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PROPOSED RESIDENTIAL DEVELOPMENT

ON LAND ADJACENT TO ROMNEY AVENUE

FOLKESTONE

KENT, CT20 3QJ

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

FOR

VILLAGE HOMES FOLKESTONE LTD

5th July 2019

Report no: 3066 FRA

REV A

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Report Status: Preliminary **Project no:** 3066 **Date:** 05/07/2019

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Contents

1 Introduction and Brief

This report has been prepared for Village Homes Folkestone Ltd to assess Flood Risk and to provide guidance on the method of surface water disposal for the proposed residential development on land adjacent to Romney Avenue, Folkestone, Kent, CT20 3QJ. The proposal is to construct 8 dwellings with associated access road and parking.

Figure 1.1 – Development Proposals – full drawing within Appendix 1

This document has been produced in accordance with current best practice and recommendations and guidance set out in the National Planning Policy Framework (NPPF).

Considine has no responsibility to any other parties to whom this report may be circulated, in part or in full, and any such parties rely on the contents of this report solely at their own risk.

2 Existing Site Conditions

2.1 Location

The development site is located at land adjacent to Romney Avenue, Folkestone, Kent, CT20 3QJ.The British National Grid Reference is: E: 620590, N: 136059. The figures below show the site in the wider area, more locally and then an aerial image to show the site in its current context.

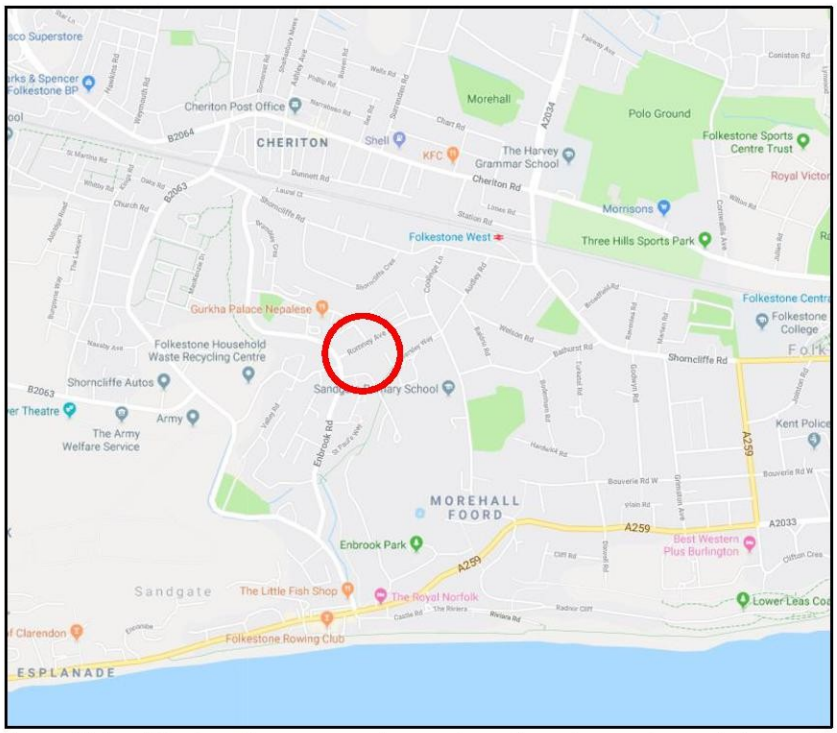

Figure 2.1 – Site location general area. Location shown by red circle. © Google Maps

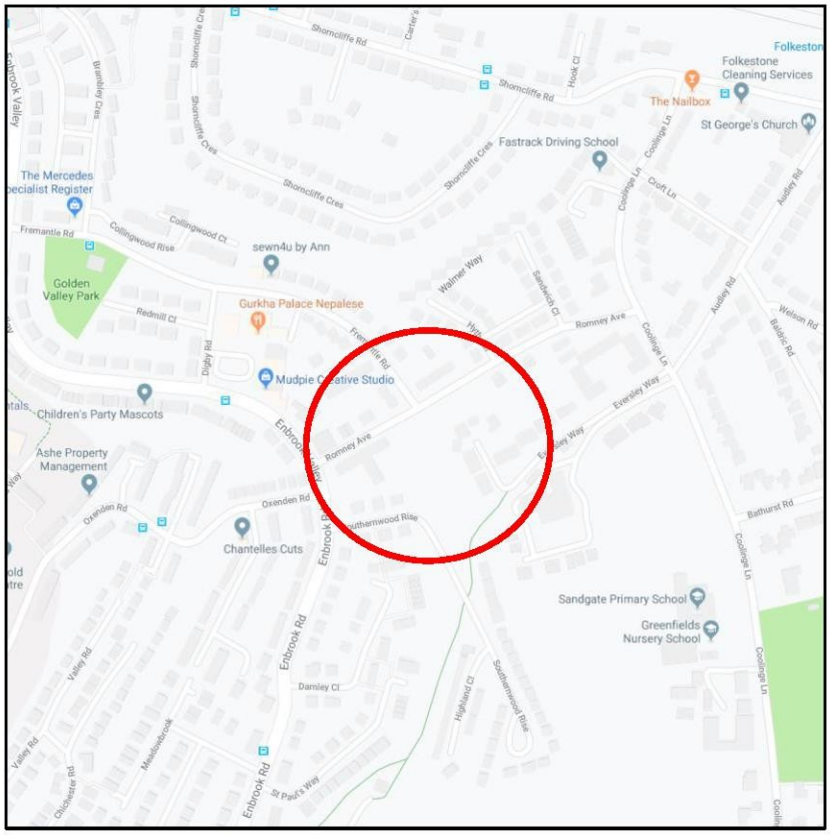

Figure 2.2 – Site Location shown by red circle. © Google Maps

The following aerial image provides additional information about the context of the site and surrounding areas.

Figure 2.3 – Aerial image of site © Google Maps. Approximate site boundary shown in red.

The site is currently undeveloped. It is bounded by Romney Avenue on the north west boundary, and residential dwellings on all other boundaries.

The existing development impermeable areas are shown in the figure below and are summarised as follows:

Total Site Area:	approximately	3,138 m^2
Existing Roof Area:		0 m^2
Existing Impermeable Hardstandings:		0 m^2
Total Impermeable Area:		0 m^2

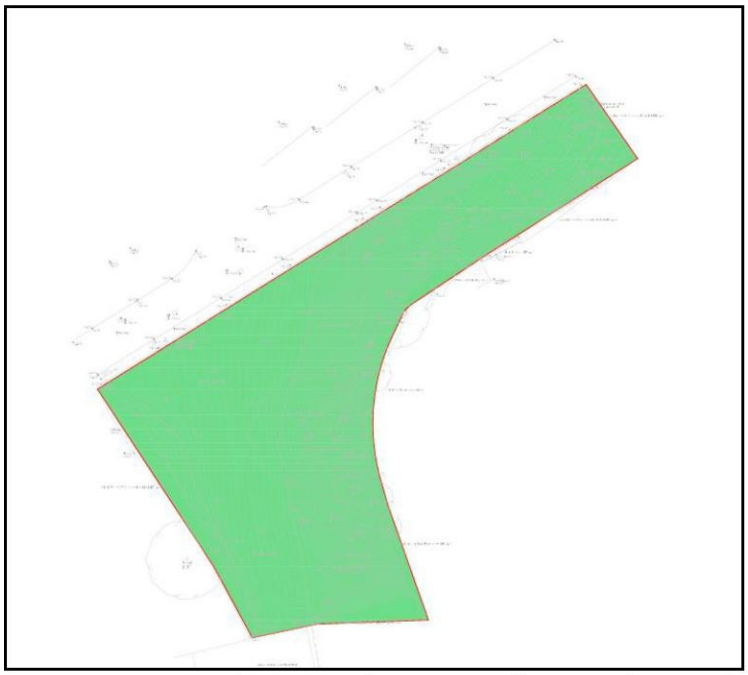

Figure 2.4 – Drained Areas Analysis Extract (Pre-Development)

2.2 Site Topography

A review of the topographical survey indicates that the site generally falls from the east to west. Overall, there is a fall of approximately 17m.

2.3 Site Geology

A review of the BGS online bedrock mapping tool has identified that the development site is likely underlain by the Folkestone Formation (Sandstone). These sedimentary rocks are defined by the BGS as 'detrital, ranging from coarse to fine grained forming interbedded sequences'.

