Nuvu Developments Ltd

Former Jacksons Brickworks, Ten Acres Lane
Temporary Surface Water Drainage Strategy

Rev A

February 2024

Vertase FLI

Contaminated Land, Brownfield & Environmental Contracting

REPORT TITLE:	**Temporary Surface Water Drainage Strategy**
REPORT NUMBER:	**Rev A**
CLIENT NAME:	**Nuvu Developments Ltd**

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1.0 Introduction

1.1 Appointments

1.1.1 Vertase FLI Ltd (VertaseFLI) was employed by Nuvu Developments Ltd ('the Client') to undertake pre-contract services to address the requirements of outstanding pre-commencement planning conditions associated with proposed land remediation works at the former Jackson's Brickworks, off Ten Acres Lane, Newton Heath, Manchester ('the Site').

1.2 Surface Water

1.2.1 The Site, which covers a total area of approximately 18ha, is located in the Newton Heath area of Greater Manchester, which receives an average precipitation in the region of 830mm per year. In its pre-remediation condition, the Site is open land, and a large proportion of this precipitation undergoes infiltration and evapotranspiration, with only a relatively small proportion forming surface water runoff. As the remediation works progress, there shall be an intentional net reduction in infiltration resulting from the engineered compaction and associated reduction in permeability of surface materials. Consequently, an increasing proportion of the precipitation received by the Site may form surface water runoff requiring appropriate storage, treatment and disposal during the remediation works to manage risks of flooding and pollution.

1.3 Document Purpose

1.3.1 The purpose of this document is to provide sufficient information to satisfy Condition 14 of Planning Permission 129197/FO/2021 granted by Manchester City Council (MCC). The wording of this condition is reproduced in paragraph 1.3.2 below:

1.3.2 No development shall take place until a document highlighting a temporary surface water drainage strategy, designed in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards, has been submitted to and approved in writing by the Local Planning Authority. The development shall be implemented in

accordance with the approved temporary surface water drainage strategy.

1.3.3 The temporary surface water drainage strategy to address the requirements of this Condition are detailed in Section 2.0.

2.0 Temporary Surface Water Drainage Strategy

2.1 Design Guidance

2.1.1 Condition 14 states that the temporary surface water drainage strategy must be designed in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015), or any subsequent replacement national standards. These non-statutory technical standards address the following design considerations which are adopted herein:

- Flood risk outside the development (Section 2.3).
- Flood risk inside the development (Section 2.4).
- Structural integrity (Section 2.5).
- Maintenance (Section 2.6).
- Construction (Section 2.7).

2.2 Existing Collection Trench System and Discharge Point

2.2.1 The temporary surface water drainage system proposed for use during the remediation works shall involve the enhancement of an existing collection trench that was installed by the Client in December 2022. The components and layout of the existing, and proposed additions, to the temporary surface water drainage system for use during the remediation works are illustrated in Drawing D1932_25 in Appendix A.

2.2.2 The existing collection trench system comprises a 1m deep, 1m wide gravel-filled interception trench containing a 150mm diameter perforated land drain, which conveys intercepted surface water runoff travelling to the south of the Site, along the southern boundary to the lowest point on the Site (in the southwest corner) where there is a water collection sump. The collected water is pumped through a water treatment plant and discharged to private foul sewer on neighbouring private land.

2.2.3 Records indicate that the average volume of intercepted surface water runoff discharged to private foul sewer over the past 12 months is circa 4,750m^3. This represents approximately 3% of the total annual precipitation received by the Site, which supports the assumption that

a large proportion of the precipitation currently undergoes infiltration and evapotranspiration.

2.2.4 It is proposed that the existing system is supplemented by construction of a circa 1000mm high earth bund barrier around the remaining boundaries of the Site coupled with separate surface water runoff interception trenches that are isolated from the southern trench via gravitational flow. Collected surface water can be pumped into the southern trench from sumps as required to enable treatment prior to discharge to public foul sewer in accordance with the terms of a trade effluent discharge consent issued by the local water authority (United Utilities).

2.2.5 The trade effluent discharge consent has not yet been issued by United Utilities. However, at the time of writing (February 2024), the application process has commenced and there is dialogue with United Utilities.

2.3 Flood Risk Outside the Development

2.3.1 The trade effluent discharge consent shall have a maximum daily discharge volume and peak discharge. The maximum daily discharge volume is anticipated to be in the region of 40m^3/hour (960m^3/day) subject to agreement with United Utilities. The discharge point to the public foul sewer shall be an access chamber located on Hallam Road.

2.3.2 In practice, the maximum allowable daily discharge volume shall be stipulated by United Utilities to ensure it is within the capabilities of the nearest treatment facility and does not cause flooding of the drainage network.

