STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

Introduction

This surface water drainage design note has been produced for Sunninghill Construction Co. Ltd by Stephen Wilson Partnership (SWP). The aim of this note is to summarise the surface water drainage design for the proposed development and outline how the design complies with current policies.

Planning Condition

The proposed development was approved through planning by Horsham District Council under planning reference DC/22/2010.

A surface water drainage condition was applied to the planning approval which is copied as below:

Pre-Commencement Condition: No development shall commence until a drainage strategy detailing the proposed means of foul and surface water disposal including the rate at which surface water will discharge, has been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved scheme.

Reason: As this matter is fundamental to ensure that the development is properly drained and to comply with Policy 38 of the Horsham District Planning Framework (2015).

Horsham Council Engineers have provided comments on the information currently submitted to discharge the condition. SWP's direct responses can be found in appendix 6.

The following and accompanying information will show how the proposals comply with the condition.

Existing Surface Water Drainage

It was found that a culverted watercourse crosses the site. Refer to SWP report 9395-SWP-XX-XX-RE-C-9501. It is proposed to divert this culverted watercourse as it conflicts with the proposals. An application to West Sussex County Council (WSCC) as the Lead Local Flood Authority (LLFA) will be required to divert the culverted watercourse. Communication with WSCC Highways Authority was sought and they confirmed the proposals as acceptable with no formal application required.

Further investigations on site, since the SWP site visit, found that the existing surface water runoff is dealt with via a traditional positive piped drainage system. It is discharged to the south-west of the site. A CCTV survey confirmed that the site surface water runoff discharges to the existing highways drainage to the west of the site. The CCTV survey can be found in appendix 5.

The existing peak surface water runoff rates have been determined using the modified rational method. These are summarised as follows:

1 in 2 year:	7.756 l/s
1 in 30 year:	14.723 l/s
1 in 100 year:	19.107 l/s

The greenfield runoff rate for the development site was calculated to be 0.9l/s (QBar).

Refer to the drainage calculations in appendix 2.

Surface Water Strategy

The National Planning Practice Guidance sets out a hierarchy of methods of surface water disposal. The first option is to discharge surface water runoff into the ground. The site investigation report (Reference: P15194) by Ashdown Site Investigation Ltd found that site conditions do not allow for infiltration. Multiple infiltration tests found that the infiltration rate was negligible, and groundwater monitoring found water levels to rise to near ground level. Extracts from the site investigation report can be found in appendix 1.

It is proposed to discharge the surface water from the proposed development into the diverted culverted watercourse. The surface water drainage system has been designed so that discharge is limited up to 2.0l/s for all rainfall events up to and including the 1in100 plus 45% climate change scenario. Refer to the drainage calculations in appendix 2.

It is proposed to construct a traditional positive piped system which discharges to a hydrobrake manhole before discharging to the diverted watercourse. The fall of pipes are in accordance with section 3.15 of Part H of the building regulations which states “100mm rainwater drains should be laid at not less than 1:100”. The minimum fall of any surface water drainage on site is at 1:100.

The driveways will be constructed from permeable block paving with a sealed subbase of porous granular material. Where possible, rainwater downpipes will connect into the permeable pavement sub-base. This has not been possible in all scenarios due to clashes with foul drainage and proposed services. Perforated pipes within the subbase shall discharge into the positive drainage system. As water levels rises within the drainage system, the water shall back up into the subbase of the permeable block paving where it shall be attenuated until it is gradually released through the hydrobrake.

The 2.0l/s discharge rate provides a betterment on the existing freely discharging flow rate. In accordance with the current LLFA policy, brownfield sites must provide a 50% betterment on the existing surface water runoff rate and aim to achieve the greenfield runoff rate. It has not been possible to achieve the greenfield runoff rate (0.9l/s) for the proposed surface water system as it has not been possible to locate enough attenuation space due to the shallow depth of the outfall whilst accommodating for sufficient pipe falls across the site. The discharge rate (2.0l/s) is as close as possible to the greenfield runoff rate and exceeds the 50% betterment required for brownfield sites.

SWP have consulted with WSCC Highways as it is proposed to discharge the surface water runoff from the site into the existing highways drainage. As the site is proven to already discharge into the Highways drainage from the CCTV survey, the proposed surface water discharge at the new connection point into the Highways drainage is acceptable. Communications with WSCC Highways can be found in appendix 4.

The surface water strategy for pollution mitigation has been assessed in accordance with the simple index approach from chapter 26 of the CIRIA SuDS Manual C753. The assessment found that the pollution hazard level is very low to low. A breakdown of the assessment can be found on the drainage drawing. The assessment has found that the surface water runoff meets the sufficient level of treatment as required by the SuDS manual. Refer to drawing 9395-SWP-ZZ-XX-DP-C-1100.

It is proposed to divert the existing culvert to enable construction of the development. A review of historical plans, refer to appendix 3, shows that the culvert crosses the site and discharges into the Highway drainage in the road. It is proposed to divert the 150mmØ culvert to an existing manhole upstream of the existing connection point. SWP have consulted with WSCC Highways about the diverting of the culvert, and they confirm the proposals are acceptable. They confirmed that no formal application with WSCC Highways is required for the proposed diversion.

Horsham District Council engineers noted that on the historical plan of an “additional 150mm ditch outfall”. There was no evidence of this outfall on site. It is likely that the existing culvert was constructed to replace this historical “ditch outfall”, as the plan notes that the outfall is “blocked/collapsed, and it would conflict with the existing dwelling.

An Ordinary Watercourse consent has been granted for the diversion of the culvert. The existing culvert is a 150mmØ pipe and is connected via serval inspection chambers. It is proposed to divert the culvert

from the existing first inspection chamber to a new catchpit manhole (S12). The surface water runoff from the site will also connect to manhole S12. To reduce the risk of the site surface water outfall from surcharging, the downstream pipe from S12 will be 225mmØ and connect to the existing Highways drainage.

Due to the proximity of plot 15/16 to the watercourse on the planning approved layout, a retaining wall is required. The retaining wall shall be of brick construction. An Ordinary Watercourse Consent from WSCC LLFA for the wall construction has been approved.

Foul Water Strategy

It is proposed to construct a traditional positive foul drainage system serving the proposed development. The foul drainage shall fall to an existing foul water inspection chamber in the southwest of the site. A review of public sewer records shows that there is no mapped public sewer records adjacent to the site. A CCTV survey has confirmed that the existing foul outfall from the site connects to the mapped public foul sewer at manhole reference 3603.

The proposed on-site drainage system has been designed in accordance with Part H of the Building Regulations. The fall of pipes are in accordance with Table 6 of Part H of the building regulations which states. The minimum fall of any foul drainage on site is at 1:80. All drainage under buildings is to fall at a minimum 1:40.

In accordance with the guidance within the DCG (Design and Construction Guidance for foul and surface water sewers offered for adoption), the peak foul flow for the proposals has been determined to be 0.37l/s.

A S106 application with Southern Water has been approved for the new indirect connection into the public foul sewers.

Maintenance Plan

A maintenance plan has been produced. Please refer to document 9494-SWP-XX-XX-RE-C-9503.

The maintenance of the drainage will be the responsibility of Saxon Weald. Their details are supplied separately.

Summary

SWP has undertaken a complete design of the surface and foul water drainage, working with Sunninghill Construction Co. Ltd, to produce a solution that deals with the details and means of surface and foul water disposal.

The surface water is discharged to the diverted culverted watercourse. The discharge rate is restricted up to 2.0l/s for up to and including the 1in100 plus 45% climate change rainfall event. Attenuation is provided within the subbase of the permeable block paving.

An Ordinary Watercourse Consent application has been approved by WSCC for the diversion and connection to the culverted watercourse. Communication with WSCC Highways has confirmed that the proposals for connection to the Highways drainage are acceptable.

A new traditional positive piped drainage system will be constructed for the foul. The system shall discharge to an existing foul inspection chamber on site which discharges to the public foul sewer. A S106 application with Southern Water for the indirect connection has been approved.

Prepared By	Seen By	Date
Craig Searle Civil Engineer	Dean Giles Director	14-05-2025
Copies to	Colin Coulthard, Chris Blain (Sunninghill Construction Ltd)	

Appendix 1 – Site Investigation
Appendix 2 – Drainage Calculations
Appendix 3 – Historic Plans
Appendix 4 – Communications with WSCC Highways
Appendix 5 – CCTV Survey
Appendix 6 – Response to Horsham Council Engineer Comments
Appendix 7 – S106 Approval
Appendix 8 – Ordinary Watercourse Approval

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 1

Site Investigation

15-18 Fairfield Cottages
Cowfold
West Sussex

Combined Geotechnical and Ground Contamination Risk Assessment

Report Beneficiary:
Saxon Weald
38-42 Worthing Road
Horsham
RH12 1DT

Project Reference: P15524

Report Reference: R15194

Document Control			
Issue No.	Status	Issue Date	Notes
1	Final	12th April 2022	

Report Section	Prepared By	Approved By
Preliminary Ground Contamination Risk Assessment	Stuart Card BA (Hons)	Alex Minchell-Bewick BSc MSc DIC AIEMA MIEnvSc CEnv
Factual Section	Sam Prior BSc	Steven McSwiney BA mod Geol MSc FGS
Geotechnical Assessment	Sam Prior BSc	Steven McSwiney BA mod Geol MSc FGS
Quantitative Ground Contamination Risk Assessment	Stuart Card BA (Hons)	Alex Minchell-Bewick BSc MSc DIC AIEMA MIEnvSc CEnv

Head Office
Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
Tel: 01273 483119
www.ashdownsi.co.uk

Limitations

This report was prepared specifically for the Client's project and may not be appropriate to alternative schemes. The copyright for the report and licence for its use shall remain vested in Ashdown Site Investigation Limited (the Company) who disclaim all responsibility or liability (whether at common law or under the express or implied terms of the Contract between the Company and the Client) for any loss or damage of whatever nature in the event that this report is relied on by a third party, or is issued in circumstances or for projects for which it was not originally commissioned.

This report is not intended to be either an ecological, archaeological or flood risk assessment. An appropriate specialist should be consulted about any concerns that may arise in this regard.

EXECUTIVE SUMMARY

The following presents a summary of the main findings of the report. It is emphasised that no reliance should be placed on any individual point until the whole of the report has been read as other sections of the report may put into context the information contained herein.

It is proposed to demolish the properties 15-18 Fairfield Cottages, Cowfold and to construct 9 no. new residential units with private and communal areas of soft landscaping and associated car parking bays.

The site is currently occupied by two pairs of bungalows, located in the north east and south west of the site, separated by an asphalt surfaced parking area and an area of grass. The site is set within a residential area with a large playing field located to the south east.

The site comprised part of an open field at the time of the earliest inspected historical map, dated 1877. The area surrounding the site was developed for residential houses in the mid-1950s, with the houses on the site shown on maps since the early 1970s. At this time a residential garage block was located between the houses, but this was shown to have been demolished by 2018.

Reference to geological datasets indicates that the site is expected to be underlain by the Weald Clay Formation. The ground investigation confirmed the underlying soils to comprise a shallow thickness of made ground/reworked soils, overlying the expected Weald Clay Formation deposits.

The Weald Clay Formation is classed as an Unproductive Stratum. The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply. Groundwater was not encountered during the short duration of the ground investigation.

It is intended to carry out ground water level monitoring within standpipes installed at the site during the winter period of 2022-23.

The preliminary contamination risk assessment identified potential pollutant linkages relating to both proposed end users of the site and controlled waters, associated with the potential presence of made ground on the site from historical demolition of the former garages.

The ground investigation identified the presence of concentrations of lead and PAH compounds above published soil screening values.

Remedial measures are considered to be necessary within the proposed garden and communal soft landscaped areas to ameliorate the risk to end users.

The Weald Clay Formation soils may be expected to exhibit a medium to high volume change potential. It is recommended that the design of precautions against shrinkage and heave for any new foundation system should assume a high volume change potential.

A net allowable bearing capacity of 150kN/m^2 may be assumed for pad or strip foundations up to 1.00m in breadth that are constructed directly onto Weald Clay Formation soils of at least stiff consistency.

A DS-1 Design Sulfate Class and an AC-2z ACEC classification should be assumed as a minimum for the design of concrete in contact with the ground.

In view of the variable thickness of made ground and the presence of soils of up to high volume change potential underlying the site, it is recommended that ground floors should be suspended.

It is considered that the Weald Clay Formation soils will only be suitable for the construction of peak flow storage tanks connected via attenuated drainage pipes to mains surface water drainage or open water courses.

TABLE OF CONTENTS

1. INTRODUCTION 1

2. WALKOVER SURVEY 2

3. ENVIRONMENTAL AND GEO-ENVIRONMENTAL DATA REVIEW 3
- 3.1 Geological and Hydrogeological Data Review 3
- 3.2 Hydrogeological and Hydrological Data Review 5
- 3.3 Geo-Environmental Data Review 6

4. HISTORICAL MAP REVIEW 9

5. PRELIMINARY CONTAMINATION RISK ASSESSMENT 10
- 5.1 Introduction 10
- 5.2 Basis of Assessment 10
- 5.3 Potential Contamination Sources Identified 11
- 5.4 Preliminary Conceptual Model 11

6. GROUND INVESTIGATION 12
- 6.1 Introduction 12
- 6.2 Exploratory Holes 12
- 6.3 Sampling 12
- 6.4 In-situ Testing 12
- 6.5 Installations 13
- 6.6 Laboratory Testing 13

7. GROUND CONDITIONS 15
- 7.1 Stratigraphy 15
- 7.2 Stability 15
- 7.3 Groundwater Conditions 15

8. GEOTECHNICAL ASSESSMENT 16
- 8.1 Foundations 16
- 8.2 Groundwater 18
- 8.3 Stability of Excavations 18
- 8.4 Aggressivity to Concrete 19
- 8.5 Ground Floors 20
- 8.6 Stormwater Infiltration Systems 20

9. QUANTITATIVE CONTAMINATION ASSESSMENT 21
- 9.1 Analysis of Contamination Test Results 21
- 9.2 Conclusions 23
- 9.3 Quantitative Contamination Risk Assessment 24
- 9.4 Risks to Other Potential Receptors 24
- 9.5 Discovery Strategy 24

FIGURES AND APPENDICES

FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan

APPENDIX A

Proposed Development Layout

APPENDIX B

Classification of Probability, Consequence and Risk

APPENDIX C

Preliminary Conceptual Model

APPENDIX D

Exploratory Hole Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records
Summary of Borehole Falling Head Soakage Test Results
Summary of Trial Pit Falling Head Soakage Test Results

APPENDIX E

Geotechnical Laboratory Test Results
Contamination Laboratory Test Results

APPENDIX F

Quantitative Conceptual Model

APPENDIX G

Groundsure Enviro+Geo Insight Report
Historical Maps

1. INTRODUCTION

It is proposed to demolish the properties 15-18 Fairfield Cottages, Cowfold and to construct 9 no. new residential units at the site with private and communal areas of soft landscaping and associated car parking bays. A copy of the proposed development layout is presented in Appendix A.

Ashdown Site Investigation Ltd was requested to undertake a ground investigation and to provide advice to assist with the structural design and report on contamination issues to accompany a planning application for the site.

The specific objectives of the works were to:

a) Establish the expected geology, hydrogeology and hydrology at the site;
b) Ascertain the development history and current site use;
c) Develop a preliminary conceptual model of the site identifying potential pollutant linkages relating to end users of the proposed development works, to controlled waters beneath and in the vicinity of the site, or to other off-site sensitive receptors, if identified;
d) Investigate the shallow ground and groundwater conditions prevailing at the site;
e) Provide advice to assist others in undertaking design of foundations, ground floors and soakaways;
f) Test for the presence of contaminants identified by the preliminary conceptual model; and
g) Develop a quantitative conceptual model of the site, refining the preliminary model to identify any pollutant linkages that may be present.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q11686, dated 2nd February 2022. The instruction to proceed was received on behalf of the client, Saxon Weald.

Copies of the historical maps and geo-environmental data referred to in this report are presented within Appendix G.

2. WALKOVER SURVEY

The site comprises an irregular shaped plot of land located to the south east of the road Fairfield Cottages, Cowfold, West Sussex, and is centred on the approximate Ordnance Survey national grid reference 521456 122686. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

The site contains two pairs of bungalows, located in the north east and south west of the site. The houses were separated by an asphalt surfaced car parking area, next to the south eastern boundary, and an open grassed surface area next to the north western boundary. The topographical survey provided by the client and used as a site plan (Figure 2), shows a large tree within this area of the site, which was no longer present at the time of the Walkover Survey.

The houses have grassed front garden areas, with concrete pathways and rear gardens generally laid to lawn, with areas of flower beds, decking and outhouses. A small pond is located in the north easternmost part of the site with a garden area.

The site is set within a residential area, with a playing field located to the south east of the site.

Houses in north east of the site



Houses in the south west of the site



Car parking and grassed area separating housing (including location of former large tree)





3. ENVIRONMENTAL AND GEO-ENVIRONMENTAL DATA REVIEW

3.1 Geological and Hydrogeological Data Review

3.1.1 Expected Geology and Aquifer Designation

The stratigraphic unit that may be expected to underlie the site is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Bedrock	Weald Clay Formation	Unproductive Stratum

The Weald Clay Formation usually consists of thinly-bedded mudstones (shales) and mudstone with subordinate siltstone, fine grained to medium grained sandstones, including calcareous sandstone (e.g. Horsham Stone Member), shelly limestones (the so called "Paludina Limestones") and clay ironstones. When fresh the beds are normally dark grey in colour but may weather to mottled yellow and brown. Conspicuous bands of red clay occur at certain horizons usually in close association with sandstone beds.

3.1.2 Bedrock Faults

The Groundsure report identifies a "normal fault, inferred" on site.

3.1.3 Natural Ground Subsidence

Table 2. Natural Ground Subsidence from Groundsure Data

Section	Risk Assessment
Soil Volume Change Potential (Shrink-Swell)	Low
Running Sands	Negligible
Compressible Deposits	Negligible
Collapsible Deposits	Very low
Landslides	Very Low
Ground Dissolution of Soluble Rocks	Negligible

Whilst the Groundsure Data identifies a low risk from soil change potential (a medium plasticity), it is noted that the Weald Clay Formation can exhibit up to a high volume change potential.

Detailed assessment of the geotechnical characteristics of the soils encountered at the site is presented in Section 8 of this report.

3.1.4 Mining, Ground Workings and Natural Cavities

Table 3. Mining, Extraction and Natural Cavities from Groundsure Data

Section	Risk Assessment
Natural Cavities	No natural cavity records are identified within 500m of the site.
BritPits	No entries are shown within 250m of the site.
Surface Ground Workings	A number of surface ground workings are identified within 250m of the site: Grave yard: 116m west of the site (1875) Pond: 16m south east of the site (1896, 1912, 1962) Pond: 163m north east of the site (1896, 1962) Unspecified ground workings: 171m north of the site (1875, 1692, 1978) Pond: 174m north east of the site (1875, 1912, 1978) Pond: 242m west of the site (1875, 1896, 1912, 1962) Pond: 244m north of the site (1896, 1912, 1962, 1978).
Underground Workings	No underground workings are identified within 250m of the site.
Historical Mineral Planning Areas	No records are identified within 500m of the site.
Non-Coal Mining	The site is located within an area where localised small scale mining for iron ore may have occurred.
Mining Cavities	No records are identified within 100m of the site.
Johnson Poole and Bloomer	No records are identified on the site.
Coal Mining	No records are identified on the site.
Brine Areas	No records are identified on the site.
Gypsum Areas	No records are identified on the site.
Tin Mining	No records are identified on the site.
Clay Mining	No records are identified on the site.

Given the distance from the site, and nature of the entry, the grave yard is not considered to represent a viable source of contamination which could pose an unacceptable risk to the site.

The review of the historical maps indicates that the unspecified ground working 174m to the north of the site represents terracing for Brookhill House, rather than an excavated pit (or similar), which could have potentially been backfilled and therefore does not pose an unacceptable risk to the site.

Backfilled ponds can potentially represent sources of ground gas generation. However, given the small size of all of the ponds identified (and therefore the limited amount of anthropogenic material which could have been placed when they were backfilled), the relatively impermeable nature of the underlying geology (Weald Clay Formation) and their respective distances from the site they are not considered to pose an unacceptable risk to the site.

3.1.5 Radon

Table 4. Radon

Section	Risk Assessment
Radon Affected Areas	The site is reported to be within an area where less than 1% of properties are at or above the action level requiring radon gas protection measures to be installed in new buildings.
Radon Protection Measures	No radon protection measures are reported by the British Geological Survey to be necessary in the construction of new dwellings or extensions.

3.1.6 Soil Chemistry

The estimated background soil chemistry does not pose an unacceptable risk in the context of the site. Detailed assessment of the chemistry of the soils encountered at the site is presented in Section 9 of this report.

3.2 Hydrogeological and Hydrological Data Review

3.2.1 Groundwater Abstractions

No groundwater abstraction licences are indicated within 2km of the site.

3.2.2 Surface Water Abstractions

No surface water abstraction licences are indicated within 2km of the site.

3.2.3 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone.

3.2.4 Surface Water Features

The nearest recorded significant surface water feature is an inland river, located 148m south east of the site.

3.2.5 Flood Risk

The table below summarises the flood risk data provided by the Groundsure report.

Table 5. Flooding

	On Site	Within 50m of the Site
Risk of Flooding from Rivers and Seas (RoFRaS)	None Identified	None Identified
Historical Flood Events	None Identified	None Identified
Flood Defences	None Identified	None Identified
Areas Benefitting from Flood Defences	None Identified	None Identified
Flood Storage Areas	None Identified	None Identified
Environment Agency Flood Zone 2	None Identified	None Identified
Environment Agency Flood Zone 3	None Identified	None Identified
Surface Water Flooding	Highest Risk: Negligible	Highest Risk: 1 in 1,000 year event Depth between 0.1m-0.3m
Groundwater Flooding	Highest Risk: Negligible	Highest Risk: Negligible

3.3 Geo-Environmental Data Review

3.3.1 Historical Industrial Sites

The following table summarises past land uses of the site and the surrounding area extracted from 1:10,000 and 1:10,560 historical maps.

Table 6. Historical Industrial Sites

Section	Remarks
Historical Industrial Land Uses Identified from 1:10,560 and 1:10,000 scale mapping	No historical land uses are identified within 100m of the site.
Historical Tank Database Identified from 1:1,250 and 1:2,500 scale mapping	No historical tanks are identified within 100m of the site.
Historical Energy Features Identified from 1:1,250 and 1:2,500 scale mapping	No energy features are identified within 100m of the site.
Historical Petrol Stations Identified from 1:1,250 and 1:2,500 scale mapping	No historical petrol stations are identified within 100m of the site.
Historical Garages Identified from 1:1,250 and 1:2,500 scale mapping	A garage is identified to be located 60m south west of the site (1972-1193 mapping). Given the distance from the site, this is not considered to represent a potential source of contamination which could impact the site.
Historical Military Sites	No historical military sites are identified within 100m of the site.

3.3.2 Landfill and Other Waste Sites

The following table summarises the location of waste sites either on the site or within the surrounding area (within 250m of the site).

