Appendix xiv) A4 67 pages

Easdield Stables, Elsenham Road, Stansted

Flood Risk Assessment

& Drainage Strategy

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NB Investment UK limited

June2023

INTERMODAL TRANSPORTATION
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IT2175

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DRAWINGS

APPENDICES

1 INTRODUCTION

1.1 Intermodal Transportation Ltd (ITL) has been commissioned by Ranger Management and Design Services Limited on behalf of NB Investment UK Limited to prepare a Flood Risk Assessment (FRA) report in support of a planning application for the provision of 5 dwellings at Eastfield Stables, Elsenham Road, Stansted, Essex, CM24 8SS.

1.2 The site falls within the jurisdiction of Uttlesford District Council (UDC) as the Local Planning Authority (LPA). Under the Flood and Water Management Act 2010, the Lead Local Flood Authority (LLFA) is Essex County Council (ECC). Where possible, Sustainable Drainage Systems (SuDS) mechanisms are the preferred methods to minimise the run off to existing public sewers or watercourses and would be used, if possible, for this development.

1.3 The development site is located in a Flood Zone 1 area in terms of potential flood risk, which is the lowest classification. Therefore the site is not predicted to be subject to fluvial (river based) or coastal flooding for a 1 in 1000 year or more frequent storm event. This FRA considers the risks to flooding on the site and downstream as well as including a drainage strategy which outlines the design philosophy for the management of surface water and disposal of foul effluent that would arise from the site, if the residential development is permitted by the LPA.

1.4 ITL obtained sewer records from Thames Water (TW) to ascertain the existing sewer infrastructure in the vicinity of the site and to establish whether there are options to drain to any existing public sewer systems.

1.5 The proposed development would be situated to the north of the B1051. The site is grass paddocks with overgrown vegetation and trees. It is proposed that vehicular access would be taken from the B1051 via an existing entrance situated along the southern boundary of the site.

1.6 The National Planning Policy Framework (NPPF) was first published in March 2012, with the current edition dating from July 2021. This framework document supersedes many planning policy guidance documents including PPS25, which covered land drainage matters. The NPPF sets out the Government's planning policies and, like its predecessor documents, provides guidance for local planning authorities when considering suitable sites for appropriate development in preparing development plans. The NPPF places a greater presumption in favour of sustainable development.

1.7 The technical guidance to NPPF, Flood Risk Section, classifies residential dwellings as 'More Vulnerable' in terms of Flood Risk Vulnerability Classification (Annex 3). NPPF also defines that developments classified as 'More Vulnerable' are appropriate in Flood Zone 1 (Table 2 Flood Risk Vulnerability and Flood Zone Compatibility).

2 SITE LOCATION AND EXISTING CONDITIONS

Site Location

2.1 The site is located in a rural setting between Elsenham and Stansted Mountfitchet. The site is located within the administrative area of Uttlesford District Council, Essex. The site is located just under 1km west of Elsenham, 1.5km east of Stansted Mountfitchet and approximately 6 km to the north east of Bishops Stortford.

2.2 The site consists of land located to the north of the B1051. The M11 runs approximately 150m to the east of the site and can be accessed from junction 8 about 5 km to the south of the site. The site is bounded by May Walk, a restricted byway, to the west which is bounded by agriculture fields. The south boundary is formed by the B1051 with the eastern and northern boundaries being formed of pasture farmland. Drawing IT2175/FRA/001 shows the site location in the local and wider context.

2.3 A topographical survey of the site is included in Appendix A. From the survey it can be seen that the north eastern end of the site is the highest point in the site, with a level of 102.45m AOD. The land falls towards the southern boundary to a level of approximately 95.0 m AOD. A bund of approximately 2 m in height runs along the northern, western and eastern boundaries.

2.4 Public surface and foul water sewers are shown on the TW records obtained. The records identify that there are no public sewers within the vicinity of the site. Appendix B contains the plans.

Existing Conditions

2.5 The area of the development site is approximately 1.97 hectares, which contains grass paddocks with areas of overgrown vegetation and trees. Within the area of the site for the proposed development no existing drainage features have been highlighted.

3 POLICY AND GUIDANCE

National Planning Policy Framework (Revised July 2021)

3.1 The revised National Planning Policy Framework (NPPF) was published in July 2021. The framework sets out the Government's planning policies for England and how the framework objectives are expected to be applied. The NPPF provides guidance for local planning authorities when preparing development plans and clarifies that there should be a presumption in favour of sustainable development. The NPPF does not propose anything dramatically new in terms of its responsibilities from the preceding PPS 25 guidance where the key principles to be applied by Authorities should:

- include Strategic Flood Risk Assessments as part of the LDF process and include policies to manage flood risk from all sources with wide consultation with all relevant bodies. LPA's should apply a sequential approach to the location of development.
- take climatic change into account and avoid increased vulnerability to ensure that risks can be managed where necessary;
- inappropriate development should be avoided in areas at risk of flooding by directing development away from areas at highest risk; where development is necessary it should be made safe without increasing flood risk elsewhere;

3.2 The NPPF requires site-specific FRAs, application of the Sequential Test where this has not been undertaken and is considered appropriate, for sites that are vulnerable, possible application of the Exception Test.

Planning Policy Statement 25 'Development and Flood Risk' (March 2010)

3.3 The last issue of PPS 25 (March 2010) has now been superseded by the NPPF. However, many of the requirements of PPS 25 have been carried forward within the Technical Guidance to the NPPF, but with an emphasis for LPA's to ensure, as far as they are able, that appropriate SuDS mechanisms are required as part of development and, in many cases, for the LPA's to maintain adoptable SuDs systems.

3.4 The Development and Flood Risk Practice Guide (December 2009) provided advice on the practical implementation of PPS 25, and provides additional guidance on what is required at regional and local level. The document is still very relevant given that the

NPPF is a more holistic document. The guidance is more helpful in considering regional spatial strategies, sustainability appraisals and local development documents and the roles and responsibilities for those managing individual planning applications. It also gives additional guidance on the importance of regional and strategic FRAs; the application of the sequential approach and Sequential and Exception Tests; surface water management and implementing sustainable drainage and measures to reduce flood risk.

3.5 Whilst the Environment Agency has the lead role in providing advice on flood issues, at a strategic level and in relation to planning applications, the LPA's have a duty to ensure that 'precautionary principles' in relation to flood risk and the location of vulnerable development are adopted, first using a risk based site search sequential review to avoid any risk of fluvial or sea flooding where possible and managing residual (perhaps pluvial) risks elsewhere.

Flood and Water Management Act, 2010

3.6 The FWMA now places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act, and supporting Regulations, together bestows more responsibility onto LPA's by requiring Authorities to:

- Develop Local Flood Risk Management Strategies (LFRMS);
- Implementing requirements of Flood and Water Management legislation;
- Preparation of preliminary flood risk assessments and flood risk management plans;
- Development and implementation of drainage and flooding management strategies; and
- Taking responsibility for approving, adopting, managing and maintaining Sustainable Urban Drainage System (SuDS) where they serve more than one property.

3.7 The FWMA makes provision for a national standard to be prepared on SuDS, and developers will be required to obtain local authority approval for SuDS in accordance with the standards; this may be covered by appropriate conditions which would need to

be discharged. Supporting this, the Act requires local authorities to adopt and maintain SuDS, removing any on-going responsibility for developers to maintain SuDS.

3.8 ITL are aware that some Local Authorities have not yet taken on the responsibility to maintain SuDS systems due to differences in opinion between the LLFA and the Highway Authority in terms of maintenance liabilities.

Sewers for Adoption / Design and Construction Guide for Developers (April 2020)

3.9 Detailed design of proposed adoptable sewers should be in accordance with the above documents and the LLFA's design requirement (where feasible and viable) which are the definitive guides for those planning and designing sewers (both surface water and foul water) for subsequent adoption by the relevant water authority. This guidance provides best practice on planning, design, construction and operation of sewers, and their maintenance. The standards do not apply to private systems although the principles of the design requirements would generally be respected to ensure efficient performance of the systems from source to the identified discharge point from the site.

SuDS Design Guide, Report C753, CIRIA 2015

3.10 This detailed document provides guidance on the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS). The guide considers the benefits of managing water quality as well as quantity, amenity and biodiversity in new and existing developments. It presents a wide collection of good practice guidance from the UK and abroad to illustrate options and ideas.

Essex County Council Sustainable Drainage Systems Design Guide (February 2020)

3.11 Essex County Council have published a comprehensive guide to illustrate the approach they would like to see in relation to surface water drainage design based on sustainable urban drainage principles. This document refers heavily to the CIRIA guidance noted above.

Uttlesford Strategic Flood Risk Assessment, JBA Consulting (May 2016)

3.12 Uttlesford District Council commissioned JBA Consulting to produce a strategic assessment of historic and possible future flood risks across the district. This document aims to guide development to suitably consider flood risk by sharing the information gathered about the district.

4 THE PROPOSED DEVELOPMENT

4.1 The proposed development consists of the construction of 5 new dwellings on land to the north of the B1051 between Elsenham and Stansted Mountfitchet. The illustrative layout plan for the proposal is contained in Appendix C of this report.

4.2 The proposal would include 5 dwellings. All plots are proposed to have the same floor plan in different orientations. The floor plan consists of a single story, bungalow style, with 3 bedrooms (one bedroom with ensuite), a study and open plan kitchen/living room. Each property would have a private driveway with a double cart lodge/garage and shed.

4.3 The proposed development would be served by a private road leading from the B1051. The development includes at least 2 parking spaces at each plot.

4.4 The 1 in 1 year runoff from the existing greenfield areas under the impermeable part of the proposed development has been calculated to be 1.6l/s. The calculation is included in Appendix D.

4.5 The CIRIA guidance suggests that an allowance is made for future increases in impermeable area within a residential development, to account for future house extensions for example. Therefore, a 10% allowance for 'urban creep' has been added to the impermeable area total to account for this.

5 DRAINAGE STRATEGY

Surface Water Drainage

5.1 The hierarchy of disposal methods identifies that discharge to the ground is the first choice, followed by discharge to a watercourse and to a sewer as the third choice. It is therefore proposed that surface water drainage of the development would be achieved utilising soakaways.

5.2 A borehole log has been undertaken on the site by GPD Waterwells Ltd. The log is contained in Appendix E. The borehole log shows that, after 200mm of made ground, there is over 7m of clay soils. The clay soils would not be suitable for standard soakaways capable of draining all the developments impermeable areas.

5.3 The borehole log indicates that at 9m depth there is a 4m thick belt of sands and gravels. GPD Waterwells Ltd tested the infiltration capabilities of the borehole and found that $1m^3$ of water soaked away in 87seconds without the borehole filling up. Therefore, it is proposed that borehole soakaways are utilised. The adjacent site has successfully implemented the use of borehole soakaways, this project was under planning application UTT/20/0780/FUL.

5.4 The above infiltration capacity of the tested borehole has been used with MicroDrainage to estimate the size of soakaway and the required storage.

5.5 The ground water protection zone map has been reviewed. The development site and the immediate vicinity are in a zone III area, total catchment. Therefore, borehole soakaways would not be draining directly into a protection zone. An extract of the map is included in Appendix F.

5.6 The borehole soakaways and attenuation tanks have been designed to accommodate and infiltrate the runoff expected in the 1 in 100 year + 40% allowance for climate change storm event, plus 10% added to the impermeable area to allow for urban creep In all cases the soakaway boreholes would need to be located at least 10m from any building in order to comply with building regulations and design guidance for borehole soakaways.

5.7 It is proposed that the site would be divided into drainage areas draining to 2 boreholes. The largest catchment would be that draining to borehole 1. The MicroDrainage analysis of this case shows that that a buried crate attenuation tank would need to be

10x7x2m in order to accommodate the 1 in 100 year + 40% +10% event. It is anticipated that borehole 1 is the worst case and borehole 2 would also require attenuation but of a smaller volume. If planning permission is granted, the volume of required attenuation for each case would be determined more precisely at the detailed design stage.

5.8 It is anticipated that permeable paving would be suitable only as an attenuation and cleansing feature. Full infiltration drainage from permeable paving would not be possible on this site due to the clay strata beneath the ground surface. Therefore, the permeable paving on this site would be membrane wrapped. The volume of attenuation that could be provided by the permeable paving would be determined at the detailed design stage and could result in the reduction in size of the attenuation tanks.