2.4 Flood Risk Inside the Development

2.4.1 During the remediation works, there shall be relatively little hardstanding present on the Site. The ground conditions are well characterised at the Site and the surface materials are likely to have a high permeability (albeit decreasing permeability as the remediation works progress). In the context of runoff calculation methodologies set out in Environment Agency guidance (Report SC030219), this would mean that the ground has a low 'standard percentage runoff' (SPR) during remediation.

2.4.2 No attempt has been made to quantify the surface water runoff during the remediation works due to the dynamic nature of the Site topography (as the cut and fill earthworks progress) and the variability of the surface materials (albeit the surface materials are expected to have a consistently relatively low SPR as the works proceed in comparison to hardstanding).

2.4.3 However, application of a ten-fold uncertainty factor to the annual volume of surface water runoff intercepted on the Site in its pre-remediation state by the existing surface water collection system (see Section 2.2) yields a worst-case daily volume of surface water runoff (equating to 130m^3/day). This worst-case daily volume is still significantly below the maximum allowable daily discharge volume (960m^3/day) requested in the application for the trade effluent discharge consent. It is unlikely that the United Utilities foul sewer network is unable to accommodate a maximum discharge greater than 130m/day.

2.4.4 Notwithstanding this, care shall be taken during the remediation works to ensure that the surface water interception trenches are not overwhelmed during intense rainfall events. This shall be achieved by regular pumping of the water for storage, treatment and consented discharge to foul sewer.

2.5 Structural Integrity

2.5.1 Components of the temporary surface water drainage system comprise:

- Earth bund barrier
- Interceptor trenches and sumps
- Mobile diesel pumps
- Water treatment plant (sedimentation tank, oil/water separator, carbon filtration units, interconnecting pipework, and discharge pipework)
- Discharge point (connection in manhole chamber for public foul sewer).

2.5.2 The remediation works are anticipated to take circa 12 months and thus the design life of the temporary surface water drainage system shall be of an equivalent minimum duration. Design considerations to ensure the structural integrity of the components of the drainage system over the design life are summarised in Table 2-1.

Table 2-1. Design considerations to ensure structural integrity

Component	Design Considerations
Earth bund barrier	Constructed using acceptable earthworks materials and appropriate methods of compaction to maximise density and minimise permeability. The slopes of the bund shall be shallow (1 in 2) to maximise slope stability and minimise the likelihood of erosion/gullying. Where necessary, the barrier shall be seeded to further enhance stability
Interceptor trenches and sumps	Constructed with appropriate falls for drainage (e.g. ~1 in 40 or steeper) towards accessible sumps constructed from perforated Polypipe installed vertically with a gravel surround. Areas of open water are to be avoided where possible to manage risks to health and safety
Mobile diesel pumps	To be positioned on flat surfaces accessible by vehicles and excavators, but secured to minimise risk of theft
Water treatment plant	To be constructed on a stable lined and bunded area of the site to manage risks of pollution associated with unforeseen equipment failure
Discharge point	Constructed with minimal above ground components in the public highway to manage risks associated with vandalism and theft of equipment

2.6 Maintenance

2.6.1 All components of the temporary surface water drainage system shall require periodic maintenance. The need for maintenance shall be evaluated during regular inspections and monitoring, which form part of the requirements of the Environmental Permit for conducting treatment operations using mobile plant. The inspections shall incorporate the components of the temporary surface water drainage system to assess for blockages to flow, bund integrity and water pump functionality.

2.6.2 The performance of the water treatment plant shall be monitored by testing of treated water samples to confirm compliance with consented limits prior to discharge to foul sewer. The analytical suite and frequency of testing shall be determined by the trade effluent discharge consent. Maintenance of the water treatment plant may involve changing of the granular activated carbon or cleaning of the pipework.

2.7 Construction

2.7.1 Within the non-statutory technical standards for sustainable drainage systems (March 2015), construction considerations relate to (a) the existing sewer or connection pipe to which the temporary surface water drainage system shall be connected; and (b) potential damage to the drainage system resulting from construction activities (in this case remediation).

2.7.2 The discharge point (a manhole chamber) into the existing foul sewer has a ground elevation of 79.88mAOD (top of manhole cover). The manhole is located at the upgradient end of the foul sewer drainage run on Hallam Road, approximately 2m outside the southern Site boundary. The foul sewer pipe comprises a 100mm diameter vitrified clay pipe that widens to a 300mm vitrified clay pipe approximately 25m downgradient.

2.7.3 The connection shall comprise an extension of the existing 100mm diameter foul sewer pipe into the Site boundary from the existing manhole chamber, therefore negating any above ground structure in the public highway.

2.7.4 The potential for damage to the temporary surface water drainage system by activities associated with the remediation works shall be managed by a combination of risk assessments, method statements and toolbox talks.

