



Flood Risk Assessment for Planning

Prepared for:

Fastspace LTD

August 2024

Our reference:

94547-PlansToBuildIt-ManleyRd

Location:

56 Manley Road

Whalley Range

Manchester

M16 8HP



Document Issue Record

Project: Flood Risk Assessment for Planning

Client: Fastspace LTD

Application: Construction of a residential extension (householder alteration) at basement and ground floor level – to remain a single dwelling

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1. Key Facts

1.1 Flood Risk Posed:

- Site within Flood Zone 2 (Medium Risk).
- The risk would appear to be fluvial and originate from the Chorlton Platt Gore approximately 850m south of the site and the Corn Brook (culverted) approximately 1.33km to the north of the site.
- Site currently defended to 1 in 100 year standard.
- The EA has provided modelled flood data from the Chorlton Platt Gore (2012) and Corn Brook (2017) flood models.
- The site is shown to be entirely outside of the modelled 1:100 year flood extents from both models, and outside of the modelled defended 1:1000 year extent from the Chorlton Platt Gore, but partially within the undefended 1:1000 year extent from the Chorlton Platt Gore and partially within the 1:1000 year extent from the Corn Brook.
- The site is shown to be entirely outside of the modelled 1:100 year +35% climate change extents from both models.
- The site is not located within a functional floodplain.
- No records of historical flooding at the site or surrounding area.
- Risk of pluvial flooding would appear to be "Very Low" to "Low".
- According to the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010 the site is within an area at risk of groundwater flooding.
- No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.
- The site lies inside the maximum inundation extent when river levels are normal on the EA Reservoir Inundation Map. The EA also advise on their website that there is a risk of flooding from reservoirs in the area.

1.2 Flood Risk Mitigation:

- The proposed development fits within EA standing advice for domestic extensions,
- No additional residential units will be created as part of the development.
- The additional footprint created by the development will not exceed 250m².
- Internal access will be maintained from the basement to the upper floors of the property.
- Flood proofing of the development will be incorporated as appropriate.
- Post development, there will be no unacceptable loss of fluvial floodplain storage.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.
- Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

2. Introduction

Unda Consulting Limited have been appointed by Fastspace LTD (hereinafter referred to as “the applicant”) to undertake a Flood Risk Assessment for the proposed development at 56 Manley Road, Whalley Range, Manchester, M16 8HP (hereinafter referred to as “the site”). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The site appears to be located within Flood Zone 2 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required if a proposed development:

- includes building or engineering works in Flood Zone 2 or 3;
- includes building or engineering works on land classified by the Environment Agency as having critical drainage problem;
- changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- is larger than 1 hectare.

The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development’s lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

- whether the proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Situation

3.1 Site Usage:

The site consists of an existing residential dwelling. The surrounding area also consists of residential properties.

A site location plan is provided in the report Appendix.



Figure 1: Aerial photograph of site and surrounding area (Source: Google Earth)

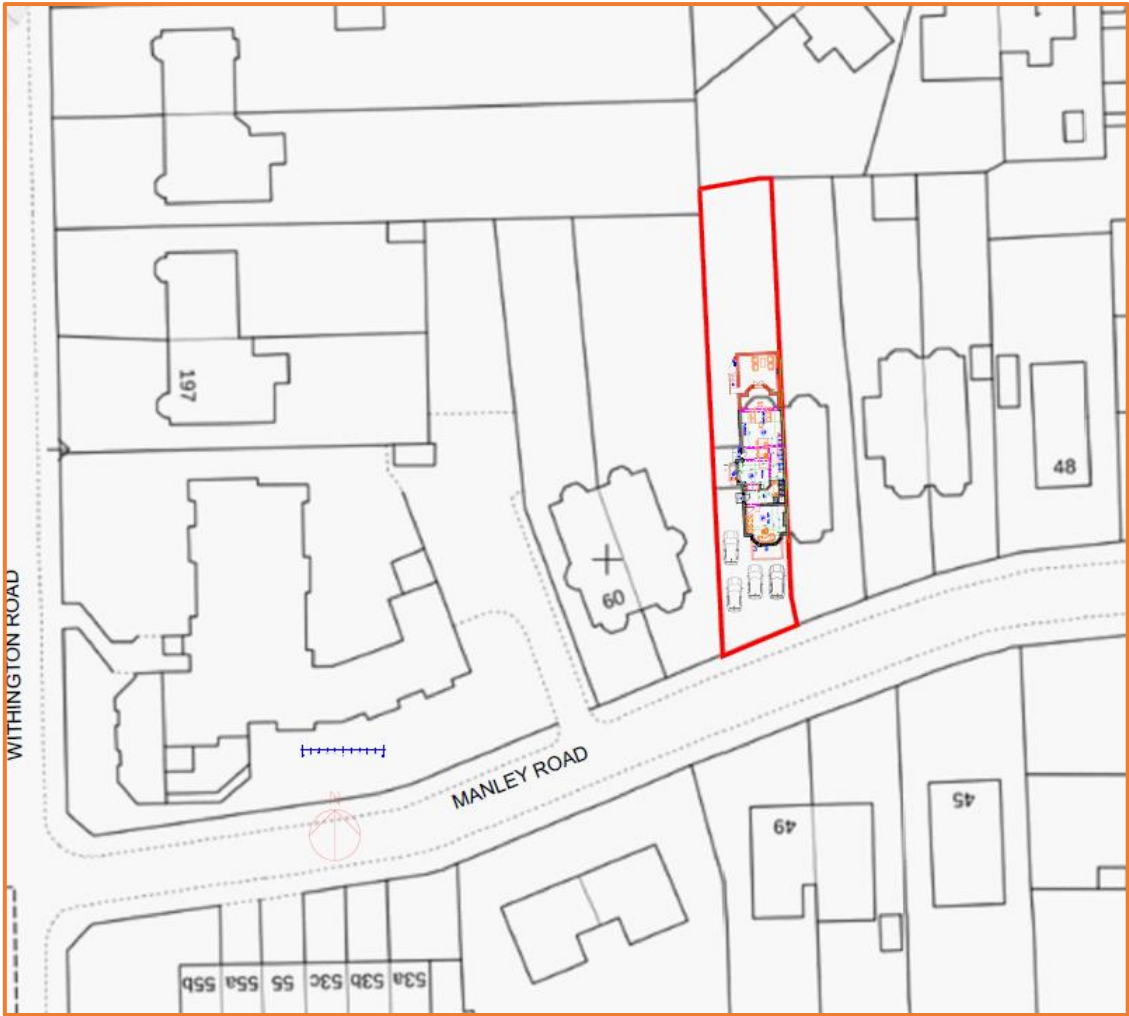


Figure 2: Site location plan (Source: Planstobuildit)



Figure 3: Existing floor plans and elevations (Source: Planstobuildit)

3.2 Topography:

Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LIDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to $\pm 0.15\text{m}$ every 1m. This dataset is derived from a combination of the full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LIDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.

LiDAR remotely sensed digital elevation data suggests that the ground topography on the site ranges between approximately 29.25mAOD at the front of the property to 30.84mAOD at rear of the property.

3.3 Geology and Soil:

The British Geological Survey (BGS) Map indicates that the bedrock underlying the site is Wilmslow Sandstone Formation - Sandstone.

The British Geological Survey (BGS) Map indicates that the superficial deposits underlying the site is Glaciofluvial Sheet Deposits, Devensian – Sand and Gravel.

The soil type taken from the UK Soil Observatory website is relatively deep soils from Glaciofluvial Deposits soil parent material with a Sand to Sandy Loam soil texture.

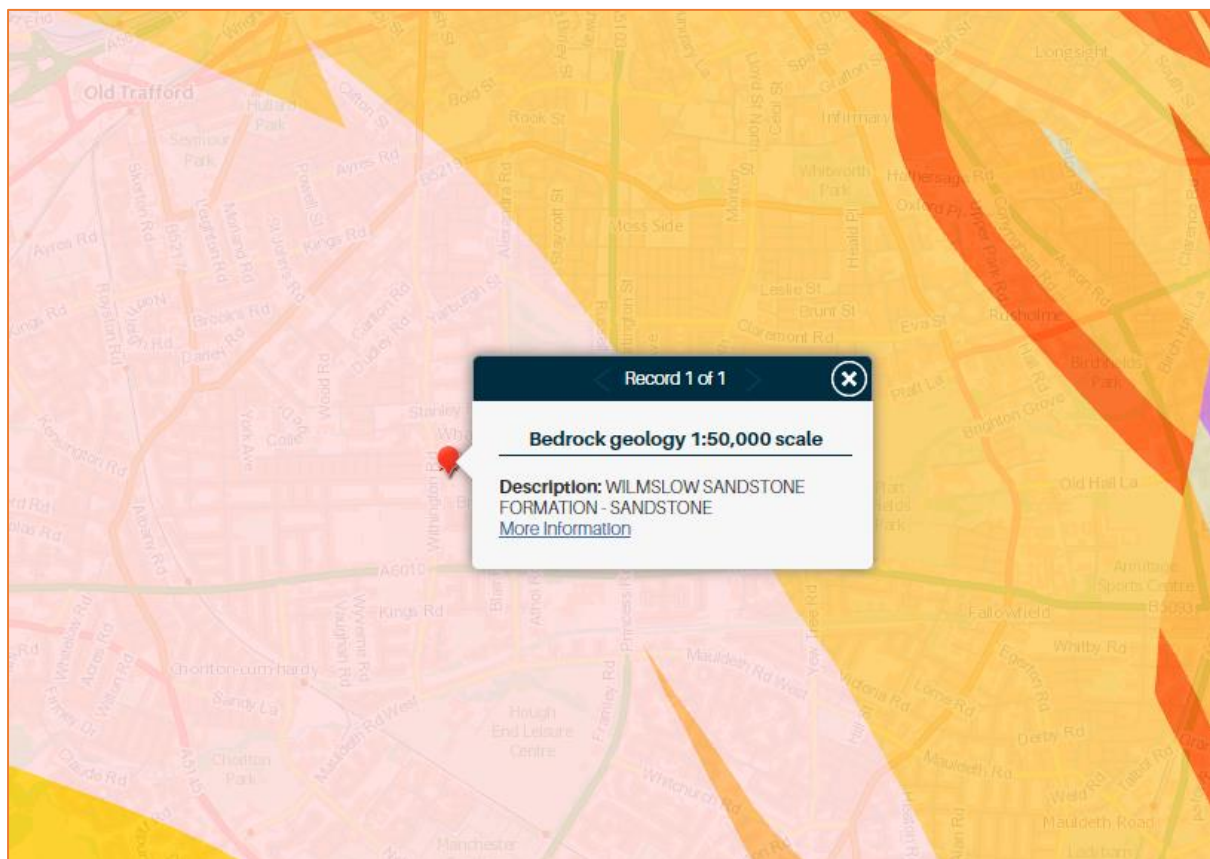


Figure 4: Bedrock Geology (Source: BGS)

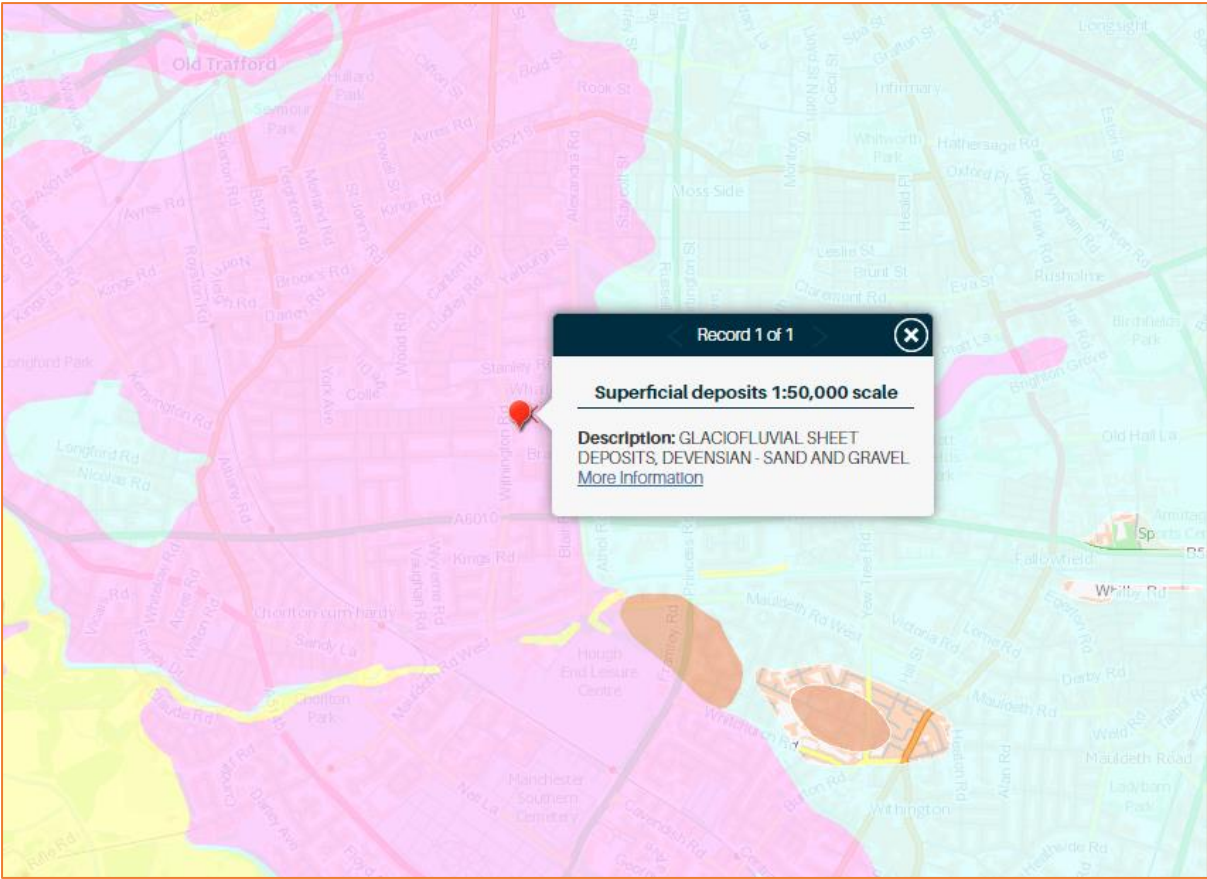


Figure 5: Superficial Deposits (Source: BGS)

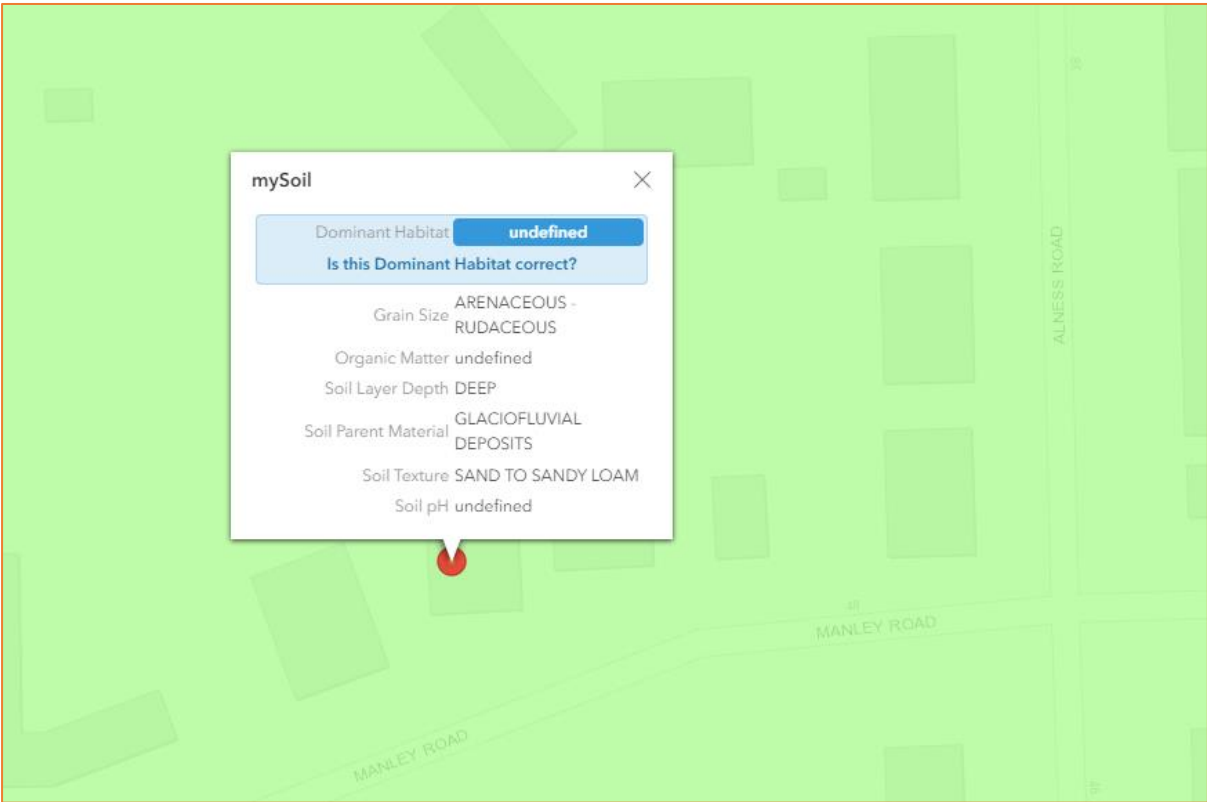


Figure 6: Local Soil Types (Source: UKSO)

4. Development Proposal

The proposed application is the construction of a residential extension (householder alteration) at basement and ground floor level (to remain a single dwelling).

Proposed plans are provided in the report Appendix.