5.9 In exceedance events, above the 1 in 100 year + (40%) climate change storm, surface water would be directed along the internal road towards southern end of the site. Suitable detailing around buildings would ensure that surface water would be directed around the buildings rather than towards thresholds for example.

5.10 See Appendix G for MicroDrainage calculations and Drawing RMDS/ES/23/002 showing the locations of the proposed drainage features. This drawing also indicates the likely exceedance routes for excess surface water in the event of a more severe storm than that tested.

Maintenance

5.11 It is envisaged that the SuDS would be maintained by an on-site management company, paid for either by householders as a standing charge or from the rent of the dwellings.

Table 5.1 Maintenance Schedule

Item	Plan of Action	Frequency
Below ground surface water systems– pipes/ manholes/ attenuation tanks	To be monitored and cleaned up when any debris/ silt reduces the cross-sectional area by 25% or more. Inspection to include both manhole inspections and silt trap/ gullies outlets.	Bi-annual Inspection
Porous Paving	Brushing or Vacuuming Clearing weed growth as required	Annually Once in growing season

Water Quality

5.12 The site would be expected to experience low traffic levels of less than 300 traffic movements a day. Consulting the CIRIA SuDS Manual 2015 Table 26.2 gives pollution hazard indices for different land use classifications. An extract of the table is reproduced in Table 5.2 below:

Table 5.2 Extract of CIRIA SuDS Manual 2015 Table 26.2 on Predicted Pollution Levels

Land Use	Pollution hazard level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Driveways, low traffic roads (<300 movements/day)	Low	0.5	0.4	0.4

5.13 The same CIRIA SuDS Manual continues in Table 26.4 to give a brief overview of the expected level of treatment various SuDS measure are expected to generate. An extract of this table is reproduced in Table 5.3

Table 5.3 Extract of CIRIA SuDS Manual 2015 Table 26.4 on Predicted Water Quality Improvement of SuDS

Type of SuDS component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Filter drain	0.4	0.4	0.4

5.14 It is therefore considered that the treatment provided by the soakaways, permeable paving and the filter strip would be sufficient.

5.15 A preliminary drainage design has been undertaken for the proposed development and is illustrated on drawing RMDS/ES/23/002. The design illustrates that the surface water from the developed area of the site should be managed on the site to ensure no surface flooding occurs, or where surface flooding is allowed, that the water is managed so as not to pose a risk of flooding to existing or proposed buildings or create safety hazards.

Foul Drainage

5.16 The Thames Water asset plan indicates that there is no public sewer in close enough proximity to the proposed development to make a connection to. the nearest public foul sewer is over 300m to east of the site with the M11 running between the site and the nearest foul public sewer. Therefore, within the site it is proposed that gravity connections would be used to take foul water to package treatments plants. It is proposed that there would be a plant for each plot such as a Klargester BA, or similar product. The clean water from the treatment plants would be directed to the borehole soakaways.

5.17 The foul package treatment plants would need regular maintenance in accordance with the manufacturers recommendations in order to ensure the continued safe and efficient operation.

Approvals

5.18 The Environment Agency (EA) are likely to require further justification/applications to be made to proceed with the use of borehole soakaways for disposal of treated effluent. Adequate time should be allowed in advance of construction to allow the applications to be considered and determined by the EA. ITL would suggest that at least six months is programmed for these activities.

5.19 The LLFA are likely to ask the LPA to impose a condition relating to the management of the surface water on site.

6 RISK APPRAISAL

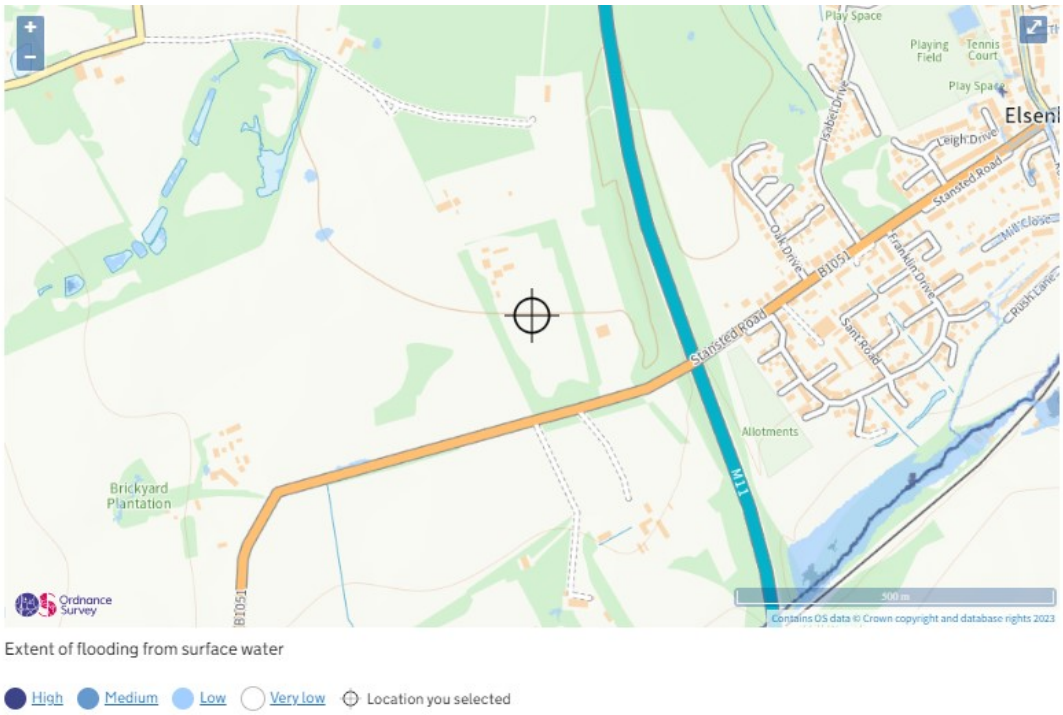
Flood Risk

6.1 The site is identified as being on the edge of a flood zone 1. The site is situated in Flood Zone 1 area, the lowest classification. The extent of the flood contour is shown on the gov.uk Flood Planning Service published web site, an extract of which is provided in Figure 6.1 below, and shows the potential of fluvial (river based) and sea based flooding.

Figure 6.1 Fluvial / Coastal Flood Risk Zones from gov.uk mapping

6.2 The gov.uk maps also indicate the risk of surface water flooding. The mapping identifies that all of the site has very low flood risk. Figure 6.2 is an extract from the gov.uk surface water flood map.

Figure 6.2 Surface Water Flood Risk Zone from gov.uk mapping

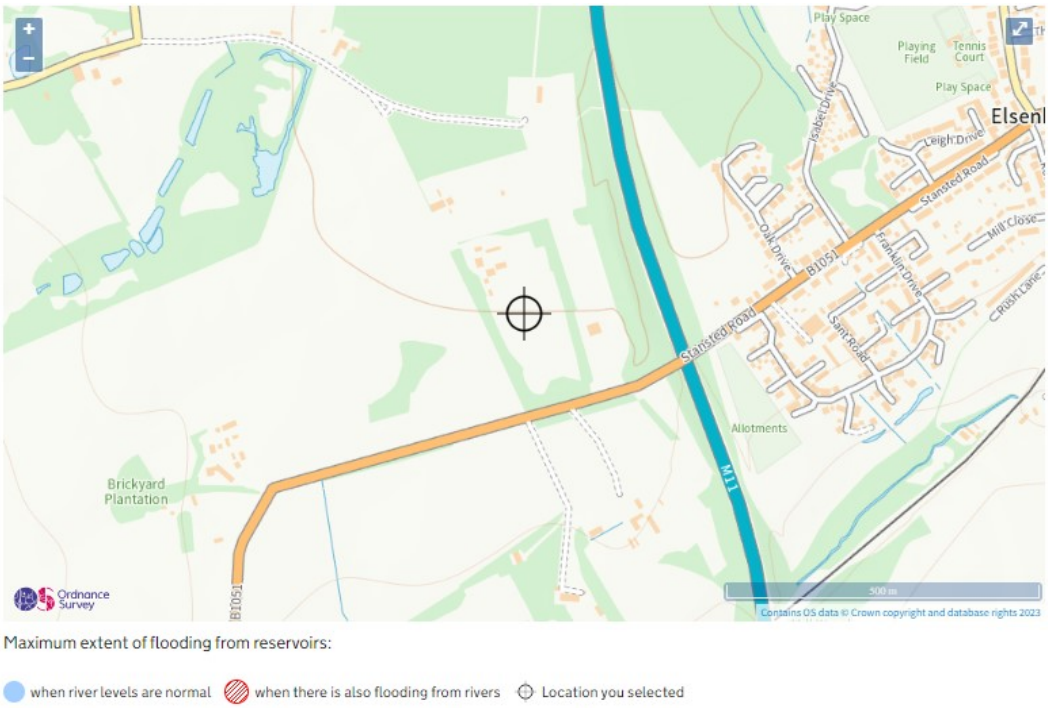


Extent of flooding from surface water

High Medium Low Very low Location you selected

6.3 The gov.uk maps identify that the site is not at risk of flooding from a reservoir, as shown in Figure 6.34.

Figure 6.3 Reservoir Water Flood Risk Zone from gov.uk mapping



6.4 Uttlesford District Council Strategic Flood Risk Assessment, by JBA Consulting May 2016, has recorded 6-10 properties having a sewer flooding event in the postcode 'CM24 8' postcode area. Therefore, considering the lack of sewers in the proximity of the site, flood risk from sewer flooding is considered low.

6.5 The SFRA also refers to the risk of groundwater flooding. The site comes within a 1 km square grid which indicates that the likelihood of groundwater flooding at this site is in <25% probability of flooding. Therefore, it is considered that on this site the likelihood of ground water flooding is low.

6.6 The NPPF emphasises that development should be located in the least vulnerable places and that Local Plans should look to the SFRA to inform the process and help with the sequential test. Clearly, the site would be unlikely to suffer from fluvial / coastal flooding even for a 1 in 1000 year event. In planning policy terms it can be asserted that the site would be compliant with national policy and local policies in terms of its location from a flood risk perspective.

6.7 As the proposed development is not at risk from fluvial, costal or pluvial flooding, the main purpose of this assessment is to consider the management of surface water run-off and to ensure that the impact of the development does not affect downstream interests and / or properties. The drainage strategy set out in the previous chapter and shown on drawing RMDS/ES/23/002 illustrates how, with conservative design, the surface water would be managed on the site to prevent flooding within or downstream of the site in storms of up to and including the 1 in 100 year event with a 40% allowance for climate change. The drainage strategy is in-line with the LLFA's guidance by utilizing soakaways to dispose of surface water runoff.

6.8 Based upon the review and conceptual drainage strategy the risk of flooding either on site or downstream of the site would be negligible.

7 CONCLUSIONS

7.1 Intermodal Transportation Ltd (ITL) has been commissioned by Ranger Management and Design Services Limited on behalf of NB Investment UK Limited to prepare a Flood Risk Assessment (FRA) report in support of a planning application for the provision of 5 dwellings at Eastfield Park Avenue, May Walk, Elsenham, Stansted, Essex, CM24 8SS. The site development area is approximately 1.97 hectares in total.

7.2 This report considers the flood risk issues arising from the proposed development. In this report the requirements of the guidance embodied within the NPPF Framework have been considered together with the guidance published by ECC and CIRIA in respect to the use of SuDS (Sustainable Urban Drainage Systems) principles.

7.3 The existing site contains grass paddocks with areas of overgrown vegetation and trees. There are believed to be no existing drainage features on the site. The site levels fall from north a high point in the north to a low point in the south of the site.

7.4 There are no public sewers or water courses adjacent to the site.

7.5 The borehole testing carried out by GPD Waterwells Ltd shows that infiltration would be possible at a depth of 9 to 13m below ground in a band of sands and gravel. This band lays beneath clay soils. Therefore, borehole soakaways have been proposed to drain the site. These have been sized and combined with attenuation tanks in order to allow for a 1 in 100 year storm + 40% climate change allowance + 10% allowance for urban creep. The adjacent site has successfully implemented the use of borehole soakaways, this project was under planning application UTT/20/0780/FUL.