Table 7. Landfill and Other Waste Sites

Section	Remarks
Active or Recent Landfills	No active or recent landfills are identified within 250m of the site.
Historical Landfill (BGS Records/LA/Mapping Records EA Records)	No historical landfills are identified within 250m of the site.
Historical Waste Sites	No historical waste sites are identified within 250m of the site.
Licensed Waste Sites	No licensed waste sites are identified within 250m of the site.
Waste Exemptions	Two exemptions are identified within 200m of the site, both for use of waste in construction and located 43m north east and 198m south west of the site. Given the nature of the exemptions and the distance from the site they are not considered to represent potential sources of contamination which could impact the site.

3.3.3 Current Industrial Land Use

The relevant current industrial land uses are discussed in the table below.

Table 8. Current Industrial Land Uses

Section	Remarks
Recent Industrial Land Use	The only record within 100m of the site is a packing company located 62m south west of the site. Given the land use and the distance to the site this is not considered to represent a potential source of contamination which could impact the site.
Current or Recent Petrol stations	No current or recent petrol stations are identified within 100m of the site.
Electricity Cables / Gas Pipelines	No underground high voltage cables or high-pressure pipes are identified within 100m of the site.
Sites determined as Contaminated Land	No sites determined as contaminated land are identified within 100m of the site.
Control of Major Accident Hazards (COMAH) Sites	No COMAH sites are identified within 100m of the site.
Regulated Explosive Sites	No regulated explosive sites are identified within 100m of the site.
Hazardous Substance Storage/Usage	No consents have been granted for hazardous substance storage/usage within 100m of the site.
Historical Licenced Industrial Activities (IPC)	No records are recorded within 100m of the site.
Licenced Industrial Activities (Part A(1))	No records are identified within 100m of the site.
Licenced Pollutant Release (Part A(2)/B)	No records are identified within 100m of the site.
Radioactive Substance Authorisations	No records are identified within 100m of the site.

Section	Remarks
Licenced Discharges to Controlled Waters	No records are identified within 100m of the site.
Pollutant Release to Surface Water / Public Sewer	No records are identified within 100m of the site.
List 1 / List 2 Dangerous Substances	No records are identified within 100m of the site.
Pollution Incidents (EA/NRW)	No pollution incidents are identified within 100m of the site.
Pollution Inventory Substances / Waste Transfers / Radioactive Waste	No records are identified within 100m of the site.

3.3.4 Sensitive Land Use

The site is located within a nitrate vulnerable zone (NVZ). The development proposals are not considered to pose an unacceptable risk to the NVZ.

No other sensitive land uses at risk from contamination are identified within 1km of the site.

3.3.5 Railway Infrastructure and Projects

No current railway or associated features are identified within 250m of the site.

4. HISTORICAL MAP REVIEW

Historical Ordnance Survey maps covering the area of the site have been reviewed and are summarised in the following table.

It is noted that each map presents information applicable at the time of the survey (or revision date) and is subject to surveying and cartographic errors and/or advances. Revisions to maps are made at irregular intervals and it is possible that significant developments may have taken place on or within the vicinity of the site that are not shown on the maps.

'In the Vicinity of the Site' generally refers to features of relevance within approximately 250m of the site boundary but may also include more distant features if considered to be pertinent to the assessment of the development history.

Table 9. Summary of Significant Features Identified on Historical Maps

Map Details	On-Site	In the Vicinity of the Site
1877 1:2,500	The site comprises part of an open field, with a track present along the south eastern boundary.	Fields generally extend around the site, with the closest structures being a pub and houses some 75m to the west of the site.
1956 1:12,500	The site remains an undeveloped area of land.	A road and residential housing bound the site to the north west and west. The area to the south east of the site is shown as a playing field.
1972 1:2,500	The site is shown as developed. Two residential properties are shown in the north east of the site, with a further two in the south west of the site. A row of residential garages runs along the south eastern boundary in the central part of the site.	
2018 Aerial Photo	The site is shown in its current layout. The garages formerly in the centre of the site are no longer shown.	

5. PRELIMINARY CONTAMINATION RISK ASSESSMENT

5.1 Introduction

The risk assessment considers the potential sources of contamination identified, the receptors that may be present in view of the development proposals and the contaminant pathways by which these may be linked. A complete pollutant linkage is only deemed to exist where all three are present and a site is considered suitable for use where no complete pollutant linkages are identified.

Where a complete pollutant linkage is deemed to be present, an assessment of the level of risk associated with the pollutant linkage has been carried out in line with current guidance[1].

The level of risk is determined using the risk matrix presented in the following table. Classifications of probability, consequence and risk are presented in Appendix B.

Table 10. Risk Assessment Matrix

		Probability			
		Very Low	Low	Moderate	High
Consequence	Very Minor	Negligible	Very Low	Low	Low/Moderate
	Minor	Very Low	Low	Low/Moderate	Moderate
	Moderate	Low	Low/Moderate	Moderate	High
	Severe	Low/Moderate	Moderate	High	Very High

5.2 Basis of Assessment

The development is to comprise new residential buildings together with areas of private garden where end users can expect to come into contact with the underlying soils, where soil derived dusts may be generated and where the growing of fruit and vegetables may feasibly occur.

The proposed development layout is presented in Appendix A. Should the proposed development plans be altered, a revised risk assessment may be required.

It is noted that an asbestos survey of existing structures and infrastructure[2] was beyond the brief of this report. The risk assessment has been undertaken on the basis that should asbestos be identified within buildings or infrastructure, these materials will be removed appropriately by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition or other works in order to avoid contaminating soils at the site.

The findings of the preliminary contamination assessment have been used to inform the ground investigation works which are discussed in the following section of the report.

[1] Contaminated Land Risk Assessment: A guide to good practice, CIRIA C552, 2001.
[2] As defined under Section 5(a) of the Control of Asbestos Regulations, 2012.

5.3 Potential Contamination Sources Identified

The following potential sources of contamination have been identified by the preliminary contamination risk assessment:

- Localised made ground associated with the demolition of the former garages in the central part of the site.

5.4 Preliminary Conceptual Model

The preliminary conceptual model for the proposed development is presented in Appendix C.

6. GROUND INVESTIGATION

6.1 Introduction

The ground investigation comprised the drilling of a series of dynamic sampler boreholes and the excavation of a hand dug pit, together with accompanying in-situ geotechnical testing. Groundwater monitoring standpipes were installed in selected exploratory holes. The intrusive work was carried out on 11th March 2022. The exploratory hole locations are shown on Figure 2.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in Appendix D, together with notes to assist in their interpretation.

6.2 Exploratory Holes

6.2.1 Dynamic Sampler Boreholes

Five boreholes, designated WS01 to WS05, were drilled to depths of between 2.60m and 2.70m below ground level.

The boreholes were formed by a series of 1.0m long, open ended, hollow steel tubes of up to 100mm diameter, each containing a removable plastic liner. The tubes, progressively reducing in diameter, were driven into the ground by means of a track-mounted drop weight. Each tube was extracted from the ground using a hydraulically operated jack and the enclosed sample was recovered in its plastic liner.

The system enables sub-samples to be taken for detailed examination and laboratory testing.

6.2.2 Trial Pit

A single trial pit, designated TP01, was dug using hand tools to a depth of 1.00m below ground level to enable soakage testing to be carried out.

6.3 Sampling

Disturbed samples of soil were taken at the depths shown in the exploratory hole records and were collected in plastic bags, plastic tubs or amber jars fitted with gas tight lids.

On collection the amber jars were stored in cool boxes with cooling blocks to maintain temperatures below 4°C until transferred to refrigerators upon return to the office and subsequently forwarded to the external accredited chemical testing laboratory.

6.4 In-situ Testing

The depths of in-situ testing, together with the test results, are either given on the exploratory hole records or are summarised separately in Appendix D.

6.4.1 DPSH Dynamic Probe (Super Heavy) Testing

Continuous dynamic probe tests were undertaken adjacent to each of the dynamic sampler boreholes. The tests were conducted to depths of between 2.80m and 4.30m below ground level using a super heavy DPSH-B[3] probing geometry.

The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

The blow counts recorded and the calculated dynamic point resistances, which account for inertia of the anvil and driving rods, are presented on the borehole records and separately in Appendix D.

6.4.2 Undrained Shear Strength

Undrained shear strength determinations were made in-situ within the fine-grained soils using a Geonor hand shear vane.

Additionally, undrained shear strength determinations were made within samples of the fine-grained soils held in the dynamic sampler liners using a hand penetrometer.

6.4.3 Soakage Testing

A falling head soakage test was undertaken in borehole WS03 with the hole at a depth of 2.70m. The test was carried out in general accordance with Kent County Council guidance[4].

A falling head soakage test was also undertaken in trial pit TP01 with the hole at a depth of 1.00m. The test was carried out in general accordance with BRE guidance[5], other than the pit was filled only once rather than the three times suggested by the digest.

6.5 Installations

Groundwater monitoring standpipes were installed to depths of between 2.60m and 2.70m in boreholes WS01, WS02 and WS04. Descriptions of the installations are shown on the exploratory hole records in Appendix B.

Winter groundwater monitoring is due to be undertaken within the standpipes during winter 2022-23. Groundwater level monitoring data will be issued under separate cover on completion of the monitoring period.

6.6 Laboratory Testing

Laboratory testing was scheduled by Ashdown Site Investigation Ltd. Results from the laboratory tests are provided in Appendix E.

[3] As defined by BS EN ISO 22476-2:2005.
[4] The Soakaway Design Guide published by Kent County Council, 2000.
[5] Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.

6.6.1 Geotechnical Testing

Geotechnical testing was undertaken by Ashdown Site Investigation Ltd in accordance with the methods given in BS1377[6]. Chemical testing to enable classification of the chemical environment of soils in accordance with BRE SD1[7] was undertaken by an external UKAS accredited laboratory.

6.6.2 Chemical Testing

Chemical (contamination) testing of selected samples was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

[6] BS1377:1990 Parts 1 to 8, Methods of test for soils for civil engineering purposes.
[7] BRE Special Digest 1:2005 Concrete in Aggressive Ground.

7. GROUND CONDITIONS

7.1 Stratigraphy

7.1.1 Surface Covering

With the exception of borehole WS03, each of the exploratory holes was excavated through a surface cover of topsoil some 200mm to 250mm in thickness.

At the position of borehole WS03, asphalt some 50mm thick was recorded.

7.1.2 Made Ground/Reworked Soils

Made ground or reworked soils, were recorded to depths of between 0.30m and 0.50m below ground level at all exploratory hole positions, with the exception of borehole WS05.

These soils generally comprised slightly gravelly slightly sandy clay; the gravel fraction comprised variable quantities of subangular to subrounded fine to coarse brick, charcoal-like material and ironstone. At the position of borehole WS03, the made ground comprised sandy gravel of brick and concrete.

7.1.3 Weald Clay Formation

Beneath the surfacing materials and made ground/reworked deposits, the exploratory holes encountered generally stiff clay becoming progressively very stiff with depth. Locally firm soils were present within the uppermost 1.0m of ground.

These soils, which continued to the full depth of the investigation, are considered to be representative of the Weald Clay Formation soils indicated to underlie the site on the published geology map.

7.2 Stability

Each of the exploratory holes was recorded to remain stable during the course of drilling / excavation.

7.3 Groundwater Conditions

Standing water was not encountered during drilling/excavation or on completion of the exploratory holes.

It should be noted that water levels within the boreholes may not have equilibrated with the groundwater table at the time the readings were recorded and that groundwater levels should be expected to fluctuate seasonally.

Groundwater monitoring is due to take place over the winter period in 2022-23.

8. GEOTECHNICAL ASSESSMENT

The geotechnical assessment has been prepared in connection with the development proposals shown on the drawing included in Appendix A.

In summary this drawing indicates the proposed development to comprise the demolition of the properties 15-18 Fairfield Cottages, Cowfold and the construction of 9 no. new residential units comprising 4 no. one-bed maisonettes and 5 no two-bed houses with private and communal soft landscaping and associated parking areas.

At the time of writing, no details were available concerning the specific loads likely to be applied to the foundations.

8.1 Foundations

8.1.1 Soil Shrinkage/Heave Potential

The fine-grained soils of the Weald Clay Formation have been classified as clays and with modified plasticity indices in the range of 28% to 44%, the soils may be expected to exhibit a medium to high volume change potential.

It is recommended that the design of precautions against shrinkage and heave for any new foundation system (spread footings, piles, pile caps and ground beams etc.) should assume a high volume change potential for the fine-grained Weald Clay Formation soils and take into account current guidance such as that given by the Building Research Establishment (BRE)[8] or the National House Builders Council (NHBC)[9].

Whilst this report has been prepared to provide advice to assist designers in undertaking detailed design, the report itself does not represent a detailed design statement. It is recommended that an arboricultural survey of the site that identifies the species and maturity of the existing trees in the areas of the proposed new buildings should be provided to engineers responsible for the foundation design. It is noted that a large tree that once stood in the grass area in the middle of the site was recently felled. Details of any felled trees that may affect foundation design should also be provided. In addition, information on proposed planting schemes and the findings of this report should be provided to the structural engineer responsible for the detailed design of foundation systems, to enable their assessment of minimum founding depths required for spread foundations, requirements for sleeving or reinforcing of piled foundations and requirements for placement of void formers et cetera.

8.1.2 Spread Foundations

8.1.2.1 Foundation Depths for Spread Foundations

Foundations should be constructed to bear below soils that are likely to be affected by significant soil volume changes caused by seasonal changes in moisture content to avoid damage to foundations that could otherwise arise. In addition, all made ground and any soils disturbed by the construction or removal of any previously existing foundations or services should be regarded as being variable in nature and state of compaction and, as such, unsuitable as a founding medium for shallow footings. New footings should be constructed to bear below made ground /

[8] www.bre.co.uk : BRE Digests 240, 241 and 242, Low rise buildings on shrinkable clay soils, parts 1, 2 and 3; and BRE Digest 298 , The influence of trees on house foundations in clay soils and BRE Digest 412, Desiccation in clay soils.
[9] http://www.nhbc.co.uk/ : NHBC Standards, Chapter 4.2.

disturbed natural soils and soil subject to seasonal soil volume changes, whichever is the deeper, and onto undisturbed, competent, natural deposits.

Summary guidance on suitable minimum foundation depths to protect against the effects of seasonal soil volume changes is presented in the table below but designers undertaking detailed design of foundations should follow the detailed guidance such as that provided within Chapter 4.2 of the NHBC Standards.

Table 11. Indicative Minimum Foundation Depths

Tree Type	Water Demand of Tree	Tree Distance to Tree Height Ratio (D/H)									
		0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.25
		Minimum Foundation Depth Required in High Volume Change Potential Soils (m)									
Broad Leaf	High	†					2.50	2.30	1.90	1.50	1.00*
	Moderate	2.40	2.25	2.05	1.85	1.65	1.50	1.30	1.00*	1.00*	1.00*
	Low	1.80	1.65	1.50	1.35	1.20	1.00*	1.00*	1.00*	1.00*	1.00*
Coniferous	High	†			2.20	1.80	1.40	1.00*	1.00*	1.00*	1.00*
	Moderate	2.40	2.00	1.60	1.20	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*

* Minimum foundation depth required to protect against soil volume changes.
† Foundations deeper than 2.50m require specialist design to protect against soil volume changes.

Details on the water demand and mature height of common trees is given within Table 3 of Chapter 4.2 of the NHBC standards which should be referred to when assessing minimum foundation depths required for the proposed development. A summary is provided in the table below.

Table 12. Indicative Summary of Water Demand and Mature Height of Common Trees

Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand	
	Tree	Height (m)	Tree	Height (m)	Tree	Height (m)
Broad Leaf	Elm	18 – 24*	Acacia	18	Birch	14
	Oak	16 – 24*	Alder	18	Elder	10
	Poplar	15 – 28*	Apple	10	Fig	8
	Willow	16 – 24*	Ash	11 – 23*	Hazel	8
	Eucalyptus	18	Laurel	10	Holly	12
	Hawthorn	10	Beech	20	Honey Locust	14
			Blackthorn	8	Hornbeam	17
			Cherry	8 – 17*	Laburnum	12
			Chestnut	20 – 24*	Magnolia	9
			Lime	22	Mulberry	9
			Maple	8 – 18*	Tulip Tree	20
			Pear	12		
			Plane	26		
			Plum	10		
			Sycamore	22		

Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand	
	Tree	Height (m)	Tree	Height (m)	Tree	Height (m)
			Tree of Heaven	20		
			Walnut	18		
			Whitebeam	12		
Coniferous	Cypress	18 – 20*	Cedar	20		
			Douglas Fir	20		
			Larch	20		
			Monkey Puzzle	18		
			Pine	20		
			Spruce	18		
			Wellingtonia	30		
			Yew	12		

* Dependent on particular species.

8.1.2.2 Bearing Capacity for Spread Foundations

For design purposes, a net allowable bearing capacity of 150kN/m^2 may be assumed for spread (pad or strip) foundations up to 1.00m across bearing within the Weald Clay Formation soils of at least stiff consistency. The quoted bearing capacity is expected to limit settlement to less than 25mm.

8.2 Groundwater

Standing water was not encountered during the fieldwork. It is noted that higher groundwater levels may prevail during wetter periods and that winter groundwater monitoring is scheduled to be undertaken.

Whilst, to date, groundwater has not been encountered within the depth of the ground investigation, the potential for perched groundwater to be present above the groundwater table, for example within the made ground/reworked soils, should not be overlooked. It is also possible that heavy precipitation during construction could lead to the ingress of perched groundwater or surface water run-off into excavations. In such circumstances it would be expected that water entering excavations would be adequately managed by pumping from sumps.

8.3 Stability of Excavations

All made ground or coarse-grained natural soils exposed in excavations should be assumed to be unstable, even in the short term. Whilst fine-grained natural soils may remain stable for a short period of time if not subjected to surcharge loads (such as may be imposed by existing foundations, traffic or storage of materials), the stability of these deposits if left unsupported should be assumed to have the potential to deteriorate. Where stable excavations are required, excavations should either be suitably supported or, where space permits, side slopes could be battered back to a safe angle of repose.

All excavations requiring human entry must be shored or battered as necessary to conform to current best practice, as accepted by the Health and Safety Executive (HSE)[10]. Current legislation requires that where personnel access is required into any excavation a competent person must inspect excavation supports or battering of slopes at the start of the working shift and at other specified times. No work should take place until the excavation is safe. Excavations should also be inspected after any event that may have affected their stability, such as a significant weather event, changes in surcharge loadings imposed by temporary storage of materials or changes in site traffic plans or alteration of support systems. Inspections should be formally recorded and any faults that are found should be corrected immediately.

8.4 Aggressivity to Concrete

The aggressivity of the soils to concrete has been assessed in accordance with guidance published by the BRE[11].

In consideration of the soils encountered beneath the site and its historical usage it is considered that 'natural ground conditions' may be assumed for the purpose of assessing the aggressivity of the chemical environment for concrete classification (ACEC class). Whilst groundwater was not encountered during the short period of the works, in the absence of long-term monitoring data being available to date, 'mobile groundwater' conditions should be conservatively assumed.

The soils present beneath the site may be expected to contain sulphides which if exposed to air and water, and potentially bacterial action, may oxidise and convert into sulphates. The sulphides are significantly more likely to oxidise in ground that has been significantly disturbed, for example by cutting and filling as part of earthworks or by excavation and backfilling. Ground that is not disturbed beyond the cut face (e.g. piling operations or excavation without backfill) would not generally be considered by the guidance as being disturbed ground. Where disturbed ground is likely to result from construction activities a Design Sulfate Class based on the total potential sulphate should be adopted.

The following table summarises the characteristic values indicated from the chemical analysis of the soils present beneath the site.

Table 13. Assessment of the Chemical Analysis of the Soil

	Characteristic Value	Design Sulfate Class	ACEC Classification
pH	5.3	-	-
Water Soluble Sulphate (mg/l as SO4) *	200	DS-1	AC-2z
Total Potential Sulphate (TPS % SO4)	No Oxidisable Sulphides	N/A	N/A

Notes: * Characteristic value rounded to nearest 100.

In accordance with the guidance, a DS-1 Design Sulfate Class and an AC-2z ACEC classification should be assumed as a minimum for the design of concrete in contact with the ground.

[10] Relevant guidance is given on the HSE website, www.hse.gov.uk
[11] BRE Special Digest 1:2005 Concrete in Aggressive Ground.

8.5 Ground Floors

In view of the variable thickness of made ground and the presence of soils of medium to high volume change potential underlying the site, it is recommended that ground floors should be suspended.

8.6 Stormwater Infiltration Systems

In-situ infiltration testing[12] was carried out in trial pit TP01 and borehole WS03. Infiltration during both tests was negligible and therefore infiltration rates could not be calculated.

The tests have been summarised below:

Table 14. Infiltration Test Results

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Driving Head of Water (m)
	Top	Bottom			
TP01	0.43	1.00	Weald Clay Formation	Negligible	n/a
WS03	2.00	2.70		Negligible	2.0

The results from the infiltration tests indicate that the Weald Clay Formation soils possess negligible infiltration characteristics. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

It is considered that the Weald Clay Formation soils will only be suitable for the construction of peak flow storage tanks connected via attenuated drainage pipes to mains surface water drainage or open water courses.

[12] Conducted in general accordance with the requirements of BRE 365, Soakaway Design.

9. QUANTITATIVE CONTAMINATION ASSESSMENT

9.1 Analysis of Contamination Test Results

Comparison of the results of the laboratory testing has been made against the 'Suitable For Use Levels' (S4UL)[13] or, in lieu of an S4UL being developed for lead, the Category 4 Screening Level (C4SL)[14]. These are collectively referred to as soil screening values (SSV).

In view of the development proposal, the SSV utilised in this assessment are those calculated for the generic "Residential" land use[15]. The critical receptor for this land use is considered to be a young female child resident on site from birth to age 6. Exposure routes that are considered include the potential for direct ingestion of the soil, the outdoor and indoor ingestion of dust, the potential inhalation of dust and vapours, ingestion of site grown vegetables and ingestion of soil attached to vegetables.

For the assessment of risk to controlled waters a qualitative assessment has been undertaken based upon the concentrations of contaminants recorded within the soil samples (comprising topsoil and made ground) and the information obtained about the sensitivity of the underlying strata or nearby surface water receptors.

9.1.1 Heavy Metals

The following table summarises the SSV along with the maximum and minimum concentrations of the heavy metals tested for.

Table 15. Summary of Test Results for Heavy Metals

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Arsenic	37	5	6.4	19.4	0	0
Cadmium	11	5	<LOD	<LOD	0	0
Chromium	910	5	26.6	33.2	0	0
Copper	2400	5	19	97.6	0	0
Lead	200	5	39.6	277	0	1
Mercury	40	5	<LOD	<LOD	0	0
Nickel	180	5	15	19.9	0	0
Selenium	250	5	<LOD	<LOD	0	0
Zinc	3700	5	44.3	115	0	0
Hexavalent Chromium	6	5	<LOD	<LOD	0	0
Water Soluble Boron	290	5	<LOD	1.2	0	0

[13] Nathanail, C.P, et al., The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015, Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3071.
[14] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.
[15] As defined within Science Report SC050021/SR3, January 2009, with the amendments discussed in the LQM/CIEH report.

9.1.2 Polycyclic Aromatic Hydrocarbon (PAH) Compounds

The following table summarises the soil screening values, maximum and minimum concentrations for the PAH compounds tested for.

