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Flood Risk Assessment

Proposed Residential Development at

Roman Acre, Wick, Littlehampton

On behalf of

Jeff Djevdet

January 2025

Document History and Status

Project Number 23953

Date	Version	Prepared By	Reviewed By	Approved By
30 Jan 2025	1.0	Stuart Magowan IEng MICE	Steve Doughty Director	Stuart Magowan Director

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CONTENTS

1 Non Technical Summary

1.1 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework on behalf of Jeff Djevdet in support of a Planning Application for the construction of one residential dwellings with associated access roads, car parking and landscaping on land north of 7 Roman Acre, Wick, Littlehampton.

1.2 This Assessment is to be read in conjunction with all planning, architectural and other reports that accompany the Outline Planning Application for the proposed development.

1.3 The vast majority of the site is located in Flood Zone 1 with a small are of the proposed driveway in protected Flood Zone 2.

1.4 The proposed development will incorporate a sustainable drainage system which will discharge surface water by infiltration to ground or, should further testing prove infiltration is not a viable method for discharging surface water at this site, surface water will be discharged at a restricted rate of 1l/s to the Southern Water public surface water sewer located beneath Roman Acre.

1.5 Calculations indicate that sufficient storage can be provided for all storm return periods up to and including the 1:100 year rainfall event with a 45% allowance for climate change.

1.6 In terms of flood risk the proposed development is suitable at this location.

2 Planning Policy Context

2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework was last updated on 12 December 2024.

2.1.2 With regard to planning and flood risk the National Planning Policy Framework states that *'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 assessment[63]. 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 such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.'

2.2 Non Statutory Technical Standards for SuDS

2.2.1 The Non Statutory Technical Standards for SuDS dated March 2015 are intended to be used in conjunction with the National Planning Policy Framework.

2.2.2 With regards to peak runoff **Non Statutory Standard S2** states that *'for greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.'*

2.3 Lead Local Flood Authority

2.3.1 West Sussex County Council became a Lead Local Flood Authority under the Flood and Water Management Act 2010 and was given a series of new responsibilities to coordinate the management of local flood risk.

2.3.2 As part of its role West Sussex County Council has commissioned and produced the following documents:

- Strategic Flood Risk Assessment - January 2010
- Preliminary Flood Risk Assessment - May 2011
- Local Flood Risk Management Strategy - May 2014

2.3.3 In addition to the above documents the West Sussex County Council Policy for the Management of Surface Water was updated in November 2018.

2.3.4 The above documents have been reviewed in the preparation of this report.

2.4 Arun District Council

2.4.1 Arun District Council has commissioned and produced the following documents:

- Arun Strategic Surface Water Management Study - October 2016
- Combined Level 1 and Level 2 Strategic Flood Risk Assessment - November 2016

2.4.2 In addition in collaboration with Chichester District Council, Arundel District Council has produced a Surface Water Drainage Proposal Checklist version 6 dated 13 September 2024 which outlines both councils' expectations and requirements for Surface Water Drainage proposals.

2.4.3 The above documents have been reviewed in the preparation of this report.

2.5 Local Planning Policy

2.5.1 The Arun Local Plan 2011 - 2031 was adopted in July 2018.

2.5.2 The following policies are of specific relevance to this Flood Risk Assessment:

2.5.3 **Policy W DM2 – Flood Risk** states that '*development in areas at risk from flooding, identified on the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment (SFRA) will only be permitted where all of the following criteria have been satisfied:*

a) The sequential test in accordance with the National Planning Policy Guidance has been met.

b) A site specific Flood Risk Assessment demonstrates that the development will be safe, including access and egress, without increasing flood risk elsewhere and reduce flood risk overall.

c) The sustainability benefits to the wider community are clearly identified.

d) The scheme identifies adaptation and mitigation measures.

e) *Appropriate flood warning and evacuation plans are in place; and*

f) *New site drainage systems are designed to take account of events which exceed the normal design standard i.e. consideration of flood flow routing and utilising temporary storage areas.*

The reports prepared as part of the criteria above must take into account contingency allowances, taking climate change into account as set out in Flood Risk Assessments: climate change allowances section of the NPPG.

In locations where strategic flood defence or resilient and resistant construction measures are necessary within the site itself, proposals will be required to demonstrate how measures have been incorporated as an intrinsic part of the scheme in a manner which is compatible with the latest Strategic Flood Risk Assessment.

All development proposals must take account of relevant Surface Water Management Plans, Catchment Flood Management Plans and related Flood Defence Plans and strategies such as the Lower Tidal River Arun Strategy. The council may require financial contributions from development on sites where measures to address flood risk or to improve the environmental quality of watercourses have been identified by these Plans and Strategies.'