7.6 It is anticipated that permeable paving would be suitable for attenuation only on this site and full infiltration using permeable paving would not be possible.

7.7 It is considered that the above strategy would provide betterment over the existing situation for all storms between a 1 in 1 year and 1 in 100 year + 40% climate change event. The drainage strategy is in-line with the LLFA's guidance by utilizing soakaways for the disposal of surface water runoff.

7.8 The proposed foul sewer system for the development site would drain under gravity to 5 package treatment plants such as a Klargester BA, or similar product. Each property would have its own plant which would share one plant. The treated effluent would drain to the borehole soakaways.

7.9 Approval/ permits/ further justification of the implementation of borehole soakaways on this project are likely to be required from the Environment Agency and sufficient time should be allowed in the pre-construction phase of the project for such activities.

7.10 The site is situated in a Flood Zone 1 area, the lowest classification. The extent of the flood contour is shown on the gov.uk Flood Planning Service published web site. Therefore, there is little risk to the development, or the future occupants, arising from fluvial or coastal flooding for any storm up to and including a 1 in 1000 year storm event. The gov.uk maps also identify that the site is not at risk of flooding from a reservoir.

7.11 Uttlesford District Council Strategic Flood Risk Assessment, by JBA Consulting May 2016, has recorded low numbers of sewer flooding events in the postcode area of the site. The SFRA also indicated that the risk of ground water flooding is low. It is therefore concluded that the site would be at very low risk of future flooding and in planning policy terms it can be asserted that the site would be compliant with national policy and local policies in terms of its location from a flood risk perspective.

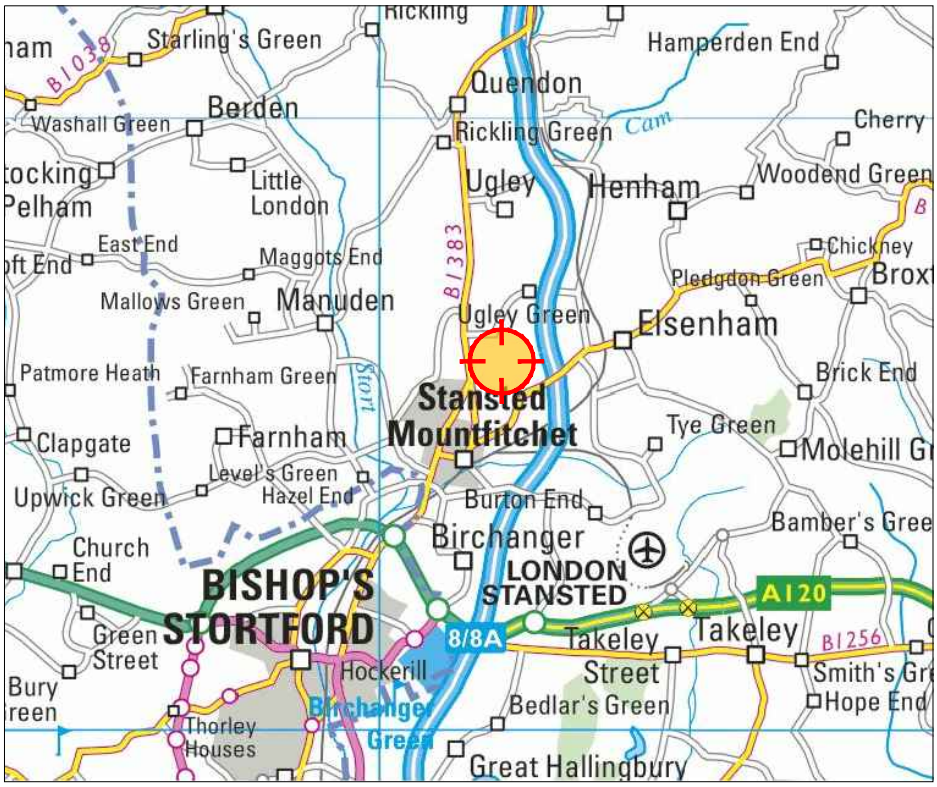
7.12 Hence, it can be concluded that there would be no flood risk affecting property or the welfare of residents and the public arising from the development of the site and that surface water discharge from the development can be adequately managed to ensure no additional risk of flooding both on site and off site, even under extreme conditions. Sufficient details have been provided to satisfy the requirements of the policy guidance and with the imposition of a suitable planning condition the Local Lead Flood Authority and Environment Agency's interests can be protected pending final detailed design and subsequent discharge of the condition.

7.13 It is therefore concluded that the development site is not at risk to fluvial, coastal or pluvial flooding and the development proposal is able to be drained without potential off-site flooding resulting from storm events up to and including 1 in 100 years with 40% allowance for climate change. It is therefore considered that from a critical drainage perspective the development proposal should not be denied planning consent.

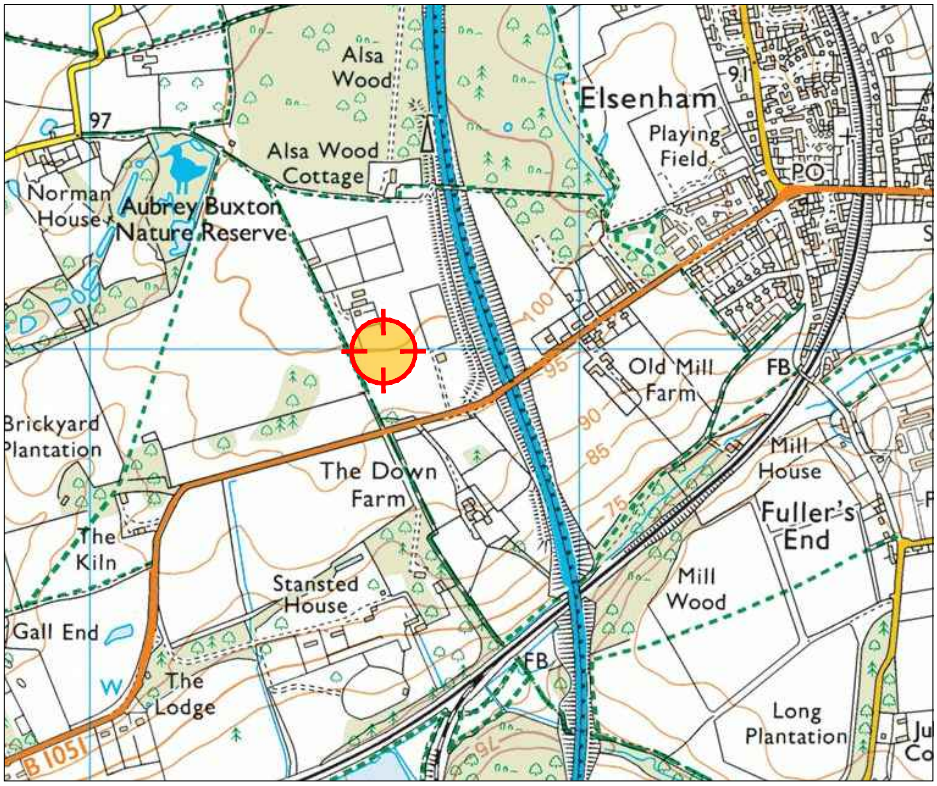
Drawings

N

WIDER CONTEXT



LOCAL CONTEXT



SITE LOCATION

Rev	Description	Date

IT Project: EASTFIELD PARK AVENUE, MAY WALK, ELSENHAM ROAD, STANSTED

Rev: -

Drawing Title: SITE LOCATION IN LOCAL AND WIDER CONTEXT

Sheet 1 of 1

Client: NB INVESTMENT UK LIMITED

Drawn By: DS

Approved By: RW

Drawing No: IT2175/FRA/001

CAD File: IT2175/SK.DWG

A4

Notes: Dimensions should not be scaled from this drawing. The contents of this drawing are confidential, should you receive this drawing in error please return it to Intermodal Transportation at the address printed.

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Date: JULY 2020

Scale: NTS

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LEGEND

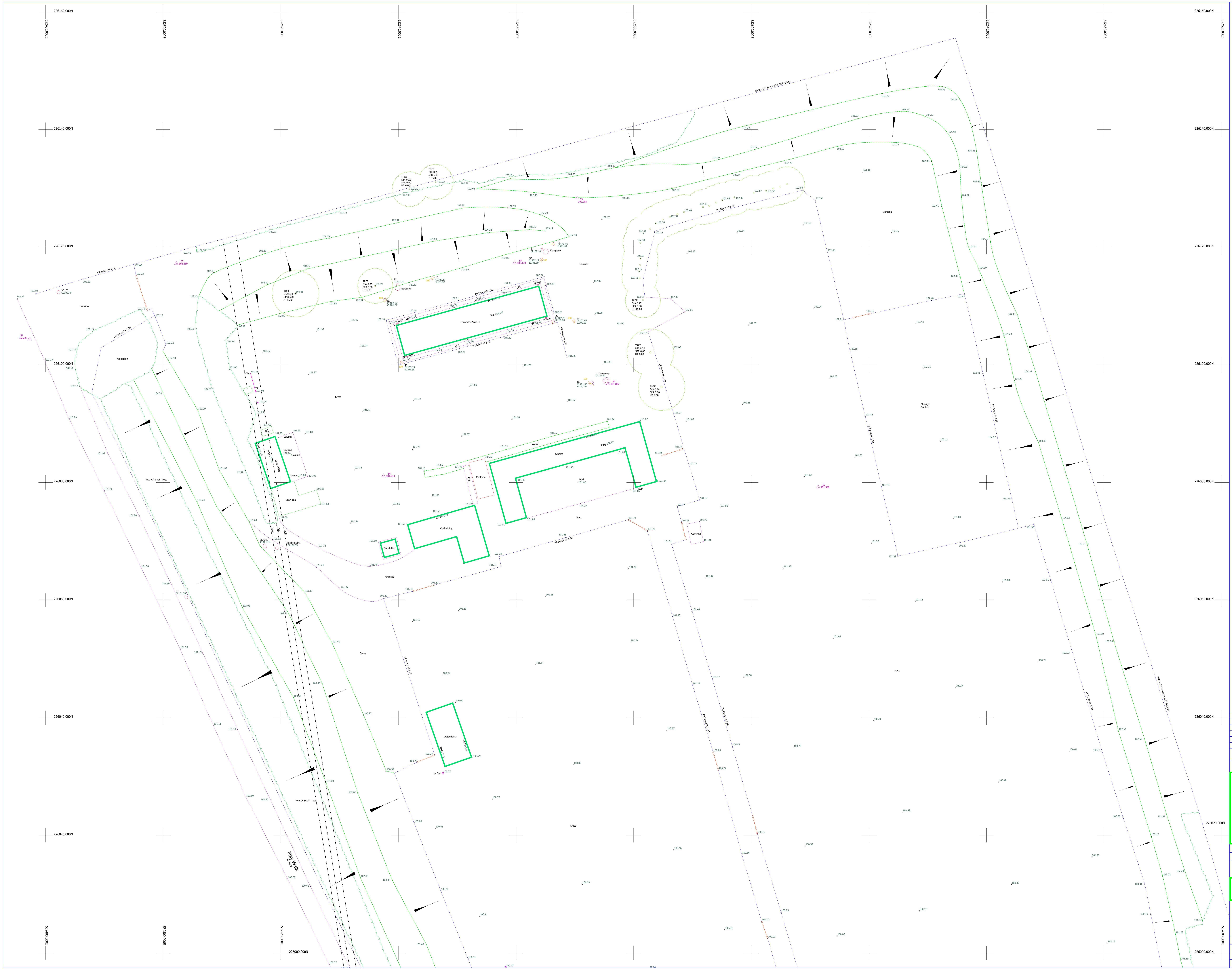
- Existing landscaped earth bunds, trees, shrubs and hedging.
- Existing built form
- Wellness Hub under construction
- 5 new dwellings, this application
- Development site boundary
- Private Foul Sewer
- Private Surface Water sewer
- Package Sewage Treatment Plant
- Deep Borehole Soakaway
- Attenuation Tank
- Filter Strip
- Exceedance Route

Eastfield Stables, Elsenham Road, Stansted CM24 8SS
Residential development of 5 dwellings.
Drawing RMDS/ES/23/002
Proposed site layout
Scale 1:500 @ A1

