



SUSTAINABLE DRAINAGE STRATEGY

HEATHROW FLIGHTPATH CARPARK



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CONFIDENCE**

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1.0 INTRODUCTION

EirEng have been appointed to undertake a Sustainable Drainage Strategy in support of a planning application on the development of an existing Heathrow flightpath car park to the north of Heathrow International Airport (LHR).

The report provides information on the proposed Drainage Strategy for the site and follows Government guidance regarding development.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority before commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, we shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to EirEng Consulting Engineers Ltd.

This report has been prepared according to our client's instructions for their sole and specific use.

2.0 SITE LAYOUT AND PROPOSED DEVELOPMENT

2.1 Site Location

The site is located in the London borough of Hillingdon, approximately 25km west of central London. The site is currently accessed from the east via an unnamed bridge that goes over the M4 and comes from a spur road of the A408. It also has an access road from the west that comes off Sipson Way. See Error! Reference source not found.. Its national Grid Reference (NGR) is 507456N, 177075E and postcode is UB7 0DW.



Figure 1 - Site Location Plan

2.2 Site Topography and Geology

The existing site is approximately 1.6ha in size and is currently used as surface level car parking. The site consists of asphalt drive aisles with gravel parking bays and is used as a car park that predominantly serves the airport and local area. A review of the topographical survey indicates that the site generally falls from the southwest to the northeast, the levels vary from 26.48 to 25.40 mAOD respectively. The existing topographic survey can be found in the Flood Risk Assessment (242120-ECE-ZZ-RP-C-0001).

The British Geological Survey map shown in **Figure 2** indicates that the site is underlain by superficial deposits comprising Langley Silt Member which is made up of clay and silt. This overlays Taplow Gravel Member deposits, a River Terrace Deposit associated with the River Thames. The site is also underlain by the London Clay formation bedrock deposits which are described as comprising Clay, Silt and Sand.

For more information on groundwater vulnerability, please refer to EirEng Flood Risk Assessment.

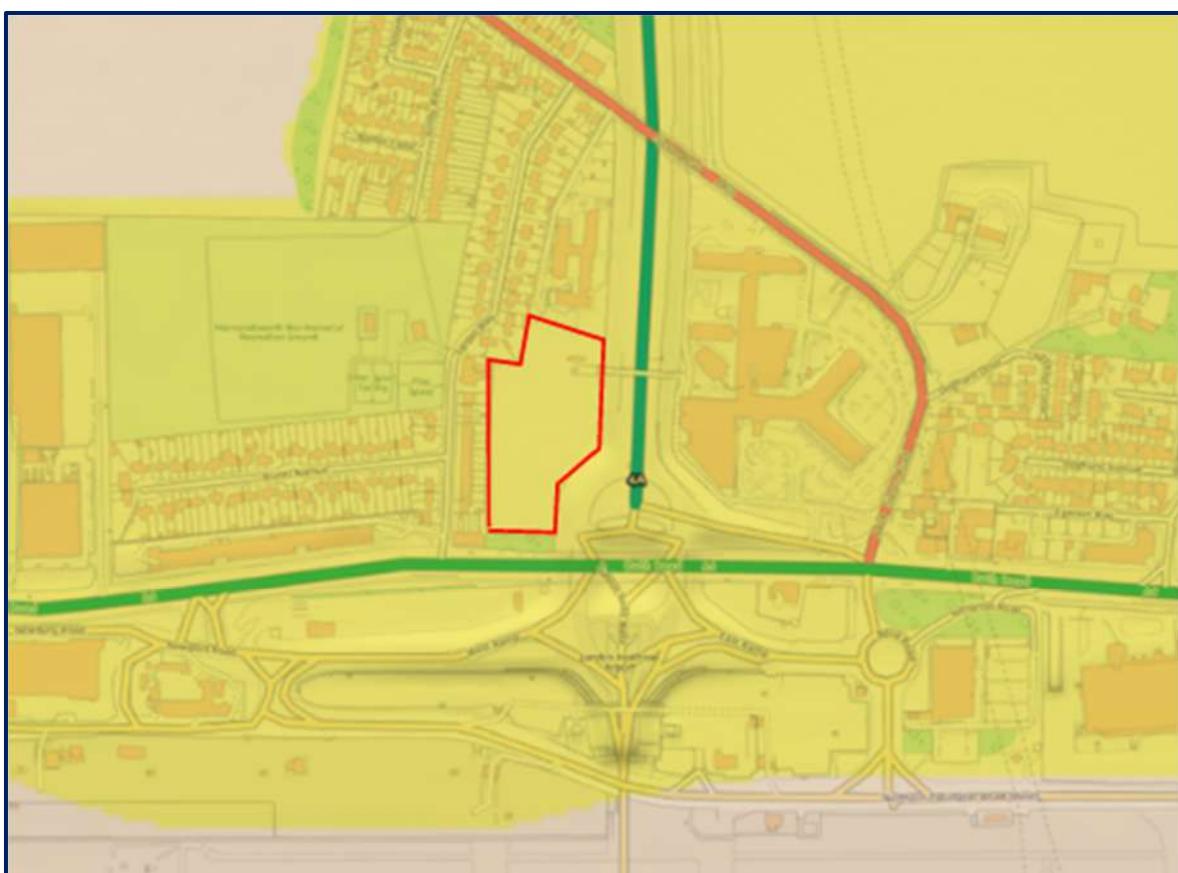


Figure 2 - Bedrock Geology from British Geological Survey Map

2.3 Proposed Development

The proposed site is approximately 1.6ha, comprising exterior hardstanding to be used for car parking along with high-speed EV charging and extensive landscaping. The proposed site, once completed, will incorporate commercial EV charging spaces, a small staff block, accessible parking bays, a food and beverages unit and two welfare units. The site will be developed in two phases, with Phase 1 being constructed first and covering the southern part of the site and then Phase 2 being developed at a later date. See the proposed site plans for phase 1 and phase 1 and 2 combined, in **Appendix A**. Proposed levels will be kept close to existing levels but raised slightly. Refer to the proposed levels plan in **Appendix B**. The drainage strategy will be split between the two phases, reflecting the phased development of the site.

3.0 SURFACE AND FOUL WATER DRAINAGE

3.1 Climate Change and Greenfield Run-Off Rates

In line with the Environment Agency (EA) and Hillingdon Council guidelines, and taking a development design life of **50-60 years**, a climate change allowance of **40%** is to be applied to the most extreme rainfall events for the site.

Greenfield run-off rates have been calculated using the greenfield run-off calculation tool on the HR Wallingford UK SuDS website, see **Appendix C**. These values for the critical rainfall return periods as well as QBar are shown in **Table 1**, using the total site area of 1.62 ha.

RETURN PERIOD (YEARS)	GREENFIELD RUN-OFF RATES (L/S)
1	2.14
QBAR (2.3)	2.52
30	5.80
100	9.44

Table 1 - Table Showing Greenfield Run-Off Rates

3.2 Infiltration Rates

Soakaway tests were conducted by Tetra Tech at the site between 18th and 20th March 2025. The results and test locations are included in **Appendix D**. As the site is being developed in two phases, there will be two separate infiltration tanks, one in each phase. The tanks have been located as close to test location SA02 as possible where the best infiltration rate was recorded. At this stage, the lower infiltration rate from SA03 further south has been taken for the phase 1 tank. Further tests at the exact location and depth of the infiltration tank within phase 1 will be conducted to confirm rates. If the rates are on the limit for full infiltration, as currently indicated at SA03, then a high-level overflow may need to be incorporated to the Thames Water sewer to the south. The surface water model shows the network works with the lower infiltration rate, albeit half drain times are exceeding 24h for some events.

3.3 Existing Surface Water Drainage

From the topographic and utilities surveys and a site visit recently undertaken, there are no traditional surface drainage features, such as channels and gullies. The asphalt drive aisles appear to drain into the gravel bays and infiltrate into the ground. The infiltration rates measured by Tetra Tech and the fact there is no record of surface water flooding at the site would back this up.

3.4 Existing Foul Water Drainage

The site currently has a small portacabin unit on it. Foul flows from this unit drain into a gravity network flowing through the site. This in turn connects into a Thames Water (TW) foul trunk sewer that passes through the east of the site. This TW network is shown in **Appendix E**. The trunk sewer has a 3m wayleave associated with it. The site layout has been developed to take account of this.

3.5 Proposed Foul Water Drainage

The site includes a small staff block, two small welfare units (one in phase 1 and one in phase 2) and a small food and beverage unit (in phase 1). Foul flows from these units will be collected via a gravity sewer network and discharge to the existing TW Foul trunk sewer located to the east of the site. Details of the proposed drainage scheme can be found in **Appendix E**. Thames Water have been consulted through a pre-

development enquiry and have confirmed that capacity is available within the foul trunk sewer. Refer to the Thames Water response letter in **Appendix F**.

3.6 Proposed Surface Water Drainage

As discussed previously, it is understood that the existing site currently infiltrates into the ground via a series of gravel parking bays within the site. It is the intention to continue to utilise this existing drainage strategy and discharge runoff into the ground via permeable bays and two large infiltration tanks, pending further tests in the location of the phase 1 infiltration tank.

3.7 Proposed Drainage Network

Under the National Planning Policy Framework (NPPF), a clear hierarchy of surface water disposal methods is set out. Infiltration into the ground is at the top of this hierarchy for viable sites and this is the chosen method for this site due to the suitability of the ground. See the proposed Drainage scheme in **Appendix E**.

The total site area is 1.64 ha, this area comprises of approximately 1.07 ha of hardstanding and 0.57 ha of soft landscaping. There is a proposed increase in soft landscaping over the existing site and therefore a reduction in impermeable hard surfacing and run-off.

3.7.1 Phase One Drainage

Phase one has a total area of approximately 0.7 ha, this comprises approximately 0.49 ha of hardstanding and approximately 0.21 ha of soft landscaping. The hardstanding is split into two types, non-permeable asphalt drive aisles and permeable parking bays. All permeable bays will have perforated collector pipes in the base to collect flows. Areas of hardstanding that do not drain to permeable bays will drain through a series of channel and kerb drains. Flows from the hardstanding are then conveyed via gravity through a Class II by-pass separator unit and finally into a geocellular infiltration tank. The tank has a plan area of 429m² and a depth of 1.0m with a 95% void ratio, giving it an effective volume of 408m³. Phase One surface water calculations can be found in **Appendix G**.