Table 16. Summary of Test Results for PAH Compounds

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Naphthalene	2.3	5	<LOD	0.08	0	0
Acenaphthylene	170	5	<LOD	1.3	0	0
Acenaphthene	210	5	<LOD	0.1	0	0
Fluorene	170	5	<LOD	0.3	0	0
Phenanthrene	95	5	<LOD	0.6	0	0
Anthracene	2400	5	<LOD	0.4	0	0
Fluoranthene	280	5	<LOD	6.7	0	0
Pyrene	620	5	<LOD	9.1	0	0
Benz(a)anthracene	7.2	5	<LOD	6.8	0	0
Chrysene	15	5	<LOD	6.7	0	0
Benzo(b)fluoranthene	2.6	5	<LOD	12	0	1
Benzo(k)fluoranthene	77	5	<LOD	11	0	0
Benzo(a)pyrene	2.2	5	<LOD	13	0	1
Indeno(123-cd)pyrene	27	5	<LOD	11.2	0	0
Dibenz(ah)anthracene	0.24	5	<LOD	1.2	0	2
Benzo(ghi)perylene	320	5	<LOD	11.6	0	0

9.1.3 Asbestos

Five samples of the made ground and topsoil were screened for the presence of asbestos. None of the samples recorded the presence of any asbestos materials.

9.1.4 Petroleum Hydrocarbons

The following table lists the screening values for petroleum hydrocarbon equivalent carbon weight fractions calculated for 1% organic content.

Table 17. Soil Screening Values for petroleum hydrocarbon equivalent carbon weight fractions

Petroleum Hydrocarbon Fraction	SSV (mg/kg)	Petroleum Hydrocarbon Fraction	SSV (mg/kg)
Aliphatic EC 5-6	42	Aromatic EC 5-7	70
Aliphatic EC >6-8	100	Aromatic EC >7-8	130
Aliphatic EC >8-10	27	Aromatic EC >8-10	34
Aliphatic EC >10-12	130	Aromatic EC >10-12	74
Aliphatic EC >12-16	1100	Aromatic EC >12-16	140
Aliphatic EC >16-35	65000	Aromatic EC >16-21	260
Aliphatic EC >35-44	65000	Aromatic EC >21-35	1100
		Aromatic EC >35-44	1100

Whilst full speciation of the concentrations of petroleum hydrocarbons by aromatic and aliphatic fractions was not undertaken, the results of the testing undertaken can still be compared with the more stringent of the screening values for the respective equivalent carbon weight fraction and, where the concentration recorded is found to be lower, it can be reasonably concluded that no significant risk is present.

None of the five samples recorded concentrations of any weight fraction above the more conservative screening value.

9.2 Conclusions

Three of the five samples of made ground and topsoil have recorded concentrations of lead or PAH compounds above the published screening values. These soils may therefore pose an unacceptable risk to end users of the development.

The concentrations of petroleum hydrocarbons recorded in the sample from borehole WS03 exceed the threshold values for the use of PE water supply pipe. Given that only a shallow depth of made ground was present in this location, this is unlikely to pose a significant risk to new water supply runs. However, it is strongly recommended that the water supply company be consulted at an early stage to determine whether they require any further investigation or assessment, or whether specific protective measures i.e. barrier pipe, are required for new water supply runs.

As the site is underlain by the relatively impermeable Weald Clay Formation and does not lie within a source protection zone, the concentrations of heavy metals, PAH compounds or petroleum hydrocarbons are not considered to pose an unacceptable risk to controlled waters.

There does not appear to be a significant risk to end users from asbestos materials within soils. However, due to the heterogeneity of made ground, there will always remain the potential for localised asbestos materials to be encountered during construction works, though the likelihood of this is considered to be very low. All workers at the site should be made aware of what actions to take in the event that suspected asbestos materials are identified at any time during the development works.

Remedial measures are considered to be required within any proposed garden or communal soft landscaped areas to ameliorate the risk from the contaminants identified to end users.

Given the relatively shallow depth of made ground recorded and the context of the development, remedial works would be expected to comprise either the removal of the made ground and topsoil, to remove the source, or the provision of a cover system of "clean" soils to sever the contaminant pathway.

Elsewhere, the presence of building cover or other permanent hard standing would be considered to effectively sever the contaminant pathway whereby no specific remedial works would be necessary.

This risk assessment should be submitted to the local authority for their review and approval. Following approval of the assessment, a remediation strategy should be prepared detailing the works necessary to ameliorate the identified pollutant linkages, along with a verification plan setting out how evidence of these works will be collected and presented in the final verification report.

9.3 Quantitative Contamination Risk Assessment

9.3.1 Contamination Sources Identified

The following source of contamination has been identified by the quantitative contamination risk assessment: Made ground and topsoil across the site containing elevated levels of heavy metals and PAH Compounds.

9.3.2 Quantitative Conceptual Model

The quantitative conceptual model for the proposed development is presented in Appendix F.

9.4 Risks to Other Potential Receptors

All construction workers must undertake their own risk assessment, based upon the works to be carried out and the proposed method by which this will be achieved, in accordance with current health and safety legislation. Their assessment should take into account all available information about the site, including that present within this report.

Appropriate working procedures and PPE should be adopted to ensure the health and safety of the site operatives. Instruction should be given in the recognition of potentially hazardous materials. All site personnel should be appropriately briefed on the discovery strategy, presented below, and what actions they must take in the event that further evidence of contamination is identified or suspected.

9.5 Discovery Strategy

If, during the course of the site clearance and development works, any materials not previously identified by the investigation that are suspected of being 'contaminants' are encountered, then the following procedure should apply:

- All works in that area should cease and the site manager should be informed.
- Advice should be sought from suitably qualified and experienced personnel as to whether any further site inspection, sampling, testing and/or assessment is deemed necessary.
- If required, the conclusions of any assessment and any proposed remedial works (if required) should be agreed by the local authority.
- If necessary, full details of any remedial works should be included in the verification report for the site.

Suspected 'contamination' may take the following form, though it is noted that this list is not exhaustive and site operatives should ask if they are at all unsure of any findings:

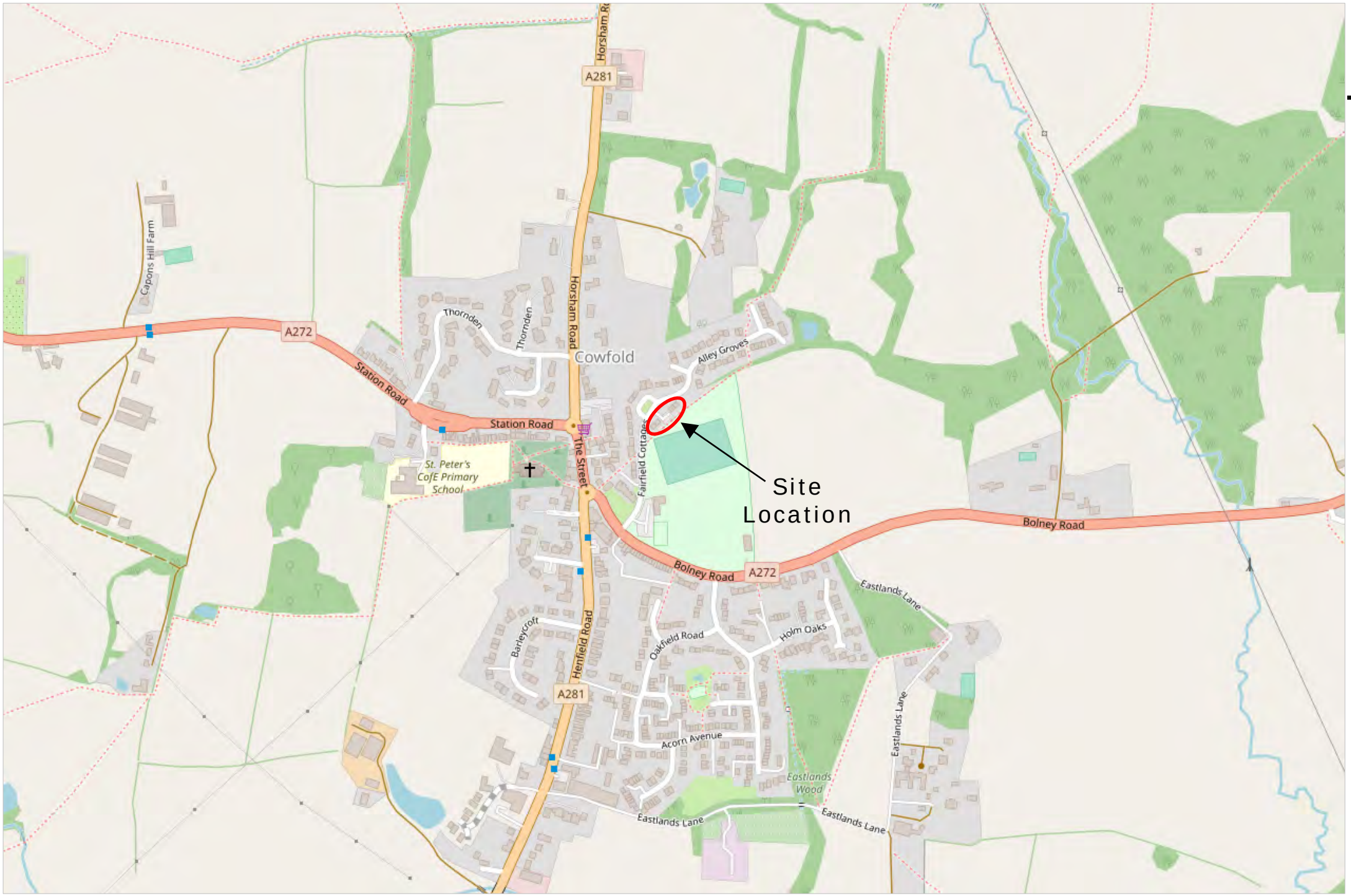
- Soil or water looks oily and/or has an oily odour
- Soil or water has a solvent type of odour
- Significant quantities of man-made materials within fill such as paint cans, car parts, glass fragments
- Suspected asbestos containing materials (insulating boards, cement, loose fibres etc.)
- Significant volumes of clinker like or ashy material
- Sand bags, and/or subsurface concrete structures

- Animal carcasses or evidence of animal burial pits

Ashdown Site Investigation Ltd.

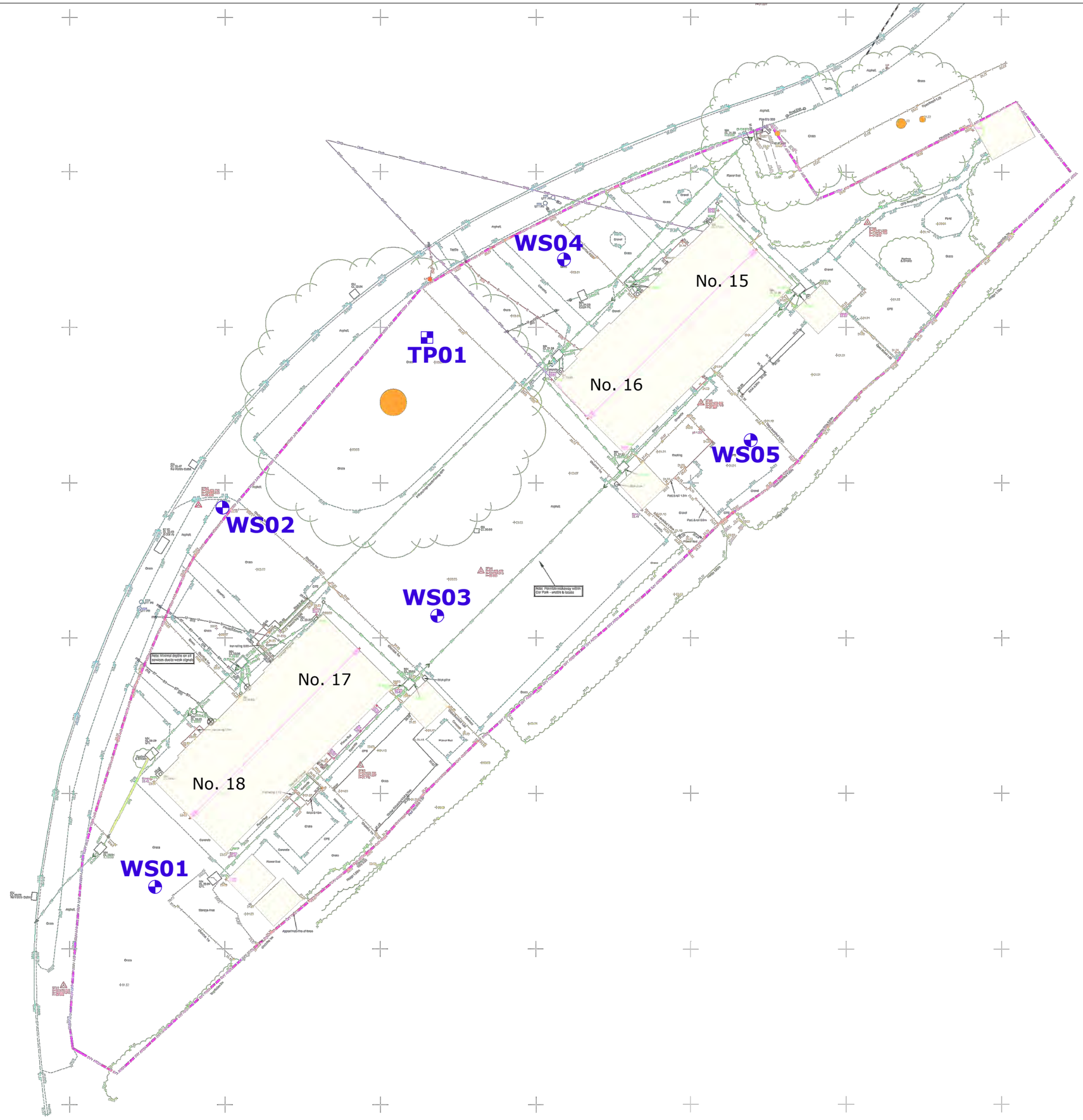
FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan



© OpenStreetMap contributors, CC BY-SA

ASHDOWN SITE INVESTIGATION LIMITED	Site Location Plan	Site Name	Figure No.	Project Reference
		15-18 Fairfield Cottages, Cowfold, West Sussex	1	P15524



ASHDOWN SITE INVESTIGATION LIMITED

Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
01273 483119
contact@ashdownsi.co.uk

Site:

15-18 Fairfield Cottages
Cowfold
West Sussex

Report Ref:

P15524

Figure No.

2

Drawing Title

Site Plan

Scale

NTS

APPENDIX D

Exploratory Hole Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records
Summary of Borehole Falling Head Soakage Test Results
Summary of Trial Pit Falling Head Soakage Test Results

NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

1 Symbols and abbreviations

Samples

U ‘Undisturbed’ Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
U_o Sample not obtained
U* Full penetration of sample not obtained
Pi Piston Sample: ‘Undisturbed’ sample 100mm diameter by 600mm long.
D Disturbed Sample
R Root Sample
B Bulk Disturbed Sample
W Water Sample
J Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T Tub Sample
Vi Vial Sample

In situ Testing

S Standard penetration test (SPT): Using the split spoon sampler.

C Standard Penetration Test (SPT): using a solid cone instead of the sampler - conducted usually in coarse grained soils or weak rocks.

V Shear Vane Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

H Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

P Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP Cable Percussion Borehole
WLS Dynamic Sampler Borehole using windowless sampler tubes
WS Dynamic Sampler Borehole using window sampler tubes
TP Trial Pit excavated using mechanic excavator
HDP Trial Pit excavated using hand tools

2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

4 Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, ‘Engineering in Chalk’. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

ASHDOWN SITE INVESTIGATION LIMITED
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

Job Number: P15524

Start Date: 11/03/2022

End Date:

Borehole Number: **WS01** Sheet 1 of 1

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
	J T	0.10					0.00	Topsoil.
	J T	0.30					0.20	MADE GROUND: Brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse brick and charcoal-like material.
	J T	0.50					0.40	Firm varying stiff brown mottled orange brown and grey CLAY. (Weald Clay Formation)
	D	0.80						
	V	1.00		>130				becoming stiff and brown mottled grey below 1.00m depth.
	H	1.10		170				
	H	1.50		140				
	H	1.70		170				becoming very stiff with horizons of mudstone below 1.70m depth.
	D	1.80						
	V	2.00		>130				
	H	2.10		250				
	H	2.30		250				
	D	2.50						
	H	2.60		250				
	V	2.70		>130			2.70	End of borehole at 2.70m

Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 2.70m depth - too hard.
Standpipe installed to 2.70m depth; 2.70m to 0.70m slotted pipe with gravel surround; 0.70m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: BA

ASHDOWN SITE INVESTIGATION L•I•M•I•T•E•D
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

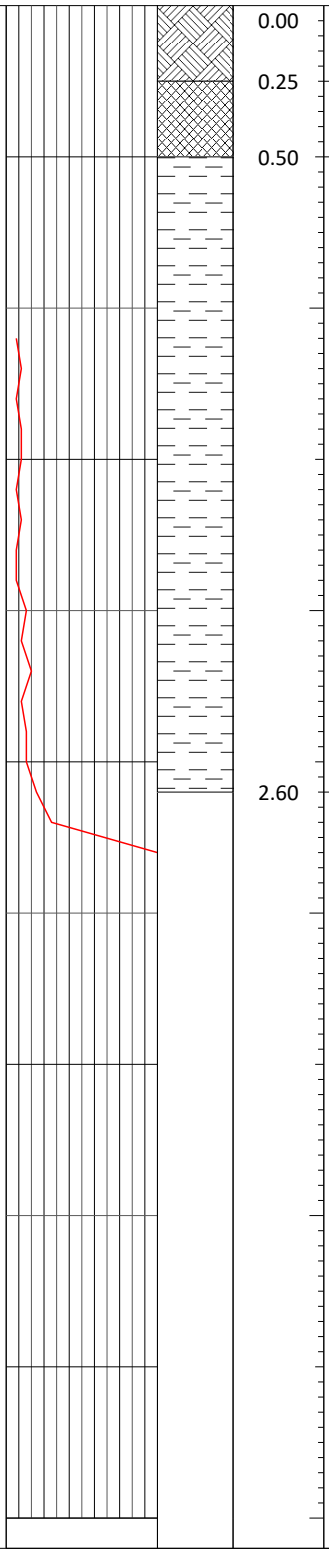
Job Number: P15524

Start Date: 11/03/2022

End Date:

Borehole Number: **WS02**

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
	J T	0.10					0.00	Topsoil.
	J T	0.30					0.25	MADE GROUND/ REWORKED: Brown slightly gravelly clay. Gravel is subangular to subrounded fine to coarse flint and ironstone.
	J T	0.60					0.50	Firm varying stiff brown mottled orange brown and grey CLAY. (Weald Clay Formation)
	D	0.70						
	V	1.00		90				becoming stiff below 1.00m depth.
	H	1.10		115				
	H	1.50		90				
	D	1.70						becoming stiff below 2.00m depth.
	H	1.70		140				
	V	2.00		>130				
	H	2.10		170				
	D	2.20						
	H	2.40		>250				
	V	2.60		>130			2.60	End of borehole at 2.60m



Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 2.60m depth - too hard.
Standpipe installed to 2.60m depth; 2.60m to 0.60m slotted pipe with gravel surround; 0.60m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: BA

ASHDOWN SITE INVESTIGATION
L•I•M•I•T•E•D
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

Job Number: P15524

Start Date: 11/03/2022

End Date:

Borehole Number: **WS03** Sheet 1 of 1

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
	J T	0.10					0.00	Asphalt.
							0.05	MADE GROUND: Sandy subangular to subrounded fine to coarrse gravel of brick and concrete.
							0.30	Firm varying stiff brown mottled grey CLAY. (Weald Clay Formation)
	J T	0.40						
	D	0.50						
	H	0.90		90				Borehole cased to 2.00m depth. becoming stiff below 0.90m depth.
	V	1.00		120				
	H	1.10		140				
	D	1.50						
	H	1.50		90				
	H	1.90		170				
	V	2.00		>130				becoming stiff to very stiff and occasionally dark brown below 2.00m depth.
	H	2.10		140				
	H	2.40		155				
	D	2.50						
	V	2.70		>130			2.70	End of borehole at 2.70m

Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 2.70m depth - too hard.

Excavation Method: WLS

Borehole Diameter: Various

Made By: BA

ASHDOWN SITE INVESTIGATION
L•I•M•I•T•E•D
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

Job Number: P15524

Start Date: 11/03/2022

End Date:

Borehole Number: **WS04** Sheet 1 of 1

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
	J T	0.10					0.00	Topsoil.
	J T	0.30					0.20	MADE GROUND: Brown slightly gravelly clay. Gravel is subangular to subrounded fine to coarse brick and charcoal-like material.
	J T	0.60					0.50	Stiff brown mottled grey and orange brown CLAY. (Weald Clay Formation)
	D	1.00						
	V	1.00		110				
	H	1.10		140				
	D	1.50						
	H	1.60		115				
	H	1.90		155				becoming very stiff below 1.90m depth.
	V	2.00		>130				
	H	2.10		>250				
	H	2.40		>250				
	D	2.50						
	V	2.60		>130			2.60	End of borehole at 2.60m

Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 2.60m depth - too hard.Standpipe installed to 2.60m depth; 2.60m to 0.60m slotted pipe with gravel surround; 0.60m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: BA

ASHDOWN SITE INVESTIGATION
L•I•M•I•T•E•D
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

Job Number: P15524

Start Date: 11/03/2022

End Date: 11/03/2022

Borehole Number: **WS05**

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
	J T	0.10					0.00	Topsoil.
	J T	0.35					0.25	Firm varying stiff brown mottled grey and orange brown CLAY. (Weald Clay Formation)
	D	0.50						
	H	0.50		115				
	H	0.70		115				
	V	1.00		110				becoming stiff below 1.00m depth.
	H	1.20		90				
	D	1.50						
	H	1.50		115				
	H	1.80		170				becoming stiff to very stiff below 1.80m depth.
	V	2.00		>130				
	H	2.10		170				
	H	2.40		185				
	D	2.50						
	V	2.60		>130			2.60	End of borehole at 2.60m

Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 2.60m depth - too hard.

