

Vale Consultancy

CONSULTING CIVIL & STRUCTURAL ENGINEERS

DRAINAGE STRATEGY REPORT (DSR)

Former Barclays
46 Station Rd
Port Talbot
Neath Port Talbot
SA13 1NW

Prepared for: Life Properties
Project Ref: 18650 DSR

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DOCUMENT CONTROL

Project:	Former Barclays, Station Rd, SA13 1NW
Client:	Life Properties
Vale Consultancy Ref:	18650 DSR

Issue	Prepared by	Approved by	Date	Status
01	Peter Nattrass BEng (Hons)	Paul Graham BSc (Hons) MSc GMICE	29.07.25	First issue
02	Peter Nattrass BEng (Hons)	Paul Graham BSc (Hons) MSc GMICE	03.10.25	Second issue
03	Peter Nattrass BEng (Hons)	Paul Graham BSc (Hons) MSc GMICE	09.03.26	Third issue



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1 INTRODUCTION

1.1 Site Location

Vale Consultancy has been instructed by Life Properties (the Client) to undertake a drainage strategy report (DSR) for the proposed development at Former Barclays, Station Road, Port Talbot, SA13 1NW.

Refer to **Appendix A** – Existing Site Plans

The proposed development is located on the corner of Station Rd and Ty-Draw Place. The site is in an urban environment located within Port Talbot town centre. The site is currently a Barclays bank with associated parking areas to the rear. The following drainage strategy will cover the hydraulic design criteria of the surface water drainage network only.



Figure 1: Site Location Satellite Plan

1.2 Proposed Development

The intention of the proposed development is to construct mixed use development including a block of apartments that retains the façade of the existing building facing out on station Rd whilst incorporating a SuDS that will provide amenity and biodiversity.

The total site area is approximately 0.04ha, the whole site is to be developed and as such the development/SAB boundary will also be 0.04ha.

Refer to **Appendix B** – Proposed Plans



1.3 Existing Geology

Due to the lack of viability for soakaways the geological investigation of the site is limited to a desk study of the BGS

British Geological Survey records note that the site is listed to have the following:

Superficial deposits: Alluvial fan deposits – sand and gravel

Bedrock geology: South Wales middle coal measures formation – Mudstone, siltstone and sandstone.

Refer to **Appendix D** – British Geological Survey record

1.4 Flood Risk

Flood risk has been assessed using the NRW development advice map and detailed view map. The site is located within the TAN 15 defended zone as identified on the DAM. According to NRW this mean that the area benefits form the following minimum, standard of protection 1 in 100 year (present day) for rivers and 1 in 200 year (present day) for the sea. NRW recommend a FCA to determine whether development can be made flood free and safe over its lifetime

Refer to **Appendix D** – Natural Resource Wales Development Advice Map (DAM)



2 SURFACE WATER

2.1 Existing Drainage Systems

The drainage systems serving the existing site connect into the combined sewer system to the rear. The combined system originates in third party land and passes into the site before continuing on into alley in the rear where it connects to the DCWW combined sewer.

There is a DCWW stormwater sewer to the front of the building under Station Rd.

The existing façade onto station Rd is to be retained and as such the RWPs are to be retained also with their existing point of discharge being the pavement to the front of the site.

Refer to **Appendix A** for existing on site drainage and **Appendix F** for DCWW Asset Plans.

2.2 Proposed Drainage Systems

2.2.1 **S1:** SuDS hierarchy of surface water discharge locations

The following receptors have been considered for surface water runoff on site, in order of SuDS preference. The aim of SuDS Standards is to ensuring that the most effective drainage scheme is delivered with the most preferred levels of surface water destination, where the design can move to the next means of discharge only under exception criteria.

- 1. Surface water collection for reuse.**
- 2. Discharge by infiltration into ground**
- 3. Discharge into open surface water body**
- 4. Discharge into surface water sewer, highway drain, or other drainage system**
- 5. Discharge into combined sewer.**

Priority Level 1 - Surface water collected for reuse:

Rainwater harvesting is not proposed due to the practicalities of such a system as well as there being no foreseeable demand for non-potable water within the development proposals throughout its design life. There is also no foreseeable need to harvest water as DCWW has not identified any potential stresses on the mains water supply.

