



- Structural Engineering
- Civil Engineering
- Hydrology

**Let's Develop
Your Tomorrow
Today**

Flood Risk Assessment

Site: Levenshulme Road

Client: Watson Homes



(01925) 243333



info@ellucprojects.co.uk



**ELLUC Projects LTD (Head Office) 760 Mandarin Court, Centre Park,
Warrington, WA1 1GG**

Document History and Status

Revision	Date	Purpose/Status	Author	File Ref	Check	Review
F1	14/06/22	Draft	Lucinda McLoughlin	F1	Lucinda McLoughlin	Michael Court

This document has been prepared in accordance with the scope of ELLUC Projects appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of ELLUC Projects' client. ELLUC Projects accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of ELLUC Projects Limited. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© ELLUC Projects Limited 2020

Document Details

Last saved	20/06/22
Path	ELLUC-WH-22037-140622-FRA-F1
Author	Lucinda McLoughlin
Project Number	22037
Project Name	Levenshulme Road

Contents

Table of Contents

Abbreviations	4
1.0 Introduction	5
2.0 Planning Policy.....	6
3.0 Requirements of a Flood Risk Assessment.....	9
4.0 Sequential Test	11
5.0 Site Context	12
6.0 Proposed Development.....	15
7.0 Proposed Drainage.....	17
8.0 Flood Hazards & Sources of Flooding	20
9.0 Flood Risk Assessment.....	23
10.0 Residual Risks & Impacts.....	26
11.0 Climate Change	28
12.0 Conclusions & Recommendations.....	29

Appendices

APPENDIX A	Extract from NPPF – Flood Risk
APPENDIX B	Topographical Survey
APPENDIX C	Proposed Architects layout
APPENDIX D	Correspondence from Statutory Services
APPENDIX E	Drainage Calculations and Drainage Strategy

ABBREVIATIONS

Term	Meaning / Definition
AEP	Annual Exceedance Probability
BGL	Below Ground Level
BGS	British Geological Society
CFMP	Catchment Flood Management Plan
CIRIA	Construction Industry Research and Information Association
CoP	Code of Practice
EA	Environment Agency
EFO	Extreme Flood Outline (Boundary of floodplain associated with a flood event with a probability of occurrence of 0.1%, 1 in 1000 years)
FDA	Flood Defence Agency (e.g. Environment Agency)
FERS	Flood Event Recording System
FFL	Finished Floor Level
FRA	Flood Risk Assessment
FW	Foul Water
GPZ	Groundwater Protection Zone
LDD	Local Development Document
LDF	Local Development Framework
LHA	Local Highway Authority
LPA	Local Planning Authority
m AOD	Metres above Ordnance Datum
MAF	Mean Annual Flood
NGR	National Grid Reference
OS	Ordnance Survey
PPG	Planning Policy Guidance
PPS	Planning Policy Statement
SFRA	Strategic Flood Risk Assessment
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SW	Surface Water
WFD	Water Framework Directive

1.0 INTRODUCTION

1.1. Watson Homes are proposing a new residential development on land off Levenshulme Road, Manchester. Total area of the site is approximately 0.505ha. (Ref. Figure 1.4).

1.2. The Local Planning Authority has requested that a Flood Risk Assessment (FRA) is undertaken to assess the risk of flooding to the site.

1.3. ELLUC Projects Limited has been commissioned by Watson Homes to prepare a formal Flood Risk Assessment to accompany the planning application

2.0 PLANNING POLICY

NATIONAL PLANNING POLICY

2.1. The National Planning Policy Framework (NPPF)¹ clearly identifies flood risk as a specific material consideration in the Planning Process and in the allocation and release of sites for development or re-development.

2.2. NPPF builds on its predecessor (PPS 25) and seeks to further strengthen the co-ordination between land-use planning and development planning and the operational delivery of flood and coastal defence strategy. NPPF retains key elements of PPS 25 continuing to encourage Local Planning Authorities to use their existing powers to guide, regulate and control development in relation to flooding and flood risk. NPPF expects Local Authorities to adopt a risk-based approach at all levels of Planning, through the application of the Sequential Test detailed in Table 1 and 2, of the Technical Guidance to NPPF document, a copy of which is attached in Appendix A.

2.3. The aim of the sequential test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.

2.4. The Water Resources Act 1991 [Section 105] also requires the Environment Agency to exercise a general supervision over all flood defence matters, including flood plains and washlands which accommodate waters during periods of flood. In discharging their functions, the Agency from time to time carries out comprehensive surveys and flood studies, largely of ‘main rivers’ within its jurisdiction.

2.5. A Section 105 Study involves the Agency topographically surveying the subject watercourse (or parts of it) and obtaining details of the flow mechanics within the watercourse. This data then enables them to generate a comprehensive hydraulic computer model for the watercourse. From this hydraulic model, the EA are able to define the approximate extent of fluvial floodplain associated with the 1 in 100-year (1% annual probability) flooding event or the extent of tidal floodplain associated with the 1 in 200-year (0.5% annual probability) flooding event.

2.6. The extents of the modelled floodplain are then provided to Local Planning Authorities, to enable them to make more informed decisions when considering proposed development in flood-susceptible areas. If development is proposed in a flood-susceptible area, or in an area where there is a history of flooding, the EA, as a statutory consultee in the Planning Process, will generally recommend that the risk of flooding be formally assessed, in accordance with NPPF, and that a Flood Risk Assessment report be produced to support the Planning Application. The broader modelled flood extents are also indicated on the EA’s Flood Zone Maps, available through their website².

¹ National Planning Policy Framework

² www.environment-agency.gov.uk

2.7. Local Planning Policy

Catchment Flood Management Plan (CFMP)

2.8. The site is located within the Irwell catchment area. The Environment Agency has produced the ‘Irwell Catchment Flood Management Plan’³. A copy of the CFMP is available from the EA on request.

2.9. CFMP’s are not specifically required by the Water Framework Directive ⁴ and are prepared voluntarily by the EA (under Government sponsorship). A CFMP is a high-level strategic plan for an area which aims to develop policies to manage flood risk over the next 50 to 100 years. These policies take into account the likely impacts of climate change and the effects of land-use and land management, and identify a range of benefits which contribute towards sustainable development. The CFMP’s policies establish whether action should be taken to increase, decrease or maintain the current level of flood risk.

Strategic Flood Risk Assessment (SFRA)

2.10. Local Planning Authorities are required to produce Local Development Frameworks, which are a portfolio of Local Development Documents that collectively deliver the spatial planning strategy for the Authority area. The LDD’s undergo a Sustainability Appraisal which assists Planning Authorities in ensuring their policies fulfill the principles of sustainability. Strategic Flood Risk Assessments are one of the documents to be used as the evidence base for planning decisions and are a component of the Sustainability Appraisal process. Therefore, SFRAs should be used in the review or production of LDD’s.

2.11. To assist Local Planning Authorities in their strategic land-use planning, SFRA’s should present sufficient information to enable Local Authorities to apply the Sequential Test to their proposed development sites: *“Decision-makers should use the SFRA to inform their knowledge of flooding, refine the information on the Flood Map and determine the variations in flood risk from all sources of flooding across and from their area. These should form the basis for preparing appropriate policies for flood risk management for these areas.”* ⁵

2.12. Manchester City Council has published a Strategic Flood Risk Assessment⁶.

2.13. The SFRA along with the EA flood risk maps indicate that the proposed development sites lie within **Flood Zone 1**. The EA highlight that a Flood Zone 1 is an area of fluvial risk of flooding above the 1 in 1000 year event.

2.14. The SFRA has been developed with the assistance of the Environment Agency and key landowners to provide a robust assessment of current and future levels of flood risk, ensuring that future development takes full account of flood risk and sustainability at the outset.

2.15. A copy of the SFRA is available from Manchester City Council

Further Guidance

CIRIA Guidance

2.16. CIRIA publication ‘C624 Development and Flood Risk – Guidance for the Construction Industry’⁷, define three levels of FRA which can be undertaken:

⁴ www.defra.gov.uk/environment/water/wfd/index.htm

⁵ NPPF

⁶ Level 1 Strategic Flood Risk Assessment, Bury Council, March 2011.

Table 2.1 Levels / Scopes of Flood Risk Assessment

FRA Level	Description / Scope
Level 1	Screening Study to identify whether there are any flooding or surface water management issues related to a development site that may warrant further consideration. This should be based on readily available existing information, including the SFRA, Environment Agency Flood Map and Standing Advice. The Screening Study will ascertain whether a FRA is required.
Level 2	Scoping Study to be undertaken if the Level 1 FRA indicates that the site may lie within an area that is at risk of flooding or that the site may increase flood risk due to increased run-off. This Study should confirm the sources of flooding which may affect the site and should include the following: • an appraisal of the availability and adequacy of existing information; • a qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere; • an appraisal of the scope of possible measures to reduce the flood risk to acceptable levels. The Scoping Study may identify that sufficient quantitative information is already available to complete a FRA appropriate to the scale and nature of the development.
Level 3	Detailed Study to be undertaken if the Level 2 FRA concludes that further quantitative analysis is required to assess flood risk issues related to the development site. The Study should include: • quantitative appraisal of the potential flood risk to the development; • Quantitative appraisal of the potential impact of development site on flood risk elsewhere; • quantitative demonstration of the effectiveness of any proposed mitigation measures.