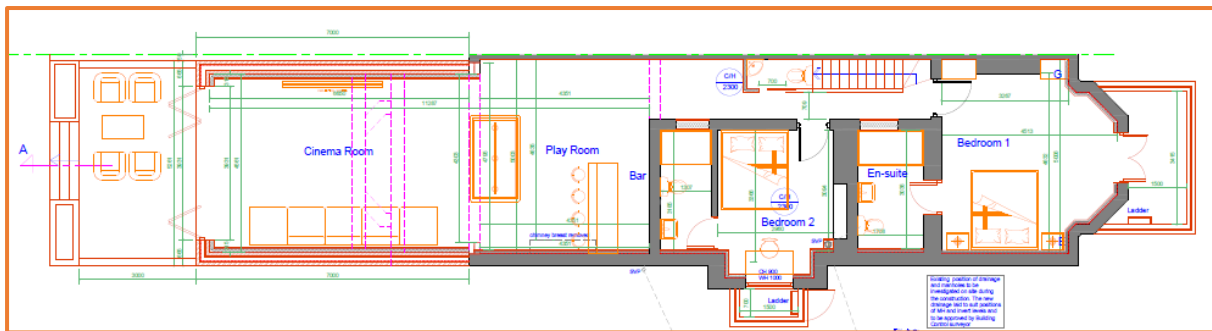


Figure 7: Proposed basement floor plan (Source: Planstobuildit)

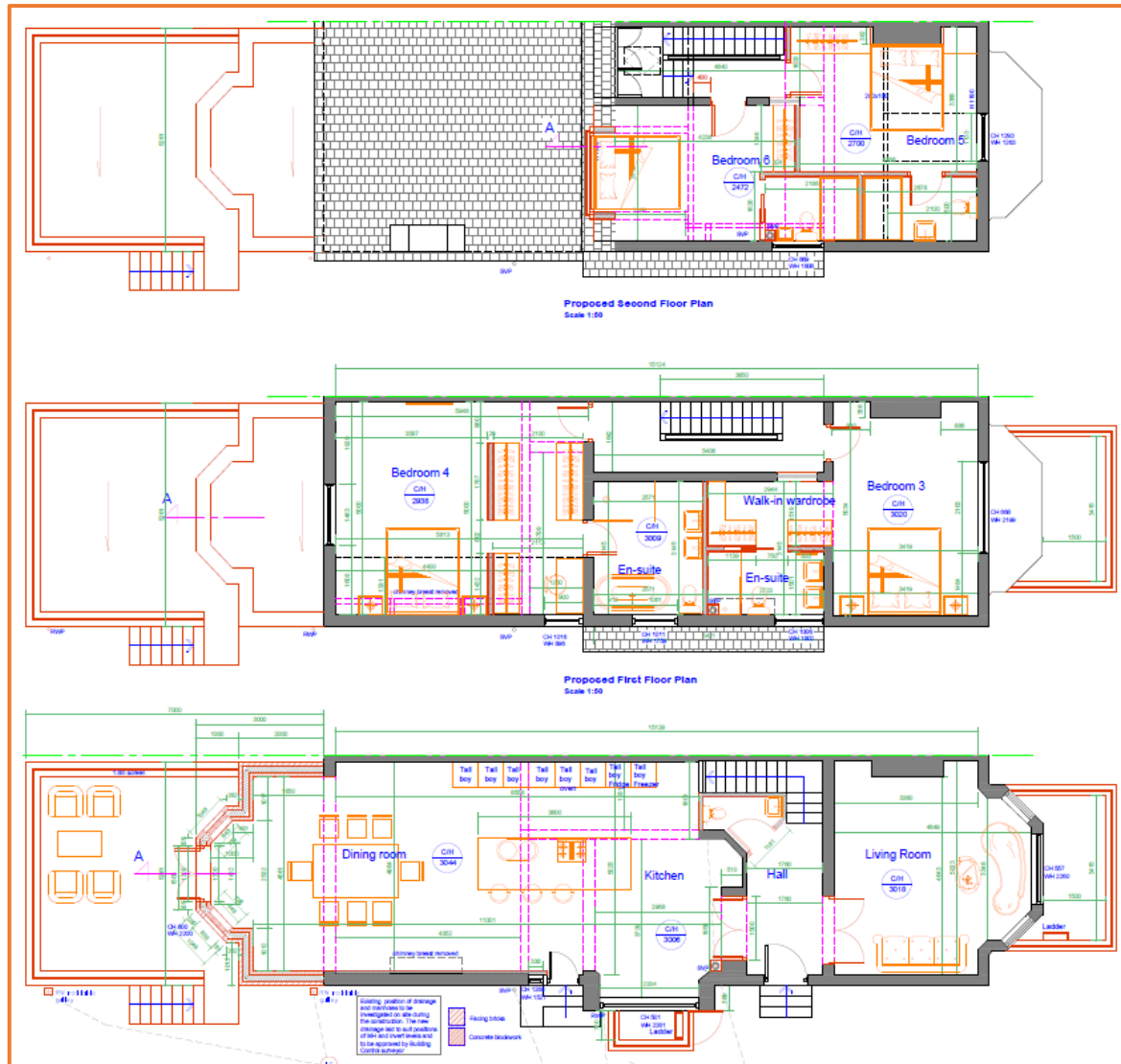


Figure 8: Proposed ground, first and second floor plan (Source: planstobuildit)

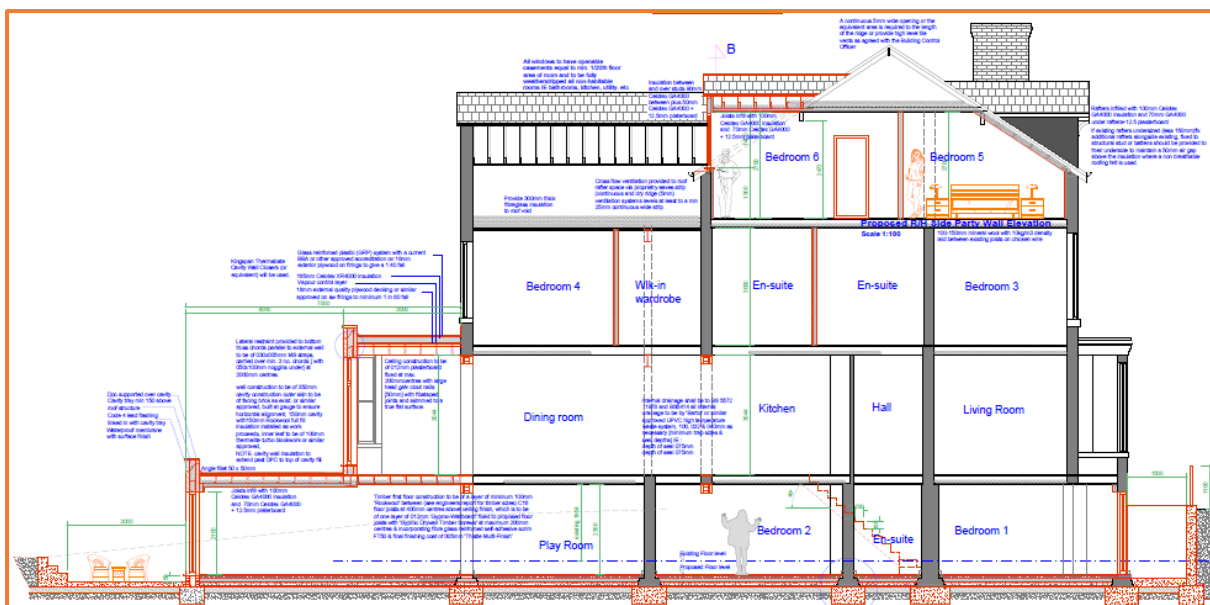


Figure 9: Proposed elevation interior plan (Source: planstobuildit)

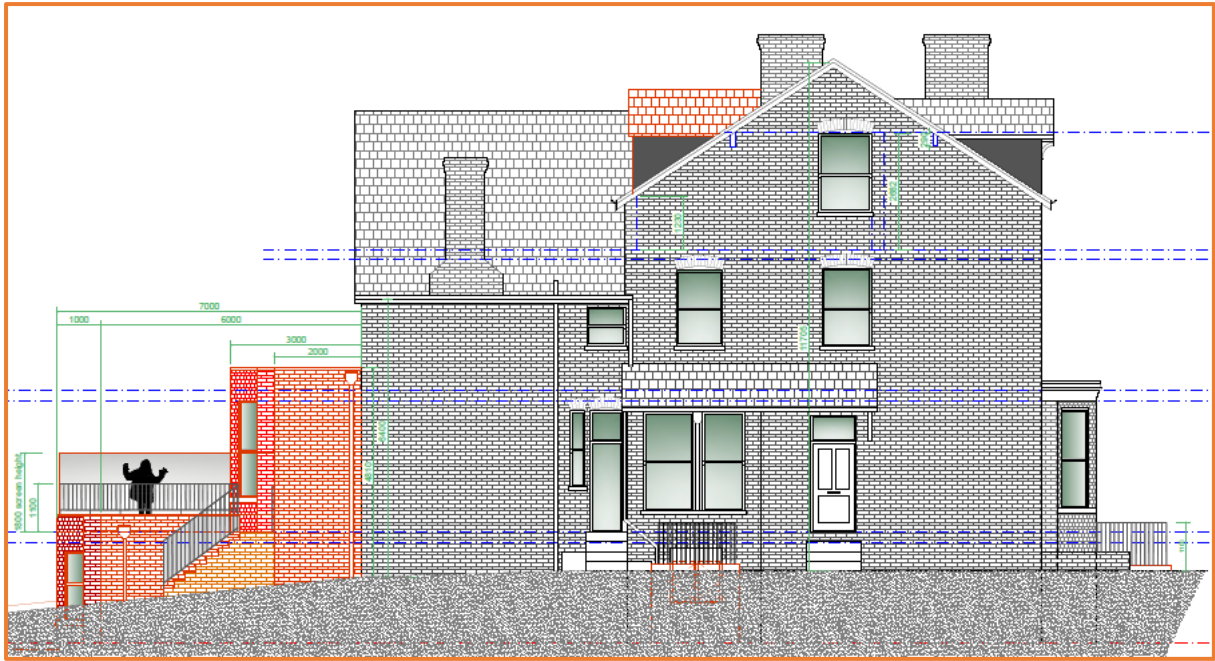


Figure 10: Proposed elevation exterior plan (Source: planstobuildit)

5. Assessment of Flood Risk

5.1 Flood Zones:

Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's website.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 1: Flood Zones

The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

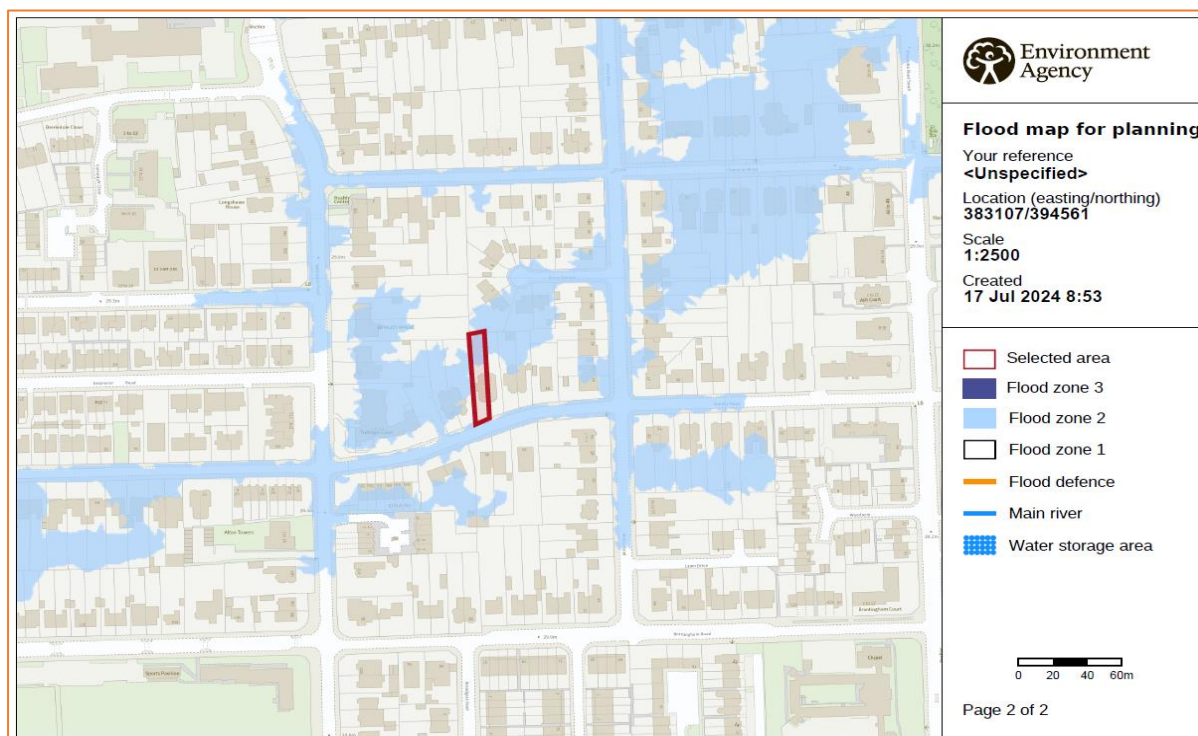


Figure 11: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located within Flood Zone 2 (Medium Probability); defined as land having between a 1 in 100 and 1 in 1000 annual probability of fluvial flooding. However, the site is currently defended to the 1 in 100 year standard.

The risk would appear to be fluvial and originate from the Chorlton Platt Gore approximately 850m south of the site and the Corn Brook (culverted) approximately 1.33km to the north of the site.

5.2 Fluvial (Chorlton Platt Gore and Corn Brook):

The Chorlton Platt Gore is 4.79km in length and covers a catchment area of 11.64km². It is heavily modified along its length and is designated as a Main River by the Environment Agency. It forms part of the Upper Mersey catchment and flows in a westerly direction in an open channel in the location of the site.

5.2.1 Modelled flood levels and extents:

Modelled flood levels and extents have been obtained from the Environment Agency for use within this report.

The EA has provided modelled flood data from the Chorlton Platt Gore (2012) and Corn Brook (2017) flood models.

Defended and undefended flood data has been provided for the Chorlton Platt Gore model.

The site is shown to be entirely outside of the modelled 1:100 year flood extents from both models, and outside of the modelled defended 1:1000 year extent from the Chorlton Platt Gore, the site is however shown to be partially within the undefended 1:1000 year extent from the Chorlton Platt Gore and partially within the 1:1000 year extent from the Corn Brook.

The site is located within Flood Zone 2, and is classified as “more vulnerable”. The Flood Risk Assessments: climate change allowances guidance – updated May 2022, states that the Central climate change allowance should be applied. The site falls within the Irwell Management Catchment, where the Central climate change allowance for the 2080's is a 35% increase in river flows.

As such, the most suitable modelled flood data provided from Chorlton Platt Gore 2012 and Corn Brook 2017 study is a 35% increase in flows, and as such this will be used for this assessment.

The site is shown to be entirely outside of the modelled 1:100 year +35% climate change extents from both models.

The following on-site flood levels have been extracted from the model outputs provided:

Return Period	Chorlton Platt Gore	Corn Brook
1:1000 year (undefended)	29.60mAOD	29.73mAOD
1:100 year + 35% climate change (undefended)	Outside	Outside

Table 2: Modelled on-site flood levels

Comparison of the maximum modelled 1:1000 year flood level (29.73mAOD) with topographic site levels (29.25mAOD at the front of the property to 30.84mAOD at rear of the property) shows that the site is between 0.48m below and 1.11m above the modelled 1:1000 year flood level.

The entire site is outside of the maximum modelled 1:100 year +35 climate change flood extents.

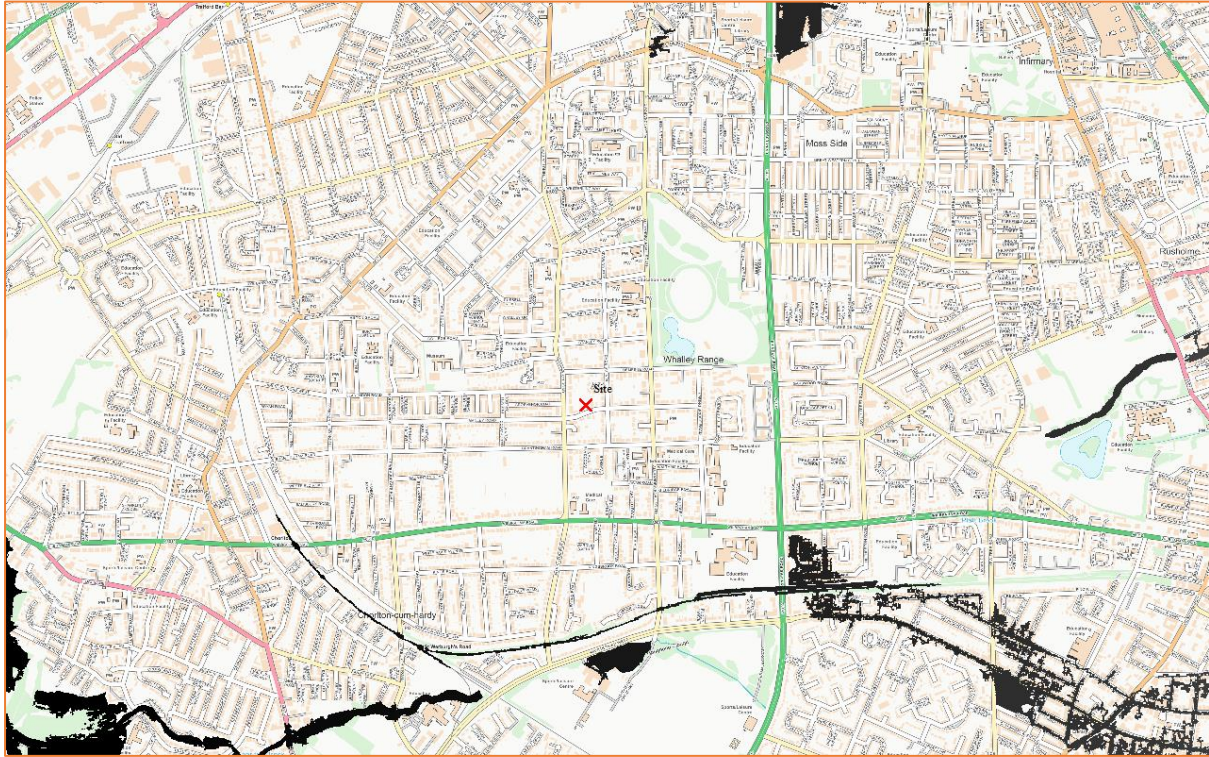


Figure 12: Maximum modelled 1:100 year +35% climate change flood extents from Chorlton Platt Gore and Corn Brook models (Source: EA)

5.2.2 Flood Storage Areas:

Flood Storage Areas are areas that act as a balancing reservoir, storage basin or balancing pond. Their purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer time interval. Flood storage areas do not completely remove the chance of flooding and can be overtopped or fail in extreme weather conditions.

There are no flood storage areas in the location of the site.

5.2.3 Functional Floodplain:

This zone comprises land where water is required to flow or be stored in times of flood. The functional floodplain designation encompasses land which would flood with an annual probability of 1 in 30 (3.33%) or greater in any year; and includes areas of land required for water conveyance routes.

The site is not located within a functional floodplain.

5.2.4 Flood Defences:

Flood defences are typically raised structures that alter natural flow patterns and prevent floodwater from entering property in times of flooding. They are generally categorised as either 'formal' or 'informal' defences. A 'formal' flood defence is a structure that was built specifically for the purpose of flood defence, and is maintained by its respective owner, which could be the Environment Agency, Local Authority, or an individual. An 'informal' flood defence is a structure that has not been specifically built to retain floodwater, and is not maintained for this specific purpose, but may afford some protection against flooding.

Asset inspections are undertaken on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings. It is unclear when both assets were last inspected.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

According to EA data, embankments flank the banks of the Chorlton Platt Gore in the location of the site which are maintained by the EA. The upstream actual crest levels range from 31.38m AOD to a downstream actual crest level of 30.25m AOD. The site is currently protected to the 1 in 100 year standard. The EA rank the condition of this asset as 3.