2.5.4 **Policy W DM3 – Sustainable Urban Drainage Systems** states that '*to increase the levels of water capture and storage and improve water quality, all development must identify opportunities to incorporate a range of Sustainable Urban Drainage Systems (SUDS), appropriate to the size of development, at an early stage of the design process.*

Proposals for both major and minor development proposals must incorporate SUDS within the private areas of the development in order to provide source control features to the overall SUDS design. These features include:

- *Green roofs*
- *Permeable driveways and parking*
- *Soakaways*
- *Water harvesting and storage features including water butts.*

Proposals for major development must also integrate SUDS within public open spaces and roads, reflecting discussion with the appropriate bodies. SUDS must therefore be integrated into the overall design of a development and must:

a) *Contribute positively to the appearance of the area, integrating access to allow maintenance of existing watercourses and the system.*

b) *Effectively manage water (including its quality)*

c) *Accommodate and enhance biodiversity by making connections to existing Green Infrastructure assets and*

d) *Provide amenity for local residents (ensuring a safe environment)*

e) *Retain the existing drainage network of the site and the wider area,*

f) *Be maintained in perpetuity, supported through a Maintenance and Management Plan/Regime, including its financing, agreed with the Local Planning Authority.*

In order to ensure that SUDS discharge water from the development at the same or lesser rate, as prior to construction, developers must:

f) *(sic)Follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations and the SUDS manual produced by CIRIA.*

g) *Undertake up to six months groundwater monitoring within the winter period.*

h) *Undertake winter percolation testing in accordance with BRE365.*

i) *The proposed drainage system must be designed to ensure that there is no flooding on a 1 in 30 year storm event.*

j) *The design must also take account of the 1 in 100 year storm event plus 30% allowance for climate change, on stored volumes, to ensure that there is no flooding of properties or the public highway or inundation of the foul sewerage system. Any excess flows must be contained within the site boundary, and within designated storage areas.'*

2.5.5 **Policy ECC SP1 – Adapting to climate change** states that '*the Council will support development which is located and appropriately designed to adapt to impacts arising from climate change such as the increased probability of tidal and fluvial flooding; water stress; health impacts as a result of extreme temperatures and a decline in the quality of habitats and richness of biodiversity.*

In order to achieve this, development must be designed to take account of the following issues:

a) *Location (in relation to flood risk and vulnerability to coastal erosion);*

b) *Water efficiency;*

c) *Shade, cooling, ventilation, solar gain;*

d) *Connectivity to the green infrastructure network;*

e) *Layout and massing;*

f) *Resilience of buildings and building materials to extreme weather events; and*

g) *Capacity of drainage systems and incorporation of Sustainable urban Drainage Systems (SuDS).'*

3 Existing Site

3.1 Site Location

3.1.1 The development site is located on land to the north of 7 Roman Acre, Wick, Littlehampton, West Sussex at Ordnance Survey reference TQ 023 027. The nearest postcode is BN17 7HN.

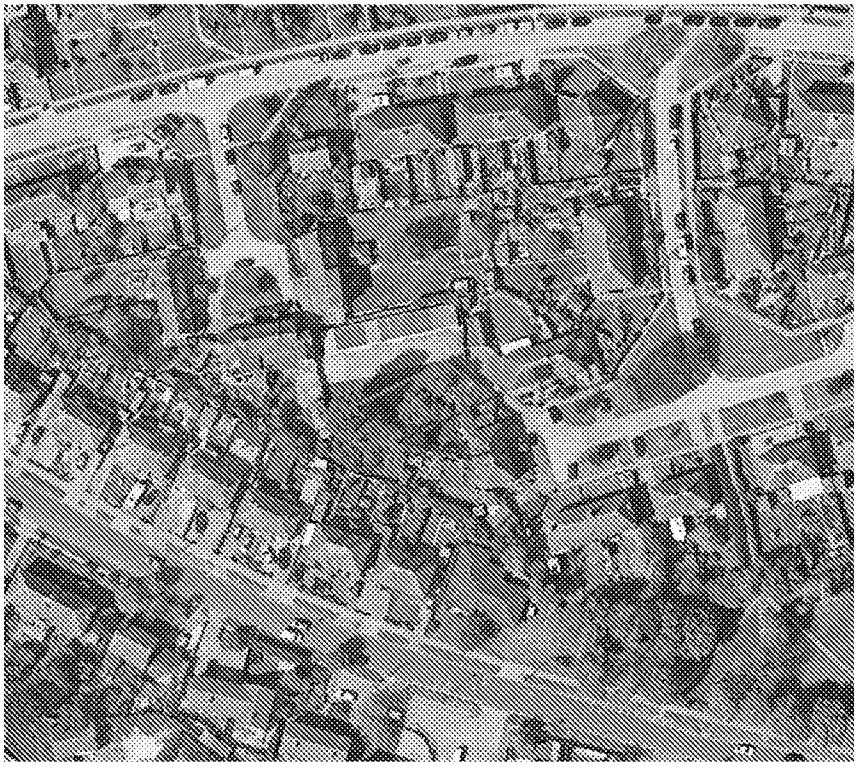


Image 1: Site Location

3.1.2 The site is bounded to the north by a row of lock up garages and to the east south and west by residential dwellings. Access to the site is from the west end of Roman Acre via the private access to the adjacent garages.

3.1.3 The closest watercourse is a tributary of the River Arun located approximately 430m to the southwest of the site, the River Arun is approximately 460m to the south of the site and is classified as Main River.

3.1.4 The site is approximately 1.7km north of the south coast.

3.1.5 A copy of the site location plan is located in Appendix 1 at the rear of this report.

3.2 Site Description

3.2.1 The site is approximately 565m^2 in area and currently comprises part of the garden of number 7 Roman Acre.

3.2.2 Existing ground levels are highest at the northwest corner of the site at approximately 4.59m AOD. The site falls towards its southeastern boundary to a level of approximately 4.0m AOD.

