

RIVERSIDE – REPLACEMENT DWELLING DRAINAGE – FOR PLANNING DOC

Drainage Information for Proposed Replacement Dwelling & Outbuildings

Revision P7

For;
Southern Rock Property

Site Address
Riverside,
Bolney Chapel Road,
Twineham,
RH17 5NN

Issued
13th December 2024

Our Reference
23-040



CREATIVE
STRUCTURES

DOCUMENT ISSUE REGISTER

Job	RIVERSIDE – REPLACEMENT DWELLING			
Document	DRAINAGE – FOR PLANNING DOC			
Issue	Date	Description	By	Checked
P1	21/04/2022	For DOC Approval	Philip Wainwright, CEng, MIstructE	22/04/2022
P2	27/04/2022	For DOC Approval	Philip Wainwright, CEng, MIstructE	27/04/2022
P3	22/06/2022	For DOC Approval	Philip Wainwright, CEng, MIstructE	23/06/2022
P4	24/07/2023	For DOC Approval	Philip Wainwright, CEng, MIstructE	25/07/2023
P5	27/09/2023	For DOC Approval	Philip Wainwright, CEng, MIstructE	27/09/2023
P6	09/07/2024	For DOC Approval	Philip Wainwright, CEng, MIstructE	09/04/2024
P7	12/12/2024	For DOC Approval	Philip Wainwright, CEng, MIstructE	13/12/2024

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.

P2 – THIS ISSUE COVERS THE UPDATED FOOTPRINT AND LANDSCAPING TO LOXLEY HOUSE ONLY. THIS INCREASES THE VOLUME OF ATTENUATION REQUIRED.

P3 – THIS ISSUE COVERS THE SPLITTING OF THE DRAINAGE FEATURES, PER DWELLING FOR EASE OF FUTURE MAINTENANCE. THE SITE LEVELS HAVE ALSO BEEN ADDED WITH ALL DRAINAGE LEVELS ADDED TO ADDRESS DRAINAGE OFFICER COMMENTS.

A NOTE HIGHLIGHTING THE NEED FOR A MAINTENANCE AND ACCESS EASEMENT HAS ALSO BEEN ADDED.

P4 – THIS ISSUE COVERS THE CHANGE FROM THE PREVIOUS ‘LITTLE LOXLEY’ PROPOSAL TO THE LARGER ‘RIVERSIDE PROPOSAL. THE POINT OF DISCHARGE TO THE WATERCOURSE HAS BEEN MODIFIED TO SUIT THE NEW BUILDING LOCATION. THE DISCHARGE RATE REMAINS AT 1.0l/s, HOWEVER THE SIZE OF THE ATTENUATION HAS INCREASED TO SUIT THE LARGER CATCHMENT AREA(S).

P5 – THIS ISSUE COVERS THE INCREASE IN THE CLIMATE CHANGE FACTOR, IN LINE WITH GOV.UK GUIDANCE ON PEAK RAINFALL INTENSITIES. THE INCREASE FROM 40% TO 45% CC FACTOR INCREASES THE REQUIRED SIZE OF ATTENUATION FOR THE 1-in-100 YEAR EVENT FROM 51m³ TO 52m³ ONLY.

P6 – THIS ISSUES COVERS THE VOC FOR RIVERSIDE, WHERE THE DWELLING FOOR CATCHMENT AREA IS NOMINALLY INCREASED FROM 474.5m² TO 511.9m² (37.4m² INCREASE) AND THE REAR PATIO HARDSTANDING AREA FROM 187.6m² TO 615.2m²(427.6m² INCREASE). THIS REPRESENTS A 465m² TOTAL CATCHMENT AREA INCREASE THAT REQUIRES AN INCREASE FROM 52m³ OF ATTENUATION TO 102m³ OF ATTENUATION TO LIMIT THE NEW FLOWS TO 1l/s.

PREVIOUSLY THIS REPORT COVERED BOTH LOXLEY HOUSE & RIVERSIDE, AS THESE WERE ORIGINALLY ONE JOINT APPLICATION, HOWEVER THIS PROJECT (RIVERSIDE) IS NOW IN NEW OWNERSHIP AND THUS THE PREVIOUSLY INSTALLED ADJACENT PROPERTY, LOXLEY HOUSE HAS BEEN OMITTED FROM THIS REPORT. THE CONVEYANCING FOR RIVERSIDE INCLUDED THE REQUIRED EASEMENTS FOR LOXLEY TO DRAIN ACROSS THE NEW BOUNDARY LINE, IN ADDITION TO RIVERSIDE HAVING PERMISSION TO ROUTE THE EXISTING LOXLEY DRAINS AROUND ANY NEW EXTERNAL PATIO DEVELOPMENTS.

P7 – THIS ISSUES COVERS THE ADDITION OF THE OUTBUILDINGS AND THE UPDATED LANDSCAPING LEVELS FOR RIVERSIDE. THIS REPRESENTS A NOMINAL INCREASE IN TOTAL CATCHMENT AREA THAT REQUIRES AN INCREASE FROM 102m³ OF ATTENUATION TO 109m³ OF ATTENUATION TO LIMIT THE NEW FLOWS TO 1l/s.

ONLY DRAWING 51 IS UPDATED WITH ALL CHANGES CLOUDED. THE NEW CALCULATIONS ARE INCLUDED WITHIN SECTION C.

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SECTION A

PROJECT DETAILS

1) Local Authority:

MID-SUSSEX DC

2) Based on architectural drawings:

BY GOULD BAXTER

3) Parts of structure:

DRAINAGE ONLY

4) Design assumptions made in calculations:

a) *N/A*

PROJECT OVERVIEW & DESIGN PHILOSOPHY

Introduction

The proposed works at Riverside comprise the demolition of the existing East Hookers) detached annex building and the construction of a new dwelling.

These proposals have previously been approved for the previous scheme. The drainage for the adjacent property, Loxley House have been installed. Thus, this package of information addresses the revised Riverside drainage design to enable the planning condition to be discharged. We have also been appointed to undertake the main sub and super structure design for the replacement building. This is detailed within a separate Building Regulations package of information.

The existing site comprises a two-storey brick building with pitched roof and a detached annex bungalow in addition to fields and a tennis court. At the bottom of the site (to the South-East) is the Holmbush Gill portion or the River Adur (see OS map extract on the next page).

The existing foul drainage arrangement comprises a shared foul treatment plant/septic tank between the original East Hookers dwelling & detached bungalow/annex. There are no known overflows or drains running down to the watercourse. The new foul drainage strategy comprises a foul treatment plant, which discharges to the watercourse at the bottom (north) of the site.

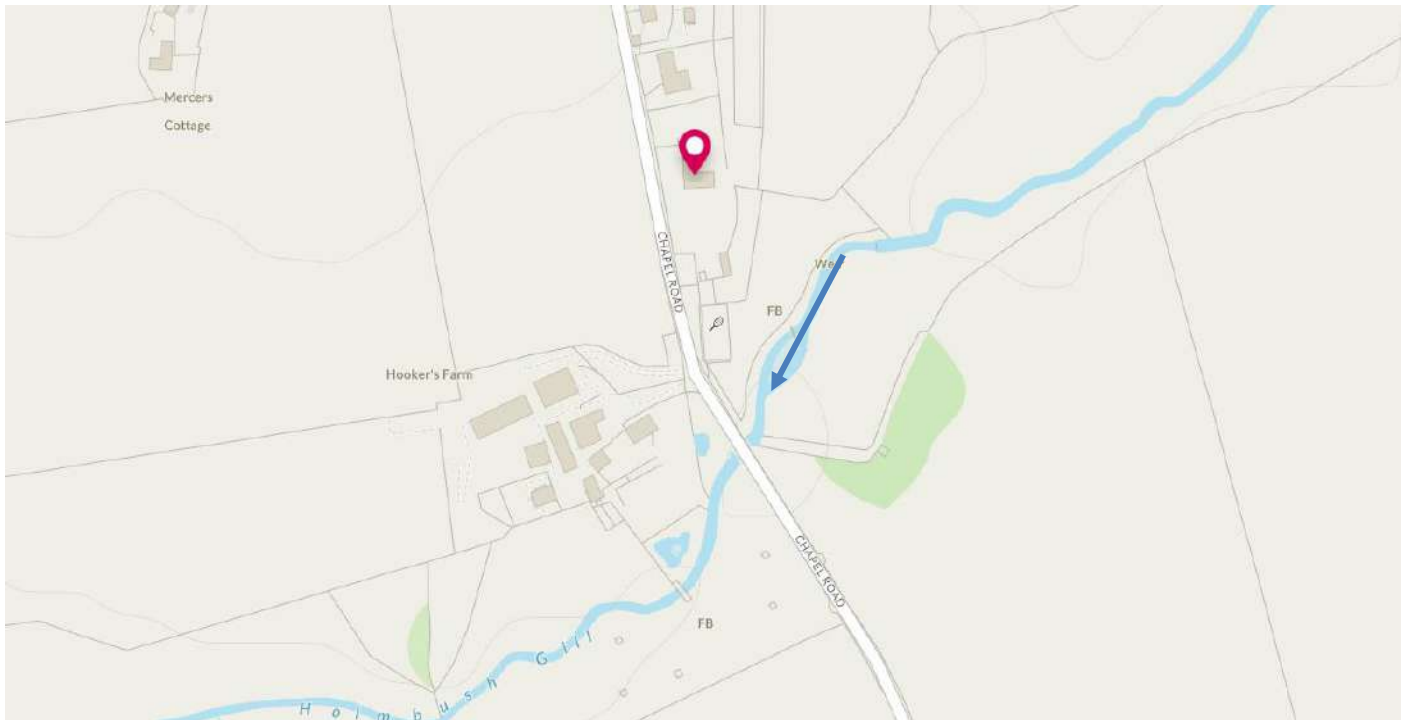
The new stormwater drainage proposals for Riverside, the Outbuildings and the rear Patio Area(s) comprise typical RWP that route to an attenuation tank with a controlled outflow to the adjacent river. The flows are controlled to 1.0 l/s,

Ground Conditions



The above figure is taken from the British Geological Survey website and shows that the site lies within the Weald Clay Formations. We are involved in a site just 200m away, where falling head tests confirmed the subsoils are non-porous.