The site is also noted to be within the vicinity of the Sandgate Formation (Sandstone, Silstone and Mudstone). These sedimentary rocks are defined by the BGS as 'detrital, ranging from coarse to fine grained forming interbedded sequences'.

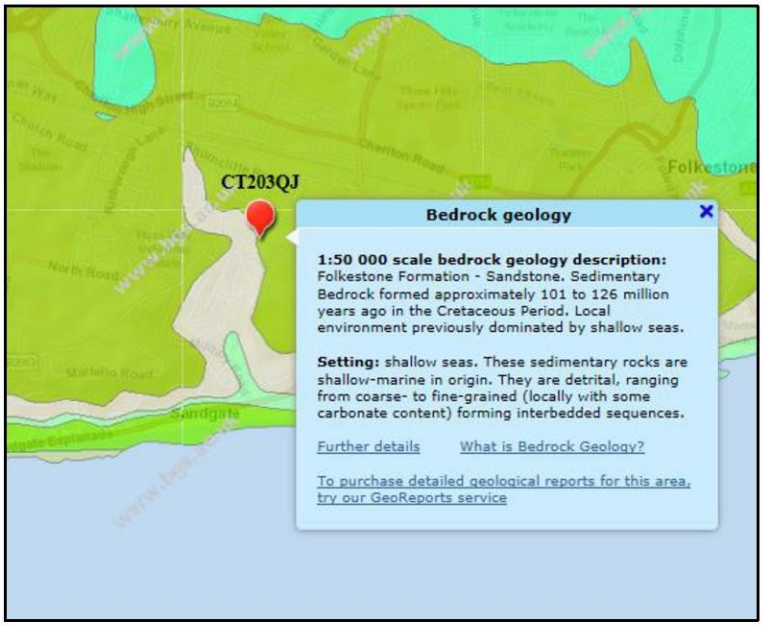

Figure 2.5 – BGS Extracts: Bedrock Geology © BGS

A review of the BGS online superficial deposits mapping tool has identified that the development site is not likely underlain by a superficial deposit. There are, however, superficial deposits within the area, comprising Peat. Peat is a partially decomposed mass of semi-carbonised vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.

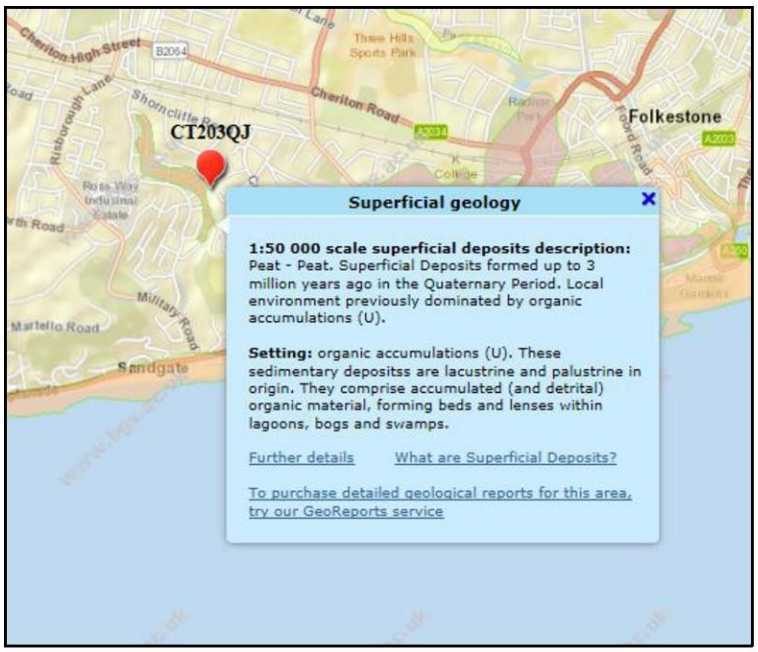

Figure 2.6 – BGS Extracts: Superficial Geology © BGS

A site investigation carried out by Peter Baxter Associates (Ref: 1145/SI) indicates that the site's geology is as per BGS predictions. Percussion Drilling Logs have been appended to this report.

2.4 Hydrogeology and Hydrology

The Environment Agency provide information about the groundwater and aquifers. Review of that information confirms that the site is not within a Ground Water Source Protection Zone. It is, however, located over a Principal Aquifer in terms of the Bedrock and it is also located within a Groundwater Vulnerability Zone. The following EA Extracts identify the zoning for the site.

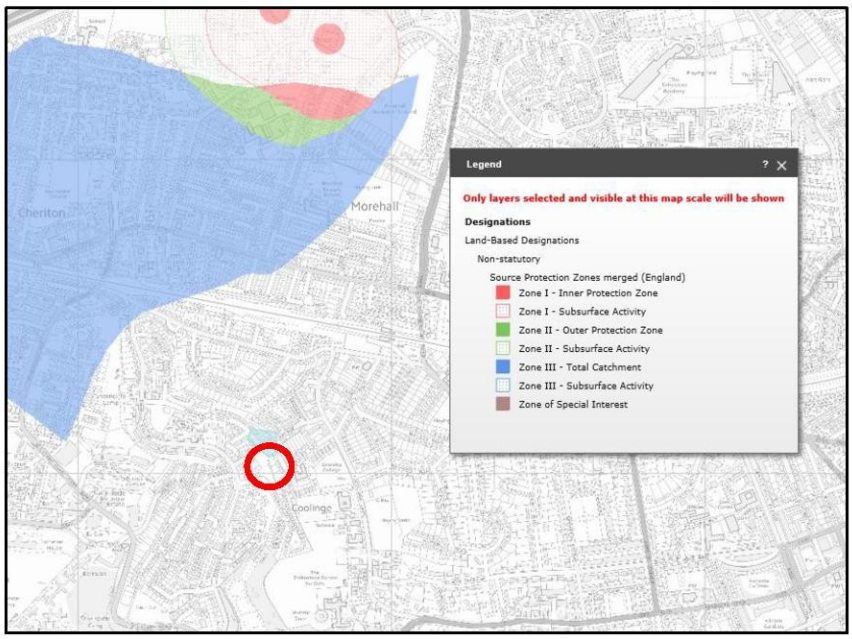

Figure 2.7 – Groundwater Source Protection Zone © Environment Agency

As defined within the figure above, the site is outside of the Groundwater Source Protection Zones.

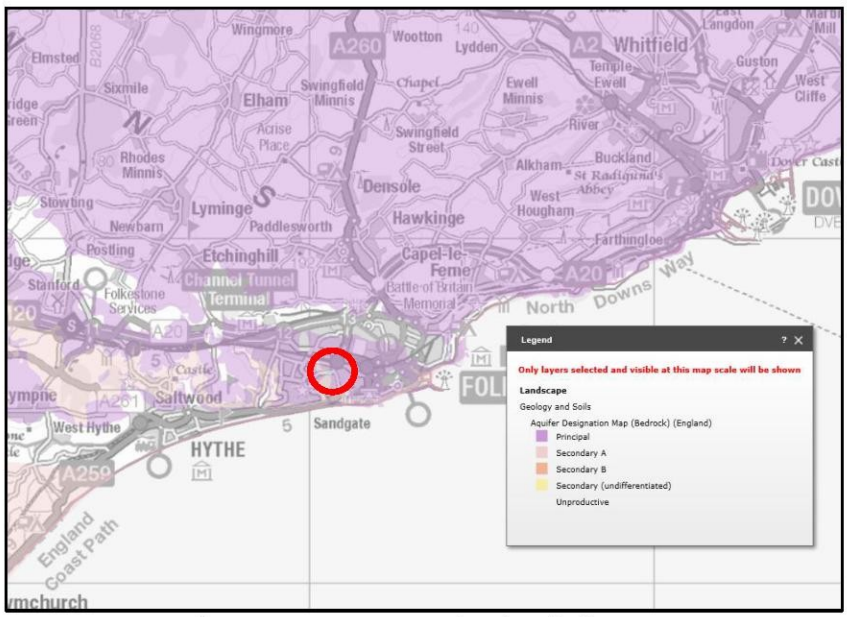

Figure 2.8 – Aquifer Designations Map (Bedrock) © Environment Agency

As noted within the figure above, the site is above a Principal Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as a major aquifer.

