

Unit 3 - L'Oreal Facility, Roach Bank Road, Bury BL9 8RY

Drainage Assessment

Technical Note

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Introduction

1. Weetwood Services Ltd ('Weetwood') has been instructed by Roach Pilsworth Ltd to prepare a Technical Note in association with the proposed development of Unit 3 – L'Oreal Facility, Roach Bank Road, Bury.
2. A full planning application (ref: 68897) for the "Proposed extension to existing warehouse with external alterations to the existing building and use of the building for Class E(g) and / or Class B2 and / or Class B8 purposes with associated works" was submitted to Bury Council on 16 September 2022. The proposed site layout is presented in **Annex 1**.
3. The application was accompanied by a Flood Risk and Drainage Assessment report (FRDA) (ref: 5655/FRDA/Final/v1.0/2022-08-26) prepared by Weetwood.
4. Full planning permission was granted by Bury Council by way of a decision notice dated 18 January 2023, subject to the following drainage related condition:

***Condition 11:** Prior to the commencement of development, details of a sustainable surface water drainage scheme and a foul water drainage scheme shall be submitted to and approved in writing by the Local Planning Authority. The drainage schemes must include:*

- *An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water in accordance with BRE365;*
- *A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations);*
- *Levels of the proposed drainage systems including proposed ground and finished floor levels in AOD;*
- *Incorporate mitigation measures to manage the risk of sewer surcharge where applicable; and*
- *Foul and surface water shall drain on separate systems.*

The approved schemes shall also be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards.

Prior to occupation of the proposed development, the drainage schemes shall be completed in accordance with the approved details and retained thereafter for the lifetime of the development.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution.

Reason. The current application contains insufficient information regarding the proposed drainage scheme to fully assess the impact. To promote sustainable development and reduce flood risk pursuant to Unitary Development Plan Policies EN5/1- New Development and Flood Risk, EN7/3 - Water Pollution and EN7/5 - Waste Water Management and chapter 14 - Meeting the challenge of climate change, flooding and coastal change of the NPPF.

5. This document presents a foul and surface water drainage scheme for the proposed development to accompany an application to discharge planning condition 11.

Site Details

6. The approximately 2.4 ha site is located to the south of Roach Bank Road, south-east of Bury, approximately 0.5 km west of Junction 3 of the M66 at Ordnance Survey National Grid Reference SD 815 090, as depicted by the red line as shown in **Figure 1**.
7. The River Roch flows predominantly in a southerly direction approximately 195 m north-west of the site.
8. A topographic survey of the site has been undertaken by ND Oliver (**Annex 2**). Site levels are indicated to range between 88.1 to 90.7 metres Above Ordnance Datum (m AOD) with levels rising towards the north of the site. Access and egress is provided via Roach Bank Road along which levels fall east to west from 90.1 m AOD to 87.5 m AOD.
9. According to the Soilscape soils dataset produced by the Cranfield Soil and AgriFood Institute¹, soil conditions at the site and within the surrounding area are naturally wet very acid sandy and loamy soils.
10. British Geological Survey mapping of surface geology² indicates the underlying bedrock formation comprises Pennine Lower Coal Measures Formation (mudstone, siltstone, and sandstone), overlain by Devensian glacial deposits (diamicton).
11. A ground investigation was undertaken by RSA Geotechnics LTD in November 2003 (extract provided in **Annex 3**). The report indicates that the majority of the site is underlain by engineered fill consisting of compact and interlayered brown and grey firm to stiff sandy clay, clayey sandy gravels, and occasional boulder sized fragments of concrete, sandstone, and brick to a depth of 3.7 m bgl. The engineered fill is underlain by glacial till to a depth of 11.4 m bgl, prior to lower coal measures being observed at the base of the boreholes to a maximum depth of 13.3 m bgl.

Foul Water Management

12. Drainage plans prepared by Burks Green in November 2004 (**Annex 4**) indicate that separate foul and surface water drainage systems serve the wider site.
13. Based on the development proposals, there is no requirement for foul drainage. As such, the existing foul drainage system is not being altered as part of the proposals.

Surface Water Drainage at the Existing Site

14. The drainage plans (**Annex 4**) indicate that surface water runoff from the site discharges into the River Roch via 525 mm and 750 mm diameter surface water sewers located in Roach Bank Road and land north-west of Pilsworth Way.
15. Runoff from impermeable hardstanding areas at the site is directed to a bypass separator and roof runoff discharges downstream of the separator before entering the 525 mm diameter surface water sewer in Roach Bank Road.
16. The site has a total area of 2.42 ha of which 1.45 ha currently comprises impermeable areas and 0.97 ha permeable areas.
17. Runoff rates from existing impermeable areas have been modelled using Causeway Flow (**Annex 5**) based on the Burks Green drainage plans. The runoff rates from the existing site are presented in **Table 1**.

