

WARWICK MILL, MIDDLETON

Flood Risk Assessment



RCEF 79519
Warwick Mill FRA
3
November 2023

REPORT

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1	Draft	T. Jones	J. Morley	J. Morley	11.07.2023
2	Draft (Incorporating Local Authority response and SFRA maps)	T. Jones	J. Morley	-	18.07.2023
3	Updates to Modelling and Drainage Inputs	J. Grady	R. Abbott	R. Abbott	29.11.2023

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1 INTRODUCTION

- 1.1 RPS was commissioned to prepare a Flood Risk Assessment (FRA) in relation to the proposed development of residential apartments and commercial units with associated infrastructure at Warwick Mill, Oldham Road, Middleton, M24 1AZ ("the site").
- 1.2 The aim of the FRA is to outline the potential for the site to be impacted by flooding and the impacts of the proposed development on flooding in the vicinity of the site. This FRA references publicly available EA data. RPS have produced a refined flood model for the site.
- 1.3 The report has been produced in accordance with the guidance detailed in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). Reference has also been made to the CIRIA SuDS manual (C753), the Greater Manchester Council Strategic Flood Risk Assessment (SFRA), the Rochdale SFRA and the Greater Manchester Surface Water Management Plan (SWMP).
- 1.4 This report has been produced in consultation with the Environment Agency (EA) and the Lead Local Flood Authority (LLFA). The site is not located within an Internal Drainage Board (IDB) District.
- 1.5 This report is not intended to provide formal details of the final drainage design for the development. However, it provides information regarding the capabilities of the conceptual surface water drainage strategy to meet the requirements of the NPPF.
- 1.6 The desk study was undertaken by reference to information provided / published by the following bodies:
- EA;
 - Centre for Ecology and Hydrology;
 - British Geological Survey (BGS);
 - Multi-Agency Geographic Information Centre (MAGIC);
 - Ordnance Survey (OS); and
 - United Utilities (UU).

2 PLANNING POLICY CONTEXT

National Planning Policy

- 2.1 The National Planning Policy Framework (NPPF) was released in March 2012 and was updated in September 2023. The document advises of the requirements for a site-specific Flood Risk Assessment (FRA) for any of the following cases (Planning and Flood Risk paragraph 167 (footnote 55)):
- All proposals (including minor development and change of use) located within the EA designated floodplain, recognised as either Flood Zone 2 (medium probability) or Flood Zone 3 (high probability);
 - All proposals of 1 hectare (ha) or greater in an area located in Flood Zone 1 (low probability);
 - All proposals within an area which has critical drainage problems (as notified to the Local Planning Authority by the EA);
 - Land identified in a strategic flood risk assessment as being at increased flood risk in future; and
 - Where proposed development may be subject to other sources of flooding, where its development would introduce a more vulnerable use.
- 2.2 Paragraph 169 of the updated NPPF identifies that major developments (developments of 10 homes or more and major commercial development) should incorporate Sustainable Drainage Systems unless there is clear evidence that this would be inappropriate. The systems used should:
- a. Take account of advice from the Lead Local Flood Authority;*
 - b. Have appropriate proposed minimum operational standards;*
 - c. Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and*
 - d. Where possible, provide multifunctional benefits.*
- 2.3 Defra published their 'Non-statutory technical standards for sustainable drainage systems' in March 2015. These are supported by the revised NPPF.

Regional Planning Policy

- 2.4 The development site is within the Greater Manchester Borough of Rochdale which is covered by the Places For Everyone Joint Development Plan, published in August 2021. The Places For Everyone Joint Development Plan contains various policies pertaining to flood risk and drainage. The main relevant policy is JP-S 5, which is reproduced below:

Policy JP-S 5

Flood Risk and the Water Environment

An integrated catchment based approach will be taken to protect the quantity and quality of water bodies and managing flood risk, by:

- 1. Returning rivers to a more natural state, where practicable, in line with the North West River Basin Management Plan;*
- 2. Working with natural processes and adopting a natural flood management approach to slow the speed of water drainage and intercept water pollutants;*
- 3. Locating and designing development so as to minimise the impacts of current and future flood risk, including retrofitting or relocating existing developments, infrastructure and places to increase resilience to flooding;*

4. *Expecting developments to manage surface water runoff through sustainable drainage systems and as close to source as possible (unless demonstrably inappropriate) so as to not exceed greenfield run-off rates or alternative rates specified in district local plans, such as those identified for areas with critical drainage issues.*

5. *Ensuring that sustainable drainage systems:*

- i. Are designed to provide multifunctional benefits wherever possible, including for water quality, nature conservation and recreation;*
- ii. Avoid adverse impacts on water quality and any possibility of discharging hazardous substances to ground;*
- iii. Are delivered in a holistic and integrated manner, including on larger sites split into different phases; and*
- iv. Are managed and maintained appropriately to ensure their proper functioning over the lifetime of the development.*

6. *Securing the remediation of contaminated land and the careful design of developments to minimise the potential for urban diffuse pollution to affect the water environment;*

7. *Securing further investment in wastewater treatment to reduce the frequency of intermittent discharges of storm sewage; and*

8. *Conserving water and maximising water efficiency in new development.*

Local Planning Policy

2.5 The Rochdale Core Strategy contains the following Policies relating to flood risk and drainage:

G1 - Tackling and adapting to climate change

We will address climate change and ensure growth does not increase CO2 emissions by:

- Locating growth in areas which are likely to minimise the need for travel and which are well served by public transport, services and infrastructure;*
- Expecting all development and regeneration schemes to be well connected to surrounding areas and facilities by sustainable means of transport (Policy T2);*
- Encouraging and promoting renewable energy developments, including standalone and community developments, that do not, by virtue of their scale, siting, construction or operation, cause harm to the local area, its character and environmental assets and adjoining uses, which cannot be satisfactorily mitigated (Policy G3);*
- Promoting the efficient re-use of buildings, especially those of heritage value, and the recycling of construction waste;*
- Ensuring that development does not cause unacceptable harm to the borough's peatlands and woodlands, and encouraging their restoration and responsible management;*
- Promoting sustainable waste management through the operation of policies in the Core Strategy and Greater Manchester Joint Waste Plan;*
- Making the best use of open space to contribute to climate change mitigation and adaptation; and*
- Securing planning obligations for energy infrastructure and climate change adaptation measures.*

New developments will be expected to:

- a. Be zero carbon in line with national targets and definitions;
- b. Adhere to the 'energy hierarchy' as outlined in policy G2, being designed in such a way that ensures that buildings require the minimum amount of energy to function over their lifetime;
- c. Reduce CO2 emissions through the use of renewable and low carbon decentralised energy technologies and networks. This will be through both on-site provision in new developments and through connection to local networks;
- d. Address the impacts of climate change by incorporating comprehensive adaptation measures, including:
 - i. suitable measures, such as urban greening, for tackling the 'urban heat island' effect;
 - ii. where possible, the opening up of covered and culverted sections of waterways and provision of new water features, to help cooling and provide biodiversity, landscape and flood prevention benefits;
 - iii. the incorporation of appropriate water conservation and management measures, such as Sustainable Drainage Systems (SuDS), including ensuring that the rate of run-off on 'greenfield' sites is not increased and on 'brownfield' sites is significantly reduced, and avoiding the use of impermeable surfaces;
 - iv. the retention of existing trees wherever possible and the taking of all appropriate opportunities to plant trees and other suitable vegetation on site; and
 - v. the incorporation of 'green roofs' wherever possible, such as with flat roofs.

G8 - Managing water resources and flood risk

We will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

- a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;
- b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;
- c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;
- d. Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';
- e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;
- f. The avoidance of culverting, and support the opening up of existing culverts wherever

g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;

h. Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater or the derogation of the quantity of groundwater;

i. The incorporation of measures to improve water quality; and

j. The taking of opportunities to improve the habitat value of watercourses and water bodies.

In addition, we will identify additional flood storage areas which will be protected from development.

- 2.6 The Greater Manchester Level 1 and Level 2 SFRAs (Strategic Flood Risk Assessment) and the Rochdale Level 1 and Level 2 SFRAs identify and map flood risk from all sources at a council and borough wide scale as well as providing guidance on producing site specific FRAs. Relevant information from the SFRAs has been referenced throughout this FRA report.
- 2.7 The SWMP assesses the risk of surface water flooding within Greater Manchester and identifies options to manage risk to acceptable level. Relevant information from the SWMP has been reproduced throughout this FRA report.

3 CONSULTATION

Environment Agency

- 3.1 An information request was submitted to the EA on 20th August 2021. A response was received on 1st September 2021. The EA provided a model for the Wince Brook (2017) including model files, results and reporting. RPS have updated the model to incorporate site-specific details i.e. topographic survey data and most recent climate change data. Results of the updated model are discussed in Sections 6 and 9 below.
- 3.2 Details of historic flooding and flood defences within the vicinity of the site were also provided by EA including the 'Flood Map for Planning'. Relevant data has been referenced within this report.
- 3.3 A Preliminary Opinion Request was submitted to the EA on 20th August 2021. A response was received 3rd September 2021. The full response is included as **Appendix A**.
- 3.4 Additional correspondence from the EA was received on 19th September 2023, in response to the submission of the planning application ref:23/00795/FUL. The response is provided in full in **Appendix A**, and is summarised below:
- The EA object to the application on the grounds that the FRA fails to:
 - Consider how people will be kept safe from the identified flood hazards;
 - Consider how a range of flooding events (including extreme events) will affect people and property;
 - Consider the requirement for flood emergency planning including flood warning and evacuation of people for a range of flooding events up to and including the extreme event;
 - Take the impacts of climate change into account in relation to the risks from Wince Brook.
 - The FRA refers to the development being classed as 'less vulnerable' as residential uses are at upper levels. The vulnerability of a development should be based on the highest vulnerability within it for the purposes of assessing it against the sequential and exception tests of NPPF.
 - It is unclear how close the proposed Loom building would be to the bank top of the Wince Brook. The permanent retention of a continuous unobstructed area is an essential requirement for future maintenance and/or improvement works together with access through the site to the bank top.
- 3.5 The above points of objection will be addressed throughout this report.

United Utilities

- 3.6 The public sewer network within the vicinity of the site is operated by United Utilities. Asset Plans have been obtained for the sewers in the vicinity, this is included in **Appendix B**. In addition, RPS has undertaken a utilities survey at the site, the report is included in **Appendix C**.
- 3.7 United Utilities provided comments in regard to the development proposals. The response is included as Appendix D and the key points are summarised below:
- The drainage scheme must include:
 - An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water in accordance with BRE365;
 - A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations);

- Levels of the proposed drainage systems including proposed ground and finished floor levels in AOD;
- Incorporate mitigation measures to manage the risk of sewer surcharge where applicable; and
- Foul and surface water shall drain on separate systems.

3.8 The above comments will be addressed within the Conceptual Drainage Strategy and accompanying calculations outlined in Section 10 of the report.

Local Planning Authority

3.9 The site is within the administrative boundary of Rochdale Council. We have requested any details that the council hold regarding flood risk at the site. A response was provided on the 13th July 2023 and is included in full in **Appendix D**. The main information provided as part of the response is summarised below:

- Site is located partially within Flood Zone 3;
- United Utilities data held indicates there is a 450mm diameter combined sewer and 225m diameter surface water sewer in Oldham Road; and,
- Council holds no historic records of flooding at the site.

3.10 A response was received from the Network Improvement/ Development/Flooding Team at Rochdale Council on 26th August 2023. The response requests the production of a Drainage Strategy which illustrates that roof drainage will be connected to a watercourse rather than the combined sewer and demonstrate a reduction in discharge of surface water from the site. The above comments will be addressed within the Conceptual Drainage Strategy and accompanying calculations outlined in Section 10 of the report.

Internal Drainage Board

3.11 The site is not located within an IDB District.

4 SITE DESCRIPTION

Site Description

- 4.1 The site is located at National Grid Reference SD 87111 05677 and occupies an area of approximately 1.2 hectares (ha). The site location is presented in Figure 1.

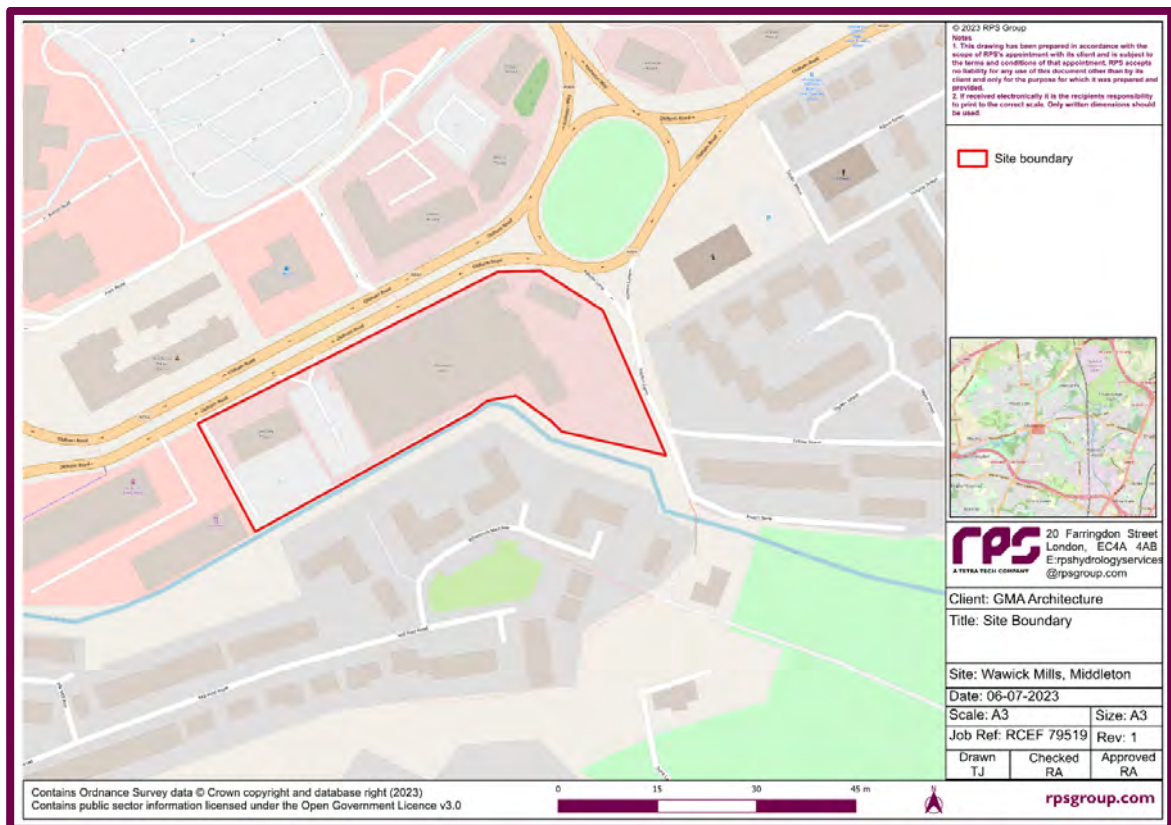


Figure 1. Site Location

- 4.2 The site is occupied by the disused Warwick Mill a Grade II listed building. The building covers the majority of the site, with a smaller associated building in the north east. London House, a disused office building is situated in the west of the site. Most of the site comprises hardstanding either as buildings, or associated hardstanding surrounding the buildings for car parking. The hardstanding occupies approximately 85% of the site.
- 4.3 Small areas of shrubbery and grass are noted in the west between London House and Warwick Mill and running along the southern boundary adjacent to the brook.
- 4.4 Vehicular and pedestrian access to site is provided via Oldham Road running along the northern boundary to the site, with an access road connecting onto Oldham Road.

Surrounding Land Uses

- 4.5 The site is located adjacent to Oldham Road and is bound at the south by Wince Brook. To the north of the site is a region of commercial buildings. This includes a large supermarket and associated car park, Middleton Shopping Centre to the northeast, the Middleton Arena sport complex and a considerable number of smaller office type building. To the south is an extended region of suburban residential buildings, comprising mostly of semi-detached houses and a small number of terrace block houses located at the norther edge. An industrial complex is located to the west of the site beyond which is a large area of woodland and open pasture comprising Alkington Woods Nature

Reserve. In the general eastern direction from there is a section of terrace housing, several commercial building and some area of open green pasture.

- 4.6 There are no designated sensitive areas (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA) or Site of Special Scientific Interest (SSSI)) within close proximity to the site. The only area designated as a SAC or SSSI is Rochdale Canal, which at its closest is approximately 1.8 km from the site to the east.

Topography

- 4.7 A topographic survey was completed by RPS in 2022 (ref: UAQ3603_A). The topographic survey indicated that the site slopes in a south westerly direction towards the brook adjacent to the southern boundary. At the northwest entrance of the site elevations are 79.18m AOD, with elevations sloping to 76.61m AOD in the southwest. In the northeast, elevations are 83.92m AOD, similarly sloping towards lower elevations in the south. There is a maximum elevation difference of approximately 7m. There are no major topographic depressions on the site.
- 4.8 The existing building entrances are raised above adjacent ground levels.
- 4.9 The topographic survey is in **Appendix E**.

5 PROPOSED DEVELOPMENT

- 5.1 The application is for the change of use of the existing listed Warwick Mill in the east of the site along with demolition of London House in the western area of the site and construction of a new building, referred to as 'The Loom'.
- 5.2 The 'Warwick Mill' building will involve the refurbishment and conversion of the disused building for the proposed commercial use on the ground level and residential use above. As such there is anticipated to be no additional hardstanding as a result of this.
- 5.3 The 'Loom building' will see the removal of the existing building, which has a total area of 0.04ha. This will be replaced by a new building comprising approximately 0.18ha. The additional built footprint will occupy an area which is already hardstanding in the form of tarmacked car parking. Development proposals for 'The Loom' have been informed by flood risk mitigation principles. This includes maintaining existing ground levels and constructing the parking area on structural columns to ensure flood water can continue to flow as per current arrangements. Further discussion is included within Section 9.
- 5.4 The current development plans are shown in **Appendix F**.
- 5.5 Vehicular and pedestrian access to site is provided via Oldham Road running along the northern boundary to the site, with an access road connect onto Oldham Road. Additional access is proposed as part of the development via Ashton Lane to the east.
- 5.6 The development comprises commercial uses which are classified as 'less vulnerable' and residential uses which are classified as 'more vulnerable' within the PPG. Note, the residential areas have been sequentially located above the ground floor, to ensure they are located above the flood levels at the site. Therefore, they are not considered to be at risk of flooding.
- 5.7 The potential to provide surface water attenuation, including the use of Sustainable Drainage Systems (SuDS), has been considered as part of the preliminary design process (see Section 10 – Surface Water Management).

6 HYDROLOGICAL SETTING

Nearby Watercourses

- 6.1 OS Mapping indicates that the nearest surface water feature is Wince Brook which flows in a westerly direction along the southern boundary of the site.
- 6.2 Wince Brook is a tributary to the River Irk the confluence being located 300m west downstream of the site. The River Irk flows east to west approximately 100 m north of the site and has an extended box culvert (approximately 500m long) which runs under Middleton shopping centre and the Tesco supermarket.
- 6.3 No significant artificial watercourses or features (for example canals and reservoirs) have been identified within 1km of the site.

Fluvial / Tidal Flood Risk Classification

- 6.4 The EA Flood Map for Planning, which is available online, provides flood zones for the different levels of risk. These are the following:
- Flood Zone 1; area which has a less than 1 in 1000-year chance of flooding (less than 0.1% AEP);
 - Flood Zone 2; area which has between a 1 in 100-year (1% AEP) and 1 in 1000-year chance of flooding (0.1% AEP); and,
 - Flood Zone 3; area which has a greater than 1 in 100-year chance of flooding (greater than 1% AEP).
- 6.5 The Flood Map for planning indicates that the majority of the site is located within Flood Zone 1. Some smaller areas of the Warwick Mill site are located within Flood Zone 2 and large areas of The Loom site is located within Flood Zone 3 and 2. The EA Flood Map for Planning is provided in Figure 2.

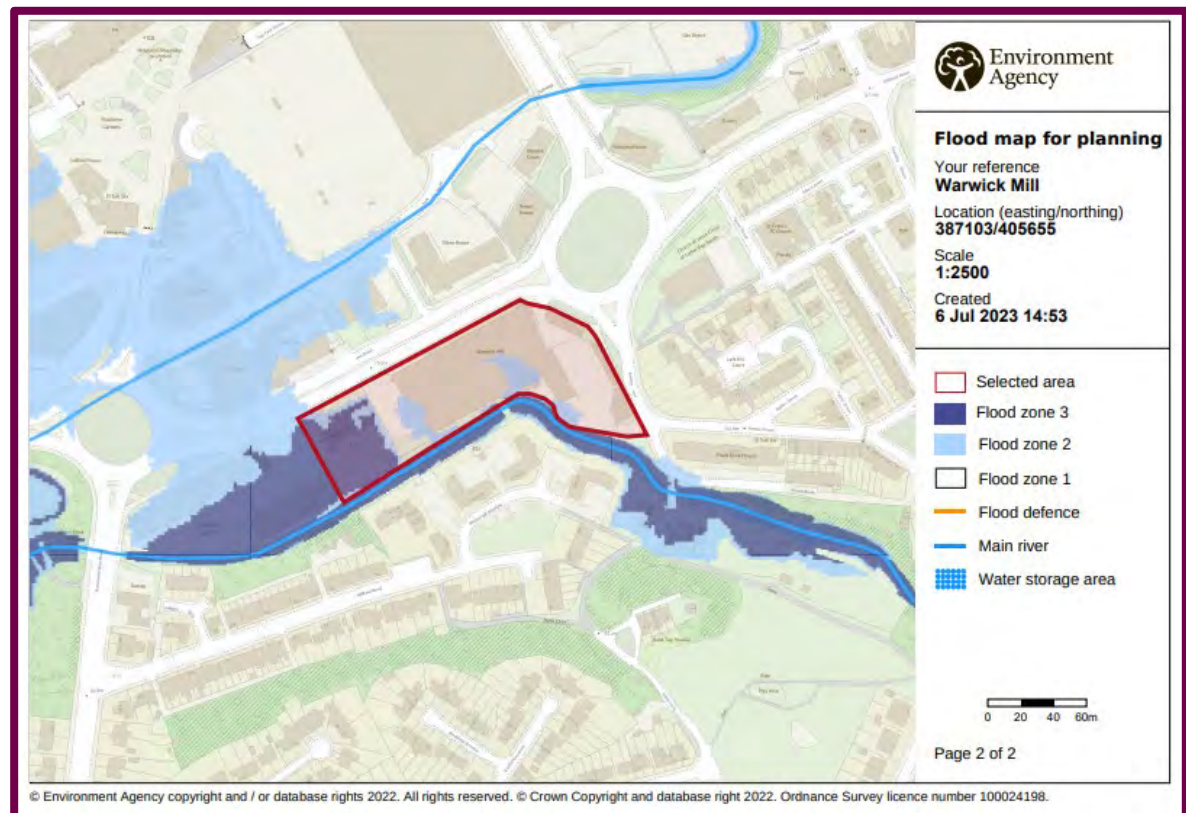


Figure 2. EA Flood Map for Planning

Hydraulic Modelling

- 6.6 The Environment Agency provided the most up to date modelling of the Wince Brook which was produced in 2017. This is a hydraulic modelling and mapping study covering the Wince Brook which flows between Chadderton and Middleton. The model is a 1D-2D linked FMP-TUFLOW model.
- 6.7 The 2017 Wince Brook model results were used to produce the EA Flood Zones. The fluvial extents from the 2017 model (2-year, 5-year, 10-year, 20-year, 25-year, 30-year, 50-year, 75-year, 100-year, 200-year, 1000-year and 1000-year plus 30% climate change) are shown in Figure 1. The extents show that the 10-year event is the first to come out of bank near to the site, the 50-year is the first event to affect the site along the southwestern edge. The 75-year is the first event to impact the London House, the existing building.

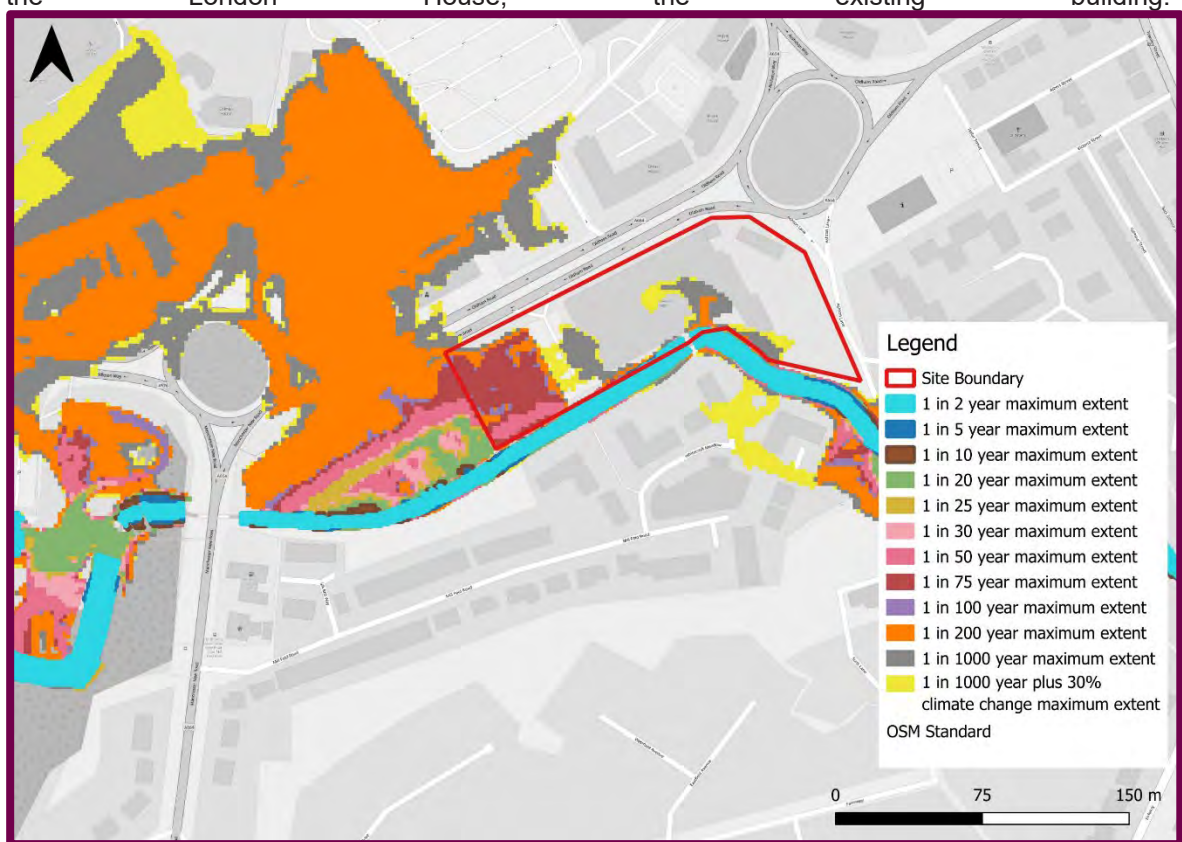


Figure 3. EA 2017 modelled Flood Extents

To support the FRA, RPS has undertaken a hydraulic modelling exercise by updating the EA 2017 Wince Brook model to create a baseline model. The model was refined to include the existing building footprints. Using the updated baseline model the proposed development has been included to create the proposed model. Further details regarding the model adjustments, the modelled results and flood risk to the site are detailed in Section 9.

EA Flood Warning Area

- 6.8 The EA defines a Flood Warning Area as “geographical areas where we expect flooding to occur and where we provide a Flood Warning Service. They generally contain properties that are expected to flood from rivers or the sea and in some areas, from groundwater.”

- 6.9 The EA have confirmed that the site is located within the “River Irk at Rhodes and Middleton” Flood Warning Area.

Surface Water Flood Risk Classification

- 6.10 The EA's updated Flood Map for Surface Water, which is available online, provides risk levels for different areas. These are categorised into the following:
- Very low; area which has a less than 1 in 1000-year chance of flooding (less than 0.1% AEP);
 - Low; area which has between a 1 in 100-year (1% AEP) and 1 in 1000-year chance of flooding (0.1% AEP);
 - Medium; area which has between a 1 in 30-year chance of flooding (3.3% AEP) and 1 in 100-year chance of flooding (1% AEP); and,
 - High; area which has a greater than 1 in 30-year chance of flooding (3.3%).
- 6.11 The map indicates that the site is largely at a ‘very low’ risk of flooding. A small area in the west is at a low risk of flooding. This appears to be in the current car parking area. The risk appears to be coming from the north and south and resulting in the pooling at the car parking in the central west. This is likely to be as there is a topographical depression within in the car park to direct water to the gully drains. The most significant velocities are along the southern border, over 0.25m/s with pooling in the car park at velocities of less than 0.25m/s.
- 6.12 The updated Flood Map for Surface Water is presented in Figure 3.