RANGER MANAGEMENT & DESIGN SERVICES
13 Berners End, Barnston, Dunmow CM6 1LY
t: 01371 874073 m: 07913 289362 e: planrmds@gmail.com

Appendix A

TOPOGRAPHICAL SURVEY DWG NOS. CLS20039001,002,003 & 004



OS NORTH

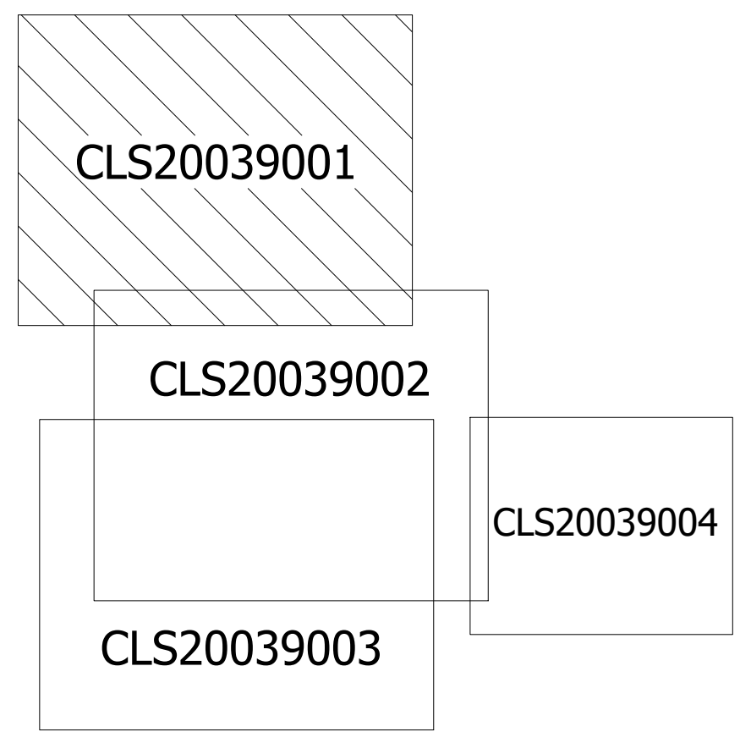
Topographical Abbreviations

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHP	Overhead Pipe
BW	Barbed Wire Fence	OSBM	Ordnance Survey Bench Mark
BWK	Brickwork	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
EJB	Electricity Junction Box	SPR	Spread
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
FH	Fire Hydrant	SW	Storm Water
FIG	Feed Into Ground	TB	Telephone Box
FW	Foul Water	TBM	Temporary Bench Mark
G	Gully	TFR	Taken From Records
GV	Gas Valve	TJB	Telephone Junction Box
HT	Height	TPT	Trial Pit
IC	Inspection Cover	TL	Traffic Light
IL	Invert Level	TP	Telephone Pole
IR	Iron Railing Fence	UTL	Unable To Lift
KO	Kerb Outlet	UTT	Unable To Trace
LB	Litter Bin	VP	Vent Pipe
LC	Lamp Column	WKH	Water Key Hole
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Survey Station Information

STA No.	Easting	Northing	Level
S1	552477.258mE	226104.365mN	102.227
S2	552502.239mE	226117.217mN	102.289
S3	552570.322mE	226128.379mN	102.203
S4	552575.653mE	226096.760mN	101.837
S5	552559.749mE	226117.339mN	102.170
S6	552537.470mE	226081.111mN	101.743
S7	552611.379mE	226079.202mN	101.558
S8	552587.863mE	225982.137mN	99.618
S9	552625.356mE	225879.853mN	95.489
S50	552575.601mE	225830.884mN	95.646
S51	552725.692mE	225871.851mN	95.496
S52	552842.630mE	225910.097mN	96.789

Sheet Layout



Notes
Grid is related to OS using GPS
All levels related to OS using GPS

5		-	
4		-	
3		-	
2		-	
1		-	
0	ACC	First Complete Issue	12/03/2020
Rev		Description	

CHINERY LAND SURVEYS

LABURNUM
MALDON ROAD
KELVEDON
ESSEX

Tele 01376 538135
Email acc@chinerylandsurveys.co.uk

SURVEYED	RJC
DRAWN	RJC
SCALE	1:200

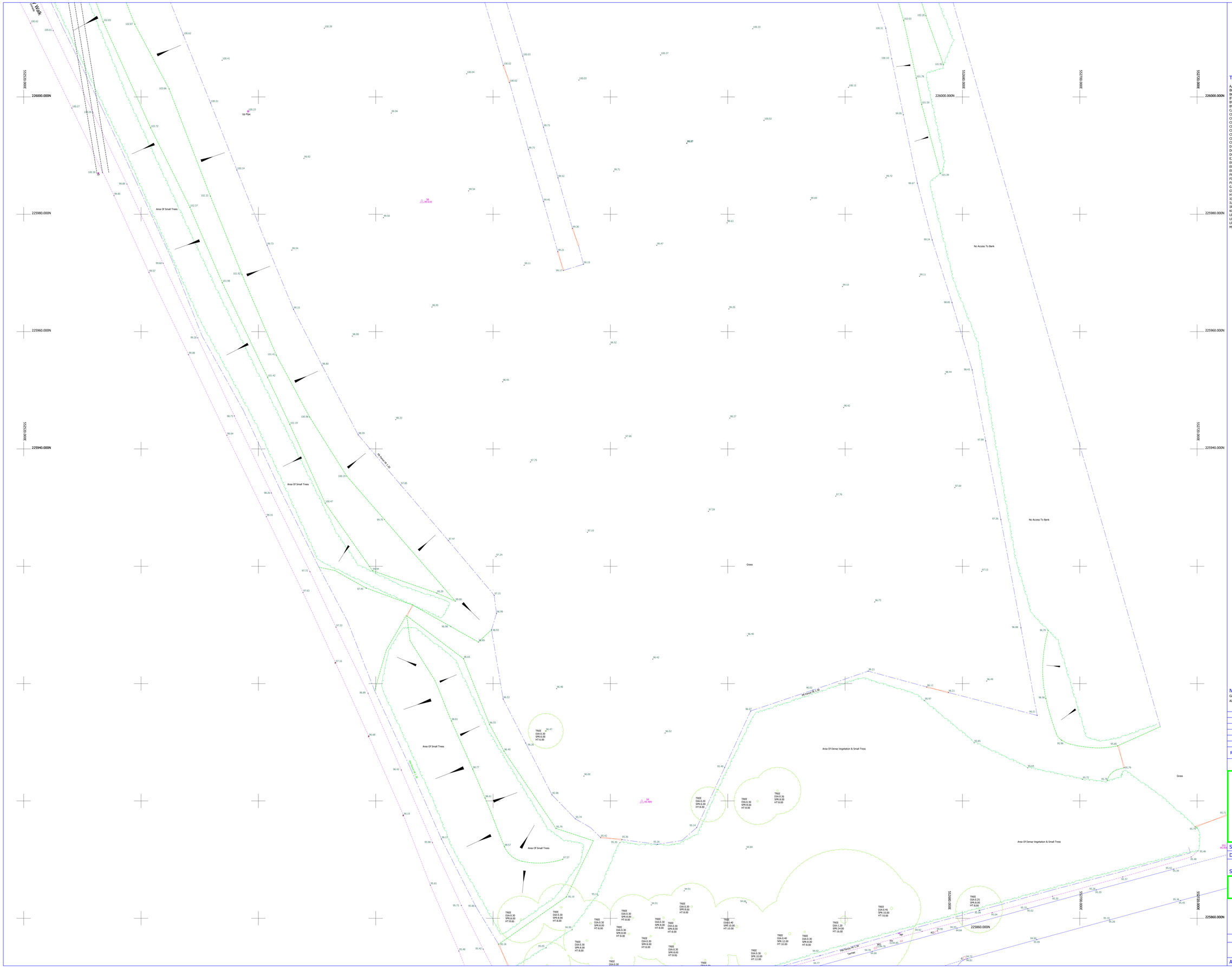
RANGER MANAGEMENT & DESIGN SERVICES LTD

EASTFIELD STABLES
ELSENHAM CM24 8SS

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS20039	CLS20039001 Rev0

A0 Sheet - 1189mm x 841mm



Topographical Abbreviations

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHP	Overhead Pipe
BW	Barbed Wire Fence	OSBM	Ordnance Survey Bench Mark
BWK	Brickwork	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chestnut Paling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Cable Marker	RN	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DIA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sapling
DP	Down Pipe	SC	Stop Cock
EJB	Electricity Junction Box	SPR	Spread
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthing Rod	SVP	Soil Vent Pipe
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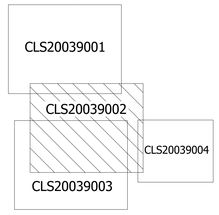
FIG	Feed Into Ground	TB	Telephone Box
FW	Foul Water	TBM	Temporary Bench Mark
G	Gully	TFR	Taken From Records
GV	Gas Valve	TJB	Telephone Junction Box
HT	Height	TPT	Trial Pit
IC	Inspection Cover	TL	Traffic Light
IL	Invert Level	TP	Telephone Pole
IR	Iron Railing Fence	UTL	Unable To Lift
KO	Kerb Outlet	UTT	Unable To Trace
LB	Litter Bin	VP	Vent Pipe
LC	Lamp Column	WKH	Water Key Hole
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Sheet Layout



Notes

Grid is related to OS using GPS
All levels related to OS using GPS

Rev		Description	
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4		-	
3		-	
2		-	
1		-	
0	ACC	First Complete Issue	12/03/2020

CHINERY LAND SURVEYS
LABURNUM
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ESSEX
Tele 01376 538135
Email acc@chinerylandsurveys.co.uk

SURVEYED	RJC	RANGER MANAGEMENT & DESIGN SERVICES LTD
DRAWN	RJC	
SCALE	1:200	

EASTFIELD STABLES
ELSENHAM CM24 8SS

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS20039	CLS20039002 Rev0

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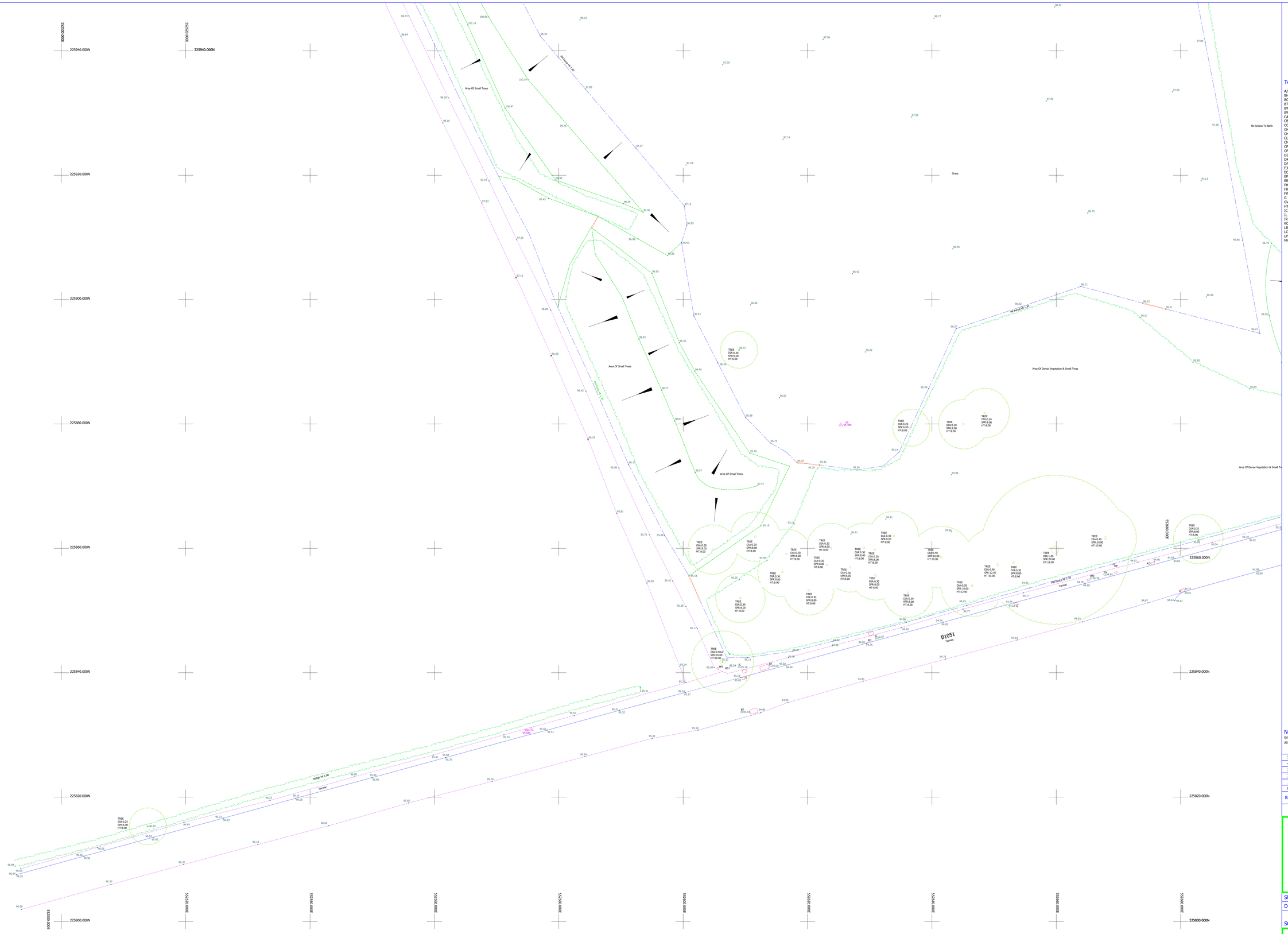