3.2.3 A copy of the existing site layout plan is located in Appendix 2 at the rear of this report.

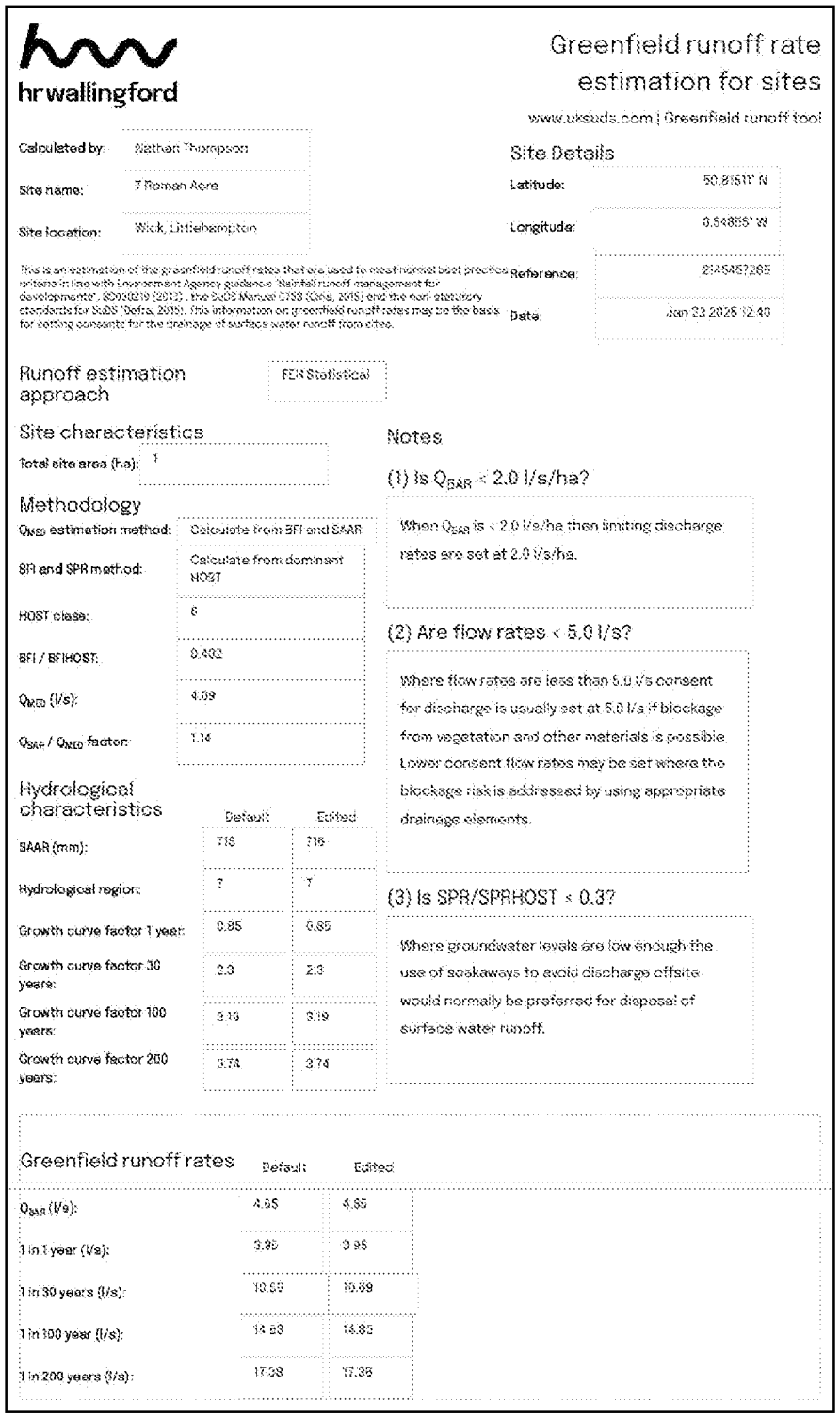
3.3 Existing Drainage

3.3.1 The site currently has no positive surface water or foul water drainage infrastructure.

3.3.2 Rainfall currently discharges in part to ground and in part overland as a greenfield runoff to the southeast of the site.

3.3.3 Pre-developed greenfield runoff rates have been established using the HR Wallingford tool for Greenfield runoff estimation based on the FEH Statistical method for rainfall estimation.

3.3.4 The Hydrology of Soil Type (HOST) has been confirmed by the National Soil Resources Institute at Cranfield University as soil type 6 which is classified as *'free draining permeable soils in unconsolidated loams or clays with low permeability and storage capacity.'*



hrwallingford

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Nathan Thompson

Site name: 7 Roman Acre

Site location: Wick, Littlehampton

Site Details

Latitude: 50.81511° N

Longitude: 0.54855° W

Reference: 2145457265

Date: Jan 23 2025 12:40

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2012) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach: FEH Statistical

Site characteristics

Total site area (ha): 1

Methodology

Q_{MED} estimation method: Calculate from SPR and SAAR

SPR and SPRHOST method: Calculate from dominant HOST

HOST class: 6

BFI / BFIHOST: 0.402

Q_{MED} (l/s): 4.09

Q_{BAR} / Q_{MED} factor: 1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	716	716
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST < 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	4.65	4.65
1 in 1 year (l/s):	3.95	3.95
1 in 30 years (l/s):	10.69	10.69
1 in 100 year (l/s):	14.83	14.83
1 in 200 years (l/s):	17.38	17.38

Image 2: Greenfield Runoff Calculation

3.3.5 The pre-developed greenfield runoff rates are as follows:

- Q_{bar} 4.65 l/s/ha
- 1:30 year 10.69 l/s/ha
- 1:100 year 14.83 l/s/ha

3.3.6 There are private drains beneath the garden of number 7 Roman Acre that convey surface and foul water to the public sewers.

