

## Flood Risk Assessment

for a development referred to as

The University of Manchester, North Campus,  
Energy Centre

undertaken on behalf of

The University of Manchester

|                   |                                                                                   |
|-------------------|-----------------------------------------------------------------------------------|
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## **1.0 INTRODUCTION**

- 1.1 WML Consulting Ltd have been commissioned by The University of Manchester to provide a Flood Risk Assessment (FRA) to support a planning application for a proposed development for a new Energy Centre at Sackville Street, Manchester, M1 7DN.
- 1.2 The Flood Risk Assessment (FRA) follows the guidance and requirements of the National Planning Policy Framework (NPPF) – and the supporting Technical Guidance to the NPPF.
- 1.3 The NPPF identifies that it is the responsibility of developers to demonstrate:
- whether the development would be affected by current or future flooding from any source;
  - that the development is safe and where possible reduces flood risk overall;
  - whether flood risk would be increased elsewhere;
  - mitigation measures for any identified flooding risks;
  - that the site can be developed and occupied safely.
- 1.4 The FRA identifies whether there are any flooding or surface water management issues related to the development site that may warrant further consideration.

## 2.0 NATIONAL PLANNING POLICY

2.1 The aim of the Sequential Test, as set out in the National Planning Policy Framework (NPPF), is as follows:-

‘Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.’

2.2 It is intended that new development is steered to areas with the lowest probability of flooding.

2.3 The flood zones are shown on the Flood Map for Planning, these zones indicate the probability of sea and river flooding. The extents of Flood Zones 2 and 3 are shown on the flood map, with Flood Zone 1 being the land outside Flood Zones 2 and 3. Flood Zone 1 is the area at the lowest probability of sea or river flooding.

These maps can be viewed on the GOV.UK website via the link below.

<https://flood-warning-information.service.gov.uk/long-term-flood-risk>

2.4 The NPPF Technical Guidance defines at Table 1 the Flood Risk Zones as below:

|                                        |                                                                                                                                                                                                                |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flood Zone 1<br>Low Probability        | Land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).                                                                                                |
| Flood Zone 2<br>Medium Probability     | Land assessed as having between 1 in 100 and 1 in 1,000 annual probability of river flooding (1% to 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% to 0.1%) in any year. |
| Flood Zone 3a<br>High Probability      | Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.                            |
| Flood Zone 3b<br>Functional Floodplain | Land where water has to flow or be stored at times of flood.                                                                                                                                                   |

2.5 The NPPF Technical Guidance defines at Table 2 the Flood Risk Vulnerability Classifications, i.e. five categories of flood risk vulnerability with each category having a list of appropriate development uses. The classifications are:

- Essential Infrastructure
- Highly Vulnerable
- More Vulnerable
- Less Vulnerable
- Water – compatible development

2.6 The NPPF Technical Guidance defines at Table 3 the Flood Risk Vulnerability and flood zone ‘compatibility’ as shown below. Thereby providing a matrix that confirms whether a proposed development type is appropriate within a particular flood risk zone.

Table 3 Flood risk vulnerability and flood zone 'compatibility'

| Flood risk vulnerability classification (see table 2) |                                | Essential infrastructure | Water compatible | Highly vulnerable      | More vulnerable        | Less vulnerable |
|-------------------------------------------------------|--------------------------------|--------------------------|------------------|------------------------|------------------------|-----------------|
| Flood Zone (Table 1)                                  | Zone 1                         | ✓                        | ✓                | ✓                      | ✓                      | ✓               |
|                                                       | Zone 2                         | ✓                        | ✓                | ExceptionTest required | ✓                      | ✓               |
|                                                       | Zone 3a                        | Exception Test required  | ✓                | X                      | ExceptionTest required | ✓               |
|                                                       | Zone 3b functional flood plain | Exception Test required  | ✓                | X                      | X                      | X               |

Key: ✓ - Development is appropriate.  
X - Development should not be permitted.

2.7 The proposed Energy Centre is to provide power, heating and cooling to the private university buildings only, and as such is not considered to be Essential Infrastructure.

2.8 The proposed development would be classified as 'less vulnerable', and from Table 3 it can be seen that this type of development is appropriate in Flood Zones 1, 2 and 3a.

### 3.0 LOCAL POLICY DOCUMENTS

3.1 Strategic Flood Risk Assessments (SFRAs) are prepared by Lead Local Flood Authorities (LLFAs) in consultation with the Environment Agency, sewerage undertakers and where applicable internal drainage boards. Their aim is to assess the risk to the local area from flooding from all sources currently and in the future, taking account of the impact of future climate change.

3.2 The Manchester City County Council SFRA and associated information can be found via the link below.

[https://www.manchester.gov.uk/info/500207/planning\\_and\\_regeneration/4700/strategic\\_flood\\_risk\\_assessment/2](https://www.manchester.gov.uk/info/500207/planning_and_regeneration/4700/strategic_flood_risk_assessment/2)

## **4.0 EXISTING SITE AND PROPOSED DEVELOPMENT**

- 4.1 The site is located at Sackville Street, Manchester, M1 7DN within the University of Manchester North Campus.
- 4.2 A site location plan is presented in appendix 01.
- 4.3 The site is bounded to the north by the John Garside Building, to the east by the George Begg Building, to the south by Sackville Street, and to the west by Princess Street.
- 4.4 The site has an area of around 350m sq. (0.035 ha), and comprises an area of soft landscaping with a number of semi-mature to mature deciduous trees along its southern boundary.
- 4.5 A topographic survey of the site was undertaken by 1<sup>st</sup> Horizon Surveying and Engineering Ltd in November 2021. A plan (ref. PF-ID6080-03) indicating the site's current configuration is presented in appendix 02. This plan indicates that the site is generally level at around 34.0m AOD, this is with the exception of a strip of land along the site's eastern boundary adjacent to the access road, where the existing levels reduce to around 33.3m AOD.
- 4.6 A Phase 1 Desk Study and Phase II Geo-environmental Investigation of the site by Pick Everard, referenced MC/KDL/221512/17-2, dated 07 December 2023, has been provided by the client for review.
- 4.7 The proposed development involves the construction of a new Energy Centre to provide power, heating and cooling to a number of buildings within the University's North Campus.
- 4.8 In terms of occupancy of the proposed facility, it is understood that the facility will not be occupied on a full time basis, i.e. there will only be people on site during installation, maintenance and monitoring operations. This is because the facility is essentially a large plantroom, so whilst it is operating normally, there will be no need for the building to be occupied. It has been anticipated that the routine monitoring and maintenance operations will require the attendance of two people for one hour per day, for five days per week.
- 4.9 A plan illustrating the development proposals can be found at appendix 03.

## **5.0 POTENTIAL SOURCES OF FLOODING**

### Correspondence

- 5.1 The Environment Agency (EA), Manchester City Council (MCC), and United Utilities (UU) have been asked to confirm if they have any information regarding past, present or future flooding issues that may affect the site.
- 5.2 The EA's response, which can be found at Appendix 04, confirms that they have no records of flooding affecting the site.
- 5.3 The response from MCC is still awaited, should this be received during the planning application determination period, and should it contain information that significantly alters the contents of this report, the report will be updated accordingly and re-submitted to the planning authority. The response would be added at Appendix 05.
- 5.4 The UU response, which can be found at Appendix 06, confirms that they have no records of sewer flooding incidents in the vicinity of the site.

### Potential Sources of Flooding

- 5.5 Potential sources of flooding that require consideration as part of the FRA are as below:-

- Flooding from rivers – fluvial flooding;
- Flooding from sea – tidal flooding;
- Flooding from surface water run-off – pluvial flooding;
- Flooding from sewers;
- Flooding from ground waters;
- Flooding from reservoirs;
- Flooding from other sources.