Excavation Method: WLS

Borehole Diameter: Various

Made By: BA

ASHDOWN SITE INVESTIGATION
L•I•M•I•T•E•D
E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

Site Name: 15-18 Fairfield Cottages, Cowfold, West Sussex

Job Number: P15524

Start Date: 11/03/2022

End Date: 11/03/2022

Trial Pit Number: **TP01**

Samples and In Situ Testing				Legend	Depth/ Reduced Level	Stratum Description
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result			
J T	0.10				0.00	Topsoil.
J T	0.30				0.20	MADE GROUND: Brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse brick.
J T	0.70				0.40	Brown mottled orange brown and grey CLAY with occasional large roots. (Weald Clay Formation)
D	0.80					
					1.00	End of trial pit at 1.00m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method:	TP
Pit Length:	n/a
Pit Width:	n/a
Made By:	BA

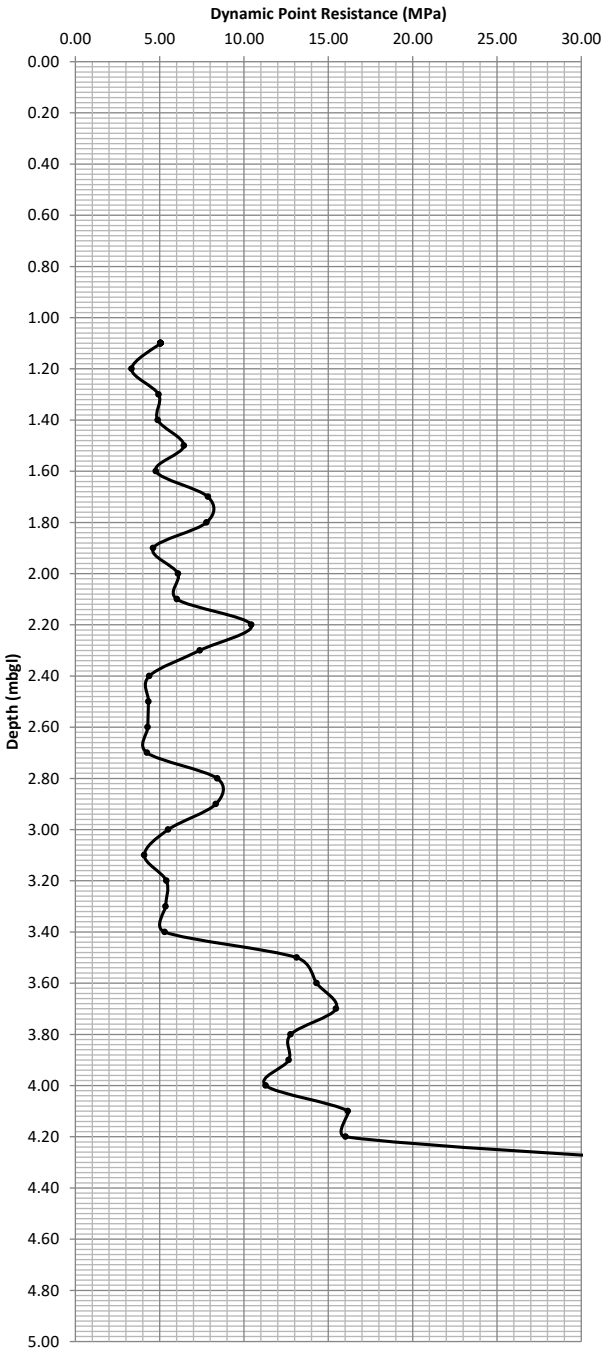
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE 15-18 Fairfield Cottages, Cowfold, West Sussex **Report Ref.** P15524

Test Location Reference	WS01

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	3	0.03	5.91	5.06
1.20	2	0.05	3.94	3.33
1.30	3	0.03	5.91	4.94
1.40	3	0.03	5.91	4.88
1.50	4	0.03	7.87	6.44
1.60	3	0.03	5.91	4.77
1.70	5	0.02	9.84	7.87
1.80	5	0.02	9.84	7.78
1.90	3	0.03	5.91	4.62
2.00	4	0.03	7.87	6.09
2.10	4	0.03	7.87	6.03
2.20	7	0.01	13.78	10.44
2.30	5	0.02	9.84	7.38
2.40	3	0.03	5.91	4.38
2.50	3	0.03	5.91	4.34
2.60	3	0.03	5.91	4.29
2.70	3	0.03	5.91	4.25
2.80	6	0.02	11.81	8.42
2.90	6	0.02	11.81	8.34
3.00	4	0.03	7.87	5.50
3.10	3	0.03	5.91	4.09
3.20	4	0.03	7.87	5.40
3.30	4	0.03	7.87	5.35
3.40	4	0.03	7.87	5.30
3.50	10	0.01	19.68	13.12
3.60	11	0.01	21.65	14.30
3.70	12	0.01	23.62	15.46
3.80	10	0.01	19.68	12.77
3.90	10	0.01	19.68	12.66
4.00	9	0.01	17.72	11.29
4.10	13	0.01	25.59	16.17
4.20	13	0.01	25.59	16.03
4.30	30	0.00	59.05	36.67
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
Hand dug starter pit to 1.00m depth.
No further progress below 4.30m depth- Hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.79	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

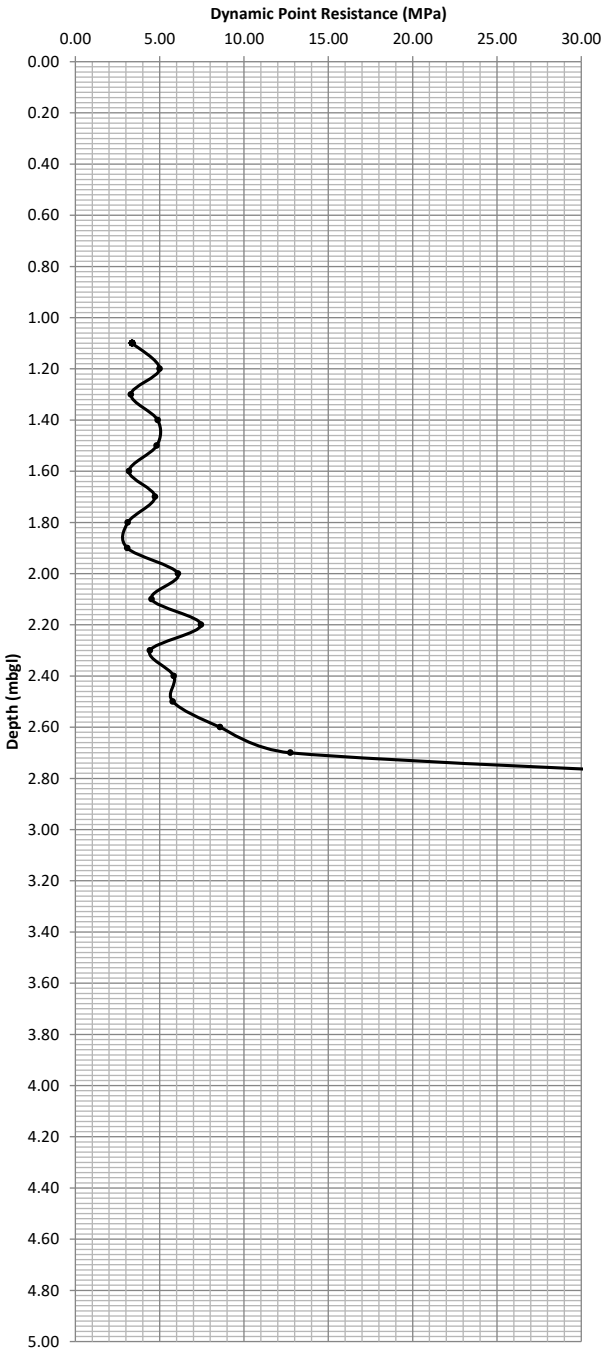
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE 15-18 Fairfield Cottages, Cowfold, West Sussex **Report Ref.** P15524

Test Location Reference	WS02

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	2	0.05	3.94	3.37
1.20	3	0.03	5.91	5.00
1.30	2	0.05	3.94	3.29
1.40	3	0.03	5.91	4.88
1.50	3	0.03	5.91	4.83
1.60	2	0.05	3.94	3.18
1.70	3	0.03	5.91	4.72
1.80	2	0.05	3.94	3.11
1.90	2	0.05	3.94	3.08
2.00	4	0.03	7.87	6.09
2.10	3	0.03	5.91	4.52
2.20	5	0.02	9.84	7.46
2.30	3	0.03	5.91	4.43
2.40	4	0.03	7.87	5.84
2.50	4	0.03	7.87	5.78
2.60	6	0.02	11.81	8.59
2.70	9	0.01	17.72	12.75
2.80	30	0.00	59.05	42.09
2.90				
3.00				
3.10				
3.20				
3.30				
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
Hand dug starter pit to 1.00m depth.
No further progress below 2.80m depth- Hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.79	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

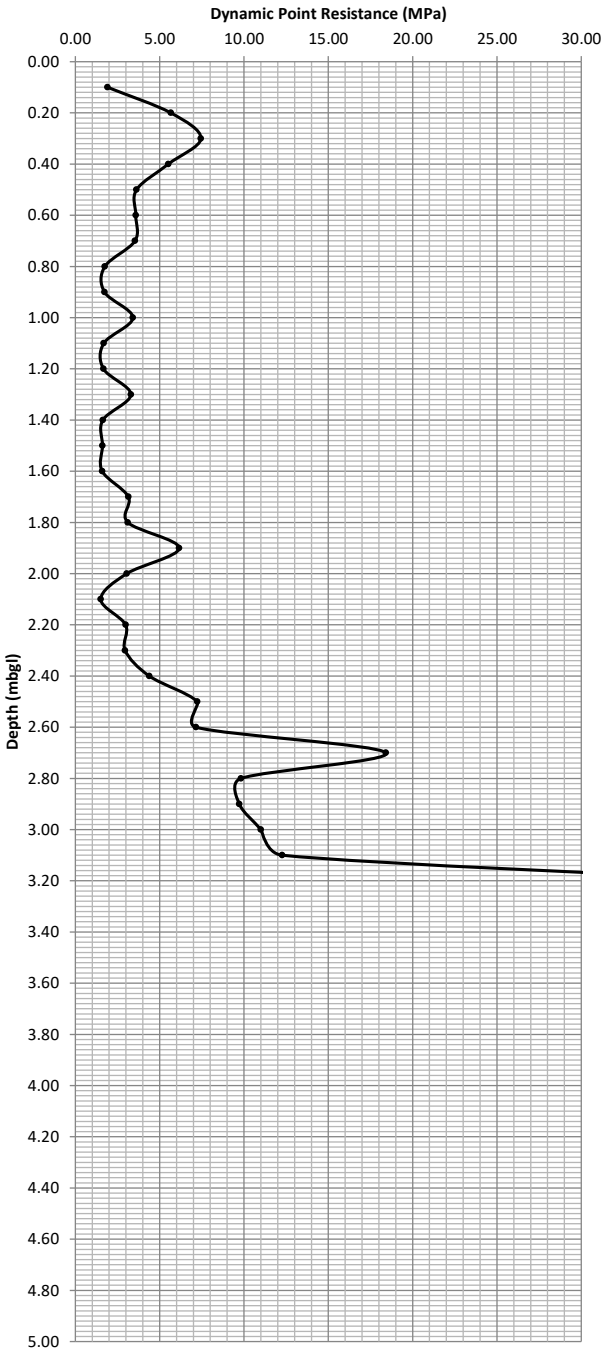
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE 15-18 Fairfield Cottages, Cowfold, West Sussex **Report Ref.** P15524

Test Location Reference	WS03

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	1	0.10	1.97	1.91
0.20	3	0.03	5.91	5.66
0.30	4	0.03	7.87	7.45
0.40	3	0.03	5.91	5.51
0.50	2	0.05	3.94	3.63
0.60	2	0.05	3.94	3.58
0.70	2	0.05	3.94	3.54
0.80	1	0.10	1.97	1.75
0.90	1	0.10	1.97	1.73
1.00	2	0.05	3.94	3.41
1.10	1	0.10	1.97	1.69
1.20	1	0.10	1.97	1.67
1.30	2	0.05	3.94	3.29
1.40	1	0.10	1.97	1.63
1.50	1	0.10	1.97	1.61
1.60	1	0.10	1.97	1.59
1.70	2	0.05	3.94	3.15
1.80	2	0.05	3.94	3.11
1.90	4	0.03	7.87	6.16
2.00	2	0.05	3.94	3.05
2.10	1	0.10	1.97	1.51
2.20	2	0.05	3.94	2.98
2.30	2	0.05	3.94	2.95
2.40	3	0.03	5.91	4.38
2.50	5	0.02	9.84	7.23
2.60	5	0.02	9.84	7.16
2.70	13	0.01	25.59	18.42
2.80	7	0.01	13.78	9.82
2.90	7	0.01	13.78	9.72
3.00	8	0.01	15.75	11.01
3.10	9	0.01	17.72	12.26
3.20	30	0.00	59.05	40.49
3.30				
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
No further progress below 3.20m depth- Hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.79	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

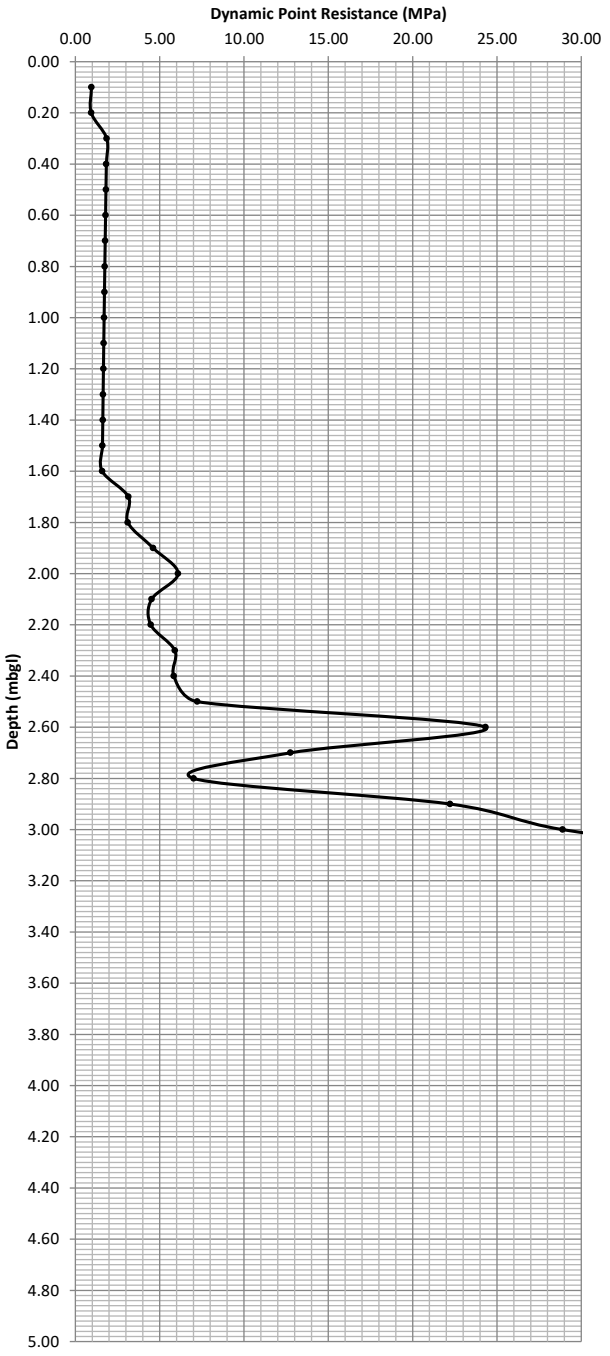
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE 15-18 Fairfield Cottages, Cowfold, West Sussex **Report Ref.** P15524

Test Location Reference	WS04

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.5	0.20	0.98	0.96
0.20	0.5	0.20	0.98	0.94
0.30	1	0.10	1.97	1.86
0.40	1	0.10	1.97	1.84
0.50	1	0.10	1.97	1.81
0.60	1	0.10	1.97	1.79
0.70	1	0.10	1.97	1.77
0.80	1	0.10	1.97	1.75
0.90	1	0.10	1.97	1.73
1.00	1	0.10	1.97	1.71
1.10	1	0.10	1.97	1.69
1.20	1	0.10	1.97	1.67
1.30	1	0.10	1.97	1.65
1.40	1	0.10	1.97	1.63
1.50	1	0.10	1.97	1.61
1.60	1	0.10	1.97	1.59
1.70	2	0.05	3.94	3.15
1.80	2	0.05	3.94	3.11
1.90	3	0.03	5.91	4.62
2.00	4	0.03	7.87	6.09
2.10	3	0.03	5.91	4.52
2.20	3	0.03	5.91	4.47
2.30	4	0.03	7.87	5.90
2.40	4	0.03	7.87	5.84
2.50	5	0.02	9.84	7.23
2.60	17	0.01	33.46	24.33
2.70	9	0.01	17.72	12.75
2.80	5	0.02	9.84	7.01
2.90	16	0.01	31.50	22.23
3.00	21	0.00	41.34	28.89
3.10	30	0.00	59.05	40.88
3.20				
3.30				
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
No further progress below 3.10m depth- Hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m^2
E_{theor}	473 J
Energy Ratio	0.79
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

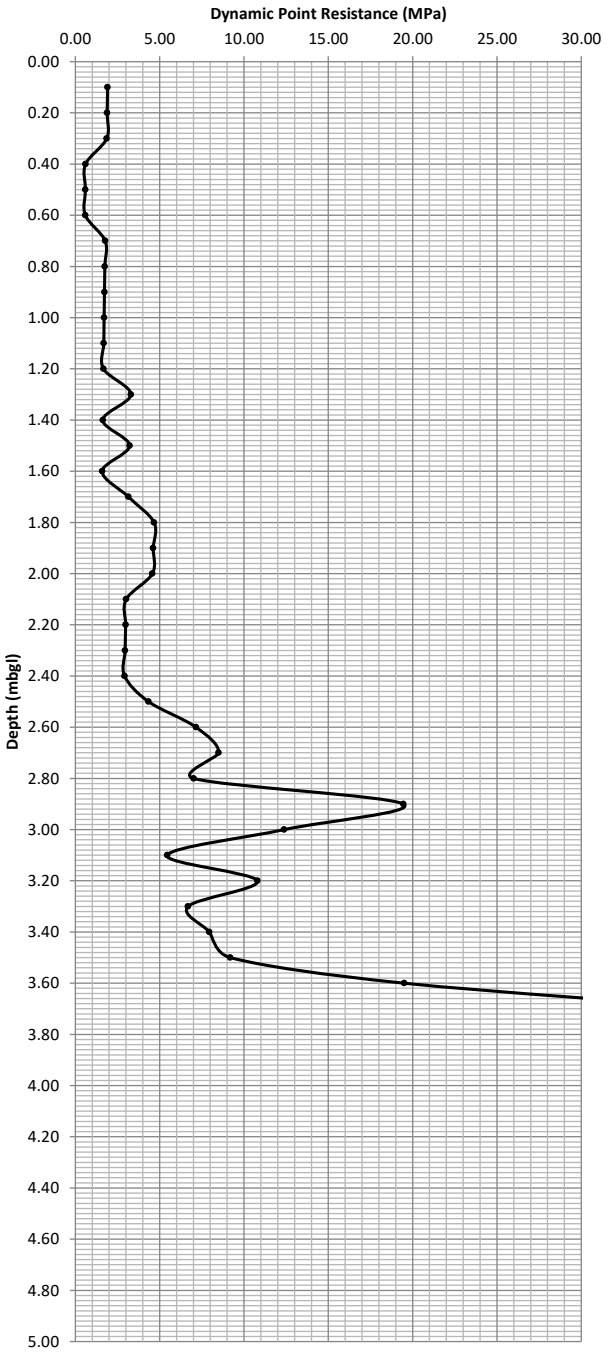
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE 15-18 Fairfield Cottages, Cowfold, West Sussex **Report Ref.** P15524

Test Location Reference	WS05

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	1	0.10	1.97	1.91
0.20	1	0.10	1.97	1.89
0.30	1	0.10	1.97	1.86
0.40	0.33	0.30	0.65	0.61
0.50	0.33	0.30	0.65	0.60
0.60	0.33	0.30	0.65	0.59
0.70	1	0.10	1.97	1.77
0.80	1	0.10	1.97	1.75
0.90	1	0.10	1.97	1.73
1.00	1	0.10	1.97	1.71
1.10	1	0.10	1.97	1.69
1.20	1	0.10	1.97	1.67
1.30	2	0.05	3.94	3.29
1.40	1	0.10	1.97	1.63
1.50	2	0.05	3.94	3.22
1.60	1	0.10	1.97	1.59
1.70	2	0.05	3.94	3.15
1.80	3	0.03	5.91	4.67
1.90	3	0.03	5.91	4.62
2.00	3	0.03	5.91	4.57
2.10	2	0.05	3.94	3.01
2.20	2	0.05	3.94	2.98
2.30	2	0.05	3.94	2.95
2.40	2	0.05	3.94	2.92
2.50	3	0.03	5.91	4.34
2.60	5	0.02	9.84	7.16
2.70	6	0.02	11.81	8.50
2.80	5	0.02	9.84	7.01
2.90	14	0.01	27.56	19.45
3.00	9	0.01	17.72	12.38
3.10	4	0.03	7.87	5.45
3.20	8	0.01	15.75	10.80
3.30	5	0.02	9.84	6.69
3.40	6	0.02	11.81	7.95
3.50	7	0.01	13.78	9.19
3.60	15	0.01	29.53	19.51
3.70	30	0.00	59.05	38.66
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
No further progress below 3.70m depth- Hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.79	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

ASHDOWN SITE INVESTIGATION LIMITED

Site: 15-18 Fairfield Cottages, Cowfold, West Sussex	Project No.: P15524 Sheet No.: 1 of 1

SUMMARY OF BOREHOLE FALLING HEAD SOAKAGE TEST RESULTS

WS01 (Test 1)	
Time (mins)	Depth to water (m bgl)
0 2 5 20 35 60 95 120 185	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Borehole Depth (m bgl)	2.70
Casing Depth (m bgl)	2.00
Borehole Diameter (mm)	70.00
Casing Diameter (mm)	105.00

Notes: bgl – below ground level.