Watercourse Network



The image above is taken from the Ordnance Survey (OS) website and shows the site location (red drop) with the river network connecting to the South-East. The arrow in blue shows the direction that the river flows.

The links below show videos taken from site on 23rd March 2022. They show the river at the base of the site.

https://www.dropbox.com/s/mmdnvzwld1m6wcw/IMG_6601.MOV?dl=0

https://www.dropbox.com/s/gatv0nikbnivcuv/IMG_6605.MOV?dl=0

See photos on the following pages – These are to be read in conjunction with plan drawing 24-040-51



Image 01 – Showing the existing East Hookers Dwelling



Image 02 – View looking South from the main dwelling showing the detached Annex/Bunglalow

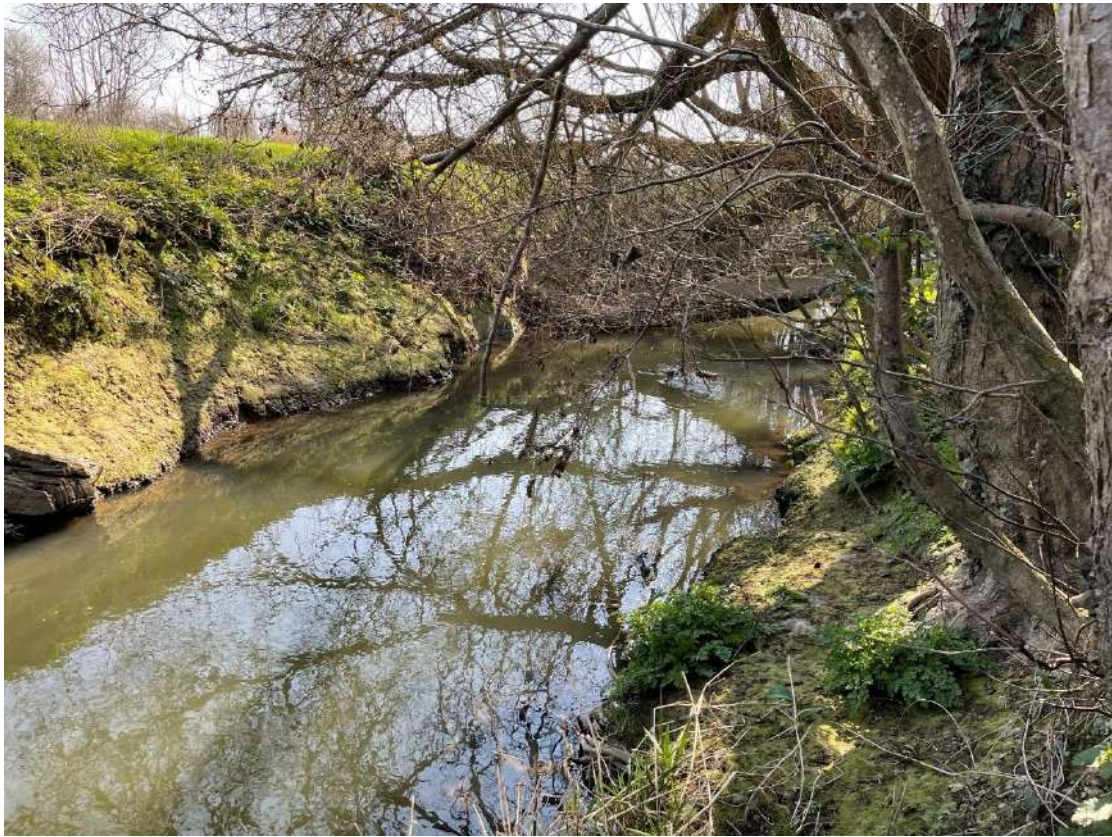


Image 03 – View looking South along the River Adur at the base of the garden (direction of flow)



Image 04 – View looking North along the River Adur at the base of the garden (against the flow).

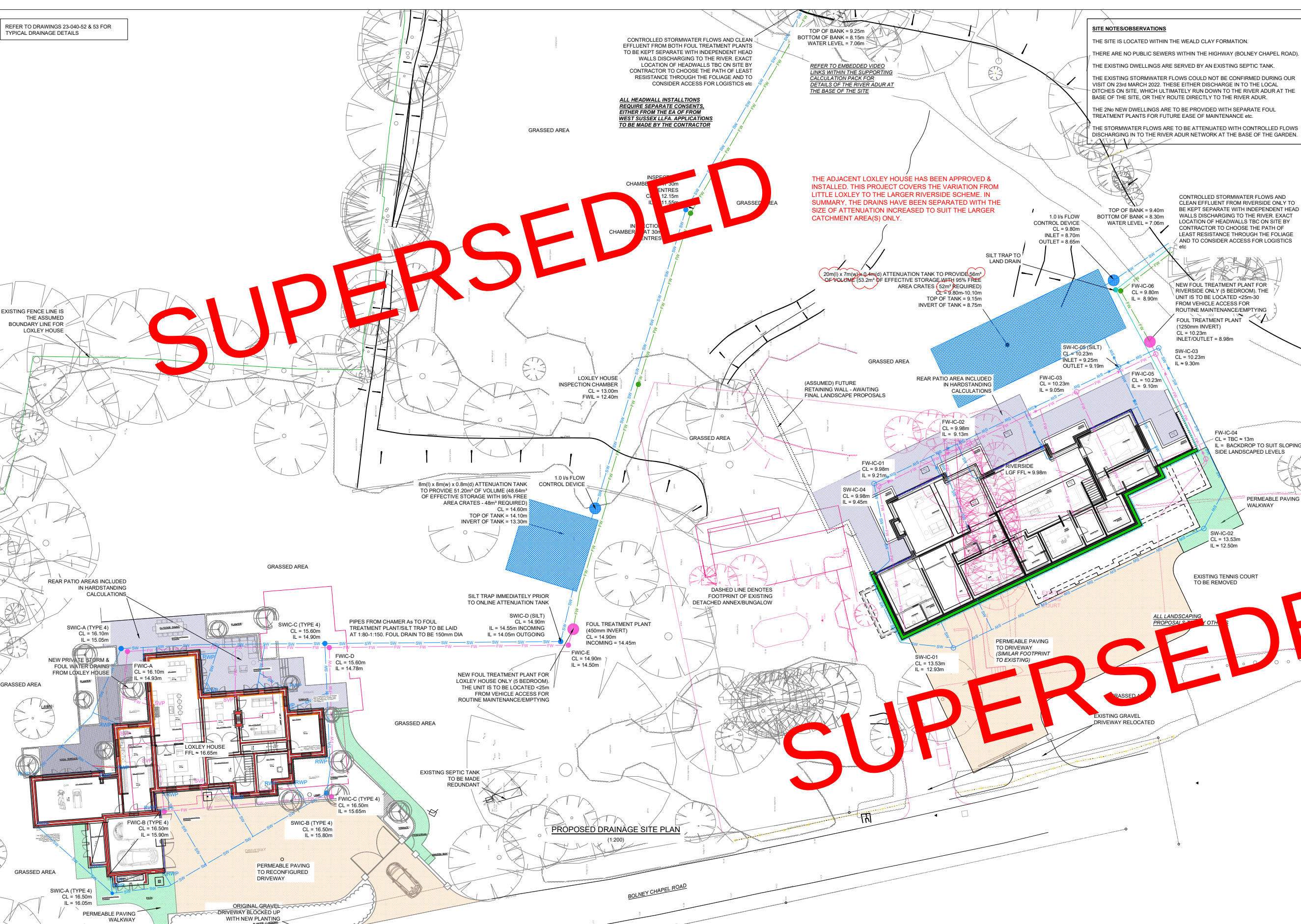
SECTION B

DRAWINGS

- 22-016-51 PROPOSED SITE DRAINAGE PLAN (PREVIOUS INCLUDED FOR COMPARISON)
- 22-016-51 PROPOSED SITE DRAINAGE PLAN (UPDATED TO SUIT RIVERSIDE DESIGN)
- 22-016-52 PROPOSED DRAINAGE DETAILS – SHEET 1 of 2
- 22-016-53 PROPOSED DRAINAGE DETAILS – SHEET 2 of 2

REFER TO DRAWINGS 23-040-52 & 53 FOR
TYPICAL DRAINAGE DETAILS

SUPERSEDED



SITE NOTES/OBSERVATIONS

THE SITE IS LOCATED WITHIN THE WEALD CLAY FORMATION.
THERE ARE NO PUBLIC SEWERS WITHIN THE HIGHWAY (BOLNEY CHAPEL ROAD).
THE EXISTING DWELLINGS ARE SERVED BY AN EXISTING SEPTIC TANK.
THE EXISTING STORMWATER FLOWS COULD NOT BE CONFIRMED DURING OUR VISIT ON 23rd MARCH 2022. THESE EITHER DISCHARGE IN TO THE LOCAL DITCHES ON SITE, WHICH ULTIMATELY RUN DOWN TO THE RIVER ADUR AT THE BASE OF THE SITE, OR THEY ROUTE DIRECTLY TO THE RIVER ADUR.
THE 2ND NEW DWELLINGS ARE TO BE PROVIDED WITH SEPARATE FOUL TREATMENT PLANTS FOR FUTURE EASE OF MAINTENANCE etc.
THE STORMWATER FLOWS ARE TO BE ATTENUATED WITH CONTROLLED FLOWS DISCHARGING IN TO THE RIVER ADUR NETWORK AT THE BASE OF THE GARDEN.