Topographical Abbreviations

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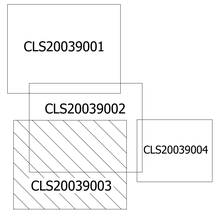
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Sheet Layout



Notes
Grid is related to OS using GPS
All levels related to OS using GPS

Rev		Description	
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3		-	
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SURVEYED	RJC	RANGER MANAGEMENT & DESIGN SERVICES LTD
DRAWN	RJC	
SCALE	1:200	

EASTFIELD STABLES
ELSENHAM CM24 8SS

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS20039	CLS20039003 Rev0

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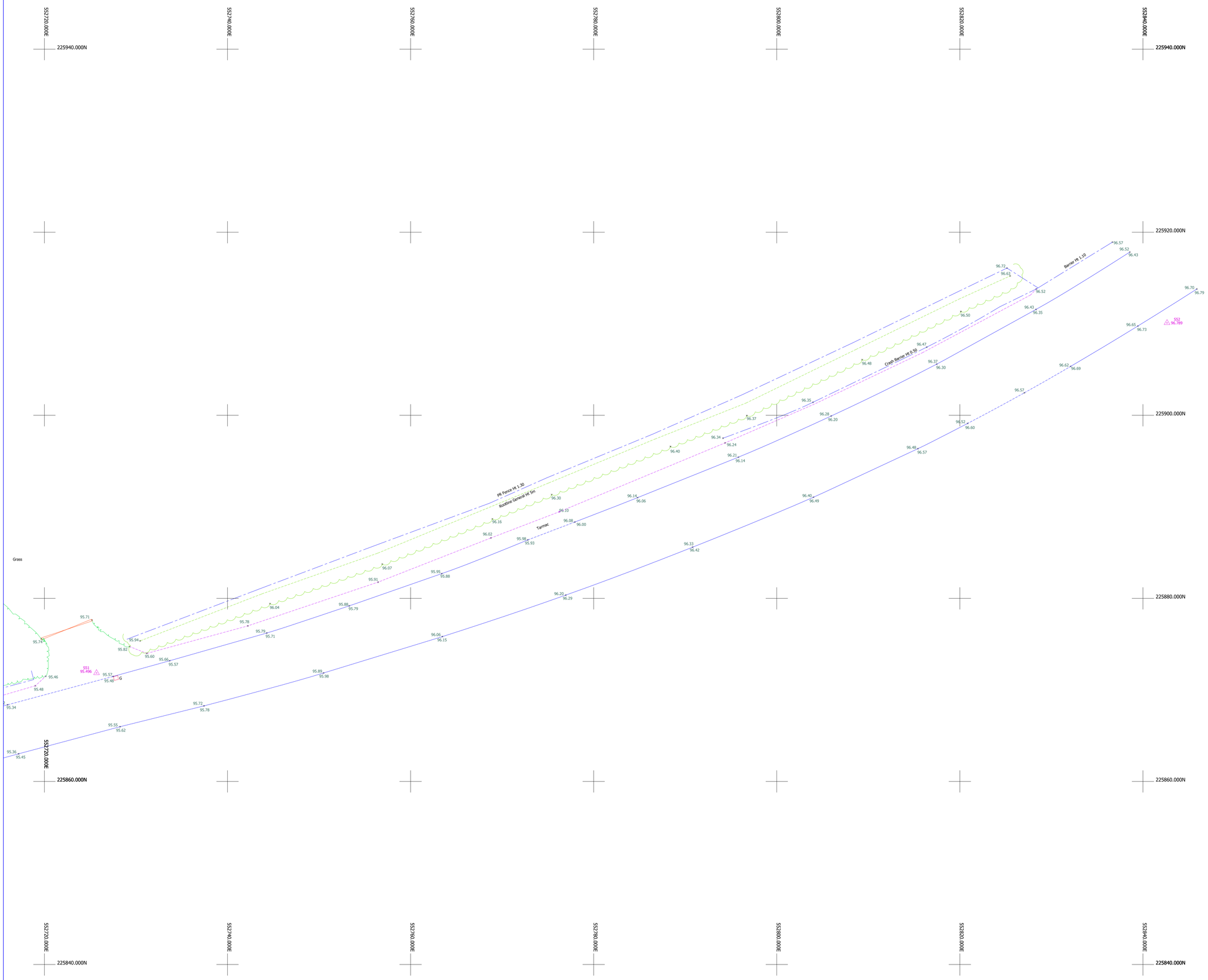

OS NORTH

Topographical Abbreviations

A/R	Assumed Route	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BOL	Bollard	OHC	Overhead Cable
BT	British Telecom Cover	OHP	Overhead Pipe
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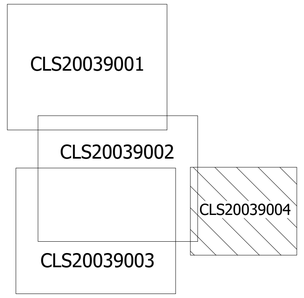
Sheet Layout



Notes

Grid is related to OS using GPS
All levels related to OS using GPS

Rev		Description	
5		-	
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3		-	
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1		-	
0	ACC	First Complete Issue	12/03/2020

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SURVEYED	RJC	RANGER MANAGEMENT & DESIGN SERVICES LTD
DRAWN	RJC	
SCALE	1:200	

EASTFIELD STABLES
ELSENHAM CM24 8SS

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS20039	CLS20039004 Rev0

A1 Sheet - 841mm X 594mm

Appendix B

THAMES WATER PLANS

Asset Location Search

Steve Williamson
Intermodal Transportation Ltd
Hunters Court
Debden Road
SAFFRON WALDEN
CB11 4AA

Search address supplied CM22 6LJ

Your reference N/A

Our reference ALS/ALS Standard/2014_2716302

Search date 19 March 2014

You are now able to order your Asset Location Search requests online by visiting
[redacted]

Asset Location Search

Search address supplied: CM22 6LJ

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: [redacted]

Asset Location Search

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TL5226SE
TL5326NE
TL5326SE
TL5326SW
TL5226NE
TL5325NE
TL5225NE
TL5325NW

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

The following quartiles have not been printed as they are out of Thames' sewer catchment area. For details of the assets requested please contact the water company indicated below:

TL5326NW Anglian

Following examination of our statutory maps, Thames Water has been unable to find any record of public sewerage within this area. However, there may be other sewerage pipework within the area that is not owned by the company. You may be able to obtain records of such pipework from the building control department of your local authority, from property deeds or from neighbouring landowners.

Anglian Water

Asset Location Search

Anglian House
Ambury Road
Huntingdon
Cambridgeshire
PE29 3NZ

Tel: 01480 323 000
Fax: 01480 323 115

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TL5326NW	Affinity Water
TL5226SE	Affinity Water
TL5326NE	Affinity Water
TL5326SE	Affinity Water

Asset Location Search

TL5326SW	Affinity Water
TL5226NE	Affinity Water
TL5325NE	Affinity Water
TL5225NE	Affinity Water
TL5325NW	Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0845 7823333

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

An invoice is enclosed. Please send remittance to Thames Water Utilities Ltd., PO Box 3189, Slough, SL1 4WW.

Asset Location Search

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Clean Water queries

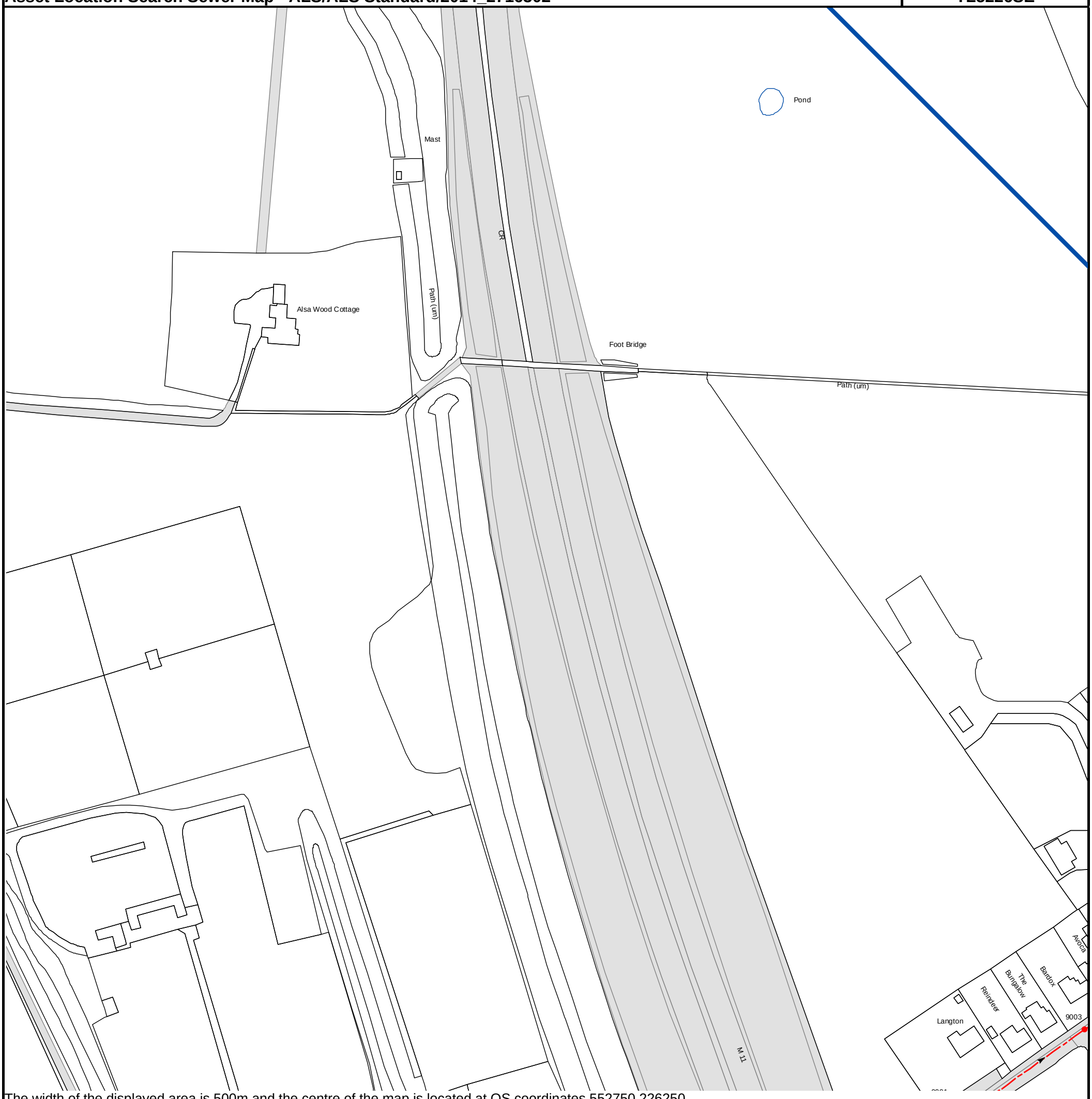
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5226SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 552750,226250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

