

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 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 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 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 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

4.0 EXISTING SITE AND PROPOSED DEVELOPMENT

4.1 A site location plan is presented in appendix 01. From this it can be seen that the development consists of a proposed Energy Centre located (located adjacent to the junction of Sackville Street and Princess Street), plus a proposed Temporary NMR Gas Storage facility (located around 100m north of the proposed Energy Centre). Both elements of the proposed development are located within the University of Manchester North Campus.

4.2 An approx. postcode for the location of the development is M1 7DN.

The proposed Energy Centre

4.3 The site of the proposed Energy Centre 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 has been carried out, and a copy of the survey plan can be found at 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 is 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.

The proposed Temporary NMR Gas Storage facility

4.10 The site of the proposed Temporary NMR Gas Storage facility is bounded to the north and west by a service yard / car parking area, to the east by the Manchester Conference Centre, and to the south by the John Garside Building.

4.11 The site has an area of around 100m sq. (0.01 ha), and comprises an area of existing hardstanding.

4.12 A topographic survey of the site has been carried out, and a copy of the survey plan can be found at appendix 02. This plan indicates that the site is generally level at around 33.0m AOD.

4.13 The proposed development involves the construction of a new gas bottle storage facility.

4.14 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, delivery, maintenance and monitoring operations. It has been anticipated that the routine delivery, monitoring and maintenance operations will require the attendance of two people for one hour per day, for five days per week.

4.15 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. It is acknowledged that the EA's response contains public sector information licensed under the Open Government Licence v3.0.
- 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 – Proposed Energy Centre Site

- 5.6 The flood map for planning provided by the EA, and which can be found at appendix 04, appears to show that the Energy Centre 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 includes flood modelling data from two model sources, the first being from the "River Medlock 2011", and the second being the "Manchester Ship Canal 2018". 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 River Medlock 2011 model node 10 is closest to the proposed development site, where flood water levels are predicted to be 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.

- 5.11 The Manchester Ship Canal 2018 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. Note that this data has been taken from the information supplied by the EA in respect of the earlier version of this FRA dated January 2024, and which has been appended as the last two pages of the EA's response at appendix 04.
- 5.12 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.
- 5.13 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.
- 5.14 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.
- 5.15 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.
- 5.16 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 Rivers – Fluvial Flooding – Temporary NMR Gas Storage facility

- 5.17 The flood map for planning provided by the EA, and which can be found at appendix 04, appears to show that the Temporary NMR Gas Storage facility site is located on the boundary of Flood Zone 2 (medium risk) and Flood Zone 3 (high risk).
- 5.18 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 3 means that this area has a chance of flooding of greater than 1% (1 in 100) each year.
- 5.19 The flooding shown on the EA flood map in the vicinity of the site, appears to be generated by the River Medlock, which flows in a culvert immediately to the south proposed development site, with the river emerging from this culvert just to the west of the site.
- 5.20 The information provided by the EA includes flood modelling data from two model sources, the first being from the "River Medlock 2011", and the second being the "Manchester Ship Canal 2018". 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.
- 5.21 From the mapping it can be seen that River Medlock 2011 model node 10 is closest to the proposed development site, where flood water levels are predicted to be 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.

- 5.22 The Manchester Ship Canal 2018 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. Note that this data has been taken from the information supplied by the EA in respect of the earlier version of this FRA dated January 2024, and which has been appended as the last two pages of the EA's response at appendix 04.
- 5.23 The existing ground level in the vicinity of the proposed Temporary NMR Gas Storage facility is at around 33.0m AOD, and as can be seen from the plan at appendix 03, the proposed facility is to have an operational floor level set 0.8m above the existing ground level, i.e. at 33.8m AOD.
- 5.24 Hence during the worst case 1 in 100 year flood event, the facility would not be affected. During the worst case 1 in 1,000 year flood event, the facility could be affected to a depth of 0.26m.
- 5.25 Given the above and the generally unattended nature of the facility, it is considered that the risk posed from this form of flooding is low.

Flooding from Sea – Tidal Flooding

- 5.26 Neither the Energy Centre nor the Temporary NMR Gas Storage facility elements of the proposed development are located in an area that is at risk of tidal flooding.
- 5.27 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

- 5.28 The online surface water flood mapping indicates that both the Energy Centre and the Temporary NMR Gas Storage facility elements of the proposed development are 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.
- 5.29 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.
- 5.30 Given the above, it is considered that the risk to the proposed development from this form of flooding is low.

Flooding from Sewers

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

Flooding from Groundwater

- 5.33 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).
- 5.34 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.

- 5.35 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.
- 5.36 Neither the EA or the site owner have raised the issue of ground water flooding at the site.
- 5.37 Whilst the Energy Centre 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.
- 5.38 Given the above, it is considered that the risk to the proposed development from this form of flooding is low.

Flooding from Reservoirs

- 5.39 The online reservoir flood mapping indicates that the both elements of the proposed development are potentially at risk from this form of flooding, together with significant portions of Manchester, Salford, Trafford and beyond.
- 5.40 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

- 5.41 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.
- 5.42 On this basis, it is considered that the risk to the development from flooding from other sources is low.

Flood Risk Summary

- 5.43 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.

- 5.44 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.

- 5.45 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.
- 5.46 Regarding item c), it is considered that this issue is adequately addressed below, within the contents of chapter 6 of this FRA.
- 5.47 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.
- 5.48 Regarding item e), as mentioned above the habitable area of the Energy Centre element 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 Energy Centre 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.
- 5.49 Also regarding item e), the Temporary NMR Gas Storage facility element of the development is located on the boundary of Flood Zone 2 (medium risk) and Flood Zone 3 (high risk). Hence safe access and escape routes may not be available to / from it at all times. Though a safe access / escape route would be available to the south via the existing internal access road (before the flood depths referred to above are reached) and then via the gated pedestrian access to Princess Street (A34), as mentioned above.
- 5.50 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 significantly 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 where practical 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 Energy Centre element of the proposed development, therefore the discharge of surface water runoff via a watercourse is not considered feasible.

6.9 With the exception of the River Medlock, there are no existing watercourses in the vicinity of the proposed Temporary NMR Gas Storage facility element of the development. Given the nature and scale of this element of the development, that it will occupy an area that is currently hardstanding and that is drained via a series of road gullies, it is considered that a new connection to the River Medlock is not merited. Therefore the discharge of surface water runoff from this element of the development via a watercourse is not considered feasible.

Surface water discharge via the public sewerage system

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

6.11 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.

- 6.12 The surface water drainage proposals for the proposed Energy Centre 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.
- 6.13 Given the nature and scale of the Temporary NMR Gas Storage facility element of the development, that it will occupy an area that is currently hardstanding and that is drained via a series of road gullies, it is considered that the surface water runoff from it will be discharged to the existing private drainage system that currently serves this area.

Foul water drainage proposals

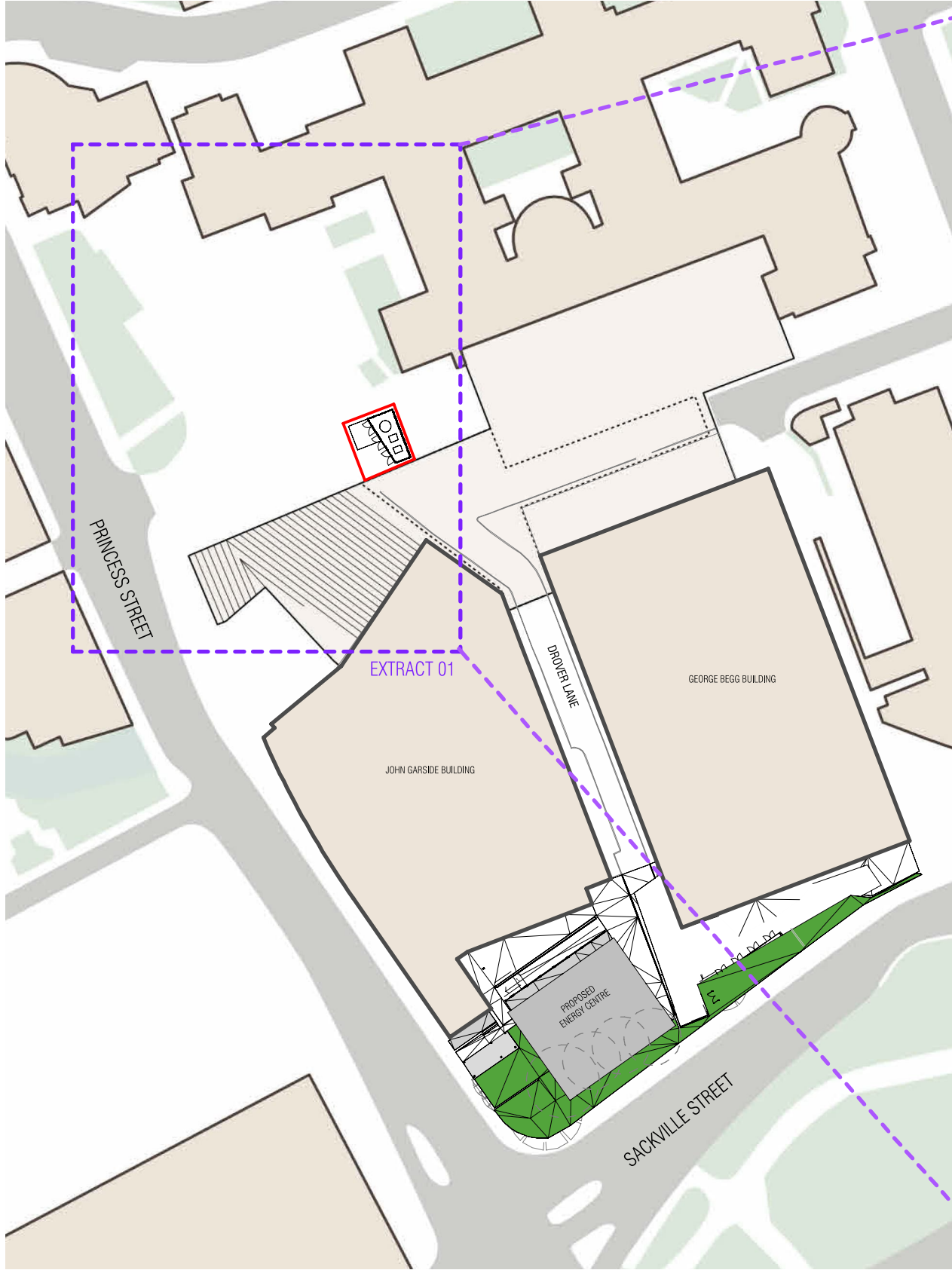
- 6.14 It is anticipated that the foul drainage flows generated by the proposed development will be directed to the existing public drainage system locally.

