

Land off Edneys Hill, Wokingham

Drainage Strategy

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Acronyms	
AOD	Above Ordnance Datum
CIRIA	Construction Industry Research and Information Association
EA	Environment Agency
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
WBC	Wokingham Borough Council
LLFA	Lead Local Flood Authority
TW	Thames Water

1 Introduction

Price & Myers have been commissioned to undertake a Drainage Strategy for the proposed development at Land off Edneys Hill, Wokingham

This report has been carried out in accordance with the DEFRA's Non-Statutory Technical Standards for Sustainable Drainage Systems, Wokingham Borough Council (WBC) guidance on SuDS and management of surface water and Building Regulations Part H. This report also incorporates advice and guidance from the Environment Agency (EA) and CIRIA documents.

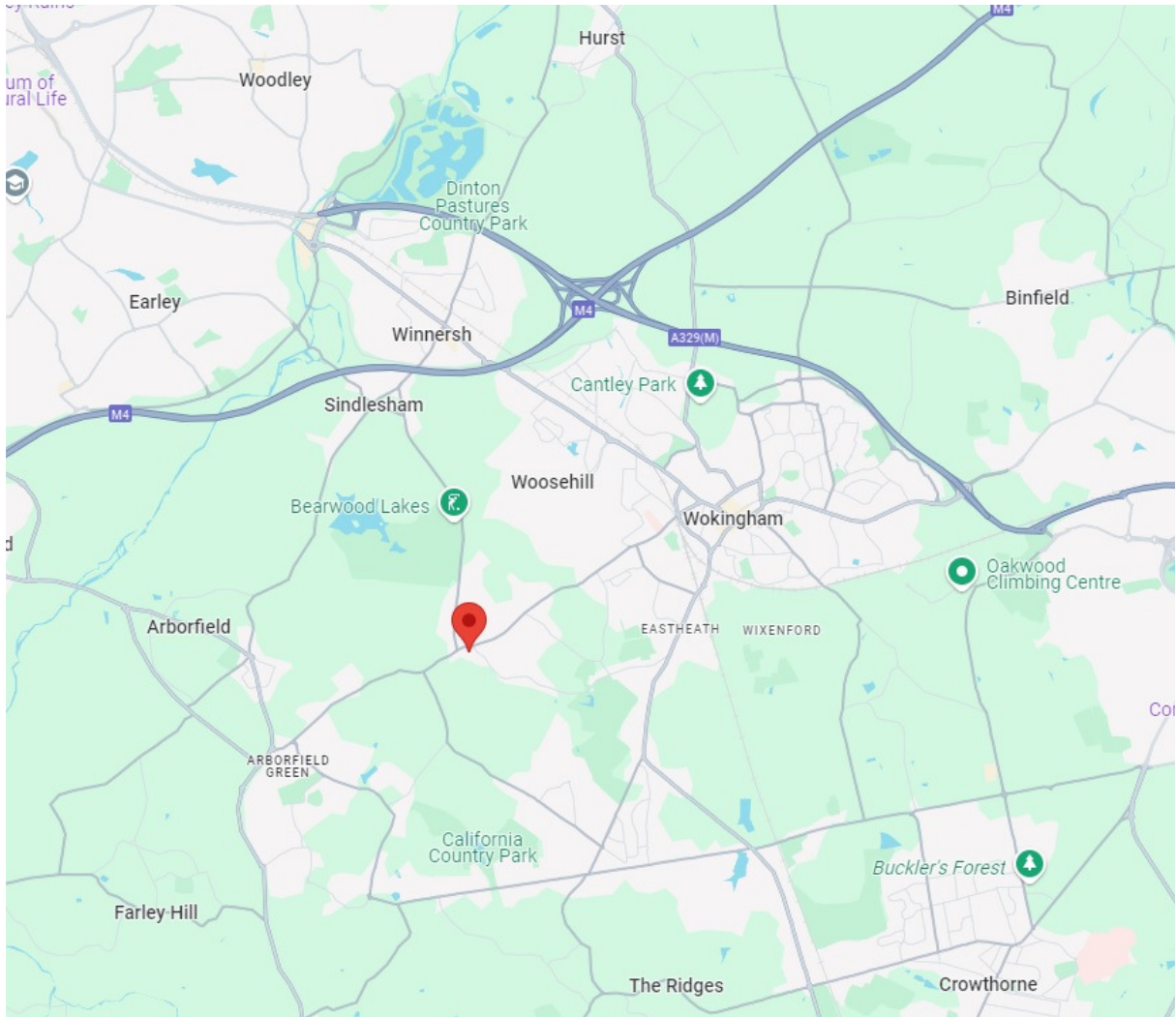


Figure 1.1: Site Location (Google Maps)

2 Site Description and Location

The site is situated to the west of Edneys Hill and it covers an area of approximately 0.69 ha. The site is currently undeveloped and covered by soft landscaped areas. It is bounded by existing residential properties to the west, Barkham Road to the north, Edneys Hill to the east and undeveloped area to the south.

The nearest watercourse to the site is a ditch that runs alongside the site's east boundary in a southern direction and terminates at the site's southeast corner. The nearest postcode to the site is RG41 4DP and the OS grid reference is 478468E 167161N. The site falls to the east, the maximum level difference is approximately 10m and the average ground level is 65m AOD. Access to the site is available from Worthing Road.



Figure 2.1: Existing site and site boundary (Google Maps)

2.1 Existing Drainage

Thames Water asset location maps show that a 225mm foul water and a 1200mm surface water public sewers cross the eastern part of the site.

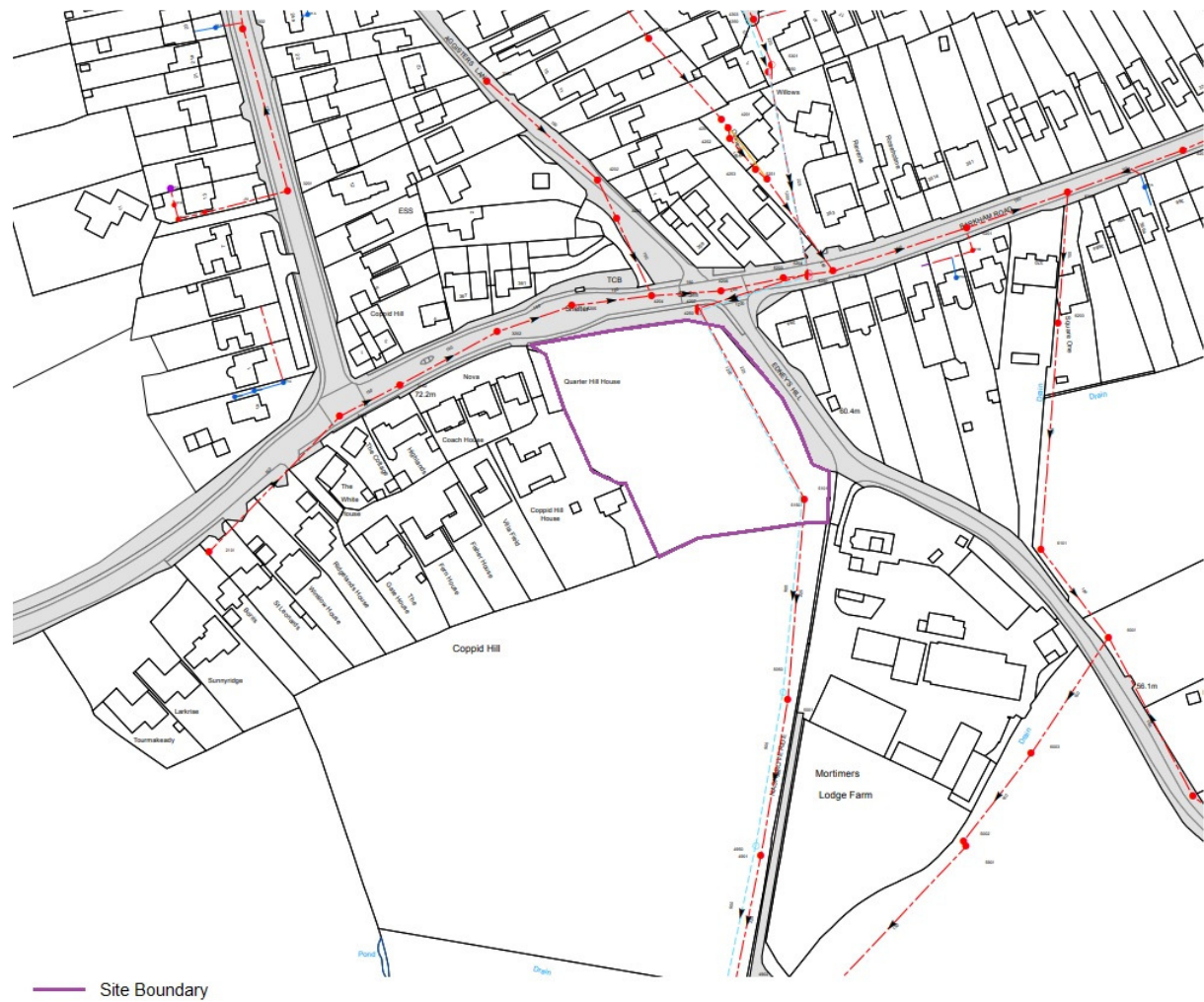


Figure 2.2: Southern Water's Sewer Records

3 Development Proposal

The proposals involve the construction of 10 no. houses and 6 apartments with associated landscaping, access roads, garages, and car parking spaces. Access to vehicles and pedestrians will be provided from Edneys Hill.

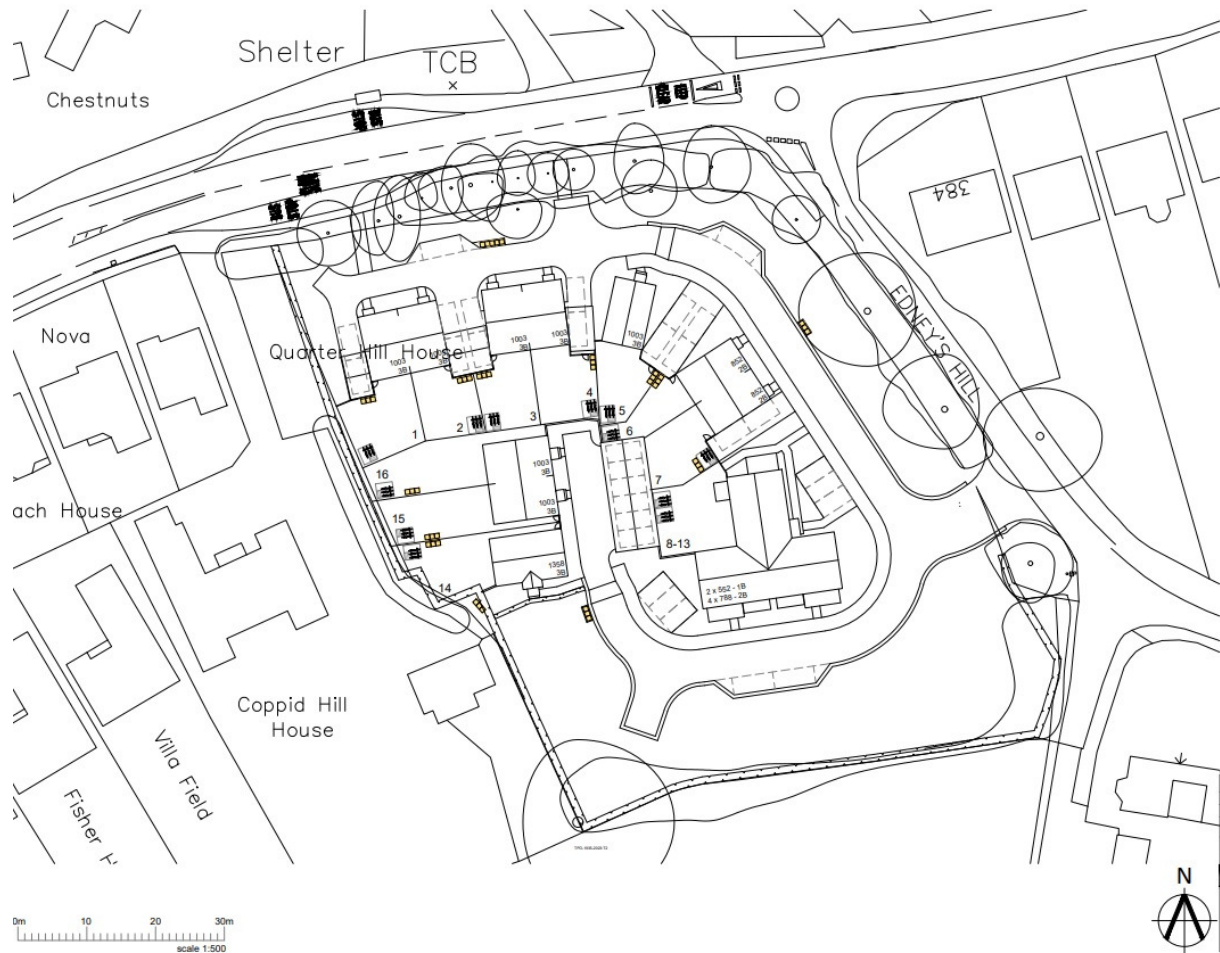


Figure 3.1: Proposed Site Layout

4 Flood Risk Summary

The EA's flood map for planning shows that the site is located in Flood Zone 1 and therefore the flood risk from watercourses is considered low. The annual probability of flooding from rivers and the sea at the site location is 0.1%.

The EA's flood risk from surface water and flood risk from reservoir failure maps also show that the site is at low risk of flooding from both sources.

Groundwater flooding is caused by the emergence of water from underground aquifers. It can be caused by a range of factors, including:

- Prolonged periods of rainfall
- Flooding of the superficial aquifer resulting from high river levels and
- Rebound – where abstraction of groundwater ceases, the groundwater level can return to a natural level. This may cause problems if springs start to reform in areas that have since been developed.

The site's topography shows that groundwater will flow to the east if it reaches near the ground surface level and from there will flow to a southern direction through Edneys Hill. Furthermore, no basements are proposed which are vulnerable to groundwater flooding. Therefore, the flood risk from groundwater is considered low.

5 Surface Water Run-off Assessment

5.1 Existing Run-off

The site occupies an area of approximately 0.69 ha and it is currently undeveloped, generating greenfield run-off rates. The site's Greenfield run-off rates were calculated for various storm events based on the IH124 method, using UK SuDS tools.

$$\begin{aligned}Q_{\text{BAR}} &= 3.08 \text{ l/s} \\Q_1 &= 2.62 \text{ l/s} \\Q_{30} &= 7.08 \text{ l/s} \\Q_{100} &= 9.81 \text{ l/s}\end{aligned}$$

5.2 Post Development Run-off

The proposed impermeable areas will occupy an area of approximately 0.343 Ha. The peak run-off rates for the design storm events were calculated using the modified rational method as shown below:

$$\begin{aligned}Q_1 &= 2.78 \times 0.343 \times 28.939 &= 27.60 \text{ l/s} \\Q_{30} &= 2.78 \times 0.343 \times 94.937 &= 90.53 \text{ l/s} \\Q_{100} &= 2.78 \times 0.343 \times 145.479 &= 138.72 \text{ l/s}\end{aligned}$$

5.3 Climate Change

The EA's "climate change allowances for peak rainfall in England" map shows that the site is within the Loddon and Tributaries Management catchment area and that a 40% allowance for climate change should be considered in the drainage design.

5.4 Proposed Surface Water Drainage

In accordance with EA guidelines, LLFA design guidelines for surface water drainage systems and CIRIA documents, surface water run-off should be managed as close to its source as possible. The preferred means of surface water drainage for any new development is an infiltration drainage system. SUDS can reduce the impact of urbanisation on watercourse flows, ensure the protection and enhancement of water quality and encourage recharge of groundwater in a manner that mimics nature. If drainage to an infiltration system or soakaways proves to be an unsuitable option for the site, then drainage to a watercourse must be assessed. Drainage to the public sewers can be considered only when all other alternative options are unsuitable.

Building Regulations Part H and LLFA's SuDS hierarchy "

1. *Surface runoff not collected for use must be discharged according to the following discharge hierarchy:*

- *to ground,*
- *to a surface water body,*
- *to a surface water sewer, highway drain, or another drainage system, or*
- *to a combined sewer.*

5.4.1 Surface Water Destination

The local geology suggests that the ground conditions are not suitable for infiltration techniques.

Soakaway tests were performed at three locations on site, confirming that the porosity properties of the soil are unsuitable for infiltration techniques (Appendix E).

5.4.2 Runoff Rate and Attenuation

The LLFA's Policy states that for greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Furthermore, Wokingham requires demonstration that discharges from the proposed development for all return periods from the 1 in 1 through to the 1 in 100 year (inclusive), do not exceed their corresponding greenfield/previously developed discharge rates. Demonstration of this is required for the 1 in 1 year, 1 in 30 year, 1 in 100 year and 1 in 100 year including allowances for climate change.

As the proposed impermeable areas will occupy 50% of the site area, flow control devices should be provided to reduce the peak flow rates from the impermeable areas to 50% of the greenfield run-off rates. This will ensure that the combined run-off from the proposed impermeable and hardstanding areas will match the site's greenfield run-off rates. Therefore, the proposed drainage system will be designed to restrict the proposed development's discharge rates to:

$Q_1 = 1.31 \text{ l/s}$

$Q_{30} = 3.54 \text{ l/s}$

$Q_{100} = 4.91 \text{ l/s}$

The LLFA's design guidelines state that all proposed discharges of 5l/sec or below from a single structure should be reviewed in terms of maintenance and blockage potential. Flow control devices restricting the rate of flow must have a bypass feature to manage flows when a blockage occurs. The bypass can be an internal weir overflow within the chamber discharging to the outfall pipe or channel.

SuDS such as detention basins and permeable paving will be able to meet the LLFA's requirements. A detention basin is proposed in the southeast corner of the site where the topography naturally directs surface water. Furthermore, an underground attenuation tank will be provided in order to provide the required volume for surface water storage during extreme storm events. Three hydrobrakes will be installed in a manhole to attenuate the site's run-off to the relevant greenfield rates. Hydraulic calculations have been produced for the 1 in 2 years, 1 in 30 years, 1 in 100 years and 1 in 100 years plus climate change storm events. The LLFA's guidance states that hydraulic calculations should be produced for the 1 in 1 year. However, FEH rainfall data cannot be simulated for the 1 in 1 year storm event. The drainage system has therefore been designed to reduce the proposed development's discharge rates to the 1 in 1 year greenfield rate for the 1 in 2 years storm event. This will ensure that

the run-off rate from the proposed development will not exceed the 1 in 1 year greenfield rates for storm events with a return period up to 1 in 2 years storm event.

Surface water from the car parking areas and access road will be collected in permeable paving systems and the detention basin, providing two levels of treatment before discharging into the watercourse.

Hydraulic calculations show that for the 1 in 2 years storm event scenario, surcharging occurs only in manhole FC1 where the hydrobrake is located and aim to control surface water. It is therefore reasonable for the water level to be elevated in manholes FC1 during all storm events.

5.4.3 Consideration of Other SUDS

Green roofs and blue roofs will not be effective for this development, as pitched roofs are proposed for all buildings which will be unable to control the surface water, particularly during extreme storm events. Flat roofs are preferable for such systems.

Shallow infiltration systems such as swales and filter drains have not been incorporated in the design, as these systems are designed to receive run-off from adjacent impermeable surfaces. The permeable paving system will control run-off from the impermeable areas.

Rainwater butts will be provided in all houses, re-using rainwater for irrigation purposes.

5.4.4 Design Parameters

Calculations based on the FEH method show that the proposed SuDS will be able to control surface water from the proposed development in the 1 in 100 year plus climate change storm event.

A 10% increase in impermeable areas was included in the calculations to allow for future urban creep. Therefore, the surface water drainage calculations are based on a total area of 0.377 ha.

5.4.5 Designing for Exceedance

The 1 in 30 years storm event is the design storm event for the proposed development. However, the proposed SuDS will be able to accommodate surface water in high storm events exceeding the design storm event, as section 5.4.2 states. The site's topography shows that surface water from the site will flow towards Edneys Hill if the capacity of the drainage network is exceeded. Refer to Appendix F for the overland flow paths. This will occur in storm events with a return period higher than 1 in 100 year plus 45%. Furthermore, all building entrances will be raised above the external areas preventing overland flows from flooding the internal areas.

5.4.6 Water Pollution

SuDS have the potential to provide water quality benefits to runoff entering the environment. The SuDS Manual states that SuDS should be designed to treat runoff to reduce the risk of environmental pollution. Chapter 26 of The SuDS Manual sets out the 'simple index approach' to water quality risk management. This approach has been used to quantify the benefits of the proposed SuDS scheme on water quality.

Step 1 of the simple index approach is to identify the pollution hazard indices for the proposed land use. The proposed residential development is considered to have a 'Very Low/Low' pollution hazard level as Table 5.1 below shows.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.5	0.4	0.4

Table 5.1: Pollution Hazard Indices, taken from Table 26.2 of The SuDS Manual (CIRIA, 2015)

Step 2 of the simple index approach is to select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index. As the destination of the runoff is to surface water and there is no infiltration from the SuDS to groundwater, the surface water pollution mitigation indices should be used as shown in Table 5.2. The indicative surface water pollution mitigation indices for permeable pavements, and detention basins are shown in Table 5.2 below:

Type of SuDS Component	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6

Table 5.2 Surface Water Pollution Mitigation Indices, taken from Table 26.3 of The SuDS Manual

Provided that the mitigation indices of the treatment techniques are greater than or equal to the hazard indices for the proposed development then there should be no reduction in the overall water quality within the receiving watercourse or groundwater body. Surface water from roofs and hardstanding areas will pass through two SuDS before discharging to the stream. Therefore, the incorporation of the proposed SuDS will provide suitable prevention from pollution to surface water.

6 Surface Water Maintenance Strategy

The successful implementation and operation of a SuDS system depend on a robust and clear maintenance strategy being implemented. The following measures should form part of the site's proposed management plan. The drainage system will be maintained by a private management company and will form part of the overall maintenance regime for the site.

The drainage layout drawing shows that SuDS are provided for all vehicular trafficked areas.

Maintenance and cleaning of gullies, gutters, rainwater pipes and stormwater manholes will ensure adequate performance. This maintenance program is outlined below;

Regular maintenance should include:

1. Inspect channel drains, gutters and gully inlet grates and remove any debris every 3 months or as determined to be reasonable based on experience with the installed systems to ensure that all drainage components are working in their intended fashion and that they are free of debris; quarterly, inspect gully sumps and bottom of drain manholes; if the depth of sediment in sumps exceeds 50% capacity, the sediment must be removed. Excessive sediment shall be removed and properly disposed of by a licensed drainage cleaning company.
2. Inspect all vegetated areas and remove litter and debris as necessary. Replant bare areas or areas with sparse growth.
3. Inspection of external bin stores for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the stormwater management system.
4. The porous surfacing must be brushed three times a year with a mechanical suction brush. It is recommended that this should be carried in the spring, mid-summer and after leaf fall in autumn.

Winter Maintenance Program:

Ensure that drainage structures are not blocked by ice, snow, debris, or rubbish during the winter months.

Fertiliser Use

Only slow-release organic low-phosphorous fertilisers will be used in any landscaped areas in order to limit the amount of nutrients that could enter the stormwater system.

The management plan should include measures for maintaining the vegetation on the basin's banks, removing debris from the detention basin and cleaning any debris from its outlet.

SUDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
Permeable Paving	Monitoring / Inspections	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, 48 hours after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually
	Regular Maintenance	Brushing and vacuuming -standard cosmetic sweep over whole surface	Once a year after autumn leaf fall
		Rubbish and litter removal	As required
	Remedial Actions	Remediate any landscaping which through vegetation maintenance or soil slip, has been raised to within 50mm of the 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	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Detention Basin	Regular Maintenance	Remove litter and debris	Monthly, or as required
		Cut the grass – public areas	Monthly during growing season
		Cut the meadow grass	Half yearly – before nesting season in spring and in autumn
		Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly, at start, then as required
		Inspect inlets, outlets, banksides, structures, pipework etc. for evidence of blockage and/or physical damage	Monthly
		Inspect water body for signs of poor water quality	Monthly from May – October
		Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
		Check any mechanical devices, e.g. penstocks	

SUDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
		Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
		Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	
		Tidy all dead growth before start of growing season	
		Remove sediment from any forebay.	Every 1–5 years, or as required
		Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
	Occasional Maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%.	With effective pre-treatment, this will only be required rarely, e.g. every 25–50 years
	Remedial Actions	Repair erosion or other damage	As required
		Replant, where necessary	
		Aerate pond when signs of eutrophication are detected	
		Realign rip-rap or repair other damage	
		Repair / rehabilitate inlets, outlets and overflows.	
Attenuation Tank	Monitoring / Inspections	Inspect all inlets, outlets, vents, overflows and control structures to ensure they are working as they should	Annually or after severe storms
		Inspect and identify any elements that are not operating correctly.	Monthly for three months, then half yearly or as required.
	Regular Maintenance	Remove sediments / debris from catch pits / gullies and control structures	Annually, after severe storms or as required
	Remedial Actions	Repair inlets, outlets, vents, overflows and control structures.	As required

Table 6.1 SuDS Maintenance Strategy as taken from the CIRIA SUDS Manual

7 Foul Water Assessment

As outlined in Section 2.1, there is an existing foul water sewer crossing the site, serving the existing property. A gravity drainage connection from the new buildings to the public sewer is feasible, as the proposed drainage layout drawing in Appendix C shows.

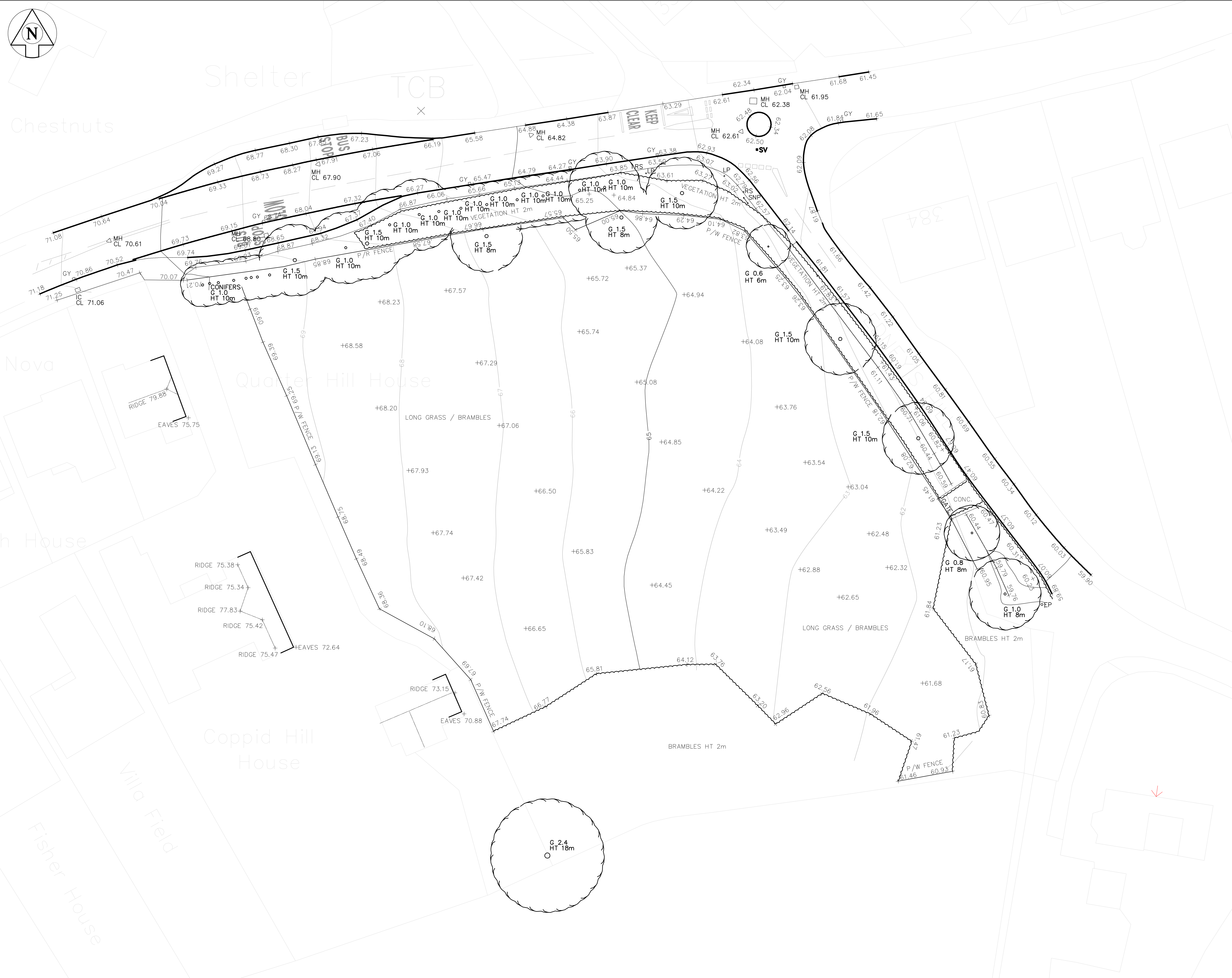
Thames Water sewer capacity check assessment for this development concluded that there is sufficient capacity in the public sewer to accommodate the foul water flows from the proposed development (Appendix F). A Section 106 application must be submitted to Southern Water for the proposed drainage connection from the new development to the public sewer.

8 Conclusions

- The proposals are for the erection of 16 new dwellings with access roads and associated soft and hard-landscaped areas.
- The site is at low risk of flooding from watercourses, groundwater, sewers, and reservoir failure.
- The proposed development will increase the impermeable areas on site and therefore the run-off rates.
- The ground conditions prevent the use of infiltration systems for surface water drainage.
- SuDS will be used for attenuation purposes, including a detention basin, permeable paving, and an underground tank.
- Hydrobrakes will be used to restrict the run-off from the proposed development to the sewers to Greenfield rates.
- Foul water from the proposed development will be discharged to the public sewer that crosses the site. The new drainage connection will be subject to a Section 106 agreement.
- Thames Water sewer capacity check assessment for this development concluded that there is sufficient capacity in the public sewers to accommodate the foul and surface water flows from the proposed development.

Appendix A

Topographical Survey Drawing



- NOTES**
- 1. Co-ordination:** Read this drawing in conjunction with all relevant Architect's, Engineer's and specialist's drawings and specifications
 - 2. Scale:** Do not scale from this drawing, use written dimensions only. All dimensions are in millimetres and levels in metres. To check the drawing has been printed at the intended scale this bar should be 50mm long at A1 or 25mm long at A3.
 - 3. Health & Safety:** All specific drawing notes are to be read in conjunction with the Project Health & Safety Issues: Construction Stage document.
 - 4. General Notes:** Refer to drawing XXXXX-0001.

-		XX	XX	Issued for
Rev.	Date	Dm.	Eng.	Amendment

**LAND OF EDNEYS HILL
WOKINGHAM**

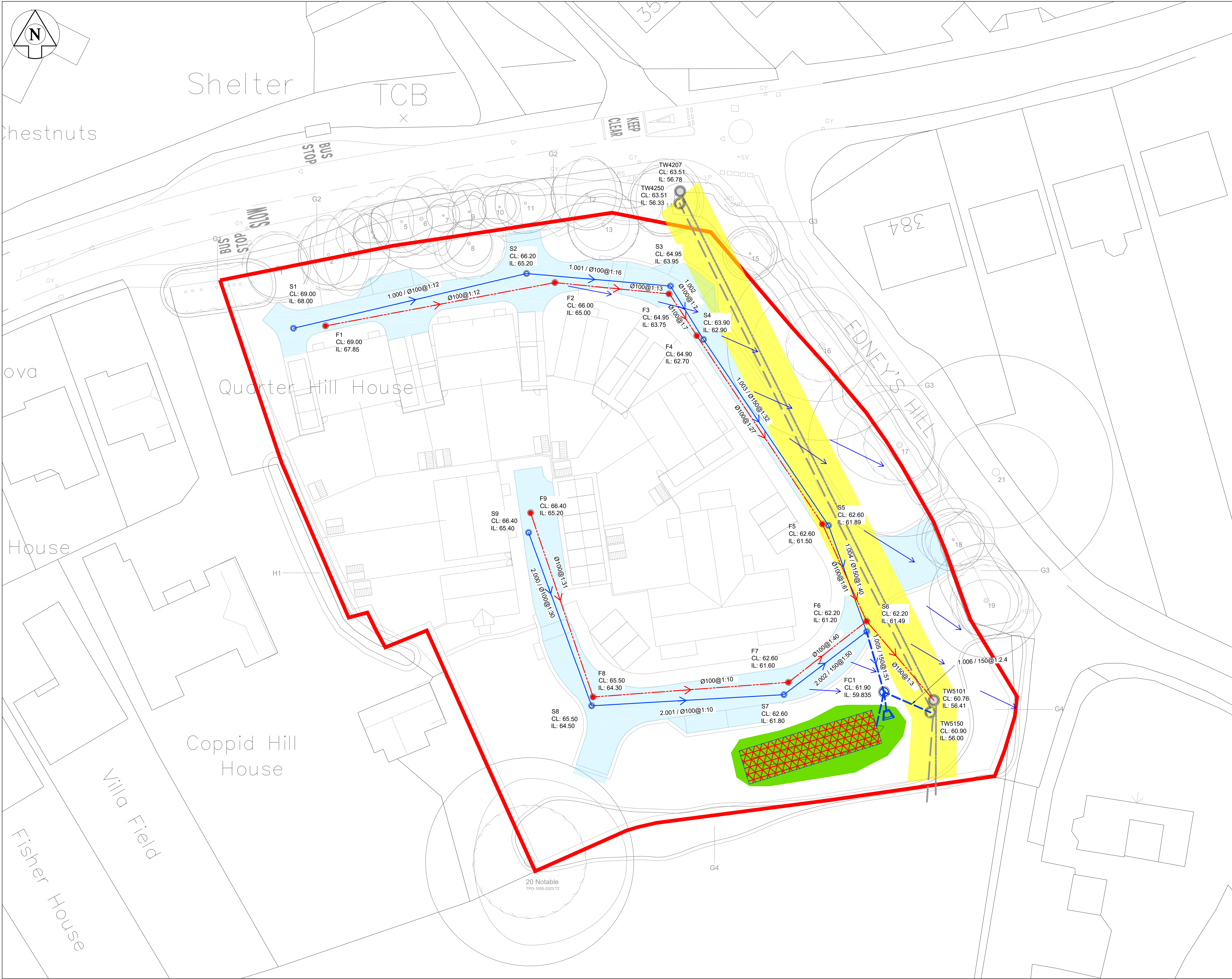
TOPOGRAPHICAL SURVEY

Status
FOR INFORMATION

Drawn	DLin	Eng.	DLin
Scales	1:250 at A1	1:500 at A3	
Drawing No.	Rev.		
31875 / 2000	P01		

Appendix B

Exceedance Routes



NOTES

1. **Co-ordination:** Read this drawing in conjunction with all relevant Architect's, Engineer's and specialist's drawings and specifications

2. **Scale:** Do not scale from this drawing, use written dimensions only. All dimensions are in millimetres and levels in metres. To check the drawing has been printed at the intended scale this bar should be 50mm long at A1 or 25mm long at A3.

3. **Health & Safety:** All specific drawing notes are to be read in conjunction with the Project Health & Safety Issues: Construction Stage document.

LEGEND

New FW Drain
New SW Drain
Existing Foul Water Sewer
Existing Surface Water Sewer
Perforated Pipe
Sewer Easement

DRAINAGE KEY

Pipe Headwall
S1 Surface Water Manhole Chamber
F1 Foul Water Manhole Chamber
Flow Control Chamber (SW only)
TW5101 Thames Water Foul Water Manhole
TW5150 Thames Water Surface Water Manhole
New Permeable Paving
New Attenuation Tank (100m² x 0.4m depth)
New Detention Basin (Base: 43m², Top: 194m², Depth: 1.20m)

ABBREVIATIONS

IL - Invert Level
CL - Cover Level

Overland Flow Path

P02	24/03/25	DLin	DLin	Issued for planning
P01	7/03/25	DLin	DLin	Issued for information
Rev.	Date	Drn.	Eng.	Amendment

**LAND OF EDNEYS HILL
WOKINGHAM**

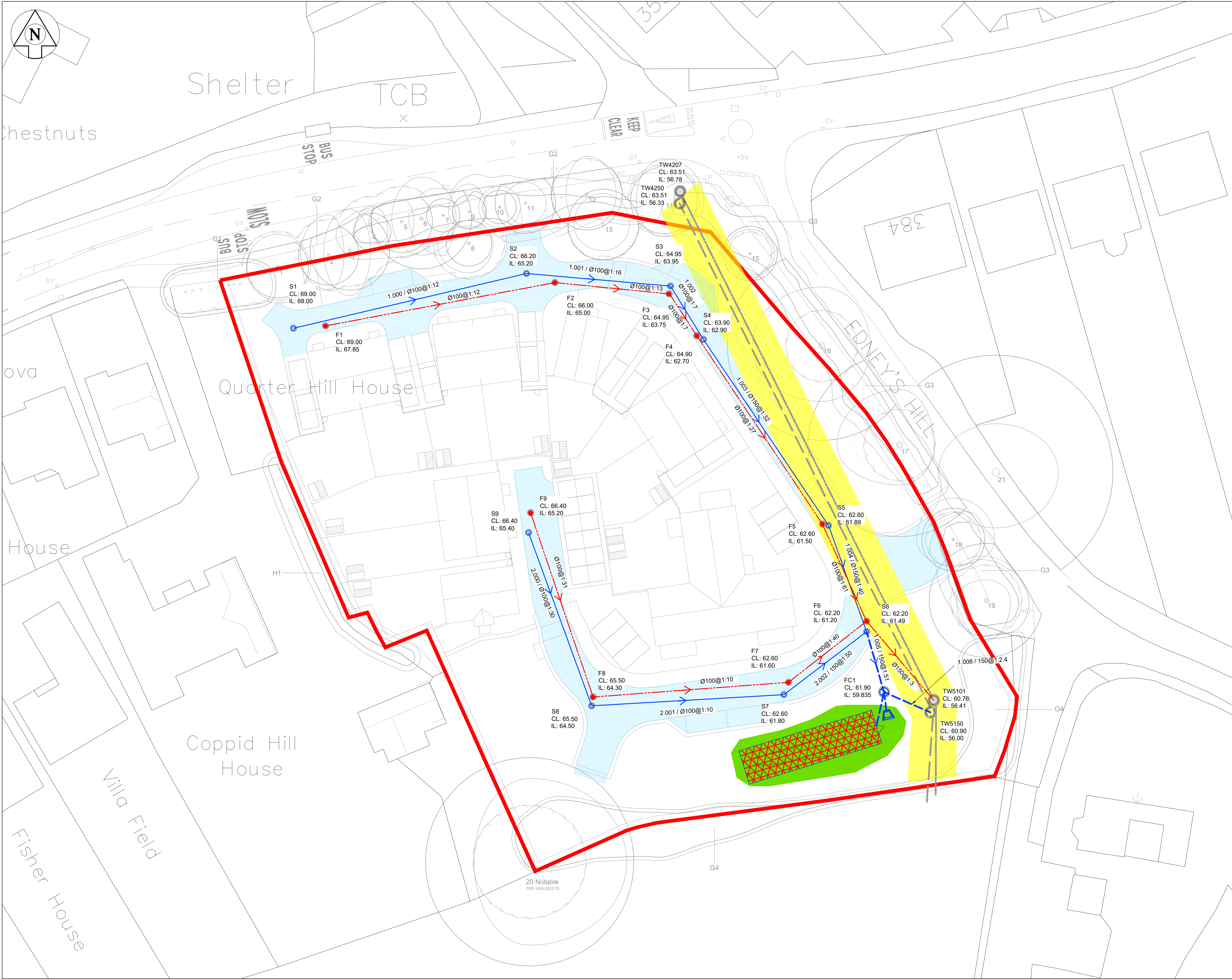
EXCEEDANCE ROUTES

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	DLin	Eng.	DLin
Scales	1:250 at A1	1:500 at A3	
Drawing No.	Rev.		
31875 / 6001	P02		

Appendix C

Proposed Drawings



NOTES

1. **Co-ordination:** Read this drawing in conjunction with all relevant Architect's, Engineer's and specialist's drawings and specifications

2. **Scale:** Do not scale from this drawing, use written dimensions only. All dimensions are in millimetres and levels in metres. To check the drawing has been printed at the intended scale this bar should be 50mm long at A1 or 25mm long at A3.

3. **Health & Safety:** All specific drawing notes are to be read in conjunction with the Project Health & Safety Issues: Construction Stage document.

LEGEND

New FW Drain

New SW Drain

Existing Foul Water Sewer

Existing Surface Water Sewer

Perforated Pipe

Sewer Easement

DRAINAGE KEY

Pipe Headwall

S1

F1

TW5101

TW5150

Surface Water Manhole Chamber

Foul Water Manhole Chamber

Flow Control Chamber (SW only)

Thames Water Foul Water Manhole

Thames Water Surface Water Manhole

New Permeable Paving

New Attenuation Tank (100m² x 0.4m depth)

New Detention Basin Base: 43m², Top: 194m², Depth: 1.20m

ABBREVIATIONS

IL

CL

- Invert Level

- Cover Level

P02

21/03/2025

DLin

DLin

Issued for planning

P01

17/03/2025

DLin

DLin

Issued for information

Rev.

Date

Drn.

Eng.

Amendment

LAND OF EDNEYS HILL WOKINGHAM

DRAINAGE STRATEGY

Status

FOR PLANNING

NOT FOR CONSTRUCTION

Drawn

DLin

Eng.

DLin

Scales

1:250 at A1

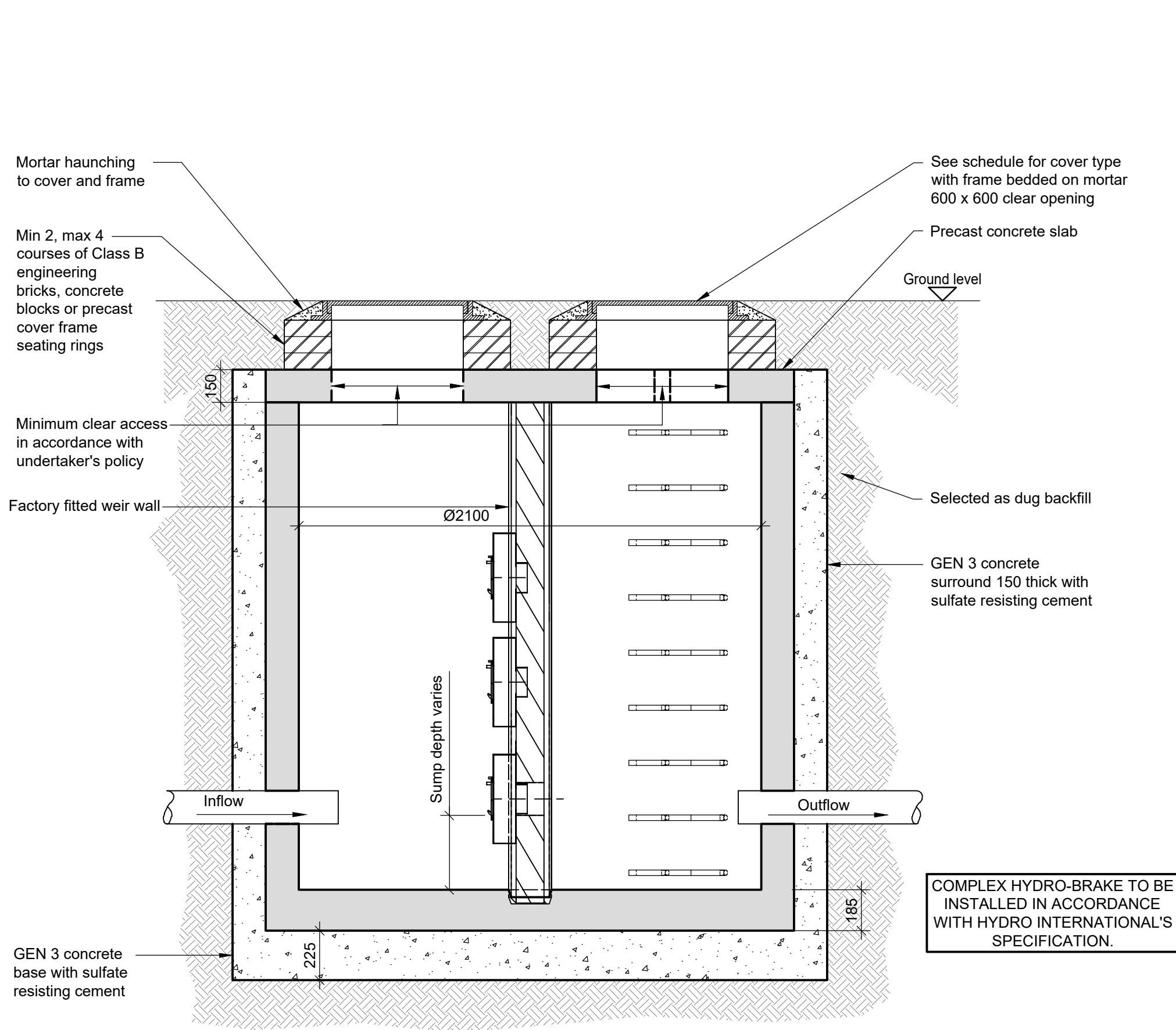
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Drawing No.

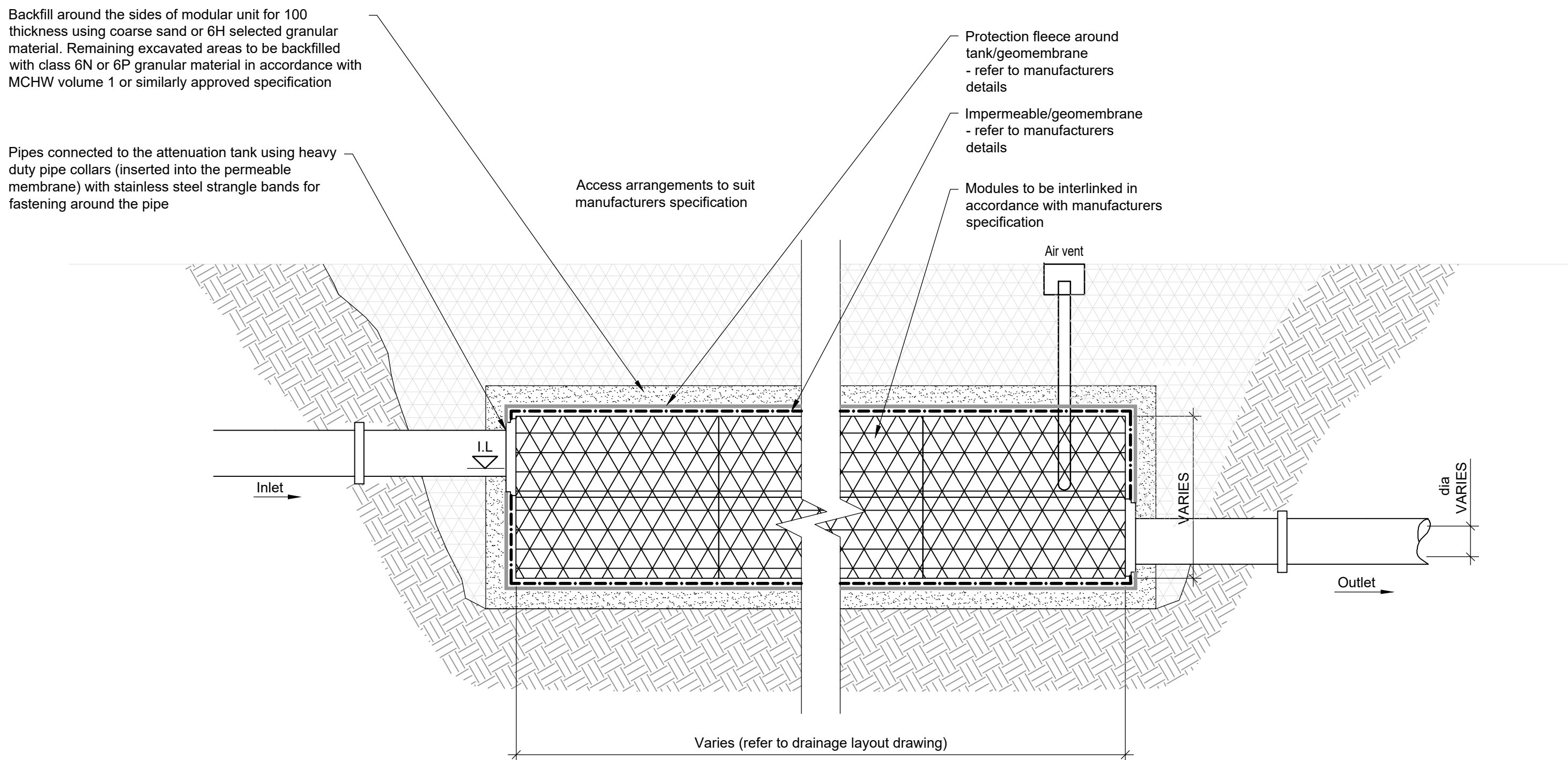
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Rev.

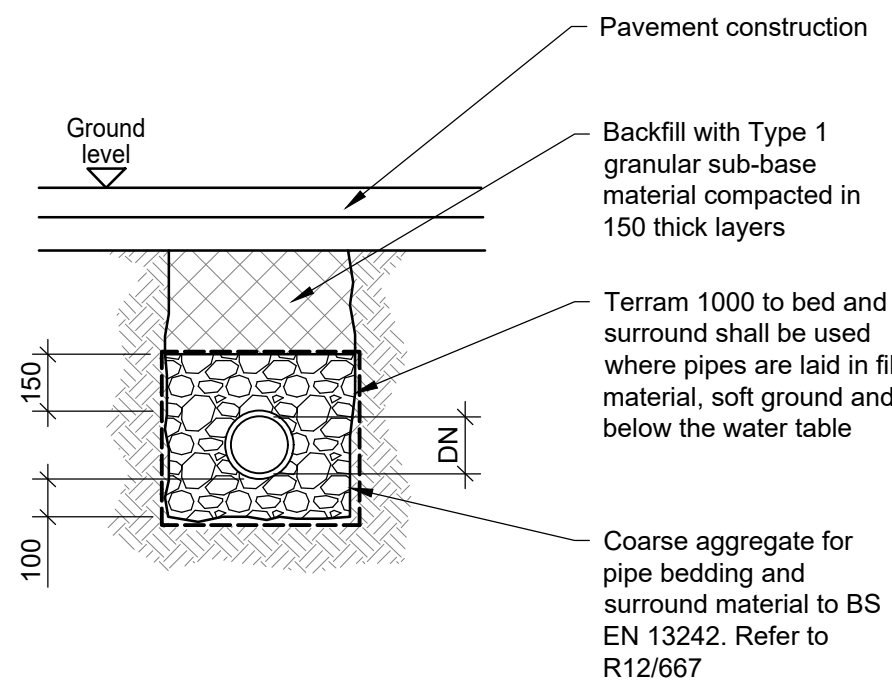
P02



TYPICAL COMPLEX FLOW CONTROL MANHOLE - SECTION A-A

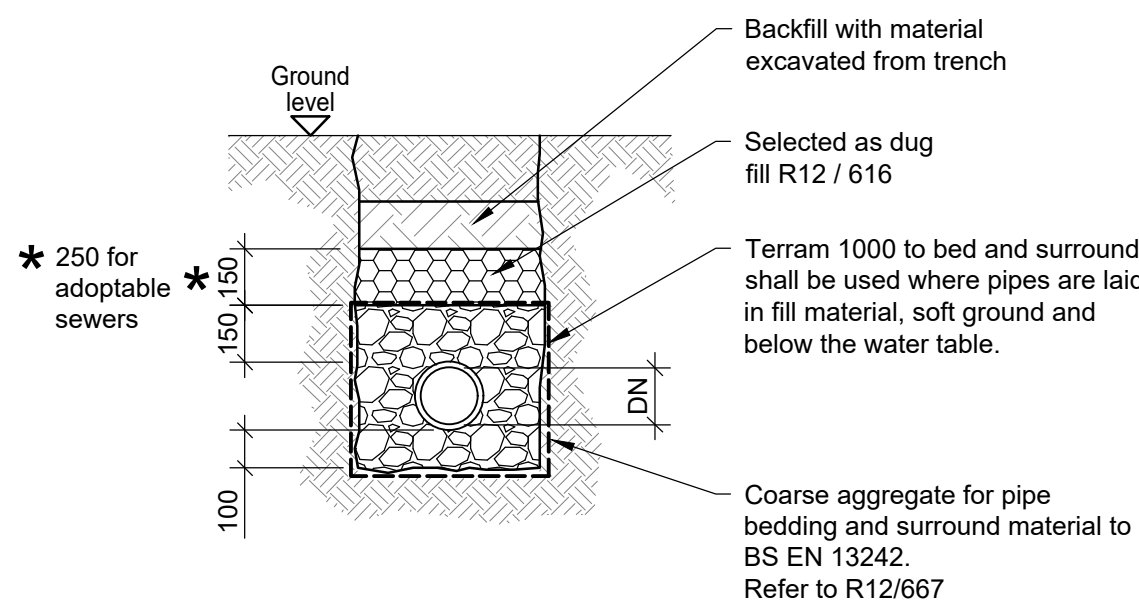


MODULAR ATTENUATION TANK DETAILS



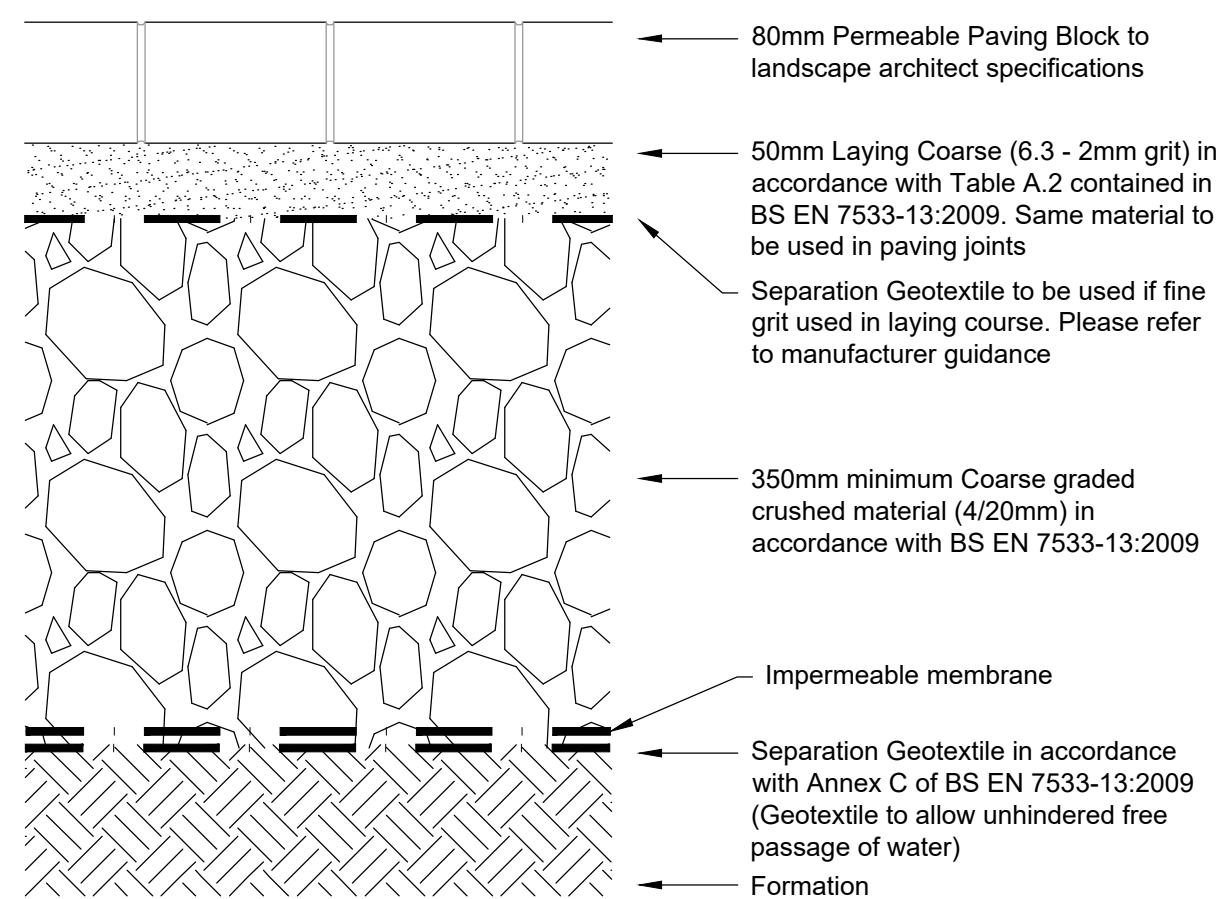
CLASS S SURROUND

GRANULAR SURROUND & BACKFILL FOR
AREAS SUBJECT TO VEHICLE LOADING



CLASS S SURROUND

GRANULAR SURROUND & BACKFILL FOR
SOFT OR HARD LANDSCAPING AREAS
NOT SUBJECT TO VEHICLE LOADING



PERMEABLE BLOCK PAVING

- NOTES :
1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
 2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
 3. Health & Safety : All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
 4. For general notes refer to Drawing No.

P1	07/03/25	DLin	DLin	Issued for Planning
Rev	Date	Drawn	Eng	Amendment

LAND OFF EDNEYS HILL
WOKINGHAM

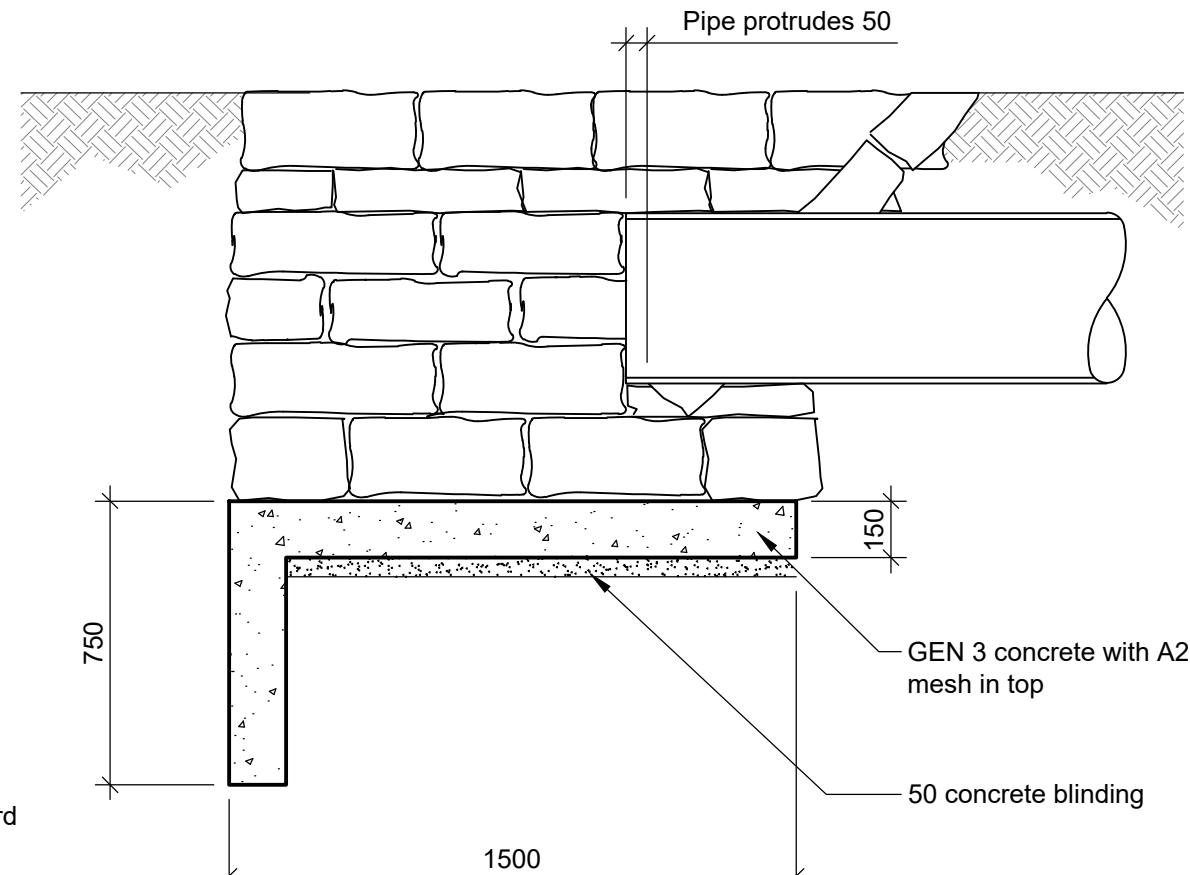
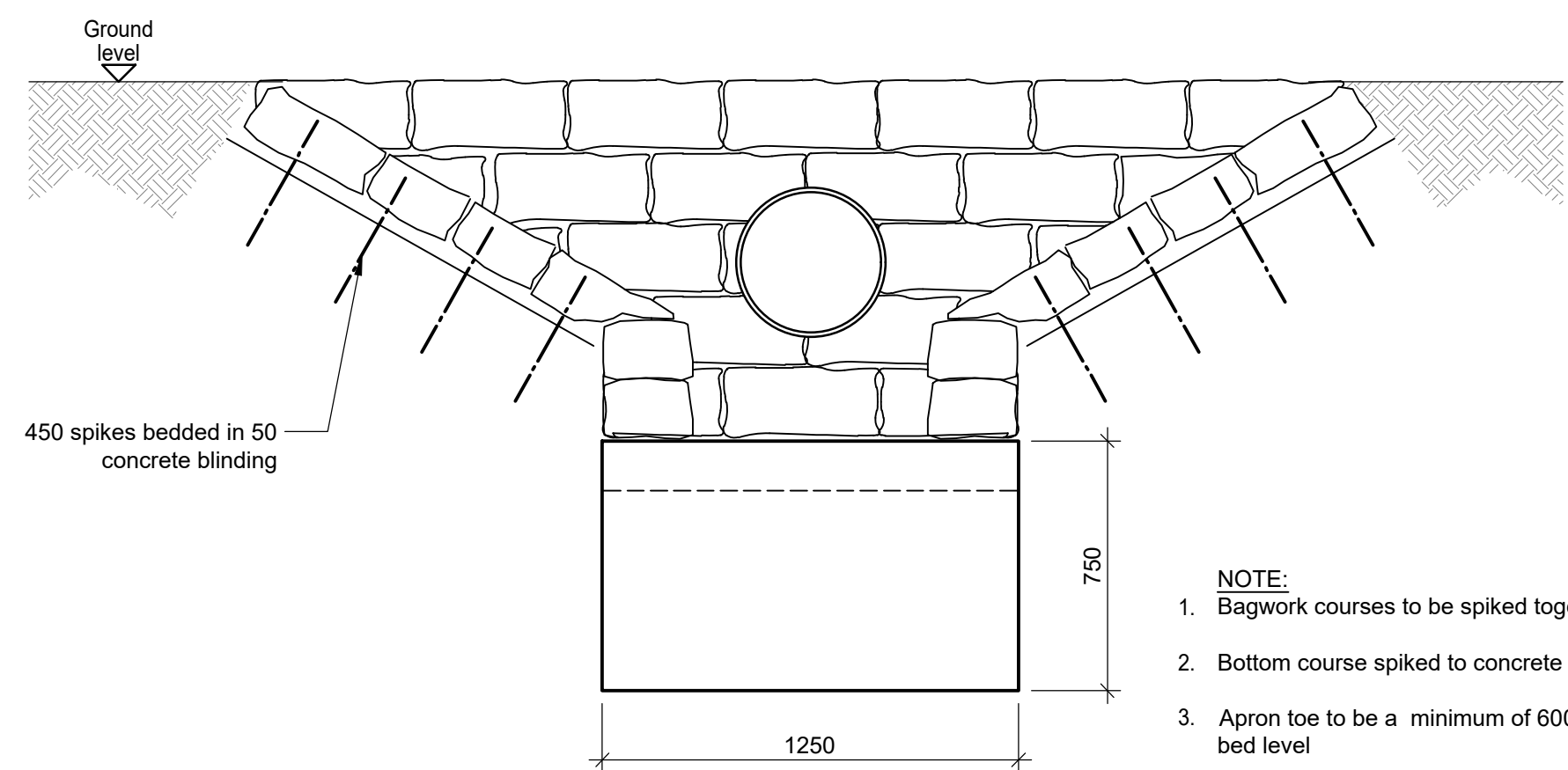
BELOW GROUND
DRAINAGE DETAILS
SHEET 1

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn	PJ	Eng	DLin
Scales	1:20 at A1	1:40 at A3	
Drawing No	Rev		
31875 / 6100	P1		

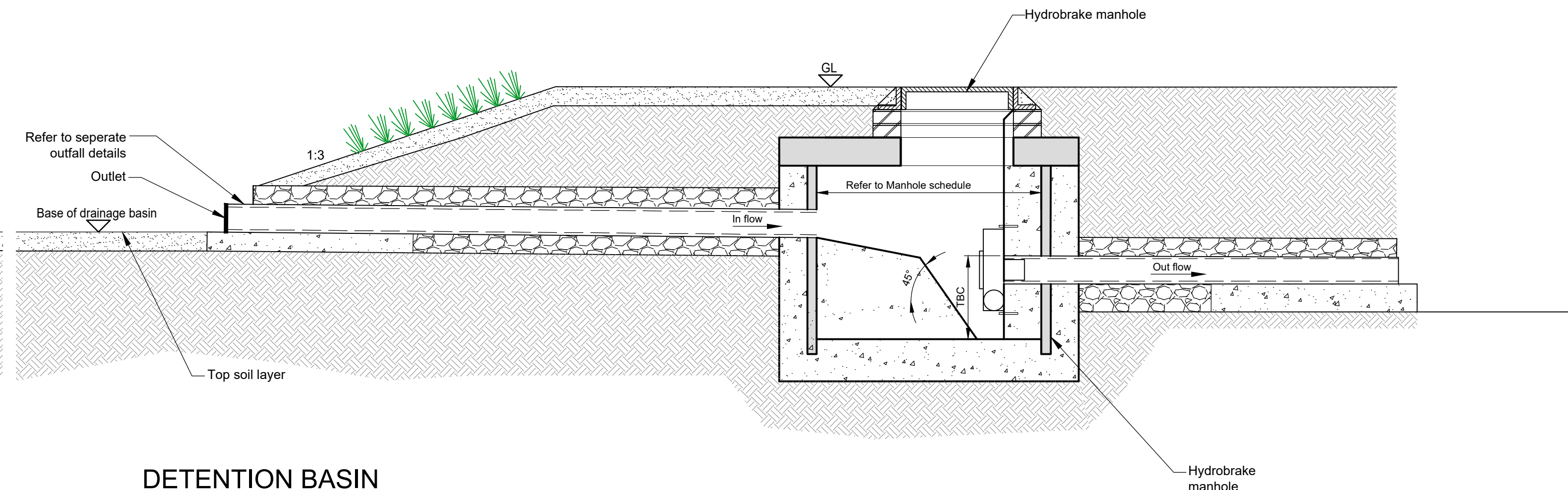
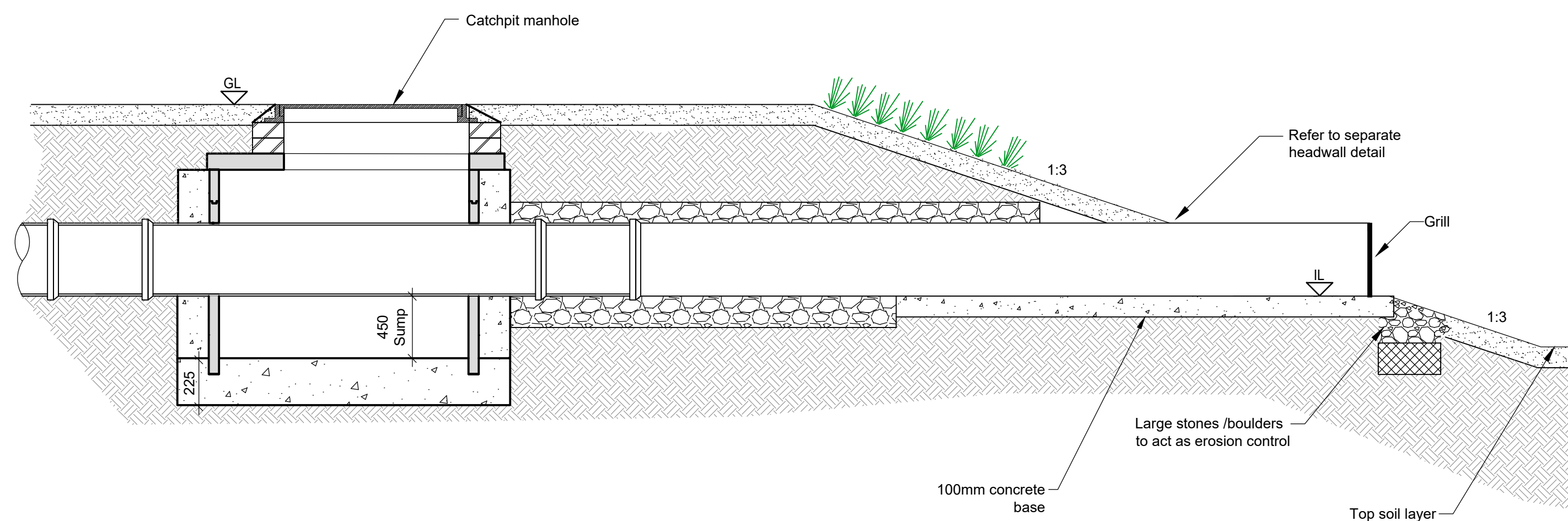
PRICE &
MYERS

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mail@pricemyers.com
www.pricemyers.com



- NOTE:
1. Bagwork courses to be spiked together
 2. Bottom course spiked to concrete apron
 3. Apron toe to be a minimum of 600 below hard bed level
 4. Spikes to be 10 MS rods

BAGWORK HEADWALL



DETENTION BASIN

Notes :

P1	07/03/25	DLin	DLin	Issued for planning
Ver	Date	Drawn	Eng	Amendment

LAND OFF EDNEYS HILL
WOKINGHAM

BELOW GROUND
DRAINAGE DETAILS
SHEET 2

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn PJ	Eng DLin
Scales 1:20 at A1 UNO	1:40 at A3 UNO
Drawing No	Ver
31875 / 6101	P1

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Appendix D

Calculations

Greenfield Run-off

Calculated by:	Dimitris Linardatos
Site name:	Edneys Hill
Site location:	Wokingham

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.39822° N
Longitude:	0.87359° W
Reference:	2565710912
Date:	Feb 27 2025 16:04

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.69
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Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	654	654
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s):	3.08	3.08
1 in 1 year (l/s):	2.62	2.62
1 in 30 years (l/s):	7.08	7.08
1 in 100 year (l/s):	9.81	9.81
1 in 200 years (l/s):	11.51	11.51

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Surface Water Drainage

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	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)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
S1	0.008	5.00	69.000	1200	1.000
S2	0.066	5.00	66.200	1200	1.000
S3	0.024	5.00	64.950	1200	1.000
S4	0.016	5.00	63.900	1200	1.000
S5	0.023	5.00	62.600	1200	0.706
S6	0.042	5.00	62.200	1200	0.711
S7	0.049	5.00	62.600	1200	0.800
S8	0.059	5.00	65.500	1200	1.000
S9	0.018	5.00	66.400	1200	1.000
FC1	0.000		61.900	1200	2.065
TW5150	0.000		60.900	1200	4.100

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	34.500	0.600	68.000	65.200	2.800	12.3	100	5.26	50.0
1.001	S2	S3	20.100	0.600	65.200	63.950	1.250	16.1	100	5.43	50.0
1.002	S3	S4	6.900	0.600	63.950	62.900	1.050	6.6	100	5.47	50.0
1.003	S4	S5	32.200	0.600	62.900	61.894	1.006	32.0	150	5.77	50.0
1.004	S5	S6	16.200	0.600	61.894	61.489	0.405	40.0	150	5.94	50.0
2.000	S9	S8	26.900	0.600	65.400	64.500	0.900	29.9	100	5.32	50.0
2.001	S8	S7	27.700	0.600	64.500	61.800	2.700	10.3	100	5.51	50.0
2.002	S7	S6	15.000	0.600	61.800	61.500	0.300	50.0	150	5.68	50.0
1.005	S6	FC1	8.500	0.600	61.489	61.322	0.167	51.0	225	6.02	50.0
1.006	FC1	TW5150	7.300	0.600	59.835	56.800	3.035	2.4	225	6.03	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	2.213	17.4	1.4	0.900	0.900	0.008	0.0	19	1.322
1.001	1.936	15.2	13.4	0.900	0.900	0.074	0.0	73	2.182
1.002	3.035	23.8	17.7	0.900	0.900	0.098	0.0	64	3.324
1.003	1.786	31.6	20.6	0.850	0.556	0.114	0.0	88	1.899
1.004	1.596	28.2	24.8	0.556	0.561	0.137	0.0	109	1.795
2.000	1.416	11.1	3.3	0.900	0.900	0.018	0.0	37	1.231
2.001	2.427	19.1	13.9	0.900	0.700	0.077	0.0	64	2.648
2.002	1.426	25.2	22.8	0.650	0.550	0.126	0.0	112	1.611
1.005	1.835	73.0	55.1	0.486	0.353	0.305	0.0	146	2.011
1.006	8.499	337.9	55.1	1.840	3.875	0.305	0.0	61	6.306

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)
1.000	34.500	12.3	100	Circular	69.000	68.000	0.900	66.200	65.200	0.900
1.001	20.100	16.1	100	Circular	66.200	65.200	0.900	64.950	63.950	0.900
1.002	6.900	6.6	100	Circular	64.950	63.950	0.900	63.900	62.900	0.900
1.003	32.200	32.0	150	Circular	63.900	62.900	0.850	62.600	61.894	0.556
1.004	16.200	40.0	150	Circular	62.600	61.894	0.556	62.200	61.489	0.561
2.000	26.900	29.9	100	Circular	66.400	65.400	0.900	65.500	64.500	0.900
2.001	27.700	10.3	100	Circular	65.500	64.500	0.900	62.600	61.800	0.700
2.002	15.000	50.0	150	Circular	62.600	61.800	0.650	62.200	61.500	0.550
1.005	8.500	51.0	225	Circular	62.200	61.489	0.486	61.900	61.322	0.353
1.006	7.300	2.4	225	Circular	61.900	59.835	1.840	60.900	56.800	3.875

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1.002	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.004	S5	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
2.000	S9	1200	Manhole	Adoptable	S8	1200	Manhole	Adoptable
2.001	S8	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
2.002	S7	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
1.005	S6	1200	Manhole	Adoptable	FC1	1200	Manhole	Adoptable
1.006	FC1	1200	Manhole	Adoptable	TW5150	1200	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	69.000	1.000	1200				
				0	1.000	68.000	100
S2	66.200	1.000	1200				
				0	1.001	65.200	100
S3	64.950	1.000	1200				
				0	1.002	63.950	100
S4	63.900	1.000	1200				
				0	1.003	62.900	150
S5	62.600	0.706	1200				
				0	1.003	61.894	150
S6	62.200	0.711	1200				
				1	2.002	61.500	150
				2	1.004	61.489	150
				0	1.005	61.489	225

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S7	62.600	0.800	1200	1	2.001	61.800	100
				0	2.002	61.800	150
S8	65.500	1.000	1200	1	2.000	64.500	100
				0	2.001	64.500	100
S9	66.400	1.000	1200	0	2.000	65.400	100
FC1	61.900	2.065	1200	1	1.005	61.322	225
				0	1.006	59.835	225
TW5150	60.900	4.100	1200	1	1.006	56.800	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440	2160	2880
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node FC1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	59.835	Product Number	CTL-SHE-0048-1300-1600-1300
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node FC1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	60.300	Product Number	CTL-SHE-0068-2200-1200-2200
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.2	Min Node Diameter (mm)	1200

Node FC1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	60.570	Product Number	CTL-SHE-0053-1200-0900-1200
Design Depth (m)	0.900	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.2	Min Node Diameter (mm)	1200

Node FC1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.835
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	72

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	43.0	0.0	1.200	194.0	0.0

Node S1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	68.500	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.30	Length (m)	4.000		

Node S2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	65.400	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	21	Depth (m)	
Safety Factor	2.0	Width (m)	7.000	Inf Depth (m)	
Porosity	0.30	Length (m)	33.500		

Node S3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	64.450	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	9	Depth (m)	
Safety Factor	2.0	Width (m)	4.600	Inf Depth (m)	
Porosity	0.30	Length (m)	18.500		

Node S4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.400	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	8.500	Inf Depth (m)	
Porosity	0.30	Length (m)	3.000		

Node S5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	62.100	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	16	Depth (m)	
Safety Factor	2.0	Width (m)	6.500	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node S6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	61.500	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	15	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	6.800		

Node S6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	62.000	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	7.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node S7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	61.800	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	19	Depth (m)	
Safety Factor	2.0	Width (m)	6.100	Inf Depth (m)	
Porosity	1.00	Length (m)	22.000		

Node S8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	64.800	Slope (1:X)	20.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	17	Depth (m)	
Safety Factor	2.0	Width (m)	7.200	Inf Depth (m)	
Porosity	0.30	Length (m)	28.000		

Node S9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	65.900	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

Node FC1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.835
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	100.0	0.0	0.400	100.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	68.016	0.016	0.9	0.0201	0.0000	OK
60 minute summer	S2	33	65.256	0.056	8.3	0.1362	0.0000	OK
60 minute summer	S3	33	63.998	0.048	11.0	0.0771	0.0000	OK
60 minute summer	S4	33	62.966	0.066	12.8	0.0963	0.0000	OK
60 minute summer	S5	33	61.973	0.079	15.4	0.1403	0.0000	OK
60 minute summer	S6	34	61.609	0.120	33.7	1.3603	0.0000	OK
60 minute summer	S7	33	61.881	0.081	14.1	0.6005	0.0000	OK
60 minute summer	S8	33	64.547	0.047	8.6	0.1092	0.0000	OK
60 minute summer	S9	33	65.429	0.029	2.0	0.0429	0.0000	OK
480 minute winter	FC1	472	60.229	0.394	7.3	64.6089	0.0000	SURCHARGED

60 minute summer	TW5150	1	56.800	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)
60 minute summer	S1	1.000	S2	0.9	0.360	0.052	0.0903	
60 minute summer	S2	1.001	S3	8.3	2.029	0.545	0.0821	
60 minute summer	S3	1.002	S4	11.0	2.377	0.460	0.0318	
60 minute summer	S4	1.003	S5	12.8	1.512	0.404	0.2717	
60 minute summer	S5	1.004	S6	15.3	1.250	0.543	0.1974	
60 minute summer	S6	1.005	FC1	33.2	1.662	0.454	0.1695	
60 minute summer	S7	2.002	S6	13.8	1.183	0.549	0.1761	
60 minute summer	S8	2.001	S7	8.6	1.636	0.451	0.1446	
60 minute summer	S9	2.000	S8	2.0	0.732	0.180	0.0740	
480 minute winter	FC1	Hydro-Brake®	TW5150	0.9				30.3
480 minute winter	FC1	Hydro-Brake®	TW5150	0.0				0.0
480 minute winter	FC1	Hydro-Brake®	TW5150	0.0				0.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	68.027	0.027	2.7	0.0345	0.0000	OK
60 minute summer	S2	37	65.702	0.502	24.8	3.1708	0.0000	SURCHARGED
60 minute summer	S3	35	64.217	0.267	23.2	0.4307	0.0000	SURCHARGED
60 minute summer	S4	35	63.022	0.122	27.4	0.1764	0.0000	OK
60 minute summer	S5	36	62.320	0.426	34.4	1.7231	0.0000	FLOOD RISK
60 minute summer	S6	36	61.703	0.214	68.3	3.4736	0.0000	OK
60 minute summer	S7	39	62.088	0.288	34.7	5.7788	0.0000	SURCHARGED
60 minute summer	S8	36	65.000	0.500	25.8	2.0431	0.0000	SURCHARGED
60 minute summer	S9	33	65.452	0.052	6.0	0.0782	0.0000	OK
360 minute winter	FC1	344	60.566	0.731	19.7	135.3947	0.0000	SURCHARGED

60 minute summer TW5150 1 56.800 0.000 0.9 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)
60 minute summer	S1	1.000	S2	2.7	0.473	0.155	0.1640	
60 minute summer	S2	1.001	S3	15.9	2.177	1.047	0.1573	
60 minute summer	S3	1.002	S4	22.3	2.857	0.934	0.0540	
60 minute summer	S4	1.003	S5	27.0	1.661	0.854	0.5296	
60 minute summer	S5	1.004	S6	31.2	1.773	1.107	0.2852	
60 minute summer	S6	1.005	FC1	67.1	1.877	0.920	0.3008	
60 minute summer	S7	2.002	S6	26.0	1.478	1.033	0.2641	
60 minute summer	S8	2.001	S7	18.4	2.403	0.966	0.2167	
60 minute summer	S9	2.000	S8	6.0	0.881	0.539	0.1611	
360 minute winter	FC1	Hydro-Brake®	TW5150	0.9				28.5
360 minute winter	FC1	Hydro-Brake®	TW5150	2.0				45.9
360 minute winter	FC1	Hydro-Brake®	TW5150	0.0				0.0

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	68.031	0.031	3.5	0.0394	0.0000	OK
60 minute summer	S2	39	65.911	0.711	32.4	7.2582	0.0000	FLOOD RISK
60 minute summer	S3	36	64.534	0.584	25.2	1.0457	0.0000	SURCHARGED
60 minute summer	S4	36	63.312	0.412	29.2	0.5982	0.0000	SURCHARGED
60 minute summer	S5	38	62.424	0.530	37.4	3.0193	0.0000	FLOOD RISK
60 minute summer	S6	36	61.756	0.267	74.2	4.6834	0.0000	SURCHARGED
60 minute summer	S7	40	62.165	0.365	40.1	9.0389	0.0000	SURCHARGED
60 minute summer	S8	38	65.219	0.719	33.4	5.4940	0.0000	FLOOD RISK
60 minute summer	S9	36	65.507	0.107	7.9	0.1592	0.0000	SURCHARGED
240 minute winter	FC1	236	60.700	0.865	34.3	167.3540	0.0000	SURCHARGED

60 minute summer TW5150 1 56.800 0.000 0.9 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)
60 minute summer	S1	1.000	S2	3.5	0.595	0.201	0.1699	
60 minute summer	S2	1.001	S3	16.8	2.193	1.107	0.1573	
60 minute summer	S3	1.002	S4	22.3	2.896	0.937	0.0540	
60 minute summer	S4	1.003	S5	27.8	1.692	0.882	0.5669	
60 minute summer	S5	1.004	S6	32.6	1.851	1.155	0.2852	
60 minute summer	S6	1.005	FC1	70.7	1.878	0.969	0.3106	
60 minute summer	S7	2.002	S6	27.6	1.571	1.097	0.2641	
60 minute summer	S8	2.001	S7	19.5	2.508	1.025	0.2167	
60 minute summer	S9	2.000	S8	7.6	1.006	0.681	0.2105	
240 minute winter	FC1	Hydro-Brake®	TW5150	1.0				24.7
240 minute winter	FC1	Hydro-Brake®	TW5150	2.0				42.1
240 minute winter	FC1	Hydro-Brake®	TW5150	1.0				10.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	68.036	0.036	4.9	0.0471	0.0000	OK
60 minute summer	S2	41	66.184	0.984	45.4	15.3671	0.0000	FLOOD RISK
60 minute summer	S3	38	64.778	0.828	28.9	2.8465	0.0000	FLOOD RISK
60 minute summer	S4	38	63.506	0.606	32.1	1.5024	0.0000	SURCHARGED
60 minute summer	S5	39	62.570	0.676	43.1	5.5441	0.0000	FLOOD RISK
60 minute summer	S6	36	61.834	0.345	83.0	6.4514	0.0000	SURCHARGED
60 minute summer	S7	41	62.276	0.476	49.0	14.9537	0.0000	SURCHARGED
60 minute summer	S8	40	65.485	0.985	44.3	12.4726	0.0000	FLOOD RISK
60 minute summer	S9	36	65.944	0.544	11.0	0.9572	0.0000	SURCHARGED
360 minute winter	FC1	352	60.994	1.159	34.5	245.8123	0.0000	SURCHARGED

60 minute summer TW5150 1 56.800 0.000 1.0 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)
60 minute summer	S1	1.000	S2	4.9	0.798	0.282	0.1794	
60 minute summer	S2	1.001	S3	17.6	2.304	1.155	0.1573	
60 minute summer	S3	1.002	S4	23.0	2.940	0.965	0.0540	
60 minute summer	S4	1.003	S5	29.1	1.705	0.921	0.5669	
60 minute summer	S5	1.004	S6	34.6	1.968	1.229	0.2852	
60 minute summer	S6	1.005	FC1	78.4	1.972	1.075	0.3348	
60 minute summer	S7	2.002	S6	29.4	1.670	1.167	0.2641	
60 minute summer	S8	2.001	S7	19.5	2.505	1.024	0.2167	
60 minute summer	S9	2.000	S8	8.3	1.062	0.747	0.2105	
360 minute winter	FC1	Hydro-Brake®	TW5150	1.1				34.5
360 minute winter	FC1	Hydro-Brake®	TW5150	2.0				46.1
360 minute winter	FC1	Hydro-Brake®	TW5150	1.1				25.9

Appendix E

Site Investigation Information



Key

-  Trial Pit
-  Continuous Tube Borehole
-  Soakaway Pit
-  CBR Test

**Exploratory Hole
Location Plan**

JOB NO.:-24-12-06

Tel:- 01280 816409
Mob:- 07858 367 125
www. geo-integrity.co.uk

**SITE:- Coppid Hill
House, Wokingham**

**CLIENT:- Abbeymill
Homes**

4 Church Street
Maids Moreton
MK18 1QE

**Drawn
EM**

**Checked
DL**

**Scale: Not To Scale, for
indicative purposes only**



To: Matthew Whatley <matthew.w@amh.co.uk>

Subject: RE: Coppid Hill House, Wokingham

Hi Matt

Absolutely, see plan attached.

Unfortunately none of the three tests worked – or provided a drop in water level significant enough to calculate an infiltration rate under the BRE 365 methodology.

SA1 – located in the north of the site only dropped 12cm over the two days.

SA2- located in the central site area Ground water level rose over the course of two days from empty BY 25cm.

SA3 - Located in the southern site area only dropped 9cm over the two days.

As such the soils are considered to be effectively impermeable beneath the site.

Kind Regards

Danny Lusardi



Mobile:- 07934 297 404

Landline:- 01280 816409

[Geo-Integrity Website](#)

[LinkedIn Profile](#)

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From: Matthew Whatley <matthew.w@amh.co.uk>

Sent: 17 February 2025 14:14

To: Danny Lusardi <Danny@geo-Integrity.co.uk>

Subject: RE: Coppid Hill House, Wokingham

Hi Danny,

I hope all is well.

Just wondered if you would be able to send over the infiltration testing results and trial pit locations while we wait for the test results and final report please?

Appendix F

Thames Water Letter



Dimitris Linardatos

Price & Myers
37 Alfred Place,
London.
WX1E 7DP



21 March 2025

Pre-planning enquiry: Confirmation of sufficient capacity (Foul and Surface Water)

Dear Dimitris,

Thank you for providing information on your development

Site Address: LAND OFF EDNEYS HILL, WOKINGHAM, RG41 4DP

Existing site is a greenfield site,

Proposed 16 general housing units to be built.

Proposed Foul water to be discharged into FWMH SU78675101 via gravity

Proposed Surface water to be discharged into SWMH SU78675150 via gravity at a peak flow rate of 3.54 l/s for the 1 in 30-year storm.

We have completed the assessment of the foul water and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water/combined sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you

have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

- 1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
- 2) rainwater infiltration to ground at or close to source
- 3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
- 4) rainwater discharge direct to a watercourse (unless not appropriate)
- 5) controlled rainwater discharge to a surface water sewer or drain
- 6) controlled rainwater discharge to a combined sewer.

Where connection to the public sewerage network is required to manage surface water flows we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of **3.54 l/s** then Thames Water would not have any objections to the proposal.

Please see our [FAQ's leaflet](#) for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 07747642636.

Yours sincerely

Nathanael Bryant Sanjaya

Developer Services – Adoptions Engineer

Office: 0800 009 3921

Mobile: 07747642636

Nathanaelbryant.sanjaya@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