3.7.2 Phase Two Drainage

Phase two has a total area of approximately 0.94 ha, this comprises of approximately 0.53 ha of hardstanding and 0.41 ha of soft landscaping. The majority of the asphalt drive aisles drain into permeable parking bays. All permeable bays have perforated collector pipes at the base to collect and attenuate flows. The main spine access road to the west will drain through a series of hit and miss kerbs, into a swale that will be used to convey flows slowly trapping silt and any pollutants and improving water quality and biodiversity on site. The remaining aisles to the south will drain through a series of channel and kerb drains. Once all surface water flows are conveyed into the gravity network, they flow through a Class II by-pass separator unit and finally into a geocellular infiltration tank. This tank has a plan area of 401m² and a depth of 1.0m with a 95% void ratio, giving it an effective volume of 381m³. Phase Two surface water calculations can be found in **Appendix G**.

3.7.3 SuDS Strategy

The SUDs scheme has been designed in line with the Hillingdon Council Guidance for Developers document. This document sets out several deliverables for all major developments. These are as follows:

All major developments must achieve greenfield run-off rates for 1 in 1 year and 1 in 100 + 40% CC rainfall, and storage volumes for all events up to 1 in 100yr +40% will be provided on-site to ensure the site will not flood from these events, any small amounts of surface water flooding must be safely stored on-site ensuring that surface water run-off will not increase any flood risk off-site, and finally Sustainable Drainage Systems (SuDS) will be used to improve sustainability, water quality, and biodiversity.

The site benefits from multiple SuDS, these are as follows: Permeable paving, swale, Class II by-pass separator and infiltration tanks. Alongside silt traps in channel and kerb drains, these capture and convey

runoff from the site and enhance water quality and biodiversity. Details of these SuDS elements can be found in **Appendix H**.

Permeable paving is proposed in all parking spaces. Permeable paving consists of permeable blocks or permeable asphalt at surface level that allows run-off to drain through into a filter/ storage medium underneath with a perforated pipe at the bottom that conveys flows to the gravity network. This system is designed to slow and attenuate flows, trapping silt and hydrocarbons (such as oil) which will break down in the subbase layer.

The swale is designed to slow and attenuate run-off, trapping silt and other contaminants as it conveys water prior to discharge into the piped network. This will also provide a biodiversity benefit.

The Class II by-pass separator units will be used upstream of the infiltration tanks ensuring any remaining silt or contaminants are captured prior to discharge into the ground. An assessment of pollution mitigation measures using the CIRIA SuDS Manual Simple Index Approach (SIA) is included in **Appendix I**.

4.0 CONCLUSION

The proposals will result in a reduction in site runoff through virtue of the reduced hardstanding areas proposed and additional landscaping provided.

Surface water flows will continue to be infiltrated into the ground in line with best practice. However, water quality will be improved via the proposed SuDS measures, which align with the CIRIA SuDS Manual Simple Index Approach.

Flood risk to both the site itself and surrounding properties will be reduced by providing storage to deal with the 1 in 100yr rainfall event, with a 40% allowance for climate change.

Exceedance flow routes have been considered in case of blockage or exceedance of the design rainfall events. Please refer to the Flood Risk Assessment (242120-ECE-ZZ-XX-RP-C-0001).

5.0 DRAINAGE MAINTENANCE AND MANAGEMENT PLAN

5.1 Introduction

Pipe sizes and gradients are designed to be self-cleansing where possible, although regular maintenance and inspections are required to ensure the long-term efficiency of the systems.

Any drainage infrastructure located within the site will be the end-user's responsibility to maintain. All works shall be undertaken by suitably qualified personnel, and waste shall be treated and removed by an appropriately registered company.

5.2 Sewer Network

The main objective of maintenance control is to establish procedures to ensure the sewer system functions appropriately in the long term within an environment of fiscal control.

Maintenance includes:

- Cleaning and removal of sediment, obstructions, etc., to restore hydraulic capacity;
- Local repair or local replacement of damaged pipes or other structures in order to maintain the functioning of the sewer;
- Jetting/vacuuming of sewers to be undertaken as often as necessary to remove silts and/or ordinary debris. To avoid damaging the pipe, PSI pressures need to be verified before jetting of plastic twin wall sewers.

- In the event that any significant issues are encountered during an inspection, further information may be required, such as a CCTV survey report.
- Maintenance to be undertaken on a six-monthly schedule.

Cleaning of drainage systems may require the temporary sealing of the system and careful collection of the effluent for disposal off-site by an appropriately registered company.

5.2.1 Manhole Chambers

All manhole covers shall be lifted and the manholes visually inspected for silt, debris and signs of blockage within the drainage system. Check manhole covers and frames for damage and ensure they are correctly bolted together. This shall be undertaken on a six-monthly basis.

Should any debris or blockages be detected, the manholes shall be cleaned along with associated pipe runs which shall be high pressure jetted and CCTV surveyed to verify/ identify that no further remedial works are required.

Any internal manholes shall have their covers checked to ensure they remain airtight.

5.2.2 Catchpit Manholes

Catchpit manholes are designed with sumps to accumulate silt and debris at specific locations on the sewer network. These shall be checked and cleaned out on a six-monthly schedule.

5.2.3 Channel Drains, Kerb Drains and Slot Drains

Channel drains, kerb drains and slot drains shall be inspected regularly to ensure that the system continues to operate effectively and is free from damage and blockage by debris or solid objects.

The system shall be cleaned once a year or when signs of loss of capacity in the slot drains are evident and incorporated into a planned maintenance schedule. All units to be cleaned with a high-pressure hose in accordance with specialist manufacturer's maintenance document.

5.2.4 By-Pass Separators

In order to prevent pollution, the separators need to be regularly maintained. This shall be conducted on a six-monthly basis by suitably qualified personnel. The supplier's guidance and recommendations should be followed, as well as general maintenance advice as below.

Maintenance shall be as follows:

- All maintenance to be undertaken in accordance with manufacturer's instructions.
- Assess the depth of accumulated oil and silt.
- Check the condition of any coalescing device and replace as necessary.
- Service any electrical equipment, i.e. alarms or management systems; and
- Physically inspect the integrity of the separator and any mechanical parts.

In the event of a spillage, the separator shall be emptied. The separator should also be emptied in the event of oil/silt level build up. All extracted waste must be removed off-site and taken by a registered waste company that has experience in emptying and servicing separators.

A detailed log shall be kept on-site and filled out when the separator is inspected, maintained, emptied and serviced along with any specific events relating to the system such as cleaning and spillages.

Every five years a full drain down and general inspection should be undertaken, refilling the separator with clean water after the inspection/cleaning.

5.2.5 Attenuation/ Infiltration Tanks

Regular inspection and maintenance are important for efficient operation of the storage system.

Further to manufacturer's requirements, it is recommended that inspection is undertaken on a six-monthly basis with all inspection points, upstream and downstream of the tanks, visually inspected for silt, debris and signs of blockage. Should any debris or blockages be detected, the tanks shall be cleaned and CCTV surveyed to verify/ identify that no further remedial works are required.

Detailed guidance on the maintenance relating to attenuation tanks can be found in the SuDS Manual (CIRIA C753, 2015 as updated 2019) Chapter 21: Table 21.3 and Guidance Document (CIRIA C768, 2017).

Maintenance Schedule	Required Action	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
	Remove sediment from pre-treatment structures and/ or internal fore-bays	Six monthly, 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

5.3 Spills

Spills of significant amounts of chemicals, oils or fuel must not be washed into the drainage system. Where any chemicals or fuels are kept on site a supply of suitable absorbent materials should be kept on-site as necessary and used for any accidental spillages.

5.4 Health & Safety

The owner shall, as far as is reasonably practicable, provide and ensure systems of work are safe and without risks to health or the environment. The systems of work shall cover all aspects of the above-ground network, e.g. manhole locations and traffic control, to access the sewer system and all operations within confined spaces of the sewer system.

Working on drainage systems exposes personnel to serious Health and Safety Hazards. These include but may not be limited to the following:

- Lifting heavy loads (eg manhole covers)
- The risk of injury through dropping heavy loads
- The risk of falling into chambers or watercourses

- Biohazards from pathogenic bacteria e.g. Weil's disease
- Poisonous, asphyxiating, and explosive gases.
- Drowning.

These hazards can be addressed by the following simple rules:

- Never work alone
- Carry out a Risk Assessment
- Never enter a confined space such as a manhole unless trained and equipped to do so with gas detectors, breathing equipment and a recovery team assisting.
- Always use the correct equipment, eg well-fitting lifting keys etc.
- Always use the correct Personal Protective Equipment (PPE) e.g. gloves, goggles, coveralls etc.
- Always fence unattended open manholes.

In addition, it should be noted that the location of some drainage apparatus may expose maintenance personnel to other hazards e.g. vehicles maneuvering. In general, it is advised that maintenance work (other than simple inspections) be carried out by specialist contractors unless specially trained personnel are available.

5.5 Recording maintenance

The end-user's site manager shall be responsible for recording and updating details of prior maintenance and operations, and also for scheduling future maintenance in accordance with the necessary requirements of each component of the drainage system. These records should be made available for future reference.