RAINWATER / STORM ATTENUATION DESIGN

THE REPLACEMENT DWELLINGS ARE TO BOTH ROUTE TO SEPARATE ATTENUATION TANKS, WHICH IS TO OUTFALL TO THE RIVER ADUR NETWORK IN LINE WITH THE EXISTING 1-IN-2 YEAR BROWNFIELD RUN OFF RATES.
LOXLEY HOUSE HAS ALREADY BEEN APPROVED & INSTALLED. THIS RIVERSIDE PROJECT IS A VARIATION ON THE EXISTING LITTLE LOXLEY.
EXISTING CATCHMENT AREA(S)
EXISTING ANNEX/BUNGALOW & HARDSTANDING = 78.51m²
EXISTING DESIGN RAINFALL (WALLINGFORD PROCEDURE):
1 IN 2 YEAR = 0.7 l/s
1 IN 100 YEAR = 1.5 l/s
EXISTING SITE OBAR = 7.37 l/s - FOR BOTH EXISTING PROPERTIES
PROPOSED CATCHMENT AREA(S) - RIVERSIDE ONLY
PROPOSED RIVERSIDE ROOF = 474.5m²
PROPOSED RIVERSIDE PATIO(S) = 187.6m²
PROPOSED RIVERSIDE TOTAL CATCHMENT AREA = 662.1m² (0.06621ha)
PROPOSED RIVERSIDE SITE AREA = 7261.1m² (0.72611ha)
REQUIRED ATTENUATION TO LIMIT FLOW RATES TO 1.0l/s ARE:
RIVERSIDE = 52m³
RIVERSIDE TANK SIZES:
PROVIDE 20m LONG x 7m WIDE x 0.4m DEEP ATTENUATION TANK TO PROVIDE 56m³ OF VOLUME (53.20m³ OF EFFECTIVE STORAGE WITH 95% FREE AREA)
DESIGN VARIABLES INC 45% GLOBAL WARMING FACTOR FOR A 6-HOUR STORM & a 1-IN-100 YEAR EVENT
THE EXISTING FLOW RATES IGNORE THE HARDSTANDING AND PATIO AREAS. THE NEW DEVELOPMENT WILL UTILISE PERMEABLE PAVING THROUGHOUT.

FOUL DRAINAGE DESIGN

THE NEW FOUL DRAINS FOR BOTH DWELLINGS ARE TO ROUTE TO NEW INDEPENDENT FOUL TREATMENT PLANTS. NO FOR EACH DWELLING (2ND IN TOTAL), THESE THEN DISCHARGE THE CLEAN EFFLUENT TO THE WATERCOURSE/RIVER NETWORK AT THE BOTTOM OF THE SITE VIA NEW SEPARATE HEADWALL INSTALLATIONS.

MEMBER KEY:

- FW PROPOSED FOUL WATER DRAIN
- SW PROPOSED SURFACE WATER DRAIN
- SW PROPOSED CLEAN EFFLUENT DRAIN FROM FOUL TREATMENT PLANT
- LAND DRAIN TO REVERSE FACE OF RC RETAINING WALL TO DISCHARGE DIRECT TO WATERCOURSE
- ACO/CHANNEL DRAIN
- FW-IC-01 PROPOSED FOUL WATER INSPECTION CHAMBER / FOUL TREATMENT PLANT
- SW-IC-01 PROPOSED SURFACE WATER INSPECTION CHAMBER / SILT TRAP / FLOW CONTROL DEVICE
- PROPOSED SURFACE WATER ATTENUATION TANK (SERVING BOTH PROPERTIES)
- DENOTES ARE OF PERMEABLE PAVING AROUND DWELLING(S) - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES ARE OF PERMEABLE ROADS AND HARDSTANDING FOR VEHICLE TRAFFIC - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES ARE OF NON-PERMEABLE INDIAN PAVING TO REAR PATIO(S)
- SOIL AND VENT PIPE
- RAINWATER PIPE
- N/A + LEVELS

PLEASE NOTE: ALL COVER LEVELS TO BE CONFIRMED FOLLOWING CONFIRMATION OF ALL EXTERNAL LEVELS.
MAIN CONTRACTOR TO CHECK EXISTING INVERT LEVELS IN ROAD PRIOR TO ANY DRAINAGE WORKS COMMENCING TO ENSURE THAT THE LEVELS AS SHOWN ON THIS DRAWING ARE CORRECT AND THAT THE PROPOSED DRAINAGE SCHEME WORKS.
MAIN CONTRACTOR TO CONFIRM AND ALLOW FOR REMOVAL OF ALL REDUNDANT DRAINS ON SITE AND CAPPING OFF TO LIVE DRAINS, ETC AS REQUIRED.
ALL RWP AND SVPS TO HAVE RODDING EYES.
ALL GAS, TELECOMMS, WATER etc UTILITY SERVICES TO BE DIVERTED/RELOCATED AS REQUIRED. SERVICES DESIGN BY OTHERS.

DRAINAGE NOTES:

- PIPEWORK TO BE UPVC-U PIPES & INSPECTION CHAMBERS TO BS EN 13598-1:2020
- ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT 'H', BS EN 752:2017 AND TO THE SATISFACTION OF THE BUILDING CONTROL OFFICER
- ALL ADAPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION AND THE RELEVANT COUNCIL DESIGN GUIDE.
- ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 80 UNLESS OTHERWISE STATED ON THE DRAWING.
- ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
- ALL PRIVATE SEWER PIPES TO BE 110 DIAMETER UNLESS OTHERWISE STATED ON THE DRAWING.
- EXISTING SEWER PIPE(S), WHERE APPLICABLE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO THE COMMENCEMENT OF THE DRAINAGE WORKS AND REBURIED IF NECESSARY.
- CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY. (ALL APPROVALS TO BE BY OTHERS)
- ALL SEWER PIPE AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.
- ALL SVPS TO HAVE TELESCOPIC PIPES BETWEEN GF & IL OF PIPE.



Client
SEVEN Home and Design

Project
RIVERSIDE
TWINEHAM, RH17 5NN

Title
SITE DRAINAGE PLAN

**ISSUED FOR PLANNING DOC
FIRST - IF APPROVED, USE
FOR BUILDING REGULATIONS**

Date **JULY 2023** Checked **25/07/2023**

Sheet **23-040**

Scale **AS SHOWN AT A1** Engineer **PW**

Status **BUILDING REGULATIONS**

Project Number Drawing Number Revision

23-040

51

B2

REV	DESCRIPTION	DATE	BY
B1	DOC / BUILDING REGS	25.07.2023	PW
B2	RIVERSIDE ATTENUATION INCREASED TO SUIT 45% CC	27.09.2023	PW

NOTES:-

- THIS DRAWING IS NOT TO BE SCALED. WORK FROM GIVEN DIMENSIONS ONLY.
- 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.
- ALL DIMENSIONS ARE TO BE CHECKED ON SITE. ANY DISCREPANCIES TO BE REPORTED TO ENGINEER IMMEDIATELY BEFORE THE AFFECTED WORK COMMENCES.
- 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 99.

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

REFER TO DRAWINGS 23-040-52 & 53 FOR TYPICAL DRAINAGE DETAILS

SITE NOTES/OBSERVATIONS

THE SITE IS LOCATED WITHIN THE WEALD CLAY FORMATION.

THERE ARE NO PUBLIC SEWERS WITHIN THE HIGHWAY (BOLNEY CHAPEL ROAD).

THE EXISTING DWELLINGS WERE SERVED BY AN EXISTING SEPTIC TANK.

THE EXISTING STORMWATER FLOWS COULD NOT BE CONFIRMED DURING OUR VISIT ON 23RD MARCH 2022. THESE EITHER DISCHARGED IN TO THE LOCAL DITCHES ON SITE, WHICH ULTIMATELY RUN DOWN TO THE RIVER ADJUR AT THE BASE OF THE SITE, OR THEY ROUTE DIRECTLY TO THE RIVER ADJUR.

THE 2ND NEW DWELLINGS (THE ADJACENT CONSTRUCTED LOXLEY HOUSE & THIS RIVERSIDE PROJECT) ARE TO BE PROVIDED WITH SEPARATE FOUL TREATMENT PLANTS & SEPARATE STORMWATER ATTENUATION SYSTEMS.

PLEASE NOTE: ALL COVER LEVELS TO BE CONFIRMED FOLLOWING CONFIRMATION OF ALL EXTERNAL LEVELS.

MAIN CONTRACTOR TO CHECK EXISTING INVERT LEVELS IN ROAD PRIOR TO ANY DRAINAGE WORKS COMMENCING TO ENSURE THAT THE LEVELS AS STATED ON THIS DRAWING ARE CORRECT AND THAT THE PROPOSED DRAINAGE SCHEME WORKS

MAIN CONTRACTOR TO CONFIRM AND ALLOW FOR REMOVAL OF ALL REDUNDANT DRAINS ON SITE AND CAPPING OFF TO LIVE DRAINS, ETC AS REQUIRED

ALL RWP AND SVP'S TO HAVE RODDING EYES.

ALL GAS, TELECOMMS, WATER etc UTILITY SERVICES TO BE DIVERTED/RELOCATED AS REQUIRED. SERVICES DESIGN BY OTHERS.

DRAINAGE NOTES:

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- EXISTING SEWER PIPE(S), WHERE APPLICABLE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO THE COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
- CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY. (ALL APPROVALS TO BE BY OTHERS)
- ALL SEWER PIPE AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.
- ALL SVP'S TO HAVE TELESCOPIC PIPES BETWEEN GF & IL OF PIPE.