7.0 SUMMARY

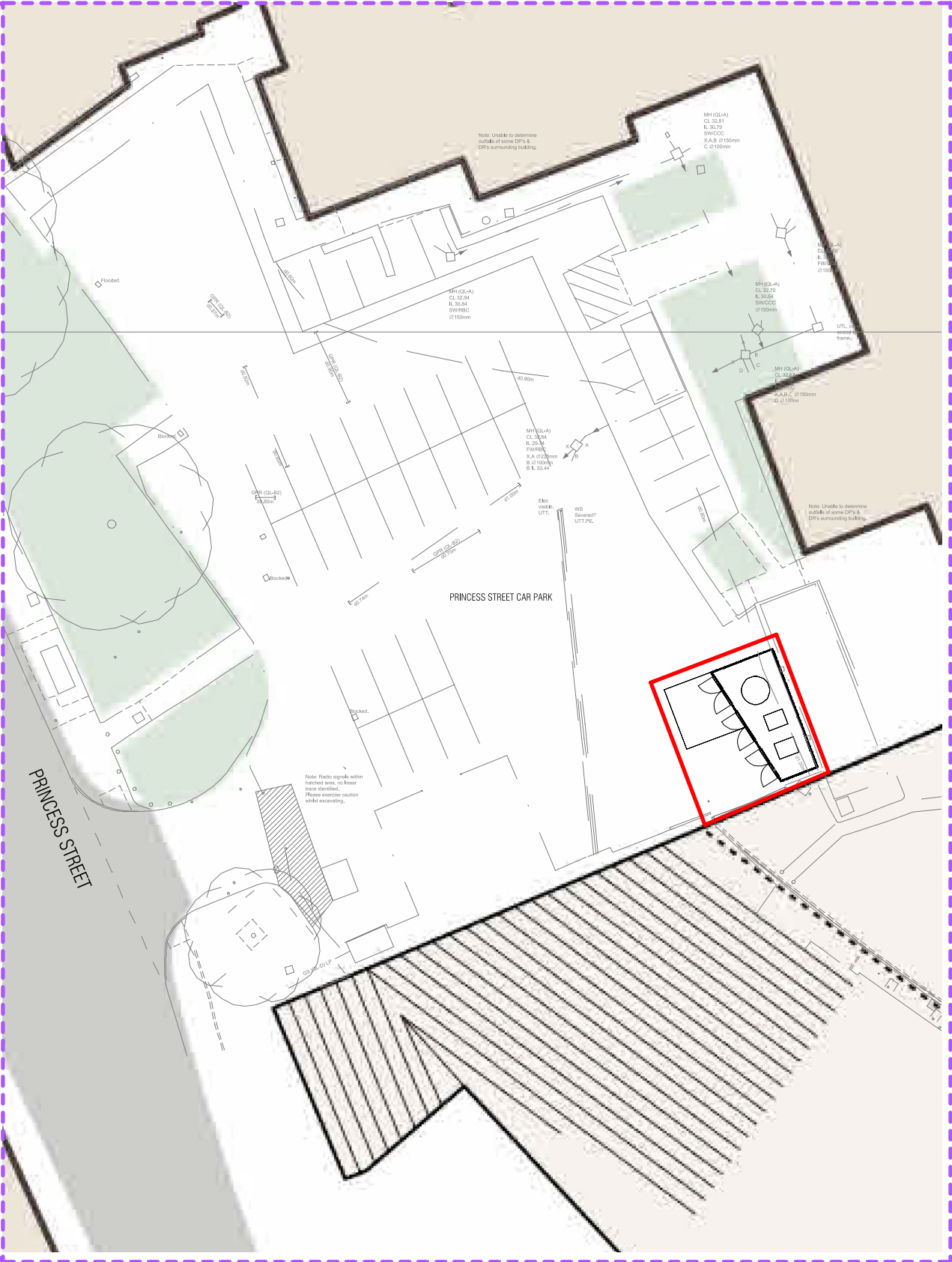
- 7.1 WML Consulting Ltd have been commissioned by The University of Manchester to provide a Flood Risk Assessment (FRA) to support a planning application for a proposed development for a new Energy Centre at Sackville Street, Manchester, M1 7DN.
- 7.2 The proposed development consists of a new Energy Centre located (located adjacent to the junction of Sackville Street and Princess Street), plus a proposed Temporary NMR Gas Storage facility (located around 100m north of the proposed Energy Centre). Both elements of the proposed development are located within the University of Manchester 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 facilities will not be occupied on a full time basis. This is because the new Energy Centre facility is essentially a large plantroom, so whilst it is operating normally, there will be no need for the building to be occupied. It is 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 In terms of occupancy of the proposed Temporary NMR Gas Storage facility, there will only be people on site during installation, delivery, maintenance and monitoring operations. It has been anticipated that the routine delivery, monitoring and maintenance operations will require the attendance of two people for one hour per day, for five days per week.
- 7.6 The flood mapping provided by the EA appears to show that the Energy Centre 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 Energy Centre site.
- 7.8 The proposed Energy Centre 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.
- 7.9 A comparison between the flood water levels provided by the EA and the proposed Energy Centre FFLs, indicates 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 The flood map for planning provided by the EA, appears to show that the Temporary NMR Gas Storage facility site is located on the boundary of Flood Zone 2 (medium risk) and Flood Zone 3 (high risk).
- 7.11 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 3 means that this area has a chance of flooding of greater than 1% (1 in 100) each year.
- 7.12 The existing ground level in the vicinity of the proposed Temporary NMR Gas Storage facility is at around 33.0m AOD, and the proposed facility is to have an operational floor level set 0.8m above the existing ground level, i.e. at 33.8m AOD.
- 7.13 Hence during the worst case 1 in 100 year flood event, the facility would not be affected. During the worst case 1 in 1,000 year flood event, the facility could be affected to a depth of 0.26m.
- 7.14 Given the above, it is considered that the risk to the proposed development from fluvial flooding is low.

- 7.15 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.
- 7.16 Given the above it is considered that the development is appropriate in this instance.
- 7.17 The surface water drainage proposals for the development will incorporate the principles of the NPPF and the SUDS manual.
- 7.18 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.
- 7.19 The surface water drainage proposals for the new Energy Centre 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.
- 7.20 Given the nature and scale of the Temporary NMR Gas Storage facility element of the development, that it will occupy an area that is currently hardstanding and that is drained via a series of road gullies, it is considered that the surface water runoff from it will be discharged to the existing private drainage system that currently serves this area.
- 7.21 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



1 NMR Site Plan
1 : 500



2 NMR Site Plan Extract 01
1 : 200

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This Drawing Should be Printed in Colour

KEY
Indicates Site boundary and Location of Temporary Gas Storage

NOTES
FOR FURTHER INFORMATION REGARDING ENCLOSURE LAYOUT AND DETAIL, REFER TO DRAWING 10-103
Please Note:
This drawing must be read in conjunction with landscape architect design.

PO6	Removal of Liquid Provision	18/08/25	JA	HC
PO5	Upgrade to Temporary Gas Store	17/08/25	JA	HC
PO4	PCSA Basis	13/08/25	AM	HC
PO3	Stage 4 Drawing Issue	09/11/24	AM	HC
PO2	Issue Material Take to Structural Concrete Thickening	16/10/24	JA	HC
PO1	Issued for Planning	20/08/24	JA	HC
Rev	Correction	date	drawn	checked

client: The University of Manchester
project: The University of Manchester North Campus Energy Centre
title: Temporary NMR Gas Storage Site Plan

project no:	7228	scale:	As indicated@A1	drawn by:	OH	checked by:	KC	date:	09/24/24
drawing no:								Status:	Rev:
MEC-WMA-XX-XX-DR-A-00-013								D2	P06

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W: www.wilsonmason.co.uk

Appendix 02
Existing site plan

PAS 128: 2014 QUALITY LEVEL GUIDE				
Q4-LEVEL	DESCRIPTION	ACC	Q4-LEVEL	DESCRIPTION
Q4-C1	Source produces literature records.	Q4-02	Source produces records with no value added.	
Q4-C2	Source produces or services records that are not available to the general public.	Q4-01	Source produces records with no value added.	
Q4-C3	Source produces or services records that are not available to the general public.	Q4-03	Source produces records with no value added.	
Q4-C4	Source produces or services records that are not available to the general public.	Q4-04	Source produces records with no value added.	
Q4-C5	Source produces or services records that are not available to the general public.	Q4-05	Source produces records with no value added.	

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and Imphomes have been proven wherever possible using audio connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV drainage and will be shown as indicated on the plan.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all of our telecom findings against record information to produce the first service layout. In some instances, where high amount of cable ducts are present, we are able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Oconrech directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EMI and GPR methodology will be combined to identify service network and achieve greater quality levels.

LC, TS and/or Sec cables will have been predominantly located using EMI methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMGS and/or WMMWS pipe work will have been attempted and [located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML locate services. The GPR has a greater success rate on pipe or service diameter upward of 203mm, 630mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, would be used as an independent utility survey instrument.

All UITS will have been predominantly located using EML methodology with (electronically) derived depths shown. GPR techniques will be employed to maintain depth resolution from one level. However, different techniques require an identified

Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes Taken from Records (GL-644D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various residences/businesses (service evidence) etc., around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and need not on drawings.