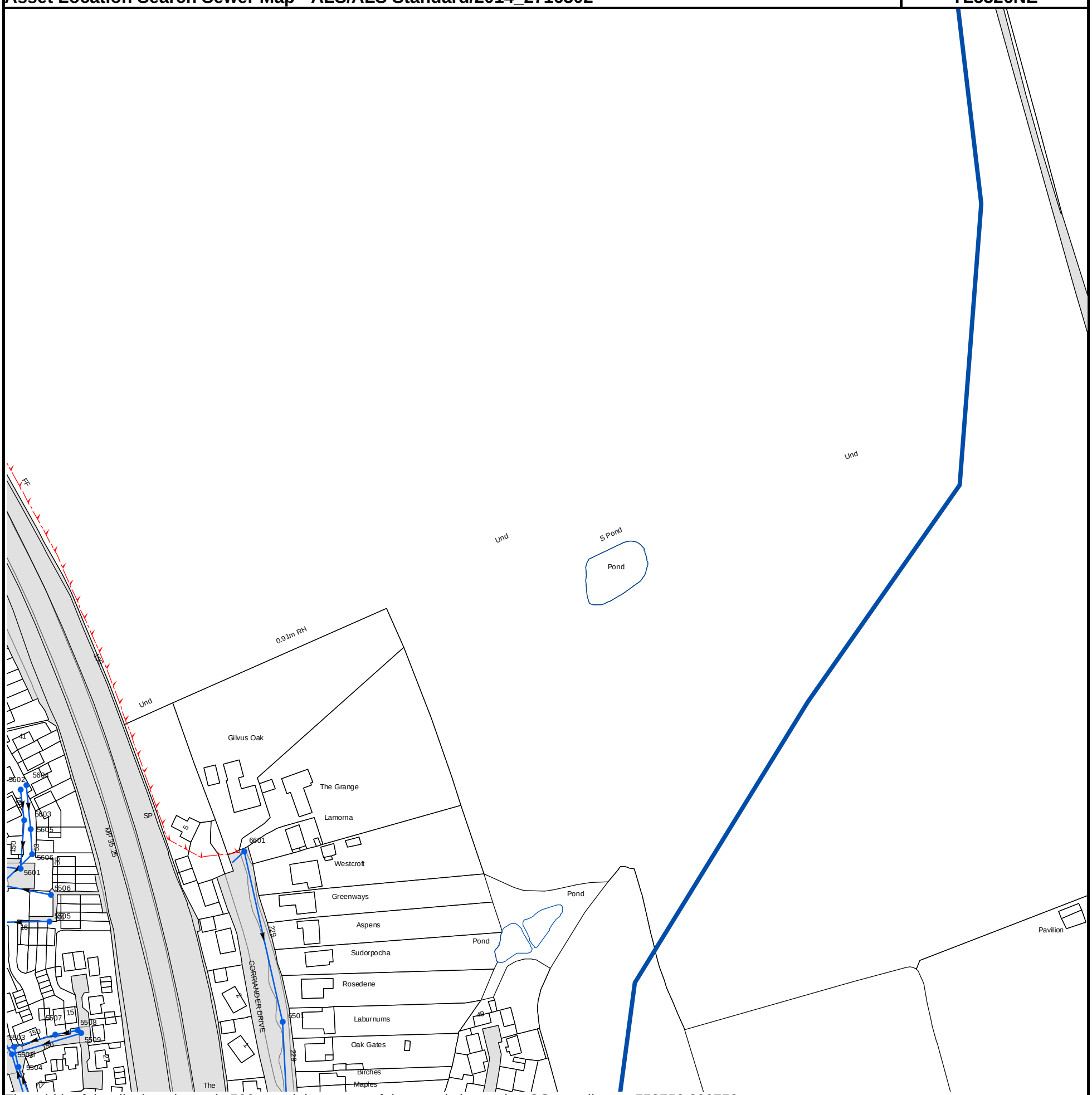
Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9003	**n/a**	**n/a**

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302 | **TL5326NE**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 553750,226750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5502	91.66	90.42
5503	91.69	89.38
5504	91.85	89.49
5601	92.17	89.68
5602	92.09	90.59
5603	92.28	90.08
5604	92.18	90.64
5605	92.31	90.32
5606	92.59	n/a
5505	n/a	n/a
5506	n/a	n/a
5507	92.07	89.97
5508	92.51	90.24
5509	92.48	90.92
6601	93.79	92.36
6501	94.27	91.8

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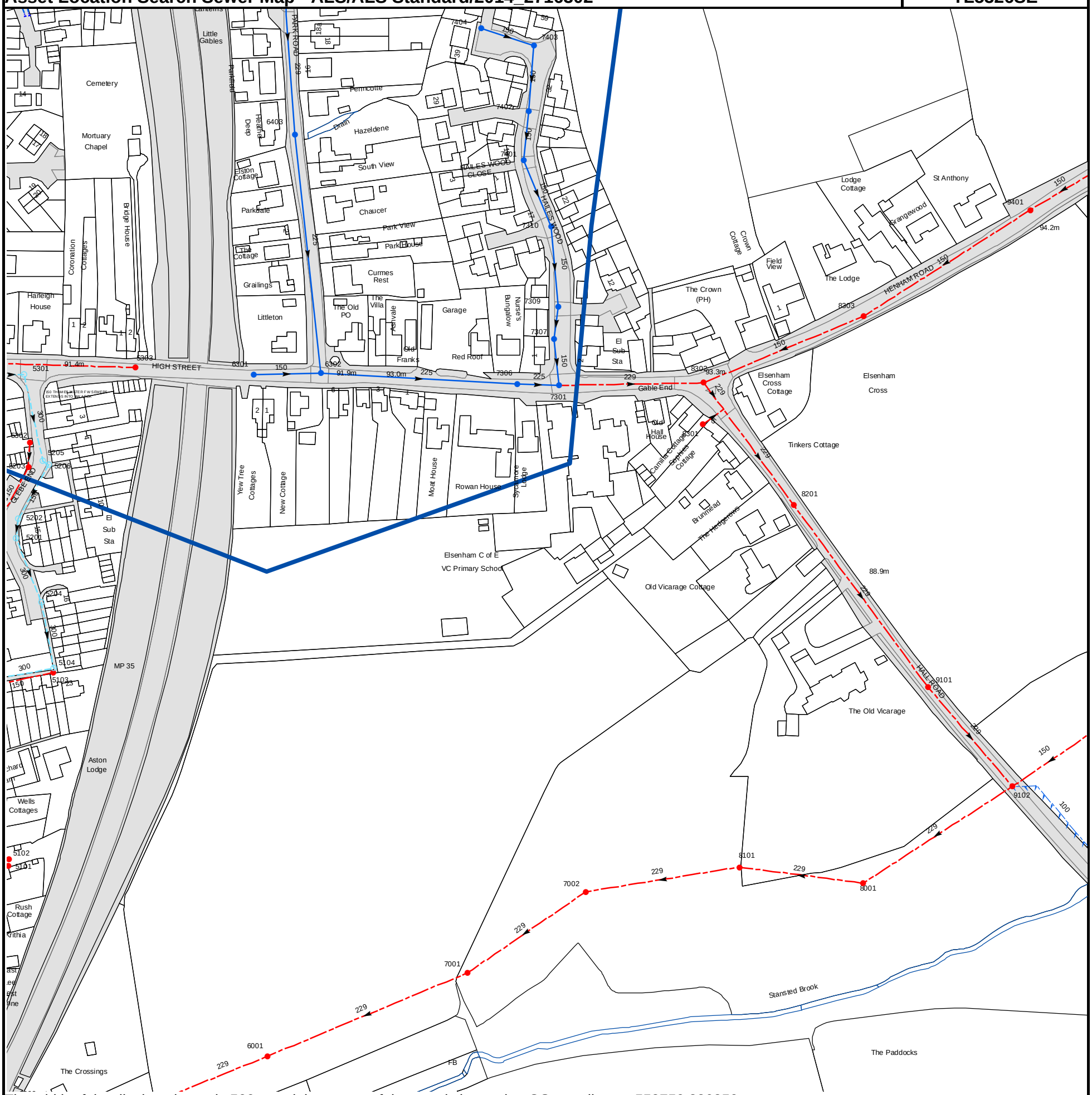
Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5326SE



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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6403	n/a	n/a
7404	n/a	n/a
7401	n/a	n/a
7402	n/a	n/a
7403	n/a	n/a
7310	n/a	n/a
9401	93.93	90.82
5101	88.47	79.59
5102	88.68	79.59
5201	91.31	89.81
5202	91.4	89.87
5301	91.37	90.12
5203	91.53	89.39
5302	91.43	89.54
5204	91.07	89.75
5205	91.53	90.03
5206	91.72	90.02
5103	91.01	89.32
5104	90.95	89.65
5303	91.43	89.94
6301	n/a	n/a
6001	82.39	79.59
6302	n/a	n/a
7001	81.55	80.07
7306	n/a	n/a
7307	n/a	n/a
7309	n/a	n/a
7301	93.13	89.72
7002	81.68	80.3
8301	92.89	91.8
8302	93.4	89.44
8101	81.37	80.59
8201	90.75	89.1
8001	81.41	80.82
8303	93.73	90.19
9101	85.4	83.62
9102	82.55	81.27