No solution, move to next Priority Level

Priority Level 2 – Discharge via infiltration:

As explained in section 1.3, due to the extents of the development it is not viable to propose infiltration within 5m of the proposed structure.

No solution, move to next Priority Level

Priority Level 3 – Discharge into open surface water body:

Given that the closest surface water body to the site is the River Afan which is 300m away and across multiple third party lands this option is not considered viable.

No solution, move to next Priority Level



Priority Level 4 – surface water sewer, highway drain, or other drainage system:

The proposed destination for surface water for this site is the DCWW surface water sewer that runs under station Rd.

Solution found

2.2.2 **S2:** Surface Water Runoff Hydraulic Control

Proposed SuDS drainage system

The aim of the drainage system is to direct all rainwater incident upon the proposed new building to the stormwater sewer to the west of the site. The water will be captured from the roof and conveyed to a green roof proposed to convey flows through a downpipe to an orifice flow control chamber and attenuation crate system that discharges to the DCWW surface water sewer.

Refer to **Appendix B** for the proposed surface water drainage layout illustrating how surface water is collected and conveyed towards their discharge location.

Hydraulic Control

The proposed SuDS drainage system will use a combination of SuDS features including a green roof, and geocellular attenuation crates to collect, attenuate and filtrate surface water runoff. Attenuation will be designed such that no flooding will occur for a 1 in 100-year storm event plus 40% climate change and a flow control device will be installed downstream of the attenuation systems to control discharge.

The volume of storage provided is limited on site by both the depth of the existing sewer meaning that the depth of attenuation is no lower than 1.2 m below ground level and the site boundary and the existing on-site combined drainage. As such the proposed discharge rate is 5.6 l/s.

Urban creep has not been considered for this development as the proposed drained area takes up the entirety of the site.

For hydraulic design of the drainage network refer to **Appendix E – Design Calculations**.

Interception of runoff

As per Box 24.6 of the CIRIA SuDS Manual C753, bioretention areas can be assumed to comply when the impermeable surface area is less than 5 times the vegetated surface area receiving the runoff. The use of the green roof to the east of the development seeks to achieve interception as much as practicable within the constraints of the site.

Refer to **Appendix B** for a contributing areas plan showing what areas of the site drain to each SuDS component as well as proposed drainage plans and design.

Given that the upper most roof area is to be used for solar panelling and that the rear ground area is to be used for parking, the lower roof area is the only place deemed suitable for a green roof, as such interception is considered to be maximised as much as practicable.

Exceedance Event Analysis & Management



It is necessary to assess the risk and consequence of flooding for exceedance events. This is to determine the likely flood volumes and water flow paths that would be caused by a storm event that exceeds the critical 1 in 100-year + 40% climate change allowance that the surface water drainage system is designed for. Please see the below table outlining the storage depths, freeboard & flooded volume of the proposed SuDS features serving the site.

SuDS feature storage depths, freeboard & flooded volume information				
SuDS feature	Storage depth(m)	Freeboard(m) for 1 in 100yr + 40% CC + 10% UC	Freeboard(m) for 1 in 200yr + 40% CC + 10% UC	Flooded Volume(m ³) from 1 in 200yr + 40% CC + 10% UC
Geocellular Attenuation	0.800m	0.000m	0.000m	0.0m ³

To assess the exceedance events the SuDS features have also been checked against the 1 in 200-year + 40% climate change event. As demonstrated by the table above, the exceedance event generates a flooded volume of 1m³ of water which will flow from the site to the north into the alleyway to the rear of the site.

If the drainage systems fail in an exceedance event surface water will flood from the proposed features and flows will largely fall towards the north boundary of the site and onto the alley to the rear.

Refer to **Appendix B** for a flood exceedance plan.

2.2.3 **S3:** Water Quality

To assess that the water quality being provided by the proposed SuDS solution is sufficient, the simple index approach as per section 26.7.1 of the CIRIA SuDS Manual 2015 is applied.