Summary of Trial Pit Falling Head Soakage Test Results

Test Position	TP01
Test No.	Test 1
Project No.	P15524
Project Name	15-18 Fairfield Cottages, Cowfold, West Sussex

Width of Pit	0.30	m	W
Length of Pit	1.00	m	L
Depth of Pit	1.00	m	D
Pit type	Open		

Depth to Water (m bg)	Elapsed Time (min)	Head of Water (m)	Head of Water (% of Initial Head)
0.43	0.00	0.57	100
0.43	1.00	0.57	100
0.43	2.00	0.57	100
0.43	3.00	0.57	100
0.43	4.00	0.57	100
0.43	5.00	0.57	100
0.43	20.00	0.57	100
0.43	35.00	0.57	100
0.43	65.00	0.57	100
0.43	123.00	0.57	100
0.43	152.00	0.57	100

Groundwater Monitoring Results

Site Name:	Fairfield Cottages, Cowfold, West Sussex		
Project Ref:	P15524		
Position	Date	Standing Water Depth (m bgl)	Standpipe Installation Depth (m bgl)
WS01	18/10/22	0.86	2.70
WS02	18/10/22	0.40	2.60
WS04	18/10/22	No Access	
WS01	01/11/22	1.17	2.70
WS02	01/11/22	0.35	2.60
WS04	01/11/22	1.35	2.60
WS01	18/11/22	0.81	2.70
WS02	18/11/22	0.38	2.60
WS04	18/11/22	0.62	2.60
WS01	30/11/22	0.80	2.70
WS02	30/11/22	0.48	2.60
WS04	30/11/22	0.86	2.60
WS01	12/12/22	0.99	2.70
WS02	12/12/22	0.79	2.60
WS04	12/12/22	1.23	2.60
WS01	04/01/23	0.80	2.70
WS02	04/01/23	0.33	2.60
WS04	04/01/23	0.72	2.60
WS01	16/01/23	0.75	2.70
WS02	16/01/23	0.20	2.60
WS04	16/01/23	0.40	2.60
WS01	02/02/23	1.09	2.70
WS02	02/02/23	0.86	2.60
WS04	02/02/23	1.23	2.60
WS01	15/02/23	1.41	2.70
WS02	15/02/23	1.04	2.60
WS04	15/02/23	1.37	2.60
WS01	02/03/23	1.47	2.70
WS02	02/03/23	1.22	2.60
WS04	02/03/23	1.46	2.60
WS01	15/03/23	1.04	2.70
WS02	15/03/23	0.57	2.60
WS04	15/03/23	1.16	2.60
WS01	29/03/23	1.00	2.70
WS02	29/03/23	0.50	2.60
WS04	29/03/23	1.00	2.60

Groundwater Monitoring Results

Site Name:	P15524		
Project Ref:	Fairfield Cottages, Cowfold, West Sussex		
Position	Date	Standing Water Depth (m bgl)	Standpipe Installation Depth (m bgl)
WS01	18/10/22	0.86	2.70
WS02	18/10/22	0.40	2.60
WS04	18/10/22	No Access	2.60
WS01	01/11/22	1.17	2.70
WS02	01/11/22	0.35	2.60
WS04	01/11/22	1.35	2.60
WS01	18/11/22	0.81	2.70
WS02	18/11/22	0.38	2.60
WS04	18/11/22	0.62	2.60
WS01	30/11/22	0.80	2.70
WS02	30/11/22	0.48	2.60
WS04	30/11/22	0.86	2.60

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 2

Drainage Calculations

STEPHEN WILSON PARTNERSHIP LTD

Title	Fairfield Cottages, Cowfold	Job No:	E9395
Description :	Surface Water Calculations	By:	CRS
		Date:	Feb-24
		Sheet No:	1

Design Data

FEH-22 = 521445, 122685

Design Criteria

Design Storm = 100Yr + 45% Climate Change

Design Discharge Rate = 2.0l/s

Discharge Point = Diverted Culverted Watercourse

CV = 1.00

Total Impermeable Area for drainage system = 740m^2 or 0.074Ha

Results

A traditional positive piped drainage system discharging at via a hydrobrake flow control at up to 2.0l/s to a diverted culvert. Attenuation is provided in a minimum 350mm sub-base to the permeable paving.

The restricted flow rate provides a betterment on the existing flow rate in accordance with the LLFA policy for brownfield sites.

Please refer to attached sheets

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Craig Searle
Site name:	E9395
Site location:	Fairfield Cottages, Cowfold

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 (2013) , 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.

Site Details

Latitude:	50.99077° N
Longitude:	0.27096° W
Reference:	420540835
Date:	Feb 13 2025 18:01

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): .1626

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	790	790
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):	0.9	0.9
1 in 1 year (l/s):	0.77	0.77
1 in 30 years (l/s):	2.08	2.08
1 in 100 year (l/s):	2.88	2.88
1 in 200 years (l/s):	3.38	3.38

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

STEPHEN WILSON
PARTNERSHIP LTD
Chalvington Barn, Ditton's Business Park, Ditton's Road,
POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

Title	Fairfield Cottages. Cowfold, Sussex	Job No:	E9395
Decription :	Estimate of Existing and Proposed Peak	By:	CRS
	Run-Off Rate using the Modified Rational Method	Date:	Feb-25
		Sheet No:	4

Existing Site

Pre-Developed Site: Estimate Surface Water Run-Off Using the Modified Rational Method

Site Area = 1625 M^2

Existing Impermeable Area = 715 M^2

Average Rate of Rainfall

2 Year 15 Minute Event (M2-15D) = 40.055 mm/hr (i)

30 Year 15 Minute Event (M30-15D) = 76.028 mm/hr (i)

100 Year 15 Minute Event (M100-15D) = 98.671 mm/hr (i)

Average Rainfall Values from FSR Data taken from the MicroDrainage Software

Peak Rate of Run-Off (Q_P)

$Q_P = C \cdot A_P \cdot i$ Where $C = C_V \cdot C_R$

C_V = 0.75 (Volumetric Co-efficient)
C_R = 1.3 (Routing Co-efficient)

Q_{P2} = 7.756 l/s

Q_{P30} = 14.723 l/s

Q_{P100} = 19.107 l/s

STEPHEN WILSON
PARTNERSHIP LTD
Chalvington Barn, Ditons Business Park, Ditons Road,
POLEGATE, BN26 6HY Telephone: 01323 112020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

Title	Fairfield Cottages. Cowfold, Sussex	Job No:	E9395
Decription :	Estimate of Existing and Proposed Peak	By:	CRS
	Run-Off Rate using the Modified Rational Method	Date:	Feb-25
		Sheet No:	5

Proposed Development

Total Impermeable Area = 740 M^2

Adjust Average Rainfall for Climate Change in Accordance with the Requirements of the NPPF Technical Guidance, +45% with FSR Data

M2-15D +45% = 56.077 mm/hr (i)

M30-15D +45% = 106.439 mm/hr (i)

M100 - 15D +45% = 138.139 mm/hr (i)

Proposed Peak Rate of Run-Off (Q_P)

Q_{P2} = 11.239 l/s

Q_{P30} = 21.332 l/s

Q_{P100} = 27.685 l/s

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	11.881	0.150	79.2	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	7.952	0.295	27.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	16.724	0.210	79.6	0.004	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	4.822	0.195	24.7	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	12.444	0.130	95.7	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	0.653	0.535	1.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	3.660	0.135	27.1	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	10.704	0.285	37.6	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.000	8.116	0.085	95.5	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	4.269	0.055	77.6	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	14.594	0.305	47.8	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	11.732	0.150	78.2	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	75.00	6.23	30.425	0.000	0.0	0.0	0.0	0.87	6.8	0.0
1.001	75.00	6.30	30.225	0.004	0.0	0.0	0.0	1.95	34.4	0.8
2.000	75.00	6.32	30.190	0.004	0.0	0.0	0.0	0.86	6.8	0.8
1.002	75.00	6.36	29.930	0.011	0.0	0.0	0.0	2.03	35.9	2.2
3.000	75.00	6.26	30.450	0.000	0.0	0.0	0.0	0.79	6.2	0.0
3.001	75.00	6.27	30.320	0.009	0.0	0.0	0.0	7.06	55.5	1.8
1.003	75.00	6.39	29.735	0.023	0.0	0.0	0.0	1.94	34.3	4.7
4.000	75.00	6.14	30.485	0.003	0.0	0.0	0.0	1.26	9.9	0.6
5.000	75.00	6.17	30.340	0.000	0.0	0.0	0.0	0.79	6.2	0.0
5.001	75.00	6.25	30.255	0.005	0.0	0.0	0.0	0.87	6.9	1.0
4.001	75.00	6.42	30.150	0.011	0.0	0.0	0.0	1.46	25.8	2.2
6.000	75.00	6.22	30.280	0.003	0.0	0.0	0.0	0.87	6.8	0.6

©1982-2020 Innovyze

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
7.000	4.303	0.055	78.2	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	5.217	0.100	52.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	9.259	0.235	39.4	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.002	16.915	0.170	99.5	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.000	2.042	0.020	102.1	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	2.052	0.020	102.6	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
10.000	5.562	0.055	101.1	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
11.000	2.862	0.030	95.4	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	15.202	0.155	98.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	3.952	0.040	98.8	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	1.403	0.360	3.9	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.003	7.515	0.075	100.2	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
7.000	75.00	6.08	30.335	0.003	0.0	0.0	0.0	0.87	6.8	0.6
7.001	75.00	6.16	30.280	0.003	0.0	0.0	0.0	1.07	8.4	0.6
6.001	75.00	6.35	30.130	0.009	0.0	0.0	0.0	1.23	9.7	1.8
4.002	75.00	6.70	29.845	0.028	0.0	0.0	0.0	1.01	17.8	5.7
8.000	75.00	6.04	30.145	0.000	0.0	0.0	0.0	0.76	6.0	0.0
9.000	75.00	6.05	30.300	0.000	0.0	0.0	0.0	0.76	6.0	0.0
10.000	75.00	6.12	30.335	0.003	0.0	0.0	0.0	0.76	6.0	0.6
11.000	75.00	6.06	30.310	0.003	0.0	0.0	0.0	0.79	6.2	0.6
9.001	75.00	6.45	30.280	0.009	0.0	0.0	0.0	0.78	6.1	1.8
8.001	75.00	6.53	30.125	0.020	0.0	0.0	0.0	0.77	6.1	4.1
8.002	75.00	6.54	30.085	0.020	0.0	0.0	0.0	3.95	31.0	4.1
4.003	75.00	6.82	29.675	0.051	0.0	0.0	0.0	1.00	17.7	10.4

©1982-2020 Innovyze

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.004	1.630	0.010	163.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.004	75.00	6.85	29.525	0.074	0.0	0.0	0.0	1.02	40.6	15.0

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
RE1	31.330	0.905	Open Manhole	100	1.000	30.425	100				
S1	31.020	0.795	Open Manhole	450	1.001	30.225	150	1.000	30.275	100	
RE2	31.180	0.990	Open Manhole	100	2.000	30.190	100				
Junction	31.020	1.090	Junction		1.002	29.930	150	1.001	29.930	150	
								2.000	29.980	100	
RE3	31.100	0.650	Open Manhole	100	3.000	30.450	100				
S2	30.950	0.630	Open Manhole	450	3.001	30.320	100	3.000	30.320	100	
Junction	31.000	1.265	Junction		1.003	29.735	150	1.002	29.735	150	
								3.001	29.785	100	
RE10	31.170	0.685	Open Manhole	100	4.000	30.485	100				
RE11	31.000	0.660	Open Manhole	100	5.000	30.340	100				
S3	30.900	0.645	Open Manhole	450	5.001	30.255	100	5.000	30.255	100	
S4	31.000	0.850	Open Manhole	450	4.001	30.150	150	4.000	30.200	100	
								5.001	30.200	100	
RE8	31.000	0.720	Open Manhole	100	6.000	30.280	100				
RE9	30.900	0.565	Open Manhole	100	7.000	30.335	100				
S5	30.880	0.600	Open Manhole	450	7.001	30.280	100	7.000	30.280	100	
S6	30.880	0.750	Open Manhole	450	6.001	30.130	100	6.000	30.130	100	
								7.001	30.180	100	50

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S7	30.700	0.855	Open Manhole	450	4.002	29.845	150	4.001	29.845	150	
								6.001	29.895	100	
RE7	30.700	0.555	Open Manhole	100	8.000	30.145	100				
RE4	30.890	0.590	Open Manhole	100	9.000	30.300	100				
RE5	31.050	0.715	Open Manhole	100	10.000	30.335	100				
RE6	30.890	0.580	Open Manhole	100	11.000	30.310	100				
Junction	30.900	0.620	Junction		9.001	30.280	100	9.000	30.280	100	
								10.000	30.280	100	
								11.000	30.280	100	
Junction	30.700	0.575	Junction		8.001	30.125	100	8.000	30.125	100	
								9.001	30.125	100	
S9	30.750	0.665	Open Manhole	450	8.002	30.085	100	8.001	30.085	100	
S10	30.900	1.225	Open Manhole	450	4.003	29.675	150	4.002	29.675	150	
								8.002	29.725	100	
S11	31.000	1.475	Open Manhole	1200 x 900	1.004	29.525	225	1.003	29.600	150	
								4.003	29.600	150	
S12	30.900	1.385	Open Manhole	1200 x 900		OUTFALL		1.004	29.515	225	

No coordinates have been specified, layout information cannot be produced.

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE1	31.330	30.425	0.805	Open Manhole	100
1.001	o	150	S1	31.020	30.225	0.645	Open Manhole	450
2.000	o	100	RE2	31.180	30.190	0.890	Open Manhole	100
1.002	o	150	Junction	31.020	29.930	0.940	Junction	
3.000	o	100	RE3	31.100	30.450	0.550	Open Manhole	100
3.001	o	100	S2	30.950	30.320	0.530	Open Manhole	450
1.003	o	150	Junction	31.000	29.735	1.115	Junction	
4.000	o	100	RE10	31.170	30.485	0.585	Open Manhole	100
5.000	o	100	RE11	31.000	30.340	0.560	Open Manhole	100
5.001	o	100	S3	30.900	30.255	0.545	Open Manhole	450
4.001	o	150	S4	31.000	30.150	0.700	Open Manhole	450
6.000	o	100	RE8	31.000	30.280	0.620	Open Manhole	100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.881	79.2	S1	31.020	30.275	0.645	Open Manhole	450
1.001	7.952	27.0	Junction	31.020	29.930	0.940	Junction	
2.000	16.724	79.6	Junction	31.020	29.980	0.940	Junction	
1.002	4.822	24.7	Junction	31.000	29.735	1.115	Junction	
3.000	12.444	95.7	S2	30.950	30.320	0.530	Open Manhole	450
3.001	0.653	1.2	Junction	31.000	29.785	1.115	Junction	
1.003	3.660	27.1	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
4.000	10.704	37.6	S4	31.000	30.200	0.700	Open Manhole	450
5.000	8.116	95.5	S3	30.900	30.255	0.545	Open Manhole	450
5.001	4.269	77.6	S4	31.000	30.200	0.700	Open Manhole	450
4.001	14.594	47.8	S7	30.700	29.845	0.705	Open Manhole	450
6.000	11.732	78.2	S6	30.880	30.130	0.650	Open Manhole	450

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	o	100	RE9	30.900	30.335	0.465	Open Manhole	100
7.001	o	100	S5	30.880	30.280	0.500	Open Manhole	450
6.001	o	100	S6	30.880	30.130	0.650	Open Manhole	450
4.002	o	150	S7	30.700	29.845	0.705	Open Manhole	450
8.000	o	100	RE7	30.700	30.145	0.455	Open Manhole	100
9.000	o	100	RE4	30.890	30.300	0.490	Open Manhole	100
10.000	o	100	RE5	31.050	30.335	0.615	Open Manhole	100
11.000	o	100	RE6	30.890	30.310	0.480	Open Manhole	100
9.001	o	100	Junction	30.900	30.280	0.520	Junction	
8.001	o	100	Junction	30.700	30.125	0.475	Junction	
8.002	o	100	S9	30.750	30.085	0.565	Open Manhole	450
4.003	o	150	S10	30.900	29.675	1.075	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	4.303	78.2	S5	30.880	30.280	0.500	Open Manhole	450
7.001	5.217	52.2	S6	30.880	30.180	0.600	Open Manhole	450
6.001	9.259	39.4	S7	30.700	29.895	0.705	Open Manhole	450
4.002	16.915	99.5	S10	30.900	29.675	1.075	Open Manhole	450
8.000	2.042	102.1	Junction	30.700	30.125	0.475	Junction	
9.000	2.052	102.6	Junction	30.900	30.280	0.520	Junction	
10.000	5.562	101.1	Junction	30.900	30.280	0.520	Junction	
11.000	2.862	95.4	Junction	30.900	30.280	0.520	Junction	
9.001	15.202	98.1	Junction	30.700	30.125	0.475	Junction	
8.001	3.952	98.8	S9	30.750	30.085	0.565	Open Manhole	450
8.002	1.403	3.9	S10	30.900	29.725	1.075	Open Manhole	450
4.003	7.515	100.2	S11	31.000	29.600	1.250	Open Manhole	1200 x 900

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	o	225	S11	31.000	29.525	1.250	Open Manhole	1200 x 900

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	1.630	163.0	S12	30.900	29.515	1.160	Open Manhole	1200 x 900

©1982-2020 Innovyze

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S11, DS/PN: 1.004, Volume (m³): 1.8

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	29.600
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

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)
0.100	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

©1982-2020 Innovyze

Storage Structures for Storm

Porous Car Park Manhole: S2, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	13.5
Max Percolation (l/s)	25.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.320	Membrane Depth (mm)	230

Porous Car Park Manhole: S3, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	7.3
Max Percolation (l/s)	13.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.255	Membrane Depth (mm)	230

Porous Car Park Manhole: S7, DS/PN: 4.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.4
Max Percolation (l/s)	13.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	29.845	Membrane Depth (mm)	230

Porous Car Park Manhole: Junction, DS/PN: 8.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	17.2
Max Percolation (l/s)	29.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.125	Membrane Depth (mm)	230

©1982-2020 Innovyze

2 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 Coeffiecient	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	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	2	+0%	100/60 Summer			
1.001	S1	15 Summer	2	+0%	100/15 Summer			
2.000	RE2	15 Summer	2	+0%	30/30 Summer			
1.002	Junction	120 Summer	2	+0%				
3.000	RE3	15 Summer	2	+0%	100/60 Summer			
3.001	S2	30 Summer	2	+0%	100/15 Summer			
1.003	Junction	15 Summer	2	+0%				
4.000	RE10	15 Summer	2	+0%	100/120 Summer			
5.000	RE11	15 Summer	2	+0%	100/30 Summer			
5.001	S3	30 Summer	2	+0%	30/120 Summer			
4.001	S4	30 Summer	2	+0%	30/30 Summer			
6.000	RE8	15 Summer	2	+0%	100/15 Summer			
7.000	RE9	15 Summer	2	+0%	100/15 Summer			
7.001	S5	15 Summer	2	+0%	100/15 Summer			
6.001	S6	15 Summer	2	+0%	10/30 Summer			
4.002	S7	120 Summer	2	+0%	2/15 Summer			

©1982-2020 Innovyze

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.240	-0.135	0.000	0.02			0.7	OK
2.000	RE2	30.212	-0.078	0.000	0.11			0.7	OK
1.002	Junction	30.080	0.000	0.000	0.03			1.0	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.337	-0.083	0.000	0.06		6	1.3	OK
1.003	Junction	29.885	0.000	0.000	0.10			2.2	SURCHARGED*
4.000	RE10	30.500	-0.085	0.000	0.06			0.5	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.277	-0.078	0.000	0.10		7	0.6	OK
4.001	S4	30.174	-0.126	0.000	0.06			1.4	OK
6.000	RE8	30.299	-0.081	0.000	0.08			0.5	OK
7.000	RE9	30.355	-0.080	0.000	0.09			0.5	OK
7.001	S5	30.298	-0.082	0.000	0.07			0.5	OK
6.001	S6	30.158	-0.072	0.000	0.17			1.5	OK
4.002	S7	30.115	0.120	0.000	-0.13		44	-2.1	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	
4.002	S7	

©1982-2020 Innovyze

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	RE7	30 Summer	2	+0%	10/60 Summer			
9.000	RE4	15 Summer	2	+0%	100/15 Summer			
10.000	RE5	15 Summer	2	+0%	100/15 Summer			
11.000	RE6	15 Summer	2	+0%	100/15 Summer			
9.001	Junction	15 Summer	2	+0%				
8.001	Junction	30 Summer	2	+0%	10/30 Summer			
8.002	S9	120 Summer	2	+0%	10/15 Summer			
4.003	S10	120 Summer	2	+0%	2/15 Summer			
1.004	S11	120 Summer	2	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
8.000	RE7	30.173	-0.072	0.000	0.00			0.0	OK
9.000	RE4	30.314	-0.086	0.000	0.00			0.0	OK
10.000	RE5	30.356	-0.079	0.000	0.10			0.5	OK
11.000	RE6	30.332	-0.078	0.000	0.11			0.5	OK
9.001	Junction	30.314	-0.066	0.000	0.25			1.5	OK*
8.001	Junction	30.173	-0.052	0.000	0.47		7	2.6	OK*
8.002	S9	30.115	-0.070	0.000	0.11			1.9	OK
4.003	S10	30.114	0.289	0.000	0.13			2.0	SURCHARGED
1.004	S11	30.111	0.361	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

©1982-2020 Innovyze

10 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 Coeffiecient	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	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	10	+0%	100/60 Summer			
1.001	S1	120 Summer	10	+0%	100/15 Summer			
2.000	RE2	120 Summer	10	+0%	30/30 Summer			
1.002	Junction	15 Summer	10	+0%				
3.000	RE3	15 Summer	10	+0%	100/60 Summer			
3.001	S2	15 Summer	10	+0%	100/15 Summer			
1.003	Junction	15 Summer	10	+0%				
4.000	RE10	15 Summer	10	+0%	100/120 Summer			
5.000	RE11	15 Summer	10	+0%	100/30 Summer			
5.001	S3	15 Summer	10	+0%	30/120 Summer			
4.001	S4	120 Summer	10	+0%	30/30 Summer			
6.000	RE8	15 Summer	10	+0%	100/15 Summer			
7.000	RE9	15 Summer	10	+0%	100/15 Summer			
7.001	S5	15 Summer	10	+0%	100/15 Summer			
6.001	S6	120 Summer	10	+0%	10/30 Summer			
4.002	S7	120 Summer	10	+0%	2/15 Summer			

©1982-2020 Innovyze

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.280	-0.095	0.000	0.02			0.7	OK
2.000	RE2	30.281	-0.009	0.000	0.10			0.6	OK
1.002	Junction	30.080	0.000	0.000	0.12			3.3	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.347	-0.073	0.000	0.16		4	3.2	OK
1.003	Junction	29.885	0.000	0.000	0.22			5.1	SURCHARGED*
4.000	RE10	30.506	-0.079	0.000	0.10			0.9	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.289	-0.066	0.000	0.25		4	1.5	OK
4.001	S4	30.286	-0.014	0.000	0.07			1.8	OK
6.000	RE8	30.305	-0.075	0.000	0.14			0.9	OK
7.000	RE9	30.361	-0.074	0.000	0.15			0.9	OK
7.001	S5	30.303	-0.077	0.000	0.12			0.9	OK
6.001	S6	30.287	0.057	0.000	0.16			1.4	SURCHARGED
4.002	S7	30.285	0.290	0.000	-0.20		101	-3.2	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	
4.002	S7	

©1982-2020 Innovyze

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	RE7	120 Summer	10	+0%	10/60 Summer			
9.000	RE4	15 Summer	10	+0%	100/15 Summer			
10.000	RE5	15 Summer	10	+0%	100/15 Summer			
11.000	RE6	15 Summer	10	+0%	100/15 Summer			
9.001	Junction	15 Summer	10	+0%				
8.001	Junction	120 Summer	10	+0%	10/30 Summer			
8.002	S9	120 Summer	10	+0%	10/15 Summer			
4.003	S10	120 Summer	10	+0%	2/15 Summer			
1.004	S11	120 Summer	10	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
8.000	RE7	30.285	0.040	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.329	-0.071	0.000	0.00			0.0	OK
10.000	RE5	30.363	-0.072	0.000	0.17			0.9	OK
11.000	RE6	30.339	-0.071	0.000	0.19			0.9	OK
9.001	Junction	30.329	-0.051	0.000	0.47			2.9	OK*
8.001	Junction	30.285	0.060	0.000	0.54		50	3.0	SURCHARGED*
8.002	S9	30.283	0.098	0.000	0.17			2.8	SURCHARGED
4.003	S10	30.282	0.457	0.000	0.12			1.8	SURCHARGED
1.004	S11	30.279	0.529	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