3.3.7 There are also 300mm diameter public foul water sewers located beneath the rear gardens of 9-20 Roman Acre to the south of the site.

3.3.8 A copy of the sewer records is located in Appendix 3 at the rear of this report.

3.4 Geology and Groundwater

3.4.1 British Geological Survey maps confirm that the site is within an area underlain by a thin layer of River Terrace Deposits, silty sandy Clay overlying a bedrock formation of Chalk.

3.4.2 The online "Magic Map" available from Defra confirms that the site is located above a principal aquifer and groundwater vulnerability is classified as medium.

4 Flood Zone and Flood History

4.1 Tidal Flood Zone

4.1.1 The Environment Agency's online mapping notes that the site is located in Tidal Flood Zone 2.

4.1.2 Product 4 modelled flood information identified the site within current Flood Zone 3 and confirms the current climate change adjusted 1:200 year tidal flood level at the site as 3.744m AOD and the current climate change adjusted 1:1,000 year flood level at 4.044m AOD.

4.1.3 The lowest existing level on site is currently 4.0m AOD on the southeast boundary. This places the majority of the site in current Flood Zone 1 above the existing 1:1,000 year flood level with a small section of the driveway at the south east of the site being located in Flood Zone 2.

4.1.4 The tidal flood level data supplied by the Environment Agency is based on the data model from 2012. The predicted climate change models were updated in October 2021.

4.1.5 Reference has been made to the Environment Agency's latest predicted sea level rise data at https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances in order to establish the present day and future year tidal flood levels using the updated climate change predictions.

4.1.6 These are presented by the Environment Agency as a higher central allowance (70th percentile exceeded by 30% of the projections in the range) and an upper end allowance (95th percentile exceeded by 5% of the projections in the range).

4.1.7 The undefended 1:200 year tidal flood level supplied by the Environment Agency based on the data model from 2012 is 3.700m AOD.

4.1.8 The predicted undefended 1:1,000 year tidal flood levels based on the updated climate change predictions are as follows:

- 2012 1:1,000 year flood zone 1 level — 3.970m AOD
- 2025 1:1,000 year flood level — 4.044m AOD
- 2125 1:1,000 year flood level — 5.103m AOD

4.1.9 The predicted undefended 1:200 year tidal flood levels based on the updated climate change predictions are as follows:

- 2012 1:200 year flood level 3.700m AOD
- 2025 1:200 year flood level 3.744m AOD
- 2125 1:200 year flood level 4.833m AOD

4.2 Fluvial Flood Zone

4.2.1 The Environment Agency's mapping confirms that the site is located in Fluvial Flood Zone 1 and is not at risk of fluvial flooding from anything less extreme than a 1:1,000 year flood event.

4.3 Flood Defences

4.3.1 The site is in an area protected from tidal flooding by flood defences.

4.3.2 There are flood defence walls on the banks of the River Arun. The two closest walls to the site have been confirmed by the Environment Agency to have crest levels of 4.4m AOD and 4.8m AOD providing an estimated standard of protection of 1 in 300 years.

4.3.3 The flood defences are section 4D19 of the Littlehampton to Selsey Bill section of the government's Shoreline Management Plan and are scheduled as HL1 Hold The Line.

4.3.4 The policy is to hold the line in the short and long term extending to 2105 as follows:

'20 to 50 Years (2025 to 2055)

50 to 100 Years (2055 to 2105)

HL1 Hold the line

Maintain/replace

Where protection is currently provided by coastal defence structures or managed beaches, and the intention is to retain a defence along approximately the current alignment. This will involve replacing defences when needed. Defence type, method and standard of protection may be modified over time.'

4.4 Flood History

4.4.1 Environment Agency

4.4.1.1 The Environment Agency map of historic flood incidents does not identify any historic incidents of flooding affecting the site.

4.4.2 West Sussex District Council

4.4.2.1 Neither the Strategic Flood Risk Assessment dated January 2010, the Preliminary Flood Risk Assessment dated July 2011 nor the Local Flood Risk Management Strategy dated August 2014 identify any specific flood incidents affecting the site.

4.4.3 Arun District Council

4.4.3.1 The Strategic Flood Risk Assessment dated November 2016 does not identify any specific flood incidents affecting the site.

4.4.4 Copies of the available flood maps and correspondence are located in Appendix 4 at the rear of this report.

5 Flooding Potential

5.1 Tidal Flooding

5.1.1 As previously noted the present day 2025 and future year 2125 predicted tidal higher central flood levels are as follows:

- 1:200 Year present day 2025 Flood level 3.774m AOD
- 1:200 future Year 2125 Flood level 4.833m AOD

5.1.2 The existing flood defences on the banks of the River Arun have crest levels of 4.4m and 4.8m AOD.

5.1.3 Based on the updated climate change predictions for sea level rise these defences should provide protection until at least 2091 in their current form.

