

JOB TITLE	Land rear of Central House	JOB NUMBER	P261
DATE	5 th September 2022	AUTHOR/REVIEWER	OM/JM
CLIENT	Shall Do Central House Limited	DOCUMENT REF.	JME.261.CentralHouse.FRA_RevA

1. INTRODUCTION

1.1 Brief

JM Enviro Limited has been appointed by Shall Do Central House Limited (the Client) to undertake a Flood risk assessment including a Sustainable Drainage Strategy to support a planning application for the erection of a 6 storey building on land to the rear of Central House, Perrymount Road, Haywards Heath to create 28 flats with associated landscaping and parking.

1.2 Project Context

The site currently comprises the car park located to the rear of Central House. Central House is currently being converted from offices to residential property as part of a previously consented prior approval application itself is and is excluded from the application boundary.

The planning application boundary (redline in Figure 1a and on Drawing in Appendix B) includes the side and front forecourt.

In March 2022, pre-application advice (application no. DM/22/0062) was sought for:

“Erection of 6 storey building on land to rear of Central House to comprise of 26 flats together with landscaping and parking.”

In response to the pre-application submission, the council commented that:

“The principle of a 6 storey residential building at the rear of Central House is accepted given the outline consent DM/20/1137 (while all matters were reserved except for access realistically there is no other means of achieving the number of residential units given the site constraints).”

Additionally, the council stated that the following needs to be considered at the full planning stage:

- The site is located in flood zone 1 and at very low surface water flood risk. However, as a major planning application a flood risk assessment should be submitted as part of the application.
- General drainage requirements for this development at application stage;
 1. Designed to cater for the 1 in 100-year, plus climate change storm event.
 2. Design follows the drainage hierarchy.
 3. Evidence that a suitability sized surface water drainage system can be located on the site taking into account site constraints, including adjacent development's utilities and drainage. This will need to be provided at application stage.
- If discharge to a public sewer be proposed then the following information will be required;
 1. Evidence that alternative more sustainable means have been considered at application stage.
 2. Evidence that Southern Water have agreed, in principle, to such a connection will be required at the application stage.
 3. Evidence that no pumped system is proposed.
 4. Evidence that any discharge off site is limited to the Greenfield QBar runoff rate for the area being drained or;
 5. Evidence that Southern Water had set a suitable discharge rate for the development to utilise.

We understand that the client will use this report to support a planning application for the erection of a 6 storey building

on land to the rear of Central House to comprise of a total of 28 flats with associated landscaping (additional 380m² soft landscaping) and parking.

The existing and proposed layouts are shown on Figures 1a & 1b and the architect's drawings located in Appendix B.

This report is intended to support the planning application and will ensure that the development proposals consider the hydrological setting of the site and surroundings, respond to planning policy and associated planning guidance relating to drainage, including a SuDS appraisal and a drainage assessment.

1.3 Objective

To ensure flood risk and drainage has considered and assessed in line with national, regional and local planning policy and guidance.

1.4 Methodology

This assessment seeks to review all readily available published information including existing drainage information, to prepare a summary of the hydrological setting, existing drainage regime, relevant planning policy, a SuDS appraisal, a summary of the drainage proposals, and a flood risk including a drainage assessment based on the available information.

1.5 Sources of Information

This report is based on a review of the information set out in Table 1.

Table 1: Documents Reviewed as part of this study

Document/Website	Author/Publisher	Date
Flood Maps for Planning, Rivers and Sea Flood Maps, Reservoir Flood Maps, Surface Water Flood Maps https://flood-warning-information.service.gov.uk/long-term-flood-risk & https://flood-map-for-planning.service.gov.uk/39T	Environment Agency	Accessed July 2022
British Geological Society (BGS) Geology of Britain Viewer https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/	BGS	Accessed June 2022
Mid Sussex District Council Strategic Flood Risk Assessment (SFRA)	Mid Sussex District Council	June 2015
West Sussex LLFA Policy for the Management of Surface Water	West Sussex LLFA	November 2018
West Sussex Local Flood Risk Management Strategy	West Sussex CC	May 2014
West Sussex Preliminary Flood Risk Assessment (PFRA)	West Sussex CC	May 2011
Mid Sussex District Plan 2014-2031	Mid Sussex District Council	March 2018
Topographical Survey (See Appendix A)	Marvin & Partners Ltd	November 2018
Drainage Survey	JM Enviro Limited	August 2022
Architect Drawings: - E21-022/SEC001 – Proposed Section - E21-022/ELE001 – Proposed Elevations East & West Elevations - E21-022/PRP001 – Proposed Plans First & Second Floor Plans - E21-022/ELE002 – Proposed Elevations North & South Elevations - E21-022/PRP000 – Proposed Plans Ground Floor & Site Plans - E21-022/PRP003 – Proposed Plans Fifth Floor Plan - E21-022/PRP001 – Proposed Plans Third & Fourth Floor Plans	Osel Architects and Development Consultants	November 2021_received 1 st September 2022

Key parties consulted as part of this report are detailed in Table 2.

Table 2: List of Parties Consulted and Summary of Outcome

Consultee	Form of Consultation	Topics Discussed and Actions Agreed
Southern Water	An asset plan for the proposed development was requested via their enquiries email address.	Southern Water were able to provide an asset plan for the existing sewer infrastructure within the vicinity of the proposed development. This included location of manholes and associated invert levels.
	Southern Water Pre-Planning Enquiry submitted August 2022.	A pre-planning enquiry has been submitted to Southern Water. Response awaited at time of report.
South East Water	Asset plans requested by email in August 2022.	Plans were delivered by email - See Appendix C

2. PLANNING POLICY

The approach taken in the assessment of flood risk at planning stage is set out in national, regional and local planning policy and associated guidance. This Chapter summarises the key policies and guidance relevant to the proposed development.

The National Planning Policy Framework (revised July 2021) includes Government policy on development and flood risk, stating that:

“159. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere....

167. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood- risk assessment⁵⁵. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate*
- d) any residual risk can be safely managed;*
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

168. Applications for some minor development and changes of use⁵⁵ should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 56.

169. Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

- a) take account of advice from the lead local flood authority;*
- b) have appropriate proposed minimum operational standards;*
- c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and*
- d) where possible, provide multifunctional benefits”.*

Footnote 55 of the NPPF states:

“A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use”.

Footnote 56 of the NPPF states:

“This includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate”.

To comply with the NPPF, an FRA must be submitted for planning applications for developments within flood zones 2 and 3 (medium or high risk of fluvial or tidal flooding) and for all developments of 1 hectare or greater located in flood zone 1 (low risk).

An FRA should be appropriate to the scale, nature and location of the development and should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

Supporting guidance relating to development and flood risk is set out in The Planning Practice Guidance.

In addition, national planning policy, local planning policy, Building Regulations and best practice guidance requires that, where feasible, site drainage should utilise Sustainable urban Drainage Systems (SuDS) to collect, treat, convey, and dispose of surface water safely. SuDS are a natural approach to managing drainage in and around properties and other developments. They work by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants.

The NPPF also requires that:

“When determining any planning applications, local planning authorities should ensure flood risk is not increased elsewhere”

An assessment of any hydrological impacts should therefore be assessed including an assessment of impacts on fluvial flood flows, surface water runoff and impacts to the drainage network in order to demonstrate how flood risk to others will be managed following development and taking climate change into account.

The Planning Practice Guidance (PPG) (paragraph 1) requires that the applicant should take full consideration of surface water runoff and drainage impacts as part of a development proposal requiring that:

“developers should seek flood risk management opportunities (e.g. safeguarding land), and to reduce the causes and impacts of flooding (e.g. through the use of sustainable drainage systems in developments”;

Paragraph 83 requires that DEFRA standards 2 for SuDS are met where practicable, and paragraph 84 requires that:

“...developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components allowing for any personnel, vehicle or machinery access required to undertake this work. Any sustainable drainage system should be designed so that the capacity takes account of the likely impacts of climate change and likely changes in impermeable area within the development over its lifetime and continues to provide effective drainage for properties. Whether maintenance and operation requirements are economically proportionate should be considered by reference to the costs that would be incurred by consumers for the use of an effective drainage system connecting directly to a public sewer”.

Mid Sussex District Plan (2014-2031) (adopted in March 2018) sets out planning policies, site allocations and land designations Borough-wide and is the central document in the Borough's Development Plan. It includes policies relating to management of flood risk and drainage (including sustainable drainage/SuDS). In relation to flood risk and drainage (including SuDS), Policy DP41 'Flood Risk and Drainage' states that:

DP41: Flood Risk and Drainage

Strategic Objectives: 1) To promote development that makes the best use of resources and increases the sustainability of communities within Mid Sussex, and its ability to adapt to climate change; and 12) To support sustainable communities which are safe, healthy and inclusive.

Evidence Base: Gatwick Sub Region Water Cycle Study; Strategic Flood Risk Assessment; Water. People. Places SuDS guidance.

Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The District Council's Strategic Flood Risk Assessment (SFRA) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs.

Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates.

Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development²² unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. Arrangements for the long term maintenance and management of SuDS should also be identified.

For the redevelopment of brownfield sites, any surface water draining to the foul sewer must be disconnected and managed through SuDS following the remediation of any previously contaminated land.

SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.

The preferred hierarchy of managing surface water drainage from any development is:

1. Infiltration Measures
2. Attenuation and discharge to watercourses; and if these cannot be met,
3. Discharge to surface water only sewers.

Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies.

Mid Sussex District Council has provided some guidance on Sustainable Drainage Systems via their website (<https://www.midsussex.gov.uk/environment/sustainable-drainage-systems-suds/>). The guidance includes what SuDS are and the aim of their incorporation into proposed developments within the district. Additionally, as mentioned above, all new developments of 10 dwellings or more should incorporate SuDS, unless proved to be inappropriate.

South East England authorities have prepared guidance for sustainable drainage titled 'Water. People. Places' that should be used at the earliest stages of the planning and design process for all types of residential, commercial and industrial development (<https://www.midsussex.gov.uk/media/2909/water-people-places-a-guide-for-master-planning-sustainable-drainage-into-developments.pdf>).

3. HYDROLOGICAL SETTING

The following summarises the hydrological setting based upon a review of the sources of information (Section 1.5) upon which the FRA and drainage strategy will be based:

- **Watercourses:** The nearest watercourse to the site is western branch of the Scrase Stream “main river”, which is located approximately 680m north of the site through Mill Green Business Estate (see Figure 10). The Scrase Stream is a tributary of the Ouse River.
- **Public Sewer network:** The Southern Water sewer records (Figure 3 and Appendix C) for the site surroundings show a 300mm diameter surface water drain running south to north past the site along Perrymount Road.

A 300mm diameter foul sewer also runs south to north past the site along Perrymount Road.

Within the details provided by Southern Water for the existing sewer system, this included their depths. The existing surface water sewer has an invert level of 60.84m AOD (Manhole ID: MH1252). The existing foul sewer has an invert level of 60.67m AOD (Manhole ID: MH1201).

- **Water supply network:** Southern Water have provided detailed mapping to show the water supply network for the area around the proposed development. The mapping shows that a 5-inch distribution main exists under Perrymount Road, adjacent to the site. An extract from the Southern Water mapping is included in Figure 4 of this report.
- **Description of existing site drainage:** The site comprises the access road and the carpark originally constructed for the existing Central House building, with planted verges present on the northern and southern boundaries. Based on a preliminary inspection of the drainage (see Drawing JME.261.SURVEY.001 in Appendix A), the majority of the hardstanding at the rear of the site (drains to two large soakaways located on the lowest part of the site closest to the railway. The existing building (Central House) and the top part of the car park (outside of the blue line shown on Figure 1b) drains via a surface water drainage run to the rear and north of Central House where it connects to the Southern water public surface water sewer network¹. An existing shallow foul drainage system serves the existing Central House building connecting the site to the Foul Water sewer beneath Perrymount Road. Recently installed foul drainage at the rear of the ground floor has to be pumped to the first floor and macerated before discharging to the front of the building due to the shallow nature of the foul drainage at the front of the property.
- **Ground Conditions:** British Geological Society (BGS) mapping (accessed online August 2022) suggests that the site is underlain by Upper Tunbridge Wells Sand formation – a mix of sandstone and siltstone (Figures 12-14). No superficial deposits are present at the site. There are no proximate BGS records located in the vicinity of the site. The SFRA notes that areas with Tunbridge Wells Sand conditions would be appropriate for infiltration techniques, those areas with Clay ground conditions may not be appropriate for the technique. The site is currently served by soakaways which would suggest that the ground conditions are suitable for soakaways.
- **Topography:** Based on the provided topographical survey (Appendix A), the site falls from approximately 62.51m AOD at the front of the proposed new building to rear of the proposed development towards the railway, where a low of 60.32m AOD is shown. Based on 1m resolution LiDAR data, the ground levels fall from 67.16m AOD to 61.02m AOD along Perrymount Road from south to north within the vicinity of the proposed development.
- **Groundwater:** According to the flood map for planning (accessed online at gov.uk, August 2022) flooding is possible in the local area when groundwater levels are high. Additionally, interrogation of the DEFRA Magic Map mapping shows the site to be within a high groundwater vulnerability area.

¹ Note that the drainage information on the topographic plan is not accurate. Two soakaways were identified in the lower part of the car park and were noted to drain only the rear car park (i.e. the site itself) based on observations made during a site visit by JME Enviro Limited. The network serving Central House (including the immediately adjacent hardstanding areas) was confirmed to drain to the public surface water network in Perrymount Road based on site observations – further survey is required to progress the detailed design.

- **Flood zones and mapping:** The site is located within Flood zone 1 (lowest flood risk category²) according to the flood map for planning (see Figure 6).

The reservoir flood maps (accessed online at gov.uk, August 2022) confirm that the site is located within the area that will not be flooded in the event of a breach of reservoirs in the surrounding area (See Figure 8) even following a breach situation during “wet” scenarios (“when there is also flooding from rivers”).

The Surface Water Flood Map (accessed online at gov.uk, August 2022), indicates that the site is at a very low risk of flooding (see Figure 7). No flooding on the site is shown in the low, medium and high risk scenarios. The railway corridor (west) and Perrymount road (east of the site) is shown to be elevated risk. In the low risk scenario, depths are <300mm, associated with a flow path running south to north along the route of the trainline (See Figure 7). According to the flood mapping, surface water flood risks are categorised as follows:

- High risk means that each year this area has a chance of flooding of greater than 3.3%.
- Medium risk means that each year this area has a chance of flooding of between 1% - 3.3%.
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Very low risk means that each year this area has a chance of flooding of less than 0.1%.

Flooding from surface water is however difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

The SFRA does not contain any publicly available mapping to show the risk of groundwater flooding. However, the SFRA does mention several areas within the district which are affected by groundwater flooding, these include; Hassocks, Hurstpierpoint and Sayers Common. Haywards Heath is not specifically mentioned within the areas affected by groundwater flooding. The EA long-term flood risk mapping website does not specify groundwater as being a source of flooding which could affect the site.

The LFRMS 2014 identifies Haywards Heath as a ‘Wet Spot’. These are defined as;

‘Wet spots have been classified as areas where a significant number (generally greater than ten properties and/or businesses) of adjacent properties may be susceptible to flooding. These property counts include flats above ground floor level.’

Each of the identified Wet Spots are broken down to identify the number of properties within each that are susceptible to several flood risk sources. These include; surface water, river and sea, and combined flood risk.

For Haywards Heath the number of properties susceptible to each of the previously mentioned flood sources are as follows;

- Surface Water = 2,200 properties
 - River and Sea = 0 properties
 - Combined Flood Risk = 100 properties
- **Historic flooding:** The following summarises the historic flood records at and in the vicinity of the site:
 - Fluvial flooding - Based on Map 004a in the SFRA (Figure 11), the site has not been flooded in the

² Floodzones are defined in the NPPG as follows:

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

past. There are no SFRA records of historic flooding for the site and its surrounding area in the SFRA (see Figure 10).

- Sewer Flooding: The SFRA does not contain any publicly available mapping to display any historical sewer flooding records. However, it does mention that records were obtained from Southern Water during the creation of the SFRA and that only one particular property was identified to have been affected by sewer flooding in the last 18 years (considering the SFRA was published in 2015).
- Surface Water: No records of surface water flooding in the site vicinity are recorded in the SFRA (Figure 10).
- Groundwater Flooding: There are no records of groundwater flooding records at the site (based on SFRA records (Figure 10)).

4. PROPOSED DRAINAGE STRATEGY

4.1. Overview

This Chapter summarises the planning and policy guidance considerations that have informed the drainage strategy.

As the NPPF states that flood risk should not be increased elsewhere by the development, adequate drainage for the proposed new buildings will need to be provided as part of the redevelopment proposals.

A 45% increase in rainfall intensity should be allowed for in the design of the drainage line with the latest UK government advice on climate change³.

National, regional & local planning policy, Approved Document H of the Building Regulations, and best practice guidance requires that, where feasible, site drainage should utilise Sustainable urban drainage systems (SuDS) to collect, treat, convey, and dispose of surface water safely. SuDS are a natural approach to managing drainage in and around properties and other developments. They work by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants.

In accordance with the SuDS hierarchy and best practice guidance, source control measures such as green roofs should preferably be used in conjunction with infiltration forms of SuDS, such as permeable paving, soakaways, swales and soakage basins being used where viable to manage surface water as close to source as possible. If infiltration is not viable, or if attenuation of surface water is required, then above ground attenuation systems such as detention basins and ponds will ideally need to be used to ensure runoff is attenuated and restricted to greenfield run off rates prior to discharge to a suitable waterbody. Below ground storage, pumped drainage, and below ground attenuation, with an outfall to surface water sewer (or a combined sewer, as a last resort) may be necessary, but will only be considered where infiltration or above ground storage SuDS are not viable. Planning policy requires the inclusion of SuDS to achieve better than greenfield runoff rates where practicable.

All new on-site drainage should ideally be separated until the point of connection to the existing sewer network in order to meet Southern Water requirements and best practice/building regulations.

To inform the detailed design of the drainage, it is recommended a drainage survey be carried out to locate and establish invert levels and condition of existing connections to the public sewer network in order to confirm it is possible to reuse any existing connections, and inform any necessary diversions/remedial/upgrade works.

A proposed foul and surface water drainage strategy which considers the scheme in the context of the hydrological setting, information available on the ground conditions, existing drainage regime and site constraints is summarised below.

4.2 Proposed Surface Water Strategy

The surface water drainage strategy is summarized in this Section and on Sketch P261-1100-C-DR-0100 in Appendix D.

The drainage discharge hierarchy has been considered in consideration of the drainage proposals for the proposed scheme, as follows:

³ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> - last updated 27th May 2022

- **Rainwater as a resource** – Rainwater harvesting for the proposed development should be considered by a specialist at the detailed design stage.
- **Infiltration of surface water to ground** – Infiltration into the ground below the proposed car park area for the development is considered viable as long as a 5m buffer around any proposed building is maintained, and an impermeable liner is included on the side of the soakaway, in order to mitigate any associated undermining risk by allowing infiltration too close to any buildings. At the time of writing no infiltration test results are available, but it is noted that the existing site drains using soakaways.
- **Discharge to surface watercourse** – No surface watercourses are present in the vicinity of the site.
- **Discharge to surface water sewer** – The surrounding area is served by separate foul and surface sewers according to the Southern Water records. The strategy on Sketch P261-1100-C-DR-0100 in Appendix D which shows an existing connection to this sewer. This would be the fallback option if soakage cannot meet the full requirements.
- **Discharge to combined or foul water sewer (last resort)** – Not required

A SuDS appraisal to assess the potential for SuDS inclusion has also been undertaken (Table 3 below). SuDS measures have therefore been implemented where possible within the bounds of the scheme to meet the requirements of the national, regional and local planning policy requirements and best practice guidance

Table 3 – SuDS Appraisal

SuDS Option	Suitability/ Included in the Scheme?	Comments
Rainwater Harvesting	*	Rainwater harvesting for the proposed development should be considered by a specialist at the detailed design stage.
Soakaways and permeable paving (infiltration and treatment)	✓	The proposed drainage strategy as shown on Sketch P261-1100-C-DR-0100. relies on infiltration to dispose of surface water. Conservative infiltration values have been assumed as shown on the drawing. Permeable paving will be incorporated above the parking spaces to collect and provide treatment of the runoff from the trafficked areas prior to disposal to the underlying soakaway. A granular soakaway tank (21x7.1x1m) is shown on the drainage strategy layout, though part of the tank will need to be lined in order to ensure that no infiltration occurs within 5m of any building structure.
Soft landscaping, filter drains, raingardens		Soft landscaping has been maximised within the scheme with the inclusion of an additional 230m ² of planted areas/grassed areas around the new building.
Green Roofs/Brown Roofs/Blue Roofs	*	Sufficient attenuation is provided in the soakaway design and no further attenuation is required. However, the need for a blue/green roof will be considered further at the detailed design stage if infiltration rates and ground conditions require further attenuation.
Attenuation Ponds (above ground storage)	X	Not considered viable due to lack of space.
Below ground storage in cellular systems	✓	Attenuation has been included to provided additional storage prior to infiltration. The need for this will be informed by site investigation at the next stage of design.
Flow control devices	*	No further attenuation is required based on the current design.

Key:

- ✓ Suitable for use and included in the scheme
- * Potentially suitable for use – not included in the client and architect design proposal at present – should be considered further as part of the next stage of design
- X Unlikely to be suitable for use

In summary, the following SuDS features are currently included in the surface water drainage strategy shown on Sketch P261-1100-C-DR-0100 in Appendix D:

- **Permeable paving** – Included in the parking bays to collect and provide treatment of the runoff from the trafficked areas.
- **Soakaway** – A soakaway is included in the scheme to drain all surface water within the affected site area to mimic the existing drainage regime.

- **Soft landscaping** – Soft landscaping has been maximised within the scheme to encourage infiltration. 230m² of additional soft landscaped areas have been included-

Opportunities to incorporate green roofs and rainwater harvesting will be considered by specialists at the next stage of design once structural and building services engineers are appointed.

The need for additional attenuation (blue roofs or additional below ground storage) and flow control devices will be considered as the design progresses, however the current design does not require these features to be included.

The remainder of the site (wider Central House) will remain unchanged and will continue to drain unrestricted to the Southern Water surface water sewer in Perrymount Road as illustrated on the surface water drainage strategy layout site plan in Appendix D.

Microdrainage calculations are included in Appendix D along with the proposed layout sketch.

4.3 Proposed Foul Strategy

The foul water strategy is also shown on Sketch P261-1100-C-DR-0100 in Appendix D.

It is proposed that the foul drainage from the new building will drain to a new foul water pump station with a wet well sized to include 24 hour emergency storage volume for 28 units/81 residents. The new rising main will be pumped to the north of Central House and then to a new manhole before the existing final manhole on the private foul water sewer in front of Central House, where it will drain under gravity to the Southern Water foul sewer in Perrymount Road.

Duty standby pumps with telemetry monitoring and venting to high level will be included in the detailed design of the pumping station. Pumping rate will be agreed as the design progresses, but is likely to be in the order of 5-6 l/s.

A full survey of the existing drainage will be required to inform the detailed design, to confirm it is necessary to pump the foul drainage, agree the best point of connection and establish whether any upgrades to the existing network are required. Any opportunities to make a new connection to the public sewer under gravity, thus avoiding the need to pump the foul water should be sought where this is viable.

The foul strategy as presented in this section has been submitted to Southern Water as part of a pre-development enquiry, though a response is pending at the time of writing. Any changes to flows and/or new points of connection will need to be agreed by consultation with building control and Southern Water at the next stage of design as part of a Section 106 application.