### Flooding from Rivers – Fluvial Flooding

- 5.6 The flood mapping provided by the EA, and which is presented in Appendix 04, appears to show that the site is located on the boundary of Flood Zone 2 (medium risk) and Flood Zone 1 (low risk).
- 5.7 Flood Zone 2 means that this area has a chance of flooding of between 1% to 0.1% (1 in 100 to 1 in 1,000) each year. Whilst Flood Zone 1 means that this area has a chance of flooding of less than 0.1% (1 in 1,000) each year.
- 5.8 The flooding shown on the EA flood map in the vicinity of the site, appears to be generated by the River Medlock, which lies around 80m to the north of the proposed development site.
- 5.9 The information provided by the EA included flood modelling data from two model sources, the first being from the “Medlock 2011 SFRA”, and the second being the “Manchester Ship Canal”. Both sources provide flood water levels and flood flow volumes at various node locations, and for various annual exceedance probabilities and climate change scenarios, on the line of the River Medlock in the vicinity of the site.
- 5.10 From the mapping it can be seen that model node 3, is closest to the proposed development site.
- 5.11 The Medlock 2011 SFRA modelling exercise indicates flood water levels at node 3 of 33.630m AOD for the 1 in 100 year plus 70% increase in flood scenario, and 33.910m AOD for the 1 in 1,000 year scenario.

- 5.12 The Manchester Ship Canal modelling exercise indicates flood water levels at node 3 of 33.770m AOD for the 1 in 100 year plus 70% increase in flood scenario, and 34.060m AOD for the 1 in 1,000 year scenario.
- 5.13 From the development layout plan at appendix 03, it can be seen that the proposed building is to have a split level arrangement at its ground floor level, set out as follows:-
- the habitable area (the office, the server room, the wc, the shower, the electrical riser and the mechanical riser) is to have an FFL of 34.15m AOD.
  - to facilitate direct vehicular access for the delivery and removal of large pieces of plant the non-habitable area (HV sub-station 01, HV sub-station 02 and the gas bottle store) is to have an FFL of 33.37m AOD.
- 5.14 From the above, it can be seen that the habitable area of the proposed building will not be affected by the worst case 1 in 100 year flood event, or the worst case 1 in 1,000 year event.
- 5.15 Though during the worst case 1 in 100 year flood event, the non-habitable area of the proposed building could be affected to a depth of 0.4m, and during the worst case 1 in 1,000 year flood event, this area could be affected to a depth of 0.69m.
- 5.16 However in this instance, each of the HV sub-stations is to be fitted with a 2500 kVA transformer, and Electricity North West (ENW) have confirmed that the safe operation of these units will not be affected by water depths of up to 0.811m, i.e. 0.121m above the worst case 1 in 1,000 year modelled flood scenario. A copy of ENW's correspondence can be found at appendix 07.
- 5.17 Given that the FFL of the habitable area of the proposed facility will be the above the worst case 1 in 1,000 year flood scenario, and that whilst the FFL of the non-habitable area will be below the worst case flood level, the safe operating of the plant in this area will not be affected. Hence it is considered that the risk posed from this form of flooding is low.

#### Flooding from Sea – Tidal Flooding

- 5.18 The site is not located in an area that is at risk of tidal flooding.
- 5.19 Given the above, it is considered that the risk to the proposed development from this form of flooding is low.

#### Flooding from Surface Water Runoff – Pluvial Flooding

- 5.20 The online surface water flood mapping indicates that the site is at “very low” risk from this form of flooding. Very low risk means that the area has a chance of flooding of less than 0.1% (1 in 1,000) each year.
- 5.21 It should be noted that flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features, such as surface water drainage systems that were not taken into account when the modelling behind the surface water flood maps was carried out, can greatly affect the chance and severity of flooding.
- 5.22 Given the above, it is considered that the risk to the proposed development from this form of flooding is low.

#### Flooding from Sewers

- 5.23 United Utilities have confirmed that they do not have any records of sewer flooding in the vicinity of the site.
- 5.24 On this basis it is considered that the risk to the proposed development from this form of flooding is low.

### Flooding from Groundwater

- 5.25 Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below ground infrastructure and buildings (tunnels, basements, etc.) where these are underlain by permeable strata (aquifers).
- 5.26 From the online British Geological Survey data, it appears that the ground conditions in the vicinity of the site are the Devensian Glacial Till, indicated to comprise predominantly clay with subordinate bands of silty, sand and gravel. In general, clayey or silty ground conditions are likely to restrict the potential for ground water flooding, whereas sandy or gravelly ground conditions would be less of a barrier to this form of flooding.
- 5.27 Site investigations undertaken by Pick Everard in 2023 encountered made ground to depths of to 3.20mbgl, underlain by cohesive glacial till to a depth of 5.65mbgl and in turn by the Chester Sandstone Formation to a maximum proven depth of 25.50mbgl. Subsequent monitoring of installed standpipes between July and September 2023 indicated perched groundwater standing at between 2.18 and 2.40mbgl.
- 5.28 Neither the EA or the site owner have raised the issue of ground water flooding at the site.
- 5.29 Whilst the development proposals do include the creation of a small "Mechanical Trench", that will be accessed by a ladder down from ground floor level, this trench will not be a habitable space and it will be tanked / sealed to prevent water ingress.
- 5.30 Given the above, it is considered that the risk to the proposed development from this form of flooding is low.

### Flooding from Reservoirs

- 5.31 The online reservoir flood mapping indicates that the site is potentially at risk from this form of flooding, together with significant portions of Manchester, Salford, Trafford and beyond.
- 5.32 However, given that the Environment Agency has a regulatory role for reservoir safety under the Reservoirs Act 1975, and that reservoir failure in the UK is generally accepted to be extremely unlikely, it is considered that the risk to the development from this form of flooding is low.

### Flooding from Other Sources

- 5.33 From a review of the Ordnance Survey mapping there does not appear to be any significant bodies of water in the vicinity of the site.
- 5.34 On this basis, it is considered that the risk to the development from flooding from other sources is low.

### Flood Risk Summary

- 5.35 Paragraph 173 of the National Planning Policy Framework (NPPF) states the following:-

*When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

*a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*

*b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*

*c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*

*d) any residual risk can be safely managed; and*

*e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

- 5.36 Regarding item a), it is considered that this issue is adequately addressed above, within the river (fluvial) flooding section of chapter 5 of this FRA.
- 5.37 Regarding item b), it is considered that this issue is adequately addressed above, within the river (fluvial) flooding section of chapter 5 of this FRA.
- 5.38 Regarding item c), it is considered that this issue is adequately addressed below, within the contents of chapter 6 of this FRA.
- 5.39 Regarding item d), it is considered that this issue is adequately addressed above, within the river (fluvial) flooding section of chapter 5 of this FRA. In addition, please refer to the paragraph below.
- 5.40 Regarding item e), as mentioned above the habitable area of the development is proposed within flood zone 1 (low risk) and is not at significant risk from the other forms of flooding. However, land considered to be within flood zone 2 (medium risk) and flood zone 3 (high risk) lies to the north of the site. Hence safe access and escape routes may not be available to / from the north of the site were flooding to occur. However, a safe access and escape route would be available to / from the site via the gated pedestrian access to Princess Street (A34) immediately to the west of the site. This access, and the areas to the east, south and west of it, are located within flood zone 1 (low risk). This information regarding safe access and escape routes should be incorporated into the Emergency Plan for the proposed development, and should be clearly communicated to all people that may attend the site.
- 5.41 In summary, given the above, it is considered that the proposed development and any occupants should not be at risk from flooding during its life time, that the development will not increase flood risk elsewhere, and that the development is appropriate in this instance.