5.1.4 The defences are to be maintained and replaced when needed as part of the governments Shoreline Management Plan and can therefore be relied on to provide flood protection into the foreseeable future.

5.1.5 The vast majority of the site is currently located in Flood Zone 1, not at risk from flooding from any event less than a 1:1,000 year return period tidal flood event.

5.1.6 The site is located behind the current flood defences.

5.1.7 A small area at the southeast of the proposed driveway is currently located in Flood Zone 2 and at risk of flooding from events between 1:100 and 1:1,000 year return period tidal flood event if the existing flood defences fail or are removed.

5.1.8 Over the lifetime of the development the predicted future tidal flood risk with climate change allowance increases the proposed tidal flood level to 4.833m AOD placing the site in the future year (2056) Flood Zone 3a albeit still within an area protected by flood defences.

5.1.9 The risk of future tidal flooding to the site is therefore a low with negligible risk to the dwelling even in the event that flood defences fail during a future 1:200 year tidal event.

5.2 Fluvial Flooding

5.2.1 The site is located in fluvial Flood Zone 1 and is not at risk of fluvial flooding from anything less extreme than a 1:1,000 year flood event.

5.3 Groundwater Flooding

5.3.1 The flood mapping contained within Arun District Council's Strategic Flood Risk Assessment dated November 2016 includes a map showing areas susceptible to groundwater emergence.

5.3.2 The mapping is divided into 1x1km squares and identifies the proportion of each square where geological and hydrogeological conditions show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring.

5.3.3 The proposed development site is located within a 1x1km square, with greater than 75% of which is potentially susceptible to groundwater emergence.

5.3.4 There are no records identified within West Sussex District Council's Strategic Flood Risk Assessment, Preliminary Flood Risk Assessment or Local Flood Risk Management Strategy nor in Arun District Council's Strategic Flood Risk Assessment of groundwater flooding affecting the site.

5.4 Overland Flow

5.4.1 The Environment Agency maps identify the southeast of the site to be at low risk of flooding from overland surface water. The locations identified are however minimal, classified as low vulnerability and the proposed development is not at a significant risk from surface water flooding.

5.4.2 The flood mapping contained within the various flood documents produced by West Sussex County Council and Arun District Council does not identify any flood risk associated with overland flow routes.

5.5 Advance Flood Warning

5.5.1 The site is located within a Flood Warning Area with alerts typically raised 5 days before a predicted flood event.

5.5.2 Flood warnings can be signed up for at www.fws.environment-agency.gov.uk or by phone using the Environment Agency's Floodline service on 0345 988 1188.

6 Development Proposals

6.1 Description

6.1.1 The development proposals are for the construction of one residential dwelling with associated access, car parking and landscaping.

6.1.2 The areas of the various positively drained elements of the development are summarised as follows:

- Roof Area $78m^2$
- Drive $69m^2$

6.2 Future Flood Risk Mitigation

6.2.1 The dwelling is proposed to be constructed with finished floor levels of 4.850m AOD, above the predicted future year 1:200 year flood level of 4.833m AOD.

6.2.2 All sleeping accommodation is proposed at first floor at a level of 7.55m AOD or above, placing all sleeping accommodation 2.717m above the predicted future undefended tidal flood level.

6.2.3 A copy of the proposed site layout plan showing the positively drained areas is located in Appendix 5 at the rear of this report.

6.3 Surface Water Drainage Generally

6.3.1 CIRIA report C753 The SuDS Manual-v6 provides guidance on surface water drainage. The aim for surface water runoff is to match greenfield runoff rates and volumes where reasonably achievable.

6.3.2 For surface water discharge, the drainage hierarchy notes the following list of drainage options in order of preference:

1 Infiltration to ground

2 Discharge to a watercourse

3 Discharge to a surface water sewer

4 Discharge to a foul water sewer

6.3.3 The geology of the area suggests that infiltration to ground is unlikely to be viable but the site will undertake soakage testing to BRE 365 and winter groundwater monitoring to confirm.

6.3.4 Two surface water options have been prepared to confirm surface water can be discharge from the site using a SuDS compatible scheme.

6.4 Surface Water Drainage Preferred Option

6.4.1 The preferred option for the surface water drainage strategy is to discharge surface water by infiltration to ground via a crate soakaway in the rear garden of the new development and a shallow Type 3 30% voided stone drainage blanket located beneath the driveway.

6.4.2 Preliminary calculations have been prepared based on an assumed infiltration rate of $1x10^{-6}$m/s has been used which is typical of the type of the river terrace deposits in the locality.

6.4.3 If the site specific testing confirms infiltration to ground is not a practical method of discharging surface water runoff from this site then following the drainage hierarchy the next available option, given that there are no watercourses located in close proximity to the site, is to discharge at a suitably restricted rate to the surface water sewer located in Roman Acre using the existing private surface water drainage network.

6.5 Surface Water Drainage Option 2

6.5.1 In the event that infiltration proves unviable a restricted discharge will be made to the public surface water sewer that crosses Roman Acre to the east of the site.

6.5.2 The total positively drained area of the site will be approximately 147m^2 and the equivalent greenfield runoffs are as follows:

- Q_{bar} (approximate 1:2 year) at 4.65 l/s/ha 0.1 l/s
- 1:30 year at 10.69 l/s/ha 0.22 l/s
- 1:100 year at 14.83 l/s/ha 0.31 l/s

6.5.3 HR Wallingford guidance recommends a maximum restriction of 2l/s. Rates of 1l/s are however now achievable for discharges from permeable paving systems.