4.4 Maintenance of the Drainage

None of the proposed below ground drainage (foul or surface water) located within the site boundary is likely to be eligible for adoption by Southern Water, and therefore the below ground surface water below ground drainage network will need to be regularly inspected and maintained by a private maintenance contractor (employed by the site management company) or the client depending on whether the freehold is retained or not.

The regular inspection and maintenance of highway drainage, public and private drainage by Mid-Sussex District Council, Southern Water, and a private maintenance contractor respectively, will minimise the residual risks associated with highway drainage, public and private sewers.

Site owners will be responsible for the aboveground drainage serving their property – cleaning gutters and removing leaf litter and ensuring that care that fats are not disposed of via sinks/drains, and non-flushable sanitary products are not disposed of via toilets.

A basic management plan for the drainage will be prepared for the development based on the SuDS manual and once the surveys are complete and the drainage strategy designs are finalised and agreed at the next stage of design. Responsibility for maintenance of the various elements of the drainage will be clearly set out

Based on the current proposals, the following schedule is proposed (Table 4).

Table 4 – Outline maintenance schedule - SUDS

Category	Activity	Indicative frequency	Typical tasks
SUDS	Routine/regular maintenance	Monthly (for normal care of SuDS)	- Litter picking - Inspection of inlets, outlets and control structures.
	Occasional maintenance	Annually (dependent on the design)	- Silt control around components - Vegetation management around components - Suction sweeping of permeable paving - silt removal from catchpits and cellular storage.
	Remedial Actions	As required (tasks to repair problems due to damage or vandalism)	- Inlet/outlet repair - Erosion repairs - Reinstatement of edgings - Reinstatement following pollution - Removal of silt build up.
Pumped Foul drainage	Regular Maintenance	Monthly	- Inspect and identify any areas that are not operating correctly. - Visually check pump sump / chamber, pumps, level controls and control panel. - If required, take remedial action
		Monthly	- Check for build-up of debris, floating waste, grease, etc. within the pump sump / chamber. - If required, take remedial action
		6 monthly or more frequent if required	Pre-planned maintenance visit by specialist pump company
		Annually, or as required	Pump sump / chamber jet cleaned and tanked by specialist company
	Remedial Actions	Call out to specialist pump company	As required
	Monitoring	Annually, or as required	Check all connecting gravity manholes to and from the pump station to ensure that they are free from debris and free flowing.
		Weekly	Check the control panel for any fault alarms

5. FLOOD RISK ASSESSMENT

5.1 Scope of Work

The scope of this FRA was refined to meet the objective set in Section 1.3 of this report and considers the following:

- Suitability of the proposed development;
- Flood risk to the development from all sources;
- Potential for the design, construction and operation of the site to change the risk of flooding to neighbouring properties including a drainage assessment;
- Any necessary mitigation measures to mitigate identified potential flood risks;
- Climate change;

- Residual flood risks.

This approach is consistent with the NPPF, PPG and the requirements of planning policy.

5.2 Site suitability for the Proposed Development

The site is located in flood zone 1 and therefore in accordance with the NPPF and PPG, all development proposals are considered acceptable in terms of flood risk, and the sequential test is thus deemed to be met and the exception test is not required.

5.3 Flood Risk to the Proposed Development

Based on our understanding of the hydrological setting, the following sources of flooding have been identified in relation to the proposed development.

Table 5 – Sources of flooding

Potential Source	Pathway	Potential Linkage to Site	Assessment of risk posed to the proposed development
Fluvial Flooding	Overtopping of the channel and overland flow	No	The site is not shown to be in the floodplain any watercourse. Flooding from this source is therefore not considered to be a significant source of flooding to the proposed development and is not considered further in this report.
Groundwater (shallow)	Potential for Perched/shallow groundwater	No	There is no information to suggest that the site is at risk of groundwater flooding. The risk of flooding due to groundwater flooding is therefore considered to be low and flooding from this source is not considered further within this report. It would be prudent to confirm groundwater levels to inform the drainage design – see recommendation in Table 6.
Artificial water Bodies	Failure of impounding structures and overland flow	No	No significant sources of flooding have been identified and flooding from this source is not considered further within this report.
Sewer flooding from Southern Water assets, highway drainage and private site drainage	Surcharge in site drainage and the public sewer network due to blockage or exceedance of capacity	Yes	Sewer flooding from blockage of internal building drainage as well as the Southern Water network is a residual risk to be managed by the regular inspection and maintenance of the public and private sewer network. The flood risk associated with this source may also increase over time due to the effects of climate change. Appropriate mitigation measures are discussed in Table 6.
Infrastructure failure from water mains and internal water supply system	Failure of the Southern Water supply network and/or internal water supply and distribution system may result in flooding of the internal building as well as the surrounding area	Yes	Flood risk from this source is considered to be a residual risk with the main threat being from internal pipe work during any building works. Flooding from this source poses a residual risk to the proposed development and property below the scheme. Appropriate mitigation measures are discussed in Table 6.
Surface water flooding as a result of extreme rainfall and runoff from overland flow	Flooding of the car parks and surrounding roads due to extreme rainfall	Yes	The EA surface water flood mapping (Figure 7) indicates that Perry Mount Road and the railway cutting is at risk of flooding in the low risk scenarios. Appraisal of the mapping in the context of the topography of the site and surroundings suggest that the flood depths would be (<300mm) and suggest that the site is not at risk of flooding from this source. As flooding from this source may affect access, surface water flooding is considered a residual flood risk. Appropriate mitigation measures are discussed in Table 6.

Appropriate mitigation measures to mitigate the identified sources of flooding are discussed in Table 6.

5.4. Drainage Assessment

This Section assesses the impact of the proposed development and the drainage strategy on the receiving sewer environment.

5.4.1 Change in Surface Water Runoff

The affected area of the site is 100% hardstanding, with the drainage falling to soakaways at the western end/lowest part of the site at present.

As set out in Section 4.2, the proposed strategy will mimic the existing drainage regime replacing the existing soakaways with a new soakaway located between the existing and proposed building. The existing drainage serving Central House including the will remain unchanged.

Overall there will be no change in the surface water flows leaving the site.

5.4.2 Change in Foul flows

The proposed development will increase foul flows to the local sewer network compared to existing as the existing site is a car park (28 units/81 residents).

The rate of pumping is to be determined and agreed as the design progresses but is likely to be in the order of 5-6l/s, with a design flow of 1.2l/s (0.6l/s, pumped) based on sewers for adoption, subject to agreement with building control and Southern Water.

5.4.3 Changes in Sewer Flows – Impact on sewer network

There will be no change in flows in the surface water sewer based on the drainage proposals set out in this report.

Foul flows from the site overall will increase due to the addition of the new building, and therefore foul flows in the public sewer will increase.

As the foul sewer system outflow is to be controlled by a new pump station located to the north of the proposed permeable paving system the pump rate will be managed so that there is minimal impact to the receiving Southern Water foul sewer. The pumping rate is to be agreed with Southern Water and a pre-planning enquiry is pending a response at the time of writing.

Further opportunities to reduce the impact of the site on the public sewer network are discussed in in Table 6.

5.4.4 Changes in exceedance flows/Overland Flow Route

Due to the fall of the site, the car park will fall to the south towards the building entrance which will need to be carefully designed the next stage of design as part of a levels study.

A slight reduction in exceedance flows is envisaged due to the introduction of additional soft landscaping. No significant changes occur to the flow routes will occur following development based on the existing and proposed levels and the type of surfacing (see Figure 15), on the basis that the mitigation measures set out in Table 6 are included.

5.5 Mitigation Measures

Table 6 sets out appropriate mitigation measures to minimise the identified flood risks.

Table 6 Mitigation Measures

Type of Flooding	Issue	Mitigation Measures	Justification	Residual Risk * ⁴
Flooding from sewers –sewer blockage/pup failure/surchar ging of public sewer network following intense rainfall including surface water flooding	Blockages, surcharges or failure in the site drainage or the public sewer network in the site vicinity may result in backing up of the site drainage/drainage serving the site which may result in property flooding of the property including external areas and site surroundings. Flooding due to excessive rainfall that cannot drain through existing drainage systems or infiltrate into the ground resulting in ponding on the site and overland flow Some flooding may occur in Perry Mount road during extreme rainfall according to the SW flood maps. Foul flows from the site will increase Flooding from this source is considered to pose residual risk to the proposed development.	• A drainage survey should be undertaken to confirm the existing drainage size, routes, flow types and condition of the sewers in order to confirm the existing connection(s) are suitable for reuse, inform the need for any required upgrades, extension or refurbishment to the existing outfalls to the public sewer network; • Opportunities should be sought to connect to the foul sewer under gravity, though provision has been made for a pumped connection based on the current information. • The design of the drainage should be progressed to ensure that the proposed drainage systems, connections to the public sewer (including any essential upgrades and/or remedial works) are undertaken and agreed with Building Control and Southern Water as necessary and agreed with the LLFA and southern Water. This should include the permeable paving system and a soakage solution for surface water. • Site residents should be made aware of the flood risk to Perry Mount Road and should be advised that no depth of floodwater is safe to pass through. • Opportunities for the inclusion of rainwater harvesting and green roofs should be considered at the next stage of design once the appropriate specialists are instructed. • An appropriate site investigation including soakage tests and groundwater monitoring should be undertaken prior to commencement of development so that the drainage strategy set out in this report can be validated. • The detailed design should ensure that the above ground building drainage serving the site is appropriately sized and agreed with Building Control; • Water saving fixtures and fittings to be included to minimise water consumption and foul flows. • Consultation should take place with Southern Water to confirm that the local sewer capacity can accommodate any changes to the sewer connection points and any changes in flows; • Ground floor FFL and thresholds to the entrances should ideally be raised where practicable to ensure that the ground floor entrance threshold is at least 300mm above the surrounding area. Threshold drainage will need to be installed as a precaution and to manage residual risks. • Exceedance flows should be directed onto the soft landscaped areas, away from property entrances, around the building. • The detailed design of the external levels will need to consider surface water flow/exceedance pathways; • Low flow water use fixtures and fittings to be included to minimise water consumption and foul flows; • An appropriate management plan for the drainage should be prepared for the development once the drainage strategy is finalised;	These measures will ensure flood risk from these sources is minimised.	Low

⁴ Following adoption of the proposed mitigation measures

Type of Flooding	Issue	Mitigation Measures	Justification	Residual Risk * 4
		- If sewer flows from the site are not currently separate, then separate connection will be sought from Southern Water to serve the new development, subject to survey and detailed design. - Prior to occupation, the owners of the property will appoint a private management company and will ensure appropriate routine inspection and maintenance of the site drainage in line with the management plan; - The site owner should ensure that public sewers including adjacent highway drainage, and public water supply are maintained by Mid-Sussex District Council Highways Department and Southern Water respectively for the life of the development. Any future ponding, flooding and backing up observed in the adjoining public highway should be investigated and reported to the appropriate authority if the cause is not the on-site drainage. - Duty standby pumps should be installed in the foul pumping station along with telemetry which should be monitored by site management or an appointed agent to be detailed in the drainage maintenance plan.		
Flooding from Water mains	Flooding of the water supply and distribution system may result in flooding of the internal building.	Care to be taken during construction not to damage the mains during construction and any future maintenance. Routine inspection of the site and public water supply and distribution system by the site owner and Southern Water.	Will ensure the risk of flooding is minimised.	Low

5.6 Residual Risk

A number of residual risks have been identified, associated with flooding from blockage, pump failure and/or surcharge of public sewers and/or site drainage, burst water supply pipes, and intense rainfall.

These risks are typical of a site like this in an urban area.

Should flooding occur in the surrounding streets, residents are warned not to walk through any depth of flood waters, and to report any flooding from water mains & sewers to Southern Water, and any flooding of the highway drain to the local authority flood risk team and/or highways department.

Mitigation measures have been provided in Table 6 to address and manage the residual risk from these forms of flooding. In summary, as long as the highway drainage, public sewer networks, site drainage/water supply infrastructure are regularly inspected by maintained by the Mid-Sussex District Council, Southern Water and site management company respectively then the residual risk will be minimised.

5.7 Climate Change

Climate change has important implications for the assessment of flood risk. The NPPF requires that the effect of climate change is considered when assessing flood risk posed to development.

Climate change has the potential to affect all sources of flooding. The likely impacts of climate change relevant to the scheme could include increased severity and frequency of storms, winters leading to higher groundwater levels, increased rainfall intensity and an increase in the frequency of sewer flooding incidents. Flood frequency and severity (duration of flooding and depths) are likely to increase over time.

A 45% increase in rainfall intensity has been allowed for in the drainage design in order to account for climate change.

6. CONCLUSION & RECOMENDATIONS

A flood risk assessment (including drainage assessment) has been undertaken for the proposed development.

Based on our understanding of the site setting and the development proposals, it is considered that the risk of flooding from all sources is generally low, and the development can be operated safely and without significantly increasing flood risk elsewhere.

A number of residual risks have been identified, associated with flooding from blockage, pump failure and/or surcharge of public sewers and site drainage, burst water supply pipes and groundwater and intense rainfall.

These are considered 'typical' of a site in an urban area and such as this, and basic specific mitigation measures have been provided in Table 6 to address and manage the residual risk from these forms of flooding.

In relation to surface water management, it is noted that the site is located in a locally designated 'Wet Spot' and SuDS measures have been considered and included to meet the requirements of the national, regional and local planning policy requirements and best practice guidance. The surface water from the trafficked areas will drain via permeable paving and along with the footpaths and the roof runoff will drain via a new soakaway (see Table 3 and Sketch PXXX-1100-C-DR-0100 in Appendix D).

These measures will ensure that there is a no increase in surface water runoff from the site following development.

The foul sewer system outflow is to be controlled by a new pump station located to the north of the proposed permeable paving system. The pump rate will be managed so that there is minimal impact to the receiving Southern Water foul sewer subject to agreement with Southern Water.

The following recommendations are made in relation to the detailed design and operation of the site drainage:

- A drainage survey should be undertaken to confirm the existing drainage size, routes, flow types and condition of the sewers in order to confirm the existing connection(s) are suitable for reuse, inform the need for any required upgrades, extension or refurbishment to the existing outfalls to the public sewer network;
- Opportunities should be sought to connect to the foul sewer under gravity, though provision has been made for a pumped connection based on the current information.
- The design of the drainage should be progressed to ensure that the proposed drainage systems, connections to the public sewer (including any essential upgrades and/or remedial works) are undertaken and agreed with Building Control and Southern Water as necessary and agreed with the LLFA and Southern Water. This should include the permeable paving system and a soakage solution for surface water.
- Site residents should be made aware of the flood risk to Perrymount Road and should be advised that no depth of floodwater is safe to pass through.
- Opportunities for the inclusion of rainwater harvesting and green roofs should be considered at the next stage of design once the appropriate specialists are instructed.
- An appropriate site investigation including soakage tests and groundwater monitoring should be undertaken prior to commencement of development so that the drainage strategy set out in this report can be validated.
- The detailed design should ensure that the above ground building drainage serving the site is appropriately sized and agreed with Building Control;
- Consultation should take place with Southern Water to confirm that the local sewer capacity can accommodate any changes to the sewer connection points and any changes in flows;
- Ground floor FFL and thresholds to the entrances should ideally be raised where practicable to ensure that the ground floor entrance threshold is at least 300mm above the surrounding area. Threshold drainage will need to be installed as a precaution and to manage residual risks.
- Exceedance flows should be directed onto the soft landscaped areas, away from property entrances, around the building;
- The detailed design of the external levels will need to consider surface water flow/exceedance pathways;
- Low flow water use fixtures and fittings to be included to minimise water consumption and foul flows;
- An appropriate management plan for the drainage should be prepared for the development once the drainage strategy is finalised;
- If sewer flows from the site are not currently separate, then separate connection will be sought from Southern

Water to serve the new development, subject to survey and detailed design.

- Prior to occupation, the owners of the property will appoint a private management company and will ensure appropriate routine inspection and maintenance of the site drainage in line with the management plan;
- The site owner should ensure that public sewers including adjacent highway drainage, and public water supply are maintained by Mid-Sussex District Council Highways Department and Southern Water respectively for the life of the development. Any future ponding, flooding and backing up observed in the adjoining public highway should be investigated and reported to the appropriate authority if the cause is not the on-site drainage.
- Water saving fixtures and fittings to be included to minimise water consumption and foul flows.
- Duty standby pumps should be installed in the foul pumping station along with telemetry which should be monitored by site management or an appointed agent to be detailed in the drainage maintenance plan.

In summary, we consider that the hydrological setting does not significantly constrain the development proposals and consider that the development will have a neutral impact on flood risk to neighbouring properties (as a result of the inclusion of SuDS), as long as the recommendations made in this report in relation to drainage are implemented. There will however be a slight increase in the foul flows leaving the site, which will need to be agreed with Southern Water.

Authored: OM/JM

Approved: Julian Moore (BSc, MSc, D.I.C) Director of JM Enviro Limited

FIGURES

Figure 1 – Existing and proposed layouts

Figure 2 – Site photos

Figure 3 – Southern Water Asset Records – Sewer Map

Figure 4 – South East Water Asset Records – Potable Water Supply Map

Figure 5 – EA flood defence Asset register

Figure 6 – Fluvial/tidal flood map for planning (Source gov.uk)

Figure 7 – Surface water flood risk maps (Source: gov.uk)

Figure 8 – Extent of flooding from reservoirs (Source: gov.uk)

Figure 9 – Surface Water Wet Spots (Source: LFRMS, 2014)

Figure 10 – Historical Flood Records (Source: PFRA 2011)

Figure 11 – Flood Zone Extents (Source: SFRA, 2015)

Figure 12 – Bedrock Geology (Source: PFRA, 2011)

Figure 13 – Superficial Geology (Source: Geology of Britain viewer)

Figure 14 – Bedrock Geology (Source: Geology of Britain viewer)

Figure 15 – Changes to exceedance flows

APPENDICES

Appendix A – Topographical Survey (including drainage information)⁵

Appendix B – Architect Drawings – Existing and Proposed Site Layouts

Appendix C – Southern Water and South East Water records

Appendix D – Proposed Drainage Strategy

⁵ Note that the drainage information on the topographic plan is not accurate. Two soakaways were identified in the lower part of the car park and were noted to drain only the rear car park (i.e. the site itself) based on observations made during a site visit by JME Enviro Limited). The network serving Central House (including the immediately adjacent hardstanding areas) was confirmed to drain to the public surface water network in Perrymount Road based on site observations – further survey is required to progress the detailed design.

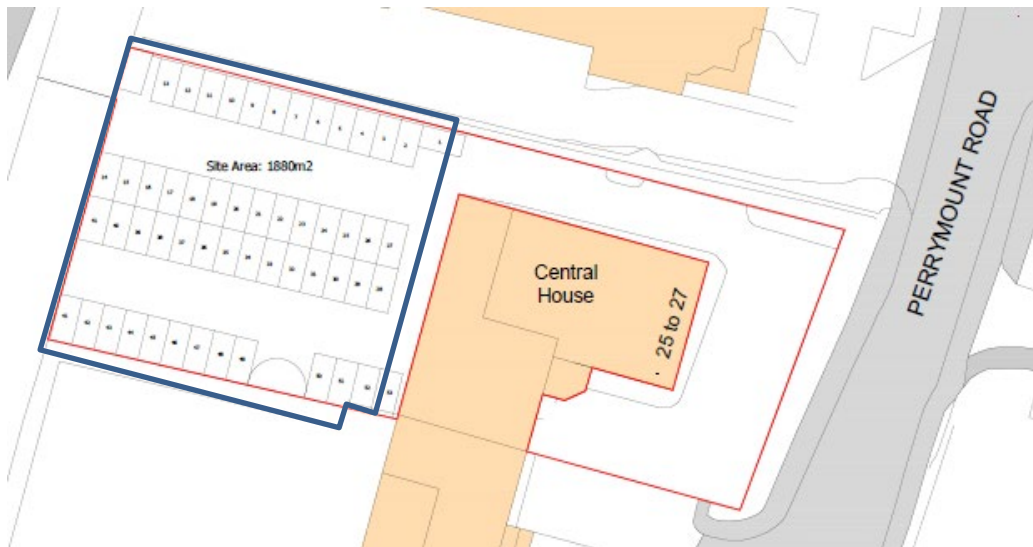


Figure 1a. Site location and existing layout
Planning application boundary in red. Site considered in drainage calcs in blue
(Source: OS Mapping)

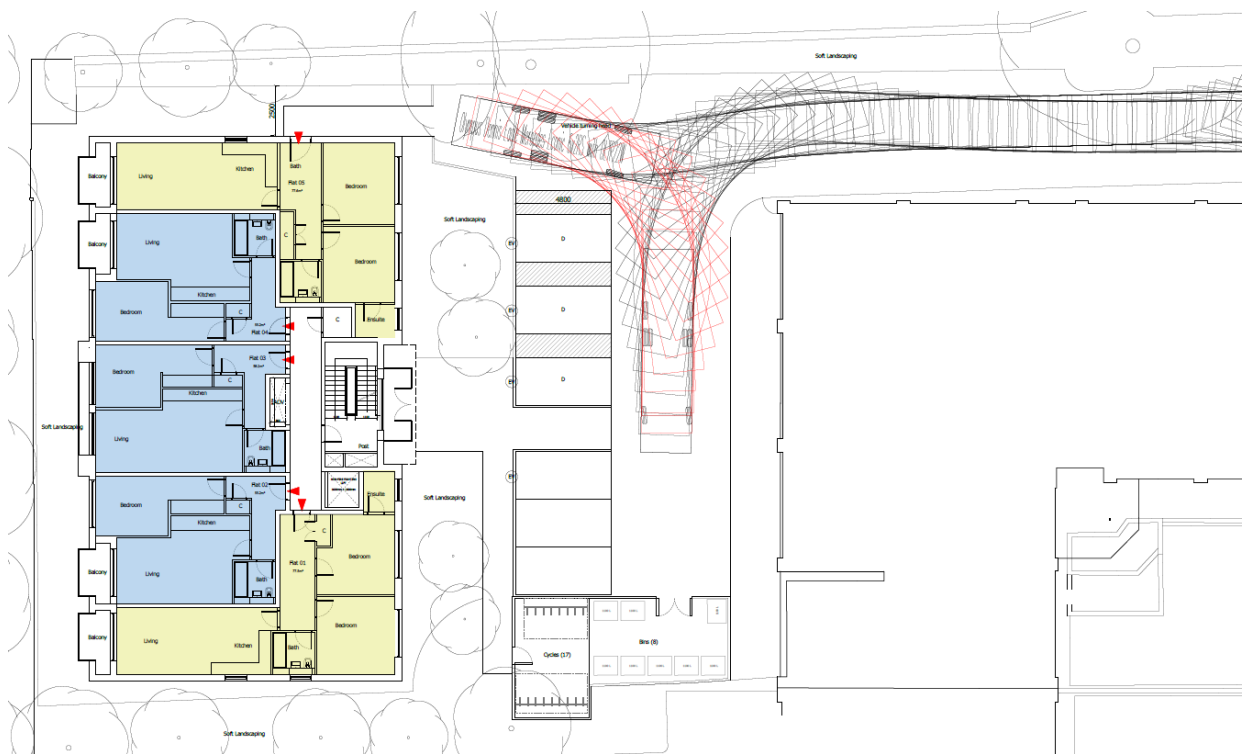


Figure 1b. Proposed site layout (Source: Osel Architects and Development Consultants)



