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SALFORD VAN HIRE LIMITED

FLOOD RISK STATEMENT

Shepherd Gilmour Infrastructure Ltd.

40 Peter Street

Manchester

M2 5GP



Report Title: Salford Van Hire Limited
Flood Risk Statement

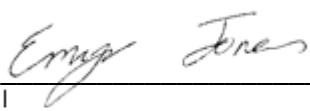
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SECTION I SITE INVESTIGATION

INTRODUCTION

- I.1. Shepherd Gilmour Infrastructure Ltd (SGi) has been engaged by Salford Van Hire Ltd to prepare a Flood Risk Statement in support of relocating a substation on a previously granted scheme.
- I.2. The Flood Risk Statement has been prepared in accordance with the Flood Risk and Coastal Change Planning Practice Guidance (PPG) and the National Planning Policy Framework (NPPF). It contains information from sources such as the Environment Agency (EA), Local Sewerage Undertaker, District Council and Site Owner.

SALFORD VAN HIRE SITE

Location

- I.3. The Salford Van Hire Site is located just off Brightside Road in Manchester and can be located with the information noted below.

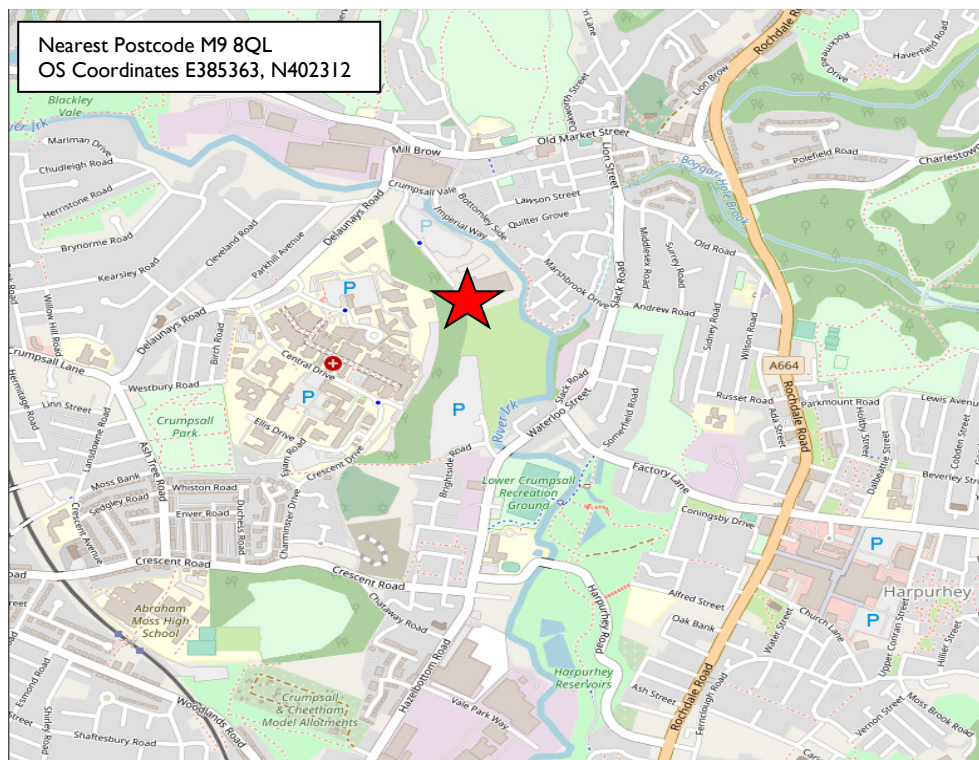


Figure I.1 Site Location Plan (Open Street Maps)

Flood Risk Background

- I.4. The site was granted planning in January 2018 and is nearing completion (118538/OO/2017). The site was largely located within Flood Zone 3 and as part of the original submission, AECOM produced a Flood Risk Assessment (FRA) to address this.

- I.5. The FRA confirmed the that proposed developments reprofiling and land raising did not result in any adverse effects downstream, and this assessment formed the foundation of the works onsite.
- I.6. A copy of the original FRA is available on request.

Approved Substation Position

- I.7. The approved substation location is shown below in **Figure 1.2**.

