

Foul and Surface Water Drainage Report

Land to North of 61 Hollybank Lane, Emsworth PO10 7UE

For

Darren Rehill

Rev - P

Reference **C1710**

Date **10th August 2021**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	10.08.21	Initial Issue	LH	CS

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1 Introduction

- 1.1.1 CGS Civils Ltd have been appointed by Darren Rehill to undertake a drainage strategy report for a proposed development at Land to North of 61 Hollybank Lane in Emsworth.
- 1.1.2 The purpose of this drainage strategy is to demonstrate how the development area can be satisfactorily drained without increasing flood risk onsite and elsewhere.
- 1.1.3 The existing site consists of a detached stable and undeveloped landscaped area. The proposed development will consist of the demolition of the existing stable and the development of 1 No. 4 bedroom dwelling with associated access and parking.
- 1.1.4 The proposed development is located as OS Grid Reference SU 74550 07894 and has the post code PO10 7UA
- 1.1.5 The total green line boundary is approximately 0.0508 Ha and the proposed development will result in an increase of 0.021 Ha of impermeable area.
- 1.1.6 The proposed site is located within a root protection zone. A copy of this plan can be found in **Appendix D**.
- 1.1.7 The proposed site plan can be found in **Appendix A**.

Fig 1. Site Location

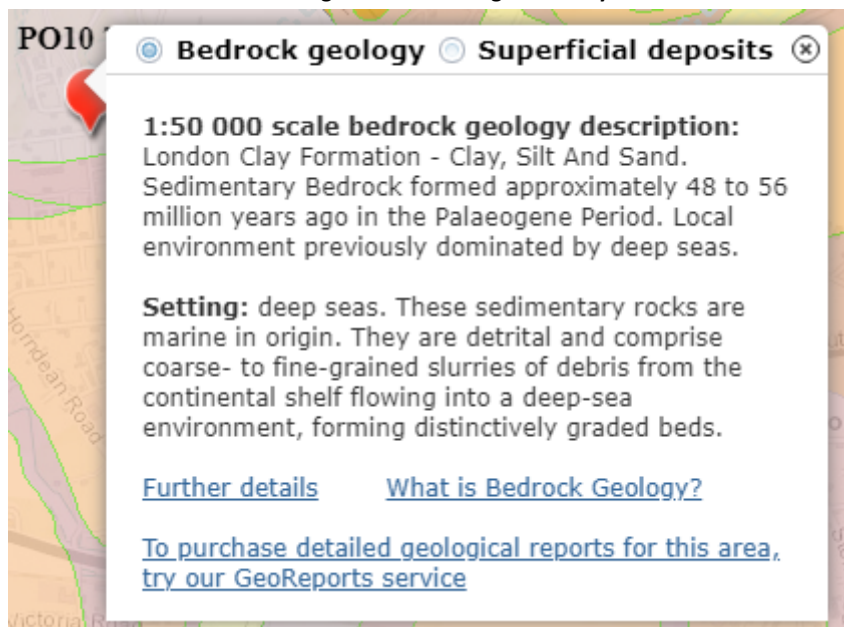


2 Site Geology

2.1 British Geological Survey information

- 2.1.1 The British Geological Survey confirms the bedrock geology to be made up London Clay Formation which is primarily comprised of Clay, Silt and Sand. At the time of writing the British Geological Survey website does not have any recorded information of the Superficial deposits on site.

Fig 2. British Geological Survey



2.2 Hydrogeology Setting

- 2.2.1 The Environment Agency (EA) mapping service, as provided by Magic Map, indicates the aquifer designation for the bedrock and superficial drift geology and the groundwater vulnerability in the area. The mapping, as included in **Appendix E**, provides the following information for the site:
- 2.2.2 The site will not pose a risk to the groundwater on site as there will be no discharge of any hazardous materials to ground.

Geology Map	Site Description
Aquifer Designation (Bedrock)	N/A
Aquifer Designation (Superficial Drift)	N/A
Groundwater Vulnerability	Unproductive
Groundwater Source Protection Zone	N/A

3 Existing Drainage

- 3.1.1 As the site consists of an undeveloped landscaped area, there is no existing drainage on site. A culvert runs across the western flank of the site; to the south runs an existing foul water sewer.

4 Proposed Drainage Strategy

4.1 SuDS Hierarchy

- 4.1.1 All options for the destination of run-off generated on site have been assessed in line with the SuDS hierarchy as set out in Building Regulations Part H document and DEFRA's Draft National Standards for SuDS.

Discharge Destination	
Discharge to Ground	N/A
Discharge to Watercourse	Discharge to watercourse via culvert – Restricted to 1.0l/s
Discharge to Surface Water Sewer	N/A
Discharge to Other Sewer	N/A

4.2 Surface Water Drainage

- 4.2.1 In order to follow the SuDS Hierarchy, soakaway usage was investigated for this site. On site soakage tests to BRE365 were carried out to calculate the infiltration rate of soil on site. These tests were deemed to be a failure; therefore, it is proposed that all surface water runoff is to be discharged into the culvert that runs along the eastern edge of the site at a restricted rate of 1.0l/s. All roof areas are to be collected into a positive drainage network before being discharged into the culvert and all hard paved areas are to be freely drained to ground via porous construction as infiltration will be sufficient to allow it to self-drain. The network has been designed to cater for the 1 in 100-year +40% storm.
- 4.2.2 An existing drainage ditch is located on the eastern border of the site which flows under the proposed access road. It is proposed that the existing culvert is to be removed, replaced, and extended. The ditch profile may need to be altered and a new headwall is to be constructed. This is subject to an Ordinary Watercourse Consent application.
- 4.2.3 Hydraulic calculations have been carried out which can be found at Appendix C.

4.3 Water Quality

- 4.3.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution.
- 4.3.2 Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals, and various organic and inorganic contaminants) Therefore the first 5-10mm of rainfall should be adequately treated with SuDS.
- 4.3.3 The new SuDS Manual (Ciria C753, November 2015) introduces slightly different approach compared to the previous version for the water quality management of surface water. The Manual describes risks posed by the surface water runoff to the receiving environment as a function of:
- The pollution hazard at a particular site (i.e., the pollution source)
 - The effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels
 - The sensitivity of the receiving environment
- 4.3.4 The EA website indicates that the site does not lie within a Source Protection Zone.
- 4.3.5 The recommended approaches for water quality risk management are given in the SuDS Manual Table 26.1.

Fig 5. Approaches to Water Quality Risk Management

Table 26.1 Approaches to Water Quality Risk Management			
Design method	Hazard Characterisation	Risk Reduction	
		For Surface Water	For Groundwater
Simple Index Approach	Simple pollution hazard indices based on land use (Table 26.2)	Simple SuDS hazard mitigation indices (Table 26.3)	Simple SuDS hazard mitigation indices (Table 26.4)
Risk Screening	Factors characterising traffic density and extent of infiltration likely to occur (Table 26.5)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (Table 26.5)
Detailed Risk Assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in even mean discharge concentrations and total annual load reductions delivered by the system	

- 4.3.6 As per Table 26.1 Simple Index approach will be used as a design method for this site.
- 4.3.7 Table 26.2 will provide hazard classification of different land uses. The land uses for the surface water drainage for this site are.
- Residential Roofs
 - Individual Property driveways and residential car parks
 - Low traffic roads
- 4.3.8 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index for each contaminant type. Therefore, the following must be achieved for the surface running off the site.

Total SuDS mitigation index $\geq$ pollution hazard index

- 4.3.9 Pollution Hazard Indices are given for different land uses in Table 26.2 of the SuDS manual;

Fig 6. Pollution Hazard Indices for Different Land Use Classifications

Table 26.2 Pollution hazard indices for different land use classifications				
Land Use	Pollution Hazard Level	Total Suspended solids (TSS)	Metals	Hydro-Carbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (Typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g., cul-de-sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g., schools, offices) i.e., < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g., hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g., haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

4.3.10 From Table 26.2 the following information is tabulated in Table 1

Table 1: Pollution hazard index and destination of runoff for the proposed site

Table 1: Pollution Hazard Index and Destination of runoff for the proposed Site					
Land Use	Destination of Runoff	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Residential Roof	Ground Water	Very Low	0.2	0.2	0.05
Individual driveways, residential car parks and low traffic roads	Ground water	Low	0.5	0.4	0.4

4.3.11 The SuDS mitigation index will be obtained from Table 26.4 (for groundwater) of the SuDS manual.

Figure 7 Indicative SuDS Mitigation Indices for discharges to ground waters.

4.3.12 SuDS mitigation index are tabulated in Table 5 as followed.

Table 26.4 Indicative SuDS mitigation indices for discharges to groundwater			
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good containment attenuation potential of at least 300mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, i.e., graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth.	0.4	0.4	0.4
Constructed permeable pavement (where a suitable filtration later is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

Table 2: SuDS mitigation index

Mitigation Indices						
Runoff Source	Destination of Runoff	Mitigation Index Source	Type of SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Individual driveways, residential car parks and low traffic roads	Ground water	Table 26.4	Permeable Pavement	0.7	0.6	0.7

4.3.13 The above analysis demonstrates that the SuDS devices within the design will mitigate any pollution present within the surface water system.

4.4 Foul water drainage

- 4.4.1 An existing foul water sewer runs along the southern flank of the site. It is proposed to connect the foul water from site onto this via a new manhole connection. This connection is subject to a S106 application with Southern Water and due to the located of the sewer to the proposed development, a declaration of works will need to be made.
- 4.4.2 A CCTV survey should be undertaken to confirm if a connection onsite is possible and if remedial works are required.

5 Maintenance

5.1 Introduction

- 5.1.1 During construction, the Contractor will be responsible for maintaining the drainage and SuDS (Sustainable Drainage Systems). Upon handover, the occupier will take on the responsibility of these duties as laid out in this report.
- 5.1.2 The maintenance schedule for the proposed development will be split down into two separate categories; SuDS features and regular private drainage.

5.2 SuDS at 61 Hollybank Lane, Emsworth

- 5.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Permeable paving**
- 5.2.2 The SuDS features have been designed for easy maintenance and comprise:
- Regular Day-to-Day care – litter collection, regular gardening to control vegetation growth and checking inlets where water enters the SuDS features
 - Occasional tasks – checking the SuDS features and removing any silt that builds up in the SuDS feature
 - Remedial work – repairing damage where necessary

5.3 SuDS Drainage Maintenance Specification

5.3.1 Permeable Paving

In order to maintain the functioning of the permeable paving, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for permeable paving		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rate and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

5.4 General Drainage Maintenance Specification

5.4.1 Inlet Structures and Inspection Chambers

- Inlet structures such as rainwater downpipes, road gullies and channel drains should be free from obstruction at all times to allow free flow through the SuDS
- Inspection Chambers and Rodding Eyes are used on bends or where pipes come together. They allow access and cleaning to the system if necessary.

Inlet Structures and Inspection Chambers	
Regular Maintenance	Frequency
Inlet Structures Inspect rainwater downpipes, channel drains and road gullies, removing obstructions and silt as necessary. Check that there is no physical damage. Trim vegetation 1m min surround to structures and keep area free from silt and debris	Monthly
Inspection Chambers and below ground control chambers. Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in Autumn	Annually
Occasional Maintenance Check topsoil levels are 20mm above edges of chambers to avoid mower damage.	As necessary
Remedial Work Repair physical damage if necessary	As required

5.4.2 Below ground drainage pipes

- Below ground drainage pipes convey water to the SuDS system. They should always be free from obstruction to allow free flow.