2.8 Groundwater Pollution

2.8.1 At present (pre-remediation), infiltration is understood to provide a significant sink for precipitation at the Site, thus minimising surface water runoff. During the remediation works, there is unlikely to be a net increase in infiltration across the Site. Therefore, there is unlikely to be a net increase in the mass of contaminants entering the shallow

perched groundwater beneath the Site via infiltration during the remediation works.

2.8.2 Furthermore, as part of the VertaseFLI remediation strategy, shallow perched groundwater beneath the Site shall undergo pump and treat, which shall reduce the contaminant mass already present in the groundwater.

2.8.3 Notwithstanding this, a network of sentinel groundwater monitoring wells located along the northern perimeter of the Site shall be retained during the remediation works to enable ongoing sampling and analysis of groundwater. As discussed in the VertaseFLI remediation strategy, these wells are primarily intended to facilitate measurement of PFAS concentrations, but the analytical suite will also include heavy metals and total petroleum hydrocarbon fractions to confirm no significant mobilisation of contaminant mass into groundwater is occurring during the works.

Appendix A

Drawings

A1

Surface Water Collection Trench Extension

Water Treatment Plant

Surface Water Collection Trench

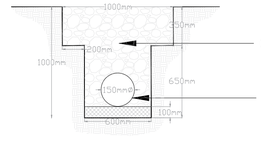
Discharge Point

NEWTON HEATH

Key

- Spot Level
- Top of Bank
- Bottom of Bank
- As-Built Extent - Surface Water Trench
- Water Treatment Plant
- Proposed Bunds - Circa 1m High
- Surface Water Trench - Extension

Typical Section - Surface Water Collection Trench



Rev.	Description	Revised By	Date
	FIRST ISSUE		03-10-2023

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Site Address:

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M40 2SP

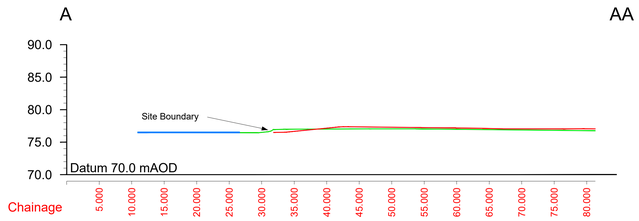
Rev:

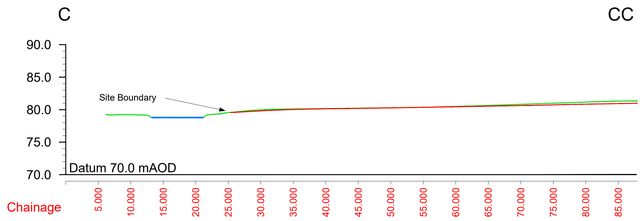
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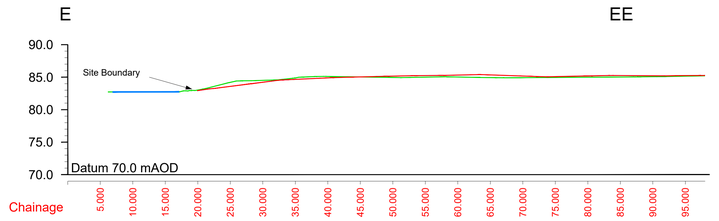
Client: Your Housing Group Ltd

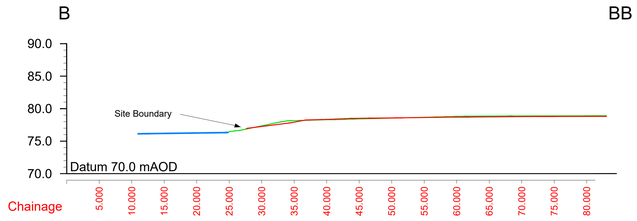
Drawn: JGL	Checked: MA	Approved: MA
Dwg:D1932_25	Contract: 1932YOU	Scale: 1:1250

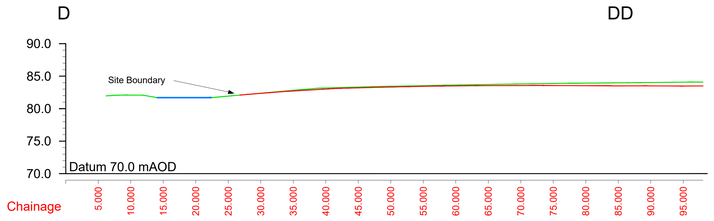
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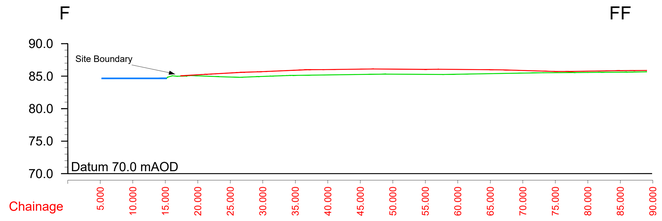