SURVEY RECOMMENDATIONS

LIST RECOMMENDATIONS TO IMPROVE SURVEY DATA

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature. GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access

points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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Do not scale from this drawing.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 64307 from Reconn Solutions Ltd. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/DWG DRAWING INFORMATION		
TOPOGRAPHICAL SURVEY DATE 02/2024		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	client supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS	
AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)		
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	SPRINT TELECOMS
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

A	ADDITIONAL SURVEY EXTENTS ADDED.	DCB/R	RN	JTM	17/09/2024
REV	DESCRIPTION	DRAIN	CHECKED	APPR	SURVEY DATA

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE CHARACTERISATION
MONITORING

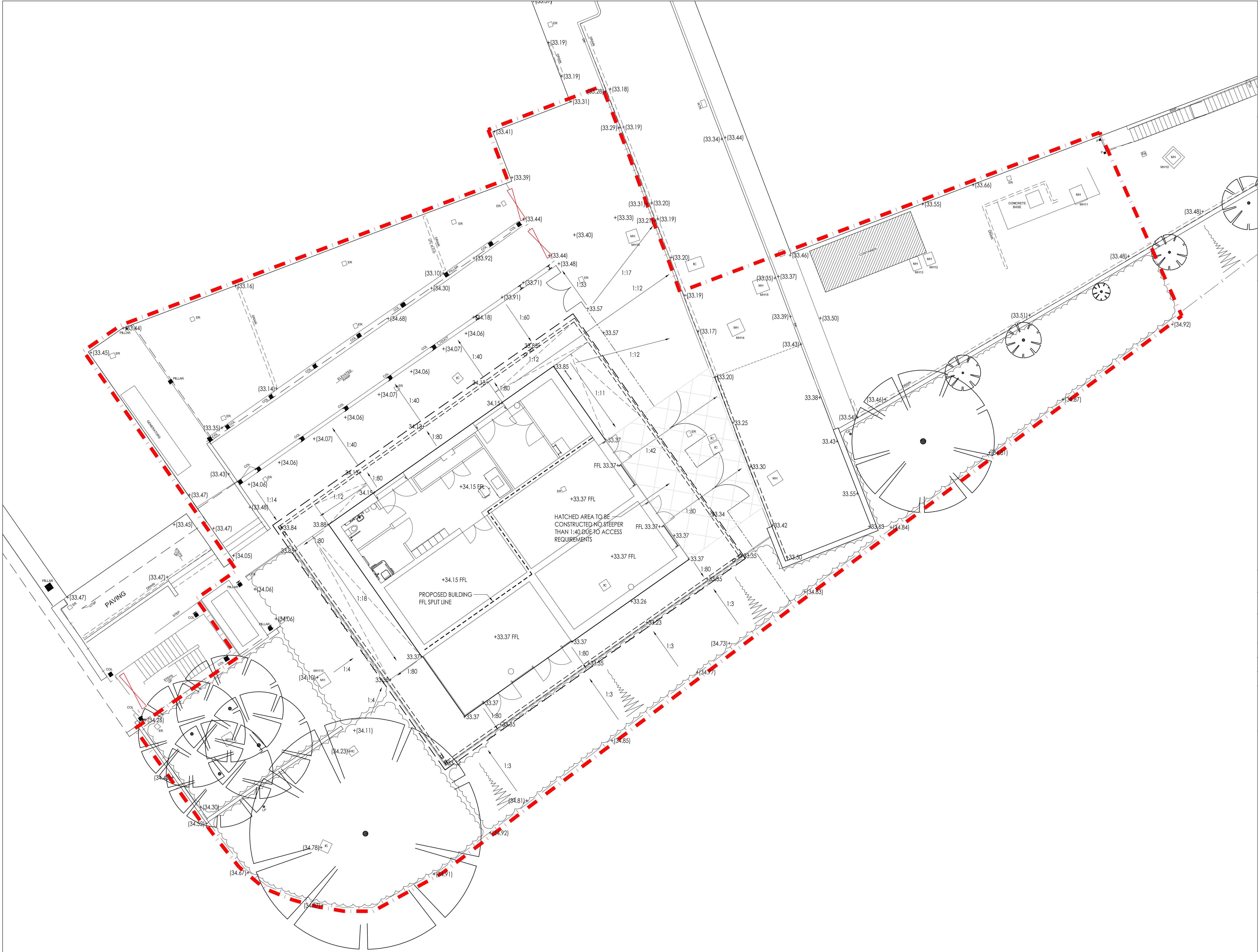
0845 040 5969
survey-solutions.co.uk

PERTH BIRMINGHAM CHESTER GLASGOW LONDON MANCHESTER NEWCASTLE NOTTINGHAM VIGOR

PROJECT TITLE UNIVERSITY OF MANCHESTER, OXFORD ROAD, MANCHESTER, M13 9PL				
DRAWING DETAIL UTILITIES AND DRAINAGE SURVEY, SHEET 1 OF 1				
CLIENT RECOM SOLUTIONS LTD				SCALE 1:200
SURVEYOR JAD	SURVEY DATE 26/02/2024	CHECKED BY OTM	APPROVED BY JTM	DWG STATUS FINAL
DRAWING NUMBER 643070NGUG-01				REVISION A
				ISSUE DATE 29/02/2024

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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E: studio@iteriad.com
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