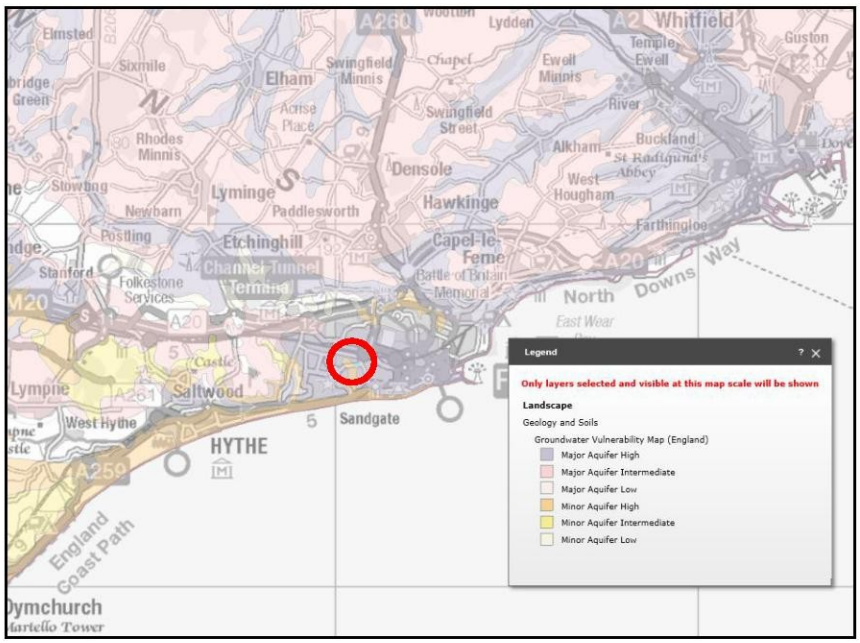

Figure 2.9 – Groundwater Vulnerability Zone Map © Environment Agency

As noted within the above figure, the site is also within the Major Aquifer High Groundwater Vulnerability Zone. The Environment Agency indicates that these areas are able to easily transmit pollution to groundwater. They are characterised by high leaching soils and the absence of low permeability superficial deposits.

It is important though to understand that pollution risks are an issue for the underlying geology. As such the risk of Pollution can be assessed using the Source, Pathway, Receptor model as follows.

Source – there are two sources of potential contamination on the site. Firstly, contamination as a result of current and previous site activities and secondly from the proposed site activities. The existing site is undeveloped with little contamination risk. The proposed development is for residential purposes. Therefore, although there shall be an increase risk of contamination, it is still considered low.

Pathway – the pathway is the vertical movement of water through the subsoils and the chalk bedrock. This can be by direct surface down soakage or from drainage features such as soakaways or other infiltration systems. The infiltration potential is low at the site, and therefore the opportunities for ingress of contaminants is also low.

Receptor – the receptor is the groundwater within the outer source protection zone. Investigations carried out by Peter Baxter Associates (Ref: 1145/SI) indicate that

groundwater is relatively high. Groundwater has been measured between 0.7-3.6m below ground level. Where infiltration is proposed, a suitable unsaturated zone should be applied.

Water Quality and Surface Water runoff is addressed later in this report.

2.5 Water Abstraction

A review of the Environment Agency's online mapping tool has identified that there are no abstraction within the immediate vicinity of the site. Also, it is not located within the catchment area for a river abstraction licence.

3 Proposed Development

The proposal is to construct 8 dwellings with associated access road and parking. The figure below shows the Architect's current proposals.

Figure 3.1 – Proposed Site Plan – full drawing within Appendix 1.

The proposed development impermeable areas are shown in the figure below and are summarised as follows:

Total Site Area:	approximately	3,138m^2
Proposed Roof Area:		509 m^2
Impermeable Hardstandings:		704 m^2
Total Impermeable Area:		1213 m^2

Figure 3.2 – Drained Areas Analysis Extract (Post-Development)

It is evident that the proposals increase the impermeable areas by 1213m^2.

In accordance with KCC's Drainage and Planning Policy Statement, an allowance of 10% should be included for urban creep. Therefore, an impermeable area of 1334m^2 needs to be considered for surface water design.

4 Flood Risk

4.1 Scoping Study

This Flood Risk Assessment (FRA) is based on the guidance provided within section 10 of the NPPF and accompanying Planning Practice Guidance (PPG). As according to the PPG, a site typically requires a specific detailed FRA where the total site area is greater than 1ha or the site is found to be at risk of flooding.

The site is less than 1ha and, therefore, the requirement for an FRA is subject to the site being at risk of flooding.

As per the Environment Agency's Flood Map for Planning, the site is noted to be within Flood Zone 1. Flood Zone 1 is defined as having a low probability of flooding (less than 1:1000 annual probability).

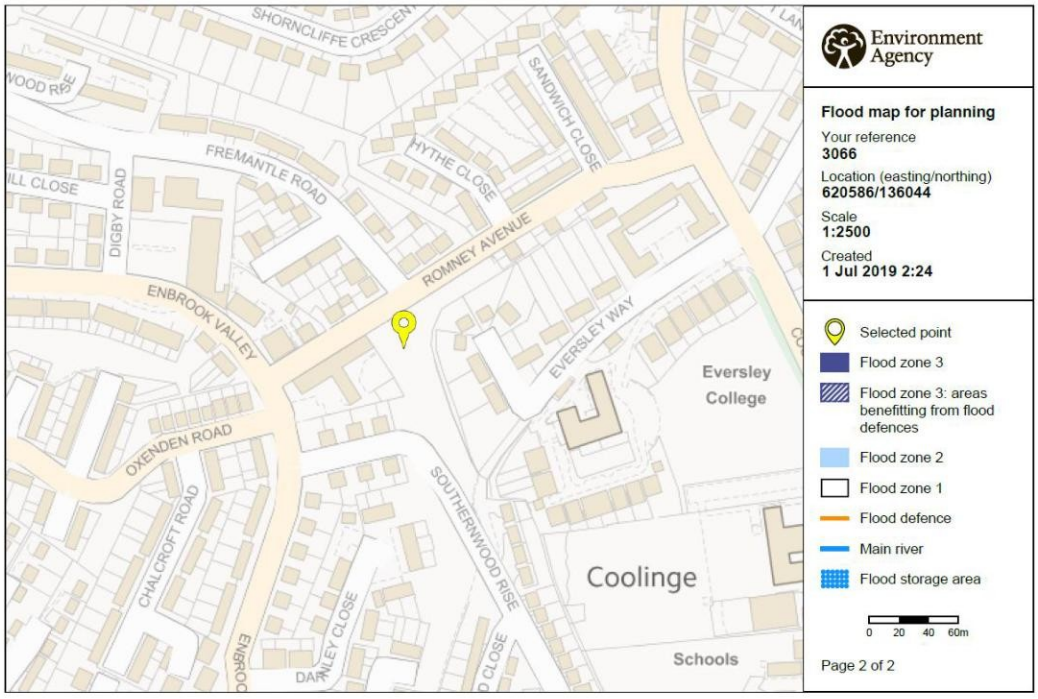

Figure 4.1 – Extract of Environment Agency's Flood Map for Planning – full report is shown at Appendix 2 of this report.

For the avoidance of doubt, the Environment Agency's Long Term Flood Risk Map has been interrogated. The site is noted to be at very low risk of flooding (less than 1:1000 annual probability).