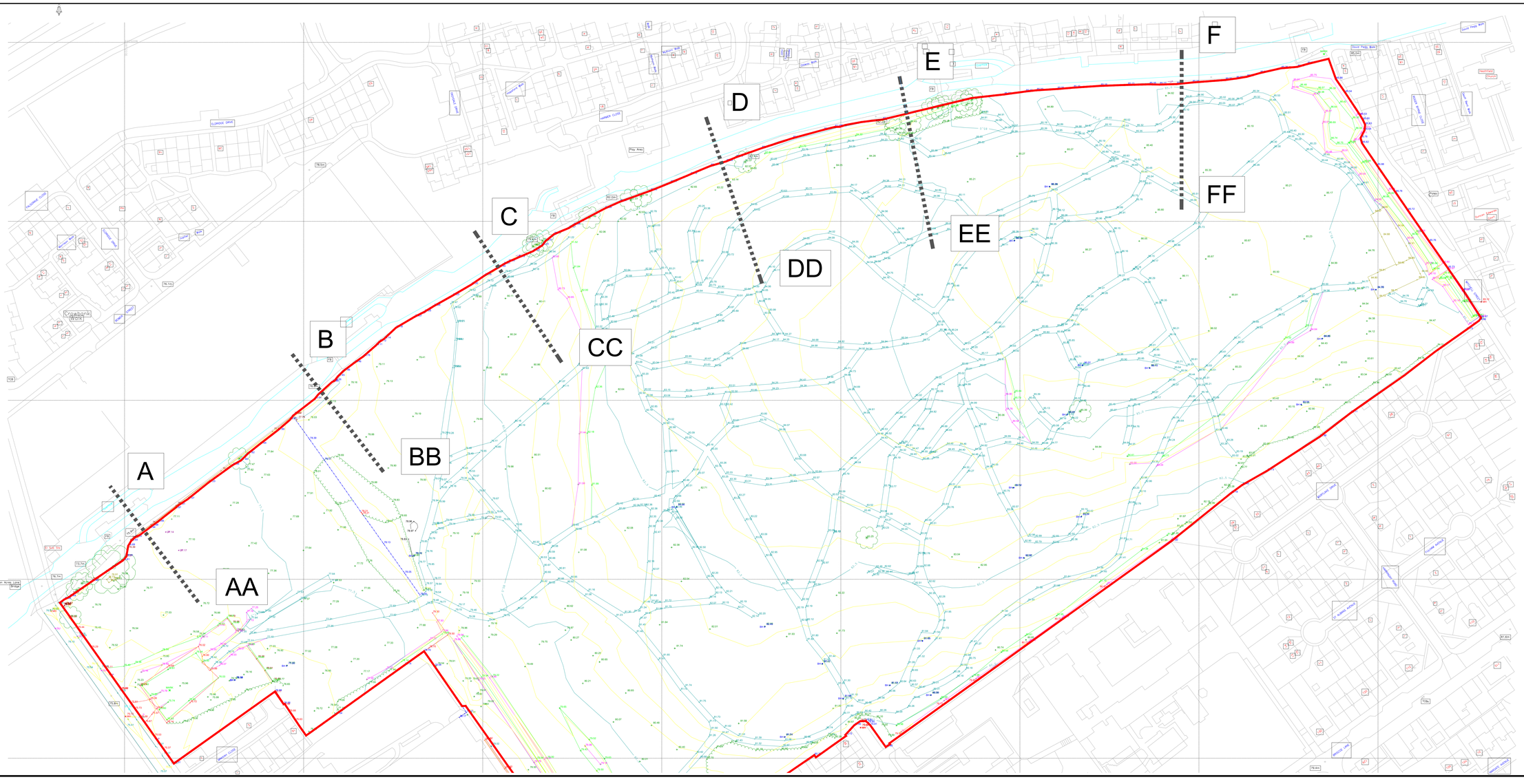
Key

- Spot Level
- Site Boundary
- Section Line (Shown in Topo)
- OGL (Section)
- Proposed (Section)
- Canal Location (Section)
- Bottom of Bank
- Top of Bank
- Track
- Contour 1m
- Contour 5m
- Tree
- Hardstanding
- Palisade Fencing
- Chain Link Fencing
- Vegetation

- Topo Surveyed via GNSS May 2022
- Canal Data Contains public sector information licensed under the Open Government Licence v3.0

No proposed changes to levels within canal corridor

The Site Boundary is where the red line begins, moving left - right.



Rev.	Description	Revised By	Date
	FIRST ISSUE		08-02-2024

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Site Address:
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Rev:

Title: Proposed vs OGL Cross Sections

Client: Your Housing Group Limited

Drawn By: TL | Checked: JGL | Approved: AD

Dwg No: D1932_32 | Contract No: 1932YOU | Scale: 1:800

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