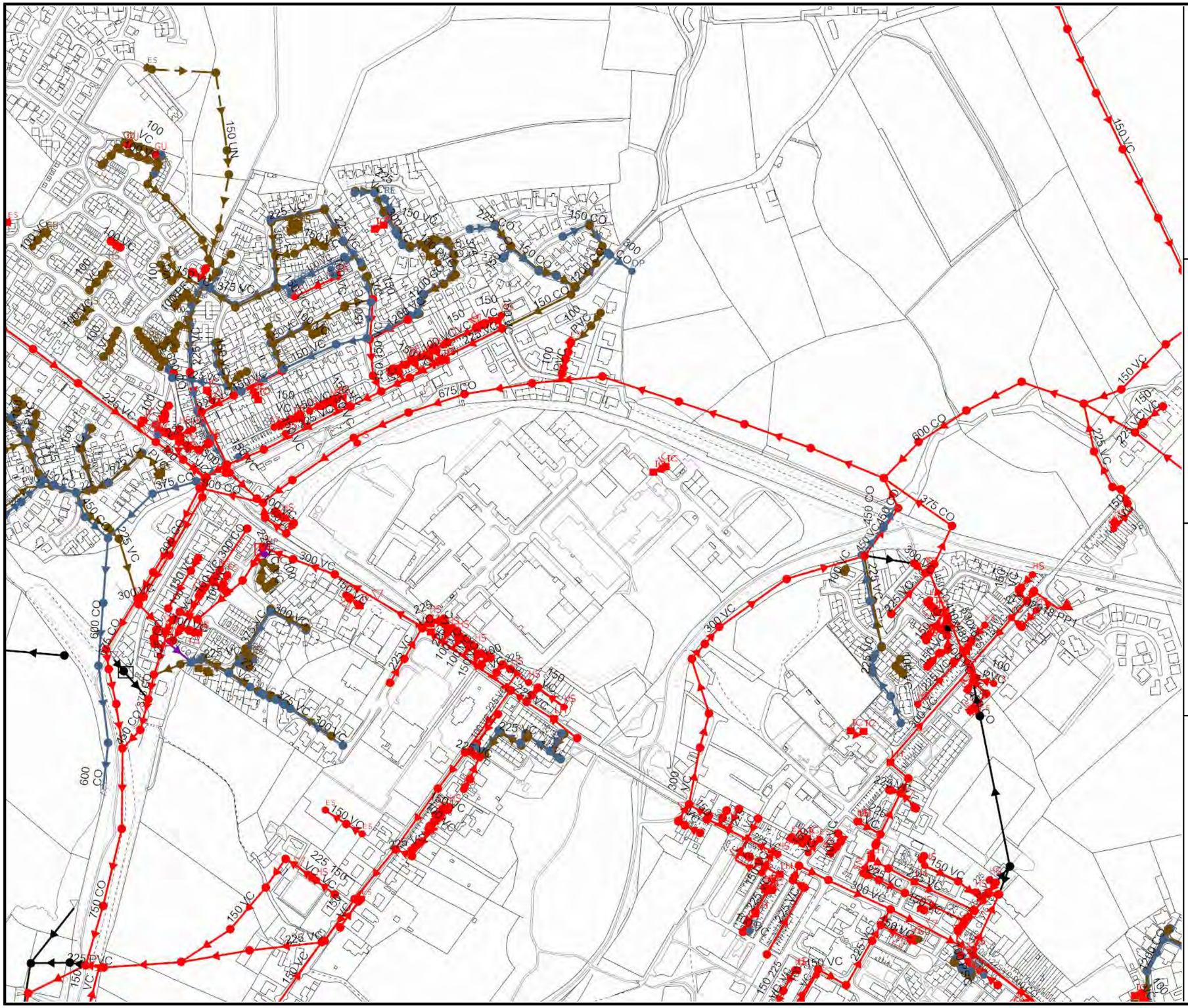
Appendix C

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

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 (%)	0
Ratio R	0.258	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	150	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)
0-4	0.380	4-8	0.067

Total Area Contributing (ha) = 0.447

Total Pipe Volume (m³) = 5.575

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	20.011	1.420	14.1	0.338	4.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	39.851	1.045	38.1	0.069	4.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	14.462	0.145	99.7	0.040	4.00	0.0	0.600	o	150	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	107.57	4.08	79.200	0.338	0.0	0.0	0.0	4.21	297.6	131.3
S2.000	105.12	4.41	80.400	0.069	0.0	0.0	0.0	1.63	28.9	26.2
S3.000	106.35	4.24	79.500	0.040	0.0	0.0	0.0	1.01	17.8	15.4

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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
S2.001	14.456	1.425	10.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	9.450	0.165	57.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	24.527	0.165	148.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	5.651	0.110	51.4	0.000	0.00	0.0	0.600	o	225	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)
S2.001	104.70	4.46	79.280	0.109	0.0	0.0	0.0	4.13	164.3	41.2
S1.001	104.16	4.54	77.780	0.447	0.0	0.0	0.0	2.08	147.1«	168.1
S1.002	101.97	4.86	77.615	0.447	0.0	0.0	0.0	1.29	91.0«	168.1
S1.003	101.63	4.91	77.450	0.447	0.0	0.0	0.0	1.83	72.7«	168.1

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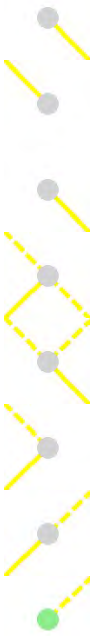
Manhole Schedules for Storm

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	80.725	1.525	Open Manhole	1200	S1.000	79.200	300				
SS7	81.750	1.350	Open Manhole	1200	S2.000	80.400	150				
SS8	80.850	1.350	Open Manhole	1200	S3.000	79.500	150				
SS6	81.000	1.720	Open Manhole	1200	S2.001	79.280	225	S2.000	79.355	150	
								S3.000	79.355	150	
SS2	80.725	2.945	Open Manhole	1500	S1.001	77.780	300	S1.000	77.780	300	
								S2.001	77.855	225	
SS3	80.725	3.110	Open Manhole	1200	S1.002	77.615	300	S1.001	77.615	300	
SS4	80.725	3.275	Open Manhole	2100	S1.003	77.450	225	S1.002	77.450	300	
SS5	80.800	3.460	Open Manhole	1500		OUTFALL		S1.003	77.340	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SS1	301411.718	515625.095	301411.718	515625.095	Required	
SS7	301464.026	515592.427	301464.026	515592.427	Required	
SS8	301425.883	515631.093	301425.883	515631.093	Required	
SS6	301436.032	515620.790	301436.032	515620.790	Required	
SS2	301425.651	515610.730	301425.651	515610.730	Required	
SS3	301432.230	515603.947	301432.230	515603.947	Required	
SS4	301414.626	515586.868	301414.626	515586.868	Required	
SS5	301410.587	515582.917			No Entry	



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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	SS1	80.725	79.200	1.225	Open Manhole	1200
S2.000	o	150	SS7	81.750	80.400	1.200	Open Manhole	1200
S3.000	o	150	SS8	80.850	79.500	1.200	Open Manhole	1200
S2.001	o	225	SS6	81.000	79.280	1.495	Open Manhole	1200
S1.001	o	300	SS2	80.725	77.780	2.645	Open Manhole	1500
S1.002	o	300	SS3	80.725	77.615	2.810	Open Manhole	1200
S1.003	o	225	SS4	80.725	77.450	3.050	Open Manhole	2100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	20.011	14.1	SS2	80.725	77.780	2.645	Open Manhole	1500
S2.000	39.851	38.1	SS6	81.000	79.355	1.495	Open Manhole	1200
S3.000	14.462	99.7	SS6	81.000	79.355	1.495	Open Manhole	1200
S2.001	14.456	10.1	SS2	80.725	77.855	2.645	Open Manhole	1500
S1.001	9.450	57.3	SS3	80.725	77.615	2.810	Open Manhole	1200
S1.002	24.527	148.6	SS4	80.725	77.450	2.975	Open Manhole	2100
S1.003	5.651	51.4	SS5	80.800	77.340	3.235	Open Manhole	1500

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)
S1.003	SS5	80.800	77.340	0.000	1500	0