To deliver adequate water quality treatment the total SuDS mitigation index must be more than or equal to the pollution hazard index for each contaminant type. The pollution hazard and mitigation indices have been taken from tables 26.2 and 26.3 of the CIRIA SuDS Manual 2015.

Water quality - Simple Index Approach									
Land Use	Pollution Hazard Level	Pollution hazard index			SuDS Components for land use	Mitigation Index			Mitigation hazard index > Pollution hazard index (for each contaminant type)
		Total Suspended Solids (TSS)	Metals	Hydro-carbons		Total Suspended Solids (TSS)	Metals	Hydro-carbons	
Commercial roof	Low	0.3	0.2	0.05	Green Roof	0.8	0.8	0.8	Yes

The proposed design will ensure that surface water runoff will pass through the proposed SuDS features before discharging to the existing watercourse. Surface water will be treated by multiple SuDS component before discharging to the local tributary to the rear of the site that leads to the Sutton Brook River. The SuDS components will separate the smaller particles and chemicals from the surface water discharge as it traverses through the feature, providing sufficient water quality treatment to any discharging water.



2.2.4 **S4:** Amenity

The use of the a green roof / elevated raingarden will provide an attractive, high quality external space that will be used to serve the site, seamlessly integrating SuDS into the amenity areas of the site. The SuDS components will effectively drain surface water as close to the source as possible. The use of these features can also provide significant aesthetic benefit. Within the site constraints the proposed solution looks to maximise amenity benefits within the development proposals.

2.2.5 **S5:** Biodiversity

In urban areas, it is of particular importance to provide biodiversity. As these areas can be generally uninhabitable for wildlife. By providing small biodiverse areas across larger urban environments wildlife can start to link areas and create networks, providing habitat as well as improving biodiversity and sustainability on a site that was previously all hardstanding.

The use of green roofs can help to provide a new quality habitat for wildlife, having a positive contribution to biodiversity in the area. The use of planting native species can support local biodiversity by providing habitat and food for invertebrates and birds. A list of plants species suitable to the raised planter can be incorporated are included on the drainage details drawings, refer to **Appendix B**.

2.2.6 **S6:** Operation and Maintenance Requirements

The construction management plan and construction phasing plan will be developed by the appointed contractor, as the SuDS scheme requires coordination with all other elements of the development that will be constructed as part of the scheme, including plot strip/trench fill foundations, plot/boundary walls, foul drainage. We understand that the construction management plan and construction phasing plan can be conditioned to the SAB approval.

To ensure SuDS components continue to operate reliably, regular inspection and maintenance should be carried out. In most cases, appropriate information should be provided by the relevant manufacturer on what has been installed, how it works, when to inspect it and whether maintenance will be required. CIRIA C753 The SuDS Manual also provides information on the operation and maintenance requirements for various SuDS components.

An inspection and maintenance plan has been produced for the site proposals, providing the site owner, who is responsible for the maintenance, guidance on the types and frequency of inspections and maintenance work that is required for the proposed SuDS element. It also provides a cost estimate for the inspection and maintenance requirements over the development's lifetime.

Refer to **Appendix C** – Management & Maintenance Plan.



3 CONCLUSIONS

The brownfield site at Former Barclays, Station Road, Port Talbot, SA13 1NW is to be developed into a block of apartments. The total site area is approximately 0.04ha, the whole site is to be developed and as such the development/SAB boundary will also be 0.04ha. All surface water incident upon each respective catchment is collected, conveyed and discharged towards the downstream SuDS components as illustrated on the drainage plan which can be found in **Appendix B**. In an exceedance event, surface water runoff will generally flow towards the boundary at the northeast of the site.

The existing drainage system all leads to a combined water sewer to the rear of the site. The proposed drainage system intends to connect to the surface water sewer to the east.

Following the hierarchical approach to discharge location of surface water for new developments as set out in the Statutory Standards for SuDS. The proposed development will provide the site with a new sustainable surface water drainage system that will incorporate multiple SuDS features, providing a solution that will intercept and treat surface water runoff before discharging to the surface water sewer.