1. Front view of the site (Central House) – From Google maps (August 2021)



2. View of lower part of car park looking at the soakaway on the south west corner of the site (June 2022)

Figure 2. Images of the Site



3. View of the car park (June 2022)



4. Looking into one of the soakaways that serves the site (June 2022)

Figure 2 (continued). Images of the site



5. Looking east towards central house from the lowest part of the site (June 2022)

Figure 2 (continued). Images of the site

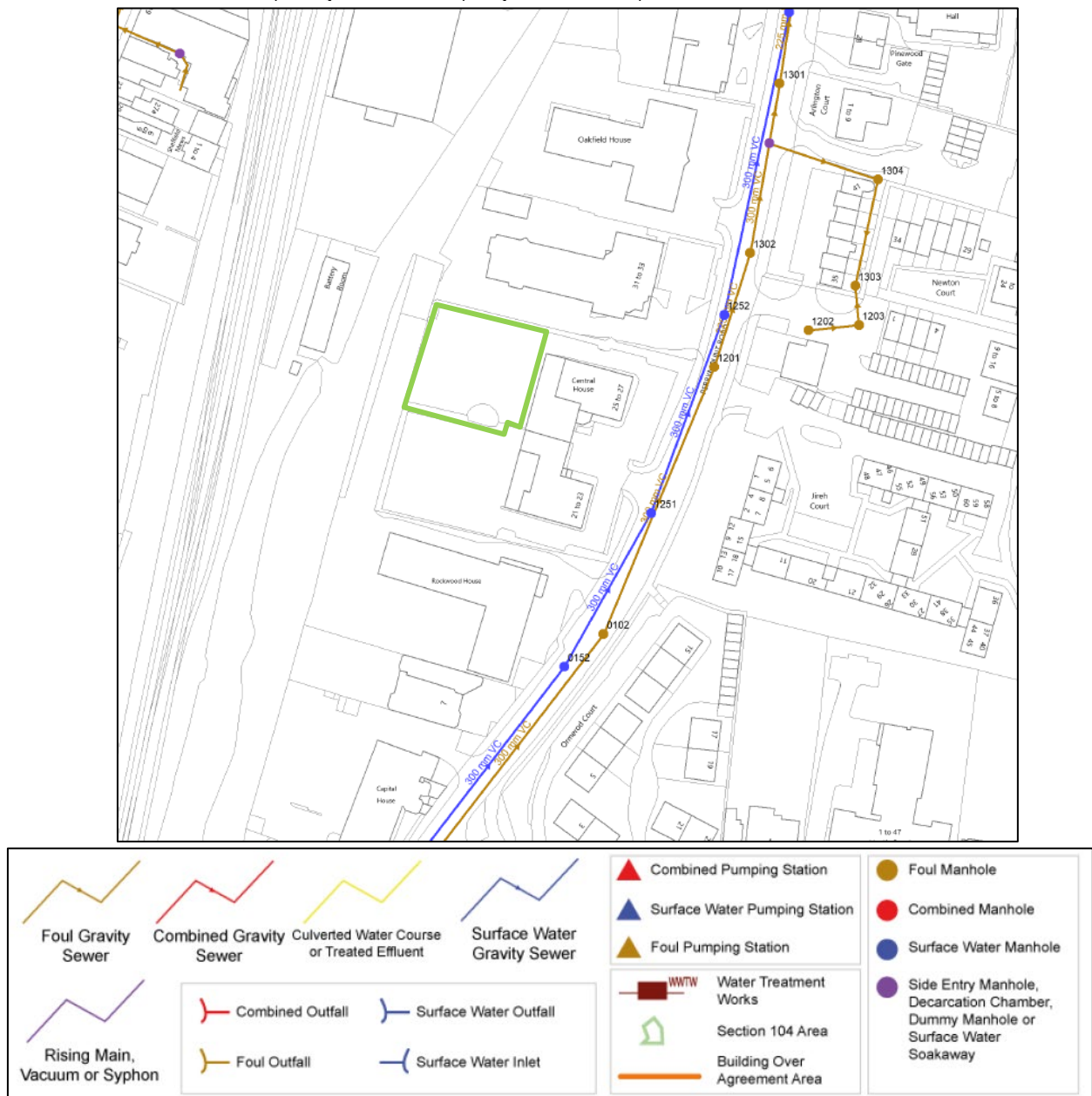


Figure 3. Southern Water Asset Records – Sewers (site in green)



Drawing Title: Land rear of Central House, Perrymount Road Haywards Heath RH16 3SP				Reference:	
South East Water Mains and Fittings Valve Washout Fire Hydrant Meter Pressure Valve Air Valve Distribution Main Abandoned Main Company Boundary				Plot Date:	17/08/2022
				Grid Reference:	533,141.8980 124,212.2629
				Scale:	1:1,250
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				south east water (Water Maps) PO Box 105 Snodland, Kent ME6 8DW Telephone: 0333 000 0058 Email: water.maps@southeastwater.co.uk Website: www.southeastwater.co.uk	

Figure 4. South East Water's water mains site in green)

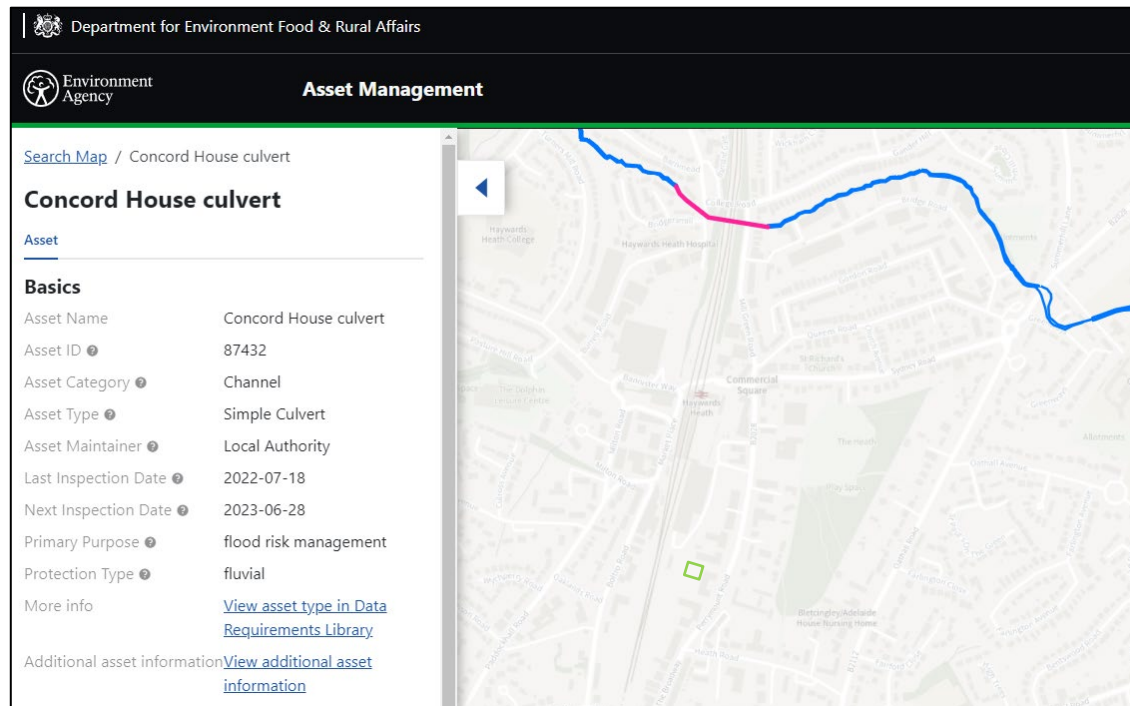


Figure 5. EA flood defence Asset register – Accessed online August 2022– site in green

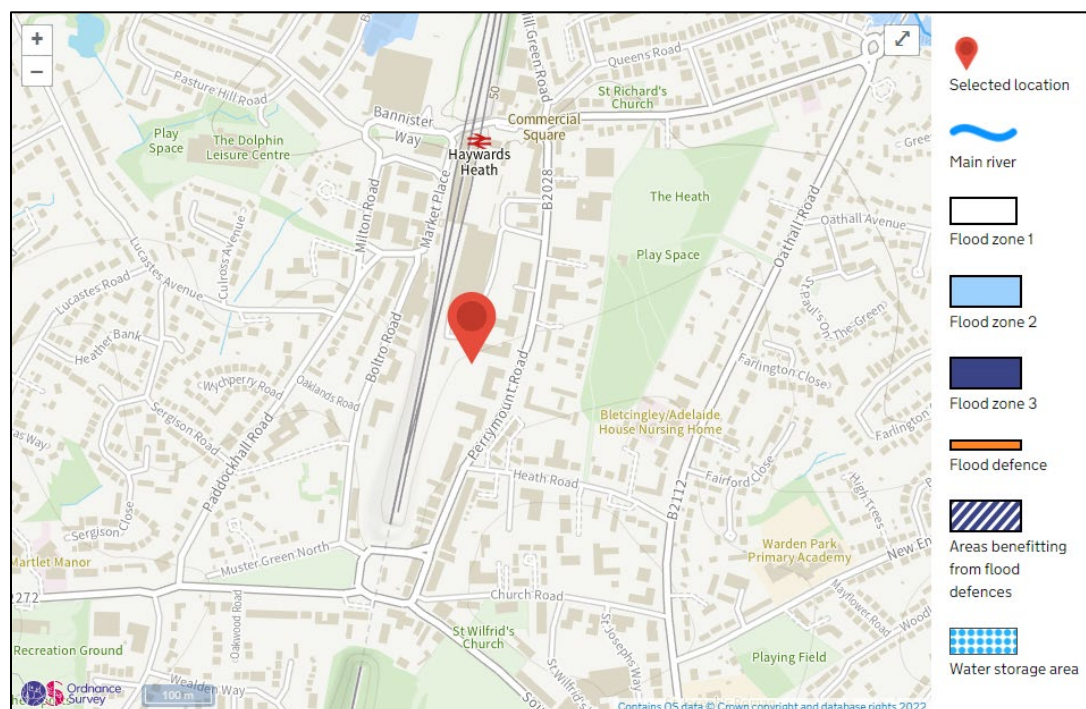


Figure 6. Fluvial/tidal flood map for planning.
 Source: gov.uk website, Flood map for planning

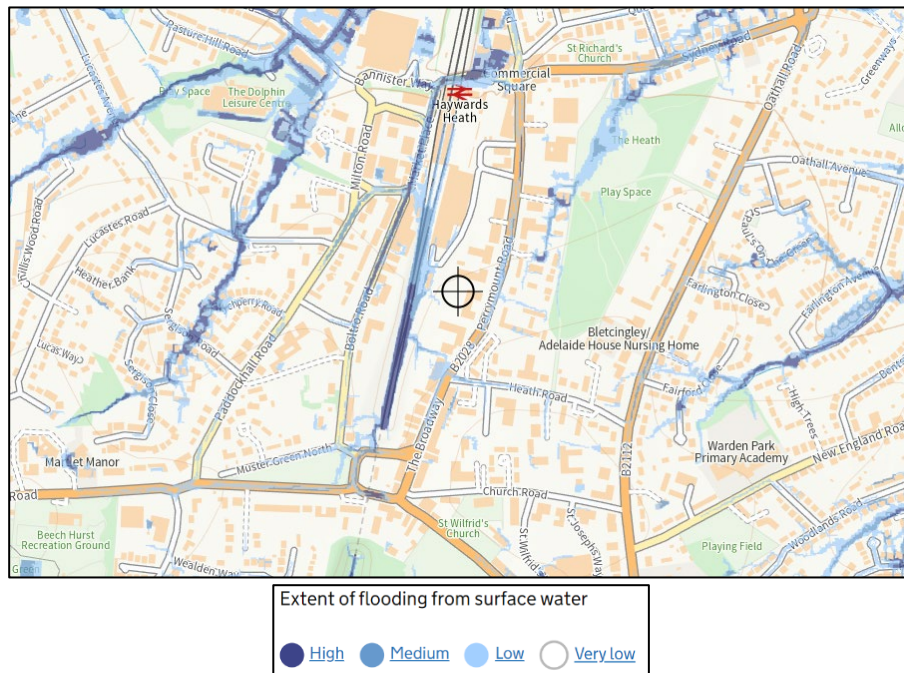


Figure 7a. Extent of flooding from surface water of the area (site marked by crosshair). Source: gov.uk website, Long term flood risk mapping

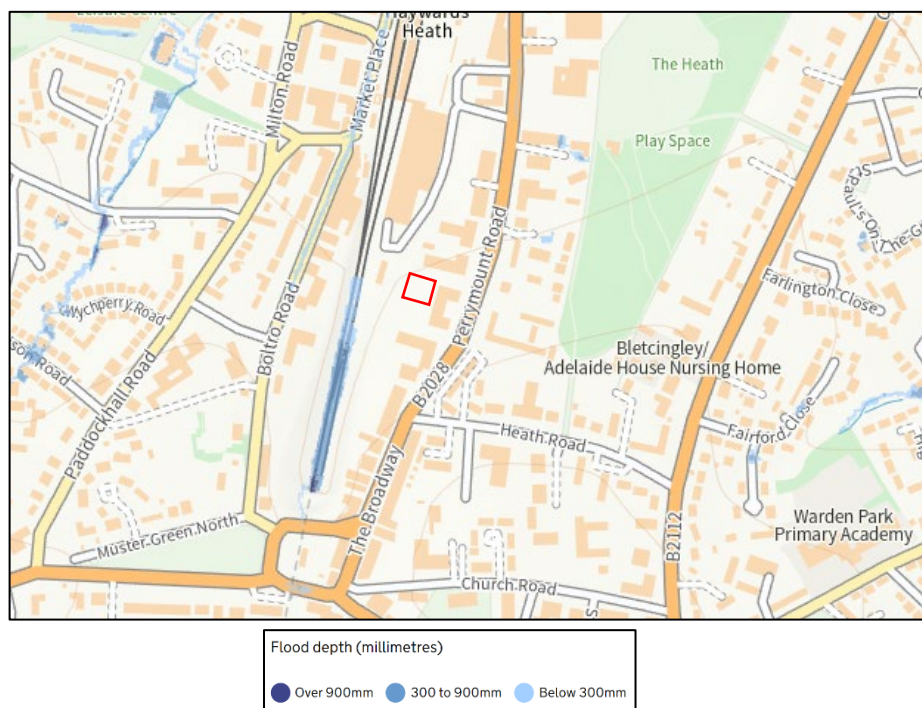


Figure 7b. High flood risk from surface water – depth (site in red). Source: gov.uk website, Long term flood risk mapping

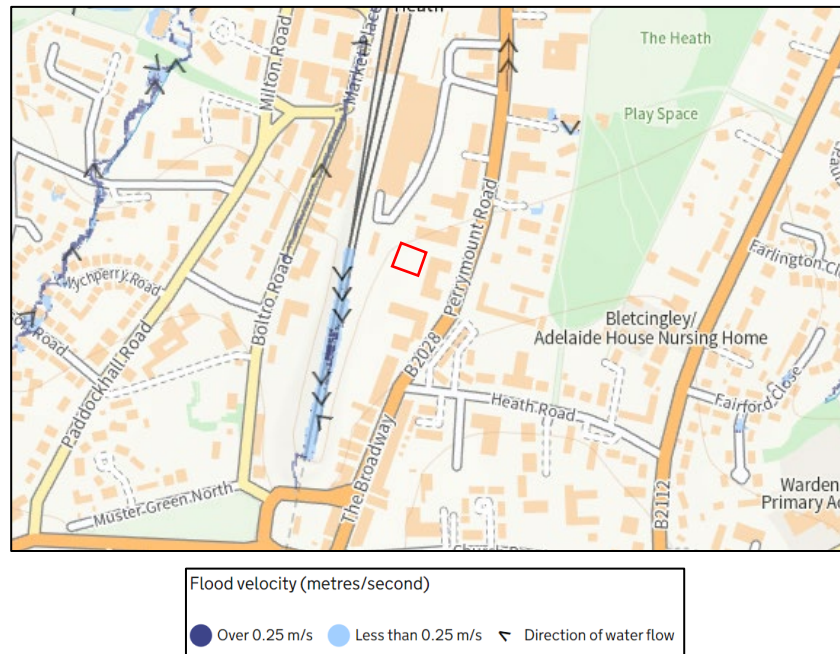


Figure 7c. High flood risk from surface water – Velocity (site in red).
Source: gov.uk website, Long term flood risk mapping

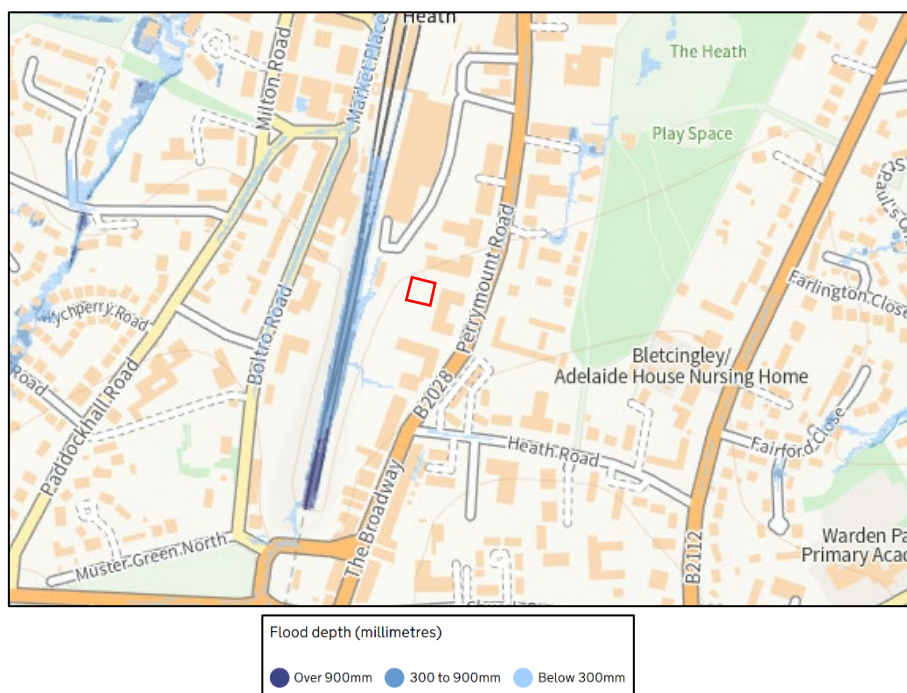


Figure 7d. Medium flood risk from surface water – Depth (site in red).
Source: gov.uk website, Long term flood risk mapping

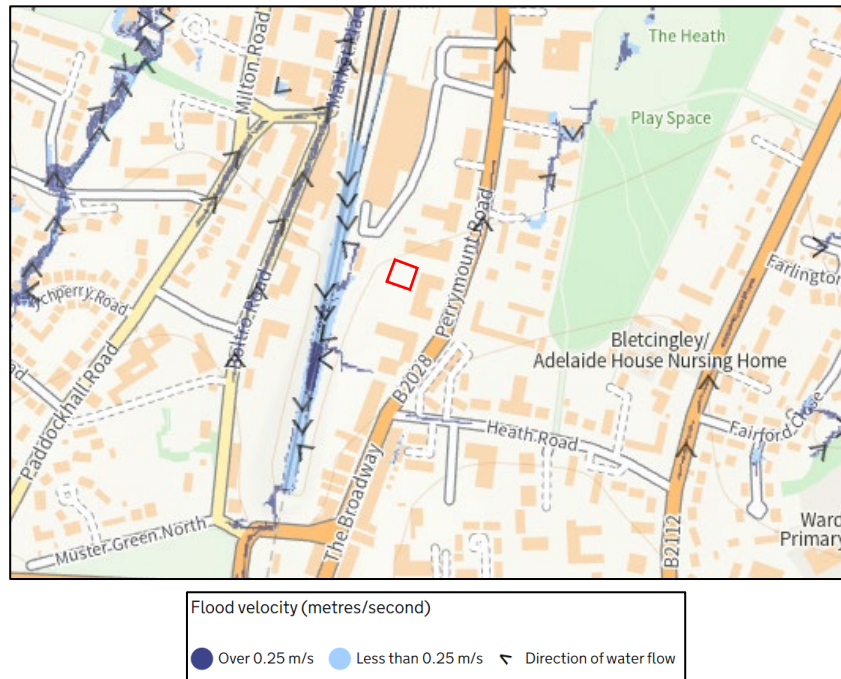


Figure 7e. Medium flood risk from surface water – Velocity (site in red).
 Source: gov.uk website, Long term flood risk mapping

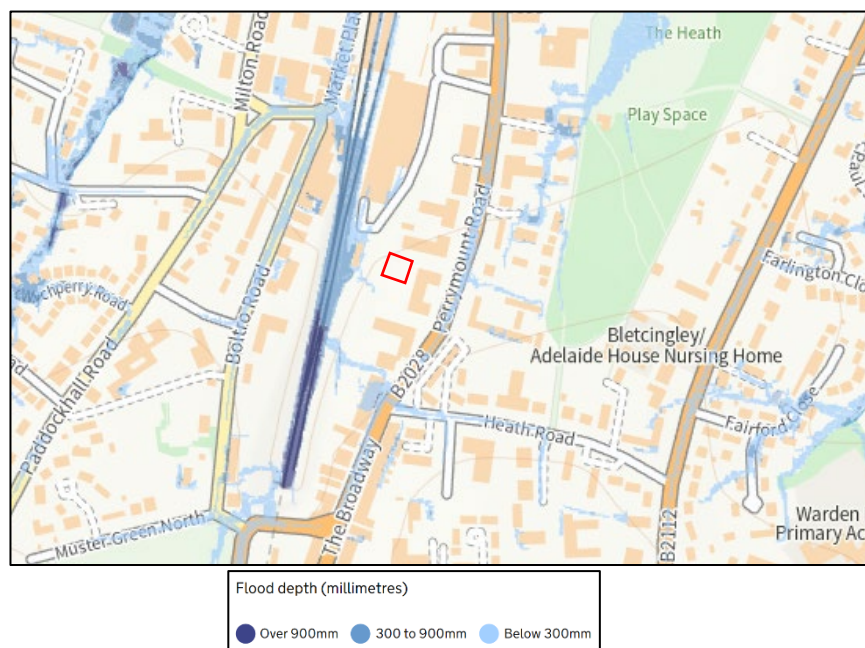


Figure 7f. Low flood risk from surface water – Depth (site in red).
 Source: gov.uk website, Long term flood risk mapping

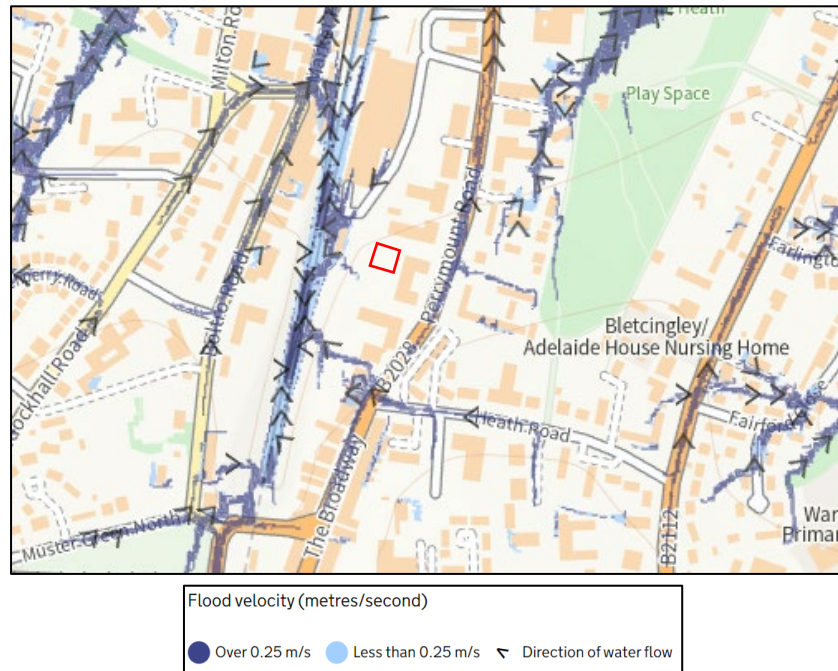


Figure 7g. Low flood risk from surface water – Velocity (site in red).
 Source: gov.uk website, Long term flood risk mapping

