Evans & Langford

Bearsted Parish Council

Church Lane Carpark

Civil Works Specification

16179

June 2024

Rev 0

FINAL

Engineering *your* Environment

Contents

Evans and Langford Consultants
Limited
07-06-2024

D20
Excavating and filling

Clauses - Not Used

Generally/the site

110 Site investigation

1. Report: Report on Soakage Tests (by Evans & Langford dated 12 December 2023)

145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured (none encountered during infiltration testing).

150 Existing services, features and structures

1. Services: Refer to utility records. There are utility columns in the vicinity of the works, as well as underground services. Some of these may be private (to CCTV and streetlight) and not shown on utility records.
2. Structures: Refer to plans for details.

Clearance/excavating

220 Stripping topsoil

1. General: Before beginning general excavation or filling, strip topsoil from areas where there will be any work.
2. Handling: Handle topsoil for reuse if needed
3. Around trees: Do not remove topsoil from below the spread of trees to be retained.

244 Excavations adjacent to existing foundations

1. Prior to commencing excavation
    1.1. Excavate trial pits adjacent to existing foundations to determine extent and formation levels. Utility columns are directly adjacent the site, with residential buildings to the east of the Landway.
    1.2. Allow time for amendment of details if required.

265 Inspecting formations in sand and gravel

1. Notice for inspection (minimum): 5 days
2. Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels and mechanically compact formation.
3. Seal: Within 4 hours of inspection, seal formations with first layer of fill.

267 Inspection of formations in shrinkable soils

1. Inspect formation: For signs of conducting and fine moisture absorbing roots.
2. Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times.

2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

320 Recorded features

1. Recorded foundations, beds, drains, manholes, etc: Break out and seal drain ends if encountered.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

Disposal of materials

410 Excavated topsoil storage

1. Storage: Stockpile in temporary storage heaps: To be agreed

420 Topsoil storage heaps

1. Location: TBA
2. Standard: To BS 3882.

450 Water

1. Generally: Keep all excavations free from water until:
    1.1. Formations are covered.
    1.2. Below ground constructions are completed.
2. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 Ground water level, springs or running water

1. Give notice: If it is considered that the excavations are below the water table. Groundwater was not encountered during infiltration testing.
2. Springs/ Running water: Give notice immediately if encountered.

Filling

520 Frost susceptibility

1. General: Except as allowed below, fill must be non frost-susceptible as defined in Highways Agency 'Specification for Highway Works', clause 801.8.
2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
    2.1. Fine grained soil with a plasticity index less than 20%.
    2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
    2.3. Crushed chalk.
    2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
    2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
    3.1. At depths below the finished ground surface greater than: 450 mm
    3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.

3.3. Where frost heave will not affect structural elements.

535 Compaction generally

1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

550 Geotextile sheet

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice (Terram 500S or similar approved)
2. Jointing: 300 mm overlap
3. Preparation of subgrade: Before laying sheet, remove humps and sharp projections. Fill hollows
4. Protect from
   4.1. Exposure to light.
   4.2. Contaminants.
   4.3. Materials listed as potentially deleterious by geotextile manufacturer.
   4.4. Wind uplift.

555 Geogrids

1. Manufacturer: Terram
   1.1. Product reference: Bodpave (or similar approved)
2. Grid geometry: 500mm X 500mm units
3. Preparation of subgrade: Before laying geogrids, remove humps and sharp projections. Fill hollows
4. Fixing: As per manufacturer's recommendation (ground spikes)
5. Jointing: Interlocking

610 Compacted filling for landscape areas

1. Fill: Material capable of compaction by light earthmoving plant.
2. Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.

Bioremediation - Not Used

'specification for highway works: earthworks specification' appendices

900 Appendix 6/1 – Requirements for acceptability and testing, etc. of earthworks materials

1. All works are to be completed in accordance with the requirements of the Specification for Highways Works tables 6/1 and 6/4.

Ω End of Section

Q10
Kerbs/ edgings/ channels/ paving accessories

Clauses - Not Used

Types of kerbs/edgings and channels

180 Drainage channel systems with gratings

1. Manufacturer: ACO
    1.1. Product reference: ACO Multidrain MD200
2. Size: Refer to detail drawings
3. Type of fall: Constant depth
4. Finish: As manufacturer
5. Colour: Natural
6. Accessories: Sump units with mud buckets
7. Bedding: Fresh concrete races
8. Joints generally: Rubber gasket Silicone sealant
9. Cover gratings: Galvanized steel / cast iron, slotted heelguard
    9.1. Fixings: Locking bolts
    9.2. Loading grade to BS EN 124: D400
    9.3. Finish/ Colour: Black

Roads/paving accessories/ marking/ demarcation - Not Used

Laying

510 Laying kerbs, edgings and channels

1. Cutting: Neat, accurate and without spalling. Form neat junctions. Pavements are to be sawcut prior to excavation.
    1.1. Long units (450 mm and over) minimum length after cutting: 300 mm.
    1.2. Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
2. Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.
3. Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 Adverse weather

1. Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

580 Drainage channel systems

1. Installation: To an even gradient, without ponding or backfall. Commence laying from outlets. Reinstate pavement (including chippings) to match existing.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washing and detritus: Safely disposed without discharging into sewers or watercourses.

Ω End of Section

Q20
Granular sub-bases to roads/ pavings

To be read with preliminaries/ general conditions.

140 Excavation of subgrades

1. Final excavation to formation or subformation level: Carry out immediately before compaction of subgrade.
2. Soft spots and voids: Give notice.
3. Wet conditions: Do not excavate or compact when the subgrade may be damaged or destabilized.

211 Granular material

1. Quality: Of a known suitability for use in sub-bases, free from excessive dust, well graded, all pieces less than 75 mm in any direction, minimum 10% fines value of 50 kN when tested in a soaked condition to BS 812-111 or a resistance to fragmentation of LA50 for the Los Angeles test to BS EN 1097-2, and in any one layer only one of the following:
    1.1. Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
    1.2. Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
    1.3. Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
    1.4. Natural gravel.
    1.5. Natural sand.
2. Filling: Spread and levelled in 150 mm maximum layers, each layer thoroughly compacted.

Ω End of Section

R12
Below ground drainage systems

Clauses - Not Used

General

110 Below ground drainage system

1. Description: Carpark pipework to channel drains and soakaways.
2. Surface water and rainwater drainage sources: Carpark surfacing

122 Soakaway system – plastics units

1. Description: Crates (heavy duty)
2. Manufacturer:: Polypipe (or similar approved)
3. Soakaway units: Polystorm crates (PSM1) with Polystorm Access module . Refer to detail drawings for dimensions and details.
    3.1. Accessories: Access covers and frames and Geotextile membranes - Terram 500S or similar.
4. Pipes, bends and junctions: PVC-U - solid wall.
5. Bed and surround: Sand and gravel
6. Backfill: Free draining Type 3 granular material lightly compacted, not single size.