6.5.4 Preliminary calculations based on a maximum discharge rate of 1l/s during the 1:100 year plus climate change event have been prepared in order to demonstrate that surface water drainage can be adequately accommodated within the site without any increased flood risk elsewhere.

6.5.5 A permeable hardstanding is can be provided with a 30% voided subbase sized with sufficient storage to accommodate a 1:100 year storm event including an additional 45% to account for the predicted effects of future climate change.

6.5.6 Copies of the preliminary drainage strategy plans together with calculations are located in Appendix 6 at the rear of this report.

6.6 Water Quality

6.6.1 The proposed development is for residential use. In accordance with CIRIA SuDS Manual 2015 (Report C753), the pollution hazard level for this type of development is classified as between very low and low depending on the use / area of the site.

6.6.2 The surface water drainage scheme will include mitigation to ensure that surface water is suitably treated and any pollution risk adequately managed prior to discharge.

6.6.3 Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types. Those of relevance to the development proposals are as follows:

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car park, low-traffic roads	Low	0.5	0.4	0.4

Table 1: Pollution Hazard Indices

6.6.4 The surface water drainage design will include the use of permeable paving which is sufficient to provide the required level of treatment.

SuDS Type	Total suspended solids (TSS)	Metals	Hydrocarbons
Permeable pavement	0.7	0.6	0.7

Table 2: Pollution Mitigation Indices

6.6.5 An outline drainage management and maintenance plan is located in Appendix 7 at the rear of this report.

7 Safe Development

7.1 Flood Zone Compatibility

7.1.1 The site and is predominantly located within Flood Zone 1 with a small area located on the outer edge of Flood Zone 2.

7.1.2 Based on current Climate Change predictions the site will move into defended Flood Zone 3a in the future year 2056.

7.1.3 With reference to Annex 3 of the National Planning Policy Framework and Table 2 of the Government Guidance on Flood Risk and Coastal Change at https://www.gov.uk/guidance/flood-risk-and-coastal-change:

- Annex 3: Flood Risk Vulnerability Classification

  Residential development is classified as More Vulnerable.

- Table 2: Flood Risk Vulnerability and Flood Zone Compatibility

  More Vulnerable development is considered appropriate in Flood Zones 1 and 2 with the Exception Test required for development in Flood Zone 3a.

7.1.4 The development is at a residual risk from future climate change adjusted tidal flood events if the current defences fail or are removed. The defences are part of the hold the line shoreline management strategy with policy to maintain or repair the defences into the foreseeable future.

7.1.5 The finished floor level of the dwelling has been set above the future year 2125 1:200 year flood level ensuring the proposed dwelling remains above any future tidal flood level even in the event of a failure of the tidal defences which ensures the development remains safe throughout its lifetime.

7.2 Risk to Others

7.2.1 The proposed surface water drainage system will be designed to current standards incorporating SuDS elements providing attenuation and storage which will minimise runoff leaving the site during times of heavy rain.

7.2.2 Allowance has been made for a 45% increase in rainfall intensities which accords with the latest figures published by the Environment Agency and with the requirements under the National Planning Policy Framework.

7.2.3 The proposed drainage system will incorporate sufficient treatment prior to final discharge thus mitigating the risk of pollution from the site.

7.2.4 Two surface water drainage strategies have been prepared to demonstrate that a suitable method of surface water discharge from this site is viable.

7.2.5 Both of the drainage strategies indicate that surface water can be attenuated and stored on site for all storm events up to and including the 1 in 100 year storm event with and additional 45% to account for the effects of climate change, and that runoff from the development can be minimised and the resultant risk is negligible.

7.2.6 The residual risk of sewer flooding from this development for the foreseeable future is therefore negligible.

7.3 Surface Water Exceedance Routes

7.3.1 In the event that part of the onsite surface water drainage network was to become blocked or suffer a failure due to lack of maintenance surface water would migrate overland towards Roman Acre mimicking the existing exceedance route.

7.3.2 In the event of a storm return period in excess of the 100 year +45% design standard surface water would flow overland towards the southeast corner of the site onto Roman Acre and via the local highway network towards the coast mimicking the existing exceedance route.

7.3.3 A surface water exceedance route plan is located in Appendix 8 at the rear of this report.

8 Conclusions

8.1 The vast majority of the site is located within Flood Zone 1 and is not at risk of flooding from tidal or fluvial sources, groundwater or at a significant risk overland surface water flows.

8.2 A small area of the proposed driveway at the southeast of the site is located in defended tidal Flood Zone 2 and only at residual risk of flooding should the existing flood defences completely fail or be removed.

8.3 The site is in an area protected by flood defences, which are to be maintained and replaced when needed as part of the government's Shoreline Management Plan and will therefore provide flood protection into the foreseeable future.

8.4 There are no historic records of flooding from any source affecting the site or its immediate area.

8.5 Two options for suitable SuDS drainage systems have been prepared both of which accord with the requirements of national and local policy.

8.6 Preliminary calculations indicate that surface water runoff generated by the proposed development can be attenuated on site for all rainfall events up to the 1:100 year event including an allowance for climate change.