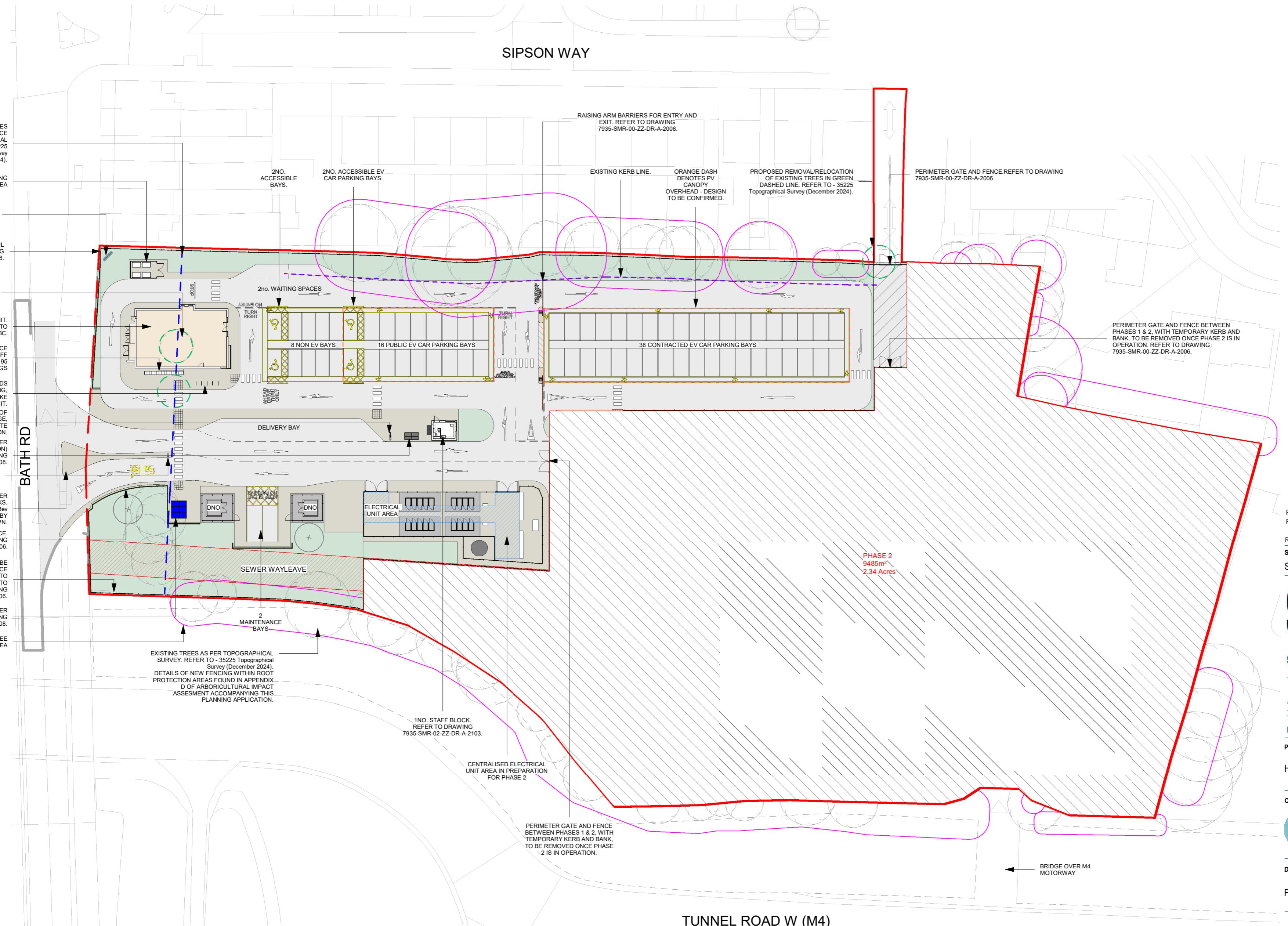
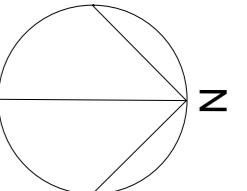
5.6 Management

Maintenance of the sewers, manholes, gullies, inlets/outlets and channel drains shall be inspected at 6 monthly intervals and cleaned out at 12 monthly intervals. A full CCTV survey shall be conducted on completion of works or if a suspected blockage occurs and at 10 yearly intervals. For the attenuation/infiltration system, this would be in line with manufacturer's information and maintenance requirements, and in accordance with CIRIA C753 SuDS Manual requirements.

The end user will ensure sufficient funds are available through identified budgets to finance the continued planned maintenance, including replacement as necessary and any reactive maintenance of the drainage in accordance with this manual.

APPENDIX A – SITE PLANS

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P2 MINOR AMENDMENTS 18.07.25 AH JC
 P1 FIRST ISSUE - COMMENT AND 15.07.25 AH CV
 Rev Description Date Drn Ckd
 Status

SKETCH - NOT FOR CONSTRUCTION

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HEATHROW FLIGHTPATH CAR PARK, UB7 0DU

Client
 **LYSARA**

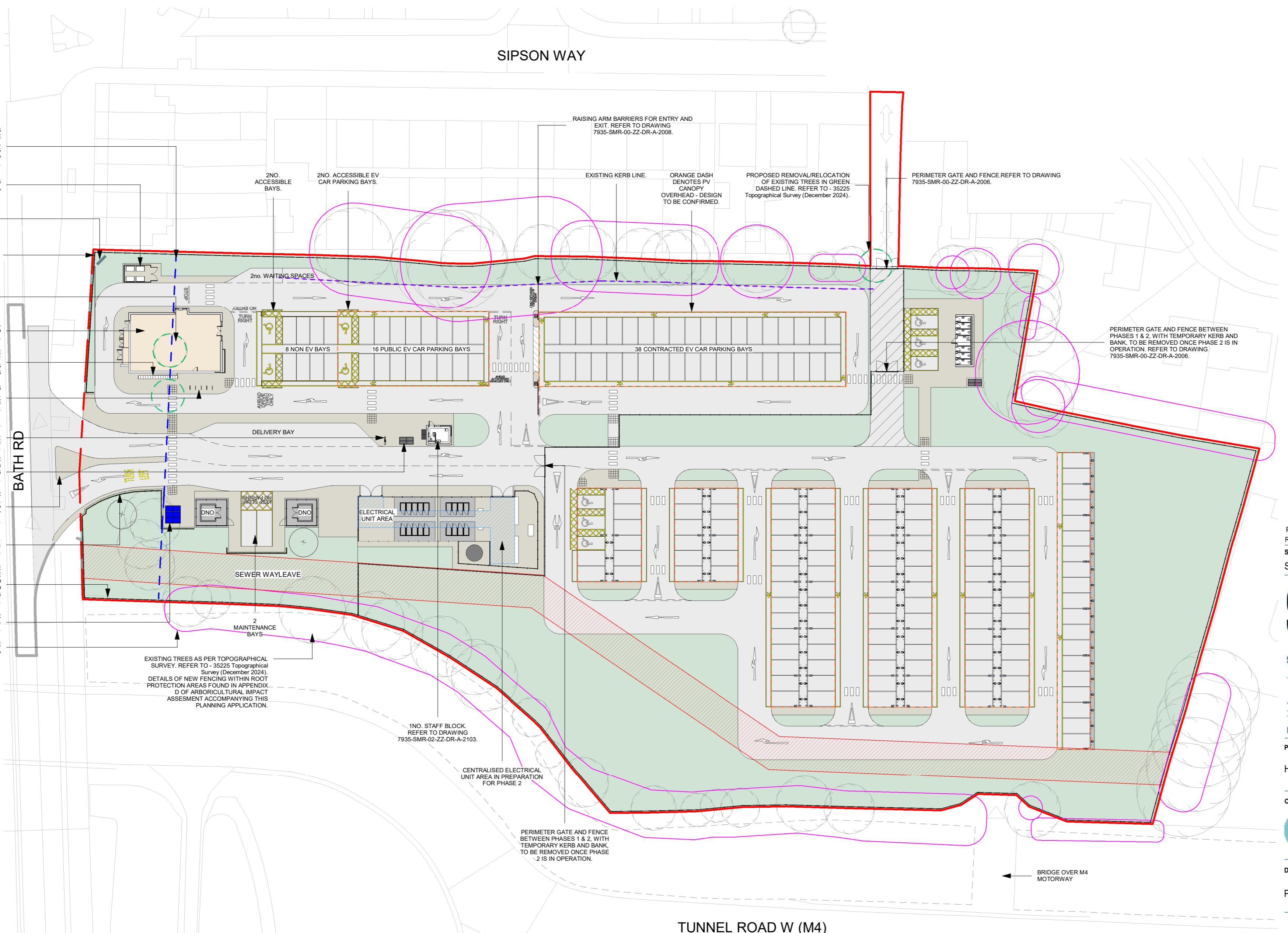
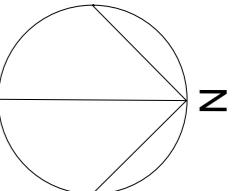
Drawing Title

PROPOSED SITE PLAN - PHASE 1 REDESIGN

Proj Ref Origin Zone Level Type Role Num Status Rev
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SMR Job Ref Sheet Scale Drawn
 7935-00-8218 A2 1 : 500 AH

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m
SCALE 1:500



P1 FIRST ISSUE
 Rev Description
 Status

18.07.25 AH JC
 Date Drn Ckd

SKETCH - NOT FOR CONSTRUCTION

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Client
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Drawing Title

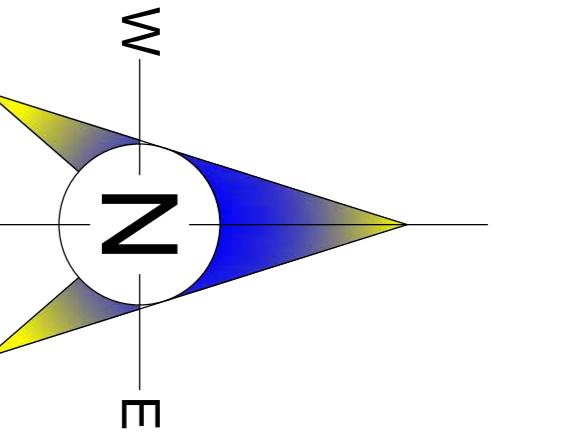
PROPOSED SITE PLAN - PHASE 2 REDESIGN

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SMR Job Ref	Sheet	Scale	Drawn
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
APPENDIX B – PROPOSED LEVELS

GENERAL NOTES:-
 1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGN DRAWINGS.
 2. LINEAR DIMENSIONS ARE IN METRES.
 3. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
 4. ALL LEVELS ARE IN METRES RELATIVE TO THE DRAUGHT LEVEL.
 5. IT IS THE RESPONSIBILITY OF THE USER TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.