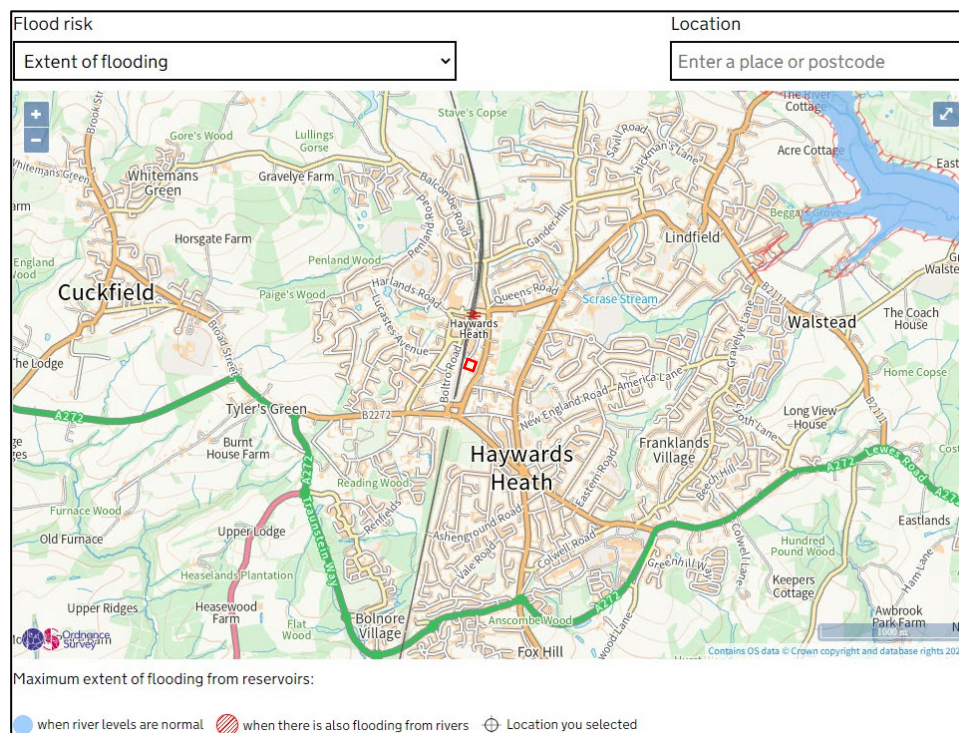


Figure 8. Extent of flooding from reservoirs (site in red).
 Source: gov.uk website, Long term flood risk mapping

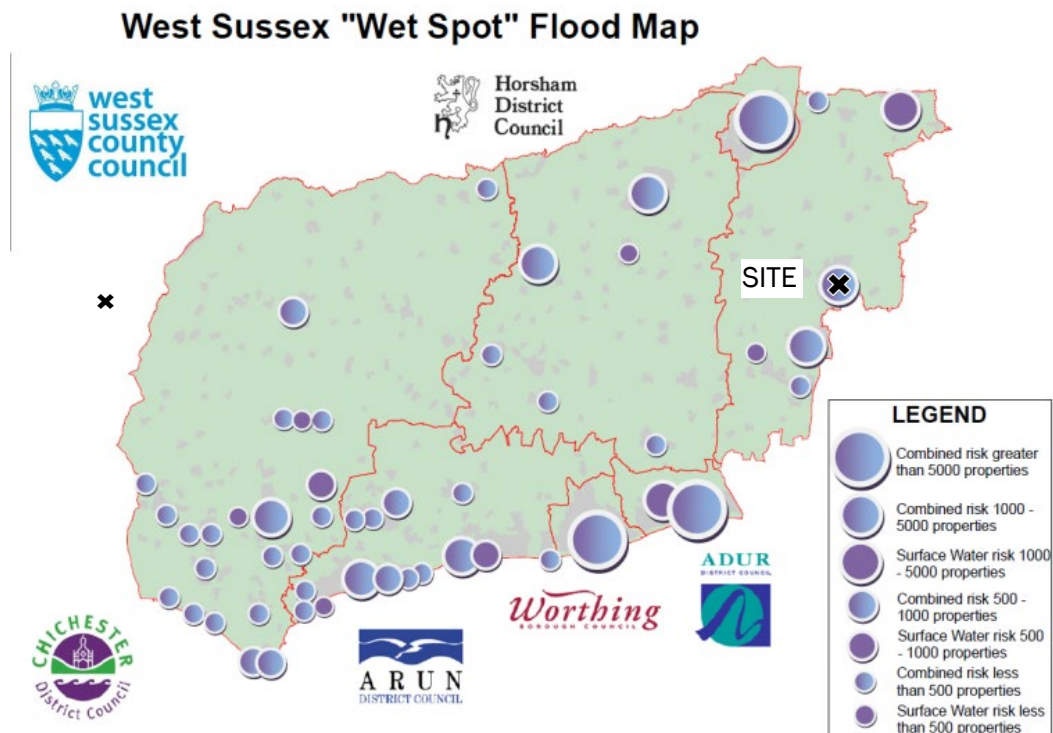


Figure 9. Surface Water Wet Spots (Source: LFRMS, 2014)

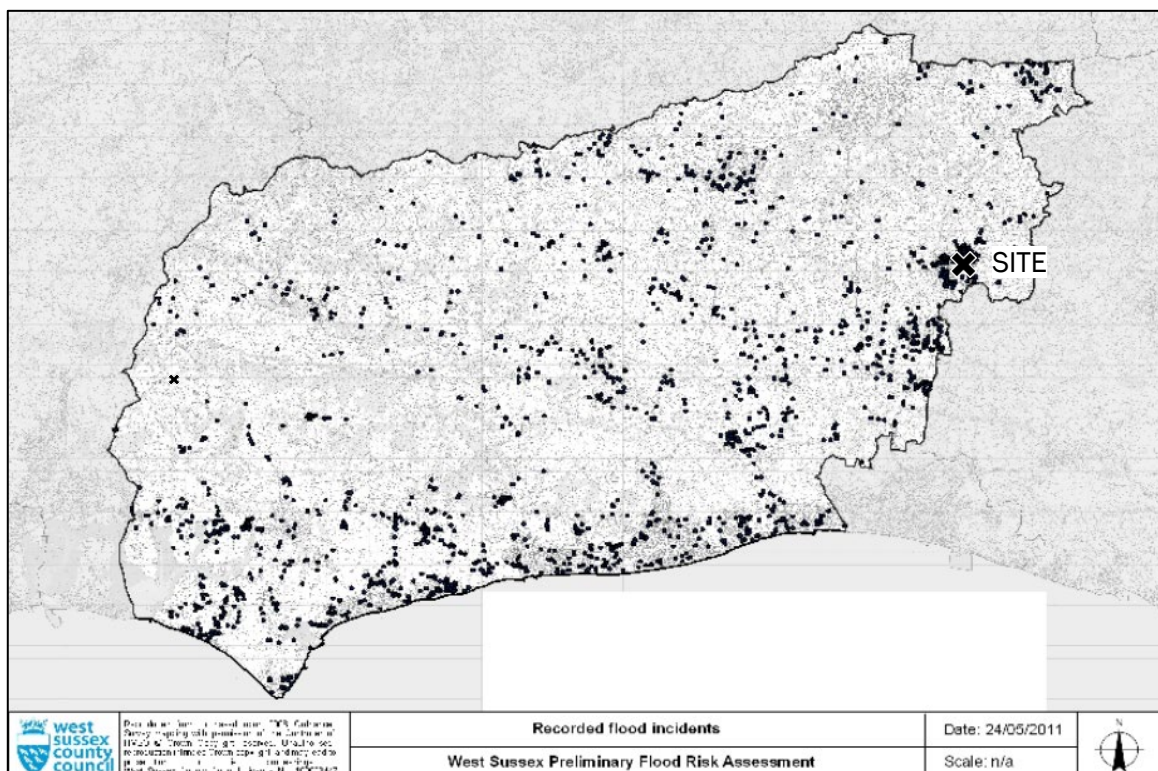


Figure 10. Historical Flood Records (Source: PFRA 2011)

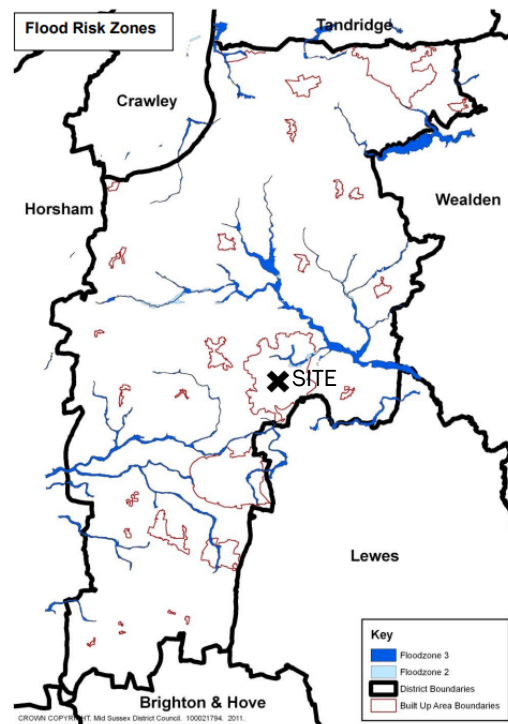


Figure 11. Flood Zone Extents (Source: SFRA, 2015)

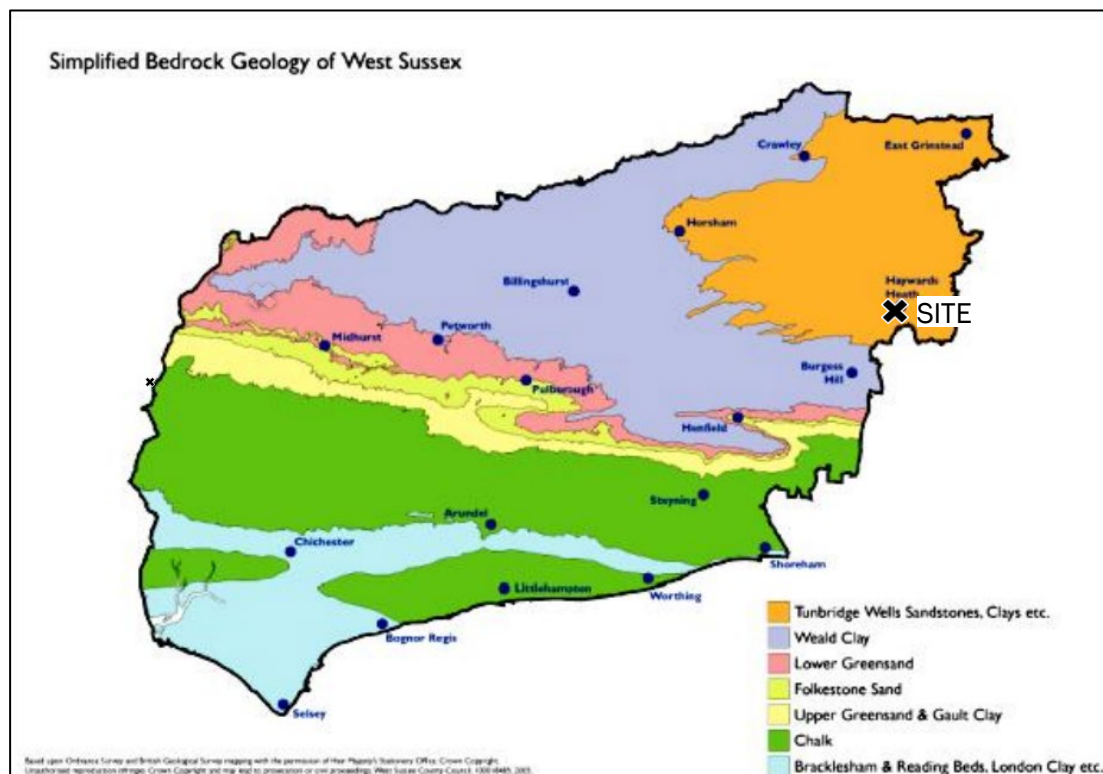


Figure 12. Bedrock Geology (Source: PFRA, 2011)

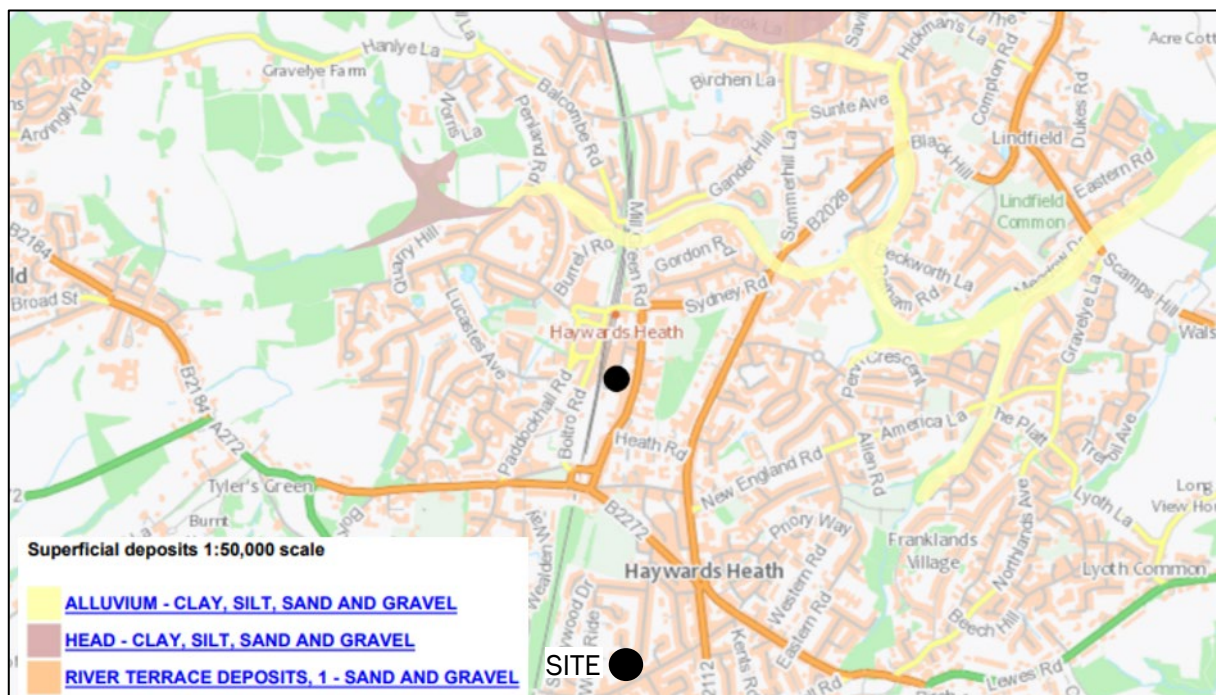


Figure 13. Superficial Geology (Source: Geology of Britain viewer)

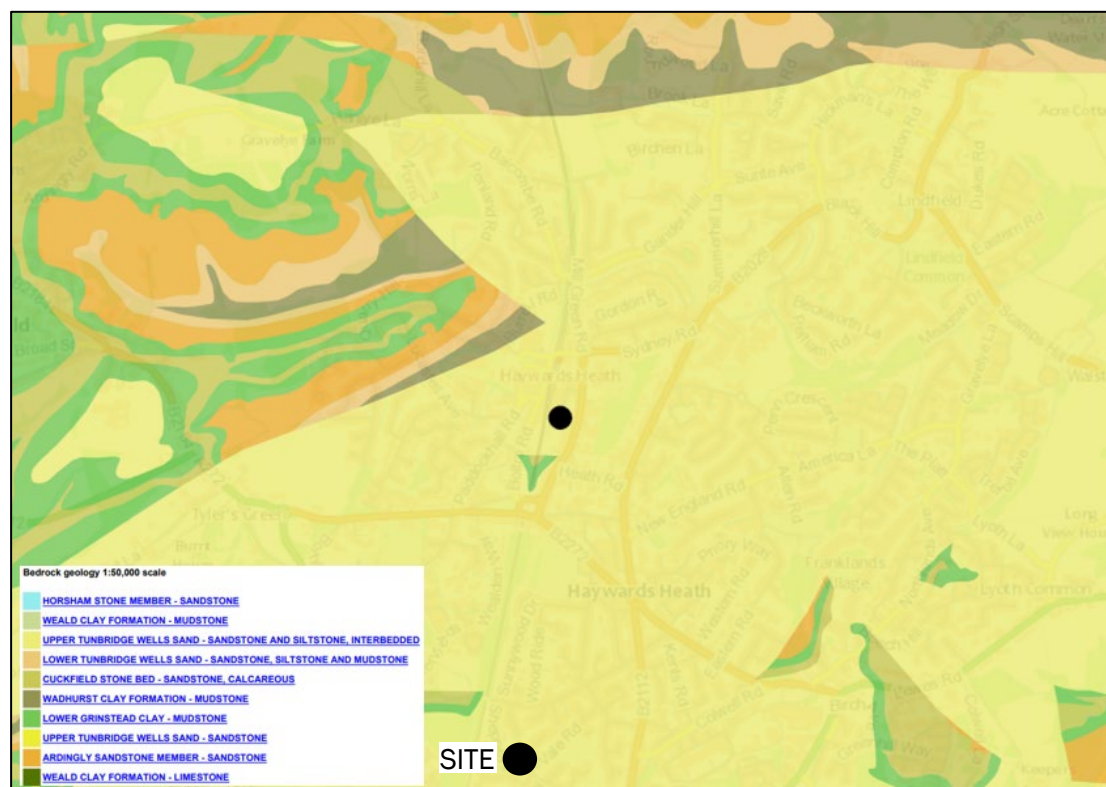
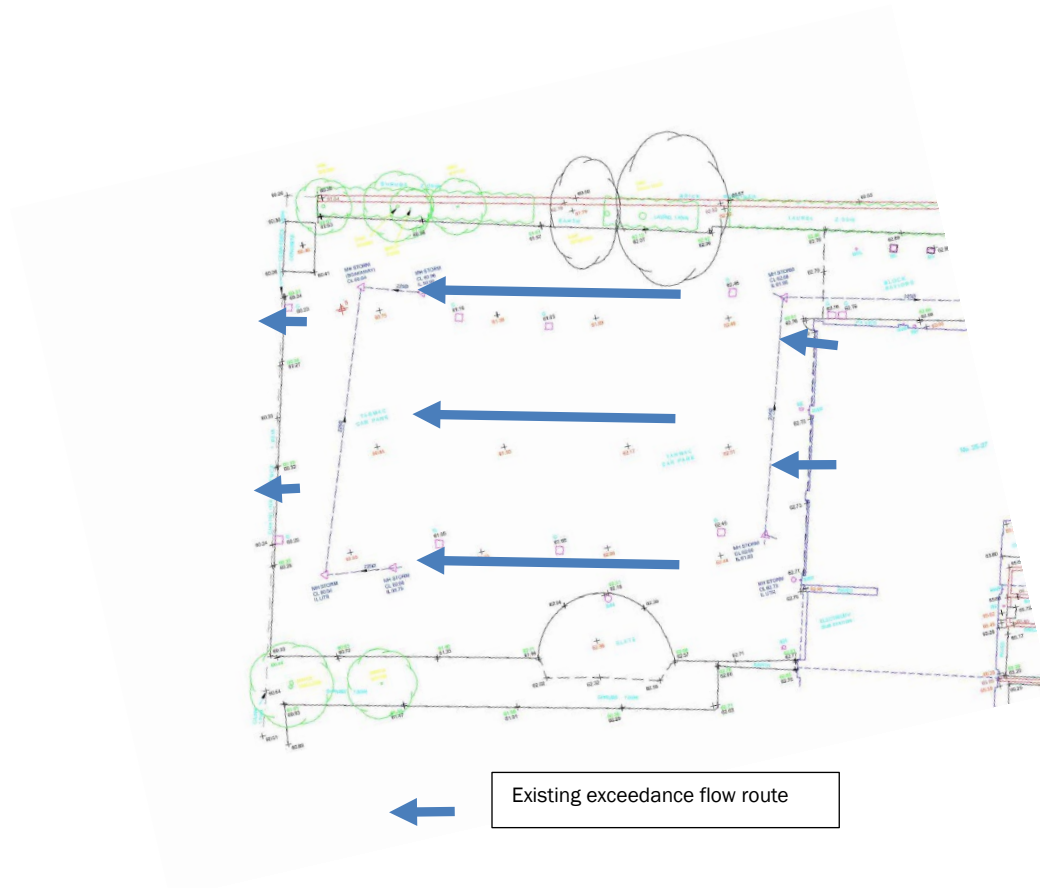


Figure 14. Bedrock Geology (Source: Geology of Britain viewer)

Existing site layout:



Detailed design of the external levels will need to consider ground levels carefully in this area. FFL of the ground floor/building entrance will need to be raised and threshold drainage included to ensure flow paths occur as shown on this drawing – see recommendations in Table 6.