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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	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	16.000	Storm Duration (mins)	30
Ratio R	0.258		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SS4, DS/PN: S1.003, Volume (m³): 13.0

Unit Reference	MD-SHE-0160-1500-2000-1500
Design Head (m)	2.000
Design Flow (l/s)	15.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	160
Invert Level (m)	77.450
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	15.0	Kick-Flo®	1.216	11.9
Flush-Flo™	0.582	15.0	Mean Flow over Head Range	-	13.1

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	5.7	0.800	14.7	2.000	15.0	4.000	20.9	7.000	27.3
0.200	12.5	1.000	13.9	2.200	15.7	4.500	22.1	7.500	28.2
0.300	13.9	1.200	12.1	2.400	16.4	5.000	23.2	8.000	29.1
0.400	14.6	1.400	12.7	2.600	17.0	5.500	24.3	8.500	30.0
0.500	14.9	1.600	13.5	3.000	18.2	6.000	25.3	9.000	30.8
0.600	15.0	1.800	14.3	3.500	19.6	6.500	26.3	9.500	31.6

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Storage Structures for Storm

Tank or Pond Manhole: SS4, DS/PN: S1.003

Invert Level (m) 77.550

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	90.0	2.000	90.0	2.001	0.0

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1 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		FSR M5-60 (mm) 16.000	Cv (Summer) 1.000
Region	England and Wales	Ratio R 0.258	Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

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	1	+0%	100/15 Summer				79.285	-0.215	0.000
S2.000	SS7	15 Summer	1	+0%	100/15 Summer				80.460	-0.090	0.000
S3.000	SS8	15 Summer	1	+0%	100/15 Summer				79.560	-0.090	0.000
S2.001	SS6	15 Summer	1	+0%	100/15 Summer				79.328	-0.177	0.000
S1.001	SS2	15 Summer	1	+0%	30/15 Summer				77.949	-0.131	0.000
S1.002	SS3	15 Summer	1	+0%	30/15 Summer				77.811	-0.104	0.000
S1.003	SS4	60 Summer	1	+0%	1/15 Summer				77.731	0.056	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	0.18			46.5	OK	
S2.000	SS7	0.34			9.5	OK	
S3.000	SS8	0.34			5.5	OK	
S2.001	SS6	0.10			15.0	OK	
S1.001	SS2	0.61			61.6	OK	
S1.002	SS3	0.74			60.4	OK	
S1.003	SS4	0.29			13.7	SURCHARGED	

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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	FSR	M5-60 (mm)	16.000
Region	England and Wales	Ratio R	0.258
Cv (Summer)	1.000		
Cv (Winter)	1.000		

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

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				79.337	-0.163	0.000
S2.000	SS7	15 Summer	30	+0%	100/15 Summer				80.503	-0.047	0.000
S3.000	SS8	15 Summer	30	+0%	100/15 Summer				79.603	-0.047	0.000
S2.001	SS6	15 Summer	30	+0%	100/15 Summer				79.356	-0.149	0.000
S1.001	SS2	15 Summer	30	+0%	30/15 Summer				78.609	0.529	0.000
S1.002	SS3	30 Summer	30	+0%	30/15 Summer				78.301	0.386	0.000
S1.003	SS4	120 Summer	30	+0%	1/15 Summer				78.268	0.593	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	0.43			111.8	OK	
S2.000	SS7	0.82			22.8	OK	
S3.000	SS8	0.81			13.2	OK	
S2.001	SS6	0.25			36.1	OK	
S1.001	SS2	1.39			141.0	SURCHARGED	
S1.002	SS3	1.59			128.7	SURCHARGED	
S1.003	SS4	0.32			15.0	SURCHARGED	

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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	FSR	M5-60 (mm)	16.000
Region	England and Wales	Ratio R	0.258
Cv (Summer)	1.000		
Cv (Winter)	1.000		

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

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	100	+40%	100/15 Summer				80.577	1.077	0.000
S2.000	SS7	15 Summer	100	+40%	100/15 Summer				81.463	0.913	0.000
S3.000	SS8	30 Summer	100	+40%	100/15 Summer				80.251	0.601	0.000
S2.001	SS6	30 Summer	100	+40%	100/15 Summer				80.075	0.570	0.000
S1.001	SS2	30 Summer	100	+40%	30/15 Summer				79.931	1.851	0.000
S1.002	SS3	240 Summer	100	+40%	30/15 Summer				79.381	1.466	0.000
S1.003	SS4	240 Summer	100	+40%	1/15 Summer				79.364	1.689	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	0.71			184.3	FLOOD RISK	
S2.000	SS7	1.18			33.1	FLOOD RISK	
S3.000	SS8	1.16			19.0	SURCHARGED	
S2.001	SS6	0.38			54.0	SURCHARGED	
S1.001	SS2	2.03			206.5	SURCHARGED	
S1.002	SS3	1.06			85.7	SURCHARGED	
S1.003	SS4	0.32			15.0	SURCHARGED	

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Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	JAMES HERBERT
Site name:	BOC Yard
Site location:	Cleator Moor

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	54.52609° N
Longitude:	3.52519° W
Reference:	2639172409
Date:	Dec 16 2021 10:45

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.34

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	1276	1276
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	3.31	3.31
1 in 1 year (l/s):	2.88	2.88
1 in 30 years (l/s):	5.63	5.63
1 in 100 year (l/s):	6.89	6.89
1 in 200 years (l/s):	7.85	7.85

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix F

Proposed Drainage Philosophy Plans

DO NOT SCALE

Notes

1. All works to be carried out in accordance with:
   - 1.1 Design and Construction Guidance (DCG) and Sewerage Sector Guidance (SSG) for all sewers proposed to be offered for adoption. (note - the SSG replaces Sewers for Adoption (SfA) for all new developments)
   - 1.2 BS EN 752 - 'Drain and Sewer Systems Outside Buildings'
   - 1.3 Current applicable Building Regulations
   - 1.4 BGP Specifications
   - 1.5 Manufacturer installation guidance and requirements
2. All levels shown are in metres and are relative to ordnance datum (m AOD).
3. Invert levels of all existing chambers and connection points are to be confirmed and engineer advised prior to commencement of any Drainage Works.
4. Where proposed sewers connect into existing sewers, the existing sewers must to be checked for line, level and condition preferably by a CCTV survey
5. Concrete bed and surround is required to all gully leads and to all pipes in highways/hardstanding where cover to pipe <1200mm
6. All pipes to be either extra strength V.C. to BS 65 or PVC certified to WIS 4-35-01 and BS/EN13476 'UPONOR ULTRARIB' or concrete pipes Class 120 to BS/EN 1916/BS5911-1 2002.
7. Existing sewer positions are indicative and are not to be used in conjunction with design. Contractor to confirm location.
8. 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.
9. Cover levels shown are indicative and may vary on site. The contractor should adjust levels to suit site conditions
10. Other services are not shown on this drawing, however their presence must be anticipated. The contractor is to confirm prior to commencing any works, the location and depth of all services that may affect the works the manufacturers requirements and recommendations.
11. All Information provided is for planning purposes only and should not be relied upon for either costing or construction.
12. All drainage outfall levels are to be investigated and confirmed prior to detailed design. Engineer to be informed of findings. Current design shown is indicative.
13. All Surface water discharge rates and methods of discharge are to be agreed with the Lead Local Flood Authority and Environment Agency.

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.