System performance - Not Used

Products

329 Pipes, bends and junctions – supply

1. Pipes and fittings: From same manufacturer for each pipeline.

346 Pipes, bends and junctions – pvc-u – solid wall

1. Description: As indicated on drawings
2. Standard: BS EN 1401-1 with flexible joints.
3. Manufacturer: Contractor's choice

352 Access points – plastics

1. Description: As indicated on drawings
2. Standard: To BS 4660 and Kitemark certified, to BS EN 13589-1, or Agrément certified.
3. Manufacturer: Polypipe
4. Nominal diameter: 500mm dia
5. Bases
    5.1. Product reference: Polystorm access turret
6. Raising pieces
    6.1. Product reference: Polystorm access shaft with seals and coupler.
    6.2. Heights: As indicated on drawings
7. Access covers and frames
    7.1. Product reference: Contractor's choice
    7.2. Loading grades to BS EN 124: D400

8. Cover support:: Cast in-situ concrete footing, cover slab and Class B brickwork.

471 Access covers and frames

1. Description: As indicated on drawings
2. Standard: To BS EN 124.
3. Types: Single seal
4. Manufacturer: Contractor's choice
5. Material: Ductile cast iron
6. Sizes: As indicated on drawings
7. Loading grades to BS EN 124: D400

Fabrication - Not Used

Execution

611 Existing drains

1. Protection: Protect existing drains (if found) to be retained and maintain normal operation if in use.

613 Excavated material

1. Turf, topsoil, hardcore, etc: Set aside for use in reinstatement or to be disposal.

616 Selected fill for backfilling

1. Selected fill: As-dug material, free from vegetable matter, rubbish, frozen soil.

635 Formation for beddings

1. Timing: Excavate to formation immediately before laying beddings or pipes.
2. Mud, rock projections, boulders and hard spots: Remove. Replace with consolidated bedding material.
3. Local soft spots: Harden by tamping in bedding material.

683 Laying pipelines

1. Laying pipes: To true line and regular gradient on even for full length of barrel with sockets (if any) facing up the gradient.
2. Ingress of debris: Seal exposed ends during construction.
3. Timing: Minimize time between laying and testing.

685 Jointing pipelines

1. Connections: Durable, effective and free from leakage.
2. Junctions, including to differing pipework systems: With adaptors intended for the purpose.
3. Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
4. Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
5. Allowance for movement: Provide and maintain appropriate clearance at ends of spigots as fixing and jointing proceeds.
6. Jointing material: Do not allow to project into bore of pipes and fittings.

715 Backfilling to pipelines

1. Backfilling above top of surround or protective cushion: Material excavated, compacted in layers

757 Laying conventional channels, branches and benching

1. Main channel: Refer to details drawings
    1.1. Branches: Connect to main channel at or slightly above invert level, but not higher than half channel level, so that discharge flows smoothly in direction of main flow.
2. Benching
    2.1. Material: Refer to details drawings
    2.2. Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
    2.3. Topping
        2.3.1. Material: Ductile iron, see drawing detail
        2.3.2. Application: Before benching concrete has set, and with dense smooth uniform finish.

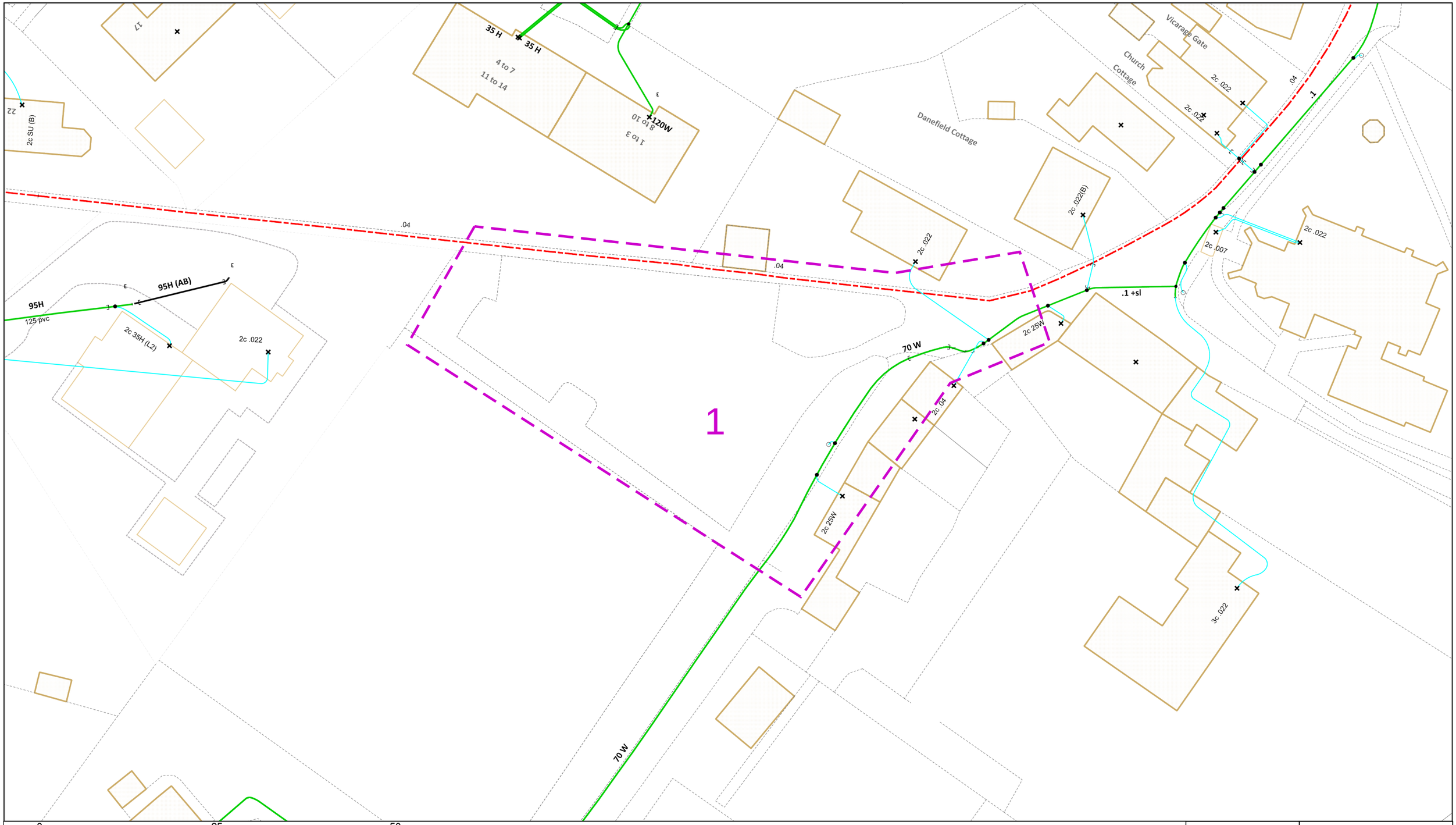
773 Installing access covers and frames

1. Seating: Brickwork class B to BSEN 124
2. Bedding and haunching of frames: Continuously.
    2.1. Material: Class 1 mortar

Completion - Not Used

Ω End of Section

Specification created using NBS Chorus



Dig Sites Area: Line:

The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.

This plan must be used with the attached 'Symbols' document.

Date Requested: 17/10/2023
Job Reference: 31215402
Site Location: 579977 155464
Requested by:
Mrs Hannah Pal
Your Scheme/Reference: 16179X

Scale: 1:500 (When plotted at A3)

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified – use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all the cables have been determined.
4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any persons or causes personal injury to a person.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.