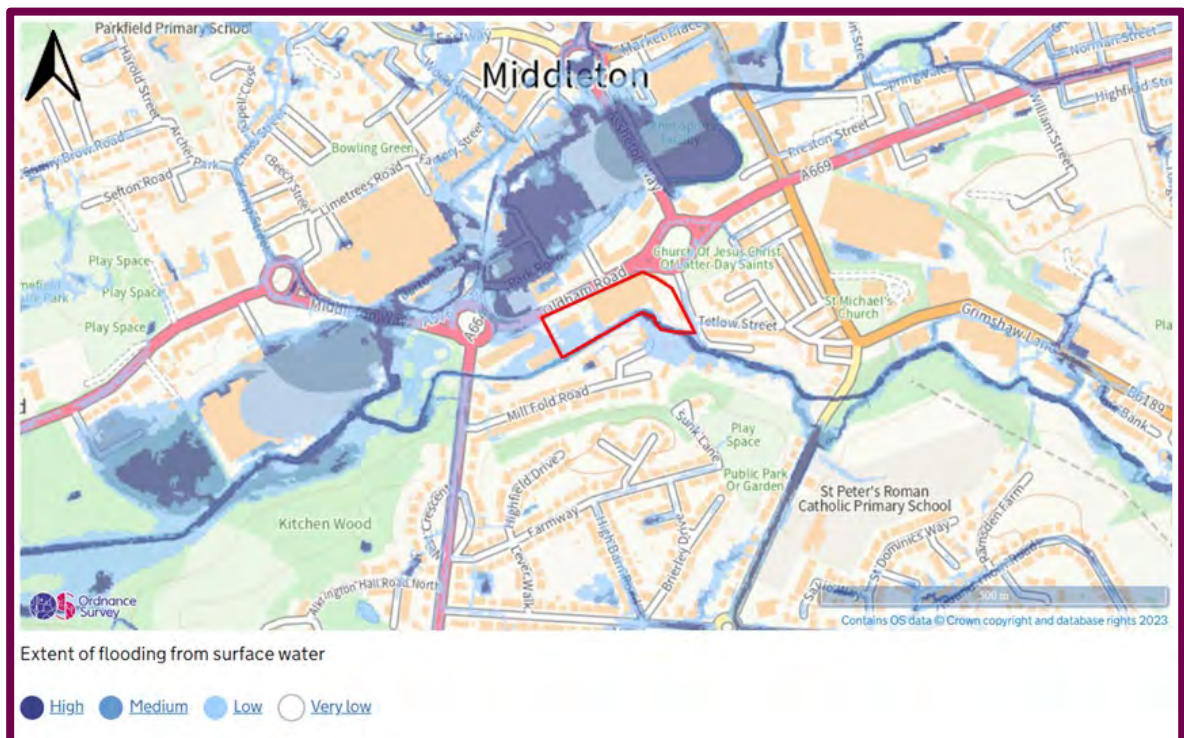


Figure 4. Flood Map for Surface Water

Reservoir Flood Risk Classification

- 6.13 EA mapping also indicates that the site not located within an area potentially at risk from reservoir flooding.

Local Authority Flood Risk Assessment

- 6.14 The Bury, Rochdale and Oldham SFRA was published in 2009. It provides an overview of flood risk from various sources within the borough.
- 6.15 Greater Manchester Strategic Flood Risk Management Framework was published in 2018. Relevant information is detailed below:
- The majority of the site is located within Flood Zone 3a.
 - Flood Zone 3 depth grids are situated in the west and reach up to 1.5m.
 - Areas utilising Natural Processes are located within the vicinity of the site, including areas utilising floodplain reconnection, riparian tree planting and floodplain tree planting.
 - Areas of the site are located within areas of Low and Medium Susceptibility to Surface Water flooding.
 - The majority of the site is identified as being at risk from one source of flooding with the west identified as being at risk from two sources of flooding.
 - The site is not located within a Critical Drainage Area.
 - The site is not at risk from canal flooding.
 - The site is within an Opportunity Areas for Further Critical Drainage Management.
 - United Utilities information on sewer flooding incidents has not identified any events in Rochdale.
 - The most recent flooding that occurred with substantial impacts in Greater Manchester was the Boxing Day 2015 floods (Storm Eva) resulted in flooding in Rochdale Town centre. No records to the 2015 flood impacted the site.
 - Climate projections for Manchester reveal an increase in temperature and decreased summer rainfall and increased winter rainfall resulting in an increase in average rainfall overall.

7 HYDROGEOLOGICAL SETTING

- 7.1 British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is situated on Pennine Lower Coal Measures Formation formed of mudstone, siltstone and sandstone. The superficial deposits are Alluvium comprising clay, silt, sand and gravel.
- 7.2 The nearest borehole record in proximity to the site is situated approximately 80m northwest of the site. The reference number is SD80NE150. The borehole indicates made ground; concrete until 0.25m bgl, hardcore to 0.75m bgl, brick, stone, ash and boulders until 2.5m bgl, and sand and brick until 3.30m bgl. Beneath this is sand; very fine to coarse and gravelly fine until 7m bgl. No groundwater was encountered.
- 7.3 The soils are described as 'freely draining slightly acid sandy soils' by the National Soils Research Institute.
- 7.4 According to the EA's Aquifer Designation Mapping, the superficial drift at the surface is classified as a Secondary A and the bedrock is classified as Secondary A also. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.
- 7.5 MAGIC map indicates that the site is not located within a groundwater Source Protection Zone (SPZ).

8 EXISTING DRAINAGE / WATER MAINS

Surrounding Area

- 8.1 United Utilities plans of public sewers, included as a Groundwise Search report, dated 2022 is included in **Appendix B**. This indicates that that several sewers are located on the site.

Combined sewers

- 8.2 In the southwest of the site boundary, south of London House there is a combined sewer (CS); manhole reference 0601. This sewer connects to Oldham Road network northwest of the site. Adjacent west of Warwick Mill there is a further CS, reference 0603. Adjacent northeast of the site a combined sewer with reference 1701 is situated.
- 8.3 Manhole reference 0700 is noted adjacent north but, this is not identified as a connection to the wider area. No details regarding invert or cover levels have been provided for this manhole.

Surface Water sewers

- 8.4 Surface water (SW) sewers run along Oldham Road. The closest manhole in proximity is located adjacent north 0604.
- 8.5 Manhole cover levels and invert levels are given in Table 1 below.

Table 1. Manhole level details

Manhole Reference	Type of Sewer	Manhole Cover Level (mAOD)	Manhole Invert Level (mAOD)	Invert Depth (m)	Size (mm)
0601	CS	78.63	74.83	3.8	600
0603	CS	78.93	-	-	450
1701	CS	-	-	-	225
0604	SW	-	-	-	225

- 8.6 No water mains information has been provided for the site.

The Site

- 8.7 RPS has conducted a topographic survey for the site, reference: UAQ3603_A, dated 2022 included in **Appendix E**.
- 8.8 This includes a plan of the gully drains on the site. It is noted that in the west of the site at the current car park there are a series of gully drains. These are generally situated 0.1m below surrounding ground levels so that overland surface water flow enters them. Water is collected in the gullies from where it enters the surface water sewers. It is then discharged into Wince Brook. Similarly, rainwater pipes at the building are assumed to collect water before connecting to the wider surface water sewer system.
- 8.9 In the east at the existing building there are rainwater pipes at the building, the assumed discharge route of these is also via surface water sewers into the Wince Brook.
- 8.10 Manholes have also been identified on the site and adjacent by RPS Utilities, reference UAQ3603_MH_Cards, dated 2022 included in **Appendix C**. One of the manholes referenced: FW02 adjacent Ashton Lane is noted to be blocked.

9 FLOOD RISK AND MITIGATION

9.1 The key sources of flooding that could potentially impact the site are discussed below:

Fluvial / Tidal Flooding

9.2 As discussed in Sections 6.6 and 6.7, the most appropriate source of fluvial flood risk data on which to assess risk from this source is the results of the RPS refined version of the EA Wince Brook model.

Baseline Modelling

9.3 The following refinements were made to the EA Wince Brook model:

- The existing building footprints for Warwick Mill (east of the site) and London House (west of the site)
- Building threshold for the above buildings set to 0.15m above ground level

9.4 .

9.5 The Environment Agency Wince Brook Model 1 in 75 year event affects the footprint of the existing and proposed building. For this study therefore RPS baseline model has been run for the following events:

- 1 in 75 year
- 1 in 100 year
- 1 in 100 year plus 35% Climate Change Allowance

9.6 The Climate Change Allowance scenario reflects the Central 2080s peak river flows scenario for the Irwell Management Catchment provided within the Government guidance, published 19th February 2016 (last updated 27th May 2022). The guidance states that for less vulnerable development within flood zones 2 & 3a, use the central allowance as the basis for designing safe access, escape routes and places of refuge.

9.7 The maximum baseline flood extents and levels are shown on Figure 5 and Table 2 below:

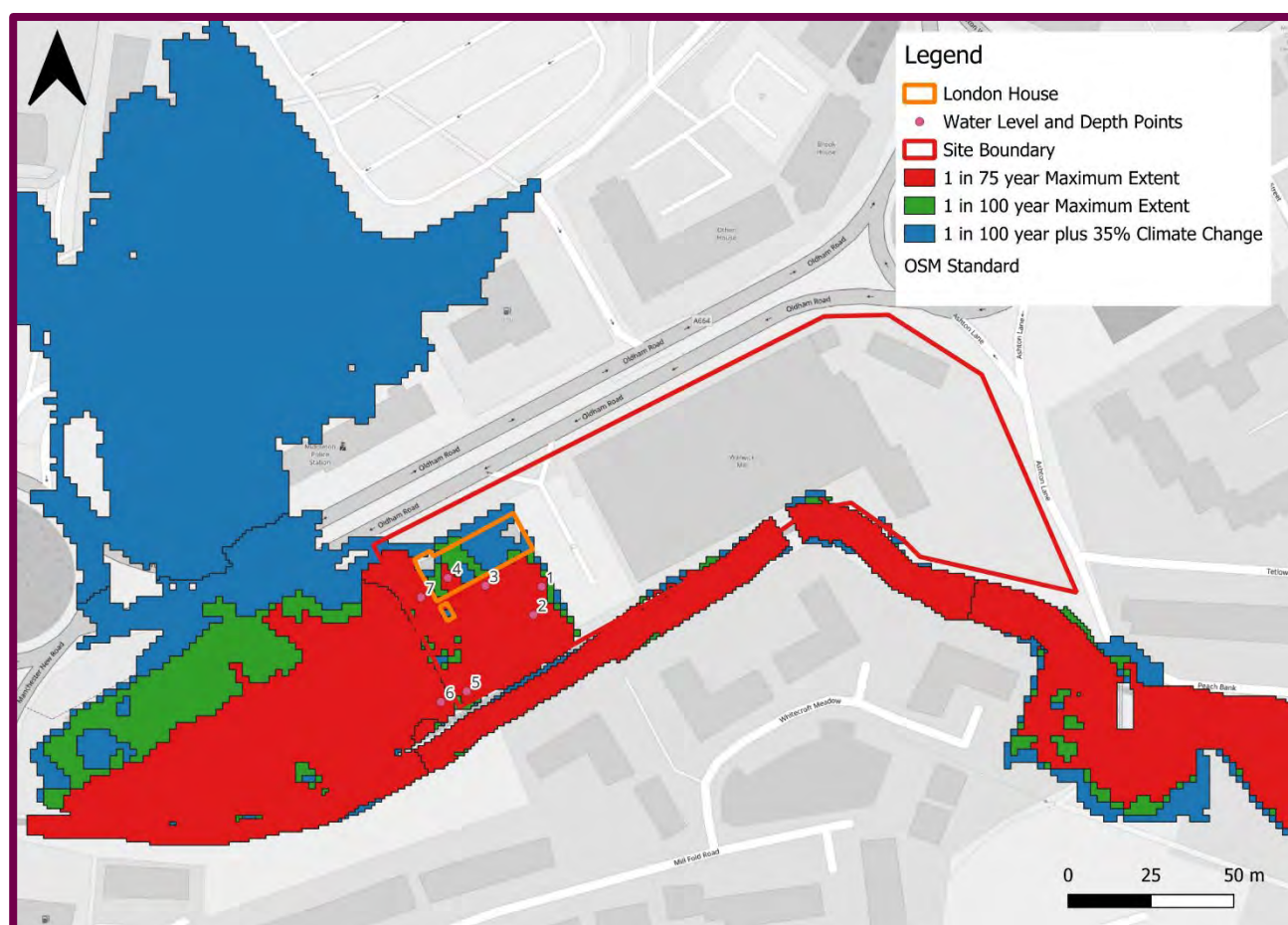


Figure 5: Baseline 1 in 75 year, 1 in 100 year and 1 in 100 year plus 35% climate change extents

Table 2: Baseline maximum modelled flood levels and depths at points indicated on Figure 5.

Point	Baseline maximum modelled water level (m AOD)			Baseline maximum modelled depth (m)		
	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change
1	78.80	78.84	78.98	0.05	0.09	0.24
2	78.81	78.85	78.98	0.06	0.1	0.24
3	78.80	78.84	78.98	0.15	0.19	0.33
4	78.79	78.82	78.95	0.02	0.05	0.18
5	78.77	78.80	78.91	0.08	0.11	0.22
6	78.48	78.59	78.90	0.45	0.56	0.86
7	78.75	78.77	78.82	0.19	0.22	0.27

9.8 The mechanism of fluvial flooding to the site comes from the Wince Brook adjacent to the site, where the flows overspill the right channel bank onto the floodplain and across the site to the west and north. Figures 6 shows the maximum velocity for the 1 in 100 year plus 35% climate change event showing the flood mechanism, and the flood waters flow across the site.

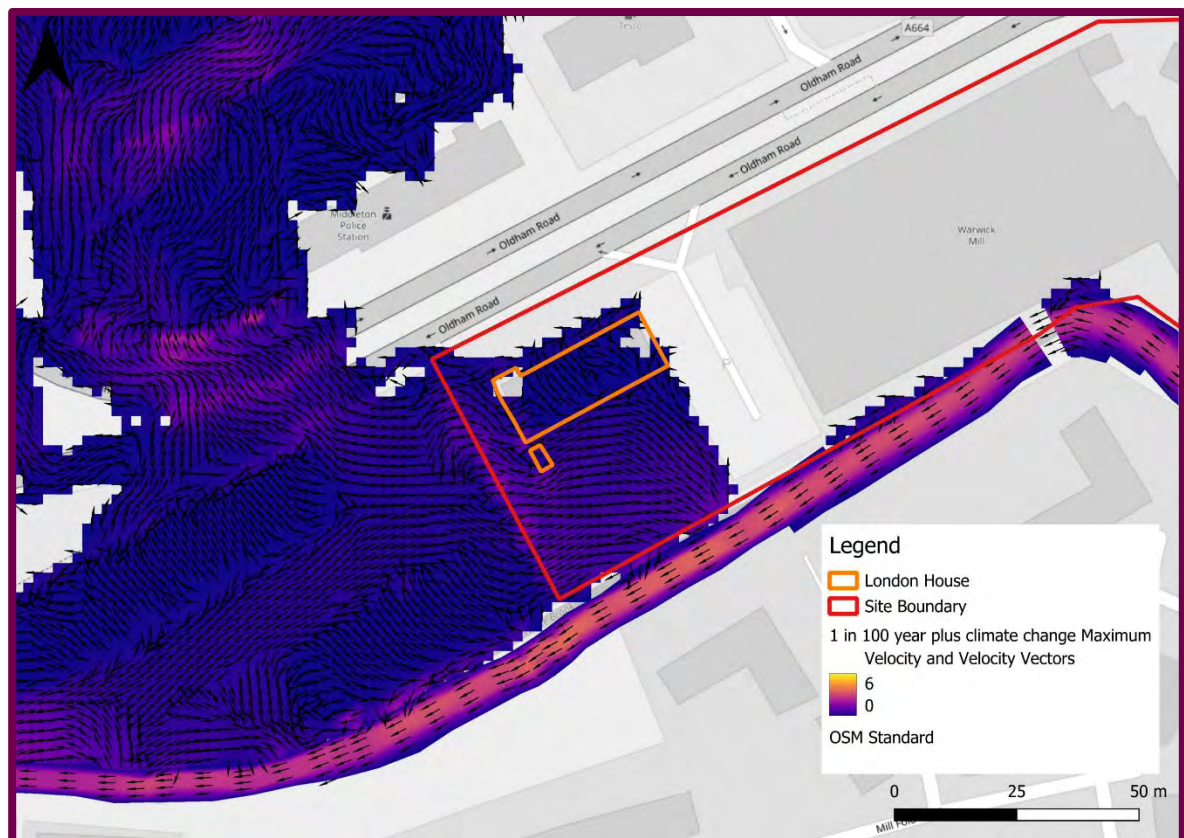


Figure 6: Baseline 1 in 100 year plus 35% climate change maximum velocity and vector velocity

Proposed Modelling

9.9 The proposed development has been designed to mimic where possible the existing baseline flooding mechanisms, i.e. allowing the flood water to flow across the site (in less vulnerable areas) by maintaining the existing ground level across the majority of the floodplain. The carpark slab and the western ramp up to the carpark are suspended on structural columns to allow the floodwater to flow underneath and across the site. The new building is designed to be safe with the finished floor levels set above the flood water levels.

9.10 To incorporate the proposed development into the model the following adjustments were made:

- Removal of London House
- Insertion of the proposed development to the slab elevations as per **Appendix F** (development plan). Note that the elevated areas are not included as these are on stilts (car park, western ramp).
- The Domestic Refuse store elevation was made higher, due to the building blocking the floodplain.
- The roughness value along the right bank was adjusted to allow for the vegetation that is to be planted.
- The retaining wall at the southern end of the western ramp was included.

9.11 The model was run for the same events as the baseline. The maximum proposed flood extents and levels are shown on Figure 7 and Table 3 below.

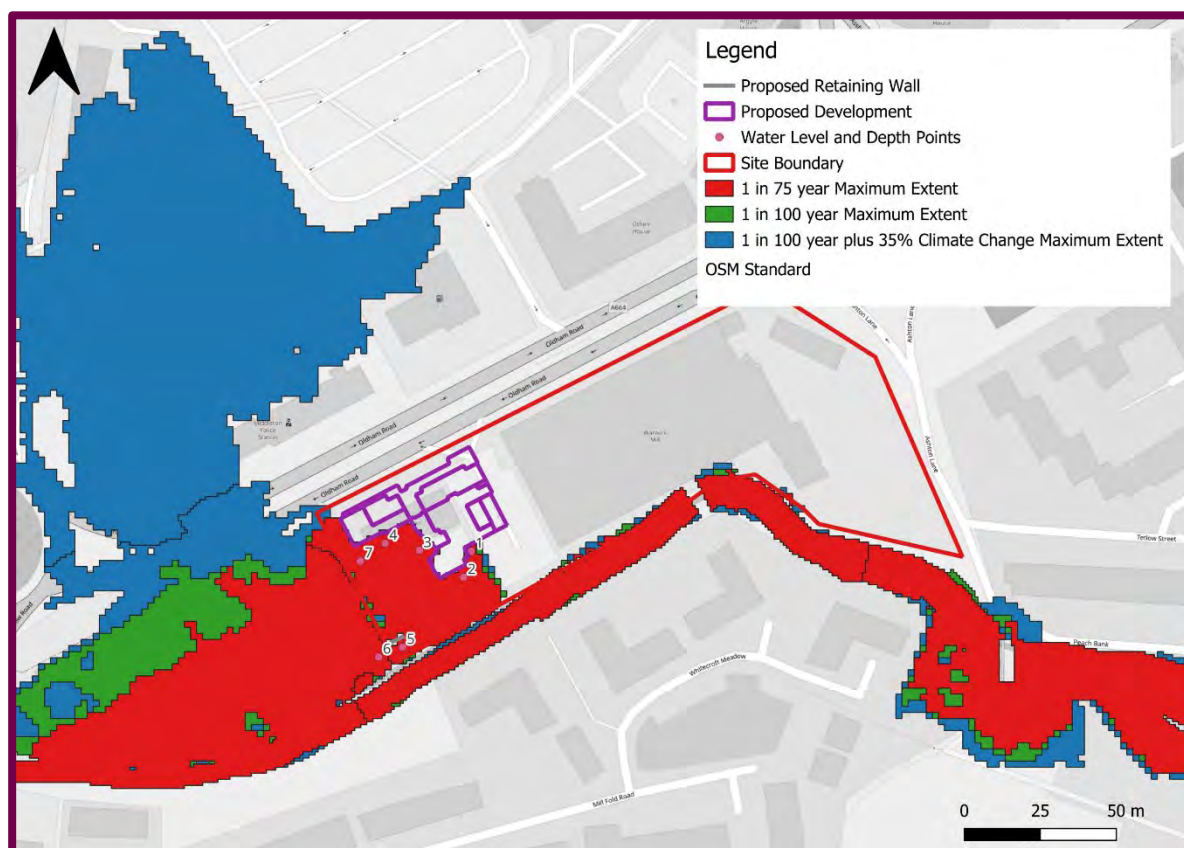


Figure 7: Proposed 1 in 75 year, 1 in 100 year and 1 in 100 year plus 35% climate change extents

Table 3: Proposed maximum modelled flood levels and depths at points indicated on Figure 7.

Point	Proposed maximum modelled water level (m AOD)			Proposed maximum modelled depth (m)		
	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change
1	78.83	78.88	79.01	0.08	0.13	0.26
2	78.83	78.88	79.00	0.08	0.13	0.26
3	78.75	78.78	78.87	0.11	0.14	0.22
4	78.75	78.78	78.87	0.13	0.16	0.25
5	78.80	78.82	78.90	0.11	0.13	0.21
6	78.47	78.57	78.87	0.44	0.54	0.84
7	78.75	78.78	78.86	0.19	0.22	0.30

9.12 The results (Figure 8) show that as intended the mechanism of flooding remains as per the baseline. Water is allowed to flow across the less vulnerable part of the site whilst buildings remain

safe.

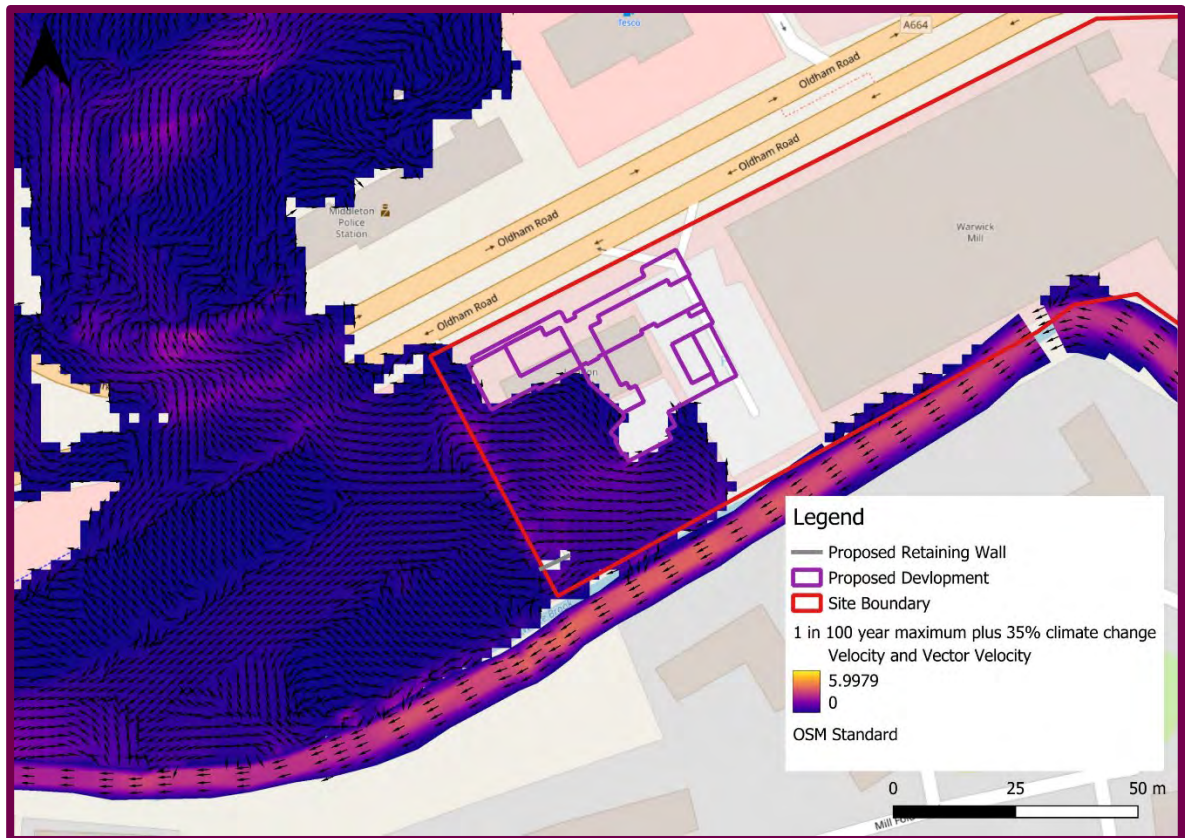


Figure 8: Proposed 1 in 100 year plus 35% climate change maximum velocity and vector velocity

9.13 An assessment of the proposed development on flood risk elsewhere has been made through reference to 'difference' maps. Figures 9, 10 and 11 show the difference plots between the baseline and proposed. Positive values (red shades) indicate flooding is deeper in the proposed development scenario. Negative values (green shades) indicate flooding is shallower in the proposed development scenario. Table 4 shows the difference between the proposed and baseline at the points shown in the figures.