2.17. It is considered that a Level 2 Scoping Study is appropriate at this stage and to minimise pre-commencement conditions this report has therefore been based on the requirements of a Level 2 Study.

⁷ CIRIA publication 'C624 Development and Flood Risk – Guidance for the Construction Industry', 2004

3.0 REQUIREMENTS OF A FLOOD RISK ASSESSMENT

3.1. The EA's Flood Zone Maps, available on the EA's website, indicate that the site is within a Flood Zone 1. Flood Zone 1 is an area of high risk of flooding, with a risk of flooding lower than 1 in 1000 year event. Current EA guidance indicates that all proposed developments in this zone should be accompanied by an FRA for a development site with an area of over 1 hectare, or the Local Authority have requested one, as in this situation. An FRA should contain:

- Information about the surface water disposal measures already in place and their state of maintenance;
- An assessment of the volume of surface water run-off likely to be generated from the proposed development;
- Information on how that surface water run-off will be disposed of (from the new development);
- Estimates of how climate change could affect the probability and intensity of flooding events in the future;
- Information about any other potential sources of flooding to the site - streams, ditches, sewers, groundwater, overland surface water flow or any combination of these.

3.2. As set out in NPPF flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

3.3. The detail and complexity of a Flood Risk Assessment should reflect the level of risk to the proposed development and should:

- be proportionate to the risk and appropriate to the scale, nature and location of the development;
- consider the risk of flooding arising from the development in addition to the risk of flooding to the development;
- take the impacts of climate change into account;
- be undertaken by competent people, as early as possible in the particular planning process, to avoid misplaced effort and raising landowner expectations where land is unsuitable for development;
- consider both the potential adverse and beneficial effects of flood risk management infrastructure including raised defences, flow channels, flood storage areas and other artificial features together with the consequences of their failure;
- consider the vulnerability of those that could occupy and use the development, taking account of the Sequential and Exception Tests and the vulnerability classification (including arrangements for safe access;

- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
- include the assessment of the remaining (known as ‘residual’) risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development or land use;
- consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems;
- be supported by appropriate data and information, including historical information on previous events.

4.0 SEQUENTIAL TEST

4.1. The sequential test is to ensure that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. The aim is to steer new developments to Flood Zone 1 (areas with a low probability of river or sea flooding).

4.2. The proposed development is set within Flood Zone 1.

4.3. The proposed residential development will be categorised as ‘less vulnerable’ as classed within NPPF.

Table 4.5 Flood Risk Vulnerability Classification Chart (NPPF)

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 *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

4.4. Based upon the Flood risk Vulnerability classification the development site is classed as appropriate and therefore the sequential test is past.

5.0 SITE CONTEXT

SITE LOCATION

5.1. The site is located off Levenshulme Road, Manchester. The residential site is approximately 0.505ha and has grid reference E388639, N395459 . Ref. Figures 5.1 and Figure 5.2.

Figure 5.1 Site Location Plan

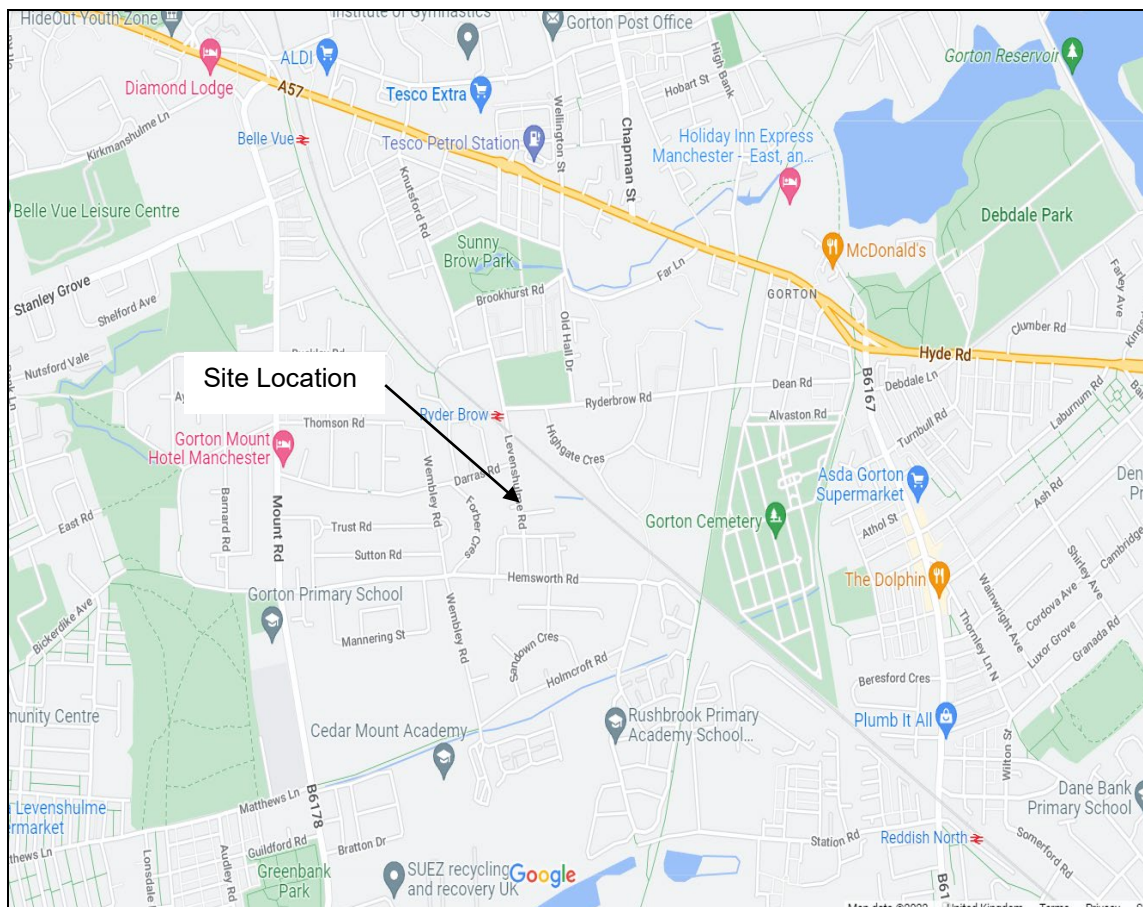




Figure 5.2: Aerial Image

EXISTING SITE CHARACTERISATION / LAND-USE

- 5.2. The site and surrounding boundary conditions are shown on the Aerial Image in Figure 5.2.
- 5.3. The site is greenfield.
- 5.4. The majority of the site is made up of an existing field and vegetation.
- 5.5. The north of the site is bound by an existing railway line.
- 5.6. To the west the site is bound by existing commercial properties and Levenshulme road.
- 5.7. The south of the site is bound by the existing residential properties and Lowfell walk.
- 5.8. To the east the site is bound by existing railway line.

EXISTING SITE TOPOGRAPHY

- 5.9. The site's general falls from the northern boundary to the southern boundary (from 67.43m AOD, existing properties / railway to 63.73m AOD, Existing properties / Lowfell walk)

EXISTING WATERCOURSES / WATER BODIES / DRAINAGE INFRASTRUCTURE

- 5.10. There is a watercourse to south of the development within site boundary. Watercourse is not suitable for discharge location due to only 800mm depth.

EXISTING GROUND CONDITIONS

- 5.11. According to the British Geological Society website 1:50,000 maps, the bedrock of the site is composed of Chester formation – Sandstone. The superficial deposits are Till, Devensian.

6.0 PROPOSED DEVELOPMENT

PROPOSED LAYOUT

- 6.1. The proposed site layout is indicatively shown in Figure 6.1 and the full version is in Appendix C
- 6.2. The proposed development is for residential dwellings. The residential dwellings include 6 houses and 34 apartments.

PROPOSED LEVELS

- 6.3. The proposed ground levels where the houses will be set as close as possible to the existing ground levels.

Figure 6.1 Proposed Layout



7.0 PROPOSED DRAINAGE

SURFACE WATER DRAINAGE OPTIONS

7.1. The BGS maps indicate that the geology of the site consists of Chester formation – Sandstone. It is anticipated that soakaways will not be feasible on the site.

7.2. The site will drain into the existing 600 diameter surface water sewer in which runs to the southern boundary within Lowfell walk. Discharge rate to be set at 5l/s subject to united utilities approval.

7.3. To ensure that post-development run-off volumes and peak flow rates discharging from the site do not exceed current levels, it may be necessary to employ SuDS (Sustainable Drainage Systems) methods and source control techniques, including flow control devices to restrict flows and to store attenuated water on site. The provision of such techniques will ensure that the maximum discharge from the site does not exceed the agreed rates with the statutory bodies. In addition, where practicable, opportunities for reducing flood risk through the management of surface water run-off from the site should be included.

7.4. Storage of attenuated flows within the site could be provided in a number of ways:

- underground – over-sized pipes / tanks or proprietary storage systems such as ‘Stormcell’;
- above ground – storage / balancing pond, designated surface areas (low risk areas such as car parks, open space);
- combination of underground and above ground.

7.5. Proposed SW drainage systems are generally designed in accordance with ‘Sewers for Adoption’⁸, which requires that any surface water drainage system, which is proposed to be Adopted after construction, should not surcharge during the 1 in 5-year storm event, and should not produce any surface flooding during a 1 in 30-year storm event (i.e. all run-off contained wholly within the sewerage system during the 1 in 30-year event).