UK Power Networks

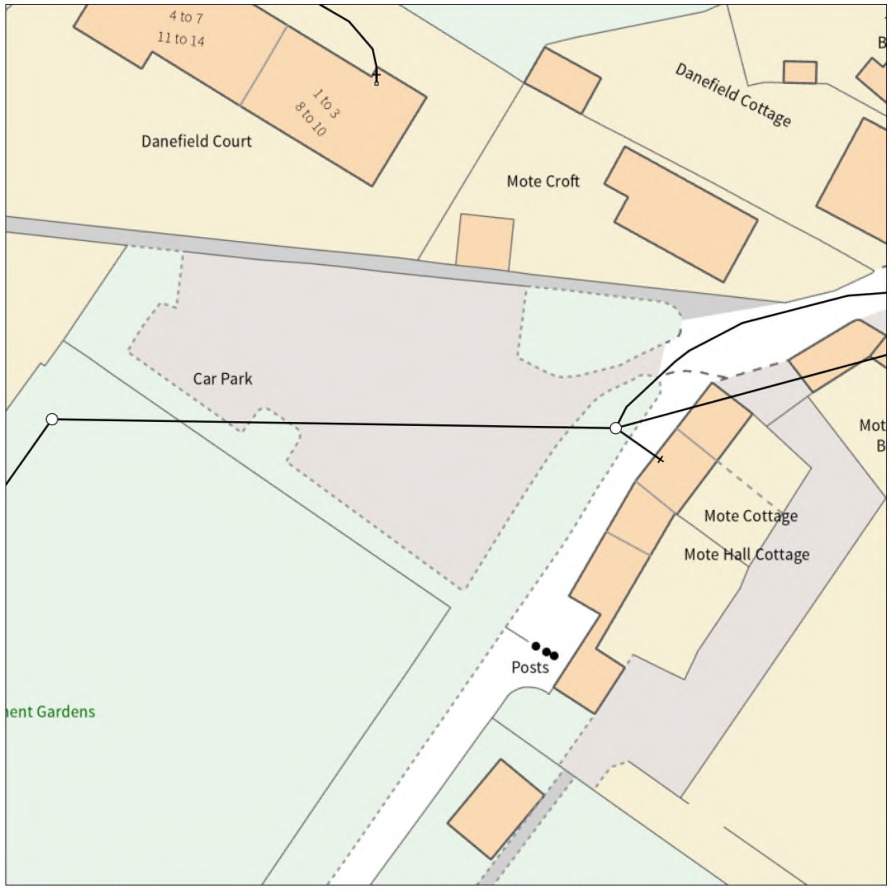
IF IN DOUBT – ASK!
PHONE 0800 056 5866
EMERGENCY – If you damage a cable or line Phone 0800 783 8838 (24hrs) URGENTLY

LOOK OUT LOOK UP

ALWAYS LOOK UP BEFORE YOU START WORK
Refer to HSE Guidance note GS6

Maps produced at 1:2500 scale are Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

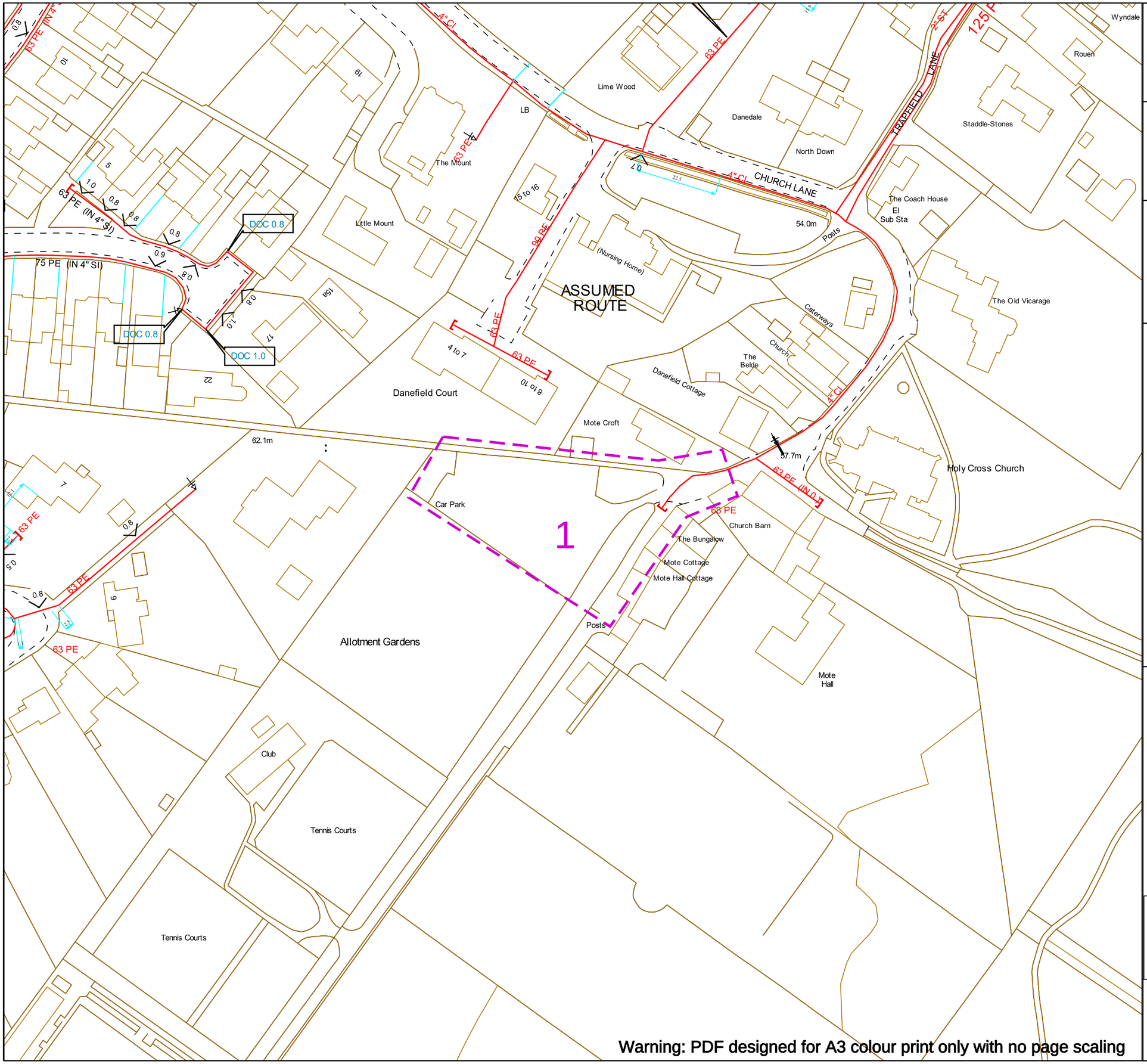
Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	In Place	Pending Remove	Not In Use
Power Cable				
Power Duct				N/A

BT Ref : NZC02414C
Map Reference : (centre) TQ8002055490
Easting/Northing : (centre) 580020,155490
Issued : 17/10/2023 14:41:56

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



SGN
Your gas. Our network.

Contact Us
SGN Safety Admin Team:
0800 912 1722
Email:
plantlocation@sgn.co.uk

Date Requested: 17/10/2023
Job Reference: 31215402
Site Location: 580027 155479
Requested by: Mrs Hannah Pal

Your Scheme/Reference: 16179X

Scale: 1:1000 (When plotted at A3)