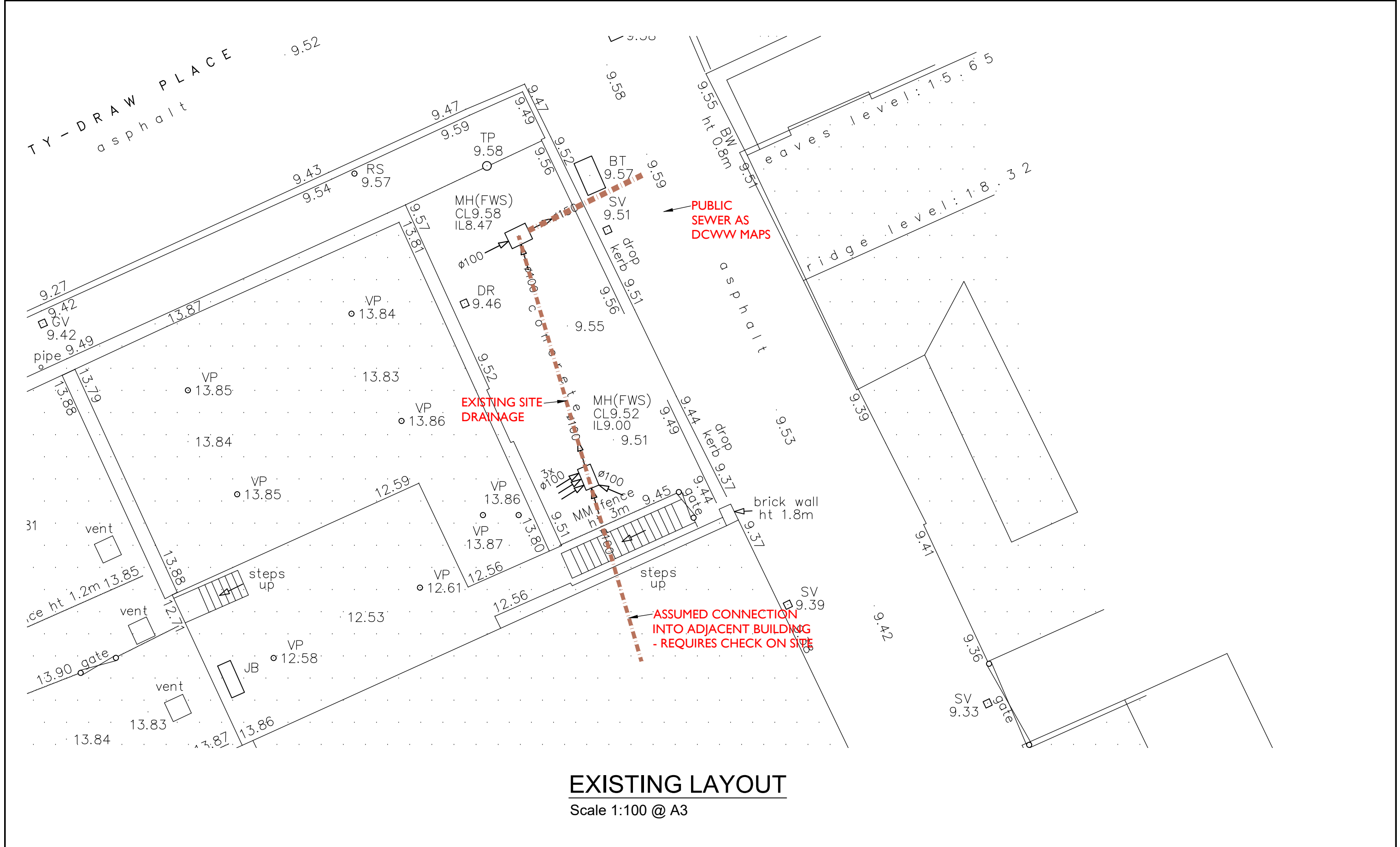
The proposed SuDS features will provide sufficient attenuation storage for all storm events up to and including the critical duration 1 in 100-year storm event plus 40% plus climate change, refer to **Appendix E – Design Calculations**.

The SuDS components considered suitable for this site are a green roof and a flow control chamber. Surface water will convey from the roof and will discharge directly onto the green roof where the water will get treated by a combination of native plant species and stone drainage blankets. The SuDS solution provides improvements to water quality, amenity and biodiversity.