## **6.0 DRAINAGE STRATEGY**

6.1 The proposed development is to be drained via separate foul and surface water drainage systems.

### Surface water drainage proposals

6.2 The surface water drainage proposals will be designed in accordance with BS EN 752-4 and the Building Regulations approved document H (2010), which indicates the following hierarchy for the disposal of surface water drainage from development sites:-

1. discharge via infiltration;
2. discharge to watercourse;
3. discharge to sewer.

6.3 These options are discussed in further detail below.

### Surface water discharge via infiltration

6.4 The BGS records indicate that near surface ground conditions at the site are anticipated to comprise cohesive glacial till. This has been confirmed by site investigations which encountered made ground to depths of up to 3.20mbgl, underlain by cohesive glacial till.

6.5 It is generally considered that relatively impermeable ground conditions such as these will not support the use of infiltration techniques to discharge the concentrated runoff that would be generated by the new roofed area.

6.6 Given the above, it is considered that the use of infiltration techniques is unlikely to be feasible for the proposed development.

6.7 However it is proposed that all new external hard landscaped areas will be drained by infiltration via the use of porous surfacing.

### Surface water discharge via watercourse

6.8 There are no existing watercourses in the vicinity of the proposed development site, therefore the discharge of surface water runoff via a watercourse is not considered feasible.

### Surface water discharge via the public sewerage system

6.9 Given the above it will be necessary to discharge the surface water runoff generated by the proposed development to the public drainage system.

6.10 In line with modern design standards for surface water drainage systems, any proposals will be formulated to ensure there will be:-

- No surcharging of sewers for the critical 1 in 1 year storm event.
- No surface flooding for the critical 1 in 30 year event.
- No surface flooding that may affect buildings on or off site for the critical 1 in 100 year event including a 45% climate change allowance.

6.11 The surface water drainage proposals will be designed to ensure that the proposed runoff rate does not exceed the generally accepted practical minimum discharge rate of 5 l / sec for all storm events up to and including the critical 1 in 100 year event plus a 45% climate change allowance.

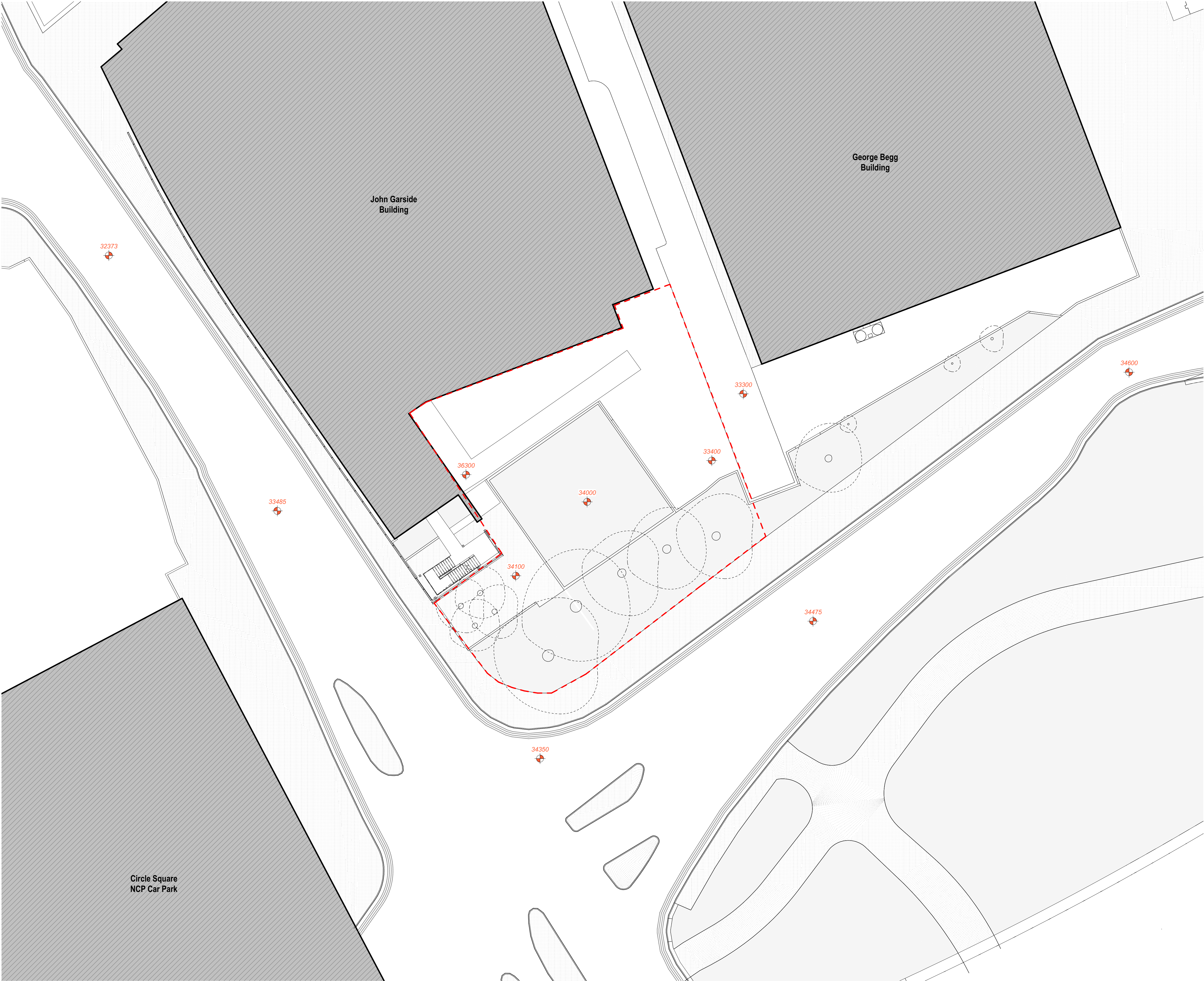
## Foul water drainage proposals

- 6.12 It is anticipated that the foul drainage flows generated by the proposed development will be directed to the existing public drainage system locally.