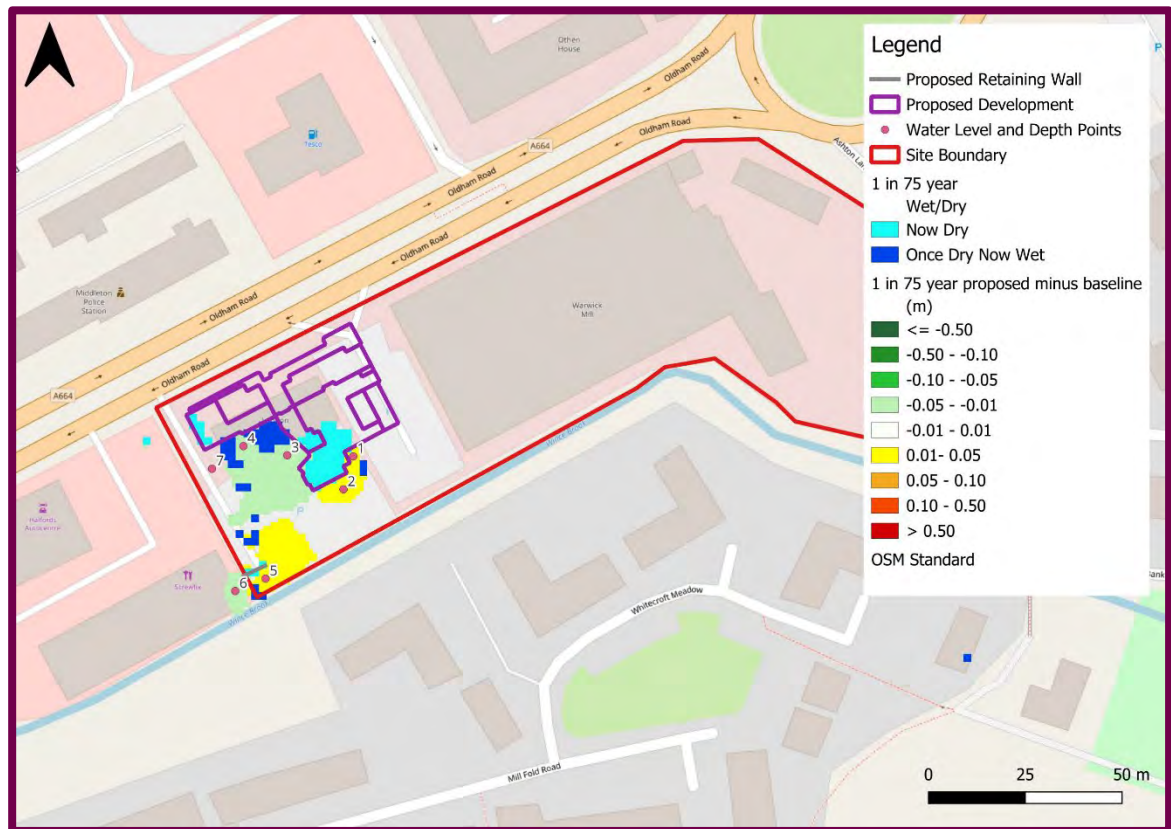


Figure 9: 1 in 75 year difference between the proposed and baseline

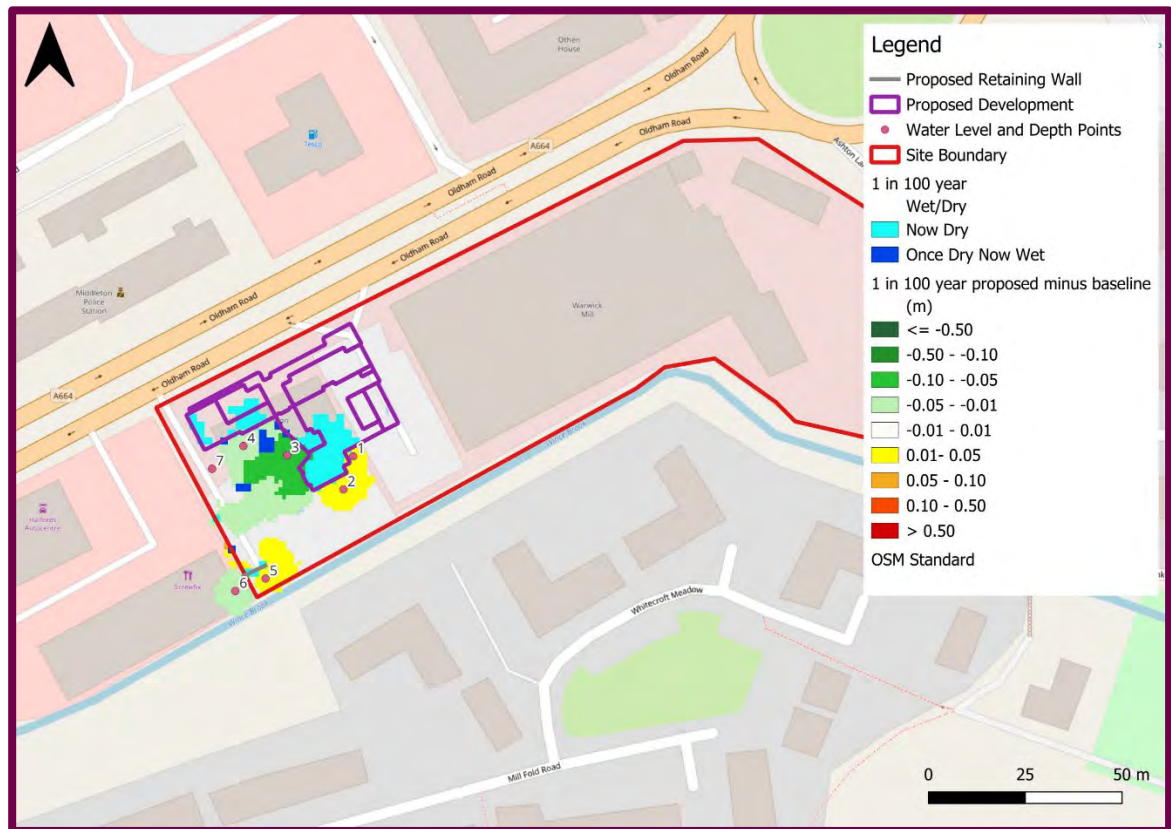


Figure 10: 1 in 100 year difference between the proposed and baseline

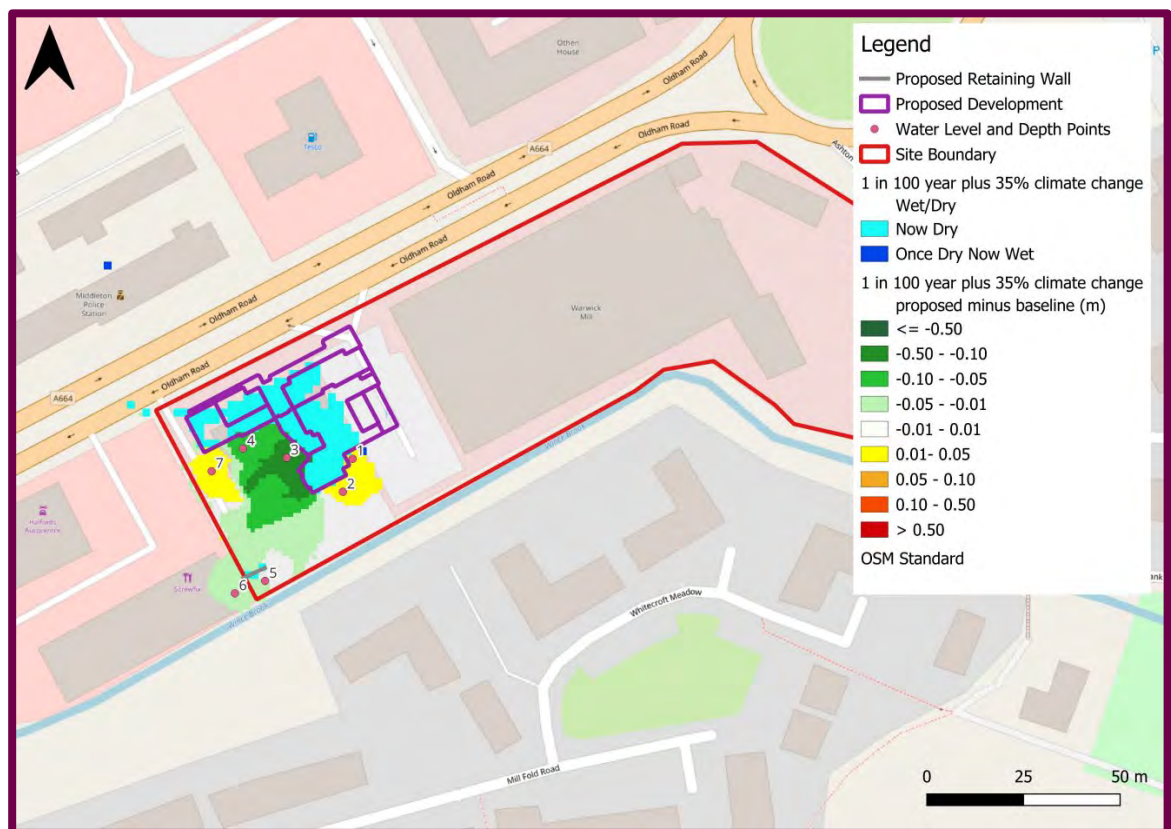


Figure 11: 1 in 100 year plus 35% climate change difference between the proposed and baseline

Table 4: Difference between the proposed and baseline at the points shown in the figures

Point	1 in 75 year difference (m)	1 in 100 year difference (m)	1 in 100 year plus 35% climate change difference (m)
1	0.03	0.04	0.03
2	0.02	0.03	0.02
3	-0.05	-0.05	-0.11
4	-0.04	-0.05	-0.08
5	0.03	0.02	-0.01
6	-0.01	-0.02	-0.02
7	-0.00	0.00	0.04

- 9.14 Within the site boundary there are localised changes in the pattern of flood depth associated with the minor change to building footprint between existing and proposed. There is minimal (>0.02m) localised decrease to a small area immediately west of the site. Approximately 350m west of the site the difference maps show small scale 'patches' of increased depth at the McBride site; these are minimal in magnitude (<0.025m) and scale. Overall the proposed development results in no significant increase in flood risk to off-site receptors.

Table 5: Baseline maximum modelled flood levels and depths at points indicated on Figure 6.

Point	Proposed maximum modelled water level (m AOD)			Proposed maximum modelled depth (m)		
	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change	1 in 75 year	1 in 100 year	1 in 100 year plus 35% climate change
1	78.83	78.88	79.01	0.08	0.13	0.26
2	78.83	78.88	79.00	0.08	0.13	0.26
3	78.75	78.78	78.87	0.11	0.14	0.22
4	78.75	78.78	78.87	0.13	0.16	0.25
5	78.80	78.82	78.90	0.11	0.13	0.21
6	78.47	78.57	78.87	0.44	0.54	0.84
7	78.75	78.78	78.86	0.19	0.22	0.30

Proposed Mitigation

- 9.15 Development plans indicate that the southern lower ground floor area will be unoccupied as this area is shown to be at risk from flooding. Commercial spaces have been sequentially located within the development on the ground level, as this type of 'less vulnerable' development is appropriate in Flood Zone 3. The entrances to the building will be located on the ground floor which is set at a level of approximately 80.650m AOD.
- 9.16 Modelling has indicated that the north entrances to the building along Oldham Road will remain flood free. The western carpark access ramp is raised above the modelled flood levels, therefore will remain flood free. The eastern carpark access ramp is also shown to remain flood free. Giving consideration to the above, access and egress should be available during flood events, therefore it is not necessary to recommend the production of any evacuation plans.
- 9.17 Generally for developments located in areas of flood risk, flood resilience and resistance measures should be considered such as raised sockets and water resistant finishes. As per general good

practice measures, finished floor levels will be set above adjacent site levels which will further mitigate residual flood risk.

Flooding from Sewers

Sewer flooding can occur during periods of heavy rainfall when a sewer becomes blocked or is of inadequate capacity. Sewers are currently located on site and are anticipated to remain as part of the development. One of the sewers was noted as being flooded at the time of inspection in 2022.

Proposed Mitigation

- 9.18 It is recommended that a maintenance plan be put in place to ensure that regular inspection and clearance of drainage at the site is undertaken.
- 9.19 The risk posed by sewer flooding is not significant, therefore, no further specific mitigation measures against this source of flooding is required. As per general good practice measures, finished floor levels will be set above adjacent site levels which will further mitigate residual flood risk.

Surface Water Flooding (Overland Flow)

- 9.20 This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems. The site is at a low risk of surface water flooding in the west of the site. Gully drains are present here, which due to their localised nature will not be included in the surface water modelling. These are anticipated to capture the majority of any overland flow.

Proposed Mitigation

- 9.21 The surface water drainage strategy outlined in Section 10, will ensure that surface water at the site is sustainably managed without increasing flood risk offsite. Due to the nature of flood risk at the site, it is likely that some surface water flows will pass through the site. As per general good practice measures, finished floor levels will be set above adjacent site levels which will further mitigate residual flood risk.

Groundwater Flooding

- 9.22 This can occur in low-lying areas when groundwater levels rise above surface levels, or within underground structures. BGS mapping indicates that during a nearby borehole log of depth 7m bgl the water table was not encountered. This indicates that the water table is not identified as being near to the surface.
- 9.23 No below ground level floors are planned for the development.

Proposed Mitigation

- 9.24 The risk posed by groundwater flooding is not significant, therefore, no specific mitigation measures against this source of flooding is required.

Other Sources

- 9.25 There is a limited risk of flooding occurring because of a break in a water main. We have not been provided with details of water mains at the site or in proximity.
- 9.26 The risk of flooding from reservoirs and canals is considered low as no features have been identified in proximity.
- 9.27 The EA reservoir flood risk maps indicate the site is not within an 'at risk' area from this source.

Proposed Mitigation

- 9.28 The risk posed by other sources of flooding is not significant, therefore, no specific mitigation measures are required. However, buildings at the site will be raised above adjacent site levels so water flows will be directed away from more vulnerable land uses.

Event Exceedance

- 9.29 The mitigation measures proposed as part of the development scheme are considered appropriate to help mitigate against event exceedance scenarios.

10 SURFACE WATER MANAGEMENT

Introduction

- 10.1 The proposed development comprises of commercial and residential use and will largely involve the development of existing buildings/impermeable land.
- 10.2 Generally this type of development is considered to have a design life of 100 years. Therefore, for the purposes of this assessment, taking into account the Environment Agency's climate change allowances (published in May 2022), a 45% increase in peak rainfall intensity has been included as climate change allowance, which caters up to the year 2115. No climate change guidance is available beyond 2115.
- 10.3 To demonstrate that all forms of flooding have been considered as required by the NPPF a surface water drainage strategy has been developed. The 'Warwick Mill' portion of the site will comprise the building footprint and external areas will be drained as per the existing arrangement. New areas of impermeable area and development will be located within 'The Loom' portion of the site.
- 10.4 The response received from United Utilities requested the production of a Drainage Strategy with conditions outlined in Section 3.7.
- 10.5 The response received from Rochdale Council requested the production of a Drainage Strategy with conditions outlined in Section 3.10.
- 10.6 The Conceptual Drainage Strategy will demonstrate that the comments provided by Rochdale Council and United Utilities are addressed and that Proposed Development will not adversely affect the surface water regime in the area and that overall, the current situation will be improved.

Existing Surface Water Drainage

- 10.7 Details of existing drainage networks within the vicinity of the site are included within **Appendix B** and **Appendix C**. As noted in Section 8, a combined sewer is located in the southwest of the site boundary and surface water sewer is located within Oldham Road. The site itself is brownfield, therefore, has an existing network of onsite gullies and manholes.

Runoff Rates

- 10.8 The site is located on land which is occupied by disused buildings, and is therefore considered a brownfield site. The brownfield runoff rate has been estimated using the Rational Method:

$$Q \text{ (standardised flow)} \times \text{Existing impermeable area (ha)} \times \text{Average rainfall (FEH data) (mm/hr)}$$

$$2.78 \times 1.00 \times 35 = \mathbf{97.3 \text{ l/s}}$$
- 10.9 In accordance with criteria outlined within The SUDS Manual 2015 (C753), surface water run off from previously developed sites, should be reduced to greenfield runoff rates where possible. If this is not technically feasible, a betterment should be provided.
- 10.10 Greenfield runoff rates for the site have been calculated by way of Interim Code of Practice for Sustainable Drainage Systems (ICP SUDS). This implements a pro rata IOH124 methodology, for sites below 50ha in size. The calculation has been included for reference within **Appendix G** and outputs are summarised within Table 5.

Table 6. Greenfield Runoff (Based on a 1ha area)

Return Period	Greenfield Runoff Rate (l/s)
Q1	3.3
QBar	4.0
Q30	7.8
Q100	10.2

Proposed Surface Water Drainage

- 10.11 Under the terms of Section 3 of Approved Document H3 of the Building Regulations 2010 (2015 edition), soakaways should be utilised as the primary means of surface water disposal. If infiltration testing undertaken in accordance with BRE:365 (2016) provides an unfavourable infiltration rate across the site or contaminated ground is present within the site, other methods of sustainable drainage should be considered. A surface water connection to an existing watercourse should be considered prior to a connection into the public sewerage system.
- 10.12 Given that the development is located within an area of existing brownfield land, it is anticipated the site is underlain by made ground. As such, it is considered that the infiltration techniques are not considered a suitable means to dispose surface water from the site. In addition, where there is soft landscaping present it is located within 8m of the brook, to avoid encroaching the 8m stand off of the nearby brook infiltration SuDS must be avoided here. The existing sewer network on the site already discharges to the nearby brook. As such it is proposed to follow this existing approach and connect the new site scheme with the existing system.
- 10.13 The Conceptual Drainage Strategy illustrating drainage proposals based upon discharge to the Wince Brook is provided within **Appendix H**. The strategy has been designed based upon the following parameters:
- Proposed Impermeable Area = 0.3ha
 - Former brownfield run off rate = 97.3l/s
 - Proposed restriction rate (greenfield rate) = 2 l/s
- 10.14 It is proposed that surface water will be intercepted by a series of drains, including building guttering such as downpipes. It is anticipated that some external surfacing at the site will be composed of permeable paving. These areas will be identified at detailed design stage. Surface water will be drained and attenuated prior to discharge within below ground geocellular crates for flows up to the 1:100 plus 45% CC. Flows will then be discharged via the Wince Brook, at the restricted rate of 2 l/s.
- 10.15 The total volume stored within the geocellular crates will be 273.6 m³. MicroDrainage calculations are provided in **Appendix H**, demonstrating that sufficient surface water storage has been provided to accommodate flows up to the 1 in 100 year + 45% climate change storm event.

- 10.16 It should be noted that both the Conceptual Drainage Strategy indicated within **Appendix H**, and supporting calculations within **Appendix I**, are preliminary, and as such, subject to further detailed design and approval by the relevant authorities. However, the designs illustrate that surface water arising from the development may be sustainably managed such that it does not pose a flood risk, either to proposed or existing development, to the 1:100 + 45% climate change storm event.

Site Specific SuDS Benefits

- 10.17 Sustainable drainage is a departure from the traditional approach to draining sites. There are some key principles that influence the planning and design process enabling SuDS to mimic natural drainage by:
- storing run-off and releasing it slowly (attenuation);
 - allowing water to soak into the ground (infiltration);
 - slowly transporting (conveying) water on the surface;
 - filtering out pollutants;
 - allowing sediments to settle out by controlling the flow of water.
- 10.18 CIRIA has produced several guidance documents covering a range of water management scenarios. A summary of the publications used as reference when the site drainage strategy was produced are listed below.
- Planning for SUDS – making it happen (C687)
 - Site handbook for the construction of SUDS (C698)
 - The SUDS Manual 2015 (C753)
 - Sustainable Drainage Systems – Hydraulic, structural and water quality advice.

Geocellular Storage Systems

- 10.19 Geocellular storage systems are modular plastic units with a high porosity (generally around 95%) that can be used to efficiently create a below-ground structure for the temporary storage of surface water before controlled release or use. The storage structure (tank) is formed by assembling the required number of individual units (sometimes in several layers), and wrapping them in either a geotextile or a geomembrane.

Water Quality

- 10.20 Surface water run-off should be managed by SuDS that are designed to attenuate flows and to avoid water quality impacts downstream. To demonstrate that surface water arising from the development will be appropriately treated prior to discharge, the Simple Index Approach, as outlined within the SuDS Manual (CIRIA C753) has been followed.
- 10.21 As stated in the SuDS Manual 2015 (C753), the risk posed by surface water runoff to the receiving environment is a function of:
- the pollution hazard at a particular site (i.e. the *pollutant source*)
 - the effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels, groundwater (i.e. the *pollutant pathway*)
 - the sensitivity of the receiving environment (i.e. the *environmental receptor*).
- 10.22 The most significant pollutant load within the site will arise from individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change. These have an identified pollutant hazard level of 'Low as per the SuDS Manual (CIRIA C753) Table 26.2,

with identified pollutant hazard indices of 0.5 for Total Suspended Solids (TSS), 0.4 for Metals, and 0.4 for Liquid Hydrocarbons.

- 10.23 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).
- 10.24 It is anticipated that some external surfacing at the site will be composed of permeable paving. These areas will be identified at detailed design stage. The proposed permeable pavement has the following mitigation indices; 0.7 for TSS, 0.6 for Metals and 0.7 for Liquid Hydrocarbons. The mitigation indices therefore exceed maximum anticipated pollutant hazard indices. This confirms that surface water arising from the development will receive an appropriate level of treatment in advance of discharge from site. Landscaping may also provide additional surface water treatment in advance of discharge.
- 10.25 The maintenance and adoption of the SuDS features are described below.

Maintenance and Adoption

- 10.26 Subject to detailed engineering designs, it is likely that surface water drainage systems within the development will be adopted by UU. A specialist management company will be identified at the detailed design stage and appointed to maintain the SuDS features for the lifetime of the development.
- 10.27 Tables 6 and 7 below, indicate the envisaged maintenance activities associated with the proposed pervious pavements and attenuation storage tanks, along with the approximate frequency within which they should be completed.

Table 7. Pervious Pavements Suggested Maintenance Schedule

Maintenance schedule	Require Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements

Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Quarterly, 48 hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 8. Attenuation Storage Tanks (oversized pipes, geo-cellular storage) Suggested Maintenance Schedule

Maintenance schedule	Require Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly, if required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required

REPORT

Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually

11 SEQUENTIAL TEST AND EXCEPTION TEST

Sequential Test

- 11.1 The NPPF requires the Local Authority to apply the Sequential Test in consideration of new development. The aim of the Test is to steer new development to areas at the lowest probability of flooding.
- 11.2 The Flood Map for planning indicates that the majority of the site is located within Flood Zone 1. Some smaller areas of the Warwick Mill site are located within Flood Zone 2 and large areas of The Loom site is located within Flood Zone 3 and 2.
- 11.3 The development seeks to utilise an existing commercial site for continued commercial/residential use. The residential use will be situated above the ground floor level out of the flood zone. The site is at low risk from all other sources. A sequential approach has been undertaken to the development placing residential land uses above ground floor. In addition, the 'low' surface water risk areas are anticipated to be managed through appropriate drainage already present at the site.
- 11.4 Modelling has indicated that the north entrances to the building along Oldham Road will remain flood free. The western carpark access ramp is raised above the modelled flood levels, therefore will remain flood free. The eastern carpark access ramp is also shown to remain flood free. Giving consideration to the above, access and egress should be available during flood events, therefore it is not necessary to recommend the production of any evacuation plans.
- 11.5 It is considered that the development passes the Sequential Test.

The Exception Test

- 11.6 According to Table 3 of the PPG to the NPPF, 'less vulnerable' developments are considered appropriate within Flood Zone 3a without the requirement to apply the Exception Test. The 'more vulnerable' residential development will be placed above the flood level, located above the ground floor level.
- 11.7 Therefore, application of the Exception Test is not required for the proposed development.

12 SUMMARY AND CONCLUSIONS

- 12.1 The aim of the FRA is to outline; the potential for the site to be impacted by flooding, the potential impacts of the development on flooding both onsite and in the vicinity, and the proposed measures which can be incorporated into the development to mitigate the identified risks. The report has been produced in accordance with the guidance detailed in the NPPF. Reference has also been made to the CIRIA SuDS manual (C753), the Greater Manchester and Rochdale SFRA's and the Greater Manchester SWMP.
- 12.2 The potential flood risks to the site, and the measures proposed to mitigate the identified risks, are summarised in Table 8.

Table 9. Proposed mitigation

Source of Flooding	Identified Risk			Mitigation Proposed	Residual Risk		
	L	M	H		L	M	H
Fluvial			✓	Lower ground floor areas unoccupied, ground floor raised, resilience and resistance measures	✓		
Tidal	✓			No mitigation required	✓		
Sewers		✓		Maintenance and inspection plan for the on-site sewers.	✓		
Surface Water	✓			No mitigation required	✓		
Groundwater	✓			No mitigation required	✓		
Other Sources (e.g. reservoirs, water mains)	✓			No mitigation required	✓		

- 12.3 Areas within the western portion of the site are indicated to be at risk from fluvial flooding during 1:75 year, 1:100 year and 1:100 year + 35% climate change events. The ground level of the development will be used for commercial use, this type of 'less vulnerable' development is appropriate in Flood Zone 3.
- 12.4 The site is brownfield and existing drainage is present at the site. It is proposed that surface water will be collected by a series of drains and attenuated prior to discharge within below ground geocellular crates. It is proposed to utilise the existing outfall to Wince Brook within the south western portion of the site.
- 12.5 Overall, it has been demonstrated that the development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the management of surface water at the site.

APPENDICES

Appendix A

EA Consultation Response

Rochdale Metropolitan Borough Council
Development Control
Number One Riverside
Smith Street
ROCHDALE
Lancashire
OL16 1XU

Our ref: SO/2023/123448/01-L01
Your ref: 23/00795/FUL
Date: 19 September 2023

Dear Sir/Madam

CONVERSION AND SUBDIVISION OF WARWICK MILL TO 135 NO. APARTMENTS (USE CLASS C3) AND FLEXIBLE COMMERCIAL SPACE (USE CLASS E) INCLUDING WORKS OF DEMOLITION AND FORMATION OF INTERIOR ATRIA, PARKING AT LOWER GROUND-FLOOR LEVEL AND DEMOLITION OF LONDON HOUSE AND ERECTION OF BUILDING TO PROVIDE 146 NO. APARTMENTS (USE CLASS C3) (281 TOTAL), AND FLEXIBLE COMMERCIAL SPACE (USE CLASS E) FORMATION OF EXTERNAL CAR PARKING, PUBLIC REALM, LANDSCAPING, ALTERATION TO EXISTING VEHICULAR ACCESS AND CREATION OF ADDITIONAL VEHICULAR ACCESS TO OLDHAM ROAD (A669) AND ASSOCIATED INTERNAL AND EXTERNAL ADDITIONS AND ALTERATIONS WARWICK MILL OLDHAM ROAD MIDDLETON M24 1AZ

Thank you for referring the above application to the Environment Agency, which was received on the 11 August 2023. We object to the proposed development, on the following grounds.

Environment Agency position

In the absence of an acceptable flood risk assessment (FRA) we object to this application and recommend that planning permission is refused.

Reason(s)

The submitted FRA does not comply with the requirements for site-specific flood risk assessments, as set out in paragraphs 20 to 21 of the Flood Risk and Coastal Change section of the planning practice guidance. The FRA does not therefore adequately assess the flood risks posed by the development. In particular, the FRA fails to:

- consider how people will be kept safe from the identified flood hazards

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency

Cont/d..

- consider how a range of flooding events (including extreme events) will affect people and property
- consider the requirement for flood emergency planning including flood warning and evacuation of people for a range of flooding events up to and including the extreme event
- take the impacts of climate change into account in relation to the risks from Wince Brook.

We have reviewed the FRA by RPS Group (ref: HLEF 79519/Ver2) dated 18/7/2023. Sections 1.2 and 9.4 states that there are further technical reports to follow relating to investigation of the fluvial flood risk to the development. We will be pleased to comment further on receipt of these. However, 5.6 refers to the development being classed as “less vulnerable” as residential uses are at upper levels. The vulnerability of a development should be based on the highest vulnerability within it for the purposes of assessing it against the sequential and exception tests of NPPF. This is confirmed in NPPF PPG notes to table 2 ([Table 2: Flood risk vulnerability and flood zone ‘incompatibility’](#)). This is applicable for the London House element, which is to be a new construction rather than change of use.

6.8 states the site is within an EA flood warning area is titled “Winford Brook at Chew Magna”. The EA’s flood warning area at the site is “River Irk at Rhodes and Middleton”.

Wince Brook Bank Top

It is also unclear how close the proposed Loom building would be to the bank top of Wince Brook. As submitted, it is unlikely that we would grant a flood risk activity permit for this application without further clarification.

The proposed development could restrict essential maintenance and emergency access to the watercourse. The permanent retention of a continuous unobstructed area is an essential requirement for future maintenance and/or improvement works together with access through the site to the bank top.

Overcoming our objection

This objection could be overcome by submission of revised/additional information showing the development would be safe whilst not increasing risk elsewhere. Clarification of the proposed developments proximity to the bank top of Wince Brook and available access points to the watercourse should also be provided. The provision of occasional vehicular access to the bank top should be identified.

Advice to the Local Planning Authority

If you are minded to approve the application contrary to our objection, please contact us to explain why material considerations outweigh our objection. This will allow us to make further representations.

Please forward a copy of this letter to the applicant.

Should you have any queries regarding this response, please contact me.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059

Direct e-mail sylvia.whittingham@environment-agency.gov.uk

RPS Group Ltd
5 New York Street
Manchester
Lancashire
M1 4JB

Our ref: SO/2021/121479/01-L01
Your ref: Warwick Mill
Date: 03 September 2021

FAO Ruth Abbot

Dear Madam,

**PRELIMINARY OPINION REQUEST - THE PROPOSED REDEVELOPMENT OF
WARWICK MILL, MIDDLETON - RESIDENTIAL AND ASSOCIATED
INFRASTRUCTURE.**

WARWICK MILL, OLDHAM RD, MIDDLETON, GREATER MANCHESTER.

Thank you for your recent enquiry dated 20th August 2021 regarding the above proposals.

Having reviewed the details submitted, we are providing you with our preliminary opinion. Our preliminary opinion outlines the key environmental issues within our remit that are relevant to the proposal and provides guidance on any actions that you will need to complete prior to the submission of a planning application. It also provides hyperlinks to any further information and advice that is available to help prepare the application. We offer one free preliminary opinion per site, per applicant / developer.

If you would like further guidance, we would be pleased to offer this through our charged advice service. Further details can be found at the end of this letter.

Environmental Constraints

Based on our records the proposed development site is affected by the following constraints:

- the site is located partly within flood zones 2 & 3 defined as having a high probability of flooding in the National Planning Practice Guidance;
- the site is located adjacent to Wince Brook which is designated as main river;
- the site is located on a secondary A aquifer;
- there is the potential for previous uses of the site to have had a polluting potential.

Based on the information currently available, the development raises some environmental concerns that you will need to address as part of your planning application. Further work will be needed to show how these issues can be satisfactorily addressed to ensure no environmental impacts.

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency

Cont/d..