8.7 Water quality improvement will be provided to mitigate against any risk to any receiving waterbody.

8.8 In terms of flood risk planning the proposed development is safe and will manage surface water from all rainfall events up to the 100 year plus climate change event so as not to increase flood risk elsewhere.

9 List of Appendices, Images and Tables

Appendix 1

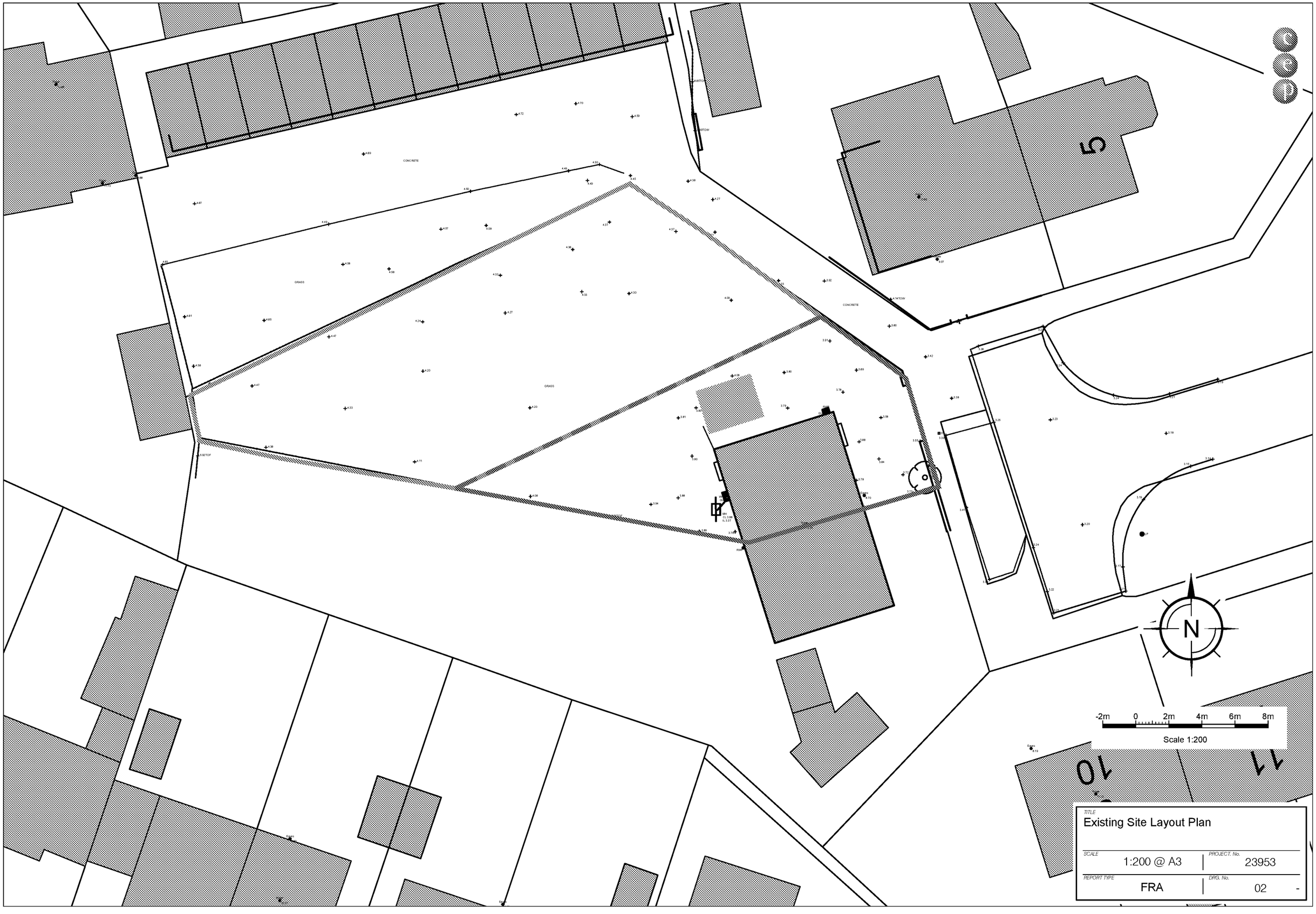
Site Location Plan

Site Location Plan - 7 Roman Acre
Wick, Littlehampton BN17 7HN
OS Reference TQ 023 027