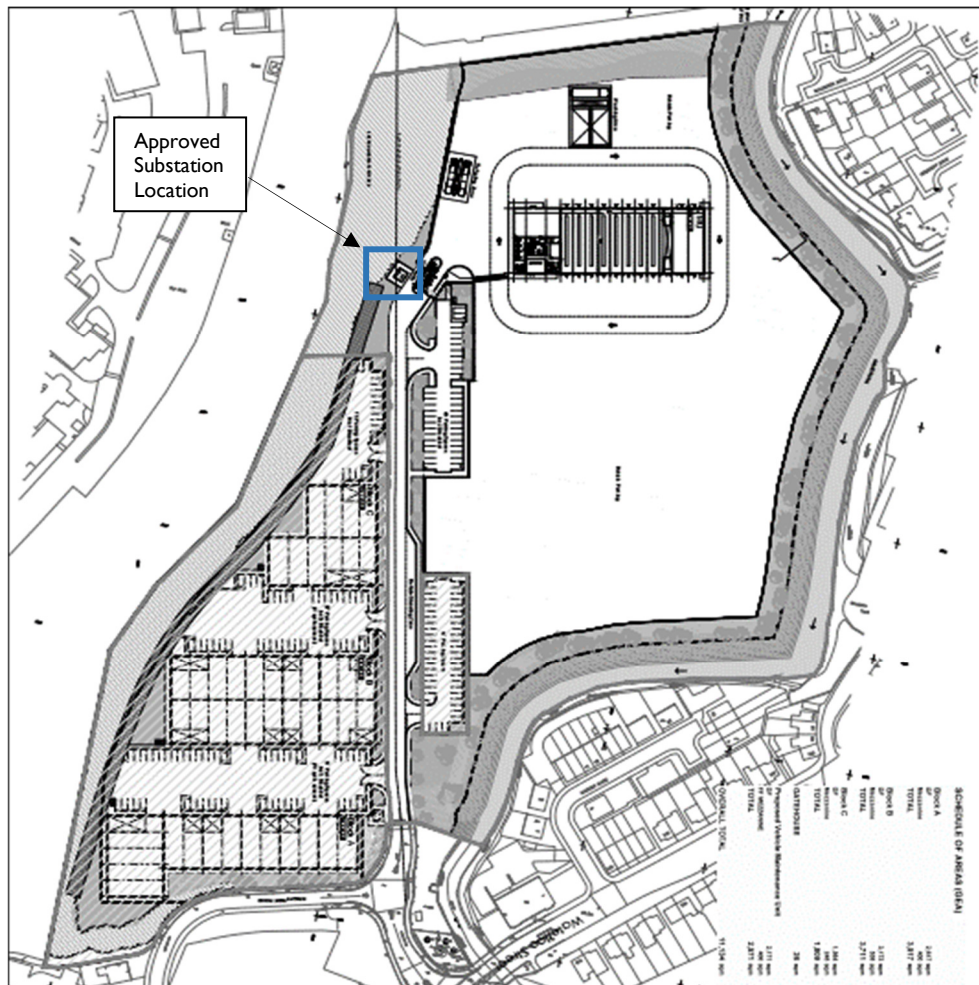


Figure 1.2 Approved Site Plan (Fletcher Rae)

Proposed Substation Position

- I.8. The original substation was located on top of United Utilities combined sewer. The client therefore has proposed to relocate the substation to the position shown in **Figure 1.3**.
- I.9. A copy of proposed site plan has been included within **Appendix A** of this report.

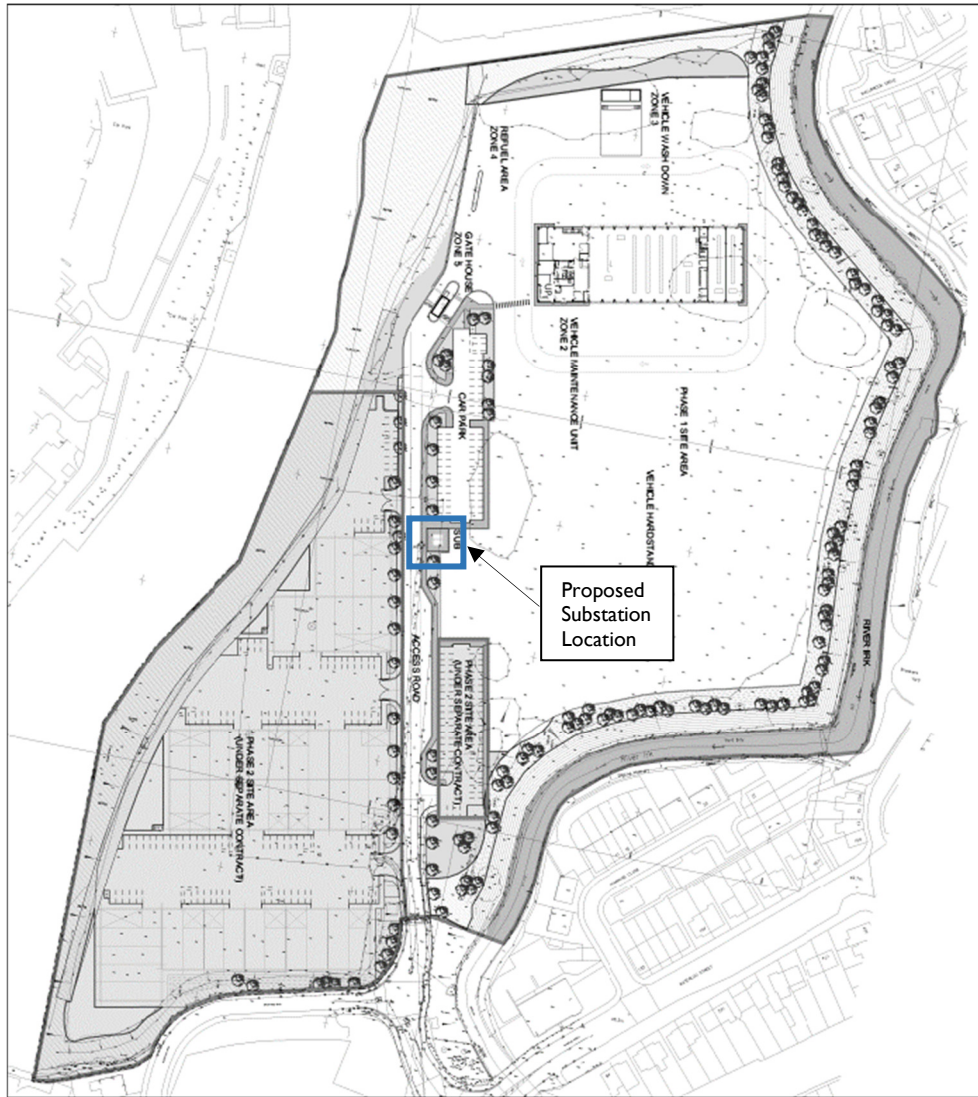


Figure I.3 Proposed Site Plan (Fletcher Rae)

SECTION 2 POTENTIAL SOURCES OF FLOODING

2.1. There are several sources of flooding which could impact the site. These potential sources have been previously assessed, but we have reviewed each source again using the latest available information/data.

