

**FORMER VICTORIA PUBLIC HOUSE, 32 NORTH HYDE ROAD, UB3 4NE
AND SANDOW GARAGE SITE, SANDOW CRESCENT, HAYES, UB3 4QH**

FJC DEVELOPMENTS AND NORTH HYDE INVESTMENTS

FLOOD RISK STATEMENT AND DRAINAGE STRATEGY

REPORT REF. 2106060-01

PROJECT NO. 2106060

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DOCUMENT CONTROL SHEET

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1.0 INTRODUCTION

Preface

- 1.1 Ardent Consulting Engineers (hereafter referred to as Ardent) has been commissioned by FJC Developments And North Hyde Investments to prepare a Flood Risk Statement and Drainage Strategy for a proposed development at the site of the former Victoria Public House and Garage Site off Sandow Crescent, Hayes (hereafter referred to as the "Site").
- 1.2 The statement has been prepared to accompany a planning application to the London Borough of Hillingdon as both planning and lead local flood authority.
- 1.3 This statement has been written with specific reference to the requirements of the National Planning Framework (NPPF – July 2021) and the Planning Practice Guidance (March 2014).

2.0 BASELINE PARAMETERS

Existing Site

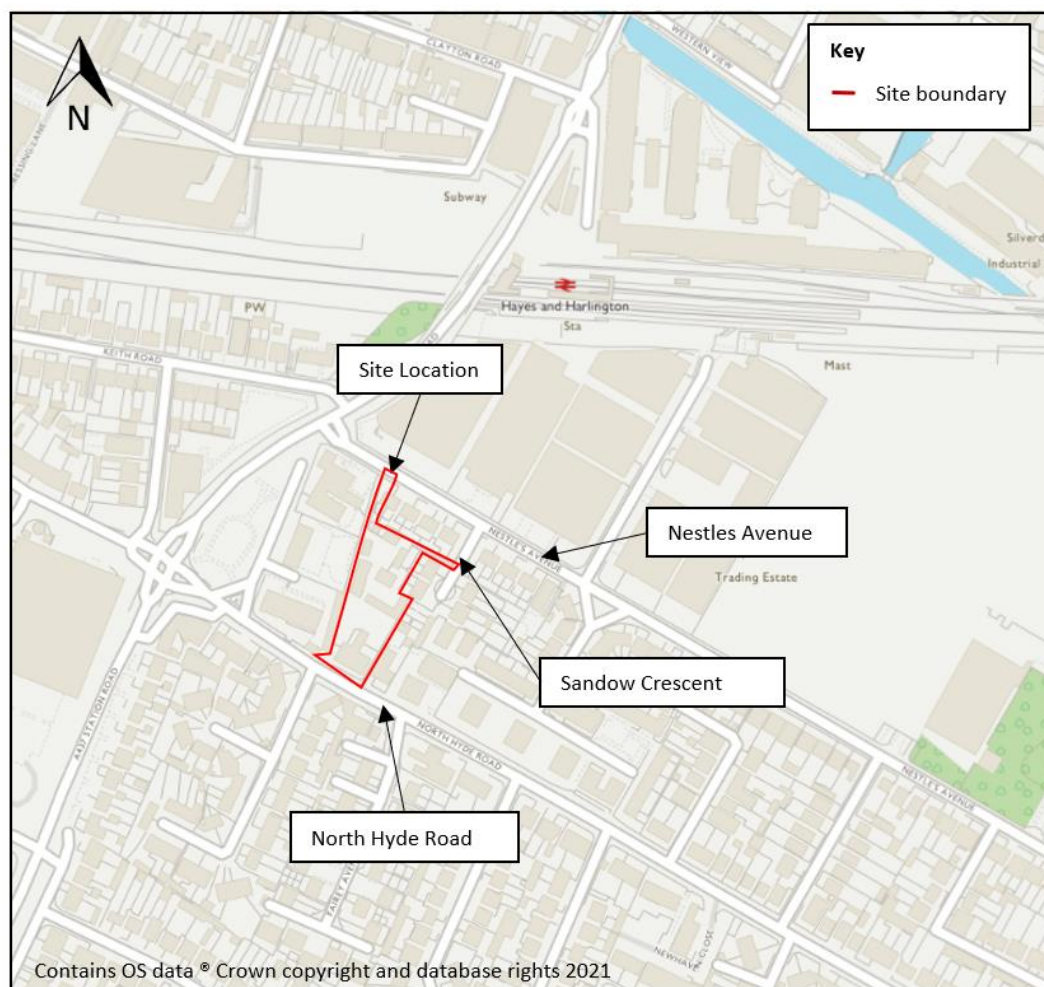


Figure 2-1: Site Location Plan

- 2.1. The Site currently consists of the former Victoria Public House and a series of parking garages and vacant workshops/offices to the rear through which there is a pedestrian link through to Sandow Crescent. It is located south of Nestles Avenue and north of North Hyde Road and is surrounded by residential properties. The Site is at OS grid reference 509636, 179199 and the nearest post code is UB3 4QH. Refer to **Figure 2-1** above.
- 2.2. The Site is currently 100% impermeable.

Development Proposals

- 2.3. The scheme proposals comprise the demolition of the buildings to allow the construction of a new residential development providing 41 residential units spread across two blocks.
- 2.4. Amenity space will also be provided consisting of balconies, private garden areas and communal space.
- 2.5. The proposed site layout plans can be found at **Appendix A**, and an extract of the ground floor plan in **Figure 2-2** below.



Figure 2-2 Proposed Development (Ground Floor)

- 2.6. The development is classified as having an overall 'More Vulnerable' land use within the NPPF.

Topography

- 2.7. A topographical survey of the former Victoria Public House area of the site was carried out by JAS Plan Ltd. in May 2015. An additional survey of the garage area was carried out by Murphy's in June 2016. Both surveys are included in **Appendix B**.
- 2.8. The survey shows external areas of the Site to be relatively flat, in the order of 31.80 to 32.55m AOD.

Hydrology

- 2.9. The nearest main River is the River Crane located approximately 800m to the east of the site. There are no other main rivers in the vicinity of the site.
- 2.10. The Grand Union Canal is located approximately 350m to the north of the site. There are no other surface water bodies within the vicinity of the site

Ground Conditions

- 2.11. Using data from the British Geological Survey (BGS) as displayed in **Figures 2-3 and 2-4** below, the Site is shown to be underlain by superficial deposits of sands and gravels of the Lynch Hill Gravel Member which are in turn underlain by the London Clay formation.
- 2.12. Borehole records from approximately 200m north of site (ref TQ07NE666) indicate the ground conditions to comprise "made ground" to a depth of 3m bgl underlain by "firm brown clay" to a depth of 3.9mbgl, which is in turn underlain by "coarse, flint gravel" to the base of the borehole at 4.14mbgl. No groundwater was encountered. Refer to **Appendix C** for the borehole logs.



Figure 2-3: BGS Geology Maps (Bedrock Geology)

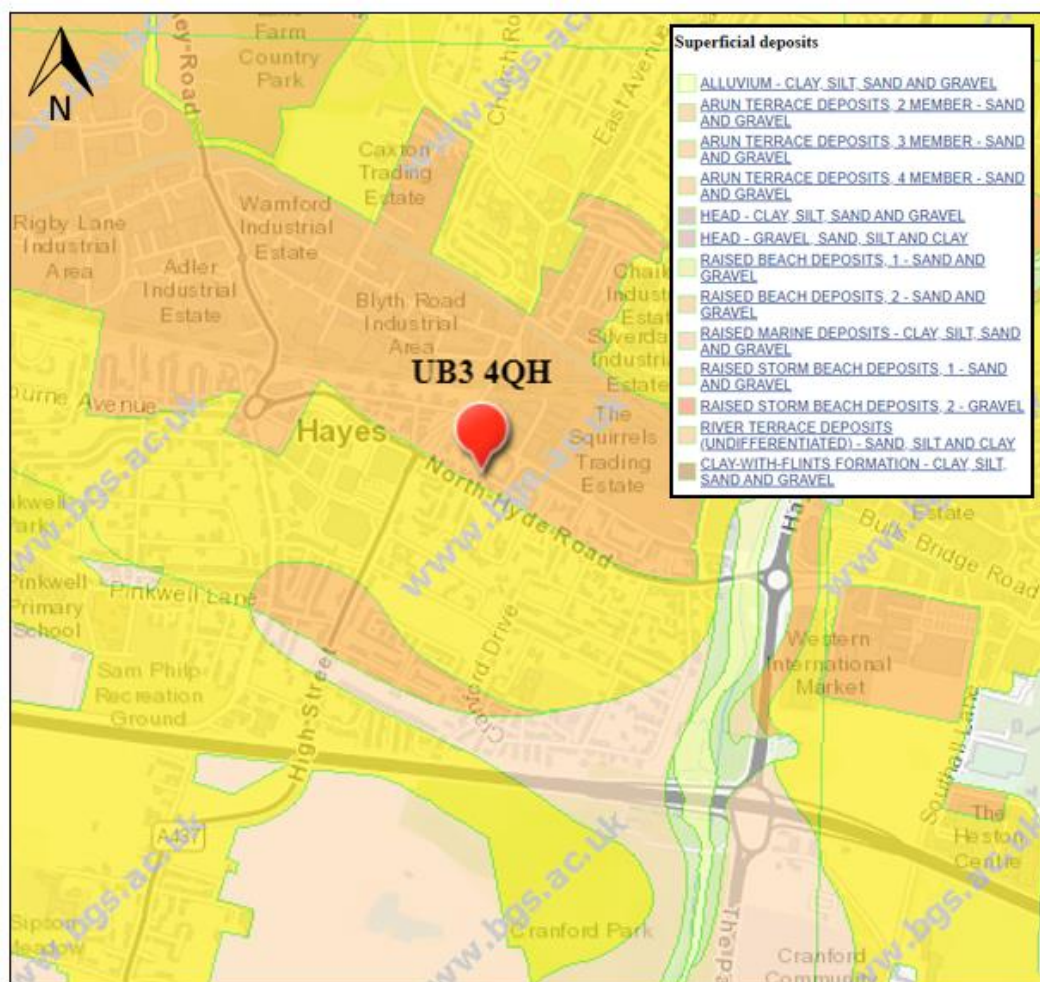


Figure 2-4: BGS Geology Maps (Superficial Geology)

2.13. The Department for the Environment, Food and Rural Affairs (Defra) mapping indicates the Site is not located within a Source Protection Zone.

Existing Sewer Infrastructure

2.14. An extract of Thames Water sewer records is provided in **Figure 2-5** below. A full copy of the plan is included in **Appendix D**.

2.15. The plan shows public surface water sewers run along Nestles Avenue and North Hyde Road surrounding the site. Mews and Holdenhurst Road. A number of gullies are present within the site boundary therefore it is assumed that a private drainage network exists that connects to the surface water sewer along North Hyde Road.

2.16. A number of foul sewers also exist around the site. Foul sewers are present on North Hyde Road and Sandow Crescent, with a sewer running through the site in the site from the centre to the northeast corner.

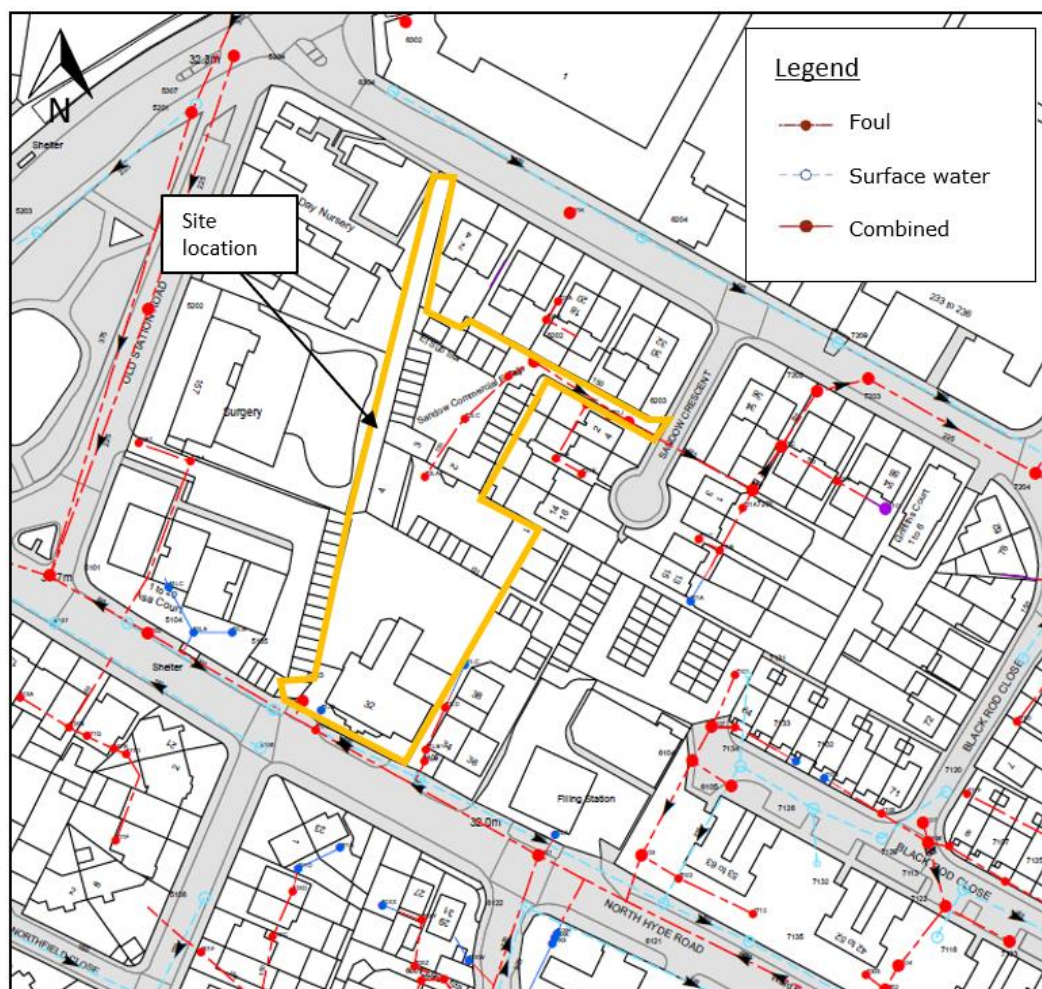


Figure 2-5: Extract of Thames Water Sewer Records

3.0 POLICY CONTEXT

National Planning Policy Framework (July 2021)

- 3.1 The National Planning Policy Framework (NPPF) was introduced on 27 March 2012. This document was revised in updated in July 2021 where paragraphs 159 to 169 inclusive, establish the Planning Policy relating to flood risk management. The Technical Guide to the NPPF was superseded by the Planning Practice Guidance (PPG) in March 2014.
- 3.2 The main focus of the policy is to direct development towards areas of the lowest practicable flood risk and to ensure that all development is safe, without increasing flood risk elsewhere. The main considerations are:
- a) applying the sequential test and then, if necessary, the exception test as set out below;
 - b) safeguarding land from development that is required, or is likely to be required, for current or future flood management;
 - c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and
 - d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development including housing, to more sustainable locations.

Flood and Water Management Act (2010)

- 3.3 The Flood and Water Management Act places a duty on all flood risk management authorities to co-operate with each other. The act also provides lead local flood authorities and the Environment Agency with a power to request information required in connection with their flood risk management functions.

Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems March 2015

- 3.4 The Non-statutory technical standards for sustainable drainage systems were published in March 2015. They should be used in conjunction with the Planning Practice Guidance. In addition, the Best Practice Guidance for the Planning Practice Guidance for the Non-Statutory Technical Standards was published in July 2015 by LASOO.
- 3.5 The Local Planning Authority (LPA) may set local requirements for planning permission that have the effect of more stringent requirements than these non-statutory technical standards.
- 3.6 In addition, SuDS should be designed in accordance with CIRIA 753 "The SuDS Manual", which represents current best practice.

The London Borough of Hillingdon Local Plan Part 1 (November 2012) and 2 (January 2020).

- 3.7 The Hillingdon Local Plan Part 1 is the key strategic planning document for Hillingdon, setting out long term objectives for the Borough including what is planned to happen and how it will be achieved.
- 3.8 The Hillingdon Local Plan Part 2 is made up of Developmental Management Policies providing detailed policies forming the basis of the council's decisions on individual planning applications. The Local Plan sets out development and investment proposals in the borough and is used to inform the approach to managing land uses, alongside planning policies and planning guidance for places and neighbourhoods.
- 3.9 Policy DMEI 9 -11 are related to *Water and Flooding* summarising different elements:
- Policy DMEI 9: Management of Flood Risk
 - Policy DMEI 10: Water Management, Efficiency and Quality
 - Policy DMEI 11: Protection of Groundwater Resources

The London Borough of Hillingdon Local Flood Risk Management Strategy (2015)

- 3.10 The London Borough of Hillingdon is required to develop, maintain, apply, and monitor a local strategy for local flood risk which is defined as flooding caused by: surface water, groundwater, and ordinary watercourses.

West London Strategic Flood Risk Assessment (WLSFRA, 2018)

- 3.11 The NPPF and PPG highlight the role of Local Planning Authorities to use a risk based approach to understand and manage flood risk, requiring a Strategic Flood Risk Assessment (SFRA) to inform local plans. Hillingdon in conjunction with 5 other London Boroughs have produced a joint SFRA setting out the local evidence and requirements.
- 3.12 The SFRA is designed to ensure development is steered away from areas identified most at risk from various flood sources, reducing the risk of flooding to its residents and buildings, through providing the evidence needed to inform the undertaking of the Sequential Test in determining the land use allocations in accordance with the NPPF, and providing guidance on how to apply the Sequential Test for windfall sites within the boroughs.

Sequential Test

- 3.13 The aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.
- 3.14 As the Site is shown to be located within Flood Zone 1 of the Environment Agency flood mapping, it is not necessary for the Site to undergo the Sequential Test.

Exception Test

3.15 Table 3 of the PPG replicated below in **Table 3-1**, confirms that the Exception Test is not required for “More Vulnerable” uses in Flood Zone 1.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
 × Development should not be permitted.

Table 3-1: Extract from the PPG: Flood Risk Vulnerability

4.0 SOURCES OF FLOODING

- 4.1. Environment Agency (EA) Flood Map indicates that the site is located entirely within Flood Zone 1 (low risk of fluvial/tidal flooding), and is almost entirely at very low risk of pluvial flooding. The Site is not located within a Critical Drainage Area and is less than 1 ha. Consequently, a formal Flood Risk Assessment is not required and there is no requirement for the Sequential and Exception Tests to be undertaken.
- 4.2. However, the following sections outline the low risk of flooding from the sources above and also assess flood risk from all other sources.
- 4.3. The NPPF requires flood risk from the following sources to be assessed, each of which are assessed separately below:
- Fluvial sources (river flooding);
 - Tidal sources (flooding from the sea);
 - Groundwater sources;
 - Pluvial sources (flooding resulting from overland flows);
 - Sewer Flooding;
 - Artificial sources, canals, reservoirs etc.; and,
 - It also requires the risk from increases in surface water discharge to be assessed (surface water management).

Fluvial/ Tidal Flood Risk

- 4.4. According to the Environment Agency's indicative flood map for planning, as illustrated in **Figure 4-1** below, the Site is located within Flood Zone 1, defined as having a low risk of flooding and being suitable for any type of development.
- 4.5. It is therefore concluded that the risk of fluvial/tidal flooding to the Site, or from the development to offsite areas, is low

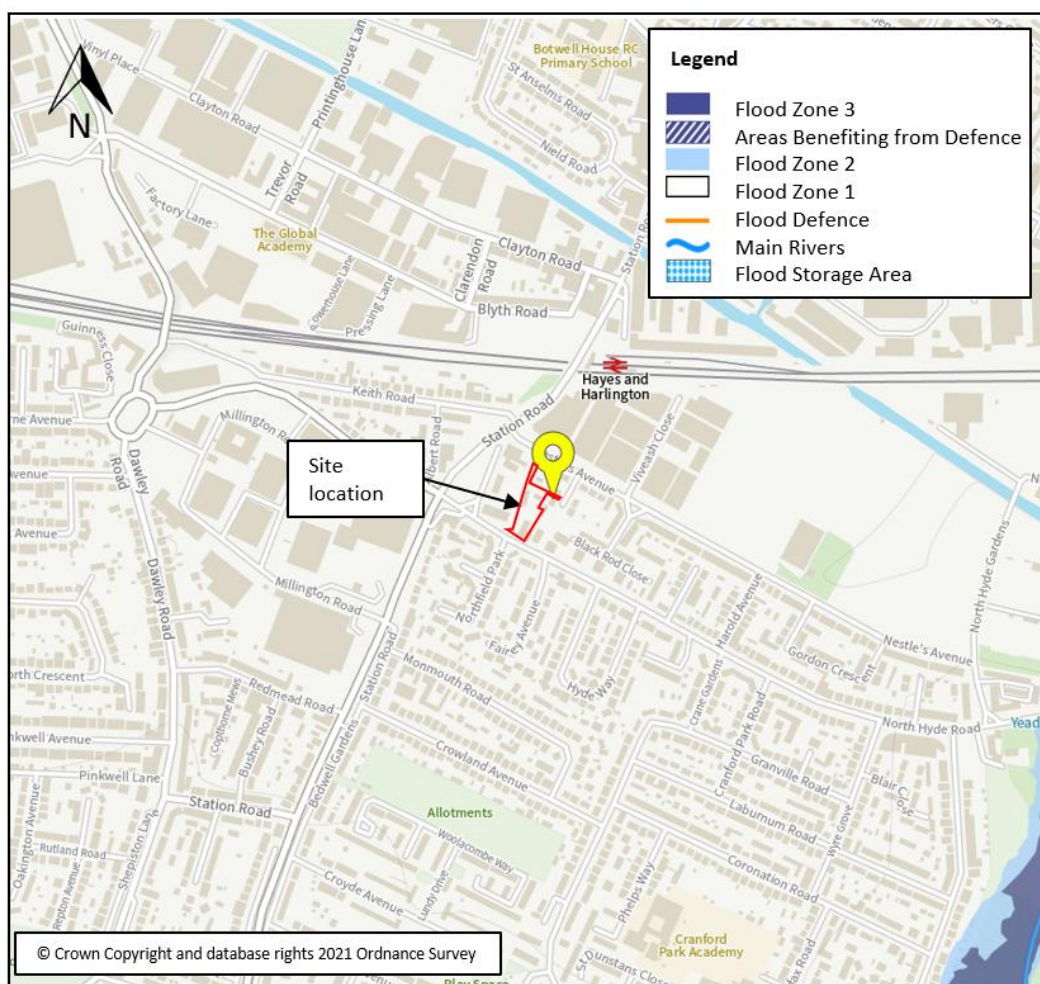


Figure 4-1: Environment Agency Flood Map for Planning

Pluvial Flood Risk

- 4.6. The Environment Agency's surface water flood map shows that the Site is almost entirely situated at 'Very Low' risk of surface water flooding (**Figure 4-2**).
- 4.7. A small area of medium risk flooding exists at the northern boundary of the site.

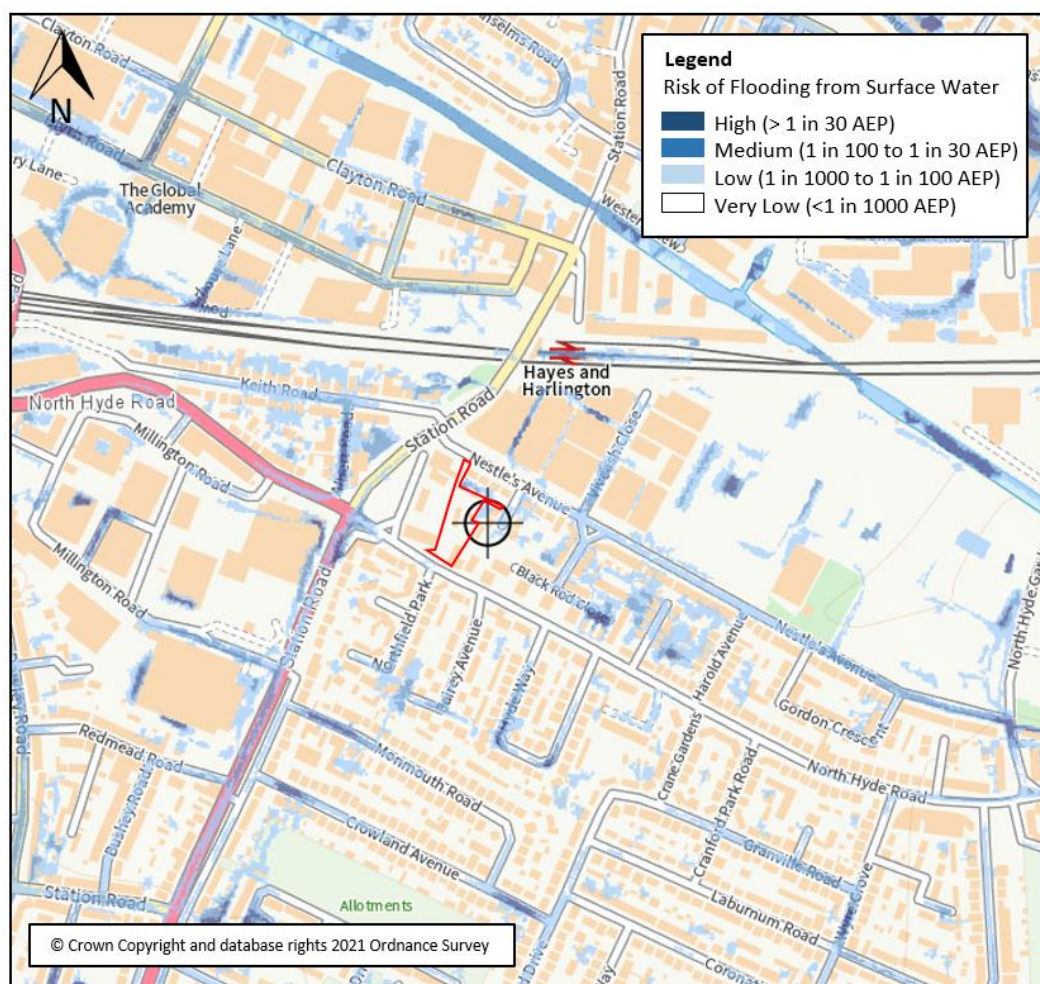


Figure 4-2: Environment Agency Flood Map for Surface Water (Extents)

- 4.8. The landscaping proposals are anticipated to decrease the impermeable area of the Site and changes to surface water flow paths as a result of the development will be minimal.
- 4.9. The risk of pluvial flooding to the Site is therefore assessed low. The development of the Site will bring improvements to the surrounding area through the implementation of a surface water drainage strategy, as described in **Section 5** of this report.

Groundwater Flood Risk

4.10. The EA Susceptibility to Groundwater Flooding Mapping included in the SFRA shows that the site is located in an area with greater than or equal to 75% susceptibility to groundwater flooding. Refer to **Figure 4-3** below.

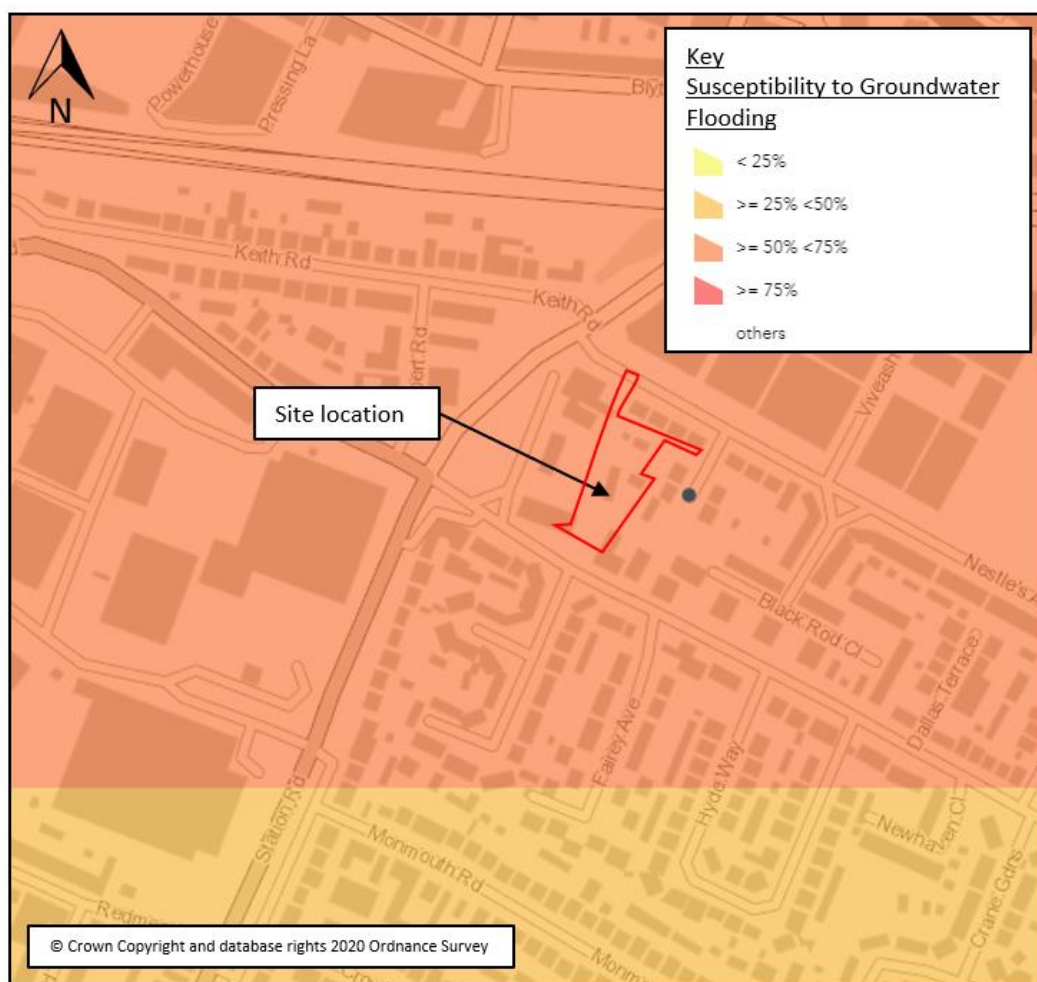


Figure 4-3: BGS Susceptibility to Groundwater Flooding

- 4.11. British Geological Survey borehole records (ref TQ07NE666) recorded a borehole with a depth of 4.14m at the Site which indicates that no groundwater was struck.
- 4.12. **Figure 4-4** below shows the Increased Potential for Elevated Groundwater Map from the Surface Water Management Plan by Hillingdon Council. The map shows that the Site is underlain by permeable superficial deposits, suggesting an increased potential for groundwater flooding.

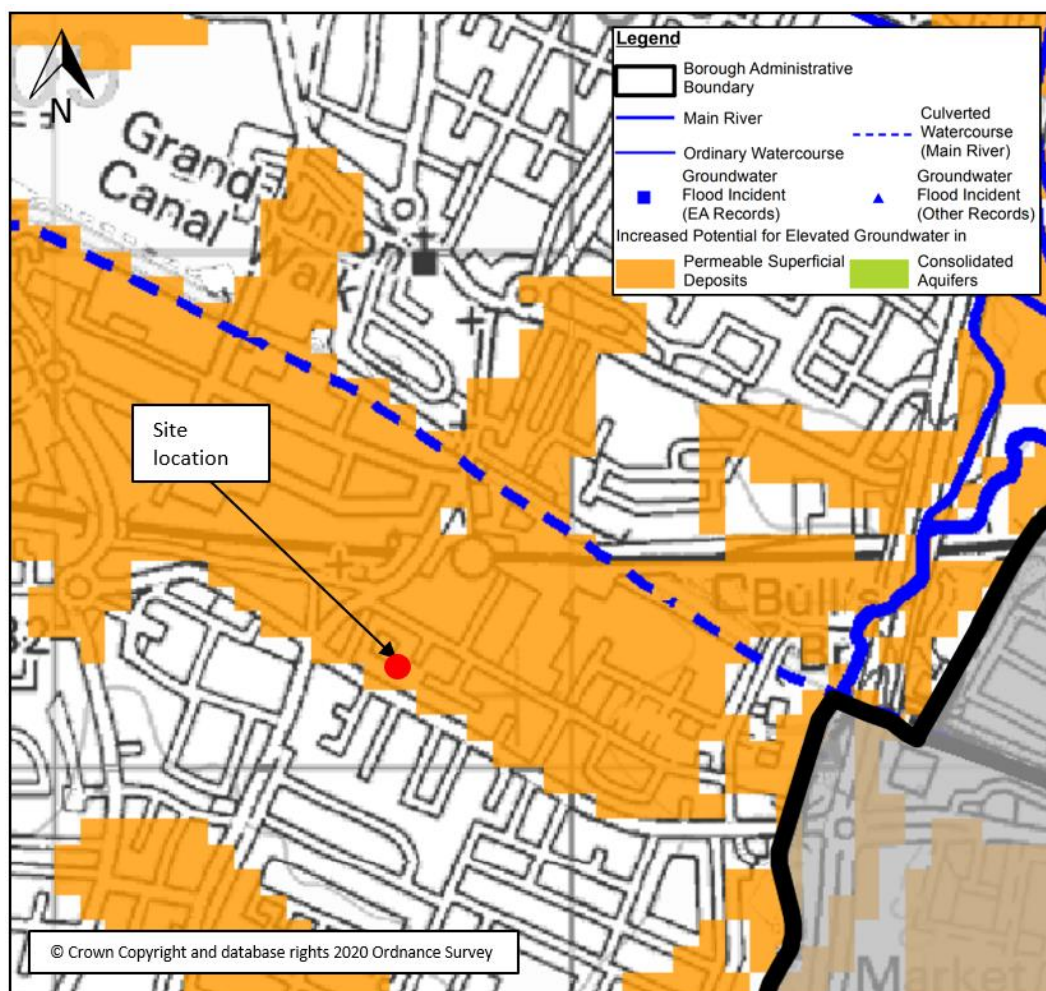


Figure 4-4: BGS Susceptibility to Groundwater Flooding

4.13. The development does not involve any below ground construction such as basements therefore risk of groundwater flood risk to the proposed development is likely to be low, however due to the maps from the SFRA, BGS and Hillingdon council it is suggested an intrusive site investigation be carried out as part of the detailed design, including groundwater monitoring.

4.14. The groundwater flood risk to the site is therefore considered to be medium.

Sewer Flood Risk

4.15. The flooding records held by Thames Water indicate that there have been no incidents of flooding in the site area as a result of surcharging public sewers.

- 4.16. The proposed drainage strategy as described in **Section 5** of this report, has been designed to accommodate rainfall volumes up to the 1 in 100 year plus 40% climate change and will therefore provide an improvement upon the current scenario.
- 4.17. The risk of flooding from sewers is therefore considered to be very low.

Flood Risk from Artificial Sources

- 4.18. The Environment Agency's flood maps from reservoirs indicate that the Site is not within an area at risk of flooding from reservoirs, canals, or other artificial water bodies.
- 4.19. The risk to the Site from reservoir flooding is therefore considered to be very low.

5.0 FOUL AND SURFACE WATER DRAINAGE STRATEGY

- 5.1. The London Borough of Hillingdon Sustainable Drainage Proforma has been included in **Appendix E**.
- 5.2. DEFRA's Non-statutory technical guidance for Sustainable Drainage Systems and CIRIA Guidance C753 "The SuDS Manual" have been used to determine the appropriate SuDS Strategy, which considers the spatial and environmental constraints of the Site.
- 5.3. Under the NPPF an allowance of 40% for the effects of climate change will achieve the policy requirements for the proposed development.

Proposed Sustainable Drainage Systems (SuDS)

- 5.4. In accordance with the London Plan Policy SI 13 (B), surface water runoff should be disposed of according to the following hierarchy:
 1. Store rainwater for later use;
 2. Use infiltration techniques, such as porous surfaces in non-clay areas;
 3. Attenuate rainwater in ponds or open water features for gradual release;
 4. Attenuate rainwater by storing in tanks or sealed water features for gradual release;
 5. Discharge rainwater direct to a watercourse;
 6. Discharge rainwater to a surface water sewer/drain; and
 7. Discharge rainwater to the combined sewer.
- 5.5. As discussed in **Section 2**, BGS data indicates that the Site is underlain by superficial deposits of sands and gravels which are in turn underlain by the London Clay formation therefore infiltration is unlikely to be feasible.
- 5.6. There is also evidence of Made Ground present on site therefore infiltration would pose the risk of mobilising pollutants (present in the Made Ground) into the underlying aquifer, as well as concerns over potential high groundwater.
- 5.7. There are no watercourses in the vicinity of the Site. It is therefore proposed to discharge surface water runoff into the Thames Water surface water sewer along North Hyde Road. As the site is currently assumed to drain via an existing private drainage network connected

to this sewer, the proposals will have a minimal impact on surface water flood risk in the area and on the drainage network.

- 5.8. The constraints and opportunities for the use of SuDS techniques are appraised using the Management Train approach outlined in CIRIA C753 'The SuDS Manual' in **Table 5-1** below.

Table 5-1: Existing and Proposed Areas

Type:	Infiltration Devices (Source Control)
Constraints:	Ground Conditions do not allow for infiltration. Presence of made ground may lead to contamination. Limited space for infiltration systems (and provision of 5m buffer from buildings) due to narrow site surrounded by buildings. The Site is also a brownfield site (commercial/industrial use) and therefore the use of infiltration techniques would carry the risk of mobilising pollutants into the soil.
Opportunities:	Limited due to ground conditions and site layout
Type:	Lined Permeable Paving (Source Control)
Constraints:	It is not possible to provide infiltrating permeable paving/permeavoid due to site characteristics (as per infiltration devices above).
Opportunities:	Permeable paving wrapped in geo-membrane could be used to provide surface water attenuation and a stage of treatment before discharging into the drainage system.
Type:	Rainwater Harvesting (Source Control)
Constraints:	The benefits of rainwater harvesting on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure.
Opportunities:	Opportunities in amenity areas to provide harvesting features such as rain gardens, raised planters and water butts exist. However, it is difficult to quantify contribution, and therefore not included within calculations as part of this surface water management strategy
Type:	Swales, etc. (Permeable Conveyance)
Constraints:	In order to provide practicable attenuation benefits 1:3 side-slope swales tend to require a significant land requirement.
Opportunities:	None due to spatial constraints.
Type:	Tree Pits/Rain gardens
Constraints:	Subject to Landscape Architect's design.
Opportunities:	There may be opportunities to use landscaped space to incorporate tree pits.
Type:	Green Roofs
Constraints:	Subject to Architect's design.
Opportunities:	Roofs are not proposed as part of the development.
Type:	Attenuation Tanks (end of pipe treatment)
Constraints:	None
Opportunities:	Should additional attenuation be required this could be achieved by use of oversized sewers or geo-cellular storage attenuation.

- 5.9. After consideration of the CIRIA C753 SuDS Management Train approach, the most viable SuDS options for this site is a solution combining permeable paving and geocellular storage. Refer to

Drawing **No. 2106060-001** in **Appendix F** for the proposed surface water drainage strategy.

Existing and Proposed Surface Water Discharge Rates

Existing development

- 5.10. The planning red line boundary area equates to 0.361 ha and comprises entirely of impermeable surfaces.
- 5.11. The topographical survey shows a number of gullies and inspection chambers serving the northern portion of the Site; the outfall location of this system is currently unknown and should be investigated on site, but it is assumed that the network outfalls to Thames Water's surface water system.
- 5.12. Existing runoff rates from the site were determined using the Wallingford Procedure Rational Method for an assumed critical 5-minute storm. Equivalent peak Greenfield Runoff rates for the site were also calculated and are presented in **Table 5-2** below. Full calculations can be found in **Appendix G**.

Table 5-2: Existing and Greenfield Discharge rates

Return Period Event	Brownfield (l/s)	Greenfield (l/s)
Q₁	50.93	0.5
Q₃₀	113.30	1.4
Q₁₀₀	144.26	1.9
Q_{bar}	-	0.6

- 5.13. In line with the Hillingdon Local Flood Risk Management Strategy (2015) Policy 5.13 and the London Plan, discharge rates from new developments should aim to achieve Greenfield run-off rates or as close as practically possible. However, greenfield runoff rates for the Site (shown in **Table 5-2** above) are 0.6 l/s which is too low to be practically achieved and would introduce a risk of flooding due to potential for blockages in the flow control device. It is therefore proposed to limit discharge to 2.0 l/s to mitigate the risk of blockages.
- 5.14. A pre-planning enquiry has been submitted to Thames Water and they have confirmed that they have sufficient capacity within the surface

water network to accommodate the flows from the development. Refer to **Appendix J** for the Thames Water correspondence.

Proposed development

- 5.15. The planning redline boundary equates to approximately 0.361 ha of which 100% is currently hardstanding areas. The redevelopment will reduce the impermeable areas across the site through the introduction of communal landscapes areas, and private gardens. Development proposals indicate that the post development layout will include approximately 1940m² of open landscaping.
- 5.16. The proposed layout additionally includes 286m² of green roof areas and 472m² permeable paving. Green roofs have been assumed as 80% impermeable areas as part of the drainage calculations. Surface water runoff from the roof would be reduced by a maximum of 20% as a result of the green roofs. This is in accord with the GRO Green Roof Code (GRO, 2011) and the Guidance for the Planning, Execution and Upkeep of Green Roof Site (FFL, 2002). Comparisons between the existing and proposed hardstanding areas excluding green roofs are shown in **Table 5-3** below.
- 5.17. The proposals therefore result in a minimum of 48% reduction in impermeable area.

Table 5-3: Existing and proposed hardstanding areas

<i>Site</i>	<i>Area (ha)</i>	<i>Impermeable Area (ha)</i>	<i>Permeable Area (ha)</i>	<i>% Impermeable</i>
Pre-Development	0.361	0.361	0.000	100%
Post-Development (excluding green roofs)	0.361	0.172	0.189	48%
Post-Development (including green roofs)	0.361	0.166	0.195	32%

Proposed surface water runoff rates

- 5.18. The London Plan states that “development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible.”
- 5.19. As such, consideration has been given to **Table 5-2** where the Greenfield rates are reported. It is considered that the Greenfield rates are impracticably low and would cause issues with blockages and maintenance challenges. As such, the lowest reasonably practicable rate of 2.0 l/s is proposed as the discharge rate for all storm events up to the 1 in 100-year plus a 40% allowance for climate change.
- 5.20. **Table 5-4** below highlights the Existing and Proposed surface water runoff discharge rates for the site under various storm scenarios. A full calculation record is provided in **Appendix D**.

Table 5-4: Existing and Proposed Surface Water Runoff Rates

	Return Period			
	1 in 1 year Discharge Rate	1 in 30 Year Discharge Rate	1 in 100 year Discharge Rate	1 in 100 year + 40% Discharge Rate
Pre Development (l/s)	50.93	113.30	144.26	-
Calculated Greenfield runoff (l/s)	0.50	1.40	1.90	-
Proposed post Development (l/s)	2.00	2.00	2.00	2.00
% Reduction from pre development	96%	98%	99%	-

- 5.21. In order to achieve the proposed discharge rate of 2.0 l/s, it is proposed that a total storage volume of approximately 125m³ will be provided within the proposed geocellular storage.
- 5.22. An additional 42m³ storage will also be available within the 0.3m layer of permeable paving.

5.23. MicroDrainage Network module modelling results show there is no flooding on the Site for the 1 in 100 year including 40% climate change rainfall event. MicroDrainage modelling results are included in **Appendix H**.

5.24. Invert and cover levels should be confirmed on-site and the location of and outfall of the existing system should be explored with a CCTV drainage survey at the detailed design stage. The proposed rate of discharge and proposed connections are subject to approval by Thames Water and the Lead Local Flood Authority

Surface Water Quality

5.25. The recommended stage of treatment in terms of water quality would be provided through the aforementioned permeable paving. In line with the SuDS Manual C753, Tables 26.2 and 26.3, the pollution hazard and mitigation indices associated with residential roofs are mitigated by the provision of SuDS features.

5.26. Please refer to **Appendix I** for copies of Tables 26.2 and 26.3, the pollution hazard and mitigation indices.

Long Term Storage

5.27. There will be a reduction of impermeable area as a result providing green amenity spaces and green roofs within the development, and as such the runoff volume generated by the developed area will be reduced. Therefore, there is no requirement for Long Term Storage.

Exceedance Flows

5.28. As a result of heavy or extreme storm events it is sometimes unavoidable for the capacities of sewers and other drainage systems to be exceeded. Drainage exceedance will occur when the rate of surface water runoff exceeds the inlet capacity of the drainage system, when the receiving water or piped system becomes overloaded, blocked or when the outfall becomes restricted due to flood levels in the receiving water.

- 5.29. The proposed attenuation features are located towards the lowest lying areas of the site and the internal highways network direct flows away from residential units. The routes will ultimately mimic the current flow routes associated with the existing site as a result of the topography.
- 5.30. The exceedance routes are shown on the Drainage Strategy drawing included in **Appendix D**.

Finished floor levels

- 5.31. It is recommended that finished floor levels be set to 150mm above the existing ground levels to mitigate against possible flooding should the capacity of the drainage system be exceeded.

Future Maintenance

- 5.32. A management company will be appointed to maintain communal areas, landscaping, and shared SuDS throughout the development.
- 5.33. All maintenance will be in accord with the best practices and the CIRIA Manual C753. Please refer to **Appendix I** for an overview of the maintenance tasks required.

Proposed Foul Water Drainage Strategy

- 5.34. The Site currently consists of the former Victoria Public House, which has been converted into 7 residential units and a series of parking garages. Based on Thames Water's foul flow loadings, the peak foul flow rate for the site is calculated to be 0.321 l/s. Refer to **Appendix K** for foul loading calculations.
- 5.35. It is proposed that foul flows from the development will discharge into the existing foul sewers within the site. Refer to the preliminary drainage strategy **drawing no. 2106060-001** provided in **Appendix F**.
- 5.36. The cumulative peak flow rate for the overall post-developed site (combined foul and surface water flows) is therefore 3.879 l/s (2.00 l/s + 1.879 l/s). Considering the existing site peak combined runoff rate is 144.581 l/s (144.26 + 0.321 l/s), the proposals will result in a

reduction of combined flows of 97% from the pre-development scenario for the 1 in 100-year event.

- 5.37. A pre-planning enquiry has been submitted to Thames Water and they have confirmed that they have sufficient capacity within the foul water network accommodate the flows from the development. Refer to **Appendix J** for the Thames Water correspondence.

6.0 SUMMARY AND CONCLUSIONS

- 6.1. Ardent Consulting Engineers has been commissioned by FJC Developments And North Hyde Investments to prepare a Flood Risk Statement and Drainage Strategy for a proposed development at the site of the former Victoria Public House and Garage Site off Sandow Crescent, Hayes.
- 6.2. This FRA considers the current policy relating to flood risk, including the National Planning Policy Framework, and local policy related to the London Borough of Hillingdon.
- 6.3. The entire Site is shown to be within Flood Zone 1 therefore at low risk of fluvial/tidal flooding. Therefore, the site does not have to undergo the Sequential and Exception Tests.
- 6.4. The site is found to be a very low risk of pluvial flooding however the surface water drainage strategy will reduce flood risk by restricting surface water flows in accordance with the London Plan. A sustainable urban drainage system has been designed to incorporate permeable paving and a geocellular attenuation tank. Storm water attenuation is provided for all storms up to and including the 1 in 100-year critical event (including a 40% allowance for climate change). The proposed development results in significant betterment over the predevelopment scenario in terms of a reduction of surface water runoff of 99%.
- 6.5. It is concluded that the development is at low risk of flooding from other sources including fluvial, tidal, a breach of any nearby reservoir, or sewer flooding. The site is considered to be at medium risk of groundwater flooding.
- 6.6. It is recommended that finished floor levels be set to 150mm above the existing ground levels to mitigate against possible flooding should the capacity of the drainage system be exceeded, or from groundwater flooding.
- 6.7. A management company will be appointed to maintain communal spaces and SuDS throughout the life of development. All maintenance

will be in accordance with the best practices and the CIRIA Manual C753.

- 6.8. In conclusion, this document demonstrates that the proposals are consistent with the aims of the NPPF and the Planning Practice Guidance to the NPPF along with the aims of the West London Strategy Flood Risk Assessment and the London Plan). The Site will not be at significant risk of flooding or increase the flood risk to others.

Appendix A

Development Proposals



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1:200
0 4 8 12m



03	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Interim Issue	DV	NC	18/11/2021
00	FOR INFORMATION	DV	NC	09/08/2021

REV	DESCRIPTION	DRAWN	CHECKED	DATE
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CREATE
DESIGN + ARCHITECTURE
Wiglesworth House 69 Southwark Bridge Road London SE1 9HH
+44 207 021 0267 info@createdesign.org www.createdesign.org

CLIENT: Curwen Group

PROJECT: The Former Victoria Pub
BUILDING: Sadow Crescent
ADDRESS: UB3 4QH

DRAWING NAME: PROPOSAL FIRST FLOOR

DRAWING SERIES: SITE PLAN

CDA REF: 000 SCALE(S): 1:200 ORIGINAL PAPER SIZE: A1

REVISION: 03 REVISION DESCRIPTION: Design Freeze Issue

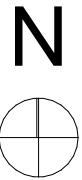
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637	- CDA	- XX	- 01	- DR	- A	- 01	- 0101



0102 SECOND FLOOR
1:200

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03	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Interim Issue	DV	NC	19/11/2021
00	FOR INFORMATION	DV	NC	09/09/2021

REV	DESCRIPTION	DRAWN	CHECKED	DATE
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Wigglesworth House 69 Southwark Bridge Road London SE1 9HH
+44 207 021 0267 info@createdesign.org www.createdesign.org

CLIENT: Curwen Group

PROJECT: The Former Victoria Pub
BUILDING: Sadow Crescent
ADDRESS: UB3 4QH

DRAWING NAME: PROPOSAL SECOND FLOOR

DRAWING SERIES: SITE PLAN

CDA REF: 000 SCALE(S): 1:200 ORIGINAL PAPER SIZE: A1

REVISION: 03 REVISION DESCRIPTION: Design Freeze Issue

PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	CLASS	NUMBER
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03	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Interim Issue	DV	NC	19/11/2021
00	FOR INFORMATION	DV	NC	09/09/2021

REV	DESCRIPTION	DRAWN	CHECKED	DATE
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CLIENT: Curwen Group

PROJECT: The Former Victoria Pub
BUILDING: Sadow Crescent
ADDRESS: UB8 3QH

DRAWING NAME: PROPOSAL THIRD FLOOR

DRAWING SERIES: SITE PLAN

CDA REF: 000 SCALE(S): 1:200 ORIGINAL PAPER SIZE: A1

REVISION: 03 REVISION DESCRIPTION: Design Freeze Issue

PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	CLASS	NUMBER
637	- CDA	- XX	- 03	- DR	- A	- 01	- 0103



0104 ROOF LEVEL
1:200

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1:200
0 4 8 12m



03	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Interim Issue	DV	NC	19/11/2021
00	FOR INFORMATION	DV	NC	09/09/2021
REV	DESCRIPTION	DRAWN	CHECKED	DATE

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+44 207 021 0267 info@createdesign.org www.createdesign.org

CLIENT: Curwen Group

PROJECT: The Former Victoria Pub
BUILDING: Sandown Crescent
ADDRESS: UB8 3QH

DRAWING NAME: PROPOSAL ROOF LEVEL

DRAWING SERIES: SITE PLAN

CDA REF: 000 SCALE(S): 1:200 ORIGINAL PAPER SIZE: A1

REVISION: 03 REVISION DESCRIPTION: Design Freeze Issue

PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	CLASS	NUMBER
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02	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Permit Issue	DV	NC	18/11/2021
00	FOR INFORMATION	DV	NC	10/08/2021

REV	DESCRIPTION	DRAWN	CHECKED	DATE
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CLIENT: Curwen Group

PROJECT: The Former Victoria Pub
BUILDING: Sandown Crescent
ADDRESS: UB3 4QH

DRAWING NAME: BLOCK 2 PLANS 1

DRAWING SERIES: 0000-0199 GA PLANS

CDA REF: 000 SCALE(S): 1:100 ORIGINAL PAPER SIZE: A1

REVISION: 02 REVISION DESCRIPTION: Design Freeze Issue

PROJECT	ORGANIZATION	VOLUME	LEVEL	TYPE	ROLE	CLASS	NUMBER
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02	Design Freeze Issue	DV	NC	20/11/2021
01	Planning Permit Issue	DV	NC	18/11/2021
00	FOR INFORMATION	DV	NC	10/08/2021

REV	DESCRIPTION	DRAWN	CHECKED	DATE
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PROJECT: The Former Victoria Pub
BUILDING: Sandown Crescent
ADDRESS: UB8 3QH

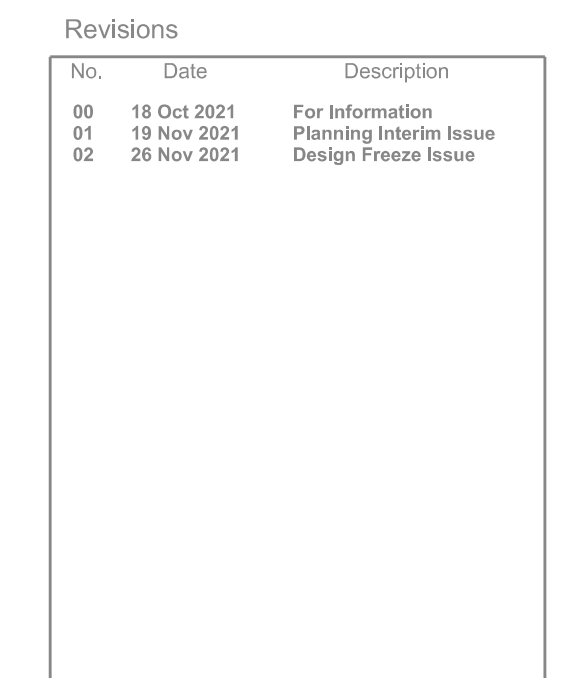
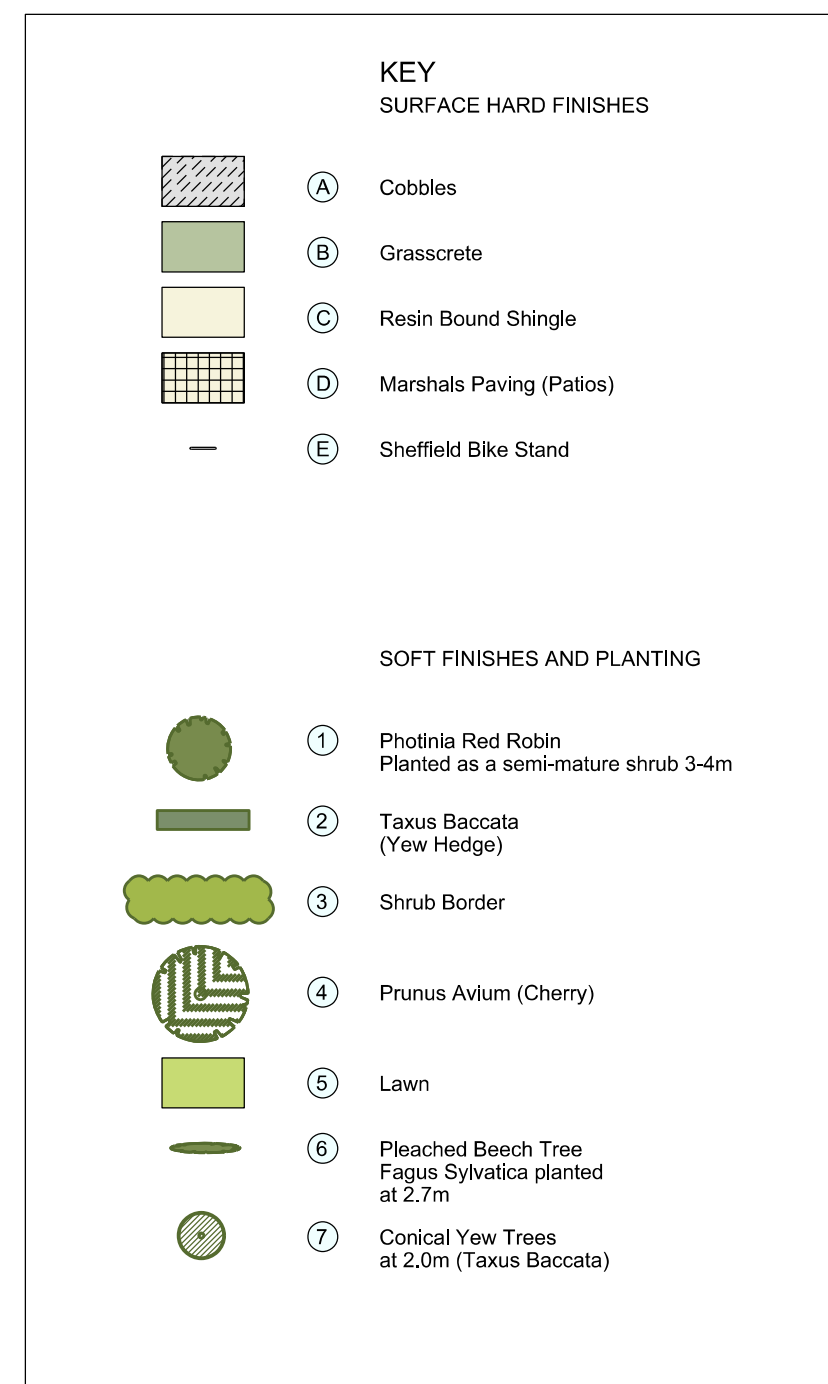
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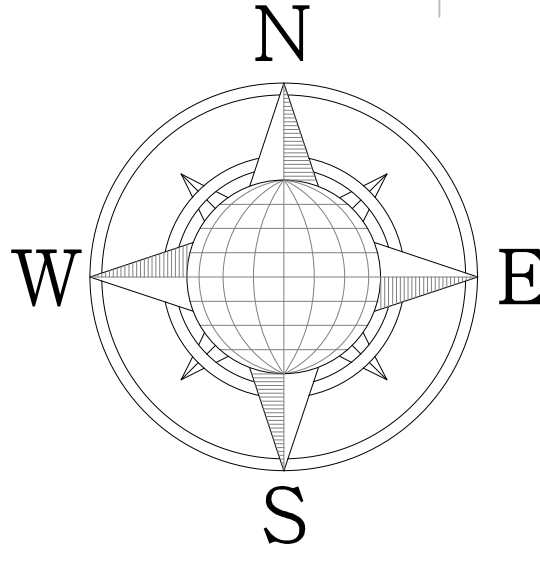
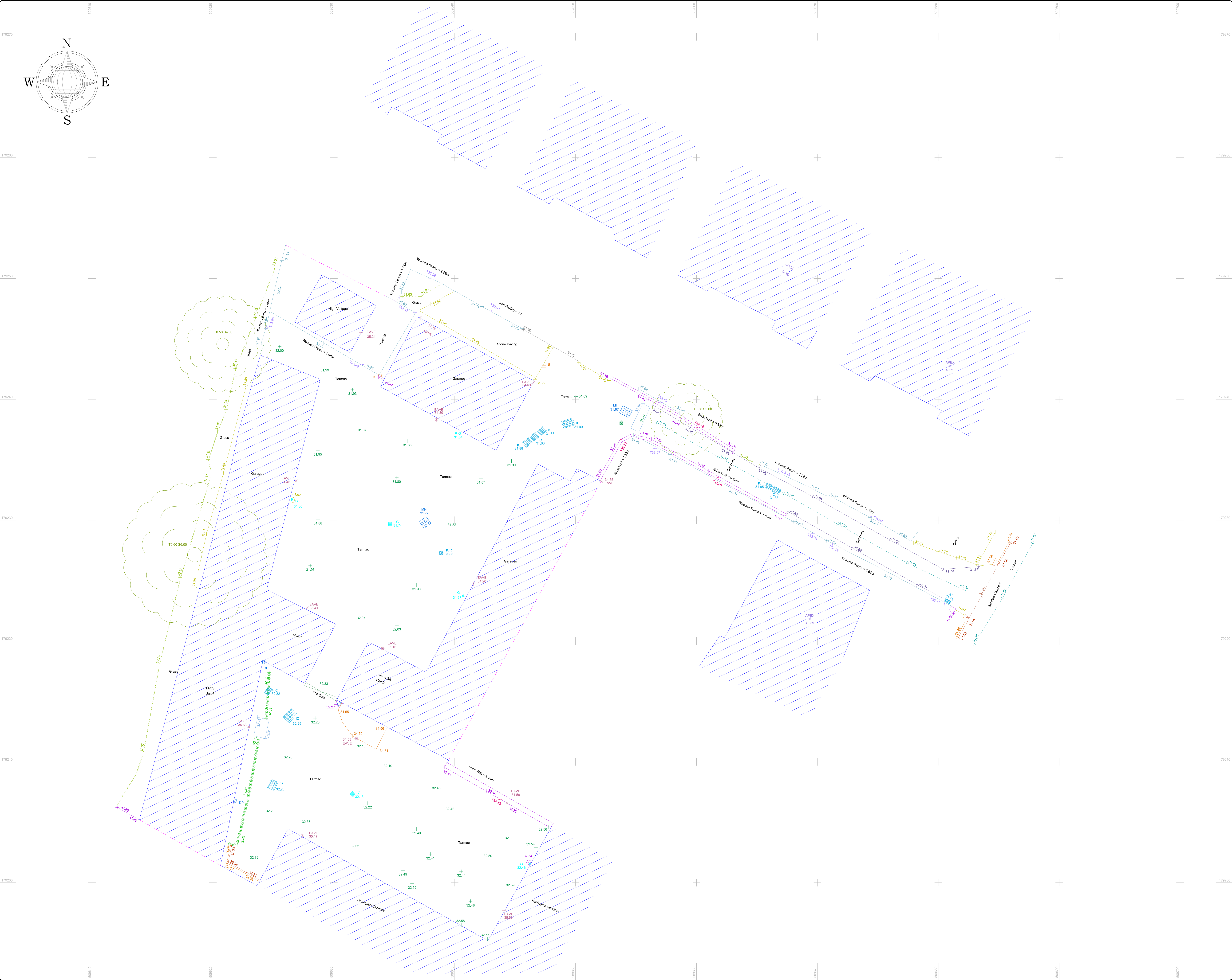
REVISION: 02 REVISION DESCRIPTION: Design Freeze Issue

PROJECT	ORGANIZATION	VOLUME	LEVEL	TYPE	ROLE	CLASS	NUMBER
637	- CDA	- XX	- 02	- DR	- A	- 20	- 0101



Appendix B

Topographical Survey



LEGEND
Topographic Linework Features
12.24 Air-Con Unit (ACU) 12.24 Hand Rail 12.24 Sky Light
12.24 Beam Line 12.24 Hoarding 12.24 Slope Bottom
12.24 Bench 12.24 Kerb Bottom 12.24 Slope Top
12.24 Bin 12.24 Kerb Drop 12.24 Slot Drain
12.24 Bollard Illuminated 12.24 Kerb Top 12.24 Steel Cladding
12.24 Bollard 12.24 Lake 12.24 Steel Structure
12.24 Bridge 12.24 Land Drain 12.24 Stop Line
12.24 Building Facade 12.24 Lift 12.24 Surface Change
12.24 Bus Stop Shelter 12.24 Opening - Slab 12.24 Tank
12.24 Cable Trough 12.24 Overhead Cables 12.24 Telephone Box (TB)
12.24 Canopy 12.24 Parapet 12.24 Toilet
12.24 Ceiling Line 12.24 Partition 12.24 Top of Fence Line
12.24 Centre Line 12.24 Parking Meter (PM) 12.24 Top of Wall Line
12.24 Column 12.24 Pipe Line 12.24 Track
12.24 Column Bottom Line 12.24 Platform Trunk/Tram 12.24 Traffic Ctrl Box (TCB)
12.24 Column Top Line 12.24 Plinth 12.24 Tree Drip Line
12.24 Concrete Base/Slab 12.24 Pond 12.24 Tree Line
12.24 Contour Major 12.24 Post-box 12.24 Trial Pit
12.24 Contour Minor 12.24 Rail 12.24 Vegetation Line
12.24 Cycle Lane 12.24 Ramp 12.24 Vent
12.24 Ditch 12.24 Red Line Dashed 12.24 Verge Line
12.24 Door 12.24 Red Line Solid 12.24 Wall Line
12.24 Electric Box (EBOX) 12.24 Red Line Double 12.24 Window
12.24 Fence 12.24 Road Edge 12.24 Window Glazing
12.24 Feature 12.24 Road Scar Line 12.24 White Line Dashed
12.24 Flowerbed 12.24 Road Text 12.24 White Line Solid
12.24 Footpath 12.24 Road Text 12.24 Yellow Line Dashed
12.24 Grating 12.24 Sanitary 12.24 Yellow Line Double
12.24 Grid Line 12.24 Service 12.24 Yellow Line Solid

Topographic Point Features
AV Air Valve IC Inspection Cover RS Road Sign
APEX Apex Building IC - CATV RE Rodding Eye
BL Bed Level IC - Comms SA Sector Antenna
BB Bellisha Beacon IC - Electric SIGM Sign (General)
B Bollard IC - Round SFL Soft Level
BOLT Bolt IC - Telecom SC Stop Cock
BH Borehole IC - Traffic TP Telegraph Pole
BUSH Bush IC - Invert Level TOP Top of Fence Line
CCTV Camera Pole IC - Lamp Post TOW Top of Tree Level
CE Ceiling Elevation LP Lamp Post TOW Top of Wall Line
DP Dipole MH Manhole TL Traffic Light
ER Earth Rod MH - Foul TL Tree (TX XX SX XXX)
EAVE Eave MH - Round T-T Trunk (Radius) S-S Spread Radius (m)
EP Electrical Pole MH - Surface Water T-T Tree Confiscatory
FL Floor Level MK Marker Post T-T Tree Deciduous
GM Gas Meter MW Microwave Dish T-T Tree Trunk
G Gas Valve W Water Level V Valve General
GATE Gate POLE Pole WM Water Meter
Gully Pipe - Down WM Water Meter
Gully Round POST Post WS Water Valve

Special Features
DATUM Datum Point E=XXXX XXX Survey Station
P Photo Point H=ZZZ ZZZ
P Panoramic Photo Point E=XXXX XXX Scan Target
H=ZZZ ZZZ

Fence Types
BW Barbed Wire CL Chain Link OB Open Boarded
CB Close Boarded H Hedges P/W Post and Wire
CI Corrugated Iron IR Iron Railings P/R Post and Rail

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Revisions				
Rev	Description	Surveyed by	Drawn by	Checked by
A	First Issue	LA - 19/06/16	LA - 20/06/16	TMD - 21/06/16

Drawing Sheet Layout:

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SURVEYS
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Client	Stonegate Homes Ltd
Project	Sandow Commercial Estate
Site Address	Sandow Commercial Estate, Sandow Crescent, HAYES, UB3 4QH
Description	Topographic Survey
Survey Grid	Localised OSG - Scale Factor 1.0
Survey Datum	GNSS - Ordnance Datum Newlyn (ODN)
Drawing Scale	1:100 @ A0
Drawing Number	MSL16682-T

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