This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 111 999

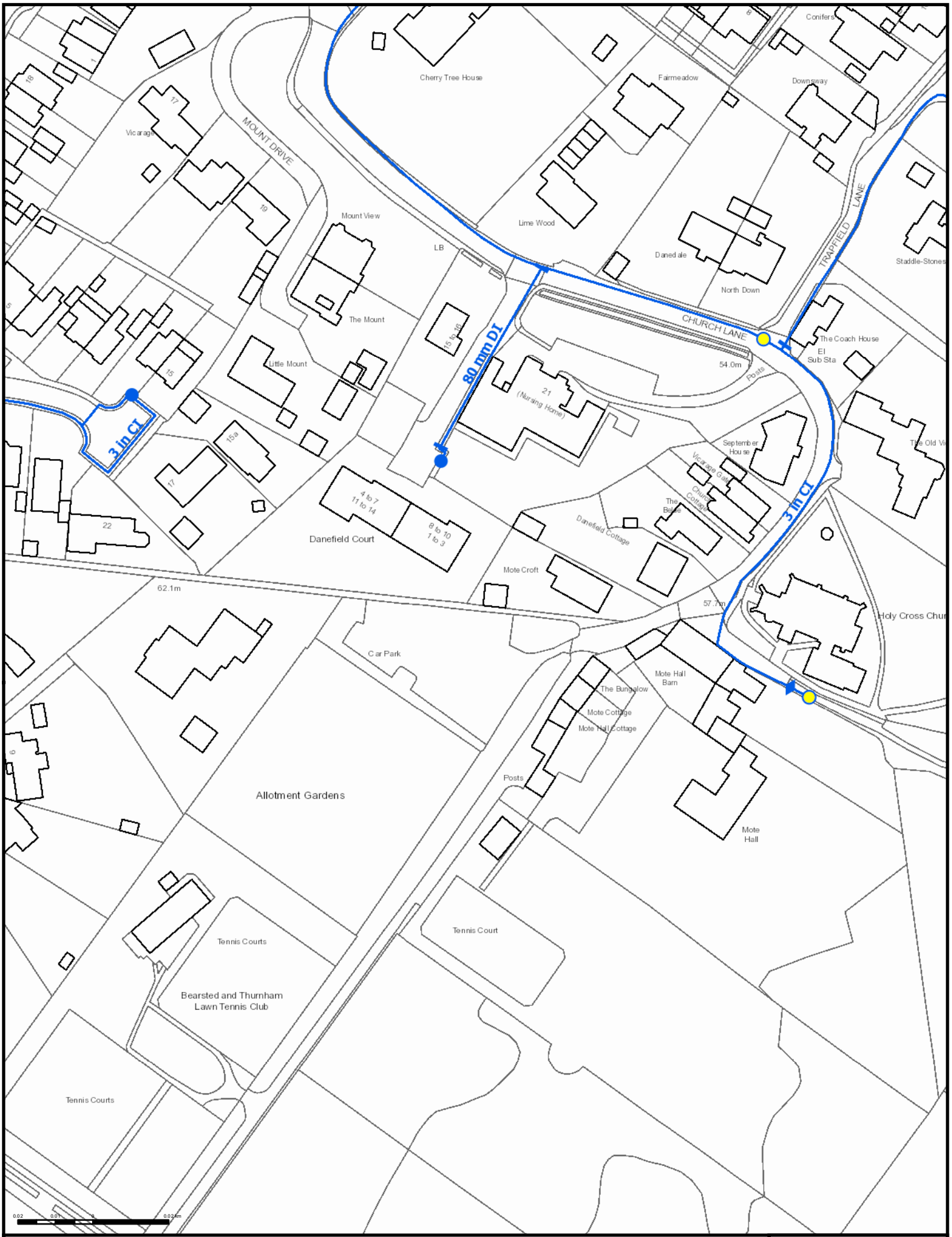
Low Pressure Mains
Medium Pressure Mains
Intermediate Pressure Mains
High Pressure Mains
LAs
GTs
SSSIs

Some Examples Of Plant Items
Valve | Syphon | Depth of Cover | Diameter Change | Material Change

Digsite: Line: Area:

Linesearch beforeUdig

Warning: PDF designed for A3 colour print only with no page scaling



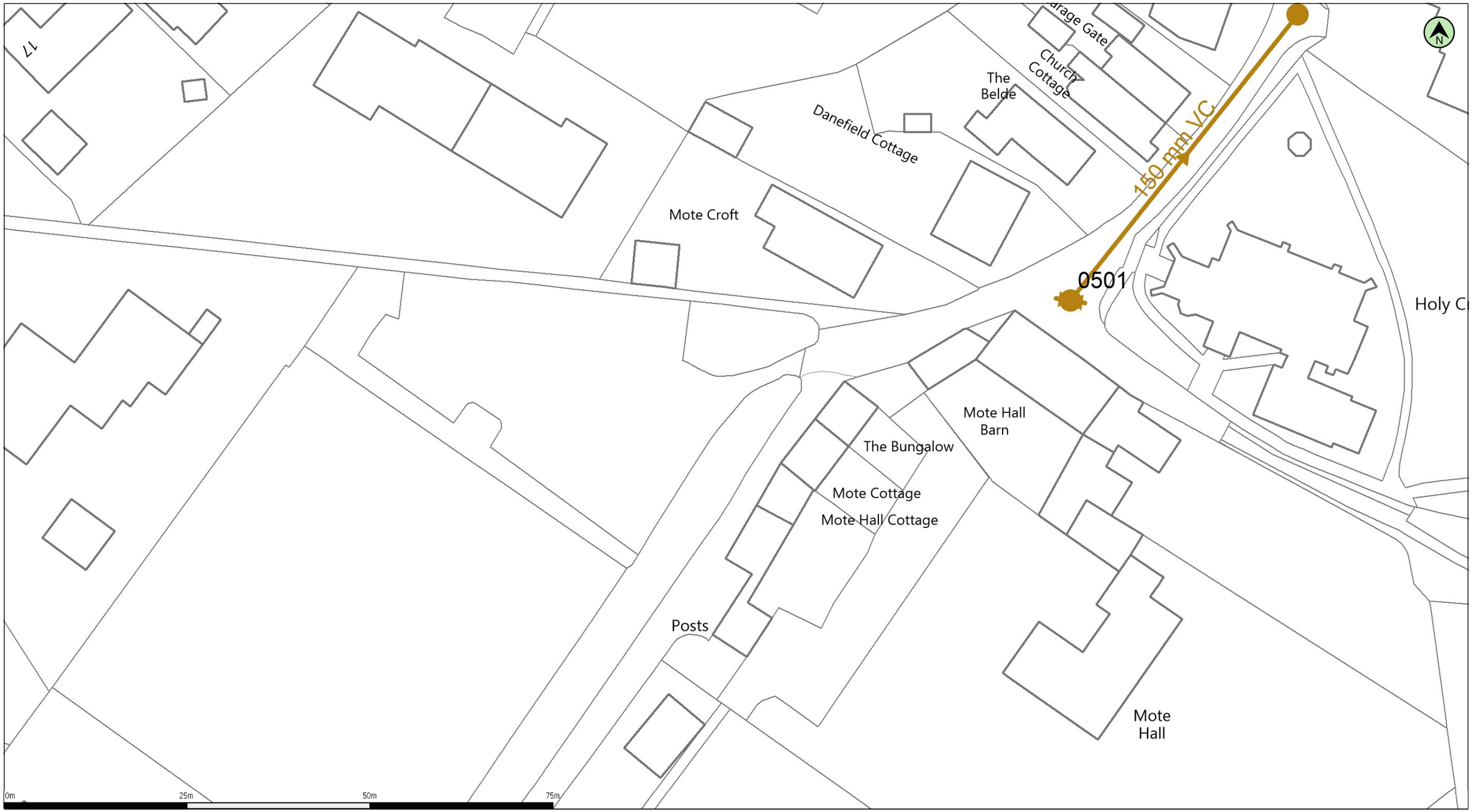
Drawing Title: 16179X Car Park at Church Lane, Bearsted, Maidstone, Kent

South East Water Mains and Fittings

Valve	Meter	Distribution Main	
Washout	Pressure Valve	Abandoned Main	
Fire Hydrant	Air Valve	Company Boundary	

Reference:	
Plot Date:	17/10/2023
Grid Reference:	580,020.0000 155,490.0000
Scale:	1:1,250

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

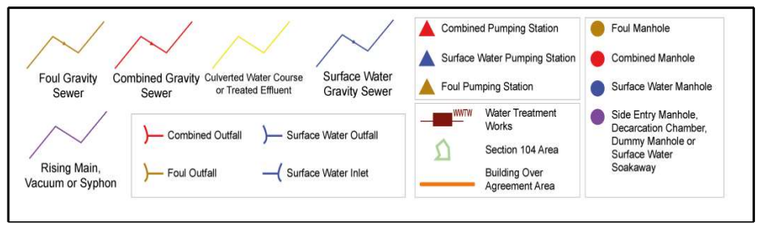


(c) Crown copyright and database rights 2023 Ordnance Survey 100031673 | Date: 17/10/23 | Scale: 1:500 | Map Centre: 580036,155494 | Data updated: 21/08/23 | Our Ref: 1298939 - 1 | Wastewater Plan A3