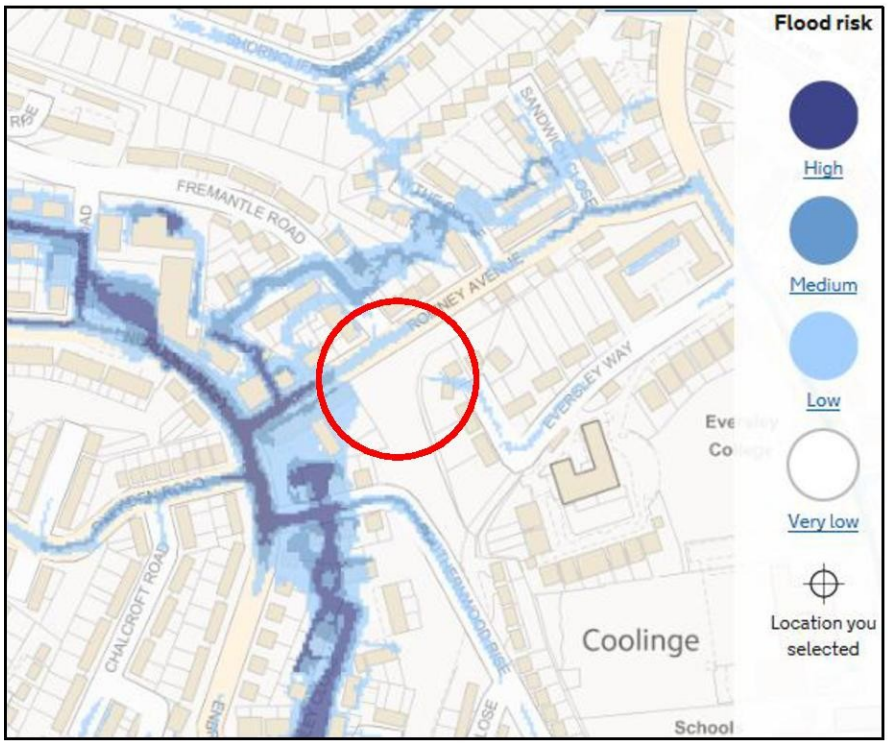

Figure 4.2 – Extract of Environment Agency's Surface Water Flood Map.

As the site area is less than 1ha and there is no noted risk of flooding to the development, it is deemed, in accordance with PPG, that an FRA is not required.

4.2 Flood Risk Summary

As the site area is less than 1ha and there is no noted risk of flooding to the development, it is deemed, in accordance with PPG, that an FRA is not required.

5 Proposed Foul Water Strategy

5.1 Existing Development FW System

It is evident from Southern Water sewer asset records that there is an existing 150mm diameter foul water sewer within Romney Avenue.

There is no development within the site currently, and therefore there is no existing foul water system.

5.2 Capacity Check

Since the OFWAT Regulation changes of April 2018 it is no longer a requisite to check available capacity. The new requirement is for the sewer authority to accept all discharge from new development sites into their nearest available sewer. In exchange they receive an enhanced connection payment per dwelling in order to fund network improvements. If the local network does not have available capacity and the improvement programme is not going to be completed until sometime after the development is complete, then the sewer authority (Southern Water Services) can work with the developers to agree temporary solutions to the capacity issue – these measures can include on site storage or timed pumping.

The proposal is to construct 8 dwellings with associated access road and parking.

Existing Occupancy

The site is greenfield with no development. Therefore, there is no existing foul discharge.

Proposed Occupancy

The FW expected to be generated by the site has a peak flow of approximately 0.378 litres per second with an average flow of 0.063 litres per second. This is calculated as follows:-

Residential Load

3 bed units – 4 x 5P = 20P
4 bed units – 4 x 6P = 24P
Total residential population (P) = 44.

Adjusted population (P) = 44 x 0.8 = 36.

Total occupancy of 36 persons @150 litres per day (Flows and Loads) = 5,400 l/day.

5,400 / (24x60x60) + = 5,400 / 86,400 = 0.063 l/s average which is 0.378 l/s peak flow.

This is an increase in peak flow by approximately 0.378 l/s. It is a requirement that the local drainage authority is consulted to approve the means and mode of connecting the new

development to the public sewer network under a formal Section 106 connection agreement.

5.3 Foul Water Strategy

On the basis of the above, it is proposed that the foul network is connected to the existing public foul sewer within Southern Water.

Detailed site investigation shall be required prior to detailed design, to ascertain the opportunities and constraints of a gravity connection.

A formal Section 106 connection approval will be required from the sewer authority.

6 Proposed Surface Water Strategy

6.1 Existing Surface Water Strategy

It is evident from Southern Water sewer asset records that there is an existing 300mm diameter surface water sewer within Romney Avenue.

As the site is greenfield and the anticipated strata is expected to have poor infiltration properties, it is assumed that a proportion of the surface water infiltrates into the ground at a slow rate whilst the remainder is assumed to discharge onto Romney Avenue.

6.2 Existing Run Off Rates

The existing site comprises dense wooded areas and grassed areas. The site is considered as greenfield in nature.

The underlying geology from review of BGS data indicates that the site is likely impermeable in terms of infiltration. Accordingly, the existing runoff rates have been calculated using Innovyze: MicroDrainage using the IH124 methodology.

The Interim Code of Practice recommends that the IH124 method is applied with 50ha, and the resulting discharge is linearly interpolated for the required area. The table below outlines the Greenfield Runoff rates for the existing site.

Table 6.1 - Summary of Greenfield Runoff Rates obtained from MicroDrainage.

Greenfield Runoff Rates			
	50ha	Greenfield Site (0.31ha)	Greenfield Runoff for Proposed Impermeable Area (0.12ha)
Qbar	231.1	1.43	0.55
1 in 1 year (l/s)	196.4	1.22	0.47
1 in 30 years (l/s)	523.7	3.25	1.26
1 in 100 years (l/s)	737.1	4.57	1.77

Methods for managing surface water are discussed in the following sections.

6.3 Managing Surface Water

The management of surface water has been assessed in accordance with the guidance set out in Ciria report C753 'The SuDS Manual 2015'.

To mimic the natural catchment processes as closely as possible, a "management train" is required. This concept is fundamental to successful management of surface water and

employs drainage techniques in series to incrementally reduce pollution, flow rates and volumes.

The hierarchy of techniques and processes that should be considered in developing the management train are as follows:

- **Prevention.** The use of good site design and housekeeping measures to prevent run off transporting pollutants to the drainage system.

- **Source Control.** Control of run off at or very near to its source. This includes disposal methods that comprise soakaways and other infiltration techniques, green roofs and permeable pavements.

- **Site Control.** Management of surface water locally within a development site. This includes disposal techniques that comprise infiltration structures and detention basins.

- **Regional Control.** Management of run off from a site, or series of sites, typically in a balancing pond or wetland. However, for this development regional controls do not apply.

6.4 Managing Surface Water – Scheme Proposals

Wherever possible, surface water should be managed in small cost effective landscaped features located within small sub catchments rather than being conveyed to and managed in large systems at the bottom of the drained area. The techniques that are higher in the hierarchy are preferred to those further down so that prevention and control of water at source should always be considered before site or regional controls. However, where upstream opportunities are restricted, a number of lower hierarchy options should be used in series and water should only be conveyed elsewhere if it cannot be dealt with on site.

Prevention

Proposed hardstandings at the site are less than 800m^2. Due to the minimal parking and access road area, it is reasonable to provide pollution prevention measures such as deep trapped gullys and catchpit chambers.

Source Control

As already noted, source control features include permeable pavements and other infiltration structures which are explored further as follows.

Permeable Pavements - provide a pavement suitable for pedestrian or vehicle traffic, while allowing rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored before either infiltrating into the ground below or discharging to piped outfall. They are traditionally 'shallow' structures with a depth to formation of around 350mm, depending on the traffic conditions and recorded soakage rate/discharge rate.

Permeable pavements also offer an extra stage of pollution control as a direct result of their construction. The permeable sub bases and block work laying course can remove between 60% and 95% of total suspended solids and 70% to 90% of hydrocarbons. When subjected to low level oil drips, such as in car parks, the pavements can continue to biodegrade the hydrocarbons indefinitely. 'Pollution Prevention Guideline' PPG 3 (Environment Agency, 2006) identified the beneficial performance of permeable pavements in removing pollution from runoff.

It stated that: "*Techniques that control pollution close to the source, such as permeable surfaces or infiltration trenches, can offer a suitable means of treatment for runoff from low risk areas such as roofs, car parks, and non-operational areas*". Permeable pavements are more effective at removing a wider range of pollutants from runoff than oil separators (Ciria, 2004).

It is anticipated that infiltration is limited at the site. Although permeable pavements can be lined and act as attenuation, it is deemed that the existing gradients onsite are not sympathetic to such storage solutions. Additionally, the area of hardstandings is low and it is believed contaminants can be adequately controlled via deep gully traps and catchpits. Therefore, permeable pavements have not been recommended for this site.

Swales – The development site layout does not naturally lend itself to the widespread use of swales. There are some areas that could include an element of swale if the detailed design of the other elements allows sufficient space, but this has been discounted in the assessment thus far.

Ponds – The development site layout does not naturally lend itself to the use of ponds for infiltration or attenuation purposes.