- *Fluvial/Tidal,*
- *Ground Water,*
- *Artificial Waterbodies (canals, reservoirs etc) and,*
- *Pluvial.*

2.2. The sources of flooding which are found to impact the site will be discussed in further detail in **Section 3 & 4.**

FLUVIAL/TIDAL FLOOD RISK

Gov.UK Website

2.3. The Gov.UK website provides a flood risk service which allows for a site to be quickly checked against fluvial/tidal flooding. An abstract has been shown in **Figure 2.1.**

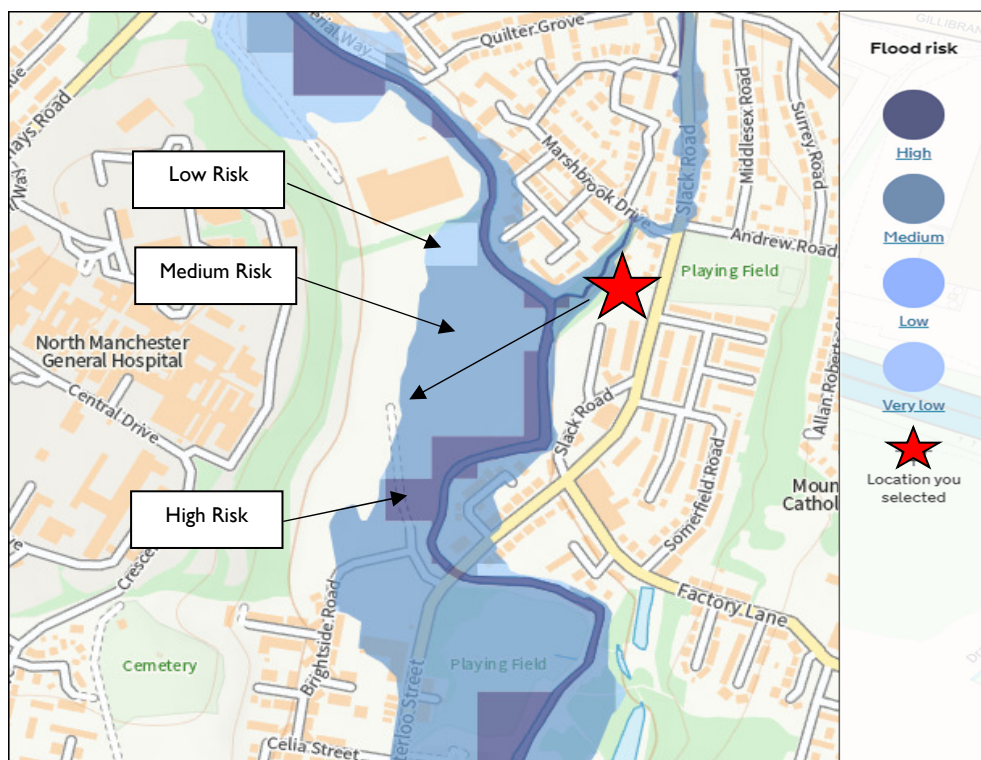


Figure 2.1 Flood Map for Planning (Gov.UK)

2.4. The Gov.UK flood maps indicate that there is a medium risk of fluvial/tidal flooding from the adjacent river/sea.

Strategic Flood Risk Assessment

- 2.5. The NPPF requires Local Planning Authorities to produce Strategic Flood Risk Assessments in support of their Local Plan. These form the basis for preparing appropriate policies for flood risk management within the area and provide the framework for assessing areas of developable land.
- 2.6. The site is within the Manchester City, Salford City and Trafford Councils SFRA and was produced by JBA Consulting in March 2010. The SFRA flood data confirms that the Site is located within Flood Zone 3.

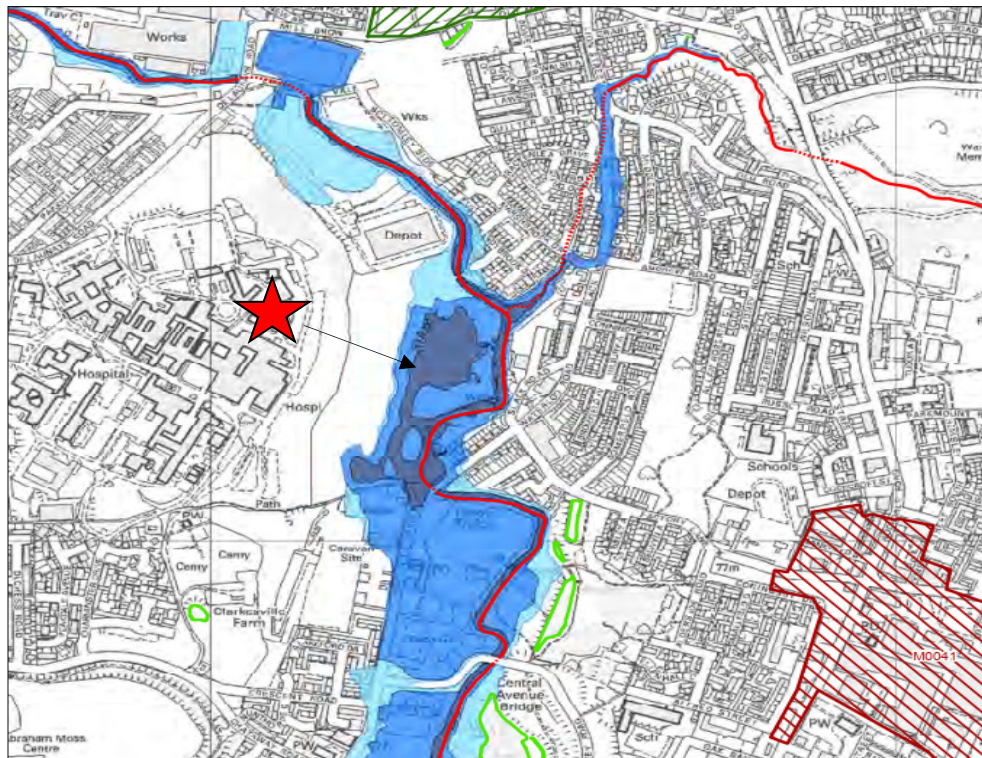


Figure 2.2 SFRA Flood Zone Map (SFRA MST FL 1.2 C)

