



**PROPOSED RESIDENTIAL DEVELOPMENT
LAND SOUTH OF ARUNDEL ROAD, FONTWELL**

**DRAINAGE STRATEGY
& SUDS STATEMENT-**

APRIL 2022

Document Control Sheet

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	Name	Position	Signature	Date
Prepared by:	Terry Seymour	Director	TRS	May 2019
Reviewed by:	Leon Darrell	Principal Engineer	LD	May 2019
Approved by:	Terry Seymour	Director	TRS	May 2019

Revision	Date	Description	Prepared	Approved
1	23.05.19	Issued for Planning.	LD	TRS
2	23.01.19	Updated layout	TRS	TRS
3	25.06.20	Update to new submission	TRS	TRS
4	30.06.20	Updated layout	TRS	TRS
5	03.11.20	Updated layout	TRS	TRS
6	01.04.22	Block A Updated	LD	TRS

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1.0 Introduction

Rogers Cory Partnership Limited have been instructed on behalf of Dandara (Southern) to prepare a Surface Water Drainage Strategy and SuDS Statement to support the Reserved Matters submission associated with the redevelopment of the site referred to as the Land South of Arundel Road, Fontwell, West Sussex per the current Outline Planning Notice (WA/22/15/OUT).

This report outlines the development of the Surface Water Drainage and SuDS Strategy following on from the Flood Risk Assessment (FRA) produced by Wormald Burrows Partnership Limited (Report dated April 2015) which formed part of the outline planning submission.

The purpose of this strategy is currently not to seek to discharge the current planning conditions relating to the surface water and SuDS of the Outline Planning Notice (WA/22/15/OUT) but rather to support the Reserved Matters application and to demonstrate that a surface water drainage solution can feasibly be delivered to support the detailed layout.

Further details, including detailed hydraulic calculations, detailed drainage layouts and associated drainage construction details will be developed and submitted as part of a separate and future Discharge of Conditions application.

The drainage strategy outlined and presented in this report build on the principles of the following:

- Flood Risk Assessment by Wormald Burrows Partnership Limited (April 2015);
- BRE 365 Soakaway Testing & Groundwater Levels Monitoring by Deltasimons (April 2014);
- BRE 365 Soakaway Testing by Leap Environmental (October 2018);
- Winter Groundwater Monitoring by Leap Environmental (April 2019);
- BRE 365 Winter Soakaway Testing by Leap Environmental (April 2019)

2.0 Existing Site

The overall site is located within Fontwell, adjacent to the A29 and Arundel Road (Refer to **Figure 1** below). The development is bounded to the north by existing residential properties and Arundel Road, to the east and south by Wandleys Lane and residential properties including a Care Home, to the west by the A29 and Fontwell racecourse just beyond this.

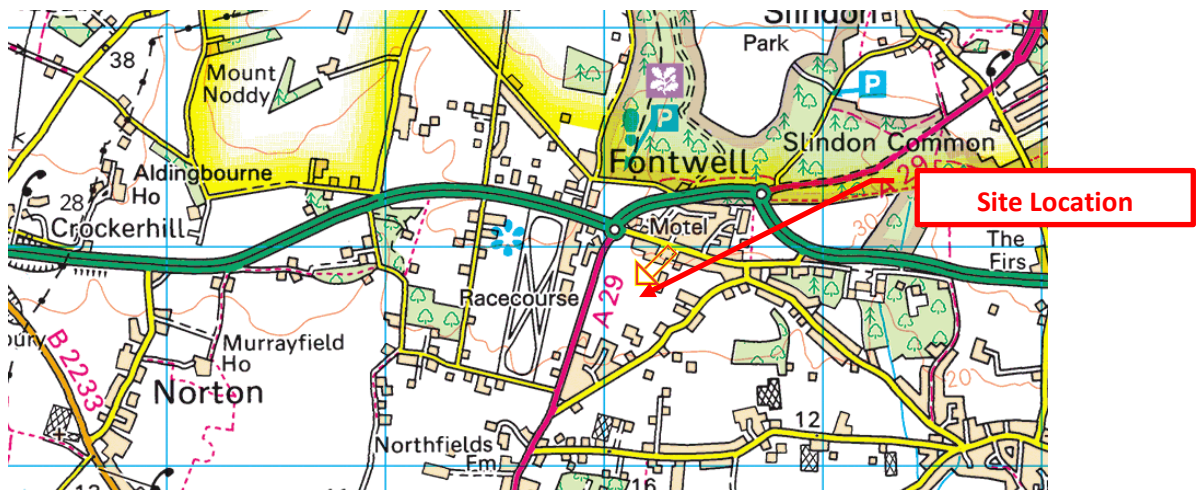


Figure 1: Site Location

The existing site proposed for development covers approximately 16.18ha of greenfield land comprising of open grassed fields. The approximate centre of the site is at Ordnance Survey (OS) Grid Reference 495140; 106820.

The application site generally falls in a southerly direction towards the western, southern and eastern boundaries respectively. An overview of the change in topography in this part of the wider site is presented as **Figure 2** overleaf. A copy of the topographical survey can be found in **Appendix A**.



Figure 2: Site Topography

Geotechnical

The current review of the geotechnical aspects of the site are based on the following documents:

- Flood Risk Assessment by Wormald Burrows Partnership Limited (April 2015);
- BRE 365 Soakaway Testing & Groundwater Levels Monitoring by Deltasimons (April 2014);
- BRE 365 Soakaway Testing by Leap Environmental (October 2018);
- Winter Groundwater Monitoring by Leap Environmental (April 2019);
- BRE 365 Winter Soakaway Testing by Leap Environmental (April 2019)

Ground Conditions

BGS geological maps indicate that the site is underlain by the Lambeth Group Formation comprising of Clay, Silt and Sand with superficial deposits of Head Deposits (comprising of Gravel, Sand, Silt and Clay).

Intrusive investigations carried out by Deltasimons and LEAP report that the site consists of topsoil up to 0.4mbgl, over sandy, silty, clayey GRAVEL, overlying a gravelly, clayey SILT and gravelly CLAY, with some areas of the site the Gravel strata was found to have stiff very gravelly CLAY.

