

Surface Water Drainage Report

Land off Athelstan Way, Horsham

For

Albert Brazil

Rev **P2**

Reference **C3852**

Date **29th September 2025**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	29/09/2025	Initial Issue	KCK	CS
P1	16/02/2026	Updated to new site plan	KCK	CS
P2	17/06/2026	Updated to new site plan	KCK	CS

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1 Introduction

- 1.1.1 CGS Civils Ltd has been appointed to undertake a drainage strategy report for a proposed development at Land off Athelstan Way, Horsham.
- 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 an undeveloped area. The proposed development will consist of proposed housing scheme for 21no. units. The proposed development is located as OS Grid Reference **TQ 18003 29883** and has the post code **RH13 6HE**.
- 1.1.4 Proposed Site Plan can be found at **Appendix A**.

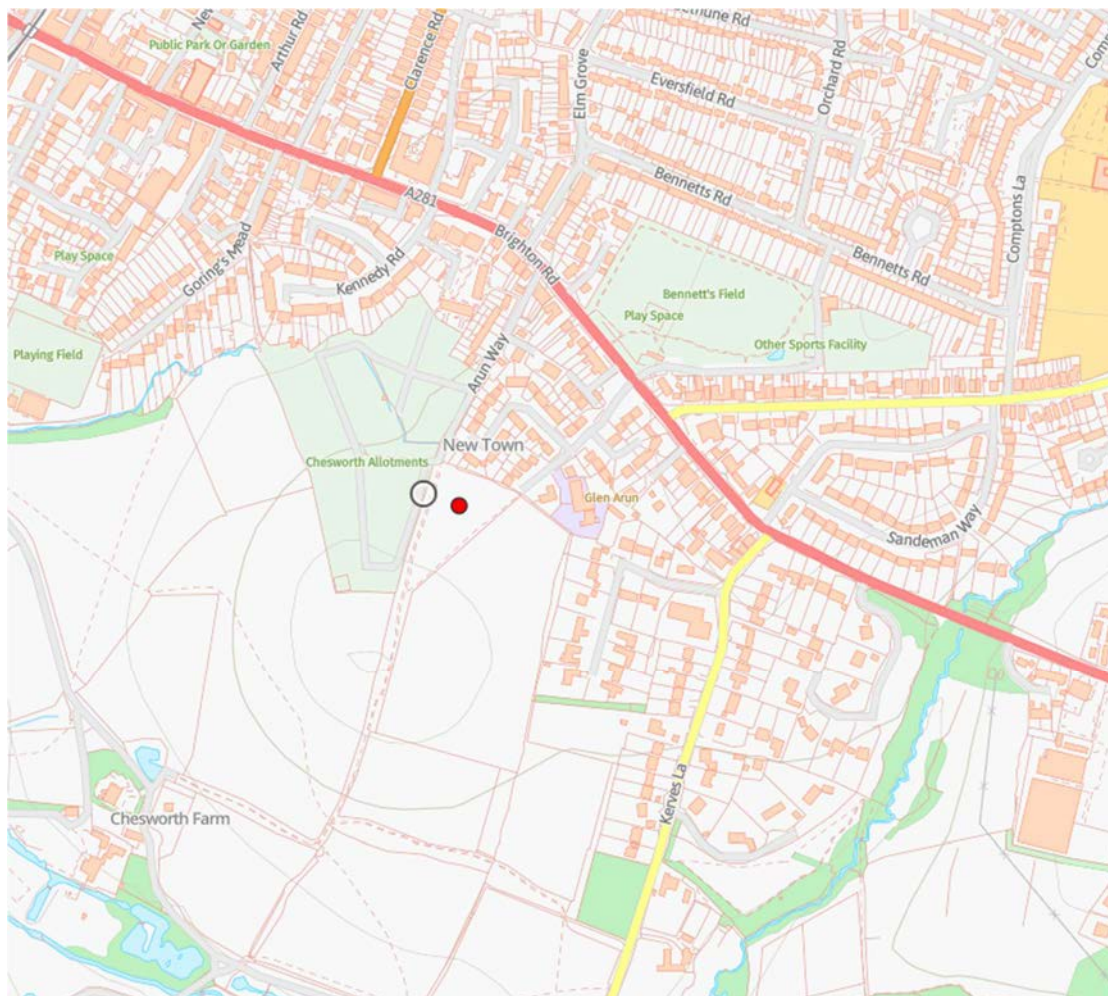


Fig 1. Site Location

2 Executive Summary:

- 2.1.1 Surface water will be discharged into an existing ditch that runs through the site. All roof and permeable paving areas are to be collected into a positive drainage network before discharging into the ditch at a restricted rate of 2.0l/s i.e. the accepted minimum. The network will make use of an attenuation tanks and detention basin to cater for the 1 in 100-year +45% storm.

3 Site Geology

3.1 British Geological Survey information

- 3.1.1 The British Geological Survey confirms the bedrock geology to be made up Upper Tunbridge Wells Sand- Sandstone and siltstone, Interbedded. At the time of writing the British Geological Survey website does not have any recorded information of the Superficial deposits on site.
- 3.1.2 The British Geological survey also holds records of historical boreholes near the site which give some insight into the ground geology.
- Borehole TQ13SE239 (Located approx. 215m North of the site) – Ground geology (Sand, Sandstone, Grey Clay.)
- 3.1.3 BGS Historical Borehole Logs can be found at **Appendix B**.

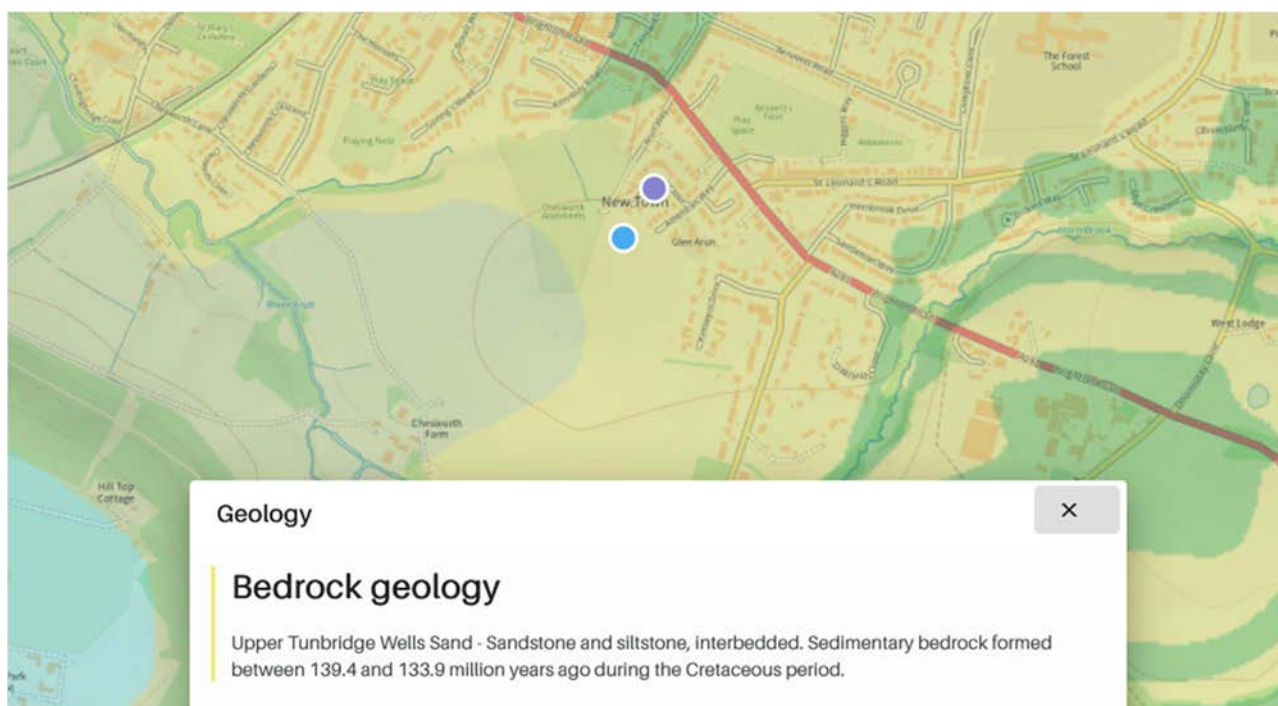


Fig 2. British Geological Survey

Snippet from BGS Website showing Bedrock geology/superficial deposits <http://mapapps.bgs.ac.uk/geologyofbritain/home.html?>

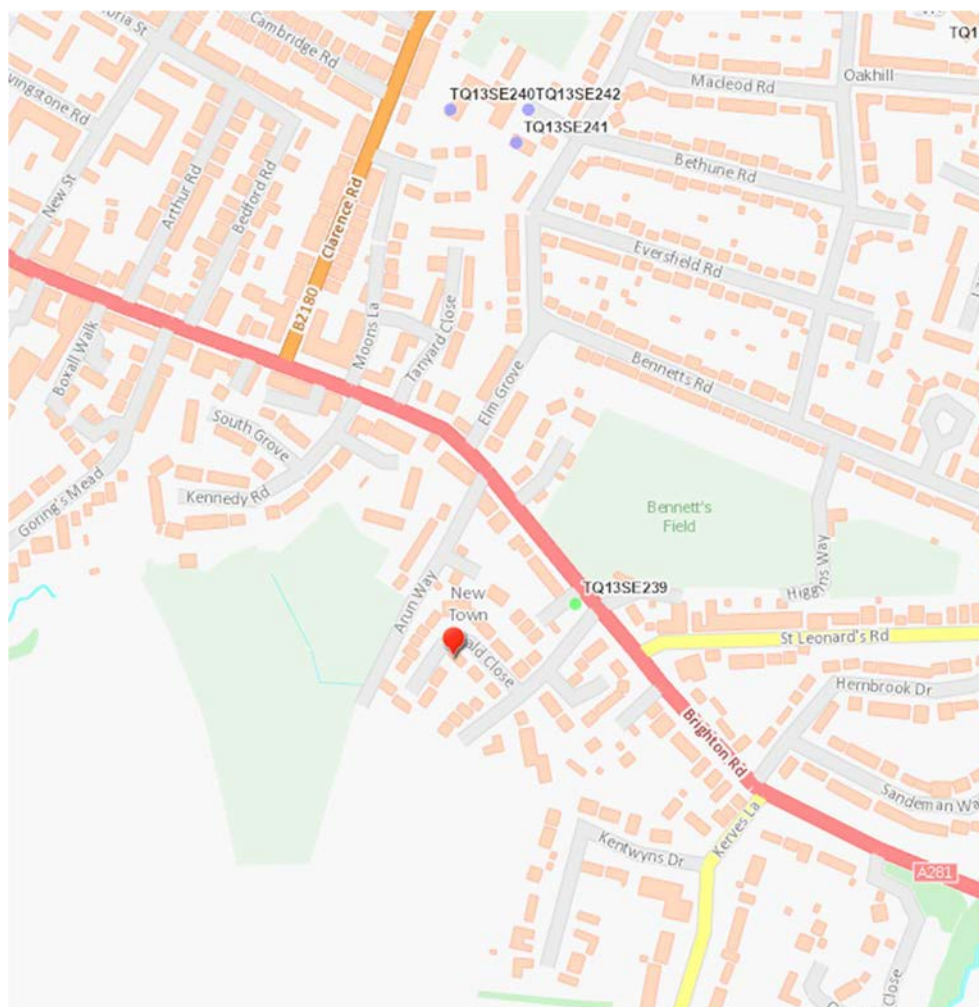


Fig 3. British Geological Survey

Snippet from BGS Website showing the Historical Borehole Log location

3.2 Geological Assessment

- 3.2.1 No intrusive full ground investigation testing has been carried out, however in order to follow the SuDS hierarchy, the use of soakaways was investigated and an onsite infiltration test to BRE365 was carried out. Due to the very low permeability, the test was deemed a **fail**.
- 3.2.2 The onsite infiltration test in accordance with BRE 365 was undertaken by CGS Civils. A trial pit measuring 300 mm x 1000 mm x 900 mm deep was excavated and filled with water to approximately 75% of its depth. Only a negligible drop in water was observed over several hours therefore, the test was deemed to have failed. Based on this the testing was determined to be a **Fail**.



Fig 4. Site Photos

- 3.2.3 The nearest borehole logs indicates that site is underlain by Upper Tunbridge Wells Sand- Sandstone and siltstone, Interbedded. The nearest borehole logs indicate soils to be as Sand, Sandstone and Grey Clay.

4 Existing Drainage

- 4.1.1 The site is currently undeveloped, so it is assumed that all surface water runoff naturally infiltrates into the ground or flows above ground, following the existing site topography towards an existing ditch which runs along the northern boundary.

5 Proposed Drainage Strategy

5.1 SuDS Hierarchy

- 5.1.1 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.

Table 1. SuDS Hierarchy

Discharge Destination	
Rainwater Harvesting	N/A
Discharge to Ground	N/A
Discharge to Watercourse	Due to the low permeability surface water runoff is to be attenuated on site and discharged into the existing ditch at a restricted rate of 2l/s
Discharge to Surface Water Sewer	N/A
Discharge to Other Sewer	N/A

5.2 Proposed Hydraulic Calculation Specifications:

Table 2. SuDS Hierarchy

Hydraulic Calculations Settings:	
Rainfall Methodology	FEH-22
Volumetric Run-off Coefficient Cv	1
CV Winter and Summer	1
Additional Storage (m ³ / ha)	0.0
Maximum Rainfall (mm/hr)	75
Flow Control	0.70m Head @ 2l/s discharge
Attenuation Tank Design	Base Coefficient (m/hr): N/A
	Side Coefficient (m/hr): N/A
	Factor of Safety: 2
	Porosity: 95%
	Time to Half Empty (mins):

5.3 Surface Water Drainage

- 5.3.1 Onsite soakage testing to BRE365, the test was deemed as a **fail**.
- 5.3.2 Surface water runoff from the proposed roof, access and parking areas will be collected, attenuated, and discharged into the existing ditch at a restricted rate of 2 l/s. The drainage system will incorporate an attenuation tanks and detention basin designed to accommodate the 1 in 100-year storm event plus a 45% allowance for climate change, ensuring controlled discharge and flood risk mitigation.
- 5.3.3 It is proposed that the access and parking area will be constructed using porous paving. However, due to the low permeability of the underlying ground, the permeable paving area has been included in the drainage calculations.
- 5.3.4 The proposed drainage drawings and hydraulic calculations can be found at **Appendix C**.

5.3.5 EA Magic Map can be found at **Appendix E**.

5.4 Water Quality

5.4.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution.

5.4.2 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.

5.4.3 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

5.4.4 The EA website indicates that the site does not lie within a Source Protection Zone.

5.4.5 The recommended approaches for water quality risk management are given in the SuDS Manual Table 26.1.

Table 26.1 from SuDS manual. 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	

5.4.6 As per Table 26.1 Simple Index approach will be used as a design method for this site.

5.4.7 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

5.4.8 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

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

Table 26.2 from SuDS manual. 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

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

Table 3: Pollution hazard index and destination of runoff for the proposed site

Table 3: 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

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

Table 26.4 from SuDS manual. Indicative SuDS Mitigation Indices for discharges to ground waters.

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

Table 26.4 Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS Components	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
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 4: SuDS mitigation index

Table 4 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	Surface water	Table 26.3 (for surface waters)	Permeable Pavement	0.7	0.6	0.7

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

5.5 Construction Phase Drainage

5.5.1 It is an offence to cause or knowingly permit the entry of any polluting, poisonous or noxious material in the water environment. If the pollution is serious enough to lower the ecological status of the water body as set out in terms by the Water Framework Directive (2000/60/EC) then prosecution may occur.

5.5.2 Remediation of any damage caused will not require the polluter to be prosecuted first. If the water pollution is serious enough to be classed an environmental damage, the damage will require to be remediated such that the area is returned to the condition it would have been in if the damage had not occurred.

- 5.5.3 If any pollution has not been reported or the polluter has not taken actions to prevent any further damage; they would then be causing an offence. Third parties (e.g., Private water supply users, landowners, recreation users and the public) who may be affected by possible damage may also report the risk of any environmental damage to the enforcing authority.
- 5.5.4 The principles of SuDS (Sustainable Drainage Systems) shall be applied to all components of design and construction regarding surface water management. Any design or site works that may impact on the site drainage or the water quality shall:
- Soakaway where soils allow
 - Consider and manage erosion
 - Remove pollutants in surface water
 - Retain any silts on site and prevent silts from discharging to watercourses or drains
 - Keep runoff rates at existing greenfield runoff
 - Prevent accidental spillages reaching watercourse
- 5.5.5 As infiltration on site is not viable, the temporary drainage for the development will be in the form of land drains which will discharge into the existing ditch
- 5.5.6 Pollution will be controlled via the use of catchpit manholes and geotextiles.
- 5.5.7 Any potential hazardous substances will be within a controlled compound with a separate drainage system that will contain a penstock valve / containment kit in the event of a spillage.

6 Summary and Conclusions

- 6.1.1 CGS Civils has been instructed to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for a 21no. units.
- 6.1.2 The Surface Water is to be discharged into an existing ditch at a restricted discharge rate of 2 l/s with storage provided in the form of a detention basin and below ground attenuation. Surface water drainage has been designed to cater for the critical 1in100 + 45% climate change event.
- 6.1.3 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.
- 6.1.4 A maintenance schedule has been written up for the drainage network including the SuDS features and can be found within Appendix D.

7 Appendices

7.1 Appendix A – Site Plan

Key

- 1. Existing access
- 2. Existing drainage ditch
- 3. Proposed detention basin
- 4. Existing public footpath
- 5. Existing trees
- 6. Public Open Space [POS]
- 7. Proposed footpath connecting to existing network
- 8. Proposed Landscaping [Biodiversity Net Gain]
- 9. Bin Collection Point
- 10. Bin Stores
- 11. Cycle Stores



Extent of West Sussex County Council's right of way



Cycle storage sheds in rear gardens



Affordable Housing



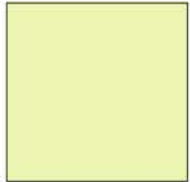
Visitor Parking



Timber Post & Wire Fencing



Scrub reinstated



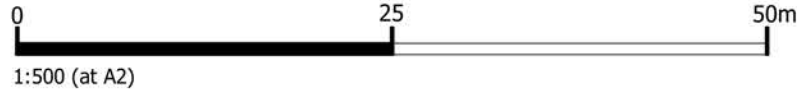
Landscaped Buffer

SITE PLAN 1:500

A Layout updated
B Issued for Planning

19/01/26
07/06/26 CW
CW

NOTES



DATE
DECEMBER 2025
SCALE @ A2
1:500

AUTHOR
CW
CHECKED BY

PROJECT
Proposed Residential Development of Land off
Athelstan Way, Horsham
CLIENT
Mr A Brazil
STATUS
FOR PLANNING
DRAWING
PROPOSED SITE PLAN

PROJECT NO.
646

DRAWING NO.
101

REV.B

7.2 **Appendix B – Borehole Logs**



WR38: Borehole record form

Borehole record

**Nicholls
Boreholes**



British
Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



Environment
Agency

Water Resources Act 1991 (as amended by the Water Act 2003)

A Site details

Borehole drilled for MIKE GALLASHER
Location 112 BRIGHTON ROAD, HURSHAM, RH13 5DE
NGR (ten digits) TQ18187 30015 Please attach site plan
Ground level (if known) _____ metres Above Ordnance Datum
Drilling company NICHOLLS BOREHOLES
Date drilling commenced 28-06-2016 (DD/MM/YYYY) Completed 29-06-2016 (DD/MM/YYYY)

B Construction details

Borehole datum (if not ground level) _____ metres (m). Please tick if this is above ☐ or below ☐ ground level.
(point from which all measurements of depth are taken, for example, flange, edge of chamber)

Borehole drilled diameter 200 mm from C to 29 m/depth
_____ mm from _____ to _____ m/depth
_____ mm from _____ to _____ m/depth
_____ mm from _____ to _____ m/depth

Casing material SOLID UPVC diameter 113 mm from C to 9 m/depth
and type (for example, if plain steel, plastic slotted). Please record permanent casing details, not temporary casing.

Casing material SLOTTED UPVC diameter 113 mm from 9 to 29 m/depth

Casing material _____ diameter _____ mm from _____ to _____ m/depth

Casing material _____ diameter _____ mm from _____ to _____ m/depth

Grouting details 40 BAGS SHINGLE, 8 BAGS MUKOLIT SEAL

Water struck at 1. 23 m (depth below datum - mbd) 2. _____ m (mbd)
3. _____ m (mbd) 4. _____ m (mbd)

C Test pumping summary (Please supply full details on form WR39)

Test pumping datum _____ m. Please tick if this is above ☐ or below ☐ ground level.
(if different from borehole datum)

Pump suction depth _____ mbd

Water level (start of test) _____ mbd

Water level (end of test) _____ mbd

Type of test (for example, bailer, step, constant rate)

Pumping rate _____ m³/hour or litres/second. Please tick as appropriate.

for _____ days, _____ hours, _____ mins

Recovery to _____ mbd in _____ days, _____ hours, _____ mins
(from end of pumping)

Date(s) of measurements Pump started (DD/MM/YYYY)

Pump stopped (DD/MM/YYYY)

Please supply chemical analysis if available. If you have included this please tick this box ☐

WR38: Borehole record form

D Strata log

Geological classification (BGS only)	Description of strata	Thickness m	Depth (to base of strata) m
	SANDS + SANDSTONE	8	8
	GREY CLAY	10	18
	SANDS + SANDSTONE	11	29
(continue on separate page if necessary)			
Other comments (for example, gas encountered, saline water intercepted)			

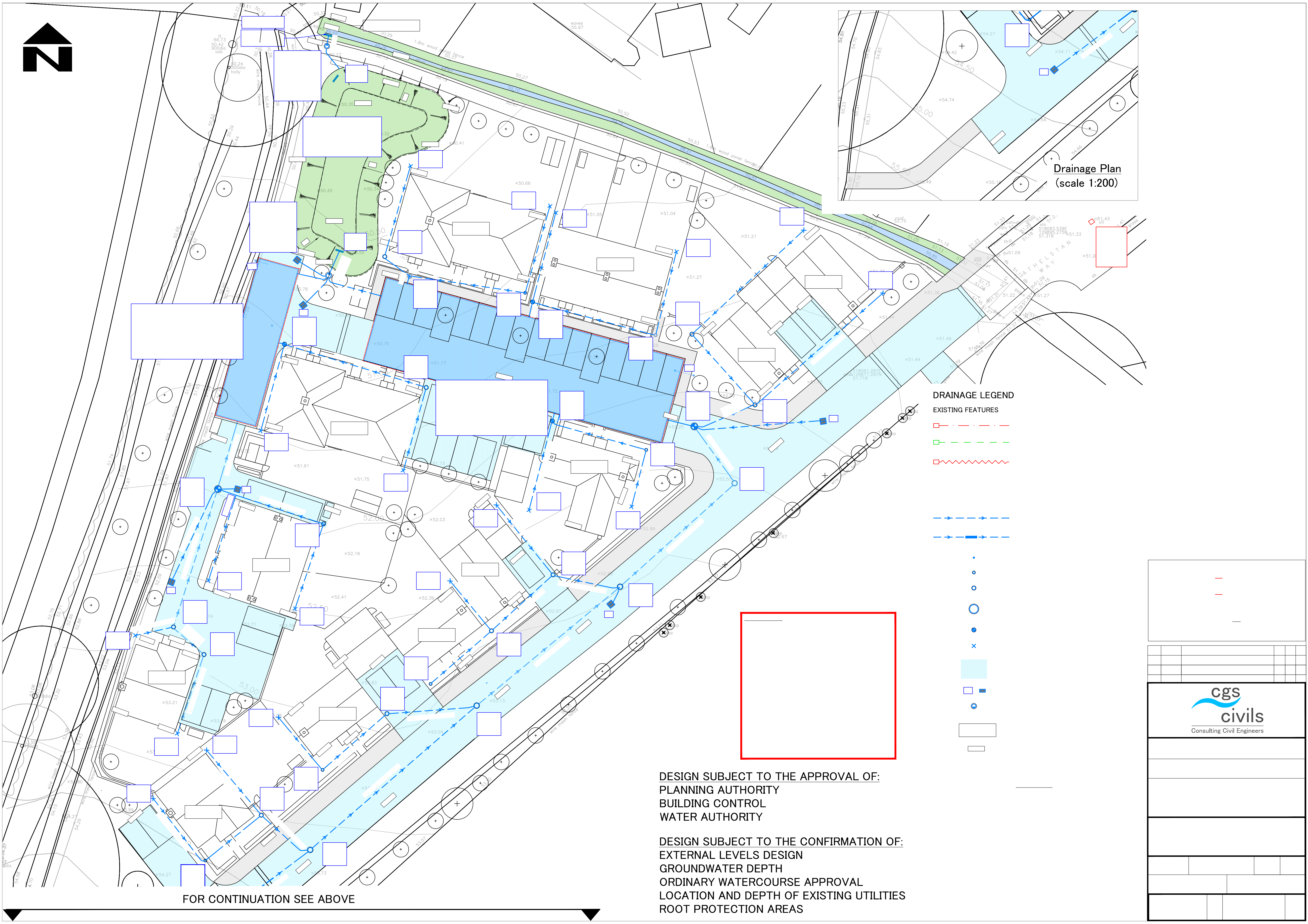
E Completing this form

How long did it take you to fill in this form? _____

For Official use only

Date received (DD/MM/YYYY)	File	Consent number	BGS reference number
Accession number	Wellmaster number	SOBI number	NGR
LIC NO	Purpose	EA reference number	
Copy number	Entered by		

7.3 **Appendix C – Proposed drainage drawings and hydraulic calculations**



DRAINAGE PLAN

(Scale 1:200)

DRAINAGE LEGEND

EXISTING FEATURES

- [Red dashed line] - Proposed boundary or feature
- [Green dashed line]
- [Blue wavy line]
- [Blue dashed line with arrows]
- [Circle symbol]
- [Cross symbol]
- [Light blue rectangle]
- [Dark blue square]
- [White rectangle]

cgs civils Consulting Civil Engineers					

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

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN
GROUNDWATER DEPTH
ORDINARY WATERCOURSE APPROVAL
LOCATION AND DEPTH OF EXISTING UTILITIES
ROOT PROTECTION AREAS

FOR CONTINUATION SEE ABOVE

Drainage Plan
(scale 1:200)

DRAINAGE LEGEND

EXISTING FEATURES

- [Red dashed line] Wall
- [Green dashed line] Fence
- [Red wavy line] Tree
- [Blue dashed line with arrows] Proposed Drain
- [Blue dashed line with arrows] Proposed Culvert
- [Blue circle] Manhole
- [Blue circle with cross] Catchpit
- [Light blue rectangle] Pond
- [White square] Building Footprint
- [Black outline] Boundary

FOR CONTINUATION SEE ABOVE

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DRAINAGE PLAN
(scale 1:200)

DRAINAGE LEGEND

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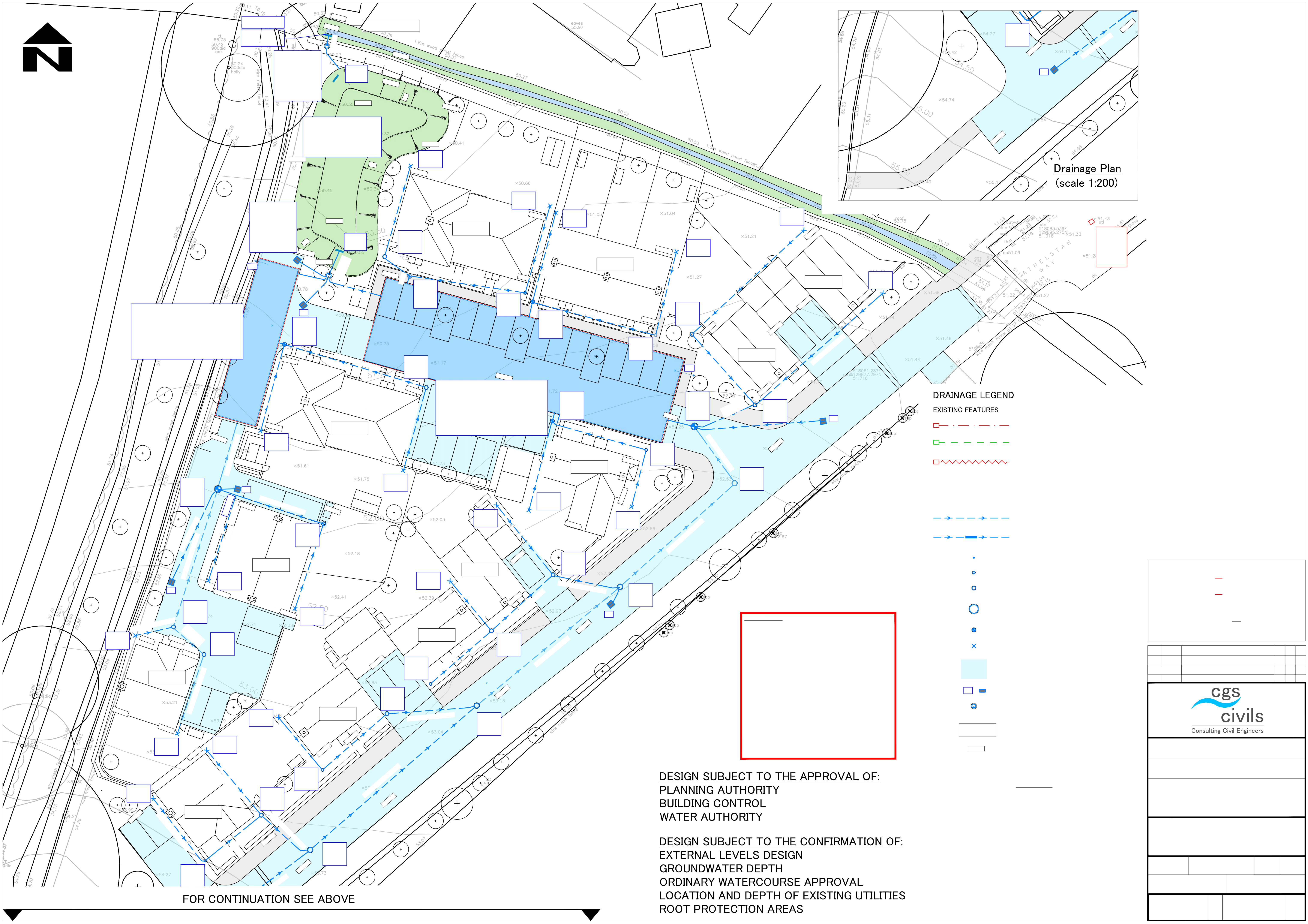
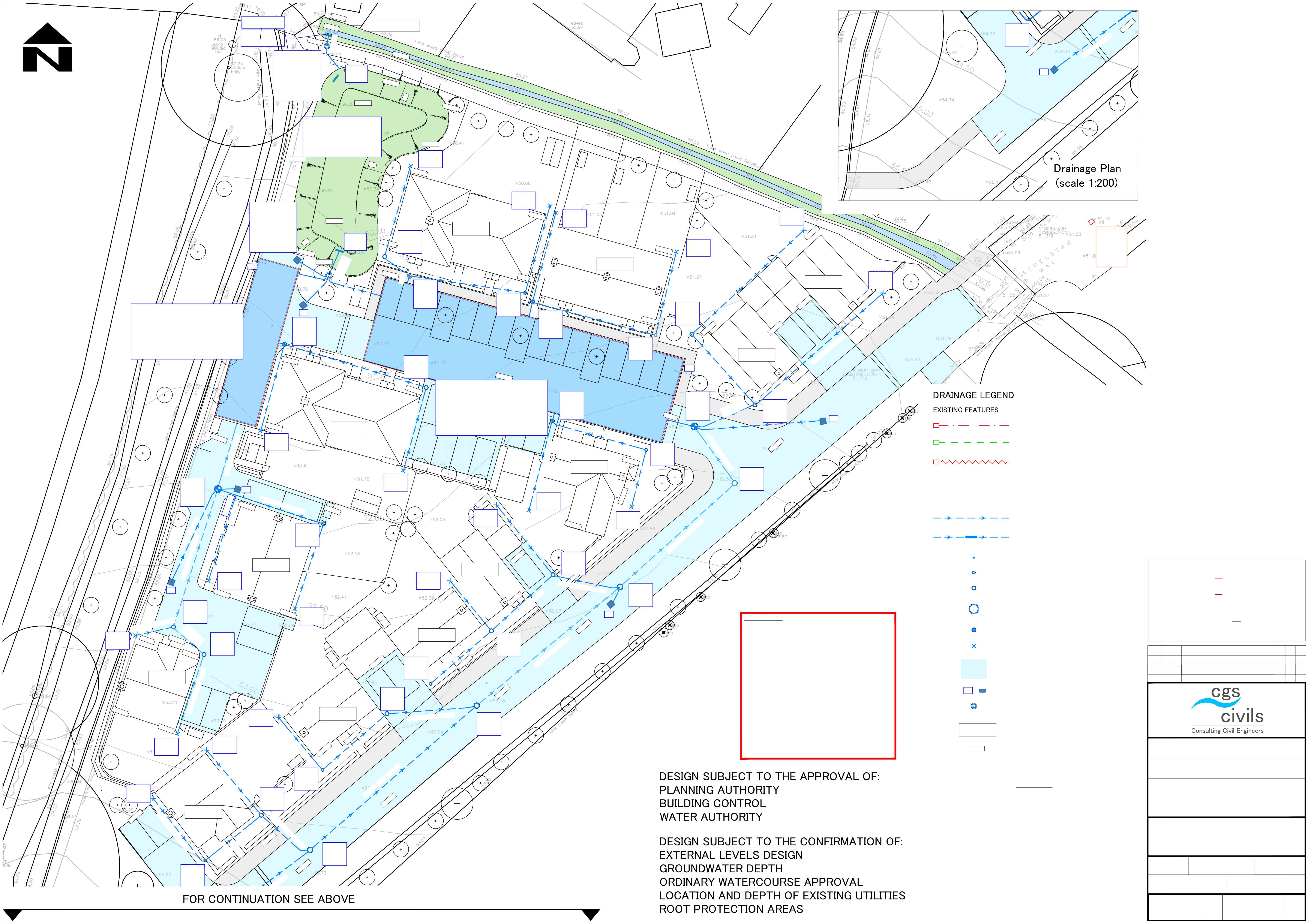
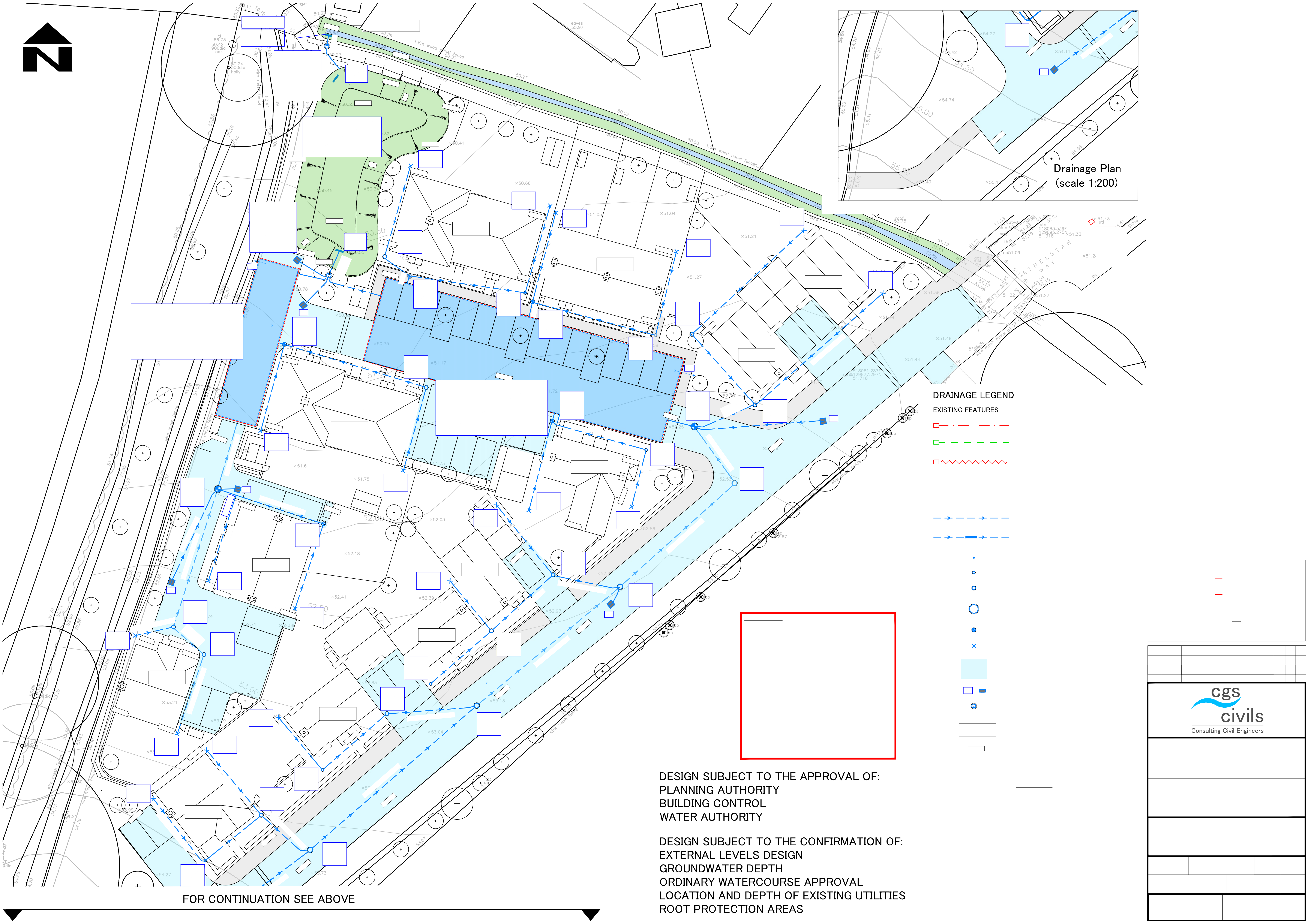
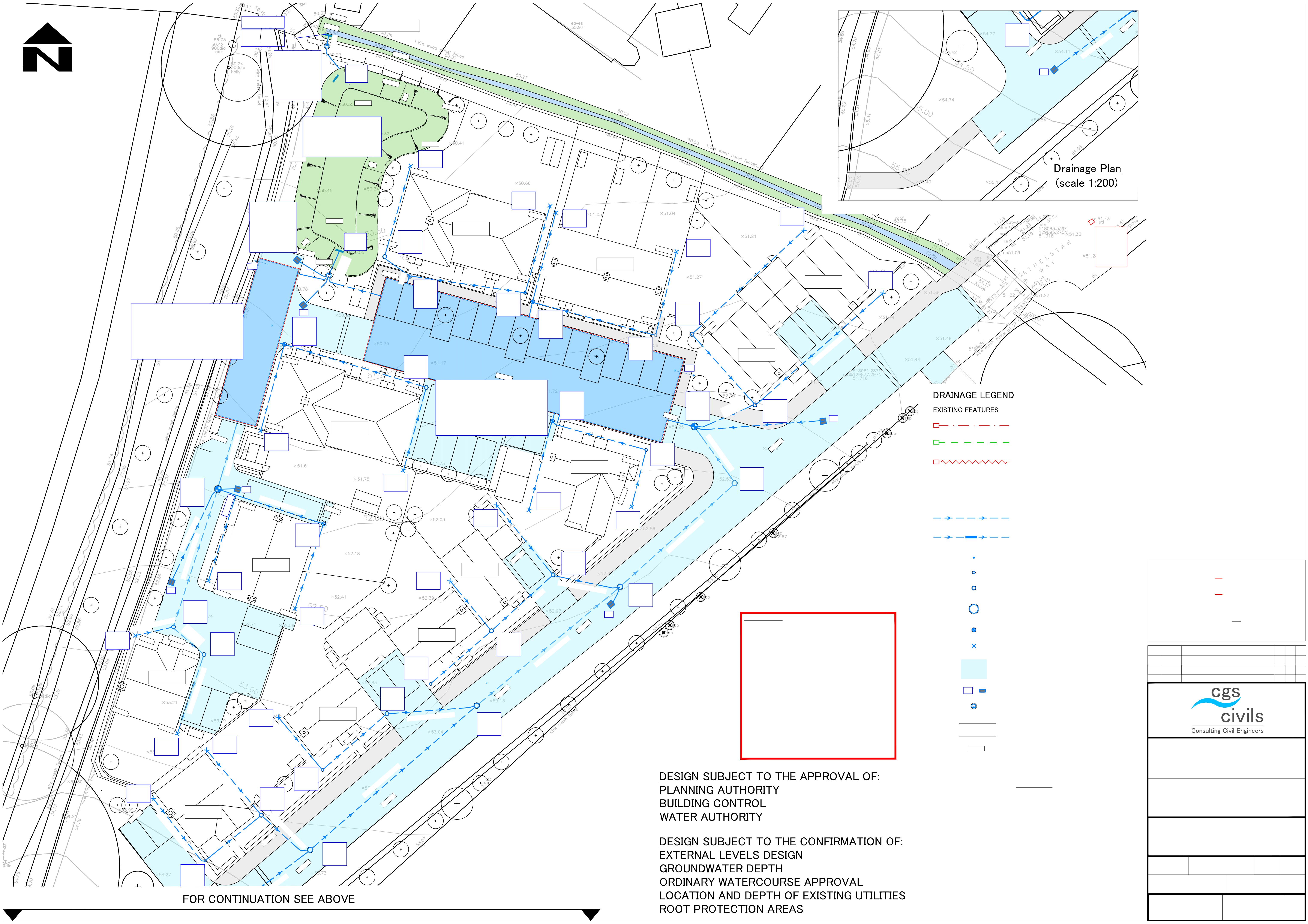
- [Red dashed line]
- [Green dashed line]
- [Red wavy line]
- [Blue dashed line with arrows]
- [Blue solid line with arrows]
- [Blue circle]
- [Blue dot]
- [Blue cross]
- [Light blue rectangle]
- [Dark blue square]
- [Small blue circle]
- [White rectangle]
- [Thin white rectangle]

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FOR CONTINUATION SEE ABOVE

cgs
civils
Consulting Civil Engineers



DRAINAGE PLAN
(scale 1:200)

DRAINAGE LEGEND

EXISTING FEATURES

- [Red dashed line]
- [Green dashed line]
- [Red wavy line]
- [Blue dashed line with arrows]
- [Blue solid line with arrows]
- [Blue circle]
- [Blue dot]
- [Blue cross]
- [Light blue rectangle]
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- [Thin white rectangle]

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FOR CONTINUATION SEE ABOVE

cgs
civils
Consulting Civil Engineers

[illegible]

DRAINAGE PLAN
(scale 1:200)

DRAINAGE LEGEND

EXISTING FEATURES

- [Red dashed line] Wall
- [Green dashed line] Drain
- [Red wavy line] Culvert

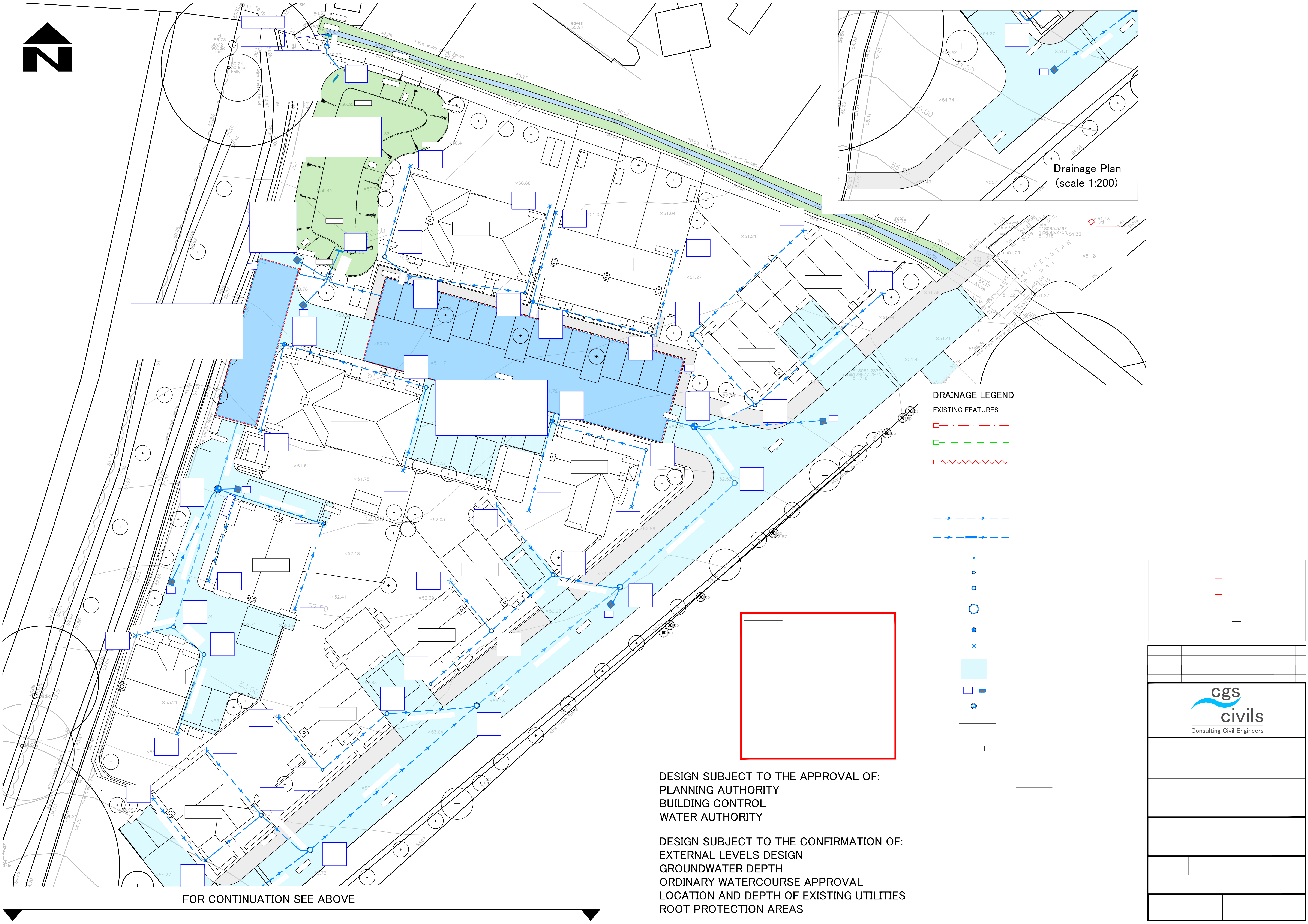
PROPOSED FEATURES

- [Blue dashed arrow] Proposed drain
- [Blue circle with cross] Manhole
- [Blue rectangle] New wall
- [Blue square] New drain
- [Blue circle] New culvert
- [Black rectangle] Bridge

FOR CONTINUATION SEE ABOVE

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DRAINAGE PLAN
(scale 1:200)

DRAINAGE LEGEND

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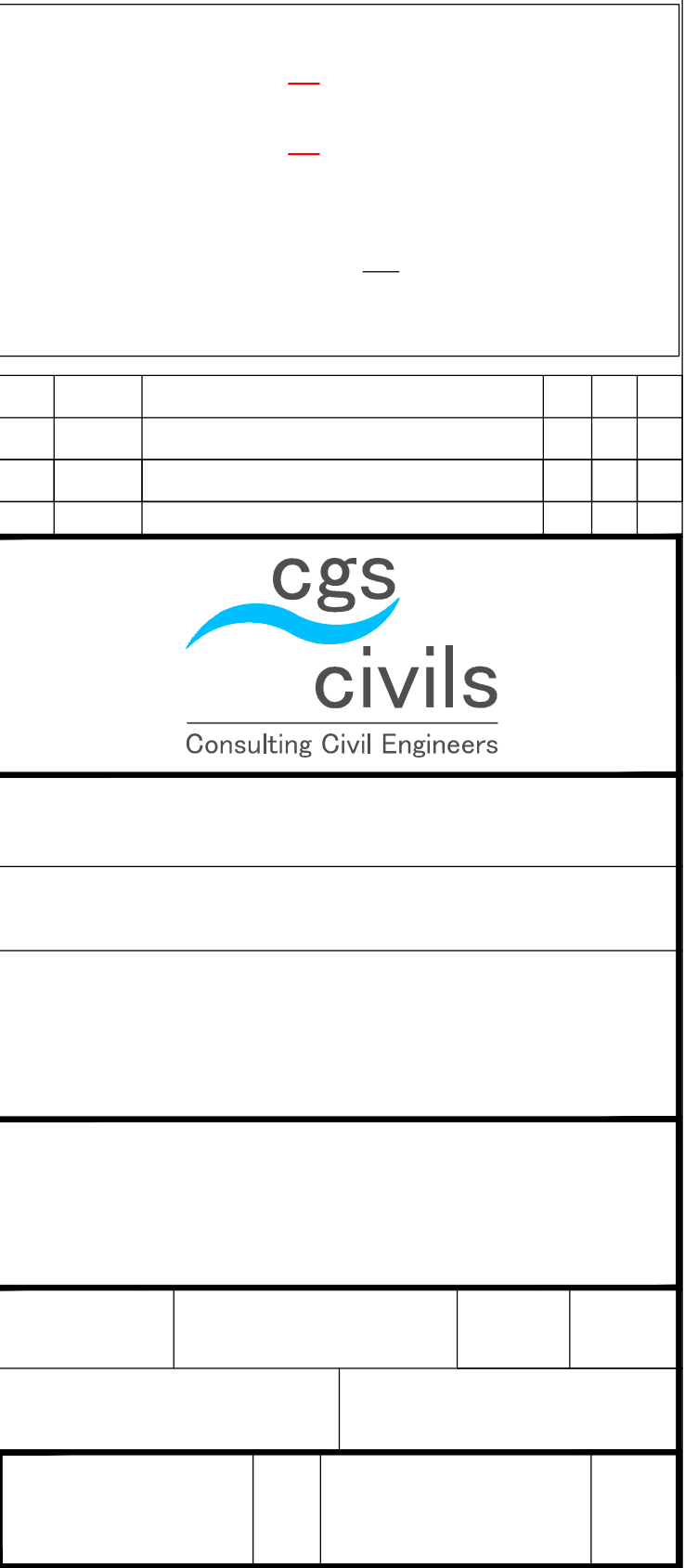
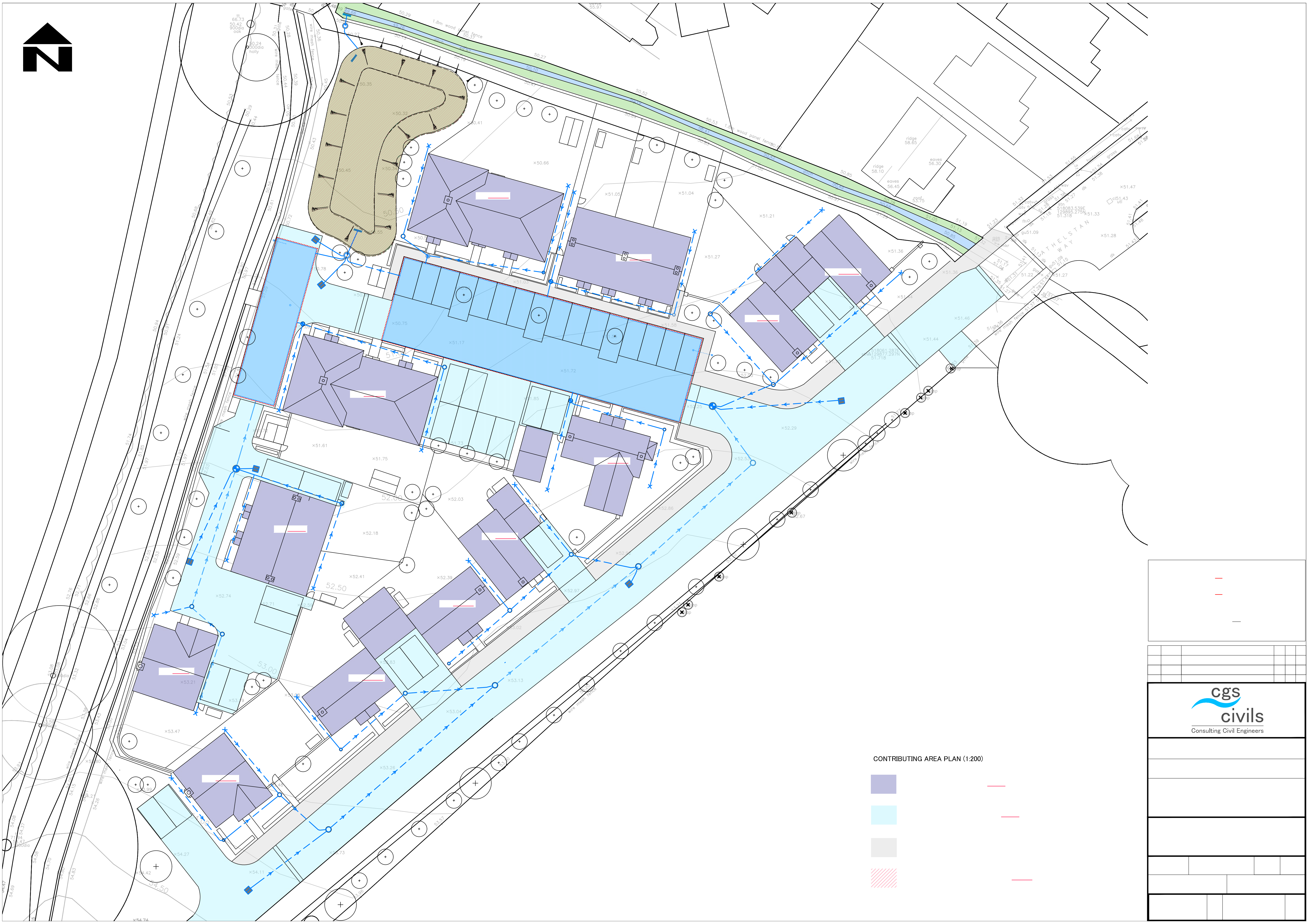
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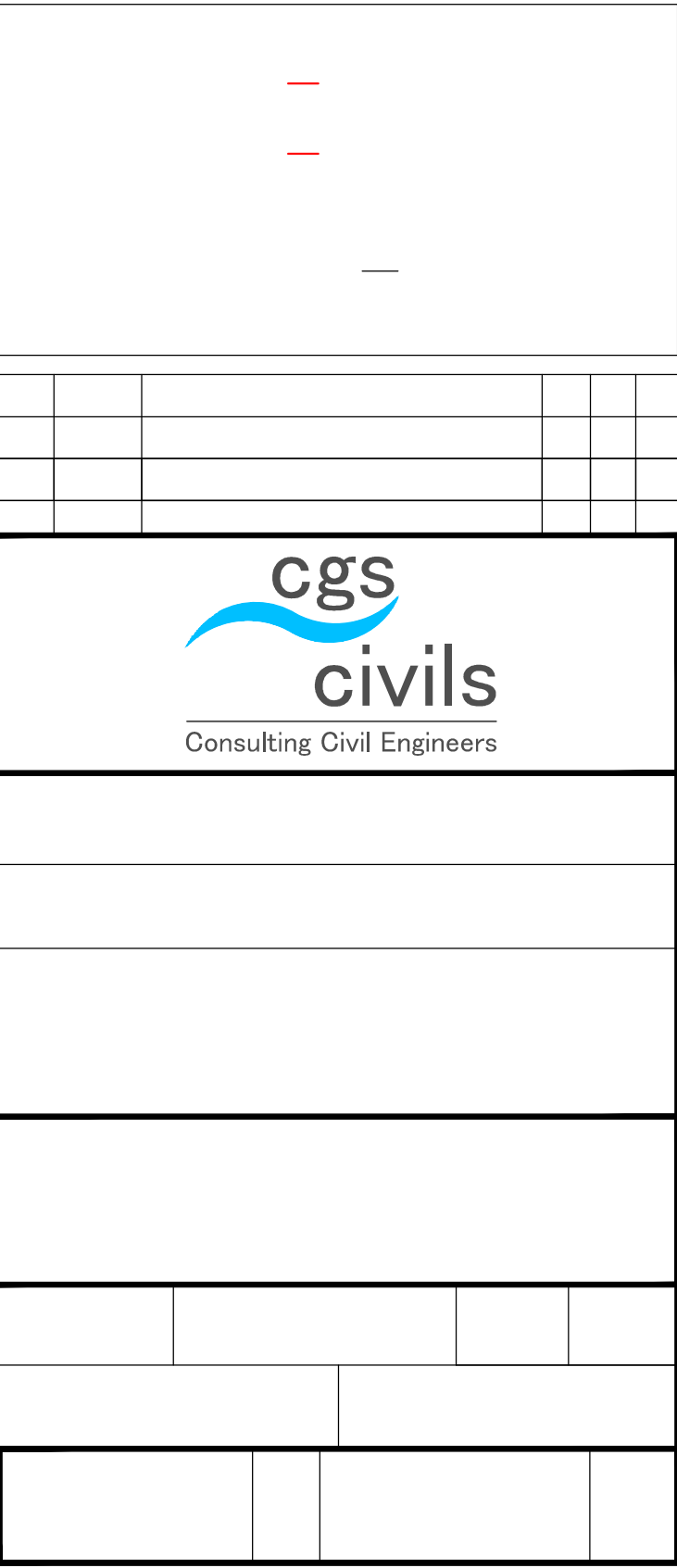
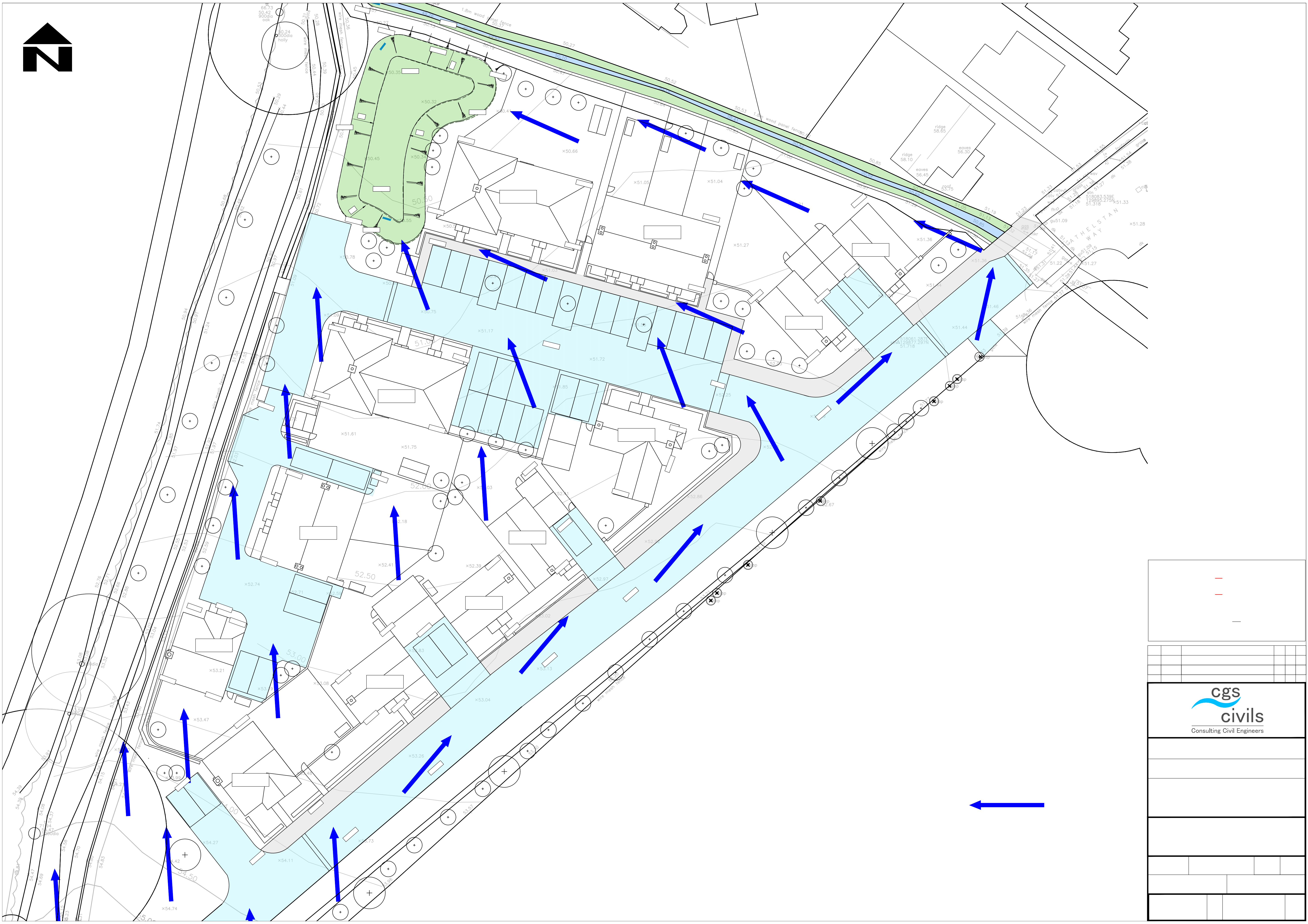
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ROOT PROTECTION AREAS

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Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	4.00	Include Intermediate Ground	x
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	75.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
DB	0.029	4.00	50.500	1200	517999.000	129904.000	0.900
FLOW			50.500	1200	517996.000	129917.000	0.930
ATT	0.190	4.00	51.000	1200	518019.334	129877.699	1.200
ATT2	0.133	4.00	51.100		517986.422	129896.683	1.300
S08			51.000	600	517996.780	129899.478	1.250

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)
1.002	DB	FLOW	3.000	0.600	49.600	49.570	0.030	100.0	300	4.12	54.0
1.000	ATT2	S08	4.500	0.600	49.800	49.750	0.050	90.0	225	4.05	54.0
2.000	ATT	S08	1.500	0.600	49.800	49.750	0.050	30.0	225	4.01	54.0
1.001	S08	DB	5.038	0.600	49.750	49.600	0.150	33.6	225	4.09	54.0

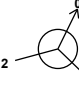
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.002	1.572	111.1	68.7	0.600	0.630	0.352	0.0	171	1.651
1.000	1.379	54.8	26.0	1.075	1.025	0.133	0.0	109	1.358
2.000	2.397	95.3	37.1	0.975	1.025	0.190	0.0	97	2.249
1.001	2.265	90.1	63.0	1.025	0.675	0.323	0.0	139	2.446

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	3.000	100.0	300	Circular	50.500	49.600	0.600	50.500	49.570	0.630
1.000	4.500	90.0	225	Circular	51.100	49.800	1.075	51.000	49.750	1.025
2.000	1.500	30.0	225	Circular	51.000	49.800	0.975	51.000	49.750	1.025
1.001	5.038	33.6	225	Circular	51.000	49.750	1.025	50.500	49.600	0.675

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	DB	1200	Manhole	Adoptable	FLOW	1200	Manhole	Adoptable
1.000	ATT2		Junction		S08	600	Manhole	Adoptable
2.000	ATT	1200	Manhole	Adoptable	S08	600	Manhole	Adoptable
1.001	S08	600	Manhole	Adoptable	DB	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
DB	517999.000	129904.000	50.500	0.900	1200		1	1.001	49.600	225
FLOW	517996.000	129917.000	50.500	0.930	1200		1	1.002	49.570	300
ATT	518019.334	129877.699	51.000	1.200	1200		0	2.000	49.800	225
ATT2	517986.422	129896.683	51.100	1.300			0	1.000	49.800	225
S08	517996.780	129899.478	51.000	1.250	600		1	2.000	49.750	225
							2	1.000	49.750	225
							0	1.001	49.750	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
10	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node FLOW Online Orifice Control

Flap Valve	x	Design Depth (m)	0.700	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		
Invert Level (m)	49.570	Diameter (m)	0.034		

Node S08 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.600	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	15.0		
Invert Level (m)	49.750	Diameter (m)	0.098		

Node DB Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	118.0	118.0	0.200	142.2	143.5	0.400	168.7	171.4	0.600	197.5	201.8
0.100	129.8	130.4	0.300	155.2	157.2	0.500	182.8	186.3	0.700	212.7	217.8

Node ATT Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	49.800	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	10.500	Number Required	1
Porosity	0.95	Pit Length (m)	38.000		

Node ATT2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	49.800	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	20.000		

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	DB	585	49.963	0.363	5.6	51.3630	0.0000	SURCHARGED
600 minute winter	FLOW	585	49.963	0.393	1.8	0.4448	0.0000	OK
600 minute winter	ATT	585	49.968	0.168	10.3	63.9845	0.0000	OK
600 minute winter	ATT2	585	49.968	0.168	6.2	15.9880	0.0000	OK
600 minute winter	S08	585	49.968	0.218	7.9	0.0618	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)
600 minute winter	DB	1.002	FLOW	1.8	0.267	0.017	0.2113	56.6
600 minute winter	FLOW	Orifice		1.5				
600 minute winter	ATT	2.000	S08	5.1	0.254	0.053	0.0535	
600 minute winter	ATT2	1.000	S08	7.9	0.529	0.144	0.1604	
600 minute winter	S08	1.001	DB	4.8	0.850	0.053	0.1983	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	DB	705	50.019	0.419	5.1	60.7828	0.0000	SURCHARGED
720 minute winter	FLOW	690	50.019	0.449	3.4	0.5078	0.0000	OK
720 minute winter	ATT	690	50.026	0.226	8.4	85.8559	0.0000	SURCHARGED
480 minute winter	ATT2	464	50.027	0.227	7.5	21.5748	0.0000	SURCHARGED
720 minute winter	S08	690	50.028	0.278	6.5	0.0787	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	DB	1.002	FLOW	3.4	0.218	0.030	0.2113	69.6
720 minute winter	FLOW	Orifice		1.6				
720 minute winter	ATT	2.000	S08	6.3	0.523	0.066	0.0596	
480 minute winter	ATT2	1.000	S08	8.2	0.548	0.149	0.1789	
720 minute winter	S08	1.001	DB	4.5	0.849	0.050	0.2004	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	DB	705	50.140	0.540	5.5	82.6087	0.0000	SURCHARGED
720 minute winter	FLOW	705	50.140	0.570	4.3	0.6444	0.0000	OK
720 minute winter	ATT	705	50.148	0.348	11.6	132.3828	0.0000	SURCHARGED
720 minute winter	ATT2	705	50.149	0.349	6.6	33.1733	0.0000	SURCHARGED
960 minute winter	S08	930	50.146	0.396	5.7	0.1120	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	DB	1.002	FLOW	4.3	0.267	0.038	0.2113	78.7
720 minute winter	FLOW	Orifice		1.8				
720 minute winter	ATT	2.000	S08	-4.5	0.400	-0.047	0.0597	
720 minute winter	ATT2	1.000	S08	7.7	0.445	0.141	0.1790	
960 minute winter	S08	1.001	DB	8.1	0.834	0.089	0.2004	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	DB	705	50.096	0.496	4.9	74.3976	0.0000	SURCHARGED
960 minute winter	FLOW	915	50.095	0.525	2.8	0.5943	0.0000	OK
720 minute winter	ATT	705	50.103	0.303	10.1	115.3037	0.0000	SURCHARGED
720 minute winter	ATT2	690	50.105	0.305	7.6	28.9599	0.0000	SURCHARGED
960 minute winter	S08	930	50.102	0.352	7.1	0.0995	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	DB	1.002	FLOW	3.8	0.219	0.034	0.2113	93.9
960 minute winter	FLOW	Orifice		1.7				
720 minute winter	ATT	2.000	S08	7.3	0.533	0.076	0.0597	
720 minute winter	ATT2	1.000	S08	7.2	0.442	0.131	0.1790	
960 minute winter	S08	1.001	DB	3.3	0.833	0.037	0.2004	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	DB	930	50.423	0.823	10.9	141.2265	0.0000	FLOOD RISK
960 minute winter	FLOW	915	50.423	0.853	5.2	0.9648	0.0000	OK
240 minute winter	ATT	176	50.696	0.896	33.6	152.8229	0.0000	SURCHARGED
240 minute winter	ATT2	176	50.696	0.896	20.6	38.0475	0.0000	SURCHARGED
240 minute winter	S08	176	50.695	0.945	16.5	0.2675	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	DB	1.002	FLOW	5.2	0.162	0.047	0.2113	113.9
960 minute winter	FLOW	Orifice		2.2				
240 minute winter	ATT	2.000	S08	9.9	0.537	0.104	0.0597	
240 minute winter	ATT2	1.000	S08	12.2	0.578	0.222	0.1790	
240 minute winter	S08	1.001	DB	15.5	1.262	0.172	0.2004	

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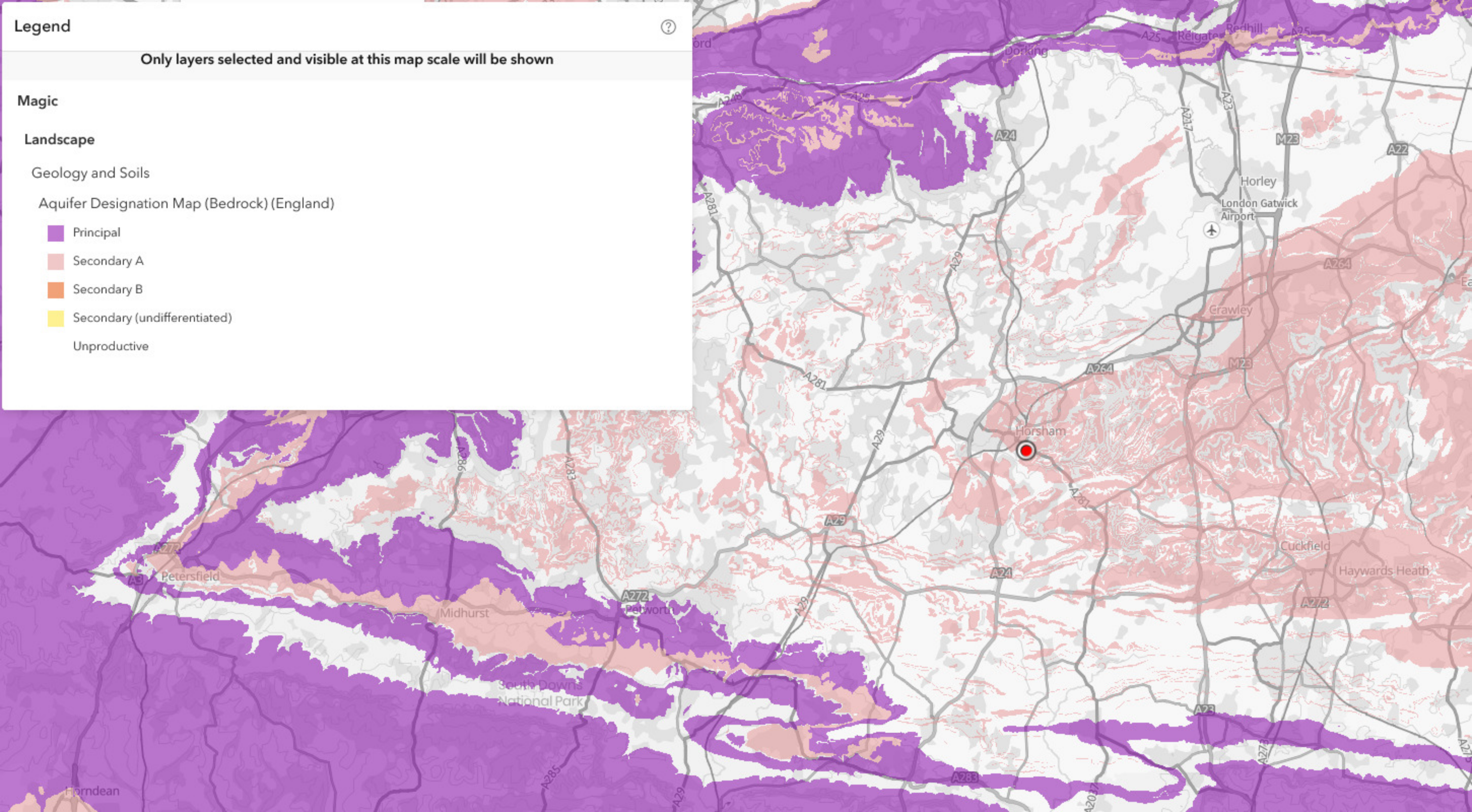
Magic

Landscape

Geology and Soils

Aquifer Designation Map (Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive



Legend



Only layers selected and visible at this map scale will be shown

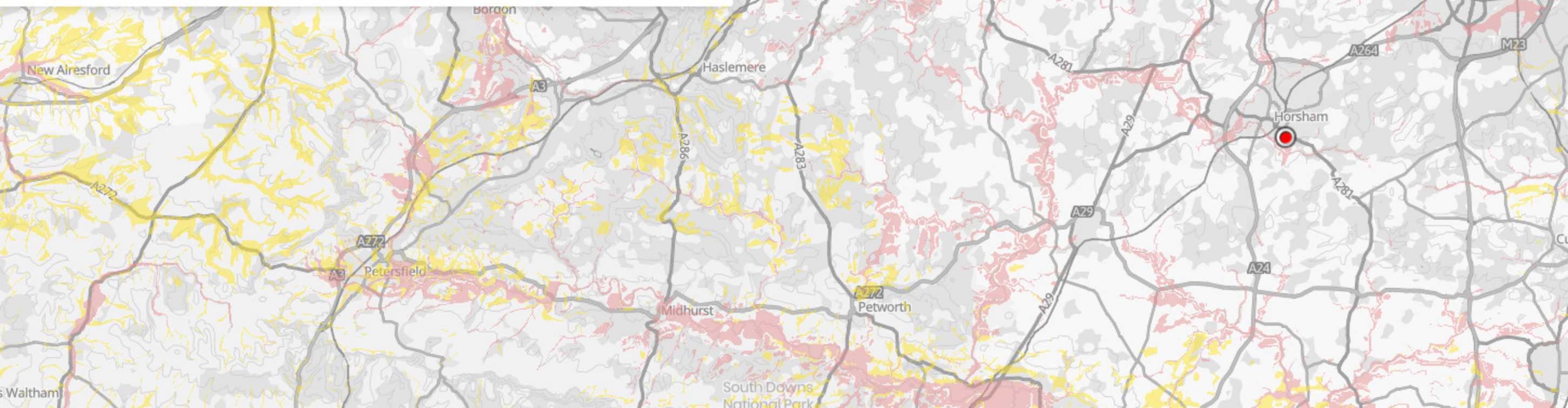
Magic

Landscape

Geology and Soils

Aquifer Designation Map (Superficial Drift) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive



Legend

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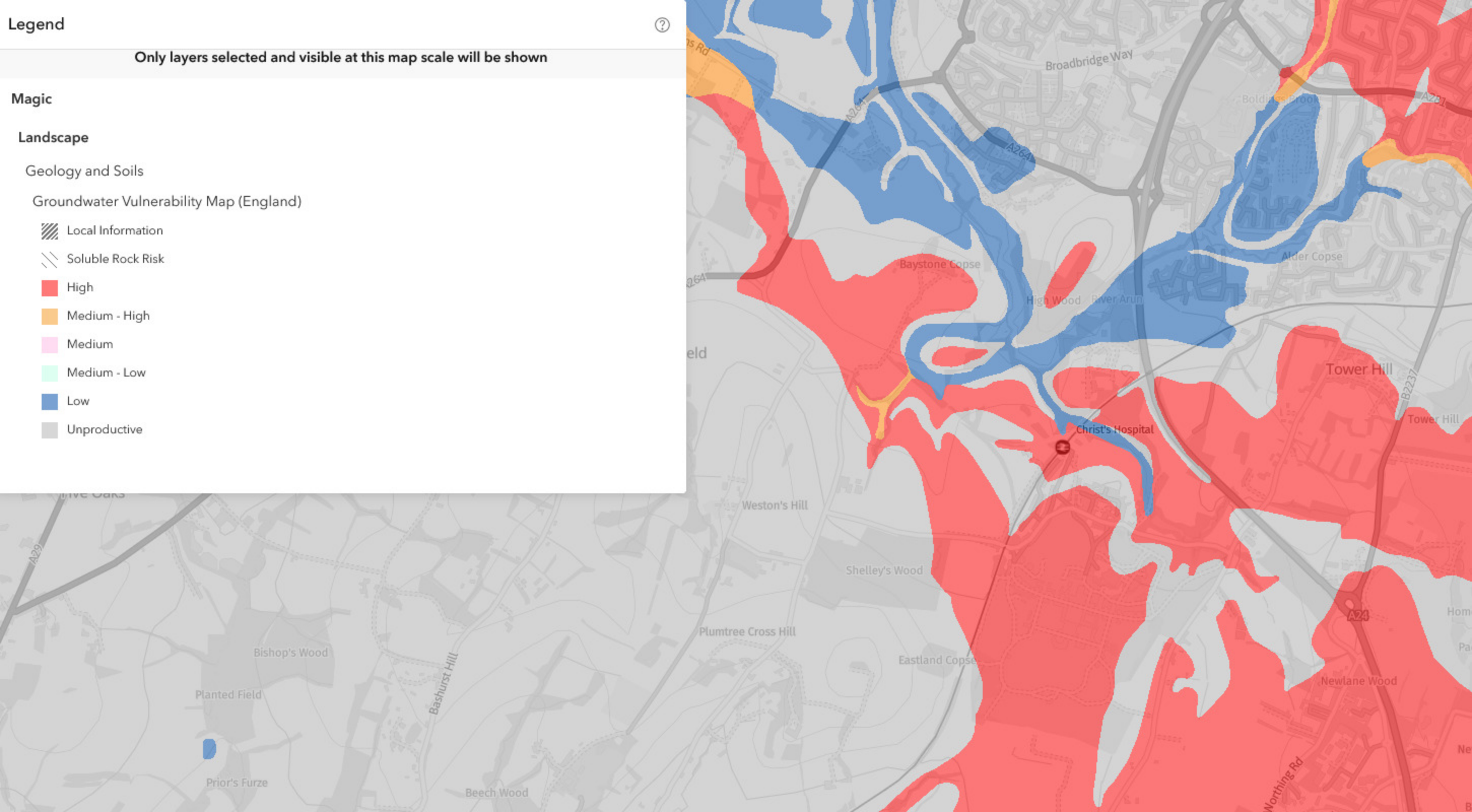
Magic

Landscape

Geology and Soils

Groundwater Vulnerability Map (England)

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



Legend

Only layers selected and visible at this map scale will be shown

Magic

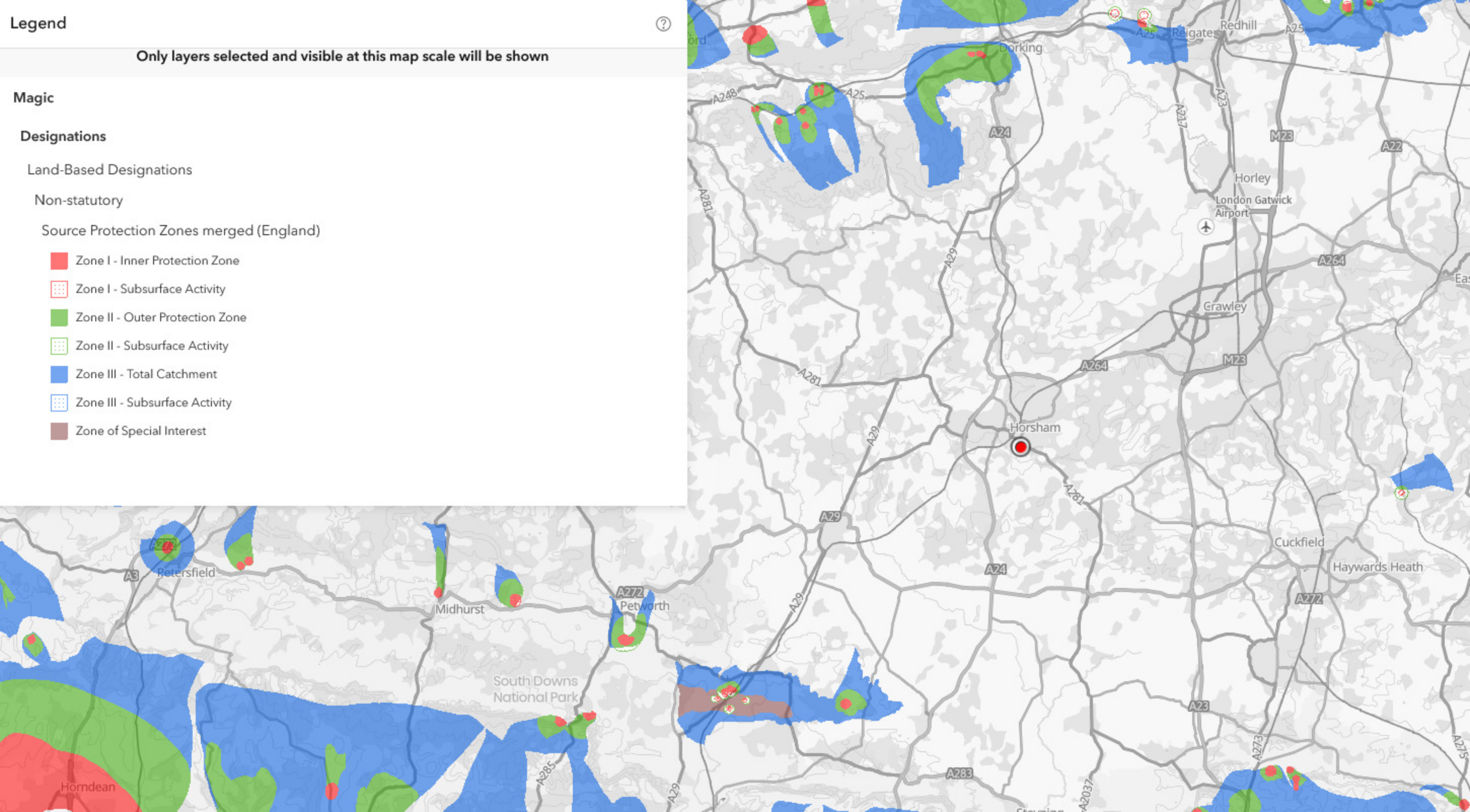
Designations

Land-Based Designations

Non-statutory

Source Protection Zones merged (England)

- Zone I - Inner Protection Zone
- Zone I - Subsurface Activity
- Zone II - Outer Protection Zone
- Zone II - Subsurface Activity
- Zone III - Total Catchment
- Zone III - Subsurface Activity
- Zone of Special Interest



7.4 **Appendix D – Maintenance Schedule**

Maintenance Schedule

Land off Athelstan Way, Horsham

For

Albert Brazil

Rev - P

Reference **C3852**

Date **29th September 2025**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	29/09/2025	Initial Issue	KCK	CS

Contents

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1 Maintenance

1.1 Introduction

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

1.2 SuDS at Land off Athelstan Way, Horsham

- 1.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Attenuations tank and Detention basin**.
- 1.2.2 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

1.3 SuDS Drainage Maintenance Specification

1.3.1 Attenuation Tank

In order to maintain the functioning of the attenuation tanks, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for attenuation storage tanks		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	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
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from per-treatment structures and/or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

1.3.2 Detention Basin

In order to maintain the functioning of the Infiltration Basin, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for Detention Basins		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter, debris, and trash	Monthly
	Cut the grass – for landscaped areas	Monthly (during growing season) or as required
	Cut the meadow grass in and around basin	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetations and remove nuisance plants (for the first 3 years)	Monthly (at start, then as required)
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair / rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surface and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages and clean if required	Monthly
	Inspect banksides, structure, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half Yearly
	Inspect infiltration surface for compaction and ponding	Monthly

1.4 General Drainage Maintenance Specification

1.4.1 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 all 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. Strim vegetation 1m min surround to structures and keep area free from silt and debris	Monthly
Inspections 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

1.4.2 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