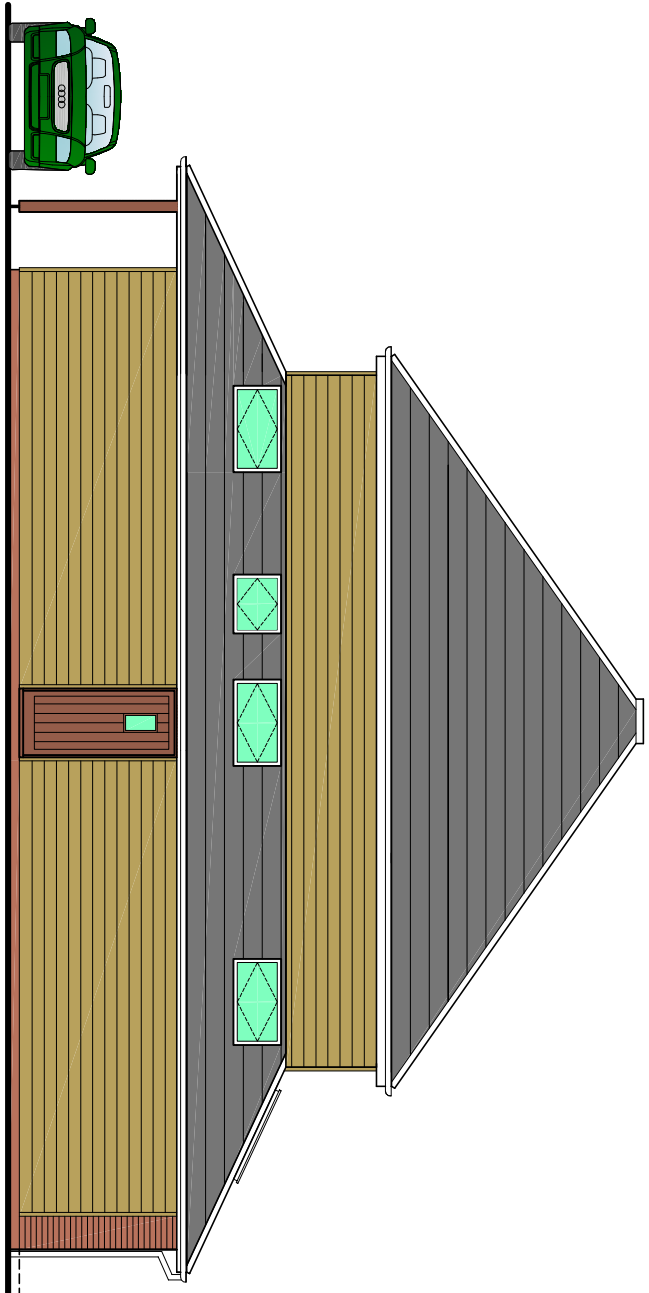
Below Ground Drainage Pipes	
Regular Maintenance	Frequency
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks.	Monthly or as required
Remedial Work	
Repair physical damage if necessary	As required
Monitoring	
Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required

6 Summary and Conclusions

- 6.1.1 CGS Civils has been instructed by Darren Rehill to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for the development of a new 1 No. 4-bedroom property with associated access and parking.
- 6.1.2 The Surface Water will discharge to into the existing culvert which is to be replaced and extended. The connection will be made via a new saddle connection and the discharge will be restricted down to 1.0l/s. All hard paved areas are to be made of a no-dig porous construction which will drain freely to ground via infiltration. The network has been designed to cater for the 1 in 100-year +40% storm.
- 6.1.3 The Foul water will discharge into the local existing foul water sewer that flows across site via a new chamber to be constructed over it. This connection is subject to a CCTV drainage survey.
- 6.1.4 The report has demonstrated that the proposed drainage measures ensure that suitable means of surface water and foul drainage can be achieved for the proposed development.

7 Appendices

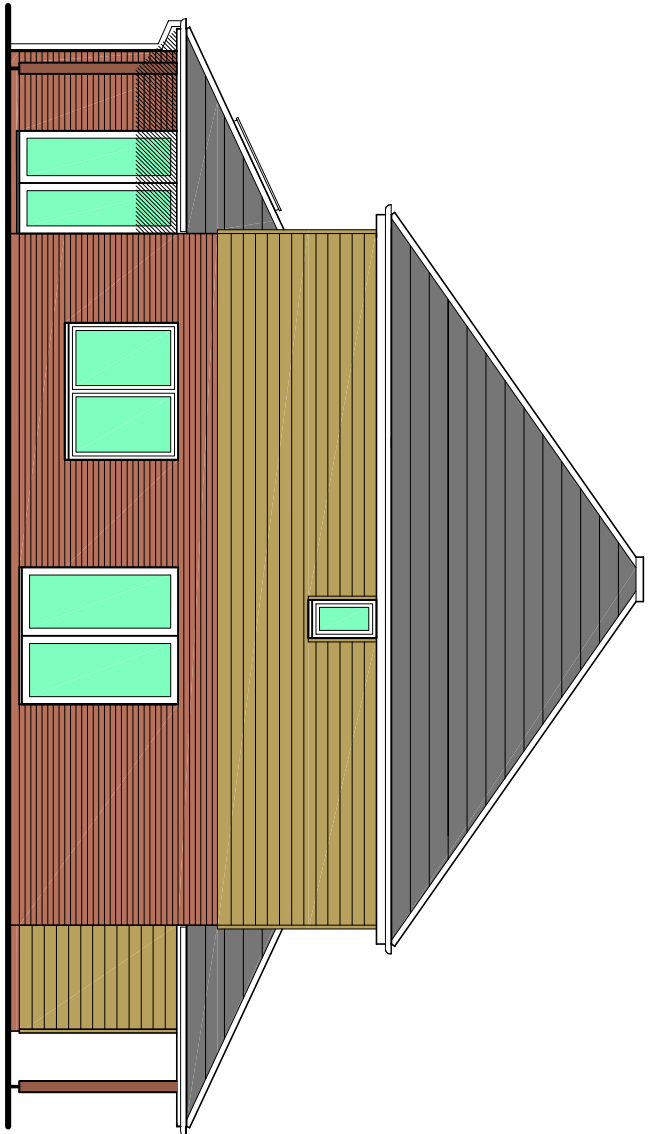
7.1 Appendix A – Site Plan



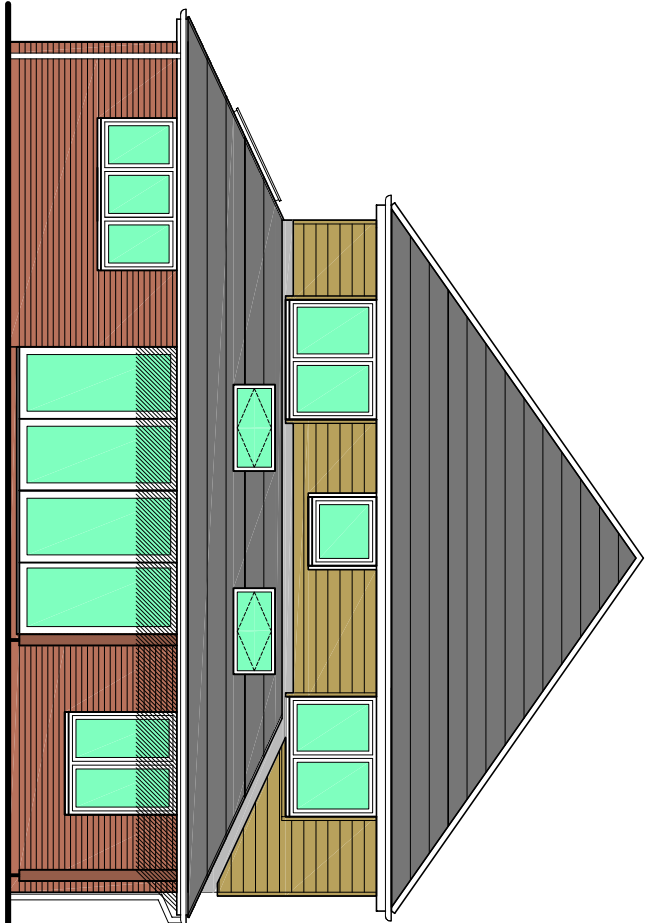
Proposed north (side) elevation scale 1:100



Proposed east (front) elevation



Proposed south (side) elevation



Proposed west (rear) elevation

Schedule of materials:



Marley Eternit cladding



Aluminum doors & windows - black

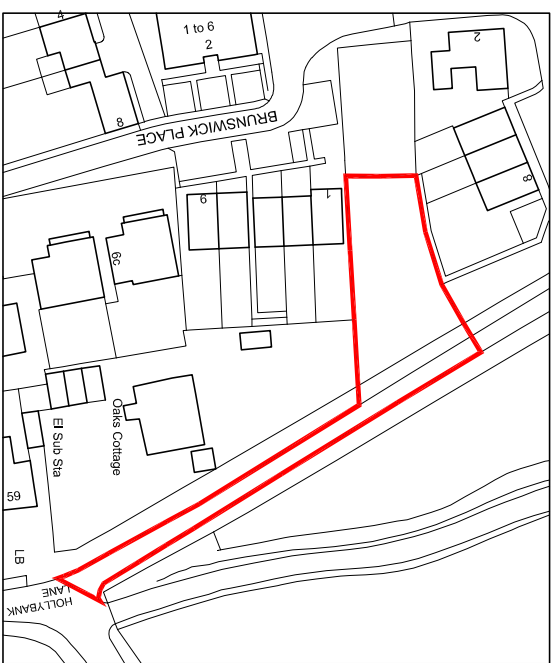


Velux skylight

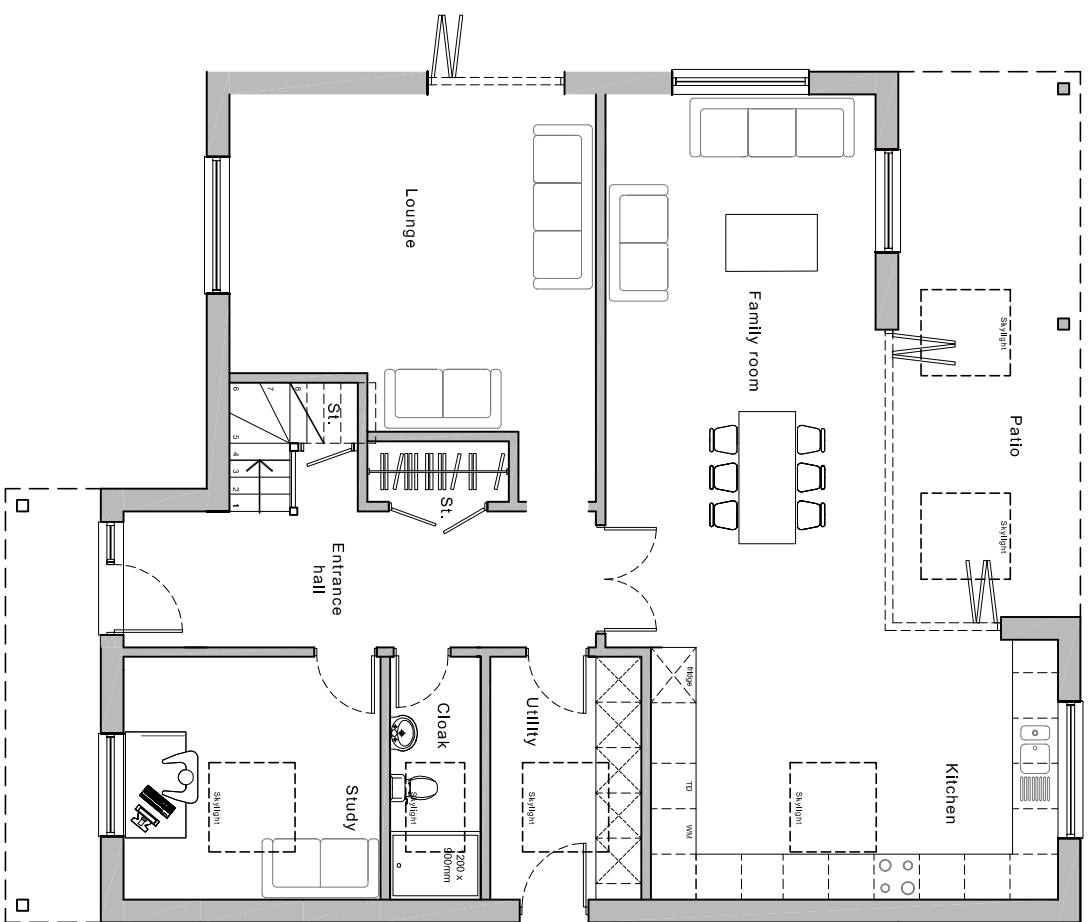
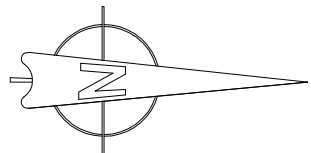


Red brick

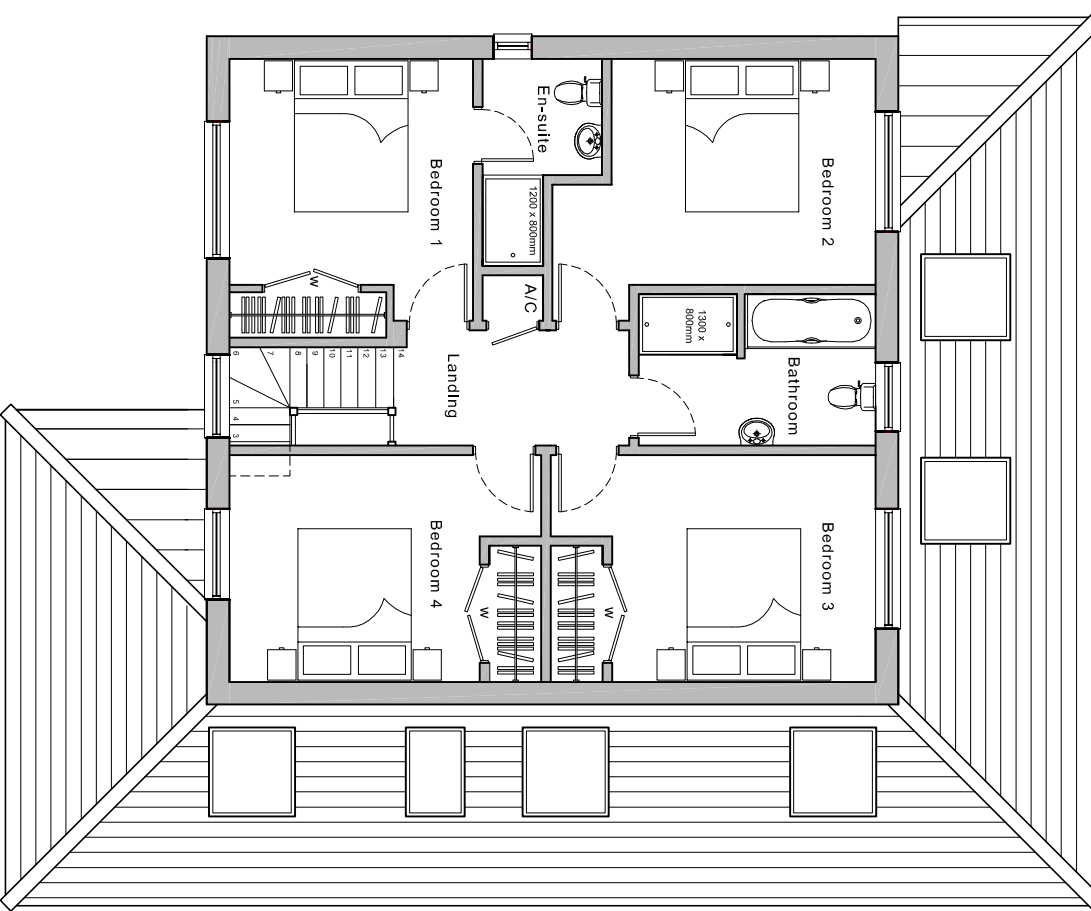
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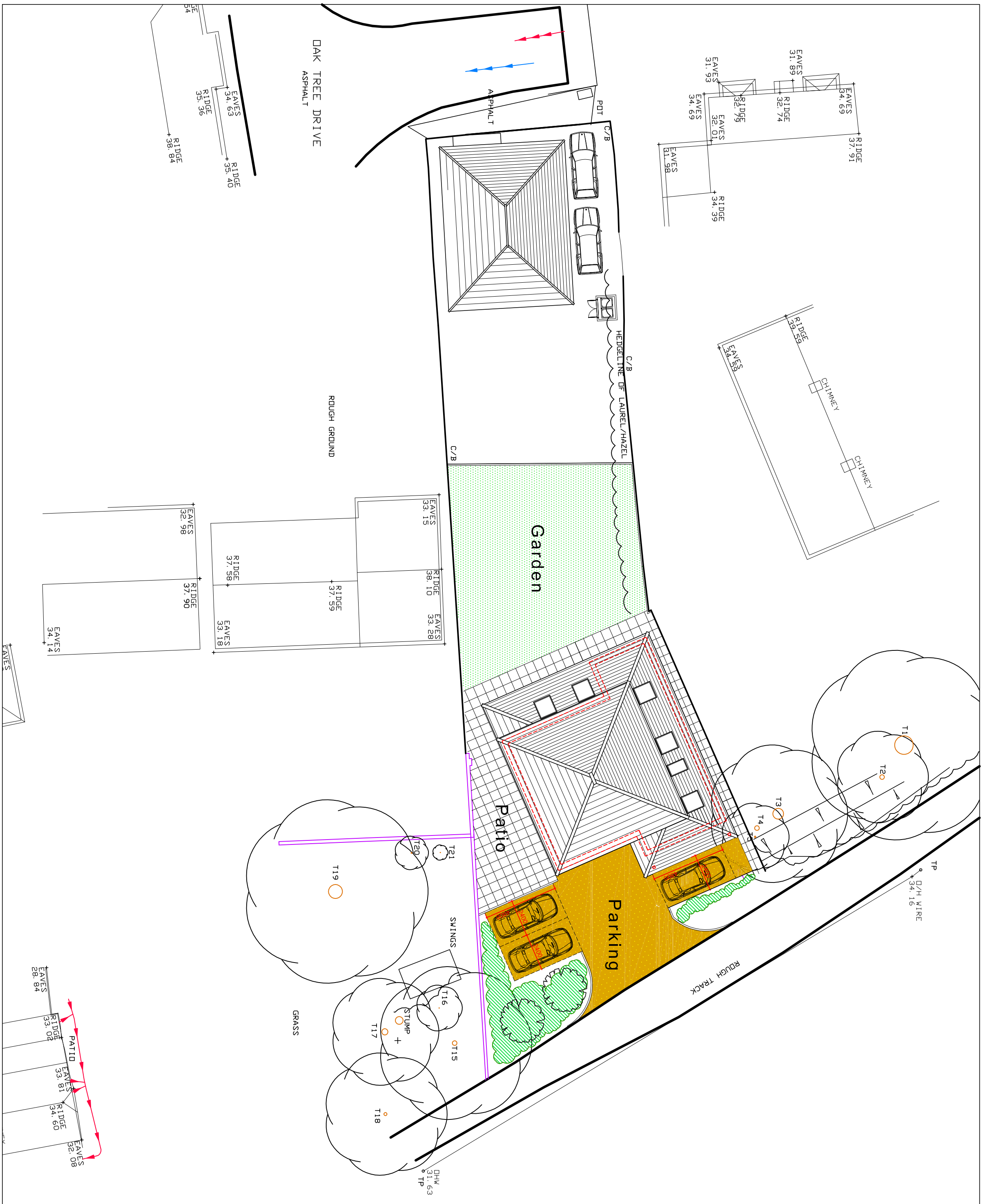
Location plan
scale 1:1250



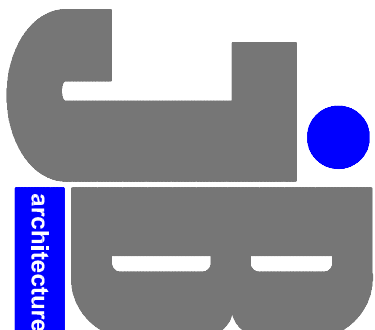
Proposed ground floor plan scale 1:100



Proposed first floor plan



Proposed site plan scale 1:200



JB ARCHITECTURE
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Web: www.jb-architecturedesign.com
TEL: 01243 993732

For
Mrs & Mrs REHILL

Project
**PROPOSED NEW DWELLING
AT LAND NORTH OF
61 HOLLYBANK LANE
HANTS**

Title
**PROPOSED FLOOR PLANS,
ELEVATIONS & SITE PLAN**

Date	Drawn	Scale	Checked
FEB 2020	JB	1:100 @ A1	-
Job Number	Drawing Number	Revision	
PL27030	B		

7.2 **Appendix B – Drainage Layout**

DESIGN SUBJECT TO THE APPROVAL OF:
PLANNING AUTHORITY
BUILDING CONTROL
SOUTHERN WATER

DESIGN SUBJECT TO THE CONFIRMATION OF:
ORDINARY WATERCOURSE APPROVAL
CCTV DRAINAGE SURVEY

DRAINAGE LEGEND (1:100)

EXISTING FEATURES

Ex FWD Existing foul water sewer/drain and manhole

PROPOSED FEATURES

SWD Storm water sewer/drain

Rainwater pipe

Storm water access chamber (3000)

Storm water inspection chamber (4500)

Porous paved parking area

'NO DIG' Construction

FWD Foul water sewer/drain

FW Soil stack (type TBC by architect/m&e engineer)

Foul water access chamber (3000)

Foul water inspection chamber (4500)

00.000

1000 4.5m 1:100
Z BED

ABBREVIATIONS

MH - MANHOLE
IC - INSPECTION CHAMBER
AC - ACCESS CHAMBER
CP - CATCHPIT
BC - BRAKE CHAMBER
RE - RODDING EYE
IL - INVERT LEVEL
SL - SUMP LEVEL
CL - COVER LEVEL