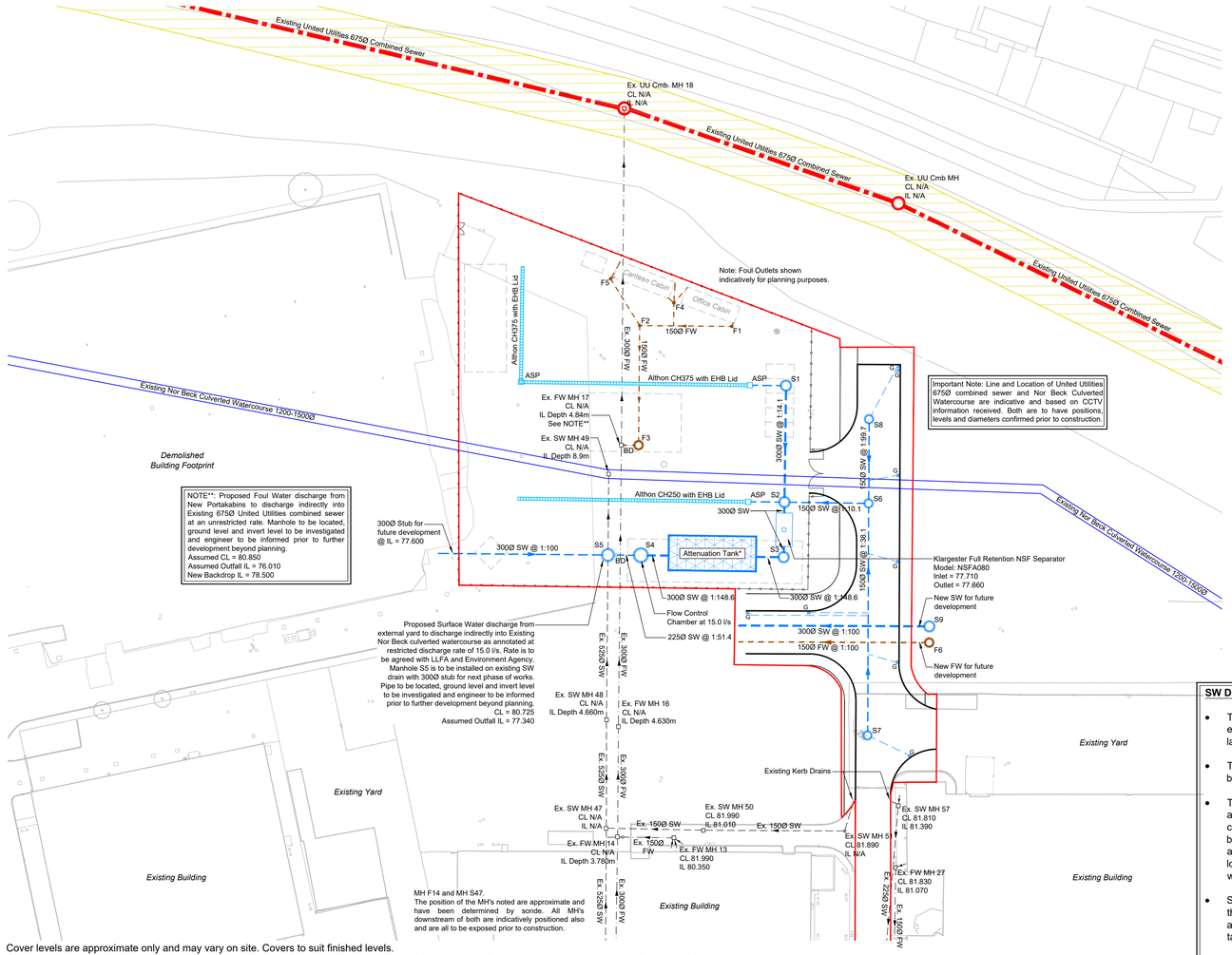
Legend

- Proposed SW Sewer
- Proposed FW Sewer
- Nor Beck (Culverted)
- Existing SW Sewer
- Existing FW Sewer
- Existing UU Combined Sewer
- BOC Yard Redline Boundary
- Existing UU Sewer Easement
- Proposed Attenuation Tank

Additional Notes

Proposed Impermeable Area	=	4470m² (0.4470Ha.)
Brownfield Discharge Rate	=	**15.0 l/s**
Storage Required	=	**180m³**

See Drawing CMIQ-BGP-01-XX-DR-C-52-01901 for Discharge Rate Calculations.



SW Drainage Philosophy - BOC Yard

- The proposals comprise the construction of an external yard for storage and distribution purposes on land previously occupied by a service yard.
- The surface water flows are to be restricted to a brownfield discharge rate of 15.0 l/s.
- The surface water drainage design for the new yard ais based on 1 in 100 year storm + 40% climate change and SW flows restricted in accordance with brownfield discharge rate noted above which is to be agreed with the LLFA and Environment Agency. The location of SW discharge is to Nor Beck culverted watercourse.
- Surface Water Attenuation has been located prior to the final connection in line with good practice. The attenuation is provided in the form of an attenuation tank which requires an approximate volume of 180m³.
- Surface Water run off from the yard area and access road is to be treated by a petrol interceptor.

*NOTE: 180m³ Storage required based on 1 in 100 year storm + 40% climate change and 15.0 l/s discharge rate.
Tank Depth = 2.0m / Tank Base = 77.550
Tank Dimensions = 6.0m x 15.0m
Vent pipe & access points TBC by Manufacturer.

Manhole S4 Flow Control Details
Hydro-Brake® Optimum Flow Control - Surface/Storm Drainage System
1Nr 160mm Type SH (MD5) Hydro-Brake® Flow Control (Horizontal Discharge)
Technical Criteria: Design / Duty Point Flow = 15.000 l/s Head = 2.000m
Flush-Flo™ Point Flow = 15.000 l/s Head = 0.582m
Kick-Flo® Point Flow = 11.900 l/s Head = 1.216m
Reference: MD-SHE-0160-1500-2000-1500

BOC Yard Reference Drawings

CMIQ-BGP-04-XX-DR-C-52-04101 - Impermeable Areas Plan
CMIQ-BGP-04-XX-DR-C-52-04102 - Flood Exceedance Flow Route
CMIQ-BGP-04-XX-DR-C-90.4-04110 - Externals Plan
CMIQ-BGP-04-XX-DR-C-52-04130 - Drainage Plan

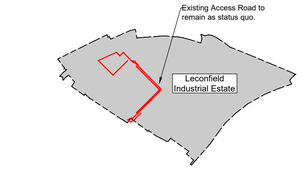
1. Cover levels are approximate only and may vary on site. Covers to suit finished levels.
2. Contractor is responsible for positioning MHs so they do not compromise line or level of kerbing or other delineation at the juncture of two surface materials.
3. PPIC manhole diameters may vary and are dependant 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

MH Ref.	Cover Level	Invert Level	Type	MH Dia.	Cover Type	Comments
S1	80.725	79.200	Conc.	1200	D400	
S2	80.725	77.780	Conc.	1500	D400	
S3	80.725	77.615	Conc.	1200	D400	
S4	80.725	77.450 (Inlet) 77.400 (Outlet)	Conc.	2100	D400	Hydrobrake Flow Control set at 15.0 l/s
S5	80.725	76.500 (TBC prior to construction)	Conc.	1500	D400	BD = 77.340
S6	81.000	79.280	Conc.	1200	D400	
S7	81.750	80.400	Conc.	1200	D400	
S8	80.850	79.500	Conc.	1200	D400	
S9	81.250	79.000	Conc.	1500	D400	MH to serve future development

Foul Water Drainage Manhole Schedule

MH Ref.	Cover Level	Invert Level	Type	MH Dia.	Cover Type	Comments
F1	80.750	79.600	PPIC	450	D400	
F2	80.700	79.075	PPIC	450	D400	
F3	80.700	78.725	Conc.	1200	D400	
F4	80.750	79.600	PPIC	450	D400	
F5	80.750	79.600	PPIC	450	D400	
F6	81.250	79.250	Conc.	1200	D400	MH to serve future development



Site Location Plan
Scale 1:10000

Issued for Planning	JJH	P02	JC	04.03.2022
FIRST DRAFT	JJH	P01	JC	11.01.2022
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
Cleator Moor Innovation Quarter - BOC Yard