Scale	1:10000 @ A3	Project No.	23953
Report Title	FRA	Dwg No.	01 -

Appendix 2

Existing Site Layout Plan

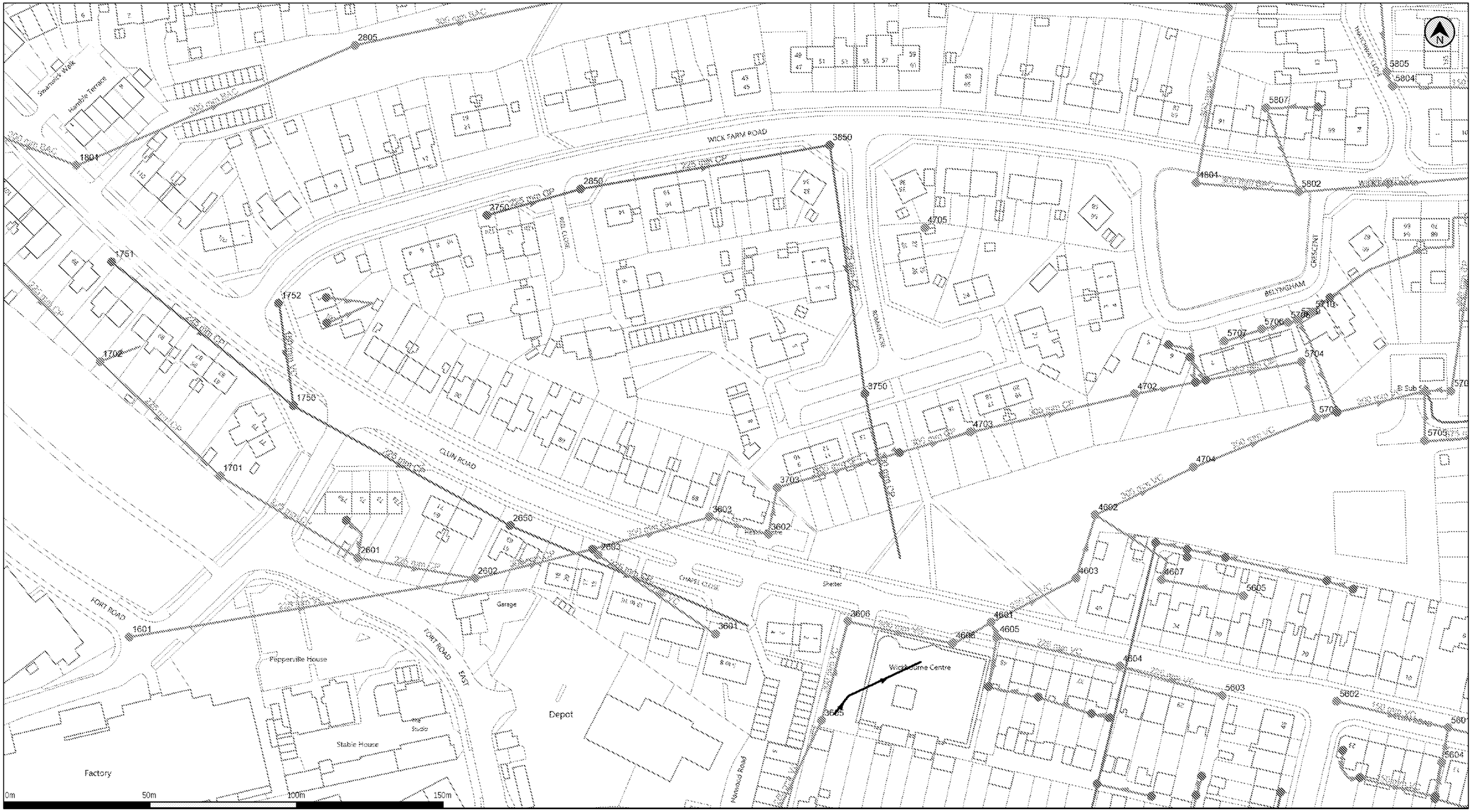


TITLE
Existing Site Layout Plan

SCALE	PROJECT. No.
1:200 @ A3	23953
REPORT TYPE	DRG. No.
FRA	02 -

Appendix 3

Sewer Records



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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 2025 Ordnance Survey AC0000808122 .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.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Demarcation Chamber, Dummy Manhole or Surface Water Soakaway

mat@civil.co.uk

23953 Roman Acre

Southern Water.

ARUN DISTRICT COUNCIL LU/36/25/PL

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1601	F	0.00	0.00	
1701	F	4.98	3.07	
1702	F	5.32	3.34	
1801	F	5.13	0.30	
2601	F	5.11	2.78	
2602	F	4.86	1.58	
2603	F	3.46	1.81	
2805	F	5.81	-0.05	
3601	F	2.90	1.99	
3602	F	3.02	1.30	
3603	F	3.24	1.35	
3605	F	3.51	-0.43	
3606	F	3.41	-0.56	
3703	F	3.04	0.00	
4601	F	3.81	-0.74	
4602	F	2.70	-1.22	
4603	F	3.46	-0.97	
4604	F	4.61	3.07	
4605	F	3.85	2.01	
4606	F	3.87	-0.70	
4607	F	0.00	0.00	
4702	F	3.11	0.00	
4703	F	2.88	1.07	
4704	F	2.51	-1.24	
4705	F	0.00	0.00	
4801	F	4.33	-1.06	
5601	F	5.64	4.13	
5602	F	5.20	4.50	
5603	F	4.79	3.74	
5604	F	0.00	0.00	
5605	F	0.00	0.00	
5701	F	2.62	-2.05	
5703	F	2.69	-1.46	
5704	F	3.10	0.77	
5705	F	2.58	-1.93	
5706	F	0.00	0.00	
5707	F	0.00	0.00	
5708	F	0.00	0.00	
5709	F	0.00	0.00	
5710	F	0.00	0.00	
5802	F	3.98	-1.21	
5803	F	3.89	-0.89	
5804	F	3.63	2.87	
5805	F	3.63	2.91	
5807	F	0.00	0.00	
1750	S	5.31	3.95	
1751	S	5.59	4.26	
1752	S	5.48	4.26	
2650	S	4.17	3.07	
2750	S	5.39	4.04	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2850	S	5.27	3.81	
3750	S	3.21	1.93	
3850	S	4.85	3.12	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert