

SHANGI-LA – 1No ADDITIONAL DWELLING DRAINAGE – FOR PLANNING DOC & BUILDING REGULATIONS

Drainage Information for 1No Additional Dwelling (Plot 3)

Revision B2

For;
Brixter Developments

Site Address
Shangri-La,
Queens Road,
Haywards Heath,
RH16 1EE

Issued
22nd February 2025

Our Reference
23-020



CREATIVE
STRUCTURES

DOCUMENT ISSUE REGISTER

Job	Shangri-La, 1No Additional Dwelling			
Document	Drainage – For Planning DOC			
Issue	Date	Description	By	Checked
P1	13/08/2024	For Planning DOC	Philip Wainwright, <i>CEng, MlstructE</i>	14/08/2024
B1	22/02/2025	For Planning DOC & Building Regs	Philip Wainwright, <i>CEng, MlstructE</i>	22/02/2025
B2	07/06/2025	For Planning DOC & Building Regs	Philip Wainwright, <i>CEng, MlstructE</i>	07/06/2025

REVISION NOTES

P1 – THIS ISSUE COVERS THE DRAINAGE ONLY AND IS AIMED AT DISCHARGING THE PLANNING CONDITION AS EARLY AS POSSIBLE TO STREAMLINE THE PROGRAMME.

THIS COVERS THE ADDITIONAL PLOT 3 DWELLING, WHICH UTILISES THE PREVIOUSLY APPROVED DRAINAGE DISPOSAL METHODS AS PLOTS 1 & 2.

PLOT 3 IS PROPOSED WHERE AN EXISTING GARAGE IS LOCATED. THE CATCHMENT AREA OF THE NEW PLOT 3 IS 65.1m², WHICH IS A 33.4m² INCREASE vs THE EXISTING 31.7m² GARAGE(S).

THIS RESULTS IN AN ATTENUATION TANK INCREASE FROM 8m³ TO 10m³ ONLY.

ALL NEW HARDSTANDING AREAS ARE TO BE PERMEABLE PAVING, AS PREVIOUSLY APPROVED FOR PLOTS 1 & 2.

THE NEW FOUL DRAINAGE UTILISES THE EXISTING PUBLIC SEWER CONNECTION PROPOSED FOR PLOTS 1 & 2, THUS NO NEW WORKS REQUIRED TO THE PUBLIC SEWER.

B1 – THIS ISSUE COVERS THE UPDATED RWP & SS/SVP LAYOUTS FOR PLOT 3 AND THE INTRODUCTION OF THE MAINTENANCE SCHEDULE & TIMELINE FOR IMPLEMENTATION ON DRAWING 53. THE INVERT LEVELS ARE ALSO UPDATED ON DRAWING 51.

THE ADDITIONAL ATTENUATION TANK SIZE WAS INSTALLED AS PART OF THE LATE 2024 WORKS FOR PLOT 1 & 2, THUS THE FOUL & SURFACE WATER RUNS ARE SIMPLY TO BE EXTENDED TO THE NEW PLOT 3.

ALL CALCULATIONS REMAIN AS PER THE P1 ISSUE, WITH SUPPORTING NOTES ADDED.

B2 – THIS ISSUE COVERS THE ADDITION OF NOTES TO DRAWING 51 ONLY. THIS IS TO ADDRESS THE PLANNING DOC COMMENTS AND CONFIRMS THE DRAIN CROSSOVER LEVELS. THE PRIVATE ATTENUATION TANK SIZE IS ALSO UPDATED ON THE UNDIMENSIONED PLAN, WHICH MATCHES THE PREVIOUS CALCULATIONS AND NOTES, THUS NO CHANGE TO THE 'DESIGN'. THE TANK WAS INSTALLED BASED ON THE 'SIZE' PREVIOUSLY STATED AS PART OF THE PLOT 1 & 2 WORKS, THUS NO CONCERNS.

ONLY DRAWING 51 IS UPDATED WITH THE HIGHLIGHTED NOTES. THERE ARE NO OTHER CHANGES TO THE DESIGN.

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SECTION A

PROJECT DETAILS

1) Local Authority:

MID-SUSSEX DC

2) Based on architectural drawings:

N/A

3) Parts of structure:

DRAINAGE ONLY

4) Design assumptions made in calculations:

a) *N/A*

PROJECT OVERVIEW & DESIGN PHILOSOPHY

Introduction

The proposed works at Shangri-La previously comprised the demolition of an existing dwelling and the detached garage and the construction of 2No new replacement dwellings & a detached garage with parking for 3No cars. This proposal replaces the detached garage with a third dwelling, plot 3.

This package of information addresses the drainage design only to enable the planning condition to be discharged. We have already provided the building regulations information for plots 1 & 2, which are now constructed. We have also been appointed to undertake the main sub and super structure design for the proposed plot 3, which is to follow imminently.

There is a public foul sewer that runs across the site. The 2No new dwellings were approved with a 3m offset. This additional third plot utilises the same 3m sewer offset. The sewer position was plotted by southern water on 04/02/2013.

Recent falling head tests within boreholes at 3m & 8m both returned negative infiltration results, thus shallow & deep borehole soakaways are not considered feasible.

The existing dwelling has SVPs and RWPs, which both connect into the existing foul sewer with some surface water taken to a chamber/drain within the rear garden, which was found to be redundant, thus waterlogging the rear garden.

The rear garden slopes down to a drainage ditch, which routes between the existing adjacent properties with an assumed outflow towards Queens Road.

Foul drainage

The proposed arrangement is to take the new foul flows from the third new dwellings to the existing sewer utilising the existing connection(s) already approved for plots 1 & 2.

Surface water drainage

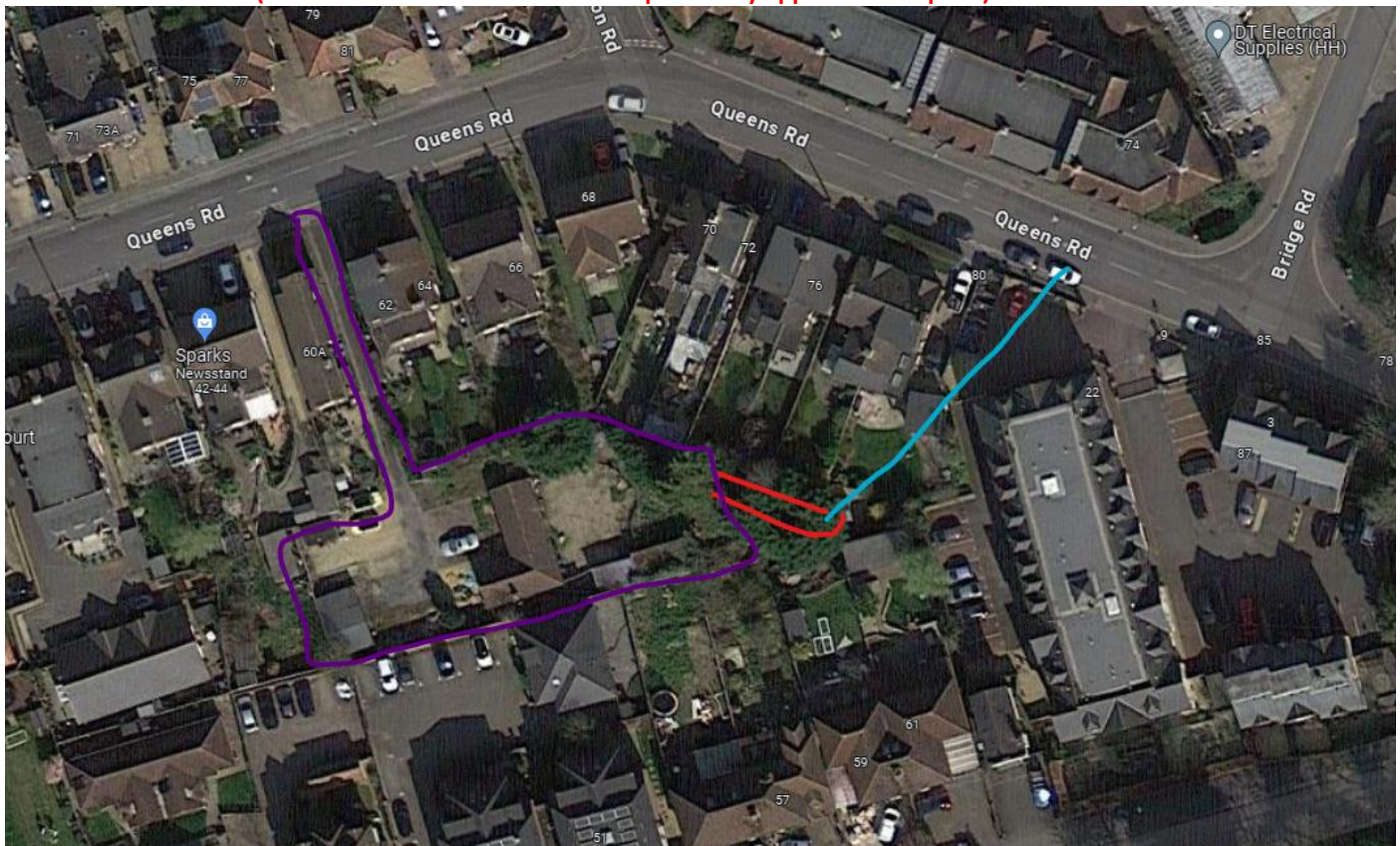
The existing site comprises part hardstanding concrete, tarmac & block paving, with 2No road gulleys to the front parking area(s) and RWPs to the rear of the site.

The existing hardstanding to the front of the site is proposed to be converted to permeable paving. Just the roof catchment area(s) of the 3No dwellings are to be positively drained. These are proposed to be attenuated within standard plastic crates within the garden area of plot 1, with a 1.0 l/s controlled outfall to the drainage ditch. Plot 3 is proposed where an existing garage was proposed. The catchment area of the new plot 3 is 65.1m², which is a 33.4m² increase vs the 31.7m² garage(s).

This requires a nominal increase from 8m³ of attenuation to 10m³ of attenuation for the additional 33.4m². This utilises all the same design principles as the previously approved 2No plots (i.e. 1.0l/s outflow + 45% CC factor, etc)

The rear garden levels are to be raised nominally 300-400mm to achieve the required garden cover levels to the attenuation and to achieve the required outfall(s) to the drainage ditch. Final garden level & landscaping TBC by others.

Watercourse Network (this information is identical to the previously approved 2No plots)



The image above is taken from Google Earth and shows the site location in purple with the ditch running to the east in red with the culverted outflow flowing off to the (assumed) north-east in light blue.

The link below shows a video taken from site on 6th December 2023. It shows the moving body of water and the site.

https://www.dropbox.com/scl/fi/w1eectzwdy1p30vafh2t3/IMG_7864.MOV?rlkey=0chfh70vcvlyh6n69sfvbqo8&dl=0

Since the video, the original topographical surveyor revisited the site and plotted the ditch following the recent site clearance.

See photos below show the ditch network and are to be read in conjunction with drawing 23-020-51.



fig 01 – the entrance to the ditch



Fig 02 – the main body of the ditch

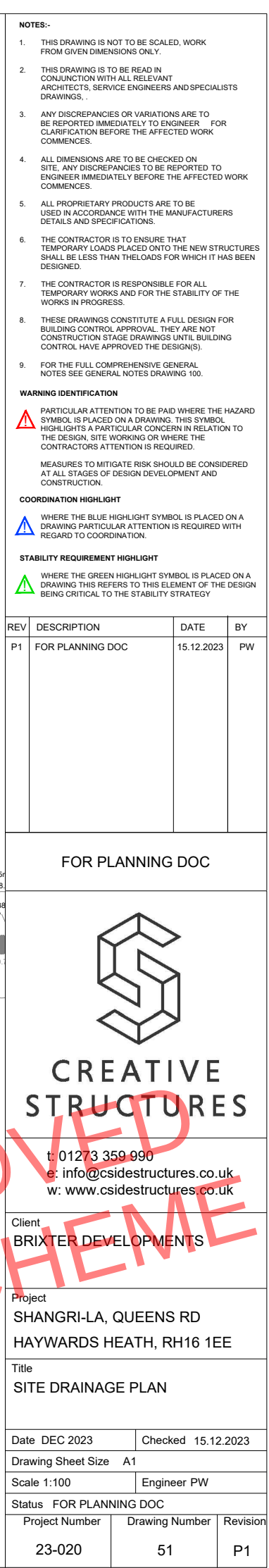


Fig 03 – the culvert

SECTION B

DRAWINGS

- 23-020-51_P1 PROPOSED SITE DRAINAGE PLAN (PREVIOUSLY APPROVED SITE PLAN)
- 23-020-51_B1 PROPOSED SITE DRAINAGE PLAN (INC PLOT 3)
- 23-020-52_B1 PROPOSED DRAINAGE DETAILS – SHEET 1 of 2
- 23-020-53_B1 PROPOSED DRAINAGE DETAILS – SHEET 2 of 2
- EXISTING SITE TOPOGRAPHICAL SURVEY



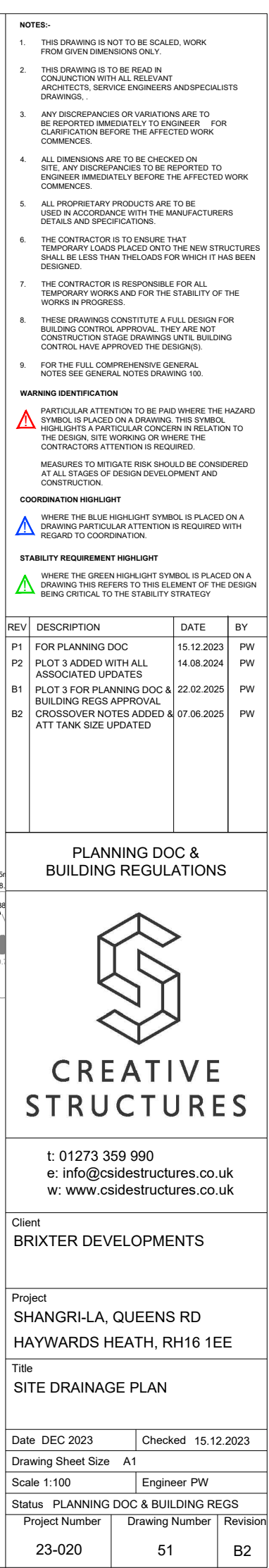


FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry

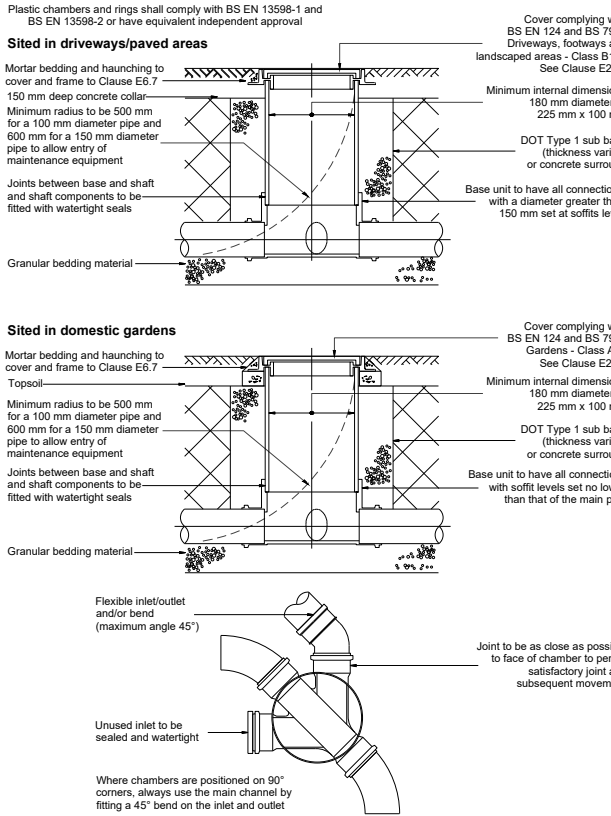
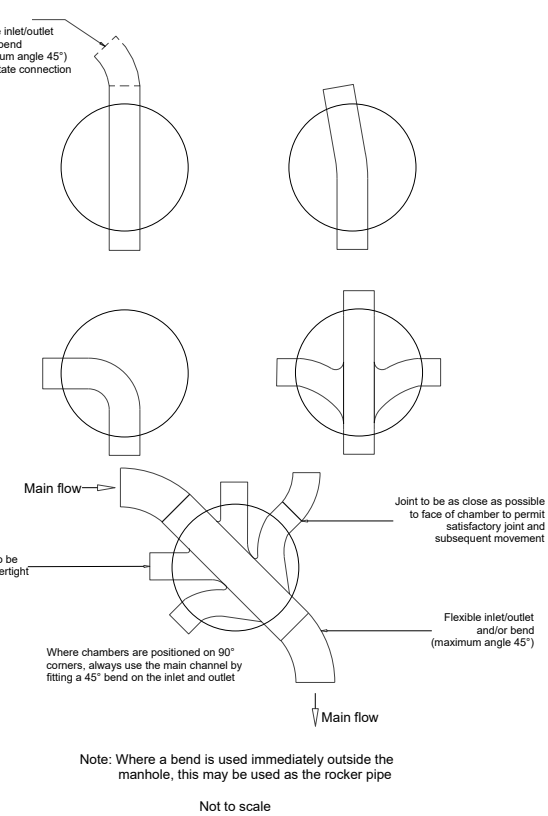
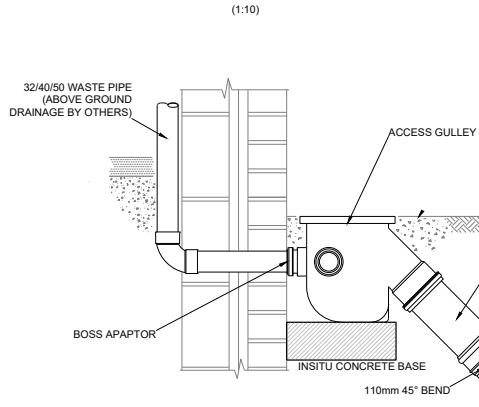


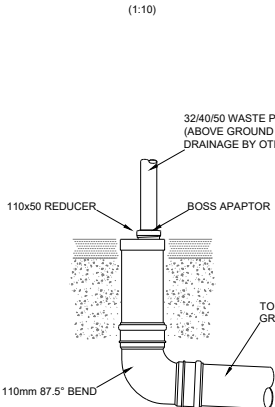
FIGURE B.20
ALTERNATIVE BASE LAYOUTS FOR TYPE 3/4 CHAMBERS



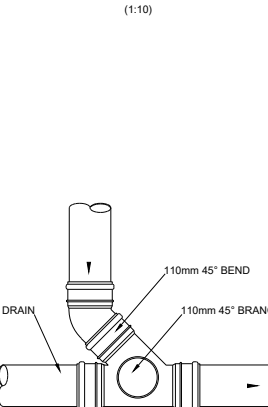
TYPICAL 68mm RWP CONNECTION TO 110mm PVCu DRAIN VIA RODABLE BOTTLE GULLEY



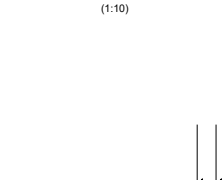
TYPICAL DETAIL AT BASE OF SVP



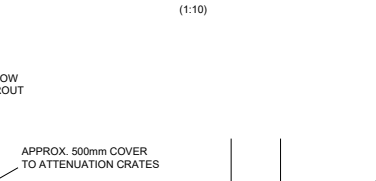
TYPICAL HEAD OF DRAIN RODDING POINT



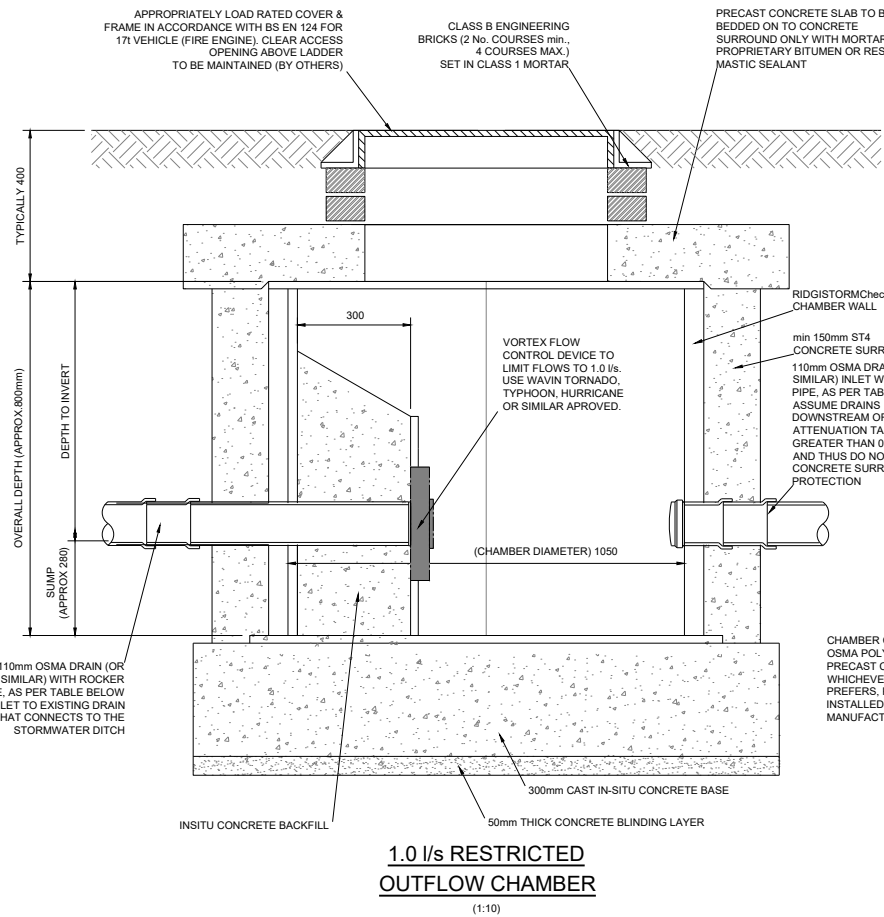
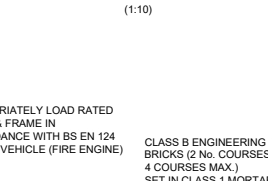
TYPICAL BACK INLET CONNECTION TO ACCESS GULLEY



TYPICAL SOIL/ STACK/STUB WASTE CONNECTION TO DRAIN

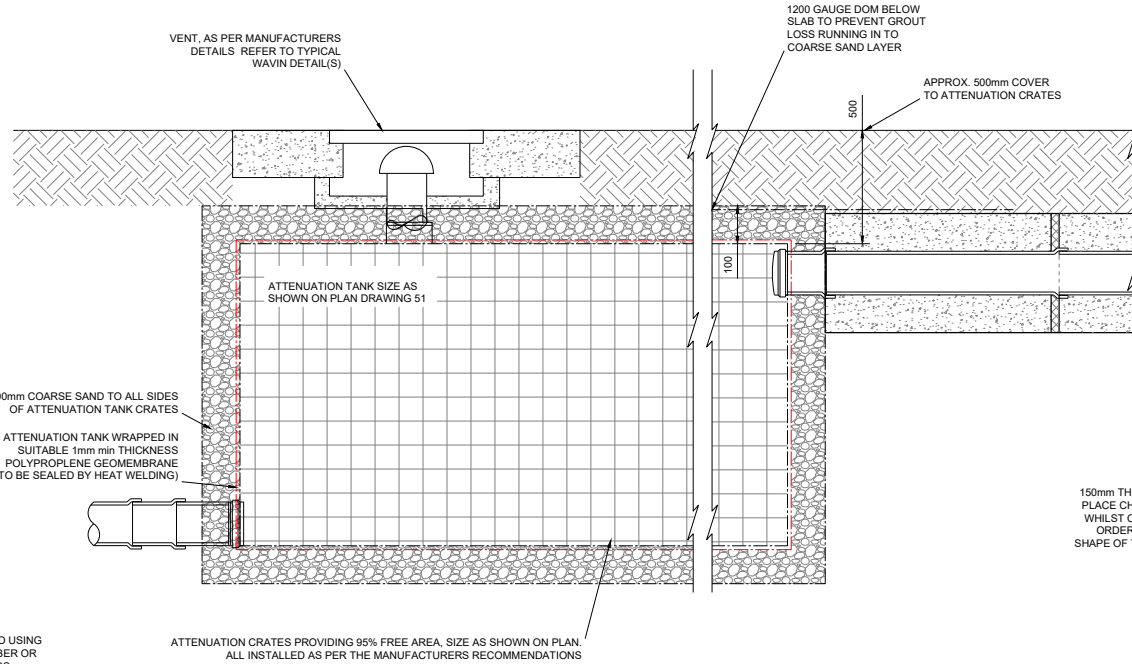


TYPICAL 110mm BRANCH CONNECTION



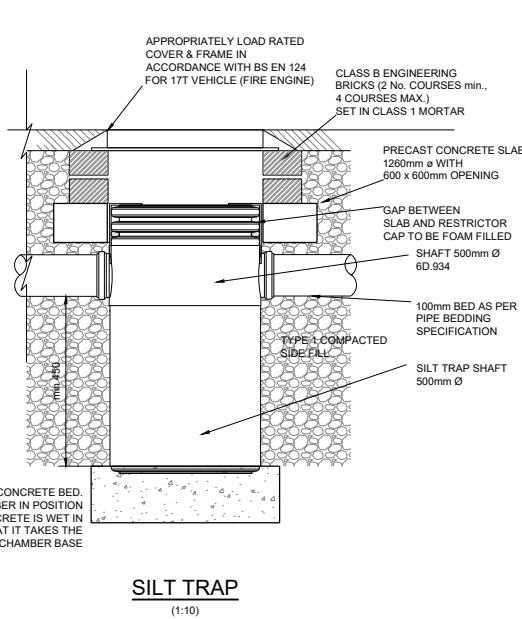
1.0 l/s RESTRICTED OUTFLOW CHAMBER

(1:10)



PIPE DIAMETER	ROCKER PIPE EFFECTIVE LENGTH
100mm-600mm	600mm

ROCKER PIPES REQUIRED TO EVERY CHAMBER AND TO EACH SIDE OF THE ATTENUATION TANK



- NOTES:-**
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 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, SERVICE ENGINEERS AND SPECIALISTS DRAWINGS..
 - ANY DISCREPANCIES OR VARIATIONS ARE TO BE REPORTED IMMEDIATELY TO ENGINEER FOR CLARIFICATION BEFORE THE AFFECTED WORK COMMENCES.
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 - ALL PROPRIETARY PRODUCTS ARE TO BE USED IN ACCORDANCE WITH THE MANUFACTURERS DETAILS AND SPECIFICATIONS.
 - THE CONTRACTOR IS TO ENSURE THAT TEMPORARY LOADS PLACED ONTO THE NEW STRUCTURES SHALL BE LESS THAN THE LOADS FOR WHICH IT HAS BEEN DESIGNED.
 - THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
 - THESE DRAWINGS CONSTITUTE A FULL DESIGN FOR BUILDING CONTROL APPROVAL. THEY ARE NOT CONSTRUCTION STAGE DRAWINGS UNTIL BUILDING CONTROL HAVE APPROVED THE DESIGN(S).
 - FOR THE FULL COMPREHENSIVE GENERAL NOTES SEE GENERAL NOTES DRAWING 100.

WARNING IDENTIFICATION

PARTICULAR ATTENTION TO BE PAID WHERE THE HAZARD SYMBOL IS PLACED ON A DRAWING. THIS SYMBOL HIGHLIGHTS A PARTICULAR CONCERN IN RELATION TO THE DESIGN, SITE WORKING OR WHERE THE CONTRACTORS ATTENTION IS REQUIRED.

MEASURES TO MITIGATE RISK SHOULD BE CONSIDERED AT ALL STAGES OF DESIGN DEVELOPMENT AND CONSTRUCTION.

COORDINATION HIGHLIGHT

WHERE THE BLUE HIGHLIGHT SYMBOL IS PLACED ON A DRAWING PARTICULAR ATTENTION IS REQUIRED WITH REGARD TO COORDINATION.

STABILITY REQUIREMENT HIGHLIGHT

WHERE THE GREEN HIGHLIGHT SYMBOL IS PLACED ON A DRAWING THIS REFERS TO THIS ELEMENT OF THE DESIGN BEING CRITICAL TO THE STABILITY STRATEGY

REV	DESCRIPTION	DATE	BY
P1	FOR PLANNING DOC	15.12.2023	PW
B1	PLOT 3 ADDED FOR PLANNING DOC & BUILDING REGS APPROVAL	22.02.2025	PW

PLANNING DOC & BUILDING REGULATIONS



CREATIVE STRUCTURES

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Client	BRIXTER DEVELOPMENTS		
Project	SHANGRI-LA, QUEENS RD HAYWARDS HEATH, RH16 1EE		
Title	TYPICAL DRAINAGE DETAILS SHEET 1 of 2		
Date	DEC 2023	Checked	15/12/2023
Drawing Sheet Size	A1		
Scale	1:20, 1:10	Engineer	PW
Status	PLANING DOC & BUILDING REGS		
Project Number	Drawing Number	Revision	
23-020	51	B1	

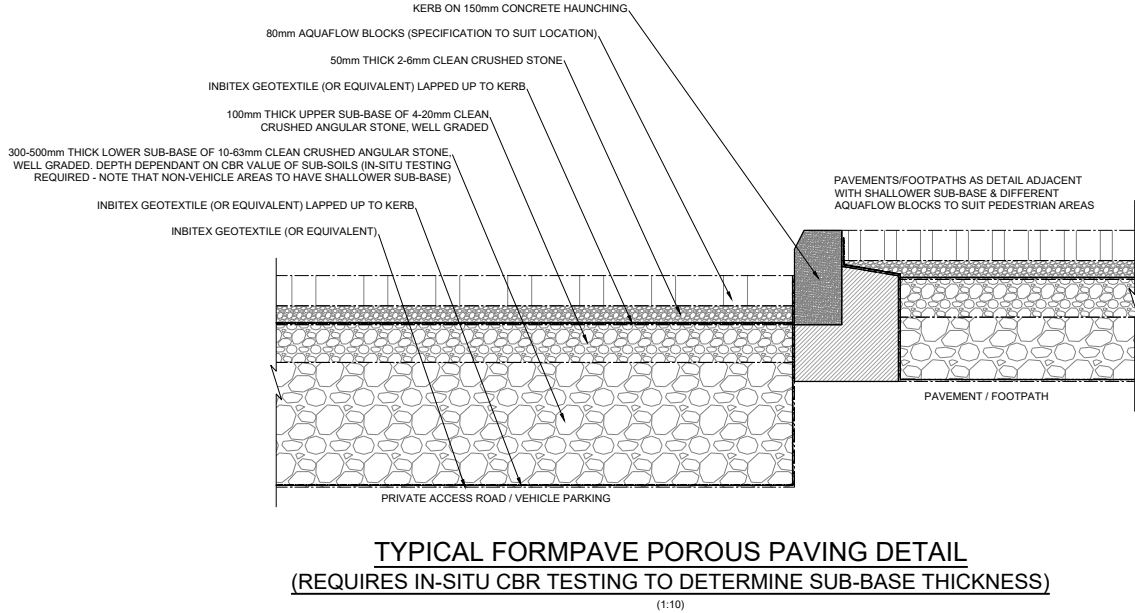
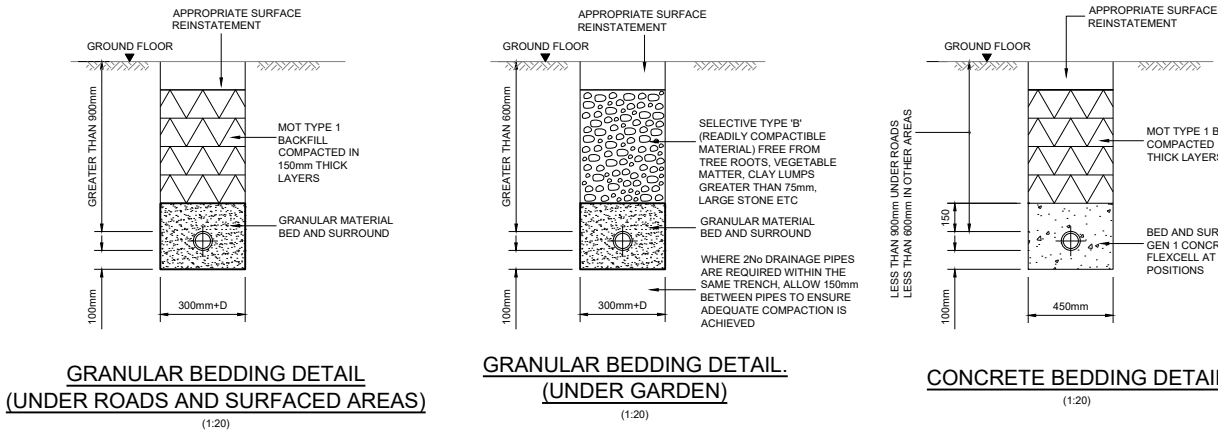
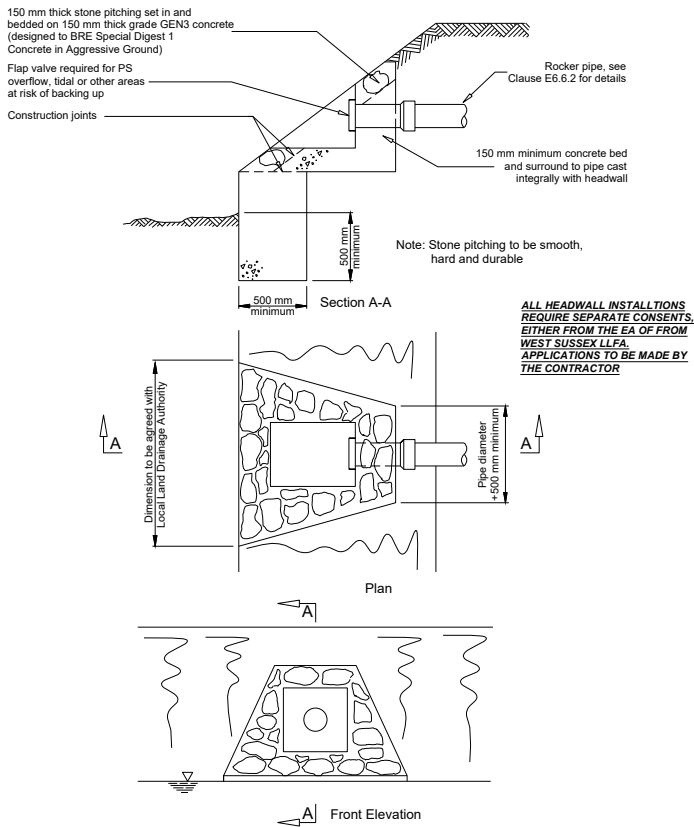


FIGURE C.5
TYPICAL DETAIL OF OUTFALL TO WATERCOURSE/DITCH
Suitable for outfall pipes of less than 350 mm



MAINTENANCE NOTES
1. THE OWNER OF EACH DWELLING IS RESPONSIBLE FOR THE MAINTENANCE OF EACH DWELLING'S DRAINAGE ARRANGEMENT RESPECTIVELY.
2. NOTE THAT AN EASEMENT FOR MAINTENANCE AND ACCESS IS REQUIRED ON THE LAND OF EACH PLOT AS THE DRAINAGE LAYOUT FOR BOTH PLOTS COLLECTIVELY RELIES ON THE ATTENUATION TANK & FLOW CONTROL DEVICE WITHIN THE GARDEN OF PLOT 1. THE CONTROLLED OUTFALL THEN ROUTES ACROSS THE GARDEN OF PLOT 2

MAINTENANCE SCHEDULE - AS TAKEN FROM SUDS MANUAL, TABLE 21.3 FOR DOMESTIC FLOW CONTROL DEVICE
(THIS INFORMATION IS TO BE WRITTEN IN TO THE O&M MANUAL)

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY	PERSON RESPONSIBLE FOR UNDERTAKING OR COMMISSIONING SUITABLE PROFESSIONAL
	INSPECT AND IDENTIFY ANY AREAS THAT ARE NOT OPERATING CORRECTLY. IF REQUIRE, TAKE REMEDIAL ACTION	MONTHLY FOR 3 MONTHS, THEN ANNUALLY	CLIENT / END USER / BUILDING OWNER
REGULAR MAINTENANCE (ATTENUATION TANKS & FLOW CONTROL DEVICE/CHAMBER)	REMOVE DEBRIS FROM THE CATCHMENT SURFACE (WHERE IT MAY CAUSE RISKS TO PERFORMANCE)	MONTHLY	CLIENT / END USER / BUILDING OWNER
	FOR SYSTEMS WHERE RAINFALL INFILTRATES IN TO THE TANK FROM ABOVE, CHECK SURFACE OF FILTER FOR BLOCKAGE BY SEDIMENT, ALGAE OR OTHER MATTER; REMOVE AND REPLACE SURFACE INFILTRATION MEDIUM AS NECESSARY	ANNUALLY	CLIENT / END USER / BUILDING OWNER
REMEDIATION ACTIONS (ALL SUDS PARTS)	REPAIR / REHABILITATE INLETS, OUTLETS, OVERFLOW AND VENTS	AS REQUIRED	CLIENT / END USER / BUILDING OWNER
REMEDIATION ACTIONS (FLOW CONTROL DEVICE)	REMOVE BLOCKAGES TO THE FLOW CONTROL DEVICE, AS REQUIRED BY FOLLOWING THE MAINTENANCE INSTRUCTIONS RELATING TO THAT PARTICULAR DEVICE, i.e. FOR TORNADO STYLE DEVICE, OPEN DOOR USING STAINLESS STEEL ROPE PROVIDED. FOR TYPHOON STYLE DEVICE PULL OUT UP-STAND PIPE TO ACTIVATE DRAIN DOWN, AND FOR HURRICANE STYLE DEVICE, USE THE LIFTING ROD TO DRAIN DOWN AND CLEAR BLOCKAGE(S).	AS REQUIRED	CLIENT / END USER / BUILDING OWNER
MONITORING	INSPECT / CHECK ALL INLETS, OUTLETS, VENTS AND OVERFLOWS TO ENSURE THAT THEY ARE IN GOOD CONDITION AND OPERATING AS DESIGNED	ANNUALLY	CLIENT / END USER / BUILDING OWNER
	SURVEY INSIDE OF TANK FOR SEDIMENT BUILD-UP AND REMOVE, IF NECESSARY	EVERY 5 YEARS, OR AS REQUIRED	CLIENT / END USER / BUILDING OWNER

MAINTENANCE SCHEDULE - AS TAKEN FROM SUDS MANUA C753, APPENDIX B, BOX-B2 FOR PERVIOUS PAVEMENTS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY	PERSON RESPONSIBLE FOR UNDERTAKING OR COMMISSIONING SUITABLE PROFESSIONAL
REGULAR MAINTENANCE	CLEANING BRUSH REGULARLY AND REMOVE SWEEPINGS FROM ALL HARD SURFACE	MONTHLY	SITE OWNER (MAINTENANCE CONTRACT)
OCCASIONAL TANKS	BRUSH AND VACUUM PERMEABLE PAVING SURFACE ONCE A YEAR TO PREVENT SILT BLOCKAGE AND ENHANCE DESIGN LIFE	ANNUALLY	SITE OWNER (MAINTENANCE CONTRACT)
REMEDIATION WORK	MONITOR EFFECTIVENESS OF PERMEABLE PAVEMENT, AND WHEN WATER DOES NOT INFILTRATE IMMEDIATELY ADVISE THE CLIENT OF POSSIBLE NEED FOR REINSTATEMENT OF TOP LAYERS OR SPECIALIST CLEANING. RECENT EXPERIENCE SUGGESTS THAT WET WASHING AND SUCTION CLEANING WILL SUBSTANTIALLY REINSTATE PAVEMENT TO 90% EFFICIENCY	AS REQUIRED	SITE OWNER (MAINTENANCE CONTRACT)

MAINTENANCE SCHEDULE - AS TAKEN FROM SUDS MANUA C753, APPENDIX B, BOX-B2 FOR INLETS, OUTLETS & INSPECTION CHAMBERS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY	PERSON RESPONSIBLE FOR UNDERTAKING OR COMMISSIONING SUITABLE PROFESSIONAL
REGULAR MAINTENANCE	INLETS, OUTLETS AND SURFACE CONTROL STRUCTURES INSPECT SURFACE STRUCTURES, REMOVING OBSTRUCTIONS AND SILT AS NECESSARY. CHECK THERE IS NO PHYSICAL DAMAGE.	MONTHLY (OR AS REQUIRED)	SITE OWNER (MAINTENANCE CONTRACT)
	STRIM VEGETATION 1m MIN. SURROUND TO STRUCTURES AND KEEP HARD APRONS FREE FROM SILT AND DEBRIS	MONTHLY	SITE OWNER (MAINTENANCE CONTRACT)
	INSPECTION CHAMBERS AND BELOW-GROUND CONTROL CHAMBERS REMOVE COVER AND INSPECT, ENSURING THAT WATER IS FLOWING FREELY AND THAT THE EXIT ROUTE FOR WATER IS UNOBSTRUCTED. REMOVE DEBRIS AND SILT. UNDERTAKE INSPECTION AFTER LEAF FALL IN AUTUMN	ANNUALLY	SITE OWNER (MAINTENANCE CONTRACT)
OCCASIONAL TANKS	CHECK TOPSOIL LEVELS ARE 20mm ABOVE EDGES OF BASKETS AND CHAMBERS TO AVOID MOWER DAMAGE	ANNUALLY (OR AS REQUIRED)	SITE OWNER (MAINTENANCE CONTRACT)
REMEDIATION WORK	REPAIR PHYSICAL DAMAGE IF NECESSARY	AS REQUIRED	SITE OWNER (MAINTENANCE CONTRACT)

TIMELINE FOR IMPLEMENTATION OF THE DRAINAGE WORKS FOR PLOT 3

THE DRAINAGE SCHEME FOR PLOT 3 IS UNUSUAL IN ITS NEW BUILD NATURE AS IT SIMPLY PIGGY BACKS ON TO THE RECENT INSTALLATIONS FOR PLOTS 1 & 2, WHICH WERE INSTALLED IN ~AUGUST 2024. THE DRAINAGE SCHEME FOR PLOT 3 PIGGY BACKS ON TO THE RECENT INSTALLATIONS FOR PLOTS 1 & 2, WHICH WERE INSTALLED IN ~AUGUST 2024.

SURFACE WATER
AS PART OF THE 2024 INSTALLATION FOR PLOTS 1 & 2, THE ATTENUATION TANK WAS OVERSIZED TO INCLUDE THE ADDITIONAL CATCHMENT AREA OF PLOT 3, THUS THE ATTENUATION TANK & CONTROLLED OUTFLOW ARE ALREADY IN SITU.

THE DRAINAGE INVERT LEVELS ALREADY CONSIDERED SURFACE WATER DRAINS TO THE PLOT 3 LOCATION AS THIS WAS ORIGINALLY PROPOSED AS A GARAGE THAT REQUIRED POSITIVE DRAINAGE, THUS THE RWP'S ARE SIMPLY TO BE CONNECTED TO THE RECENTLY INSTALLED SW-IC-01 AT THE TIME OF THE ROOF CONSTRUCTION.

FOUL DRAINAGE
AS PART OF THE 2024 INSTALLATION FOR PLOTS 1 & 2, THE FOUL DRAINS WERE RECONFIGURED WITH THE EXISTING CONNECTION TO THE PUBLIC SEWER MAINTAINED, ALL IN LINE WITH THE SOUTHERN WATER APPROVED DESIGN.

THE FOUL DRAINS FROM PLOT 3 ARE SIMPLY TO CONNECT TO THE PREVIOUSLY INSTALLED FW-IC-03 PRIOR TO THE PRACTICAL COMPLETION OF THE BUILD AND PRIOR TO ANY OCCUPATION.

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COORDINATION HIGHLIGHT

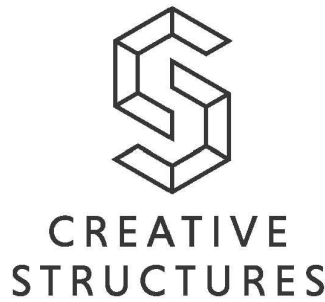
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STABILITY REQUIREMENT HIGHLIGHT

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REV	DESCRIPTION	DATE	BY
P1	FOR PLANNING DOC	15.12.2023	PW
B1	PLOT 3 ADDED FOR PLANNING DOC & BUILDING REGS APPROVAL	22.02.2025	PW

PLANNING DOC & BUILDING REGULATIONS



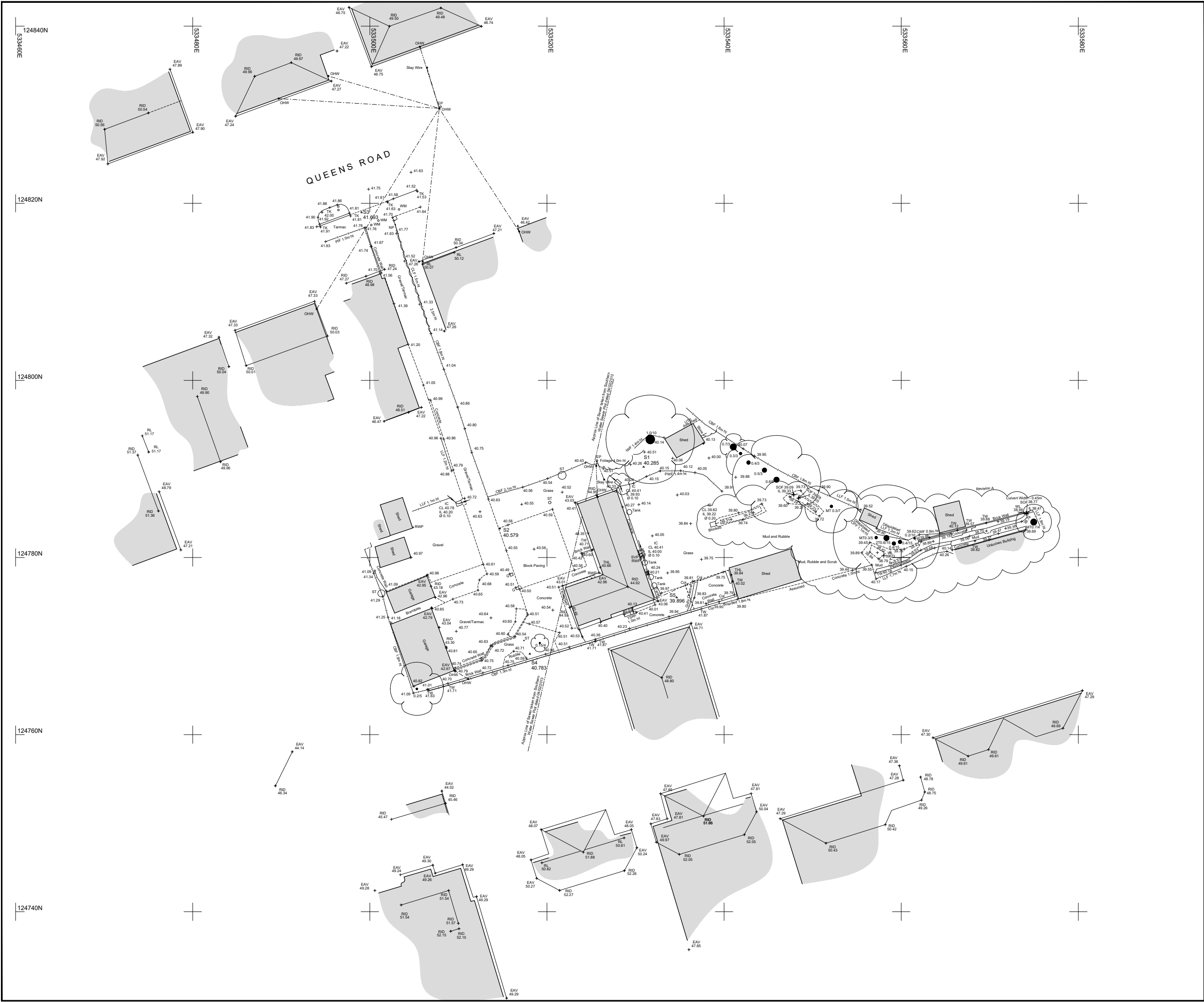
t: 01273 359 990
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w: www.csidestructures.co.uk

Client
BRIXTER DEVELOPMENTS

Project
**SHANGRI-LA, QUEENS RD
HAYWARDS HEATH, RH16 1EE**

Title
**TYPICAL DRAINAGE DETAILS
SHEET 2 of 2**

Date	DEC 2023	Checked	08.12.2023
Drawing Sheet Size	A1		
Scale	1:20, 1:10	Engineer	PW
Status	PLANNING DOC & BUILDING REGS		
Project Number	Drawing Number	Revision	
23-020	53	B1	