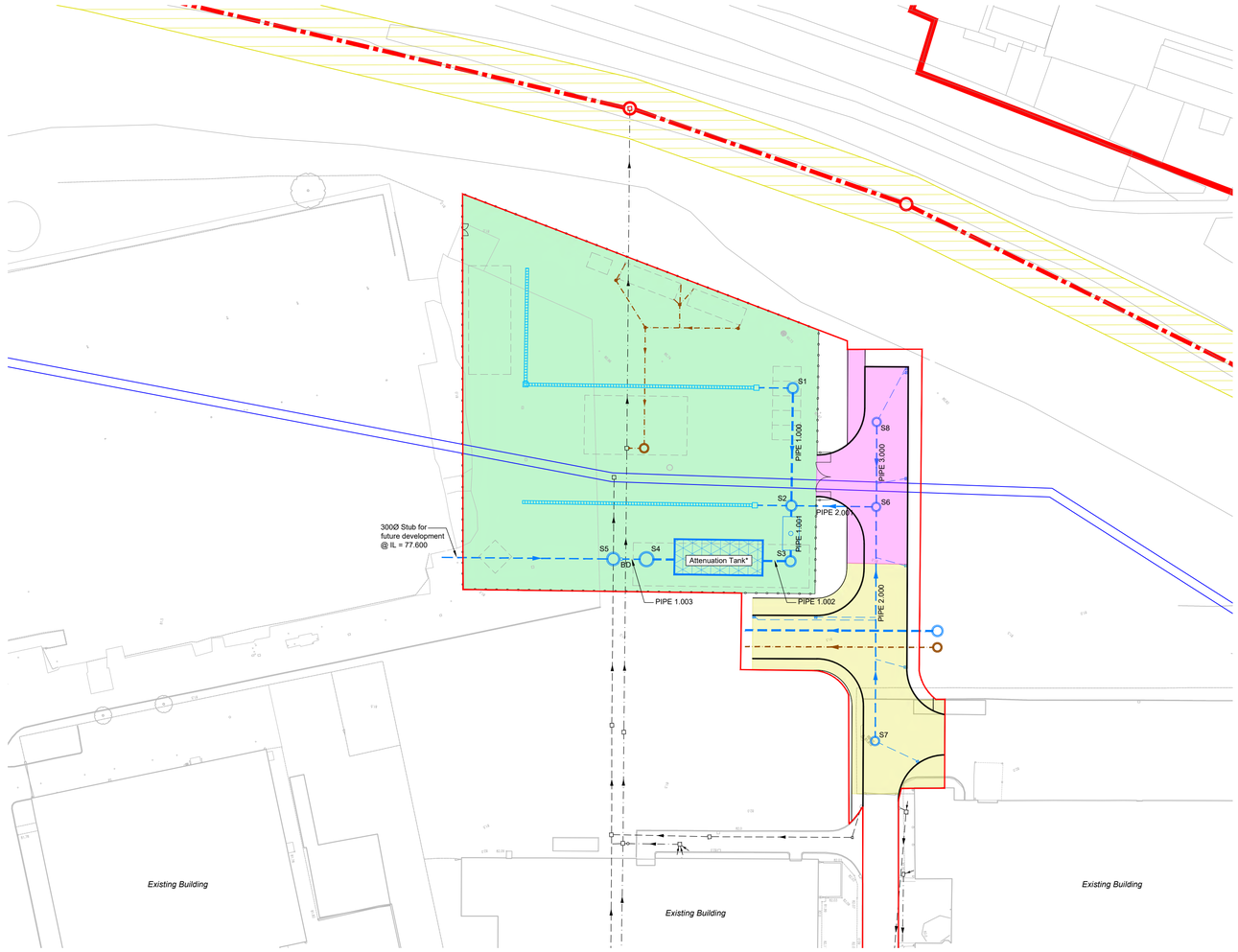
Project No.
21T2034

Drawing Title
Drainage Plan

Drawn	Date	Checked	Date	Size	Scale	Class.	Rev.
JJH	Jan 2022	JC	Jan 2022	A1	1:500	52	P02

Location	Originator	Volume	Level	Type	Role	Unique No.
CMIQ	BGP	04	XX	DR	C	04130

File Reference
CMIQ-BGP-04-XX-DR-C-52-04130



DO NOT SCALE

Legend - BOC Yard

Pipe 1.000
Area = 3380m² = (0.3380ha)
Fall = 1.420m / Length = 20.011m

Pipe 1.001
Area = 0m² = (0.0ha)
Fall = 0.165m / Length = 9.450m

Pipe 1.002
Area = 0m² = (0.0ha)
Fall = 0.165m / Length = 24.527m

Pipe 1.003
Area = 0m² = (0.0ha)
Fall = 0.110m / Length = 5.651m

Pipe 2.000
Area = 690m² = (0.0690ha)
Fall = 1.045m / Length = 39.851m

Pipe 2.001
Area = 0m² = (0.00ha)
Fall = 1.425m / Length = 14.456m

Pipe 3.000
Area = 400m² = (0.0400ha)
Fall = 0.145m / Length = 14.462m

Impermeable Areas Total = 4470m² = (0.4470ha)

BOC Yard Reference Drawings

CMIQ-BGP-04-XX-DR-C-52-04101 - Impermeable Areas Plan
CMIQ-BGP-04-XX-DR-C-52-04102 - Flood Exceedance Flow Route
CMIQ-BGP-04-XX-DR-C-90.4-04110 - Externals Plan
CMIQ-BGP-04-XX-DR-C-52-04130 - Drainage Plan

Issued for Planning	JJH	P02	JC	04.03.2022
FIRST DRAFT	JJH	P01	JC	11.01.2022
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
Cleator Moor Innovation Quarter - BOC Yard

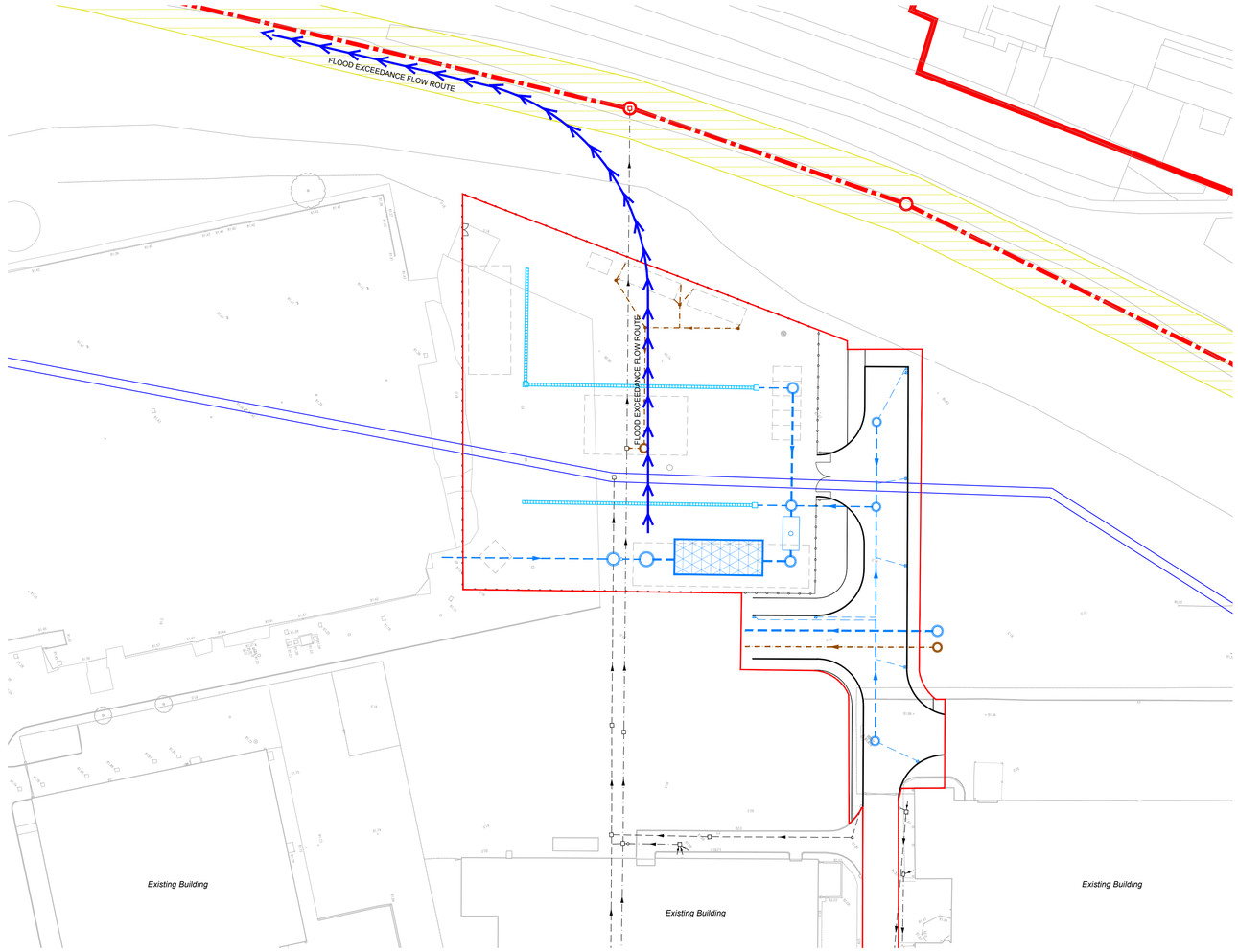
Project No.
21T2034

Drawing Title
Impermeable Areas Plan

Drawn	Date	Checked	Date	Size	Scale	Class.	Rev.
JJH	Jan 2022	JC	Jan 2022	A1	1:500	52	P02