RAINWATER / STORM ATTENUATION DESIGN

EXISTING CATCHMENT AREA(S)
EXISTING ANNEX/BUNGALOW & HARDSTANDING = 78.51m²

EXISTING DESIGN RAINFALL (WALLINGFORD PROCEDURE):
1 IN 2 YEAR = 0.7 l/s
1 IN 100 YEAR = 1.5 l/s

PROPOSED CATCHMENT AREA
PROPOSED ROOF = 511.9m²
PROPOSED REAR PATIO(S) = 615.2m²
PROPOSED TOTAL CATCHMENT AREA = 1127.1m² (0.11271ha)
PROPOSED RIVERSIDE SITE AREA = 6378.4m² (0.63784ha)

REQUIRED ATTENUATION TO LIMIT FLOW RATES TO 1.0l/s IS = 102.2m³

RIVERSIDE TANK SIZES:

273m³ OF ATTENUATION TANK LOCATED WHERE THE EX. GROUND IS ABOVE 9.80m (OR WHERE THE PROPOSED LANDSCAPING IS ABOVE 9.80m) TO PROVIDE 103.74m³ OF EFFECTIVE STORAGE WITH 0.4m DEEP (SINGLE CRATE) x 95% FREE AREA CRATES

DESIGN VARIABLES INC 45% GLOBAL WARMING FACTOR FOR A 6-HOUR STORM & a 1-IN-100 YEAR EVENT

THE EXISTING FLOW RATES IGNORE THE HARDSTANDING AND PATIO AREAS. THE NEW DEVELOPMENT WILL UTILISE PERMEABLE FINISHES THROUGHOUT THE FRONT/UPPER DRIVEWAY AND FOOTPATH AREAS.

THE POOL DRAINAGE WILL BE BY THE SPECIALIST POOL SUPPLIER. THIS WILL BE VIA A HOLDING TANK FOR ANY BACK WASH. THIS TANK HOLDS THE CHLORINATED WATER FOR THE REQUIRED LENGTH OF TIME (~10 DAYS) SUCH THAT THE CHLORINE EVAPORATES AND POTABLE WATER IS LEFT, WHICH CAN BE DISCHARGED VIA THE MAINS DRAINS, OR TO THE WATERCOURSE VIA THE STORMWATER DRAINS. THIS AMOUNTS TO <1m³ EVERY 2 WEEKS, THUS VERY NOMINAL.

FOUL DRAINAGE DESIGN

THE NEW FOUL DRAINS FOR THE DWELLING IS TO ROUTE TO NEW INDEPENDENT FOUL TREATMENT PLANT. THIS THEN DISCHARGE THE CLEAN EFFLUENT TO THE WATERCOURSE/RIVER NETWORK AT THE BOTTOM OF THE SITE VIA A NEW INDEPENDENT HEADWALL INSTALLATION, OR AS REQUIRED TO MEET THE EA BINDING RULES.

MEMBER KEY:

- FW PROPOSED FOUL WATER DRAIN
- SW PROPOSED SURFACE WATER DRAIN
- PROPOSED CLEAN EFFLUENT DRAIN FROM FOUL TREATMENT PLANT
- LAND DRAIN TO REVERSE FACE OF RC RETAINING WALL TO DISCHARGE DIRECT TO WATERCOURSE
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- PROPOSED SURFACE WATER ATTENUATION TANK
- DENOTES ARE OF PERMEABLE PAVING AROUND DWELLING - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES AREA OF PERMEABLE ROADS AND HARDSTANDING FOR VEHICLE TRAFFIC - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES ARE OF NON-PERMEABLE INDIAN PAVING, OR SIMILAR TO REAR PATIO(S) - 615.2m²
- DENOTES ROOF CATCHMENT AREA - 511.9m²
- SVP SOIL AND VENT PIPE
- RWP RAINWATER PIPE
- N/A + LEVELS

THE ADJACENT LOXLEY HOUSE HAS BEEN APPROVED & INSTALLED. THIS PROJECT COVERS THE VARIATION FROM LITTLE LOXLEY TO THE LARGER RIVERSIDE SCHEME. IN SUMMARY, THE DRAINS HAVE BEEN SEPARATED WITH THE SIZE OF ATTENUATION INCREASED TO SUIT THE LARGER CATCHMENT AREA(S) ONLY.

revP6
SUPERSEDED



CREATIVE
STRUCTURES

Client
SOUTHERN ROCK PROPERTY

Project
RIVERSIDE
TWINEHAM, RH17 5NN

Title
SITE DRAINAGE PLAN

ISSUED FOR PLANNING DOC

Date 09.07.2024 Checked 09.07.2024

Sheet 23-040

Scale AS SHOWN AT A1 Engineer PW

Status PLANNING

Project Number	Drawing Number	Revision
23-040	51	B3

REV	DESCRIPTION	DATE	BY
B1	DOC / BUILDING REGS	25.07.2023	PW
B2	RIVERSIDE ATTENUATION INCREASED TO SUIT 45% CC	27.09.2023	PW
P6	RIVERSIDE ATTENUATION INCREASED TO SUIT LARGER VOC ROOF & REAR PATIO CATCHMENT AREAS	09.07.2024	PW

NOTES:-

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

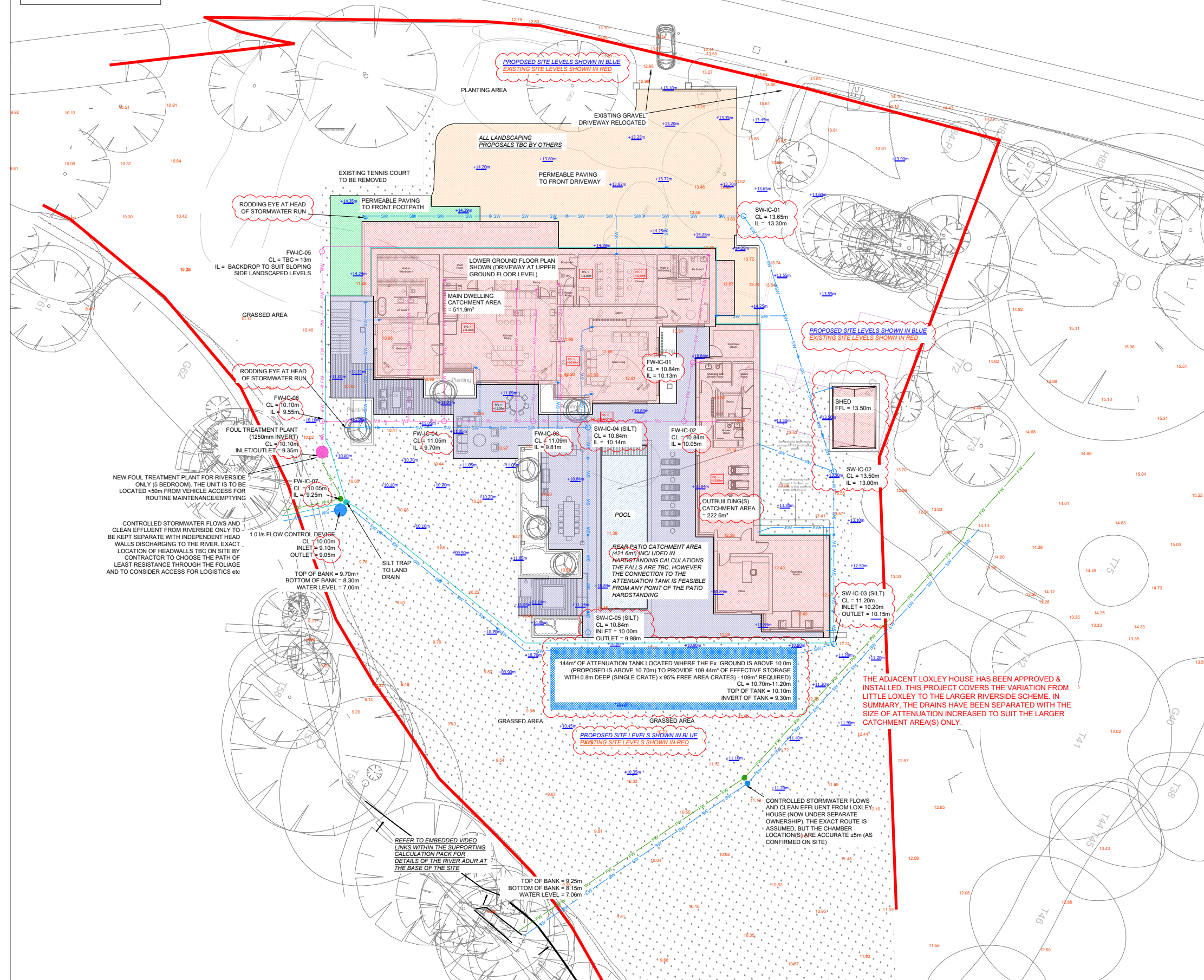
COORDINATION HIGHLIGHT

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

REFER TO DRAWINGS 23-040-52 & 53 FOR
TYPICAL DRAINAGE DETAILS



SITE NOTES/OBSERVATIONS

THE SITE IS LOCATED WITHIN THE WEALD CLAY FORMATION.

THERE ARE NO PUBLIC SEWERS WITHIN THE HIGHWAY (BOLNEY CHAPEL ROAD).

THE EXISTING DWELLINGS WERE SERVED BY AN EXISTING SEPTIC TANK.

THE EXISTING STORMWATER FLOWS COULD NOT BE CONFIRMED DURING OUR VISIT ON 23rd MARCH 2022. THESE EITHER DISCHARGED IN TO THE LOCAL DITCHES ON SITE, WHICH ULTIMATELY RUN DOWN TO THE RIVER ADJUR AT THE BASE OF THE SITE, OR THEY ROUTE DIRECTLY TO THE RIVER ADJUR.

THE 2ND NEW DWELLINGS (THE ADJACENT CONSTRUCTED LOXLEY HOUSE & THIS RIVERSIDE PROJECT) ARE TO BE PROVIDED WITH SEPARATE FOUL TREATMENT PLANTS & SEPARATE STORMWATER ATTENUATION SYSTEMS.

PLEASE NOTE: ALL COVER LEVELS TO BE CONFIRMED FOLLOWING CONFIRMATION OF ALL EXTERNAL LEVELS.