Winter groundwater monitoring indicates the presence of groundwater parts of the site varying from 0.67mbgl to 3.45mbgl. Winter infiltration testing to BRE 365 was carried out and indicated permeability rates ranging from 1.27×10^{-6} to 2.91×10^{-4} m/s.

Investigations on the potential presence and risk of formation of solution features was carried out by Leap Environmental, who have provided recommendations on the minimum offsets for the construction of new plot soakaways from the structural foundations. A copy of the extracts from the Leap Environmental Ground investigation report is contained in **Appendix B**.

Hydrology

There are no existing ordinary watercourses immediately within the vicinity of the site.

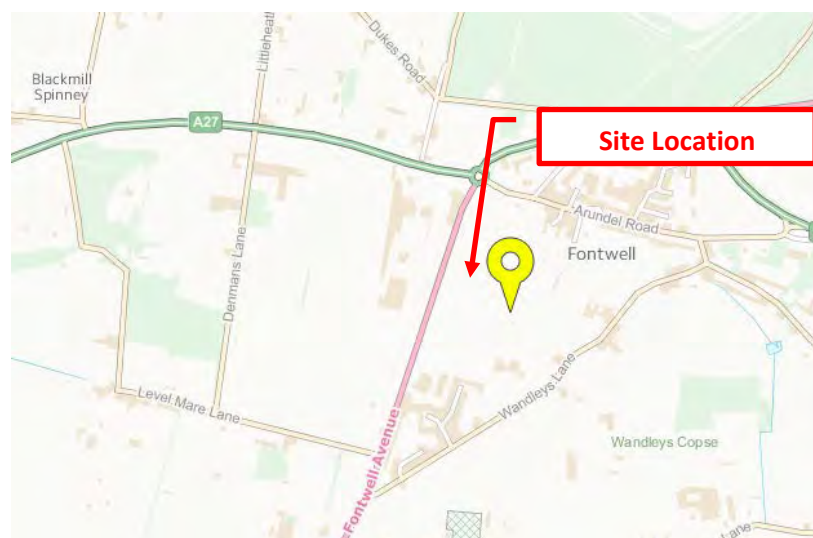


Figure 3: Extract of Flood Map from the EA's website

Hydrogeology

Groundwater mapping published by the EA indicates that the site is located over a Groundwater Vulnerability Zone designated as a Minor Aquifer Intermediate, with a Secondary A Bedrock and Secondary A Superficial Deposit designation respectively. The site is located over a groundwater source protection Zone 1 (Inner Protection Zone) in the north western part, whilst the remainder lies within Zone 2 (Subsurface Activity)

3.0 Flood Risk and Existing Surface Water Drainage

This report reviews the existing risk of flooding to the site and requirements for a compliant drainage strategy by interrogating the following information:

- Available topographic survey information;
- Arun District Council Strategic Flood Risk Assessment (SFRA);
- West Sussex LLFA Policy for the Management of Surface Water;
- Available mapping from the Environment Agency's website;
- Existing Southern Water sewer service records;
- Wormald Burrows Partnership Limited Flood Risk Assessment (April 2015);

Based on a review of the EA's Flood Zone maps (see **Figure 3**), the development site appears to lie wholly within Flood Zone 1, considered to be at low risk from fluvial and tidal flooding.

The risk of flooding from pluvial sources has been assessed and based on the mapping information provided by the EA is deemed low for the site. Whilst there is a small localised area highlighted as high risk this is due to a localised low point in the site topography which would allow potential exceedance flows to accumulate. The risk to the future development could be mitigated through consideration of proposed finished levels in relation to these existing low points on the site to ensure such localised surface water flooding will not pose a risk to buildings or people, nor increase the risk of surface water flooding elsewhere.

It should be noted that as from April 2015, the Lead Local Flood Authority (LLFA) has now become a statutory consultee with respects to surface water drainage and risk of flooding from surface water, groundwater, reservoirs and sewers. As such West Sussex County Council (WSCC) and Arun District Council (ADC) will become a primary consultee during the Reserved Matter submission and discharging planning conditions relating to localised flood risk and the surface water drainage strategy.

Existing Site Drainage

A review of the existing topographic information and sewer records has been carried out to assess the existing surface water drainage regime of the site.

The majority of the surface water from fields within the development site appear to drain naturally to ground via infiltration.

4.0 Surface Water Management

The surface water management section should ensure that there is no adverse impact on flood risk elsewhere as a result of a change in the surface water runoff regime from the re-development.

Design Principles

Key design principles in the following guidance documents steer the approach to managing surface water runoff at sites:

- Building Regulations hierarchy of drainage (H3);
- Interim Code of Practice for SuDS; and
- CIRIA best practice guidance, including the use of the 'SuDS management train'.

Building Regulations hierarchy of drainage outlines the preferred methods for the disposal of surface water with infiltration methods being the preferred option. If this is not possible the next favoured option is to drain to an existing watercourse. If neither of these options are feasible, the regulations state that rainwater discharge should be directed to a sewer.

The Interim Code of Practice for SuDS provides guidance about the hydraulic design criteria for Sustainable drainage systems. This in general refers to both peak rate of runoff and the volume of runoff, post development. Prior to mitigation measures such as the use of SuDS attenuation features, both the volume and peak rate of runoff may increase post development.

The design principles for surface water management extend beyond simple hydraulic criteria. CIRIA guidance promotes the use of the SuDS management train, a concept where SuDS techniques are used to treat, convey and store surface water runoff. This approach is considered as part of the SuDS selection methodology.

Sustainable Drainage Systems

To drain the development in a sustainable manner whilst complying with the requirements of the NPPF, the scheme should seek to adopt an appropriate form(s) of sustainable urban drainage systems (SuDS).

SuDS techniques comprise of implementation of permeable paving and on plot soakaways (where applicable) as well as an infiltration basin in the south western corner of the site.

Surface Water Drainage Strategy

In view of the requirements of the NPPF, PPG, WSCC, ADC the design parameters and constraints associated with redeveloping this site, a surface water drainage strategy design has been devised and hydraulically modelled to demonstrate that the scheme can be suitably implemented without increasing the level of flood risk, when the surface water drainage system experiences a 1:100-year rainfall event (including climate change).