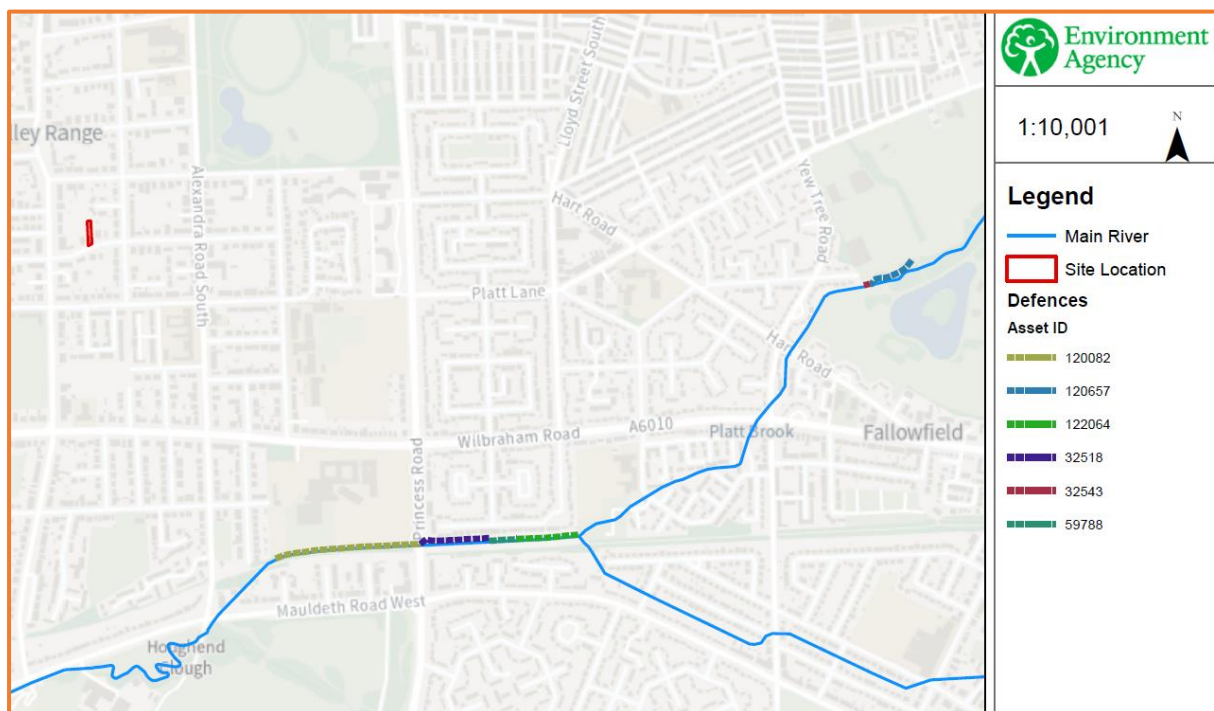


Figure 13: Flood Defence Map (Source: EA)

Start Date	Asset Type	Asset ID	Standard of Protection	Upstream Actual Crest Level (m aod)	Downstream Actual Crest Level (m aod)
01/01/1996	Embankment	120082	100	31.38	30.25
01/01/1996	Embankment	120657	100	36.27	36.29
01/01/1996	Wall	122064	100	31.90	31.84
01/01/1996	Wall	32518	100	31.84	31.48
01/01/1996	Wall	32543	100	35.76	35.74
01/01/1996	Embankment	59788	100	32.82	31.81

Table 3: Flood Defences (Source: EA)

5.2.5 Residual risk (breach or overtopping of flood defences):

Breaching of flood defences can cause rapid inundation of areas behind flood defences as flow in the river channel discharges through the breach. A breach can occur with little or no warning, although they are much more likely to concur with extreme river levels or tides when the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life. Breaches are most likely to occur in soft defences such as earth embankments although poorly maintained hard defences can also be a potential source of breach.

Overtopping of flood defences occurs when water levels exceed the protection level of raised flood defences. The worst case occurs when the fluvial or tidal levels exceed the defence level as this can lead to prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes cyclic overtopping, with intermittent discharge over the crest level of the defence. Flood defences are commonly designed with a freeboard to provide protection against overtopping from waves. The risk from overtopping due to exceedance of the flood defence level is much more significant than the risk posed by wave overtopping. Exceedance of the flood defence level can lead to prolonged and rapid flooding with properties immediately behind the defences at highest risk.

There remains a residual risk in the incidence of failure. Overtopping or breach are the principal mechanisms of flooding.

The site is however shown to be entirely outside of the modelled 1:100 year +35% climate change undefended flood extents.

5.2.6 Historical flood events:

The EA have no records of historical flooding having affected the site.

5.3 Pluvial (Surface Water):

Pluvial (surface water) flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

In 2013 the EA, working with Lead Local Flood Authorities (LLFAs), produced an updated Flood Map for Surface Water. It is considered to represent a significant improvement on the previous surface water flood maps available, both in terms of method and representation of the risk of flooding.

The modelling techniques and data used are considerably improved, and also incorporated locally produced mapping where this is available to represent features best modelled at a local scale.

The Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year (3.3%)
- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

Please note that the EA to not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation.

The EA Risk of Flooding from Surface Water Map suggests that the site lies in an area of “Very Low” to “Low” risk from surface water.

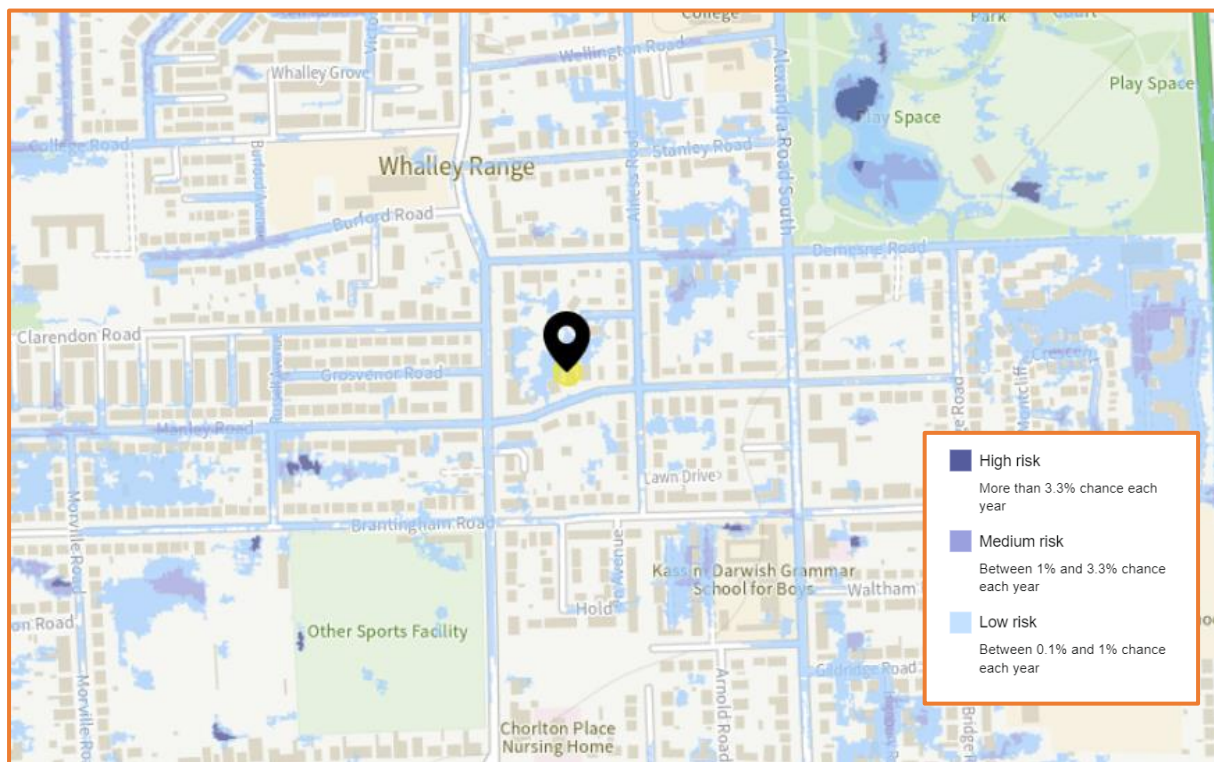


Figure 14: Extract from Environment Agency Surface Water Flood Map (Source: EA)

The Lead Local Flood Authority (LLFA) responsible for managing the flood risk from surface water in the area is Manchester council.

In addition, according to the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010 the site is not located within a Critical Drainage Area.

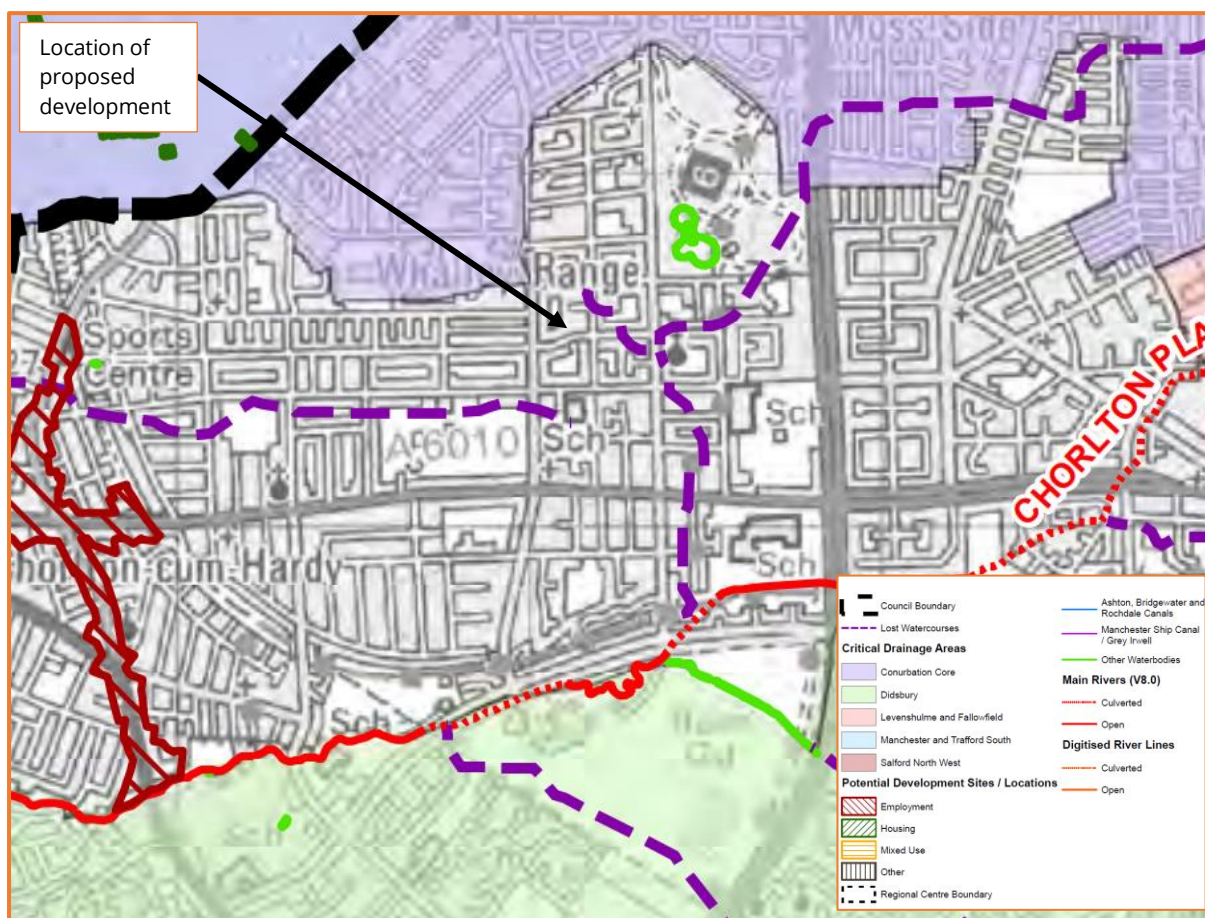


Figure 15: Critical Drainage Areas (Source: Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010)

5.4 Groundwater:

Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas, the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

According to the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010 the site is within an area at risk of groundwater flooding.

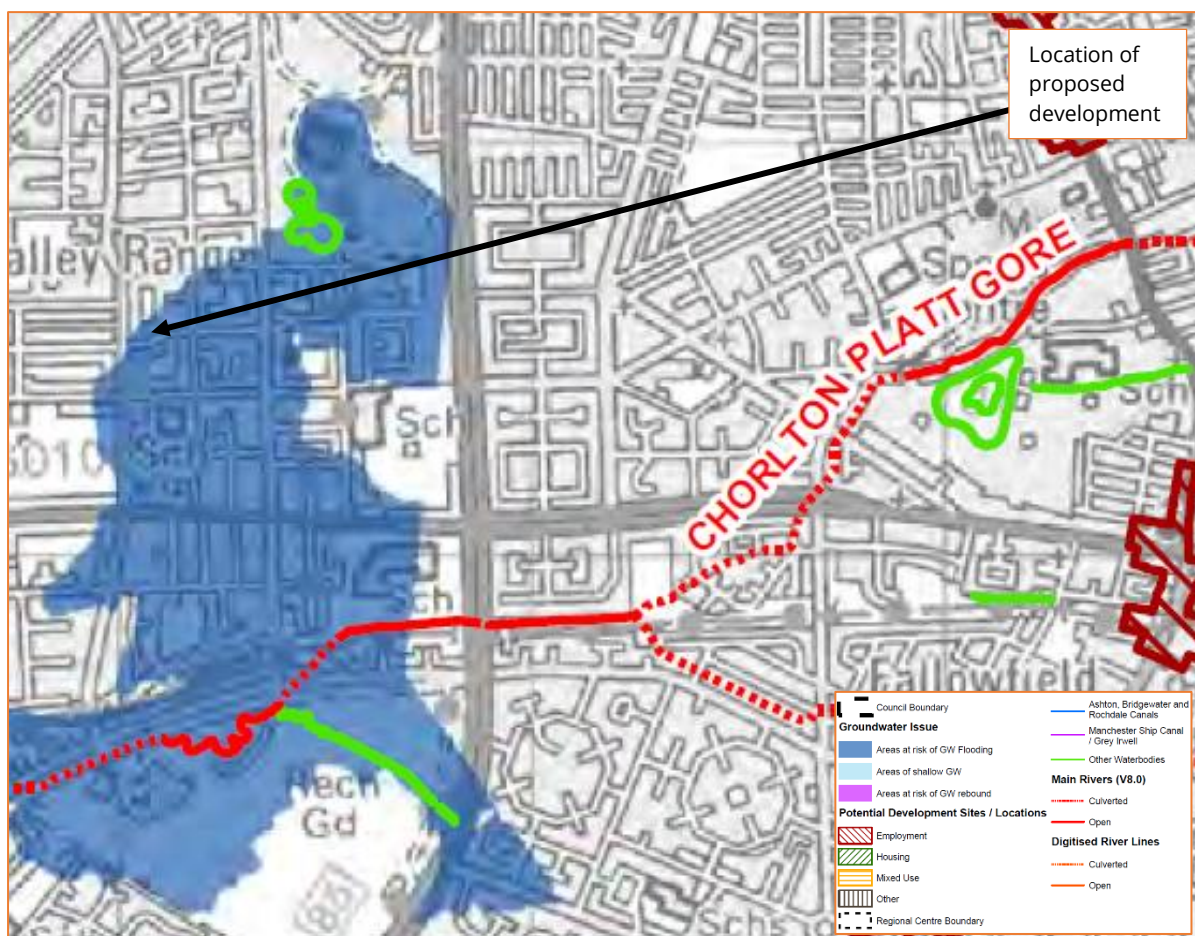


Figure 16: Groundwater flooding (Source: Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010)

In addition, no further records have been provided to suggest that the site has been affected by groundwater flooding previously.

5.5 Sewer Surcharge:

Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.

All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be

removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.

5.6 Other Sources:

Reservoirs with an impounded volume in excess of 25,000 cubic metres (measured above natural ground level) are governed by the Reservoirs Act and are listed on a register held by the Environment Agency. The site lies inside the maximum inundation extent when river levels are normal on the EA Reservoir Inundation Map. The EA also advise on their website that there is a risk of flooding from reservoirs in the area. There has been no loss of life in the UK from reservoir flooding since 1925. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. In accordance with the Reservoirs Act 1975 in England, these inspections are monitored and enforced by the EA themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial / tidal flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.

Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.

Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.

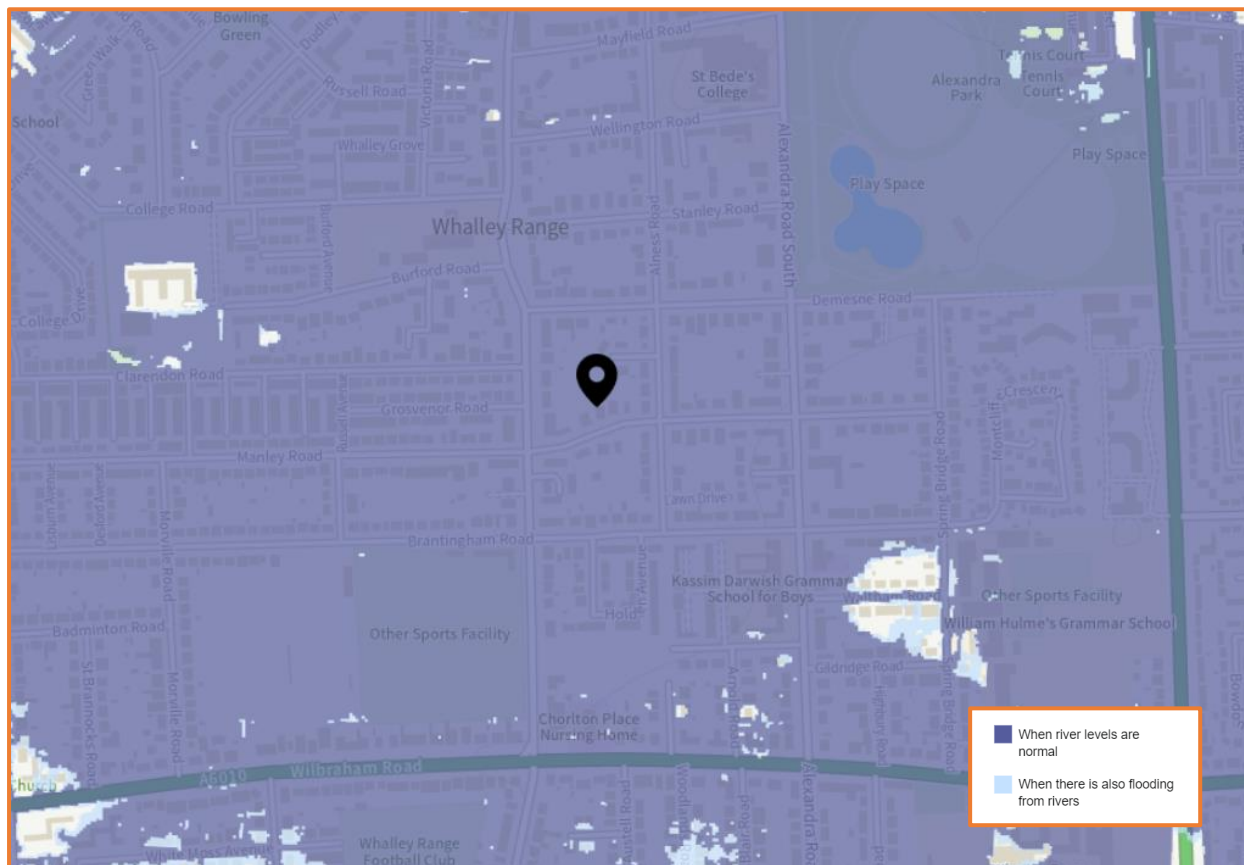


Figure 17: Maximum extent of flooding from reservoirs (Source: EA)

6. Flood Risk Management

6.1 Vulnerability to flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing site usage is classified as "more vulnerable" throughout, as it is a residential property. Post development, the site will remain "more vulnerable", as the application is for a residential extension.