## **7.0 SUMMARY**

- 7.1 WML Consulting Ltd have been commissioned by The University of Manchester to provide a Flood Risk Assessment (FRA) to support a planning application for a proposed development for a new Energy Centre at Sackville Street, Manchester, M1 7DN.
- 7.2 It is understood that the proposed development involves the construction of a new Energy Centre to provide power, heating and cooling to a number of buildings within the University's North Campus.
- 7.3 The proposed development would be classified as a 'less vulnerable' form of development. From Table 3 of the NPPF Technical Guidance it can be seen that this type of development is appropriate in Flood Zones 1, 2 and 3a.
- 7.4 The new facility will not be occupied on a full time basis. This is because the facility is essentially a large plantroom, so whilst it is operating normally, there will be no need for the building to be occupied. It has been anticipated that the routine monitoring and maintenance operations will require the attendance of two people for one hour per day, for five days per week.
- 7.5 The proposed building is to have a split level arrangement at its ground floor level. The habitable area is to have an FFL of 34.15m AOD, whilst the non-habitable area is to have an FFL of 33.37m AOD.
- 7.6 The flood mapping provided by the EA appears to show that the site is located on the boundary of Flood Zone 2 (medium risk) and Flood Zone 1 (low risk). Flood Zone 2 means that this area has a chance of flooding of between 1% to 0.1% (1 in 100 to 1 in 1,000) each year. Whilst Flood Zone 1 means that this area has a chance of flooding of less than 0.1% (1 in 1,000) each year.
- 7.7 The flooding shown on the EA flood map in the vicinity of the site, appears to be generated by the River Medlock, which lies around 80m to the north of the proposed development site.
- 7.8 The information provided by the EA included flood modelling data from two model sources. Both sources provide flood water levels and flood flow volumes at various node locations on the line of the River Medlock in the vicinity of the site.
- 7.9 A comparison between the flood water levels provided by the EA and the proposed development's FFLs, indicate that the FFL of the habitable area of the proposed facility will be the above the worst case 1 in 1,000 year flood scenario, and that whilst the FFL of the non-habitable area will be below the worst case flood level, the safe operating of the plant in this area will not be affected.
- 7.10 Given the above, it is considered that the risk to the proposed development from fluvial flooding is low.
- 7.11 It is also considered that the development is not at significant risk of flooding from tidal waters, surface water, reservoirs, sewers, groundwater or from other sources.
- 7.12 Given the above it is considered that the development is appropriate in this instance.
- 7.13 The surface water drainage proposals for the development will incorporate the principles of the NPPF and the SUDS manual.
- 7.14 Ground conditions are not anticipated to support the use of infiltration techniques, and there are no watercourses in the vicinity of the site. Therefore it will be necessary to discharge the surface water runoff generated by the proposed development to the existing public drainage system.
- 7.15 The surface water drainage proposals will be designed to ensure that the proposed runoff rate does not exceed the generally accepted practical minimum discharge rate of 5 l / sec for all storm events up to and including the critical 1 in 100 year event plus a 45% climate change allowance.
- 7.16 Given the above it is considered that the proposed development should not be at risk from flooding during its life time, and that it will not increase flood risk to elsewhere.

Appendix 01  
Site location plan



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

CDM - RESIDUAL HAZARDS The following are considered to be significant risks relevant to this drawing, which could not be fully mitigated or removed through design:

|                                   |          |        |
|-----------------------------------|----------|--------|
| P01 - Architectural Stage 2 Issue | 06.02.23 | JE     |
| Revision                          | Date     | Dm Chk |

This document references the following files:-

Client  
The University of Manchester

Project  
North Campus Phase 2 - Main Works  
Energy Centre

Drawing Title  
Existing Site Plan

Suitability Status  
S3 - For Review and Comment

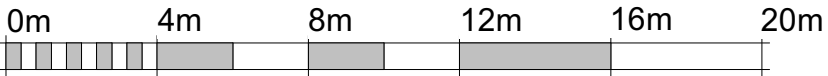
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| [221512] | 1 : 200 | @ A1 | P01 |

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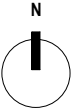
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| Project Code | Originator | Zone | Level | Type | Role | Number |
|--------------|------------|------|-------|------|------|--------|

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SCALE 1:200 @ A1



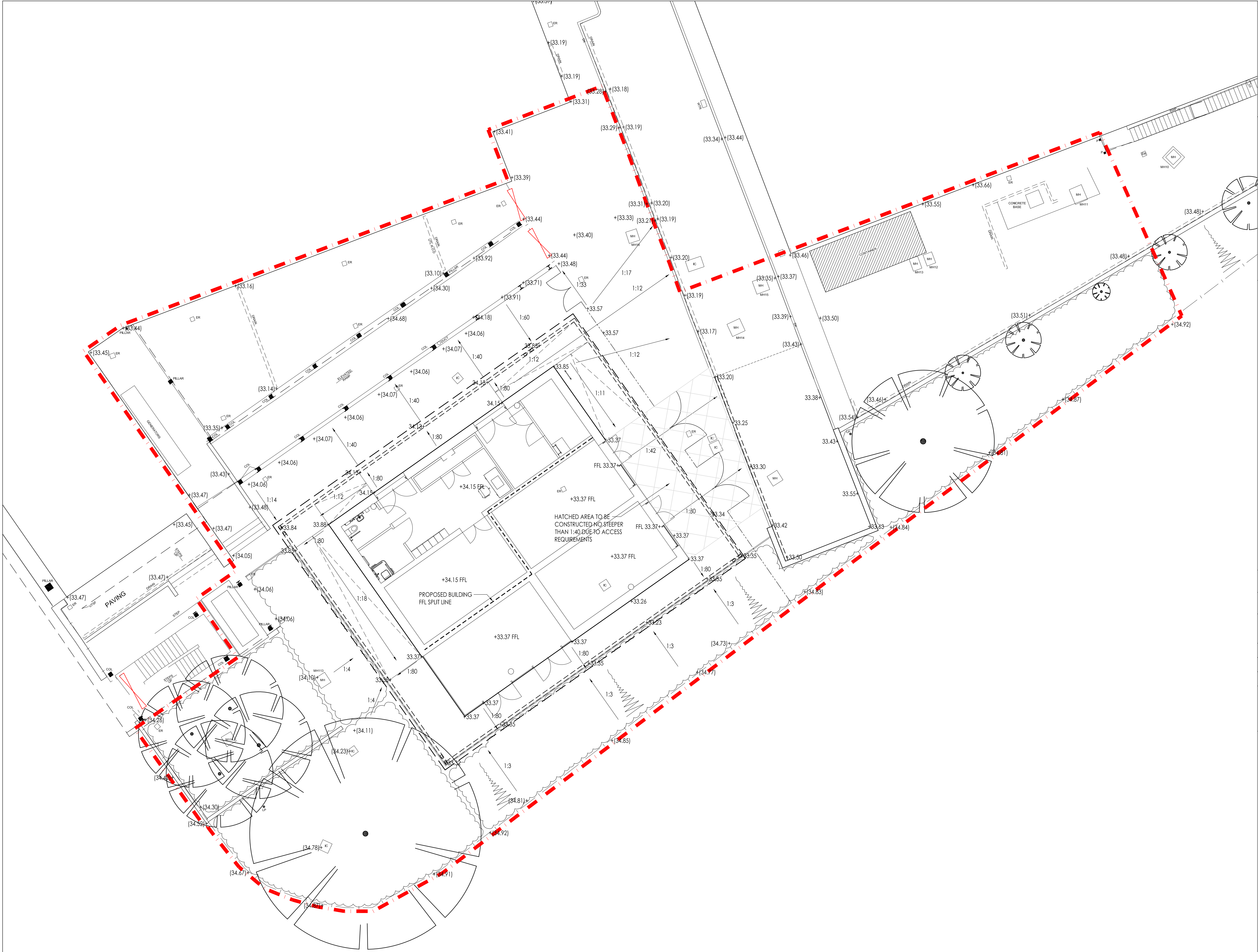
## Appendix 02

### Existing site plan



## Appendix 03

### Proposed development plans



**NOTES:**

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KEY PLAN

|     |                                               |          |            |              |
|-----|-----------------------------------------------|----------|------------|--------------|
| P04 | LEVELS UPDATED                                | IF       | MS         | 02.10.24     |
| P03 | NMR GAS STORAGE REMOVED                       | MS       | MS         | 16.09.24     |
| P02 | UPDATED FOLLOWING BUILDING GF FFL LEVEL SPLIT | MS       | MS         | 13.09.24     |
| P01 | FIRST ISSUE                                   | IF       | MS         | 02.07.24     |
| REV | DETAILS                                       | DRAWN BY | CHECKED BY | CHECKED DATE |

DRAWING RECORD

STATUS  
FOR REVIEW, COMMENT AND APPROVAL

CLIENT

MASTERPLANNERS/LANDSCAPE ARCHITECTS

**( iteriad )**

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W: www.iteriad.com

PROJECT TITLE  
UoM North Campus Energy Centre

DRAWING TITLE  
Proposed Landscape Levels Plan

SCALE  
1:100@A1

DRAWN BY  
IF

DATE  
JUN '24

JOB/DRAWING NUMBER  
MEC-ITE-XX-XX-D-L-900301

REVISION  
P04

## Appendix 04

### Environment Agency correspondence

## Tom Booth

---

**From:** GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>  
**Sent:** 31 January 2024 14:32  
**To:** Kevin Tyldesley  
**Subject:** GMMC344640SW Response attached from the Environment Agency  
**Attachments:** GMMC344640SW DFM.pdf; GMMC344640SW Table.pdf

Dear Kevin,

Thank you for your enquiry which was received on 29/01/24.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I enclose the data requested.