The surface water drainage scheme has been designed to ensure:

- A reduction in the pre development site discharge for peak storm events.
- Sustainable Urban Drainage systems are wholly incorporated within the scheme.
- Consideration is given for the improvement of water quality within the design.
- The designed drainage scheme can satisfactorily retain a critical 1 in 100 Year storm event with climate change.

The development of the onsite surface water drainage strategy has been carried out through ongoing consultation with ADC Drainage Officers. Following additional infiltration testing a further round of consultation was carried out with the Drainage Officer. Details of the final requirements set out by the Officer are provided in **Appendix F**.

All new access roads, parking bays and access drives will be permeable paving with full infiltration. Run-off from the new plots will be directed to trench soakaways. In the parts of the site where the infiltration rates were poorer, the runoff from the new buildings will be directed to the new infiltration basin located in the south western corner of the site. An outline of the above proposal is provided in drawings DAN/E4736/031-034 in **Appendix C**.

Calculations to demonstrate the feasibility of permeable paving for parking bays, access roads, on plot soakaways and the infiltration basin are provided in **Appendix D**. The drainage strategy has been developed in accordance with the agreed criteria set with ADC Drainage Officer as per the correspondence in **Appendix E**.

It must be noted that the strategy layout and calculations presented at this stage is to demonstrate that the detailed layout can feasibly be drained in terms of surface water. The full details of the drainage layouts including construction details for permeable paving, soakaways and infiltration basin will be provided as part of the separate Discharge of Conditions application of the Outline Consent.

Water Quality

It is important to address issues with regards to quality when considering surface water management. As part of the surface water is proposed to be discharge to the existing downstream watercourses, treatment is proposed as part of a SuDS Management Train in accordance with the recommendations of the SuDS Manual (CIRIA 753) and as required by the LLFA.

This SuDS management train will be achieved through the use of on plot soakaways, permeable paving and the infiltration basin.

Chapter 26 of the CIRIA SuDS Manual (2015) provides guidance on methods that should be used to design SuDS to meet the water quality design criteria and good practice design standards. Diffuse urban pollution is a significant factor in compromising groundwater and receiving water standards that are required under the EA Water Framework Directive. Chapter 4 of the SuDS Manual summarises factors, which influence pollution levels in urban run-off. This summary is presented in **Table 1 below:**

Factors influencing pollution levels in urban run-off
The amount and type of pollution washed off a surface will depend on many things including: • Planning activities on, above and adjacent to the surface that affect the deposition of pollutants, their retention on the surface and the extent to which they are mixed with runoff (including pollution prevention strategies) • Unplanned activities (accidents and spillages) that can cause temporary unexpected high pollution concentrations • The surface location and type, affecting wash-off rates and contaminant movement mechanisms • The drainage path • The length of the dry weather period before the rainfall event • The intensity and the duration of the rainfall, and the associated flow velocities Any further pollutant transformations occurring during residence and conveyance within gullies, chambers, pipe or channel networks, gravels, soils and vegetation and quiescent bodies of water.

Table 1: Extract of Box 4.1 of the SuDS Manual (CIRIA 753)

Table 4.3 of the SuDS Manual classifies the pollution hazard level for residential sites, including residential car parks, low traffic roads as being “low” and thus only

requiring a “Simple index approach” in terms of the requirements for the discharge to surface waters, including coasts and estuaries.

The SuDS Manual summarises the steps for the simple index approach:

Step 1 – *Allocate suitable pollution hazard indices for the proposed land use*

Step 2 – *Select SuDS with a total pollution mitigation index that equals or exceeds the pollution index*

Step 3 – *Where the discharge to a protected surface waters or groundwater, consider the need for a more precautionary approach*

The SuDS Manual describes “protected surface waters” as protected surface water resources, which include those designated for drinking water abstraction or for other environmental protection reasons

Table 26.2 of the SuDS manual notes the following pollution hazard indices for residential land use development:

Land Use	Pollution Hazard Level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg. cul-de sacs, home zones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie. Less than 300 vehicle movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospital, retail), all roads except low traffic roads and trunk roads/ motorways	Medium	0.7	0.6	0.7

Table 2: Extract of Table 26.2 of SuDS Manual (2015)

Table 26.3 of the SuDS Manual provides details of the SuDS pollution mitigation indices for various types of SuDS components

Type of SuDS component	Mitigation indices		
	TSS	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable Paving	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8

Table 3: Extract of Table 26.3 of SuDS Manual (2015)

As such the total SuDS mitigation index (figure 5) must be greater than the pollution hazard index (figure 4), furthermore when used in combination of two or more SuDS components, a factor of 0.5 is used to account for the reduced performance of the secondary or tertiary components associated with the already reduced inflow of concentration, therefore:

Total SuDS mitigation index = mitigation index₁ + 0.5 (mitigation index₂)

The use of the permeable paving for the access roads and soakaways/infiltration for roof drainage will provide the minimum required level of SuDS mitigation index to the run off from the development.

Long Term Maintenance

Consideration will need to be given to the long-term maintenance of the proposed drainage structures. Permeable paving, soakaways and all associated external pipework, chambers and manholes within the demise of each plot ownership boundaries will be the responsibility of the future occupants. Elsewhere, the surface water networks below the access roads and open space will be the responsibility of the Management Company. Details of the Maintenance Plan will be provided as part of the separate Discharge of Conditions application of the Outline Consent.

Exceedance

Whilst the drainage system has been designed to a very high standard (1 in 100 Year storm event including climate change), it is possible that a more extreme event will occur and that the design standard for the system will be exceeded. It is best practice to design the drainage system to shed water, primarily into landscaped and

other areas, therefore reducing the risk of flooding areas of built development during extreme events.

A strategy for directing overland flows for the site will be confirmed using overland flow modeling and provided as part of the separate Discharge of Conditions application.

5.0 Foul Drainage

The proposed foul water discharge generated by the site has been calculated at 18.51l/s (based on 400 dwellings at 4000l/dwelling/day) in accordance with Sewers for Adoption 7th Edition.

The foul water drainage will be conveyed via a new below ground foul sewer network through development to a new connection to the Southern Water network within Fontwell Avenue

All domestic foul drainage will be designed in accordance with Part H of the Building Regulations.

6.0 Conclusion

A surface water drainage strategy has been prepared and demonstrates that the development proposal can be successfully implemented and designed to withstand the impact of a 1:100-year rainfall event (including climate change), in accordance with the NPPF, PPG, WSCC and ADC requirements.

In view of this assessment, the report concludes that:

- i. The Development can be drained in a sustainable manner utilizing SuDS techniques;
- ii. The Development will satisfactorily manage and maintain a 1 in 100 Year storm event with an allowance for climate change;
- iii. The detailed drainage strategy generally follows the principles of the approved FRA and Surface Water Drainage Strategy and SuDS Statement;
- iv. The drainage strategy has been developed in consultation with the ADC Drainage Officer.
- v. The findings of this report identify the opportunity to promote the sustainable re-use of existing resources and potential to implement an appropriate SuDS strategy.

Appendix (A)

Topographic Survey



Notes:
1. GRID AND LEVELS RELATED TO OSGB36 NATIONAL DATUM DERIVED FROM THE NATIONAL GPS NETWORK (LSF (0.99971) USED IN ALL CALCULATIONS)
2. DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHIST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION. IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
3. ALL SEWERS ARE PRESUMED TO BE STRAIGHT BETWEEN CHAMBERS.
4. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
5. BACKGROUND INFORMATION (SHOWN BLUE) IS CURRENT ORDNANCE SURVEY DIGITAL DATA, CROWN COPYRIGHT. ALL RIGHTS RESERVED. LICENCE NUMBER: 10002432.
6. BACKGROUND AERIAL IMAGERY (c) Getmapping plc 2014.

Coordinate Table				
Station	Description	Easting	Northing	Level
S1	ROAD NAIL	495221.789	107043.742	31.633
S2	ROAD NAIL	495147.851	107044.290	29.326
S3	ROAD NAIL	495083.446	107088.548	27.122
S4	ROAD NAIL	495108.787	107088.953	28.235
S5	ROAD NAIL	495034.223	107088.958	26.414
S6	ROAD NAIL	494989.424	106944.370	23.820
S7	ROAD NAIL	494948.888	106935.924	22.980
S8	ROAD NAIL	494988.088	106931.796	21.892
S9	PEG	494984.817	106920.200	24.555
S10	PEG	495048.554	106920.072	27.516
S11	PEG	495163.848	106925.478	29.513
S12	PEG	495354.554	106976.168	29.578
S13	PEG	495140.971	106744.223	28.997
S14	ROAD NAIL	495330.303	106717.149	27.340
S15	PEG	495382.076	106859.180	29.912
S16	ROAD NAIL	495557.892	106917.401	28.317
S17	ROAD NAIL	495610.185	106837.144	28.872
S18	ROAD NAIL	495342.296	107010.041	31.943
S19	ROAD NAIL	495421.424	106950.041	31.298
S20	ROAD NAIL	495462.896	106957.508	30.971
S21	ROAD NAIL	495544.584	106958.820	30.888
S22	ROAD NAIL	495604.731	106948.996	29.719
S23	ROAD NAIL	495655.034	106960.772	29.797
S24	ROAD NAIL	495675.728	106960.756	26.632