Following development:

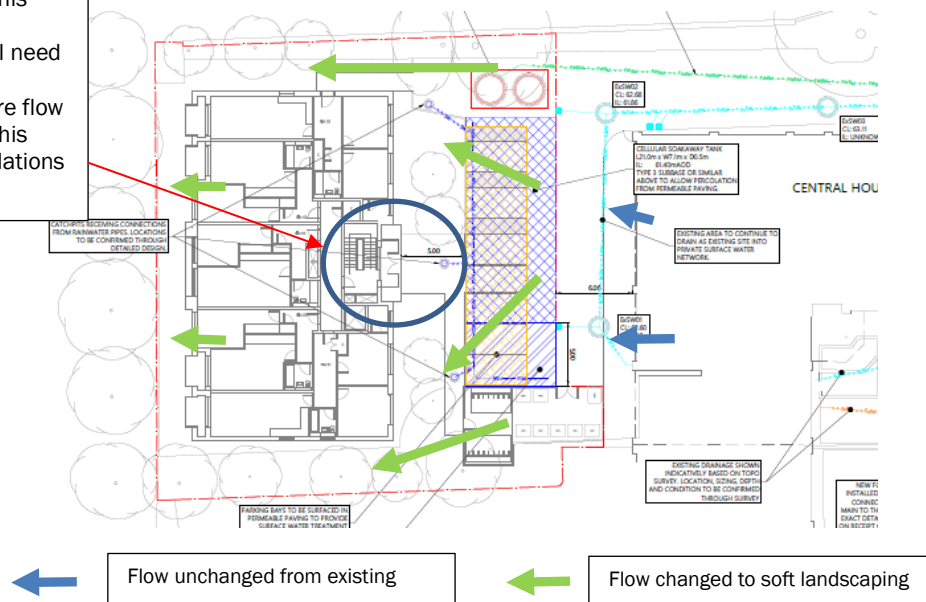


Figure 15. Changes to exceedance flows



Figure 1a. Site location and existing layout
Site affected by development in red – client ownership in blue
(Source: OS Mapping)

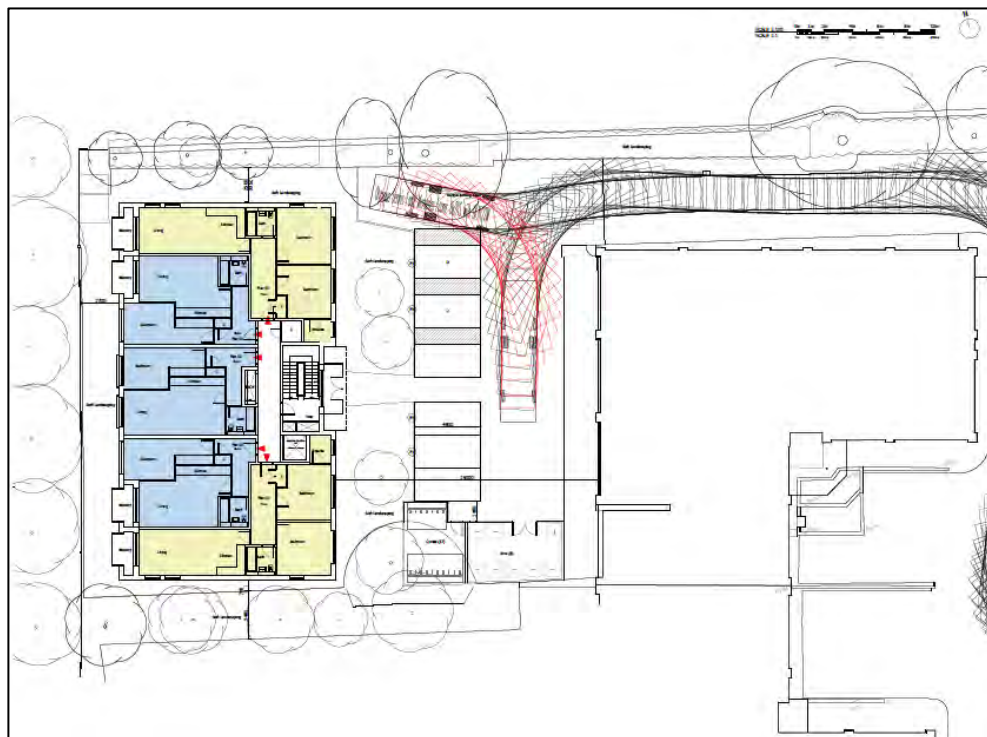


Figure 1b. Proposed site layout (Source: Osel Architects and Development Consultants)

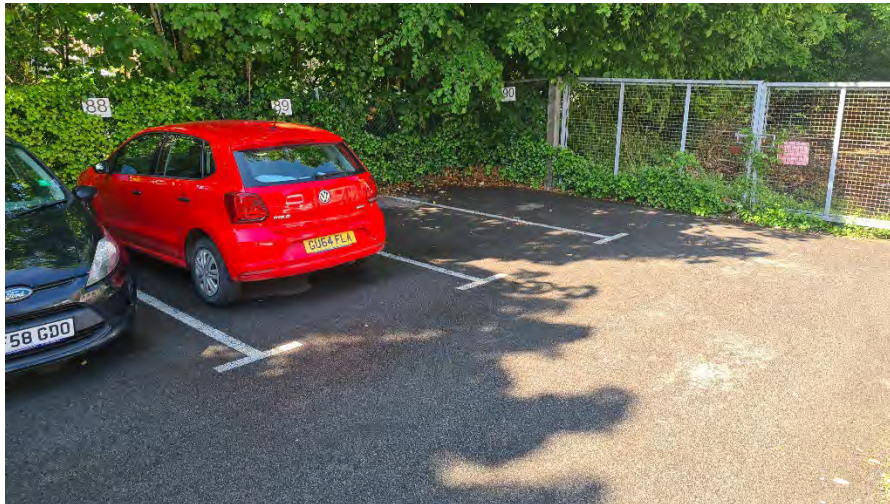


1. Front view of the site (Central House) – From Google maps (August 2021)



2. View of lower part of car park looking at the soakaway on the south west corner of the site (June 2022)

Figure 2. Images of the Site



3. View of the car park (June 2022)



4. Looking into one of the soakaways that serves the site (June 2022)

Figure 2 (continued). Images of the site



5. Looking east towards central house from the lowest part of the site (June 2022)

Figure 2 (continued). Images of the site

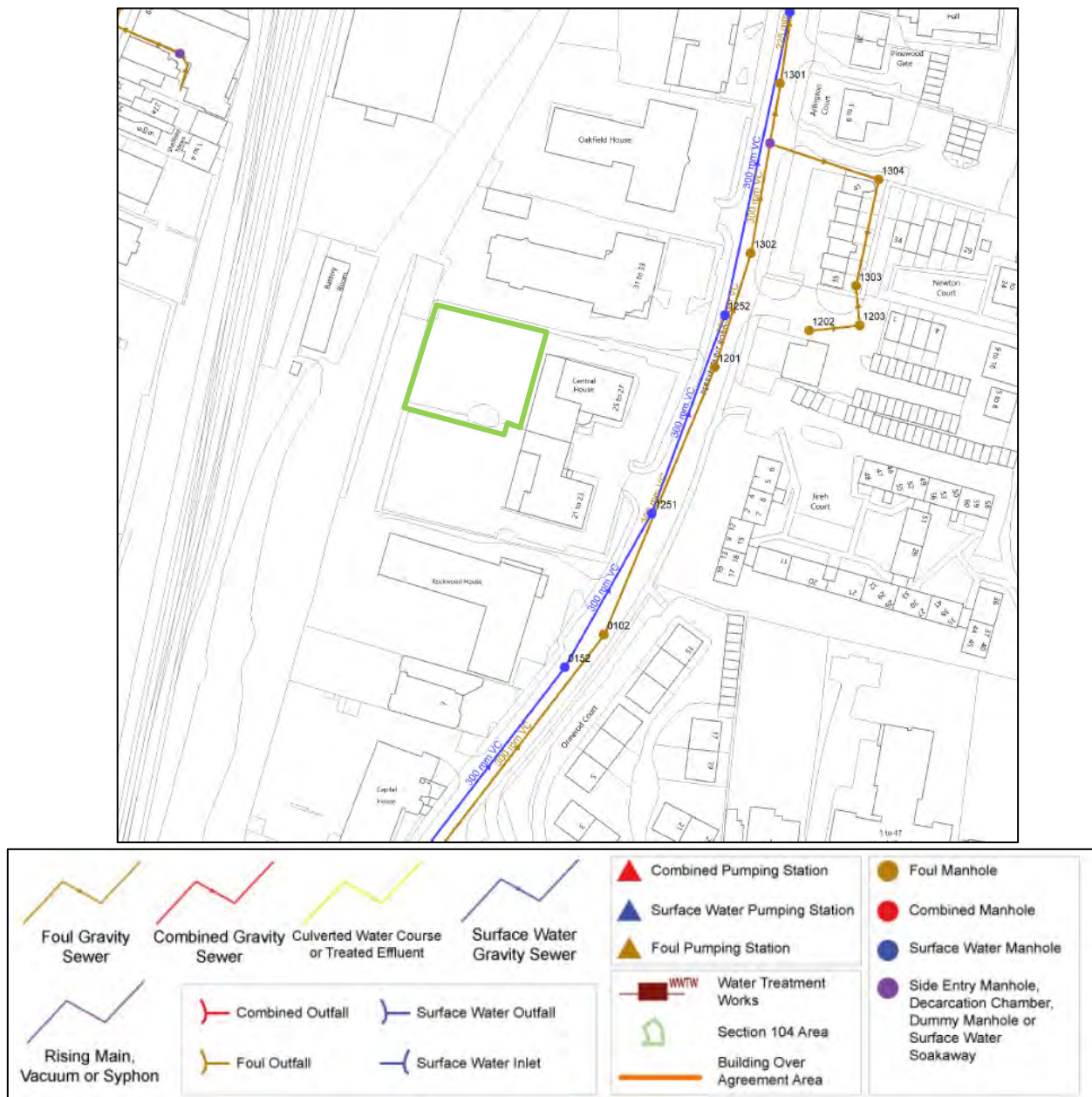


Figure 3. Southern Water Asset Records – Sewers (site in green)



Drawing Title: Land rear of Central House, Perrymount Road Haywards Heath RH16 3SP				Reference:	
South East Water Mains and Fittings - Valve - Washout - Fire Hydrant - Meter - Pressure Valve - Air Valve - Distribution Main - Abandoned Main - Company Boundary				Plot Date:	17/08/2022
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				south east water (Water Maps) PO Box 105 Snodland, Kent ME8 8DW Telephone: 0333 000 0058 Email: water.maps@southeastwater.co.uk Website: www.southeastwater.co.uk	

Figure 4. South East Water's water mains site in green)

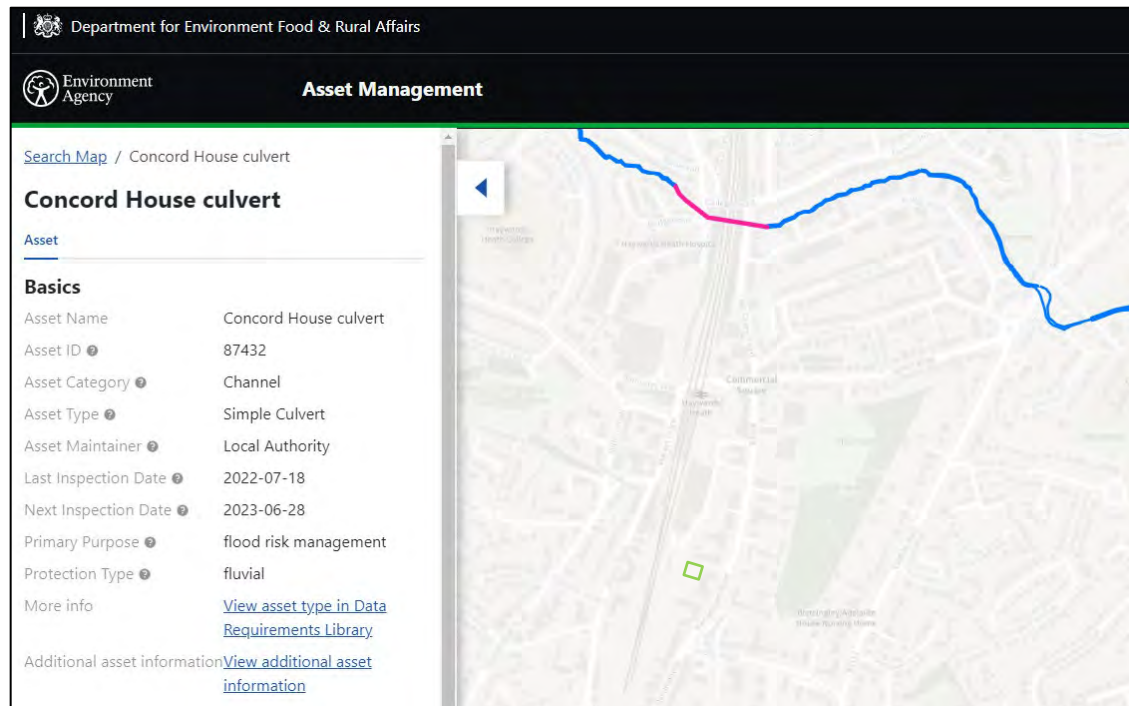


Figure 5. EA flood defence Asset register – Accessed online August 2022– site in green

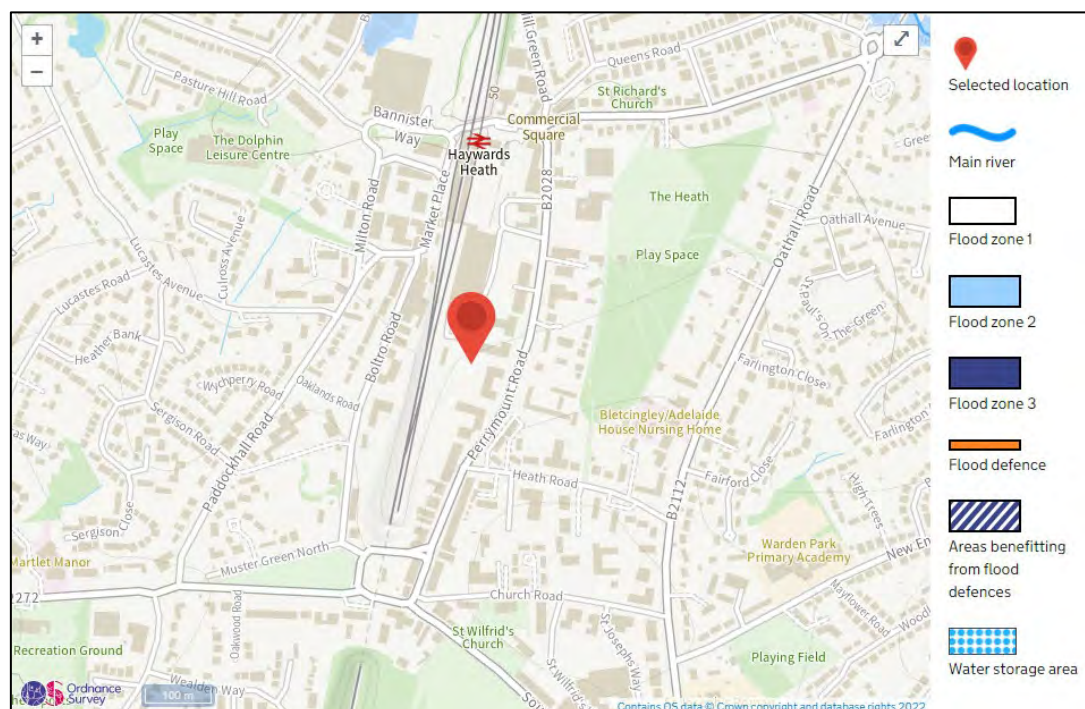


Figure 6. Fluvial/tidal flood map for planning.
 Source: gov.uk website, Flood map for planning

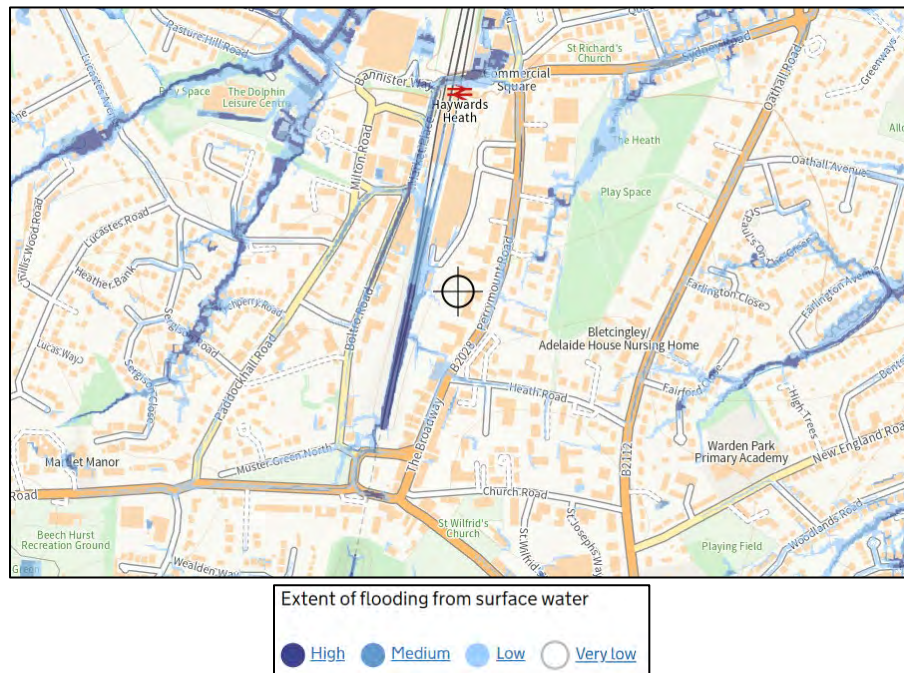


Figure 7a. Extent of flooding from surface water of the area (site marked by crosshair). Source: gov.uk website, Long term flood risk mapping

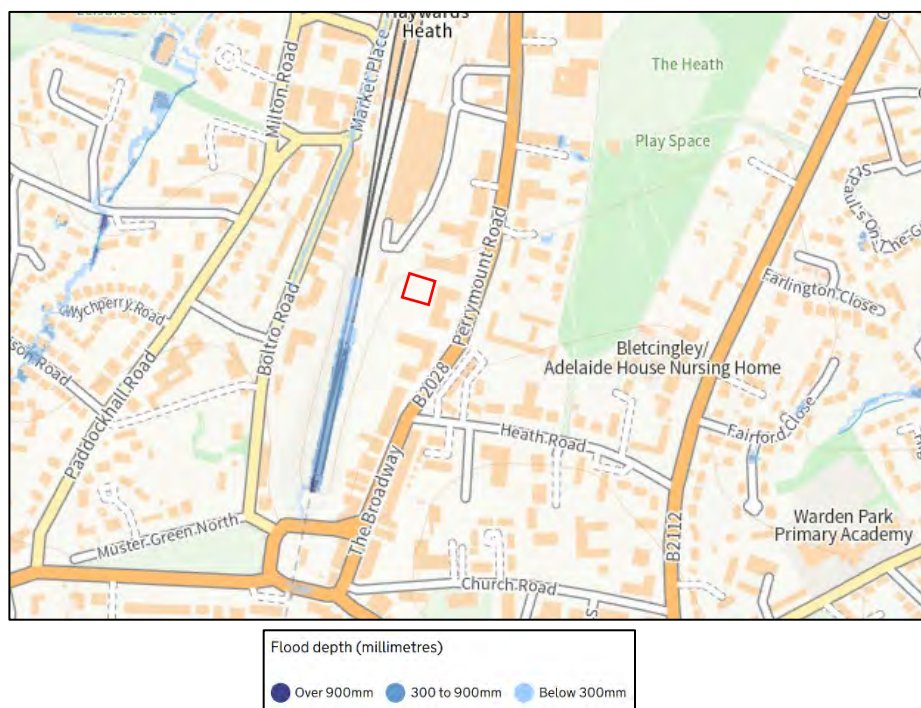


Figure 7b. High flood risk from surface water – depth (site in red).
 Source: gov.uk website, Long term flood risk mapping

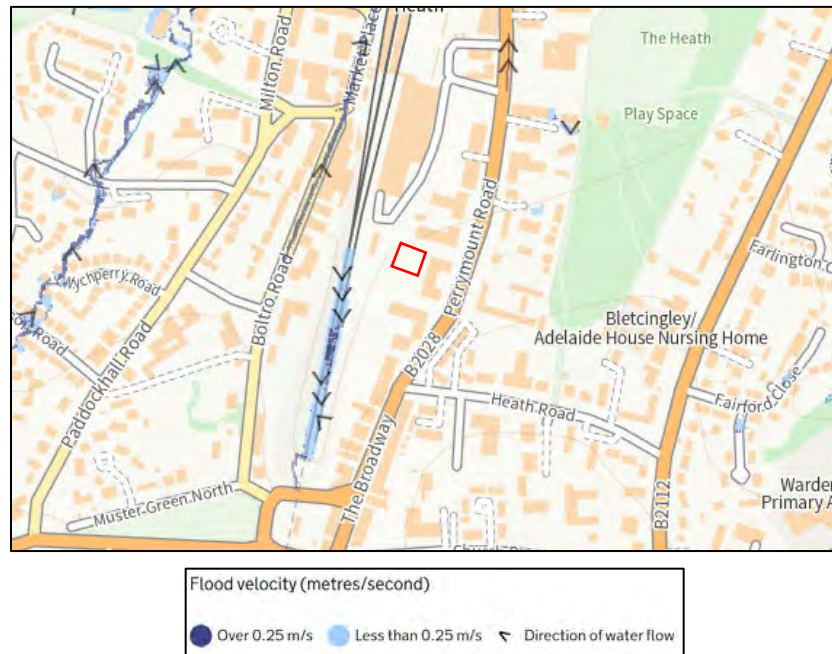


Figure 7c. High flood risk from surface water – Velocity (site in red).
Source: gov.uk website, Long term flood risk mapping

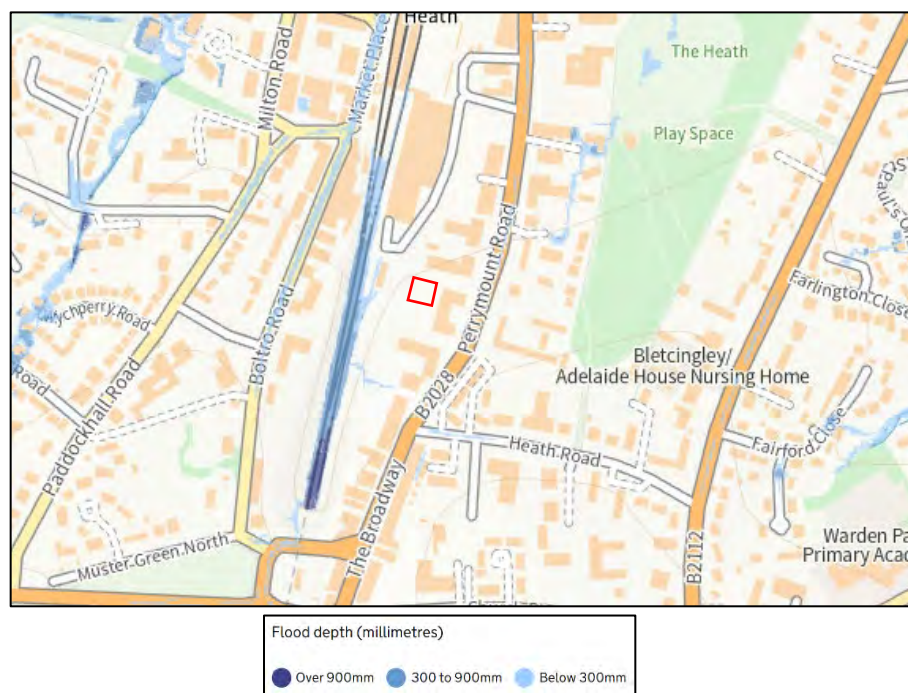


Figure 7d. Medium flood risk from surface water – Depth (site in red).
Source: gov.uk website, Long term flood risk mapping

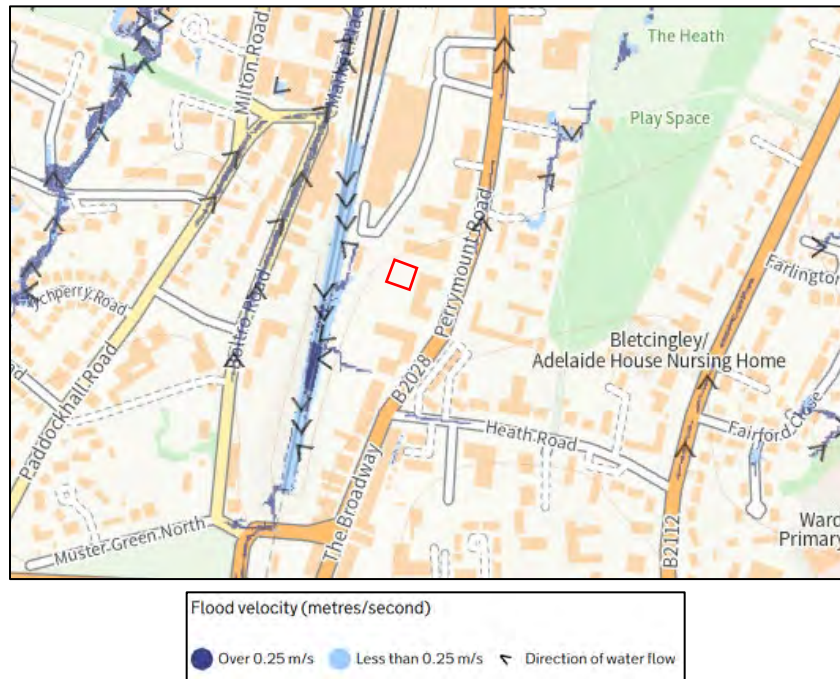


Figure 7e. Medium flood risk from surface water – Velocity (site in red).
 Source: gov.uk website, Long term flood risk mapping