©1982-2020 Innovyze

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 Coeffiecient	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	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	30	+0%	100/60 Summer			
1.001	S1	120 Summer	30	+0%	100/15 Summer			
2.000	RE2	120 Summer	30	+0%	30/30 Summer			
1.002	Junction	15 Summer	30	+0%				
3.000	RE3	15 Summer	30	+0%	100/60 Summer			
3.001	S2	120 Summer	30	+0%	100/15 Summer			
1.003	Junction	15 Summer	30	+0%				
4.000	RE10	15 Summer	30	+0%	100/120 Summer			
5.000	RE11	120 Winter	30	+0%	100/30 Summer			
5.001	S3	120 Winter	30	+0%	30/120 Summer			
4.001	S4	120 Winter	30	+0%	30/30 Summer			
6.000	RE8	120 Summer	30	+0%	100/15 Summer			
7.000	RE9	15 Summer	30	+0%	100/15 Summer			
7.001	S5	120 Summer	30	+0%	100/15 Summer			
6.001	S6	120 Summer	30	+0%	10/30 Summer			
4.002	S7	120 Winter	30	+0%	2/15 Summer			

©1982-2020 Innovyze

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.357	-0.018	0.000	0.03			0.8	OK
2.000	RE2	30.359	0.069	0.000	0.12			0.8	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.13			3.5	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.354	-0.066	0.000	0.09		47	1.9	OK
1.003	Junction	29.885	0.000	0.000	0.29			6.7	SURCHARGED*
4.000	RE10	30.509	-0.076	0.000	0.13			1.2	OK
5.000	RE11	30.359	-0.081	0.000	0.00			0.0	OK
5.001	S3	30.359	0.004	0.000	0.12		34	0.7	SURCHARGED
4.001	S4	30.359	0.059	0.000	0.06			1.5	SURCHARGED
6.000	RE8	30.362	-0.018	0.000	0.10			0.6	OK
7.000	RE9	30.366	-0.069	0.000	0.21			1.2	OK
7.001	S5	30.362	-0.018	0.000	0.08			0.6	OK
6.001	S6	30.361	0.131	0.000	0.18			1.6	SURCHARGED
4.002	S7	30.358	0.363	0.000	-0.15			-2.4	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	
4.002	S7	

©1982-2020 Innovyze

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
8.000	RE7	120 Winter	30	+0%	10/60 Summer			
9.000	RE4	120 Winter	30	+0%	100/15 Summer			
10.000	RE5	15 Summer	30	+0%	100/15 Summer			
11.000	RE6	120 Winter	30	+0%	100/15 Summer			
9.001	Junction	120 Winter	30	+0%				
8.001	Junction	120 Winter	30	+0%	10/30 Summer			
8.002	S9	120 Winter	30	+0%	10/15 Summer			
4.003	S10	120 Winter	30	+0%	2/15 Summer			
1.004	S11	120 Winter	30	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
8.000	RE7	30.357	0.112	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.360	-0.040	0.000	0.00			0.0	OK
10.000	RE5	30.367	-0.068	0.000	0.23			1.2	OK
11.000	RE6	30.360	-0.050	0.000	0.09			0.4	OK
9.001	Junction	30.359	-0.021	0.000	0.21			1.3	OK*
8.001	Junction	30.357	0.132	0.000	0.44		64	2.4	SURCHARGED*
8.002	S9	30.356	0.171	0.000	0.14			2.3	SURCHARGED
4.003	S10	30.356	0.531	0.000	0.12			1.9	SURCHARGED
1.004	S11	30.354	0.604	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

©1982-2020 Innovyze

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 Coeffiecient	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	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 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.
1.000	RE1	120 Winter	100	+45%	100/60 Summer			
1.001	S1	120 Winter	100	+45%	100/15 Summer			
2.000	RE2	120 Winter	100	+45%	30/30 Summer			
1.002	Junction	15 Summer	100	+45%				
3.000	RE3	120 Winter	100	+45%	100/60 Summer			
3.001	S2	120 Winter	100	+45%	100/15 Summer			
1.003	Junction	15 Summer	100	+45%				
4.000	RE10	120 Winter	100	+45%	100/120 Summer			
5.000	RE11	120 Winter	100	+45%	100/30 Summer			
5.001	S3	120 Winter	100	+45%	30/120 Summer			
4.001	S4	120 Winter	100	+45%	30/30 Summer			
6.000	RE8	120 Winter	100	+45%	100/15 Summer			
7.000	RE9	120 Winter	100	+45%	100/15 Summer			

©1982-2020 Innovyze

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.592	0.067	0.000	0.00			0.0	SURCHARGED
1.001	S1	30.592	0.217	0.000	0.03			1.0	SURCHARGED
2.000	RE2	30.593	0.303	0.000	0.16			1.0	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.28			7.8	SURCHARGED*
3.000	RE3	30.591	0.041	0.000	0.00			0.0	SURCHARGED
3.001	S2	30.591	0.171	0.000	0.10		88	2.0	SURCHARGED
1.003	Junction	29.885	0.000	0.000	0.49			11.3	SURCHARGED*
4.000	RE10	30.600	0.015	0.000	0.08			0.8	SURCHARGED
5.000	RE11	30.600	0.160	0.000	0.00			0.0	SURCHARGED
5.001	S3	30.600	0.245	0.000	-0.39			-2.3	SURCHARGED
4.001	S4	30.599	0.299	0.000	0.08			1.9	SURCHARGED
6.000	RE8	30.602	0.222	0.000	0.12			0.8	SURCHARGED
7.000	RE9	30.602	0.167	0.000	0.13			0.8	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	

©1982-2020 Innovyze

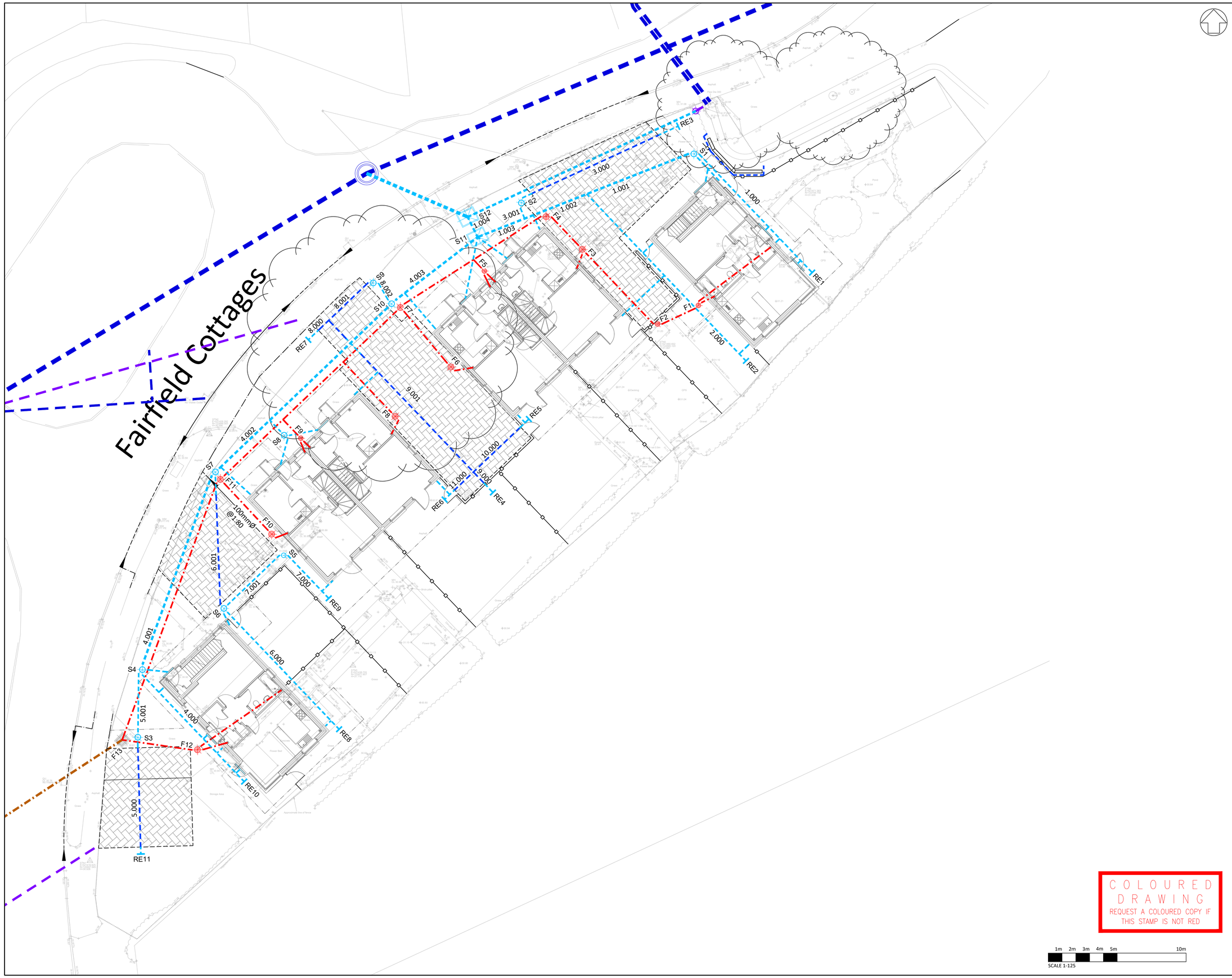
100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.001	S5	120 Winter	100	+45%	100/15 Summer			
6.001	S6	120 Winter	100	+45%	10/30 Summer			
4.002	S7	120 Winter	100	+45%	2/15 Summer			
8.000	RE7	120 Winter	100	+45%	10/60 Summer			
9.000	RE4	120 Winter	100	+45%	100/15 Summer			
10.000	RE5	120 Winter	100	+45%	100/15 Summer			
11.000	RE6	120 Winter	100	+45%	100/15 Summer			
9.001	Junction	15 Summer	100	+45%				
8.001	Junction	30 Summer	100	+45%	10/30 Summer			
8.002	S9	120 Winter	100	+45%	10/15 Summer			
4.003	S10	120 Winter	100	+45%	2/15 Summer			
1.004	S11	120 Winter	100	+45%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
7.001	S5	30.601	0.221	0.000	0.10			0.7	SURCHARGED
6.001	S6	30.601	0.371	0.000	0.24			2.2	SURCHARGED
4.002	S7	30.598	0.603	0.000	-0.17			-2.8	SURCHARGED
8.000	RE7	30.598	0.353	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.599	0.199	0.000	0.00			0.0	SURCHARGED
10.000	RE5	30.601	0.166	0.000	0.14			0.8	SURCHARGED
11.000	RE6	30.600	0.190	0.000	0.16			0.7	SURCHARGED
9.001	Junction	30.380	0.000	0.000	0.99			6.0	SURCHARGED*
8.001	Junction	30.470	0.245	0.000	0.80			4.4	SURCHARGED*
8.002	S9	30.595	0.410	0.000	-0.15			-2.5	SURCHARGED
4.003	S10	30.594	0.769	0.000	-0.13			-2.1	SURCHARGED
1.004	S11	30.590	0.840	0.000	0.07			2.0	SURCHARGED

PN	US/MH Name	Level Exceeded
7.001	S5	
6.001	S6	
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

©1982-2020 Innovyze



NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.

Refer to the latest drainage layout drawing. 9395-SWP-ZZ-XX-DP-C-1101

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

1m 2m 3m 4m 5m 10m
SCALE 1-125

REV.	DATE	DESCRIPTION
P01	27.03.2025	PRELIMINARY ISSUE

PRELIMINARY

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION CO. LTD

ARCHITECT: MH ARCHITECTS

JOB TITLE: FAIRFIELD COTTAGES
COWFOLD, SUSSEX

DRAWING TITLE: CALCULATIONS PIPE REFERENCE PLAN

SCALE AT A1	DATE	DRAWN
1-125	MAR 2025	CRS
	ENG. CRS	CHECKED JWM

RIBA STATUS: STAGE 3 - SPATIAL COORDINATION

DRAWING STATUS: S2 | DRAWING SUITABILITY: INFORMATION

JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - FORM - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1103	P01



Drawing Legend

Impermeable Areas	
	Roof Areas
	Driveways
	Private Paths and Patios
	Site Boundary

NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.

Proposed Impermeable Areas

Total Site Area =	1626m²
Proposed Roof Area =	335m²
Proposed Driveways =	285m²
Proposed Paths =	120m²
Total Impermeable Area =	**740m²**

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

1m 2m 3m 4m 5m 10m
SCALE 1-125

REV.	DATE	DESCRIPTION
P01	27.03.2025	PRELIMINARY ISSUE

PRELIMINARY

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road,
POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION CO. LTD

ARCHITECT: MH ARCHITECTS

JOB TITLE: FAIRFIELD COTTAGES
COWFOLD, SUSSEX

DRAWING TITLE: IMPERMEABLE AREAS PROPOSED

SCALE AT A1	DATE	DRAWN
1-125	MAR 2025	CRS
	ENG. CRS	CHECKED JWM

RIBA STAGE: STAGE 3 - SPATIAL COORDINATION

DRAWING STATUS: S2 — DRAWING SUITABILITY: INFORMATION

JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1104	P01


Asphalt
Grass
Gravel
Tactile
Pond
Flower Bed
Hedge
Fence
Ditch
Storage Area
Approximate line of fence
Approximate line of hedge
Post & rail 1.0m
Post & rail 0.9m
Hot rolling 0.90m
Block 0.15m
Timber Deck
Top of bank
Edge of pond
Edge of ditch
Centre of ditch
Edge of path
Edge of road
Edge of track
Edge of gravel
Edge of grass
Edge of hedge
Edge of fence
Edge of tactile
Edge of pond
Edge of flower bed
Edge of storage area
Edge of timber deck
Edge of block
Edge of post & rail
Edge of hot rolling
Edge of asphalt

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 3

Historic Plans

NOTES

1.0 GENERAL
1.1 DO NOT SCALE FROM THIS DRAWING
1.2 This drawing is based on a survey by Colin Wykes & Associates Ltd dated May 1995 and Jan1996 and all levels are related to O.S.B.M. value 29.50 on No1 Hunterscroft Gardens
1.3 All building work is to comply with NHBC requirements.

2.0 HIGHWAYS
2.1 All highway works including highway drainage are to be constructed in accordance with West Sussex County Council - Specification and Guidance Notes for Residential Estate Roads dated Aug 1991
2.2 Within any vision splays shown for highway junctions and forward visibility there shall be no obstruction to visibility higher than 600mm above adjacent carriageway level.

3.0 STREET LIGHTING
Proposed street lights are to be 5m concrete columns with 0.50 bracket arms and 70W SON lamps with integral gear all to WSCC specification.

4.0 DRAINAGE GENERAL
4.1 Before commencing construction the contractor must check the invert levels of any existing drains, sewers or outfalls to which connections are to be made.
4.2 Connections from road gullies are to be 150mm dia.
All other drainage is to be 100mm dia. unless shown otherwise.
4.3 Cover levels are shown for guidance only. Final levels to be determined on site.
Where affected by proposed works, existing covers are to be adjusted as necessary.
4.4 All existing ditches on the boundary to be trimmed and graded to good farming practice where shown on the layout. Any inlets from adjacent development are to be left clear.

5.0 ADOPTED DRAINAGE
5.1 Any sewers which are to be offered for adoption are to be constructed in accordance with Sewers For Adoption (4th Edition) or the above WSCC Specification.
Clay-ware pipework shall comply with BS65.
5.3 Bed & surround is to be Class S throughout with minimum 150mm deep bed.

6.0 PRIVATE DRAINAGE
6.1 Private drainage, both foul and surface water, is to be Marley Shallow Access or a similar system for plots 1-14 and clayware for plots 15-20 constructed in accordance with BS 8301:1985 and Approved Document H of The Building Regs.
6.2 UPVC pipe-work is to comply with BS 4660, clay-ware shall comply with BS65.
6.3 Drains passing beneath footings are to be bridged by pre-cast concrete lintels of adequate strength where necessary. Minimum clearance below lintel or ground beam to be 50mm. openings each side of footing to be closed with rigid sheet material.
Pipes beneath floor slabs are to surrounded with granular materiel which is to taken up to the underside of the slab.
6.4 (a) Inspection chambers more than 1500mm deep to invert are to be either 1200mm dia. or rectangular, 1200 x 750mm minimum.
(b) Chambers 1500mm deep or less to invert may be 1050mm dia. or rectangular, 1200 x 750mm minimum.
(c) Chambers 900mm deep or less to invert may be 450mm dia. preformed chambers or rectangular 450 x 450mm minimum.
(d) Access points which are no deeper than 600mm to invert may be 250mm dia.
(e) Inspection chambers for plots 15-20 shall be constructed of brickwork to the minimum dimensions in a, b and c above.

7.0 DRIVES & PARKING SPACES
7.1 Gradients of drives and parking spaces are not to exceed 1 in 12. (1 in 20 plots 15-20)
7.2 Drives are to drain to gullies if necessary to prevent surface water run-off onto the highway.
7.3 Where a drive meets the back of footway, vision splays 2.4 x 2.4m are to be provided each side with no obstruction to visibility more than 600mm above back of footway.

8.0 HOUSE FOOTPATHS & PATIOS
8.1 Layout of paths and patios is indicative only - refer to architect's details.
8.2 Gradients of paths not to exceed 1 in 12 (1 in 20 plots 15 -20)

9.0 CONDAM REGULATIONS - THE ATTENTION OF THE CLIENT AND THE PRINCIPAL CONTRACTOR IS DRAWN TO THE FOLLOWING POTENTIAL RISKS IN CONNECTION WITH THE PROPOSED ON-SITE AND OFF-SITE WORKS AS DESIGNED FOR THIS PROJECT
9.1 The works will entail deep excavation for which appropriate support and safety measures must be provided.
9.2 Works in the vicinity of live services including gas and electricity (underground and overhead) will be necessary and the advice of all statutory service companies must be sought before any works commence.
9.3 In making connection to existing sewers and drainage installations, man entry to confined spaces will be required and all appropriate safety precautions must be followed including the use of gas detection apparatus. The same precautions must be followed during future inspection and/or maintenance of any part of the completed drainage system.
9.4 Work in the existing highway will involve conflict with traffic and all due precautions including traffic controls and signing must be taken to ensure the safety of operatives and the general public.

COLOUR KEY			
SECTION 38		SECTION 111	
	Carriageway		Carriageway
	Footway		Footway
	Verge		Surface Water Drain
	Surface Water Drain		

KEY

Foul / SW

- Proposed sewer / MH to be adopted
- Road gully
- Rainwater pipe
- Soil and vent pipe
- 250 dia shallow access chamber
- 450 dia or 450 x 450mm inspection chamber
- 1200 x 750mm inspection chamber
- Proposed yard gully
- Air admittance valve
- Standing waste
- Proposed street lighting column
- Dropped kerb
- Street nameplate
- Pedestrian crossing with tactile paving
- Existing spot level
- Proposed spot level
- Existing lighting column

ADOPTABLE MANHOLE SCHEDULE							
MH No	Cover Level	Invert Level	Depth to Invert (m)	Depth to Soffit	MH Type	Dia or Dims (mm)	Cover Class	S38 / S104
H1.0	31.465	30.091	1.374	1.224	B	1070	HD.Gr A	S 38
H1.1	31.373	29.725	1.655	1.505	B	1070	HD.Gr A	S 38
H1.2	31.275	29.650	1.625	1.475	B	1070	HD.Gr A	S38
H1.3	31.050	29.389	1.661	1.436	B	1070	HD.Gr A	S38
H1.4	30.680	29.233	1.447	1.222	B	1070	HD.Gr A	S38
F1.0	31.427	30.015	1.412	1.262	C	1220 x 685	D400	S104
F1.1	31.300	29.912	1.388	1.238	C	1220 x 685	D400	S104
F1.2	31.350	29.788	1.565	1.412	C	1220 x 685	D400	S104
F1.3	31.275	29.700	1.575	1.425	C	1220 x 685	B125	REQUISITIONED

RECEIVED 19 JUN 1996

REV	DATE	DESCRIPTION
A	13.6.96	Forward vis defined with p.c edging added Shared surface road margins increased to 2m and SLS adjusted Tactile paving added to ped. crossings Vision splay drives added S.W. drainage amended plots 7 and 17 - 20 Location F1.2 amended. Parking amended plots 15 - 20 Bellmouth radius shown at site entrance. Length of lay by added Ditch outfall S.W. corner added. Colour key added Diverted footpath added to eastern boundary

Lovell Partnerships
Lovell Partnerships (Southern) Ltd
South East Region, Kelvin House, Kelvin Way,
Crawley, West Sussex, RH10 2SE
Tel : 01293 544810 Fax : 01293 540204

Project
ALLEY GROVES
COWFOLD

Title
ENGINEERING LAYOUT

Scale 1:200 Date MARCH 96

Drawn by

Drg No AG/E/001 Rev A

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 4

Communications with WSCC Highways

From:	Lee Moses
To:	Craig Searle
Cc:	Andrew Howick
Subject:	RE: E9395 - Fairfield Cottages, Cowfold - Drainage
Date:	21 February 2025 12:06:30
Attachments:	image002.png Fairfield Cottages_9395-SWP-ZZ-XX-DP-C-1100 P1 Drainage Layout_WSCCC Comments.pdf

Good Afternoon Craig,

Please responses to your questions regarding the drainage at Fairfield Cottages, Cowfold and attached PDF with comments.

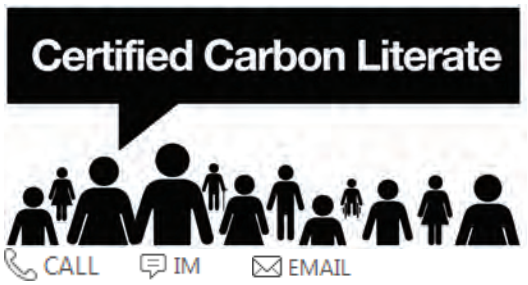
Can you please confirm if you have any further records of the drainage within this area? We have no records that show any existing surface water drainage in this area.

Can you confirm are proposals are acceptable? I don't have an issue with the proposed (culvert) diversion work. The culvert is already connected into the highway system, so I don't see an issue with moving the connection point. This work will need consent from the LLFA.

Are any formal applications required with yourselves for the change of discharge locations? Culvert diversion works will need consent from the LLFA. Private surface water should not be discharged into the existing highway system unless a connection already exists from the site.

Kind regards

Lee Moses MIHE
Senior Engineer, Highway Agreements,
Planned Delivery.
West Sussex County Council.



Location: Ground Floor Northleigh, County Hall, Chichester, West Sussex, PO19 1RH
Contact: Internal: 22088 | External: +44 (0)330 2222088 | E-mail: lee.moses@westsussex.gov.uk

Good Afternoon,

We are the consulting civil engineers for a development site in Fairfield Cottages. The site has planning permission with Horsham District Council under planning reference DC/22/2010. We are currently reviewing the design of the surface water drainage system and where it outfalls.

We have found that a watercourse has been culverted which crosses the site and discharges into what we believe are highways drains. In order to construct the development, we are proposing to divert the culvert so that it discharges into a highways manhole which is located upstream of the existing connection. This is referenced as H1.4.

We also believe the site surface water might discharge into the same drainage system but to the south-west of the site. There is a surface water drain which discharges in that direction. We are proposing to change the point of discharge to the diverted culvert crossing the site which in turn discharges into the highway's drainage. We are proposing to restrict the surface water discharge up to 2.0l/s so that a betterment on the current freely discharge rate is provided.

The public sewer records show no public surface water sewers within the vicinity of the site.

A CCTV survey of the drainage in the area is currently being carried out.

Can you please confirm if you have any further records of the drainage within this area?
Can you confirm are proposals are acceptable?
Are any formal applications required with yourselves for the change of discharge locations?