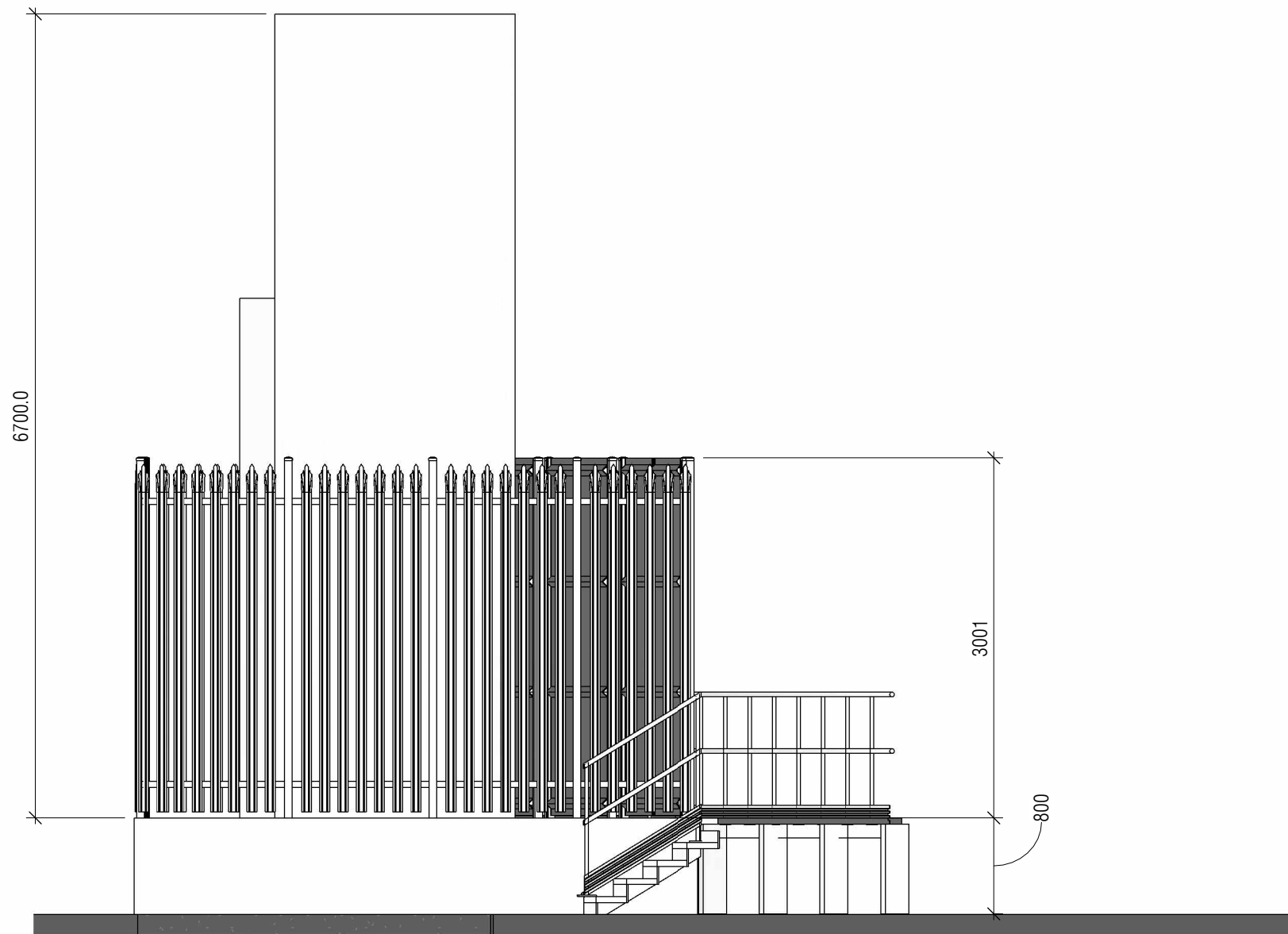
JUN '24

JOB/DRAWING NUMBER

MEC-ITE-XX-XX-D-L-900301

REVISION

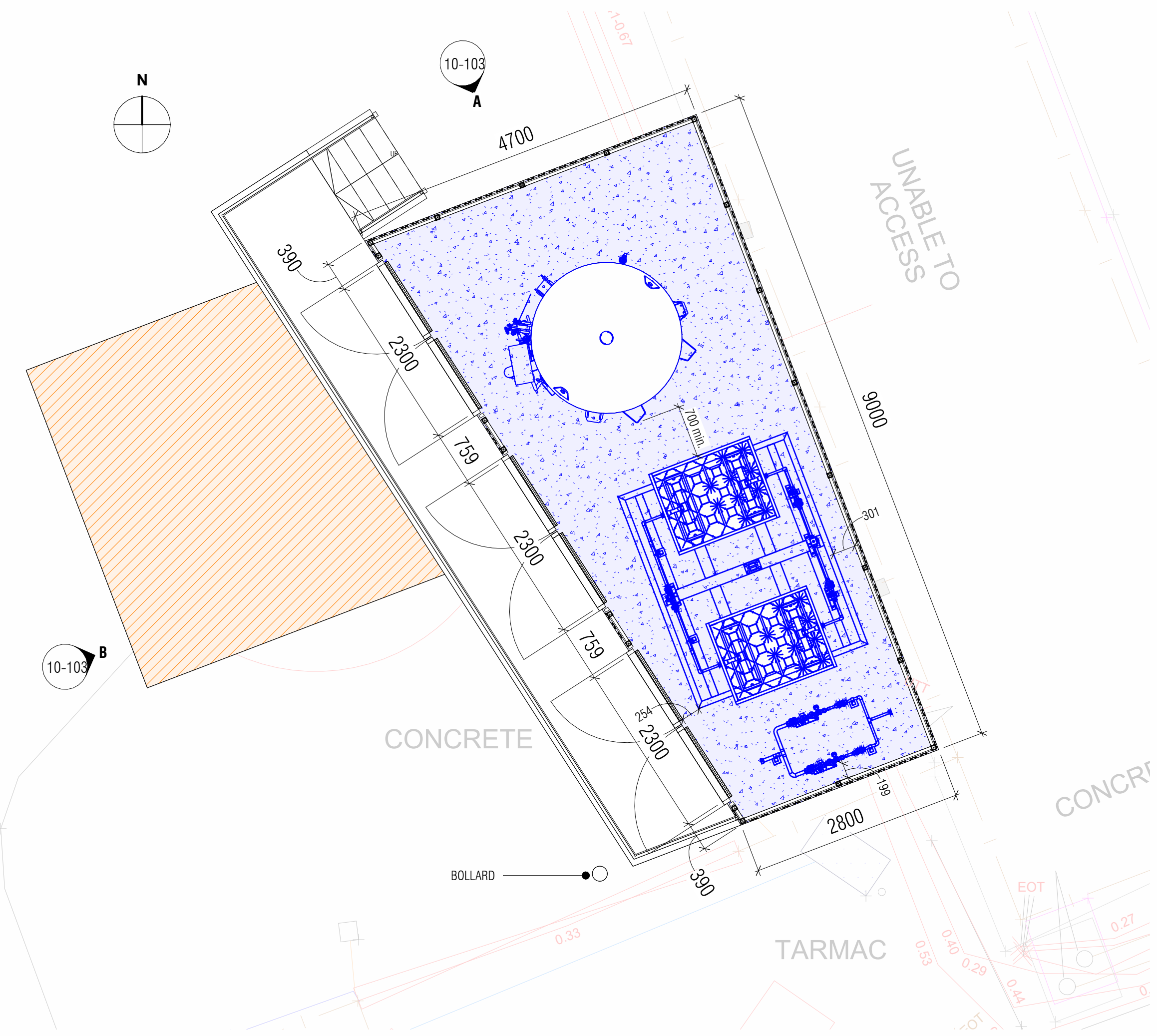
P04



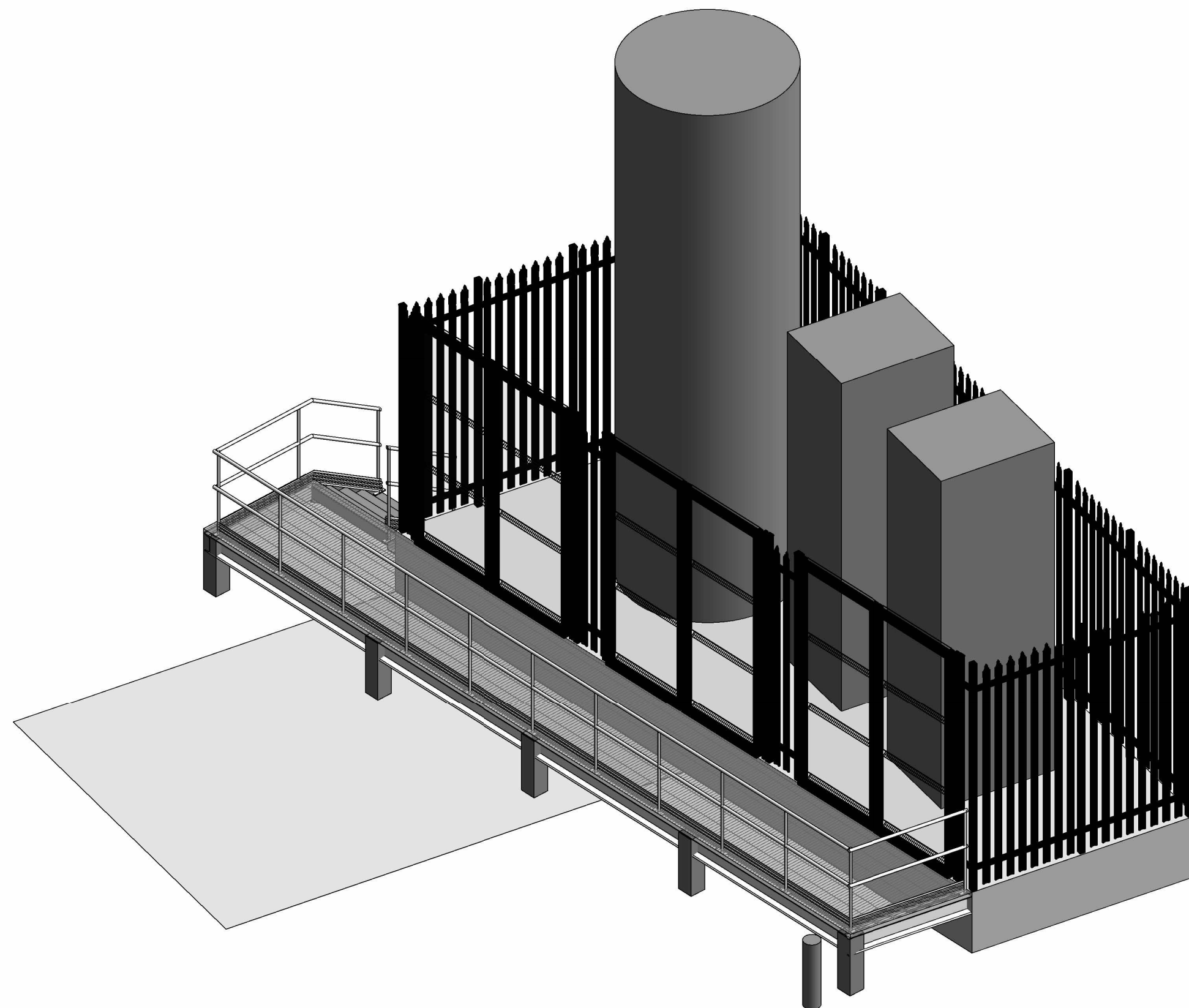
A NMR - Elevation B
1 : 50



B NMR - Elevation A
1 : 50



1 General Arrangement - NMR
1 : 50



2 NMR Axonometric

Wilson Mason Architecture and Interior Design

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Specification

Product - 3.0m Steel Palisade Fencing:

3.0m Palisade Post 100 x 55 RSJ,
2.95m Palisade Pale 2mm Thickness,
Palisade Back Rail 50 x 50 x 5 RSA, Fish Plate

(Support Steel Sizes Advised By Manufacturer,
To Be Confirmed By Structural Engineer)

Fixings - M12 Nut & Bolt, M8 Nut & Bolt
Material - Galvanised Steel
Colour - Mid Grey
Finish - Powder Coated

NOTE: ARRANGEMENT AND SPECIFICATION OF PLANT AND EQUIPMENT, SHOWN IN BLUE, TAKEN DIRECTLY FROM BOC DRAWINGS

NOTE: SLAB DETAIL TO BE CONFIRMED BY STRUCTURAL ENGINEER

NOTE: GAS VESSEL HEIGHT AS ADVISED BY PROJECT MANAGER 19/08/2025. CLIENT / BOC TO ADVISE IF DIFFERENT.

NOTE: ACCESS TBC ACCEPTABLE BY BOC / CLIENT

KEY

Indicates Rased slab +800mm above Ground Level

Indicates Sunken Slab Flush with Ground Level

P07	Slab raised by 800mm and Gully Added	26/11/25	JL	KC
P06	Removal of Liquid Provisors	18/08/25	JL	KC
P05	Upgrade to Temporary Gas Store	13/08/25	JL	KC
P04	PCSA Issue	13/06/25	AW	KC
P03	Stage 4 drawing Issue	16/11/24	HW	KC
P02	Block Allocation Due to Structural Concrete Thickening	16/10/24	OH	KC
P01	Issued For Planning	05/08/24	OH	KC
Rev	Description	date	drawn	checked

client: The University of Manchester

project: The University of Manchester North Campus Energy Centre

title: Temporary Gas Storage Plan and Elevations

project no: 7352	scale: 1 : 50	drawn by: @A1	checked by: OH	date: 09/23/24
drawing no: MEC-WMA-XX-ZZ-DR-A-10-103	Status: D2	Rev: P07		

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Appendix 04

Environment Agency correspondence

Kevin Tyldesley

From: Greater Manchester, Merseyside and Cheshire Enquiries
<inforequests.gmmc@environment-agency.gov.uk>
Sent: 15 September 2025 14:55
To: Kevin Tyldesley
Subject: Request for information - Ref: EIR2025/27144
Attachments: 8GU8RNHTF4Y9 Auto.pdf; MEC-WMA-XX-XX-DR-A-00-013_D2-P05-Temporary
NMR Gas Storage Site Plan.pdf

Dear Kevin Tyldesley,

I am writing in response to your request for information, received 28 August 2025 regarding Ref 250901/KAY04: UoM - North Campus Energy Centre / NMR - 11263.

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

We hold no record of flooding in this area.

However, this does not mean flooding has not occurred in the past or that it will not flood in future.

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

For Manchester Ship Canal 2D levels, please request a P56.

We recommend that you also contact United Utilities and Lead Local Flood Authority Manchester Council, who may hold additional information (the former especially in relation to sewer flooding).

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

For further surface information: [Surface water map - Check your long term flood risk - GOV.UK](#)

For further information on your property's flood risk, visit:

Check Your Long Term Flood Risk: [Check the long term flood risk for an area in England - GOV.UK](#)

Check for Flooding: [Check for flooding in England - GOV.UK](#)

Sign up for flood warnings: [Sign up for flood warnings - GOV.UK](#)

Flood Map for Planning: <https://flood-map-for-planning.service.gov.uk/>

For additional flood risk information, advice and support in your area, please visit: <https://thefloodhub.co.uk/>

For more information on how the rivers and sea dataset is used and its limitations, we recommend you visit [How to use rivers and sea data - Flood map for planning - GOV.UK](#)

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.