Location	Originator	Volume	Level	Type	Role	Unique No.
CMIQ	BGP	04	XX	DR	C	04101

File Reference
CMIQ-BGP-04-XX-DR-C-52-04101



DO NOT SCALE

Notes

1. Contours shown are based on Gov UK Lidar information.
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 in soft landscaping that depressions will be provided to direct surface water away from properties. 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
- Nor Beck (Culverted)
- Existing SW Sewer
- Existing FW Sewer
- Existing UU Combined Sewer
- Site A Redline Boundary
- Existing UU Sewer Easement
- Proposed Attenuation Tank
- Flood Exceedance Flow Path (Based on a Complete Drainage System Failure) — FLOOD EXCEEDANCE FLOW ROUTE

BOC Yard Reference Drawings
CMIQ-BGP-04-XX-DR-C-52-04101 - Impermeable Areas Plan
CMIQ-BGP-04-XX-DR-C-52-04102 - Flood Exceedance Flow Route
CMIQ-BGP-04-XX-DR-C-90.4-04110 - Externals Plan
CMIQ-BGP-04-XX-DR-C-52-04130 - Drainage Plan

Issued for Planning	JJH	P02	JC	04.03.2022
FIRST DRAFT	JJH	P01	JC	11.01.2022
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.

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Client
Copeland Borough Council

Project
Cleator Moor Innovation Quarter - BOC Yard

Project No.
21T2034

Drawing Title
Flood Exceedance Flow Path

Drawn	Date	Checked	Date	Size	Scale	Class.	Rev.
JJH	Jan 2022	JC	Jan 2022	A1	1:1000	52	P02

Location	Originator	Volume	Level	Type	Role	Unique No.
CMIQ	BGP	04	XX	DR	C	04102

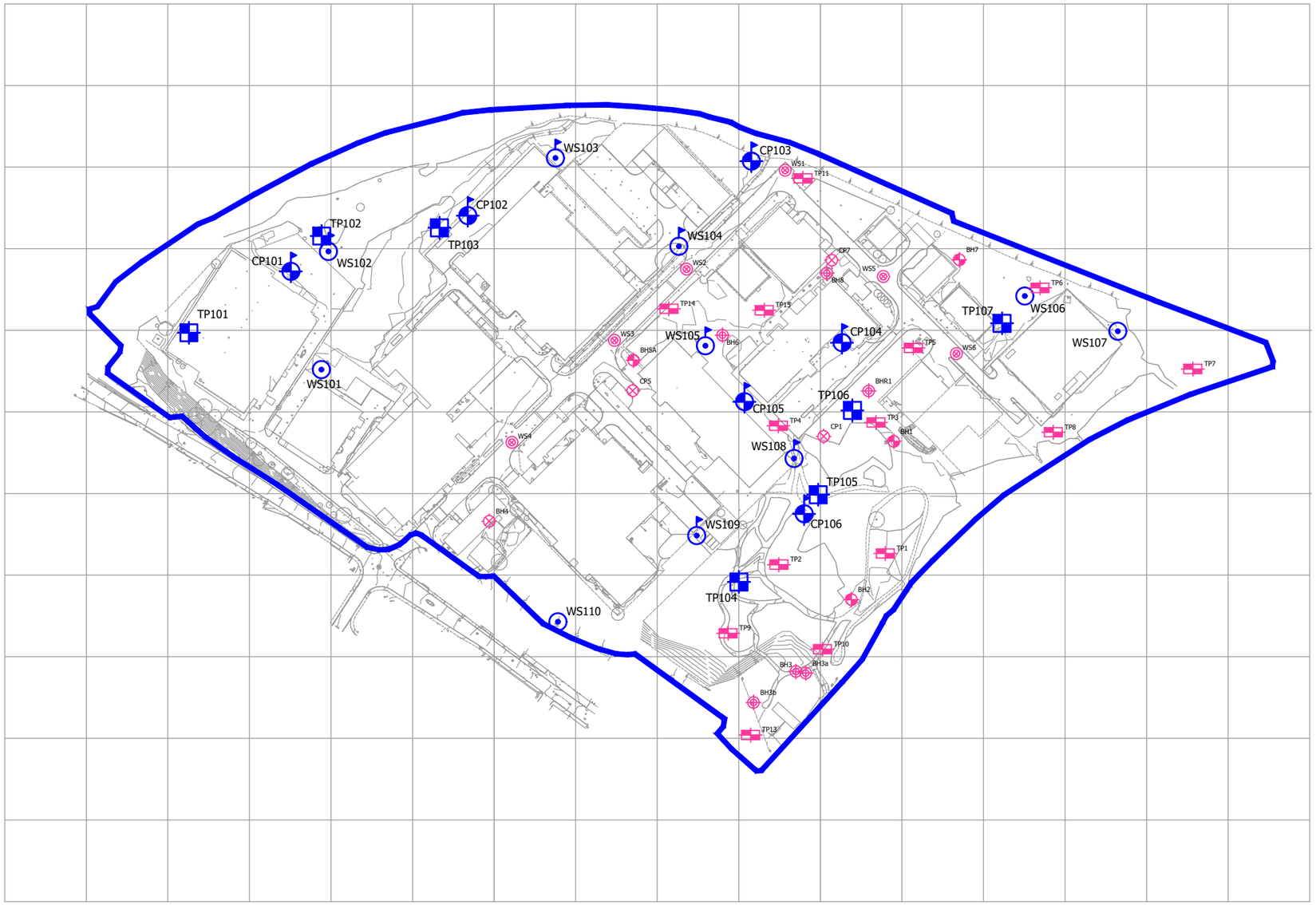
File Reference
CMIQ-BGP-04-XX-DR-C-52-04102

Appendix G

Borehole Logs

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

N



KEY

SITE BOUNDARY

WYG GROUND INVESTIGATION 2020

- CABLE PERCUSSIVE BOREHOLES (15m bgl)
- TRIAL PITS
- WINDOWLESS SAMPLING BOREHOLES
- GAS & GROUNDWATER MONITORING INSTALLATIONS

WYG GROUND INVESTIGATION 2007

- CABLE PERCUSSION BOREHOLES
- ROTARY OPENHOLE BOREHOLES
- ROTARY OPENHOLE FOLLOWED BY CABLE PERCUSSIVE BORING
- WINDOW SAMPLING HOLES
- TRIAL PITS

FINAL ISSUE

REV	DESCRIPTION	BY	CHK	APP	DATE

Client:

COPELAND BOROUGH COUNCIL &
ENERGY COAST WEST CUMBRIA (PROPERTIES) LTD

QUAY WEST at MediaCityUK
TRAFFORD WHARF ROAD
TRAFFORD PARK
MANCHESTER
M17 1HH

TEL: +44 (0)161 872 3223
e-mail: manchester@wyg.com

Project: A114312-1

LECONFIELD INDUSTRIAL ESTATE
CLEATOR MOOR

Drawing Title:

MADE GROUND & DRIFT GROUND INVESTIGATION

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
1:3,000	PP	06.10.20	CA	06.10.20	CM	06.10.20

Project No.	Office	Type	Drawing No.	Revision
A114312-1	MAN	N	101	

© WYG Group Ltd.