Root Protection Zone

STANDARD DRAINAGE NOTES

- DO NOT SCALE FROM THIS DRAWING. REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
- ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
- ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
- BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
- ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT. THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY.
- COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
- ALL UN-REFERENCED PIPES ARE ASSUMED TO BE 100mm DIA.
- ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 295 AND BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911:PART 1.
- ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
- ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION LAID DOWN DOWN IN 'SEWERS FOR ADOPTION' 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
- ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
- THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
- STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
- IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. SUB SOIL DRAINS ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER.
- NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
- ALL EXISTING MANHOLE COVERS, GULLIES, ETC. ARE TO BE RAISED/LOWERED TO SUIT NEW LEVELS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT.
- UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION.
- MANHOLE AND CHAMBER COVER GRADES:
 - 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
 - 'B125' IN ALL DRIVEWAYS
 - 'C250' IN PRIVATE PARKING AREAS
 - 'D400' IN CARRIAGEWAY/ACCESS ROAD



Prefixed to drawing numbers shall signify the following:-

P = PRELIMINARY	Shall not be used for contract or construction purposes
T = TENDER	Shall not be used for construction purposes
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

REV	DATE	DESCRIPTION	BY	CHK	APP
P-	10.08.21	PRELIMINARY ISSUE	LH	CS	CS



CLIENT
DARREN REHILL

ARCHITECT
JB ARCHITECTURE

JOB TITLE
LAND NORTH OF 61 HOLLYBANK LANE
EMSWORTH

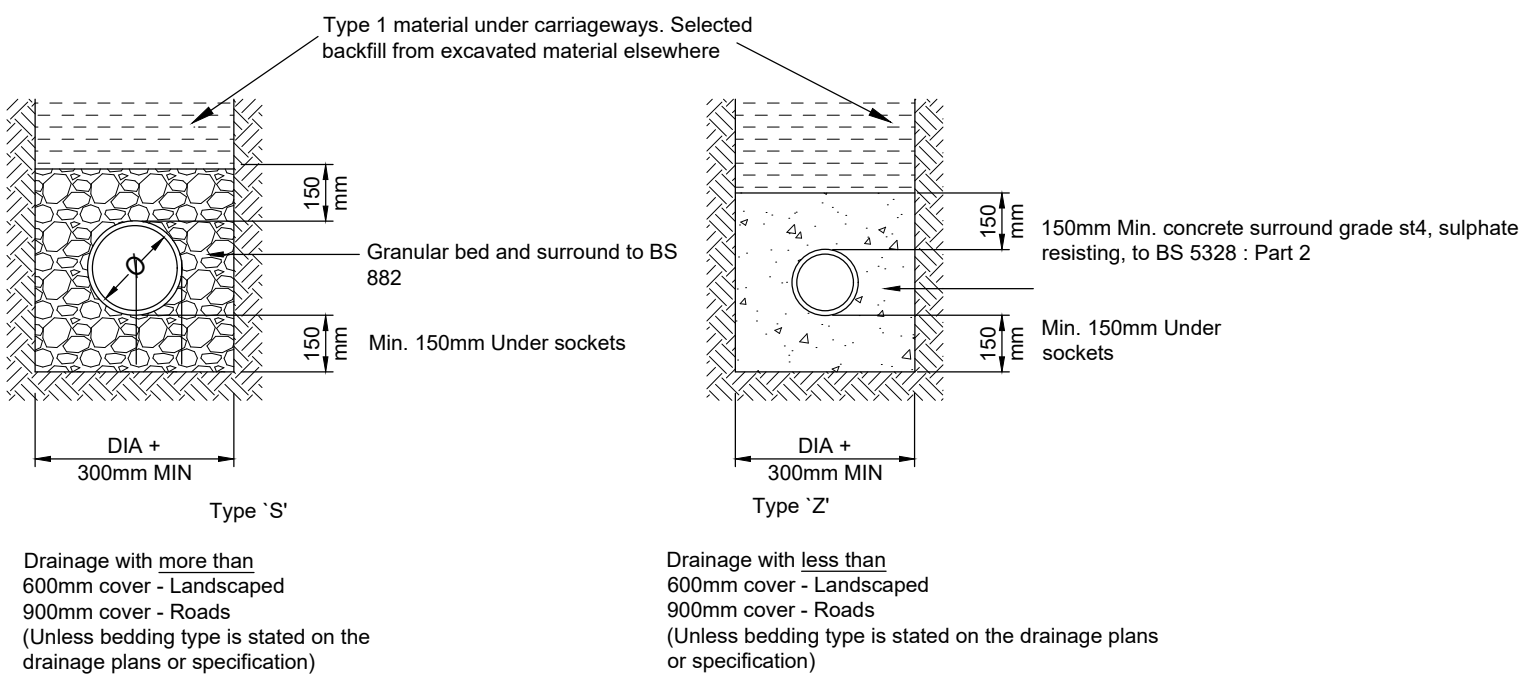
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DRAINAGE LAYOUT

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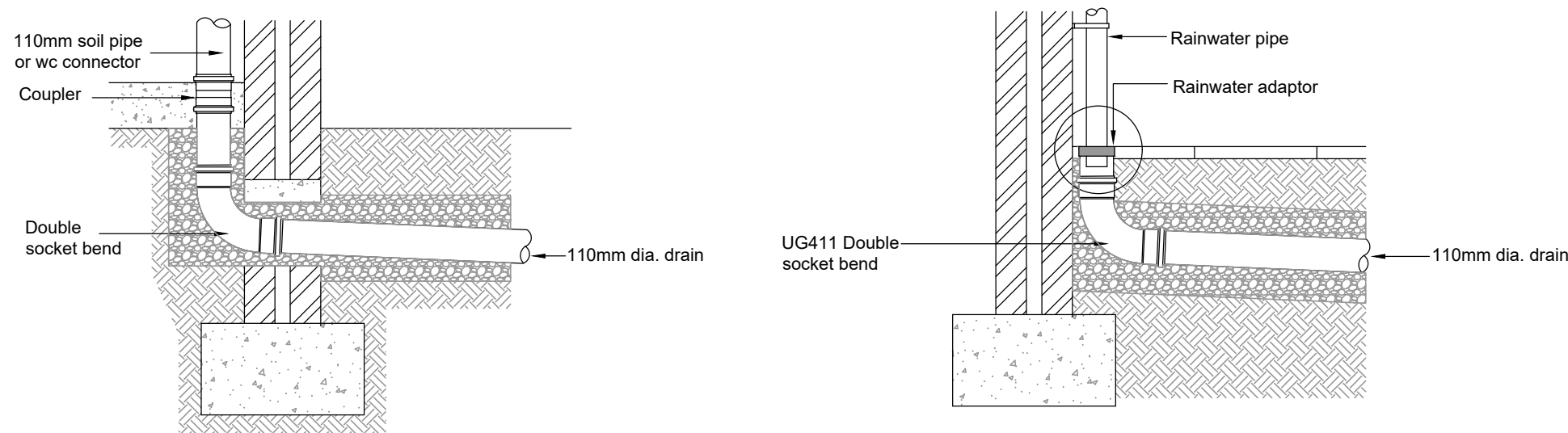
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JOB No.	STATUS	DRAWING No.	REV.
C1710	P	100	P-