Yours sincerely,

Sarah Walters

GMMC Area Customers and Engagement Team

Your feedback is important to us - please visit [Environment Agency FOI Customer Satisfaction Survey](#)

Flood risk assessment data



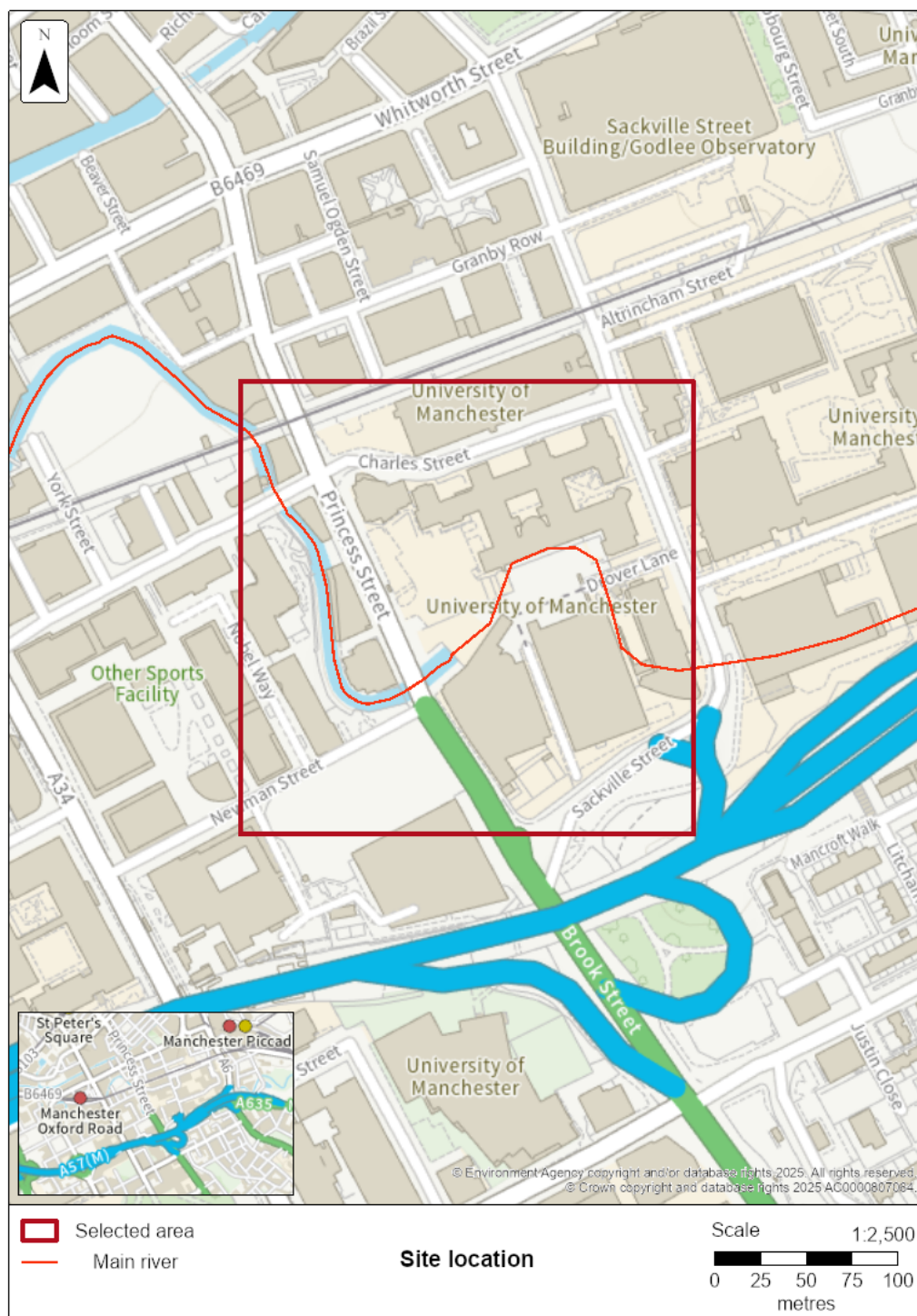
Location of site: 384430 / 397451 (shown as easting and northing coordinates)

Document created on: 3 September 2025

This information was previously known as a product 4.

Customer reference number: 8GU8RNHTF4Y9

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- past floods
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Information that's unavailable

This document **does not** contain:

- flood defences and attributes

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

Surface water and other sources of flooding

When using the surface water map on the [check your long term flood risk service](#) the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- [reservoir flood risk](#)
- groundwater flood risk - you could use the [British Geological Survey groundwater flooding data](#), [groundwater: current status and flood risk](#) and the guide on [mining and groundwater constraints for development](#) - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is Manchester District.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: Manchester Ship Canal 2018

Scenario(s): No defences exist fluvial, no defences exist climate change fluvial

Date: 1 May 2020

Model name: River Medlock 2011

Scenario(s): No defences exist fluvial, no defences exist climate change fluvial

Date: 22 December 2010

These models contain the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occurring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

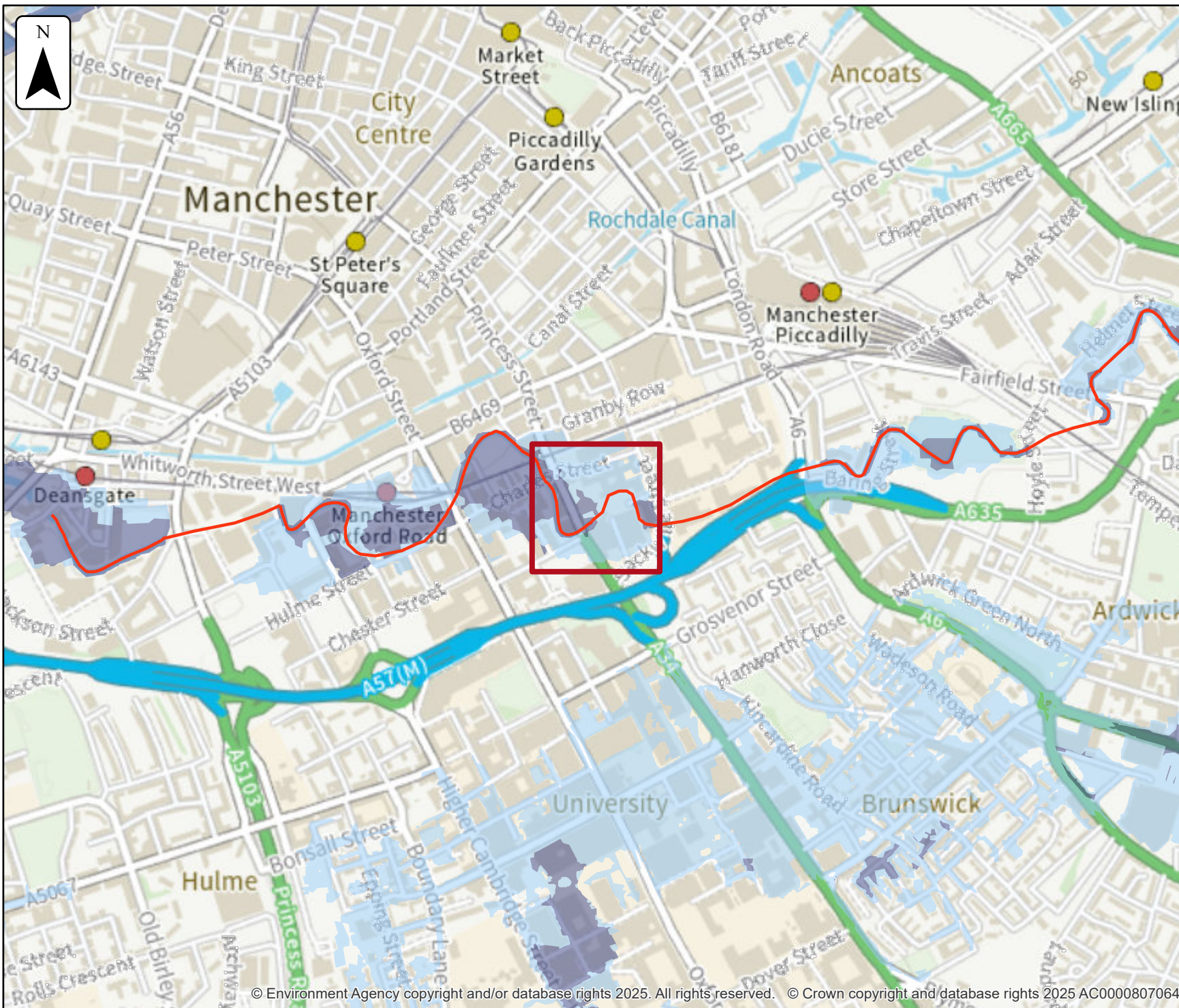
- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change