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2023 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



hannah.pal@evanslangford.co.uk

16179X

WATER for LIFE from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0501	F	57.76	55.71	
1501	F	55.94	53.46	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Evans & Langford

- Structural & Civil Engineers
- Land & Building Surveying
- Geo-Environmental Engineers
- Project Managers
- CDM Consultants
- Contract Administrators

Engineering *your* Environment

Our Ref: 16179X/HP/CPS

12 December 2023

Dealt with by: Colin Shackleford

Direct Dial No: 01622 621978

Bearsted Parish Council
Madginford Hall
Egremont Road
Bearsted
Kent
ME15 8LH

By email only

For the attention of J Upton

Dear Joanne

Church Lane Car Park, Bearsted – Soakage Testing

Further to your instruction of 12 October 2023, received via email, we now write to present the findings of the soakage testing undertaken at the above site.

Evans & Langford attended site on 14 November 2023 to drill three boreholes, each installed with a temporary monitoring well, to allow for soakage testing. The locations of the boreholes are shown on Figure 1.

Findings of the Ground Investigation

The borehole logs are included as Figures 2-4, with a summary only of the findings being presented below. All of the boreholes were located in grass and were commenced by hand digging to a depth of 1.00m. Made Ground was encountered to a depth of between 0.50m and 0.65m, and typically comprised slightly gravelly, locally silty or sandy clay beneath a layer of clayey topsoil. Gravel was of flint, clay tile, brick, limestone and/or shell fragments. Beneath the Made Ground, the expected Folkestone Formation was encountered. This typically comprised a series of firm to stiff, become stiff CLAY layers which in their upper part were typically sandy or silty. The upper part of the Folkestone Formation in WS1 was soft. WS2 encountered orange silty, very clayey SAND between 0.50m and 1.10m. All of the boreholes were terminated a depth of approximately 3.00m.

All boreholes remained dry and stable whilst open.

On completion of drilling, a 50mm perforated monitoring pipe was installed to the base of each of the boreholes, which was surrounded by shingle. Water was then poured into the pipe, up to a level of approximately 1.00mbgl. The water level in each of the boreholes was then monitored at regular intervals throughout the remainder of the day. At the end of the day, the pipes were removed where possible, and the borehole then backfilled with arisings and shingle, with the grass replaced.

Continued/

Soakage Test Result and Surface Water Disposal

WS1 was located in the north eastern part of the site, slightly back from the corner of the car park. Due to very heavy rain during the course of the day, water ponded in the adjacent area of the car park, and continued to accumulate, eventually overflowing and completely flooding the borehole and installation, leading to the early termination of the soakage test. During the first 55 minutes of the test in WS1, before flooding occurred, the water level in the monitoring well fell by 95mm; this is less than the fall observed in WS2 and WS3 over a corresponding time period (approximately 155mm and 140mm respectively).

All boreholes demonstrated a fairly slow rate of soakage, with the water level not falling enough in any of the tests for them to be in full compliance with the method set out in BRE365. As a result of this, the soakage rates have been calculated for the fall in water level which actually occurred. The slow soakage also prevented any repeat tests being carried out.

The site readings and calculations of the soakage rates are shown in Figures 5-7. The calculated soakage rates were as follows:

- WS1: 8.5×10^{-8}m/s (based on first 55 minutes of test only)
- WS2: 1.3×10^{-7}m/s
- WS3: 1.5×10^{-7}m/s

As noted above, these results represent fairly poor soakage, but they are within the range anticipated for the predominantly clay and silty clay soils found on site.

The soakage rates suggest that any soakaway device will need to provide a significant volume of storage, and as such shallow crate soakaways are likely to be the preferred type of soakaway construction, since these can provide a relatively large storage volume and discharge water over a large area, mimicking the predevelopment drainage pattern more closely than conventional ring soakaways, which would concentrate all surface water to one or two locations.

Any soakaway should be installed within natural, undisturbed soils, and should be sealed through any Made Ground.

Given the nature of the site, gravel filled trenches or swales could also be utilised. The location of any surface water drainage features must also take into account the buried utilities in the area, in particular the BT cable, and the CCTV camera and lighting cabling known to be in the verge at the eastern end of the car park, adjacent to the footpath. In addition, the soakaways should be sited deep enough so as not to risk inundating the adjacent building, to the north east.

The performance of any infiltration devices will degrade over time. This process can be greatly slowed by the inclusion of features which minimise the silt content of water and enable regular cleaning. Items such as channel drains should undergo regular cleaning and maintenance checking, to ensure their effectiveness over their design life.

We trust that the above is clear, but please do not hesitate to contact us if you have any queries.

Yours sincerely
For and on behalf of Evans & Langford

Enc.

Figure 1	Ground Investigation Layout
Figures 2-4	Windowless Sampler Borehole Logs
Figures 5-7	Soakage Test Results

Bearsted

Author:

Date: 12/10/2023

0 2 4 6 8m
Scale: 1:500

Parish Online

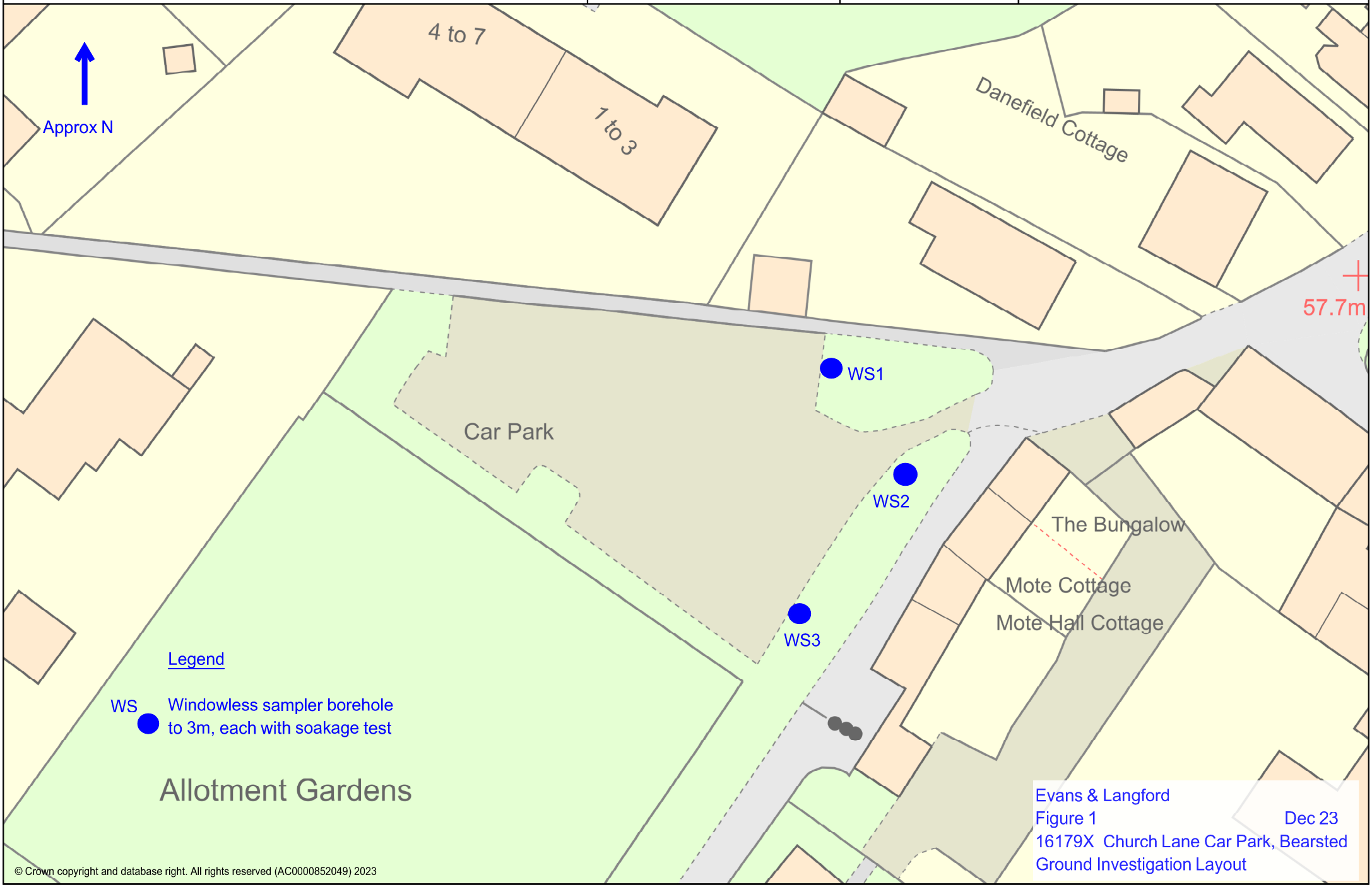


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Figure 1 Dec 23
16179X Church Lane Car Park, Bearsted
Ground Investigation Layout

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Borehole Log

WS No.: 1

Sheet 1 of 1

Location: Church Lane Car Park, Bearsted

Job No.: 16179X | **Final Depth:** 3 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm			14/11/2023	14/11/2023

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.10	●					0.15	Grass over brown slightly gravelly clayey topsoil with rare fine roots. Gravel is rounded, fine of flint.	
							(Made Ground)	
0.40	●					(0.35)	Orange brown sandy clay, with a little silt and rare fine gravel of clay tile.	
						0.50	***(Made Ground)***	
							Soft dark grey silty CLAY with rare, locally frequent fine roots.	
0.90	●					(0.70)	***(Folkestone Formation)***	
		pp=0.4				1.20		
							Firm grey green becoming orange sandy CLAY.	
		pp=1.1				(0.60)	***(Folkestone Formation)***	
1.80	●					1.80		
							Stiff grey brown, mottled orange CLAY.	
		pp=2.2					***(Folkestone Formation)***	
						(1.20)		
		pp=1.5						
2.90	●					3.00		
		pp=2.8						

Remarks

Hand dug trial pit to 1.00m to check for buried services.
Borehole remained dry and stable during drilling.
Soakage test commenced but was terminated early due to the borehole being flooded by rainwater.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 2

Method: Tracked Window Sampler	Logged	HP	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: 2

Sheet 1 of 1

Location: Church Lane Car Park, Bearsted

Job No.: 16179X | **Final Depth:** 3 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm			14/11/2023	14/11/2023

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.10	●					(0.25)	Grass over brown slightly gravelly clayey topsoil with rare fine roots. Gravel is fine of clay tile.	
						0.25	***(Made Ground)***	
0.40	●					(0.25)	Brown slightly gravelly silty clay with rare fine roots. Gravel is fine to medium of brick and clay tile.	
						0.50	***(Made Ground)***	
0.90	●					(0.60)	Orange brown silty, very clayey SAND. ***(Folkestone Formation)***	
						1.10		
		pp=1.5					Firm to stiff orange brown silty CLAY. Silt content increases below 2.10m. ***(Folkestone Formation)***	
		pp=2.2				(1.60)		
2.00	●							
		pp=1.3						
						2.70		
		pp=3.0					Stiff grey mottled orange CLAY. ***(Folkestone Formation)***	
2.90	●					(0.30)		
						3.00		

Remarks

Hand dug trial pit to 1.00m to check for buried services.
Borehole remained dry and stable during drilling.
Soakage test carried out in borehole, please refer to separate sheets.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 3

Method: Tracked Window Sampler	Logged	HP	Checked	CPS	Approved	CPS

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Borehole Log

WS No.: 3

Sheet 1 of 1

Location: Church Lane Car Park, Bearsted

Job No.: 16179X | **Final Depth:** 3 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm			14/11/2023	14/11/2023

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
						(0.20) 0.20	Grass over brown slightly gravelly clayey topsoil with rare fine roots. Gravel is fine of limestone.	
							(Made Ground)	
0.40	●					(0.45)	Brown slightly gravelly clay with rare roots up to 3mm diameter. Gravel is fine to medium of limestone and shell fragments.	
						0.65	***(Made Ground)***	
1.00	●	pp=1.5					Firm to stiff orange brown silty CLAY. Silt content decreases below 1.50m. Fine root at 2.50m. ***(Folkestone Formation)***	
		pp=1.4				(2.35)		
2.00	●	pp=2.2						
		pp=1.5						
3.00	●					3.00		

Remarks

Hand dug trial pit to 1.00m to check for buried services.
Borehole remained dry and stable during drilling.
Soakage test carried out in borehole, please refer to separate sheets.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 4

Method: Tracked Window Sampler	Logged	HP	Checked	CPS	Approved	CPS

Borehole Soakage Test Results - WS1 (14/11/23)

Time (minutes)	Depth below ground level (metres)
0.00	0.825
1.00	0.835
3.00	0.840
4.00	0.845
5.50	0.850
7.50	0.855
10.00	0.860
15.00	0.865
24.00	0.875
30.00	0.890
42.00	0.905
55.00	0.920
84.00	Borehole flooded by rain - terminated

Note: Any soakage in this test is assumed to have occurred below 1m depth; the pipe from GL to 1m depth was surrounded by bentonite through the hand dug starter pit.