7.6. It is generally accepted that a degree of surface flooding can be permitted during extreme storm events, subject to specific surface areas being designated as flood-susceptible and subject to flooding of these areas posing little or no risk to human life and/or damage to property. Examples of surface areas which might be permitted to flood during extreme events are:

- Agricultural land;
- Recreational land (playing fields etc.);
- Landscaped areas;
- Car parks;
- Other non-inhabited, designated areas.

7.7. In all cases where surface flooding might be permitted or designed in to a scheme, due diligence needs to be given to NPPF and the need to make potential users of such areas aware of their functionality and purpose, and the requirement to maintain safe access and egress at all times.

⁸‘Sewers for Adoption’ 7th Edition, published by WRc Plc., March 2006

7.8. The Building Regulations Approved Document H (2002) outlines a hierarchy of potential methods of disposing of surface water from a site:

- A soakaway; or where that is not practicable
- A watercourse or river; or where that is not practicable,
- A sewer.

7.9. The viability of this hierarchy has been assessed below:

SOAKAWAY

7.10. According to the BGS survey the ground is Chester formation – Sandstone. Soakaways are not feasible at this site.

WATERCOURSES / WATER BODIES

7.11. There is a watercourse which runs within the development boundary to the south. However due to watercourse depth of 800mm it is not possible to outfall into this location due to level restraints onsite.

SEWERS

7.12. The foul water will drain into the Combined 300 diameter water sewer located to the west of the development within Levenshulme road, at an unrestricted rate – subject to approval from united utilities.

7.13. Below is a chart based on table 1.1 typical SuDS components within CIRIA Guidance 697 SuDS manual. This discusses the viable SuDS components and whether they are useable for this site.

Component	Description	Is it viable
Filter Strips	These are wide, gently sloping areas of grass or other dense vegetation that treat runoff from adjacent impermeable areas.	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.
Swales	Swales are broad, shallow channels covered by grass or other suitable vegetation. They are designed to convey and/or store runoff, and can infiltrate the water into the ground (if ground conditions allow)	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.
Infiltration Basins	Infiltration basins are depressions in the surface that are designed to store runoff and infiltrate the water to the ground. They may also be landscaped to provide aesthetic and amenity value	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.
Wet Ponds	Wet ponds are basins that have a permanent pool of water for water quality treatment. They provide temporary storage for additional storm runoff above the permanent water level. Wet ponds may provide amenity and wildlife benefits	The site does not have sufficient space for wet ponds. Therefore wet ponds will be viable.
Extended detention basins	Extended detention basins are normally dry, though they may have small permanent pools at the inlet and outlet. They are designed to detain a certain volume of runoff as well as providing water quality treatment.	Extended detention basins would not be suitable as there is not enough available space on site. Therefore this type of SuDS would be viable and likely situated on site.
Constructed Wetland	Constructed wetlands are ponds with shallow areas and wetland vegetation to improve pollutant removal and enhance wildlife habitat	Constructed wetland would not be possible Therefore this type of SuDS is unsuitable.
Filter drains and perforated pipes	Filter drains are trenches that are filled with permeable material. Surface water from the edge of paved areas flows into the trenches, is filtered and conveyed to other parts of the site. A slotted or	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.

	perforated pipe may be built into the base of the trench to collect and convey the water.	
Infiltration devices	Infiltration devices temporarily store runoff from a development and allow it to percolate into the ground.	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.
Pervious surfaces	Pervious surfaces allow rainwater to infiltrate through the surface into an underlying storage layer, where water is stored before infiltration to the ground, reuse, or release to surface water	Infiltration is not likely to be successful therefore this type of SuDS system should not be viable on the site.
Green Roofs	Green roofs are system which cover a building's roof with vegetation. They are laid over a drainage layer, with other layers providing protection, waterproofing and insulation.	Green roofs are not suitable for this type of development.
Oversized Pipes	Oversized pipes are pipes below ground that hold surface water	These should be viable and will be used within the site.

SURFACE WATER DRAINAGE STRATEGY

- 7.16 The surface water will discharge to: -The adopted sewer within Lowfell Walk.
- 7.17 The site will discharge at 5l/s, to be agreed with united utilities.
- 7.18 The proposed surface water network has been designed using Microdrainage flow simulation software to ensure the following:
- No surcharging of drainage network for Design Storm of 1 in 2 years.
 - No flooding for design flood frequency of 1 in 30 years.
 - 1:100 year + 40% model should be duly reviewed and flood routing plans prepared as part of the detailed site designs.
 - Maintenance of the drainage will be undertaken by Watson Homes until adopted and/or transferred to a management company.

8.0 FLOOD HAZARDS & SOURCES OF FLOODING

POTENTIAL FLOOD HAZARDS

- 8.1 Prior to undertaking an FRA, the different types of flooding mechanisms which may affect the site need to be identified and then assessed to determine whether the development site is located within an area which is at risk of flooding from one or more of the applicable mechanisms.
- 8.2 CIRIA Report C624 ⁹, Table A2.1, lists a number of key factors that should be considered during a Level 1 FRA. This table can be used to summarise the findings of a Level 1 FRA study and to identify those flood hazards which may be applicable to the site in question. The boxes shaded grey indicate those sources of flooding which are unlikely to be identified for each question. If sufficient information is not available to identify the specific source of flooding, then all possible sources should be ticked. If a tick is placed below any flood hazard then a Level 2 FRA will be required to assess flood risk issues relating to that hazard in more detail.
- 8.3 Table 8.1 below identifies the flood hazards applicable to this site.

⁹CIRIA publication 'C624 Development and Flood Risk – Guidance for the Construction Industry'

Table 8.1 Flood Hazard Identification

Question	Flood Hazard						
	Fluvial	Sea	Estuaries	Groundwater	Overland flow	Artificial drainage systems	Infrastructure failure
Is the development site next to the sea or any watercourse shown on Ordnance Survey maps?	✓	×	×				
Is the development site, or part of the development site, identified as being at risk of flooding within available documentation?	×	×	×	×	×	×	×
If a strategic flood risk assessment is available, is the development site, or part of the development site, identified as being at risk of flooding?	×	×	×	×	×	×	×
If a flood zone map is available, is the development site, or part of the development site, within a High Risk zone?	×	×	×				
If a flood zone map is available, is the development site, or part of the development site, within a Low to Medium Risk zone?	×	×	×				
If a flood zone map is not available, is the development site, or part of the development site, situated on alluvium based on consideration of geological maps of the area?	×	×	×				
If there is an existing property on, or next to the site at the same level, is the property within a flood warning area?	×	×	×	×			
Are the LPA / FDA aware of any existing, historical or potential flooding problems that may affect the site?	×	×	×	×	×	×	×
Do the physical characteristics of the site suggest that it may be prone to flooding?	×	×	×	×	×	×	×
If a flood zone map is not available, is the development site, or part of the development site below 10m AOD AND does the FDA consider the development to be at risk of tidal flooding?		×	×				
Is the development located within a natural or artificial hollow, or at the base of a valley or at the bottom of a hill slope?				×	×		
Does examination of historical maps indicate any likelihood of flood risk at the site?	×	×	×	×	×		
Do the names of surrounding roads, areas or houses suggest the possibility of seasonal or historical flooding?	×	×	×	×	×		
Is the site likely to involve excavation / construction below existing ground levels (excluding foundations)?	×	×	×	×	×		
Is the land use upslope of the site such that the generation of overland flow may be encouraged, and can water from this area flow onto the site?					×		
Are there any artificial drainage systems on or next to the site, at the same level, or upslope of, the site?						×	×
Is the development site protected by an existing flood defence?	×	×	×			×	×
Is the development site protected by a flood control structure (e.g. flap valve, sluice gate, tidal barrier etc)	×	×	×			×	×
Is the development site located upstream of a culvert which may be prone to blockage?	×		×	×	×	×	×
Are water levels in a watercourse located in or next to a development site controlled by a pumping station?	×	×	×	×	×	×	×
Is the development site next to or downstream / down slope of a canal?						×	×
Is the development site downstream/ down slope of a reservoir or other significant water body?						×	×
FURTHER COMMENT ON FLOOD RISK WITHIN THIS FRA?	✓	×	×	×	×	×	×

SOURCES OF FLOODING

8.4 It is considered that there are two potential sources of flooding to the site:

- Risk of surface water flooding to the site from itself.
- Groundwater flooding to the site.