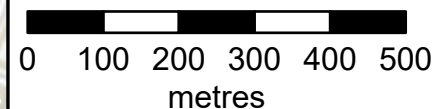
Flood map for planning

Location (easting/northing)
384430/397451

Scale
1:10,000

Created
3 Sep 2025

-  Selected area
-  Main river
-  Flood Zone 3
-  Flood Zone 2



Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

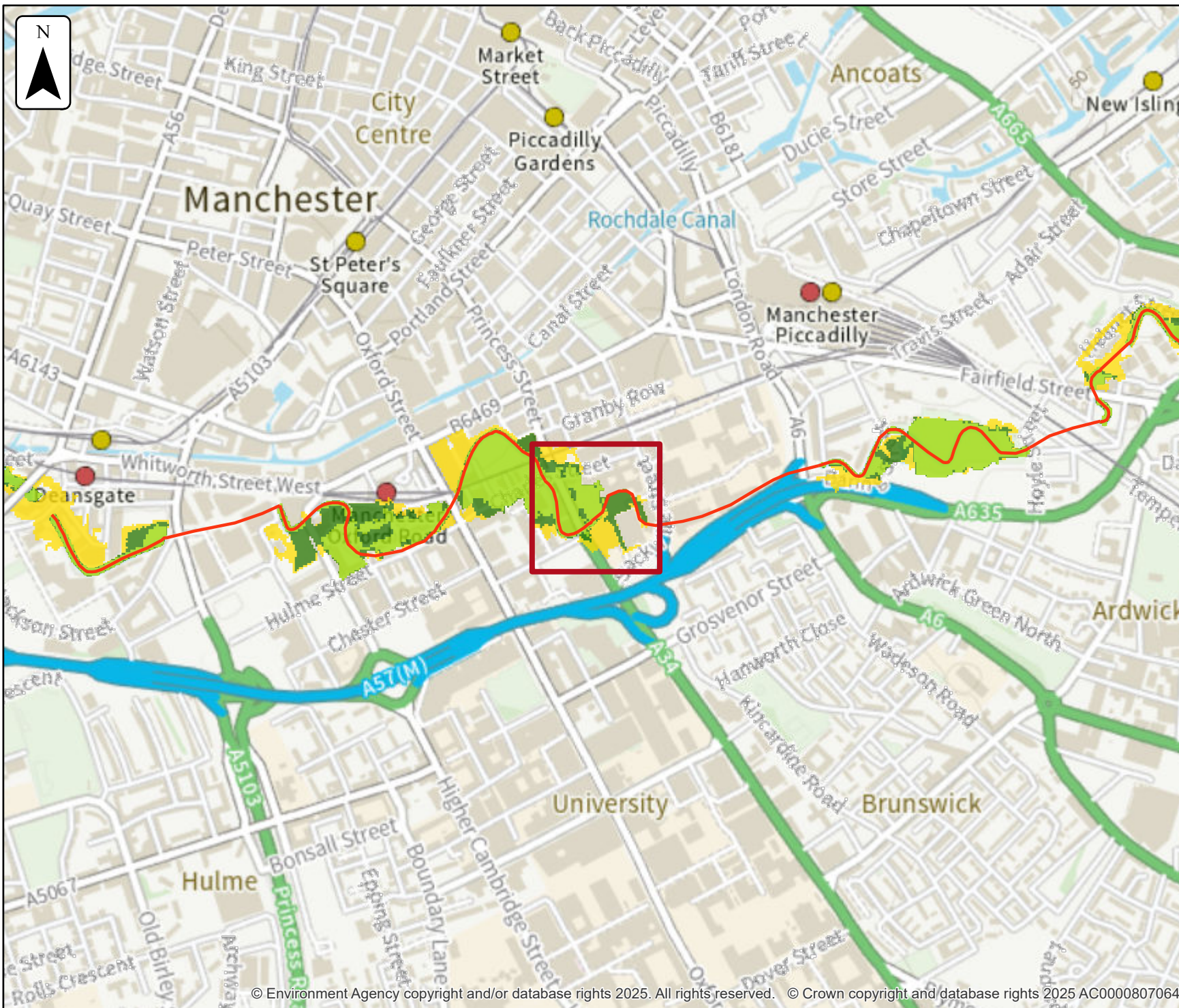
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- No defences exist climate change modelled fluvial: risk of flooding from rivers where there are no flood defences, including estimated impact of climate change



No defences exist climate change modelled fluvial extent

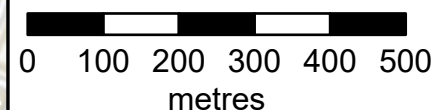
Location (easting/northing)
384430/397451

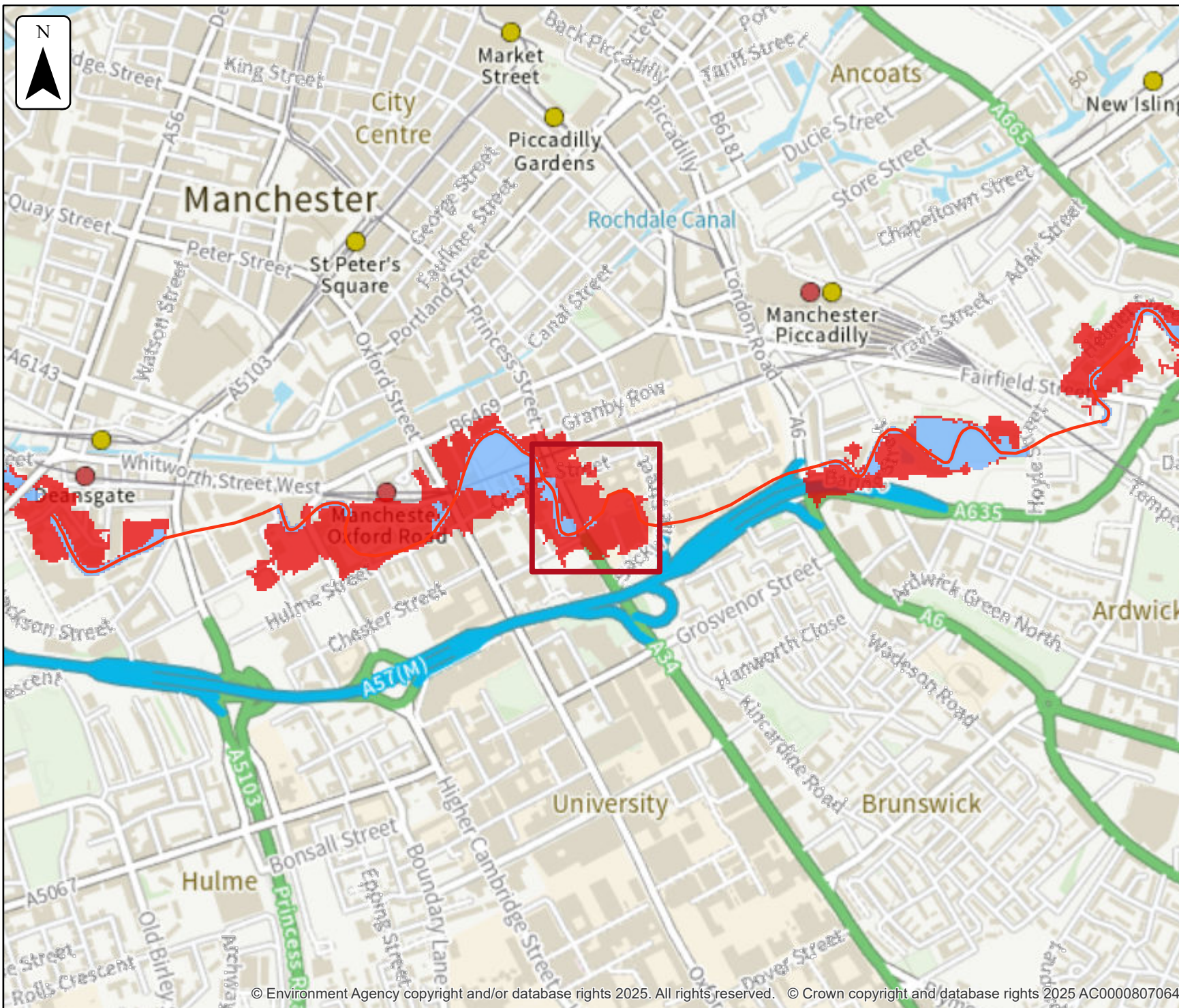
Scale Created
1:10,000 3 Sep 2025

Model name
River Medlock 2011

- Selected area
- Main river
- Modelled flood extent
 - 1% AEP (+20%)
 - 1% AEP (+35%)
 - 1% AEP (+70%)

Flood extents may not be visible where they overlap other return periods





**No defences exist
modelled fluvial extent**

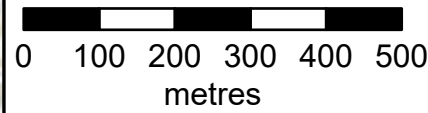
Location (easting/northing)
384430/397451

Scale Created
1:10,000 3 Sep 2025

Model name
River Medlock 2011

-  Selected area
-  Main river
- Modelled flood extent
 -  1% AEP
 -  0.1% AEP

Flood extents may not be
visible where they overlap
other return periods





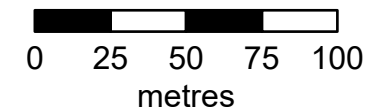
**No defences exist
climate change
modelled fluvial
node locations**

Location (easting/northing)
384430/397451

Scale Created
1:2,500 3 Sep 2025

Model name
River Medlock 2011

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

No defences exist climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)
				Level	Level	Level	Flow	Flow	Flow
1	1468049	384330	397506	31.99	32.62	34.08	63.24	63.54	87.12
2	1468180	384345	397487	32.33	32.77	33.33	62.58	63.04	63.08
3	1468063	384351	397471	32.34	32.77	33.34	65.0	65.66	66.07
4	1468098	384354	397456	32.34	32.77	33.26	65.95	66.62	67.07
5	1468096	384355	397440	32.35	32.77	33.27	65.98	66.67	67.12
6	1468191	384359	397415	32.39	32.80	33.29	65.06	65.78	66.20
7	1468020	384375	397398	32.41	32.82	33.29	65.35	66.12	66.56
8	1468018	384390	397401	32.42	32.84	33.30	66.26	67.08	67.55
9	1468054	384410	397414	33.23	33.54	33.77	66.26	67.08	67.55
10	1467995	384425	397428	33.19	33.45	33.63	67.05	74.44	87.52

Data in this table comes from the River Medlock 2011 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.



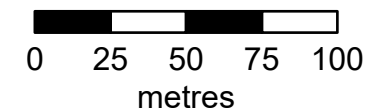
No defences exist modelled fluvial node locations