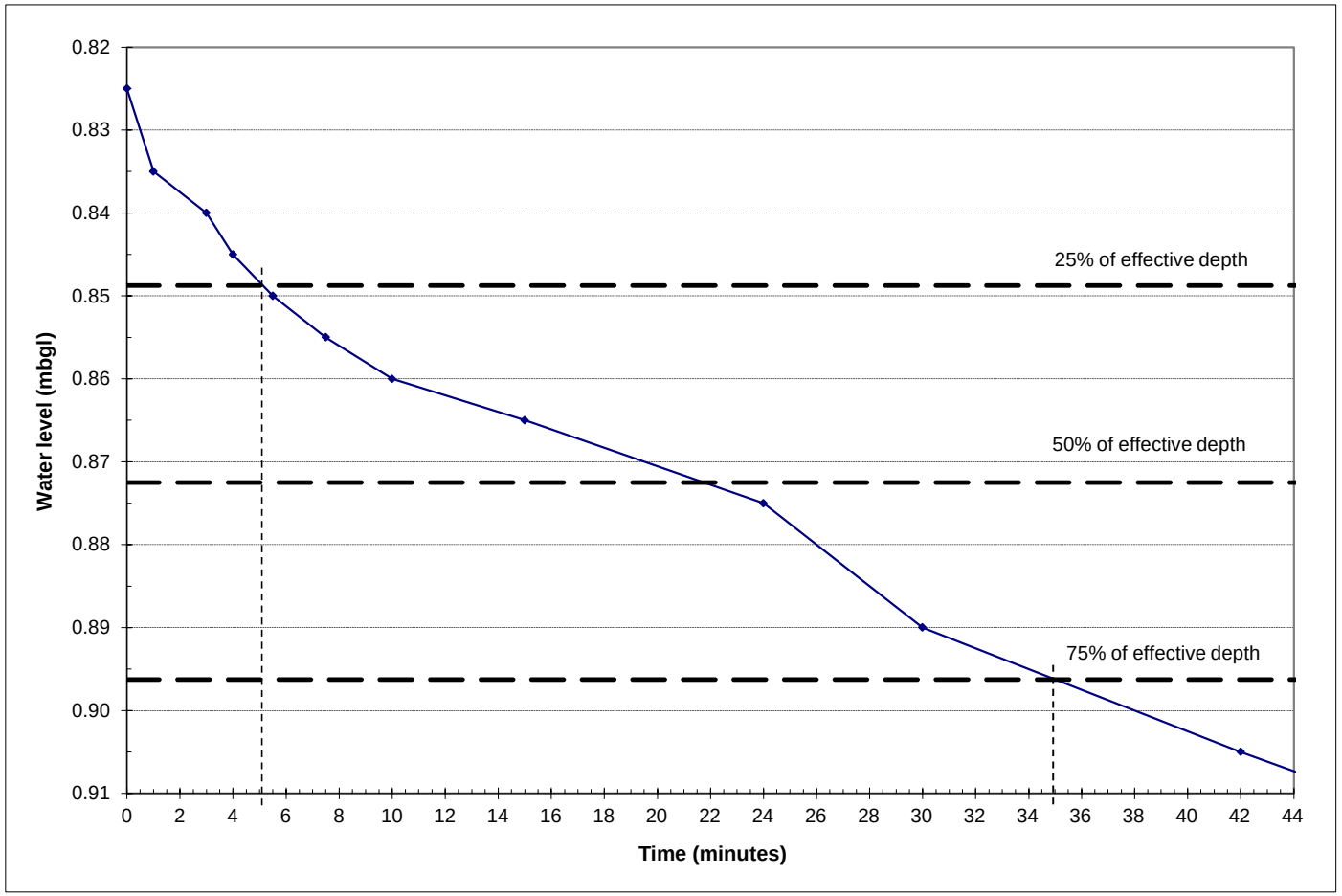

Figure 5a

16179X Church Lane Car Park, Bearsted

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Borehole Soakage Test Results - WS1 (14/11/23)

Calculation of Soakage Rate to BRE Digest 365

Depth of borehole	3.000	m
Water level at start of test (B)	0.825	m
Water level at end of test (A)	0.920	m
Effective Depth (A-B)	0.095	m

Note: The water level did not fall far enough for the test to be in full compliance with BRE365 (water level would have had to fall to 75% of the full depth of water, 75% x (3.00-0.825) = 1.63m, plus starting depth = 2.46m). Therefore the effective depth has been taken as the drop in water level that actually occurred, in accordance with BRE recommendations.

Soil infiltration rate $f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

where V_{p75-25} = effective storage volume between 75% and 25% of effective depth

a_{p50} = internal surface area of the trial pit up to 50% effective depth

t_{p75-25} = time for water level to fall from 75% to 25% effective depth.

75% of effective depth =	0.071	m
plus original water level=	**0.896**	m
50% of effective depth=	0.048	m
plus original water level=	**0.873**	m
25% of effective depth=	0.024	m
plus original water level=	**0.849**	m

Soil infiltration rate is calculated based upon the time for water level to fall from 25% to 75% of the effective depth

t_{p75-25}=	35.0-5.0		30	minutes
		or	1800	seconds
a_{p50}=	0.613		m^2	} calculated separately
V_{p75-25}=	0.00009		m^3	} calculated separately

Soil infiltration rate =

$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$ = **8.5E-08 m/s**

Figure 5b

16179X Church Lane Car Park, Bearsted

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Borehole Soakage Test Results - WS2 (14/11/23)

Time (minutes)	Depth below ground level (metres)
0.0	1.050
1.0	1.055
2.0	1.060
4.0	1.070
6.5	1.080
11.0	1.100
14.0	1.110
17.5	1.120
25.0	1.145
40.0	1.175
70.0	1.225
93.0	1.245
120.0	1.260
142.0	1.275
172.0	1.290
202.0	1.305
230.0	1.325
258.0	1.340
285.0	1.355

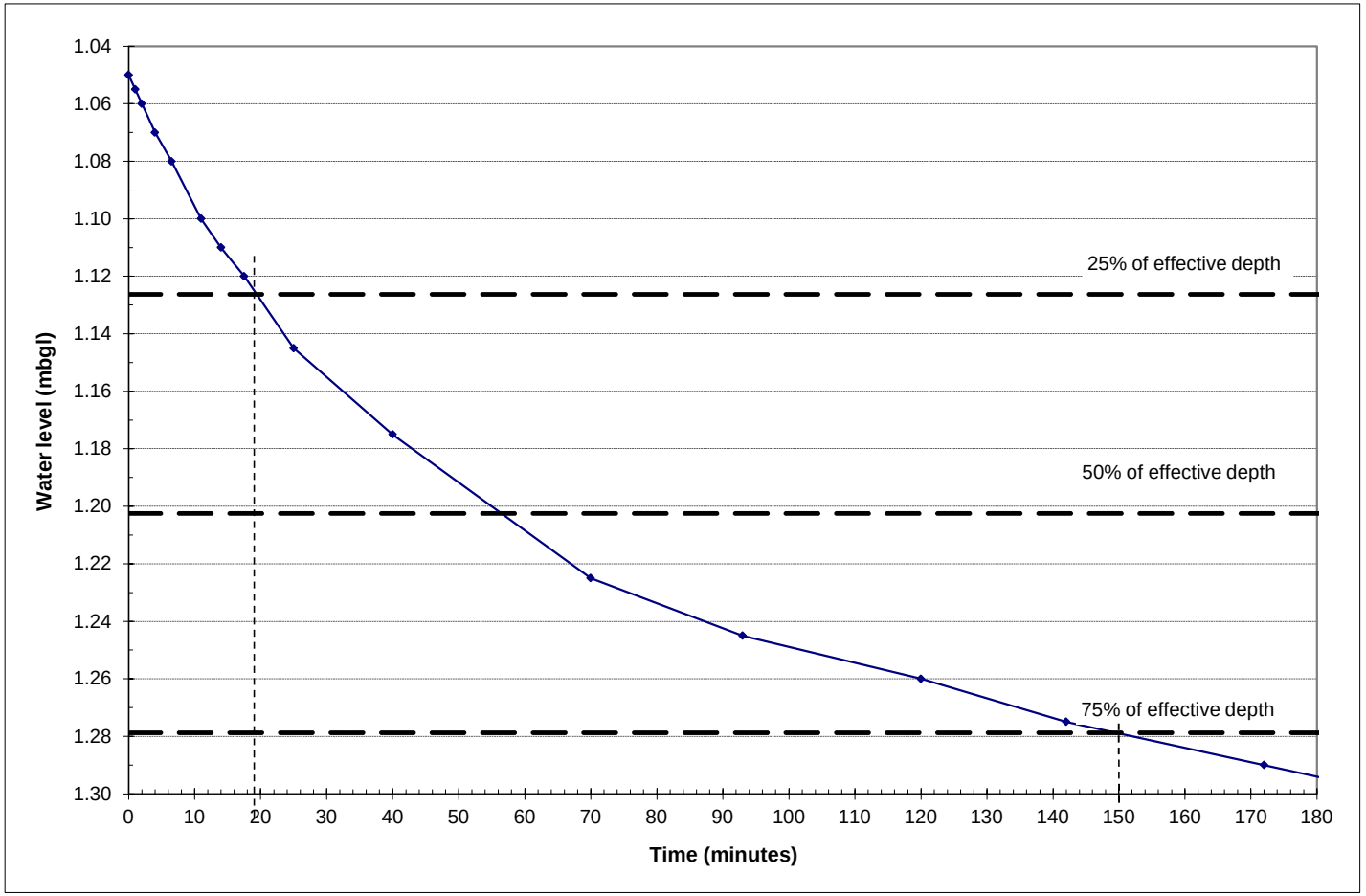

Figure 6a

16179X Church Lane Car Park, Bearsted

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Borehole Soakage Test Results - WS2 (14/11/23)

Calculation of Soakage Rate to BRE Digest 365

Depth of borehole	3.040	m
Water level at start of test (B)	1.050	m
Water level at end of test (A)	1.355	m
Effective Depth (A-B)	0.305	m

Note: The water level did not fall far enough for the test to be in full compliance with BRE365 (water level would have had to fall to 75% of the full depth of water, 75% x (3.04-1.05) = 1.49m, plus starting depth = 2.54m). Therefore the effective depth has been taken as the drop in water level that actually occurred, in accordance with BRE recommendations.