We have no records of flooding affecting the site.  
However, this does not mean flooding has not occurred in the past or that it will not flood in future.  
We recommend that you also contact United Utilities and Manchester Council  
Who may hold additional information (the former especially in relation to sewer flooding).

There are no flood defences in the vicinity of the site.

There are no 2D levels available for this site.

Manchester Council is responsible for issues relating to surface water and hold information on surface water flooding.

Please be aware you can check your risk of flooding on our external website <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Here are some useful links below:

<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards,

Sarah Walters

Customer and Engagement Officer

**Greater Manchester, Merseyside and Cheshire**

**Email:** [InfoRequests.gmmc@environment-agency.gov.uk](mailto:InfoRequests.gmmc@environment-agency.gov.uk)

Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA14 4UW

---

**From:** Kevin Tyldesley <[Kevin.Tyldesley@wmlconsulting.com](mailto:Kevin.Tyldesley@wmlconsulting.com)>

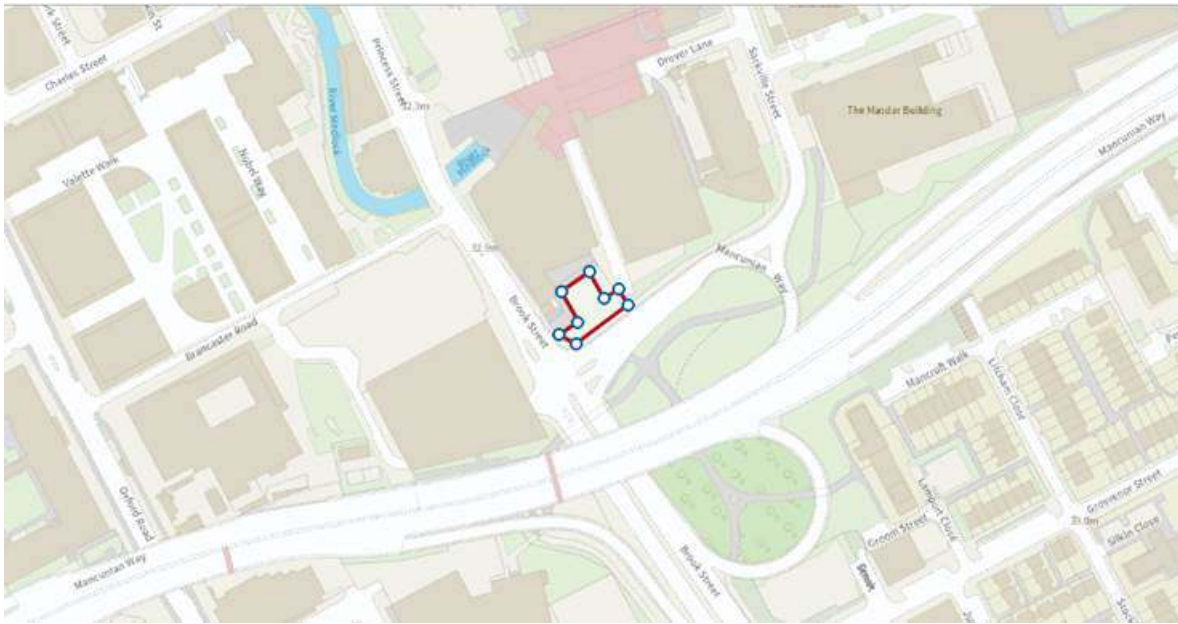
**Sent:** Monday, January 29, 2024 11:25 AM

**To:** Enquiries, Unit <[enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)>

**Subject:** 240130/ER01 11263 - Energy Centre - Sackville Street, Manchester, M1 7DN

Hi.

We have been asked to provide a Flood Risk Assessment for a proposed development at the above site, as indicated on the screenshot below.



Can you confirm if you are aware of any flood risk issues that may affect the site please ?

Can you also provide your "Product 4" information for this site ?

Kind regards.

Kevin Tyldesley

**WML Consulting Ltd**

**Civil, Structural & Geotechnical Engineers**

No. 8 Oak Green | Earl Road | Stanley Green Business Park | Cheadle Hulme | Cheshire | SK8 6QL

Tel: 0161 482 0600 | email: [kevin.tyldesley@wmlconsulting.com](mailto:kevin.tyldesley@wmlconsulting.com)

#### COVID-19 UPDATE

All our staff are able to work safely and flexibly from office or home.

Visit WML's Website: [www.wmlconsulting.com](http://www.wmlconsulting.com)

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The Institution of  
**StructuralEngineers**