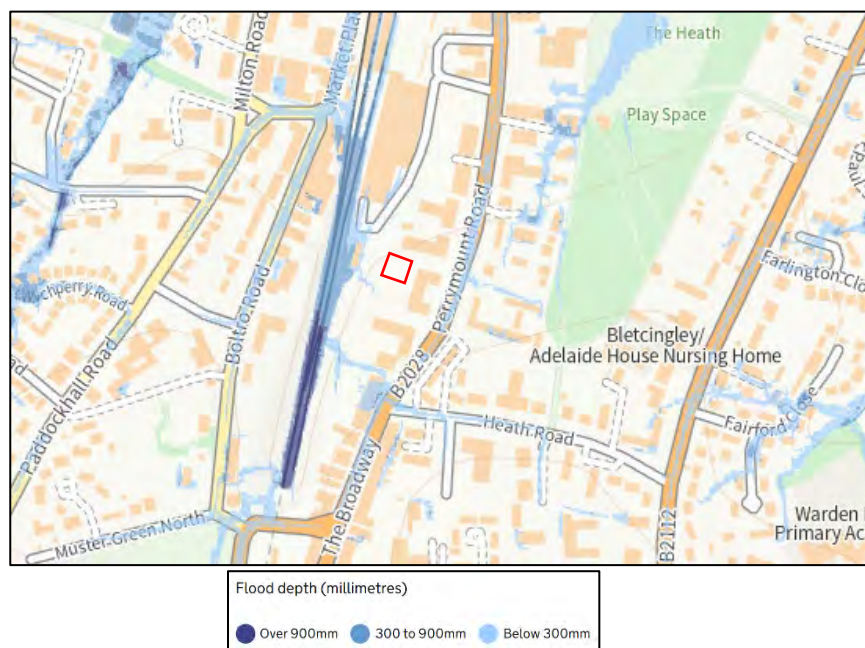


Figure 7f. Low flood risk from surface water – Depth (site in red).
 Source: gov.uk website, Long term flood risk mapping



Figure 7g. Low flood risk from surface water – Velocity (site in red).
 Source: gov.uk website, Long term flood risk mapping

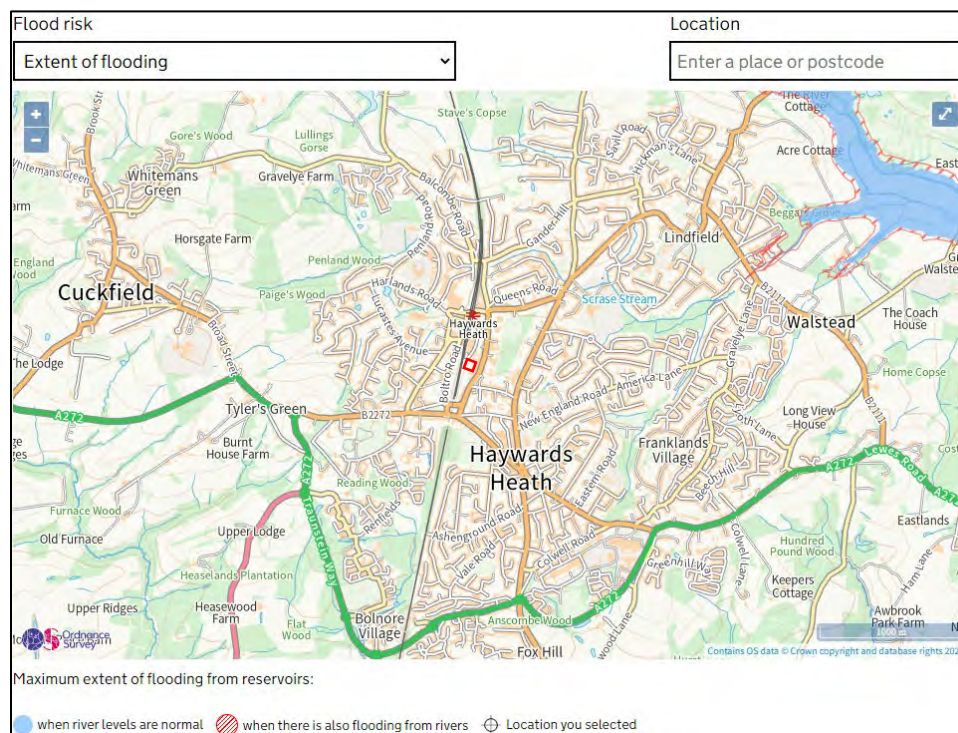


Figure 8. Extent of flooding from reservoirs (site in red).
 Source: gov.uk website, Long term flood risk mapping

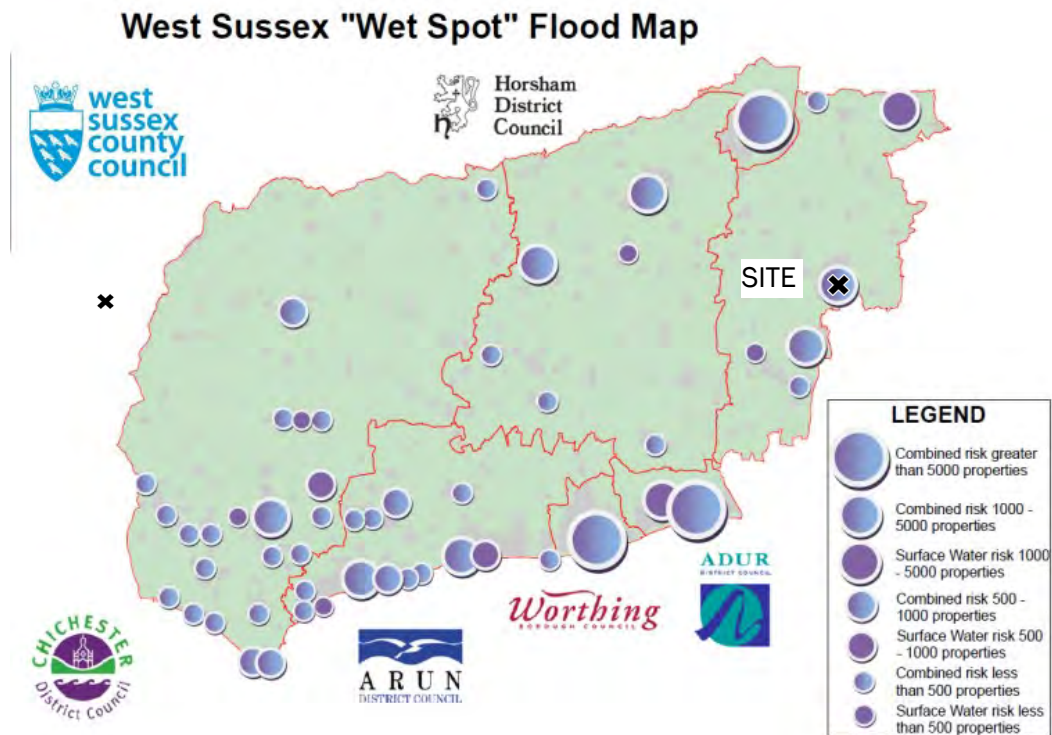


Figure 9. Surface Water Wet Spots (Source: LFRMS, 2014)

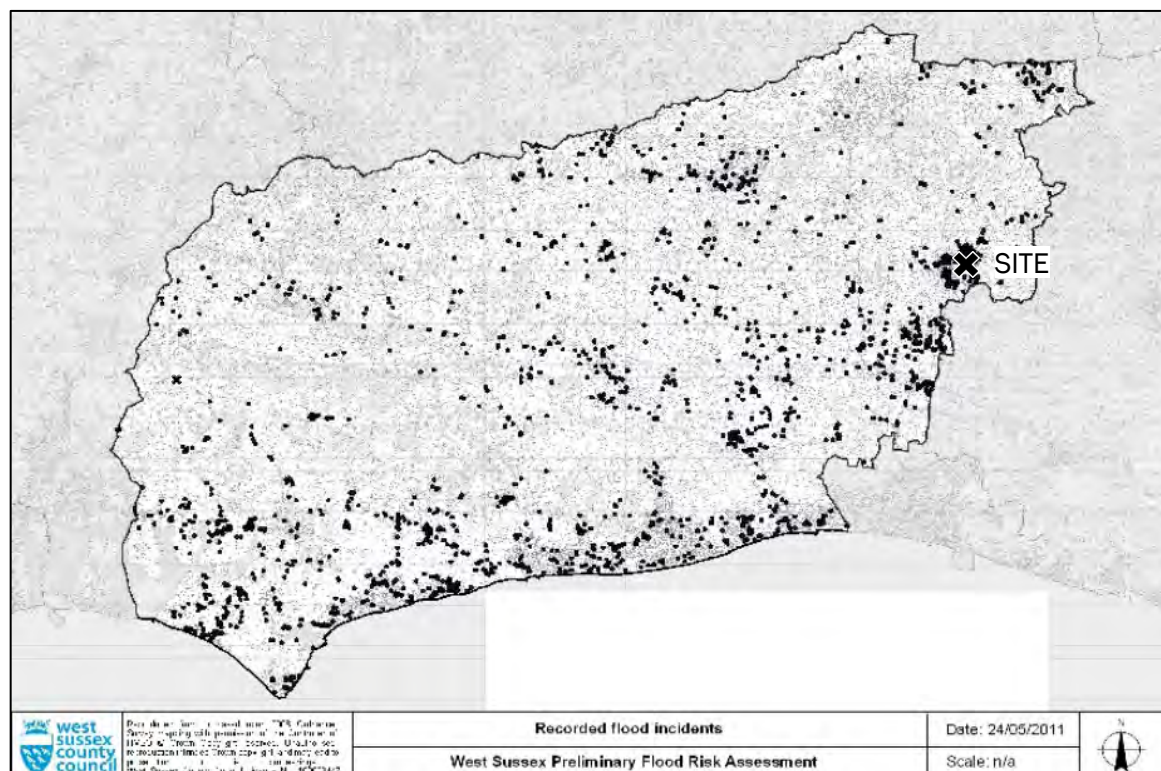


Figure 10. Historical Flood Records (Source: PFRA 2011)

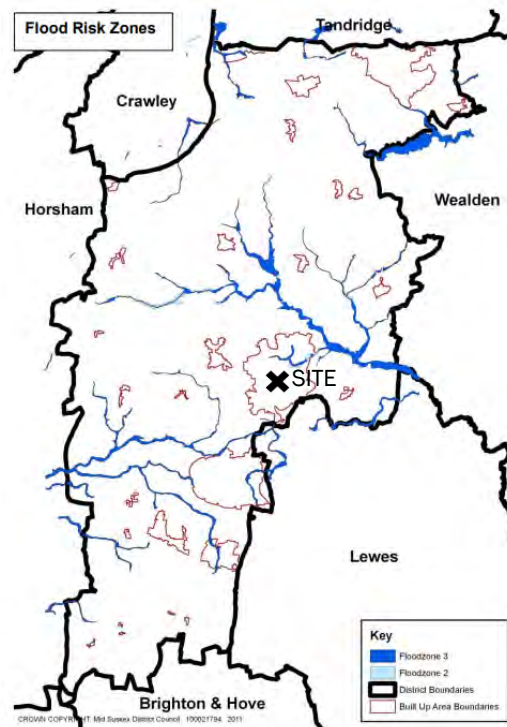


Figure 11. Flood Zone Extents (Source: SFRA, 2015)

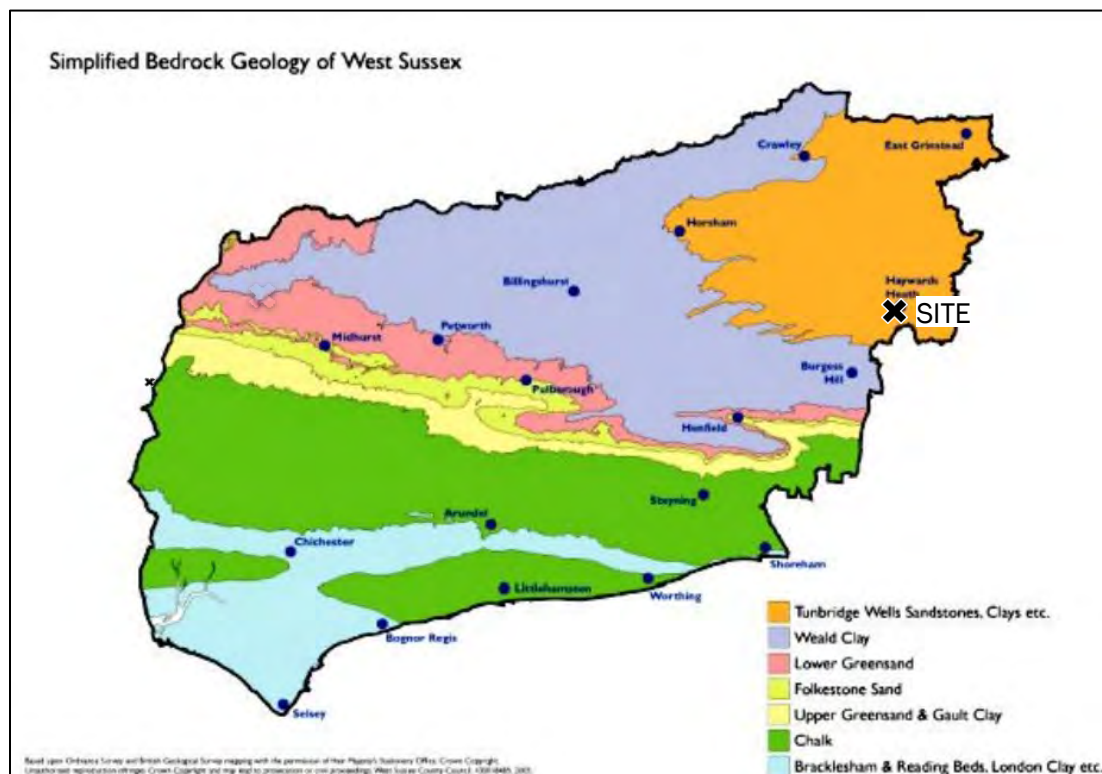


Figure 12. Bedrock Geology (Source: PFRA, 2011)

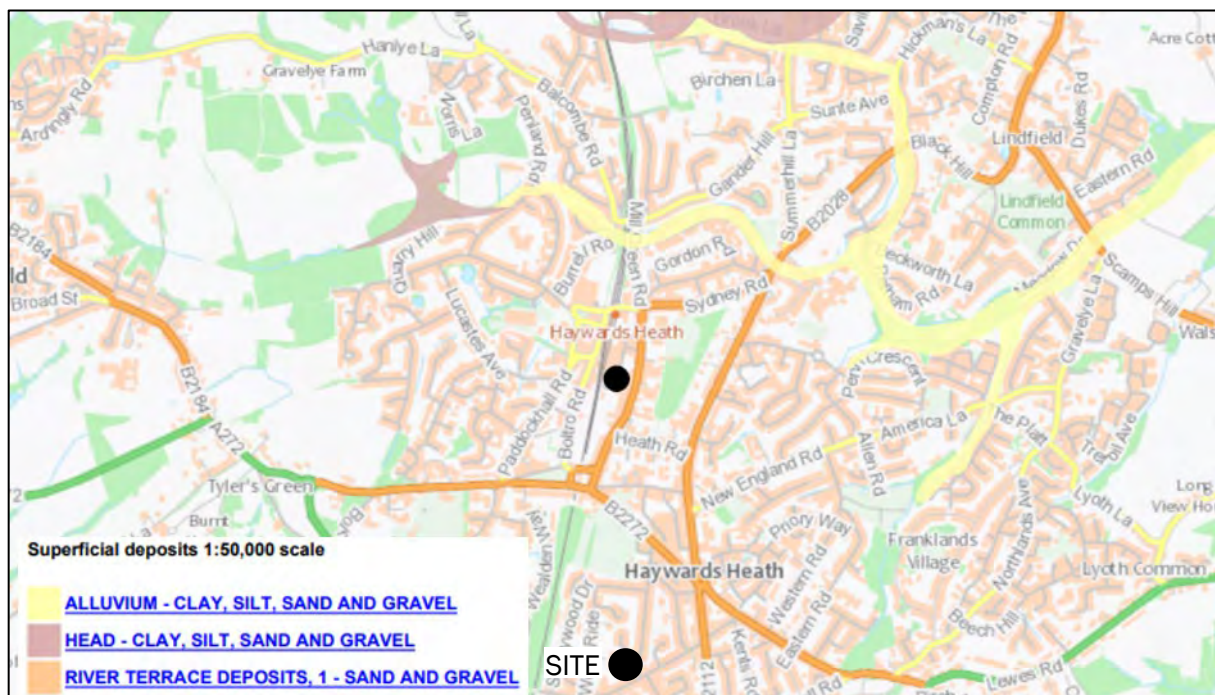


Figure 13. Superficial Geology (Source: Geology of Britain viewer)

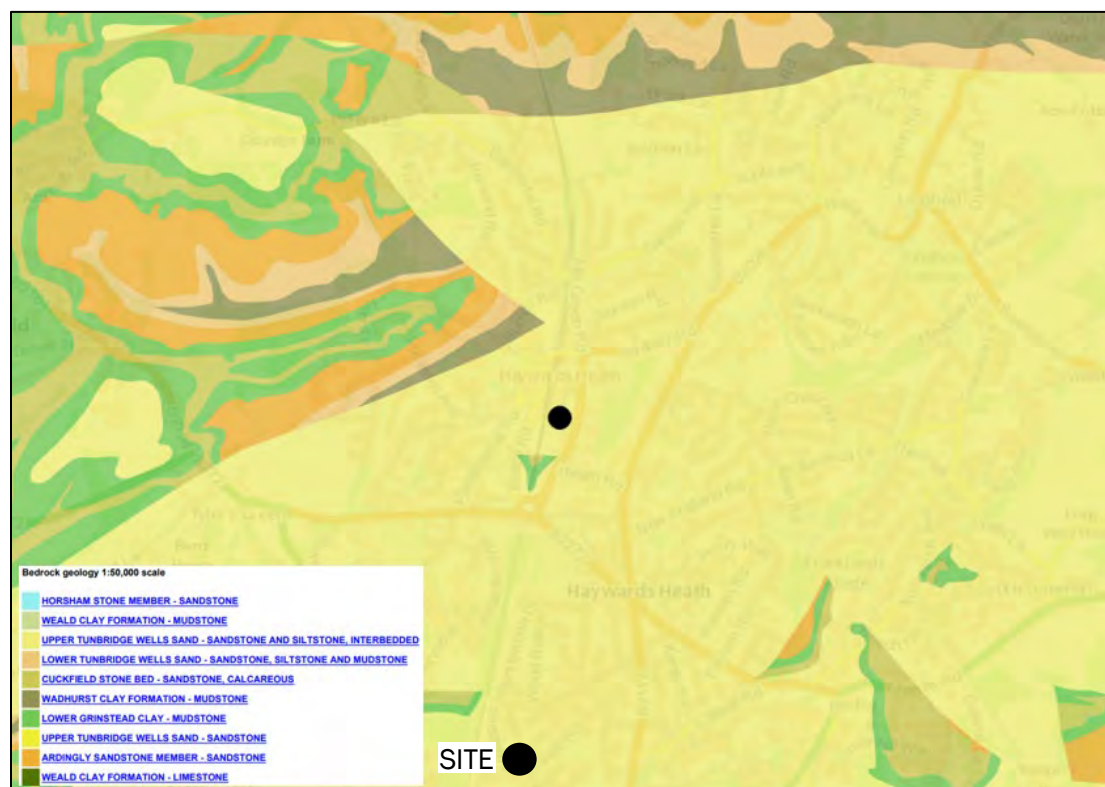
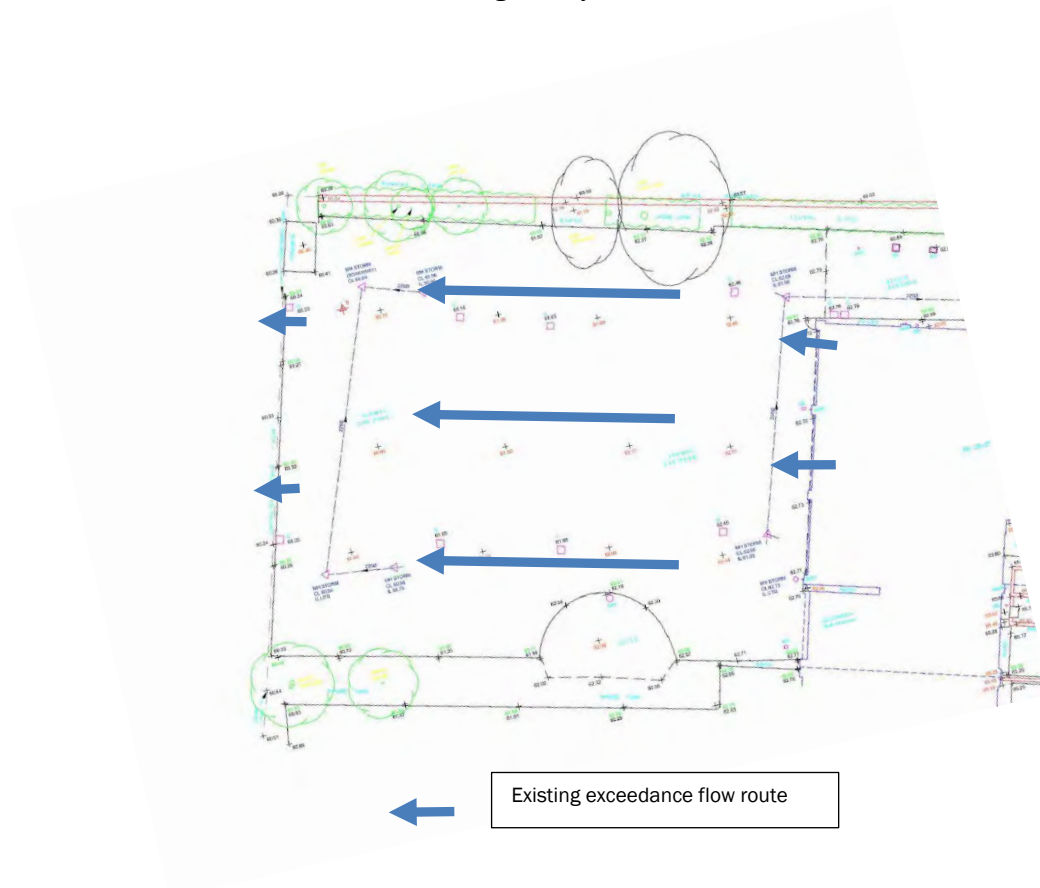


Figure 14. Bedrock Geology (Source: Geology of Britain viewer)

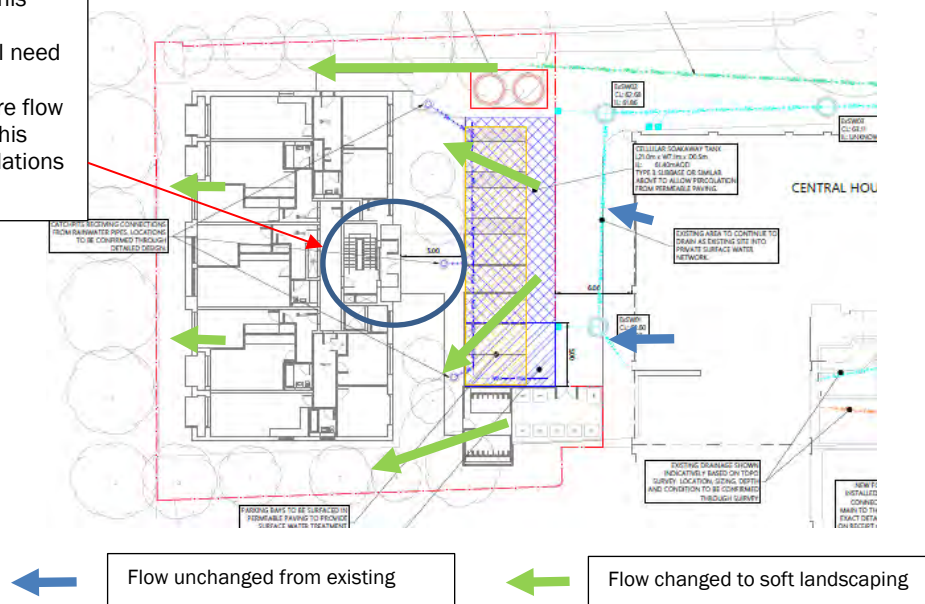
Existing site layout:



Existing exceedance flow route

Detailed design of the external levels will need to consider ground levels carefully in this area. FFL of the ground floor/building entrance will need to be raised and threshold drainage included to ensure flow paths occur as shown on this drawing – see recommendations in Table 6.