Green Roofs - comprise a multi-layered system that covers the roof of a building or podium structure with vegetation/landscaping over a drainage layer. They are designed to intercept and retain rainfall and reduce the volume of run off and attenuate peak flows. Green roofs should be designed to attenuate all storms up to and including the peak 2 year event, they will also contribute to attenuation of peak flows during larger storm events. This should be taken in to account when sizing downstream drainage systems.

Ciria Report C697 gives advice on the installation of green roofs and states that they operate at their optimum at angles between 0 and 18 degrees. Ciria Report C644 states that a green roof comprising a strata thickness between a 100mm and 150mm offers between a 50% and 60% reduction in run off when compared to an impermeable surface of equivalent area, depending on pitch. Ciria C697 states that on roofs steeper than 18 degrees, design input should be sought from the specific manufacturer to prevent rapid run off.

It should also be noted that extensive green roofs can increase the self-weight of a roof by up to 5.0kN/m^2, depending on the specific manufacturer and planting mix. Specialist structural design input is required to ensure the roof can support the increased loading imposed by the green roof.

The roof lines do not naturally lend themselves to utilising green roofs. Green roofs have therefore been discounted for this development.

Site Control

The use of a geocellular attenuation tank provides a means to retain all the water that falls on the site within the site and thus the proposals provide 100% site control. An element of site control must include provision for Climate Change. The Technical Guidance to the National Planning Policy Framework States that:

"In making an assessment of the impacts of climate change on flooding from land, rivers and the sea as part of a flood risk assessment, the sensitivity ranges in table 5 may provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, river flow, wave height and wind speed"

Table 5: Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	*+5%*	*+10%*	*+20%*	*+30%*
Peak river flow	*+10%*	*+20%*		
Offshore wind speed	*+5%*		*+10%*	
Extreme wave height	*+5%*		*+10%*	

Figure 6.1 – NPPF Technical Guidance, Table 5

It is assumed that the lifetime of the development will be in excess of 100 years. Over this period climate change is predicted to cause an increase in rainfall of 5% rising to 30% in the period 2085 – 2115.

However, KCC have adopted recently emerging government policy which calls for an increase in allowance for climate change to 40%. Therefore, the surface water drainage strategy will include a 40% allowance from increased rainfall intensities as a direct result of climate change.

The proposal is to utilise a geocellular attenuation tank, with a restricted outfall to the public sewer. Accordingly, all storm events up to and including the critical 100-year event with a 40% allowance for climate change will be assessed when considering the volume for the infiltration structures.

Flow Controls

The existing site is greenfield, this is to be mimicked where possible. As noted previously, the anticipated runoff is less than 2.0l/s for the 1:100 year event.
It is considered that devices used to restrict runoff to less than 2.0l/s are often subject to maintenance issues and therefore cause a greater flood risk.

Therefore, it is proposed that the offsite discharge is restricted to 2.0l/s for the 1:100 year event inclusive of a 40% climate change allowance. This can be achieved through the use of a vortex control device such as Hydro-Brake or equivalent.

Attenuation Tank Proposals

The surface water from the proposed dwellings and associated hardstandings shall be positively drained and flow via gravity to a geocellular attenuation tank with 95% voids. A Hydro-Brake, downstream of the attenuation tank, shall restrict discharge to the public sewer to 2l/s for the 1:100 year event.

Although no infiltration test has been undertaken at the time of writing, it has been assumed that infiltration is not viable due to the anticipated strata. Prior to detailed design, a full BRE365 infiltration test should be undertaken to confirm assumptions.

The preliminary design calculations, appended to this report, indicate that one 90m^3 geocellular attenuation tank structure shall fully accommodate the 1:100 year storm event with a 40% climate change allowance. There shall be no flooding from the surface water network.

A drainage strategy layout has been appended to this report, which identifies the strategic network and associative infiltration features.

6.5 Exceedance and Surface Water Conveyance

Exceedance routes shall be provided by appropriate external levels design during the detailed design stage. The exceedance routes shall need to accommodate system failure and events greater than the 1:100 year event inclusive of a 40% climate change allowance. Proposed exceedance routes have been recommended on the appended drainage strategy layout.

6.6 SuDS Hierarchy

The SuDS Hierarchy has been considered and the results are found within Appendix 5.

6.7 Surface Water Strategy Summary

As the site is greenfield and the anticipated strata has poor infiltration properties, it is assumed that a proportion of the surface water infiltrates into the ground at a slow rate whilst the remainder is assumed to discharge onto Romney Avenue.

The surface water from the proposed dwellings and associated hardstandings shall be positively drained and flow via gravity to a geocellular attenuation tank. A Hydro-Brake, downstream of the attenuation tank, shall restrict discharge to the public sewer to 2l/s for the 1:100 year event.

The geo-cellular attenuation tank will be sized to accommodate a 1 in 100 year storm event with a 40% allowance for future climate change. This is in accordance with KCC's Drainage and Planning Policy Statement (June 2017).

It is anticipated that a condition will be imposed on a planning permission requiring further details of the surface water drainage system to be submitted for approval.

It is evident from the aforementioned that a suitable surface water network can be provided that accords with National and Local Planning Policy Guidance in addition to KCC's Drainage and Planning Policy Statement (June 2017).

7 Conclusions

This document has been produced in accordance with current best practice and recommendations and guidance set out in the National Planning Policy Framework (NPPF) and as required by Kent County Council's Drainage and Planning Policy Statement (2017).

The report concludes:

- The site is currently undeveloped. It is bounded by Romney Avenue on the north west boundary, and residential dwellings on all other boundaries.
- A review of the BGS online bedrock mapping tool has identified that the development site is underlain by the Folkestone Formation (Sandstone).
- At the time of writing, infiltration test results are not available. However, it is anticipated that the strata is not suitable for infiltration. Prior to detailed design, and for the avoidance of doubt, a full BRE365 infiltration test should be undertaken to confirm assumptions.
- A review of the Environment Agency's online mapping tool has identified that the site is within Flood Zone 1, and at low risk of flooding from Rivers and Sea.
- A review of the Environment Agency's Long Term Flood Risk Map has identified the site is at very low risk of flooding (less than 1:1000 annual probability).
- The proposal is to construct 8 dwellings with associated access road and parking.
- An assessment of peak foul water flow has been carried out in accordance with 'Sewers for Adoption 7th Edition'. It is anticipated that there shall be an increase in peak flow by approximately 0.378 l/s.
- It is proposed that the foul network is connected to the public foul sewer within Romney Avenue. A connection is subject to a formal Section 106 connection agreement with Southern Water.
- The surface water from the proposed buildings and hardstandings shall flow through a gravity network with the final discharge point at the public surface water sewer. The discharge shall be restricted to 2l/s by an appropriate vortex flow control device. Levels of the existing sewer shall be confirmed prior to construction to ensure a gravity connection is feasible.
- A 90m^3 geocellular attenuation tank with minimum 95% voids is required upstream of the proposed vortex control device.
- The surface water drainage strategy will include a 40% allowance from increased rainfall intensities as a direct result of climate change.

- It is evident that the site can be drained satisfactorily in accordance with Local and National Planning Policy Guidance. The details of the drainage systems should be the subject of suitably worded Planning Conditions which would require the schemes to be submitted to the local authority for approval prior to construction work commencing.

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Appendix 1

Proposed Site Plan

Proposed Site Plan 1:200

Proposed Residential Development

Do not scale this drawing
Architects to be informed of all discrepancies in dimensions
Contractor to check all dimensions on site

Revision	Date / Details	Revised by
P1	10/06/2019 First Issue	BB
P2	01/07/2019 Reduction from 10 units to 8 units, car parking amended to suit.	BB

Finishes Key:

- New Permeable Surface
- Soft Landscaping
- Tiled Roof
- Storage Shed
- Existing Trees
- Access to Dwelling
- Proposed Parking Restrictions
- P# Assigned Parking Space
- VP Visitor Parking Space

Access points to new development to be vehicle crossover points i.e. dropped kerb.