MAIN CONTRACTOR TO CHECK EXISTING INVERT LEVELS IN ROAD PRIOR TO ANY DRAINAGE WORKS COMMENCING TO ENSURE THAT THE LEVELS AS STATED ON THIS DRAWING ARE CORRECT AND THAT THE PROPOSED DRAINAGE SCHEME WORKS

MAIN CONTRACTOR TO CONFIRM AND ALLOW FOR REMOVAL OF ALL REDUNDANT DRAINS ON SITE AND CAPPING OFF TO LIVE DRAINS, ETC AS REQUIRED

ALL RWP AND SVP'S TO HAVE RODDING EYES.

ALL GAS, TELECOMMS, WATER etc UTILITY SERVICES TO BE DIVERTED/RELOCATED AS REQUIRED. SERVICES DESIGN BY OTHERS.

DRAINAGE NOTES:

- PIPEWORK TO BE UPVC-U PIPES & INSPECTION CHAMBERS TO BS EN 13598-1:2020
- ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT 'H', BS EN 752:2017 AND TO THE SATISFACTION OF THE BUILDING CONTROL OFFICER
- ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION AND THE RELEVANT COUNCIL DESIGN GUIDE.
- ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 80 UNLESS OTHERWISE STATED ON THE DRAWING.
- ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
- ALL PRIVATE SEWER PIPES TO BE 110 DIAMETER UNLESS OTHERWISE STATED ON THE DRAWING.
- EXISTING SEWER PIPE(S), WHERE APPLICABLE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO THE COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
- CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY. (ALL APPROVALS TO BE BY OTHERS)
- ALL SEWER PIPE AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.
- ALL SVP'S TO HAVE TELESCOPIC PIPES BETWEEN GF & IL OF PIPE.

RAINWATER / STORM ATTENUATION DESIGN

EXISTING CATCHMENT AREA(S)
EXISTING ANNEX/BUNGALOW & HARDSTANDING = 78.51m²

EXISTING DESIGN RAINFALL (WALLINGFORD PROCEDURE):
1 IN 2 YEAR = 0.7 l/s
1 IN 100 YEAR = 1.5 l/s

PROPOSED CATCHMENT AREA
PROPOSED MAIN DWELLING ROOF = 511.9m²
PROPOSED OUTBUILDING(S) = 222.6m²
PROPOSED REAR PATIO(S) = 421.6m²
PROPOSED SHED = 13.50m²
PROPOSED TOTAL CATCHMENT AREA = 1175m² (0.1175ha)
PROPOSED RIVERSIDE SITE AREA = 6378.4m² (0.63784ha)

REQUIRED ATTENUATION VOLUME TO LIMIT FLOW RATES TO 1.0 l/s IS = 109.0m³

PROPOSED SIZE IS 24m LONG x 6m WIDE x 0.8m DEEP & LOCATED WHERE THE GROUND LEVEL IS ABOVE 10.70m. THIS PROVIDES 109.44m³ OF EFFECTIVE STORAGE WITH 95% FREE AREA CRATES.

DESIGN VARIABLES INC 45% GLOBAL WARMING FACTOR FOR A 6-HOUR STORM & a 1-IN-100 YEAR EVENT

THE EXISTING FLOW RATES IGNORE THE HARDSTANDING AND PATIO AREAS. THE NEW DEVELOPMENT WILL UTILISE PERMEABLE FINISHES THROUGHOUT THE FRONT/UPPER DRIVEWAY AND FOOTPATH AREAS.

THE POOL DRAINAGE WILL BE BY THE SPECIALIST POOL SUPPLIER. THIS WILL BE VIA A HOLDING TANK FOR ANY BACK WASH. THIS TANK HOLDS THE CHLORINATED WATER FOR THE REQUIRED LENGTH OF TIME (~10 DAYS) SUCH THAT THE CHLORINE EVAPORATES AND POTABLE WATER IS LEFT, WHICH CAN BE DISCHARGED VIA THE MAINS DRAINS, OR TO THE WATERCOURSE VIA THE STORMWATER DRAINS. THIS AMOUNTS TO <1m³ EVERY 2 WEEKS, THIS VERY NOMINAL.

FOUL DRAINAGE DESIGN

THE NEW FOUL DRAINS FOR THE DWELLING IS TO ROUTE TO NEW INDEPENDENT FOUL TREATMENT PLANT. THIS THEN DISCHARGE THE CLEAN EFFLUENT TO THE WATERCOURSE/RIVER NETWORK AT THE BOTTOM OF THE SITE VIA A NEW INDEPENDENT HEADWALL INSTALLATION, OR AS REQUIRED TO MEET THE EA BINDING RULES.

MEMBER KEY:

- FW PROPOSED FOUL WATER DRAIN
- SW PROPOSED SURFACE WATER DRAIN
- SW PROPOSED CLEAN EFFLUENT DRAIN FROM FOUL TREATMENT PLANT
- LAND DRAIN TO REVERSE FACE OF RC RETAINING WALL TO DISCHARGE DIRECT TO WATERCOURSE
- ACO/CHANNEL DRAIN
- FW-IC-01 PROPOSED FOUL WATER INSPECTION CHAMBER / FOUL TREATMENT PLANT
- SW-IC-01 PROPOSED SURFACE WATER INSPECTION CHAMBER / SILT TRAP / FLOW CONTROL DEVICE
- PROPOSED SURFACE WATER ATTENUATION TANK
- DENOTES ARE OF PERMEABLE PAVING AROUND DWELLING - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES AREA OF PERMEABLE ROADS AND HARDSTANDING FOR VEHICLE TRAFFIC - BODPAVE, FORMPAVE, OR SIMILAR
- DENOTES ARE OF NON-PERMEABLE INDIAN PAVING, OR SIMILAR TO REAR PATIO(S) (421.6m²)
- DENOTES ROOF CATCHMENT AREAS 748m²
- SVP SOIL AND VENT PIPE
- RWP RAINWATER PIPE
- N/A + LEVELS



CREATIVE
STRUCTURES

Client
SOUTHERN ROCK PROPERTY

Project
**RIVERSIDE
TWINEHAM, RH17 5NN**

Title
SITE DRAINAGE PLAN

ISSUED FOR PLANNING DOC

Date 09.07.2024 Checked 09.07.2024

Sheet 23-040

Scale AS SHOWN AT A1 Engineer PW

Status PLANNING

Project Number Drawing Number Revision

23-040

51

P7

REV	DESCRIPTION	DATE	BY
B1	DOC / BUILDING REGS	25.07.2023	PW
B2	RIVERSIDE ATTENUATION INCREASED TO SUIT 45% CC	27.09.2023	PW
P6	RIVERSIDE ATTENUATION INCREASED TO SUIT LARGER VOC ROOF & REAR PATIO CATCHMENT AREAS	09.07.2024	PW
P7	OUTBUILDINGS ADDED & LANDSCAPING LEVELS UPDATED (ATTENUATION REQ INCREASES FROM 102.2m³ TO 109m³). TANK LOCATION RELOCATED TO HIGHER GROUND LEVEL(S)	13.12.2024	PW

NOTES:-

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- FOR THE FULL COMPREHENSIVE GENERAL NOTES SEE GENERAL NOTES DRAWING 99.

WARNING IDENTIFICATION

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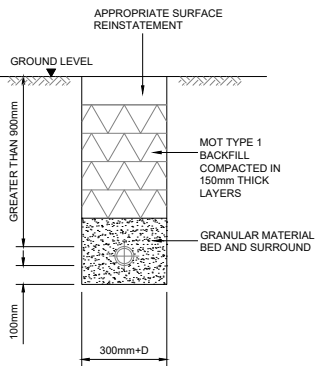
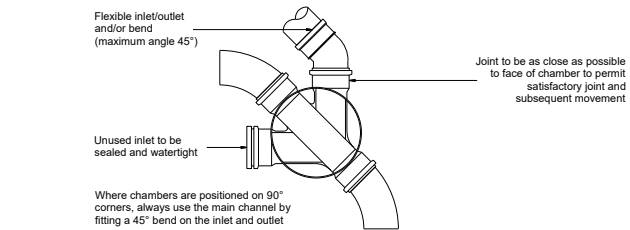
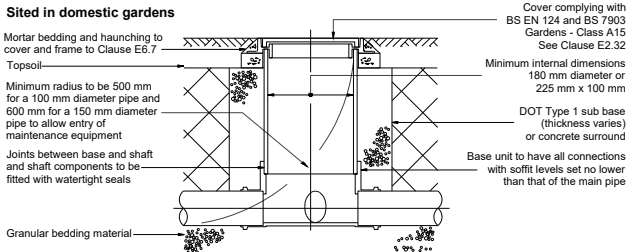
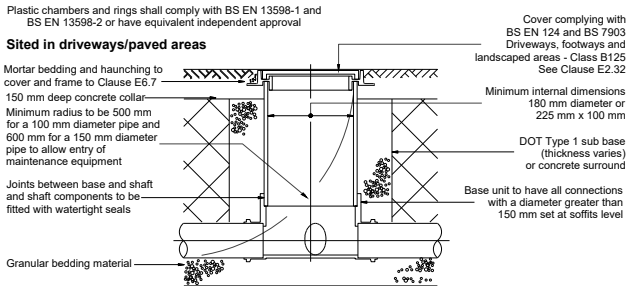
COORDINATION HIGHLIGHT

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

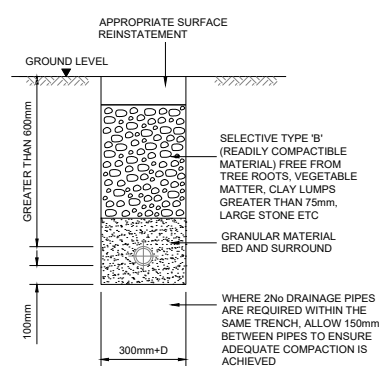
STABILITY REQUIREMENT HIGHLIGHT

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

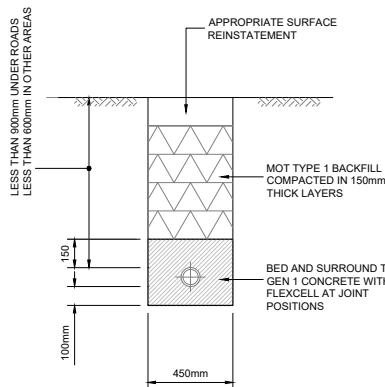
FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry



GRANULAR BEDDING
DETAIL (UNDER ROADS
AND SURFACED AREAS)
(1:20)



GRANULAR BEDDING DETAIL
(UNDER GARDEN & FIELDS)
(1:20)



CONCRETE
BEDDING DETAIL
(1:20)

FIGURE B.20
ALTERNATIVE BASE LAYOUTS
FOR CHAMBERS

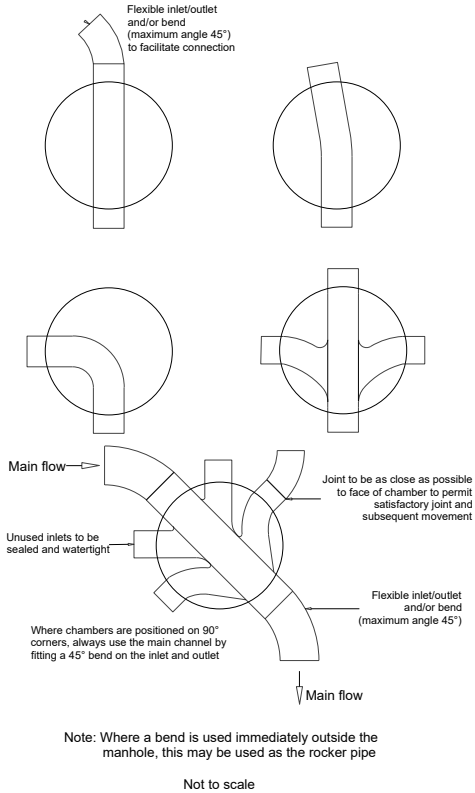
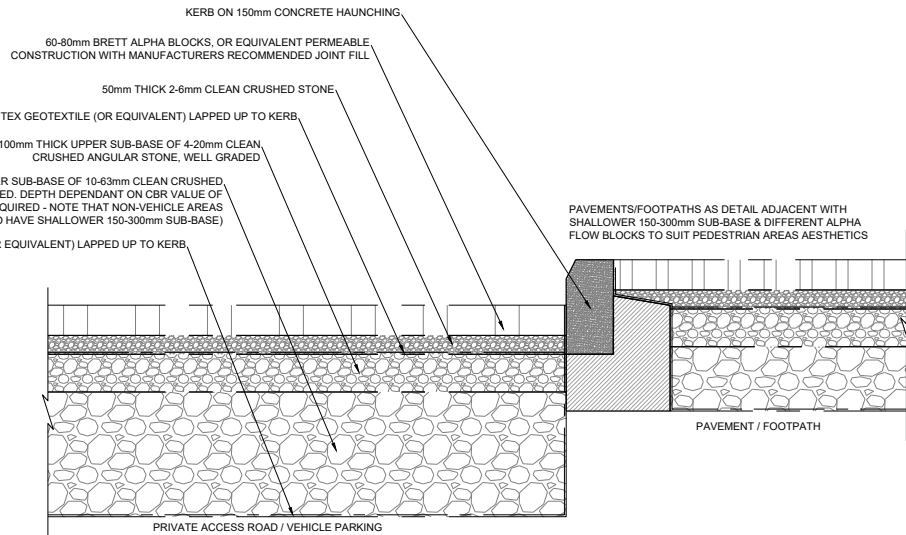
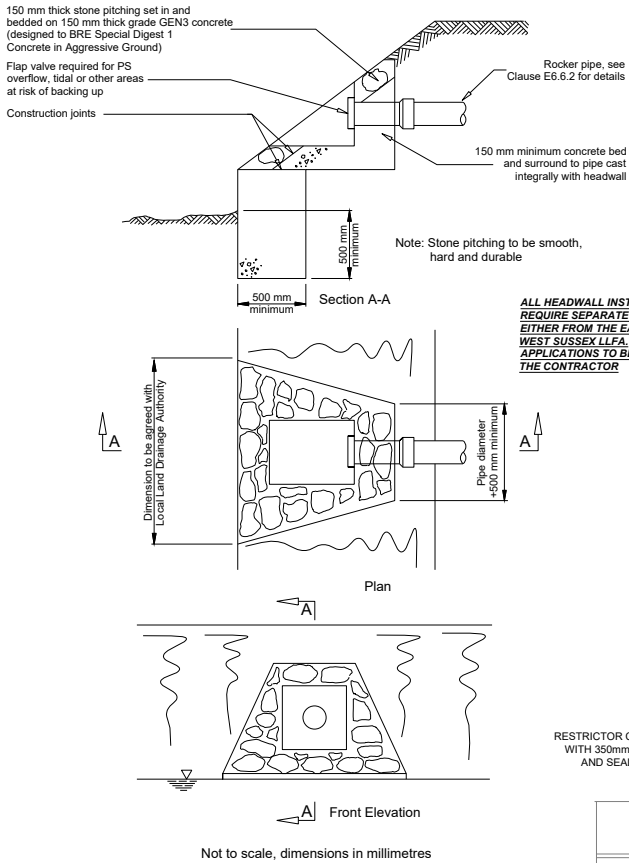
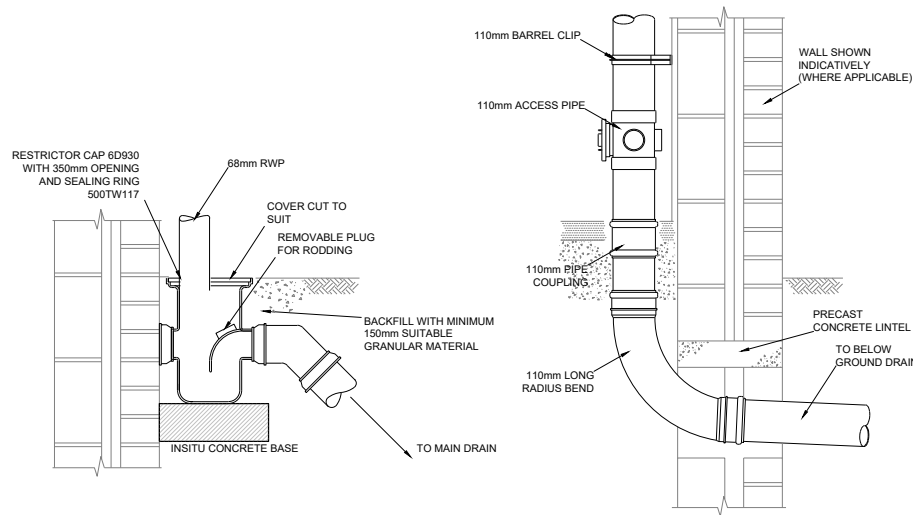


FIGURE C.5
TYPICAL DETAIL OF OUTFALL TO WATERCOURSE/DITCH
Suitable for outfall pipes of less than 350 mm

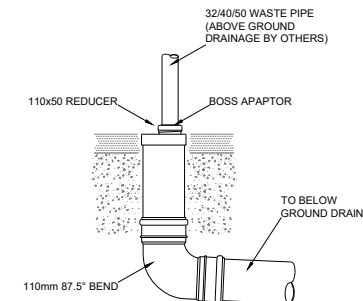


TYPICAL POROUS PAVING DETAIL
(REQUIRES IN-SITU CBR TESTING TO DETERMINE SUB-BASE THICKNESS)
(1:10)

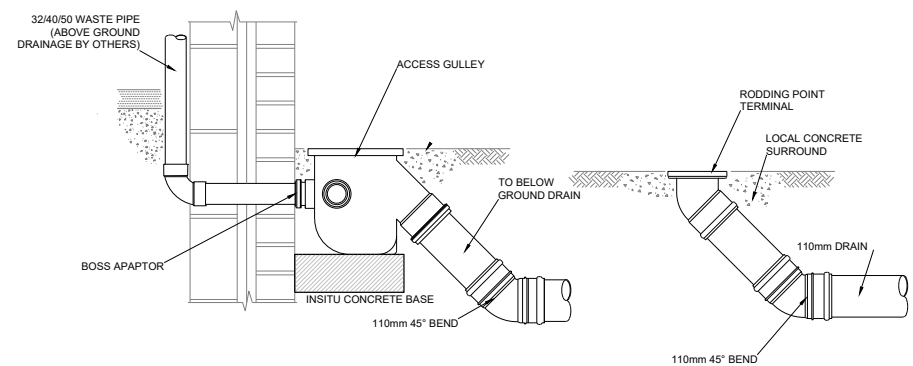


TYPICAL 68mm RWP CONNECTION
TO 110mm PVCu DRAIN VIA
RODABLE BOTTLE GULLEY
(1:10)

TYPICAL DETAIL
AT BASE OF SVP
(1:10)

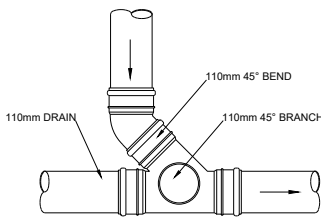


TYPICAL SOIL/ STACK/STUB
WASTE CONNECTION TO DRAIN
(1:10)



TYPICAL BACK
INLET CONNECTION
TO ACCESS GULLEY
(1:10)

TYPICAL HEAD OF DRAIN
RODDING POINT
(1:10)



TYPICAL 110mm
BRANCH CONNECTION
(1:10)