Technical Advice

Flood Risk

The development site is located in 2 and 3 and any subsequent planning application must be accompanied by a Flood Risk Assessment (FRA). Any subsequent FRA should demonstrate that the development will not be at an unacceptable risk of flooding or increase flood risk elsewhere.

Preparing a FRA

The following guidance is available on the GOV.UK website for use when preparing flood risk assessments for planning applications:-

- <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>
- <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

We recommend that the applicant refers to the site-specific FRA checklist in the National Planning Practice Guidance to ensure all relevant issues have been considered <https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section>

Data requests

We do not prepare or provide FRAs. However, you can submit a request to our Customers and Engagement team to obtain what flood risk information we have to inform the FRA, for example a Product 4. This service is available free of charge and requests should be sent by e-mail to InfoRequests.GMMC@environment-agency.gov.uk.

For further information on what flood risk information packages we offer, please refer to the GOV.UK website at <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#get-information-to-complete-an-assessment>

The local planning authority should have undertaken a Strategic Flood Risk Assessment (SFRA) which will also include local flood risk information to inform a FRA. Please contact your local planning authority to determine what information is available.

Flood Risk Activity Permitting

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission.

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03702 422 549. You should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise you to consult with us at the earliest opportunity.

Contaminated Land

It is possible that former land use(s) may have had the potential to cause adverse concentrations of soil and/or groundwater contamination.

We recommend that developers should:

- Follow the risk management framework provided in Guidance on [Land contamination risk management \(LCRM\)](#), when dealing with land affected by contamination
- Refer to our [Guiding principles for land contamination](#) for the type of information that we require in order to assess risks to controlled waters from the site - the local authority can advise on risk to other receptors, such as human health
- Consider using the [National Quality Mark Scheme for Land Contamination Management](#) which involves the use of competent persons to ensure that land contamination risks are appropriately managed
- Refer to the [contaminated land](#) pages on gov.uk for more information

All investigations of land potentially affected by contamination should be carried out by or under the direction of a suitably qualified competent person and in accordance with BS 10175 (2001) Code of practice for the investigation of potentially contaminated sites.

Seeking Further Advice

Should you wish us to review any technical documents or want further advice to address any of the environmental issues raised in this response, we may be able to do this as part of our charged for planning advice service.

Further engagement will provide you with certainty of our position as to what our response to a planning application will be. It should also result in a better quality and more environmentally sensitive development.

As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per person per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. Our standard terms and conditions are available to view online at <https://www.gov.uk/government/publications/planning-and-marine-licence-advice-standard-terms-for-our-charges/planning-and-marine-licence-advice-standard-terms-for-our-charges>.

If you would like more information on our planning advice service, including a cost estimate, please contact us at SPPlanning@environment-agency.gov.uk.

Please note that the views expressed in this letter do not represent our final response in relation to any future planning application that may be made in relation to this site. We reserve the right to change our position in relation to any such application.

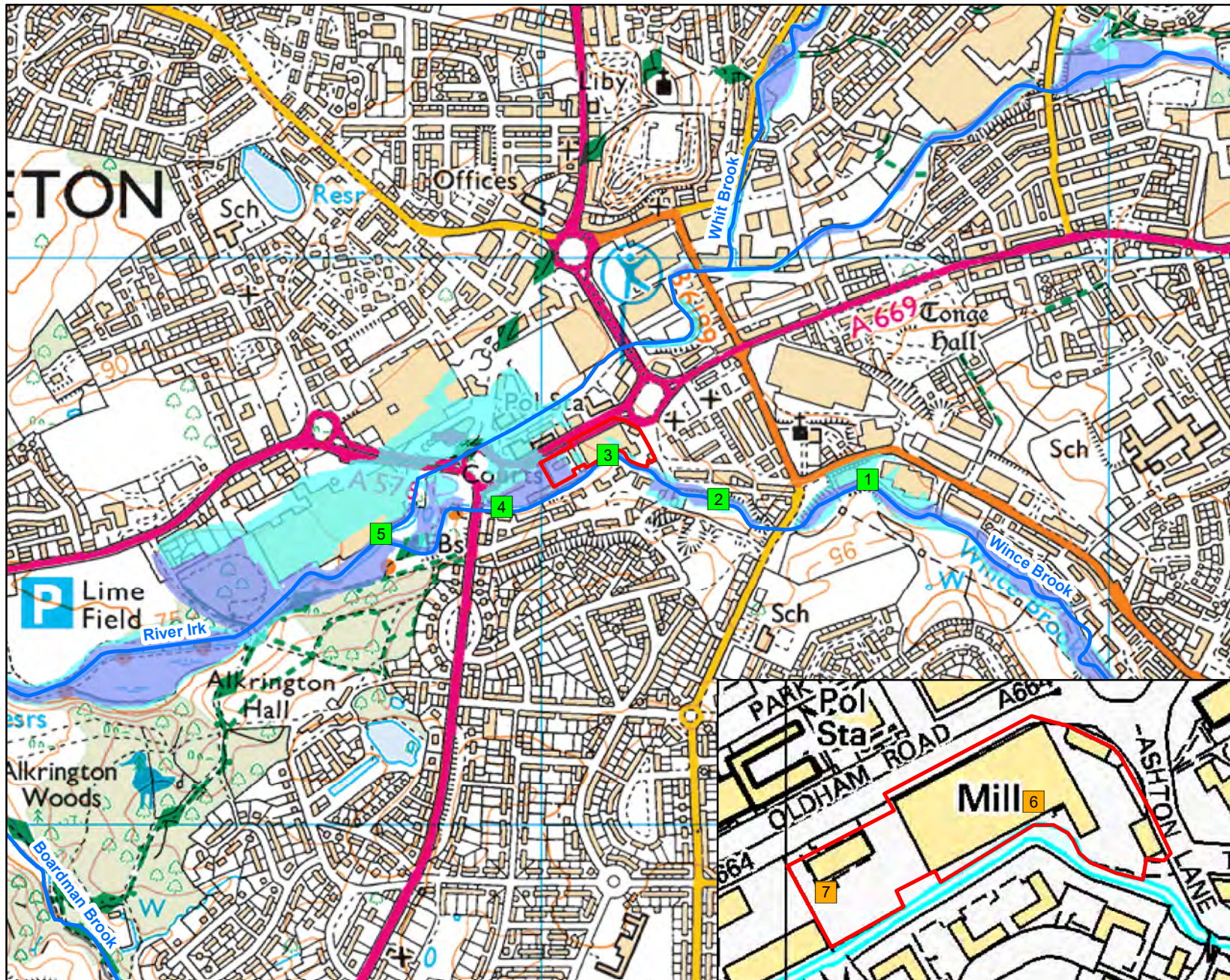
Yours sincerely

Jeni Templeman
Sustainable Places Advisor

e-mail SPPlanning.RFH@environment-agency.gov.uk

End

Detailed Flood Map centred on Oldham Road, Manchester, M24 1AZ. Created on 25/08/2021 [GMMC230610AB]



1:10,001



Legend

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

Undefended																
Map Reference	Model Node Reference	Easting	Northing	Data	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 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	ea013_0242_WINC01_01017	387578	405609	Modelled Water Level (m aodN)	81.08	81.28	81.55	81.66	82.05	82.39	82.67	83.51	83.57	84.35	83.44	84.86
				Modelled Flow (cumecs)	13.73	16.10	19.17	20.34	24.54	26.93	28.97	34.89	35.78	41.07	34.26	42.97
2	ea013_0242_WINC01_00711	387314	405576	Modelled Water Level (m aodN)	79.58	79.71	79.93	79.98	80.13	80.18	80.20	80.49	80.50	80.60	80.48	80.66
				Modelled Flow (cumecs)	14.02	16.46	19.64	20.84	25.14	26.41	27.26	39.40	39.71	42.75	39.22	46.46
3	ea013_0242_WINC01_00492	387120	405652	Modelled Water Level (m aodN)	78.55	78.70	78.87	78.94	79.13	79.18	79.21	79.44	79.44	79.54	79.43	79.57
				Modelled Flow (cumecs)	14.18	16.67	19.87	21.09	25.47	26.79	27.63	38.69	38.96	42.46	38.54	45.62
4	ea013_0242_WINC_00280i	386932	405560	Modelled Water Level (m aodN)	77.37	77.58	77.68	77.76	78.06	78.15	78.21	78.76	78.77	78.82	78.76	78.88
				Modelled Flow (cumecs)	14.33	16.86	20.05	21.14	24.07	25.00	25.60	32.50	32.61	35.12	32.64	36.87
5	ea013_0242_WINC01_00000	386721	405513	Modelled Water Level (m aodN)	75.56	75.56	75.56	75.56	75.56	75.56	75.56	75.56	75.56	75.56	75.56	75.56
				Modelled Flow (cumecs)	14.33	16.85	20.02	20.95	24.09	25.08	25.76	31.31	31.50	32.56	31.26	33.18

					Undefended						
Map Reference	Model Node Reference	Easting	Northing	Data	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)
6	2D Levels	387131	405673	Modelled Water Level (m aodN)							
				Modelled Flow (cumecs)			79.28	79.30	79.68	79.26	79.77
7		387020	405625	Modelled Water Level (m aodN)							
				Modelled Flow (cumecs)	78.73	78.75	78.88	78.95	78.93	78.94	79.05

Model data taken from Wince Brook 2017 Study

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum NewWyn

cumecs - cubic metres per second

Notes: Climate Change Scenario - 30%, 36% 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.

Appendix B

Groundwise Utilities Survey

GROUNDWISE

Groundwise Searches Ltd

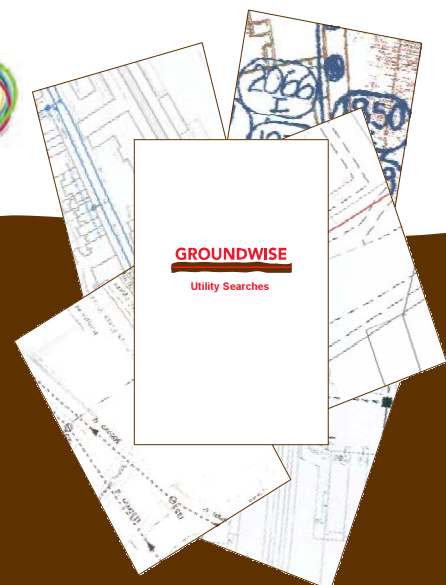


Groundwise Searches Limited

Suite 6, Princess Caroline House
1 High Street
Southend-on-Sea
Essex, SS1 1JE

Telephone 01702 615566
Email mail@groundwise.com
Website www.groundwise.com

Registered Office Address:
Matrix House, 12-16 Lionel Road
Canvey Island, Essex, England, SS8 9DE



GROUNDWISE

Groundwise Searches Ltd

Product	Desktop Utility Search (United Utilities - Sewers search)
Scope	PAS 128 – Level D

Groundwise Reference	29715JS
Site	Warwick Mills
Client	Chris Alcock
Company	RPS Environmental Management Ltd
Client Reference	Warwick Mills
Purchase Order	ST0810-00711

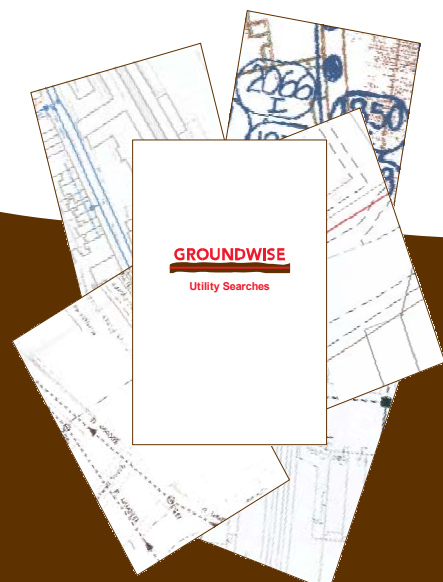


Researcher	Joe Shawyer jshawyer@groundwise.com
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Canvey Island, Essex, England, SS8 9DE



GROUNDWISE

Groundwise Searches Ltd

Groundwise Reference 29715JS

Site Warwick Mills

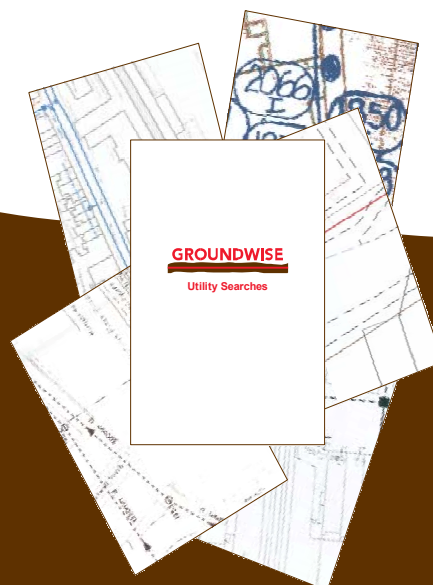
Version	Date Issued	Notes
#1	06/01/2022	Utility Report issued – complete (no results outstanding)

Groundwise Searches Limited

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Essex, SS1 1JE

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Website www.groundwise.com

Registered Office Address:
Matrix House, 12-16 Lionel Road
Canvey Island, Essex, England, SS8 9DE



GROUNDWISE



Groundwise Searches Ltd

Groundwise Reference 29715JS

Site Warwick Mills

Click on a Data Supplier to view their response

Type	Data Supplier	Date Sent	Assets in Area
Sewers	United Utilities	6/1	X



Water for the North West

Groundwise Searches Ltd

Suite 6, Princess Caroline House
1 High Street,
Southend on Sea, ESSEX
SS1 1JE

FAO:

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Your Ref: 29715JS
Our Ref: UUPS-ORD-355784
Date: 06/01/2022

Dear Sirs

Location: Warwick Mills

I acknowledge with thanks your request dated 05/01/2022 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,

A handwritten signature in black ink, appearing to read 'Karen McCormack', written over a light blue horizontal line.

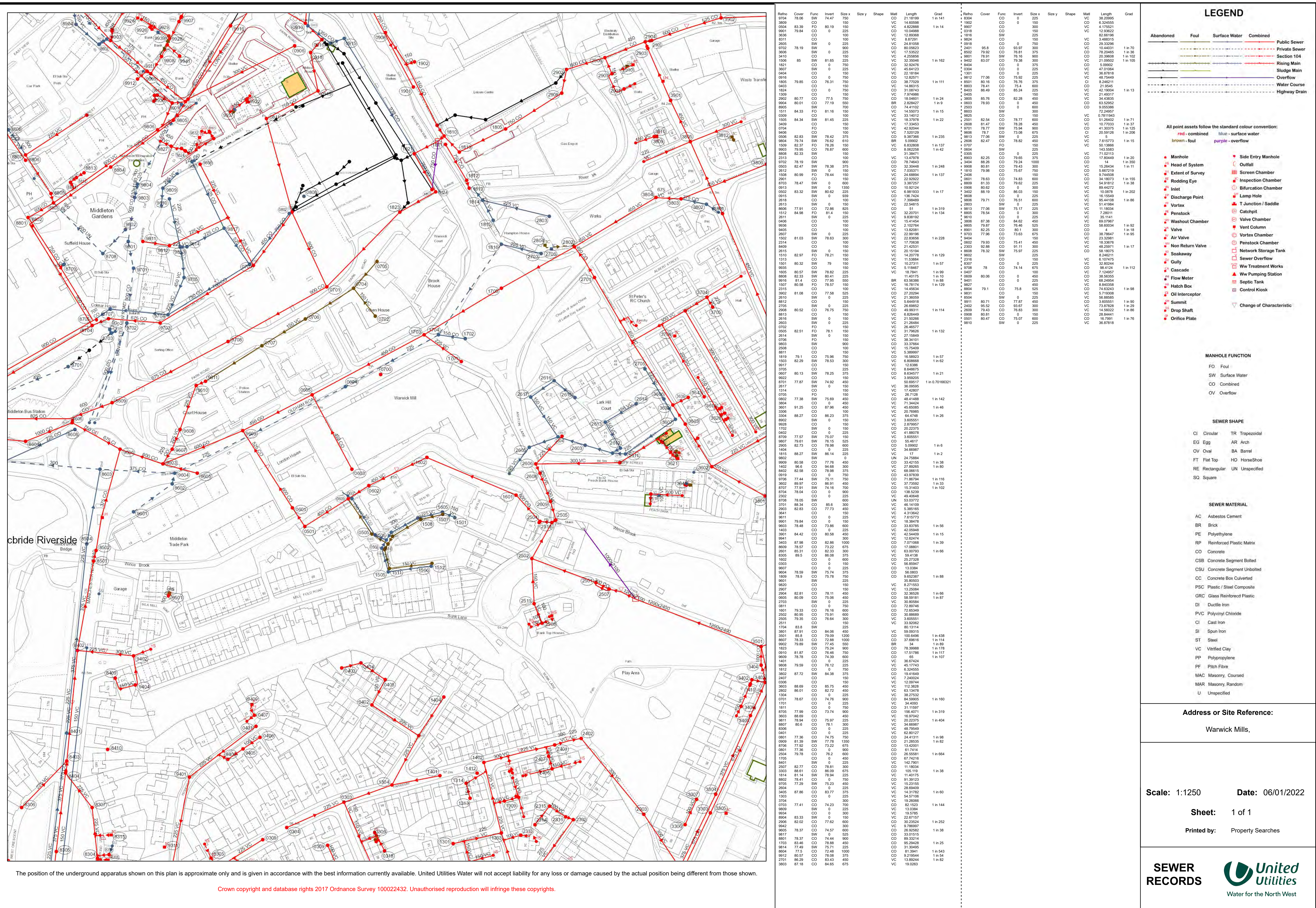
Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



GROUNDWISE

Groundwise Searches Ltd

Advice

1 Purpose of Utilities Report

The Utilities Report is intended to be for project planning and feasibility only. It is not suitable to be used for construction or excavation purposes. The existence of utilities on the plans does not imply that they are suitable in size, capacity, type or location for the project purpose. The Utility Companies should be contacted directly for clarification in this regard.

2 Compilation of the Utilities Report

The Utilities Report is a compilation of Utility Company record plans. These are obtained via application to the Utility Companies following a geographic search to determine which Companies are in a given area. The data is provided by the Utility Companies in a variety of formats including faxed plans, pdf files, digital drawing files and paper drawings. They are all converted to pdf files for inclusion in the report. The quality of the plans therefore varies. A quality assured process is followed for each report. This requires that it is checked at different stages during the process before being subjected to a final assessment prior to issue.

3 Limitations and Accuracy of the data

Each Utility Company has its own disclaimer statement in respect of the information they provide. They do not guarantee or provide a warranty for the data. The Utility Company disclaimers should be referred to when considering the accuracy and completeness of the data. Generally the plans provided are for guidance only and are not guaranteed to be up to date or to be a complete record of the Utility Company plant in a given area.

Some Utility Companies only show main utilities. Therefore service pipes or cables may not be shown on the plans but they may be present on the site.

Some Utility Companies state that the utilities may deviate from the route and position shown on the plans. Due to the time delay between installation of, or repair or upgrading of utilities and the subsequent updating of the Utility Companies plans, it should be noted that there could be utilities present that are not shown on the plans.

The exact position of the utilities should be verified by the use of suitable detecting devices and safe digging practices in accordance with HS(G)47. Further advice on the location of the utilities should be requested from the owner.

4 Completeness

Whilst every effort is made to locate all Utility Companies in a given area, due to the sensitive or restrictive nature of certain sites, the existence of redundant utilities, the emergence of new companies and the combining of, takeover or sale of existing Companies, we cannot guarantee to provide details on all utilities in a given area.

5 Date

Due to the Utility Companies plans being regularly changed and updated, the Utility Report is only valid at the time of production.

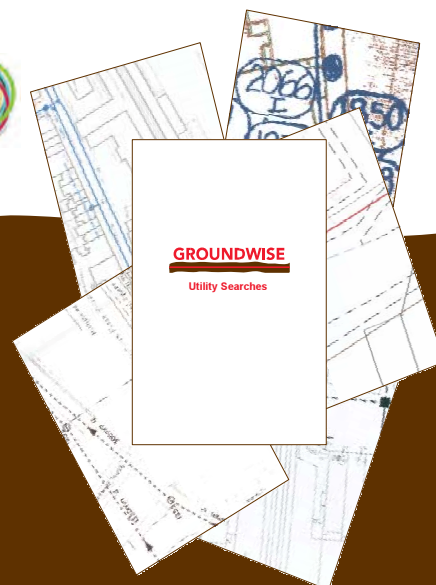


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Groundwise Searches Ltd Terms & Conditions

1. Definitions

"Client" means any company or other person or body placing an Order with Groundwise;
"Equipment" means pipes wires cables and other plant or equipment;
"Fee" means in relation to a Site of an area not exceeding the Standard Maximum Area the fee for carrying out a Search identified either on Groundwise website (where an Order is placed through the website) or on the Order Form where an Order is placed using an Order Form plus Value Added Tax and in relation to a Site of an area exceeding the Standard Maximum Area shall be such sum as shall be agreed between Groundwise and a Client plus Value Added Tax;
"Groundwise" means Groundwise Searches Limited;
"Order" means an order by a Client from Groundwise for the provision of a Search whether placed electronically through Groundwise's website or in paper form using an Order Form;
"Order Form" means Groundwise's current standard Utility Searches Order Form for placing an order for a Search in hard copy;
"Report" means a written report provided by Groundwise to a Client in response to an Order reflecting the results of Groundwise's enquiries of Utility Companies made on or before the date of the Report;
"Search" means making enquiries of the Utility Companies likely to have utilised or operated Equipment on a Site, as to the location of any Equipment on that Site following acceptance by Groundwise of an Order, and providing the Client with a Report;
"Site" means a site identified on a plan submitted with an Order which in relation to any Order placed electronically shall not exceed the Standard Maximum Area;
"Standard Maximum Area" means an area no greater than 15 hectares or of a length no greater than one kilometre and a width no greater than two hundred metres;
"Terms of an Order" means in the case of an Order placed electronically the information requested from a Client relating to a Site, the provisions relating to the method of payment, the information contained in or accessed through the tabs appearing on an Order Summary and all other applicable information contained in Groundwise's website and in the case of an Order placed in hard copy means the provisions of a completed Order Form.

2. Agreement

2.1 The Terms of an Order together with these Terms and Conditions constitute the terms of a contract ("Contract") between Groundwise and a Client for the carrying out of a Search.

2.2 A Contract shall come into effect when Groundwise notifies a Client that it has accepted an Order. Where such notification is by email it shall be deemed to have occurred as soon as Groundwise has sent the email to the Client, where such notification is by letter, upon the posting of the letter to the Client, or where there is a verbal acceptance when Groundwise verbally confirms acceptance of an Order to the Client.

3. Payment and Refunds

3.1 Other than in the case of Clients who have set up an account with Groundwise, when placing an Order a Client shall provide Groundwise with credit card details sufficient to enable Groundwise to debit that credit card with the Fee and by such notification and subject to accepting the relevant Order Groundwise is authorised to debit that credit card with the Fee.

3.2 In the case of Clients who have an account with Groundwise the Fee shall be paid within 30 days of the delivery of the Report.

3.3 Groundwise shall be entitled to terminate any account set up with it by a Client any time without notice and to require payment in accordance with paragraph 3.1.

3.4 Where a Client cancels an Order :

3.4.1 within three hours of that Order being accepted by Groundwise, Groundwise shall promptly refund the Fee paid plus Value Added Tax in full, or where no fee has been paid no fee shall be payable;

3.4.2 within three days but after the elapse of three hours of an Order being accepted by Groundwise, Groundwise shall promptly refund 50% of the Fee paid plus Value Added Tax or where no fee has been paid 50% of the fee plus Value Added Tax shall be payable and in either such case following such reimbursement or where no payment has been made upon making any payment due the relevant Contract shall terminate without further liability on the part of Groundwise or of the Client.

4. Limitation of Liability

4.1 Groundwise shall use its reasonable endeavours to provide a Search within the period referred to in the Order and shall not be liable for any delay arising because of any act omission or delay of any Utility Company.

4.2 Without limiting the liability of Groundwise in the case of death or personal injury Groundwise shall have no liability to a Client:

4.2.1 for the information contained in a Report to the extent that any errors or omissions reflect the errors or omissions of a Utility Company in providing or omitting to provide information to Groundwise and to the extent that that Utility Company has no liability to Groundwise in relation to the provision of such information, or the omission to provide relevant information;

4.2.2 in relation to any Report for loss or damage arising in relation to loss of profits, loss of business, loss of use, or any special indirect consequential or pure economic loss, costs, damages, charges or expenses and subject as earlier provided Groundwise's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation restitution or otherwise in relation to the performance or contemplated performance of the Services shall be limited £5,000,000.00.

4.2.3 In the absence of express written agreement to the contrary, Groundwise shall have no liability to any third party for any errors or omissions contained in or omitted from a Report.

5. Copyright

5.1 The copyright in the Report is the property of Groundwise and the Report may not be copied or reproduced in whole or in part nor communicated or divulged to any third party without the prior written consent of Groundwise save as set out below.

5.2 The Report may, without further charge, be made available to the owner of the Site at the date of the Report, their agents, consultants and professional advisors, any person who purchases the whole of the Site, any person who provides funding secured on the whole of the Site, and prospective buyers of the Site, and any of their respective agents, consultants and professional advisors. The Report may also be published on a local authority planning portal in relation to a proposed development of the site.

5.3 The provisions concerning liability in Clause 4 shall apply to any of the third parties mentioned above in the same manner as they do to the Client.

6. Data Protection

In processing any personal data received from a Client or potential Client, Groundwise will comply with its privacy policy a copy of which can be viewed at [address] on its website.

7. Force Majeure

Groundwise will have no liability to the Client if it is prevented from or delayed in performing its obligations under a Contract by acts events omissions or accidents beyond its reasonable control, including strikes, lock-outs and other industrial disputes, failure of a utility service or transport network, act of God, war, riot, civil commotion, malicious damage, compliance with any law or governmental order rule regulation or direction, accident, breakdown of plant or machinery, fire, flood, storm or default of suppliers or sub-contractors.

8. Severance

8.1 If any provision or part of any provision in these terms and conditions or of any Contract is found by any court or administrative body of competent jurisdiction to be invalid, unenforceable or illegal, the other provisions will remain force.

8.2 If any invalid, unenforceable or illegal provision would be valid, enforceable or legal if some of it were deleted that provision will apply with whatever modification is necessary to make it valid, enforceable and legal.

8.3 The parties agree, in the circumstances referred to in paragraph 8.1 above to attempt to substitute for any invalid, unenforceable or illegal provision a valid, enforceable and legal provision which achieves to the greatest extent possible the same effect as would have been achieved by the invalid, unenforceable or illegal provision.

9. Status of Pre-Contractual Statements

Each of the parties acknowledges and agrees that in entering into a Contract it does not rely on any undertaking, promise, assurance, statement, representation, warranty or understanding (whether in writing or not) of any person (whether party to these terms and conditions or not) relating to the subject matter of a Contract, provided that without prejudice to the generality of the foregoing, any revision to the Terms and Conditions agreed in writing by Groundwise and a Client or a potential Client (including any express written agreement relating to the assignment of copyright or licensing of all or part of the contents of a Report) shall apply to the Contract to which it has been agreed that it will apply.

10. Assignment

A Client shall not, without the prior written consent of Groundwise, assign transfer charge sub-contract or deal in any other matter with any of its rights under a Contract.

11. Third Party Rights

For the purposes of the Contracts (Rights of Third Parties) Act 1999 it is not intended that the rights of either of the parties shall be contractually enforceable by any third party.

12. Governing Law and Jurisdiction

These terms and conditions and any Contract are governing by and construed in accordance with the laws of England and Wales and the parties irrevocably agree that the courts of England and Wales shall have non-exclusive jurisdiction to settle any dispute or claim that arises out of or in connection with these terms and conditions or any Contract.

Rochdale Borough Council
By email

Your ref: 23/00795/FUL
Our ref: DC/23/3040
Date: 19-SEP-23

Dear Planning Team

Location : Warwick Mill Oldham Road Middleton M24 1AZ.

Proposal : Conversion and subdivision of Warwick Mill to 135 no. apartments (Use Class C3)

United Utilities wish to make the following comments regarding the proposal detailed above.

DRAINAGE

Noting this is a Full application, we request that the applicant provides a detailed drainage plan, and that United Utilities has the opportunity to review and comment on this plan PRIOR TO DETERMINATION of this application.

Should planning permission be granted without the provision of this information we request the following condition is attached to any subsequent Decision Notice:

CONDITION

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

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

(v) Foul and surface water shall drain on separate systems.

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

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

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

The applicant can discuss their drainage proposals with an **Engineer from our Developer Services team by email at SewerAdoptions@uuplc.co.uk**. Alternative ways to contact the team are detailed in the 'Contacts' section below.

Please note, United Utilities is not responsible for advising on rates of discharge to the local watercourse system. This is a matter for discussion with the Lead Local Flood Authority and / or the Environment Agency (if the watercourse is classified as main river).

The importance of Sustainable Drainage Systems (SuDS)

We strongly encourage all developments to include sustainable drainage systems to help manage surface water and to offer new opportunities for wildlife to flourish. We request that Local Planning Authorities and applicants do all they can to avoid surface water entering the public sewer. The flows that come from this surface water are very large when compared with the foul water that comes from toilets, showers, baths, washing machines, etc. It is the surface water that uses up a lot of capacity in our sewers and results in the unnecessary pumping and treatment of surface water at our pumping stations and treatment works. If new developments can manage flows through sustainable drainage systems that discharge to an alternative to the public sewer, it will help to minimise the likelihood of sewers spilling into watercourses and the flooding of homes and businesses.

Without effective management and maintenance, sustainable drainage systems can fail or become ineffective. We believe we have a duty to advise the Local Planning Authority of this potential risk to ensure the longevity of the surface water drainage system and the service it provides to people. We also wish to minimise the risk of a sustainable drainage system having a detrimental impact on the public sewer network should the two systems interact. We therefore recommend the Local Planning Authority include a condition in any subsequent Decision Notice regarding a management and maintenance regime for any sustainable drainage system that is included as part of the proposed development. The following may be a useful example.

Prior to occupation of the development a sustainable drainage management and maintenance plan for the lifetime of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum:

- a. *Arrangements for adoption by an appropriate public body or statutory undertaker, or, management and maintenance by a resident's management company; and*
- b. *Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.*

The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

Reason: To ensure that management arrangements are in place for the sustainable drainage system in order to manage the risk of flooding and pollution during the lifetime of the development.

Please note United Utilities cannot provide comment on the management and maintenance of an asset that is owned by a third party management and maintenance company and we would not be involved in the discharge of the management and maintenance condition in these circumstances.

Adoption and construction of drainage systems

If the applicant intends to offer wastewater assets forward for adoption by United Utilities, their proposed detailed design will be subject to a technical appraisal by our Developer Services team and must meet the requirements outlined in 'Sewerage Sector Guidance Appendix C – Design and Construction Guidance v2-2' dated 29 June 2022 or any subsequent iteration. This is important as drainage design can be a key determining factor of site levels and layout.

Acceptance of a drainage strategy does not infer that a detailed drainage design will meet the requirements for a successful adoption application. We strongly recommend that no construction commences until the detailed drainage design, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

UNITED UTILITIES PROPERTY, ASSETS AND INFRASTRUCTURE

Where United Utilities' assets cross the proposed red line boundary, developers must contact our Developer Services team prior to commencing any works on site, including trial holes, groundworks or demolition. Please see 'Contacts' section below.

Water pipelines

United Utilities will not allow building over or in close proximity to a water main.

Wastewater pipelines

United Utilities will not allow a new building to be erected over or in close proximity to a public sewer or any other wastewater pipeline. This will only be reviewed in exceptional circumstances.

Nb. Proposals to extend domestic properties either above, or in close proximity to a public sewer will be reviewed on a case by case basis by either by a building control professional or following a direct application to United Utilities (see our website for further details).

A number of public sewers cross the site and we will not allow building over them. We require an access strip for maintenance or replacement of each sewer and this access must not be compromised in any way. The minimum distances that might be acceptable to United Utilities are detailed within Part H of the Building Regulations however, we recommend the applicant determines the precise location, size, depth and condition of each pipeline as this is likely to influence the required stand-off distance from any structure.

Should the Council deem this application suitable for approval we request the following condition is included in the subsequent Decision Notice to afford appropriate protective measures for the wastewater asset:

CONDITION

No construction shall commence until details of the means of ensuring the 400mm and 600mm combined water sewer that is laid within the site boundary is protected from damage as a result of the development have been submitted to and approved by the Local Planning Authority in writing. The details shall outline the potential impacts from construction activities and the impacts post completion of the development on the 400mm and 600mm combined water sewer that crosses the site and identify mitigation measures to protect and prevent any damage to the pipeline both during construction and post completion of the development. Any mitigation measures shall be implemented in full in accordance with the approved details.

Reason: In the interest of public health and safety and to ensure protection of essential services.

REQUEST FOR INFORMATION PRIOR TO DETERMINATION

Following our review of the proposed site layout, we have concerns regarding the proximity of proposed development to our wastewater asset(s). To resolve this matter, and to avoid any unnecessary costs or delays to either the applicant or any future developer, we request the applicant submits a detailed site layout plan which overlays the proven location of the sewer in relation to any proposed development (including walls, fencing, parking etc.). Without this information we are unable to provide further comment and there is a risk that as the scheme progresses, the applicant, or any subsequent developer, may discover that their plans are not implementable in their existing form. Therefore, we strongly recommend this matter is resolved **PRIOR TO DETERMINATION**. The applicant should contact our Developer Services team to discuss. See Contacts Section below.

Important information regarding water and wastewater pipelines and apparatus

It is the applicant's responsibility to investigate and demonstrate the exact relationship between United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service, including United Utilities (see '*Contacts*' section below). The position of the underground apparatus shown on water and wastewater asset maps is approximate only and is given in accordance with the best information currently available. Therefore, we strongly recommend the applicant, or any future developer, does not rely solely on the asset maps to inform decisions relating to the detail of their site and instead investigates the precise location of any underground pipelines and apparatus. Where additional information is requested to enable an assessment of the proximity of proposed development features to United Utilities assets, the proven location of pipelines should be confirmed by site survey; an extract of asset maps will not suffice. The applicant should seek advice from our Developer Services team on this matter. See '*Contacts*' Section below. United Utilities Water will not accept liability for any loss or damage caused by the actual position of our assets and infrastructure being different from those shown on asset maps.

Developer's should investigate the existence and the precise location of water and wastewater pipelines as soon as possible as this could significantly impact the preferred site layout and/or diversion of the asset(s) may be required. Unless there is specific provision within the title of the property or an associated easement, any necessary disconnection or diversion of assets to accommodate development, will be at the applicant/developer's expense. In some circumstances, usually related to the size and nature of the assets impacted by proposals, developers may discover the cost of diversion is prohibitive in the context of their development scheme.

Any agreement to divert our underground assets will be subject to a diversion application, made directly to United Utilities. This is a separate matter to the determination of a planning application. We will not guarantee, or infer acceptance of, a proposed diversion through the planning process (where diversion is indicated on submitted plans). In the event that an application to divert or abandon underground assets is submitted to United Utilities and subsequently rejected (either before or after the determination of a planning application), applicants should be aware that they may need to amend their proposed layout to accommodate United Utilities' assets.

Where United Utilities' assets exist, the level of cover to United Utilities pipelines and apparatus must not be compromised either during or after construction and there should be no additional load bearing capacity on pipelines without prior agreement from United Utilities. This would include sustainable drainage features, earth movement and the transport and position of construction equipment and vehicles.

Any construction activities in the vicinity of United Utilities' assets, including any assets or infrastructure that may be located outside the applicant's red line boundary, must comply with national building and construction standards and where applicable, our '*Standard Conditions for Works Adjacent to Pipelines*', a copy of which is available on our website. The applicant, and/or any subsequent developer should note that our '*Standard Conditions*' guidance applies to any design and construction activities in close proximity to water pipelines and apparatus that are no longer in service, as well as pipelines and apparatus that are currently operational.

It is the applicant's responsibility to ensure that United Utilities' required access is provided within any proposed layout and that our infrastructure is appropriately protected. The developer would be liable for the cost of any damage to United Utilities' assets resulting from their activity.

WATER AND WASTEWATER SERVICES

If the applicant intends to receive water and/or wastewater services from United Utilities they should visit our website or contact the Developer Services team for advice at the earliest opportunity. This includes seeking confirmation of the required metering arrangements for the proposed development. See '*Contacts*' Section below.

If the proposed development site benefits from existing water and wastewater connections, the applicant should not assume that the connection(s) will be suitable for the new proposal or that any existing metering arrangements will suffice. In addition, if reinforcement of the water network is required to meet potential demand, this could be a significant project and the design and construction period should be accounted for.

In some circumstances we may require a compulsory meter is fitted. For detailed guidance on whether the development will require a compulsory meter please visit <https://www.unitedutilities.com/my-account/your-bill/our-household-charges-20212022/> and go to section 7.7 for compulsory metering.

To promote sustainable development United Utilities offers a reduction in infrastructure charges for applicant's delivering water efficient homes and draining surface water sustainably (criteria applies). For further information, we strongly recommend the applicant visits our website when considering any water or wastewater design <https://www.unitedutilities.com/builders-developers/your-development/planning/building-sustainable-homes/>

Business customers can find additional information on our sustainable drainage incentive scheme at <https://www.unitedutilities.com/Business-services/retailers/incentive-schemes/>

To avoid any unnecessary costs and delays being incurred by the applicant or any subsequent developer, we strongly recommend the applicant seeks advice regarding water and wastewater services, and metering arrangements, at the earliest opportunity. Please see '*Contacts*' Section below.

CONTACTS

Website

For detailed guidance on water and wastewater services, including application forms and the opportunity to talk to the Developer Services team using the '**Live Chat**' function, please visit:

<http://www.unitedutilities.com/builders-developers.aspx>

Email

For advice on water and wastewater services or to discuss proposals near to pipelines, email the Developer Services team as follows:

Water mains and water supply, including metering - DeveloperServicesWater@uuplc.co.uk

Public sewers and drainage - SewerAdoptions@uuplc.co.uk

Telephone - 0345 072 6067

Property Searches (for asset maps):

A number of providers offer a paid for mapping service including United Utilities. For more information, or to purchase a sewer and water plan from United Utilities, please visit <https://www.unitedutilities.com/property-searches/>

Water and sewer records can be viewed for free at our Warrington Head Office by calling 0370 751 0101. Appointments must be made in advance. Public sewer records can be viewed at local authority offices. Arrangements should be made directly with the local authority.

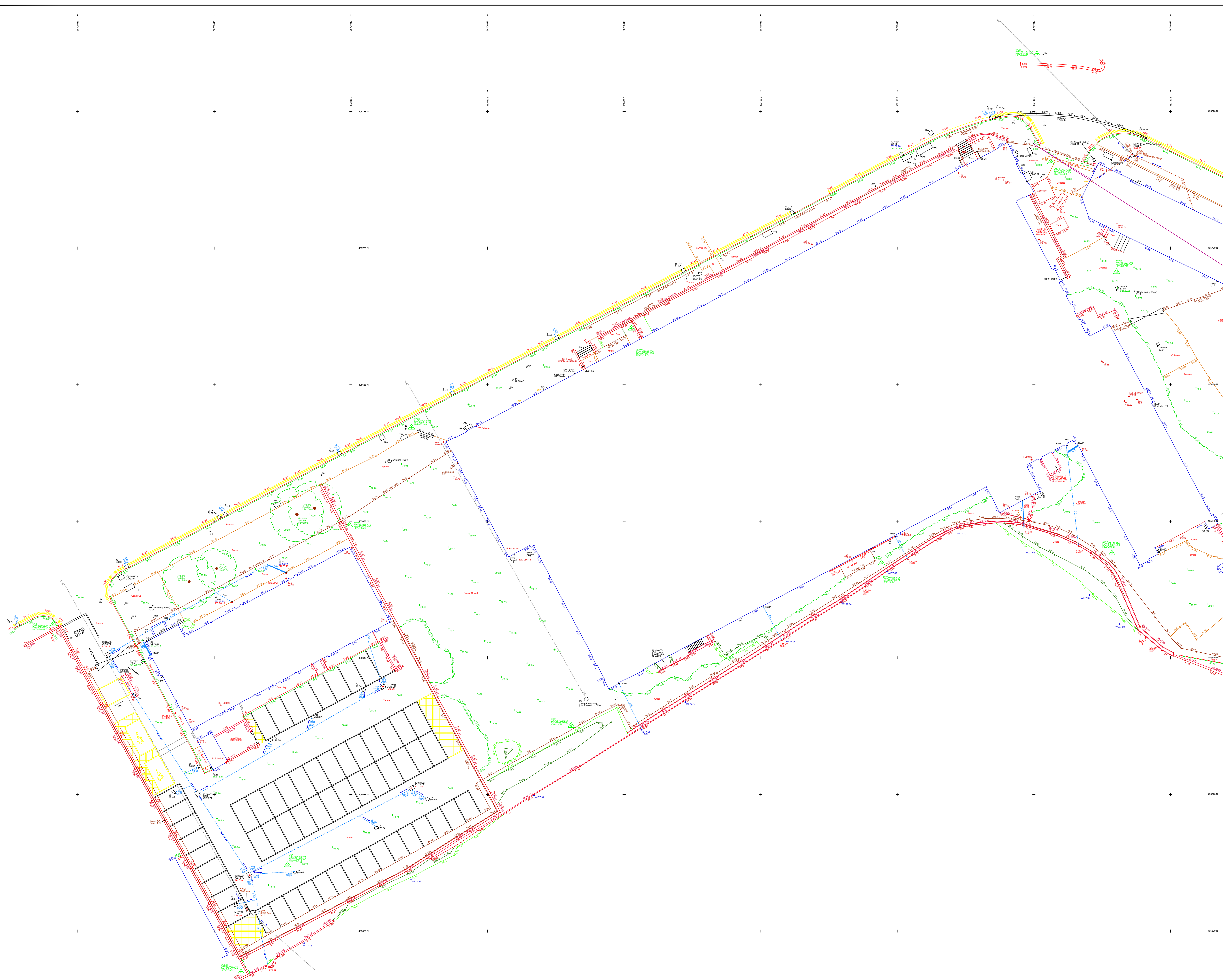
We request that a copy of this letter is made available to the applicant.

Yours faithfully

The Planning, Landscape and Ecology Team

Appendix C

RPS Utilities Survey

[illegible]

Project Information

Site Name	Warwick Mills, Middleton		Site No.	UAQ3603	
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	FW01

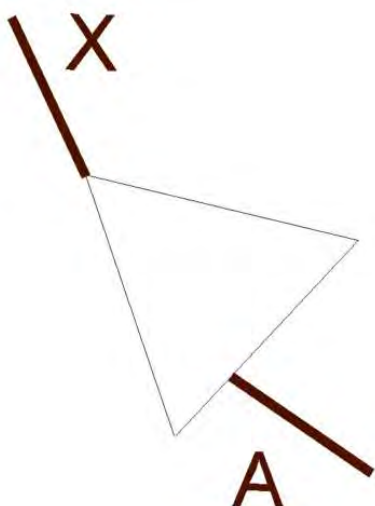
Project Information

Eastings	387024.769	Northings	405603.267	MH Cover Level	78.71
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Hinged	No	Man Entry Required?	No	Cover Shape	Triangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Foul Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	600 apx	3.72	74.99	UTT - Unable to Sonde	
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	600 apx	3.81	74.90	Road	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	Not able to trace Incoming A pipe due to flow/volume of water.
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Project Information



Site Name	Warwick Mills Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	FW02

Project Information

Eastings	387210.154	Northings	405640.799	MH Cover Level	82.16
Hinged	Yes	Man Entry Required?	No	Cover Shape	Square
Padlocked	No	Cover Type	Heavy	Cover Material	Steel

Service Information

Drainage Type	Foul Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	150	2.39	79.77	Capped	
B	150	3.23	78.93	UTS	
C	100	0.92	81.24	Silted	
D	300	2.54	79.62	OSA	
E	300	1.77	80.39	OSA	
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	NVP			NVP	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber

Comments	Manhole flooded, No visible X pipe
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Project Information



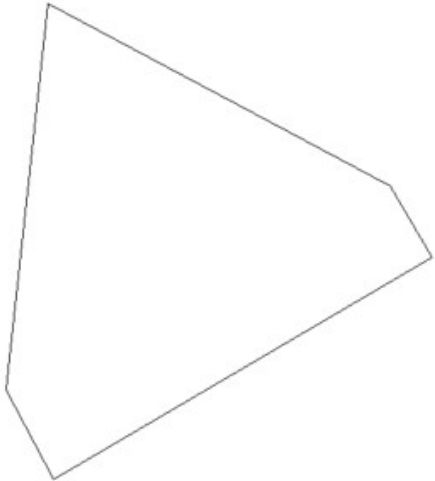
Site Name	Warwick Mills, Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	MH01

Project Information

Eastings	387020.656	Northings	405660.609	MH Cover Level	79.34
Hinged	No	Man Entry Required?	No	Cover Shape	Triangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Unknown				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A					
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X					
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	Unable to raise due to constant flow of traffic in the road.
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Project Information

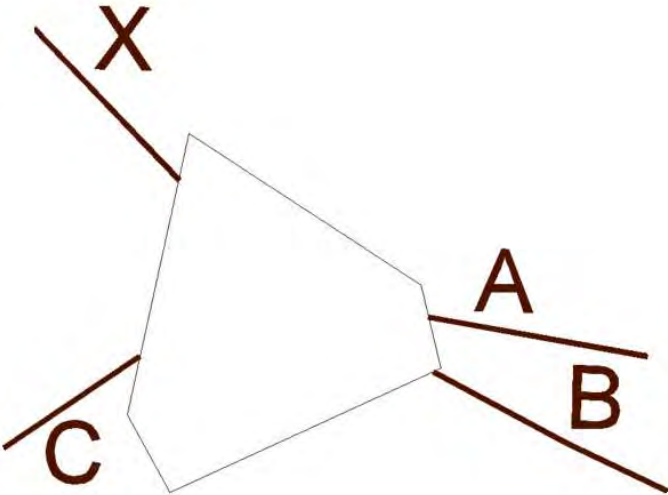
Site Name	Warwick Mills, Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	MH02

Project Information

Eastings	387154.384	Northings	405713.588	MH Cover Level	84.25
Hinged	No	Man Entry Required?	No	Cover Shape	Triangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Unknown			
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity
A	300	2.68	81.57	UTT - Poss Back Drop
B	150	1.35	82.90	Building
C	300	2.64	81.61	EOT
D				
E				
F				
G				
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity
X	300	2.75	81.50	OSA
Y				
Z				

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	Stats Suggest Combined, Unable to confirm connectons
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Project Information



Site Name	Warwick Mills, Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW06

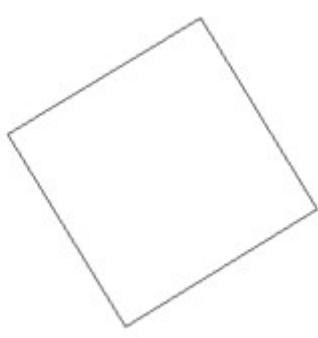
Project Information

Eastings	387208.241	Northings	405648.166	MH Cover Level	82.54
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Hinged	Yes	Man Entry Required?	No	Cover Shape	Square
Padlocked	No	Cover Type	Heavy	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	UTS			UTS	
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	UTS			Brook	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	Unable to raise frame broken and loose
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Project Information



Site Name	Warwick Mills, Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW01

Project Information

Eastings	387025.114	Northings	405608.259	MH Cover Level	78.72
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Hinged	No	Man Entry Required?	No	Cover Shape	Rectangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	225	1.20	77.52	SW03	
B	150	1.16	77.56	SW02	
C	100	1.08	77.64	Gully	
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	225	1.22	77.50	Discharges Into the Brook	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber

Comments	
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Project Information

Site Name	Warwick Mills, Middleton			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW02

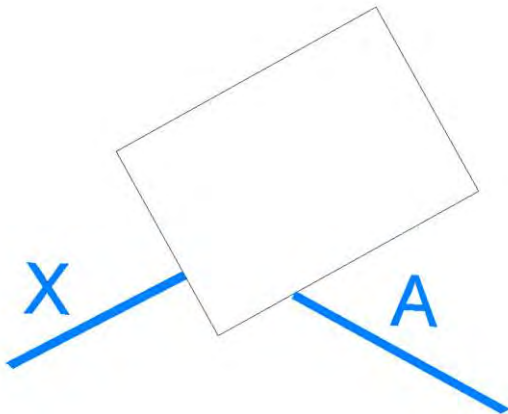
Project Information

Eastings	387048.879	Northings	405620.959	MH Cover Level	78.71
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Hinged	No	Man Entry Required?	No	Cover Shape	Rectangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	100	0.76	77.95	Gully	
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	150	0.82	77.89	SW01	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	
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Project Information



Site Name	Warwick Mills, Middleton		Site No.	UAQ3603	
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW03

Project Information

Eastings	387017.519	Northings	405620.144	MH Cover Level	78.71
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Hinged	No	Man Entry Required?	No	Cover Shape	Rectangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	150			SW05	
B	150			SW04	
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	225			SW01	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber

Comments	Unable to raise, Cover Cracked
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Project Information



Site Name	Warwick Mills, Middleton		Site No.	UAQ3603	
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW04

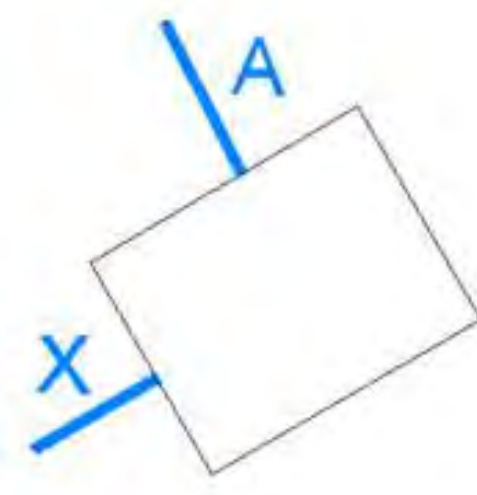
Project Information

Eastings	387044.699	Northings	405635.783	MH Cover Level	78.79
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Hinged	No	Man Entry Required?	No	Cover Shape	Rectangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	100	0.70	78.09	Building - Poss Internal RWP	
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	150	0.73	78.06	SW03	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	
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Project Information

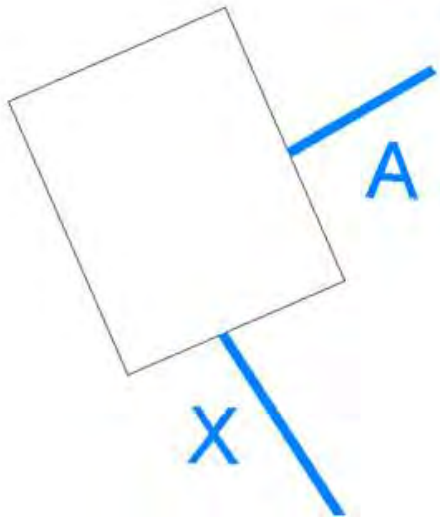
Site Name	Warwick Mills			Site No.	UAQ3603
Surveyor	JS	Date	10/Jan/2022	Manhole Ref.	SW05

Project Information

Eastings	387004.454	Northings	405640.491	MH Cover Level	78.71
Hinged	No	Man Entry Required?	No	Cover Shape	Rectangular
Padlocked	No	Cover Type	Medium	Cover Material	Steel

Service Information

Drainage Type	Surface Water				
Incoming Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
A	100	0.56	78.15	End Of Trace	
B					
C					
D					
E					
F					
G					
Outgoing Pipes	Size (mm) Ø	Invert Depth from Cover Level (m)	Reduced Invert Level (m)	Manhole Connectivity	
X	150	0.60	78.11	SW03	
Y					
Z					

Chamber Sketch (Orientated to North)	Manhole Chamber
	

Comments	
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Appendix D

Local Authority Response

Tamsin Jones

From: Laura Precious <Laura.Precious@Rochdale.Gov.UK>
Sent: 13 July 2023 11:00
To: Tamsin Jones
Cc: Francis Comyn; Sarah Parkington; Stephen McCann
Subject: RE: INT-639745-M0F0P2: Warwick Mill, Middleton (Response due 03/08/2023)

CAUTION: This email originated from outside of RPS.

Hi Tamsin

As set out in Stephen's email below, as LLFA, we do not hold any specific records of flood events at this site.

Please note that whilst we have no records of flooding at this site, this is not to suggest that there has not been flooding in the past, especially if these events have gone unreported due to the unoccupied nature of the site. So whilst our records do not show any incidents, we cannot confirm categorically that the site has not experienced flooding (and what area any such flood may have covered). You will appreciate that reports of flooding to us, as LLFA, are generally only made where there is a direct human impact.

The flood risk of an area for rivers and the sea, surface water, reservoirs and groundwater (where available) is findable via the EA flood risk service [here](#).

As Stephen has suggested, the EA and UU will be best placed to provide any modelled data, including historic flood outlines. Datasets, last updated in June 2023 are available directly from the EA [here](#).

Please also refer to the SFRA mapping and documents sent to you via download link last week for any further information on the Wince Brook.

Many thanks

Laura

Laura Precious
Principal Planning Officer
Planning & Development



 01706 924381
 07975 231656
 laura.precious@rochdale.gov.uk

Rochdale Borough Council
Floor 3, Number One Riverside
Smith Street, Rochdale, OL16 1XU

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Please consider the environment before printing this email.

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Sent: 13 July 2023 08:46
To: Tamsin.Jones@rpsgroup.com

Cc: Francis Comyn <Francis.Comyn@Rochdale.Gov.UK>; Laura Precious <Laura.Precious@Rochdale.Gov.UK>; Sarah Parkington <Sarah.Parkington@Rochdale.Gov.UK>

Subject: RE: INT-639745-MOFOP2: Warwick Mill, Middleton (Response due 03/08/2023)

Hello Tamsin,

I received your email (below). Within my section, we have no record of flooding in this area. Laura Precious will advise whether her dept. has flooding records of this area.

The EA flood risk for this areas – see appended screenshot – shows that part of the site lies within Flood zone 3. United Utilities have records of public sewers; there is a 450mm dia combined sewer and a 225mm dia. surface water sewer in Oldham Rd.

For more information, you will need to contact the EA and UU.

Stephen McCann

Drainage & Flooding Engineer

Network Improvement/Development/Flooding



☎ 01706 924606

📠 07552 570262

✉ stephen.mccann@rochdale.gov.uk

Rochdale Borough Council

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Smith Street, Rochdale, OL16 1XU

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Please consider the environment before printing this email.

From: Francis Comyn <Francis.Comyn@Rochdale.Gov.UK>

Sent: 11 July 2023 15:28

To: Laura Precious <Laura.Precious@Rochdale.Gov.UK>; Sarah Parkington <Sarah.Parkington@Rochdale.Gov.UK>; Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>

Subject: FW: INT-639745-MOFOP2: Warwick Mill, Middleton (Response due 03/08/2023)

Hi

Can you co-ordinate a combined response please via Laura?

Cheers

Fran

Francis Comyn

Service Manager Strategic Planning

Planning & Development



☎ 01706 924353

📠 07976 059367

 francis.comyn@rochdale.gov.uk

Rochdale Borough Council
Floor 3, Number One Riverside
Smith Street, Rochdale, OL16 1XU

Request details:

From: Tamsin.Jones@rpsgroup.com

Sent: Thursday, July 6, 2023 8:56 AM

To: council@rochdale.gov.uk

Subject: FW: Flood data - Warwick Mill, Middleton

Good Morning,

I am looking to obtain some further details regarding flooding for a site located at Warwick Mill, Oldham Rd, Middleton, Manchester M24 1AZ.

Can you please forward my email on to the relevant team?

The site is within flood zone 3.

We would like to request:

1. Any information on the Wince Brook, including flood modelled data (if available), flood defences, flood history etc.
2. Details of any groundwater flooding issues in the area
3. Details of any sewerage flood risk at the site.
4. Details of any other (reservoir, Canal etc) flood risk at the site.

Many thanks,

Tamsin

Tamsin Jones(She/Her)
Senior Consultant - Hydrology
RPS | Consulting UK & Ireland
6-7 Lovers Walk
Brighton, East Sussex BN1 6AH, United Kingdom
T +44 1273 546 800

D +44 1273 856 061

E tamsin.jones@rpsgroup.com

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Jessica Grady

From: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>
Sent: 26 August 2023 07:48
To: Ryan Killeen (He/Him)
Subject: Drainage Consultation Ref: 23/00795/FUL
Attachments: UU safedig plans- vicinity of Warwick Mill.jpg

Hi Ryan,

I looked at the information submitted i.e. proposed site plan and Flood Risk Assessment (a large document).

I note that a drainage survey has been undertaken – it is in the Appendices of the FRA. However, this appendices doesn't explain whether the current building's roof drainage is connected to combined sewer or the culverted watercourse – shown as blue dashed line on appended UU safedig plans. The Applicant should have investigated this. A sustainable drainage plan will require roof drainage to be connected to this culvert rather than combined sewer. The re-development should also include some mitigation/ reduction in discharge of surface water from the site. These measures should be provided in a Drainage Strategy.

I wasn't able to find a Drainage Strategy, which is normal for a site with such a large number of apartments. Has one been submitted? I can't complete a Drainage Consultation until one has been submitted.

Stephen McCann

Drainage & Flooding Engineer
Network Improvement/Development/Flooding



 01706 924606

 07552 570262

 stephen.mccann@rochdale.gov.uk

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From: ryan.killeen@rochdale.gov.uk <ryan.killeen@rochdale.gov.uk>

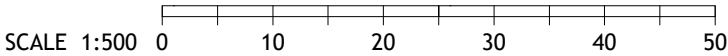
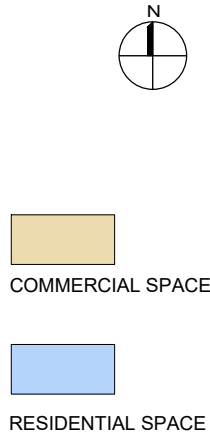
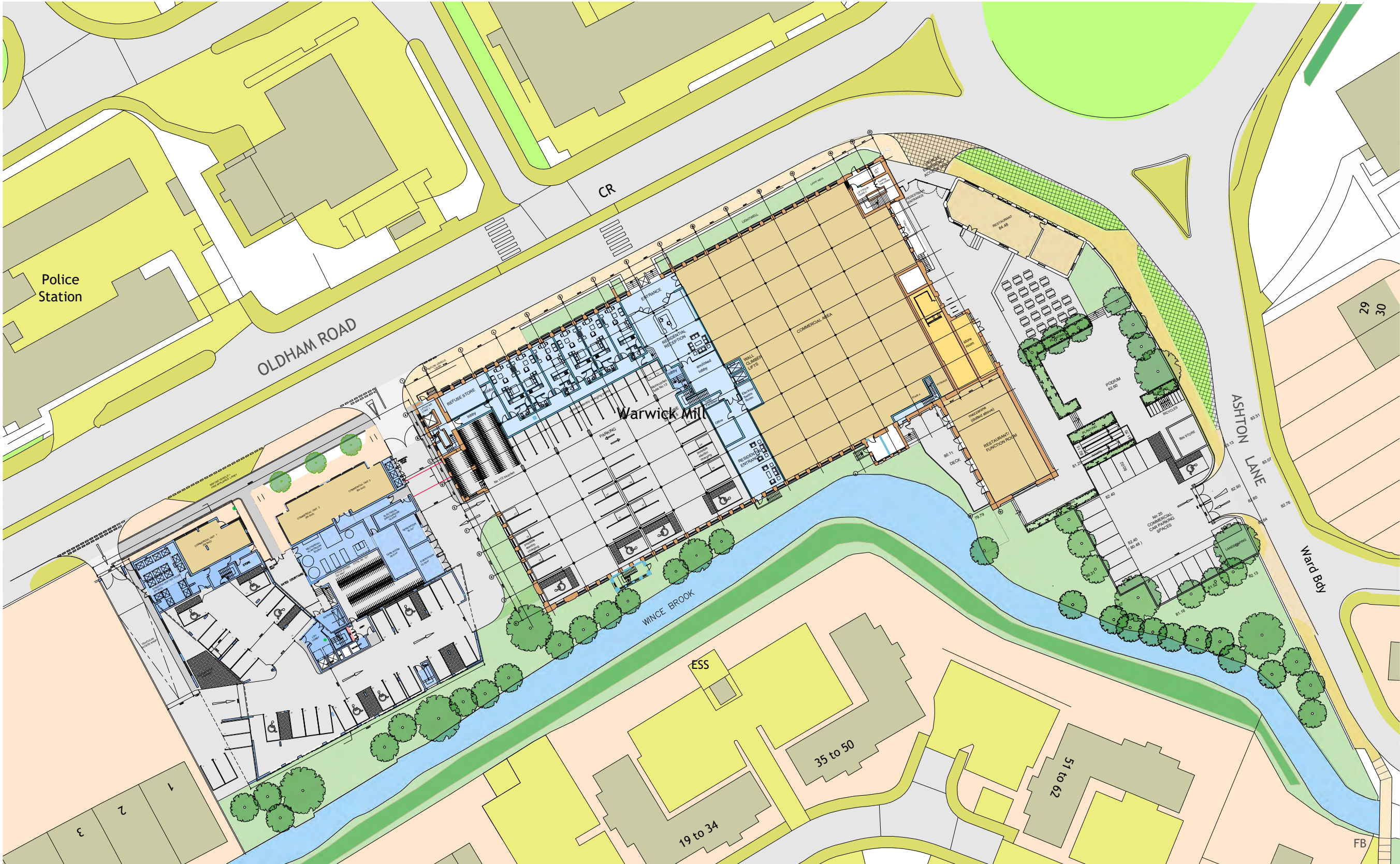
Sent: 10 August 2023 14:04

To: Stephen McCann <Stephen.McCann@Rochdale.Gov.UK>

Subject: Consultation Letter for Planning Application Ref: 23/00795/FUL:Please see attached letter

Appendix E
Topographic Survey

Appendix F
Development Plans



- Notes :
- Dimensions are to be checked on site before fabrication and construction
 - Any discrepancies are to be immediately notified to the architects
 - Structural measurements are to be taken from the structural engineers drawings
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DRAWING ISSUE STATUS

PLANNING

Project
WARWICK MILL
MIDDLETON
MANCHESTER

Client
KAM LEI FONG LTD

Drawing
Warwick Mill Development
Site Plan Lower Ground Floor

Scale	Date	Drawn	Checked
1:500@A2	June 23	SJS	IL

Type	Client	
01	277/01	WM EH 010

REV	DESCRIPTION	DATE
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SCALE 1:500 0 10 20 30 40 50

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DRAWING ISSUE STATUS
PLANNING

Project
**WARWICK MILL
MIDDLETON
MANCHESTER**

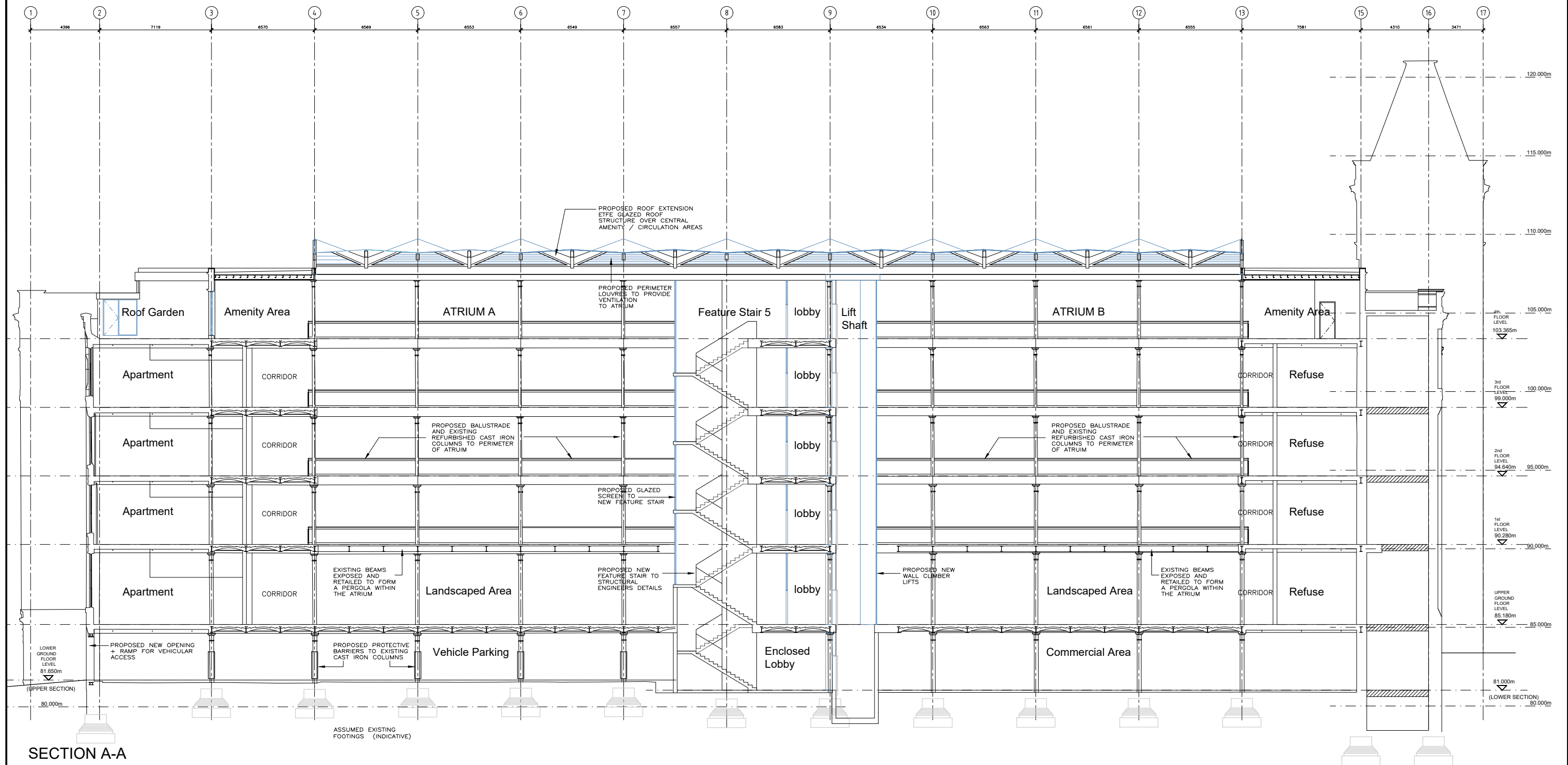
Client
KAM LEI FONG LTD

Drawing
**Warwick Mill Development
Site Plan Upper Ground Floor**

Scale	Date	Drawn	Checked
1:500@A2	Sep '21	SJS	IL

Type	Client	
01	277/01	WM EH 011

REV	DESCRIPTION	DATE
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DRAWING ISSUE STATUS

PLANNING

Project

WARWICK MILL
MIDDLETON MANCHESTER

Client

KAM LEI FONG LTD

	Drawing
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PROPOSED
SECTION A-A

	Scale
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1:250 @ A3

Date	
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June 23

Drawn

MD

Checked

IL

Type

01

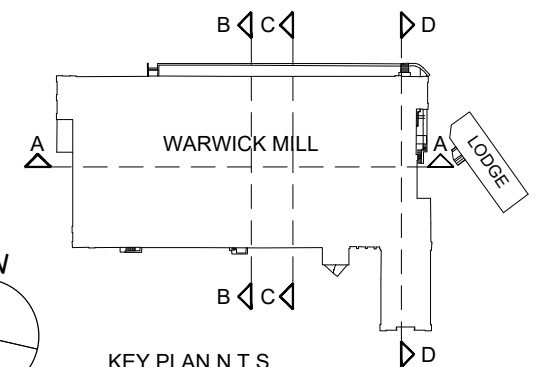
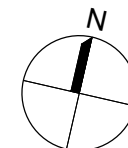
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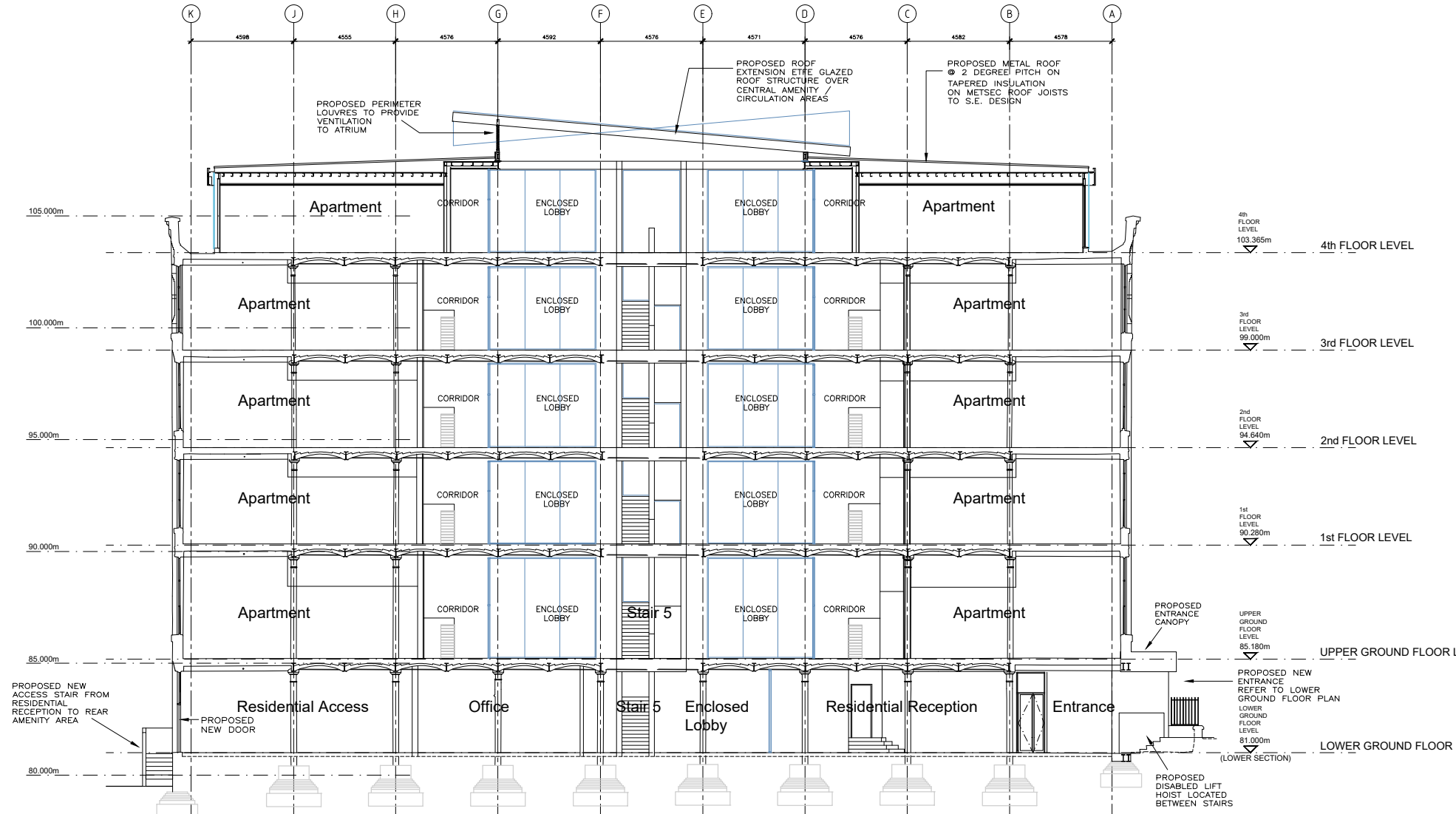
277-01

Drawing No

WM PA-201

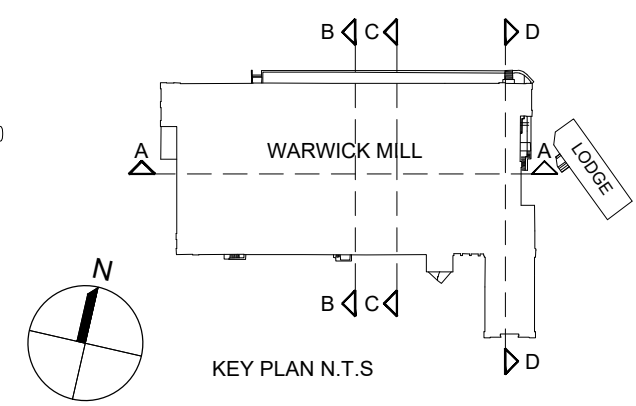
Revision



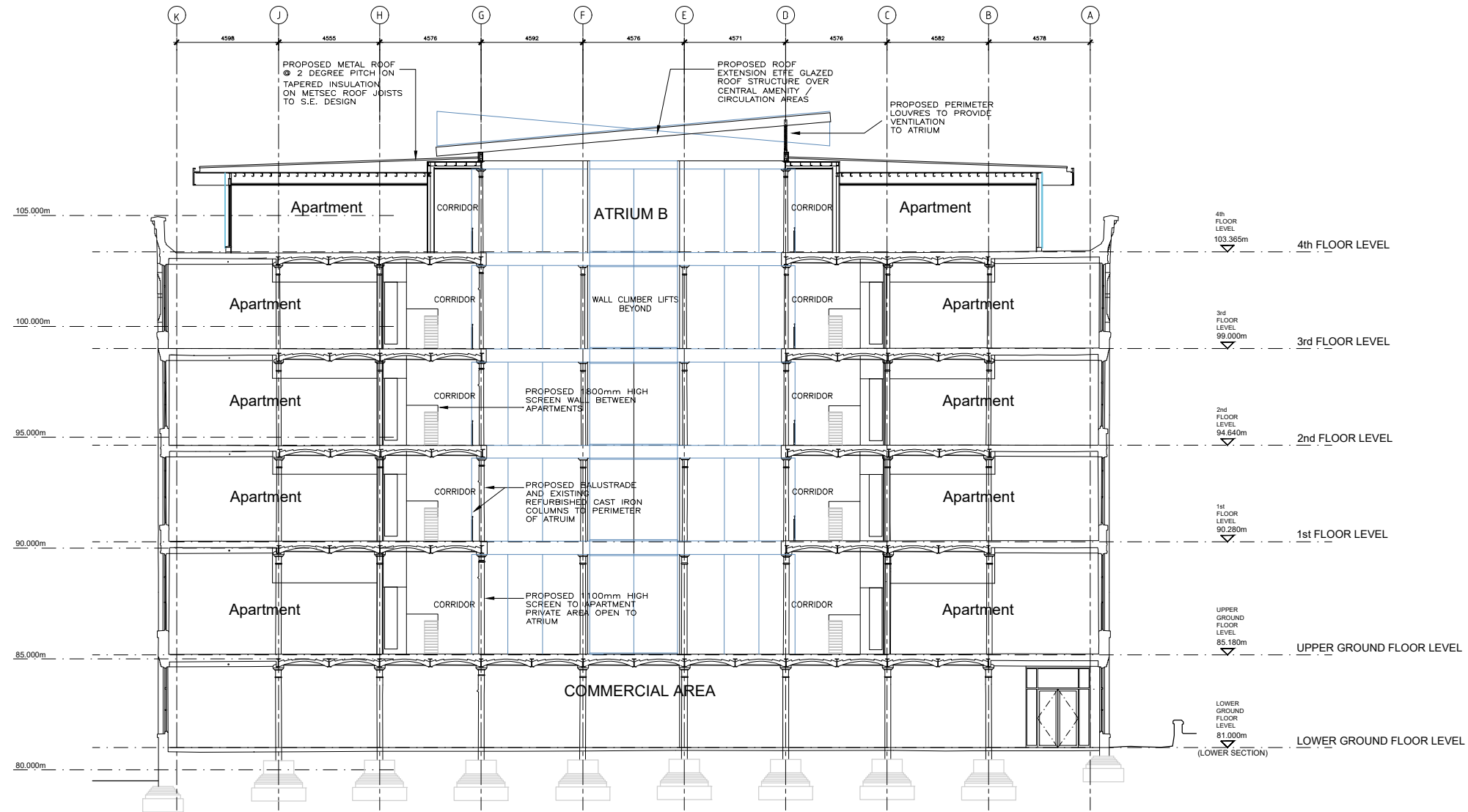


SECTION B-B

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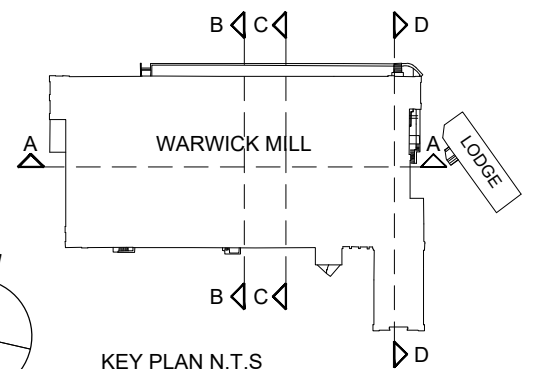
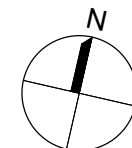
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		Project WARWICK MILL MIDDLETON MANCHESTER	Drawing PROPOSED SECTION B-B	Type 01	Client 277-01	Drawing No WM PA-202	Revision



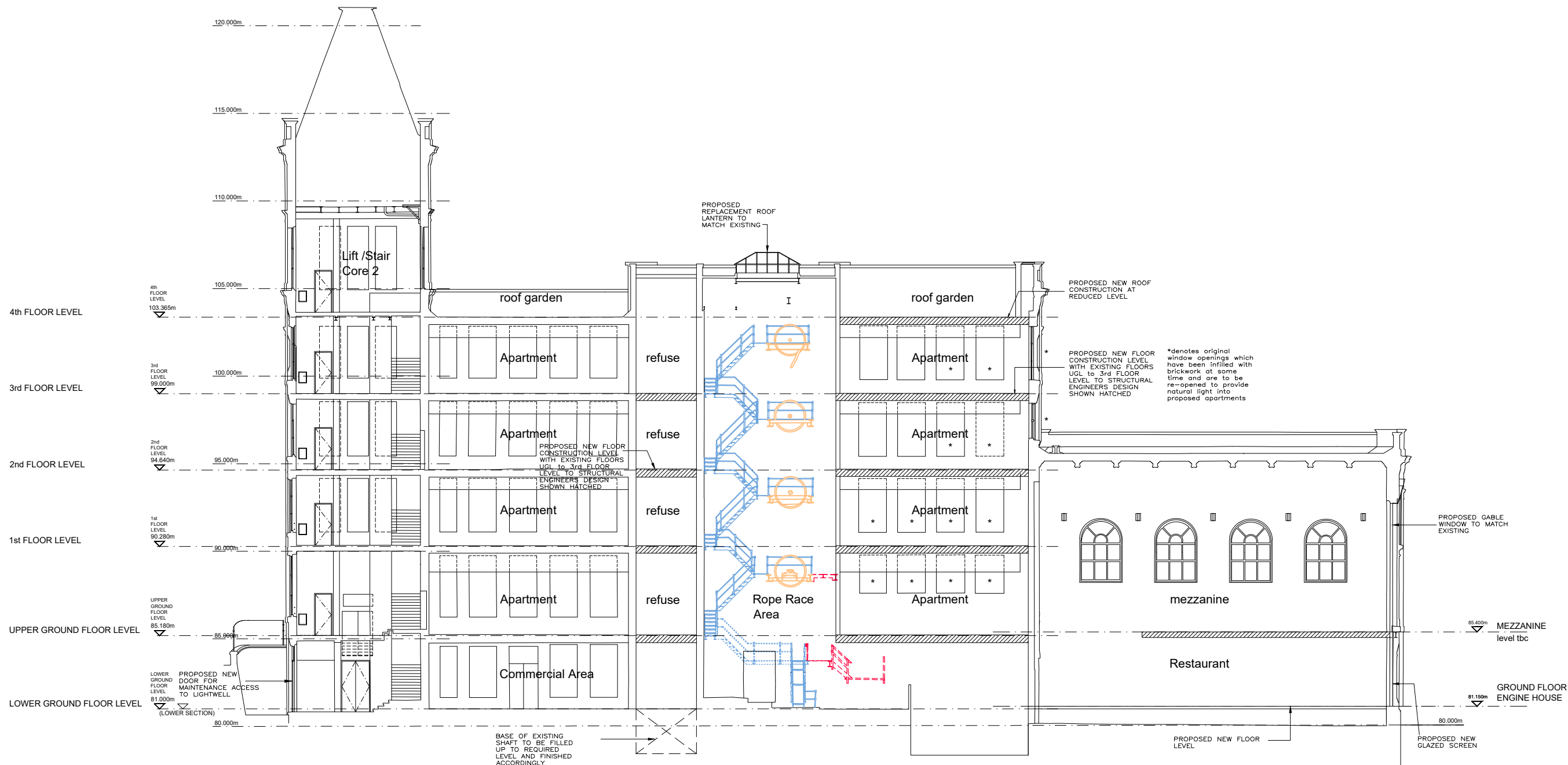
SECTION C-C

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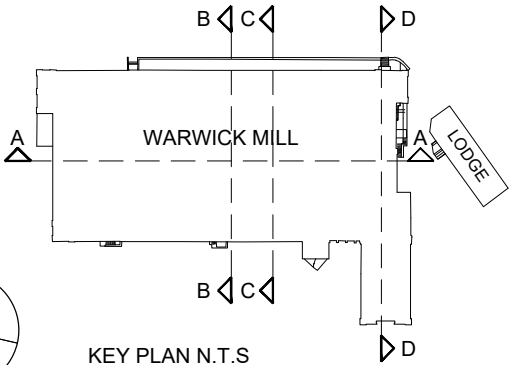
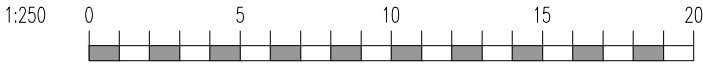


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			PLANNING		KAM LEI FONG LTD	1:250 @ A3	June 23	MD	IL
			Project		Drawing	Type	Client	Drawing No	Revision
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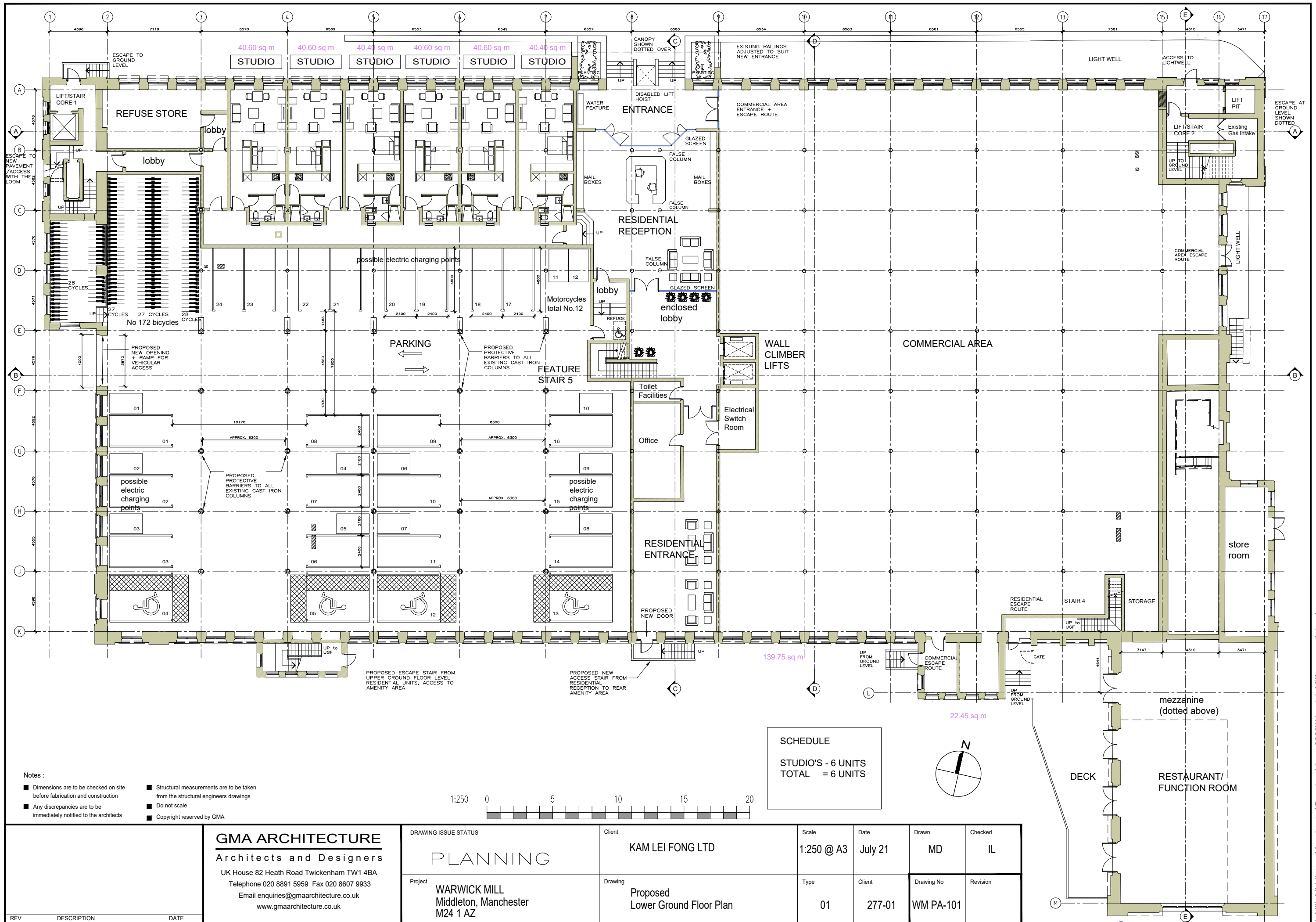


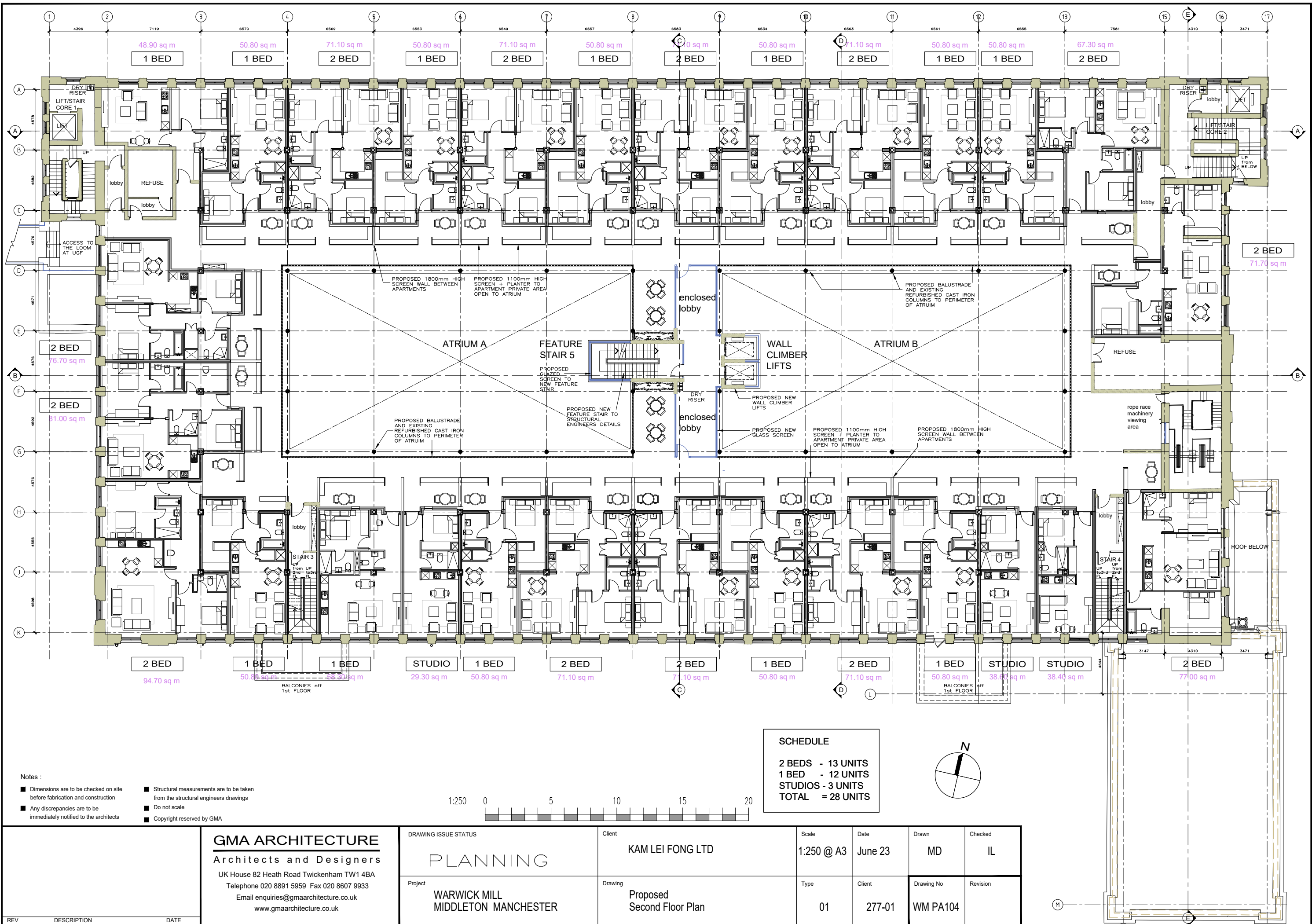
SECTION D-D MAIN MILL BUILDING

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REV DESCRIPTION DATE		Project WARWICK MILL MIDDLETON MANCHESTER	Drawing PROPOSED SECTION D-D	Type 01	Client 277-01	Drawing No WM PA-204	Revision



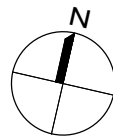


Notes :

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SCHEDULE

2 BEDS - 13 UNITS
1 BED - 12 UNITS
STUDIOS - 3 UNITS
TOTAL = 28 UNITS



DRAWING ISSUE STATUS

PLANNING

Project

WARWICK MILL
MIDDLETON MANCHESTER

Client

KAM LEI FONG LTD

Drawing

Proposed
Second Floor Plan

Scale

1:250 @ A3

Date

June 23

Drawn

MD

Checked

IL

Type

01

Client

277-01

Drawing No

WM PA104

Revision

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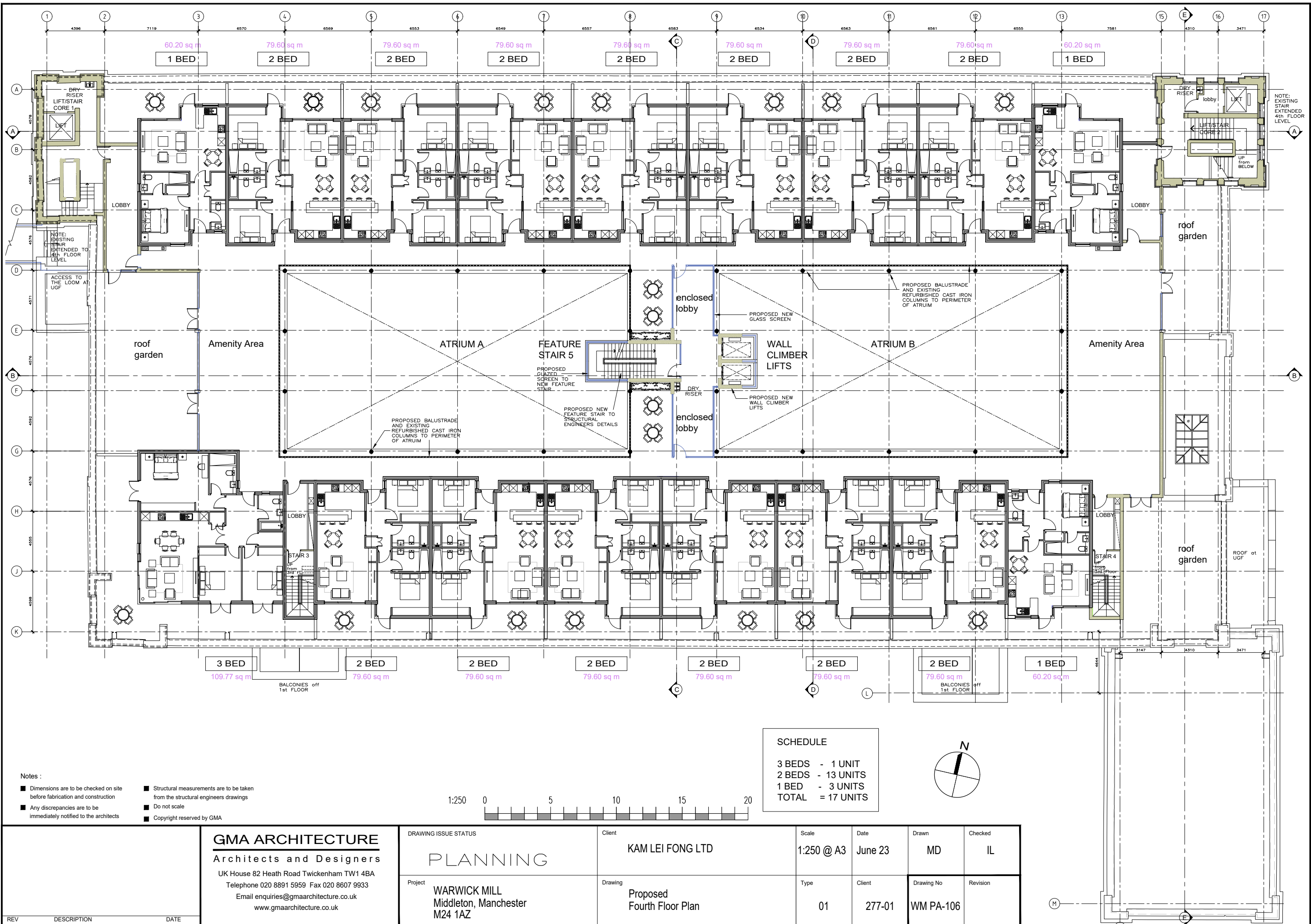
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DRAWING ISSUE STATUS

PLANNING

Project
WARWICK MILL
Middleton, Manchester
M24 1AZ

Client
KAM LEI FONG LTD

Drawing
**Proposed
Fourth Floor Plan**

Scale
1:250 @ A3

Date
June 23

Drawn
MD

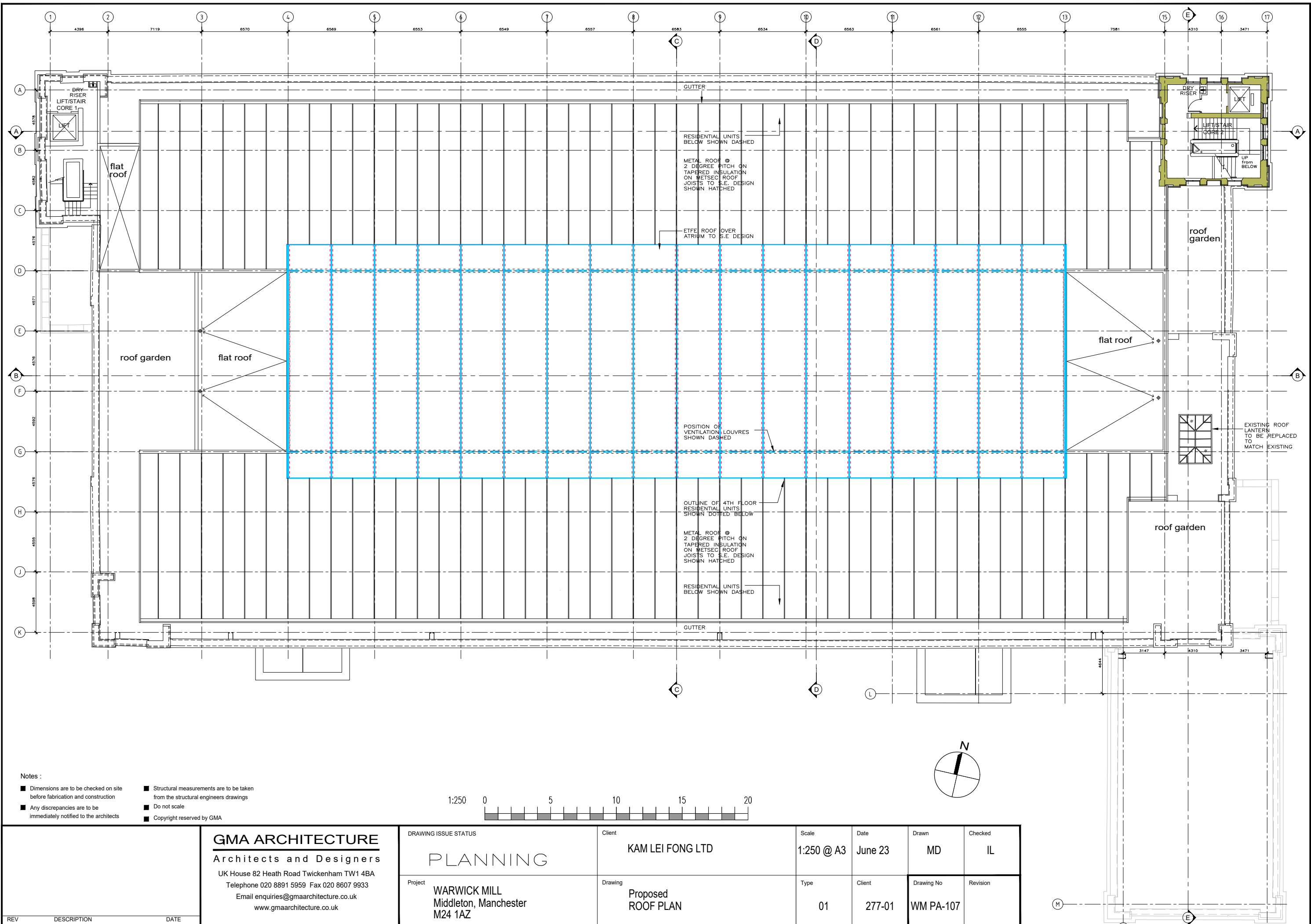
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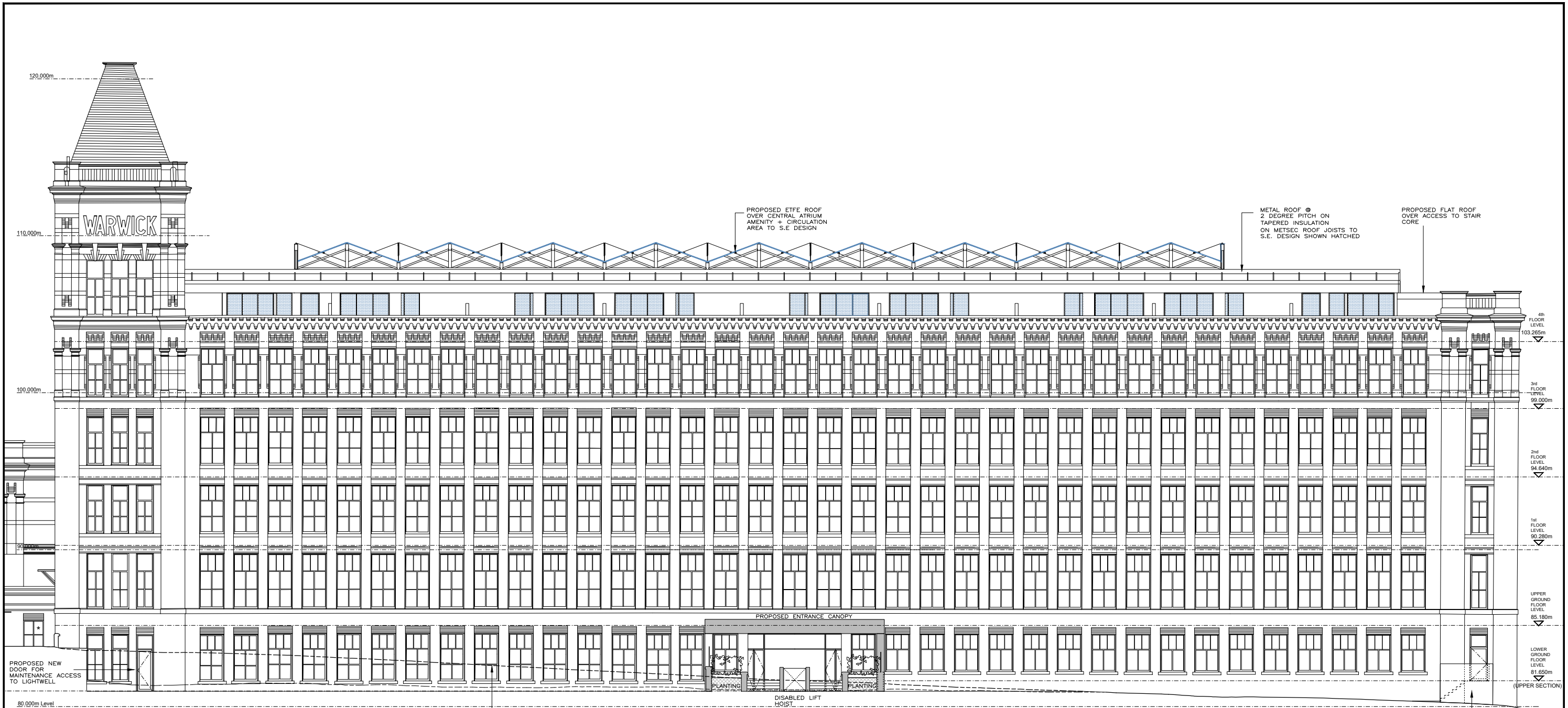
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Client
277-01

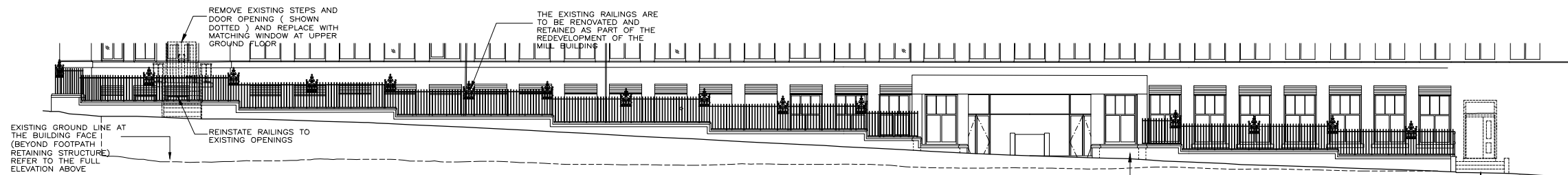
Drawing No
WM PA-106

Revision





NORTH ELEVATION - MAIN MILL BUILDING



NORTH ELEVATION - FOOTPATH LEVEL

Notes :

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NOTES:

All existing windows to be replaced with replica units to satisfaction of the Local Authority.

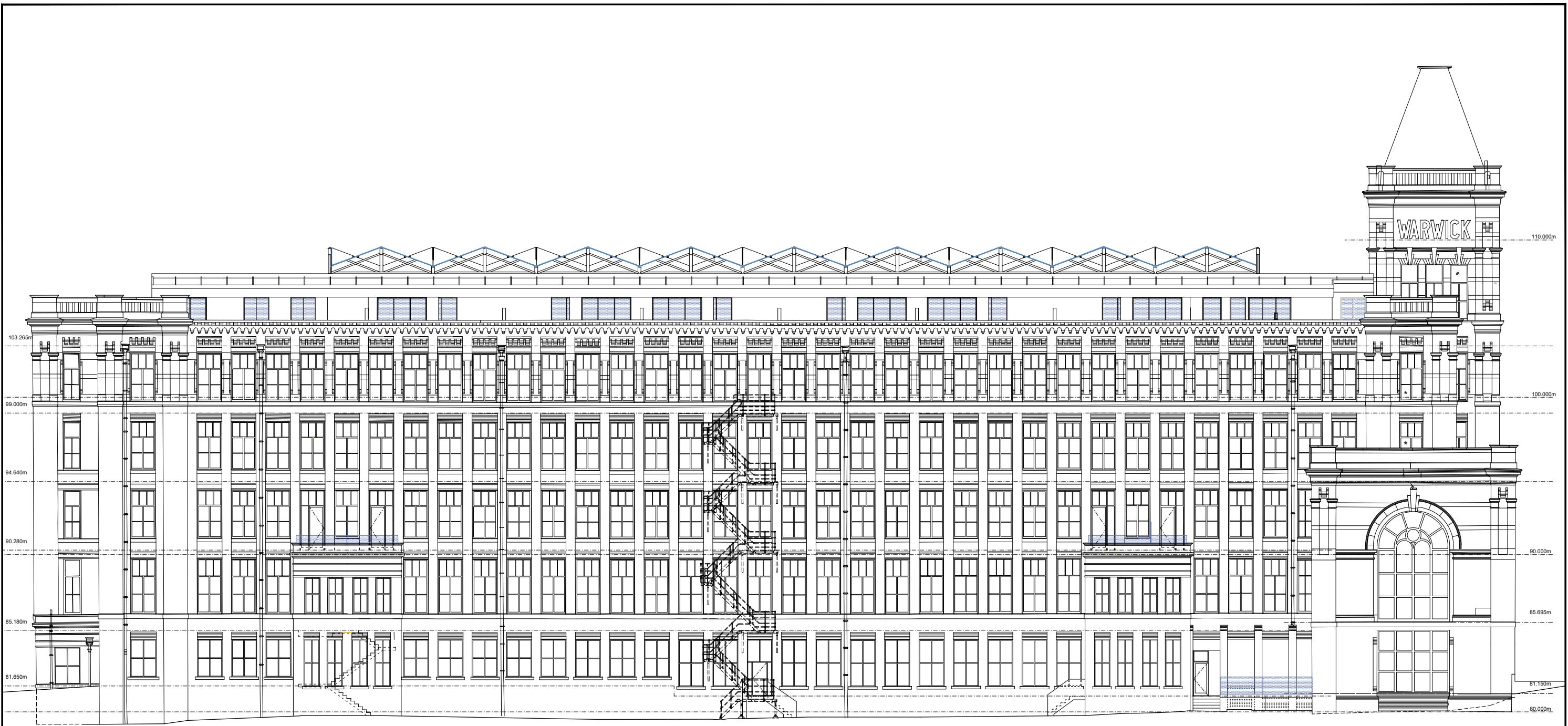
Original existing cast iron rainwater pipes, hopper heads etc to be replaced with replica units to satisfaction of the Local Authority.

All existing foul water pipework, wiring, ducting, service boxes, flues, redundant lighting and signage etc currently located on the building facade to be removed and building made good unless specifically requested to be retained by the Local Authority.

The existing facing brickwork and stonework detailing to doors, windows, parapets etc to be cleaned/restored to the satisfaction of the Local Authority.

The existing windows are to be replaced with aluminium windows to match the existing design

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		Project WARWICK MILL Middleton, Manchester M24 1 AZ	Drawing Proposed NORTH ELEVATION	Type 01	Client 277-01	Drawing No WM PA-301	Revision



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NOTES:

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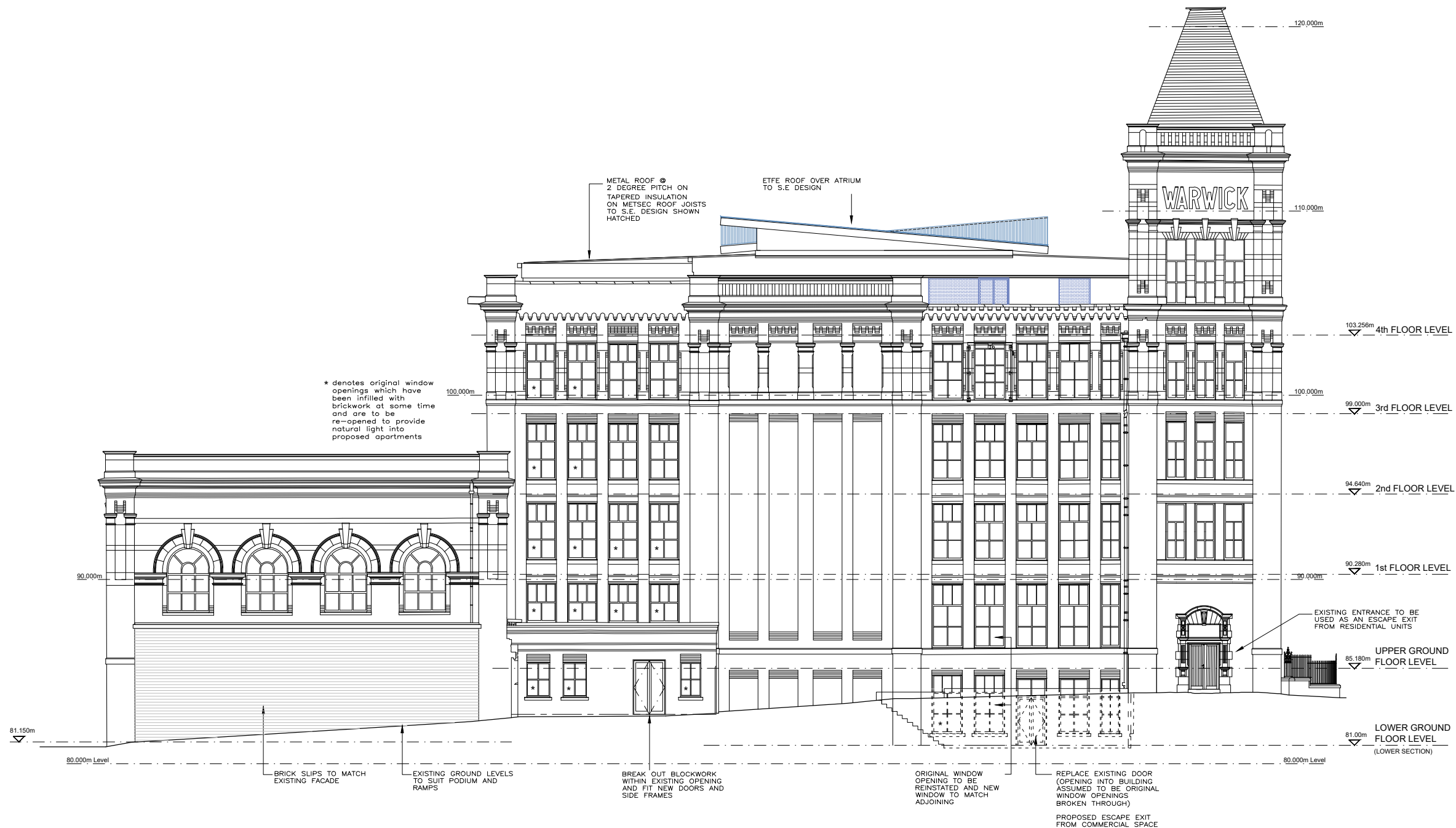
Original existing cast iron rainwater paipes, hopper heads etc to be replaced with replica units to satisfaction of the Local Authority.

All existing foul water pipework, wiring, ducting, service boxes, flues, redundant lighting and signage etc currently located on the building facade to be removed and building made good unless specifically requested to be retained by the Local Authority.

The existing facing brickwork and stonework detailing to doors, windows, parapets etc to be cleaned/restored to the satisfaction of the Local Authority.

The existing windows are to be replaced with aluminium windows to match the existing design

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			Project WARWICK MILL Middleton, Manchester M24 1AZ		Drawing Proposed SOUTH ELEVATION		Type 01	Client 277-01	Drawing No WM PA-302	Revision	



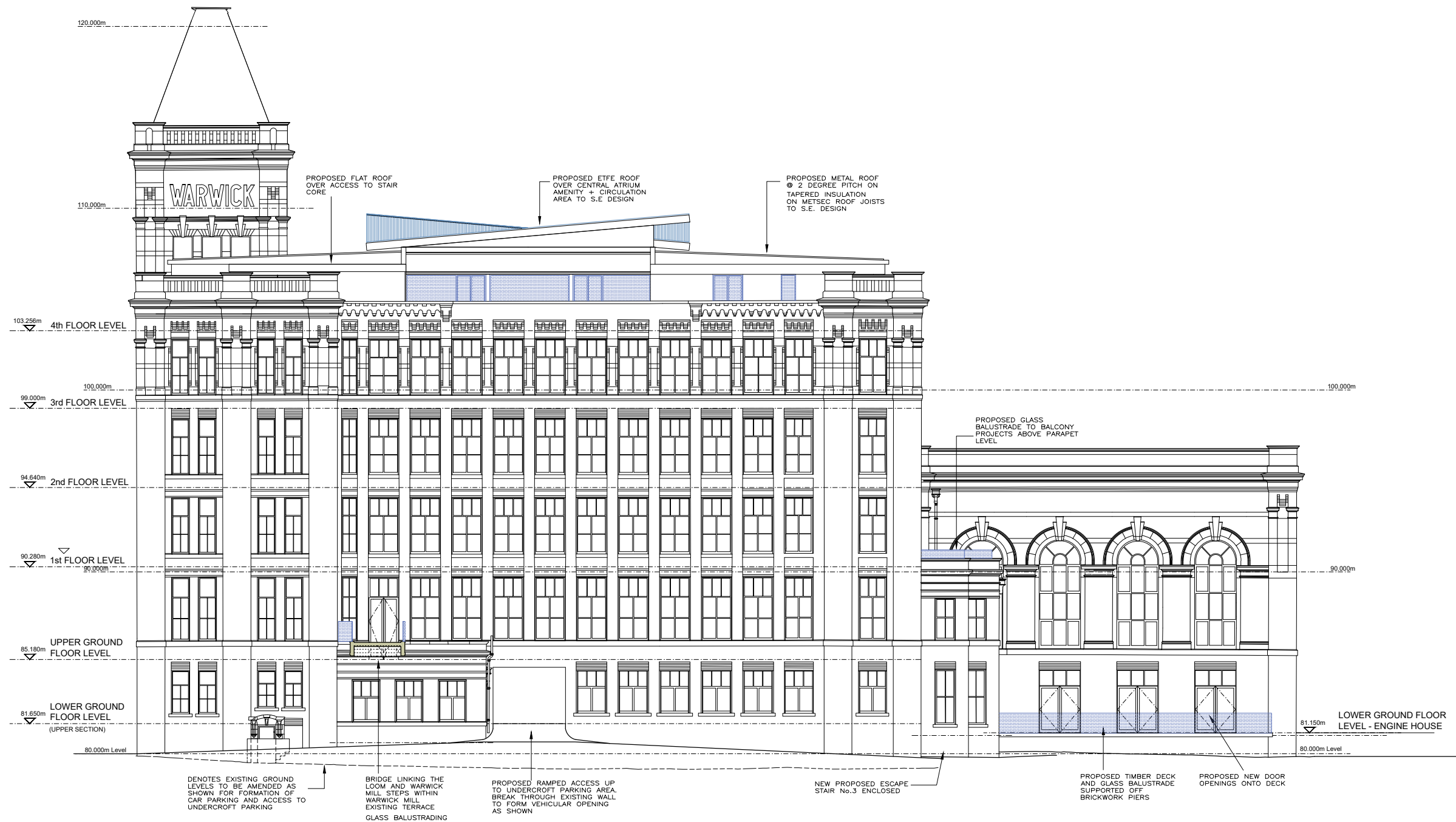
Notes :

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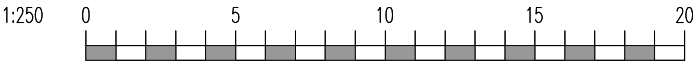
- NOTES:
- All existing windows to be replaced with replica units to satisfaction of the Local Authority.
- Original existing cast iron rainwater pipes, hopper heads etc to be replaced with replica units to satisfaction of the Local Authority.
- All existing foul water pipework, wiring, ducting, service boxes, flues, redundant lighting and signage etc currently located on the building facade to be removed and building made good unless specifically requested to be retained by the Local Authority.
- The existing facing brickwork and stonework detailing to doors, windows, parapets etc to be cleaned/restored to the satisfaction of the Local Authority.
- The existing windows are to be replaced with aluminium windows to match the existing design

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			Project WARWICK MILL Middleton, Manchester M24 1AZ		Drawing Proposed EAST ELEVATION		Type 01	Client 277-01	Drawing No WM PA-303	Revision	



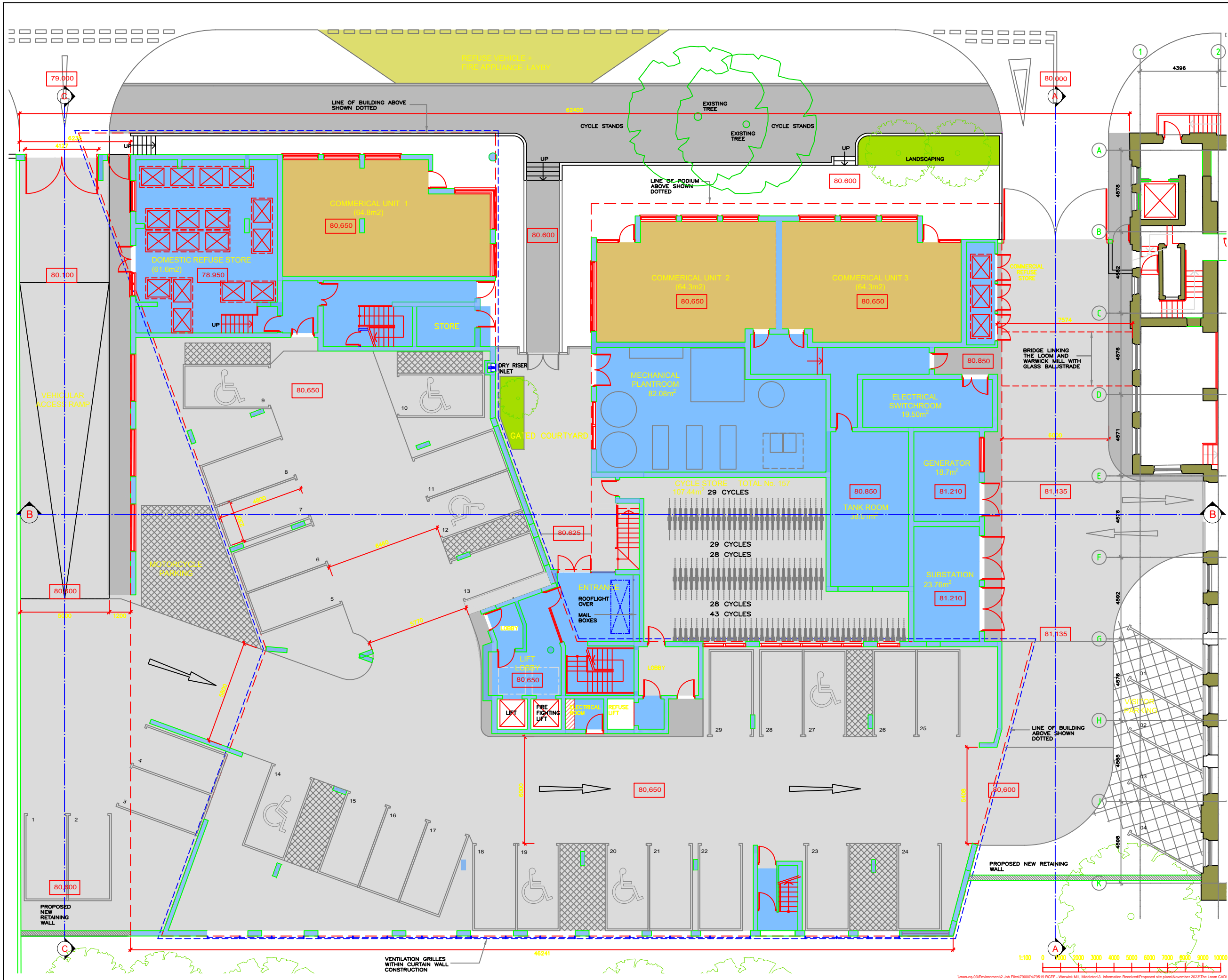
Notes :

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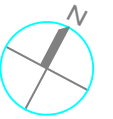


- NOTES:
- All existing windows to be replaced with replica units to satisfaction of the Local Authority.
- Original existing cast iron rainwater paipes, hopper heads etc to be replaced with replica units to satisfaction of the Local Authority.
- All existing foul water pipework, wiring, ducting, service boxes, flues, redundant lighting and signage etc currently located on the building facade to be removed and building made good unless specifically requested to be retained by the Local Authority.
- The existing facing brickwork and stonework detailing to doors, windows, parapets etc to be cleaned/restored to the satisfaction of the Local Authority.
- The existing windows are to be replaced with aluminium windows to match the existing design

REV	DESCRIPTION	DATE	GMA ARCHITECTURE Architects and Designers UK House 82 Heath Road Twickenham TW1 4BA Telephone 020 8891 5959 Fax 020 8607 9933 Email enquiries@gmaarchitecture.co.uk www.gmaarchitecture.co.uk	DRAWING ISSUE STATUS		Client	Scale	Date	Drawn	Checked
				PLANNING		KAM LEI FONG LTD	1:250 @ A3	June 23	MD	IL
				Project	WARWICK MILL Middleton, Manchester M24 1 AZ	Drawing	Type	Client	Drawing No	Revision
						Proposed WEST ELEVATION	01	277-01	WM PA-304	



- Notes :
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 - Structural measurements are to be taken from the structural engineers drawings
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P1	UPDATED TO SITE CONDITIONS	05.10.23
REV	DESCRIPTION	DATE

DRAWING ISSUE STATUS

PLANNING

GMA ARCHITECTURE
Architects and Designers

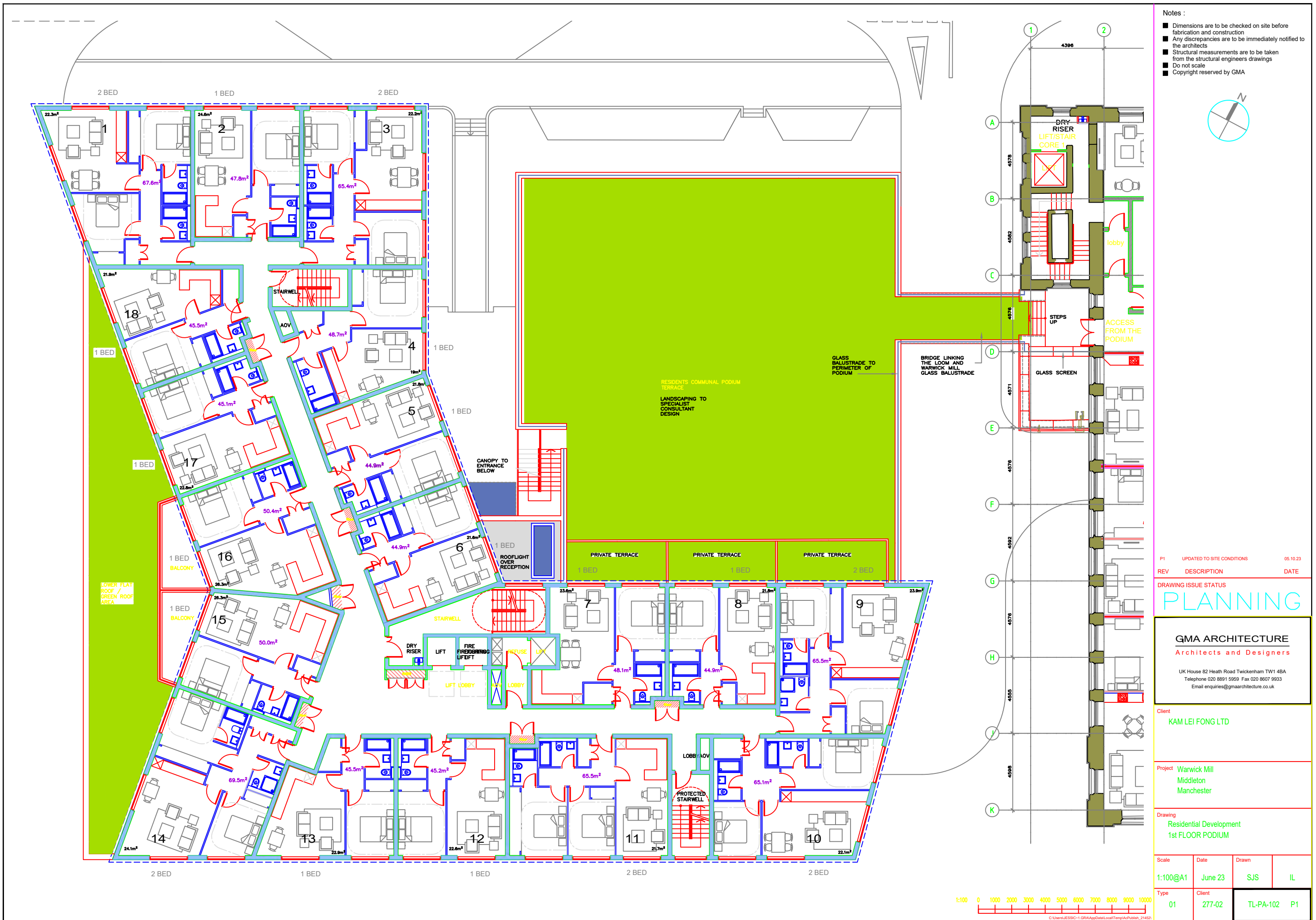
UK House 82 Heath Road Twickenham TW1 4BA
Telephone 020 8891 5959 Fax 020 8607 9933
Email enquiries@gmaarchitecture.co.uk

Client
KAM LEI FONG LTD

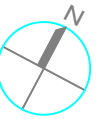
Project
**Warwick Mill
Middleston
Manchester**

Drawing
**Residential Development
Ground Floor Plan**

Scale	Date	Drawn	IL
1:100@A1	June 23	SJS	IL
Type	Client	TL-PA-101	P1
01	277-02		



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Client
KAM LEI FONG LTD

Project
**Warwick Mill
Middleton
Manchester**

Drawing
**Residential Development
1st FLOOR PODIUM**

Scale	Date	Drawn	
1:100@A1	June 23	SJS	IL
Type	Client		
01	277-02	TL-PA-102	P1



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REV	DESCRIPTION	DATE

DRAWING ISSUE STATUS

PLANNING

GMA ARCHITECTURE
Architects and Designers

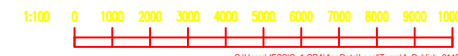
UK House 82 Heath Road Twickenham TW1 4BA
Telephone 020 8891 5959 Fax 020 8607 9933
Email enquiries@gmaarchitecture.co.uk

Client
KAM LEI FONG LTD

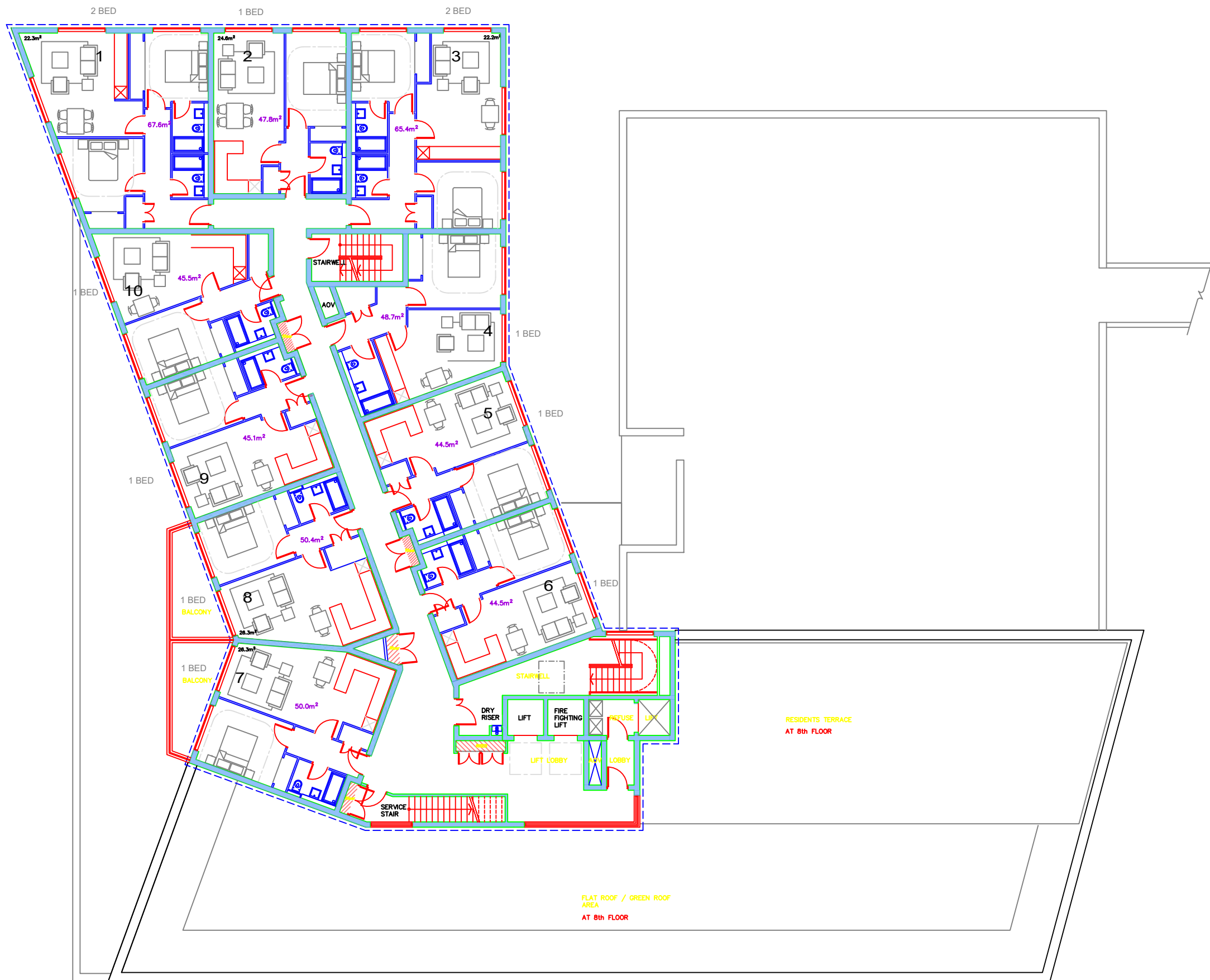
Project
Warwick Mill
Middleton
Manchester

Drawing
Residential Development
8th FLOOR

Scale	Date	Drawn	
1:100@A1	June 23	SJS	IL
Type	Client		
01	277-02	TL-PA-104	P1



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PLANNING

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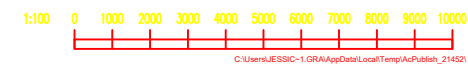
UK House 82 Heath Road Twickenham TW1 4BA
Telephone 020 8891 5959 Fax 020 8607 9933
Email enquiries@gmaarchitecture.co.uk

Client
KAM LEI FONG LTD

Project **Warwick Mill
Middleton
Manchester**

Drawing
**Residential Development
9th FLOOR**

Scale	Date	Drawn	
1:100@A1	June 23	SJS	IL
Type	Client		
01	277-02	TL-PA-105	P1



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REV	DESCRIPTION	DATE

DRAWING ISSUE STATUS

PLANNING

GMA ARCHITECTURE
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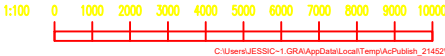
UK House 82 Heath Road Twickenham TW1 4BA
Telephone 020 8891 5959 Fax 020 8607 9933
Email enquiries@gmaarchitecture.co.uk

Client
KAM LEI FONG LTD

Project
Warwick Mill
Middleton
Manchester

Drawing
Residential Development
ROOF PLAN

Scale	Date	Drawn	
1:100@A1	June 23	SJS	IL
Type	Client		
01	277-02	TL-PA-106	P1



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Appendix G

Greenfield Runoff

RPS Group Plc		Page 1																								
Noble House, Capital Drive Linford Wood Miltton Keynes, MK14 6QP																										
Date 15/11/2023 15:19 File	Designed by JESSICA.GRADY Checked by																									
Innovyze	Source Control 2020.1																									
<u>ICP SUDS Mean Annual Flood</u> Input <table> <tr> <td>Return Period (years)</td> <td>100</td> <td>Soil</td> <td>0.450</td> </tr> <tr> <td>Area (ha)</td> <td>1.000</td> <td>Urban</td> <td>0.000</td> </tr> <tr> <td>SAAR (mm)</td> <td>1012</td> <td>Region Number</td> <td>Region 10</td> </tr> </table> Results 1/s <table> <tr> <td>QBAR Rural</td> <td>6.8</td> </tr> <tr> <td>QBAR Urban</td> <td>6.8</td> </tr> <tr> <td>Q100 years</td> <td>14.1</td> </tr> <tr> <td>Q1 year</td> <td>5.9</td> </tr> <tr> <td>Q30 years</td> <td>11.5</td> </tr> <tr> <td>Q100 years</td> <td>14.1</td> </tr> </table>			Return Period (years)	100	Soil	0.450	Area (ha)	1.000	Urban	0.000	SAAR (mm)	1012	Region Number	Region 10	QBAR Rural	6.8	QBAR Urban	6.8	Q100 years	14.1	Q1 year	5.9	Q30 years	11.5	Q100 years	14.1
Return Period (years)	100	Soil	0.450																							
Area (ha)	1.000	Urban	0.000																							
SAAR (mm)	1012	Region Number	Region 10																							
QBAR Rural	6.8																									
QBAR Urban	6.8																									
Q100 years	14.1																									
Q1 year	5.9																									
Q30 years	11.5																									
Q100 years	14.1																									
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Appendix H

Conceptual Drainage Strategy



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- Notes
1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
 2. If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.
 3. This drawing should be read in conjunction with all other relevant drawings and specifications.

PRELIMINARY SUBJECT TO DETAILED DESIGN

This drawing illustrates a sketch proposal only and is not to be used for construction. It is subject to investigation including ground conditions, constraints, drainage, design and planning requirements. The final design shall be based upon an enlargement of an OS sheet or other small scale plans and its accuracy will need to be verified by survey. Full risk analysis under the CDM Regulations has not been undertaken.

KEY	
Surface Water Manhole	
Surface Water Pipe Line	
Surface Water Headwall	
Gully	
Geocellular Crates	
Aco Drain	

The Loom
Brownfield Runoff Rate
2.78 x 1.00 x 35 = 97.3 l/s
Greenfield Runoff Rate = 6.8 l/s/ha
Impermeable Area = 0.3 ha
Restriction Rate = 2.0 l/s
Storage Requirement for 1:100 year + 45%CC storm event = 255.4m³
Total Storage within Geocellular Crates = 273.6m³

Rev	Description	By	Chk	Date
A	Conceptual Surface Water Drainage	JG	JH	15.11.23

RPS
A TETRA TECH COMPANY
4th Floor, 1 Newhall Street, Birmingham,
West Midlands B3 3NH
T: +44 121 622 8520 E: rps@hydrology.com

Client: **GMA Architecture**

Project: **Warwick Mill/The Loom**

Title: **Conceptual Surface Water
Drainage Strategy**

Status Preliminary	Scale 1:100 @A0	Date Created 15.11.2023
Task Team Manager RA	Information Author JG	Task Information Manager JH
Document Number D01		

RPS Project Number
RCE79519
Revision
A

Appendix I

MicroDrainage Calculations

RPS Group Plc		Page 1
Noble House, Capital Drive Linford Wood Milton Keynes, MK14 6QP	North Weald OH Southern Catchment Storage Volume	
Date 20/10/2023 File Storage Calcs.SRCX	Designed by JH Checked by CR	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 1225 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	77.871	0.271	0.0	1.7	1.7	77.2	O K
30 min Summer	77.968	0.368	0.0	1.8	1.8	104.8	O K
60 min Summer	78.076	0.476	0.0	1.8	1.8	135.5	O K
120 min Summer	78.165	0.565	0.0	1.8	1.8	161.0	O K
180 min Summer	78.221	0.621	0.0	1.8	1.8	177.0	O K
240 min Summer	78.262	0.662	0.0	1.8	1.8	188.5	O K
360 min Summer	78.314	0.714	0.0	1.8	1.8	203.6	O K
480 min Summer	78.346	0.746	0.0	1.8	1.8	212.6	O K
600 min Summer	78.365	0.765	0.0	1.8	1.8	218.0	O K
720 min Summer	78.376	0.776	0.0	1.8	1.8	221.3	O K
960 min Summer	78.384	0.784	0.0	1.8	1.8	223.4	O K
1440 min Summer	78.377	0.777	0.0	1.8	1.8	221.4	O K
2160 min Summer	78.353	0.753	0.0	1.8	1.8	214.7	O K
2880 min Summer	78.326	0.726	0.0	1.8	1.8	206.9	O K
4320 min Summer	78.271	0.671	0.0	1.8	1.8	191.1	O K
5760 min Summer	78.210	0.610	0.0	1.8	1.8	174.0	O K
7200 min Summer	78.149	0.549	0.0	1.8	1.8	156.4	O K
8640 min Summer	78.096	0.496	0.0	1.8	1.8	141.5	O K
10080 min Summer	78.052	0.452	0.0	1.8	1.8	128.8	O K
15 min Winter	77.904	0.304	0.0	1.8	1.8	86.5	O K
30 min Winter	78.013	0.413	0.0	1.8	1.8	117.6	O K
60 min Winter	78.134	0.534	0.0	1.8	1.8	152.2	O K
120 min Winter	78.236	0.636	0.0	1.8	1.8	181.3	O K
180 min Winter	78.300	0.700	0.0	1.8	1.8	199.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	139.846	0.0	61.4	26
30 min Summer	95.402	0.0	89.0	41
60 min Summer	62.214	0.0	124.1	70
120 min Summer	37.619	0.0	153.1	130
180 min Summer	28.010	0.0	172.5	188
240 min Summer	22.707	0.0	187.4	248
360 min Summer	16.866	0.0	209.8	366
480 min Summer	13.623	0.0	226.1	486
600 min Summer	11.531	0.0	238.5	604
720 min Summer	10.055	0.0	247.6	722
960 min Summer	8.093	0.0	254.5	960
1440 min Summer	5.944	0.0	243.1	1196
2160 min Summer	4.357	0.0	337.2	1580
2880 min Summer	3.503	0.0	362.0	1992
4320 min Summer	2.594	0.0	401.2	2820
5760 min Summer	2.108	0.0	440.5	3640
7200 min Summer	1.800	0.0	471.1	4400
8640 min Summer	1.588	0.0	499.3	5184
10080 min Summer	1.433	0.0	525.6	5856
15 min Winter	139.846	0.0	70.6	26
30 min Winter	95.402	0.0	101.1	40
60 min Winter	62.214	0.0	140.7	70
120 min Winter	37.619	0.0	173.0	128
180 min Winter	28.010	0.0	194.6	186

RPS Group Plc		Page 2
Noble House, Capital Drive Linford Wood Milton Keynes, MK14 6QP	North Weald OH Southern Catchment Storage Volume	
Date 20/10/2023 File Storage Calcs.SRCX	Designed by JH Checked by CR	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	78.345	0.745	0.0	1.8	1.8	212.4	O K
360 min Winter	78.406	0.806	0.0	1.8	1.8	229.7	O K
480 min Winter	78.443	0.843	0.0	1.8	1.8	240.3	O K
600 min Winter	78.467	0.867	0.0	1.8	1.8	247.1	O K
720 min Winter	78.482	0.882	0.0	1.8	1.8	251.4	O K
960 min Winter	78.496	0.896	0.0	1.8	1.8	255.4	O K
1440 min Winter	78.488	0.888	0.0	1.8	1.8	253.1	O K
2160 min Winter	78.456	0.856	0.0	1.8	1.8	243.9	O K
2880 min Winter	78.417	0.817	0.0	1.8	1.8	232.9	O K
4320 min Winter	78.333	0.733	0.0	1.8	1.8	209.0	O K
5760 min Winter	78.243	0.643	0.0	1.8	1.8	183.3	O K
7200 min Winter	78.135	0.535	0.0	1.8	1.8	152.4	O K
8640 min Winter	78.051	0.451	0.0	1.8	1.8	128.5	O K
10080 min Winter	77.983	0.383	0.0	1.8	1.8	109.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	22.707	0.0	211.1	244
360 min Winter	16.866	0.0	235.4	360
480 min Winter	13.623	0.0	251.9	476
600 min Winter	11.531	0.0	261.8	590
720 min Winter	10.055	0.0	264.4	704
960 min Winter	8.093	0.0	260.6	926
1440 min Winter	5.944	0.0	248.1	1342
2160 min Winter	4.357	0.0	379.2	1672
2880 min Winter	3.503	0.0	406.8	2140
4320 min Winter	2.594	0.0	446.3	3072
5760 min Winter	2.108	0.0	495.1	3984
7200 min Winter	1.800	0.0	529.5	4696
8640 min Winter	1.588	0.0	561.1	5448
10080 min Winter	1.433	0.0	590.7	6152

RPS Group Plc		Page 3
Noble House, Capital Drive Linford Wood Mittlton Keynes, MK14 6QP	North Weald OH Southern Catchment Storage Volume	
Date 20/10/2023 File Storage Calcs.SRCX	Designed by JH Checked by CR	
Innovyze	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 387111 405677 SD 87111 05677
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.300

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.100	4 8	0.100	8 12	0.100

RPS Group Plc		Page 4
Noble House, Capital Drive Linford Wood Milton Keynes, MK14 6QP	North Weald OH Southern Catchment Storage Volume	
Date 20/10/2023 File Storage Calcs.SRCX	Designed by JH Checked by CR	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 78.800

Cellular Storage Structure

Invert Level (m) 77.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	300.0	0.0	1.200	300.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0064-2000-1200-2000
Design Head (m) 1.200
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 64
Invert Level (m) 77.650
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.0	Kick-Flo®	0.573	1.4
Flush-Flo™	0.282	1.8	Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	0.800	1.7	2.000	2.5	4.000	3.5	7.000	4.5
0.200	1.7	1.000	1.8	2.200	2.6	4.500	3.7	7.500	4.7
0.300	1.8	1.200	2.0	2.400	2.7	5.000	3.9	8.000	4.8
0.400	1.7	1.400	2.1	2.600	2.8	5.500	4.0	8.500	5.0
0.500	1.6	1.600	2.3	3.000	3.0	6.000	4.2	9.000	5.1
0.600	1.5	1.800	2.4	3.500	3.3	6.500	4.4	9.500	5.2