LEGEND:

—	PHASE 1 SITE BOUNDARY
—	TREE ROOT PROTECTION ZONE
△ 66.750	PROPOSED SITE LEVEL
+ 69.600	EXISTING SITE LEVEL
↓ 140°	PROPOSED SITE GRADIENTS
—	MAJOR CONTOUR (0.5m)
—	MINOR CONTOUR (0.1m)



P3	05.08.25	CJ	MR	UPDATED LAYOUT
P2	05.06.25	DM	MR	REVISED LAYOUT
P1	06.03.25	DM	MR	DRAFT ISSUE FOR REVIEW
REVISIONS	BY	APPROVED	DESCRIPTION	

CLIENT
LYSARA

PROJECT TITLE
HEATHROW CAR PARK
BATH ROAD

DRAWING TITLE
PROPOSED LEVELS
PHASE 1

EIR EIR ENG
CONSULTING ENGINEERS

DRAWN BY D.MCGRATH DATE 04.03.25

ENG CHECK M.REDFERN DATE 04.03.25

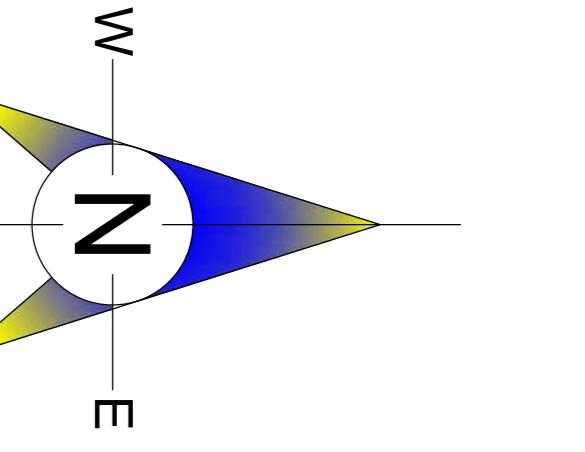
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STATUS PRELIMINARY REVISION P3

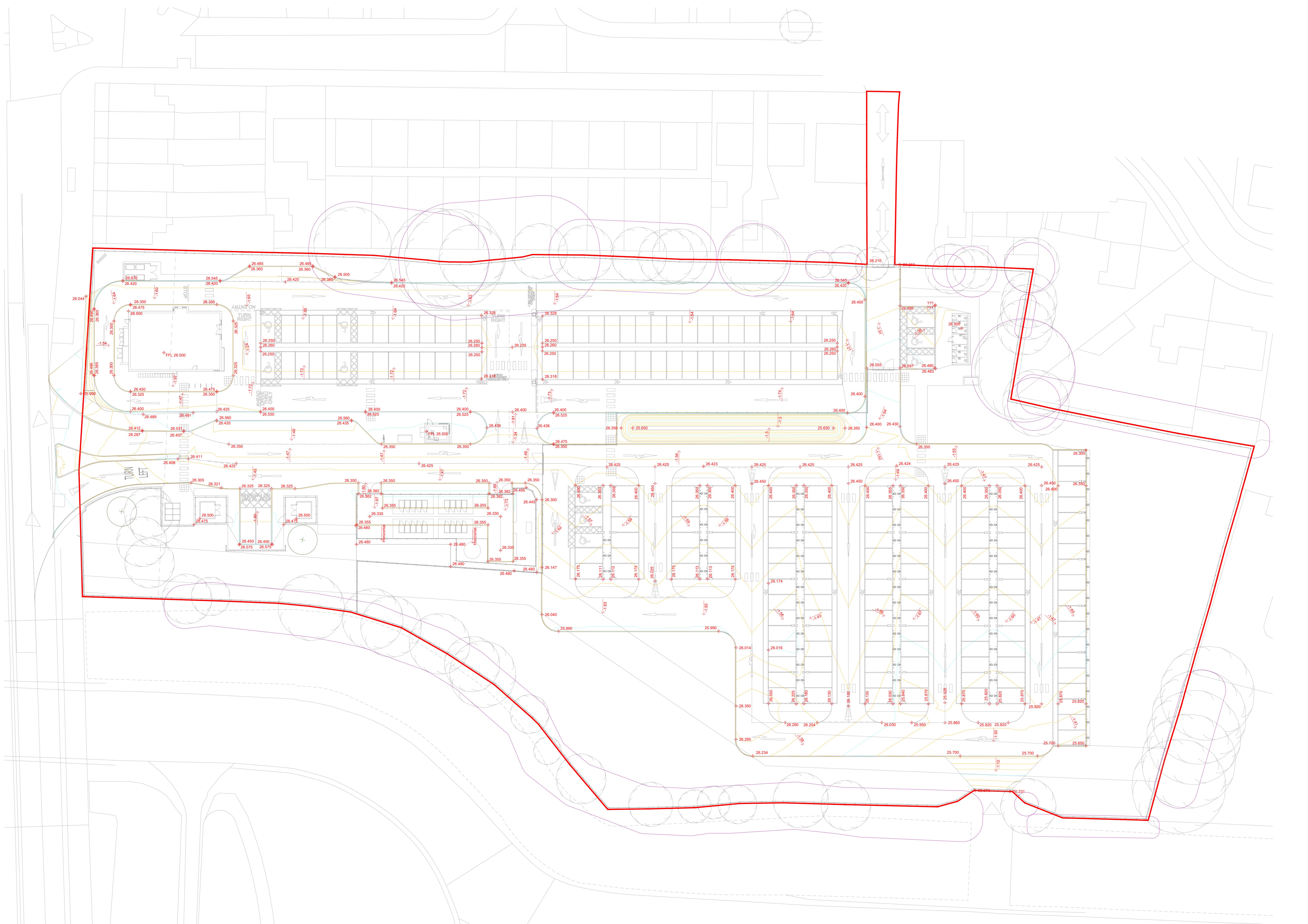
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GENERAL NOTES:-
 1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGN DRAWINGS
 2. LISTED DIMENSIONS ARE IN METRES
 3. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY
 4. ALL LEVELS ARE IN METRES RELATIVE TO THE DRAUGHT LINE
 5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.



LEGEND:

—	PHASE 1 AND 2 SITE BOUNDARY
△	TREE ROOT PROTECTION ZONE
+ 66.750	PROPOSED SITE LEVEL
+ 69.600	EXISTING SITE LEVEL
↓ -140°	PROPOSED SITE GRADIENTS
—	MAJOR CONTOUR (0.5m)
—	MINOR CONTOUR (0.1m)



P4	05/08/25	CJ	MR	UPDATED LAYOUT
P3	29/07/25	CE	MR	REVISED LAYOUT
P2	05/06/25	DM	MR	REVISED LAYOUT
P1	06/03/25	DM	MR	DRAFT ISSUE FOR REVIEW
REVISION	BY	APPROVED	DESCRIPTION	

CLIENT: LYSARA

PROJECT TITLE: HEATHROW CAR PARK BATH ROAD

DRAWING TITLE: PROPOSED LEVELS COMBINED PHASE 1 AND 2

EIR EIR ENG CONSULTING ENGINEERS

DRAWN BY: D.MCGRATH DATE: 04/03/25

ENG CHECK: M.REDFERN DATE: 04/03/25

APPROVED: E.DEASY DATE: 04/03/25

SCALE: 1:250 @ A0 JOB NO: 242120

STATUS: PRELIMINARY REVISION: P4

DWG NO: 242120-ECE-ZZ-XX-DR-C-9002

APPENDIX C – GREENFIELD RUN-OFF RATES

Calculated by:	Daniel McGrath
Site name:	Infinium
Site location:	Heathrow

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:	51.48248° N
Longitude:	0.45415° W
Reference:	1728033743
Date:	Jan 06 2025 16:32

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1.62

Notes

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

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

Methodology

 Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics

SOIL type:

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

(2) Are flow rates $< 5.0 \text{ l/s}$?

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

SAAR (mm):

	Default	Edited
SAAR (mm):	612	612
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 $SPR/SPRHOST \leq 0.3$?


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):	2.52	2.52
1 in 1 year (l/s):	2.14	2.14
1 in 30 years (l/s):	5.8	5.8
1 in 100 year (l/s):	8.05	8.05
1 in 200 years (l/s):	9.44	9.44

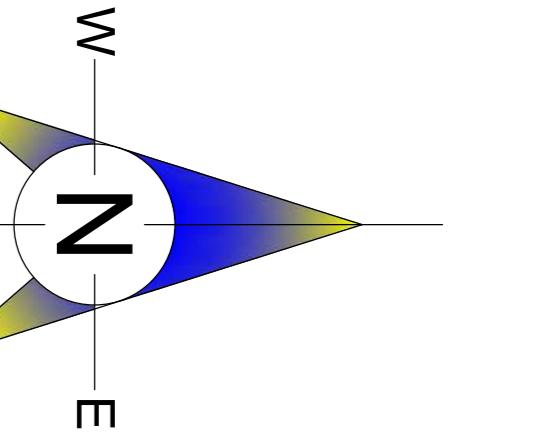
This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.eksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.eksuds.com/terms-and-conditions.htm. The outputs from this tool 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.

APPENDIX D – SOAKAWAY TESTS



APPENDIX E – DRAINAGE PLANS





NOTE

INGS ARE TO BE READ IN CONJUNCTION WITH ALL
/ANT DESIGN DRAWINGS
IMENSIONS ARE IN METRES.
OT SCALE, USE FIGURED DIMENSIONS ONLY.
EVELS ARE IN METERS RELATIVE TO DATUM U.N.O.
HE CONTRACTORS RESPONSIBILITY TO VERIFY OR
RMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR
COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF
CATION DRAWINGS.

20

- PHASE 1 AND 2 SITE BOUNDARY
- TREE ROOT PROTECTION ZONE
-  3m THAMES WATER WAYLEAVE ZONE FOR LARGE DIAMETER FOUL SEWER
- SW — PROPOSED SURFACE WATER SEWER WITH PIPE SIZE & SLOPE
- xx,xxx
xx,xxx PROPOSED SURFACE WATER MANHOLE WITH COVER LEVEL (CL) AND INVERT LEVEL (IL)
- (IC)
xx,xxx
xx,xxx PROPOSED SURFACE WATER INSPECTION CHAMBER
- WP INDICATIVE RAINWATER DOPWNPIPE POSITION (TBC)
-  PROPOSED SURFACE WATER CHANNEL DRAIN
- PROPOSED KERB DRAIN
- — — PROPOSED HIT AND MISS KERBING
-  PROPOSED FILTER DRAIN WITH PERFORATED COLLECTOR PIPE
-  EXISTING SURFACE WATER SEWER AND FLOW DIRECTION
-  EXISTING SURFACE WATER MANHOLE
-  PROPOSED FOUL SEWER WITH PIPE SIZE & SLOPE
- xx,xxx
xx,xxx PROPOSED FOUL WATER MANHOLE WITH COVER LEVEL (CL) AND INVERT LEVEL (IL)
- (IC)
xx,xxx
xx,xxx PROPOSED FOUL WATER INSPECTION CHAMBER
- INDICATIVE FOUL CONNECTION
-  EXISTING FOUL SEWER AND FLOW DIRECTION
-  EXISTING FOUL WATER MANHOLE
-  PROPOSED PERMEABLE BLOCK PAVING
-  PROPOSED INFILTRATION TANK

6	CJ	MR	UPDATED LAYOUT
6	DM	MR	MINOR CHANGE TO S278 NOTES
6	DM	MR	REVISED LAYOUT
6	DM	MR	DRAFT ISSUE FOR REVIEW
	BY	Aprvd.	DESCRIPTION


1

LE THROW CAR PARK ROAD

LE POSED DRAINAGE LAYOUT NED PHASE 1 AND 2



D.MCGRATH	DATE	04.03.25
M.REDFERN	DATE	04.03.25
E.DEASY	DATE	04.03.25
50 @ A0	JOB No.	242120
Preliminary		REVISION P4
P120-FCF-77-XX-DR-C-5212		



APPENDIX F – TW RESPONSE LETTER



Daniel McGrath

EirEng Consulting Engineers
Cambridge House South
Henry Street
Bath
BA1 1BT

**Wastewater
pre-planning**



Our ref **DS6136302/DTS73302**

09 April 2025

Pre-planning enquiry: Confirmation of sufficient capacity

**Site address: NCP Heathrow Terminals 2-3 Heathrow flightpath West
Drayton UB7 0DU**

Dear Daniel

Thank you for providing information on your development for the demolition of existing car park and guard hut and redevelopment for Welfare Blocks (total:71m²), F&B unit (181m²) and staff block (15m²).

Proposed foul water to discharge by gravity into existing manhole TQ07774001 on the 525mm foul water sewer located to the east of the site.

Proposed surface water to discharge to ground via infiltration and not to Thames Water asset and so no capacity check carried out as requested.

We have completed the assessment of the foul water flows 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 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.

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

Asset Protection

If there are existing public sewers crossing the site. New buildings will need to be kept between 3 and 6.5m away from existing sewer depending on the size and depth of the sewer. Alternatively, it may be possible for sewers to be diverted around the new development. If you wish us to review a diversion proposal, please submit this via a Section 185 Diversion application. On some occasions it may be possible to abandon existing public sewers. Please see link below and contact us for further information on this process.

<https://www.thameswater.co.uk/help/home-improvements/building-over-sewers-or-public-drains>

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 **0800 009 3921**.

Yours sincerely

Gemma Connolley

Adoptions & Pre-Planning Engineer

Developer Services

APPENDIX G – SURFACE WATER CALCULATIONS

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1 (IC)	0.020	0.450	Unknown	26.338	25.288	0.900	507415.705	176965.412
S2 (IC)	0.027	0.450	Unknown	26.369	25.111	1.032	507425.526	176968.181
S4 (IC)	0.004	0.450	Unknown	26.392	25.341	0.901	507405.832	176990.602
S3	0.017	1.200	Type 2	26.377	24.975	1.177	507425.267	176990.750
S6	0.039	1.200	Type 2	26.392	25.340	0.902	507434.791	176985.891
S7	0.024	1.200	Type 2	26.388	24.760	1.403	507435.062	177036.357
S8 (IC)	0.127	0.450	Unknown	26.312	25.262	0.900	507417.172	177035.605
S5	0.000	1.350	Type 2	26.369	24.550	1.444	507425.152	177036.709
S9	0.000	1.350	Type 2	26.365	24.459	1.531	507424.998	177065.290
S10	0.174	1.350	Type 2	26.278	24.430	1.474	507415.834	177065.304
S11	0.000	1.350	Type 2	26.278	24.000	1.903	507415.835	177076.799

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1 (IC)	25.288	S2 (IC)	25.186	Circ	0.15mØ	10.204	100.0	0.600	0.900	1.032
1.001	S2 (IC)	25.111	S3	24.975	Circ	0.225mØ	22.571	166.2	0.600	1.032	1.177
2.000	S4 (IC)	25.341	S3	25.050	Circ	0.15mØ	19.436	66.8	0.600	0.901	1.177
1.002	S3	24.975	S5	24.700	Circ	0.225mØ	45.958	167.0	0.600	1.177	1.444
3.000	S6	25.340	S7	24.835	Circ	0.15mØ	50.466	100.0	0.600	0.902	1.403
3.001	S7	24.760	S5	24.700	Circ	0.225mØ	9.916	165.2	0.600	1.403	1.444
4.000	S8 (IC)	25.262	S5	24.775	Circ	0.15mØ	8.056	16.6	0.600	0.900	1.444
1.003	S5	24.550	S9	24.459	Circ	0.375mØ	28.582	313.0	0.600	1.444	1.531
1.004	S9	24.459	S10	24.430	Circ	0.375mØ	9.164	313.0	0.600	1.531	1.474
1.005	S10	24.430	S11	24.000	Circ	0.375mØ	11.496	26.8	0.600	1.474	1.903

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving1	S8 (IC)	20.336	26.312	25.932	0.00000000	2.00	507412.555	176996.448
Permeable Paving2	S8 (IC)	19.588	26.312	25.932	0.00000000	2.00	507419.160	177001.435
Permeable Paving3	S10	26.333	26.278	25.898	0.00000000	2.00	507412.605	177092.092
Permeable Paving4	S10	27.775	26.278	25.898	0.00000000	2.00	507419.098	177071.228

Outfall Details

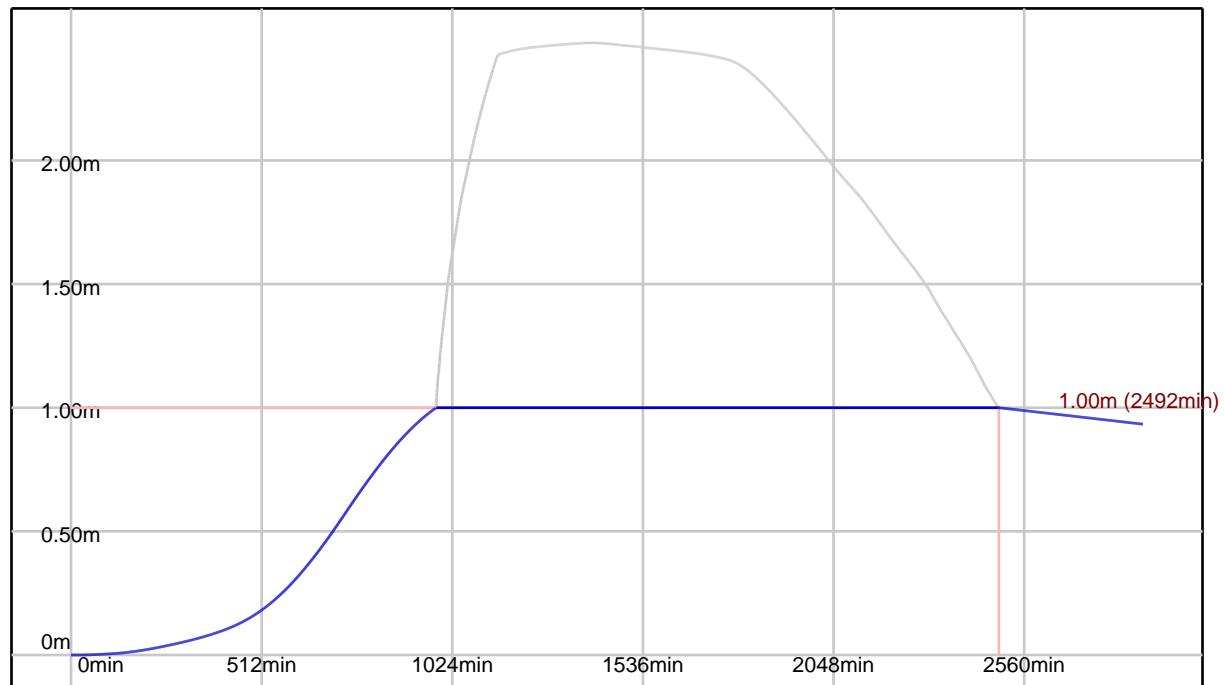
Outfall Manhole S11 : Infiltration Tank

Flow Control Details

Tank Structure at Manhole S11

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
24.000	1.000	95.00	357.304	339.439	339.439	0.01690000	0.01690000	2.00

Tank at S11 (100Yr+40% 1440Min Winter)



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_507459_177103_v5_0_1.xml

Summer (Cv: 0.75), Winter (Cv: 0.84)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Periods (yrs) + Climate Change: (2, +0%), (30, +0%), (100, +40%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	29.723	0.00	0.00	30Yr 720Min Winter	5.361	0.00	0.00
2Yr 15Min Summer	29.723	0.00	0.00	30Yr 960Min Summer	4.172	0.00	0.00
2Yr 30Min Winter	18.956	0.00	0.00	30Yr 960Min Winter	4.172	0.00	0.00
2Yr 30Min Summer	18.956	0.00	0.00	30Yr 1440Min Summer	2.945	0.00	0.00
2Yr 60Min Winter	11.631	0.00	0.00	30Yr 1440Min Winter	2.945	0.00	0.00
2Yr 60Min Summer	11.631	0.00	0.00	30Yr 2160Min Summer	2.083	0.00	0.00
2Yr 120Min Winter	8.642	0.00	0.00	30Yr 2160Min Winter	2.083	0.00	0.00
2Yr 120Min Summer	8.642	0.00	0.00	30Yr 2880Min Summer	1.632	0.00	0.00
2Yr 180Min Summer	7.039	0.00	0.00	30Yr 2880Min Winter	1.632	0.00	0.00
2Yr 180Min Winter	7.039	0.00	0.00	30Yr 4320Min Summer	1.173	0.00	0.00
2Yr 240Min Summer	5.726	0.00	0.00	30Yr 4320Min Winter	1.173	0.00	0.00
2Yr 240Min Winter	5.726	0.00	0.00	30Yr 5760Min Summer	0.941	0.00	-0.02
2Yr 360Min Summer	4.284	0.00	0.00	30Yr 5760Min Winter	0.941	0.00	-0.02
2Yr 360Min Winter	4.284	0.00	0.00	30Yr 7200Min Summer	0.799	0.00	-0.03
2Yr 480Min Summer	3.466	0.00	0.00	30Yr 7200Min Winter	0.799	0.00	-0.02
2Yr 480Min Winter	3.466	0.00	0.00	30Yr 8640Min Summer	0.703	0.00	-0.03
2Yr 600Min Summer	2.906	0.00	0.00	30Yr 8640Min Winter	0.703	0.00	-0.03
2Yr 600Min Winter	2.906	0.00	0.00	30Yr 10080Min Summer	0.634	0.00	-0.03
2Yr 720Min Summer	2.502	0.00	0.00	30Yr 10080Min Winter	0.634	0.00	-0.03
2Yr 720Min Winter	2.502	0.00	0.00	100Yr+40% 15Min Summer	161.189	0.00	0.00
2Yr 960Min Summer	1.981	0.00	0.00	100Yr+40% 15Min Winter	161.189	0.00	0.00
2Yr 960Min Winter	1.981	0.00	0.00	100Yr+40% 30Min Summer	104.924	0.00	0.00
2Yr 1440Min Winter	1.433	0.00	0.00	100Yr+40% 30Min Winter	104.924	0.00	0.04
2Yr 1440Min Summer	1.433	0.00	0.00	100Yr+40% 60Min Summer	64.848	0.00	0.00
2Yr 2160Min Winter	1.043	0.00	0.00	100Yr+40% 60Min Winter	64.848	0.00	0.09
2Yr 2160Min Summer	1.043	0.00	0.00	100Yr+40% 120Min Summer	40.430	0.00	0.13
2Yr 2880Min Summer	0.838	0.00	0.00	100Yr+40% 120Min Winter	40.430	0.00	0.01
2Yr 2880Min Winter	0.838	0.00	0.00	100Yr+40% 180Min Summer	30.205	0.00	-0.01
2Yr 4320Min Summer	0.627	0.00	0.00	100Yr+40% 180Min Winter	30.205	0.00	0.01
2Yr 4320Min Winter	0.627	0.00	0.00	100Yr+40% 240Min Summer	24.078	0.00	0.00
2Yr 5760Min Summer	0.519	0.00	-0.04	100Yr+40% 240Min Winter	24.078	0.00	0.02
2Yr 5760Min Winter	0.519	0.00	-0.04	100Yr+40% 360Min Summer	17.347	0.00	0.01
2Yr 7200Min Summer	0.453	0.00	-0.04	100Yr+40% 360Min Winter	17.347	0.00	0.10
2Yr 7200Min Winter	0.453	0.00	-0.04	100Yr+40% 480Min Summer	13.681	0.00	-0.02
2Yr 8640Min Summer	0.409	0.00	-0.04	100Yr+40% 480Min Winter	13.681	0.00	0.66
2Yr 8640Min Winter	0.409	0.00	-0.04	100Yr+40% 600Min Summer	11.320	0.00	0.00
2Yr 10080Min Winter	0.377	0.00	-0.05	100Yr+40% 600Min Winter	11.320	0.00	0.74
2Yr 10080Min Summer	0.377	0.00	-0.05	100Yr+40% 720Min Summer	9.664	0.00	0.02
30Yr 15Min Summer	89.054	0.00	0.00	100Yr+40% 720Min Winter	9.664	0.00	0.56
30Yr 15Min Winter	89.054	0.00	0.00	100Yr+40% 960Min Summer	7.515	0.00	-0.00
30Yr 30Min Summer	57.542	0.00	0.00	100Yr+40% 960Min Winter	7.515	0.00	0.09
30Yr 30Min Winter	57.542	0.00	0.00	100Yr+40% 1440Min Summer	5.261	0.00	0.03
30Yr 60Min Summer	35.417	0.00	0.00	100Yr+40% 1440Min Winter	5.261	0.00	-0.03
30Yr 60Min Winter	35.417	0.00	0.00	100Yr+40% 2160Min Summer	3.679	0.00	1.15
30Yr 120Min Summer	22.362	0.00	0.00	100Yr+40% 2160Min Winter	3.679	0.00	-9.72
30Yr 120Min Winter	22.362	0.00	0.00	100Yr+40% 2880Min Summer	2.854	0.00	0.00
30Yr 180Min Summer	16.799	0.00	0.00	100Yr+40% 2880Min Winter	2.854	0.00	-2.85
30Yr 180Min Winter	16.799	0.00	0.00	100Yr+40% 4320Min Summer	2.015	0.00	0.00
30Yr 240Min Summer	13.387	0.00	0.00	100Yr+40% 4320Min Winter	2.015	0.00	1.23
30Yr 240Min Winter	13.387	0.00	0.00	100Yr+40% 5760Min Summer	1.589	0.00	-0.01
30Yr 360Min Summer	9.665	0.00	0.00	100Yr+40% 5760Min Winter	1.589	0.00	-0.01
30Yr 360Min Winter	9.665	0.00	0.00	100Yr+40% 7200Min Summer	1.332	0.00	-0.02
30Yr 480Min Summer	7.623	0.00	0.00	100Yr+40% 7200Min Winter	1.332	0.00	-0.01
30Yr 480Min Winter	7.623	0.00	0.00	100Yr+40% 8640Min Summer	1.159	0.00	-0.02
30Yr 600Min Summer	6.293	0.00	0.00	100Yr+40% 8640Min Winter	1.159	0.00	-0.02

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr 600Min Winter	6.293	0.00	0.00	100Yr+40% 10080Min Winter	1.036	0.00	-0.02
30Yr 720Min Summer	5.361	0.00	0.00	100Yr+40% 10080Min Summer	1.036	0.00	-0.02

Simulation Results

Return Period Yrs: 2.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1 (IC)	15 min Winter	8	25.327	0.039	2.693		OK
S2 (IC)	15 min Winter	8	25.171	0.060	6.409		OK
S4 (IC)	15 min Winter	8	25.358	0.017	0.593		OK
S3	15 min Winter	9	25.047	0.071	8.916		OK
S6	15 min Winter	9	25.395	0.055	5.014		OK
S7	15 min Winter	9	24.828	0.068	8.212		OK
S8 (IC)	180 min Summer	108	25.293	0.031	4.099		OK
S5	15 min Winter	9	24.647	0.097	17.136		OK
S9	15 min Winter	10	24.555	0.096	16.597		OK
S10	15 min Winter	10	24.482	0.053	17.002		OK
S11	720 min Winter	703	23.741	0.241	0.886		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	8	S1 (IC)	S2 (IC)	0.039	0.727	2.663	0.150	OK
1.001	15 min Winter	9	S2 (IC)	S3	0.065	0.681	6.335	0.158	OK
2.000	15 min Winter	9	S4 (IC)	S3	0.017	0.533	0.574	0.026	OK
1.002	15 min Winter	9	S3	S5	0.071	0.822	8.871	0.221	OK
3.000	15 min Winter	9	S6	S7	0.055	0.875	5.102	0.288	OK
3.001	15 min Winter	9	S7	S5	0.068	0.810	8.265	0.205	OK
4.000	180 min Summer	108	S8 (IC)	S5	0.031	1.564	4.100	0.093	OK
1.003	15 min Winter	9	S5	S9	0.096	0.761	17.090	0.152	OK
1.004	15 min Winter	10	S9	S10	0.075	1.084	16.889	0.150	OK
1.005	15 min Winter	10	S10	S11	0.053	1.803	17.076	0.044	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving1	180 min Summer	109	25.983	0.051	1.678		OK
Permeable Paving2	180 min Summer	107	25.995	0.064	2.376		OK
Permeable Paving3	180 min Summer	110	25.968	0.069	2.616		OK
Permeable Paving4	180 min Summer	111	25.958	0.060	2.144		OK

Return Period Yrs: 30.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1 (IC)	15 min Winter	8	25.359	0.070	8.079		OK
S2 (IC)	15 min Winter	8	25.219	0.108	19.246		OK
S4 (IC)	15 min Winter	8	25.370	0.029	1.777		OK
S3	15 min Winter	9	25.109	0.133	26.587		OK
S6	15 min Winter	9	25.447	0.107	15.004		OK
S7	15 min Winter	9	24.886	0.126	24.695		OK
S8 (IC)	60 min Winter	48	25.315	0.053	11.966		OK
S5	15 min Winter	9	24.726	0.176	52.305		OK
S9	15 min Winter	9	24.634	0.175	52.415		OK
S10	15 min Winter	9	24.521	0.092	52.399		OK
S11	960 min Winter	955	24.100	0.600	0.956		OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	8	S1 (IC)	S2 (IC)	0.070	0.985	8.009	0.452	OK
1.001	15 min Winter	9	S2 (IC)	S3	0.120	0.892	19.094	0.476	OK
2.000	15 min Winter	9	S4 (IC)	S3	0.043	0.654	1.757	0.081	OK
1.002	15 min Winter	9	S3	S5	0.134	1.101	27.050	0.675	OK
3.000	15 min Winter	9	S6	S7	0.107	1.143	15.391	0.868	OK
3.001	15 min Winter	9	S7	S5	0.126	1.085	24.866	0.617	OK
4.000	60 min Winter	48	S8 (IC)	S5	0.053	2.123	11.966	0.272	OK
1.003	15 min Winter	9	S5	S9	0.176	1.033	52.415	0.467	OK
1.004	15 min Winter	9	S9	S10	0.133	1.473	51.904	0.462	OK
1.005	15 min Winter	10	S10	S11	0.092	2.506	52.333	0.135	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving1	60 min Winter	49	26.048	0.116	5.177		OK
Permeable Paving2	60 min Winter	48	26.081	0.150	6.595		OK
Permeable Paving3	60 min Winter	51	26.062	0.164	6.888		OK
Permeable Paving4	60 min Winter	51	26.036	0.137	6.365		OK

Return Period Yrs: 100.0

Climate Change %: 40

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1 (IC)	1440 min Winter	1395	25.976	0.687	0.046		Surcharged
S2 (IC)	1440 min Winter	1395	25.976	0.864	0.115		Surcharged
S4 (IC)	1440 min Winter	1398	25.976	0.634	0.009		Surcharged
S3	1440 min Winter	1395	25.976	1.000	0.156		Surcharged
S6	1440 min Winter	1387	25.976	0.636	0.106		Surcharged
S7	1440 min Winter	1396	25.976	1.215	0.133		Surcharged
S8 (IC)	1440 min Winter	1396	25.975	0.714	0.200		Surcharged
S5	1440 min Winter	1399	25.976	1.425	0.597		Surcharged
S9	1440 min Winter	1386	25.976	1.517	0.656		Surcharged
S10	1440 min Winter	1383	25.976	1.546	1.151		Surcharged
S11	1440 min Winter	1389	25.977	2.477	1.393		Surcharged