KEY

SURVEY STATION 5

BANKING

HEDGE SPREADS

WOODLAND CANOPY

MARSH / WATERLOGGED

TREES

GATE

WATER CHANNEL

ROAD UNMARKED

FOOTPATH

CHANGE IN SURFACE

FENCE

WALL

OVERHEAD ELECTRIC

OVERHEAD TELECOM

FOUL SEWER

SURFACE SEWER

BUILDING

OPEN SIDED BUILDING

GLASSHOUSE

CONTOUR

SPOT LEVEL

BORE HOLE

TRIAL HOLE

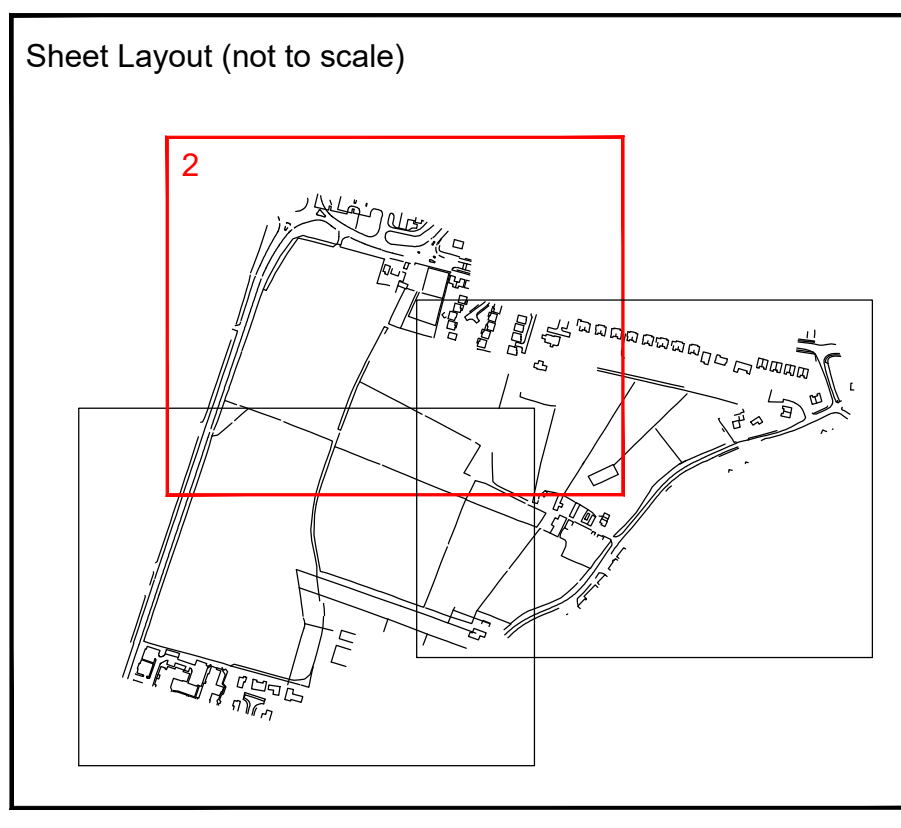
GENERAL ABBREVIATIONS

AIR VALVE
BACK STOP
BOLLARD
BVS STOP
BT INSPECTION COVER
CABLE TV COVER
CONTROL BOX
COVER LEVEL
CATCH PIT
ELECTRICITY CONTROL BOX
ELECTRICITY POLE
EARTH ROD
FLOOR LEVEL
GATE POST
GULLY
FOUL WATER SEWER
FOUL WATER SEWER
GP
INVERT LEVEL
INVERT
LAMP POST
LETTER BOX
LITTER BIN
MANHOLE
MANHOLE POST
METER
METER
ROAD SIGN
ROAD SIGN
RAIN WATER PIPE
RETAINING WALL
STOP COCK
STREET NAME PLATE
STREET LIGHT
SURFACE WATER SEWER
STOP VALVE
SURFACE WATER SEWER
TOP VALVE
TELEPHONE CALL BOX
TRAFFIC LIGHT
TELECOM POLE
TRAIL HOLE
VENT PIPE
WATER LEVEL
WATER METER
WATER OUT

FENCE ABBREVIATIONS

BARBED WIRE FENCE
CLOSE BONDED FENCE
CONCRETE PANEL FENCE
CORRUGATED IRON FENCE
CHAIN LINK FENCE
CHESTNUT PALING
POST AND RAIL FENCE
POST AND RAIL FENCE
WIRE MESH FENCE

AV
BS
BK
BT
CB
CCTV
CB
C-PT
DK
EB
EP
ER
FL
FL
FWS
GP
IL
IN
IP
LB
BN
MH
MK
MT
RM
RS
RWP
RPV
SC
SPP
SWP
SWS
SV
BWP
TCB
TL
TP
UPL
VPL
VL
WM
WMO



Revision	Description	Date
2	Aerial imagery added	August 2014
1	Survey extended around Barn Farm	June 2014

mk surveys

40 years old in 2012

www.mk-surveys.co.uk

Tel 01908 565561
Fax 01908 565562
Tel 01908 547350
Tel 01908 577000
Tel 01908 243182

Mike Kaynes
Owner
Mike Kaynes
Manager
Mike Kaynes
Manager

enquiries@mk-surveys.co.uk
mkland@mk-surveys.co.uk
mkland@mk-surveys.co.uk
mkland@mk-surveys.co.uk
mkland@mk-surveys.co.uk



Land at Fontwell Avenue
Fontwell
West Sussex

Topographical Survey				
Scale	Sheet Size	Sheet Number	Date	
1:500	A0	2	May 2014	
Project Number	Rev	Surveyed By	Approved By	
19734	2	NC/MJW	NL	

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S9	PEG	494984.817	106920.200	24.555
S10	PEG	495048.554	106970.072	27.116
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S17	ROAD NAIL	495610.185	106937.144	28.872
S18	ROAD NAIL	495342.226	107013.041	31.943
S19	ROAD NAIL	495421.424	106945.961	31.326
S20	ROAD NAIL	495422.886	106957.508	30.971
S21	ROAD NAIL	495544.584	106955.820	30.888
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S23	ROAD NAIL	495655.044	106950.772	29.797
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KEY