Location (easting/northing)
384430/397451

Scale Created
1:2,500 3 Sep 2025

Model name
River Medlock 2011

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

No defences exist

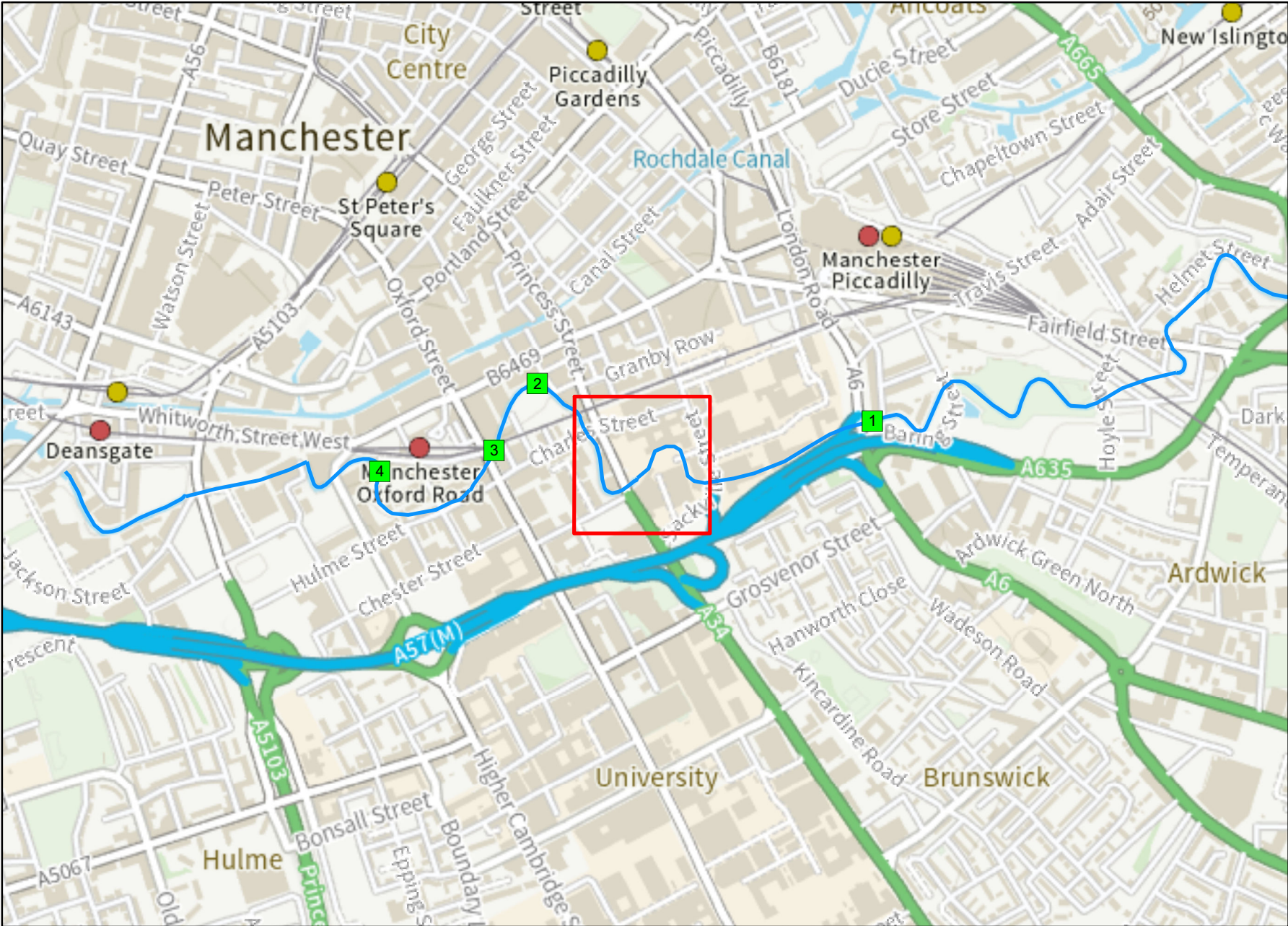
Label	Modelled location ID	Easting	Northing	4% AEP	1% AEP	0.1% AEP	4% AEP	1% AEP	0.1% AEP
				Level	Level	Level	Flow	Flow	Flow
1	1468049	384330	397506	30.52	31.29	33.55	50.87	59.40	64.42
2	1468180	384345	397487	30.64	31.49	33.83	50.86	59.87	63.97
3	1468063	384351	397471	30.67	31.52	33.73	50.85	59.97	66.80
4	1468098	384354	397456	30.70	31.54	33.79	50.84	59.99	67.76
5	1468096	384355	397440	30.72	31.55	33.76	50.83	60.01	67.92
6	1468191	384359	397415	30.77	31.59	33.83	50.81	59.98	67.10
7	1468020	384375	397398	30.81	31.62	33.83	50.79	59.90	67.54
8	1468018	384390	397401	30.84	31.64	33.84	50.77	60.17	68.61
9	1468054	384410	397414	31.09	32.07	34.07	50.77	60.17	68.61
10	1467995	384425	397428	31.11	32.09	33.91	50.76	60.20	96.25

Data in this table comes from the River Medlock 2011 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

**Detailed Flood Map Centred on Charles Street, Manchester, M1 7DQ.
Created 09/09/2025 [EIR2025/27144]**



1:10,001



Legend

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

				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_2094	384853	397536	Modelled Water Level (m aodN)	31.29	31.48	31.71	32.16	32.69	33.15	34.27	34.39	35.07	34.01	35.28	33.15	33.15	35.28
				Modelled Flow (cumecs)	29.69	34.66	40.95	47.57	52.25	56.19	71.50	74.03	95.36	67.25	113.28	56.19	56.19	113.28
2	ea013_0251_MEDL01_1240	384238	397602	Modelled Water Level (m aodN)	29.73	30.17	30.77	31.44	31.95	32.39	33.33	33.39	33.65	33.16	33.87	32.39	32.39	33.87
				Modelled Flow (cumecs)	30.74	35.89	42.39	49.27	54.10	58.19	74.10	76.73	95.45	69.63	118.74	58.19	58.19	118.74
3	ea013_0251_MEDL01_1079	384159	397473	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
4	ea013_0251_MEDL01_0749	383950	397437	Modelled Water Level (m aodN)	29.07	29.28	29.53	29.78	29.94	30.08	30.58	30.66	31.24	30.44	31.58	30.08	30.08	31.58
				Modelled Flow (cumecs)	31.53	36.82	43.49	50.55	55.50	59.70	76.05	78.75	99.10	71.42	121.21	59.70	59.70	121.21

Model data taken from Manchester Ship Canal 2018

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 ponded 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.



No defences exist modelled fluvial extent and height

Location (easting/northing)
384430/397451

Scale Created
1:2,500 3 Sep 2025

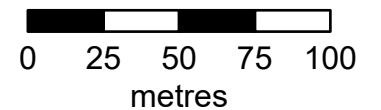
Model name
River Medlock 2011

-  Selected area
-  Main river

Modelled 2D grid
Water level in mAOD

-  0 - 4.375
-  4.375 - 8.75
-  8.75 - 13.125
-  13.125 - 17.5
-  17.5 - 21.875
-  21.875 - 26.25
-  26.25 - 30.625
-  30.625 - 35.0
-  35.0 - 39.375

This map shows the
0.1% AEP height data



Sample point data

No defences exist

Label	Easting	Northing	4% AEP	1% AEP	0.1% AEP	4% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Depth	Depth	Depth
1	384311	397331	NoData	NoData	NoData	NoData	NoData	NoData
2	384370	397331	NoData	NoData	NoData	NoData	NoData	NoData
3	384429	397331	NoData	NoData	NoData	NoData	NoData	NoData
4	384488	397331	NoData	NoData	NoData	NoData	NoData	NoData
5	384547	397331	NoData	NoData	NoData	NoData	NoData	NoData
6	384311	397390	NoData	NoData	NoData	NoData	NoData	NoData
7	384370	397390	NoData	NoData	33.84	NoData	NoData	0.92
8	384429	397390	NoData	NoData	33.86	NoData	NoData	0.32
9	384488	397390	NoData	NoData	33.92	NoData	NoData	0.20
10	384547	397390	NoData	NoData	NoData	NoData	NoData	NoData
11	384311	397449	NoData	NoData	33.84	NoData	NoData	2.00
12	384370	397449	NoData	NoData	33.84	NoData	NoData	1.66

Label	Easting	Northing	4% AEP	1% AEP	0.1% AEP	4% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Depth	Depth	Depth
13	384429	397449	NoData	NoData	33.92	NoData	NoData	1.39
14	384488	397449	NoData	NoData	33.92	NoData	NoData	0.52
15	384547	397449	NoData	NoData	NoData	NoData	NoData	NoData
16	384311	397508	NoData	NoData	33.97	NoData	NoData	2.45
17	384370	397508	NoData	NoData	33.88	NoData	NoData	1.15
18	384429	397508	NoData	NoData	NoData	NoData	NoData	NoData
19	384488	397508	NoData	NoData	NoData	NoData	NoData	NoData
20	384547	397508	NoData	NoData	NoData	NoData	NoData	NoData
21	384311	397567	NoData	NoData	33.83	NoData	NoData	2.99
22	384370	397567	NoData	NoData	33.86	NoData	NoData	1.03
23	384429	397567	NoData	NoData	NoData	NoData	NoData	NoData
24	384488	397567	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	4% AEP	1% AEP	0.1% AEP	4% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Depth	Depth	Depth
25	384547	397567	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			31.11	32.09	34.33	5.44	6.41	7.64

Data in this table comes from the River Medlock 2011 model. Height values are shown in mAOD, and depth values are shown in metres.

Any blank cells show where a particular scenario has not been modelled for this location.

Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



**No defences exist
climate change
modelled fluvial
extent and height**

Location (easting/northing)
384430/397451

Scale Created
1:2,500 3 Sep 2025

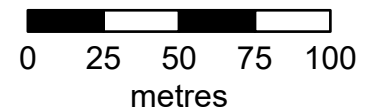
Model name
River Medlock 2011

-  Selected area
-  Main river

Modelled 2D grid
Water level in mAOD

-  0 - 4.375
-  4.375 - 8.75
-  8.75 - 13.125
-  13.125 - 17.5
-  17.5 - 21.875
-  21.875 - 26.25
-  26.25 - 30.625
-  30.625 - 35.0
-  35.0 - 39.375

This map shows the
1% AEP +70% height data



Sample point data

No defences exist climate change

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)
			Height	Height	Height	Depth	Depth	Depth
1	384311	397331	NoData	NoData	NoData	NoData	NoData	NoData
2	384370	397331	NoData	NoData	NoData	NoData	NoData	NoData
3	384429	397331	NoData	NoData	NoData	NoData	NoData	NoData
4	384488	397331	NoData	NoData	NoData	NoData	NoData	NoData
5	384547	397331	NoData	NoData	NoData	NoData	NoData	NoData
6	384311	397390	NoData	NoData	NoData	NoData	NoData	NoData
7	384370	397390	NoData	NoData	33.29	NoData	NoData	0.41
8	384429	397390	NoData	NoData	33.54	NoData	NoData	0.02
9	384488	397390	NoData	NoData	NoData	NoData	NoData	NoData
10	384547	397390	NoData	NoData	NoData	NoData	NoData	NoData
11	384311	397449	32.21	32.75	33.28	0.36	0.92	1.45
12	384370	397449	32.51	32.93	33.46	0.33	0.73	1.27

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)
			Height	Height	Height	Depth	Depth	Depth
13	384429	397449	33.20	33.45	33.63	0.67	0.90	1.07
14	384488	397449	NoData	33.46	33.64	NoData	0.10	0.28
15	384547	397449	NoData	NoData	NoData	NoData	NoData	NoData
16	384311	397508	32.07	32.78	33.37	0.56	1.41	2.01
17	384370	397508	32.85	33.04	33.45	0.12	0.15	0.54
18	384429	397508	NoData	NoData	NoData	NoData	NoData	NoData
19	384488	397508	NoData	NoData	NoData	NoData	NoData	NoData
20	384547	397508	NoData	NoData	NoData	NoData	NoData	NoData
21	384311	397567	NoData	32.62	33.24	NoData	1.78	2.40
22	384370	397567	NoData	NoData	33.40	NoData	NoData	0.46
23	384429	397567	NoData	NoData	NoData	NoData	NoData	NoData
24	384488	397567	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+20%)	1% AEP (+35%)	1% AEP (+70%)
			Height	Height	Height	Depth	Depth	Depth
25	384547	397567	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			33.22	33.54	34.32	6.55	7.87	8.66

Data in this table comes from the River Medlock 2011 model. Height values are shown in mAOD, and depth values are shown in metres.