Client
SOUTHERN ROCK PROPERTY

Project
RIVERSIDE
TWINEHAM, RH17 5NN

Title
TYPICAL DRAINAGE DETAILS
SHEET 1 of 2

ISSUED FOR PLANNING DOC

Date JULY 2023 Checked 25/07/2023

Sheet 23-040

Scale AS SHOWN AT A1 Engineer PW

Status PLANNING

Project Number Drawing Number Revision
23-040 51 P6

REV DESCRIPTION DATE BY
B1 DOC / BUILDING REGS 25.07.2023 PW
P6 CLIENT UPDATED ONLY 09.07.2024 PW

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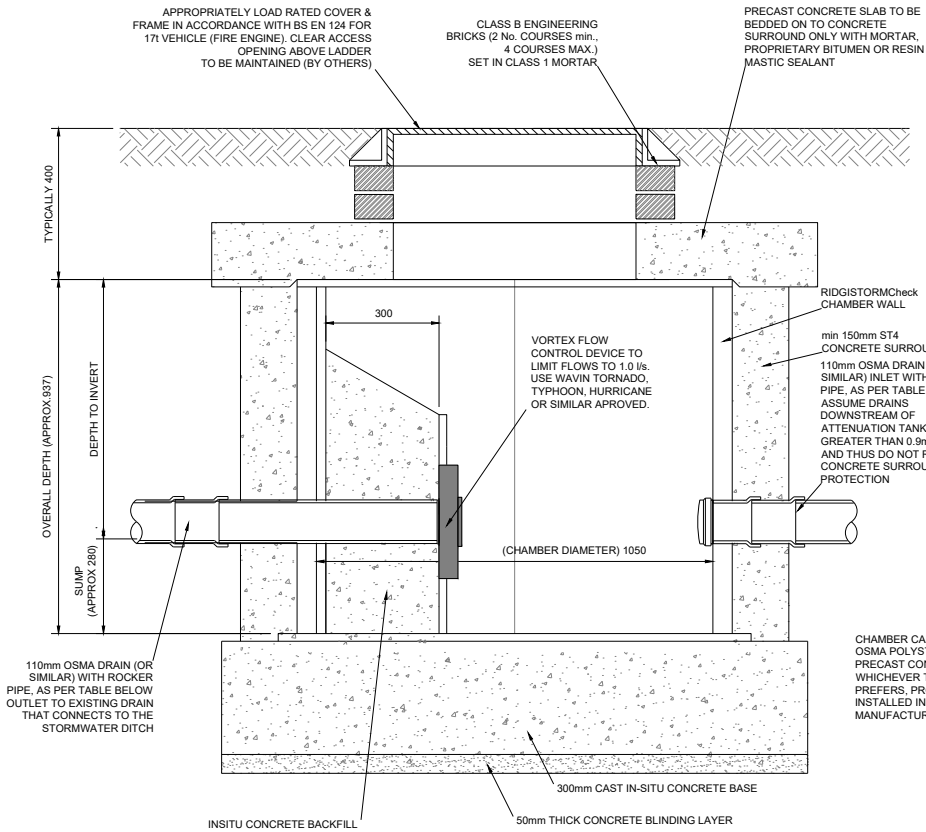
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COORDINATION HIGHLIGHT

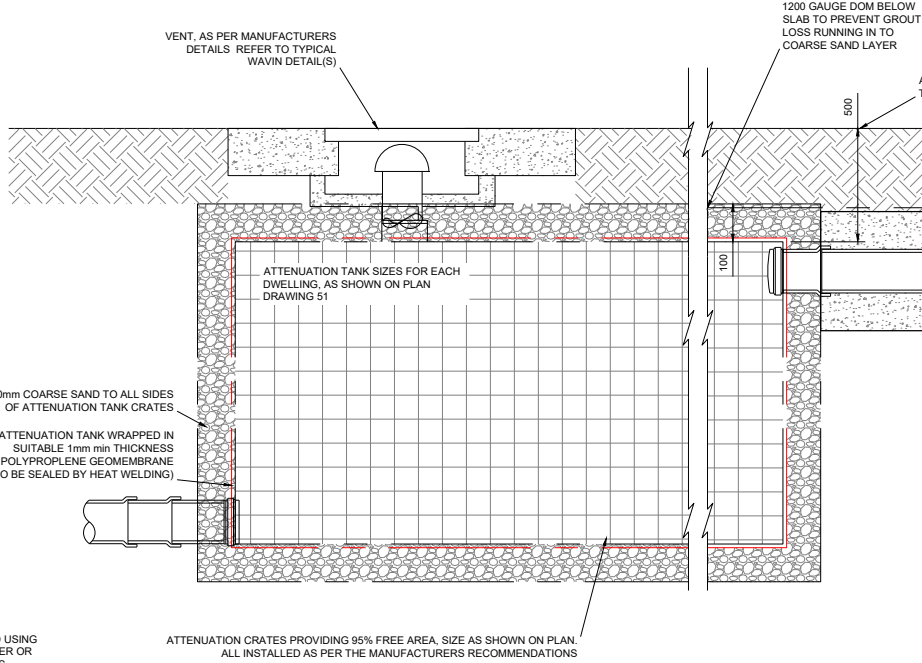
WHERE THE BLUE HIGHLIGHT SYMBOL IS PLACED ON A DRAWING PARTICULAR ATTENTION IS REQUIRED WITH REGARD TO COORDINATION.

STABILITY REQUIREMENT HIGHLIGHT

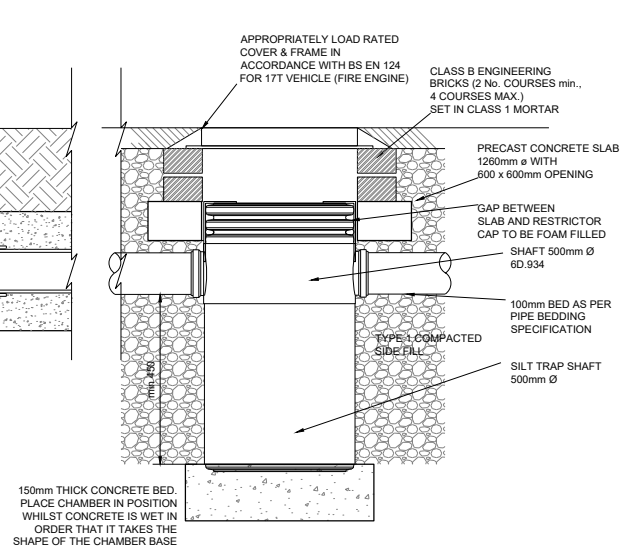
WHERE THE GREEN HIGHLIGHT SYMBOL IS PLACED ON A DRAWING THIS REFERS TO THIS ELEMENT OF THE DESIGN BEING CRITICAL TO THE STABILITY STRATEGY



**1.0 l/s RESTRICTED
OUTFLOW CHAMBER**
(1:10)



ON-LINE ATTENUATION TANK DETAILS
(1:10)



SILT TRAP
(1:10)

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 RIVERSIDE TO SERVE THE LOXLEY HOUSE DRAINAGE.
THIS IS TO BE ENTERED IN TO ALL LEGAL DOCUMENTS

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
REMEDIAL ACTIONS (ALL SUDS PARTS)	REPAIR / REHABILITATE INLETS, OUTLETS, OVERFLOW AND VENTS	AS REQUIRED	CLIENT / END USER / BUILDING OWNER
REMEDIAL 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)
REMEDIAL 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. STRIM VEGETATION 1m MIN. SURROUND TO STRUCTURES AND KEEP HARD APRONS FREE FROM SILT AND DEBRIS 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	MONTHLY (OR AS REQUIRED)	SITE OWNER (MAINTENANCE CONTRACT)
		MONTHLY	SITE OWNER (MAINTENANCE CONTRACT)
		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)
REMEDIAL WORK	REPAIR PHYSICAL DAMAGE IF NECESSARY	AS REQUIRED	SITE OWNER (MAINTENANCE CONTRACT)



**CREATIVE
STRUCTURES**

Client
SOUTHERN ROCK PROPERTY

Project
**RIVERSIDE
TWINEHAM, RH17 5NN**

Title
TYPICAL DRAINAGE DETAILS

SHEET 2 of 2

ISSUED FOR PLANNING DOC

Date	JULY 2023	Checked	25/07/2023
Sheet	23-040		
Scale	AS SHOWN AT A1	Engineer	PW
Status	PLANNING		
Project Number	23-040	Drawing Number	51
		Revision	P6

REV	DESCRIPTION	DATE	BY
B1	DOC / BUILDING REGS	25.07.2023	PW
P6	CLIENT UPDATED ONLY	09.07.2024	PW

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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

SECTION C

CALCULATIONS

Rainwater / storm attenuation design

The replacement dwelling is to route to a new attenuation tank, which is to outfall to the river Adur network with a controlled 1 litre/sec flow.

Existing catchment area(s)

Existing east hookers (main dwelling)	= 303.42m ²
Existing annex/bungalow & hardstanding	= 78.51m ²
Existing total	= 381.93m ²

Existing design rainfall (Wallingford procedure):

1 in 2 year = 0.7 l/s

1 in 100 year = 1.5 l/s

Existing site Qbar = 7.37 l/s

Proposed catchment areas – Riverside only

~~Proposed Roof = 511.9m²~~

~~Proposed Rear Patio(s) = 615.2m²~~

~~Proposed Total Catchment Area = 1127.1m² (0.11271ha)~~

~~Proposed Riverside Site Area = 6378.4m² (0.63784a)~~

Proposed Main Dwelling Roof = 511.9m²

Proposed Rear Patio(s) = 421.6m²

Proposed Outbuildings = 222.6m²

Proposed Shed = 13.50m²

Proposed Total Catchment Area = 1175.0m² (0.1175ha) revP7 – THIS IS A 47.9 m² INCREASE

Proposed Riverside Site Area = 6378.4m² (0.63784a)

Required attenuation to limit flow rates to 1.0l/s is ~~102.2m³~~ 109m³

Required Tank size(s):

~~Riverside (with VOC layouts) – 273m² of attenuation tank located where the ex. ground is above 9.80m (or where the proposed landscaping is above 9.80m) to provide 103.74m³ of effective storage with 0.4m deep (single crate) x 95% free area crates~~

Proposed size is 24m long x 6m wide x 0.8m deep & located where the ground level is above 10.70m. This provides 109.44m³ of effective storage with 95% free area crates