SURVEY STATION

5

BANKING

TOP

BOTTOM

HEDGE SPREADS

WOODLAND CANOPY

MARSH / WATERLOGGED

TREES

GATE

WATER CHANNEL

ROAD UNWEAVED

FOOTPATH

CHANGE IN SURFACE

FENCE

WALL

OVERHEAD ELECTRIC

OVERHEAD TELECOM

FOAL SEWER

SURFACE SEWER

BUILDING

OPEN SIDED BUILDING

GLASSHOUSE

CONTOUR

SPOT LEVEL

BORE HOLE

TRIAL HOLE

GENERAL ABBREVIATIONS

AIR VALVE

BACK DROP

BOLLARD

BT INSPECTION COVER

CABLE TV COVER

CONTROL BOX

COVER LEVEL

CURB

DRAINAGE

ELECTRICITY CONTROL BOX

ELECTRICITY POLE

FLOOR LEVEL

FLOOR RIDGE

FOAL WATER SEWER

GATE POST

GULLY

INVERT LEVEL

LETTER BOX

LAMP POST

LITTER BIN

LITTER BOX

MANHOLE

MANHOLE POST

METER

RODING EYE

ROAD SIGN

RAIN WATER PIPE

RETAINING WALL

STOP COCK

STREET NAME PLATE

STAY CABLES

SURFACE WATER SEWER

TOP VALVE

SOIL VENT PIPE

TELEPHONE CALL BOX

TRAFFIC LIGHT

TELECOM POLE

UNABLE TO LIFT

UTL

VENT PIPE

WATER LEVEL

WATER METER

WASH OUT

FENCE ABBREVIATIONS

BARBED WIRE FENCE

CORRUGATED FENCE

CONCRETE FENCE

CORRUGATED WIRE FENCE

CHAIN LINK FENCE

CHESTNUT PALING

POST AND RAIL FENCE

POST AND RAIL FENCE

WIRE MESH FENCE

ABBREVIATIONS

AV

BD

BC

BO

BT

CA

CB

CC

CD

CE

CF

CG

CH

CI

CJ

CK

CL

CM

CP

CQ

CR

CS

CT

CU

CV

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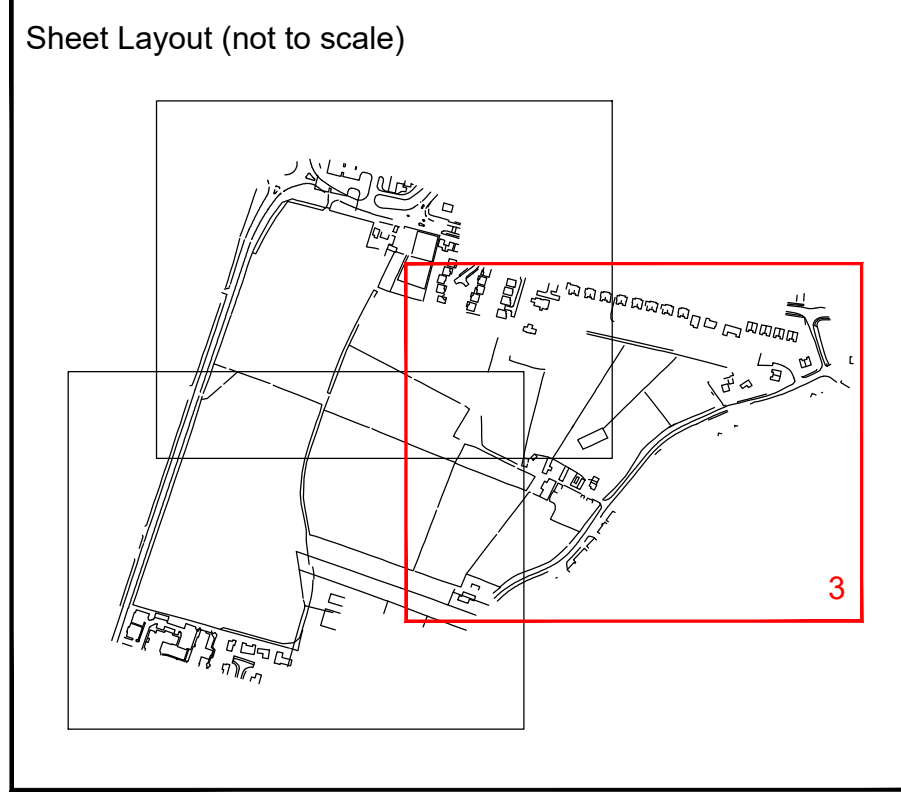
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ZW

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ZY

ZZ



2	Aerial imagery added	August 2014
1	Survey extended around Barn Farm	June 2014
Revision	Description	Date
0		
5		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		

40 years old in 2012

mksurveys

www.mksurveys.co.uk

Tel 01908 565651
Fax 01908 565651
Tel 01902 541300
Tel 01476 517000
Tel 01476 241162

London
Oxford
Nottingham
Newcastle
Reading

enquiries@mksurveys.co.uk
mksurveys@mksurveys.co.uk
mksurveys@mksurveys.co.uk
mksurveys@mksurveys.co.uk
mksurveys@mksurveys.co.uk



Land at Fontwell Avenue
Fontwell
West Sussex

Topographical Survey

Scale	Sheet Size	Sheet Number	Date
1:500	A0	3	May 2014
Project Number	Rev	Surveyed By	Approved By
19734	2	NC/MJW	NL



- Notes:
- GRID AND LEVELS RELATED TO OSGB36 NATIONAL DATUM DERIVED FROM THE NATIONAL GPS NETWORK. LSF (0.99971) USED IN ALL CALCULATIONS.
 - DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHIST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION. IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
 - ALL SEWERS ARE PRESUMED TO BE STRAIGHT BETWEEN CHAMBERS.
 - TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
 - BACKGROUND INFORMATION (SHOWN BLUE) IS CURRENT ORDNANCE SURVEY DIGITAL DATA. CROWN COPYRIGHT. ALL RIGHTS RESERVED. LICENCE NUMBER: 10002682.
 - BACKGROUND AERIAL IMAGERY (c) Getmapping plc 2014.

Coordinate Table				
Station	Description	Easting	Northing	Level
S1	ROAD NAIL	495221.789	107043.742	31.633
S2	ROAD NAIL	495147.491	107044.200	29.326
S3	ROAD NAIL	495083.446	107048.548	27.122
S4	ROAD NAIL	495108.797	107058.953	28.235
S5	ROAD NAIL	495034.223	107058.958	26.414
S6	ROAD NAIL	494989.424	106944.370	23.820
S7	ROAD NAIL	494948.888	106935.924	22.990
S8	ROAD NAIL	494948.888	106931.796	21.992
S9	PEG	494984.817	106920.200	24.555
S10	PEG	495048.888	106910.072	27.116
S11	PEG	495163.848	106925.478	29.313
S12	PEG	495354.554	106976.168	29.578
S13	PEG	495140.971	106744.223	28.997
S14	ROAD NAIL	495303.303	106717.401	28.217
S15	PEG	495382.376	106859.180	29.912
S16	ROAD NAIL	495610.185	106837.144	28.872
S17	ROAD NAIL	495342.226	107010.041	31.943
S18	ROAD NAIL	495421.424	106981.041	31.208
S19	ROAD NAIL	495444.584	106985.820	30.888
S20	ROAD NAIL	495462.886	106987.508	30.871
S21	ROAD NAIL	495655.024	106985.996	29.719
S22	ROAD NAIL	495655.024	106985.772	29.797
S23	ROAD NAIL	495675.728	106990.756	26.632
S24	ROAD NAIL	495675.728	106990.756	26.632

KEY	
	5
	BANKING
	HEDGE SPREADS
	WOODLAND CANOPY
	MARSH / WATERLOGGED
	TREES
	GATE
	KERB CHANNEL
	ROAD UNKERBED
	FOOTPATH
	CHANGE IN SURFACE
	FENCE
	WALL
	OVERHEAD ELECTRIC
	OVERHEAD TELECOM
	FOIL SEWER
	SURFACE SEWER
	BUILDING
	OPEN SIDED BUILDING
	GLASSHOUSE
	CONTOUR
	SPOT LEVEL
	BORE HOLE
	TRIAL HOLE
	AIR VALVE
	BACK DROP
	BENCH MARK
	BOLLARD
	BORE STOP
	BT INSPECTION COVER
	CABLE TV COVER
	CONTROL BOX
	COVER LEVEL
	CULVERT
	DROP KERB
	ELECTRICITY CONTROL BOX
	ELECTRICITY POLE
	FIRE HYDRANT
	FLOOR LEVEL
	GAS VALVE
	GATE POST
	GULLY
	INVERT LEVEL
	INVERT OUTLET
	LAMP POST
	LETTER BOX
	LITTER BIN
	MANHOLE
	MANOMETER POST
	METER
	ROAD SIGN
	RAIN WATER PIPE
	RETAINING WALL
	STOP COCK
	STREET NAME PLATE
	SLAT VALVES
	SURFACE WATER SEWER
	SEWER
	SOIL VENT PIPE
	TELEPHONE CALL BOX
	TRAFFIC LIGHT
	TELECOM POLE
	UNKERB TO LIFT
	VENT PIPE
	WATER LEVEL
	WATER METER
	WASH OUT
	BARBED WIRE FENCE
	CLOSE BOARDED FENCE
	CONCRETE PANEL FENCE
	CORRUGATED IRON FENCE
	CHAIN LINK FENCE
	CHESTNUT PALING
	POST AND RAIL FENCE
	POST AND WIRE FENCE
	WIRE MESH FENCE