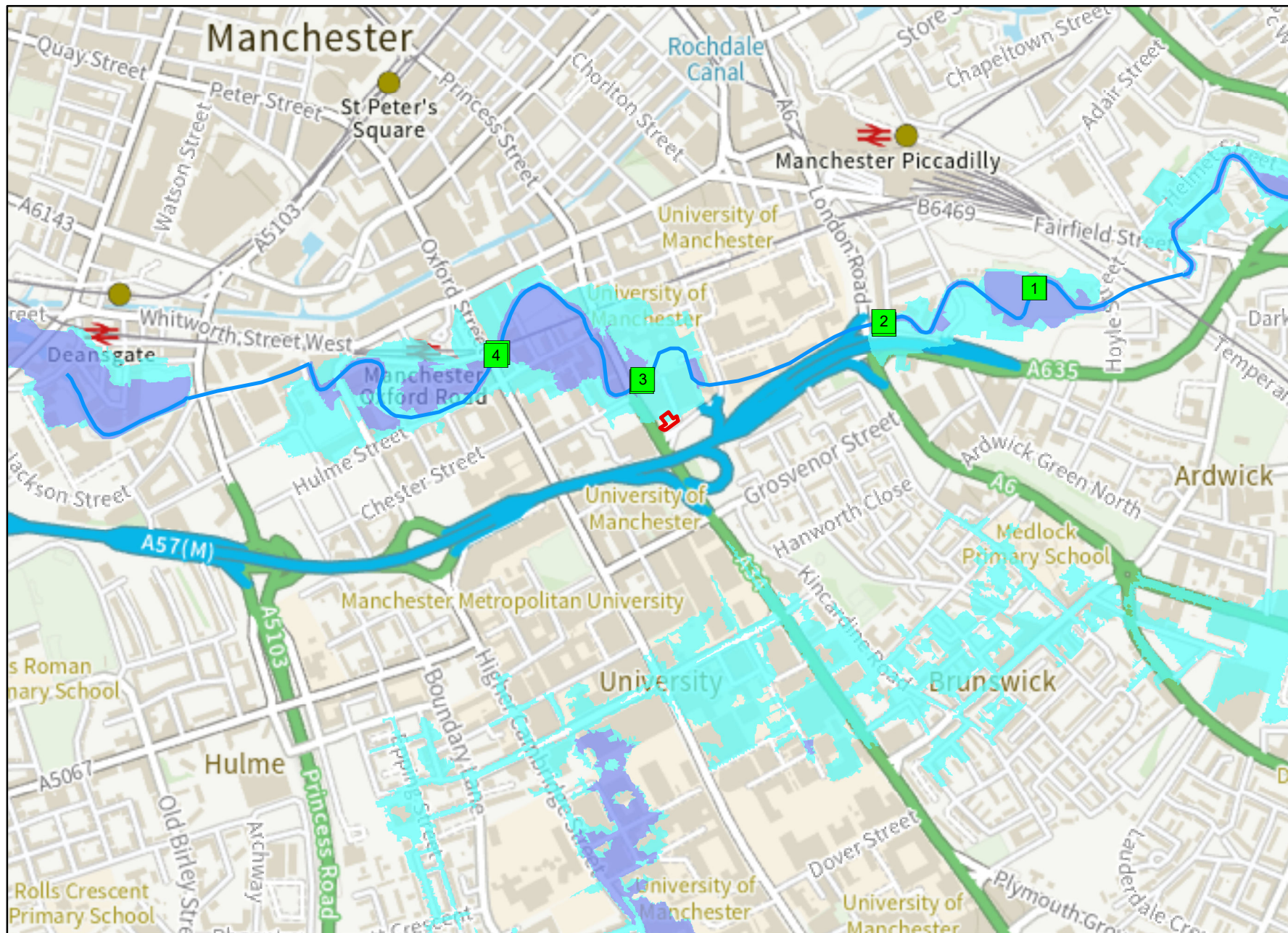


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# Detailed Flood Map Centred on Sackville Street, Manchester, M1 7DN. Created 30/01/2024 [GMMC344640SW]



1:10,001



## Legend

-  Site Location
-  Model Measurements
-  Main River
-  Flood Zone 3
-  Flood Zone 2

|               |                         |         |          |                               | Undefended             |                         |                                                |                                                |                            |
|---------------|-------------------------|---------|----------|-------------------------------|------------------------|-------------------------|------------------------------------------------|------------------------------------------------|----------------------------|
| Map Reference | Model Node Reference    | Easting | Northing | Data                          | 4 % AEP (1 in 25 year) | 1 % AEP (1 in 100 year) | 1 % AEP (1 in 100 year) + 35% increase in flow | 1 % AEP (1 in 100 year) + 70% increase in flow | 0.1 % AEP (1 in 1000 year) |
| 1             | ea013_0127_MEDL01_2492B | 385139  | 397600   | Modelled Water Level (m aodN) | 34.23                  | 34.65                   | 35.55                                          | 36.03                                          | 36.44                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 50.43                  | 57.48                   | 61.40                                          | 62.27                                          | 62.37                      |
| 2             | ea013_0127_MEDL01_2091A | 384863  | 397535   | Modelled Water Level (m aodN) | 32.15                  | 32.42                   | 34.01                                          | 34.40                                          | 34.81                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 50.52                  | 59.99                   | 73.73                                          | 86.61                                          | 94.67                      |
| 3             | ea013_0127_MEDL01_1554M | 384423  | 397426   | Modelled Water Level (m aodN) | 31.11                  | 32.09                   | 33.45                                          | 33.63                                          | 33.91                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 50.76                  | 60.20                   | 74.44                                          | 87.52                                          | 96.25                      |
| 4             | ea013_0127_MEDL01_1076D | 384157  | 397471   | Modelled Water Level (m aodN) | 30.06                  | 30.87                   | 32.30                                          | 32.88                                          | 33.55                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 51.67                  | 59.59                   | 72.89                                          | 78.41                                          | 82.10                      |

Model data taken from Medlock SFRA 2011

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: \*Climate Change Scenario - 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

|               |                         |         |          | Normal Operation              |                        |                         |                        |                        |                           |                         |                                                |                                                |                                                |                           |                            | Latchford 1 Gate Closed | Latchford 3 Gates Closed |                            |
|---------------|-------------------------|---------|----------|-------------------------------|------------------------|-------------------------|------------------------|------------------------|---------------------------|-------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|---------------------------|----------------------------|-------------------------|--------------------------|----------------------------|
| Map Reference | Model Node Reference    | Easting | Northing | Data                          | 20 % AEP (1 in 5 year) | 10 % AEP (1 in 10 year) | 4 % AEP (1 in 25 year) | 2 % AEP (1 in 50 year) | 1.33 % AEP (1 in 75 year) | 1 % AEP (1 in 100 year) | 1 % AEP (1 in 100 year) + 30% increase in flow | 1 % AEP (1 in 100 year) + 35% increase in flow | 1 % AEP (1 in 100 year) + 70% increase in flow | 0.5 % AEP (1 in 200 year) | 0.1 % AEP (1 in 1000 year) | 1 % AEP (1 in 100 year) | 1 % AEP (1 in 100 year)  | 0.1 % AEP (1 in 1000 year) |
| 1             | ea013_0251_MEDL01_2490  | 385139  | 397600   | Modelled Water Level (m aodN) | 32.93                  | 33.03                   | 33.14                  | 33.24                  | 33.36                     | 33.55                   | 34.57                                          | 34.70                                          | 35.25                                          | 34.28                     | 35.48                      | 33.55                   | 33.55                    | 35.48                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 29.49                  | 34.41                   | 40.66                  | 47.23                  | 51.90                     | 55.82                   | 71.01                                          | 73.53                                          | 96.14                                          | 66.83                     | 109.65                     | 55.82                   | 55.82                    | 109.65                     |
| 2             | ea013_0251_MEDL01_2102  | 384863  | 397535   | Modelled Water Level (m aodN) | 31.26                  | 31.43                   | 31.67                  | 32.14                  | 32.69                     | 33.16                   | 34.30                                          | 34.42                                          | 35.12                                          | 34.03                     | 35.34                      | 33.16                   | 33.16                    | 35.34                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 29.65                  | 34.61                   | 40.90                  | 47.51                  | 52.19                     | 56.12                   | 71.41                                          | 73.94                                          | 95.27                                          | 67.16                     | 110.80                     | 56.12                   | 56.12                    | 110.80                     |
| 3             | ea013_0251_MEDL01_1555d | 384423  | 397426   | Modelled Water Level (m aodN) | 30.03                  | 30.47                   | 31.07                  | 31.81                  | 32.27                     | 32.67                   | 33.43                                          | 33.49                                          | 33.77                                          | 33.27                     | 34.06                      | 32.67                   | 32.67                    | 34.06                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 29.69                  | 34.65                   | 40.92                  | 47.56                  | 52.24                     | 56.19                   | 71.50                                          | 74.03                                          | 95.36                                          | 67.25                     | 113.28                     | 56.19                   | 56.19                    | 113.28                     |
| 4             | ea013_0251_MEDL01_1079  | 384157  | 397471   | Modelled Water Level (m aodN) | 29.66                  | 30.10                   | 30.70                  | 31.38                  | 31.89                     | 32.33                   | 33.27                                          | 33.32                                          | 33.56                                          | 33.10                     | 33.72                      | 32.33                   | 32.33                    | 33.72                      |
|               |                         |         |          | Modelled Flow (cumecs)        | 31.34                  | 36.59                   | 43.21                  | 50.23                  | 55.16                     | 59.33                   | 75.57                                          | 78.25                                          | 98.26                                          | 70.97                     | 120.61                     | 59.33                   | 59.33                    | 120.61                     |

Model data taken from Manchester Ship Canal

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: \*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

For the Manchester Ship Canal Model, we provide the following three scenarios:

1. Normal Operation: All sluice gates operate automatically to maintain a navigable pounded water level upstream of each set of sluice gates. During times of high flow the gates are opened automatically to allow excess water pass downstream. During extreme conditions the sluice gates can be manually overridden to extend the opening heights.
2. Latchford 1 Gate Closed Scenario: This scenario represents a single operational sluice gate at Latchford Locks fixed closed. Therefore, only operational movements from 2 active sluice gates.The model setup removes the gate from PID controller setup and an IED file is used to define the sluice gate as fixed in the closed position.
3. Latchford 3 Gates Closed Scenario: This scenario has been defined as the removal of operational rules at all three sluice gates at Latchford Locks, thus, all gates are fixed in the closed position resulting in no regulation of upstream water levels. The model setup removes each of the gates from PID controller setup and an IED file is used to define sluice gates fixed in the closed position.