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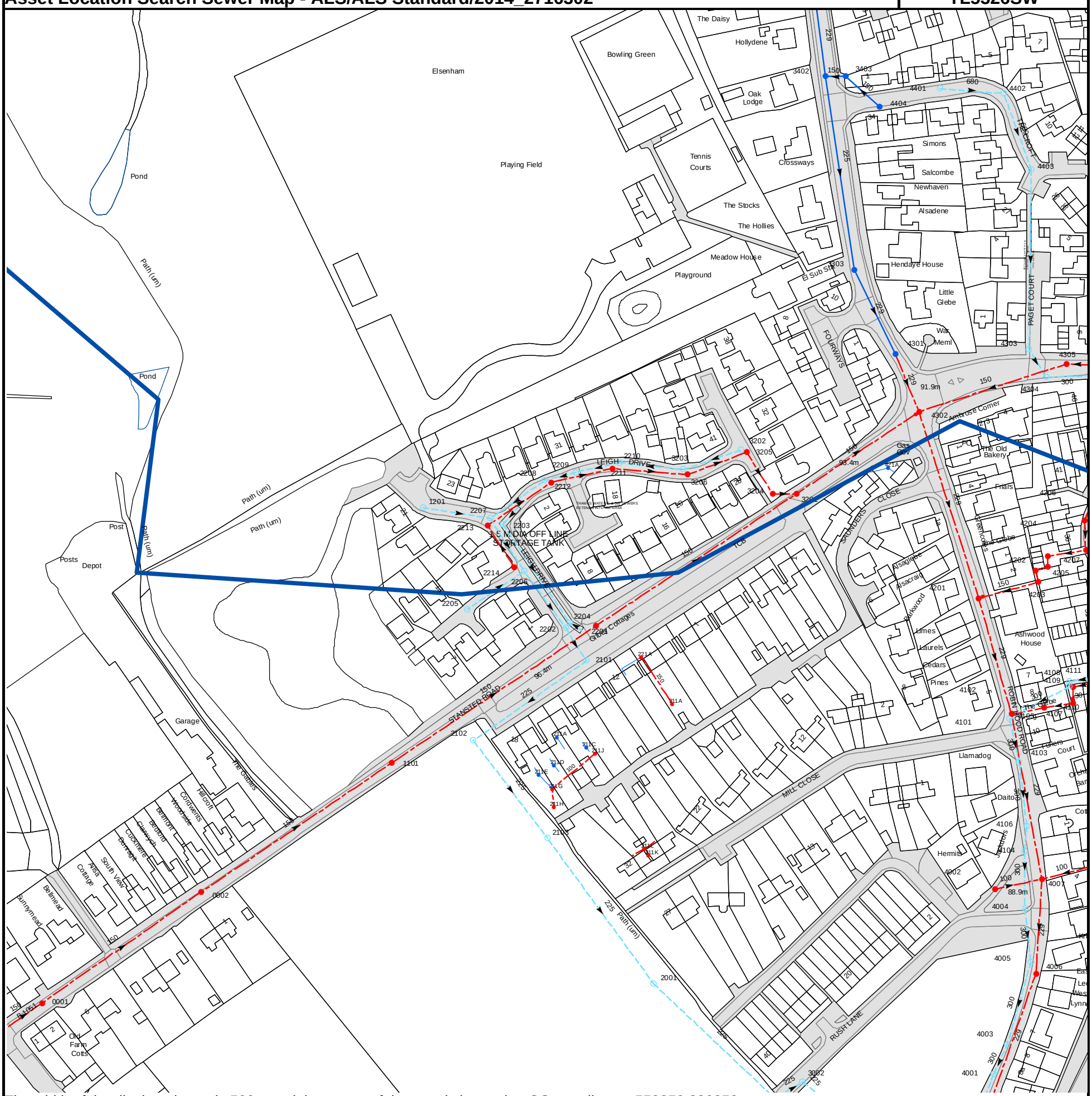
Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5326SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 553250,226250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3303	n/a	n/a
4403	91.5	90.27
4404	n/a	n/a
4402	91.58	90.22
4401	92.02	90.48
3403	n/a	n/a
3402	n/a	n/a
4106	89.2	87.35
4103	89.78	88.06
4101	90.31	88.54
4102	90.41	87.35
4105	n/a	n/a
4107	n/a	n/a
311A	n/a	n/a
4110	90.88	87.65
4111	90.87	89.02
4109	90.83	89.47
4108	90.87	89.51
4201	91.81	87.56
4203	n/a	n/a
4202	91.55	88.93
4205	91.58	89
4204	91.53	89.01
3201	94.43	92.32
3204	n/a	n/a
3206	n/a	n/a
3203	n/a	n/a
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3205	n/a	n/a
3202	n/a	n/a
4302	92.24	87.94
4304	91.29	90.21
4305	91.52	89.04
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2207	n/a	n/a
2203	n/a	n/a
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2206	n/a	n/a
211E	n/a	n/a
2208	n/a	n/a
2103	n/a	n/a
2212	n/a	n/a
211G	n/a	n/a
211H	n/a	n/a
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4207	91.41	89.15
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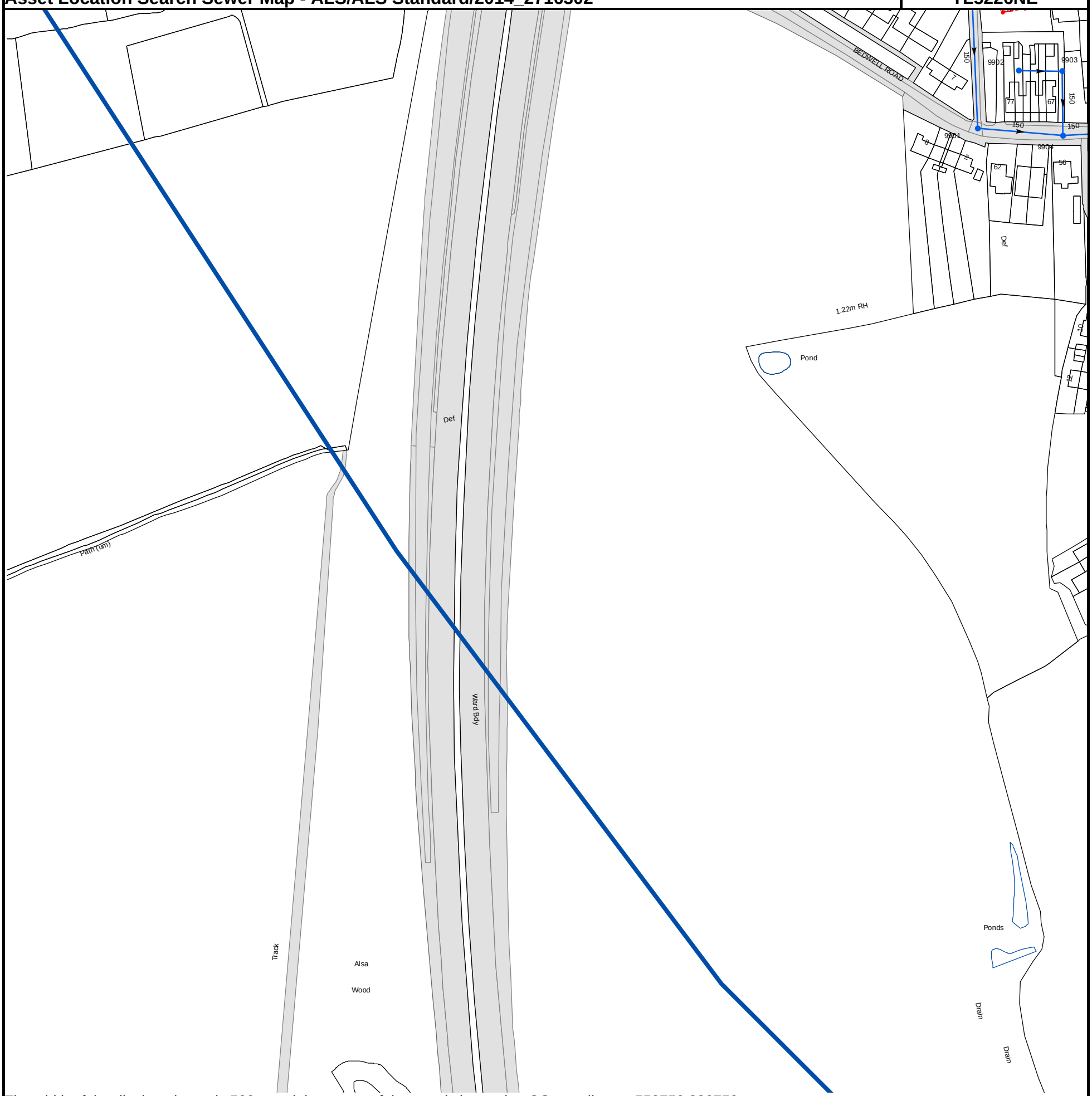
4001	84.89	83.36
4003	85.82	84.25
2001	n/a	n/a
4006	87.45	85.2
4005	87.83	85.75
4004	88.99	86.44
4002	88.82	87.73
4007	88.62	87.01
211K	n/a	n/a
4104	88.97	87
211L	n/a	n/a
0001	96.98	94.59
0002	96.44	94

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5226NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 552750,226750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9901	95.63	92.32
991A	n/a	n/a
9902	95.09	93.98
9903	94.62	93.16
9904	94.11	91.66

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5325NE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 553750,225750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5902	n/a	n/a
5903	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5225NE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 552750,225750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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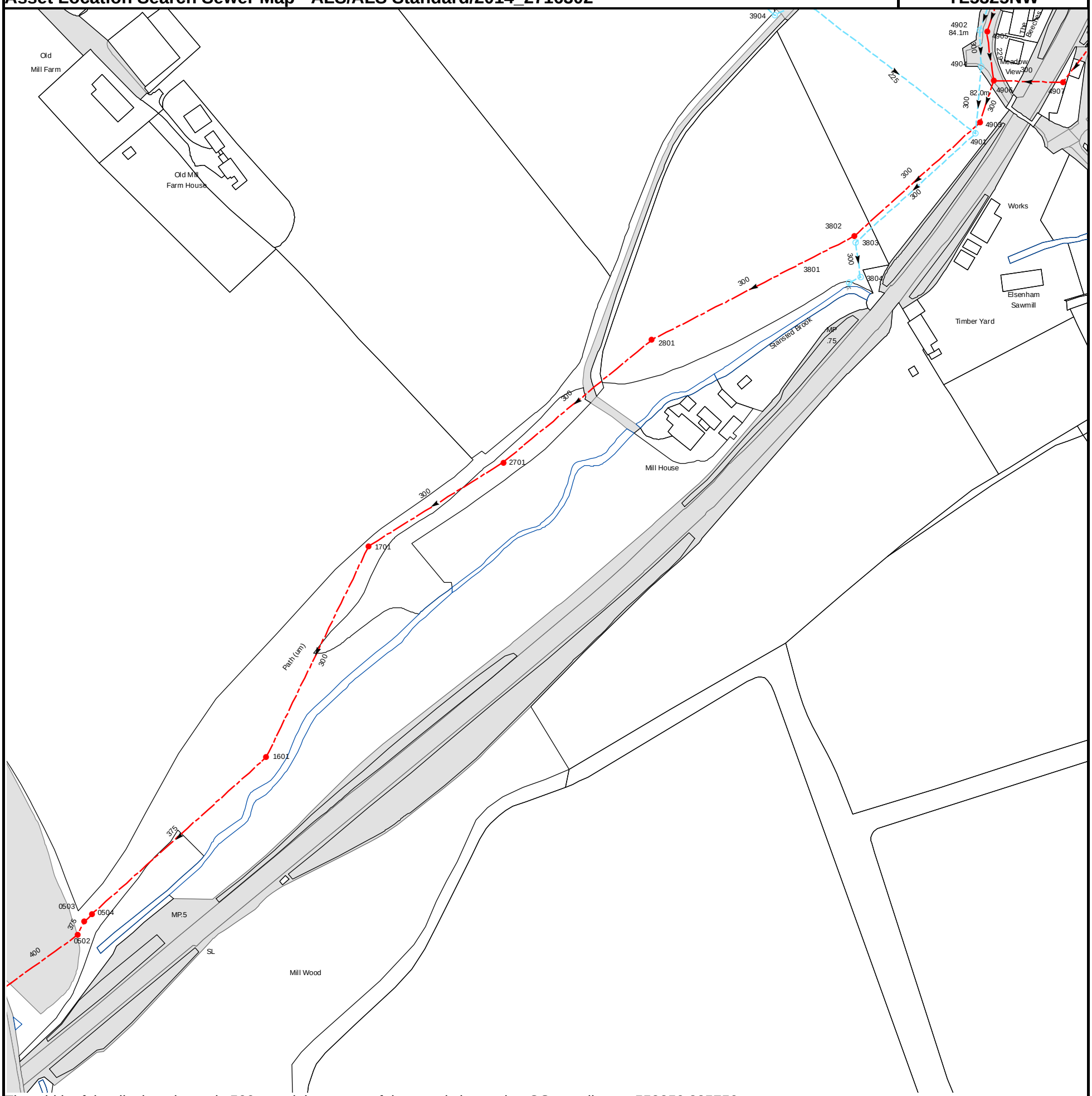
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9901	97.04	95.48

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2716302

TL5325NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 553250,225750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1701	73.91	72.38
2701	75.74	73.44
2801	77.63	75.67
3801	75.33	72.32
3804	76.97	74.21
3803	78.5	76.73
3802	78.74	77.4
4901	81.27	79.86
4903	81.67	78.63
4907	82.39	78.99
4906	82.59	78.79
4904	82.98	81.11
4905	83.92	82.32
4902	84.18	82.41
3904	n/a	n/a
0502	71.86	69.77
0503	71.79	69.82
0504	71.85	69.91
1601	72.53	70.68

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

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3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
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Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0845 070 9148** quoting your invoice number starting CBA or ADS.	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Invoice

Steve Williamson
Intermodal Transportation Ltd

Debden Road
Saffron Walden
CB11 4AA

Thames Water Utilities Ltd.
PO Box 3189
Slough
SL1 4WW

Invoice No: ADS14363272
Customer Reference: N/A
Our Ref: ALS/ALS Standard/2014_2716302
Customer Number: ADS104872
Posting Date: 19-03-2014
Purchase Order No:
Due Date: 02-04-2014

Search Address Supplied: CM22 6LJ

Description of Charges	Qty	Unit Price	VAT (20%)	Amount (Inc VAT)
Asset Location Search	1	£47.40	£9.48	£56.88

OUTSTANDING AMOUNT (Inc. VAT) £56.88

Please send any outstanding amount to Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.

Your payment terms are within 14 days. Please see previous page for ways to pay.

For queries please contact the Property Searches Customer Support Team on Tel: 0845 070 9148.