N

0 5 10 20m

CLARCHITECTS
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website: www.clarchitects.co.uk
tel : 01303 647233
email : info@clarchitects.co.uk

Project Title
Proposed Residential Development on land adjacent to Romney Avenue, Folkestone

Drawing Title			Scale
Proposed Site Plan			1:200 @ A1
			Job No 17026
Drawn BB	Status Planning	Checked	Date June 2019
Dwg No PL02			Rev No P2

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Appendix 2

Environment Agency Flood Map for Planning Purposes

Flood map for planning

Your reference	Location (easting/northing)	Created
3066	**620586/136044**	**1 Jul 2019 2:24**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

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

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

Environment Agency

Flood map for planning

Your reference
3066

Location (easting/northing)
620586/136044

Scale
1:2500

Created
1 Jul 2019 2:24

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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Appendix 3

FW and SW Drainage Strategy

DO NOT SCALE THIS DRAWING. ALL SETTING OUT TO ARCHITECTS DETAILS AND DRAWINGS

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWING ISSUES AND THE SPECIFICATION.

Notes:

G1. All building materials, components and workmanship to comply with the appropriate public health acts, building regulations, british standards and codes of practice and the appropriate manufacturers recommendations.

G2. For all specialist work see relevant drawings.

G3. Any discrepancies, errors or omissions to be reported to the project co-ordinator for further instructions before commencement of works.

G4. The Engineer is not responsible for dimensions, except where shown on his drawings. All setting out information, dimensions, etc, shall be calculated from the Architects drawings.

G5. All private drainage shall comply with the requirements of the Building Regulations approved Document H.

G6. All drainage forming part of, or connecting to a public sewer shall comply with the requirements of Sewers for Adoption 7th Edition.

G7. Cover levels are shown indicative only and are subject to final adjustment on site.

G8. All FW pipes to be 100mm diameter unless noted otherwise.

G9. All SW pipes to be 100mm diameter unless noted otherwise.

G10. Minimum depth to invert of foul branch pipes to SVP/SS below finished floor level to be:

450mm 0 - 3 storey's
750mm 4 - 5 storey's

G11. Gradient of under floor branch pipes to be 1:40 and no flatter than 1:80 (minimum of 1 WC connected).

G12. All RWP, SVP and SS positions are subject to confirmation from the architect.

Mews

FREMANTLE ROAD

ROMNEY AVENUE

Turner Court

225mmø

Unknown ø

300mmø

150mmø

Hydro-Brake chamber with sump. Discharge restricted to 2l/s.

Proposed connection to existing public foul water sewer. S106 approval required.

Proposed connection to existing public surface water sewer. S106 approval required.

HB + CP

Geocellular Attenuation Tank (ATT1). 20m x 3m x 1.5m effective depth. 95% voids required.

The British Geological Survey (BGS) and site investigations indicate the site is underlain by the Folkestone Formation (Sandstone). Therefore, infiltration has been assumed not viable. Viability to be confirmed through full BRE365 infiltration test during detailed design.

BIRCO
RWP
DP
RE
CP
VP
P1
P2
P3
P4
P5
P6
P7
P8
UNIT 1
UNIT 2
UNIT 3
UNIT 4
UNIT 5
UNIT 6
UNIT 7
UNIT 8

1m 2m 3m 4m 5m 10m 15m 20m
SCALE 1-200

KEY

- Proposed Surface Water Pipe Ø and gradient as stated
- Proposed Foul Water Pipe Ø and gradient as stated
- IndicativeSurface Water Sewer. Location and geometry to be confirmed to construction.
- Indicative Foul Water Sewer. Location and geometry to be confirmed prior to construction.
- Proposed Surface Water PPIC size as stated in MH schedule
- Proposed Foul Water PPIC size as Stated in MH schedule
- Proposed Surface Water Manhole Pre Cast Concrete - Circular Size as Stated in MH Schedule
- Indicative existing Manhole Location and geometry to be confirmed prior to construction.
- BIRCO — Proposed Birco Channel Vehicular Areas
- CP — Proposed Catchpit
- HB — Proposed Hydro-Brake
- RWP — Proposed Rainwater Pipe
- DP — Indicative Drain Point
- RE — Proposed Rodding Eye
- Proposed Geocellular Attenuation
- Proposed Exceedance Route

Rev	Amendment	Drn	Chk	Date
P02	Revised to reflect sewer records. Client amended.	JEM	MJF	05.07.19
P01	Preliminary issue.	JEM	MJF	03.07.19

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Client:
VILLAGE HOMES FOLKESTONE LTD

Project:
PROPOSED RESIDENTIAL DEVELOPMENT
LAND ADJACENT TO ROMNEY AVENUE
FOLKESTONE, CT20 3QJ

Drawing Title:
DRAINAGE STRATEGY LAYOUT

considine ref	drawn by	date	drawing scales	original paper size
3066	JEM	JULY '19	1:200@A1	A1

drawing reference : project - originator - volume - level - type - role - number
3066 - CON - 00 - XX - DR - C - 1810

status : S0 — status description : SUITABLE FOR INFORMATION
revision : P02 — revision status : PRELIMINARY

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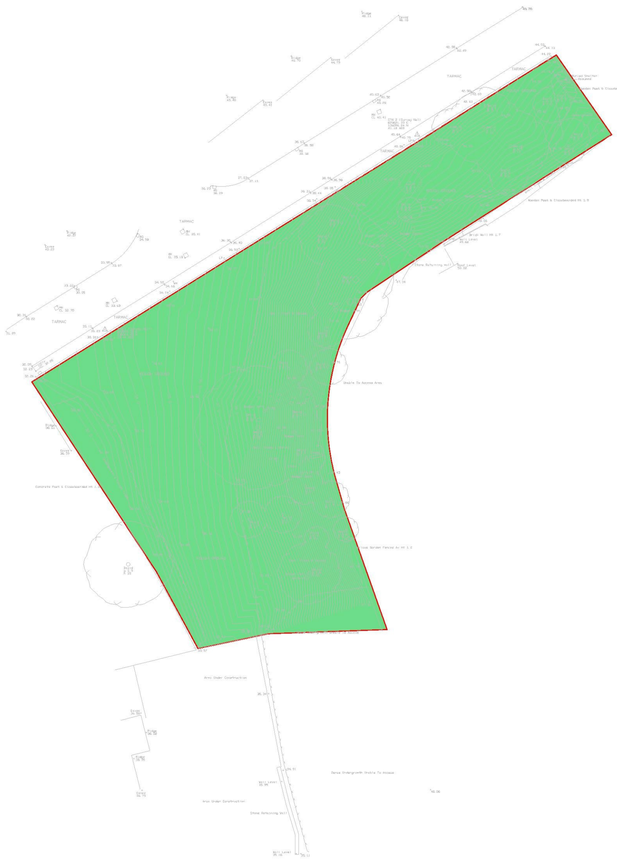
Appendix 4