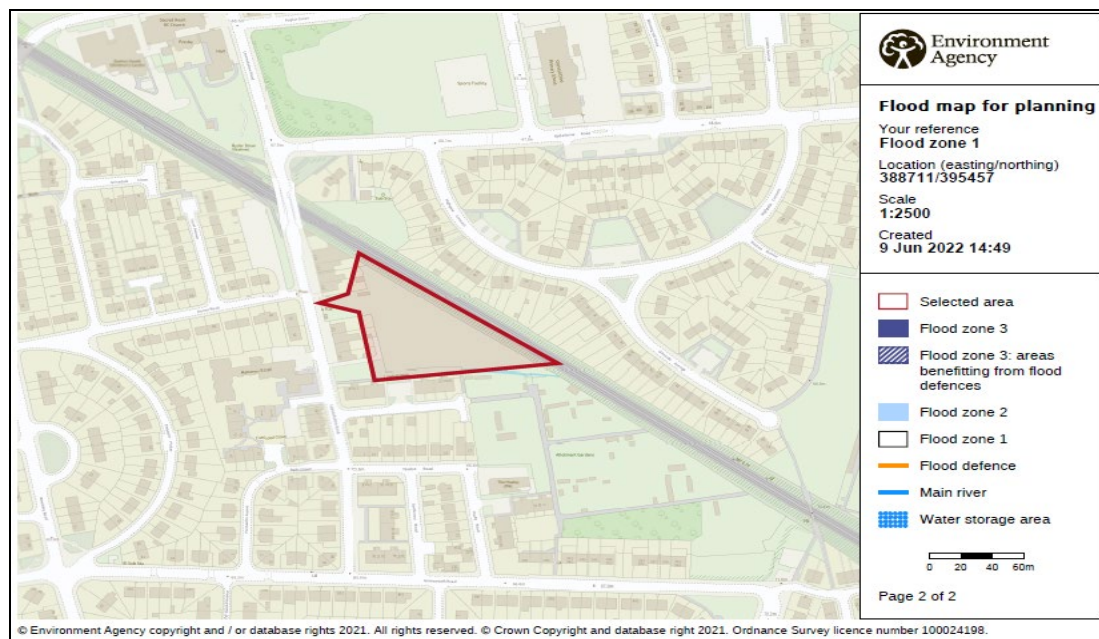
8.5 The risk of flooding from these various sources is assessed in the following sections of this report.

9.0 FLOOD RISK ASSESSMENT

FLUVIAL FLOODING

- 9.1 The site is within an area of Flood Zone 1. Flood Zone 1 is an area at low risk of flooding.
- 9.2 The Flood Zone Maps, which are available on the Environment Agency's website (ref. Section 2 of this Assessment), shows the site to be within Flood Zone 1. (see figure 9.2).

Figure 9.2 EA Flood Zone Map (not to scale)



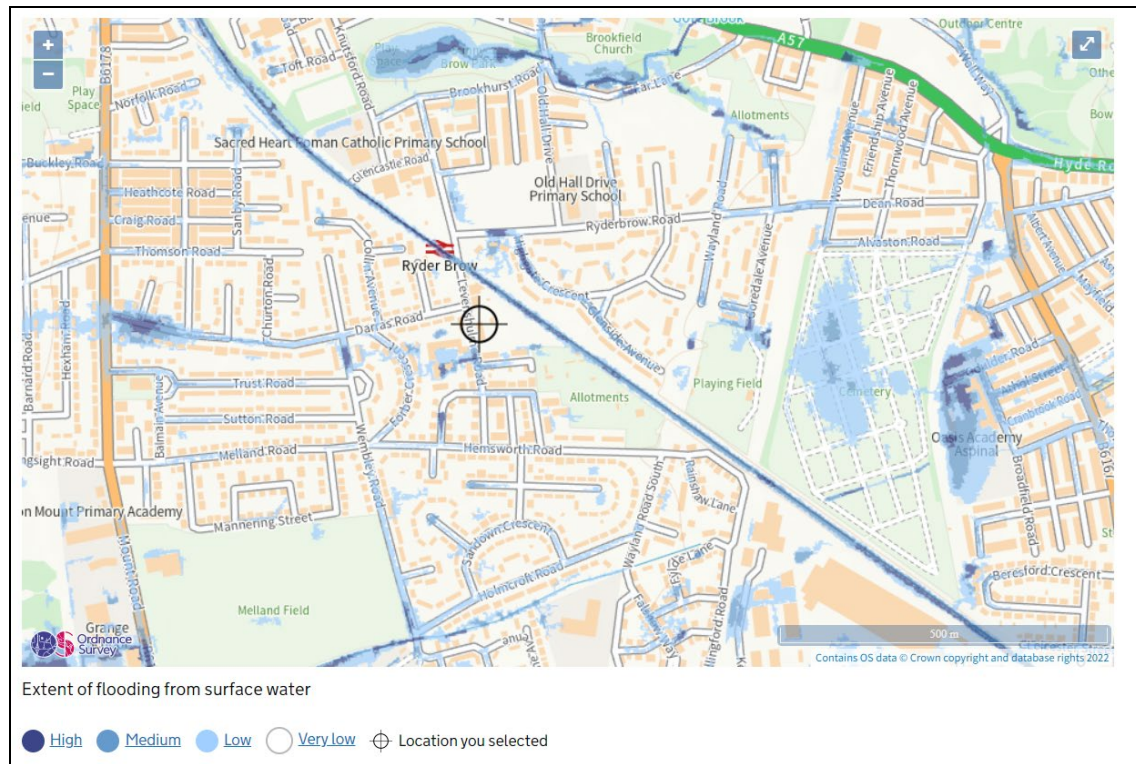
© Crown copyright. All rights reserved. Environment Agency, 100026380, 2008

- 9.3 Based on currently available information, the risk of fluvial flooding at the site from adjacent watercourses, drains and other waterbodies is currently considered to be low.

SURFACE WATER FLOODING

- 9.4 The EA surface water map indicates that the site is at low risk of surface water flooding.
- 9.5 Figure 9.13 shows areas of the site which are at different levels of risk of surface water flooding.

Figure 9.13 EA Surface Water Map (not to scale)



- 9.6 It is assumed that there are no springs underneath the site.
- 9.7 The majority of the site is at a low to very low risk of surface water flooding. The levels are to be raised slightly above existing ground levels which will mitigate the risk of surface water flooding.
- 9.8 A new drainage system will be included which will attenuate drainage up to and including the 1 in 100 year event plus climate change.
- 9.9 Based on currently available information, the risk of surface water flooding to the proposed development is Low.

SURCHARGING OF ARTIFICIAL DRAINAGE

- 9.10 There is a UU surface water sewer which crosses the development briefly in which then discharges into an open ditch. However, with the current information available there is no concern that the artificial drainage will cause any flood risk to the development.

INFRASTRUCTURE FAILURE

- 9.11 The central CIRIA Report C624 defines 'infrastructure failure' as the structural, hydraulic, geotechnical, mechanical or operational failure of infrastructure which normally retains, transmits or controls the flow of water. This risk of flooding is usually associated with three main categories of infrastructure:

- failure of infrastructure designed to store or carry water (e.g. dam break, canal leak, water mains burst);

- failure of infrastructure designed to protect an area from flooding (e.g. flood defence breach, flap valve failure, penstock failure, pumping station failure);
- blockage of a pipe, bridge or culvert.

- 9.12 There are no additional dams, canals located upstream / upslope of the site.
- 9.13 Failure of any water mains could result in leakage and consequently over-land flows within the site. There is therefore a risk of over-land flows being generated because of an infrastructure failure in any water mains, however, such failures occur very infrequently and there is little that can be done to anticipate them.
- 9.14 Water main failures are usually notified to the asset owner within a short period of time of the failure occurring and remedial Work is usually implemented soon thereafter to prevent subsequent property damage and inconvenience. Any failure of a water main is therefore likely to continue for a relatively short period of time.
- 9.15 Based on the above information, the risk of flooding as a result of infrastructure failure is considered to be low and on this basis any further assessment of flooding from infrastructure failure is not considered necessary.

GROUNDWATER FLOODING

- 9.16 There is only a minimal risk of groundwater flooding in the full planning area due to the development sites gradients
- 9.17 The ground levels will be raised by a minimum of 150mm to take into account groundwater flooding and minimise the risk of groundwater flooding.

10.0 RESIDUAL RISKS & IMPACTS

RESIDUAL RISKS

- 10.1 Table 10.1 outlines the initial qualitative assessment of risk posed by each potential source of flooding, the mechanisms for flooding and the likely consequences. The table also includes a review of possible mitigation measures and what effect, if any, the mitigation measures are likely to have on the residual risk posed by each potential flood source.
- 10.2 Categories of risk have been qualitatively defined as:
- ‘High’ Risk: Flooding is likely to result in significant damage to property and pose a significant risk to life;
 - ‘Medium’ Risk: Flooding is likely to result in possible minor damage to property but flood progress would allow adequate time for residents to be warned and safely evacuated to higher ground or appropriate places of safety;
 - ‘Low’ Risk: Flooding is unlikely to result in any damage to property damage and pose little or no risk to life.

Table 10.1 Qualitative Assessment of Residual Flood Risks

Source	Flood Mechanism & Consequences	Initial Assessment of Risk	Recommended Mitigation Measures	Residual Risk
Fluvial flooding	The site is within Flood Zone 1. An area at low risk of flooding	Low	• No fluvial mitigation required.	Low
Surface Water Flooding	The EA surface water flood map indicates that the site is mostly at low risk of surface water flooding.	Low	• The installation of an effective drainage strategy will help mitigate to risk of surface water flooding on the site.	Low
Surcharging of artificial drainage systems	Drainage systems operating above design capacity, resulting in: • surcharging of manholes / drainage systems; • over-land flow through development; • ponding in low-lying areas of site; • no over-land flow route for flood waters accumulating in low-lying areas.	Low	• Appropriate design of SW drainage system to provide sufficient attenuation. • There are no records of sewer flooding on the site.	Low
Infrastructure failure	Water main burst or pumping station failure, resulting in: • Possible over-land flows through / adjacent to the site and possible inundation of property; • Possible pooling in low-lying	Low	• None required	Low

	areas.			
Groundwater	There is no known record of groundwater	Low	- The levels in on the site will be raised to minimise the risk of flooding.	Low

- 10.3 The mitigation measures proposed in this report will generally reduce the risk of flooding from each potential source.

IMPACT OF DISPLACED WATER

- 10.4 The proposed site is not within an area of fluvial flooding. This suggests there will be minimal risk of displacing water.

IMPACT ON COASTAL OR FLUVIAL MORPHOLOGY

- 10.5 The proposed development will not directly impact on coastal morphology.

11.0 CLIMATE CHANGE

- 11.1 Below are the recommended rainfall intensity increases from the Flood Risk Assessment climate change allowances

Table 11.1 Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

- 11.2 For practical reasons, it is difficult to define the lifetime of a development as each development has different characteristics. However, residential development is considered to have a minimum lifetime horizon of 100 years, unless there is specific justification for considering a shorter period (e.g. development controlled by a time-limited Planning Condition). This development lifetime is approximately 100-year design life.
- 11.3 Therefore, over the next 100 years, the recommendations contained in table 2 Flood Risk assessments: climate change allowance document in terms of increased rainfall, would equate to an increase of between 20% and 40% in peak rainfall intensity.
- 11.4 A rainfall intensity of 40% has been used for designing this development. The preliminary design of the proposed SW drainage system has taken account of this increase in peak rainfall intensity over the lifetime of the proposed development and has demonstrated that surface water run-off can be managed in a sustainable manner on the site, including the effects of climate change. It is therefore considered that the proposed development has taken account of climate change effects.

12.0 CONCLUSIONS & RECOMMENDATIONS

- 12.1 Watson Homes are proposing a new residential development at the land of Levenshulme Road, Manchester. Total area of the site is approximately 0.505Ha.
- 12.2 The Local Planning Authority has requested that the risk of flooding be formally assessed through a Flood Risk Assessment.
- 12.3 The development site is greenfield and currently consists of an existing field and vegetation.
- 12.4 The site lies within Flood Zone 1.
- 12.5 The site is overall at a low risk from surface water flooding.
- 12.6 The installation of an effective drainage strategy will mitigate the risk of surface water and groundwater flooding on the site.
- 12.7 The discharge will be set at 5l/s to discharge into the 600-diameter surface water sewer within Lowfell walk, subject to united utilities approval.
- 12.8 The foul water will discharge into the 300-diameter combined water sewer within Levenshulme road at an unrestricted rate, subject to united utilities approval.
- 12.9 Based on the information provided to ELLUC Projects Ltd to accompany this Flood Risk Assessment, redevelopment of the site would be considered sustainable in terms of Flood Risk

APPENDIX A:

Introduction

1. This document provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding and in relation to mineral extraction. This guidance retains key elements of Planning Policy Statement 25 and of the existing minerals policy statements and minerals planning guidance notes which are considered necessary and helpful in relation to these policy areas. The retention of this guidance is an interim measure pending a wider review of guidance to support planning policy.

Flood risk

2. As set out in the National Planning Policy Framework, inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:
 - “areas at risk of flooding” means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency;
 - “flood risk” means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

The Sequential and Exception Tests

3. As set out in the National Planning Policy Framework, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The flood zones (see table 1) are the starting point for this sequential approach. Zones 2 and 3 are shown on the flood map¹ with Flood Zone 1 being all the land falling outside Zones 2 and 3. These flood zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences.
4. Strategic Flood Risk Assessments (see paragraphs 7-8) refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change (see paragraphs 11-15) into account. They provide the basis for applying the Sequential Test, on the basis of the flood zones in table 1. Where table 1

¹ To access the flood map, see the Environment Agency's website at:
<http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx>

indicates the need to apply the Exception Test (as set out in the National Planning Policy Framework), the scope of a Strategic Flood Risk Assessment will be widened to consider the impact of the flood risk management infrastructure on the frequency, impact, speed of onset, depth and velocity of flooding within the flood zones considering a range of flood risk management maintenance scenarios. Where a Strategic Flood Risk Assessment is not available, the Sequential Test will be based on the Environment Agency flood zones.

5. The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

Table 1: Flood zones

(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - low probability

Definition

This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

Flood risk assessment requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems².

² Sustainable drainage systems cover the whole range of sustainable approaches to surface drainage management. They are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible.

Zone 2 - medium probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table 2, are appropriate in this zone. The highly vulnerable uses are *only* appropriate in this zone if the Exception Test is passed.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage systems.

Zone 3a - high probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;

- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Zone 3b - the functional floodplain

Definition

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. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

Appropriate uses

Only the water-compatible uses and the essential infrastructure listed in table 2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land with a lower probability of flooding.

Table 2: Flood risk vulnerability classification

Essential infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”)⁵.
More vulnerable • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.⁷
Less vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services,

³ For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests should be applied.

⁴ See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at: www.communities.gov.uk/publications/planningandbuilding/circularplanningcontrols

⁵ In considering any development proposal for such an installation, local planning authorities should have regard to planning policy on pollution in the National Planning Policy Framework.

⁶ For definition, see *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10* at

www.communities.gov.uk/publications/planningandbuilding/planningsustainable

⁷ See footnote 3.

restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable”, and assembly and leisure.

- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do *not* need to remain operational during times of flood.
- Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to a specific warning and evacuation plan*.

Notes to table 2:

- This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)*⁸ and also on the need of some uses to keep functioning during flooding.
- Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

⁸ See website for further details.

www.defra.gov.uk/science/Project_Data/DocumentLibrary/FD2320_3364_TRP.pdf

APPENDIX B:



Ordnance Survey (c) Crown Copyright 2022. All rights reserved. Licence number 100022432

Abbreviations where applicable

AS	Air Brick	276	Access Box
BS	As Trench	277	Access Point
BS	Barbed Wire	278	Access Point
BS	Barbed Wire	279	Access Point
BS	Barbed Wire	280	Access Point
BS	Barbed Wire	281	Access Point
BS	Barbed Wire	282	Access Point
BS	Barbed Wire	283	Access Point
BS	Barbed Wire	284	Access Point
BS	Barbed Wire	285	Access Point
BS	Barbed Wire	286	Access Point
BS	Barbed Wire	287	Access Point
BS	Barbed Wire	288	Access Point
BS	Barbed Wire	289	Access Point
BS	Barbed Wire	290	Access Point
BS	Barbed Wire	291	Access Point
BS	Barbed Wire	292	Access Point
BS	Barbed Wire	293	Access Point
BS	Barbed Wire	294	Access Point
BS	Barbed Wire	295	Access Point
BS	Barbed Wire	296	Access Point
BS	Barbed Wire	297	Access Point
BS	Barbed Wire	298	Access Point
BS	Barbed Wire	299	Access Point
BS	Barbed Wire	300	Access Point

General Legend

Survey Station	CGS84/83
Boundary	Boundary
Plot	Plot

Survey Control

STN1	420	STN2	420
STN1	388024.902	STN2	388024.902
STN1	388040.383	STN2	388040.383

Relative to Ordnance Survey grid via Active Network RTK GPS
Please Table Grid

Sheet Legend

A0

Disclaimer - West Coast Geomatics Limited 2022.
This document is the property of West Coast Geomatics Limited. It is not to be used for any other purpose without the written consent of West Coast Geomatics Limited. Any reproduction or use of this document without the written consent of West Coast Geomatics Limited is strictly prohibited.

Additional Notes

Amendments

Client

Project Name

Project Address

Project Description

Project Status

Project Date

Project Location

Project Contact

Project Notes

Project Details

Project Information

Project Summary

Project Overview

Project Background

Project Objectives

Project Scope

Project Methodology

Project Results

Project Conclusions

Project Recommendations

Project Acknowledgements

Project References

Project Appendix

Project Glossary

Project Bibliography

Project Index

Project Table of Contents

Project List of Figures

Project List of Tables

Project List of Appendices

Project List of References

Project List of Acknowledgements

Project List of Bibliography

Project List of Index

Project List of Table of Contents

Project List of List of Figures

Project List of List of Tables

Project List of List of Appendices

Project List of List of References

Project List of List of Acknowledgements

Project List of List of Bibliography

Project List of List of Index

Project List of List of Table of Contents

Project List of List of List of Figures

Project List of List of List of Tables

Project List of List of List of Appendices

Project List of List of List of References

Project List of List of List of Acknowledgements

Project List of List of List of Bibliography

Project List of List of List of Index

Project List of List of List of Table of Contents

Project List of List of List of List of Figures

Project List of List of List of List of Tables

Project List of List of List of List of Appendices

Project List of List of List of List of References

Project List of List of List of List of Acknowledgements

Project List of List of List of List of Bibliography

Project List of List of List of List of Index

Project List of List of List of List of Table of Contents

Project List of List of List of List of List of Figures

Project List of List of List of List of List of Tables

Project List of List of List of List of List of Appendices

Project List of List of List of List of List of References

APPENDIX C:



General Notes
01: Dimensions must not be scaled from this drawing. If in doubt, please ask.
02: All dimensions are in millimetres unless noted otherwise.
03: All dimensions should be verified on site before proceeding with the work.
04: TADW Architects shall be notified in writing of any discrepancies.
05: © TADW Limited (UK) 2015

- Schedule of Accommodation**
- 14no. 2B3P apartments at 61sqm each
 - 20no. 1B2P apartments at 50sqm each
 - 6no. 3B5P three storey houses

Total 40 units

- DESIGN CONSIDERATIONS**
- Plots 1 to 6 - 3 storey houses.
 - Plot 7 - Plot 40 - 3 storey apartment blocks
 - Site boundary to be confirmed
 - Apartment sizes comply with NDSS sizes
 - Apartment block respects overlooking distances with surrounding properties
 - Apartment block to be predominantly brick elevations
 - Access into development for pedestrians and cars via new road crossing off Levenshulme Road
 - It is assumed refuse vehicles will access the site for bin collections
 - 87% parking provision (including visitor spaces)
 - Secure communal bike store provided
 - A number of existing trees to be removed to enable development
 - Generally timber fencing and metal railings to site boundary in line with SBD standards

P8	House sizes amended	11.05.22	AM	MH
P7	Mix of houses and apartments amended	11.05.22	AM	MH
P6	Scheme revised	5.5.22	KM	MH
P5	Overlaid onto topographical survey	30.3.22	KM	MH
P4	Cottage flats added	24.3.22	MH	BB
P3	Plots 28-48 revised	3.3.22	MH	BB
P2	Scheme redesigned	3.3.22	MH	BB
P1	Issued for comment	20.12.21	MH	BB
Issue	Description	Date	Drawn	Checked

Drawing Status
P - Planning | T - Tender | C - Construction | R - As Record

For Approval

tadw|architects

Six St. Petersgate Stockport Cheshire SK1 1HD
Ph 0161 477 6158 Fx 0161 480 8342 mail@tadw.co.uk www.tadw.co.uk

Client	Watson Construction Ltd	
Job	Levenshulme Road Gorton	
Title	Proposed Site Plan	
Scale	1:250 @ A1	
Note - Prints from PDF files may not be to scale, check accuracy against scale		
Job Number	Drawing Number	Issue
221310	02	P8

APPENDIX D

Lucinda McLoughlin

From: Lucinda McLoughlin
Sent: 17 June 2022 14:51
To: 'Wastewater Developer Services'
Subject: RE: 22037 - Levenshulme Road, Gorton, Pre-development
Attachments: Sewer recs a3.pdf

Good afternoon,

Following on from my below email I can confirm that your new outfall is now to the surface water sewer to the south of the development within Lowfell walk via new manhole online (please find attached sewer records) – subject to invert level.

Please can you confirm approval.

Kind regards,

Lucinda McLoughlin
Civil Design Engineer

ELLUC Projects Ltd
Yorkshire Office
Airedale House | 423 Kirkstall Road | Leeds | LS4 2EW | UK

Office: +44 (0) 113 357 2100
Web: www.ellucprojects.com

Offices in Australia & New Zealand



Its contents are confidential to the intended recipient at the e-mail address to which it has been sent. It may not be disclosed to or used by anyone other than this addressee, nor may it be copied in any way. If received in error, please contact ELLUC Projects on the details above quoting the name of the sender and the addressee, then delete it from your system. Please note that neither ELLUC Projects Ltd or the sender accepts any responsibility for viruses and it is your responsibility to scan any attachments. No contracts may be concluded on behalf of ELLUC Projects by means of e-mail communications.

From: Lucinda McLoughlin
Sent: 14 June 2022 11:55
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Michael Court <michael.court@ellucprojects.com>
Subject: 22037 - Levenshulme Road, Gorton, Pre-development

Good Afternoon,

Please find attached pre-development application for new residential development based at – Levenshulme Road, Gorton, M18 7NF.

I can confirm that infiltration is not feasible due to the ground being made of sandstone and clay.

I can confirm we are unable to drain to the ditch to the south of the development due to the ditch only being 800mm deep. Therefore we are unable to get sufficient cover to our surface water pipes.

Therefore we are proposing to discharge our surface water via new manhole built online of surface water sewer running within Levenshulme road.

Foul to drain via new manhole online of combined water sewer which runs within Levenshulme road.

Any queries, please let me know.

Kind regards,

Lucinda McLoughlin
Civil Design Engineer

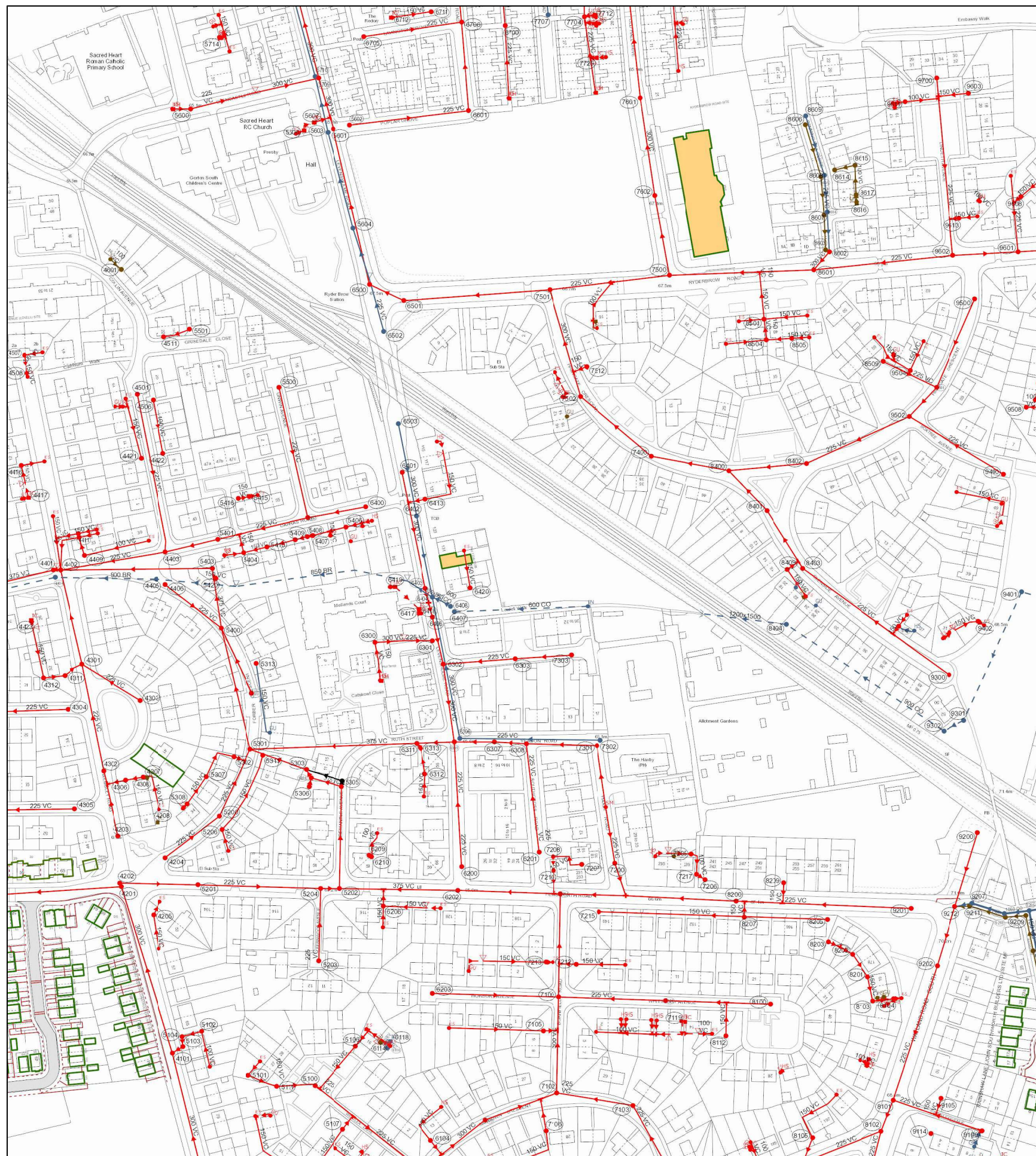
ELLUC Projects Ltd
Yorkshire Office
Airedale House | 423 Kirkstall Road | Leeds | LS4 2EW | UK

Office: +44 (0) 113 357 2100
Web: www.ellucprojects.com

Offices in Australia & New Zealand

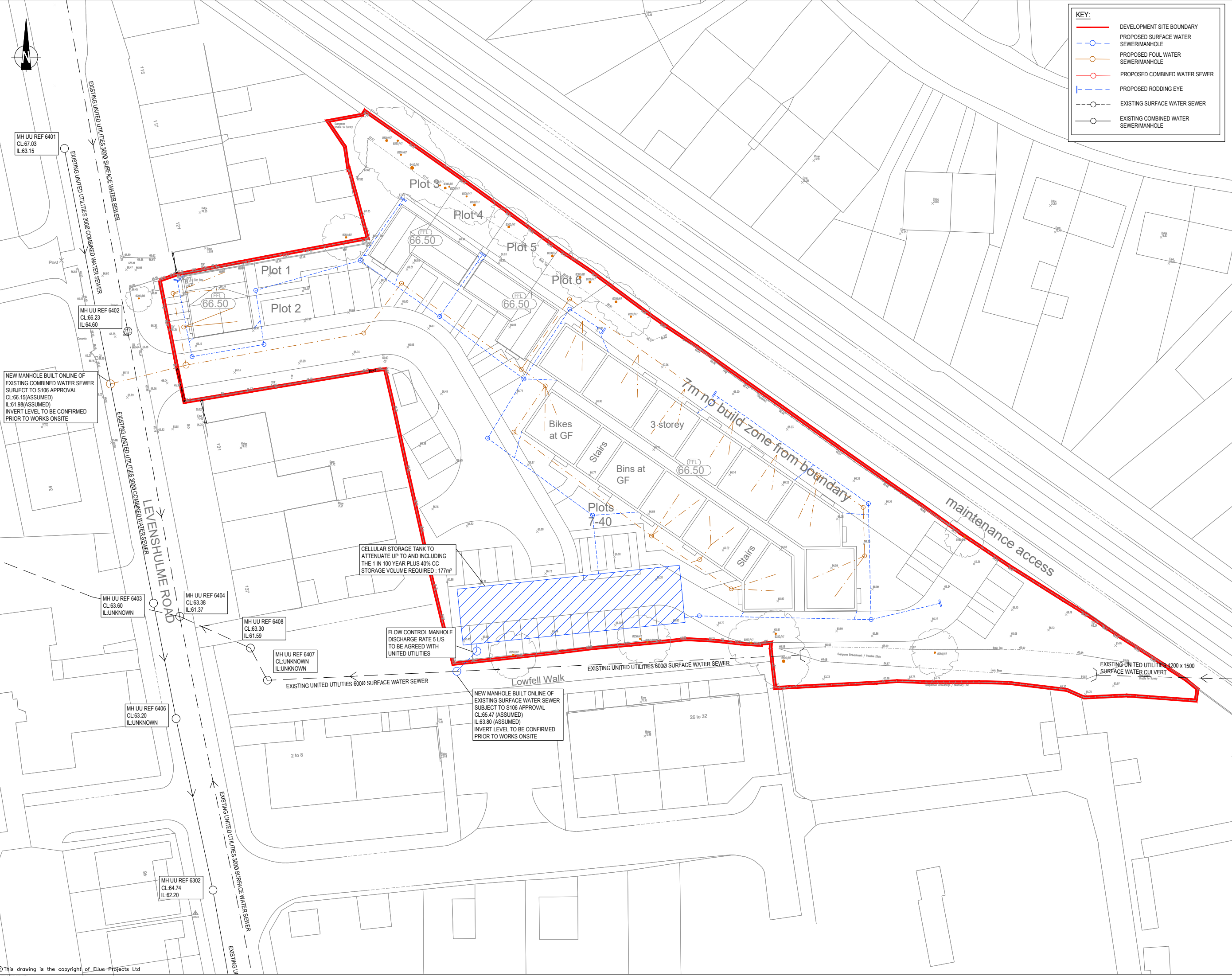


Its contents are confidential to the intended recipient at the e-mail address to which it has been sent. It may not be disclosed to or used by anyone other than this addressee, nor may it be copied in any way. If received in error, please contact ELLUC Projects on the details above quoting the name of the sender and the addressee, then delete it from your system. Please note that neither ELLUC Projects Ltd or the sender accepts any responsibility for viruses and it is your responsibility to scan any attachments. No contracts may be concluded on behalf of ELLUC Projects by means of e-mail communications.



Reho	Cover	Func	Invert	Size x	Size y	Shape	Mat	Length	Grad
3304	64.04	CO	62.89	375	150	VC	1	520	
3210	70.5	FO	68.16	150	150	VC	1	138	
9209	70.59	FO	68.24	150	150	VC	1	141	
8413		CO		150	150	VC	1	141	
9105		CO		150	150	VC	1	141	
7207		CO		150	150	VC	1	141	
8406		CO		150	150	VC	1	141	
9603		CO		150	150	VC	1	141	
4205		CO		150	150	VC	1	141	
4312		CO		150	150	VC	1	141	
6312		CO		150	150	VC	1	141	
9207	70.72	CO	65.90	300	225	SW	1	155	
8602	68.44	CO	65.90	300	225	SW	1	155	
5416		CO		150	150	VC	1	141	
6410		CO		150	150	VC	1	141	
8112		CO		150	150	VC	1	141	
7205		CO		150	150	VC	1	141	
8104		CO		150	150	VC	1	141	
8201		CO		150	150	VC	1	141	
5102		CO		150	150	VC	1	141	
5302		CO		150	150	VC	1	141	
7500	67.45	CO	63.86	225	150	SW	1	81	
4201		CO		150	150	VC	1	141	
8202		CO		150	150	VC	1	141	
9205	70.66	SW	67.88	1050	150	VC	1	457	
8313		CO		150	150	VC	1	141	
8601	68.50	CO	65.91	225	150	VC	1	65	
4409		CO		150	150	VC	1	141	
8207		CO		150	150	VC	1	141	
5404		CO		150	150	VC	1	141	
5308	65.1	CO	62.77	375	150	VC	1	42	
8607	68.25	SW	66.18	225	150	VC	1	116	
9211	70.71	FO	68.01	150	150	VC	1	12	
5409		CO		150	150	VC	1	141	
7217		CO		150	150	VC	1	141	
8209	70.72	CO	67.9	150	225	VC	1	63	
8103		CO		150	150	VC	1	225	
8603	68.44	CO	66	150	225	VC	1	56	
7213		CO		150	150	VC	1	133	
9301		CO		150	150	VC	1	133	
9208	70.46	CO	66.39	150	150	VC	1	133	
7105		CO		150	150	VC	1	133	
8401		SW		800	800	CO	1	436	
9608		CO		150	150	VC	1	141	
9308		CO		150	150	VC	1	141	
6206		CO		150	150	VC	1	141	
5415		CO		150	150	VC	1	141	
5305	64.4	CO	60.83	375	150	VC	1	125	
8401		CO		150	150	VC	1	141	
6210		CO		150	150	VC	1	141	
5408		CO		150	150	VC	1	141	
9206	70.53	SW	67.85	1050	150	VC	1	379	
5408		CO		150	150	VC	1	141	
8104		CO		150	150	VC	1	141	
5407		CO		150	150	VC	1	141	
7210		CO		150	150	VC	1	141	
8402		CO		150	150	VC	1	141	
8604	68.25	CO	66.13	225	150	VC	1	148	
5104		CO		150	150	VC	1	141	
8509		CO		150	150	VC	1	141	
8604		CO		150	150	VC	1	141	
8102	66.16	CO	65.78	225	150	VC	1	101	
5200	64.17	CO	62.33	225	150	VC	1	110	
8311	65.5	CO	62.33	225	150	VC	1	110	
5303	65.56	CO	60.68	375	150	VC	1	475	
5302		CO		150	150	VC	1	141	
5307		CO		150	150	VC	1	141	
7100	66.26	CO	61.89	300	225	VC	1	380	
7201	66.38	CO	61.7	375	150	VC	1	256	
8609	67.7	SW	66.61	225	150	VC	1	127	
8615		CO		150	150	VC	1	141	
8608	68.04	SW	66.34	225	150	VC	1	128	
8606	67.7	FO	66.46	225	150	VC	1	132	
8606	67.7	FO	66.46	225	150	VC	1	143	
8602	67.67	SW	65.96	225	150	VC	1	54	
8603	68.04	CO	65.96	225	150	VC	1	74	
8406	63.2	CO	60.74	300	225	VC	1	16	
8703	65.92	CO	64.46	225	150	VC	1	101	
4406	63.42	CO	61.36	225	150	VC	1	101	
8401	67.45	CO	64.99	225	150	VC	1	109	
8200	65.94	CO	63.93	225	150	VC	1	95	
8400	67.45	CO	64.96	300	225	VC	1	125	
8202	66.86	CO	67.03	225	150	VC	1	62	
5300	63.93	CO	61.71	225	150	VC	1	67	
5601	65.81	CO	62.23	300	225	VC	1	285	
9200	71.72	CO	68.1	225	150	VC	1	107	
8303	64.80	CO	62.98	225	150	VC	1	111	
9602	65.76	CO	64.39	225	150	VC	1	201	
4303	63.95	CO	61.84	225	150	VC	1	58	
5402	65.21	CO	63.05	225	150	VC	1	27	
8603	67.96	SW	66.17	300	225	VC	1	33	
8401	67.03	CO	65.15	300	225	VC	1	30	
8100	67.55	CO	65.53	225	150	VC	1	75	
8708	69.22	CO	67.08	225	150	VC	1	184	
8708	65.71	CO	62.72	225	150	VC	1	63	
8602	67.45	CO	64.99	225	150	VC	1	154	
7303	65.12	CO	63.25	225	150	VC	1	119	
8500	67.55	CO	62.99	300	225	VC	1	201	
7101	67.27	CO	64.73	225	150	VC	1	37	
9300	68.11	CO	66.13	225	150	VC	1	99	
7302	66.06	CO	63.25	225	150	VC	1	99	
5103		CO		150	150	VC	1	141	
5203	63.31	CO	61.68	225	150	VC	1	22	
4410		CO		150	150	VC	1	141	
5104	70.11	CO	66.91	225	150	VC	1	198	
5404	66.87	SW	64.82	300	225	VC	1	51	
9602	68.91	CO	66.99	225	150	VC	1	451	
9603	68.83	SW	67.4	300	225	VC	1	54	
6601	66.08	CO	64.02	225	150	VC	1	285	
5500	65.22	CO	63.79	225	150	VC	1	107	
6202	65.94	CO	61.47	375	150	VC	1	139	
8404	67.45	CO	64.99	225	150	VC	1	49	
7102	66.18	CO	62.13	300	225	VC	1	196	
7103	68.44	CO	64.54	225	150	VC	1	89	
8101	68.25	CO	66.04	225	150	VC	1	84	
7501	66.63	CO	63.04	300	225	VC	1	389	
4501		CO		150	150	VC	1	141	
8301	66.31	CO	64.5	225	150	VC	1	78	
9305	65.87	CO	61.87	375	150	VC	1	332	
5202	65.35	CO	61	375	150	VC	1	332	
7200	66.5	CO	64.89	225	150	VC	1	186	
5800	65.08	CO	62.71	225	150	VC	1	148	
4301	62.9	CO	60.3	225	150	VC	1	112	
7707	65.19	SW	62.37	225	150	VC	1	112	
7704	65.23	CO	63.85	225	150	VC	1	24	
6300	64.63	CO	63.17	300	225	VC	1	42	
6308	66.02	CO	62.22	375	150	VC	1	120	
8408	66.06	CO	63.23	225	150	VC	1	82	
9501	66.32	CO	66.95	225	150	VC	1	35	
4302	63.75	CO	61.42	225	150	VC	1	55	
8408	63.3	SW	61.56	800	800	CO	1	58	
9212	70.82	CO	67.7	225	150	VC	1	54	
5403		CO		150	150	VC	1	141	
9500	66.78	CO	68.05	225	150	VC	1	50	
5501		CO		150	150	VC	1	141	
6402	66.23	SW	64.6	300	225	VC	1	15	
4305	63.83	CO	62.18	225	150	VC	1	119	
8200	67.52	CO	65.32	225	150	VC	1	119	
4405	63.75	SW	65.76	300	225	VC	1	85	
5201	64.79	CO	61.83	225	150	VC	1	91	
4402	63.09	CO	59.16	225	150	VC	1	111	
9301	64.1	CO	60.59	375	150	VC	1	82	
4201	64.82	CO	60.42	300	225	VC	1	181	
7500	67.45	CO	63.91	300	225	VC	1	128	
4204	64.96	CO	63.06	225	150	VC	1	52	
4202	64.58	CO	62.98	225	150	VC	1	41	
8307	65.84	CO	62.95	375	150	VC	1	138	
8404	63.38	SW	61.37	850	850	BR	1	130	
8705	65.31	CO	64.04	225	150	VC	1	53	
5204	63.64	CO	59.82	225	150	VC	1	136	
8403	63.6	CO	60.94	300	225	VC	1	96	
8302	64.74	CO	62.2	300	225	VC	1	136	
6309	65.94	SW	63.87	300	225	VC	1	96	
7601	66.06	CO	63.09	300	225	VC	1	88	
7602	66.07	CO	62.57	375	150	VC	1	122	
6100	65.84	CO	62.35	300	225	VC	1	253	
7602	67.09	CO	63.54	300	225	VC	1	127	
7400	66.99	CO	63.89	300	225	VC	1	100	
4404	63.94	CO	60.07	300	225	VC	1	51	
9502	66.1	CO	66.55	225	150	VC	1	141	
5401	64.32	CO	62.14	225	150	VC	1	186	
4101	64.15	CO	60.8	300	225	VC	1	257	
9501	67.72	CO	6						