Project: **Leconfield Industrial Estate**	Location Details		Status	Borehole Number
Location: **Cleator Moor, Cumbria**	Easting: 301375.32	Northing: 515586.07	FINAL	**CP101**
Client: **Copeland Borough Council & Energy Coast West Cumbria (Properties) Ltd**	Level: 80.76mAOD	Depth: 14.07m		Sheet 1 of 2
	Logger: AL	Type: CP		
		Inclination: 90°		

Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: DF
0.00	1.20	Trial Pit	JCB 3CX		5.00	200	5.00	200	11/08	18:00	8.00	7.50	5	Approved By: CEM
1.20	7.28	Rotary Open Hole	T57 Rotary Rig	NS	14.07	150	14.00	150	12/08	12:00	14.45	14.00	13.5	Start Date: 05/08/2020
7.28	14.07	Cable Percussion	Dando 2000 Mk2	RH										Finish Date: 12/08/2020

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Grey ASPHALT.								
MADE GROUND: Reddish brown very clayey slightly sandy fine to coarse angular to sub-angular slag GRAVEL. Sand is fine to coarse.		0.20	80.56			0.50 0.50	B1 ES1	PID 0.50m, 0.3ppm
MADE GROUND: Grey fine to coarse angular slag GRAVEL. Sand is fine to coarse.		1.20	79.56					
MADE GROUND: Reddish brown clayey fine to coarse SAND and fine to coarse angular to sub-angular limestone GRAVEL with rare slag fragments and clay pockets.		5.00	75.76	▼				PID 6.00m, 0.1ppm
MADE GROUND: Grey fine to coarse angular to sub-angular slag GRAVEL. *Below 7.00m bgl hydrogen sulphide odour.*		7.00	73.76			7.50 - 7.95 7.50 - 7.95 8.00 - 8.80	B8 D7 B9	SPT(S) 7.50m, N=19 (3,3/5,7,4,3)
Soft brown silty CLAY.		8.80	71.96					
Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-angular mudstone. Sand is fine to coarse.		9.00	71.76			9.00 9.00 - 9.45 9.00 - 9.45 10.00	ES3 B11 D10 D12	SPT(S) 9.00m, N=27 (4,7/5,8,6,8) PID 9.00m, 0.0ppm

Observations / Remarks

1. Groundwater seepage observed at 5.00m bgl & 13.50m bgl.
2. Combined gas/groundwater monitoring standpipe installed to 8.00m bgl.
3. Exploratory hole pre-excavated to remove slag cobbles and then rotary open hole through the Slag deposits.
4. Hydraulic breaker used at 0.20m and 0.60m bgl for 20 minutes each.

Chiselling

From (m)	To (m)	Time (mins)
8.00	8.20	30

Water Added

From (m)	To (m)

Hammer Information

Serial No.	Energy Ratio %
PBD05	88

Groundwater

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
5.00	-	-	0	0.00	Seepage.

Project Number: **A114312-1**

Project:	**Leconfield Industrial Estate**	Location Details	Status
Location:	**Cleator Moor, Cumbria**	Easting: 301375.32 Northing: 515586.07	FINAL
Client:	**Copeland Borough Council & Energy Coast West Cumbria (Properties) Ltd**	Level: 80.76mAOD Depth: 14.07m Logger: AL Type: CP Inclination: 90°	

Borehole Number: CP101

Sheet 2 of 2

Method, Plant and Crew

From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Trial Pit	JCB 3CX	
1.20	7.28	Rotary Open Hole	T57 Rotary Rig	NS
7.28	14.07	Cable Percussion	Dando 2000 Mk2	RH

Diameter

Depth (m)	Diam (mm)
5.00	200
14.07	150

Casing

Depth(m)	Diam (mm)
5.00	200
14.00	150

Drilling Progress by Time

Date	Time	Depth (m)	Casing (m)	Water (m)
11/08	18:00	8.00	7.50	5
12/08	12:00	14.45	14.00	13.5

Scale: 1:50
Checked By: DF
Approved By: CEM
Start Date: 05/08/2020
Finish Date: 12/08/2020

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-angular mudstone. Sand is fine to coarse.						10.50 - 10.95 10.50 - 10.95	B14 U13	Ublows=120 Recovery=30%
Weathered grey MUDSTONE recovered as gravel.		11.80	68.96			11.80 12.00 - 12.45 12.00 - 12.45 13.00 13.50 - 13.95 13.50 - 13.95	D15 B17 D16 D18 B20 D19	SPT(S) 12.00m, N=40 (7,8/14,8,8,10) SPT(S) 13.50m, 32 (25,18/32 for 60mm)
EOH at 14.07m - Terminated due to refusal on rockhead.		14.07	66.69			14.00 - 14.07	D21	SPT(C) 14.00m, 50 (25 for 50mm/50 for 20mm)

Observations / Remarks

1. Groundwater seepage observed at 5.00m bgl & 13.50m bgl.
2. Combined gas/groundwater monitoring standpipe installed to 8.00m bgl.
3. Exploratory hole pre-excavated to remove slag cobbles and then rotary open hole through the Slag deposits.
4. Hydraulic breaker used at 0.20m and 0.60m bgl for 20 minutes each.

Chiselling

From (m)	To (m)	Time (mins)
13.80	14.00	30

Water Added

From (m)	To (m)

Hammer Information

Serial No.	Energy Ratio %
PBD05	88

Groundwater

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
13.50	-	-	0	0.00	Seepage.

Project Number: **A114312-1**

Project: **Leconfield Industrial Estate**	Location Details		Status	Borehole Number
Location: **Cleator Moor, Cumbria**	Easting: 301713.21	Northing: 515542.35	FINAL	**CP104**
Client: **Copeland Borough Council & Energy Coast West Cumbria (Properties) Ltd**	Level: 82.99mAOD	Depth: 15.14m		Sheet 1 of 2
	Logger: AL	Type: CP		
		Inclination: 90°		

Method, Plant and Crew

From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Trial Pit	JCB 3CX	
1.20	8.78	Rotary Open Hole	T57 Rotary Rig	SG
8.78	15.14	Cable Percussion	Dando 2000 Mk2	RH

Diameter

Depth (m)	Diam (mm)
8.50	200
15.14	150

Casing

Depth(m)	Diam (mm)
8.50	200
15.00	150

Drilling Progress by Time

Date	Time	Depth (m)	Casing (m)	Water (m)
13/08	18:00	7.60	0.00	5
14/08	15:00	15.14	13.50	Dry

Scale:	1:50
Checked By:	DF
Approved By:	CEM
Start Date:	05/08/2020
Finish Date:	18/08/2020

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Brick setts over grey fine to coarse angular slag GRAVEL.								
MADE GROUND: Grey slag GRAVEL (Drillers Description).		1.20	81.79					
Red CLAY (Drillers Description).		8.00	74.99					
Stiff brown slightly sandy silty gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to sub-angular mudstone.		8.78	74.21			9.00	ES1	SPT(S) 9.00m, N=21 (6,3/5,5,5,6)
						9.00 - 9.45	B3	PID 9.00m, 0.1ppm
Very weathered dark grey MUDSTONE recovered as gravel.		9.20	73.79			9.00 - 9.45	D2	
		9.90	73.09	▼		9.90	D4	
						10.00	ES2	PID 10.00m, 0.0ppm

Observations / Remarks

1. Groundwater seepage observed at 9.90m bgl.
2. Combined gas/groundwater monitoring standpipe installed to 15.00m bgl.
3. Exploratory hole pre-excavated to remove slag cobbles and then rotary open hole through the Slag deposits.
4. Hydraulic breaker used at 0.00m, 0.20m, 0.60m and 1.00m bgl for 15 minutes each.