Any blank cells show where a particular scenario has not been modelled for this location.

Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is Manchester District.

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

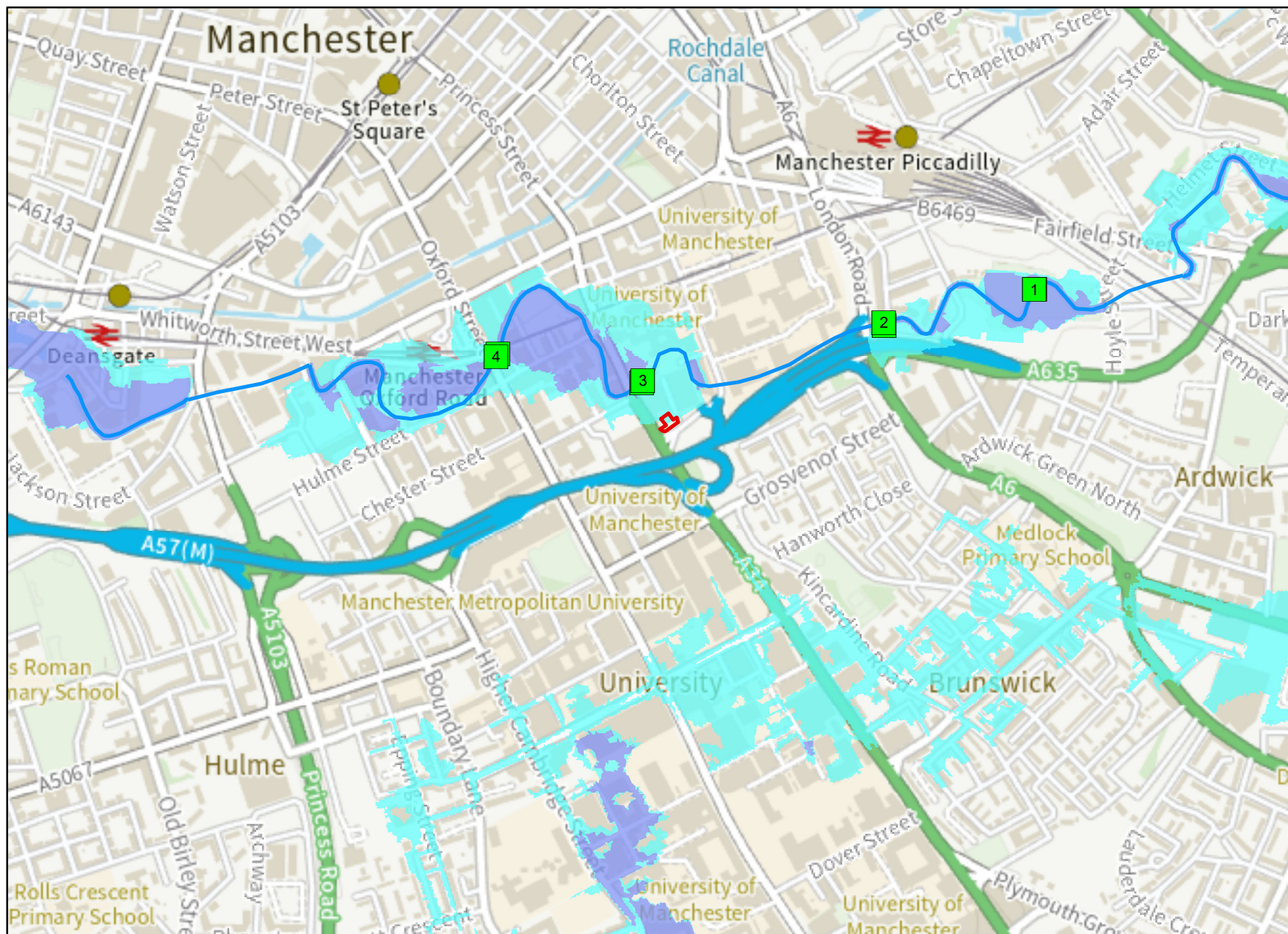
[Find out more about flood risk activity permits](#)

Help and advice

Contact the Greater Manchester Merseyside and Cheshire Environment Agency team at inforequests.gmmc@environment-agency.gov.uk for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for

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	34.05	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: UoM - North Campus Energy Centre / NMR - 11263

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>
Sent: 02 September 2025 14:17
To: Kevin Tyldesley <Kevin.Tyldesley@wmlconsulting.com>
Subject: RE: UoM - North Campus Energy Centre / NMR - 11263

Good Afternoon Kevin,

Thank you very much for your enquiry, I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

If I can be of any further assistance please don't hesitate to contact me.

Regards,



Daniel McDermott
Customer Area Manager WW
Developer Services & Metering
Customer Services
M: 07795046445
unitedutilities.com

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

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]
Sent: 28/08/2025 13:07
To: kevin.tyldesley@wmlconsulting.com
Subject: RE: UoM - North Campus Energy Centre / NMR - 11263

Good Afternoon

Your enquiry has been logged and sent to our engineer Gulshan and his contact number is 01925 429092. Our service Level agreement is to respond to you within 5 working days.

Many thanks



Laura Owens
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 0345 026 8989 option 4
unitedutilities.com

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



Visit: <https://unitedutilities.thewowawards.co.uk/nominate>

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

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

Sent: 28/08/2025 12:43

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: UoM - North Campus Energy Centre / NMR - 11263

Hi,

We have been asked to provide a Flood Risk Assessment for a proposed development of the site shown on the attached plan.

Please can you confirm if you are aware of any flood risk issues that may affect the site.

Any queries, let me know.

Kind regards.

Kevin Tyldesley

WML Consulting Ltd

Civil, Structural & Geotechnical Engineers

Third Floor South | Metropolitan House | Station Road | Cheadle Hulme | Cheshire | SK8 7AZ

Tel: 0161 482 0600 | email: kevin.tyldesley@wmlconsulting.com | web: 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

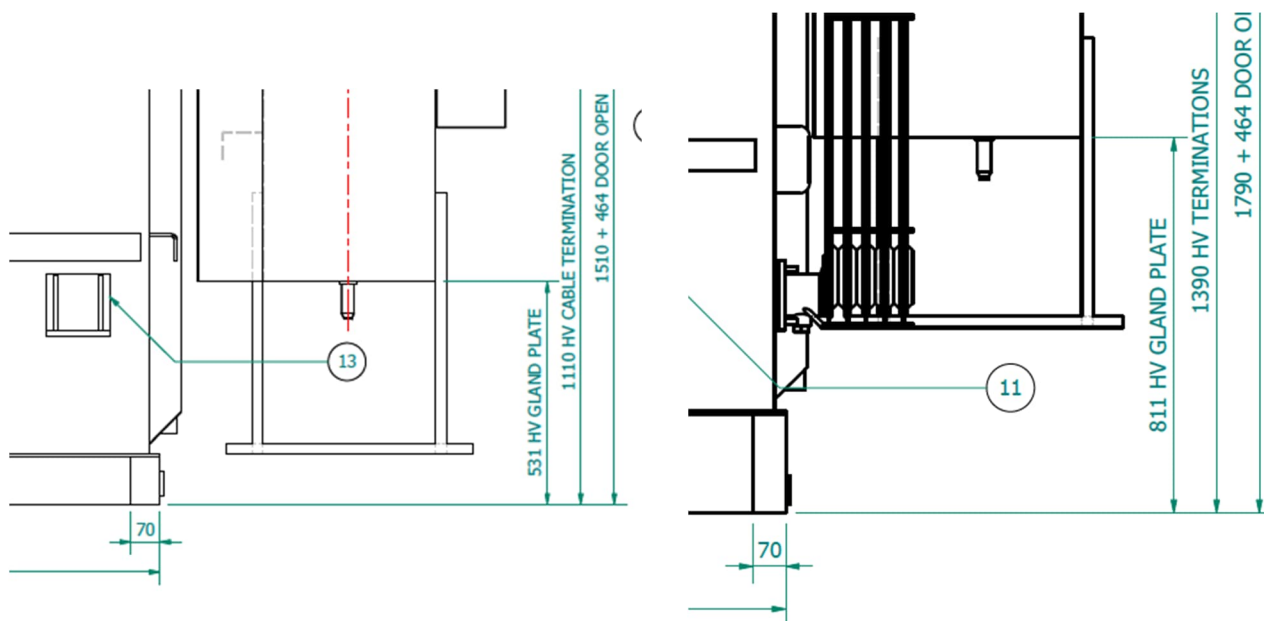
Subject: RE: UoM | Energy Centre - 11263

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



From: Kevin Tyldesley <Kevin.Tyldesley@wmlconsulting.com>
Sent: Monday, September 23, 2024 4:06 PM
To: Rak, Steven <Steven.Rak@enwl.co.uk>
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

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>
Sent: 29 August 2024 16:27
To: Gkikopouli, Antriana <ANTRIANA.GKIKOPOULI@tetrattech.com>
Cc: Machin, ian <IAN.MACHIN@tetrattech.com>; James, Mike <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



From: Gkikopouli, Antriana <ANTRIANA.GKIKOPOULI@tetrattech.com>
Sent: Thursday, August 29, 2024 3:23 PM
To: Rak, Steven <Steven.Rak@enwl.co.uk>
Cc: Machin, ian <IAN.MACHIN@tetrattech.com>; James, Mike <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

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From: Gkikopouli, Antriana
Sent: Friday, August 9, 2024 7:41 AM
To: Rak, Steven <Steven.Rak@enwl.co.uk>
Cc: Machin, ian <IAN.MACHIN@tetrattech.com>; James, Mike <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

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