Soil infiltration rate $f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

where V_{p75-25} = effective storage volume between 75% and 25% of effective depth

a_{p50} = internal surface area of the trial pit up to 50% effective depth

t_{p75-25} = time for water level to fall from 75% to 25% effective depth.

75% of effective depth =	0.229	m
plus original water level=	**1.279**	m
50% of effective depth=	0.153	m
plus original water level=	**1.203**	m
25% of effective depth=	0.076	m
plus original water level=	**1.126**	m

Soil infiltration rate is calculated based upon the time for water level to fall from 25% to 75% of the effective depth

t_{p75-25}=	150-19		131	minutes
		or	7860	seconds
a_{p50}=	0.557		m^2	} calculated separately
V_{p75-25}=	0.00057		m^3	} calculated separately

Soil infiltration rate =

$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$ = **1.3E-07 m/s**

Figure 6b

16179X Church Lane Car Park, Bearsted

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Borehole Soakage Test Results - WS3 (14/11/23)

Time (minutes)	Depth below ground level (metres)
0.0	1.060
1.0	1.065
2.0	1.070
3.0	1.075
4.0	1.080
5.0	1.085
7.5	1.090
13.0	1.105
19.0	1.120
26.0	1.140
35.0	1.160
42.0	1.180
52.0	1.200
63.0	1.205
91.0	1.235
113.0	1.260
143.0	1.270
173.0	1.290
201.0	1.305
229.0	1.315
262.0	1.330

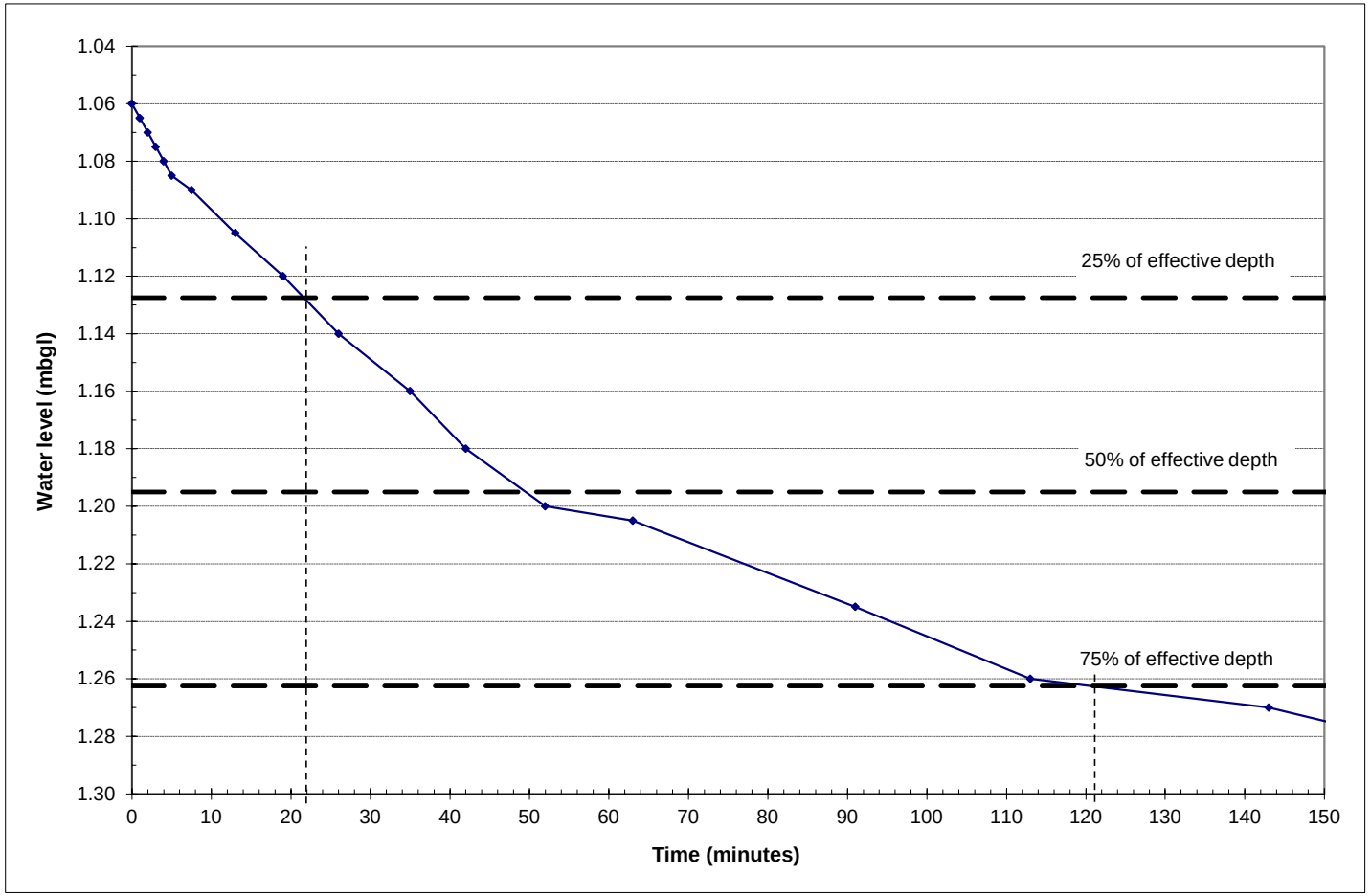

Figure 7a

16179X Church Lane Car Park, Bearsted

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Borehole Soakage Test Results - WS3 (14/11/23)

Calculation of Soakage Rate to BRE Digest 365

Depth of borehole	3.050	m
Water level at start of test (B)	1.060	m
Water level at end of test (A)	1.330	m
Effective Depth (A-B)	0.270	m

Note: The water level did not fall far enough for the test to be in full compliance with BRE365 (water level would have had to fall to 75% of the full depth of water, 75% x (3.05-1.06) = 1.49m, plus starting depth = 2.55m). Therefore the effective depth has been taken as the drop in water level that actually occurred, in accordance with BRE recommendations.

Soil infiltration rate $f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

where V_{p75-25} = effective storage volume between 75% and 25% of effective depth

a_{p50} = internal surface area of the trial pit up to 50% effective depth

t_{p75-25} = time for water level to fall from 75% to 25% effective depth.

75% of effective depth =	0.203	m
plus original water level=	**1.263**	m
50% of effective depth=	0.135	m
plus original water level=	**1.195**	m
25% of effective depth=	0.068	m
plus original water level=	**1.128**	m

Soil infiltration rate is calculated based upon the time for water level to fall from 25% to 75% of the effective depth

t_{p75-25}=	121-22		99	minutes
		or	5940	seconds
a_{p50}=	0.562		m^2	calculated separately
V_{p75-25}=	0.00050		m^3	calculated separately

Soil infiltration rate =

$\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$ = **1.5E-07 m/s**

Figure 7b