2	Aerial imagery added	August 2014
1	Survey extended around Barn Farm	June 2014
Revision	Description	Date

40 years old in 2012
mk surveys
www.mk-surveys.co.uk
Tel: 01908 565561
Fax: 01908 565571
Tel: 01902 541300
Tel: 01476 517000
Tel: 01476 543162
Milton Keynes
Oxford
Huddersfield
Newcastle
Birmingham
enquiries@mk-surveys.co.uk
mkdandara@mk-surveys.co.uk
mkdandara@mk-surveys.co.uk
mkdandara@mk-surveys.co.uk
mkdandara@mk-surveys.co.uk
mkdandara@mk-surveys.co.uk



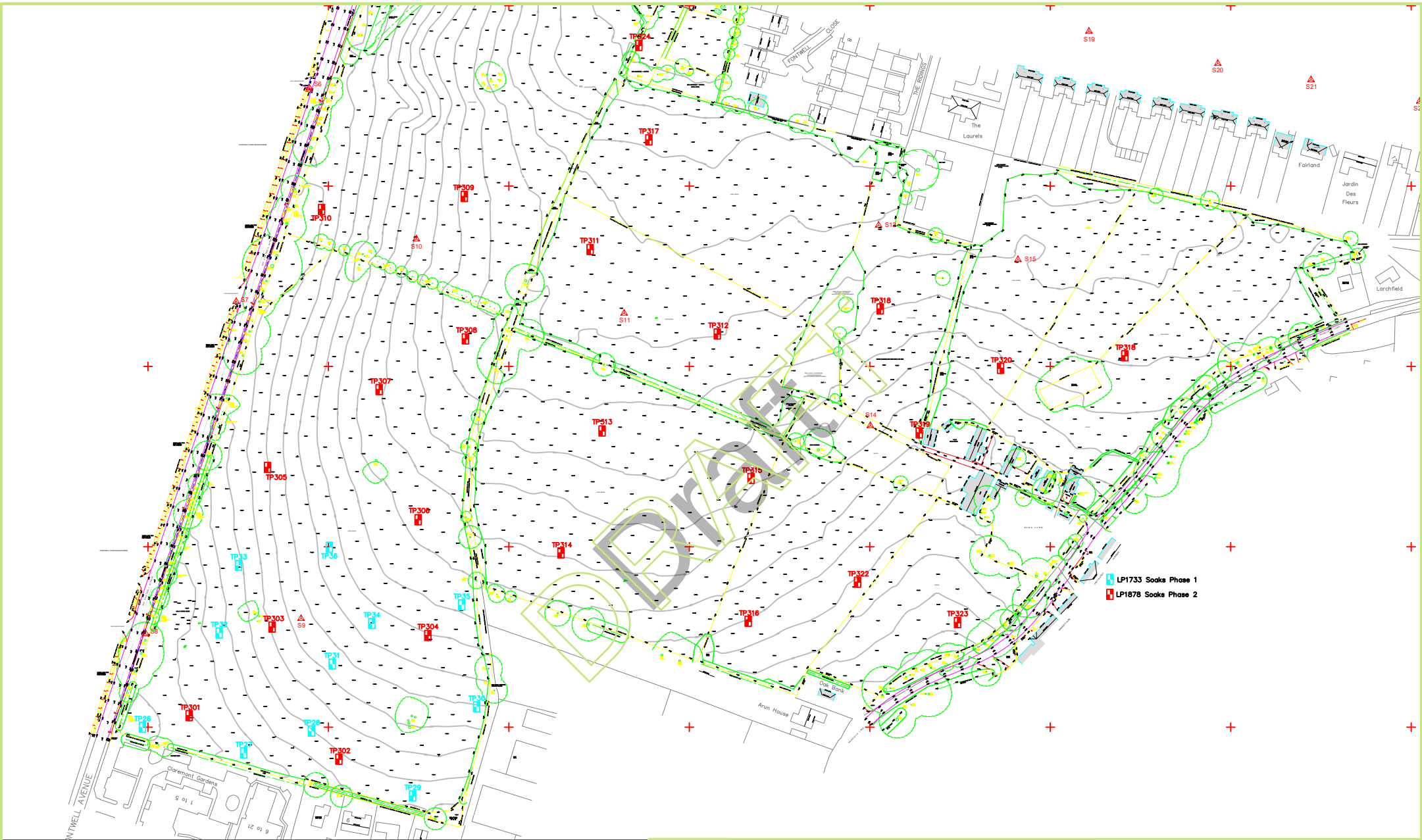
Land at Fontwell Avenue
Fontwell
West Sussex

Topographical Survey

Scale	Sheet Size	Sheet Number	Date
1:1000	A0	4	May 2014
Project Number	Rev	Surveyed By	Approved By
19734	2	NC/MJW	NL

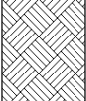
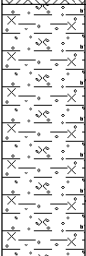
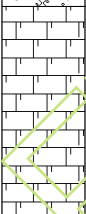
Appendix (B)

Geotechnical Information (Extract)

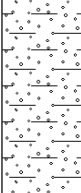


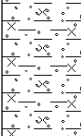
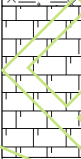
Client	Dandara Properties Ltd	Date	5/4/19	Project Ref.	LP1878
Project	Fontwell Shallow Soaks	Scale	NTS	Fig No.	I
Title	Shallow Soakage Positions	at A4			