Please do not hesitate to contact us if you have any queries or wish to discuss further.

Regards,

Craig Searle

Craig Searle
BEng(Hons) MCHIT GMICE
Civil Engineer

STEPHEN WILSON PARTNERSHIP LTD

Chalvington Barn, Unit C Dittons Business Park,
Ditton Road, Polegate, BN26 6HY
Tel: 01323 412020

E: craig.searle@swpeast.co.uk
Website: www.swpeast.co.uk

STEPHEN WILSON PARTNERSHIP LTD. Registered in England No. 4304280. This e-mail is confidential and should be read only by the intended recipient. If you are not the recipient please notify us immediately by telephone and destroy and delete this message from your computer. (tel. 01323 412020).

WARNING. Computer viruses may be transmitted or downloaded onto your computer system via e-mail communication. It is the recipients responsibility to take any action necessary to prevent computer viruses being transmitted in this way. Accordingly SWP Ltd. disclaims all responsibility which arises directly or indirectly from such transmission of computer viruses.

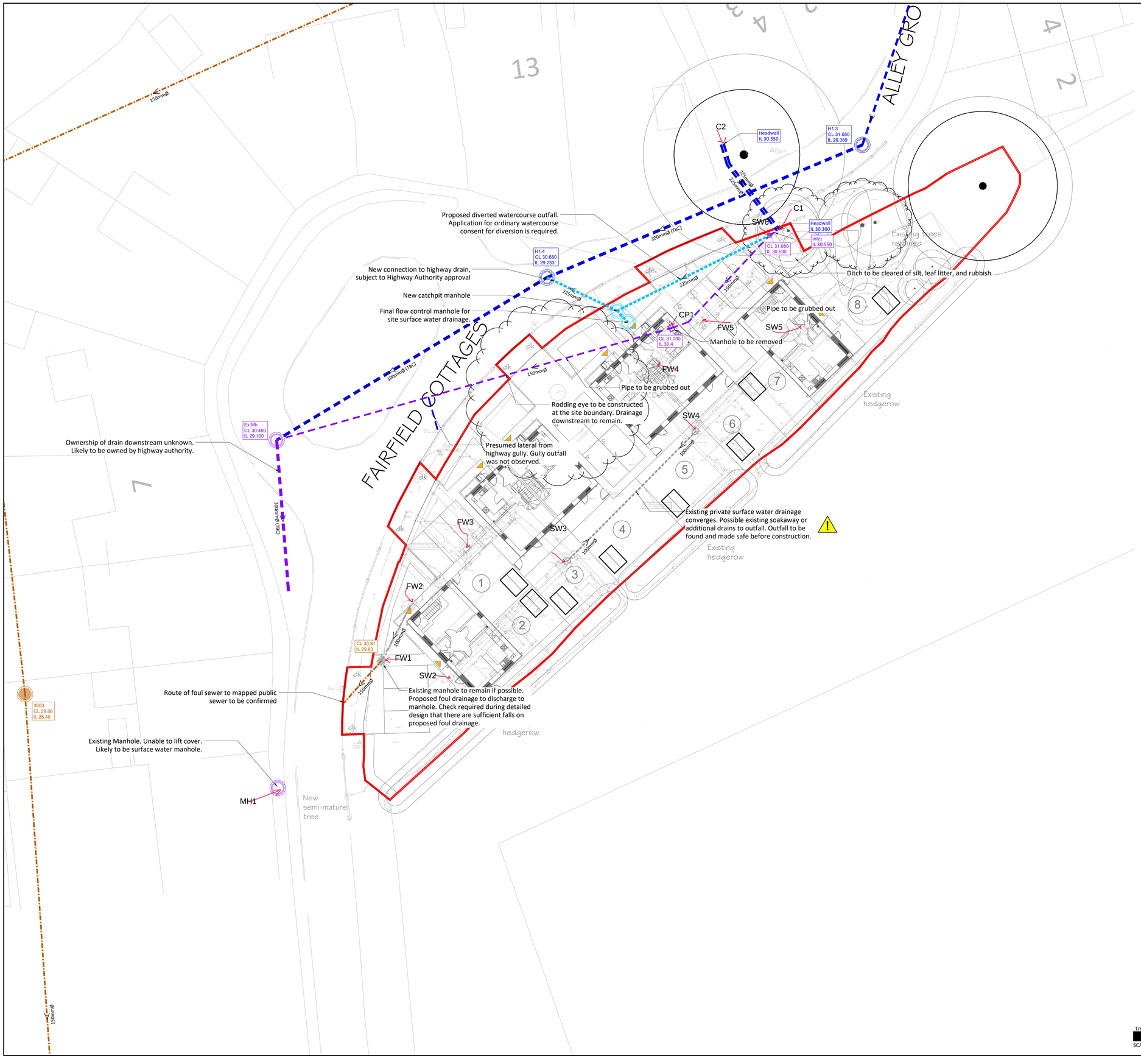
CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

LEGAL DISCLAIMER
This email and any attachments are confidential and intended solely for the persons addressed. If it has come to you in error please reply to advise us but you should not read it, copy it, show it to anyone else nor make any other use of its content. West Sussex County Council takes steps to ensure emails and attachments are virus-free but you should carry out your own checks before opening any attachment.

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 5

CCTV Survey



Drawing Legend

Surface Water Drainage

- Proposed surface water drainage
- Existing surface water drainage
- Existing Highway Drainage
- Existing private surface water drainage
- Manhole
- Inspection Chamber

Foul Water Drainage

- Existing private foul water sewer
- Existing public foul water sewer
- Public Sewer Manhole
- Existing Inspection Chamber

NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.

Position of existing drainage is approximate and is to be confirmed on site.

Existing levels shown are approximate and are to be confirmed on site

Connections to existing highway gullies not shown

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

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

REV.	DATE	DESCRIPTION
P01	11.02.2025	PRELIMINARY ISSUE

PRELIMINARY

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION

ARCHITECT: MH ARCHITECTS

JOB TITLE: FAIRFIELD COTTAGES COWFOLD, SUSSEX

DRAWING TITLE: DRAINAGE LAYOUT

SCALE AT A1	DATE	DRAWN
1-200	FEB 2025	CRS
	ENG. CRS	CHECKED JWM

RIBA STATUS: STAGE 2 - CONCEPT

DRAWING STATUS: S3 DRAWING SUITABILITY: REVIEW & COMMENT

JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - FORM - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1100	P01

Advanced Blockage Clearance Ltd
84 Upper Ratton Drive EASTBOURNE BN20 9DJ
Mobile : 07866 410870Telephone : 01323 503345
E - Mail : .Ross@abcdrainage.co.uk

CCTV DRAINAGE REPORT

Client :	Sunninghill
Location :	Fairfield Cottages Cowfold
Date :	19th February 2025
Order no :	Email

Manhole FW1

0.00m	Survey starts Upstream
6.40m	Enters Manhole FW2
10.50m	Enters Manhole FW3
14.40m	Enters Manhole FW4
42.30m	Enters Manhole FW5
48.40m	Enters Manhole FW6

Manhole FW1

0.00m	Survey starts downstream
16.40m	Enters Manhole FW7
41.30m	Tumbling bay
41.90m	Enters Manhole 3603

Advanced Blockage Clearance Ltd

84 Upper Ratton Drive EASTBOURNE BN20 9DJ

Mobile : 07866 410870Telephone : 01323 503345

E - Mail : .Ross@abcdrainage.co.uk

Manhole SW2

0.00m	Survey starts downstream
20.00m	Pipe appears to be collapsed

Will camera from SW main to complete

Manhole SW Main

0.00m	Survey starts Upstream
1.10m	Pipe appears to be collapsed

Manhole CP1

0.00m	Survey starts Upstream
5.70m	Displaced joint
6.80m	Displaced joint
14.20m	Enters Manhole SW1
15.10m	Enters Ditch

Manhole CP1

0.00m	Survey starts downstream
0.50m	Displaced joint
13.60m	End of run

Advanced Blockage Clearance Ltd

84 Upper Ratton Drive EASTBOURNE BN20 9DJ

Mobile : 07866 410870Telephone : 01323 503345

E - Mail : .Ross@abcdrainage.co.uk

Road Gulley 1

0.00m	Survey starts downstream
5.60m	Break at the top of pipe
6.40m	Lateral connection on the right
15.80m	Enters Ex Mh

Advanced Blockage Clearance Ltd

84 Upper Ratton Drive EASTBOURNE BN20 9DJ
Mobile : 07866 410870Telephone : 01323 503345
E - Mail : .Ross@abcdrainage.co.uk



STEPHEN WILSON
PARTNERSHIP LTD

Appendix 6

Response to Horsham Council Engineer Comment

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 417020
E-mail: info@swpcost.co.uk • Website: www.swpcost.co.uk

Reference	Horsham Council Engineers Comments	SWP Comments
1	We require more information on the location of the watercourse to the east of the site as this is not shown on the drainage plans. The contributing catchment of the culverted watercourse running through the site is not provided, and the direction of flow is unclear. For access and maintenance purposes, we also require confirmation that suitable easements have been provided from the proposed built development to the banks of the watercourse to the east of the site, and from the culverted watercourse through the site in accordance with LLFA policy. The proposed diverted culverted watercourse is running beneath the curtilage of a proposed driveway which may raise ownership/maintenance issues.	The existing extents of the watercourse has been drawn on the plans. The exact catchment of the watercourse is unclear due to the urbanisation of the area. The flow of the watercourse to the north of the site converges at the existing culvert inlet. The diverted culvert will be maintained by the landowners as per riparian ownership rules. Guidance on the maintenance of the culvert is included in the drainage maintenance plan. Ordinary Watercourse Consent has been approved for the culvert construction and retaining wall by plot 15.
2	The Drainage Layout shows roof water directly discharged into the private pipework then to the flow control prior to the culverted watercourse. It is noted that some of the rainwater downpipes connect into the permeable pavement sub-base, however there may be opportunities for further downpipes to be connected into the sub-base. This should be reviewed.	Rainwater downpipes discharge where possible into the subbase of the permeable pavement. This is not possible in every scenario due to clashes with foul drainage or service routes.
3	It is required that the points of connection for the foul water and surface water sewer are confirmed to ensure that the development can drain. The applicant states that a CCTV survey has been instructed, and we would welcome this and the supporting evidence to assess that suitable connections can be made to the foul water sewer and the surface water sewer, and to confirm the existing drainage regime at the site.	A CCTV survey has been carried out. It proves that the existing foul drain connects to the public sewer to the west. The CCTV survey also showed that the site surface water is currently drained to the highway drain in Fairfield Cottages. A S106 has

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 417020
E-mail: info@swpcost.co.uk • Website: www.swpcost.co.uk

		been approved by Southern Water for the connection.
4	Suitable pollution mitigation should be clearly evidenced in the drainage strategy to ensure there is no pollution risk arising from the development.	Pollution mitigation has been provided in the form of permeable pavements and catchpits. The overall pollution hazard is very low to low.
5	Insufficient information has been provided to assess the flood risk impact of altering the existing drainage and diverting the culverted watercourse. The LLFA and Highways must be consulted on these proposals.	Ordinary Watercourse Consent application has been approved for the culvert construction and retaining wall by plot 15.
6	The foul water drainage strategy does not demonstrate a connection to the public foul sewer, this must be provided.	The CCTV survey has proven the existing connection to the foul public sewer to the west. The survey identified no defects in the foul connection. A S106 with Southern water has been approved.
7	The applicant has provided the total site area, and pre- and post-development impermeable areas. A supporting plan should be provided to clearly show the impermeable areas that correspond with the Microdrainage model.	A set of plans has been provided with the calculations showing impermeable areas and pipe numbers.
8	As described in the Drainage Strategy note and Site Visit report, there are sewer connections and routes that require further investigation. The Southern Water sewer records provided show there are no public sewers adjacent to the site, however the site visit finds this not to be the case. The Site Visit report is unclear and does not include manhole references. A CCTV survey is proposed by the applicant to confirm the sewer locations and connections. This must be provided as evidence to prove that the development has a feasible connection into the wider drainage network and to confirm the existing drainage regime at the site.	A CCTV survey has been carried out. It proves that the existing foul drain connects to the public sewer to the west. The CCTV survey also showed that the site surface water is currently drained to the highway drain in Fairfield Cottages.

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 417020
E-mail: info@swpcost.co.uk • Website: www.swpcost.co.uk

9	The Drainage Layout shows roof water directly discharged into the private pipework then to the flow control prior to the diverted culverted watercourse. It is noted that some of the rainwater downpipes connect into the permeable pavement sub-base, however there may be opportunities for further downpipes to be connected into the sub-base. This should be reviewed.	Rainwater downpipes discharge where possible into the subbase of the permeable pavement. This is not possible in every scenario due to clashes with foul drainage or services.
10	Pipe numbers should be shown on the Drainage Layout, corresponding with the MicroDrainage outputs. It is noted several pipes are laid too flat and must be revised.	A plan showing pipe numbers has been provided with the calculations. The minimum falls for surface water pipes are 1:100, which is only for the collector pipes under the permeable paving or the 150mmØ pipes. The foul pipes are laid at 1:40 under buildings and a minimum 1:80 elsewhere. This is in accordance with building regulations and the DCG. SWP is unsure what pipes are too flat that Horsham Council engineers are referring to.
11	The location of the watercourse to the east of the site is not clearly shown on the Drainage Layout. The Drainage Plan in Appendix 2 of the Site Report notes an “additional 150mm ditch outfall”, this must be clearly identified on the Drainage Layout.	The existing extents of the watercourse has been drawn on the plans. There was no evidence of the “additional 150mm ditch outfall” on site. It is likely that the existing culvert was constructed to replace this historical “ditch outfall”, as the plan notes that the outfall is “blocked/collapsed, and it would conflict with the existing dwelling.

12	For access and maintenance purposes, confirmation is required on the Drainage Layout that suitable easements have been provided from the proposed built development to the banks of the watercourse to the east of the site, and from the culverted watercourse through the site in accordance with LLFA policy.	Ordinary Watercourse Consent application has been approved for the culvert construction and retaining wall by plot 15.
13	Technical drainage details must be provided, including but not limited to, detailed sections through the permeable paving and flow control manhole.	Typical details have been provided. Refer to typical detail drawings.
14	Drainage modelling should be updated in line with best practice as follows: • FEH22 data should be used rather than FSR data. • As per Section 5.5.3 of the West Sussex LLFA Policy, The Coefficient for Volumetric Runoff (Cv) values should be set to 1. • The MADD factor should be set to 0. • Maximum Rainfall Rate (mm/hr) should be set to the maximum value the software allows. Justification and details must be provided if values less than 75 mm/hr are used for a 2 year design event. • The design calculations must show consideration of a surcharged scenario if required and so have considered and evidenced the expected water level of the receiving watercourse in the design event.	Drainage modelling has been updated to accord with the requirements of the Horsham Council engineers. A surcharged scenario has not been modelled as the size of the culvert has been increased downstream of the surface water site outfall to mitigate this.
15	Evidence of measures to prevent pollution of the receiving surface water, in line with Table 26.3 of the SuDS Manual, must be provided.	Pollution mitigation has been provided in the form of permeable pavements and catchpits. The overall pollution hazard is very low to low.
16	Insufficient information has been provided to assess the flood risk impact of altering the existing drainage and diverting the culverted	The exact catchment of the watercourse is unclear due to the urbanisation of the

	watercourse. An assessment and evidence of the contributing catchment to this watercourse should be provided. The diversion of a culverted watercourse is the responsibility of the LLFA. The LLFA must be consulted by the applicant due to flood risk concerns. This is separate to Ordinary Watercourse Consent, which will also be required. As a result of the culvert diversion and proposed development contributing surface water at manhole H1.4, there could be an increase in surface water entering this Highway drain in Fairfield Cottages Road. Highways must also be consulted on the proposals, and as the maintenance is the responsibility of Highways. It must be demonstrated that the diverted watercourse has sufficient capacity.	area. The proposed culvert size for the diversion is like for like as the existing. A detailed assessment is therefore not required. Ordinary Watercourse Consent application has been approved for the culvert construction. WSCC Highways have been consulted and are accepting of the proposed culvert diversion. The culvert is the responsibility of the landowner under riparian rules.
17	The foul water drainage strategy does not demonstrate a connection to the public foul sewer, this must be provided.	The CCTV survey has proven the existing connection to the foul public sewer to the west. The survey identified no defects in the foul connection. A S106 application to Southern Water has been approved.
18	Due to the complexities of draining this site, further evidence in addition to that requested above may be required once the above clarifications and additional details are submitted.	Noted.

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 7

S106 approval

Mr Craig Searle
Unit C, Chalvington Barn,
Ditton Road
Polegate
East Sussex
BN26 6HY

Your ref
19961

Our ref
DSA000042599

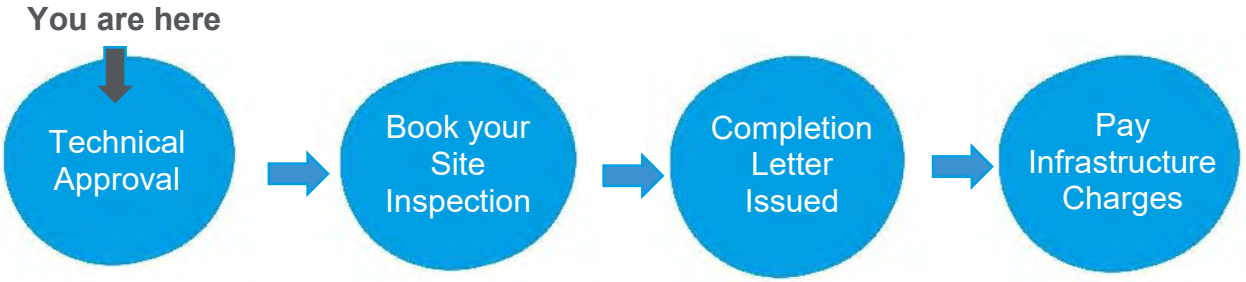
Date
07/04/2025

Contact
Tel 07510 379242

Dear Mr Searle,

Application to Connect to the Public Sewerage System - Section 106.

Location: 15-18 Fairfield Cottages, Cowfold, Horsham, West Sussex, RH13 8BL



What happens next?

1. This is your technical approval.
2. Construction of the wastewater connection begins. Once completed, ensure you book a site inspection, so we know the connection is in line with your application.
3. Once the site inspection has confirmed the work is satisfactory, a completion letter will be issued. See the Essential Sewer Connection Information document to find out why this letter is important.
4. Your infrastructure charge invoice will be issued (if applicable*).

How to book your site Inspection

To progress, select the **'Accept'** option on the Get Connected customer dashboard. Or, if you have further questions, please select the 'Query' option. If you do not wish to progress with the application, then please select the 'Withdraw' option.

Now you have received our approval, you will need to arrange with your contractor to carry out your works on site to connect into our sewer. Once the connection has been made it is a mandatory requirement for the point of connection to be inspected by one of our Assistant Adoption Managers.

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

To arrange this inspection, please select **'Ready for Inspection'** on your Get Connected customer dashboard. Once this has been selected, please contact **Malcolm Penny** our Assistant Adoption Manager for this area on **07922860784** and request an inspection giving at least two full working days' notice.

Once we are happy that your connection to the public sewer complies with our requirements and have passed our inspection, we will send you a completion letter within 7 working days. It's important to ensure your connection is inspected to prevent any risk of disconnection at a later date.

Technical Approval

We are pleased to advise that your Section 106 application to connect to the **Foul** sewer, as shown on your drawing **9395-SWP-ZZ-XX-DP-C-1100** Rev **P03** dated **27.03.2025**, is approved by Southern Water. Our approval means we are satisfied with your connection method. Inspection of the wastewater connection is required to complete your Section 106 application. Please note approval is valid for 2 years from date of issue.

Connections to existing/new Southern Water assets (i.e., manholes) and the arrangement of Southern Water assets (i.e., pipe junctions within manholes) should always be in accordance with the new Design and Construction Guidance manual ("the Code") and Southern Water's guidance documentation. water.org.uk/sewerage-sector-guidance-approved-documents/

This Section 106 approval does not confirm that public sewer network capacity is available at your location for the proposed development. The availability of capacity may be assessed through the Pre-Planning Enquiry process.

Please note that your connection should not proceed if:

- There are unapproved changes to your submitted plan or to the intended connection point. Any unapproved changes may lead to us disconnecting your connection under Section 109 of the Water Industry Act 1991.
- The relevant Planning Authority has set out conditions relating to the site's drainage and those conditions have not yet been discharged.
- You have not consulted our Health and Safety Advisory that can be viewed at the following link southernwater.co.uk/developing-building/health-and-safety
- You have not obtained the necessary Building Regulations Approvals or, if relevant, obtained a Highway Authority Road Opening License.
- Landowner consent has not been obtained where your connection is to be made through another Party's land.

Yours sincerely,

Vicky Pearce

Vicky Pearce
Technical Coordinator - Wastewater
Developer Services
07510 379242

Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX
southernwater.co.uk

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

Essential Sewer Connection Information

1. Site Inspection Checklist
2. What happens if the sewer connection is not inspected?
3. Adoption of a sewer
4. Infrastructure charges
5. Enforcement Policy

1. Site Inspection Checklist

We have prepared a site inspection checklist so that inspection of your sewer connection can be passed first time southernwater.co.uk/media/3028/ds-site-inspection-checklist.pdf

2. What happens if the sewer connection is not inspected and a completion letter is not issued?

Incidences where construction of the sewer connection has been completed but a site inspection has not been requested then the sewer connection application is not completed. You will need to request for a site inspection to finalise the application. If the sewer connection has not been built as per the designs submitted then we will ask you to rectify.

3. Adoption of a sewer

When a new development is planned, the developer can construct the sewers using approved materials and to a standard, which makes them suitable for adoption by Southern Water when construction is complete.

An adoption agreement can be entered into under Section 104 of the Water Industry Act 1991, prior to the sewers being built. This is the most desirable arrangement and if all new developments were covered by such adoption agreements, there would be few, if any, new private sewers on housing estates. However, there are many kilometres of existing private sewers that were built without an adoption agreement in place.

Section 102 of the Water Industry Act 1991 provides for the adoption of such sewers to be considered. It is important to draw a distinction between sewers, drains, and lateral drains:

- Sewers are pipes carrying sewage from more than one property
- Drains are pipes carrying sewage from only one property to the curtilage of the building or premises

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

- Lateral drains are those pipes which extend from the curtilage of a single building to the point of connection with an existing public of private sewer

To start the process of having the private sewer adopted, please visit our website and fill in the S102 Adoption Form.

4. Infrastructure charges

New developments increase the load on our networks and may require investment in upstream network reinforcement. This investment is funded through the Infrastructure Charge where the cost of network reinforcement is levied per property at the time of final connection.

* In addition to the sewer connection application charge, a charge for sewerage infrastructure is levied on each dwelling connecting onto the sewerage system. Non domestic properties will be individually assessed according to the number of appliances/fittings producing wastewater. Infrastructure charges are applicable even if the connection is made via a private sewer providing that the private sewer ultimately discharges into the public system.

There are three scenarios:

1. Water and wastewater connections are made within Southern Waters supply area. Infrastructure charges will be included in you water connection quote.