## Appendix 05

### Manchester City Council correspondence

## Appendix 06

### United Utilities correspondence

Kevin Tyldesley

---

To: wastewaterdeveloperservices@uuplc.co.uk  
Subject: RE: Our reference - 05234913 11263 - Energy Centre - Sackville Street, Manchester, M1 7DN

---

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>  
Sent: 30 January 2024 11:58  
To: Kevin Tyldesley <Kevin.Tyldesley@wmlconsulting.com>  
Subject: Our reference - 05234913 11263 - Energy Centre - Sackville Street, Manchester, M1 7DN



Good Afternoon

Thank you for your enquiry.

I can see from our records that there are no known flood risks in the area of the planned works.

Please note our records are not 100% accurate and we would always recommend site investigation ahead of any planned works.

You can purchase a map from our property searches team, please see the link below for more information

<https://www.unitedutilities.com/property-searches/>

Or

You can apply to register through our safe dig application, see link below

<https://www.unitedutilities.com/safe-dig-application/>

Kind Regards



Lois Williams  
Developer Services Assistant  
Developer Services & Metering  
Customer Services  
unitedutilities.com  
Tel: 0345 072 6067 Option 2 for  
Wastewater Services)  
Direct Tel:

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated

----- Original Message -----

From: Kevin Tyldesley [kevin.tyldesley@wmlconsulting.com]

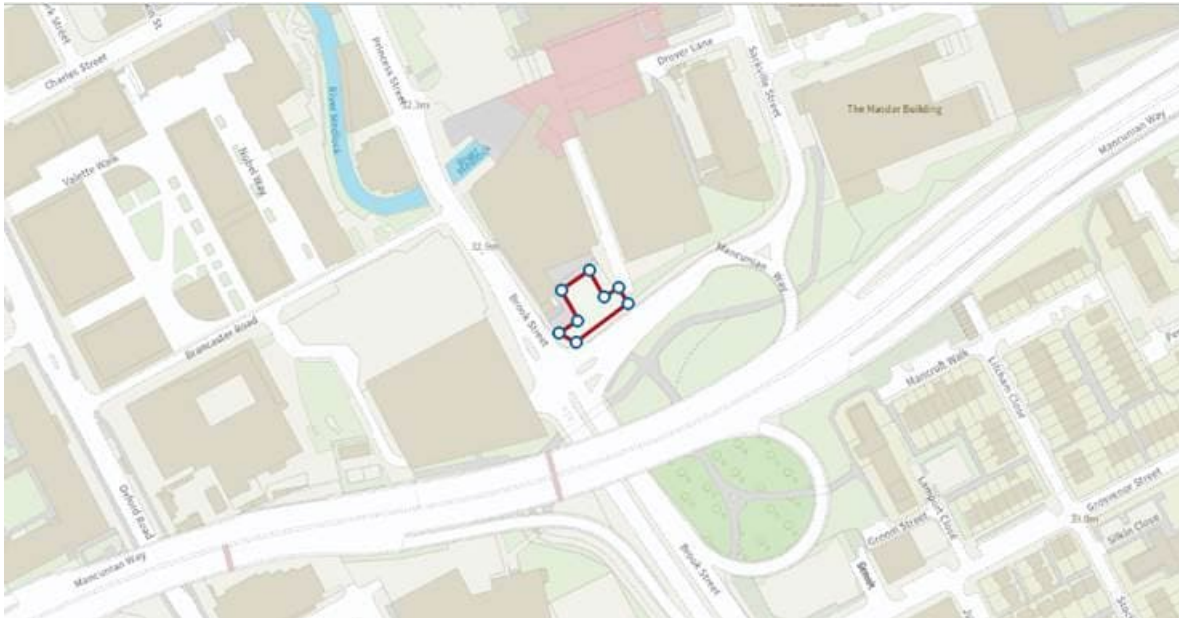
Sent: 29/01/2024 11:22

To: [wastewaterdeveloperservices@uuplc.co.uk](mailto:wastewaterdeveloperservices@uuplc.co.uk)

Subject: 11263 - Energy Centre - Sackville Street, Manchester, M1 7DN

Hi.

We have been asked to provide a Flood Risk Assessment for a proposed development at the above site, as indicated on the screenshot below.



Can you confirm if you are aware of any flood risk issues that may affect the site please ?

Kind regards.

Kevin Tyldesley

WML Consulting Ltd

Civil, Structural & Geotechnical Engineers

No. 8 Oak Green | Earl Road | Stanley Green Business Park | Cheadle Hulme | Cheshire | SK8 6QL

Tel: 0161 482 0600 | email: [kevin.tyldesley@wmlconsulting.com](mailto:kevin.tyldesley@wmlconsulting.com)

Visit WML's Website:

[www.wmlconsulting.com](http://www.wmlconsulting.com)

## Appendix 07

### Electricity North West correspondence

Kevin Tyldesley

Subject:

RE: UoM | Energy Centre - 11263

From: Rak, Steven <Steven.Rak@enwl.co.uk>

Sent: 24 September 2024 08:48

To: Kevin Tyldesley <Kevin.Tyldesley@wmlconsulting.com>

Cc: James, Mike <MIKE.JAMES@tetrattech.com>; Greg Matejko <Greg.Matejko@wmlconsulting.com>; David Fitzgibbon <David@recomsolutions.co.uk>; Keith Cheshire <kcheshire@wilsonmason.co.uk>; ANTRIANA.GKIKOPOULI@tetrattech.com; IAN.MACHIN@tetrattech.com

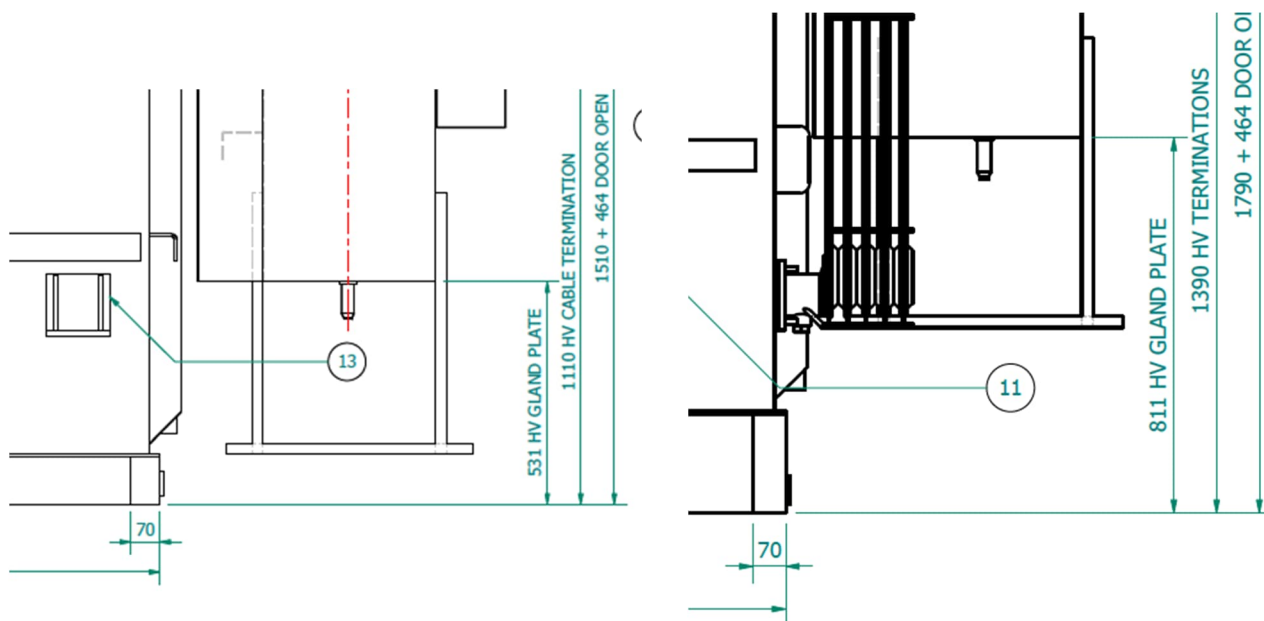
Subject: RE: UoM | Energy Centre - 11263