Chiselling

From (m)	To (m)	Time (mins)

Water Added

From (m)	To (m)

Hammer Information

Serial No.	Energy Ratio %
PBD05	88

Groundwater

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
9.90	-	-	0	0.00	Seepage

Project Number: **A114312-1**

Project:	**Leconfield Industrial Estate**	Location Details	Status
Location:	**Cleator Moor, Cumbria**	Easting: 301713.21 Northing: 515542.35	FINAL
Client:	**Copeland Borough Council & Energy Coast West Cumbria (Properties) Ltd**	Level: 82.99mAOD Depth: 15.14m Logger: AL Type: CP Inclination: 90°	

Borehole Number: CP104

Sheet 2 of 2

Method, Plant and Crew

From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Trial Pit	JCB 3CX	
1.20	8.78	Rotary Open Hole	T57 Rotary Rig	SG
8.78	15.14	Cable Percussion	Dando 2000 Mk2	RH

Diameter

Depth (m)	Diam (mm)
8.50	200
15.14	150

Casing

Depth(m)	Diam (mm)
8.50	200
15.00	150

Drilling Progress by Time

Date	Time	Depth (m)	Casing (m)	Water (m)
13/08	18:00	7.60	0.00	5
14/08	15:00	15.14	13.50	Dry

Scale: 1:50
Checked By: DF
Approved By: CEM
Start Date: 05/08/2020
Finish Date: 18/08/2020

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
Highly weathered dark grey MUDSTONE recovered as very clayey gravelly SAND.						10.50 - 10.95	B6	SPT(S) 10.50m, 50 (6,9/50 for 265mm)
						10.50 - 10.95	D5	
						11.50	D7	
						12.00 - 12.45	B9	
						12.00 - 12.45	D8	
						13.00	D10	
						13.50 - 13.95	B12	SPT(S) 13.50m, 50 (25 for 145mm/50 for 205mm)
						13.50 - 13.95	D11	
						14.50	D13	
						15.00 - 15.45	D14	SPT(S) 15.00m, 50 (25 for 70mm/50 for 70mm)
EOH at 15.14m - Terminated due to refusal on rockhead.		15.14	67.85					

Observations / Remarks

1. Groundwater seepage observed at 9.90m bgl.
2. Combined gas/groundwater monitoring standpipe installed to 15.00m bgl.
3. Exploratory hole pre-excavated to remove slag cobbles and then rotary open hole through the Slag deposits.
4. Hydraulic breaker used at 0.00m, 0.20m, 0.60m and 1.00m bgl for 15 minutes each.

Chiselling

From (m)	To (m)	Time (mins)

Water Added

From (m)	To (m)

Hammer Information

Serial No.	Energy Ratio %
PBD05	88

Groundwater

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Project Number: A114312-1

Project: **Leconfield Industrial Estate**

Location: **Cleator Moor, Cumbria**

Client: **Copeland Borough Council & Energy Coast West Cumbria (Properties) Ltd**

Location Details			
Easting:	301653.41	Northing:	515506.18
Level:	82.99mAOD	Depth:	8.64m
Logger:	AL	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **CP105**

Sheet 1 of 1

Method, Plant and Crew				
From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Trial Pit	JCB 3CX	
1.20	5.00	Rotary Open Hole	T57 Rotary Rig	SG
5.00	8.64	Cable Percussion	Dando 2000 Mk2	RH

Diameter	
Depth (m)	Diam (mm)
5.00	200
8.64	150

Casing	
Depth(m)	Diam (mm)
5.00	200
8.64	150

Drilling Progress by Time				
Date	Time	Depth (m)	Casing (m)	Water (m)
10/08	18:00	8.50	7.50	Dry
11/08	15:00	8.60	8.60	4

Scale:	1:50
Checked By:	DF
Approved By:	CEM
Start Date:	05/08/2020
Finish Date:	11/08/2020

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Vegetation over sandy silty TOPSOIL with rootlets.		0.10	82.89			0.00 - 1.00	B1	
MADE GROUND: Reddish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to sub-angular mixed lithologies. Sand is fine to coarse.						0.10	ES1	PID 0.10m, 0.5ppm
						0.70	B2	
						0.70	ES2	PID 0.70m, 0.7ppm
						1.00 - 2.00	B2	
						1.20	ES3	PID 1.20m, 0.6ppm
Stiff reddish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of mudstone.		2.00	80.99			2.00 - 2.45	B4	SPT(S) 2.00m, N=17 (1,2/3,4,5,5)
						2.00 - 2.45	D3	PID 2.10m, 0.0ppm
						2.10	ES4	
						3.00	ES5	Ublows=98 Recovery=70%
						3.00 - 3.45	U5	PID 3.00m, 0.0ppm
						3.50	D6	
From 4.00m bgl: Very stiff.						4.00 - 4.45	B8	SPT(S) 4.00m, N=47 (3,5/15,15,10,7)
						4.00 - 4.45	D7	
						5.00 - 5.45	B10	Ublows=120 Recovery=30%
						5.00 - 5.45	U9	
						6.00 - 6.45	B12	SPT(S) 6.00m, N=43 (5,5/10,17,9,7)
						6.00 - 6.45	D11	
						7.00	D13	
Reddish brown clayey gravelly very sandy fine to coarse sub-angular quartz and mudstone GRAVEL. Sand is fine to coarse.		7.10	75.89					
Dark and light grey very sandy angular fine to coarse diorite and limestone GRAVEL.		7.30	75.69			7.50 - 7.95	B15	SPT(S) 7.50m, 50 (10 for 0mm/50 for 10mm)
						7.50 - 7.95	D14	
Reddish brown clayey very sandy fine to coarse angular quartz and diorite GRAVEL. Sand is fine to coarse.		8.50	74.49			8.50 - 8.95	B17	SPT(S) 8.50m, 50 (30 for 0mm/50 for 30mm)
		8.64	74.35			8.50 - 8.95	D16	SPT(S) 8.60m, 50 (15 for 0mm/50 for 20mm)
EOH at 8.64m - Terminated due to refusal.						8.60 - 9.05	D18	

Observations / Remarks

1. Groundwater was not observed.
2. Combined gas/groundwater monitoring standpipe installed to 8.60m bgl.
3. Exploratory hole pre-excavated to remove slag cobbles and then rotary open hole through the Slag deposits.

Chiselling		
From (m)	To (m)	Time (mins)
7.50	8.60	240

Water Added	
From (m)	To (m)
7.50	8.60

Hammer Information	
Serial No.	Energy Ratio %
PBD05	88

Groundwater					
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Project Number: **A114312-1**

BOREHOLE RECORD 104/01 10W/355

Contract No. C457 Client E.I.E. Corporation

Ground Level Location Cleator Moor

Date MARCH 1969 BOREHOLE No. 2

Depth	Thickness	Legend	Description of Strata	Type of Sample	C_2 Lbs./ft.	M %	Ø	Density 3 Lbs./ft.	N
				P 2'-6"					14
	10'-0"		Red clay & slag	P 5'-0"					12
10'-0"				P 10'-0"					12
	10'-0"		Ash & small stones	P 15'-0"					16
20'-0"				P 18'-6"					17

Water Struck at DRY Standing Water Level

British Geological Survey

Appendix H

Flood Maps for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
BOC Yard	**301400/515601**	**16 Dec 2021 8:16**