Sheet Layout

Grid

N

W E

S

LEGEND

BANKING

BUSHES & HEDGES

TREES

GATES

WALL

BUILDING

OPEN SIDED BUILDING

GLASS ROOFED

CONTOURS

ABBREVIATIONS (WHERE APPLICABLE)

ARCH HEAD HEIGHT	AHH	MARKER	MKR
ARCH HEAD LEVEL	AHL	MONITORING WELL	MW
ARCH SPRINGER HEIGHT	ASH	NAME BOARD	NB
AIR VALVE	AV	OVERHEAD WIRES	OHV
BED LEVEL	BL	PARKING METER	PM
BELISHA BEACON	BB	RODGE LEVEL	RL
BOLLARD	B	ROOF LEVEL	RL
BRITISH TELECOM BOX	BTB	ROAD SIGN	RS
BRITISH TELECOM MANHOLE	BTMH	RODDING EYE	RE
BRICKWORK	BRWK	RETAINING WALL	RTW
BUS STOP	BS	RAIN WATER PIPE	RWP
CABLE TV	CATV	SLUICE VALVE	SV
COVER LEVEL	CL	STOP COCK	SC
CABLE MARKER	CM	SOFFIT LEVEL	SOF
COLUMN	Col	STRUCTURAL SLAB LEVEL	SSL
CONCRETE POST	CP	TREE STUMP	ST
EAVES LEVEL	EAV	SOIL AND VENT PIPE	SVP
ELECTRICAL COVER	ELEC	THRESHOLD LEVEL	THL
ELECTRICITY CONTROL BOX	ECB	TELEGRAPH POLE	TP
ELECTRICITY POLE	EP	TELEPHONE CALL BOX	TCB
EARTH ROD	ER	TOP OF KERB	TK
FLOWER BED	FB	TURNSTILE	TS
FINISHED FLOOR LEVEL	FFL	TRAFFIC LIGHT	TL
FIRE HYDRANT	FH	TOP OF WALL	TW
FLOOR LEVEL	FL	UNABLE TO LIFT	UTL
FLAG STAFF	FS	UNABLE TO SURVEY	UTS
GAS PIPE	GP	VENT PIPE	VP
GAS VALVE	GV	WATER METER	WM
GULLY	G	WATER LEVEL	WL
GATE STOP	GS	WASH OUT	WO
INSPECTION COVER	IC	WASTE PIPE	WP
INVERT LEVEL	IL	WATER TANK	WT
LAMP POST	LP	WATER VALVE	WV

FENCES

BARBED WIRE FENCE	BWF	LARCH LAP FENCE	LLF
CORRUGATED IRON FENCE	CIF	METAL RAILING FENCE	MRF
CLOSE BOARD FENCE	CBF	POST AND CHAIN FENCE	PCF
CHAIN LINK FENCE	CLF	PICKET FENCE	PIF
CHESTNUT PALING FENCE	CPF	POST AND RAIL FENCE	PRF
FENCE POST	FPO	POST AND WIRE FENCE	PWF
INTERWOVEN FENCE	IWF	STEEL PALISADE SECURITY FENCE	SPSF
IRON RAILING FENCE	IRF	TUBULAR STEEL RAIL FENCE	TSRF

REV.	NOTES	DWN	DATE
A	Drainage Ditches and Culvert added.	RP	13/12/2023

ISO 9001 REGISTERED

THE SURVEY ASSOCIATION

ISO 14001 REGISTERED

Notes:

Grid and levels relate to OS GPS Active Network.

Sheet is North orientated unless stated.

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SURVEYED	RP	CLIENT
DRAWN	RP	Belmont Designs
CHECKED	AKM	SCALE
		1/200 (A1 Sheet)

Shangri-La, Queens Road, Haywards Heath, RH16 1EE

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
20/082	A	20/082/100

Date : May 2020

SECTION C

CALCULATIONS

Rainwater / Storm Attenuation Design

The existing site comprises part hardstanding concrete, tarmac & block paving, with 2no road gulleys to the front parking area(s) and RWP's to the rear of the site.

The existing hardstanding to the front of the site is proposed to be converted to permeable paving, with the area outside the sewer 3m easement utilised as storage attenuation.

A controlled outflow of 1 l/s is the proposed to the drainage ditch to the rear of the site.

The existing catchment areas are;

Existing roofs	= 180m ²
Existing hard paved area	= 208m ²
Total existing area	= 388m ²

The proposed catchment areas are;

Plot 1 roof	= 85.1m ²
Plot 2 roof	= 90.1m ²
Plot 3 roof	= 65.1m ²
Total proposed area	= 240.3m ²

Site area (red line) = 836m² (0.083ha)

The required attenuation to achieve 1 l/s with 45% climate factor is 10m³. This is to be achieved with 6.0m long x 5.0m wide x 0.4m deep plastic crate system with 95% free area, achieving 10.26m³ of effective storage.

This is an increase from 8m³ to 10m³ for the additional 33.4m².

The plot 3 additional roof catchment area was accounted for within the attenuation tank installation in 2004, thus the head of the surface water run is simply extended to plot 3.

The rear garden levels are to be raised nominally 300-400mm to achieve the required garden cover levels to the attenuation and to achieve the required outfall(s) to the drainage ditch. Final garden level & landscaping tbc by others.

SUPPORTING CALCULATIONS

- PROPOSED ATTENUATION TO LIMIT FLOWS TO 1l/s



Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by: PHILIP WAINWRIGHT

Site name: SHANGRI-LA

Site location: HAYWARDS HEATH

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site characteristics

Total site area (ha): 0.0836

Significant public open space (ha): .0593

Area positively drained (ha): 0.024299999999999995

Impermeable area (ha): 0.0242999

Percentage of drained area that is impermeable (%): 100

Impervious area drained via infiltration (ha): 0

Return period for infiltration system design (year): 10

Impervious area drained to rainwater harvesting (ha): 0

Return period for rainwater harvesting system (year): 10

Compliance factor for rainwater harvesting system (%): 66

Net site area for storage volume design (ha): 0.02

Net impermeable area for storage volume design (ha): 0.02

Pervious area contribution to runoff (%): 10

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti IH124

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

SPR estimation method: Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	96.25
FEH / FSR conversion factor:	1.25	1.25
SAAR (mm):	823	823
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.62	1.62
Growth curve factor 30 year:	2.3	2.3

Design criteria

Climate change allowance factor: 1.45

Urban creep allowance factor: 1.1

Volume control approach: Use long term storage

Interception rainfall depth (mm): 5

Minimum flow rate (l/s): 1

Growth curve factor 100 years:	3.19	3.19
Q _{BAR} for total site area (l/s):	0.49	0.49
Q _{BAR} for net site area (l/s):	0.14	0.14

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	1	1
1 in 30 years (l/s):	1	1
1 in 100 year (l/s):	1	1

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	10	10
Long term storage 1/100 years (m³):	0	0
Total storage 1/100 years (m³):	10	10

This report was produced using the storage estimation tool developed by HRWallingford and available at [www.uksuds.com](http://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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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 these data in the design or operational characteristics of any drainage scheme.