Following development:

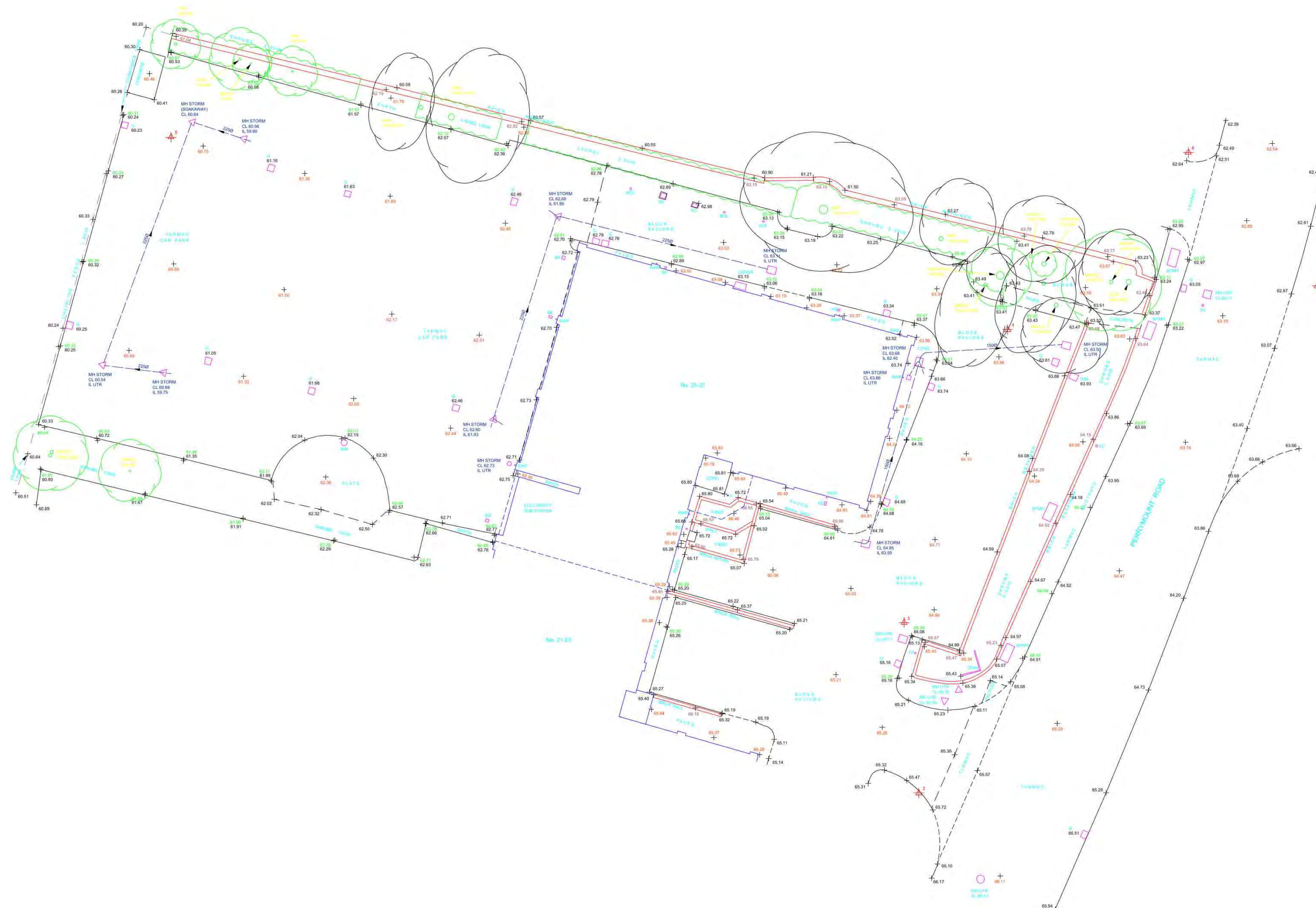


Flow unchanged from existing

Flow changed to soft landscaping

Figure 15. Changes to exceedance flows

Appendix A



Control Data

Station	Eastings	Northings	Level	Mark
1	533126.986	124281.669	62.997	Nail
2	533095.493	124241.603	65.685	Nail
3	533094.349	124255.070	65.065	Nail
4	533102.518	124278.213	63.488	Nail
5	533036.434	124293.424	60.536	Nail
6	533116.791	124292.204	62.664	Nail

Survey Notes

This survey was carried out in accordance with the specification guidelines in the RICS Surveys of Land, Buildings and Utility Surveys at Scales of 1:500 and Larger. Plinthed accuracies expected

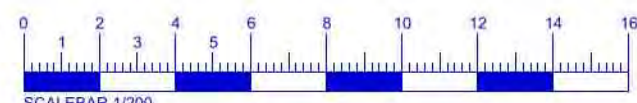
- ±30mm from survey control at 1:100
- ±120mm from survey control at 1:250

The scales quoted are in which the money was carried out NOT at which it is reproduced. Any dimensions that require greater accuracy should be specifically measured on site.

Tree species are identified by use of reference books and while the surveyor has taken reasonable care to ensure that they are identified correctly Marys & Partners recommend that an Arboriculturist should be commissioned if these species are critical to the project.

All drainage connectivity is done by visual inspection and soundings, and assumed to be straight line between any points, unless it has been specifically requested that all connections to be proven on site by use of exspection.

All drainage details are recorded from the surface. No Confined Space entry by survey



Surveyed by: S Smith

Plotted by: S Brown

Drawn by: A

Legend

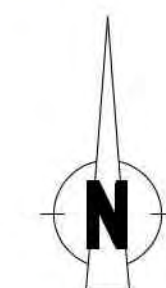
ACU Air Conditioning Unit
AV Air Valve
BC Barrier Control
BOL Bolt
BTB British Telecom Junction Box
BTM British Telecom Manhole
CL Cover Level
CTV Cavity
ECP Electricity Cable Pit
EM Electricity Cable Marker
EP Electricity Pole
ER Earth Rod
FH Fire Hydrant
FP Flag Pole
G Gully
GV Gas Valve
IB Illuminated Bollard
LI Invert Level
BJ Junction Box
LB Letter Box
LC Lamp Column
MH Manhole
MRK Concrete Marker
OF Outfall
PM Pump
REF Reflector
RWP Rainwater Pipe
SC Stop Cock
SP Stop Post
SV Sluice Valve
TCB Telephone Kiosk
TL Traffic Light
TLC Traffic Light Control
TM Traffic Machine
TP Telegraph Pole
UTR Unearthed Terminal
UTS Unable To Survey
VC Vent Column
WM Waste Water
WO Waste
WWP Waste Water Pipe

Data

- i) Trees shown thus 9/6/200 indicates
Ht. in metres/Span. dia in metres
Trunk dia. in millimetres
- ii) Trees shown thus 9/6x6/200 indicates
Ht. in metres/Span. dia in metres
Trunk dia. in millimetres
- iii) Grid : Metric and oriented to
north

iv) Levels : Metric and based on OS GPS DATA
Situating on Survey station 1

Value: 62.997m



Client **FAIRFAX**

Site

CENTRAL HOUSE
25-27 PERRYMOUNT ROAD
HAYWARDS HEATH



Marvin & Partners
Limited

Plestor House
Farnham Road
West Liss
Hampshire GU33 6JQ

Tel : 01428 751888
Email: paul@maplimited.com

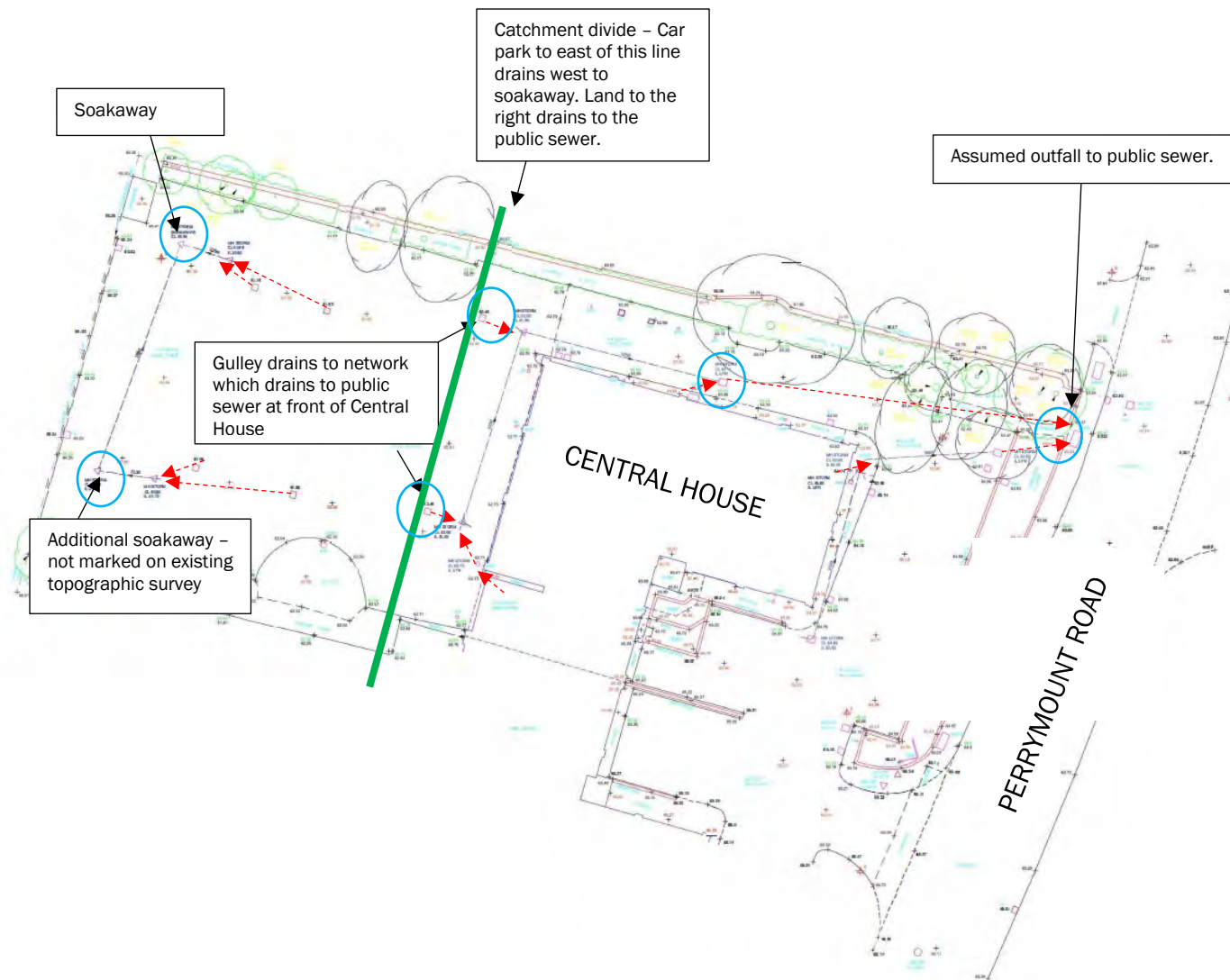
Date	NOV 2018
Scale	1/200 @ A
Dwg/Job No.	18/5184
Checked By	

JM Enviro Limited

Environmental Consulting

Water, Air & Land

Email: flood@jmenviro.co.uk



NOTES:

- For Planning purposes, not for construction. **BEFORE DESIGN PROGRESSES A FULL DRAINAGE SURVEY SHOULD BE UNDERTAKEN.**
- To be read in conjunction with JM Enviro Limited FRA report.
- All existing services are to be located prior to the commencement of any works.
- Observations shown on this drawing are subject to detailed drainage survey including confirmation of existing connections to the public sewer.
- Location of existing connection is shown for info – existing locations are to be determined by survey.
- Detailed drainage design to be agreed with LLFA/LPA and Thames Water.
- Arrows in red are assumed based site observations made during a site visit by JM Enviro Limited in June 2022.

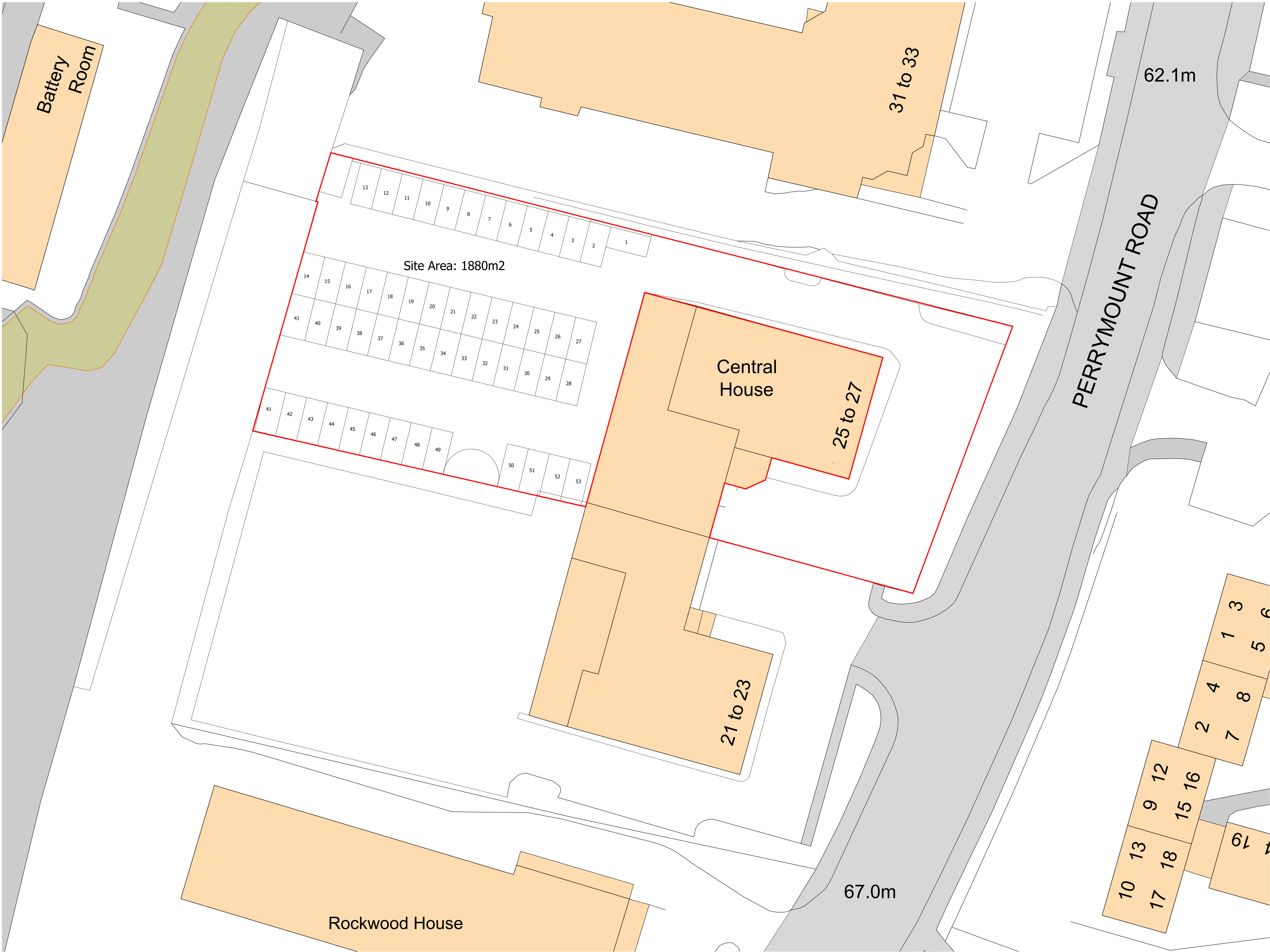
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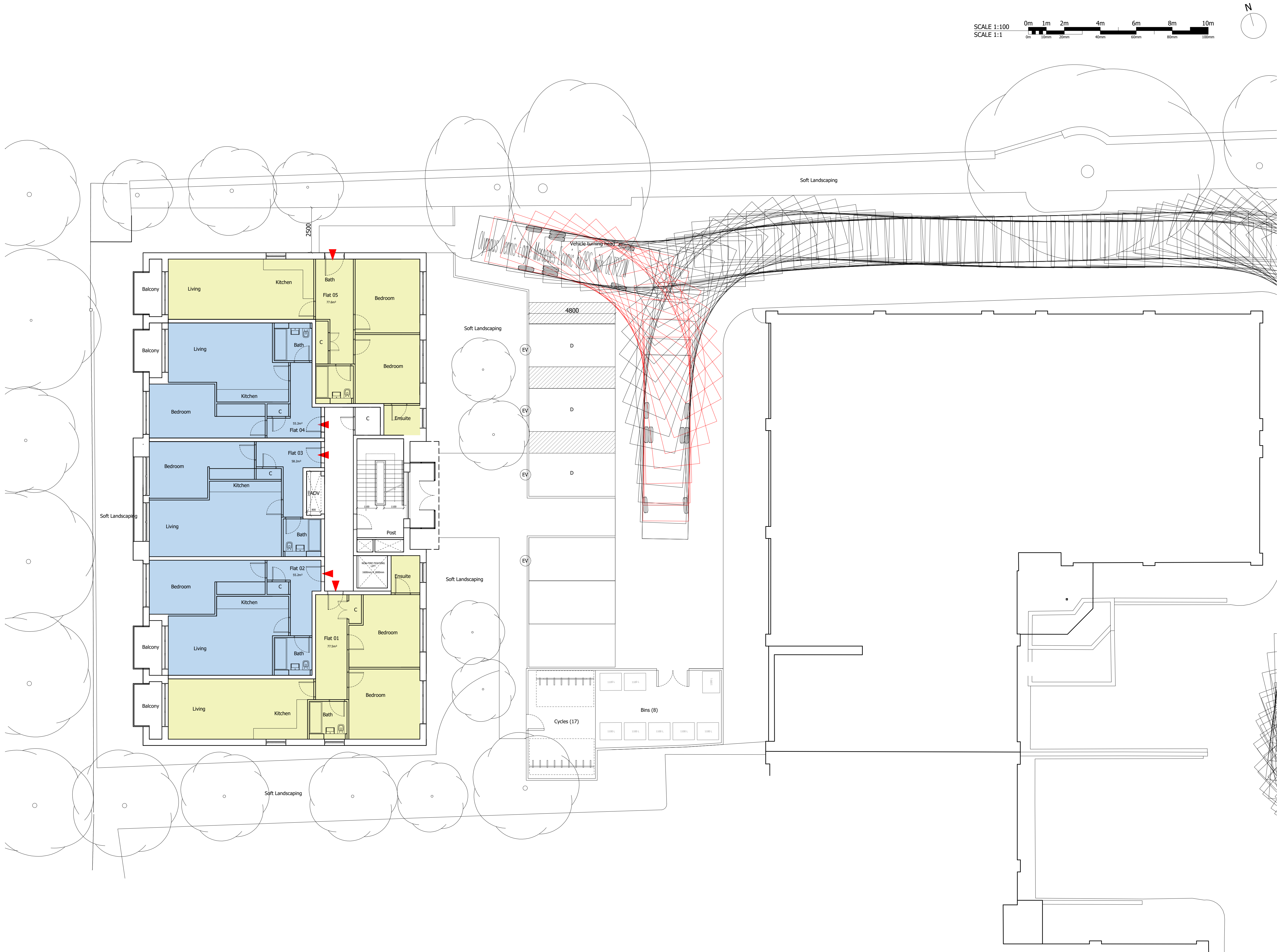
- Manhole chambers lifted in June 22
- Assumed based site observations made during a site visit by JM Enviro Limited in June 2022.

Drawing Title: **Drainage survey**
 Project Name: **Land rear of Central House, Perrymount Road**
 Date: **23rd August 2022**

Client: **Shall Do Central House Limited**
 Drawing No: **JME.261.SURVEY.001**
 Purpose: **Planning**

Appendix B





THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK OF ANY KIND. NO DIMENSIONS TO BE SCALED FROM THIS DRAWING.

REV.	DATE	REVISION
-	23.11.2021	Draft Issue
P2	26.03.22	REVISED FOLLOWING PRE-APP FEEDBACK
P3	02.04.22	Parking adjusted to facilitate refuse truck tracking
P4	04.04.22	Cycle spaces combined and parking space added
P5	14.06.22	Updates following pre-app feedback
P6	28.07.22	Accommodation schedule added

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
Ground	1	2B/4P	77
Ground	2	1B/2P	55
Ground	3	1B/2P	58
Ground	4	1B/2P	55
Ground	5	2B/4P	77

Drawing Legend	
	1B/2P Unit
	2B/3P Unit
	2B/4P Unit

PLANNING

Osel
architects and
development consultants

PROJECT:
Central House Western Annex Building
Haywards Heath

CLIENT:
SHALL DO CENTRAL HOUSE

DRAWING:
Proposed Plans
Ground Floor & Site Plan

DRAWING No.:
E21-022/PRP000

REV:
P6

SCALE: 1:100@A1

DRAWN: DH DATE: 18.10.2021

CHECKED: DATE:

26 Oldbury Place, London W1U 5PR Tel: 020 7224 2447 Fax: 020 7224 2997

E-mail: admin@oselarch.co.uk Web: www.oselarchitecture.co.uk
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REV.	DATE	REVISION
-	23.11.2021	Draft Issue
P2	14.06.22	Updates following pre-app feedback
P3	28.07.22	Accommodation schedule added



1 FIRST FLOOR PLAN
Scale 1:100



2 SECOND FLOOR PLAN
Scale 1:100

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
First	1	2B/4P	77
First	2	1B/2P	55
First	3	1B/2P	58
First	4	1B/2P	55
First	5	2B/4P	77

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
Second	1	2B/4P	77
Second	2	1B/2P	55
Second	3	1B/2P	58
Second	4	1B/2P	55
Second	5	2B/4P	77

Drawing Legend	
	1B/2P Unit
	2B/3P Unit
	2B/4P Unit

PLANNING

Osel
architects and
development consultants

PROJECT:
Central House Western Annex Building
Haywards Heath

CLIENT:
SHALL DO CENTRAL HOUSE

DRAWING:
Proposed Plans
First & Second Floor Plans

DRAWING No.:
E21-022/PRP001

REV:
P3

SCALE: 1:100@A1
DATE: 11.10.2021
DRAWN: DH
CHECKED: DATE:



REV.	DATE	REVISION
-	23.11.2021	Draft Issue
P2	14.06.22	Updates following pre-app feedback
P3	28.07.22	Accommodation schedule added



1 THIRD FLOOR PLAN
Scale 1:100



2 FOURTH FLOOR PLAN
Scale 1:100

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
Third	1	28/4P	77
Third	2	18/2P	55
Third	3	18/2P	58
Third	4	18/2P	55
Third	5	28/4P	77

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
Fourth	1	28/4P	77
Fourth	2	18/2P	55
Fourth	3	18/2P	58
Fourth	4	18/2P	55
Fourth	5	28/4P	77

Drawing Legend	
	18/2P Unit
	28/3P Unit
	28/4P Unit

PLANNING

Osel
architects and
development consultants

PROJECT:
Central House Western Annex Building
Haywards Heath

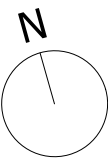
CLIENT:
SHALL DO CENTRAL HOUSE

DRAWING:
Proposed Plans
Third & Fourth Floor Plans

DRAWING No.:
E21-022/PRP002

REV:
P3

SCALE: 1:100@A1
DATE: 11.10.2021
DRAWN: DH
CHECKED: DATE:



REV.	DATE	REVISION
-	23.11.2021	Draft Issue
P2	14.06.22	Updates following pre-app feedback
P3	28.07.22	Accommodation schedule added



1 FIFTH FLOOR PLAN
Scale 1:100

ACCOMMODATION SCHEDULE			
Level	Unit	Mix	GIA (M2)
Fifth	1	2B/4P	72
Fifth	2	2B/4P	70
Fifth	3	2B/3P	67

Drawing Legend	
	1B/2P Unit
	2B/3P Unit
	2B/4P Unit

PLANNING

Osel architects and
development consultants

PROJECT:
Central House Western Annex Building
Haywards Heath

CLIENT:
SHALL DO CENTRAL HOUSE

DRAWING:
Proposed Plans
Fifth Floor Plan

DRAWING No.: **E21-022/PRP003** REV: **P3**

SCALE: 1:100@A1

DRAWN: RC

DATE: 11.10.2021

CHECKED:

DATE:

26 Oldbury Place, London W1U 5PR Tel: 020 7224 2447 Fax: 020 7224 2997

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1

WEST ELEVATION

Scale 1:100



2

EAST ELEVATION

Scale 1:100

PLANNING

Osel
architects and
development consultants

PROJECT:
Central House Western Annex Building
Haywards Heath

CLIENT:
SHALL DO CENTRAL HOUSE

DRAWING:
Proposed Elevations
East & West Elevations

DRAWING No.:
E21-022/ELE001

REV:
P2

SCALE: 1:100@A1

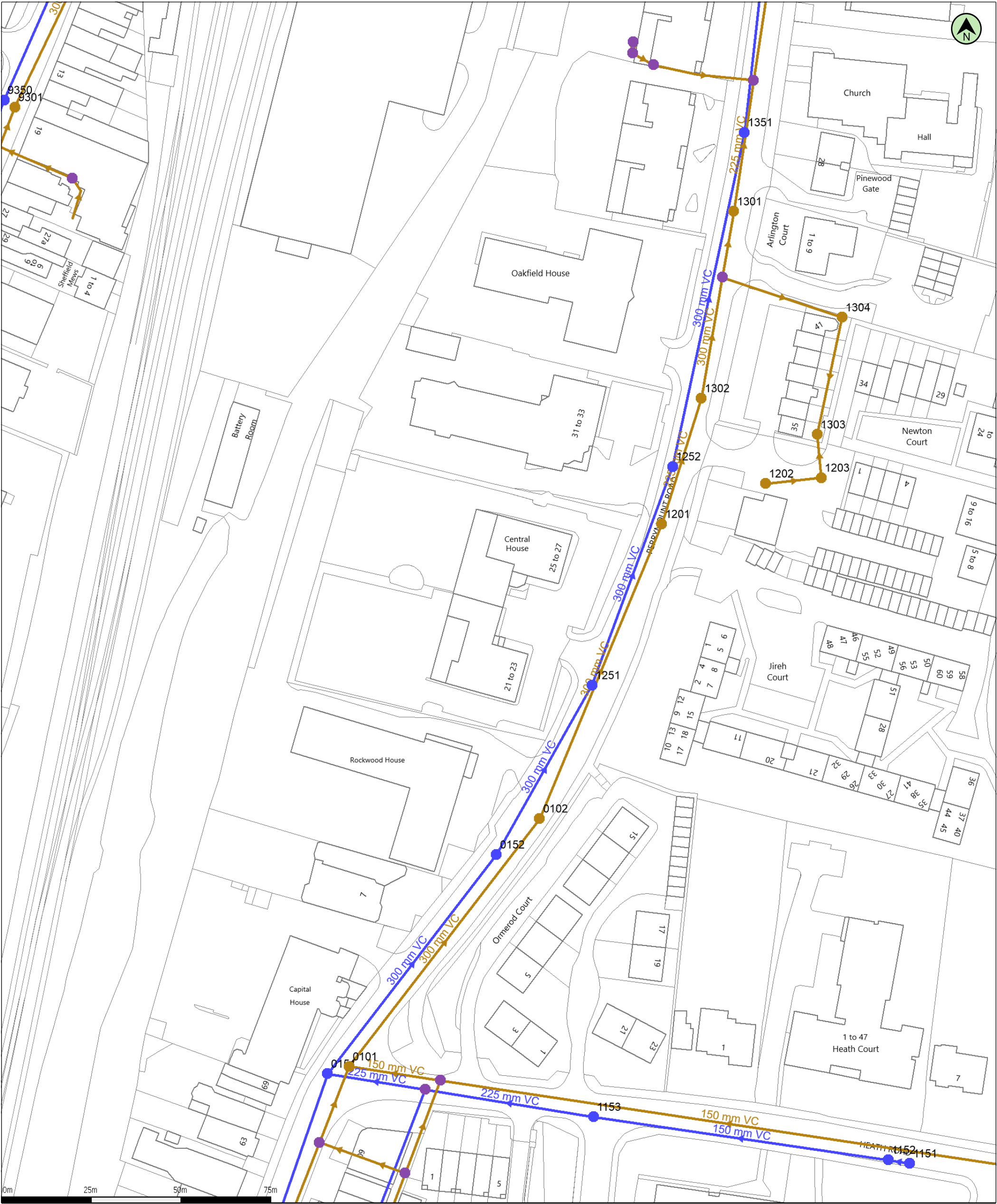
DRAWN: RC DATE: 02.11.2021

CHECKED: DATE:

26 Oldbury Place, London W1U 5PR Tel: 020 7224 2447 Fax: 020 7224 2997

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Appendix C



(c) Crown copyright and database rights 2022 Ordnance Survey 100031673
Data updated: 16/06/22
Scale: 1:1000
Map Centre: 533075,124259
Date: 30/06/22
Our Ref: 890237 - 1
Wastewater Plan A3
Powered by digdat

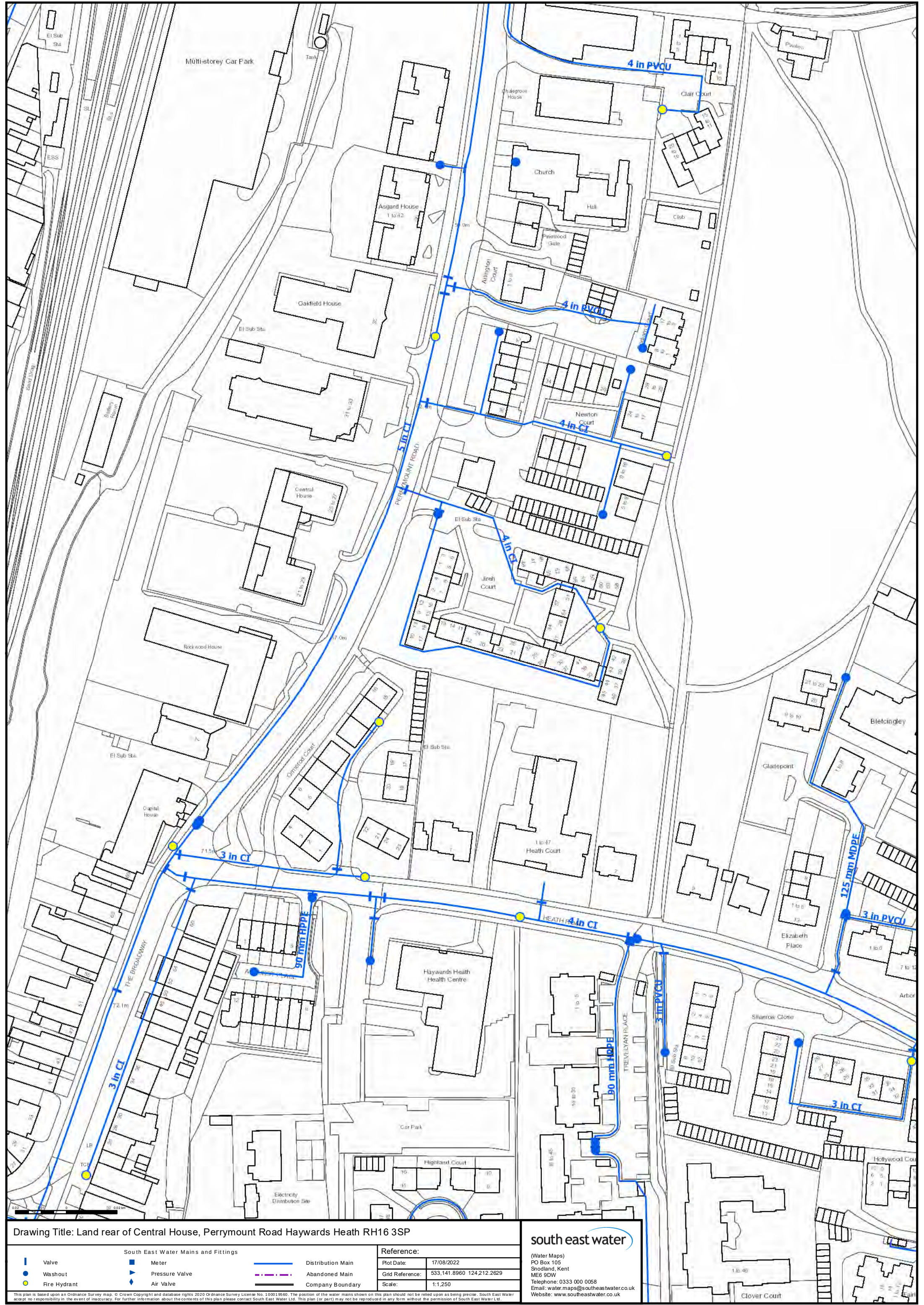
julian@jmenviro.co.uk

Central House



The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



Drawing Title: Land rear of Central House, Perrymount Road Haywards Heath RH16 3SP

South East Water Mains and Fittings			
	Valve		Distribution Main
	Washout		Abandoned Main
	Fire Hydrant		Company Boundary
	Meter		
	Pressure Valve		
	Air Valve		

Reference:	
Plot Date:	17/08/2022
Grid Reference:	533,141.8960 124,212.2629
Scale:	1:1,250

south east water

(Water Maps)
PO Box 105
Snodland, Kent
ME6 9DW
Telephone: 0333 000 0058
Email: water.maps@southeastwater.co.uk
Website: www.southeastwater.co.uk

This plan is based upon an Ordnance Survey map. © Crown Copyright and database rights 2020 Ordnance Survey License No. 100019560. The position of the water mains shown on this plan should not be relied upon as being precise. South East Water accept no responsibility in the event of inaccuracy. For further information about the contents of this plan please contact South East Water Ltd. This plan (or part) may not be reproduced in any form without the permission of South East Water Ltd.

Appendix D



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HAS BEEN OR IS GRANTED TO ANY THIRD PARTY WHETHER BY PROVISION OF
COPIES OR ORIGINALS OR OTHERWISE UNLESS AGREED IN WRITING.

NOTES:

- DO NOT SCALE FROM THIS DRAWING. ONLY FIGURED
- DIMENSIONS ARE TO BE USED.
- ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- PROPOSED DEVELOPMENT IS LOCATED AT APPROXIMATE NATIONAL GRID REFERENCE 533075,124259.
- ALL EXTERNAL TRAFFICKED AREAS ARE TO BE DRAINED INTO THE PERMEABLE PAVING PARKING BAYS FOR TREATMENT PRIOR TO DISCHARGE INTO THE GROUND. THE EXISTING SITE IS DRAINED VIA EXISTING SOAKAWAYS HOWEVER NO INFILTRATION RATES ARE AVAILABLE. THE SURFACE WATER SOAKAWAY DESIGN IS BASED ON A CONSERVATIVE INFILTRATION RATE OF 1x10-6m/s. THE SOAKAWAY SIZING AND SUITABILITY SHOULD BE REVIEWED AND CONFIRMED BY A SITE INVESTIGATION INCLUDING INFILTRATION TESTING IN ACCORDANCE WITH BRE365. REFER TO THE DRAINAGE STRATEGY DOCUMENT FOR FURTHER DETAILS.
- FOUL WATER DISCHARGE LOCATIONS AND RATES ARE SUBJECT TO APPROVAL BY THE SEWERAGE UNDERTAKER.
- INITIAL SITE SURVEYS INDICATE THAT A GRAVITY FOUL WATER CONNECTION TO THE SOUTHERN WATER SEWER NETWORK IS NOT FEASIBLE. A NEW PRIVATE FOUL WATER PUMP STATION IS PROPOSED. THIS PUMP STATION HAS BEEN LOCATED AS FAR AS PRACTICABLE FROM THE EXISTING AND PROPOSED BUILDINGS. 24 HOUR STORAGE FOR THE DEVELOPMENT IN LINE WITH BUILDING REGULATIONS PART H.
- ALL EXISTING DRAINAGE INVERT LEVELS ARE TO BE CONFIRMED ONSITE PRIOR TO CONSTRUCTION. IF LEVELS ARE DIFFERENT TO THAT ASSUMED THEN THE DRAINAGE MAY NEED TO BE UPDATED OR PUMPING STATIONS PROVIDED.
- PERMITTED DISCHARGE RATES AND STORAGE VOLUMES ARE INDICATIVE ONLY AND ARE TO BE CONFIRMED AS THE DESIGN DEVELOPS AND MORE DETAILED HYDRAULIC MODELLING IS UNDERTAKEN.

KEY

- SITE AREA COVERED BY DRAINAGE STRATEGY
- - - EXISTING FOUL WATER PUBLIC SEWER
- - - EXISTING SURFACE WATER PUBLIC SEWER
- EXISTING FOUL WATER SEWER
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER MANHOLE
- EXISTING SURFACE WATER ROAD GULLY
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER MANHOLE/PUMP STATION
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER RISING MAIN
- PROPOSED CELLULAR ATTENUATION SOAKAWAY TANK
- PROPOSED CELLULAR TANK LINED TO PREVENT INFILTRATION
- PROPOSED PERMEABLE PARKING BAYS

P01	22/08/2022	PRELIMINARY ISSUE	AOR	AP
REV	DATE	DESCRIPTION	DRN	APP
STATUS				

PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP BETWEEN

JM Enviro Limited
Environmental Consulting
Water, Air & Land

WWW.JMENVIRO.CO.UK

**CU CONSULTING
BE ENGINEERS**

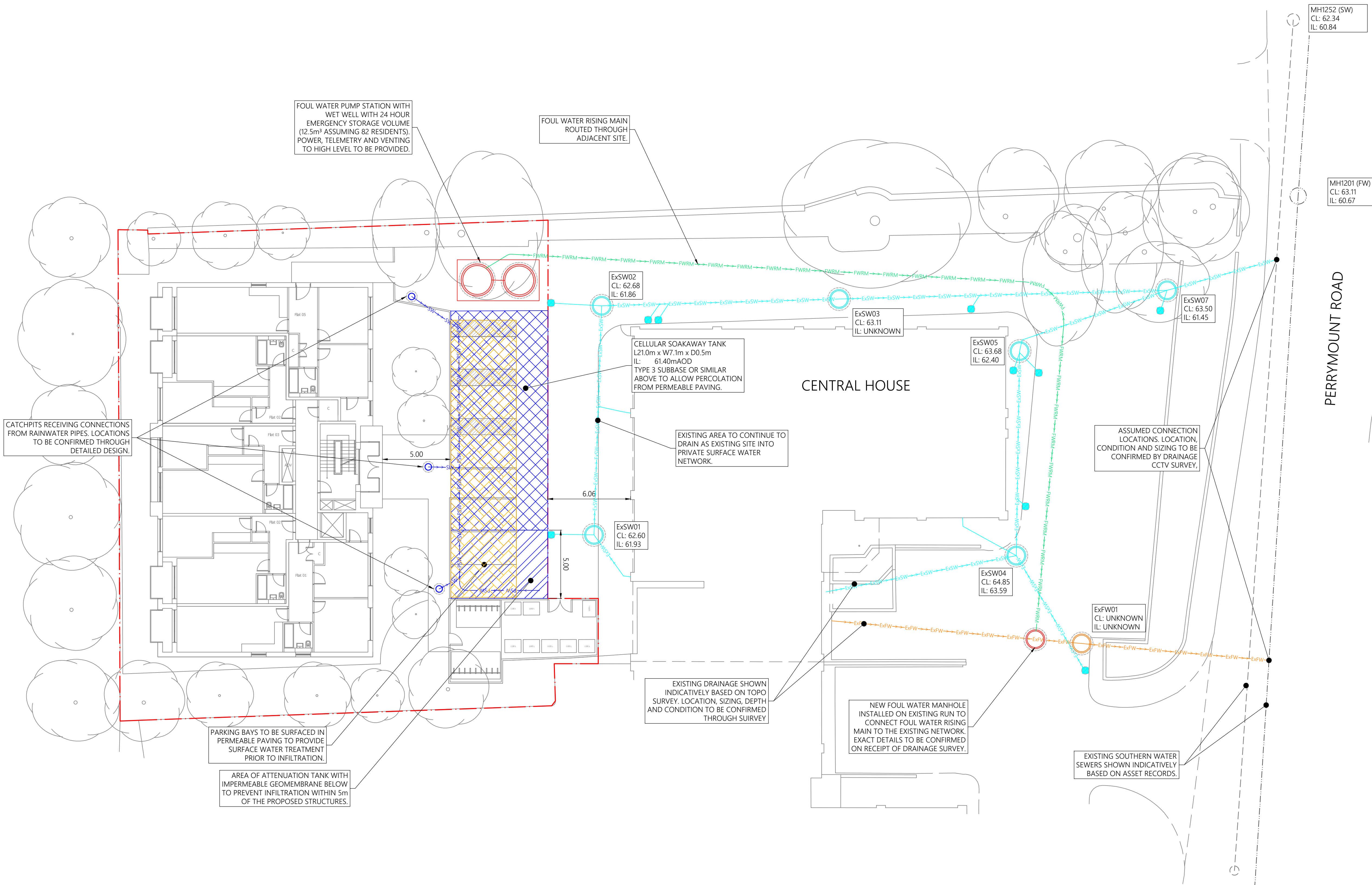
WWW.CONSULTTHECUBE.CO.UK

CLIENT
SHALL DO CENTRAL HOUSE

PROJECT
CENTRAL HOUSE WESTERN ANNEX
BUILDING, HAYWARDS HEATH

DRAWING TITLE
PROPOSED BELOW GROUND DRAINAGE
SITE PLAN

JOB NO.	1100	DATE	04/08/2022	SCALE	1:150		
DRN	AOR	DES	AOR	CHK	AP	APP	JM
DRAWING NUMBER						REV	
P261-1100-C-DR-0100						P01	



Cube Consulting Engineers		Page 1
24 Carronade Court London N7 8EP	Perrymount Road Haywards Heath Proposed Soakaway Calcs	
Date 04/08/2022 File HAYWARDS HEATH SOAKAWAY...	Designed by AOR Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 533075 124275 TQ 33075 24275
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.065	4-8	0.011

Total Area Contributing (ha) = 0.076

Total Pipe Volume (m³) = 0.216

Cube Consulting Engineers		Page 2
24 Carronade Court London N7 8EP	Perrymount Road Haywards Heath Proposed Soakaway Calcs	
Date 04/08/2022 File HAYWARDS HEATH SOAKAWAY...	Designed by AOR Checked by	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.044	0.044	0.044
1.001	-	-	100	0.000	0.000	0.000
1.002	User	-	100	0.006	0.006	0.006
	User	-	100	0.026	0.026	0.031
				Total	Total	Total
				0.076	0.076	0.076

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Online Controls for Storm

Pump Manhole: 3, DS/PN: 1.002, Volume (m³): 1.0

Invert Level (m) 61.675

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.0000	0.900	0.0000	1.700	0.0000	2.500	0.0000
0.200	0.0000	1.000	0.0000	1.800	0.0000	2.600	0.0000
0.300	0.0000	1.100	0.0000	1.900	0.0000	2.700	0.0000
0.400	0.0000	1.200	0.0000	2.000	0.0000	2.800	0.0000
0.500	0.0000	1.300	0.0000	2.100	0.0000	2.900	0.0000
0.600	0.0000	1.400	0.0000	2.200	0.0000	3.000	0.0000
0.700	0.0000	1.500	0.0000	2.300	0.0000		
0.800	0.0000	1.600	0.0000	2.400	0.0000		

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Storage Structures for Storm

Complex Manhole: 3, DS/PN: 1.002

Cellular Storage

Invert Level (m) 61.675 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00360 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	150.0	113.0	0.501	0.0	113.0
0.500	150.0	113.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 7.1
Membrane Percolation (mm/hr) 1000 Length (m) 21.0
Max Percolation (l/s) 41.4 Slope (1:X) 0.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 61.900 Membrane Depth (mm) 0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

```
Margin for Flood Risk Warning (mm) 300.0      DVD Status OFF
      Analysis Timestep      Fine Inertia Status OFF
      DTS Status      ON
```

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	40, 40, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

Water Level									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
1.000	1	15 Summer	2	+40%					62.100
1.001	2	1440 Winter	2	+40%	30/15 Summer				61.949
1.002	3	1440 Winter	2	+40%	2/240 Summer				61.948

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
1.000	1	0.000	0.000	1.18			12.0	SURCHARGED*	
1.001	2	-0.011	0.000	0.03			0.8	OK	
1.002	3	0.123	0.000	0.00			0.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
 FEH Rainfall Version 2013
 Site Location GB 533075 124275 TQ 33075 24275
 Data Type Point
 Cv (Summer) 1.000
 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 40, 40, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Summer	30	+40%					62.100
1.001	2	1440 Summer	30	+40%	30/15 Summer				62.120
1.002	3	1440 Winter	30	+40%	2/240 Summer				62.119

Surcharged Flooded					Half Drain		Pipe		
PN	US/MH Name	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.000	2.36			24.0	SURCHARGED*	
1.001	2	0.160	0.000	0.09			2.0	SURCHARGED	
1.002	3	0.294	0.000	0.00			0.0	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
 FEH Rainfall Version 2013
 Site Location GB 533075 124275 TQ 33075 24275
 Data Type Point
 Cv (Summer) 1.000
 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 40, 40, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Summer	100	+45%					62.100
1.001	2	1440 Winter	100	+45%	30/15 Summer				62.454
1.002	3	1440 Winter	100	+45%	2/240 Summer				62.454

Surcharged Flooded					Half Drain		Pipe		
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	
1.000	1	0.000	0.000	2.86		29.1	SURCHARGED*		
1.001	2	0.494	0.000	0.08		1.8	FLOOD RISK		
1.002	3	0.629	0.000	0.00		0.0	FLOOD RISK		