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

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

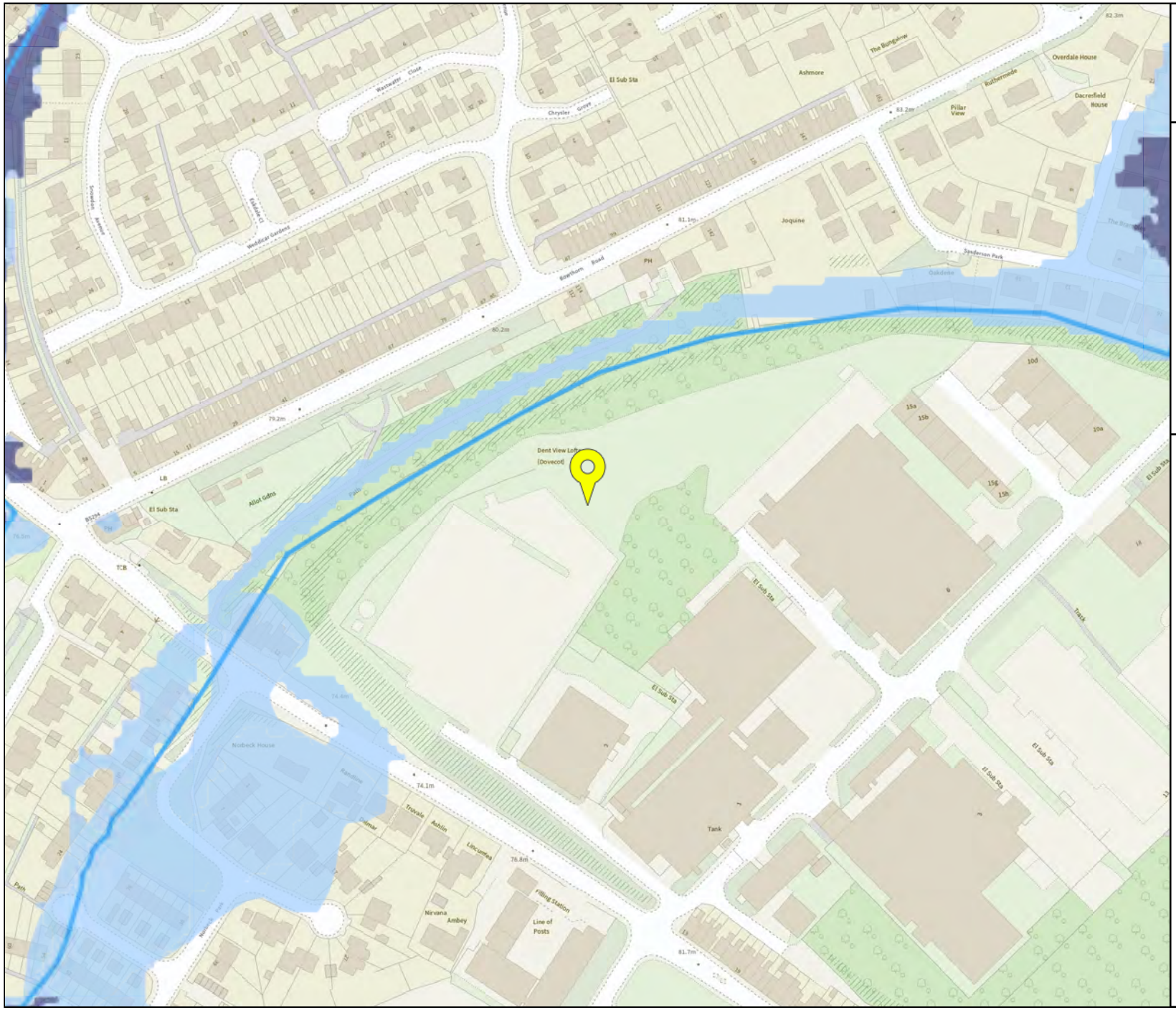
Notes

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 2021 OS 100024198. https://flood-map-for-planning.service.gov.uk/os-terms



Environment Agency

Flood map for planning

Your reference
BOC Yard

Location (easting/northing)
301400/515601

Scale
1:2500

Created
16 Dec 2021 8:16

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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Appendix I

United Utilities, LLFA and EA

Predevelopment Correspondence

James Herbert

From: NWNorthPlanning
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

From: James Herbert
Sent: 05 October 2021 16:25
To: NWNorthPlanning
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.

Cumbria County Council

Flood & Development Management • Economy & Infrastructure • Parkhouse Building • Baron Way • Carlisle • CA6 4SJ
T: 01228 221 331 • Email: DMandLLFA_west@cumbria.gov.uk

Barbara Vernon

For the attention of Barbara Vernon

Date: 22 September 2021
Our reference: PPA/2021/2180

Dear Barbara Vernon

PRE-PLANNING APPLICATION ADVICE

Pre-App Reference No. PPA/2021/2180
Site Location: Leconfield Industrial Estate, Cleator Moor, Cleator Moor, CA25 5QB
Proposal: Site A (re-develop existing) = 6 New Buildings with associated parking/service yards.
Site B (Greenfield) = 5 New Buildings with associated parking/service yards.
Site C (Greenfield) = 4 New Buildings with associated parking

Thank you once again for your request for pre-planning application advice in respect of the above proposed development. Cumbria County Council, in its capacity as the Lead Local Flood Authority (LLFA) has carefully reviewed your proposal and our advice and findings are detailed below.

Overview

In principle the proposals are acceptable, i would note the following observations.

- In looking back through our records, Norbeck is a main river which is controlled by the Environment Agency so discharge rates will require confirming with them and i would advise contact be made with the EA prior to any submission.
- River flooding levels in regard to site B and confirmation of acceptability of 1.0% AEP undefended/defended +35% CC will be from the EA.
- For all proposed sites the drainage hierarchy must be considered.
- I would suggest early pre-application advice is obtained from the EA, United Utilities and Sustrans.

Lead Local Flood Authority Advice and Comments

Existing Flood Risks:

- Site A - Shows minor areas affected by 1in100 year events
- Site B - Shows a significant portion to be affected at a 1in30 & 100 year event this area is also within flood zone 3.

- Site C - Shows flooding two areas affected by 1in3 & 100 year events.

Drainage Strategy/Design:

Site A - As this is an existing site which is to be expanded on, providing further new buildings the applicant is proposing a reduction in Brownfield of 50% if a existing outfall cannot be established to Norbeck in principle this is acceptable.

Should a discharge point be confirmed to Norbeck then the applicant needs to consider any new drainage in the northern area of the site being connected into the new drainage system at the southern end allowing it to out fall to Norbeck at a rate agreed with by the EA, the applicant needs to consider treatment of the surface water before out falling to main river.

Site B - The drainage hierarchy needs to be considered, infiltration testing to BRE365 should be undertaken to determine if land is suitable for infiltration. The proposed QBar discharge is acceptable to the LLFA however this should be agreed with the EA as the discharge point is main river.

Site C - As this land has previous use as allotment gardens it must be considered a greenfield site, again the drainage hierarchy must be considered, infiltration testing undertaken, there is local surface water drainage in the vicinity of the site in the form of the old railway drainage on the cyclepath to the north west boundary this should be explored further. Sustrans manage the cycle-way i would suggest contact be made with them.

Should investigations prove that the combined system in this area is the only available discharge point then it is likely that United Utilities would only accept the surface water into the combined system at a forward pass rate of 5L/s for all storm events.

Opportunities:

- Should an outfall to Norbeck not exist the applicant needs to consider establishing a new outfall to Norbeck for surface water from Site A with the agreement of the EA
- There is opportunity if the outfall to Norbeck can be confirmed then the northern part of site A needs to be configured to connect to the southern area drainage allowing surface water to discharge to main river if agreement can be obtained from the EA.
- Can the pre-existing part of Site A be retro fitted allowing for full separation of foul and surface water within this site?
- There requires consideration for treatment of surface water before out falling to the main river, has there been consideration of above ground storage that could incorporate treatment? Has permeable surfaces been considered within car parking areas that would allow for attenuation and also treatment of surface water to remove pollutants?

Information Necessary to Support a Planning Application

The following documents would be required to support a planning application:-

- Flood Risk Assessment
- Drainage Strategy
- CCTV survey information of existing drainage
- Management & Maintenance Plan for drainage that will remain private.

Proviso

The views and/or opinions expressed in the above advice are given in good faith and to the best of ability. They are based on existing guidance, standards and planning policies; and are given without prejudice to the consideration of any future planning application. The County Council cannot guarantee that new issues will not be raised following submission and evaluation of a planning application. Consequently County Council officers cannot give guarantees in respect of the recommendation it will make to the Local Planning Authority upon any future planning application subsequently lodged. This pre-planning application advice will be referred back to and considered by the County Council in preparing its technical recommendation, but it is subject to the proviso that circumstances and information may change or come to light that could alter the advice and/or position set out above. If there has been a significant delay in submitting your planning application after the pre-application advice was given then there will be a greater chance that there will have been a material change in national, regional or local policy and guidance or local circumstances. As you are no doubt aware, the final decision on a planning application will be taken by the relevant local planning authority, and not by the county council in its capacity as a statutory consultee.

I trust that the above is of assistance. Should you have any queries in respect of any aspect of the above then please do not hesitate to contact me.

Yours sincerely

Pieter Barnard
Lead Officer - Flood & Development Management(

James Herbert

From: Wastewater Developer Services
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
Emai
unitedutilities.com

If you have received a great service today why not tell us?
Visit: unitedutilities.com/wow

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry https://www.unitedutilities.com/builders-developers/ or you can email us at developerserviceswater@uuplc.co.uk