Environment Agency

- 2.7. According to the Environment Agency (EA) flood search the new substation will be located within Flood Zones 3. The constraints of this zones are discussed in further detail in **Section 3**.
- 2.8. An abstract of this EA Flood Map has been shown below in **Figure 2.3**.
- *Flood Zone 1 – Low Probability*
Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as ‘clear’ on the Flood Map – all land outside Zones 2 and 3)
 - *Flood Zone 2 – Medium Probability*

Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)

- **Flood Zone 3 – High Probability**

Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)

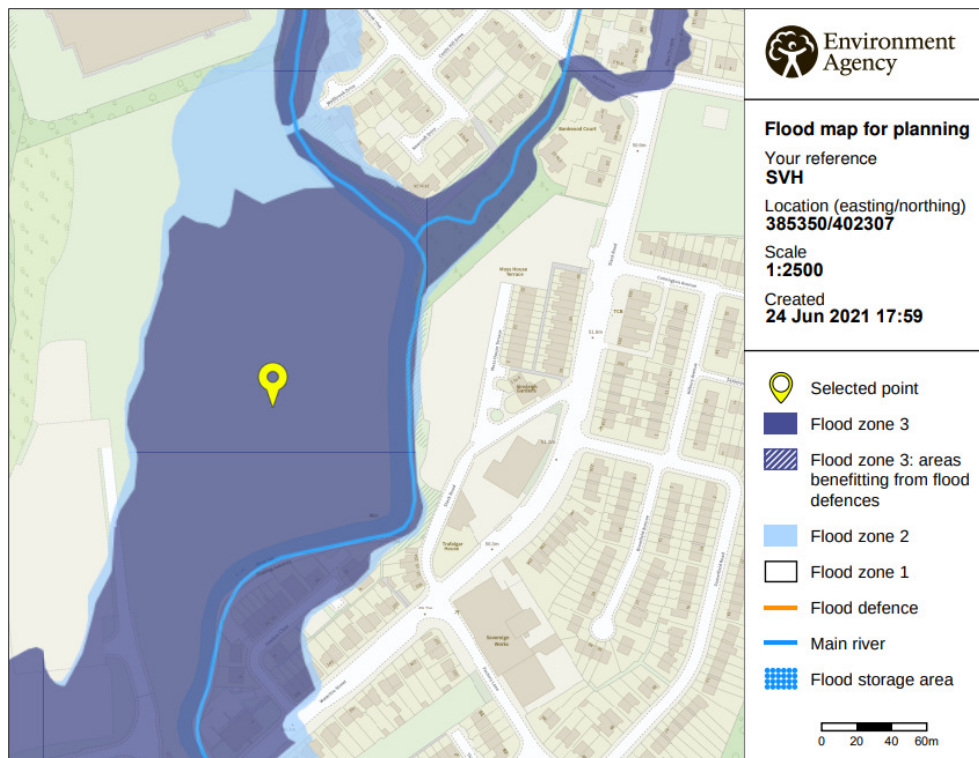


Figure 2.3 Flood Map (Environment Agency)

Ordinary Watercourse

2.9. Ordinary watercourses do not form part of a 'main river' and can consist of rivers, ditches, swales, drains etc. These watercourses are the responsibility of the riparian owner who must ensure that:

- *Flows can pass freely without obstruction, pollution, or diversion (affecting the rights of others).*
- *The banks and bed of the watercourse are maintained (including vegetation).*
- *Any approved onsite watercourse structures are maintained.*
- After reviewing the available historic maps there is no clear evidence of any ordinary watercourses onsite.

CANAL FLOOD RISK

- 2.10. Most of the UK Canals are owned, maintained, and operated by the Canal & River Trust (CRT). Water levels are maintained/regulated by sluice gates along the canal and whilst a breach or overtopping is unlikely, the possible risk should be assessed.
- 2.11. According to the SFRA maps the site is outside of any canal breach risk/assessment. The site however would be safeguarded by the adjacent River Irk should a breach occur from the Rochdale Canal.

GROUNDWATER FLOOD RISK

- 2.12. Unlike flooding from rivers and the sea, groundwater does not pose a significant risk to life. It is more associated with damage to the building, due to the flooding persisting over several weeks.
- 2.13. The SFRA maps indicates that the site is at risk of Ground Water flooding as shown in **Figure 2.4**.

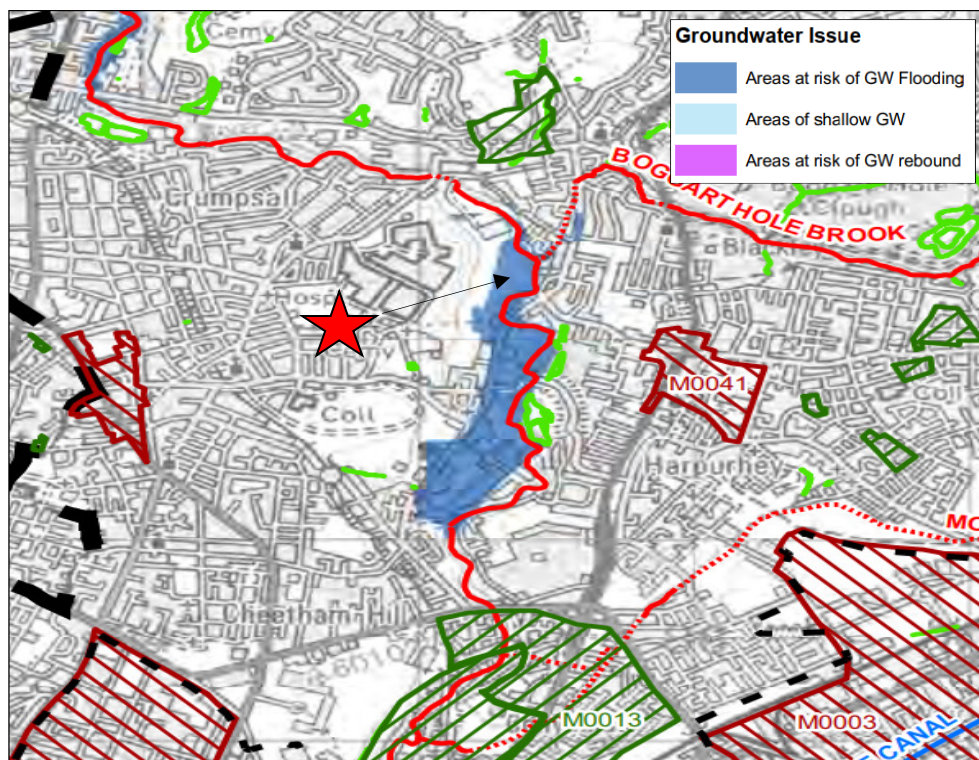


Figure 2.4 Ground Water Flood Risk (MST GW 2.1)

ARTIFICIAL WATERBODIES

- 2.14. The reservoirs in the area are owned and operated by United Utilities and are covered by the Reservoirs Act 1975. Whilst the probability of a catastrophic dam failure occurring is relatively low the consequences of such an event are severe.
- 2.15. Reservoir flood plans are still required and are prepared by their owners. These documents are considered sensitive due to national security and only indicative plans are made available by the Environment Agency/Gov.UK.
- 2.16. The indicative flood routing plan (**Figure 2.5**) indicates that the site would be at risk during a potential breach.



Figure 2.5 Reservoir Flood Risk (Gov.Uk)

PLUVIAL RUNOFF

- 2.17. Pluvial flooding is defined as 'flooding from rainfall generated overland flow before the runoff enters any watercourse or sewer.' It is usually associated with high-intensity rainfall events but can also occur during low-intensity events when the ground is saturated/frozen or has low permeability.
- 2.18. The maps provided within the SFRA and Gov.UK (**Figure 2.5**) indicate that the site has a low to very low risk of pluvial flooding.
- 2.19. There are no maps within the SFRA relating to CDA's.

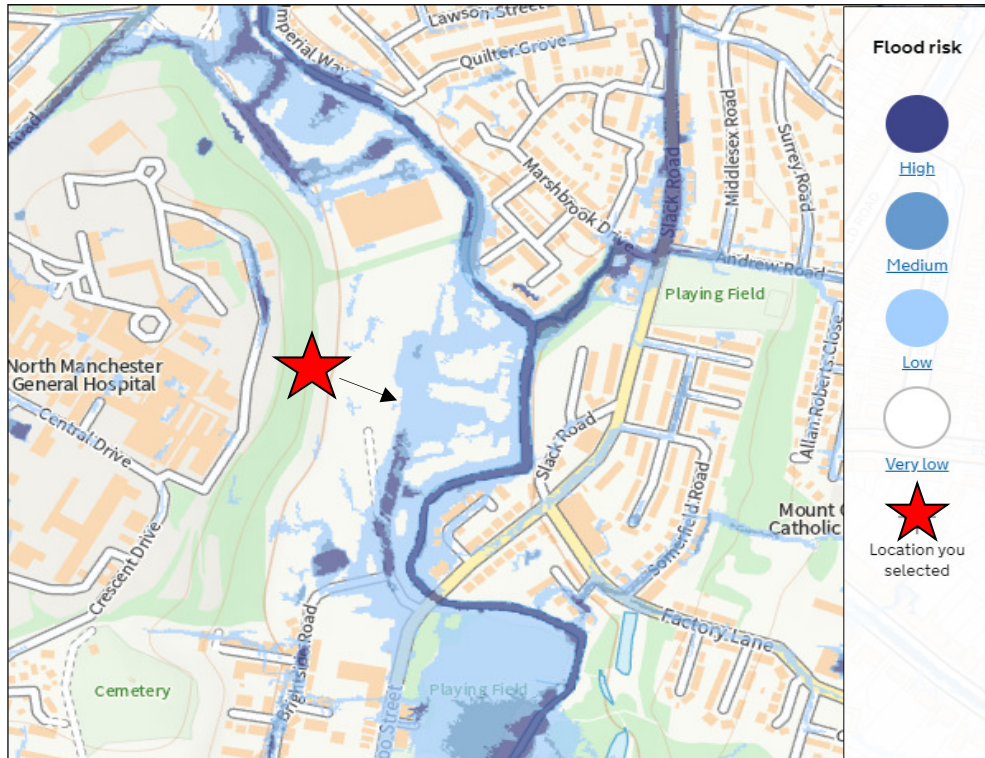


Figure 2.5 Pluvial Flood Risk Map (Gov UK)

CRITICAL DRAINAGE AREA

- 2.20. Critical Drainage Areas (CDA) are areas that are particularly sensitive to an increase in surface water runoff, either as direct overland flow or from the existing sewer network.

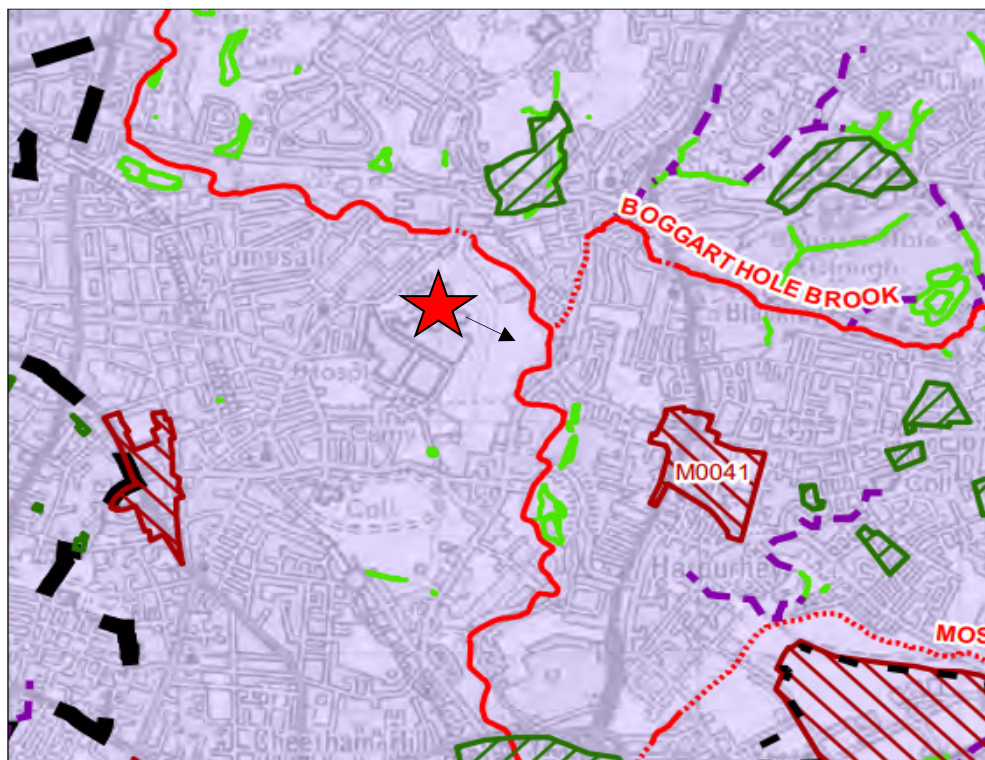


Figure 2.6 Critical Drainage Areas (MST SS4.5)

- 2.21. Maps within the SFRA relating to CDA's indicate that the site is located within the Conurbation Core CDA.

FLOOD RISK OVERVIEW

- 2.22. The potential sources of flooding which could be experienced have been summarised in **Table 2.1**. Those posing the greatest flood risk to the site have been investigated further in **Section 3** to determine the potential mitigation measures.

Source of Flooding	Potential Flood Risk				Site Description
	High	Medium	Low	Very Low or Negligible	
Fluvial/Tidal	X				The Environment Agency maps indicate that the site is in Flood Zone 3
Canal				X	Risk is considered negligible
Ground Water	Yes				SFRA confirms that the site is at risk of ground water flooding
Artificial Waterbodies	Yes				In the event of a breach, the site is located within the potential flood routing.
Pluvial Runoff			X		The Gov.UK Maps identifies that the site is at low risk of surface flooding.
Critical Drainage Areas	Yes				The SFRA confirms that the site is located within the Conurbation CDA.

Table 2.1 Potential Sources of Flooding Overview

SECTION 3 FLOOD RISK ANALYSIS

FLUVIAL/TIDAL FLOODING

AECOM Flood Risk Assessment

- 3.1. As previously mentioned in **Section 1**. The overall site has been granted planning based on the FRA produced by AECOM. The report recommended that the site be reprofiled to the suit the development and would mitigate any loss in flood storage elsewhere on site.
- 3.2. These proposals were approved by the LLFA, and the Environment Agency and the detailed external levels design was also approved as part of Condition 39. A copy of the detailed levels design can be provided on request (CI386-20200082).

Flood Zone 3 Level

- 3.3. According to the hydraulic model within the approved FRA the 100-year level with a 35% allowance for climate change is estimated to be 46.44m AOD. The area surrounding the proposed substation position has been raised above 47.20m AOD so the area would now be within Flood Zone 2 rather than Flood Zone 3.

Mitigation Measures

- 3.4. The EA's current guidance for building within Flood Zone 3 is that the finished floor level (FFL) should be at least 600mm above the estimated 100-year fluvial level. The FFL of the proposed substation FFL must therefore be set at or above 47.040m AOD.

Fluvial/Tidal Flood Risk = Low/Medium Flood risk if implemented.

GROUND WATER

- 3.5. The intrusive ground investigation confirmed that the ground water was encountered very close to the surface at the proposed substation location. When these tests were undertaken the existing ground was 45.90m AOD but this has since been raised to 47.20m AOD (1.3m uplift).

Mitigation Measure

- 3.6. None required. The risk from ground water flooding is now be considered negligible.

Ground Water Flood Risk = Negligible

ARTIFICIAL WATERBODIES

- 3.7. In the event of a reservoir breach. The Gov.UK maps indicate that the site could experience over 2m of flooding.

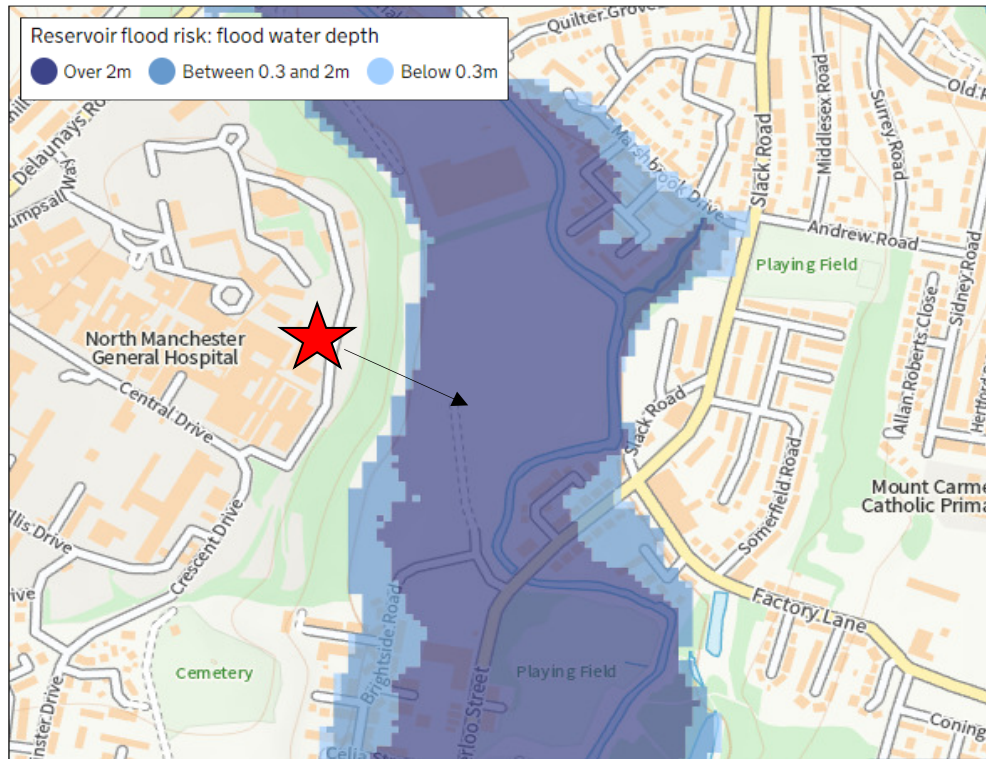


Figure 3.1 Reservoir Flood Route (Gov.UK)

Mitigation Measure

- 3.8. Whilst the 2m plus of flood water onsite is significant, we would note that this is the “maximum extent” and would only occur if the reservoir completely failed and released all the water it held (when full).
- 3.9. This is a worst-case scenario of a highly unlikely event, and the flood data is intended more for emergency planning rather than large scale flood assessments.
- 3.10. Proposing any mitigation measure to defend against such an event would be impractical and cost prohibitive. A residual risk from this source will therefore remain.

Reservoir Flooding = Residual Risk remains

PLUVIAL FLOODING

- 3.11. The Gov.UK Maps indicates that the PDS is at risk of pluvial flooding. These maps are based on LIDAR data and purely highlight low spots/depressions that could be at risk of pluvial flooding.



- 3.12. The data however is now out of data since the site has been reprofiled and new surface water drainage has been installed. we would therefore expect the current risk from pluvial sources to be very low to negligible.

Mitigation Measures I

- 3.13. None required. The newly installed site wide drainage infrastructure will safe guard the substation.

Pluvial Flood Risk = Negligible

CRITICAL DRAINAGE AREAS

- 3.14. The site is located within the Conurbation Core CDA and specific details relating to this CDA are limited. The site however discharges surface water runoff to the adjacent River Irk so this risk is mitigated.

Mitigation Measures

- 3.15. Non required.

CDA Flood Risk = Negligible Risk

SECTION 4 FLOOD ZONE REQUIREMENTS

Development Flood Zone

4.1. Based on the information available, the proposed substation is located within Flood Zone 2.

- Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

Proposed Development Type

4.2. In accordance with the National Planning Policy Framework Practice Guidance on flooding a substation would be classed as essential infrastructure. This would be allowed within Flood Zone 2.

Flood Zone	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	✓	✓	✓	✓	✓
2	✓	Exception Test Required	✓	✓	✓
3a	Exception Test Required	x	Exception Test Required	✓	✓
3b	Exception Test Required	x	x	x	✓

Key: ✓ Development is appropriate x Development should not be permitted

Table 4.1 Flood Risk Classification (NPPF)

Policy Aims

- 4.3. In this zone developers and Local Authorities should still seek opportunities to reduce the overall level of flood risk in the area through the layout design and form of development and the appropriate application of sustainable drainage techniques.
- 4.4. Relocate existing development to land in zones with a lower probability of flooding; and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Finished Floor Level Restrictions

4.5. The FFL for the proposed substation must be set at **47.040m AOD** to safeguard from the adjacent Flood Zone 3 estimated level.

Flood Compensation

4.6. None Required in Flood Zone 2.



Flood Resilient Construction

4.7. Not applicable for substations

Safe Access and Egress

4.8. Not applicable for substations



SECTION 5 CONCLUSION

- 5.1. A Flood Risk Statement is required to satisfy all requirements of the National Planning Policy Framework (NPPF) and the Flood Risk and Coastal Change Planning Practice Guidance (PPG).
- 5.2. This Flood Risk Statement as far as reasonably practical; determines the potential flood risk associated with the site and has concluded the following:
 - a) The proposed substation location is situated within Flood Zone 2 due to the ground reprofile undertaken onsite (medium probability of fluvial/Tidal flooding).
 - b) There is a residual risk of flooding to the substation from the upstream reservoir In the event of a breach.
 - c) The risk of pluvial flooding to the substation is negligible due to the substations level and the newly installed site wide drainage.
 - d) No additional flood compensation is required as a result of the relocated substation.
 - e) Runoff from the proposed substation will drain into the adjacent infrastructure which has provided under planning permission.
- 5.3. SGi recommends that the Local Planning Authority accept this Flood Risk Statement in support of the relocated substation position.



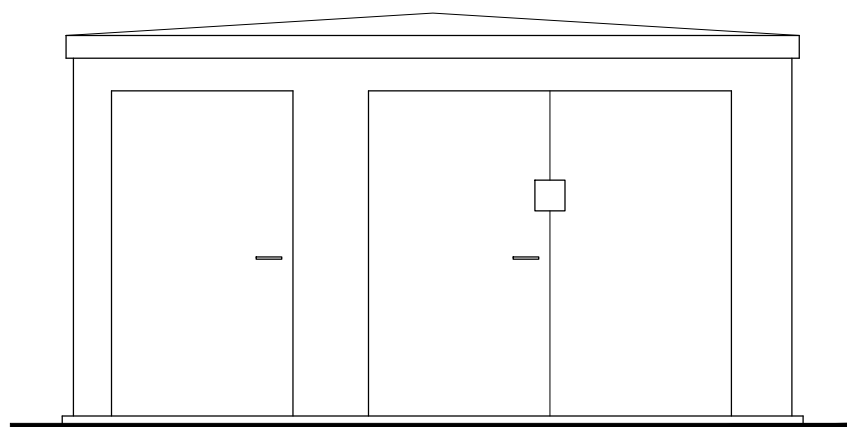
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APPENDIX A1

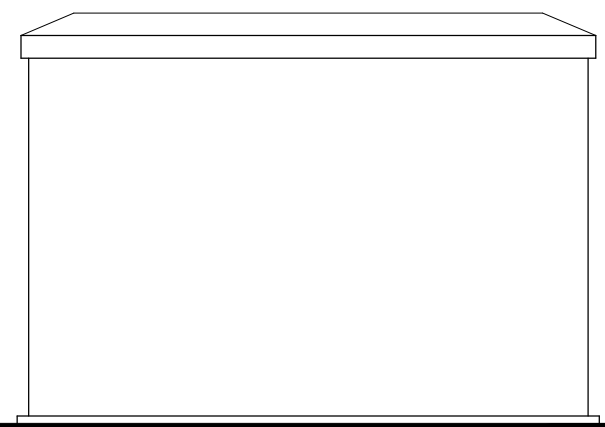


PROPOSED PLAN 1:50

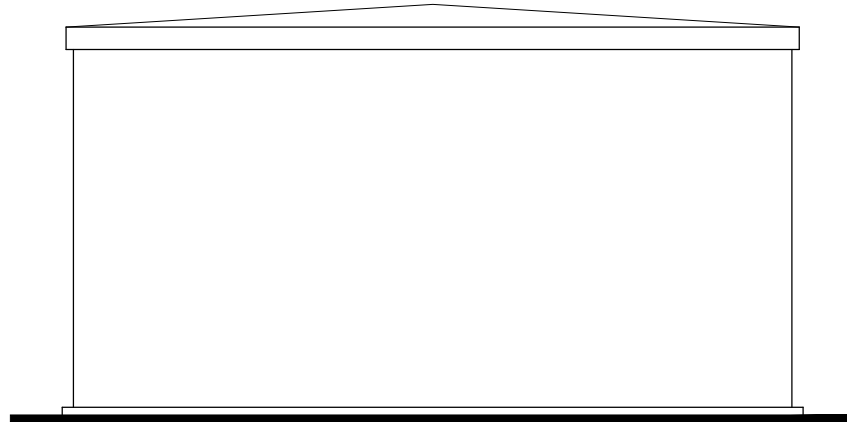
GRP Housing
Colour: British Racing Green



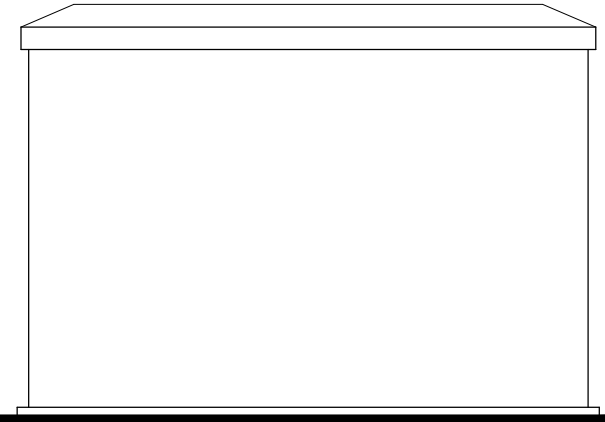
West
Elevation



North
Elevation

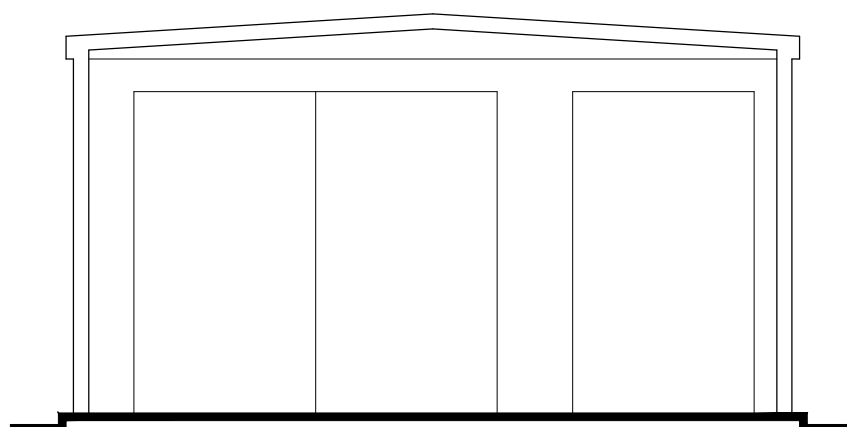


East
Elevation

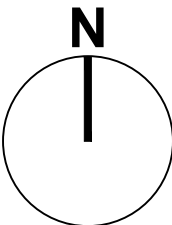


South
Elevation

SUBSTATION ELEVATIONS 1:50



SECTION A-A 1:50



General Notes

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Salford Van Hire Limited

Project

North Manchester Business Park
Brightside Road, Crumpsall

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Sections

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Rev.

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CONSTRUCTION

Location Plan Legend

Phase 1 Site Boundary

Phase 2 Site Boundary



C2	Construction Issue	22.07.20	AE	AT
C1	Contract Issue	07.07.20	AE	AT
Rev.	Description	Date	ISS	APP

Scale
Status
Drawn By
Checked By
Date

As indicated @ A1
Construction
Author
Checker

Client:
Salford Van Hire Limited

Project:
North Manchester Business Park
Brightside Road, Crumpsall

Sheet Name:
Proposed Site Master Plan