PRELIMINARY

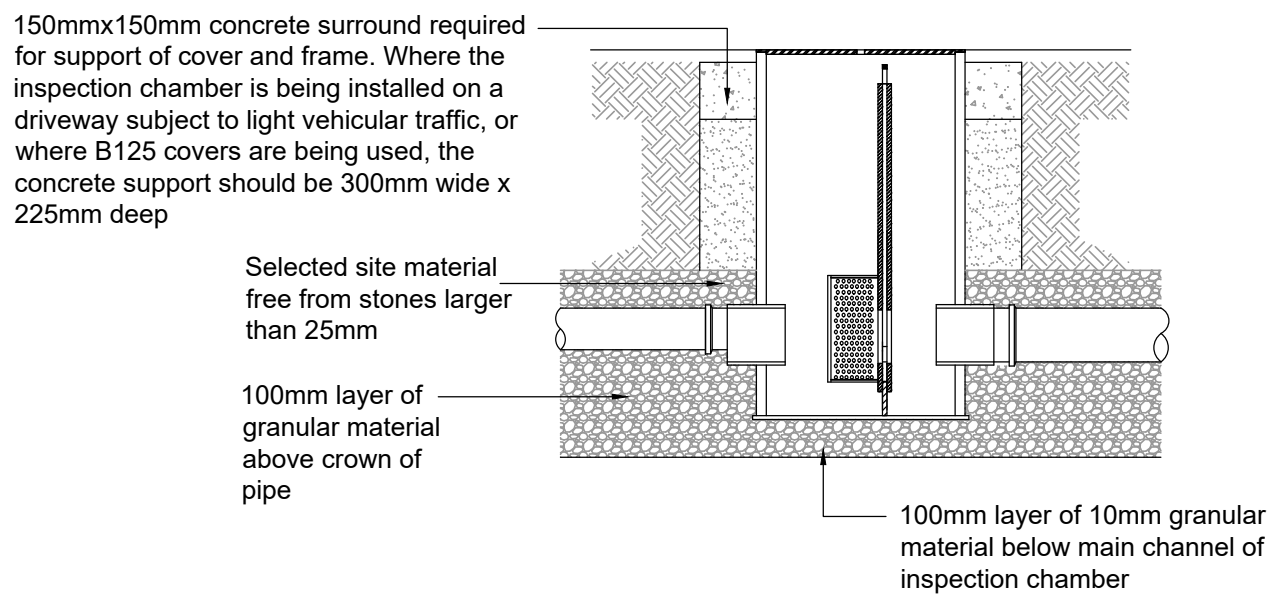


Pipe bedding details in private Areas



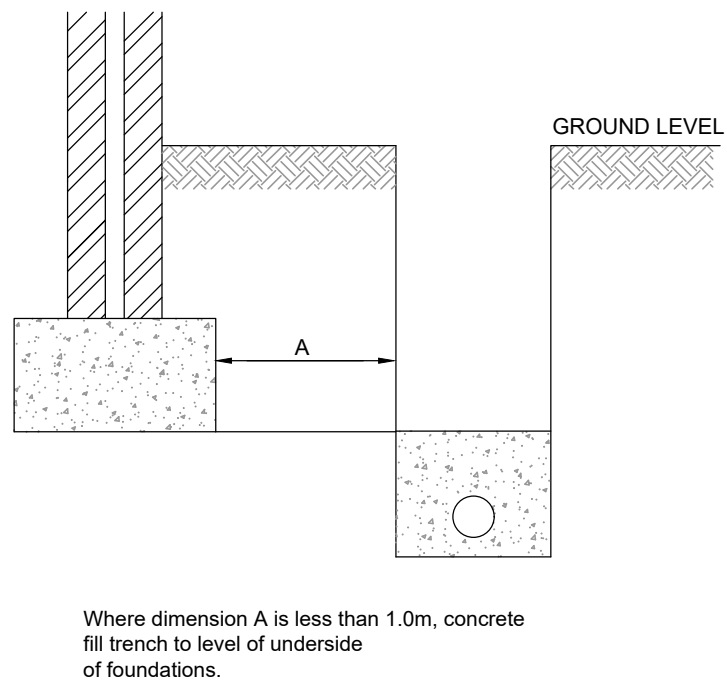
Soil pipe / wc connection

Rainwater pipe connection

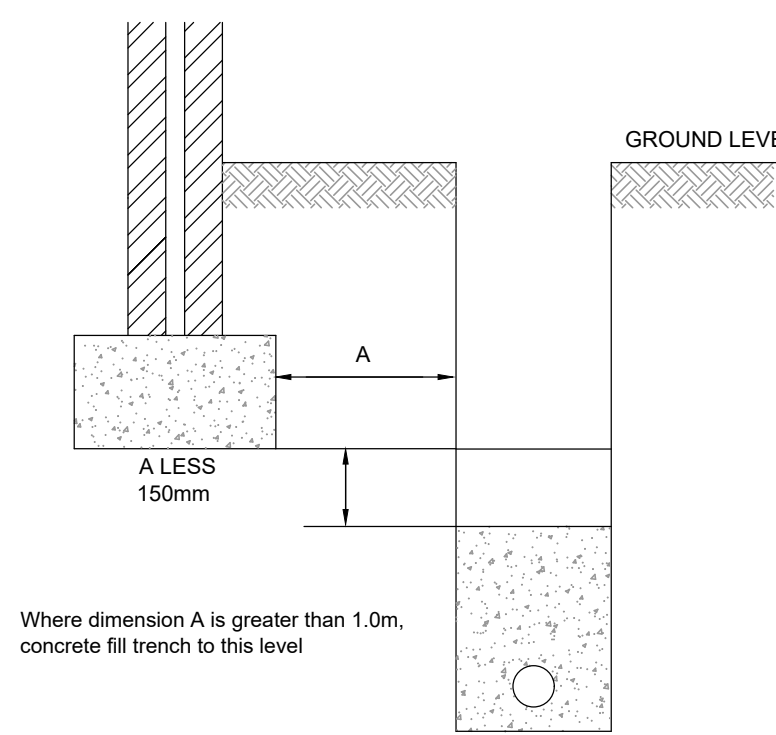


SEL CONTROFLOW 500 ORIFICE CHAMBER

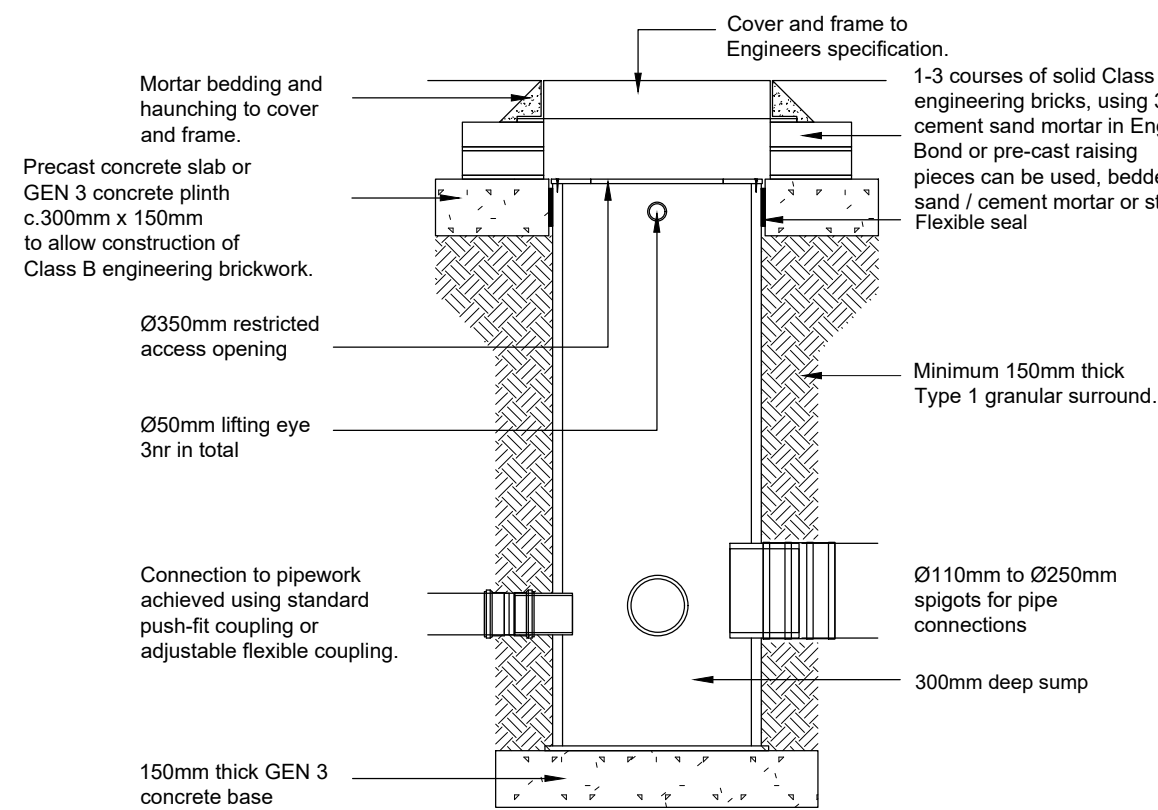
SEL Environmental LTD
Phone: 01254 589987
Email: sales@selenvironmental.com



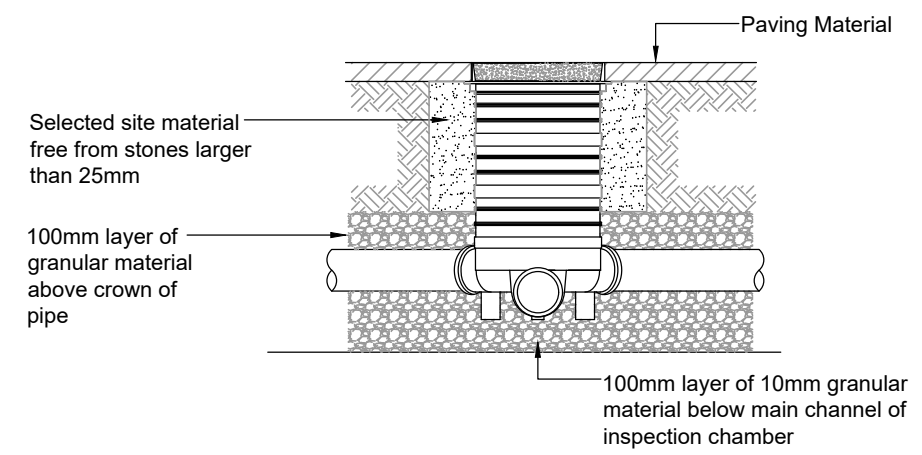
Pipes near buildings



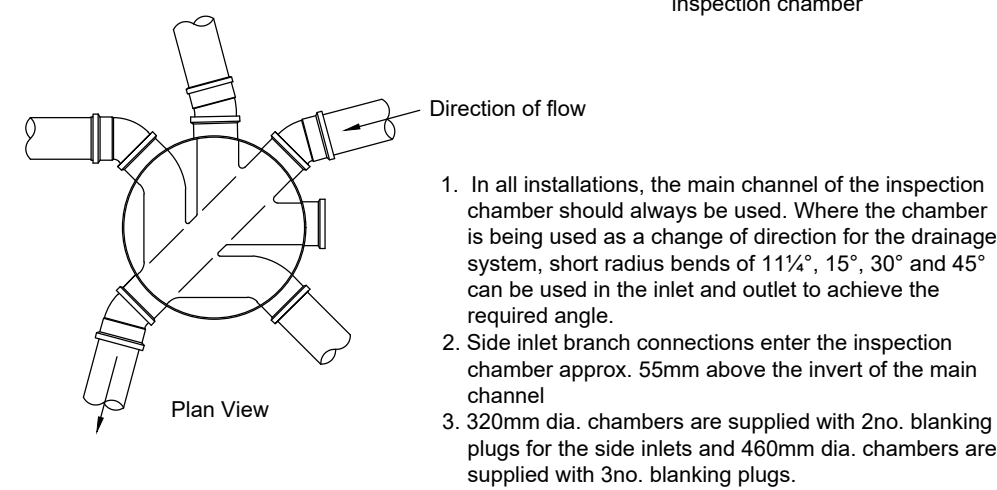
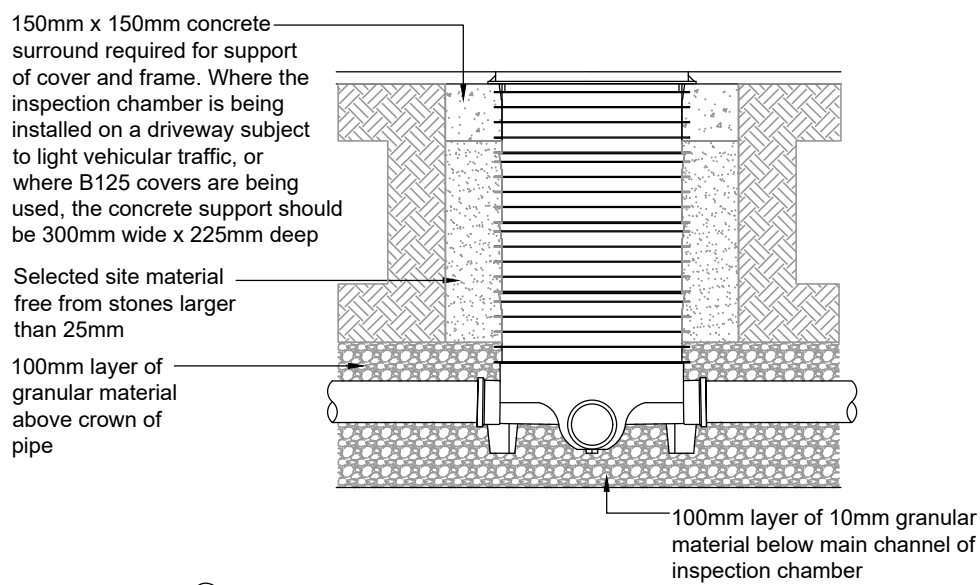
Pipes near buildings