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP301 Sheet 1 of 1	
Project Name: Fontwell Additional Shallow Soaks				Project No. LP01878		Co-ords: - Level:		Date 05/03/2019	
Location: Land near Fontwell, BN18 0SW						Dimensions (m): 175 47		Scale 1:25	
Client: Dandara Ltd						Depth 2.00		Logged SN	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.35			Grass over brown slightly gravelly silt TOPSOIL. Gravel of fine to coarse, sub-angular to sub-rounded flints.	
	1.00	B	N=32	1.20			Firm to stiff brown silty gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint. <i>Hand Pen at 0.6m = 120kPa</i> <i>Hand Pen at 1m = 120kPa</i>	1
	1.70	B	N=27	1.90			Pale grey occasionally mottled yellow brown weathered CHALK recovered as slightly clayey slightly gravelly silt. Gravel of extremely weak medium to coarse sub-angular to sub-rounded chalk. Clasts are low density. Matrix dominated.	
	2.00	D		2.00			Firm to stiff brown silty slightly gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint. End of pit at 2.00 m	2
								3
								4
								5

Remarks: Moderate water seepage at 1.5m. Some collapsing below 1.6m. Pit was backfilled with gravel to 0.5mbgl.		
Stability: Collapsing below 1.6m.		

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP302 Sheet 1 of 1	
Project Name: Fontwell Additional Shallow Soaks				Project No. LP01878		Co-ords: - Level:		Date 05/03/2019	
Location: Land near Fontwell, BN18 0SW						Dimensions (m): Depth 2.00 185		Scale 1:25	
Client: Dandara Ltd						Depth 2.00		Logged SN	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
				0.30			Grass over brown slightly gravelly silt TOPSOIL. Gravel of fine to coarse, sub-angular to sub-rounded flints.		
	0.80	B	N=28				Dense brown silty very clayey GRAVEL. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint. Occasional partings of gravelly silty clay.		
			N=26				Too gravelly for hand penetrometer test at 1m.		
	2.00	D		1.80			Firm to stiff brown silty gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint.		
				2.00			End of pit at 2.00 m		
DRAFT									
Remarks: Pit remained dry and stable. Pit was backfilled to 0.5mbgl.									
Stability: Stable.									
									

 Leap Environmental Ltd The Atrium, Curtis Road Dorking, Surrey RH4 1XA Tel: 01306 646510 www.leapenvironmental.com				Trial Pit Log				Trialpit No TP303 Sheet 1 of 1	
Project Name: Fontwell Additional Shallow Soaks				Project No. LP01878		Co-ords: - Level:		Date 05/03/2019	
Location: Land near Fontwell, BN18 0SW						Dimensions (m):		Scale 1:25	
Client: Dandara Ltd						Depth 2.00		Logged SN	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	1.00	B	N=32	0.30		 Grass over brown slightly gravelly silt TOPSOIL. Gravel of fine to coarse, sub-angular to sub-rounded flints.	1		
			N=35	1.50		 Firm to stiff brown silty gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint. <i>Hand Pen at 0.8m = 150kPa</i> <i>Becoming more gravelly below 1m.</i>			
	2.00	D		2.00		 Pale grey occasionally mottled yellow brown weathered CHALK recovered as slightly clayey slightly gravelly silt. Gravel of extremely weak medium to coarse sub-angular to sub-rounded chalk. Clasts are low density. Matrix dominated. <i>Too gravelly for hand penetrometer test at 1.5m.</i> End of pit at 2.00 m	2 3 4 5		
Remarks: Pit remained dry and stable. Pit was backfilled to 0.5mbgl.									
Stability: Stable.									



Trial Pit Log

Trialpit No

TP304

Sheet 1 of 1

Project Name: Fontwell Additional Shallow Soaks

Project No.
LP01878

Co-ords:	-
Level:	

Date
05/03/2019

Location: Land near Fontwell, BN18 0SW

Dimensions
(m):

182

Client: Dandara Ltd

Depth
2.00

47

Scale
1:25

Logged
SN

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.20			Grass over brown slightly gravelly silt TOPSOIL. Gravel of fine to coarse, sub-angular to sub-rounded flints.
	1.00	B	N=16				Firm to stiff brown silty gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint.
			N=9				Hand Pen at 0.8m = 175kPa
	1.80	B					Hand Pen at 1.5m = 220kPa
				1.90			Pale grey weathered CHALK recovered as slightly clayey slightly gravelly silt. Gravel of extremely weak medium to coarse sub-angular to sub-rounded chalk. Clasts are low density. Matrix dominated.
				2.00			End of pit at 2.00 m

Remarks: Pit remained dry and stable. Pit was backfilled to 0.8mbgl.

Stability: Stable.

AGS



Leap Environmental Ltd
The Atrium, Curtis Road
Dorking, Surrey RH4 1XA
Tel: 01306 646510
www.leapenvironmental.com

Trial Pit Log

Trialpit No

TP305

Sheet 1 of 1

Project Name: Fontwell Additional Shallow Soaks

Project No.
LP01878

Co-ords: -
Level:

Date
05/03/2019

Location: Land near Fontwell, BN18 0SW

Dimensions
(m):

166

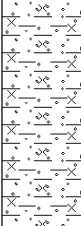
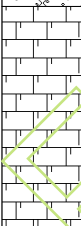
Scale
1:25

Client: Dandara Ltd

Depth
2.00

46

Logged
SN

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			Grass over brown slightly gravelly silt TOPSOIL. Gravel of fine to coarse, sub-angular to sub-rounded flints.	
	0.80	B	N=27				Firm to stiff brown silty gravelly CLAY. Gravel of fine to coarse and occasional cobbles, angular to sub-rounded flint. <i>Hand Pen at 0.5m = 60kPa</i> <i>Hand Pen at 1m = 160kPa</i>	1
	1.60	D	N=25	1.20			Pale grey occasionally mottled yellow brown weathered CHALK recovered as slightly clayey slightly gravelly silt. Gravel of extremely weak medium to coarse sub-angular to sub-rounded chalk. Clasts are low density. Matrix dominated.	
				2.00			End of pit at 2.00 m	2
								3
								4
								5

Remarks: Moderate water seepage at 1.9m. Some collapsing below 1.6m. Pit was backfilled with gravel to 0.5mbgl.

Stability: Collapsing below 1.6m.

AGS