VAT Reg. No GB 537456915

Girobank Trans cash
Girobank plc Bootle Merseyside GIR 0AA

Payment slip

bank giro credit

138 208 70

Reference (customer account number): ADS104872 / ADS14363272

Credit account number: 257 1706

Amount due (40p fee payable at PO counter): £ 56.88

Cheque NOT acceptable at Post Office

By transfer from Alliance and Leicester Giro account number

Cashiers stamp and initials

Items Fee

Signature

Intermodal Transportation Ltd

Debden Road
Saffron Walden
CB11 4AA

Date

NatWest
Collection Account
Thames Water
Utilities Ltd

Cash

Cheques

£

57-17-06

Please do not write or mark below this line and do not fold this counterfoil

Paragon 9530 01/2004

010010003632722 V7702571706 000056880 74 X

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

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TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from [redacted]

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Appendix C

ARCHITECTS DRAWING

LEGEND

- Existing landscaped earth bunds, trees, shrubs and hedging.
- Existing built form
- Wellness Hub under construction
- 5 new dwellings, this application
- Development site boundary

Eastfield Stables, Elsenham Road, Stansted CM24 8SS
Residential development of 5 dwellings.
Drawing RMDS/ES/23/002a
Proposed site layout
Scale 1:500 @ A1

RANGER MANAGEMENT & DESIGN SERVICES
13 Berners End, Barnston, Dunmow CM6 1LY
t: 01371 874073 m: 07913 289362 e: planrmds@gmail.com

Appendix D

GREENFIELD RUNOFF CALCULATIONS

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 600 Urban 0.000
Area (ha) 0.507 Soil 0.450 Region Number Region 6

Results	**l/s**
QBAR Rural	1.9
QBAR Urban	1.9
Q1 year	1.6
Q1 year	1.6
Q30 years	4.2
Q100 years	5.9

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Appendix E

GPD WATERWELLS LTD BOREHOLE LOG

GPD Waterwells LTD

34 Somers Road, Welham Green, Hatfield, Herts, AL9 7PX
Tel: 0781 510 8934
SPECIALIST BOREHOLE CONTRACTORS
VAT: 863580992 **UTR NO: 6765521349**
Company Registration No: 5494017

BORING RECORD

Site Elsenham **B.H. No.** 1.

Client Stuart.

Site Address May Walk, Elsenham Road, Elsenham CM24 8ST.

Boring Started 7th August 2019 **Boring Completed** 17th August 2019 **Level** .

Dia. of Bore 250mm **Cased to** 18m **with** 200mm **dia. casing and to** 29m **with** **dia casing and to** .

Water struck at: **(1)** **b.s.** **(2)** **b.s.** **(3)** **b.s.** **(4)** **b.s.**

Standing W.L. in bore at **on** **b.s.**

Permanent Liner 32m of 150mm diameter steel lining tube.

Grout Used Cement grout.

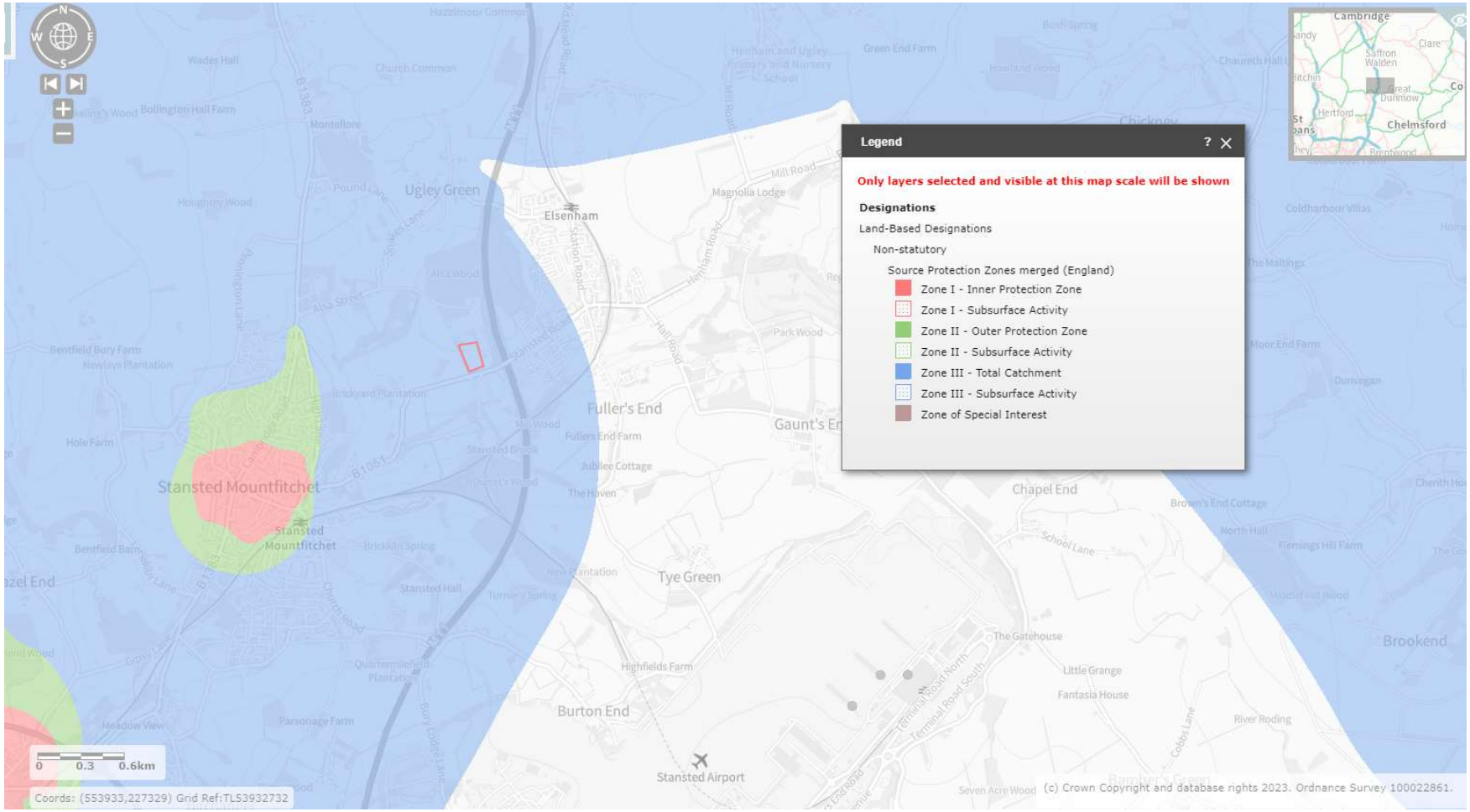
Pumping or Soakaway Results. 1000 litres in 1.45mins – did not fill up.

.

DRILLERS DESCRIPTION	DEPTH		THICKNESS	SAMPLE DETAILS		
	FROM	TO		NO.	TYPE	DEPTH
Made up ground	G.L.	0.20	0.20			
Brown sandy clay	0.20	7.00	6.80			
Gravel & clay	7.00	7.90	0.90			
Sand & gravel	9.00	13.00	4.00			
Green sandy clay	13.00	16.00	3.00			
Boulder clay	16.00	21.00	5.00			
Green & red sandy clay	21.00	31.00	10.00			
Chalk	31.00	40.00	9.00			
Total depth			40.00			

Appendix F

GROUND WATER SOURCE PROTECTION ZONE MAP



Source Protection Zone Map (from MAGIC map DEFRA)

Appendix G

MICRO DRAINAGE CALCULATIONS

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

Half Drain Time : 162 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.034	12.034	7.2	72.9	O K
30 min Summer	9.304	12.304	7.2	91.8	O K
60 min Summer	9.498	12.498	7.2	105.4	O K
120 min Summer	9.528	12.528	7.2	107.5	O K
180 min Summer	9.447	12.447	7.2	101.8	O K
240 min Summer	9.374	12.374	7.2	96.7	O K
360 min Summer	9.238	12.238	7.2	87.2	O K
480 min Summer	9.114	12.114	7.2	78.5	O K
600 min Summer	8.996	11.996	7.2	70.3	O K
720 min Summer	8.882	11.882	7.2	62.3	O K
960 min Summer	8.675	11.675	7.2	47.8	O K
1440 min Summer	8.345	11.345	7.2	24.7	O K
2160 min Summer	8.063	11.063	7.2	5.0	O K
2880 min Summer	1.664	4.664	6.7	0.2	O K
4320 min Summer	0.336	3.336	4.8	0.2	O K
5760 min Summer	-0.371	2.629	3.8	0.1	O K
7200 min Summer	-0.814	2.186	3.1	0.1	O K
8640 min Summer	-1.123	1.877	2.7	0.1	O K
10080 min Summer	-1.349	1.651	2.4	0.1	O K
15 min Winter	9.177	12.177	7.2	82.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	138.700	0.0	24
30 min Summer	89.947	0.0	38
60 min Summer	55.544	0.0	66
120 min Summer	33.174	0.0	120
180 min Summer	24.241	0.0	152
240 min Summer	19.305	0.0	182
360 min Summer	13.918	0.0	250
480 min Summer	11.043	0.0	316
600 min Summer	9.223	0.0	384
720 min Summer	7.957	0.0	450
960 min Summer	6.300	0.0	576
1440 min Summer	4.527	0.0	812
2160 min Summer	3.248	0.0	1132
2880 min Summer	2.565	0.0	1428
4320 min Summer	1.836	0.0	2132
5760 min Summer	1.447	0.0	2872
7200 min Summer	1.203	0.0	3544
8640 min Summer	1.034	0.0	4264
10080 min Summer	0.909	0.0	5096
15 min Winter	138.700	0.0	25

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	9.492	12.492	7.2	105.0	O K
60 min Winter	9.734	12.734	7.2	121.9	O K
120 min Winter	9.819	12.819	7.2	127.8	O K
180 min Winter	9.735	12.735	7.2	122.0	O K
240 min Winter	9.627	12.627	7.2	114.4	O K
360 min Winter	9.438	12.438	7.2	101.2	O K
480 min Winter	9.253	12.253	7.2	88.2	O K
600 min Winter	9.071	12.071	7.2	75.5	O K
720 min Winter	8.898	11.898	7.2	63.4	O K
960 min Winter	8.586	11.586	7.2	41.6	O K
1440 min Winter	8.134	11.134	7.2	9.9	O K
2160 min Winter	1.261	4.261	6.1	0.2	O K
2880 min Winter	0.364	3.364	4.8	0.2	O K
4320 min Winter	-0.591	2.409	3.5	0.1	O K
5760 min Winter	-1.101	1.899	2.7	0.1	O K
7200 min Winter	-1.422	1.578	2.3	0.1	O K
8640 min Winter	-1.644	1.356	2.0	0.1	O K
10080 min Winter	-1.807	1.193	1.7	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	89.947	0.0	38
60 min Winter	55.544	0.0	66
120 min Winter	33.174	0.0	120
180 min Winter	24.241	0.0	172
240 min Winter	19.305	0.0	196
360 min Winter	13.918	0.0	272
480 min Winter	11.043	0.0	346
600 min Winter	9.223	0.0	416
720 min Winter	7.957	0.0	484
960 min Winter	6.300	0.0	610
1440 min Winter	4.527	0.0	824
2160 min Winter	3.248	0.0	1076
2880 min Winter	2.565	0.0	1448
4320 min Winter	1.836	0.0	2148
5760 min Winter	1.447	0.0	2936
7200 min Winter	1.203	0.0	3592
8640 min Winter	1.034	0.0	4296
10080 min Winter	0.909	0.0	5000

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.600	Shortest Storm (mins)	15
Ratio R	0.431	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.320

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.107	4	8	0.107	8	12	0.107

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Model Details

Storage is Online Cover Level (m) 10.000

Deep Bore Soakaway Structure

Chamber Invert Level (m)	8.000	Borehole Depth (m)	11.000
Chamber Diameter/Length (m)	10.000	Infiltration Coefficient Base (m/hr)	0.00000
Chamber Width (m)	7.000	Safety Factor	2.0
Borehole Diameter (m)	0.250		

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	13.20000	3.000	13.20000	6.000	0.00000	9.000	0.00000
1.000	13.20000	4.000	13.20000	7.000	0.00000	10.000	0.00000
2.000	13.20000	5.000	0.00000	8.000	0.00000	11.000	0.00000

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