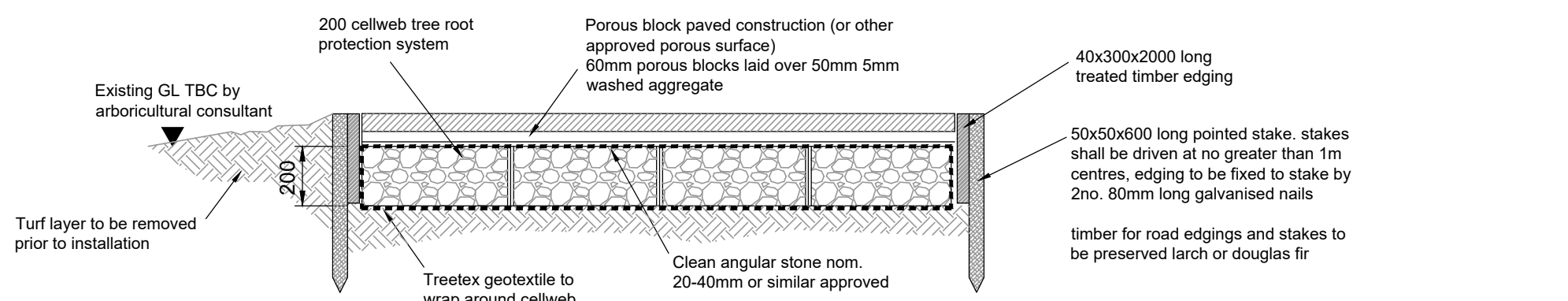
SEL WASP05050 500Ø Inspection Chamber



300mmØ SHALLOW INSPECTION CHAMBER DETAIL

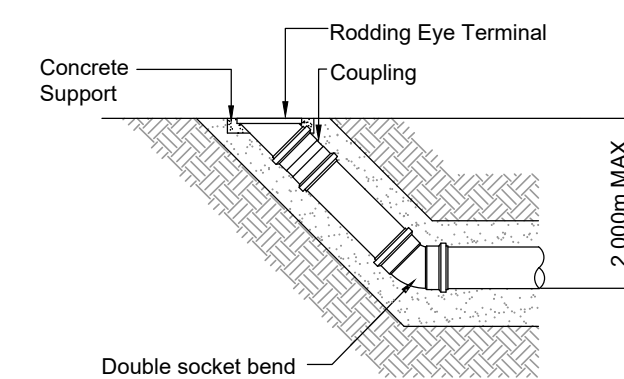


460mmØ INSPECTION CHAMBER DETAIL

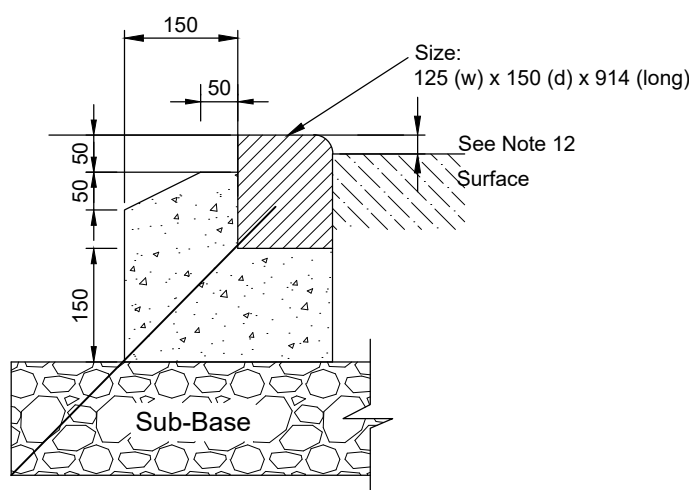


Typical 'no dig' access road construction

subject to detailed design by geosynthetics ltd
to be installed in accordance with geosynthetic lds installation guide and specification

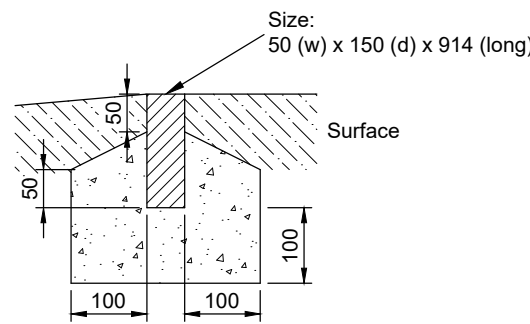


Rodding eye detail



DROP KERB TYPE BN (1:10)

Where upstand of BN kerb is 0mm (flush), kerbs are to be inverted.



Edging type EF flat top (1:10)

Prefixed to drawing numbers shall signify the following:-			
P = PRELIMINARY	Shall not be used for contract or construction purposes	LH	CS
T = TENDER	Shall not be used for construction purposes	BY	CHK APP
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes		
R = RECORD	Record of actual completed work		

P-	10.08.21	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP
 Consulting Civil Engineers					
CLIENT DARREN REHILL					
ARCHITECT JB ARCHITECTURE					
JOB TITLE LAND NORTH OF 61 HOLLYBANK LANE EMSWORTH					
DRAWING TITLE CONSTRUCTION DETAILS					
DRAWN LH		ENGINEER C SLADE		CHECKED CS	APPROVED CS
DATE AUGUST 2021		SCALE @ A1		1:100	
JOB No. C1710		STATUS P		DRAWING No. 300	
				REV. P-	

PRELIMINARY

7.3 **Appendix C – Surface Water Calculations**

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.600
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.006	5.00	28.507	450	531.935	155.173	0.452
S2	0.001	5.00	28.750	500	532.205	149.708	0.750
S3	0.002	5.00	28.750	450	523.613	146.018	0.592
S4			28.750	450	518.519	145.438	0.541
S5	0.001	5.00	28.750	450	516.325	150.507	0.486
S6	0.002	5.00	28.750	300	516.089	154.079	0.450
OUTFALL			27.600	100	538.823	149.492	0.500

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	5.472	0.600	28.055	28.000	0.055	99.5	100	5.12	50.0
1.001	S2	OUTFALL	6.622	0.600	28.000	27.100	0.900	7.4	100	5.50	50.0
2.000	S6	S5	3.580	0.600	28.300	28.264	0.036	99.4	100	5.08	50.0
2.001	S5	S4	5.523	0.600	28.264	28.209	0.055	100.4	100	5.20	50.0
2.002	S4	S3	5.127	0.600	28.209	28.158	0.051	100.5	100	5.31	50.0
2.003	S3	S2	9.351	0.600	28.158	28.000	0.158	59.2	100	5.46	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.771	6.1	0.8	0.352	0.650	0.006	0.0	25	0.533
1.001	2.868	22.5	1.6	0.650	0.400	0.012	0.0	18	1.671
2.000	0.771	6.1	0.3	0.350	0.386	0.002	0.0	14	0.382
2.001	0.767	6.0	0.4	0.386	0.441	0.003	0.0	18	0.431
2.002	0.767	6.0	0.4	0.441	0.492	0.003	0.0	18	0.431
2.003	1.003	7.9	0.7	0.492	0.650	0.005	0.0	20	0.611

Node S2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.750	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	28.000	Diameter (m)	0.024		

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

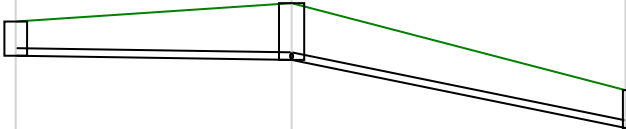
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S1	24	28.362	0.307	1.8	0.1305	0.0000	FLOOD RISK
30 minute summer	S2	26	28.361	0.361	1.6	0.0806	0.0000	SURCHARGED
60 minute summer	S3	43	28.362	0.204	0.9	0.0463	0.0000	SURCHARGED
60 minute summer	S4	43	28.362	0.153	0.9	0.0243	0.0000	SURCHARGED
30 minute summer	S5	25	28.362	0.098	1.1	0.0196	0.0000	OK
30 minute summer	S6	25	28.362	0.062	0.6	0.0100	0.0000	OK
15 minute summer	OUTFALL	1	27.100	0.000	0.7	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	S1	1.000	S2	1.3	0.428	0.218	0.0428	2.2
30 minute summer	S2	Orifice	OUTFALL	0.7				
60 minute summer	S3	2.003	S2	0.6	0.104	0.070	0.0732	
60 minute summer	S4	2.002	S3	-0.5	0.357	-0.081	0.0401	
30 minute summer	S5	2.001	S4	0.9	0.522	0.149	0.0431	
30 minute summer	S6	2.000	S5	0.6	0.413	0.099	0.0231	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

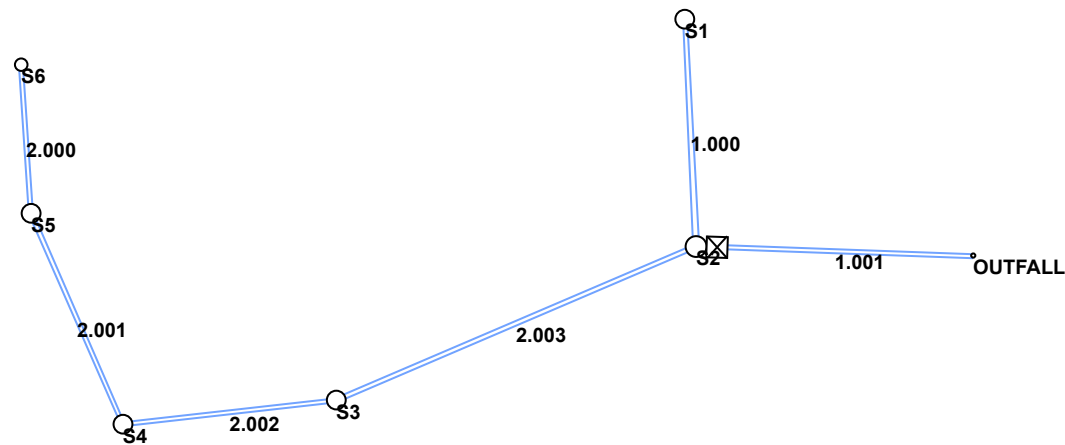
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	13	28.507	0.452	3.6	0.2076	0.0000	FLOOD RISK
60 minute summer	S2	45	28.644	0.644	2.1	0.1436	0.0000	FLOOD RISK
60 minute summer	S3	45	28.645	0.487	1.5	0.1105	0.0000	FLOOD RISK
60 minute summer	S4	46	28.645	0.436	0.9	0.0693	0.0000	FLOOD RISK
60 minute summer	S5	46	28.645	0.381	0.9	0.0762	0.0000	FLOOD RISK
60 minute summer	S6	46	28.645	0.345	0.9	0.0552	0.0000	FLOOD RISK

15 minute summer	OUTFALL	1	27.100	0.000	0.9	0.0000	0.0000	OK
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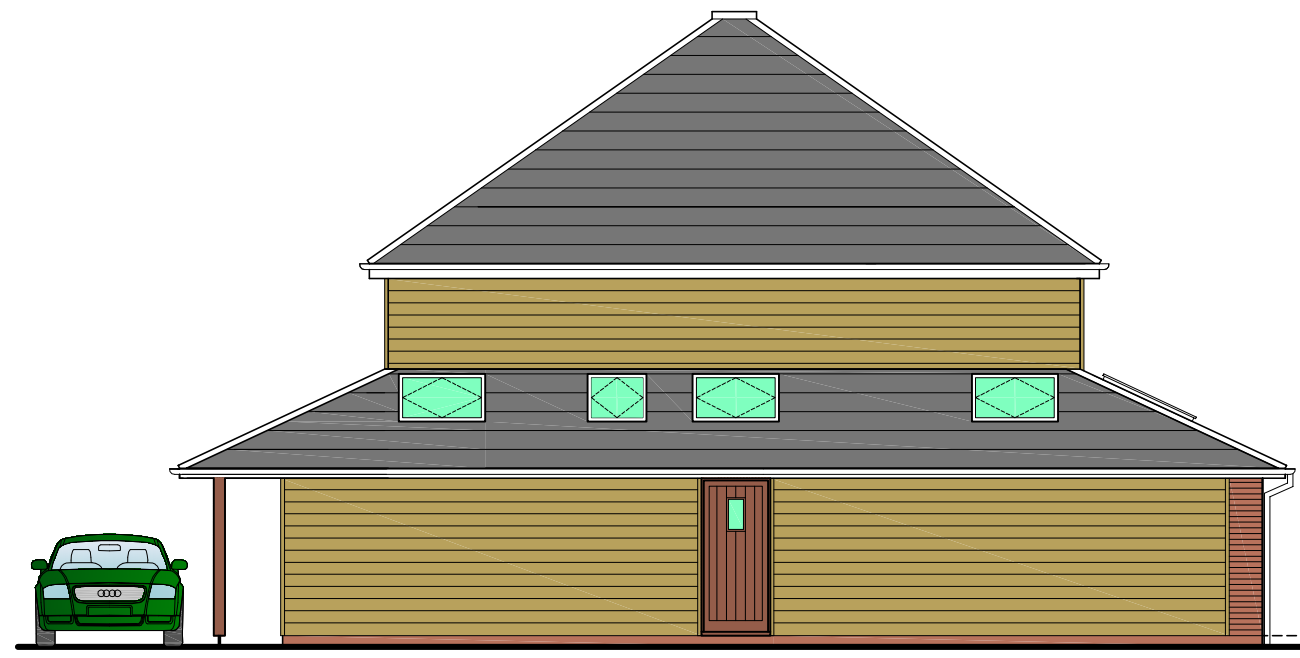
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	2.6	0.466	0.421	0.0428	
60 minute summer	S2	Orifice	OUTFALL	1.0				5.1
60 minute summer	S3	2.003	S2	-0.7	0.150	-0.087	0.0732	
60 minute summer	S4	2.002	S3	-0.9	0.356	-0.152	0.0401	
60 minute summer	S5	2.001	S4	0.6	0.455	0.104	0.0432	
60 minute summer	S6	2.000	S5	0.6	0.397	0.095	0.0280	