Design variables inc 45% global warming factor for a 6-hour storm

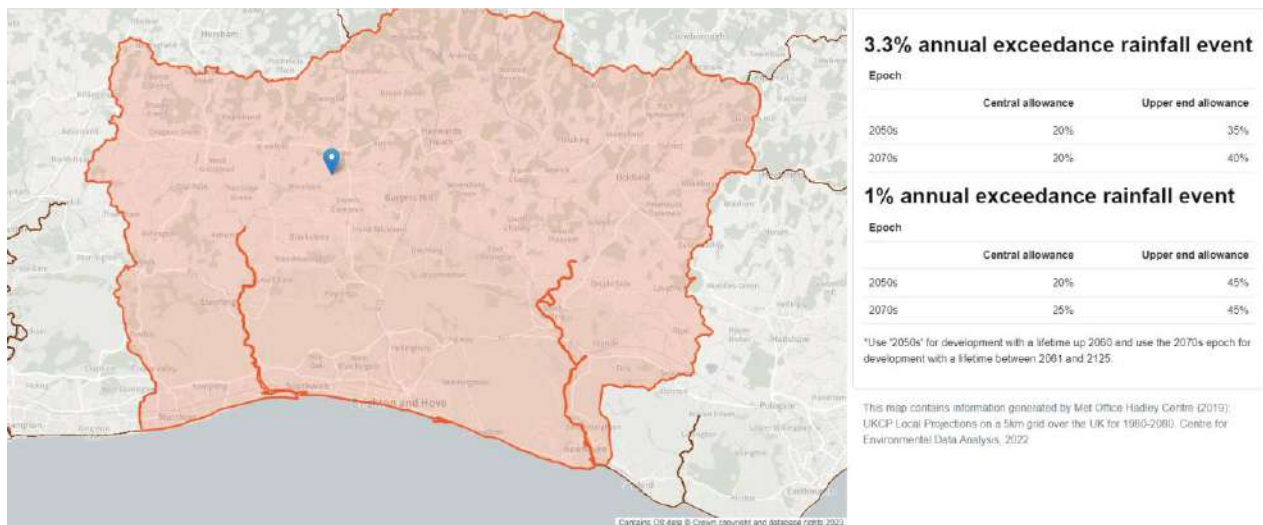
The existing flow rates ignore the hardstanding and patio areas. The new development will utilise permeable paving to the front area and impermeable but attenuated rear patio areas.

The pool drainage will be by the specialist pool supplier. This will be via a holding tank for any back wash. This tank holds the chlorinated water for the required length of time (~10 days) such that the chlorine evaporates, and potable water is left, which can be discharged via the mains drains, or to the watercourse via the stormwater drains. This amounts to <1m³ every 2 weeks, thus very nominal.

SUPPORTING CALCULATIONS

- EXISTING EAST HOOKERS & ANNEX FLOW RATES
- GREENFIELD RUNOFF RATE CALCULATION (FOR TOTAL SITE)
- PROPOSED ATTENUATION TO LIMIT FLOWS TO 1l/s
 - LOXLEY HOUSE
 - RIVERSIDE

IN LINE WITH LATEST GOV.UK PEAK RAINFALL INTENSITY, THE PROPOSED ATTENUATION HAS BEEN INCREASED TO SUIT THE 45% CLIMATE CHANGE FACTOR & THE LARGER CATCHMENT AREAS. THIS RESULTS IN AN INCREASE FROM 102.2m³ TO 109m³



Project LOXLEY HOUSE				Job no. 22-016	
Calcs for EXISTING DWELLING & ANNEX DESIGN RAINFALL (1in1)				Start page no./Revision 1	
Calcs by PW	Calcs date 22/04/2022				

DESIGN RAINFALL

In accordance with the Wallingford Procedure

Tedds calculation version 2.0.00

Design rainfall intensity

Location of catchment area	Brighton
Storm duration	D = 6 hr
Return period	Period = 2 yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = 0.350
5-year return period rainfall of 60 minutes duration	M5_60min = 20.0 mm
Increase of rainfall intensity due to global warming	p _{climate} = 40 %
Factor Z1 (Wallingford procedure)	Z1 = 1.69
Rainfall for 6hr storm with 5 year return period	M5_6hr _i = Z1 × M5_60min × (1 + p _{climate}) = 47.3 mm
Factor Z2 (Wallingford procedure)	Z2 = 0.85
Rainfall for 6hr storm with 2 year return period	M2_6hr = Z2 × M5_6hr _i = 40.1 mm
Design rainfall intensity	I _{max} = M2_6hr / D = 6.7 mm/hr

Maximum surface water runoff

Catchment area	A _{catch} = 382 m ²
Percentage of area that is impermeable	p = 100 %
Maximum surface water runoff	Q _{max} = A _{catch} × p × I _{max} = 0.7 l/s

SUPERSEDED

Project LOXLEY HOUSE				Job no. 22-016	
Calcs for EXISTING DWELLING & ANNEX DESIGN RAINFALL (1in100)				Start page no./Revision 1	
Calcs by PW	Calcs date 22/04/2022				

DESIGN RAINFALL

In accordance with the Wallingford Procedure

Tedds calculation version 2.0.00

Design rainfall intensity

Location of catchment area	Brighton
Storm duration	D = 6 hr
Return period	Period = 100 yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = 0.350
5-year return period rainfall of 60 minutes duration	M5_60min = 20.0 mm
Increase of rainfall intensity due to global warming	p _{climate} = 40 %
Factor Z1 (Wallingford procedure)	Z1 = 1.69
Rainfall for 6hr storm with 5 year return period	M5_6hr _i = Z1 × M5_60min × (1 + p _{climate}) = 47.3 mm
Factor Z2 (Wallingford procedure)	Z2 = 1.83
Rainfall for 6hr storm with 100 year return period	M100_6hr = Z2 × M5_6hr _i = 86.7 mm
Design rainfall intensity	I _{max} = M100_6hr / D = 14.4 mm/hr

Maximum surface water runoff

Catchment area	A _{catch} = 382 m ²
Percentage of area that is impermeable	p = 100 %
Maximum surface water runoff	Q _{max} = A _{catch} × p × I _{max} = 1.5 l/s

SUPERSEDED

Calculated by:

PHILIP WAINWRIGHT

Site name:

RIVERSIDE

Site location:

TWINEHAM

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 Details

Latitude:

50.96024° N

Longitude:

0.21397° W

Reference:

3197028727

Date:

Sep 27 2023 16:50

Site characteristics

Total site area (ha):

.72611

Significant public open space (ha):

.6599

Area positively drained (ha):

0.06620999999999999

Impermeable area (ha):

0.06620999999999999

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):

0.07

Net impermeable area for storage volume design (ha):

0.07

Pervious area contribution to runoff (%):

30

* 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 SP and SAAR

SPR estimation method:

Calculate from SOIL type

Soil

characteristics

SOIL type:

Default

Edited

4

4

SPR:

0.47

0.47

Hydrological characteristics

Default

Edited

Rainfall 100 yrs 6 hrs:

--

70

Rainfall 100 yrs 12 hrs:

--

105

FEH / FSR conversion factor:

1.25

1.25

SAAR (mm):

809

809

M5-60 Rainfall Depth (mm):

20

20

'r' Ratio M5-60/M5-2 day:

0.3

0.3

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

Growth curve factor 100 years:

3.19

3.19

Q_{BAR} for total site area (l/s):

4.15

4.15

Design criteria

Climate change allowance factor:

1.45

Urban creep allowance factor:	1.1	Q _{BAR} for net site area (l/s):	0.38	0.38
Volume control approach	Use long term storage			
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	1			

Site discharge rates

1 in 1 year (l/s):

1 in 30 years (l/s):

1 in 100 year (l/s):

Default

Edited

1

1

1.2

Estimated storage volumes

Attenuation storage 1/100 years (m³):

Long term storage 1/100 years (m³):

Total storage 1/100 years (m³):

Default

Edited

52

52

0

0

52

52

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Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:

PHILIP WAINWRIGHT

Site name:

RIVERSIDE

Site location:

TWINEHAM

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):

.63784

Significant public open space (ha):

0.525129

Area positively drained (ha):

0.112711

Impermeable area (ha):

0.112711

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):

0.11

Net impermable area for storage volume design (ha):

0.11

Pervious area contribution to runoff (%):

30

* 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:	--	70
Rainfall 100 yrs 12 hrs:	--	106.68
FEH / FSR conversion factor:	1.27	1.27
SAAR (mm):	803	803
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological 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):	3.62	3.62
Q _{BAR} for net site area (l/s):	0.64	0.64

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	1	1
1 in 30 years (l/s):	1.5	1.5
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	89	89
Long term storage 1/100 years (m³):	13	13
Total storage 1/100 years (m³):	102	102

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revP6
SUPERSEDED

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:

PHILIP WAINWRIGHT

Site name:

RIVERSIDE

Site location:

TWINEHAM

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):

0.63784

Significant public open space (ha):

0.5203399

Area positively drained (ha):

0.1175001

Impermeable area (ha):

0.1175

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):

0.12

Net impermable area for storage volume design (ha):

0.12

Pervious area contribution to runoff (%):

30

* 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

SOIL type:

Default

4

Edited

4

SPR:

0.47

0.47

Hydrological characteristics

Rainfall 100 yrs 6 hrs:

Default

--

Edited

70

Rainfall 100 yrs 12 hrs:

--

106.68

FEH / FSR conversion factor:

1.27

1.27

SAAR (mm):

803

803

M5-60 Rainfall Depth (mm):

20

20

'r' Ratio M5-60/M5-2 day:

0.3

0.3

Hydological 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):	3.62	3.62
Q _{BAR} for net site area (l/s):	0.67	0.67

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	1	1
1 in 30 years (l/s):	1.5	1.5
1 in 100 year (l/s):	2.1	2.1

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	96	96
Long term storage 1/100 years (m³):	14	14
Total storage 1/100 years (m³):	109	109

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