Drained Areas Analysis



PRE DEVELOPMENT DRAINED AREAS

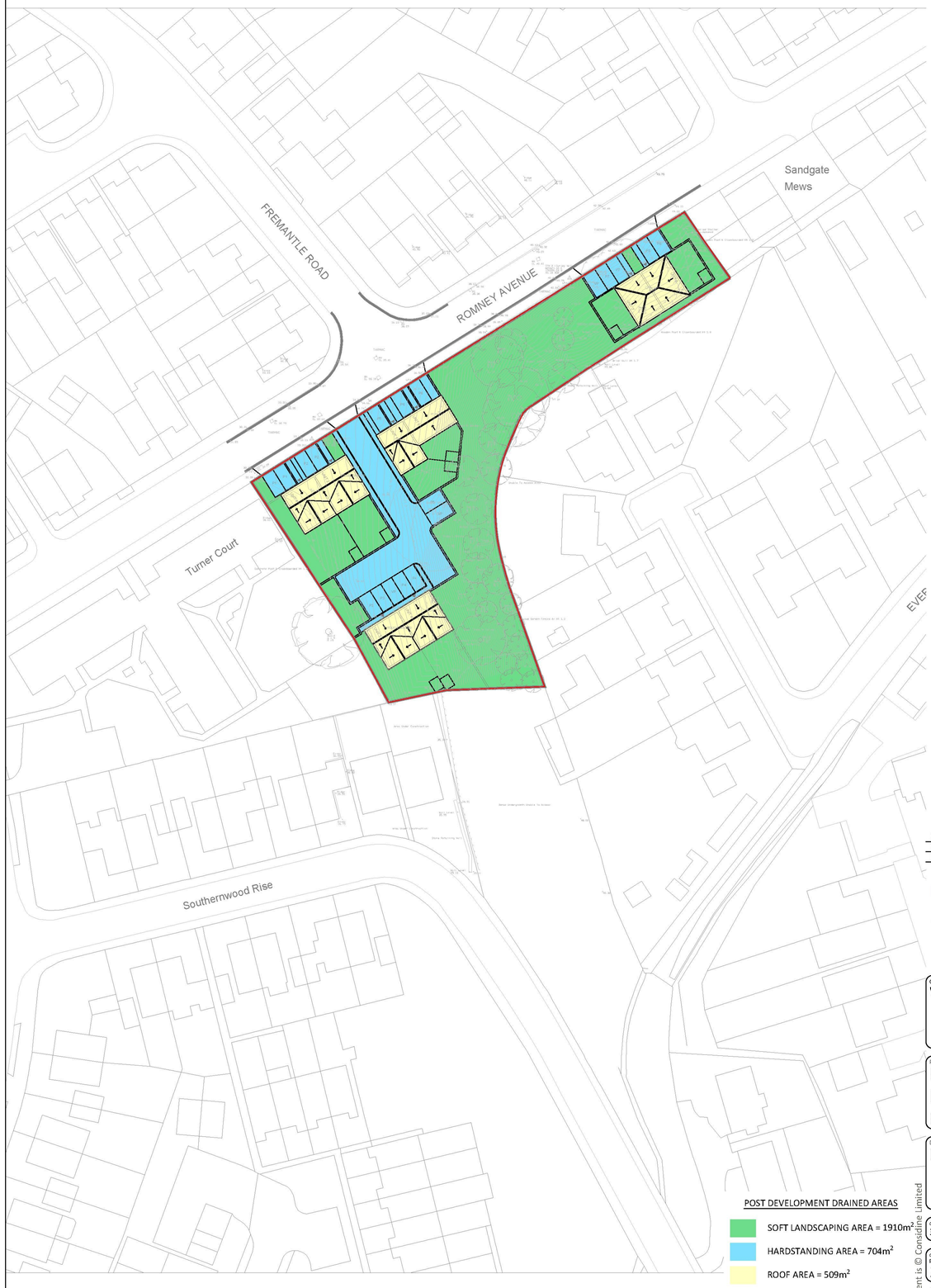
SOFT LANDSCAPING AREA = 3138m²

TOTAL IMPERMEABLE AREA = 0m²

TOTAL AREA = 3138m²

5m 10m 15m 20m 30m 40m 50m

SCALE 1-500



POST DEVELOPMENT DRAINED AREAS

SOFT LANDSCAPING AREA = 1910m²

HARDSTANDING AREA = 704m²

ROOF AREA = 509m²

TOTAL IMPERMEABLE AREA = 1213m²

TOTAL AREA = 3138m²

5m 10m 15m 20m 30m 40m 50m

SCALE 1-500

DO NOT SCALE THIS DRAWING. ALL SETTING OUT TO ARCHITECTS DETAILS AND DRAWINGS

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWING ISSUES AND THE SPECIFICATION.

Notes:

Rev	Amendment	Drn	Chk	Date
P02	Client amended.	JEM	MJF	05.07.19
P01	Preliminary issue.	JEM	MJF	03.07.19

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Client:
VILLAGE HOMES FOLKESTONE LTD

Project:
PROPOSED RESIDENTIAL DEVELOPMENT
LAND ADJACENT TO ROMNEY AVENUE
FOLKESTONE, CT20 3QJ

Drawing Title:
DRAINED AREAS ANALYSIS

considine ref	drawn by	date	drawing scales	original paper size
3066	AM	JULY' 19	1:500@A1, 1:1000@A3	A1

drawing reference : project originator volume level type role number
3066 - CON - 00 - XX - DR - C - SK001

status :	status description :
S0	SUITABLE FOR INFORMATION
revision :	revision status :
P01	PRELIMINARY

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Appendix 5

SuDS Hierarchy Assessment

The SuDS Hierarchy

Most Suitable	SuDS Technique	Flood Reduction	Pollution Reduction	Landscape and Wildlife Benefit	Included in the Scheme?	Comments
	Living Roofs	√	√	√		The proposed roofs do not lend themselves to living roofs.
	Basins and Ponds + Constructed + Wetlands + Detention Ponds + Retention ponds	√	√	√		Space on site is restricted and therefore ponds are not suitable here.
	Filter strips and Swales	√	√	√		Insufficient space and gradients for suitable swales to be provided and maintained.
	Infiltration Devices + soakaway + infiltration trench + infiltration basin	√	√	√		Infiltration is unlikely viable at the site.
	Permeable surfaces and filter drains + gravelled areas + porous surfaces + engineered grass + solid paving blocks + resin bound + filter trenches	√	√	√		Infiltration is unlikely viable at this site. Existing site levels indicate that proposals shall be too steep to benefit from lined permeable pavements.
	Tanked System + oversized pipes/ crated tanks / storage cells	√	√	√	√	Geocellular Attenuation Tank is proposed.
Least Suitable						

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Appendix 6

Preliminary Surface Water Network Calculations

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 419 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	32.582	0.582	0.0	1.6	1.6	33.2	O K
30 min Summer	32.764	0.764	0.0	1.6	1.6	43.6	O K
60 min Summer	32.943	0.943	0.0	1.6	1.6	53.8	O K
120 min Summer	33.091	1.091	0.0	1.7	1.7	62.2	O K
180 min Summer	33.164	1.164	0.0	1.8	1.8	66.4	O K
240 min Summer	33.204	1.204	0.0	1.8	1.8	68.6	O K
360 min Summer	33.241	1.241	0.0	1.8	1.8	70.7	O K
480 min Summer	33.267	1.267	0.0	1.9	1.9	72.2	O K
600 min Summer	33.283	1.283	0.0	1.9	1.9	73.1	O K
720 min Summer	33.290	1.290	0.0	1.9	1.9	73.5	O K
960 min Summer	33.285	1.285	0.0	1.9	1.9	73.2	O K
1440 min Summer	33.225	1.225	0.0	1.8	1.8	69.8	O K
2160 min Summer	33.092	1.092	0.0	1.7	1.7	62.2	O K
2880 min Summer	32.954	0.954	0.0	1.6	1.6	54.4	O K
15 min Winter	32.654	0.654	0.0	1.6	1.6	37.3	O K
30 min Winter	32.860	0.860	0.0	1.6	1.6	49.0	O K
60 min Winter	33.065	1.065	0.0	1.7	1.7	60.7	O K
120 min Winter	33.241	1.241	0.0	1.8	1.8	70.7	O K
180 min Winter	33.333	1.333	0.0	1.9	1.9	76.0	O K
240 min Winter	33.388	1.388	0.0	1.9	1.9	79.1	O K
360 min Winter	33.442	1.442	0.0	2.0	2.0	82.2	O K
480 min Winter	33.467	1.467	0.0	2.0	2.0	83.6	O K
600 min Winter	33.485	1.485	0.0	2.0	2.0	84.7	O K
720 min Winter	33.491	1.491	0.0	2.0	2.0	85.0	O K
960 min Winter	33.472	1.472	0.0	2.0	2.0	83.9	O K
1440 min Winter	33.369	1.369	0.0	1.9	1.9	78.0	O K
2160 min Winter	33.164	1.164	0.0	1.8	1.8	66.4	O K
2880 min Winter	32.963	0.963	0.0	1.6	1.6	54.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	137.424	0.0	34.4	22
30 min Summer	91.616	0.0	45.9	37
60 min Summer	58.408	0.0	58.7	66
120 min Summer	35.931	0.0	72.2	124
180 min Summer	27.090	0.0	81.6	182
240 min Summer	22.211	0.0	89.2	240
360 min Summer	16.849	0.0	101.5	316
480 min Summer	13.942	0.0	112.0	382
600 min Summer	12.048	0.0	121.0	446
720 min Summer	10.688	0.0	128.8	516
960 min Summer	8.810	0.0	141.6	656
1440 min Summer	6.610	0.0	159.3	936
2160 min Summer	4.861	0.0	175.8	1344
2880 min Summer	3.873	0.0	186.8	1756
15 min Winter	137.424	0.0	38.6	22
30 min Winter	91.616	0.0	51.4	36
60 min Winter	58.408	0.0	65.7	64
120 min Winter	35.931	0.0	80.8	122
180 min Winter	27.090	0.0	91.4	178
240 min Winter	22.211	0.0	99.9	234
360 min Winter	16.849	0.0	113.7	342
480 min Winter	13.942	0.0	125.5	398
600 min Winter	12.048	0.0	135.5	470
720 min Winter	10.688	0.0	144.3	548
960 min Winter	8.810	0.0	158.6	706
1440 min Winter	6.610	0.0	178.4	1010
2160 min Winter	4.861	0.0	196.9	1448
2880 min Winter	3.873	0.0	209.2	1876