Accordingly, it is considered that the vulnerability of the site as a whole has not increased post development.

There will be no introduction of additional units or dwellings.

6.2 EA Standing Advice:

The EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m². It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.

The proposed planning application is for the construction of a residential extension which does not exceed 250m².

Flood proofing of the development will be incorporated as appropriate.

There will be no introduction of additional or separate units, no sub-division, and no intensification of usage.

The proposed development is considered to fit within the EA's standing advice for domestic extensions.

6.3 Physical Design Measures:

The proposed application is for a residential extension to the existing property (and will not introduce any additional or separate residential units) internal access will be maintained from the basement to the upper floors of the property.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposal, in consultation with the Local Building Authority building control department. These measures can include the following:

- Tanking of the basement and structural water proofing system with sump pump;
- Waterproof screed used on floors;
- Closed-cell foam used in wall cavities;
- Sealing any gaps with water resistant sealants, around windows and doors;
- Basement on separate electrical circuit;

- Basement electrical main ring and electrical sockets run from 600mm above floor level;
- Boilers, control and water storage / immersion installed at first floor level or above;
- Gas meter installed at first floor level or above;
- Waterproof ground floor internal render;
- External walls rendered resistant to flooding;
- All exterior service points sealed;
- Non-ferrous flood defence windows;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Anti-syphon fitted to all toilets;
- New kitchen units of solid, water resistant material;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs of solid hardwood construction with wood faces treated to resist water penetration.

All external doors to be flood proof / flood defence doors, or 600mm demountable flood defence barriers installed if flood proof doors are not practical or other planning constraints prevent it.

6.4 Safe Escape and Flood Action Plan:

The NPPF requires a route of safe escape for all residents and users to be provided from new residential properties in Flood Zone 3. Safe escape is usually defined as being through slow moving flood water no deeper than 25cm.

However, it should be noted that the proposed application is for the construction of a residential extension. No additional or new units or dwellings will be created as part of the development. The entire site and Manley Road is shown to be outside of the modelled 1:100 year +35% climate change undefended flood extents.

Residents and users should follow the warning and evacuation procedure detailed in the following section.

6.5 Flood Warning:

The EA is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.

Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.

The site lies within an Environment Agency Flood Warning/ Alert Area. The EA issue flood warnings/alerts to specific areas when flooding is expected. It is recommended that the applicant

registers online with the free Environment Agency Floodline Warnings/Alert Direct service at www.gov.uk/sign-up-for-flood-warnings to receive flood warnings by phone, text or email.

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

Flood Warning	Flood Alert	Flood Warning	Severe Flood Warning
			
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 4: EA Flood Warning Service

6.6 Flood Plan:

It is recommended that the applicant and future owners, occupiers and Landlords of the property prepare a flood plan to protect life and property during a flood event:

Before a flood:

- Prepare and keep a list of all your important contacts to hand or save them on your mobile phone.
- Think about what items you can move now and what you would want to move to safety during a flood.
- Know how to turn off electricity and water supplies to the site.
- Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.

During a flood:

- Activate the evacuation plan and evacuate the site.

- Remove cars from the site if there is sufficient warning and the water levels are not rising rapidly.
- Switch off water and electricity for the site.
- Tune into your local radio station on a battery or wind-up radio.
- Listen to the advice of the emergency service and evacuate if told to do so.
- Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.

After a flood:

- If you have flooded, contact your insurance company as soon as possible.
- Take photographs and videos of your damaged property as a record for your insurance company.
- If you don't have insurance, contact your local authority for information on grants and charities that may help you.
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask.
- Have your electrics and water checked by qualified engineers before switching them back on.

6.7 Off-Site Impacts:**6.7.1 Fluvial floodplain storage:**

The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

The site is situated in Flood Zone 2 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The application is for a residential extension of less than 250m², and therefore there will be no unacceptable loss of floodplain storage.

In addition, the entire site is shown to be outside of the modelled 1:100 year +35% climate change undefended flood extents.

6.7.2 Surface Water Drainage:

The development will utilise Sustainable drainage systems (SuDS) design in accordance with the NPPF for Planning Applications and the drainage hierarchy as follows:

1. Store rainwater for later use;
2. Infiltration techniques;
3. Attenuate rainwater by storing in tanks for gradual release;
4. Discharge rainwater direct into watercourse;
5. Discharge rainwater into surface water sewer;
6. Discharge rainwater into a combined sewer;

Due to the small scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning. However, SuDS features will be incorporated into the development where practically possible or will utilise the existing arrangement on site.

As such, any change in surface water runoff from the site will likely be negligible.

7. Sequential and Exception Test

The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.

The Sequential Test is applied to developments in area identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.

The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk. The lowest risk of flooding, taking all sources of flood risk and climate change into account.

The site is situated within Flood Zone 2 when using the Environment Agency Flood Map for Planning (Rivers and Sea) and within an area of "Very Low" to "Low" risk of flooding from surface water.

Post development, the site will remain "more vulnerable", as the application is for the construction of a residential extension.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Table 5: Flood risk vulnerability and flood zone 'compatibility'

Using the table above, the proposed application is considered to be suitable within Flood Zone 2.

The Sequential and Exception Tests do not need to be applied to minor developments and changes of use (this application is for 'minor development' – a residential extension).

8. Discussion and Conclusions

Unda Consulting Limited have been appointed by Fastspace LTD to undertake a Flood Risk Assessment for the proposed development at 56 Manley Road, Whalley Range, Manchester, M16 8HP. The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The proposed application is for the construction of a residential extension. Post development, the site will be “more vulnerable”, as the application is for the construction of a residential extension. Accordingly, it is considered that the vulnerability of the site as a whole will not increase post development. There will be no introduction of additional units or dwellings.

The site is located within Flood Zone 2 (Medium Probability); defined as land having between a 1 in 100 and 1 in 1000 annual probability of fluvial flooding.

The risk would appear to be fluvial and originate from the Chorlton Platt Gore approximately 850m south of the site and the Corn Brook (culverted) approximately 1.33km to the north of the site.

The site is currently defended to the 1 in 100 year standard.

Modelled flood levels and extents have been obtained from the Environment Agency for use within this report.

The EA has provided modelled flood data from the Chorlton Platt Gore (2012) and Corn Brook (2017) flood models.

Defended and undefended flood data has been provided for the Chorlton Platt Gore model.

The site is shown to be entirely outside of the modelled 1:100 year flood extents from both models, and outside of the modelled defended 1:1000 year extent from the Chorlton Platt Gore, the site is however shown to be partially within the undefended 1:1000 year extent from the Chorlton Platt Gore and partially within the 1:1000 year extent from the Corn Brook.

The site is located within Flood Zone 2, and is classified as “more vulnerable”. The Flood Risk Assessments: climate change allowances guidance – updated May 2022, states that the Central climate change allowance should be applied. The site falls within the Irwell Management Catchment, where the Central climate change allowance for the 2080's is a 35% increase in river flows.

As such, the most suitable modelled flood data provided from Chorlton Platt Gore 2012 and Corn Brook 2017 study is a 35% increase in flows, and as such this will be used for this assessment.

The site is shown to be entirely outside of the modelled 1:100 year +35% climate change extents from both models.

Comparison of the maximum modelled 1:1000 year flood level (29.73mAOD) with topographic site levels (29.25mAOD at the front of the property to 30.84mAOD at rear of the property) shows that the site is between 0.48m below and 1.11m above the modelled 1:1000 year flood level.

The entire site is outside of the maximum modelled 1:100 year +35 climate change flood extents.

There are no Flood Storage Areas located in close proximity to the site.

The site is not located within a functional floodplain.

According to EA data, embankments flank the banks of the Chorlton Platt Gore in the location of the site which are maintained by the EA. The upstream actual crest levels range from 31.38m AOD to a downstream actual crest level of 30.25m AOD. The site is currently protected to the 1 in 100 year standard. The EA rank the condition of this asset as 3.

There remains a residual risk in the incidence of failure. Overtopping or breach are the principal mechanisms of flooding. The site is however shown to be entirely outside of the modelled 1:100 year +35% climate change undefended flood extents.

No records of historical flooding at the site or surrounding area.

The EA Surface Water Flood Map suggests that the site lies within an area of "Very Low" to "Low" risk of flooding from surface water.

According to the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA May 2010 the site is within an area at risk of groundwater flooding.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.

The site lies inside the maximum inundation extent when river levels are normal on the EA Reservoir Inundation Map. The EA also advise on their website that there is a risk of flooding from reservoirs in the area.

The proposed application is for a residential extension to the existing property (and will not introduce any additional or separate residential units) and internal access will be maintained from the basement to the upper floors of the property.

The entire site and Manley Road is shown to be outside of the modelled 1:100 year +35% climate change undefended flood extents.

Due to the small scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning. However, SuDS features will be incorporated into the development where practically possible or will utilise the existing arrangement on site.

The applicant has confirmed that:

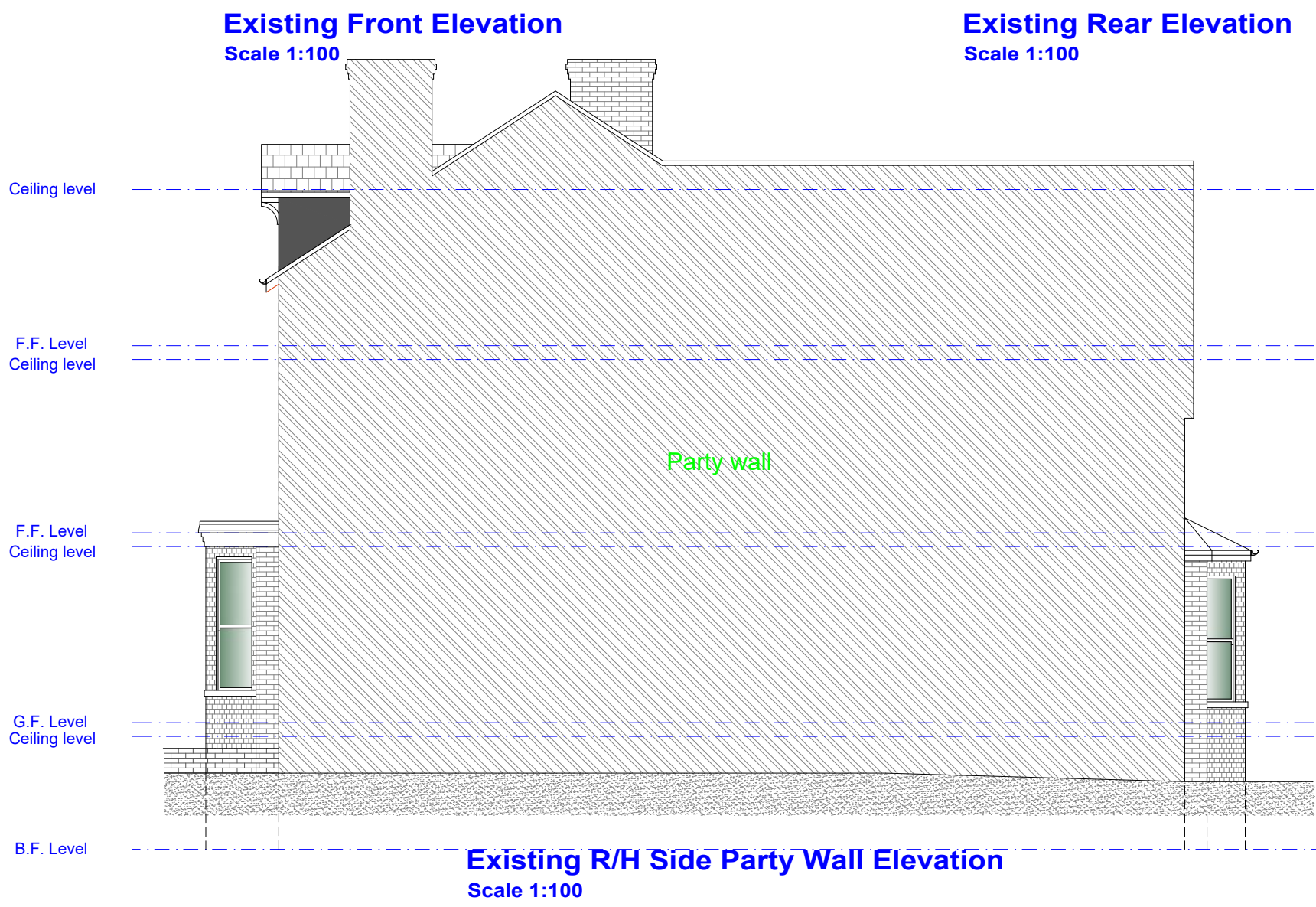
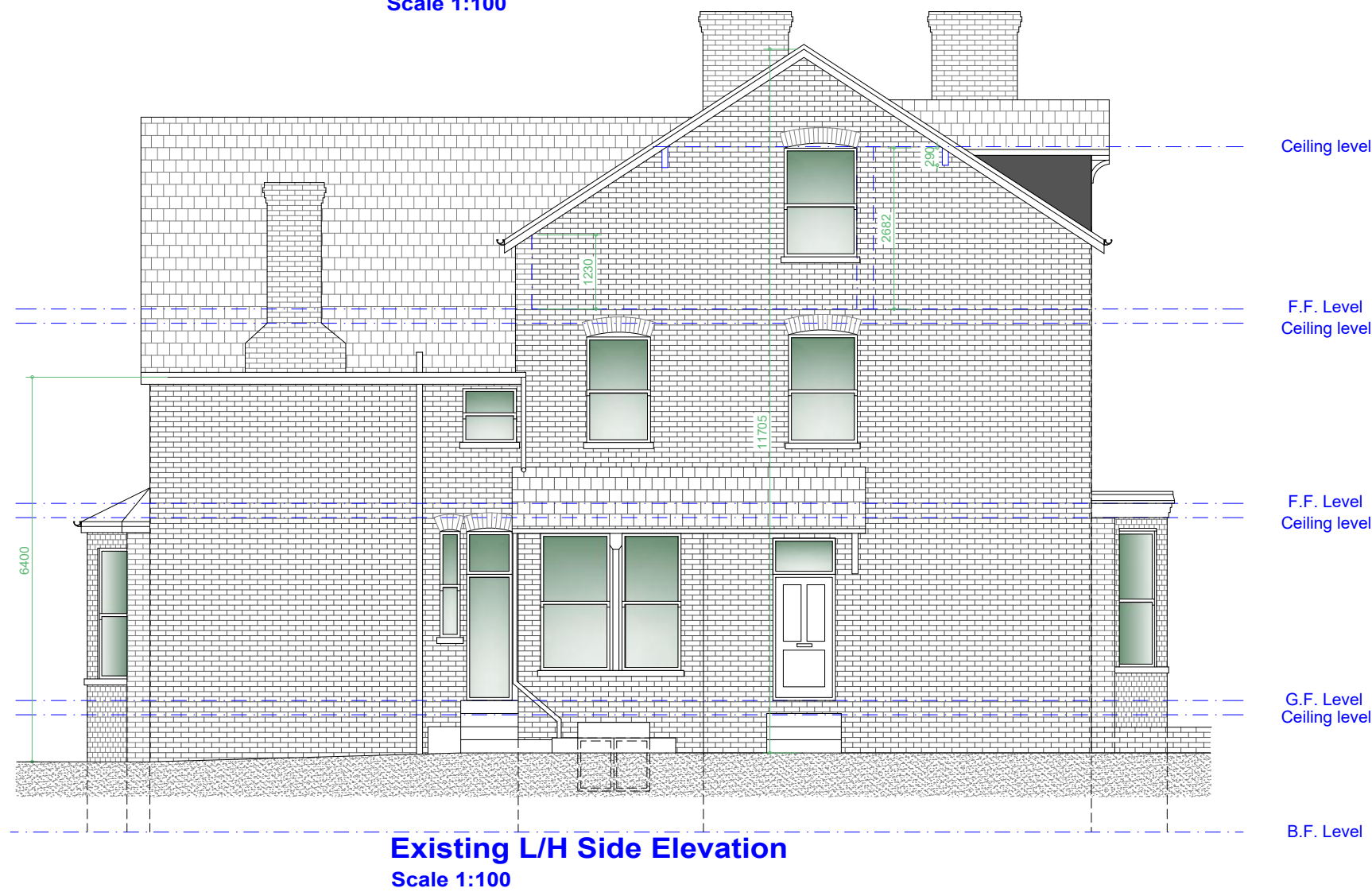
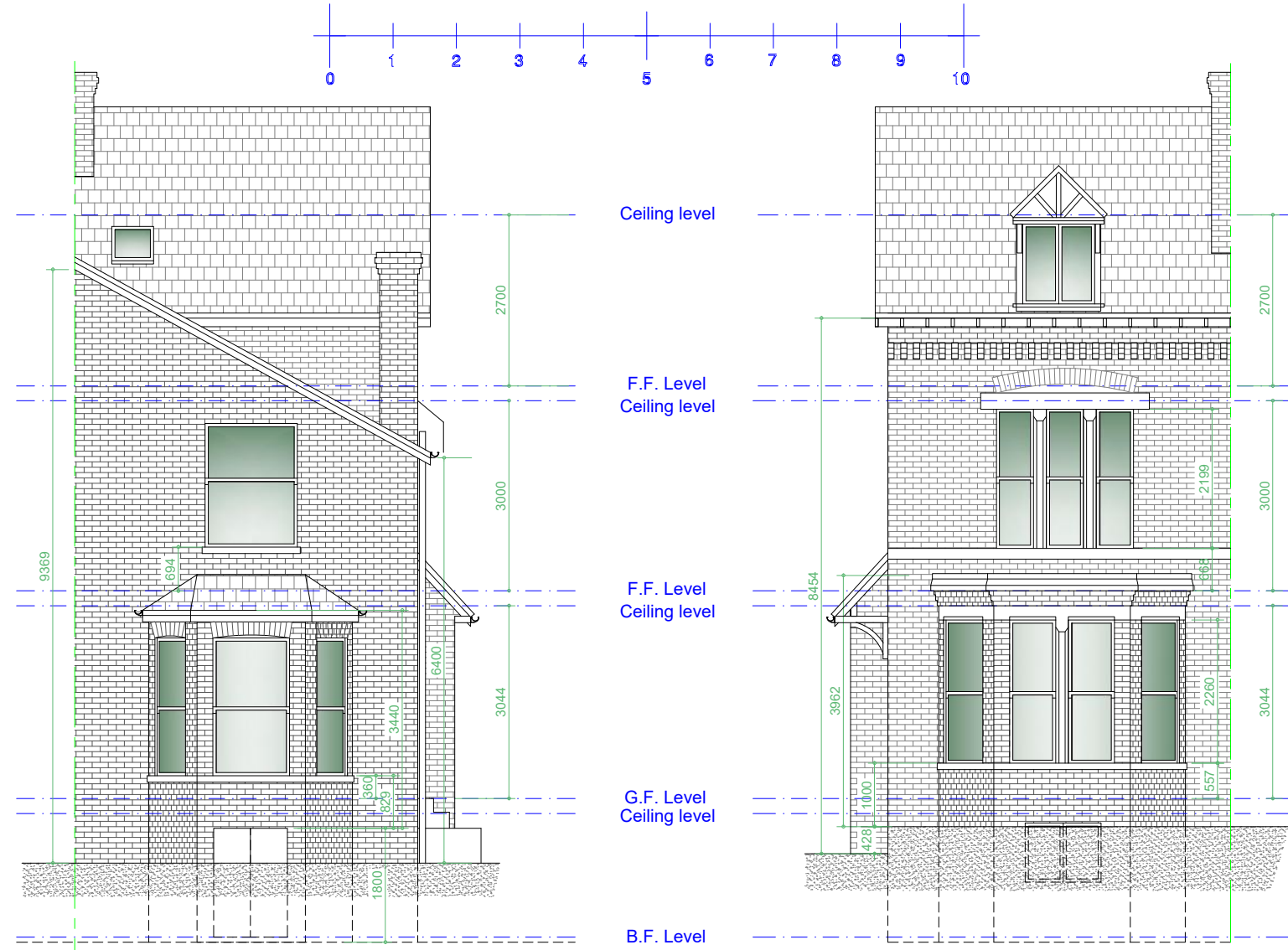
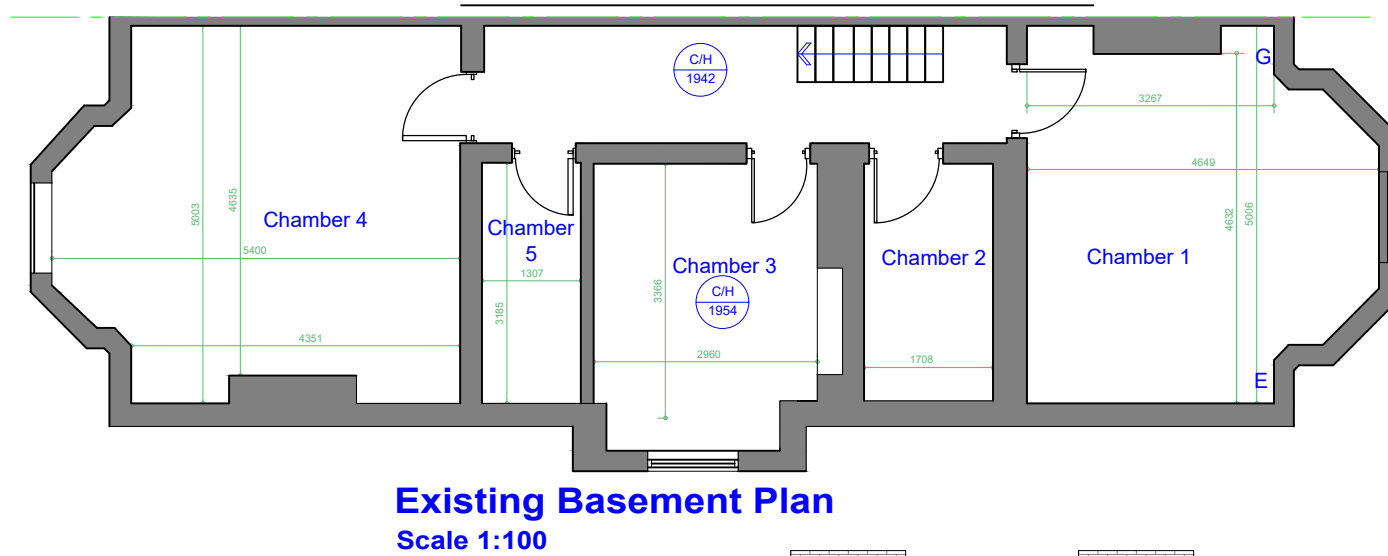
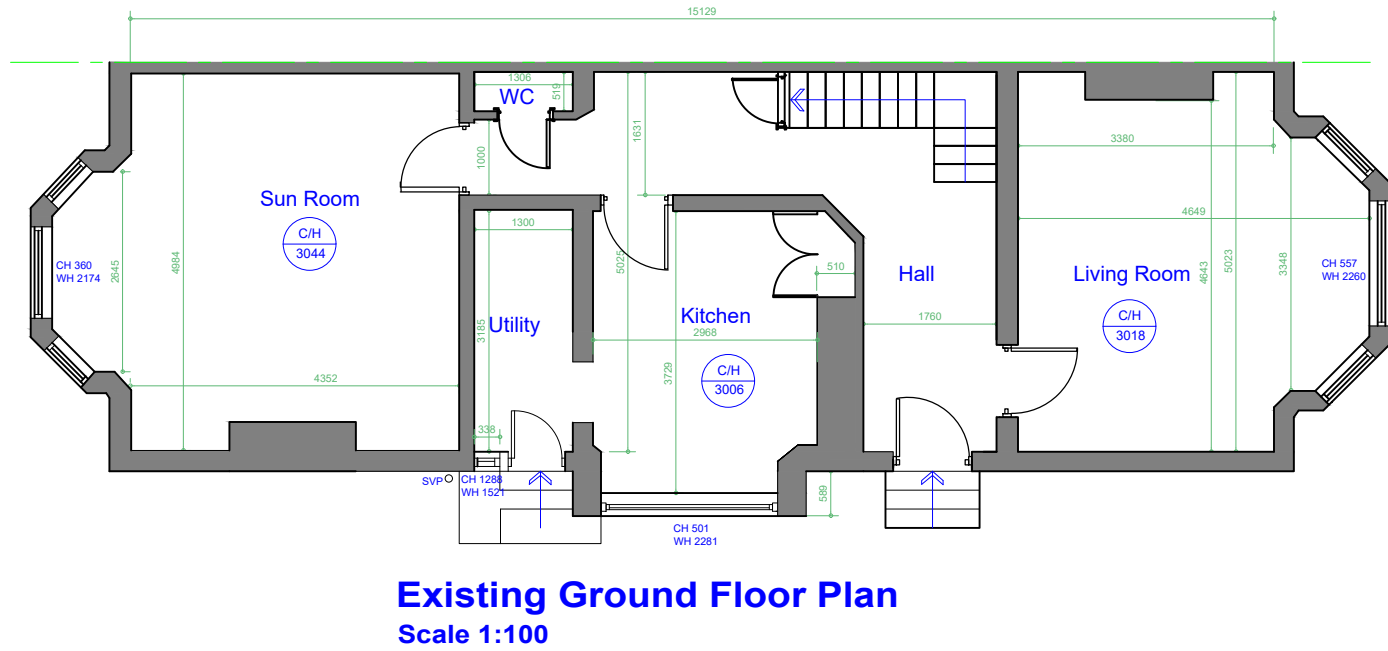
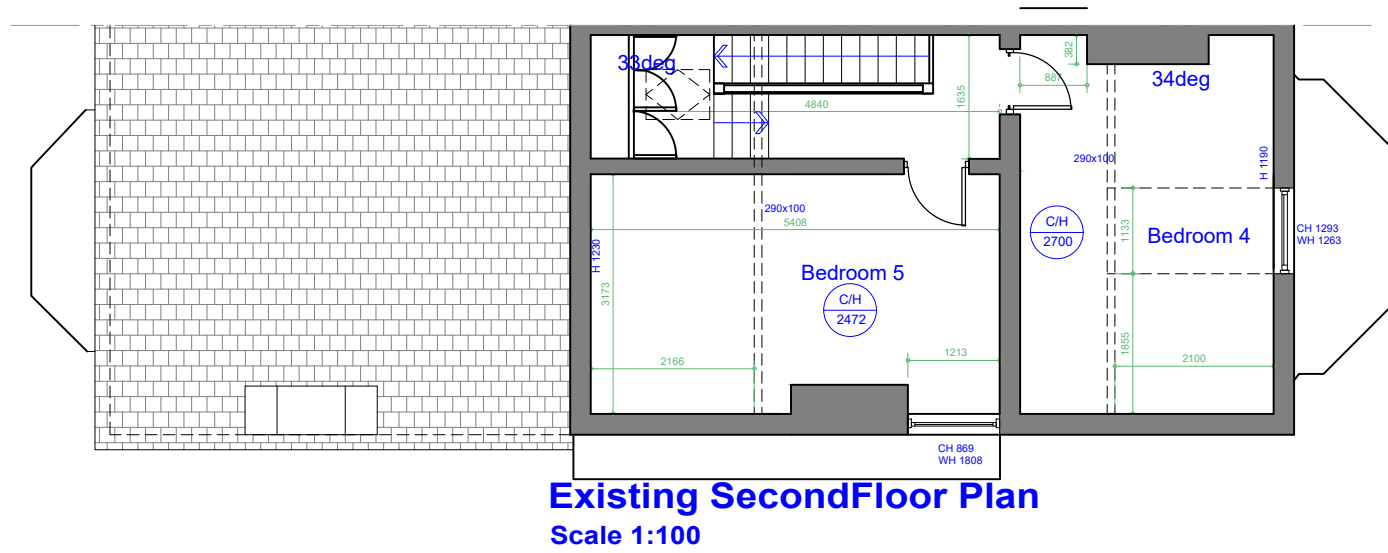
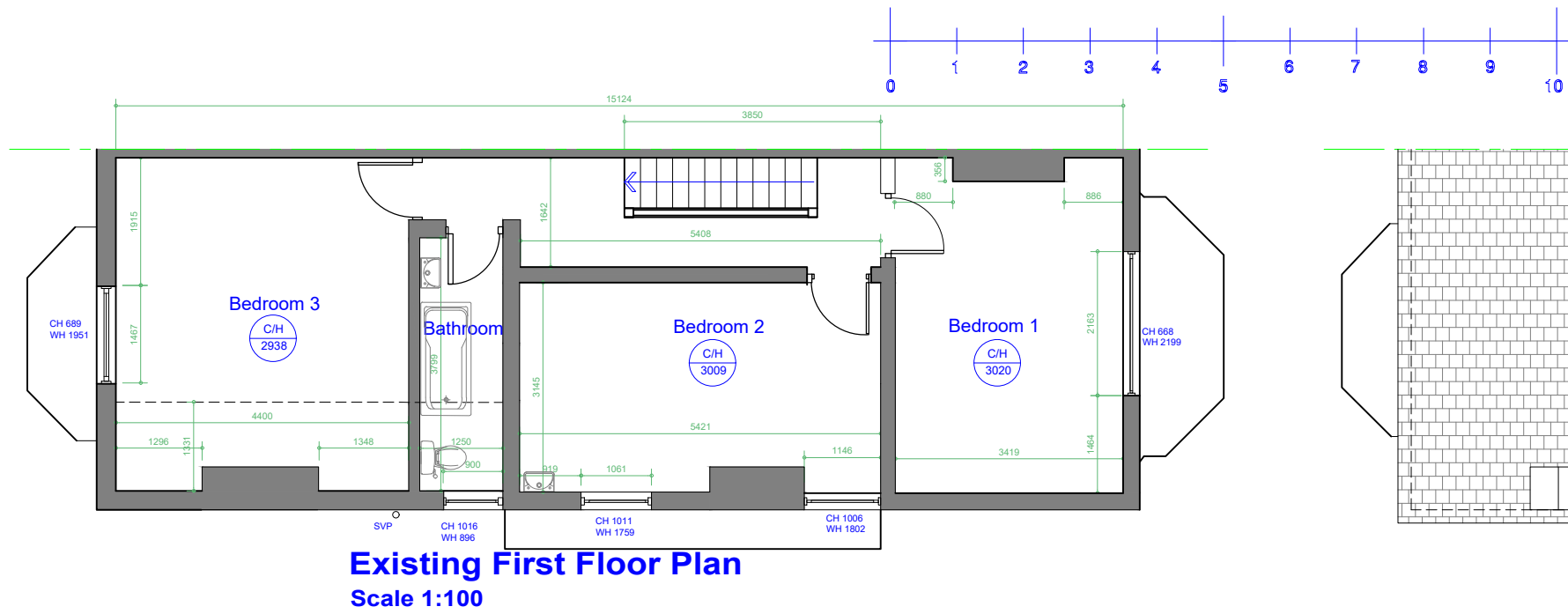
- The proposed development fits within EA standing advice for domestic extensions,
- No additional residential units will be created as part of the development.
- The additional footprint created by the development will not exceed 250m².
- Internal access will be maintained from the basement to the upper floors of the property.
- Flood proofing of the development will be incorporated as appropriate.
- Post development, there will be no unacceptable loss of fluvial floodplain storage.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.
- Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

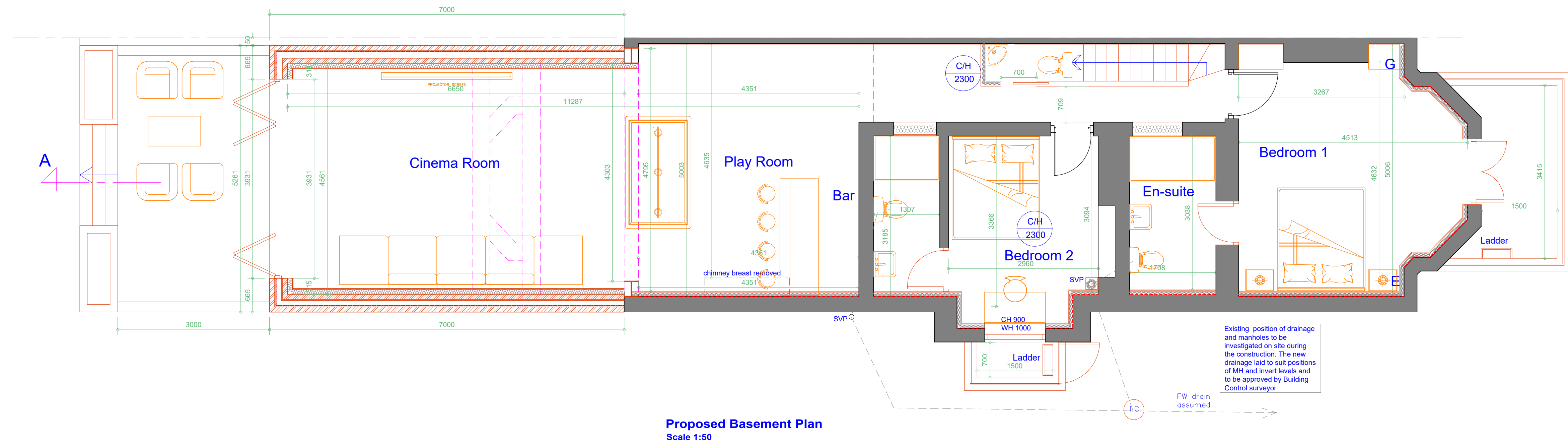
Appendix

- Site location, existing and proposed plans
- EA Flood Map for Planning
- EA flood data

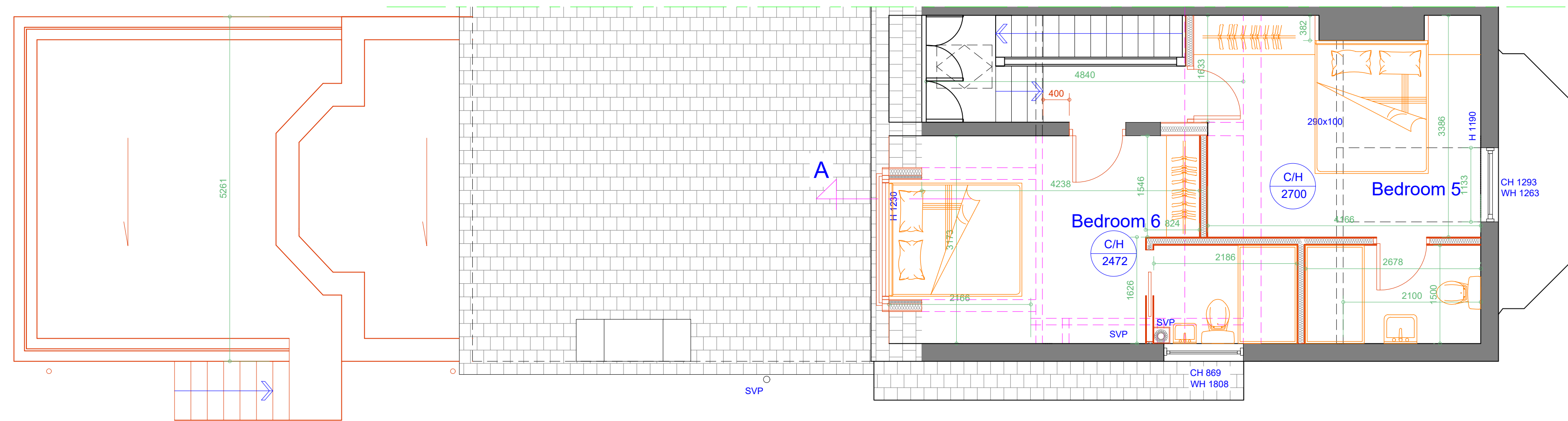
All dimensions are to be checked on site. This drawing shall not be scaled to ascertain dimensions.



All dimensions are to be checked on site.
This drawing shall not be scaled to ascertain dimensions.