Node Name	S1	S2	OUTFALL
A4 drawing Hor Scale 150 Ver Scale 100 Datum (m) 22.000			
Link Name	1.000	1.001	
Section Type	100mm	100mm	
Slope (1:X)	99.5	7.4	
Cover Level (m)	28.507	28.750	27.600
Invert Level (m)	28.055	28.000	27.100
Length (m)	5.472	6.622	

Node Name	S6	S5	S4	S3	S2
A4 drawing Hor Scale 150 Ver Scale 100 Datum (m) 23.000					
Link Name	2.000	2.001	2.002	2.003	
Section Type	100mm	100mm	100mm	100mm	
Slope (1:X)	99.4	100.4	100.5	59.2	
Cover Level (m)	28.750	28.750	28.750	28.750	28.750
Invert Level (m)	28.300	28.264 28.264	28.209 28.209	28.158 28.158	28.000
Length (m)	3.580	5.523	5.127	9.351	



7.4 Appendix D – Root Protection Zone



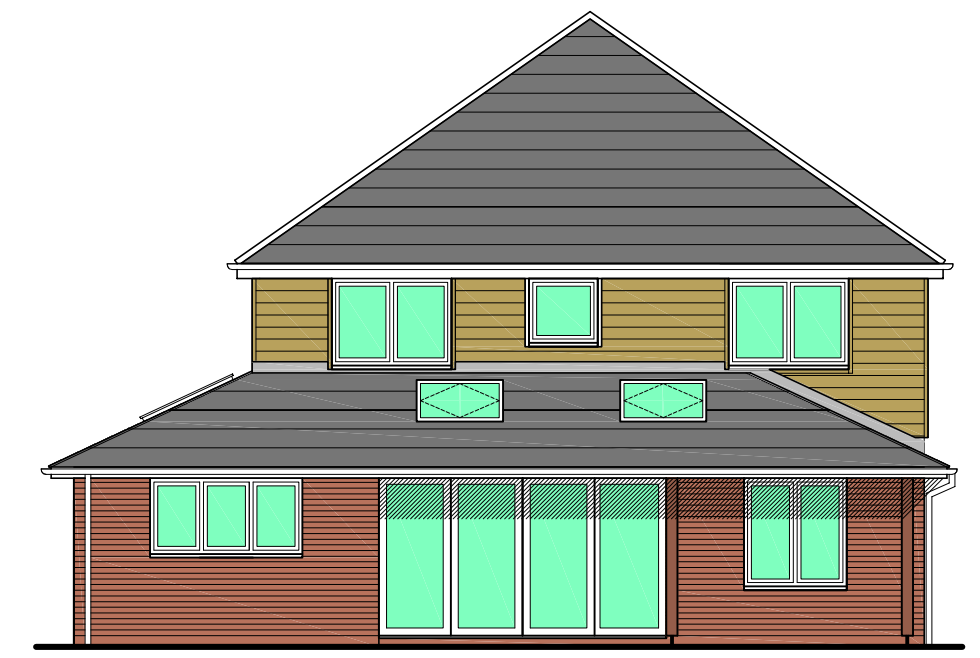
Proposed north (side) elevation scale 1:100



Proposed east (front) elevation



Proposed south (side) elevation

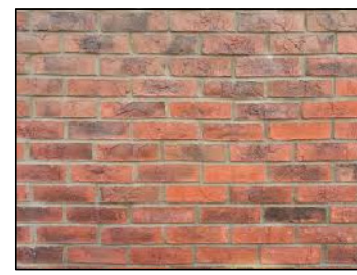


Proposed west (rear) elevation

Schedule of materials:



Marley Eternit cladding



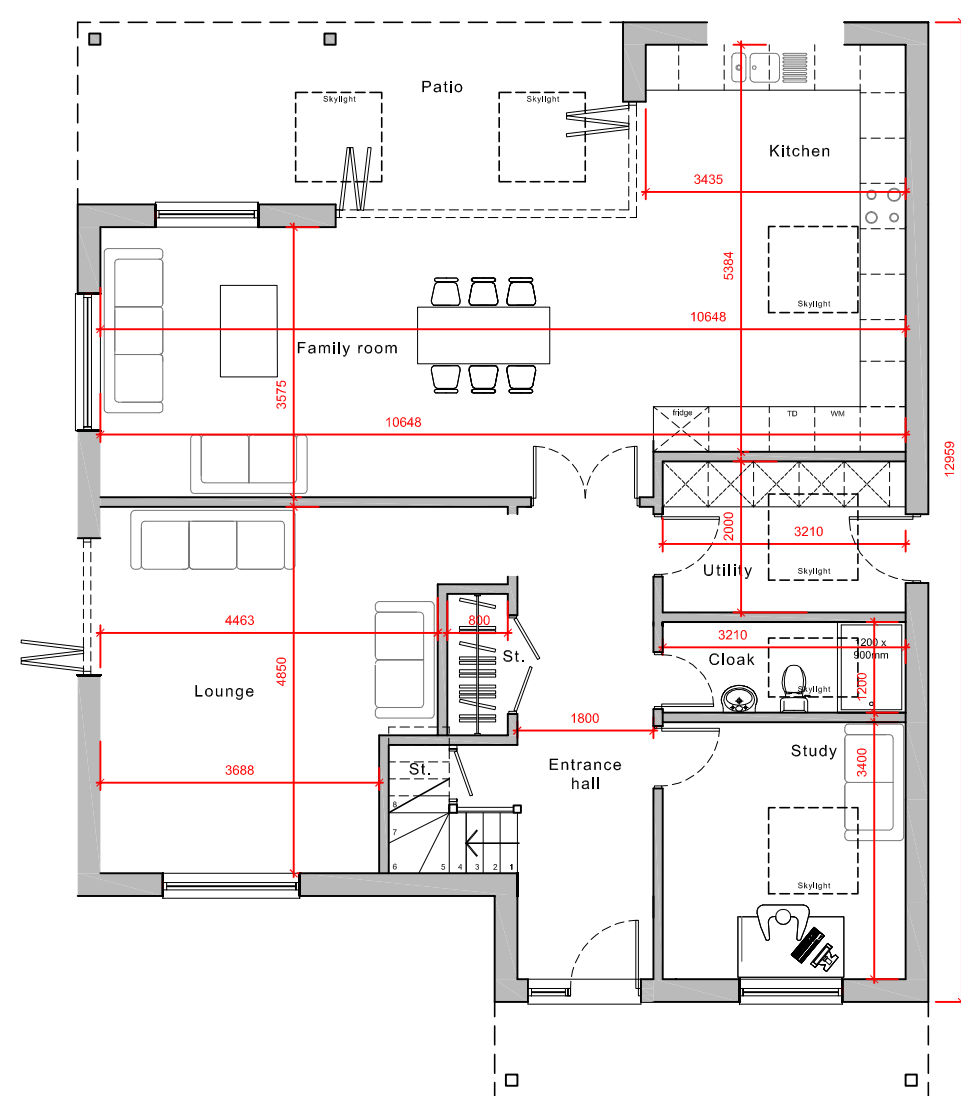
Red brick



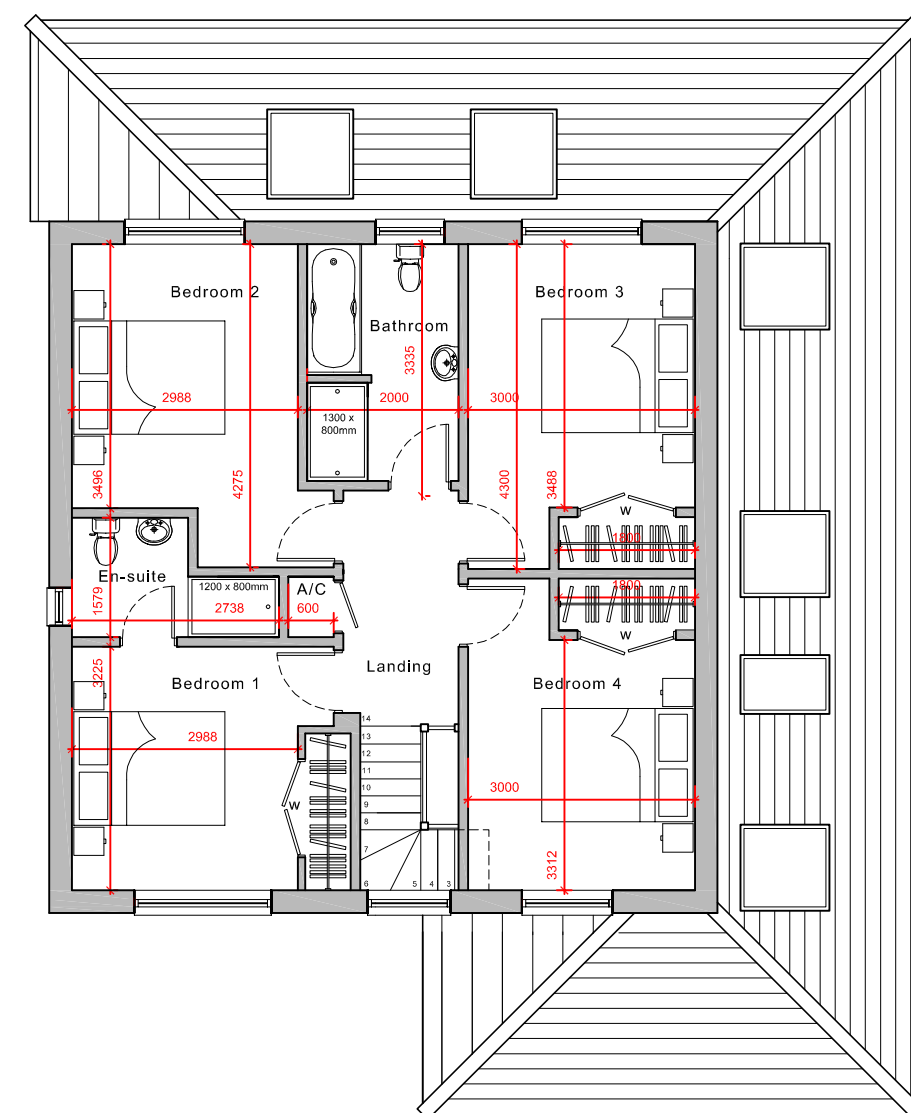
Aluminum doors & windows - black



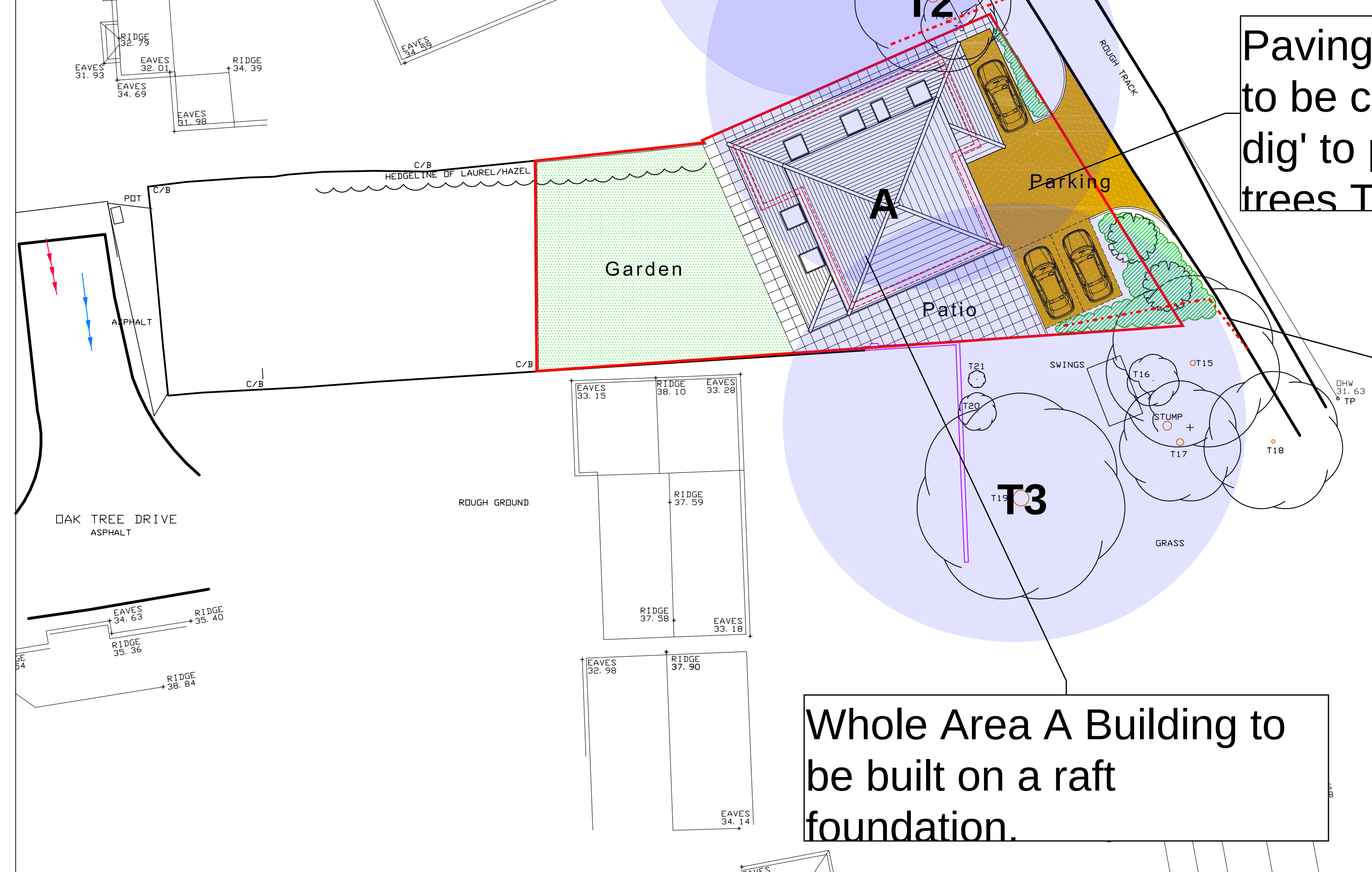
Velux skylight



Proposed ground floor plan scale 1:100



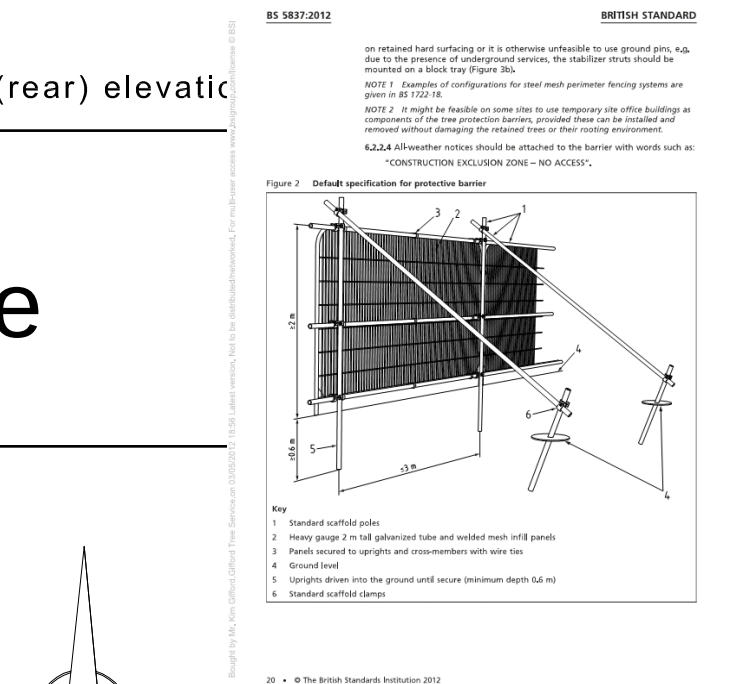
Proposed first floor plan



Proposed site plan scale 1:200

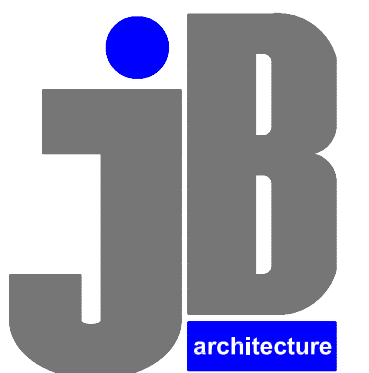
Tree Protection Plan Overlay: To be read in conjunction with tree report by Arboricultural Consultant Kim Gifford
kim@treetesting.com 07831488456
27th January 2020

BS5837
Protective
fencing



Paving and driveway to be constructed 'no dig' to protect RPA of trees T1 T2 T3

BS5837
Protective
fencing



JB ARCHITECTURE

E: admin@jb-architecturedesign.com
Web: www.jb-architecturedesign.com
TEL: 01243 933732

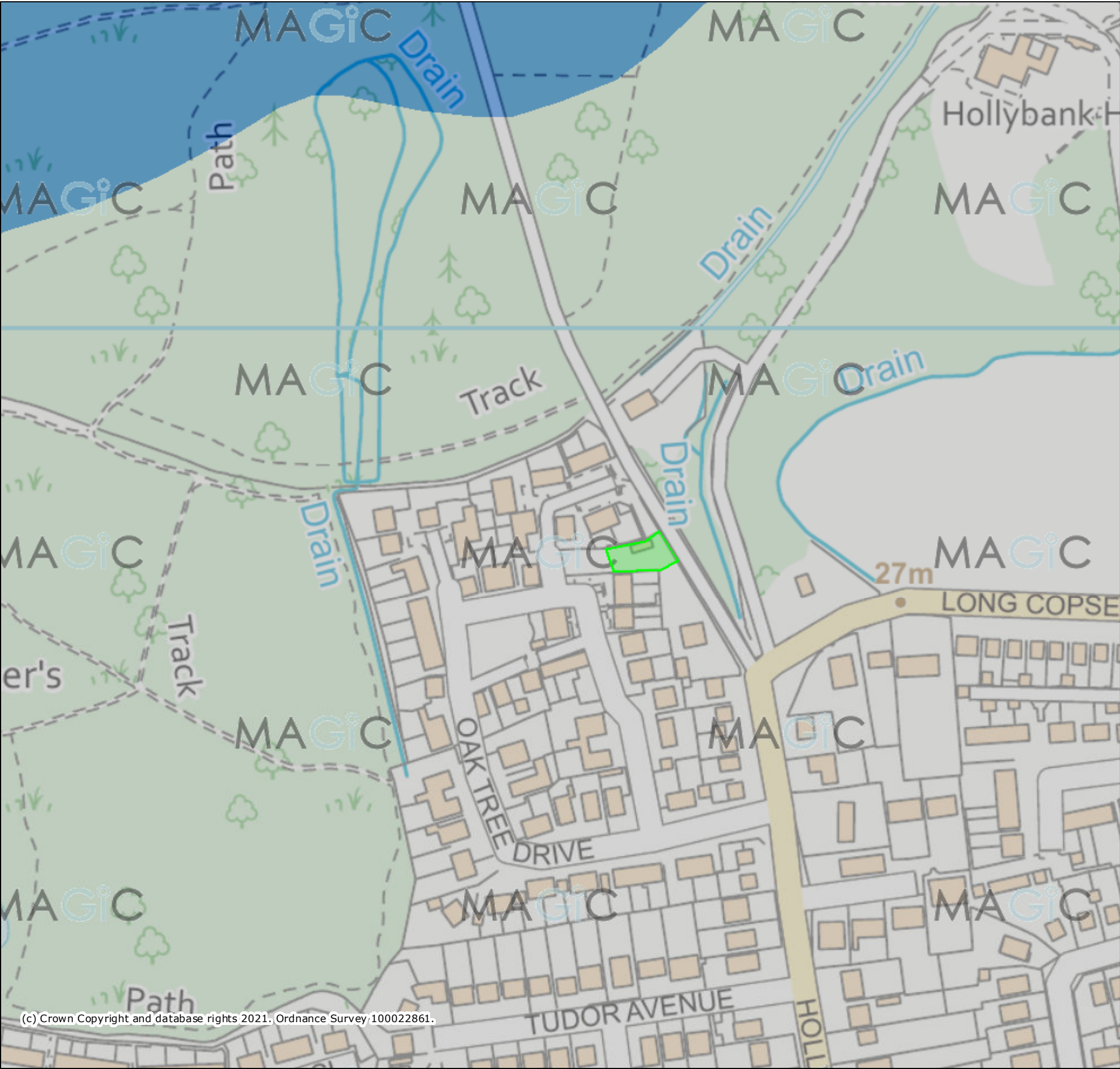
For
MR & MRS REHILL

Project
PROPOSED NEW DWELLING
AT LAND NORTH OF
61 HOLLYBANK LANE
HANTS

Title
PROPOSED FLOOR PLANS,
ELEVATIONS & SITE PLAN

Date	Drawn	Scale	Checked
SEPT 2019	JB	1:100 @ A1	-
Job Number	Drawing Number	Revision	
FE 279.19	04	C	

7.5 **Appendix E – Magic Map from Environment Agency**



Legend

Groundwater Vulnerability Map (England)

- Local Information
- Soluble Rock Risk
- High
- Medium - High
- Medium
- Medium - Low
- Low
- Unproductive

Projection = OSGB36
xmin = 474300
ymin = 107700
xmax = 474800
ymax = 108100



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