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 620845 135645 TR 20845 35645	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	2880
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.134

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.067	4	8	0.067

Model Details

Storage is Online Cover Level (m) 35.000

Cellular Storage Structure

Invert Level (m) 32.000 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	0.0	1.500	60.0	0.0	1.501	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0061-2000-1500-2000	Sump Available	Yes
Design Head (m)	1.500	Diameter (mm)	61
Design Flow (l/s)	2.0	Invert Level (m)	32.000
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	2.0	Kick-Flo®	0.545	1.3
Flush-Flo™	0.269	1.6	Mean Flow over Head Range	-	1.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	0.600	1.3	1.600	2.1	2.600	2.6	5.000	3.5	7.500	4.2
0.200	1.5	0.800	1.5	1.800	2.2	3.000	2.7	5.500	3.6	8.000	4.3
0.300	1.6	1.000	1.7	2.000	2.3	3.500	3.0	6.000	3.8	8.500	4.5
0.400	1.5	1.200	1.8	2.200	2.4	4.000	3.1	6.500	3.9	9.000	4.6
0.500	1.4	1.400	1.9	2.400	2.5	4.500	3.3	7.000	4.1	9.500	4.7

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Appendix 7

Percussion Drilling Logs

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 21/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	Co-ords: E620588.28 N136026.13
Project No. : 1145	Crew Name: Craig	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH1	CP	35.74m AoD	KB	1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND (concrete fragments and sand)
					0.80	34.94		
		1.20	D					Loose brown silty SAND
		1.20	SPT	N=7 (0,0/1,2,2,2)				
		1.50	B					
		2.00	D					
		2.00	SPT	N=8 (1,2/2,2,2,2)				
		2.50	B		2.40	33.34		Medium dense orange brown mottled grey clayey silty SAND
		3.00	D					
		3.00	SPT	N=10 (1,2/2,2,3,3)				
		3.50	B					
		4.00	D					
		4.00	SPT	N=12 (2,3/3,3,3,3)				
		4.50	B					
		5.00	D					
		5.00	SPT	N=14 (0,2/3,3,4,4)				
		5.50	B					
					5.60	30.14		Firm grey sandy CLAY
		7.00	D					
		7.00	SPT	N=21 (4,4/5,5,5,6)				
		7.50	B					
					7.90	27.84		Dense dark grey silty SAND
		9.00	D					
		9.00	SPT	N=48 (5,7/8,12,13,15)				
		9.50	B					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
15.45	150										

Remarks

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 21/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	Co-ords: E620588.28 N136026.13
Project No. : 1145	Crew Name: Craig	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH1	CP	35.74m AoD	KB	1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00	D					
		11.00	SPT	N=49 (5,7/9,13,13,14)				
		11.50	B					
		13.00	D					
		13.00	SPT	N=50 (5,8/10,13,13,14)				
		13.50	B					
		15.00	D					
		15.00	SPT	N=52 (5,8/10,13,14,15)				
					15.45	20.29		End of Borehole at 15.450m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
15.45	150										

Remarks

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 24/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	Co-ords: E620585.69 N136062.13
Project No. : 1145	Crew Name: Craig - South Eastern Drilling	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH2	CP	36.69m AoD	KB	1:50	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND
					0.50	36.19		Soft dark brown slightly gravelly sandy CLAY with rootlets
		1.20	D					
		1.20	SPT	N=5 (0,1/1,1,1,2)				
		1.50	B					
		2.00	D					
		2.00	SPT	N=8 (1,1/2,2,2,2)				
	▼	2.50	B					
		3.00	D					
		3.00	SPT	N=7 (1,1/2,1,2,2)				
		3.50	B					
		4.00	D					
		4.00	SPT	N=11 (1,2/3,2,3,3)	4.10	32.59		Firm grey brown mottled orange brown sandy CLAY with trace gravel
		4.50	B					
	▼							
		5.00	D					
		5.00	SPT	N=12 (1,2/3,3,3,3)				
		5.50	B					
					6.80	29.89		Stiff dark grey CLAY with lenses of sand
		7.00	D					
		7.00	SPT	N=23 (3,4/5,6,6,6)				
		7.50	B					
		9.00	D		9.00	27.69		Dense grey clayey silty SAND
	▽	9.00	SPT	N=25 (3,4/6,6,6,7)				
		9.50	B					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		15.45 15.45	150								

Remarks

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 24/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	Co-ords: E620585.69 N136062.13
Project No. : 1145	Crew Name: Craig - South Eastern Drilling	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH2	CP	36.69m AoD	KB	1:50	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00	D					Dense grey clayey silty SAND
		11.00	SPT	N=44 (5,6/7,10,13,14)				
		11.50	B					
		13.00	D					
		13.00	SPT	N=46 (5,6/8,11,13,14)				
		13.50	B					
		15.00	D					
		15.00	SPT	N=48 (5,7/8,13,13,14)				
					15.45	21.24		End of Borehole at 15.450m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		15.45 15.45	150								

Remarks

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 20/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	Co-ords: E620638.55 N136098.23
Project No. : 1145	Crew Name: Site Serve Ltd	Drilling Equipment: Windowless Sampler

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS1	WLS	45.15m AoD	KB	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D					Very stiff brown slightly gravelly very sandy CLAY
		1.50	D		1.40	43.75		Very stiff olive brown very sandy CLAY with layers of limestone fragments
		3.30	D		3.30	41.85		Very stiff olive grey brown clayey SAND
		4.00	D					
		5.10	D					
		5.50	D		5.40	39.75		Stiff orange brown sandy CLAY
					5.80	39.35		Dense grey silty SAND
					6.00	39.15		End of Borehole at 6.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

AGS

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date: 21/09/2018
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	
Project No. : 1145	Crew Name: Site Serve Ltd	Drilling Equipment: Windowless Sampler

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS2	WLS	38.92m AoD	KB	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.40	B					TOPSOIL
					0.45	38.47		
		0.60	D					Soft olive brown sandy CLAY with occasional rootlets
					0.75	38.17		
								Medium dense orange brown silty SAND
		1.50	D					
					3.00	35.92		End of Borehole at 3.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date:
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	
Project No. : 1145	Crew Name: Site Serve Ltd	Drilling Equipment: Windowless Sampler

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS3	WLS	38.78m AoD	KB	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.70	D					Stiff olive brown very sandy CLAY with rootlets
					1.00	37.78		
		1.50	D					Dense grey silty SAND
		2.50	D					
					3.00	35.78		End of Borehole at 3.000m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

AGS

Percussion Drilling Log

Project Name: Folkestone Romney Avenue SI	Client: CLArchitects	Date:
Location: Land at Romney avenue, Folkestone CT20 3QJ	Contractor: Peter Baxter Associates Ltd	
Project No. : 1145	Crew Name: Site Serve Ltd	Drilling Equipment: Windowless Sampler

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS4	WLS	38.70m AoD	KB	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00	B					Dense brown slightly clayey SAND with limestone fragments
					0.75	37.95		
		1.40	D					Dense olive brown mottled orange brown silty SAND
		2.50	D					
					3.00	35.70		End of Borehole at 3.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

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Appendix 8

Greenfield Runoff Rates

IH 124 Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 731 Urban 0.000
Area (ha) 50.000 Soil 0.450 Region Number Region 7

Results	l/s
QBAR Rural	231.1
QBAR Urban	231.1
Q100 years	737.1
Q1 year	196.4
Q2 years	203.6
Q5 years	295.8
Q10 years	374.3
Q20 years	462.9
Q25 years	496.4
Q30 years	523.7
Q50 years	605.4
Q100 years	737.1
Q200 years	866.5
Q250 years	908.1
Q1000 years	1192.4

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Appendix 9

Public Sewer Records

SEWER RECORDS PAGE 1 OF 2

136203

135915

620354

620826

O.S. REF. TR2036SE	Drawn by: kumaria	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 determnined on site. WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement
	Scale: 1:1250	
Title: 343790_Land Adjacent to Romney	Date: 04/07/2019	Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.

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Southern Water