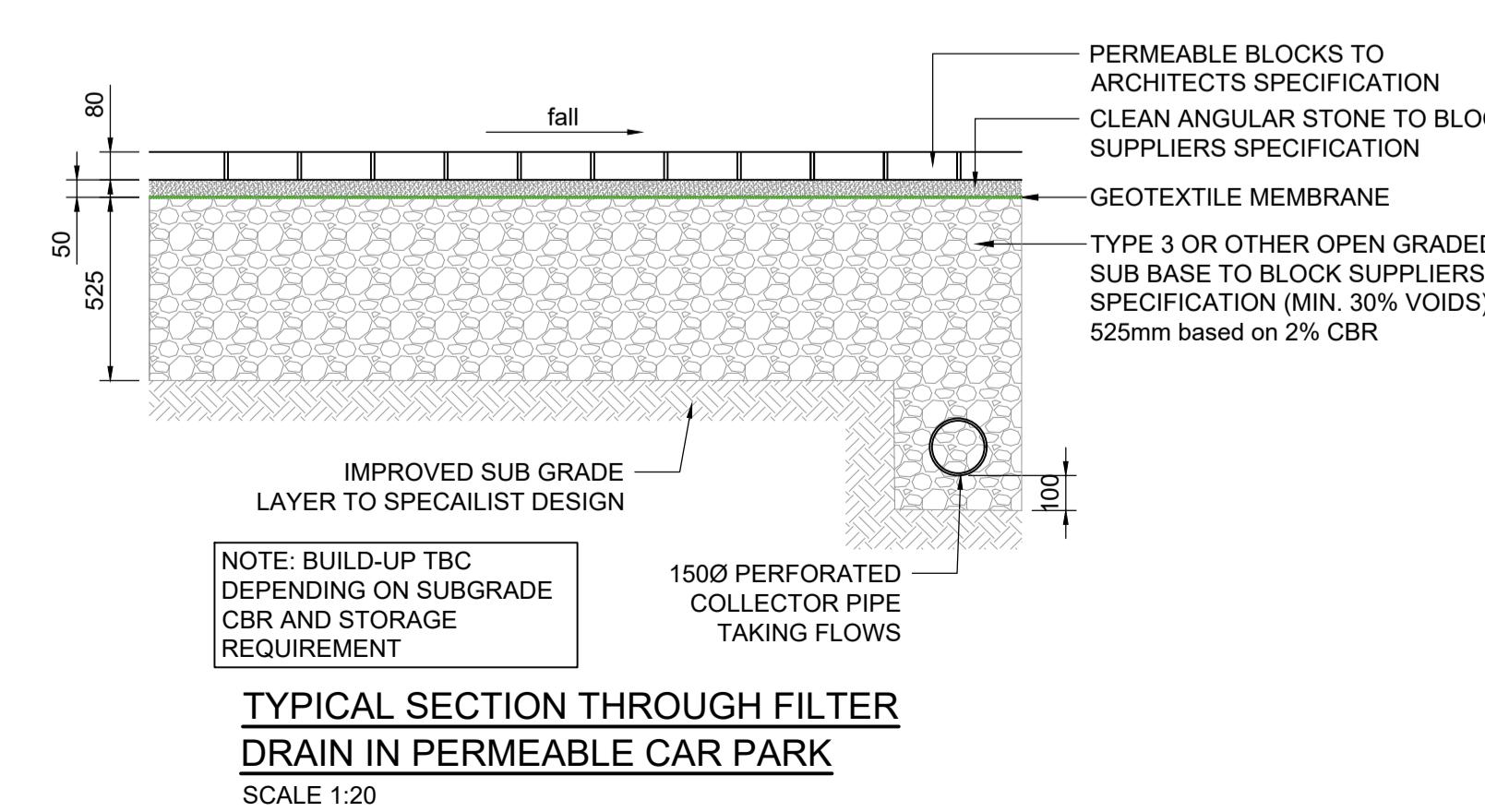
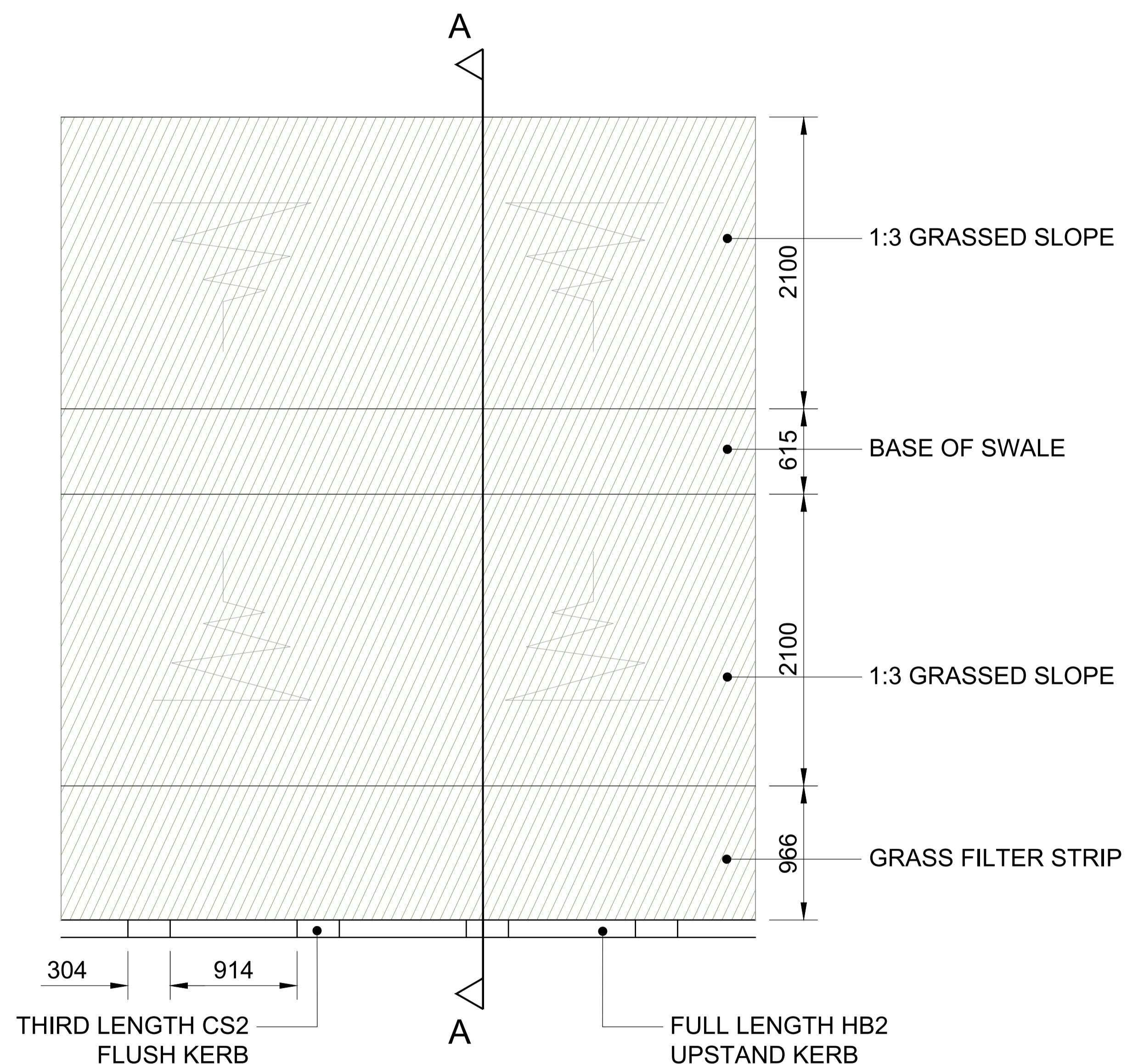
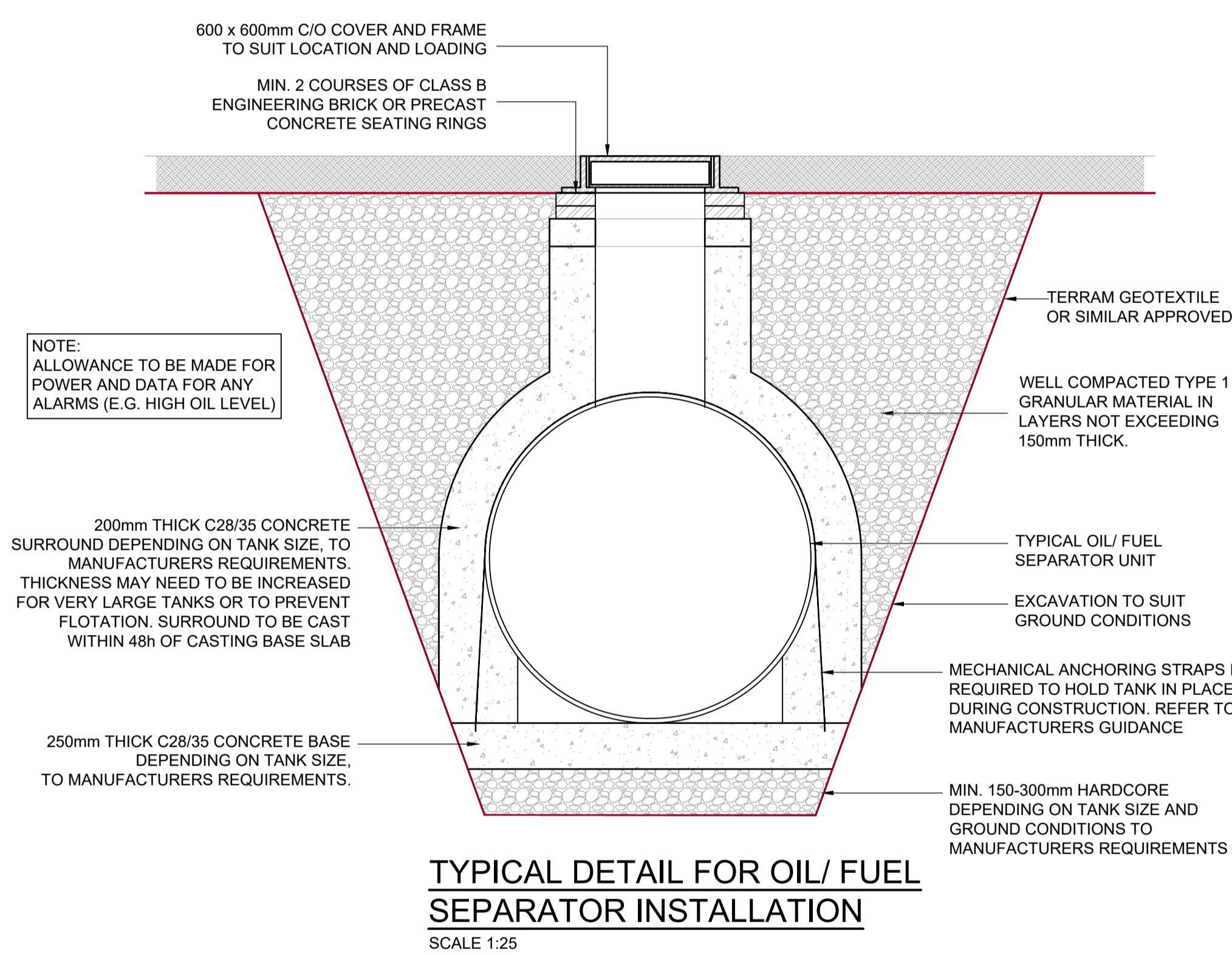
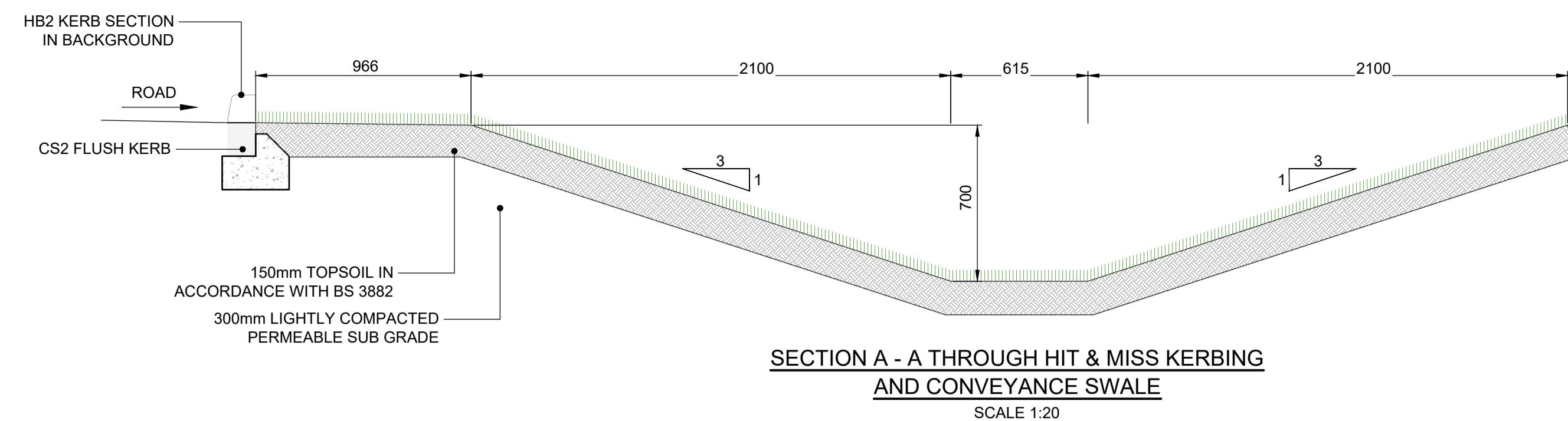
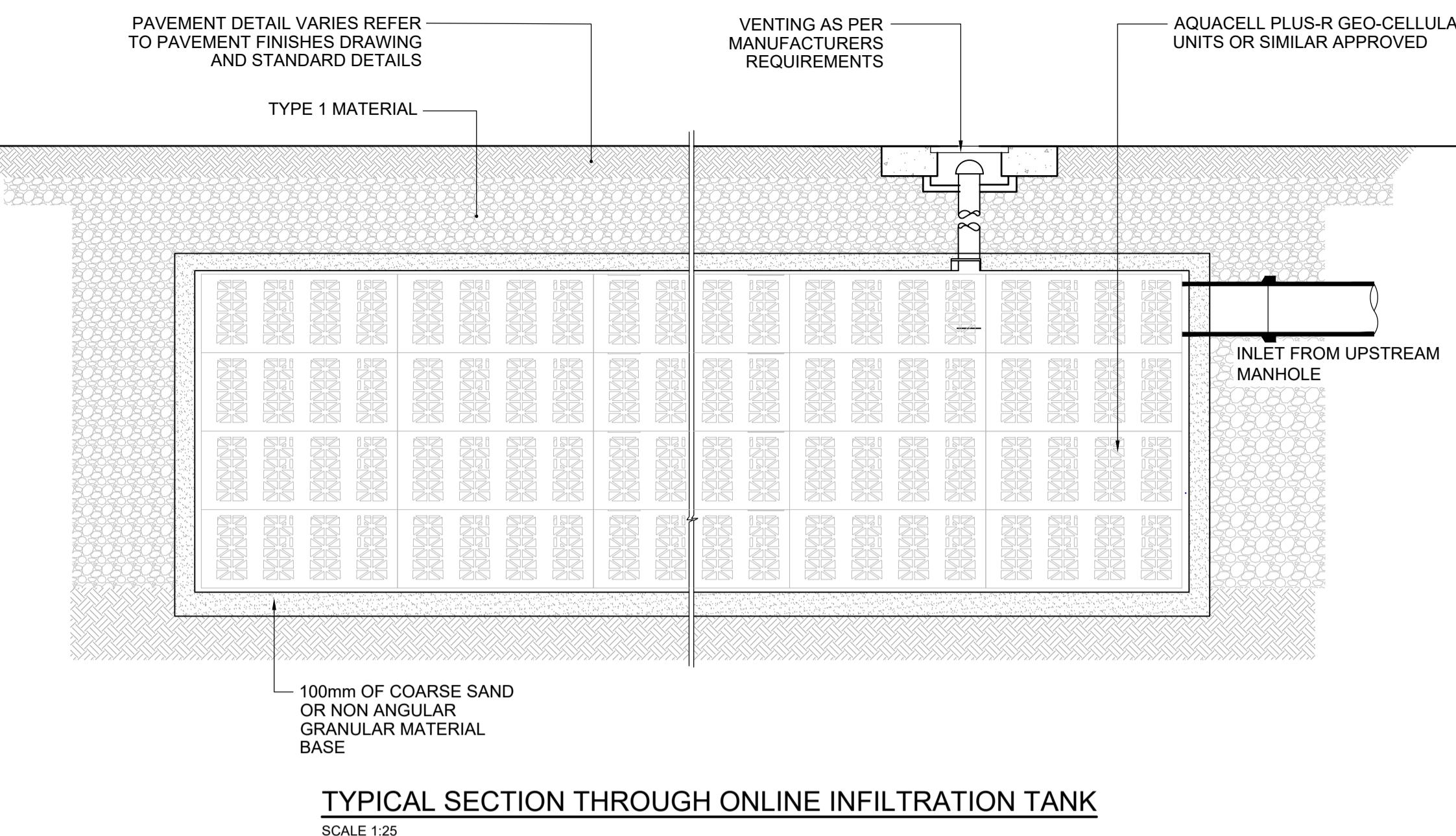
Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	600 min Winter	508	S1 (IC)	S2 (IC)	0.150	0.591	1.298	0.073	Surcharged
1.001	480 min Winter	430	S2 (IC)	S3	0.225	0.561	3.752	0.093	OK
2.000	2880 min Winter	3291	S4 (IC)	S3	0.150	0.284	0.297	0.014	Surcharged
1.002	480 min Winter	419	S3	S5	0.225	0.715	5.418	0.135	OK
3.000	600 min Winter	513	S6	S7	0.150	0.720	2.555	0.144	Surcharged
3.001	600 min Summer	617	S7	S5	0.225	0.731	5.791	0.144	OK
4.000	600 min Winter	505	S8 (IC)	S5	0.150	1.929	8.504	0.194	Surcharged
1.003	600 min Summer	603	S5	S9	0.375	0.818	21.571	0.192	Surcharged
1.004	600 min Summer	589	S9	S10	0.375	1.083	22.149	0.197	Surcharged
1.005	600 min Summer	585	S10	S11	0.375	2.198	33.535	0.086	Surcharged