Morning Kevin,

Sorry, I think the way I answered the query regarding the damage point included information that has confused things.

The dimensions were shown on the drawing I attached within the email, below this level the substation would remain in operation and no damage would be caused to the equipment.

We have now received the latest GA's for the transformers being considered, the heights are 2000kVA 531mm and 2500kVA 811mm.



Kind regards

Steven

Steven Rak  
Project Engineer

**Electricity North West (Construction & Maintenance) Limited**  
Whitebirk Depot  
Whitebirk Drive  
Blackburn  
BB1 3HT

T: +44 (0) 845 070 2520  
M: +44 (0) 7833 082253 (Primary)  
W: [www.enwcml.co.uk](http://www.enwcml.co.uk)



---

From: Kevin Tyldesley <[Kevin.Tyldesley@wmlconsulting.com](mailto:Kevin.Tyldesley@wmlconsulting.com)>  
Sent: Monday, September 23, 2024 4:06 PM  
To: Rak, Steven <[Steven.Rak@enwl.co.uk](mailto:Steven.Rak@enwl.co.uk)>  
Cc: James, Mike <[MIKE.JAMES@tetrattech.com](mailto:MIKE.JAMES@tetrattech.com)>; Greg Matejko <[Greg.Matejko@wmlconsulting.com](mailto:Greg.Matejko@wmlconsulting.com)>; David Fitzgibbon <[David@recomsolutions.co.uk](mailto:David@recomsolutions.co.uk)>; Keith Cheshire <[kcheshire@wilsonmason.co.uk](mailto:kcheshire@wilsonmason.co.uk)>; [ANTRIANA.GKIKOPOULI@tetrattech.com](mailto:ANTRIANA.GKIKOPOULI@tetrattech.com); [IAN.MACHIN@tetrattech.com](mailto:IAN.MACHIN@tetrattech.com)  
Subject: RE: UoM | Energy Centre - 11263

Hi Steven

Thanks very much for the info below.

Can I just seek some clarifications though please ?

Are you saying that the sub-stations could remain in operation with water up to the depths quoted below (1320mm and 1720mm) ?

Or are you anticipating that they would be shut down if a flood was expected, but would only actually be damaged once the water levels above were reached ?

Note that in this instance the worst case (1 in 1,000 year flood event) would be anticipated to attain a water depth of 690mm.

Please feel to call if you prefer (07741 489 409).

Kind regards.

Kevin Tyldesley

WML Consulting Ltd

---

From: Rak, Steven <[Steven.Rak@enwl.co.uk](mailto:Steven.Rak@enwl.co.uk)>  
Sent: 29 August 2024 16:27  
To: Gkikopouli, Antriana <[ANTRIANA.GKIKOPOULI@tetrattech.com](mailto:ANTRIANA.GKIKOPOULI@tetrattech.com)>  
Cc: Machin, ian <[IAN.MACHIN@tetrattech.com](mailto:IAN.MACHIN@tetrattech.com)>; James, Mike <[MIKE.JAMES@tetrattech.com](mailto:MIKE.JAMES@tetrattech.com)>  
Subject: RE: UoM | Energy Centre

Hi Antriana,

Apologies for not replying regarding this point.

- Damage would be caused to the transformers once the water level reached the level of the bushings which is where both the HV and LV connections are made, 2000kVA (approx. 1320mm) 2500kVA (approx. 1720mm)
- The ring main units will suspend from the transformers and the ring switch termination boxes and relay housing will be the lowest point of the equipment.

I've attached a drawing identifying the height of the ring main unit for both bushing heights, the protection relay is housed within the base of the ring main unit and this will be the most vulnerable to a flood.

I hope this provides adequate information.

Thanks  
Steven

Steven Rak  
Project Engineer

**Electricity North West (Construction & Maintenance) Limited**  
Whitebirk Depot  
Whitebirk Drive  
Blackburn  
BB1 3HT

T: +44 (0) 845 070 2520  
M: +44 (0) 7833 082253 (Primary)  
W: [www.enwcml.co.uk](http://www.enwcml.co.uk)



---

From: Gkikopouli, Antriana <[ANTRIANA.GKIKOPOULI@tetrattech.com](mailto:ANTRIANA.GKIKOPOULI@tetrattech.com)>  
Sent: Thursday, August 29, 2024 3:23 PM  
To: Rak, Steven <[Steven.Rak@enwl.co.uk](mailto:Steven.Rak@enwl.co.uk)>  
Cc: Machin, ian <[IAN.MACHIN@tetrattech.com](mailto:IAN.MACHIN@tetrattech.com)>; James, Mike <[MIKE.JAMES@tetrattech.com](mailto:MIKE.JAMES@tetrattech.com)>  
Subject: RE: UoM | Energy Centre

Hello Steven,

Hope you've been well.

I wanted to reach out and check with you whether you have any information about the first point below on flood risk.

We are being chased to provide information about the transformer and the ring unit, any information you can provide is appreciated.

Kind regards,

**Antriana Gkikopouli, Meng MSc MIET** | Senior Electrical Engineer

Pronouns: she, her, hers

Direct +44 292 082 9200| Mobile +44 7974 368 754

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Registered Office: 3 Sovereign Square, Sovereign Street, Leeds LS1 4ER. VAT No: 431-0326-08



---

From: Gkikopouli, Antriana  
Sent: Friday, August 9, 2024 7:41 AM  
To: Rak, Steven <[Steven.Rak@enwl.co.uk](mailto:Steven.Rak@enwl.co.uk)>  
Cc: Machin, ian <[IAN.MACHIN@tetrattech.com](mailto:IAN.MACHIN@tetrattech.com)>; James, Mike <[MIKE.JAMES@tetrattech.com](mailto:MIKE.JAMES@tetrattech.com)>  
Subject: UoM | Energy Centre

Good morning Steve,

I am reaching out for two reasons.

- I would like your help to understand at which flood level depth, would the transformers and ring main units become inoperably damaged and dangerous. If the site were to flood it is highly likely the HV would be shut down, so we are looking at the risk of water ingress to the terminal boxes , the nominal mounting heights of these and any other vulnerability on the equipment.
- We would like from you a HV/LV quote for the Energy Centre. I have attached the LV schematic, the ground floor and first floor plant layouts. Do you have enough information in order to provide us with a quote?

Kind regards,

**Antriana Gkikopouli, Meng MSc MIET** | Senior Electrical Engineer

Pronouns: she, her, hers

Direct **+44** 292 082 9200 | Mobile **+44** 7974 368 754

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