Table 1: Existing Peak Modelled Runoff Rates

AEP of Rainfall Event	Existing Runoff Rate (l/s)
100.0% (1 in 1 year)	117.8
3.3% (1 in 30 year)	438.5
1.0% (1 in 100 year)	536.0
1.0% (1 in 100 year) + 45% Climate Change	667.1

¹ www.landis.org.uk/soilscape/

² <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Proposed Surface Water Drainage Scheme

18. In accordance with the National Standards for SuDS, surface water runoff from impermeable surfaces should be disposed of according to the following hierarchy: Collected for non-potable use; Infiltrated to ground; To an above ground surface water body; To a surface water sewer or another piped surface water drainage system; To a combined sewer.
19. The demand for non-potable water within the proposed extension is low. As such, the incorporation of rainwater harvesting has been discounted.
20. As detailed in pages 14-17 of the ground investigation report (**Annex 3**), the majority of the site is underlain by varying depths of engineered fill consisting of compact and interlayered brown and grey firm to stiff sandy clay, clayey sandy gravels, and occasional boulder sized fragments of concrete, sandstone, and brick to a depth of up to 3.7 m bgl. The report estimates that the engineering fill was compacted in layers not greater than 350 mm and was noted to be hard and difficult to excavate. Additionally, groundwater was encountered within the underlying superficial geology. As such the disposal of surface water via infiltration is not deemed to be feasible given the presence of made ground and likelihood of groundwater.
21. It is subsequently proposed to direct all runoff from the proposed extension to the River Roch via the existing surface water drainage system serving the wider site.
22. The area of impermeable surfaces within the proposed development area has been calculated to be 0.422 ha. This area includes new roof and hardstanding areas. An impermeable area plan is provided in **Annex 6**.
23. Due to site constraints, it is proposed to allow hardstanding runoff to discharge freely via an existing channel drain. Proposed roof runoff is proposed to be restricted to 3.0 l/s. This will ensure that the post development surface water runoff from the wider site is not greater than the existing runoff rates as shown in **Table 1**.
24. Attenuation storage will be required to facilitate the proposed restriction in surface water runoff. The storage facilities have been modelled using Causeway Flow (**Annex 7**). The required storage volume has been sized to store the 1.0% AEP rainfall event including a 45% increase in rainfall intensity to allow for climate change in accordance with Government guidance.
25. Assuming peak discharge rates are restricted to no greater than existing, a total storage volume of 198.1 m³ would be required. The storage volume could be accommodated within the pipe network, drainage channel and an attenuation tank. The peak post development runoff rates are presented in **Table 2** below.

Table 2: Proposed Modelled Peak Runoff Rates

AEP of Rainfall Event	Existing Runoff Rate (l/s)	Proposed Runoff Rate (l/s)
100.0% (1 in 1 year)	117.8	117.6
3.3% (1 in 30 year)	438.5	437.6
1.0% (1 in 100 year)	536.0	534.9
1.0% (1 in 100 year) + 45% Climate Change	667.1	666.6

26. The majority of the storage is provided in an attenuation tank located to the east of the proposed extension, which accommodates roof runoff only. The hardstanding area to the west of the proposed extension must discharge freely and tie in to the existing channel drain as it is not feasible to provide attenuation storage in this location and provide a connection to the existing surface water drainage network.
27. A preliminary drainage layout and typical drainage construction details are provided in **Annex 8** and **Annex 9** respectively.
28. Flows resulting from rainfall in excess of the 1.0% AEP rainfall event including an allowance for climate change will be managed in exceedance routes. Existing site levels, which are to be matched post development, would ensure flood flows are held within the lower areas of hardstanding. Given that dock levellers are used on site and there is a 1.23 m level difference between threshold levels and the lower level required in the dock levellers, any exceedance flows would be retained on site and would be expected to drain away via the channel drains as rainfall subsides.