APPENDIX E



KEY:

- DEVELOPMENT SITE BOUNDARY
- PROPOSED SURFACE WATER SEWER/MANHOLE
- PROPOSED FOUL WATER SEWER/MANHOLE
- PROPOSED COMBINED WATER SEWER
- PROPOSED RODDING EYE
- EXISTING SURFACE WATER SEWER
- EXISTING COMBINED WATER SEWER/MANHOLE

- NOTES
1. ALL ADAPTABLE DRAINAGE WORKS HAVE BEEN DESIGNED AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7TH EDITION" AND UU SUPPLEMENT GUIDELINES AND STANDARD DETAILS
 2. ALL CLAY PIPE WORK SHALL BE EXTRA STRENGTH CLAYWARE TO B.S EN 295:1991 PART 1
 3. ALL PRECAST CONCRETE PIPEWORK SHALL BE TO THE CLASS STATED ON THE DRAWINGS IN ACCORDANCE WITH B.S EN 1916:2002. ALSO, ALL MANHOLES AND CHAMBERS SHALL BE TO B.S EN 1917:2002
 4. THE CONTRACTOR MAY ELECT TO USE REINFORCED PVC PIPES AS COVERED BY B.S. 4660:2000 & B.S EN 1401-1. STRUCTURED WALL UPVC PIPES TO COMPLY WITH WIS 4.35-01 UP TO AND INCLUDING 300MM. (BY PRIOR AGREEMENT WITH ADOPTING AUTHORITY) MAX. PIPE LENGTH TO BE 3.0M
 5. ALL LEVELS RELATE TO TOPOGRAPHICAL SURVEY DATUM
 6. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS
 7. PLOT DRAINAGE CONNECTIONS TO SEWERS MUST BE 150MM DIAMETER AND UNLESS OTHERWISE STATED LAID TO THE INVERT SHOWN.
 8. LEVELS GIVEN ON DRAGOUT CHAMBERS ARE INCOMING PIPE LEVELS
 9. PLOT DRAINAGE RUNS TO BE KEPT WITHIN THE CURTLAGE OF THE PLOT THEY SERVE WHEREVER POSSIBLE.
 10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ANY EXISTING INVERT LEVELS AND EXISTING SITE LEVELS (EXISTING BOUNDARY LEVELS) INDICATED ON DRAWINGS ARE CORRECT BEFORE WORKS COMMENCE.
 11. ALL CONNECTIONS TO ADOPTABLE SEWERS SHALL BE MANUFACTURED JUNCTION PIPES. SADDLE CONNECTIONS WILL NOT BE PERMITTED, UNLESS SPECIFIED.
 12. ALL SEWERS FOR ADOPTION WITH GREATER THAN 1.20M COVER IN ROADS OR 0.9M COVER IN FIELDS SHALL HAVE CLASS S GRANULAR BED AND SURROUND.
 13. ANY SEWER FOR ADOPTION WITH LESS THAN 1.2M COVER IN ROADS OR 0.9M COVER IN FIELDS SHALL HAVE A MINIMUM OF 150MM ST4 CONCRETE SURROUND. FLEXIBILITY SHALL BE MAINTAINED BY THE PROVISION OF FLEXCELL OR SIMILAR APPROVED JOINT FILLER BREAKS IN THE CONCRETE SURROUND AT EACH PIPE JOINT
 14. IT IS THE RESPONSIBILITY FOR THE CONTRACTOR TO CHECK ALL ONSITE EXISTING GROUND LEVELS PRIOR TO COMMENCING AND IF THERE ARE ANY DISCREPANCIES THE CONTRACTOR MUST REPORT TO THE ENGINEER IMMEDIATELY
 15. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE DRAINAGE AUTHORITY OF THE COMMENCEMENT OF ANY DRAINAGE WORKS AND TO COMPLETE ANY REQUIRED SEWER CONNECTION FORMS INCLUSIVE OF PAYING ANY REQUIRED FEES. THE CONTRACTOR MUST ALLOW FOR THE SUPERVISION OF THE SEWER CONSTRUCTION WORKS BY THE LOCAL AUTHORITY AND NOTIFY THE SUPERVISING OFFICER, GIVING NOTICE WHICH IN ACCORDANCE WORTH THE L.A REQUIREMENTS
 16. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY FOR ANY REQUIRED ROAD OPENING PERMITS WITH THE LOCAL AUTHORITY INCLUDING THE PAYMENT OF ANY FEES
 17. BEFORE COMMENCING ANY WORKS ON SITE, THE CONTRACTOR MUST CONTACT THE RELEVANT STATUTORY UNDERTAKER AND BE IN POSSESSION OF THE LATEST AVAILABLE DRAWINGS FROM THE STATUTORY UNDERTAKERS WHICH SHOWS DETAILS OF THEIR SERVICES/APPARATUS. THE CONTRACTOR MUST CONFIRM EXACT LOCATION AND DEPTH OF ANY SERVICES/APPARATUS BY THE USE OF ELECTRO-LOCATION OR SIMILAR DEVICES AND BY HAND DUG TRIAL HOLES. MECHANICAL EXCAVATOR, POWER TOOLS ETC. MUST NOT BE USED TO LOCATE EXISTING SERVICES/APPARATUS.

Rev	Description	Date	By	Chkd
PRELIMINARY				
Client: WATSON HOMES				
Project: LEVENSHULME ROAD MANCHESTER				
Dwg Title: DRAINAGE STRATEGY				
ELLUC Projects				
ELLUC PROJECTS 423 KIRKSTALL ROAD AIREDALE HOUSE LEEDS LS4 2EW				
t: (0113) 357 2100 info@ellucprojects.co.uk www.ellucprojects.co.uk				
Scale: 1:250	Size: A1	Print Date: 17/06/22	Drawn: LGM	Checked: MC
Drawing No: ELL-22037-WH-L-1000				