2. Water connections are made within another water company's supply zone and Wastewater is within the Southern Water supply area. Infrastructure charges will be invoiced following connection of the meters as advised by each water company.

3. You already have a water connection and require a wastewater connection in the Southern Water supply area. Infrastructure charges will be invoiced directly following completion of the wastewater connection.

For information and our current Connection Charges please refer to section 2 of the Southern Water Charging Arrangements Connection charging arrangements (southernwater.co.uk)

5. Enforcement Policy

It is an offence to not comply with the requirements of a S106 Water Industry Act 1991, which are detailed in the body of the letter. This can result in prosecution and a fine and/or removal of the illegal connection.

Please contact the Developer Services Team via the Get Connected customer dashboard / on 0330 303 0119 should you require any further advice.

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

STEPHEN WILSON
PARTNERSHIP LTD

Appendix 8

Ordinary Watercourse Approval

Ground Floor
Northleigh
County Hall
Chichester
West Sussex
PO19 1RH

Lead Local Flood Authority

Date: 14th May 2025

Craig Searle
Stephen Wilson Partnership
Unit C
Ditton Business Park
Dittons Road
Polegate
BN36 6HY BY EMAIL

Dear Craig,

RE: Land Drainage Works at 15 Fairfield Cottages, Cowfold RH13 8BL

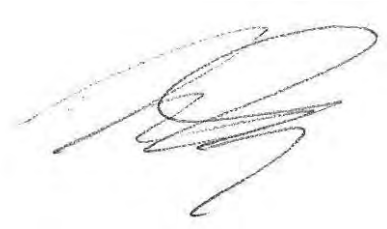
Thank you for your recent applications for Ordinary Watercourse Land Drainage Consent.

I confirm that your proposal for the permanent works under Application references WSCC- 703950152 and 703024213 is approved by West Sussex County Council. I enclose consent number LDC-2025-029 issued under Section 23 of the Land Drainage Act 1991.

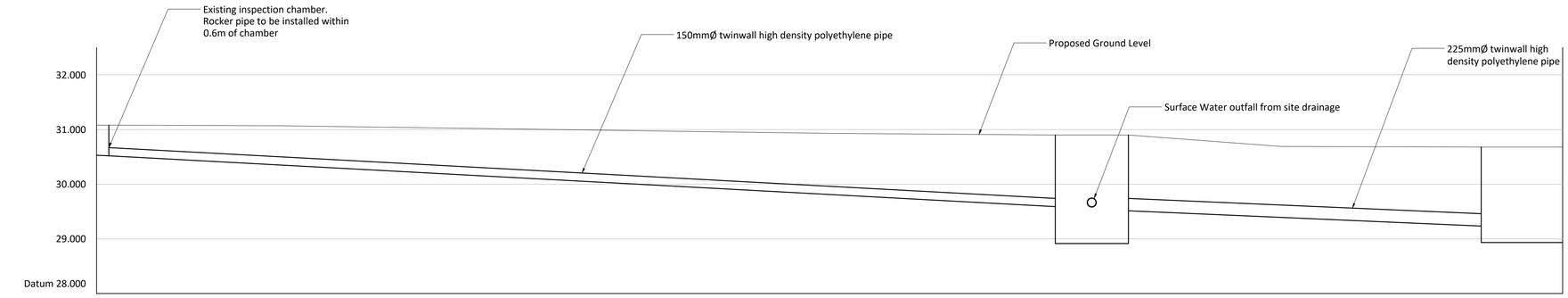
Please notify this authority no less than seven days before commencement and upon completion of the works, quoting the above consent number for reference. Please note that inspections will be carried out as deemed necessary.

The applicant must provide photographs of the works during construction and on completion, and forward digital copies to this office. Please note the 'Conditions' attached to this approval.

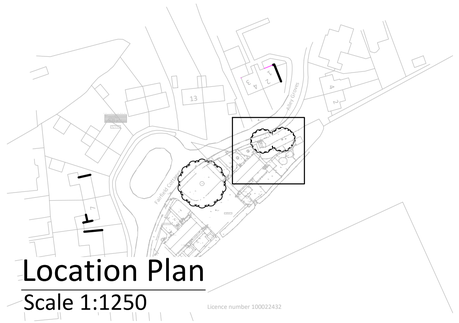
Yours sincerely,



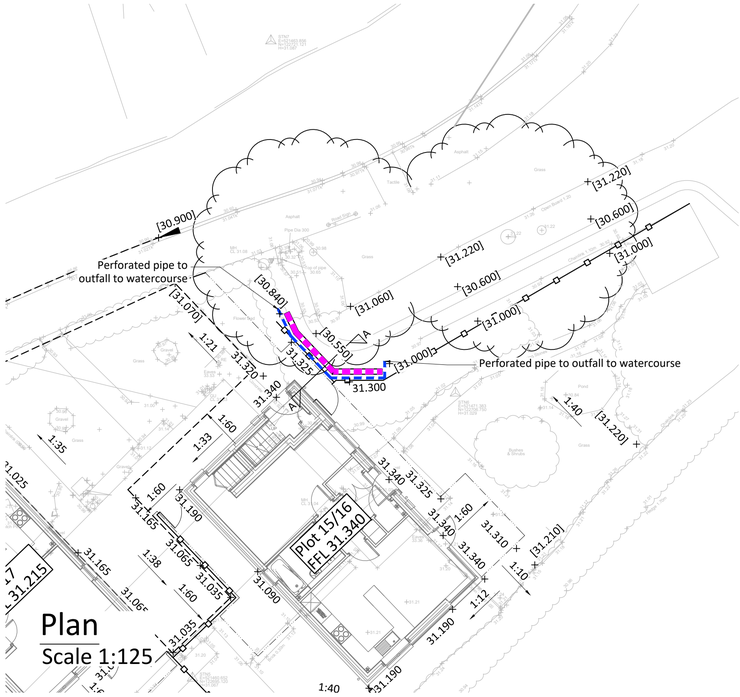
Michael Elkington
Head of Planning Services
West Sussex County Council


Existing inspection chamber.
Rocker pipe to be installed within
0.6m of chamber
150mmØ twinwall high density polyethylene pipe
Proposed Ground Level
Surface Water outfall from site drainage
225mmØ twinwall high
density polyethylene pipe
32.000
31.000
30.000
29.000
Datum 28.000

| | | |



Location Plan
Scale 1:1250



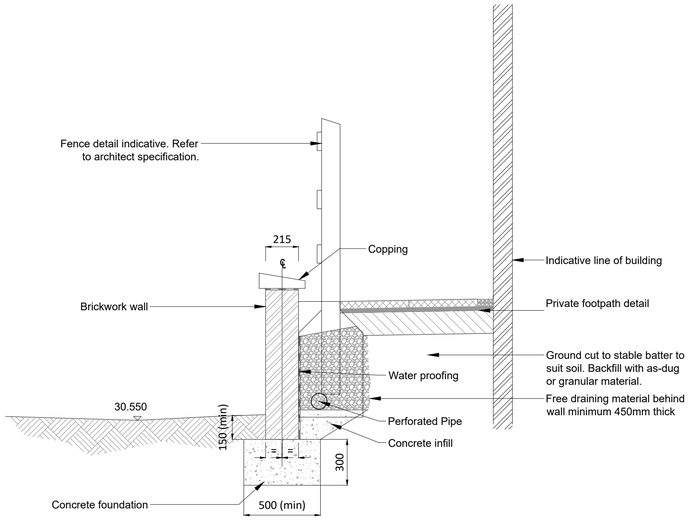
Plan
Scale 1:125

Drawing Legend

Proposed Levels	
FFL 31.340	Proposed Finished Floor Level
+31.000	Proposed Spot Level
+[31.000]	Proposed Existing Spot Level
+31.00	Existing Spot Level
1:40	Proposed Gradient
	Retaining Structure
	Perforated Pipe

NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.



Notes:

Concrete foundation: GEN1 (10N/mm²) or ST2 concrete with s3 consistence class (130mm target slump) min 180kg/m³/ cement content and 20mm max aggregate

Brickwork wall: HD: F2 and S2 bricks, English or Flemish bond (min 1500kg/m³/ density) in M12 mortar with bucket handle joints. Minimum brick strength 50N/mm².

Concrete infill: GEN1 concrete infill (as for main footing) to underside of weep holes

Rear face of wall: painted with two coats of bitumastic paint

Allow 28 days for mortar to cure before backfiling or provide temporary propping

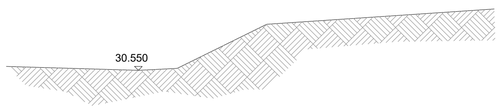
Free draining material: min 450mm width of 20mm single size stone wrapped in filter fabric - Terram T1000 or similar, with perforated pipe at base to drain to ends of wall.

Backfill: selected granular material fully compacted

Coping: Forticrete ow315 coping (or similar to be agreed with architect) laid in M4 mortar on flexible DPC.

Chainage	0.000	0.862	1.700	2.185	3.185
Proposed Level	30.575	30.550	30.587	31.325	31.350

Section A-A
Proposed
Scale 1-20



Chainage	0.000	0.862	1.700	3.185
Existing Level	30.575	30.550	30.850	30.950

Section A-A
Existing
Scale 1-20

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

SCALE 1-20 (0.5m, 1m, 2m)
SCALE 1-125 (1m, 2m, 3m, 4m, 5m, 10m)
SCALE 1-1250 (10m, 20m, 30m, 40m, 50m, 100m)

REV.	DATE	DESCRIPTION
P01	27.03.2025	PRELIMINARY ISSUE

PRELIMINARY

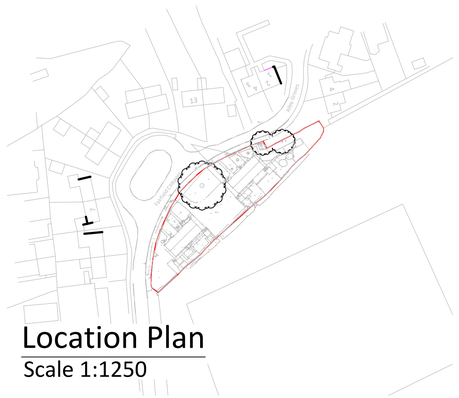
STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION CO. LTD
ARCHITECT: MH ARCHITECTS
JOB TITLE: FAIRFIELD COTTAGES COWFOLD, SUSSEX
DRAWING TITLE: ORDINARY WATERCOURSE CONSENT RETAINING WALL

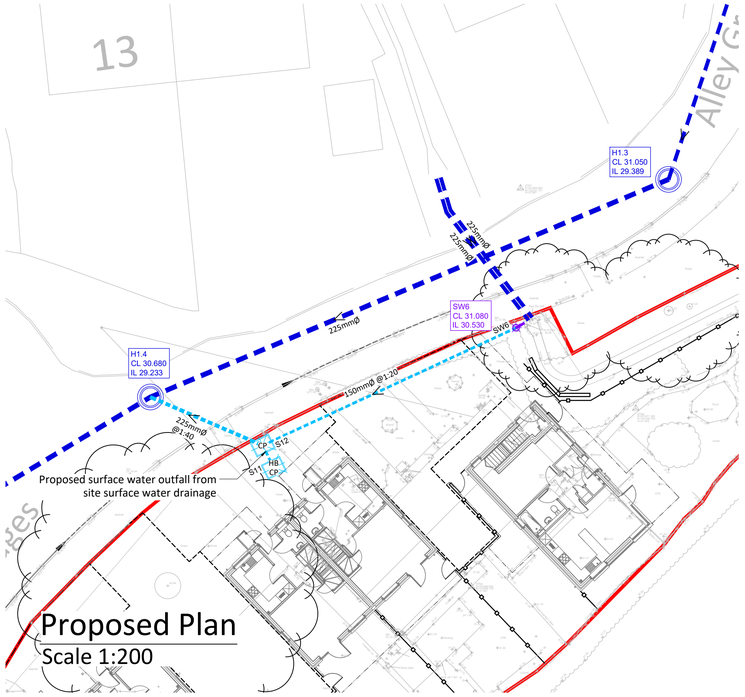
SCALE AT A1	DATE	DRAWN
AS SHOWN	MAR 2025	CRS
	ENG. CRS	CHECKED JWM

RIBA STATUS: STAGE 3 - SPATIAL COORDINATION
DRAWING STATUS: S3 | DRAWING SUITABILITY: REVIEW & COMMENT

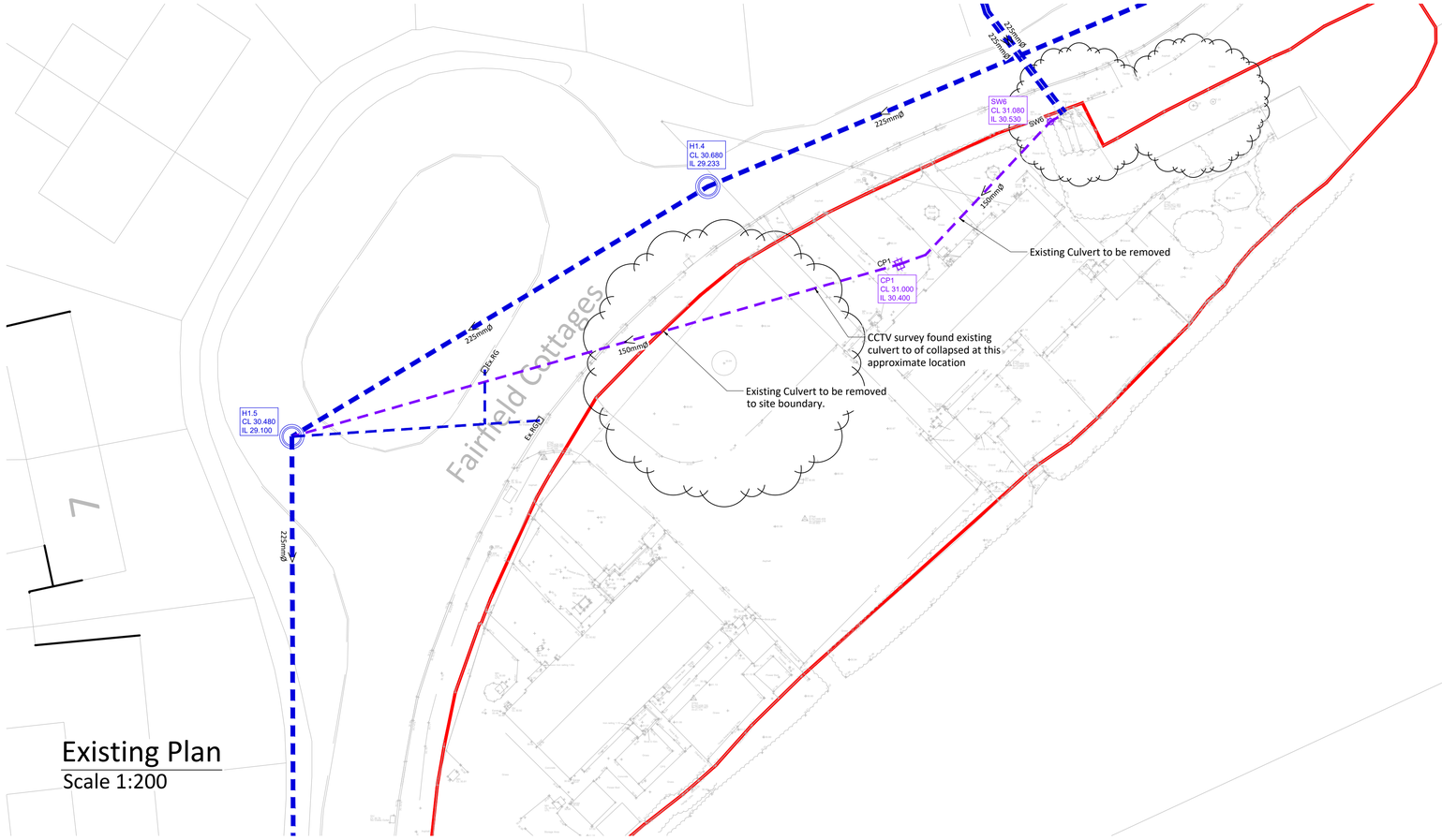
JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - FORM - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1350	P01



Location Plan
Scale 1:1250



Proposed Plan
Scale 1:200



Existing Plan
Scale 1:200

Drawing Legend

Surface Water Drainage	
	Proposed surface water drainage
	Existing surface water drainage
	Existing Highway Drainage
	Existing Surface Water Manhole
	Type C manhole Rigid Construction - Rectangular
	Type D inspection chamber Flexible Construction
CP	Catchpit
HB	Hydrobrake 2.0l/s @ 1.0m head

NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.

REV.	DATE	DESCRIPTION
P01	27.03.2025	PRELIMINARY ISSUE

PRELIMINARY

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

0.5m 1m 2m
SCALE 1-20

10m 20m 30m 40m 50m 100m
SCALE 1-1250

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road, POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION CO. LTD

ARCHITECT: MH ARCHITECTS

JOB TITLE: FAIRFIELD COTTAGES COWFOLD, SUSSEX

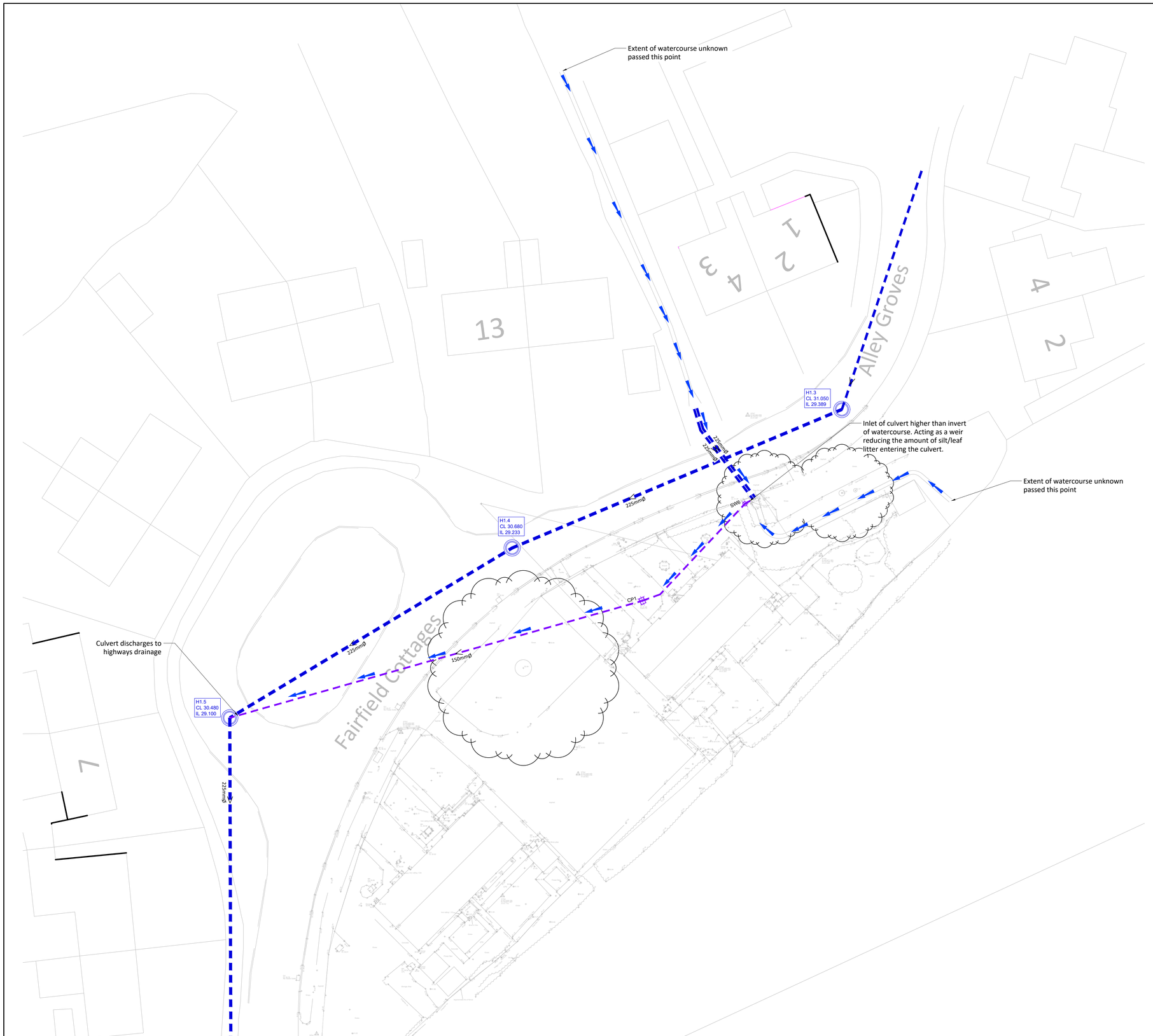
DRAWING TITLE: ORDINARY WATERCOURSE CONSENT CULVERT - PLAN

SCALE AT A1	DATE	DRAWN
AS SHOWN	MAR 2025	CRS
	ENG. CRS	CHECKED JWM

RIBA STATUS: STAGE 3 - SPATIAL COORDINATION

DRAWING STATUS: S3 DRAWING SUITABILITY: REVIEW & COMMENT

JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1351	P01



Drawing Legend

Surface Water Drainage	
	Existing surface water drainage
	Existing Highway Drainage
	Existing Surface Water Manhole
	Existing Flows within Watercourse

NOTES:

1. This drawing is to be read in conjunction with all other SWP drawings, and with all relevant architect's and engineer's drawings and specification and any discrepancies found are to be reported immediately to the engineer.
2. No dimensions are to be scaled from this drawing. unless noted otherwise all dimensions are in millimeters and all levels are in metres from the site datum.
3. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. figured dimensions must be used for setting out and detailing. swp logos and company information must be removed from copies if information is re-used.
5. The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
6. The main contractor is responsible for all occurrences of ground water during the construction period.
7. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care and attention whilst undertaking the works.
8. The contractor must comply with all current legislation relating to health & safety.
9. All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any swp drawings, the manufacturers instructions must be used.

COLOURED DRAWING
REQUEST A COLOURED COPY IF THIS STAMP IS NOT RED

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

REV.	DATE	DESCRIPTION
P01	08.04.2025	PRELIMINARY ISSUE

PRELIMINARY

STEPHEN WILSON PARTNERSHIP LTD
Chalvington Barn, Dittons Business Park, Dittons Road,
POLEGATE, BN26 6HY Telephone: 01323 412020
E-mail: info@swpeast.co.uk • Website: www.swpeast.co.uk

CLIENT: SUNNINGHILL CONSTRUCTION CO. LTD

ARCHITECT: MH ARCHITECTS

JOB TITLE: FAIRFIELD COTTAGES
COWFOLD, SUSSEX

DRAWING TITLE: ORDINARY WATERCOURSE CONSENT
EXISTING FLOW DIRECTIONS

SCALE AT A1	DATE	DRAWN	CHECKED
1-200	APR 2025	CRS	CRS
	ENG. CRS		

RIBA STATUS: STAGE 4 - TECHNICAL DESIGN

DRAWING STATUS: S2 DRAWING SUITABILITY: FOR INFORMATION

JOB No.	DRAWING No. (PROJECT - ORIGINATOR - VOLUME - LEVEL - FORM - DISCIPLINE - NUMBER)	REV.
E9395	9395-SWP-ZZ-XX-DP-C-1352	P01