29. Table 26.2 of the CIRIA SuDS Manual identifies commercial roofs and approaches to industrial estates as having low and high pollution hazard levels, and indicates that the pollution hazard indices associated with such uses for total suspended solids, metals and hydrocarbons are 0.30, 0.20 and 0.05, and 0.80, 0.80 and 0.90 respectively.
30. The existing bypass separator will continue to provide water quality treatment prior to surface water runoff from hardstanding areas discharging off site. The SuDS mitigation indices for Class 1 bypass separators for total suspended solids, metals and hydrocarbons are typically 0.80, 0.60 and 0.90 respectively.
31. The existing bypass separator, Conder NS 15/1 can accommodate a drainage area of 8,333 m² as per the manufacturer's literature (**Annex 10**). The unit previously served a drainage area of 6,684 m² and can therefore accommodate the additional 1,060 m² of proposed hardstanding.
32. SuDS elements within the site, including the continued maintenance of the existing bypass separator (as per manufacturer's recommendations), would be the responsibility of the owner of the property. An indicative maintenance schedule is presented in **Table 2**.

Table 2: Maintenance Requirements

Schedule	Required action	Frequency
Geo-cellular attenuation storage tank		
Regular maintenance	Inspect and identify any areas that are not operating correctly	Monthly for 3 months, then annually
	Remove debris from the catchment surface	Monthly
	Remove sediment from internal forebays	Annually, or as required
Remedial action	Repair inlet/outlet and vents	As required
Monitoring	Inspect catchpit manholes and note rate of sediment accumulation	Monthly in the first year and then annually
	Inspect inlet/outlet and vents to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years, or as required
Flow Control Unit		
Routine maintenance	Remove litter and debris and inspect for sediment accumulation	Six Monthly
	Remove sediment from sump	As necessary – Indicated by system inspections
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six Monthly
	Inspect flow control unit and establish appropriate replacement frequencies	Six Monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first year of operation, then every six months

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FIGURES

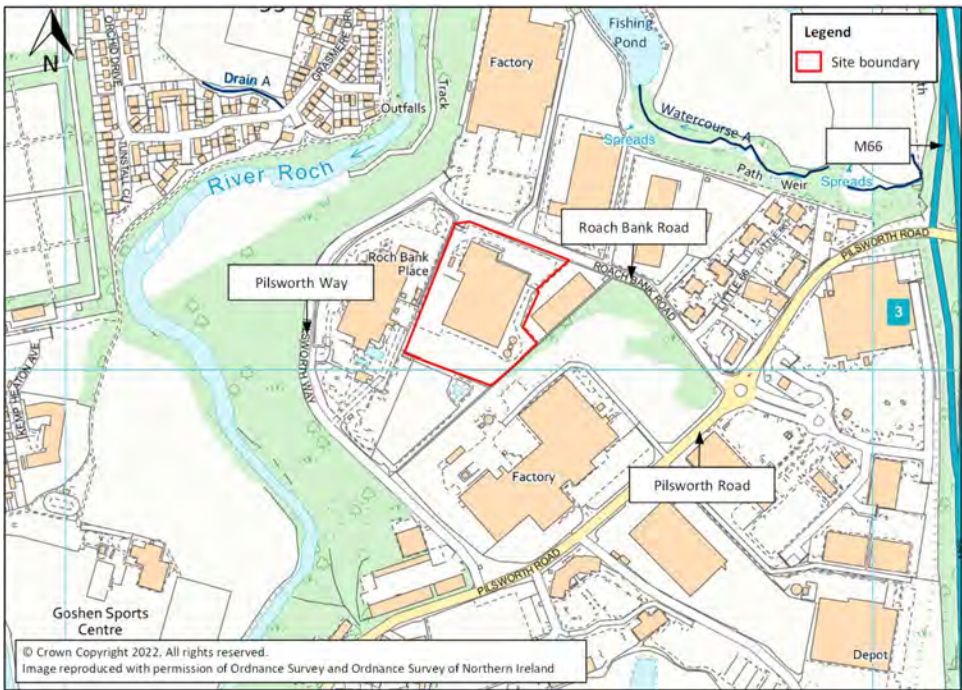


Figure 1: Site Location

ANNEX 1

Proposed Site Layout



Proposed Site Layout Scale 1:500

N

- Layout to be confirmed

C1

- Revision reference

SCHEDULE OF ACCOMMODATION

Unit 1

Warehouse Area

- 75,354 sq ft (7,000m²)

Office Area

- 13,566 sq ft (1,260m²)

Warehouse Expansion

- 33,000 sq ft (3,065m²)

Total GIA

- 121,919 sq ft (11,325m²)

(above areas taken from the scheme requirements document)

GEA(Warehouse Expansion) - 34,220 sq ft (3,179m²)

Loading Docks

- 10

Level Access

- 2

Car Parking

- 90

Site Area

- 5.97 Acres (2.41 Hectares)