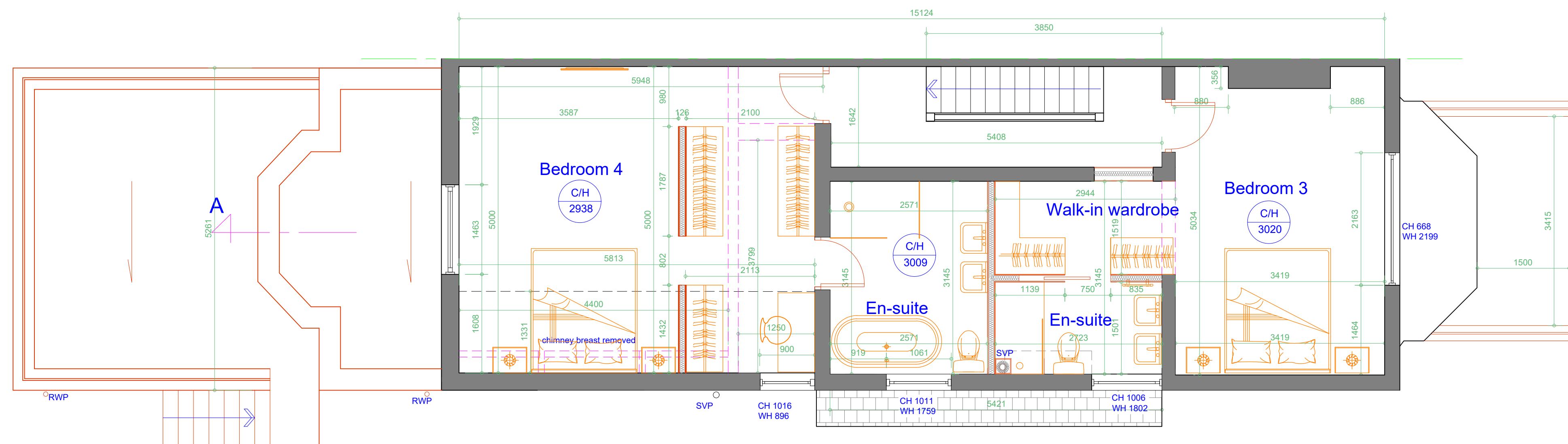


All dimensions are to be checked on site.
This drawing shall not be scaled to ascertain dimensions.



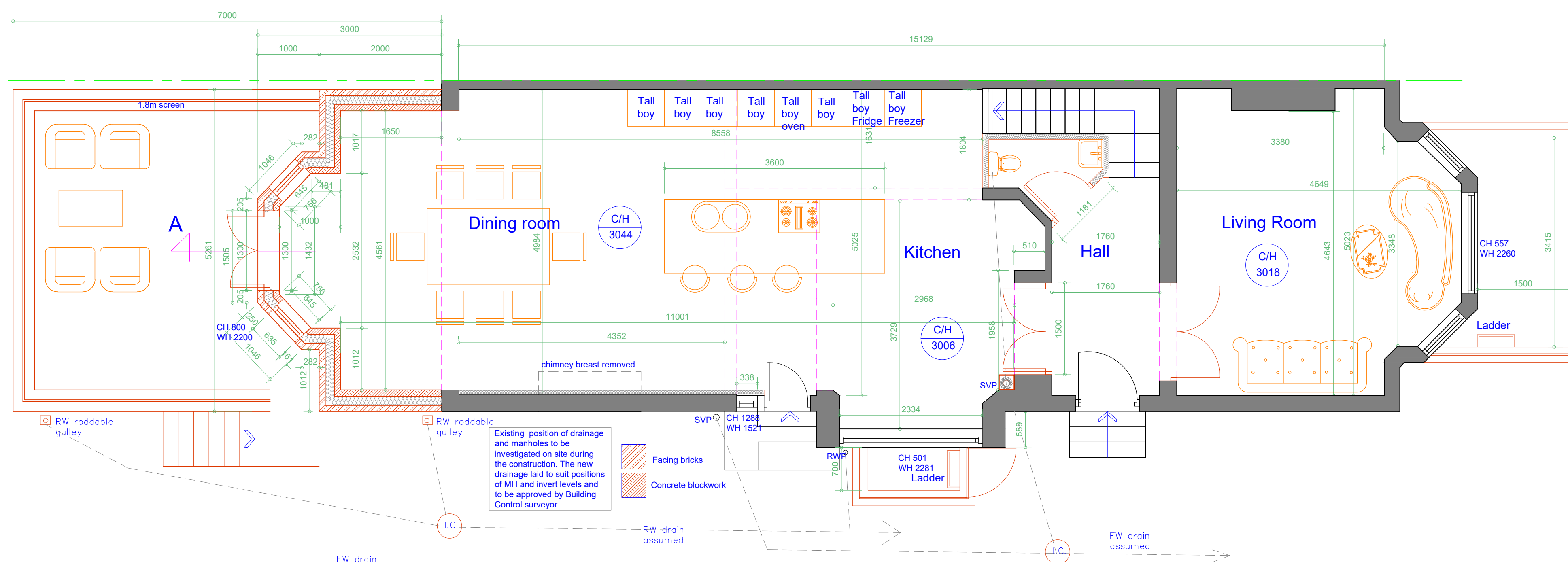
Proposed Second Floor Plan

Scale 1:50



Proposed First Floor Plan

Scale 1:50

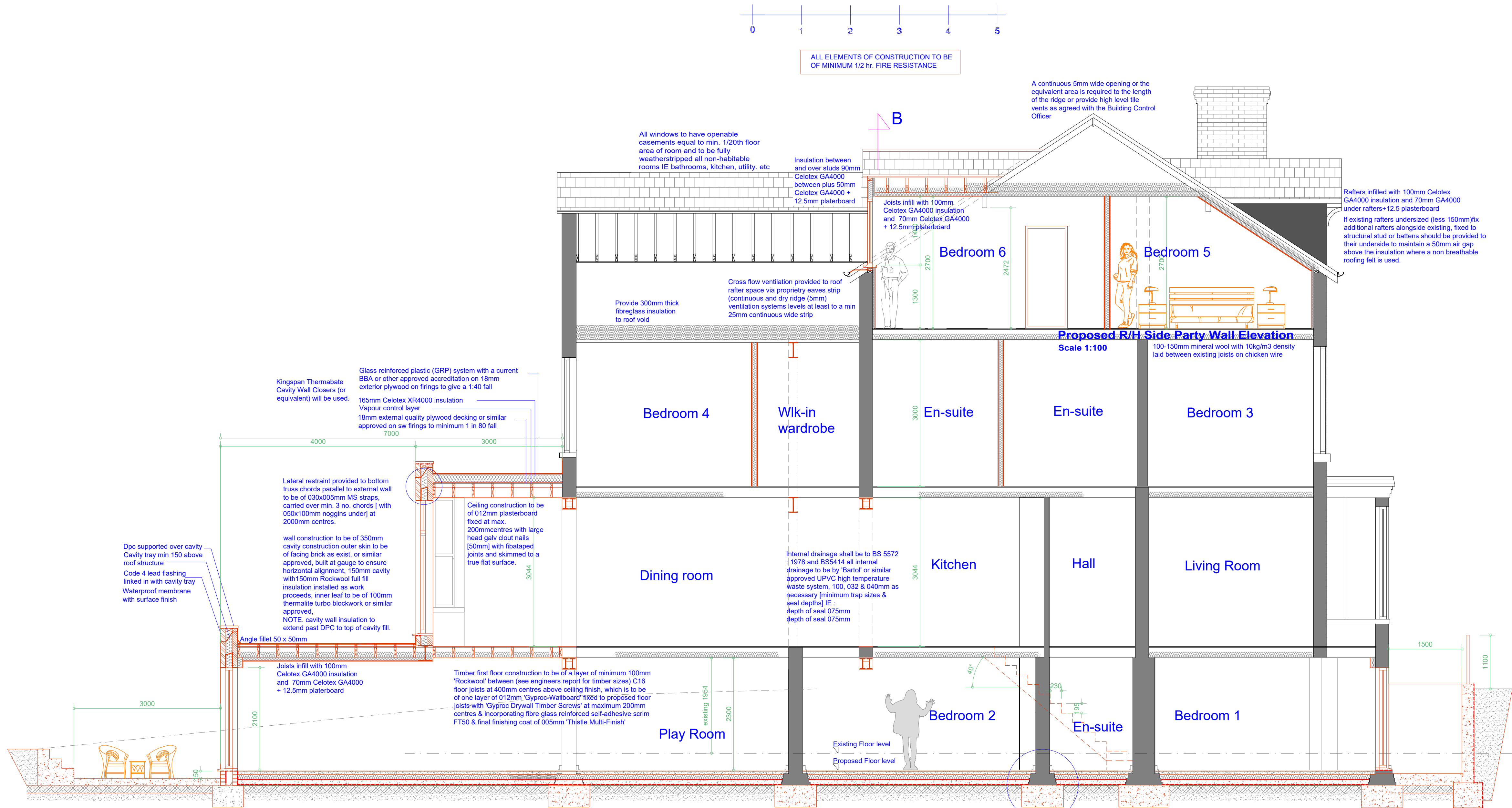


Proposed Ground Floor Plan

Scale 1:50

Rev	Date	Description
Issued For INFORMATION PURPOSES ONLY		
Client Mr. Joe Cravagan - Fastspace Ltd		
Project 56 Manley Road, Whalley Range, Manchester, M16 8HP Proposed single storey rear extension, rear cottage dormer to existing log extension, Collier conversion and extension.		
Scheme - Drawing Title Proposed Ground Floor, First Floor and Second Floor Plans.		
03		Date 04.06.24
Drawing No.	Revision	Scale 1:50 @A1
		

All dimensions are to be checked on site.
This drawing shall not be scaled to ascertain dimensions.



Note:
Ground conditions to be investigated to determine the foundation type and depth and to be approved by Building Control Officer

NOTE: Positions of proposed drainage runs and types of drainage indicated on drawings are provisional only, and may be altered to suit site conditions. Contractor to check invert & position of existing drainage systems to ensure adequate fall & to ensure BCO is satisfied with proposed drainage layout, fall and site inverts before excavation of drainage runs

ELECTRICITY service into existing buildings, care must be taken when any excavation is taking place near these positions. Confirm position of electricity cables with UK Power Networks (plans@ukpowernetworks.co.uk) before commencing on site, position of service cable to be marked on site, and also on copy of plans.

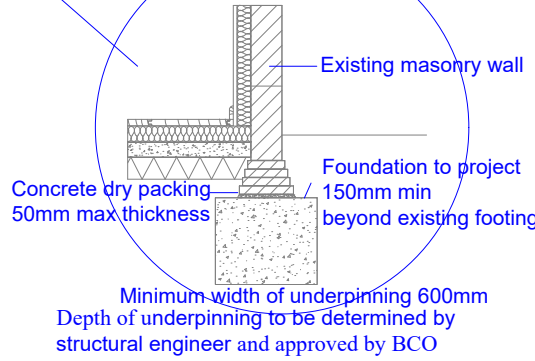
WATER supply to be located & isolated prior to removal of any pipework, water supply pipe to be adequately protected from accidental / willful damage at all times, contact United Utilities 0845 746 2200

GAS service into existing buildings, care must be taken when any excavation is taking place near these positions. Confirm position of gas supply pipe with Transco 01204 - 546900, before commencing on site, position of service pipe to be marked on site, and also on copy of plans, once position of pipe has been established. IN AN EMERGENCY CALL 0800 111999 IMMEDIATELY

Maintain any existing floor ventilation from the existing dwelling with 100mm dia PVC duct over / under new floor and extending telescopic air vents and air bricks with cavity trays over at maximum 1500mm centres, all vegetable strip to be removed from site of slab & ground to be treated where necessary with proprietary weedkiller

TYPICAL UNDERPINNING DETAIL (BCO)

For general guidance only
All underpinning proposals to be designed by structural engineer and undertaken in accordance with structural engineer's details



UNDERPINNING
Proposals to be in accordance with BS 8004 (+A1:2020), supported by full structural details and calculations by a Structural Engineer and the superstructure to be assessed for differential movement. Movement joints to be provided between any existing and underpinned/new foundations. Where trees are within close proximity of the existing structure the potential risk of movement must be fully assessed. The extent of the root intrusion to be investigated and soil samples to be taken to determine the plasticity of the ground. A detailed analysis of the findings and a comprehensive structural design package for the proposal, should be provided.
The design should take into account all imposed loads and actions including:
Ground movement
Lateral forces from ground water, retained ground and ground surcharging loads
Buoyancy
Loading from other parts of the building
Temporary loading conditions
Structural design should be co-ordinated with the design of the waterproofing.

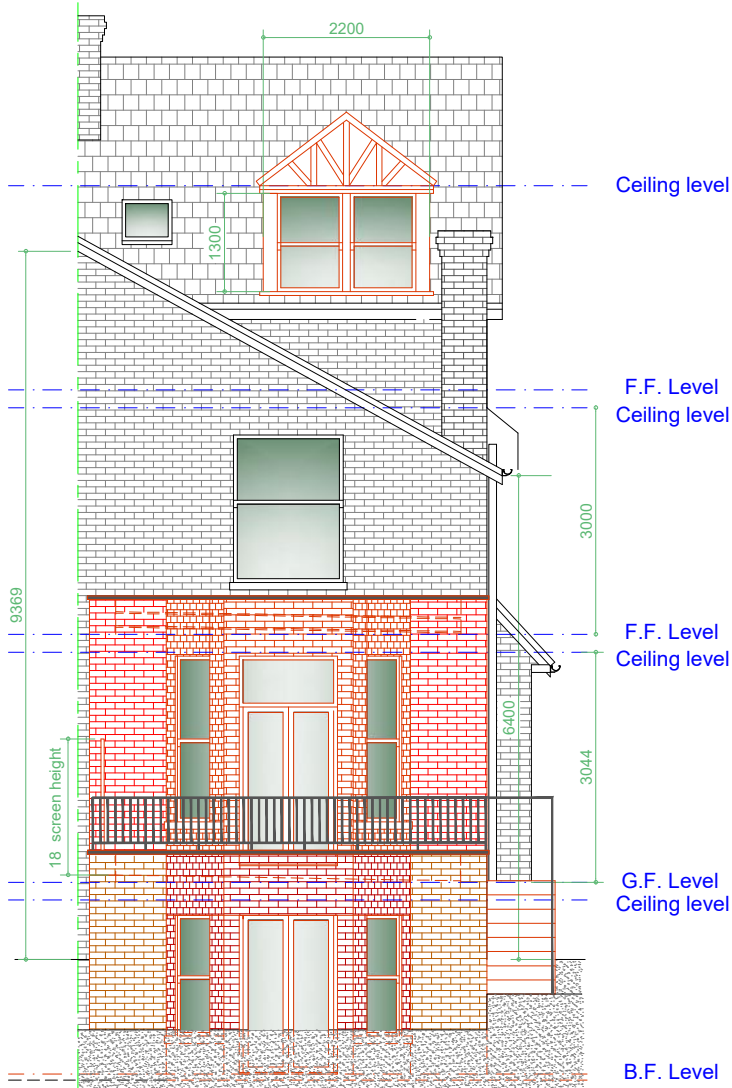
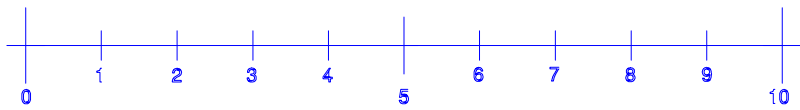
Rev	Date	Description
Issued For [INFORMATION PURPOSES ONLY]		
Client Mr. Joe Cravagan - Fastspace Ltd		

Project
56 Manley Road, Whalley Range, Manchester, M16 8HP
Proposed single storey rear extension, rear cottage dormer to existing loft conversion, Cellar conversion and extension

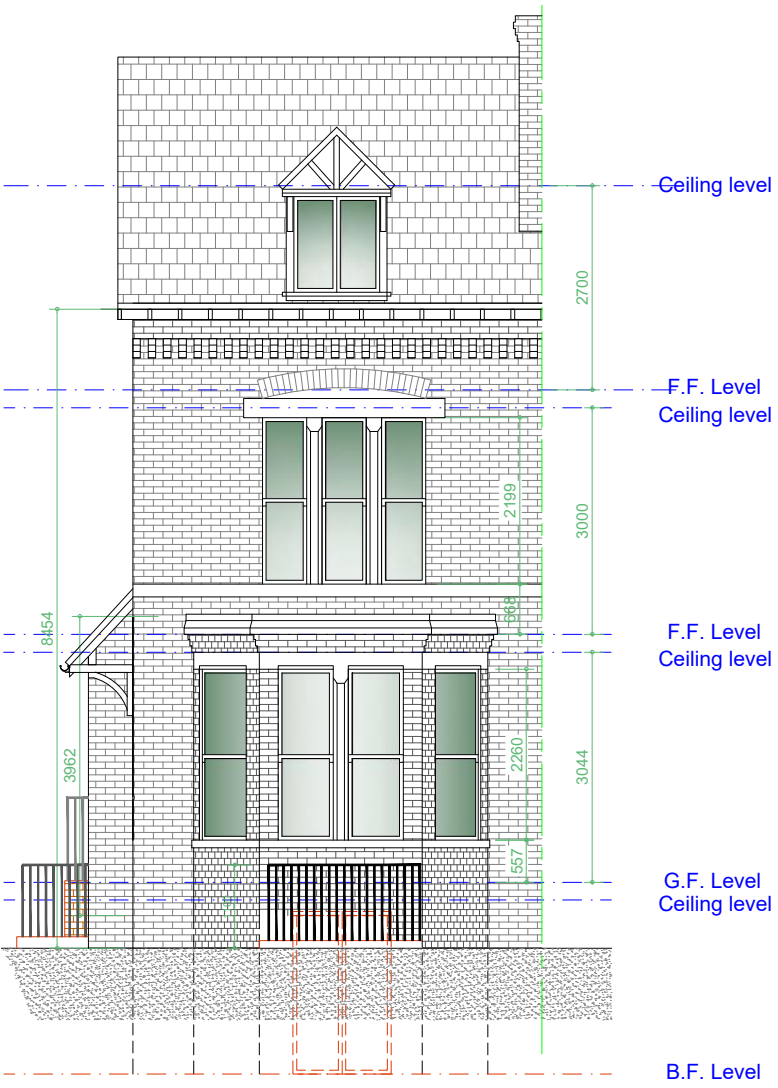
Scheme - Drawing Title
Proposed Section.

04	Revision	Date 04.06.24
Drawing No.	Scale 1:50 @A2	

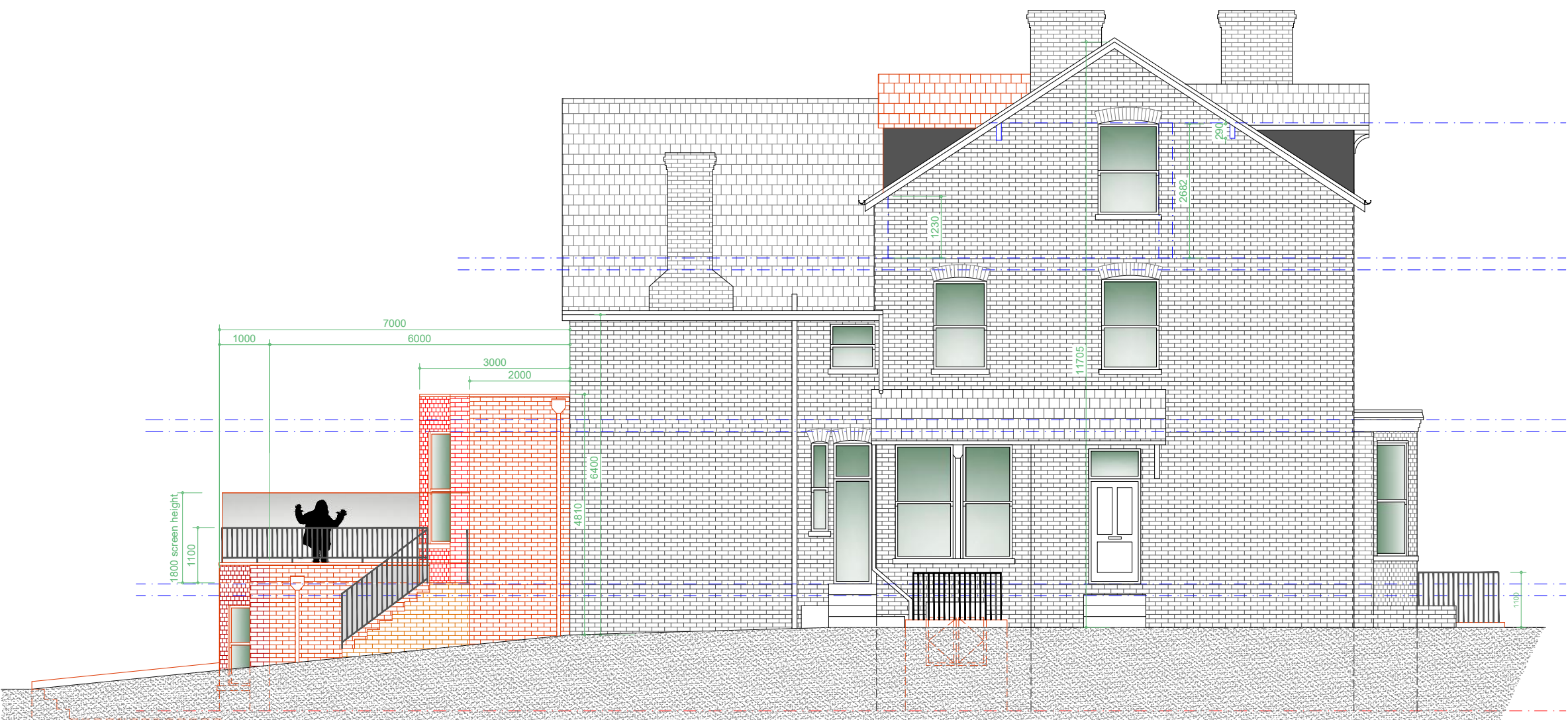




Proposed Rear Elevation
Scale 1:100



Proposed Front Elevation
Scale 1:100

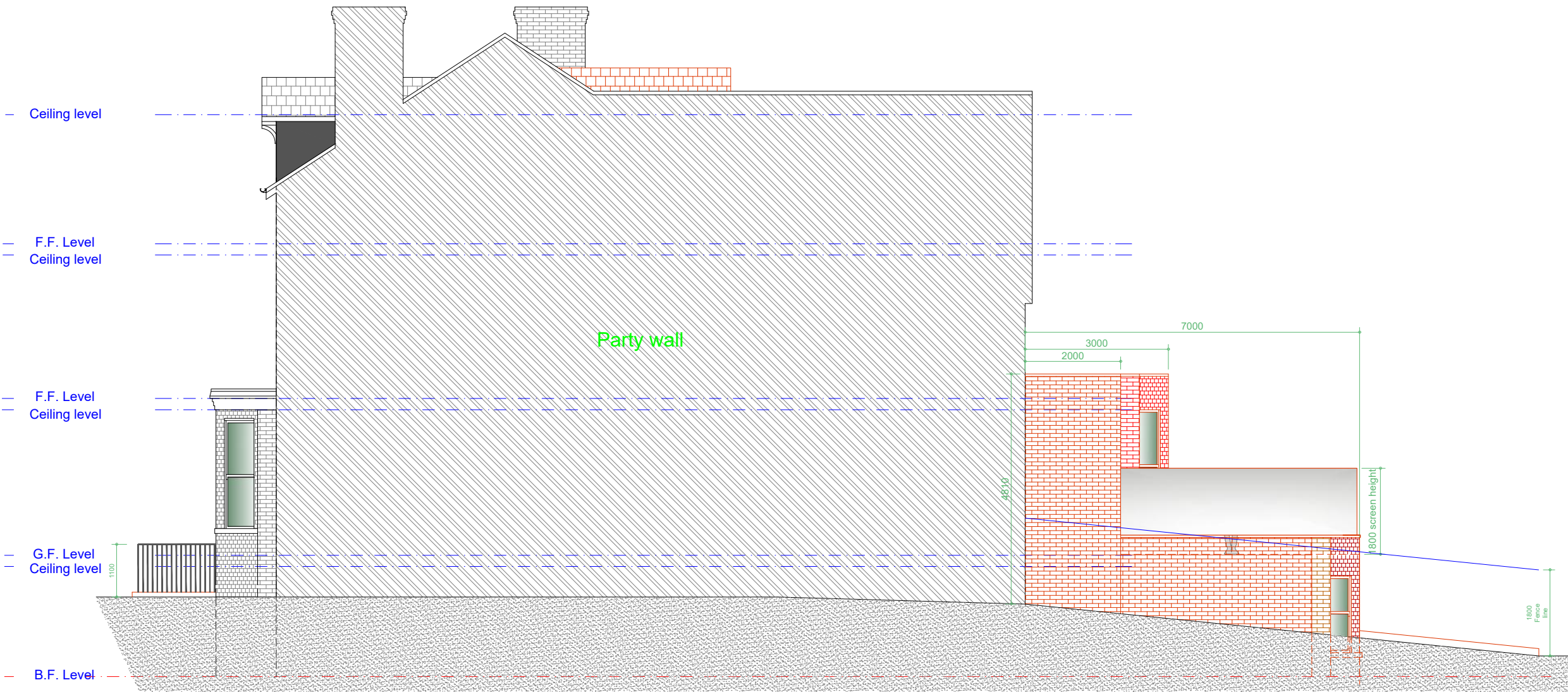


Proposed L/H Side Elevation
Scale 1:100

GENERAL NOTES

Contractor to visit site prior to commencement of work and check all dimensions and familiarise himself with the site conditions. This drawing must then be checked and verified by the contractor prior to work commencing on site.

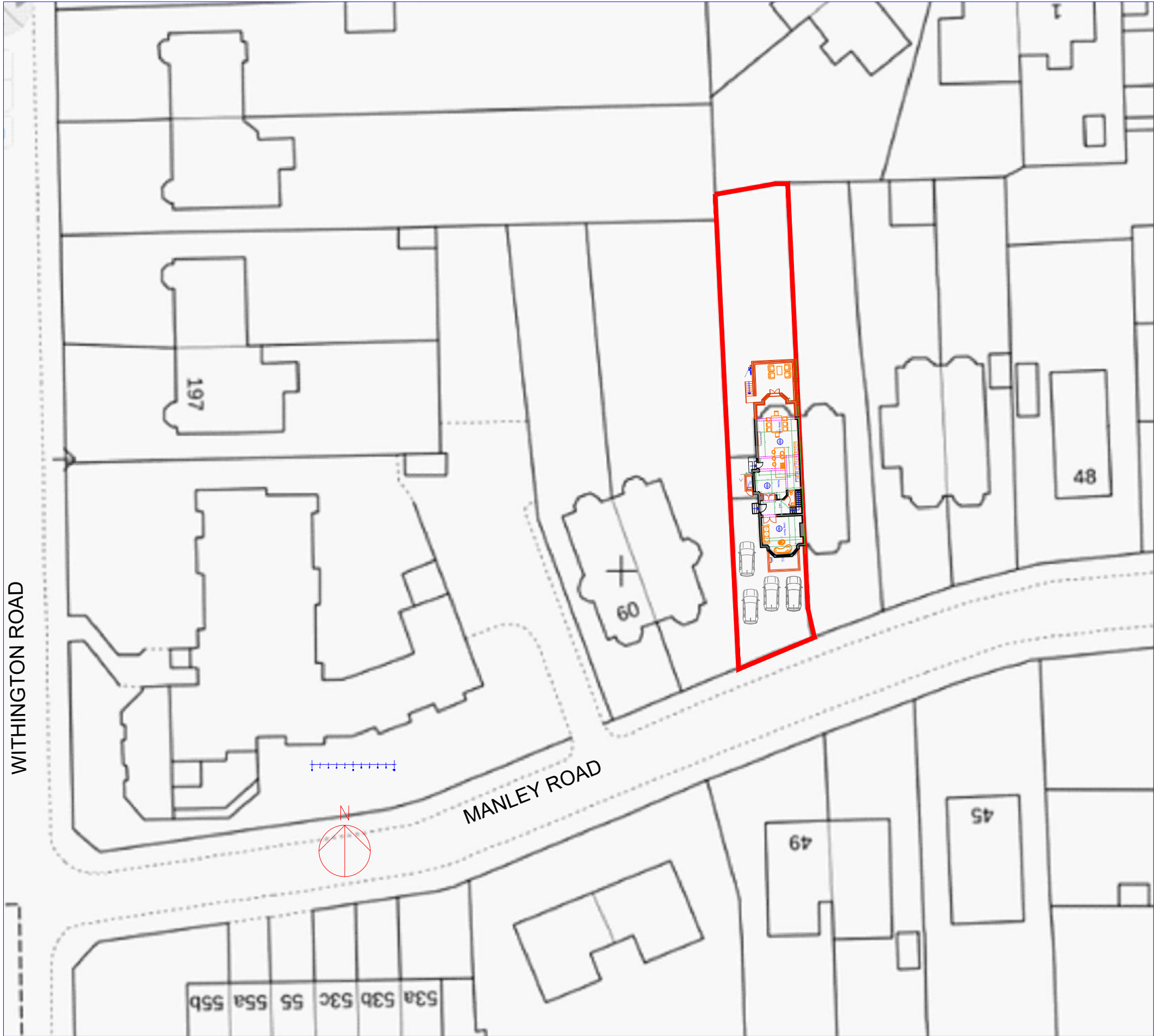
This drawing is for the purpose of achieving local authority approval only and should not be used as a working drawing. Client must have received written approval from both the local authority, planning and building control departments before instruction or commencement of any building works on the relevant site. Client to obtain written permission from relevant bodies for any encroachment whatsoever. All workmanship, materials and construction to comply with Building Regulations, British Standards, Codes of Practice and N.H.B.C requirements whether or not specifically stated on these drawings. All materials to be fixed, applied or mixed in accordance with manufacturers instructions or specifications. All materials shall be suitable for their purpose. The contractor shall take into account everything necessary for the proper execution of the works, to the satisfaction of the "Inspector" whether or not indicated on the drawings. Sample of external materials to be submitted to L.A for approval. All external timber to be preservative treated. All air bricks to be ducted through walls. Where additional load is to be applied over existing openings, lintels to be exposed and checked for structural stability to the satisfaction of local building control officer.



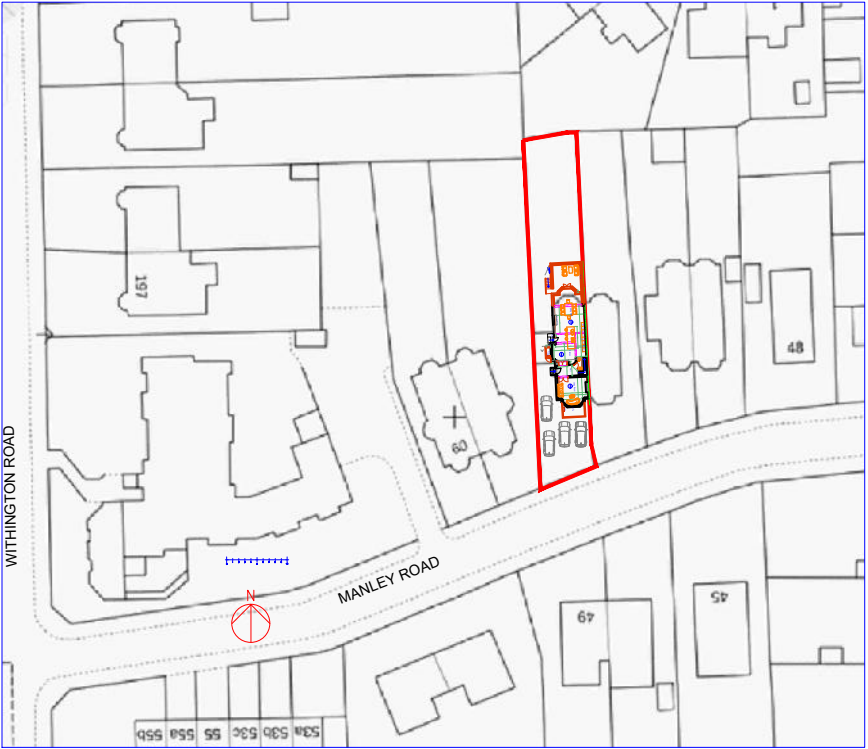
Proposed R/H Side Party Wall Elevation
Scale 1:100

Rev	Date	Description
Issued For: INFORMATION PURPOSES ONLY		
Client		
Mr. Joe Cravagan - Fastspace Ltd		
Project		
56 Manley Road; Whalley Range, Manchester, M16 8HP		
Proposed single storey rear extension, rear cottage dormer to existing loft conversion, Cellar conversion and extension.		
Scheme - Drawing Title		
Proposed elevations		
07		
Drawing No.	Revision	Date 04.06.24
		Scale 1:50 @A2
Plans To Build It Ltd		
Tel: 0161 728 5730		
Mob: 07741175755		
www.planstobuildit.com		

The driveway will be constructed using permeable (or porous) surfacing, which allows water to drain through it (such as gravel, permeable concrete block paving or porous asphalt);



OS Map
Scale 1:500



OS Map
Scale 1:1250

Rev	Date	Description
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Issued For : INFORMATION PURPOSES ONLY

Client

Mr. Joe Cravagan - Fastspace Ltd

Project

56 Manley Road, Whalley Range, Manchester, M16 8HP
Proposed single storey rear extension, rear cottage dormer to existing loft conversion, Cellar conversion and extension

Scheme - Drawing Title

OS Map

06	Date	04.06.24
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Drawing No.	Revision	Scale	Various @A3
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Plans To Build It Ltd

Tel: 0161 728 5730

Mob: 07741175755

www.planstobuildit.com

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
383107/394561

Created
17 Jul 2024 8:53

Your selected location is in flood zone 2, an area with a medium probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

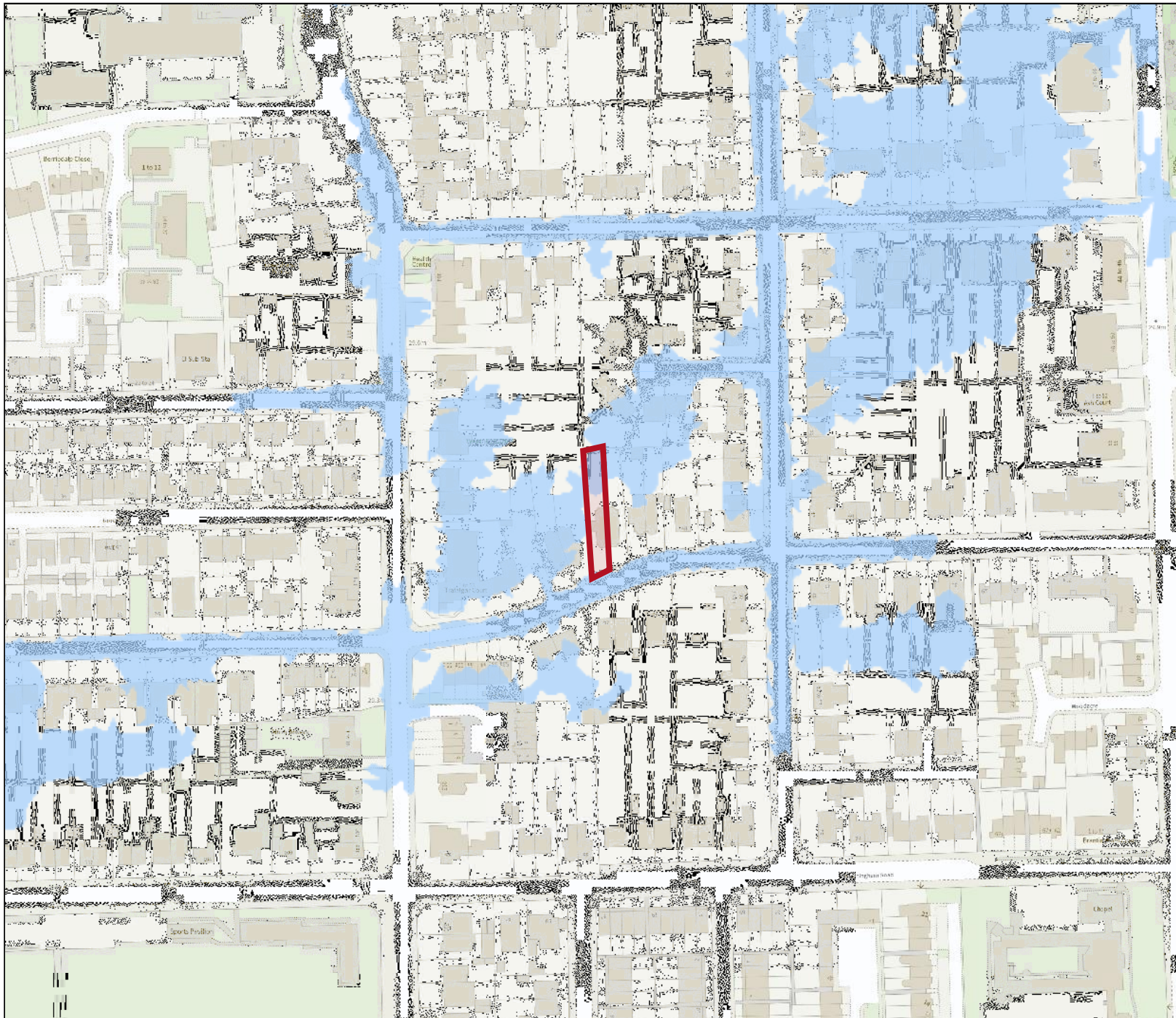
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
383107/394561

Scale
1:2500

Created
17 Jul 2024 8:53

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 20 40 60m

Emma Jeffery

From: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Sent: 18 July 2024 13:48
To: Emma Jeffery
Subject: GMMC368678SW Response attached from the Environment Agency

Dear Emma,

Thank you for your enquiry which was received on 17/07/24.

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

I enclose the data requested, please see supporting comments from my colleague.
Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

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

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

Please be aware you can check your risk of flooding on our external website <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>
Here are some useful links below:
<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Here are some useful links below:

<https://ea.sharefile.com/public/share/web-sa5d0c51ef6c148b3af88be56cd76f0e6>

The ShareFile links contains the following data:

Chorlton Platt Gore 2012 Report (P5) Outputs (P6) Mapedit (P6) Model (P7)
Corn Brook 2017 Report (P5) Outputs (P6) Mapedit (P6) Model (P7)

Please can you advise that the link will expire in 30 days from 18/07/2024.
It is therefore advisable that the client saves this data to their own system.

Product 5/6/7

1. You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you.
2. Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice.
3. We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentiality of others. In this instance it is because of third party data. If you contact us in

writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights.

4.1 The Information may contain some data that we believe is within the definition of “personal data” under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual.

4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data.

5 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km². Information about the operation of flood assets should not be published.

6 .1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as “the Data”.

6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.

We are supplying this information to you under the Environment Agency Conditional Licence Please check the special conditions above to determine if the conditions on the use are suitable for your purposes. If they are not, this information is not provided with a licence for use, and the data is provided for read right only.

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

Kind regards,

Sarah Walters

Customer and Engagement Officer

Greater Manchester, Merseyside and Cheshire

Email: InfoRequests.gmmc@environment-agency.gov.uk

From: Emma Jeffery <emma.jeffery@unda.co.uk>

Sent: Wednesday, July 17, 2024 9:06 AM

To: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>; Enquiries, Unit <enquiries@environment-agency.gov.uk>

Cc: Admin @ Unda <administrator@unda.co.uk>

Subject: GMMC368678SW EA Products 4, 5, 6 and 8 data request for Planning: 56 Manley Road; Whalley Range; Manchester; M16 8HP. Our ref: 94547

Dear Sir/Madam,

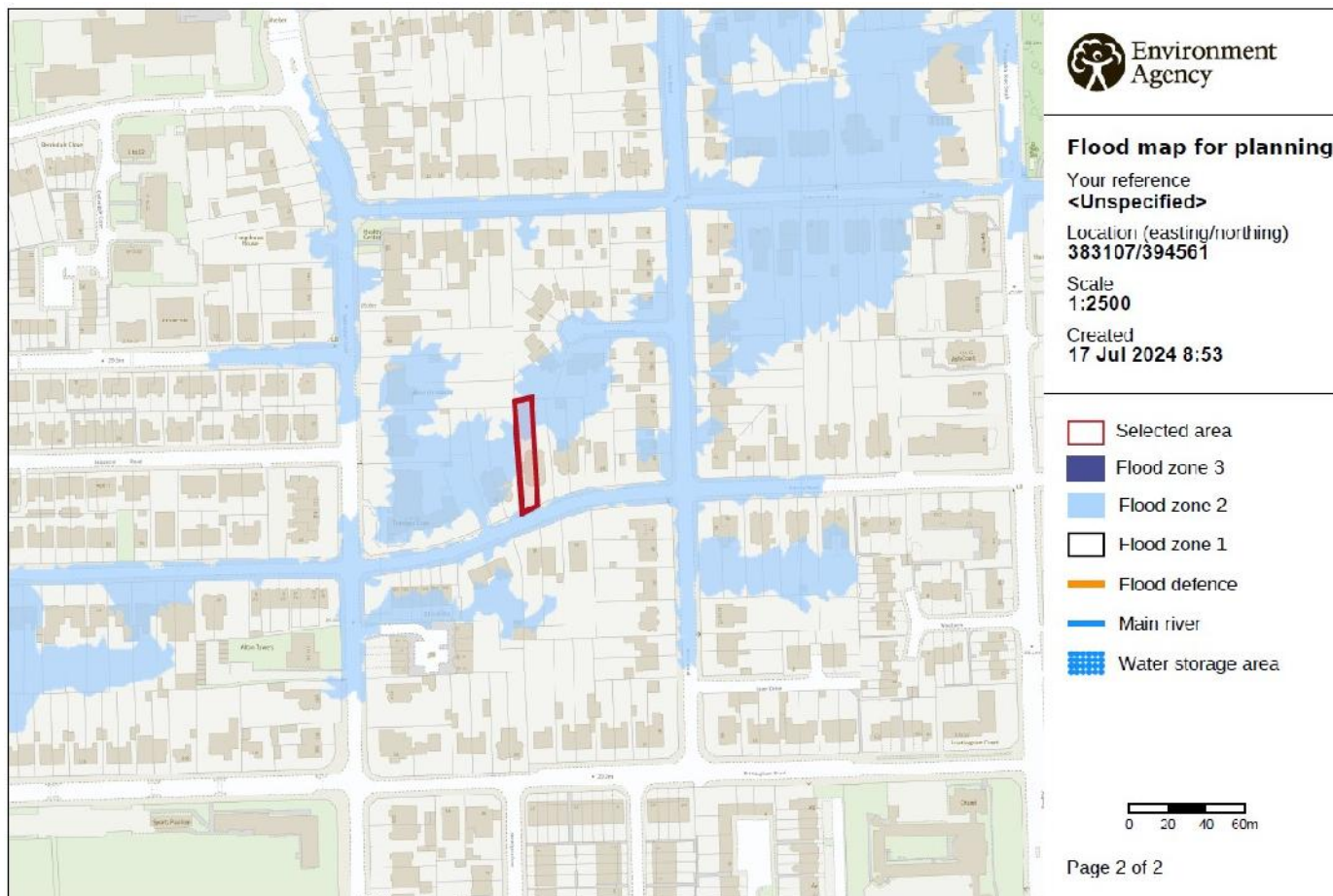
I would like to request a “Products 4, 5, 6, and 8” flood map package for the following site, for use within a Flood Risk Assessment for planning.

- 56 Manley Road; Whalley Range; Manchester; M16 8HP. Our ref: 94547
- Please acknowledge receipt of this email and provide the EA logged reference number for this site by email.
- Please quote our reference on all correspondence (including emails and Product 4 data): Our ref: 94547
- Please email the Product data to administrator@unda.co.uk

- Please ensure that the data covers the entire application area (as indicated with red line) and the adjacent roads.
- Is there is only J-Flow data available for the site please could you provide the depths and levels



OS Map
Scale 1:500



Please do not hesitate to contact me if you have any questions.

Kind Regards

Emma Jeffery | Senior Consultant



Unda Consulting Limited

W: www.unda.co.uk

T: +44 (0) 1293 214 444

M: +44 (0) 7434 771826

E: emma.jeffery@unda.co.uk

(please note my usual working days are Tuesday to Thursday)

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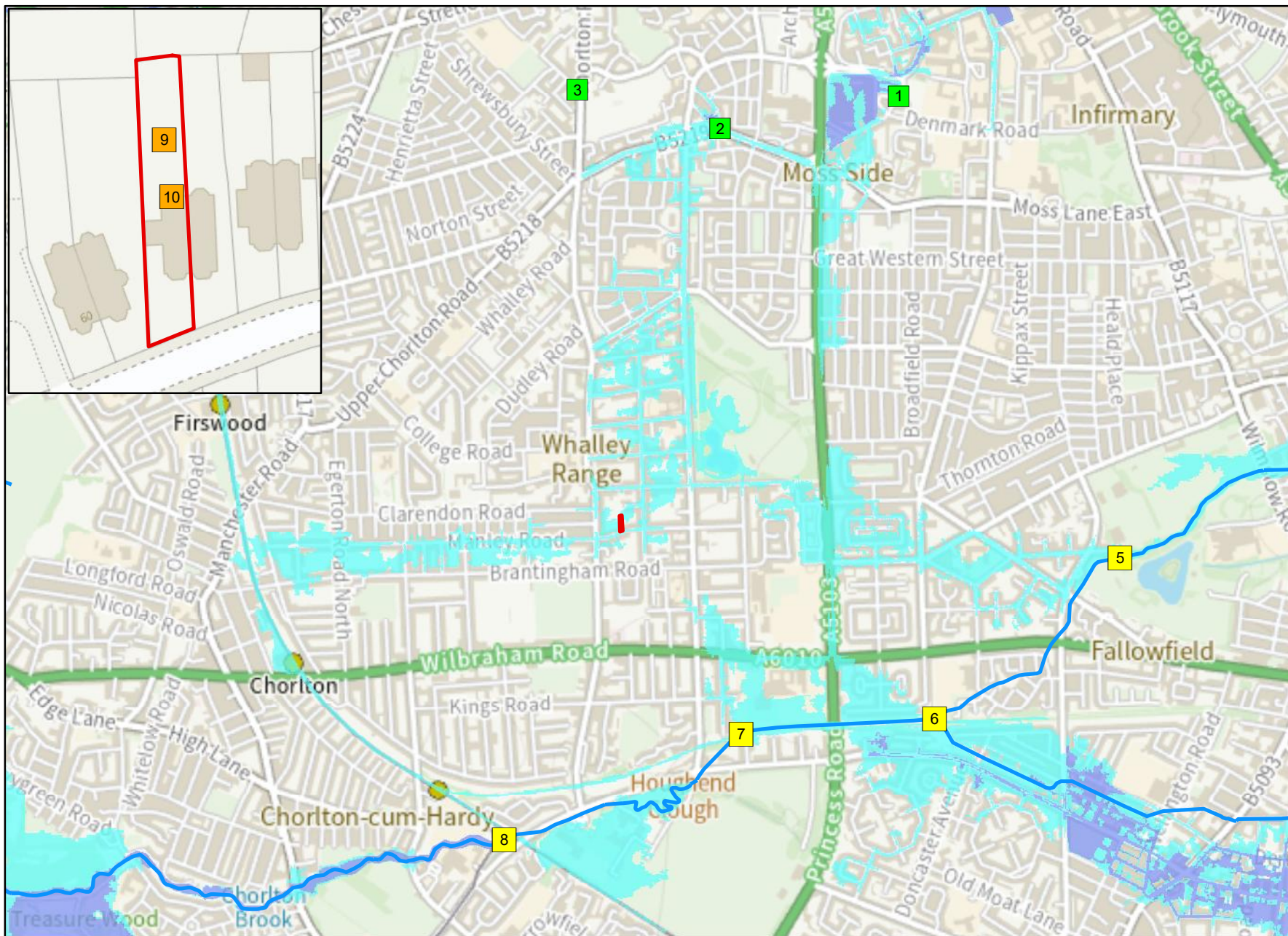
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Detailed Flood Map Centred on Manley Road, Whalley Range, M16 8HP. Created 12/07/2024 [GMMC367900LB]



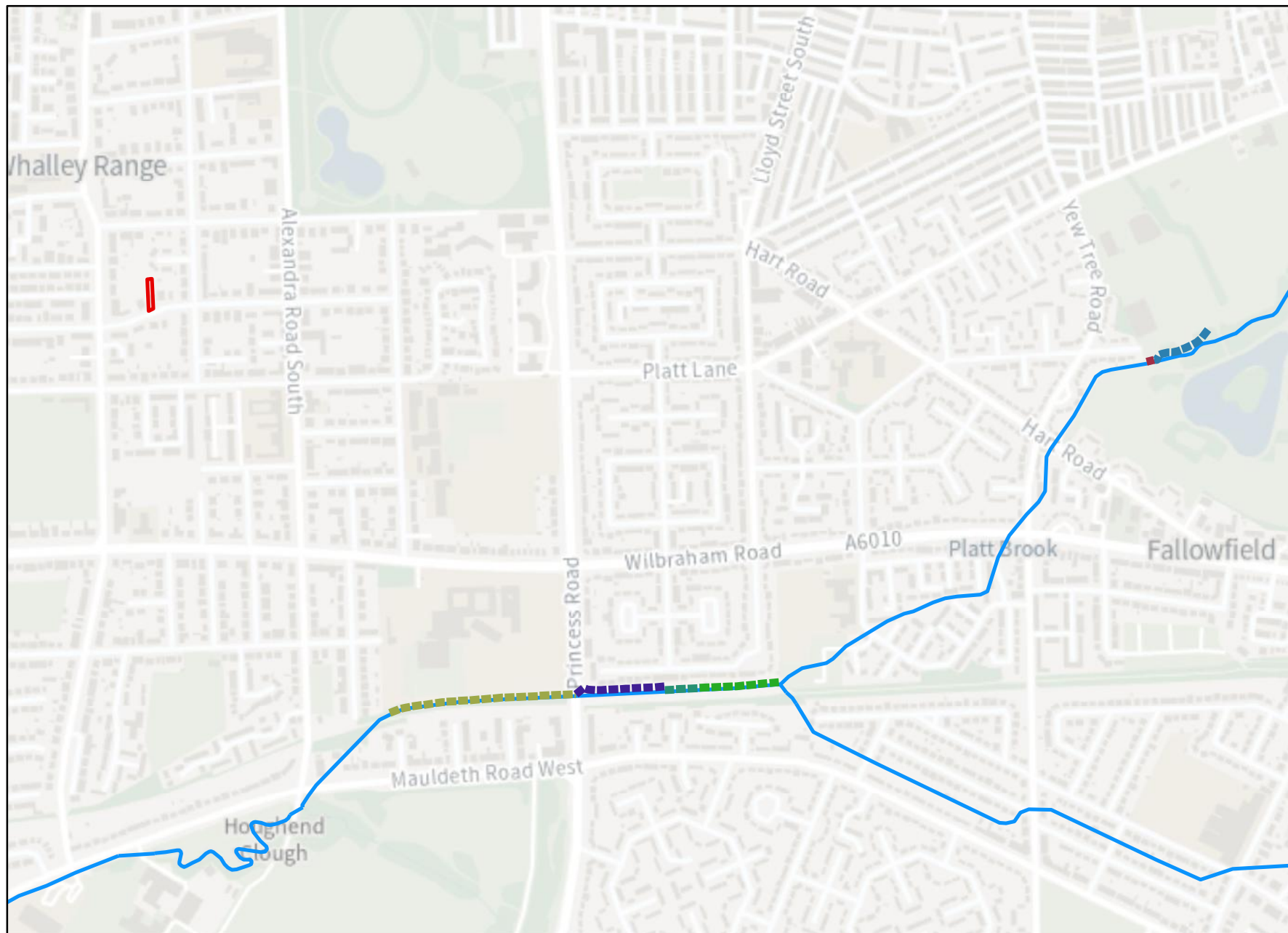
1:20,001



Legend

- Site Location
- Corn Brook
- Chorlton Platt Gore
- 2D Levels
- Main River
- Flood Zone 3
- Flood Zone 2

Flood Defence Map Centred on Manley Road, Whalley Range, M16 8HP. Created 12/07/2024 [GMMC367900LB]



1:10,001



Legend

-  Main River
-  Site Location

Defences

Asset ID

-  120082
-  120657
-  122064
-  32518
-  32543
-  59788

					Undefended													
Map Reference	Model Node Reference	Easting	Northing	Data	50 % AEP (1 in 2 year)	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)	0.1 % AEP (1 in 1000 year) + 30% increase in flow
1	ea013_0249_com3908	384113	396108	Modelled Water Level (m aodN)	32.15	32.28	32.37	32.44	32.51	32.77	33.26	33.47	33.75	33.79	34.02	33.83	34.34	34.46
				Modelled Flow (cumecs)	0.19	0.27	0.34	0.39	0.47	0.81	1.03	1.21	1.57	1.63	2.05	1.70	3.47	4.51
2	ea013_0249_com3215	383467	395995	Modelled Water Level (m aodN)	30.61	30.71	30.80	30.90	31.01	31.93	32.43	32.58	32.78	32.81	32.99	32.84	33.28	33.39
				Modelled Flow (cumecs)	0.24	0.34	0.42	0.49	0.58	1.03	1.32	1.57	2.03	2.11	2.66	2.24	4.60	5.98
3	ea013_0249_com2587	382949	396138	Modelled Water Level (m aodN)	29.22	29.36	29.46	29.55	29.63	29.95	30.07	30.16	30.34	30.39	30.82	30.47	31.73	31.99
				Modelled Flow (cumecs)	0.26	0.37	0.46	0.53	0.63	1.13	1.46	1.72	2.24	2.33	2.93	2.47	5.10	6.63

Model data taken from Corn Brook 2017

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

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

				Undefended											Defended										
Map Reference	Model Node Reference	Easting	Northing	Data	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 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	0.1 % AEP (1 in 1000 year)	50 % AEP (1 in 2 year)	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 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	0.1 % AEP (1 in 1000 year)				
5	ea013_0171_CHOP01_5882u	384920	394436	Modelled Water Level (m aodN)	32.98	33.15	33.37	33.42	34.30	34.56	35.53	35.63	32.70	32.98	33.15	33.37	33.42	34.30	34.60	35.82	35.95				
				Modelled Flow (cumecs)	5.89	8.16	10.69	11.23	13.76	13.96	15.68	15.92	0.00	5.89	8.16	10.69	11.23	13.76	13.94	16.12	16.42				
6	ea013_0171_CHOP01_4770d	384246	393853	Modelled Water Level (m aodN)	31.39	31.61	31.81	31.84	31.99	32.01	32.11	32.13	30.97	31.99	31.61	31.81	31.81	31.85	32.02	32.04	32.18	32.20			
				Modelled Flow (cumecs)	10.14	13.52	16.85	17.59	21.07	21.54	24.00	24.07	0.00	10.14	13.55	16.87	17.63	20.98	21.44	24.12	24.19				
7	ea013_0171_CHOP01_4057u	383542	393799	Modelled Water Level (m aodN)	27.63	28.06	28.87	29.08	30.34	30.52	30.90	30.96	27.29	27.63	28.07	28.89	29.09	30.50	30.61	31.01	31.03				
				Modelled Flow (cumecs)	19.28	13.67	17.00	17.69	20.08	20.27	21.11	21.17	0.00	10.28	13.69	17.03	17.73	20.88	21.24	22.30	22.41				
8	ea013_0171_CHOP01_2870d	382683	393415	Modelled Water Level (m aodN)	26.34	26.63	26.95	27.02	27.40	27.45	27.85	27.58	25.72	26.34	26.63	26.95	27.02	27.43	27.47	27.56	27.58				
				Modelled Flow (cumecs)	10.75	13.52	16.15	16.71	18.58	20.04	20.97	21.05	0.00	10.75	13.53	16.17	16.73	19.90	20.23	21.07	21.09				

					Undefended
Map Reference	Model Node Reference	Easting	Northing	Data	0.1 % AEP (1 in 1000 year)
9	2D Levels	383107	394574	Modelled Water Level (m aodN)	29.60
10		383108	394562	Modelled Water Level (m aodN)	

Model data taken from Chorlton Platt Gore 2012

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

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

Flood Defences

Start Date	Asset Type	Asset ID	Standard of Protection	Upstream Actual Crest Level (m aod)	Downstream Actual Crest Level (m aod)
01/01/1996	Embankment	120082	100	31.38	30.25
01/01/1996	Embankment	120657	100	36.27	36.29
01/01/1996	Wall	122064	100	31.90	31.84
01/01/1996	Wall	32518	100	31.84	31.48
01/01/1996	Wall	32543	100	35.76	35.74
01/01/1996	Embankment	59788	100	32.82	31.81

†Standard of Protection of the asset(s) are based on design estimates.