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving1	60 min Winter	54	26.144	0.213	8.681		OK
Permeable Paving2	120 min Winter	84	26.312	0.380	13.603	0.483	Flood
Permeable Paving3	120 min Winter	75	26.278	0.380	18.287	4.935	Flood
Permeable Paving4	60 min Winter	55	26.278	0.380	14.927	0.187	Flood

APPENDIX H – SUDS DETAILS



GENERAL NOTES :-

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGN DRAWINGS.
2. ALL DIMENSIONS ARE IN METRES.
3. DO NOT SCALE, USE FIGURED DIMENSIONS ONLY.
4. ALL LEVELS ARE IN METERS RELATIVE TO DATUM U.N.O.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY OR DETERMINE ALL DIMENSIONS AND LEVELS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OR PRODUCTION OF FABRICATION DRAWINGS.

CLIENT
INFINIUM LOGISTICS

PROJECT TITLE
HEATHROW CAR PARK
BATH ROAD

DRAWING TITLE
SuDS DETAILS SHEET

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DRAWN BY	D.MCGRATH	DATE	05.03.25
ENG CHECK	M.REDFERN	DATE	05.03.25
APPROVED	E. DEASY	DATE	05.03.25
SCALE	As Shown @ A1		
STATUS	PRELIM		
DWG NO	242120-ECE-ZZ-XX-DR-C-5230		
	P2		

APPENDIX I – SIA ASSESSMENT

SIA Assessment - Phase 1

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Non-residential car parking with frequent change (eg hospitals, retail)				
Pollution Hazard Level	Medium				
Pollution Hazard Indices					
TSS	0.7				
Metals	0.6				
Hydrocarbons	0.7				
SuDS components proposed					
Component 1	Pervious pavement (where the pavement is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 2	SPEL Puraceptor ESR	Detailed assessment of performance of designed component in reducing inflow concentrations of each pollutant type require as evidence of adopted indices. Enter indices approved by the environmental regulator in appropriate 'User Defined Indices' row below	SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. WAT-RM-08 (SEPA, 2014) also provides a flow chart with a summary of checks on suitability of a proprietary system	See Chapter 15 Proprietary treatment systems for approaches to demonstrate product performance. Note: a British Water/Environment Agency assessment Code of Practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: http://www.britishwater.co.uk/Publications/codes-of-practise.aspx .	
Component 3	None				
SuDS Pollution Mitigation Indices					
TSS	>0.95				
Metals		0.9			
Hydrocarbons	>0.95				
Groundwater protection type	None				
Groundwater protection					
Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices					
TSS	>0.95				
Metals		0.9			
Hydrocarbons	>0.95				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				
Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), Interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but Interception requires separate evaluation.		Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			

SIA Assessment - Phase 2

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Non-residential car parking with frequent change (eg hospitals, retail)				
Pollution Hazard Level	Medium				
Pollution Hazard Indices					
TSS	0.7				
Metals	0.6				
Hydrocarbons	0.7				
SuDS components proposed					
Component 1	Pervious pavement (where the pavement is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 2	SPEL Puraceptor ESR	Detailed assessment of performance of designed component in reducing inflow concentrations of each pollutant type require as evidence of adopted indices. Enter indices approved by the environmental regulator in appropriate 'User Defined Indices' row below	SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. WAT-RM-08 (SEPA, 2014) also provides a flow chart with a summary of checks on suitability of a proprietary system	See Chapter 15 Proprietary treatment systems for approaches to demonstrate product performance. Note: a British Water/Environment Agency assessment Code of Practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: http://www.britishwater.co.uk/Publications/codes-of-practise.aspx .	
Component 3	Swale	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
SuDS Pollution Mitigation Indices					
TSS	>0.95				
Metals	>0.95				
Hydrocarbons	>0.95				
Groundwater protection type	None				
Groundwater protection Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices					
TSS	>0.95				
Metals	>0.95				
Hydrocarbons	>0.95				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				
Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), Interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but Interception requires separate evaluation.			Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England		



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