B	Areas increased to suit latest site plan	CJD	DEB	04.08.22
A	Initial Issue	LF	DEB	25.07.22
rev	amendments	by	ckd	date

Unit 3 - Pilsworth Ind Est

Proposed Site Plan

M

MIRASTAR

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Drawing Status:	Feasibility
Drawn / Checked:	LF / DEB
Date:	25.07.2022
Scale:	1:500 A1
Drawing no:	Revision:
21663 F0002	B

ANNEX 2

Topographic Survey

ANNEX 3

Ground Investigation Report Extract

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PROPOSED COMMERCIAL DEVELOPMENT

AT

UNIT 3, ROACH BANK, BURY, LANCASHIRE

FOR

ASK PROPERTY DEVELOPMENTS

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GROUND INVESTIGATION REPORT NUMBER 8951

NOVEMBER 2003

3. GROUND INVESTIGATION

3.1 Fieldwork

The fieldwork comprised the drilling of seven boreholes (BH101 to BH107 inclusive) by conventional light cable percussion methods, and the excavation of ten trial pits (TP201 to TP210 inclusive) using a mechanical excavator. The positions of the exploratory holes are recorded on the copy of drawing number 8951/5 which accompanies this report. The exploratory hole positions were set out by RSA Geotechnics and levelled and co-ordinated by surveyors after the fieldwork.

Fieldwork was carried out during the period 10 to 18 September 2003.

The fieldwork for the investigation was carried out generally in accordance with BS 5930: 1999, 'Code of Practice for Site Investigations' and BS 1377: 1990, 'Methods of test for soils for civil engineering purposes'.

Undisturbed samples were taken and penetration tests carried out at intervals in the cable percussion boreholes. The results of the penetration tests are recorded as 'N' values and given on the borehole logs.

A number of tests could not be driven for the full 450 mm because rock was encountered. In these cases the actual blow count and distance penetrated were recorded.

In order to monitor ground gas emissions, 50 mm diameter wells were installed in all the cable percussion boreholes. The details of the construction are shown on the borehole logs. A protective cover was also installed at ground level over each standpipe.

The trial pits were excavated under the supervision of an experienced engineer who described the soils encountered in detail as they were revealed. A record was made of the groundwater conditions, together with the orientation and stability of each trial pit.

The undrained shear strength of the cohesive deposits encountered was assessed by carrying out tests using a Pilcon hand vane. Several readings were taken at each depth tested.

Full details of the fieldwork and the ground conditions are shown on the logs later in this report.

A total of three return visits were conducted to record ground gas concentrations and groundwater levels in the borehole installations. The installations were purged and groundwater samples collected for laboratory analyses during the second visit. The monitoring results are presented after the exploratory hole logs later in this report.

3.2 Laboratory Testing

3.2.1 Geotechnical

3.2.2 Environmental Testing

Samples from the investigation were registered in the laboratory sample store between 12 and 22 September 2003.

Chemical contamination analyses were carried out between 17 September and 23 October 2003 on selected samples to determine whether any contamination was evident from previous uses of the site. The chemical analyses were undertaken by ALcontrol

4. GROUND CONDITIONS

4.1 Published Data

The One Inch to One Mile Series Geological Survey Sheet 85, 'Manchester', Drift Edition indicates the Roach Bank Site to be constructed over the eastern valley side of River Roch.

Alluvium was shown exposed adjacent to the River Roch. The valley side was progressively underlain by Boulder Clay capped at a higher level (consistent with the eastern part of the Roach Bank Site) by a cover of Glacial Sand and Gravel.

The drift deposits unconformably overlie Carboniferous age Westphalian Coal Measures. The 1:50,000 Series Geological Survey Sheet 85 'Manchester', Solid Edition indicates the Coal Measures comprising interbedded sandstones, mudstones and coal seams to dip southwards at an angle of 10° to the horizontal. The strata are subdivided into fault blocks by faultlines trending north west to south east and east to west. The downthrow on the faultlines is predominantly to the south west and south respectively, resulting in progressively younger Carboniferous age strata outcropping from north to south.

A north west to south east tracking fault traverses beneath the middle of the Roach Bank Site and to the south of Unit 3. The Geological Survey suggests the drift beneath the Unit 3 is underlain by Westphalian A mudstones containing the Arley Mine coal seam resting upon the Old Lawrence Rock sandstone.

Wardell Armstrong undertook a deep borehole investigation of the Roach Bank Site in 1989 which encountered sandstones and mudstones but no coal below a cover of glacial drift