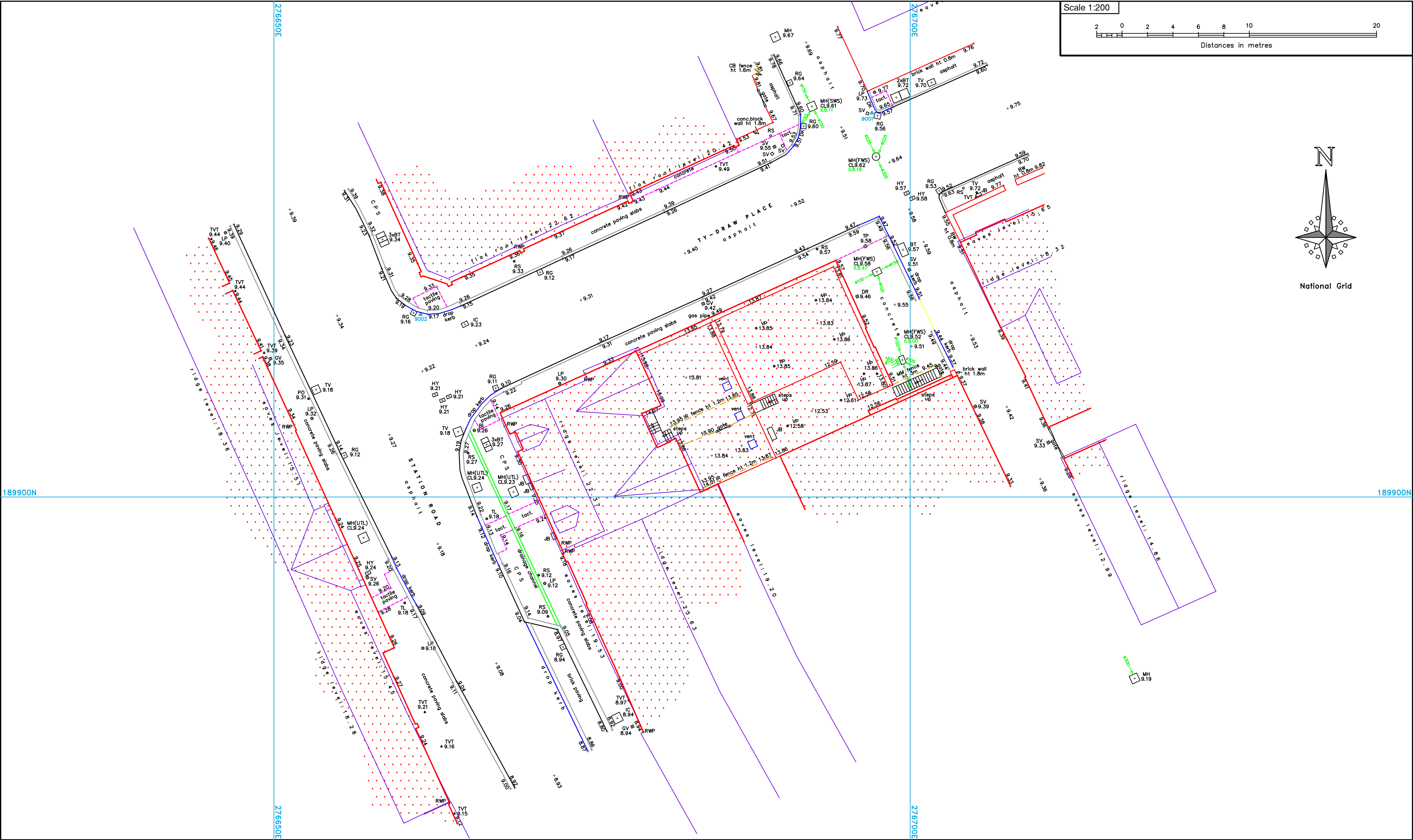
Overall, the proposed surface water drainage system seeks to be a cost effective and easily maintainable sustainable drainage solution. The surface water discharge locations are the most appropriate and preferred method within the sites constraints and the SuDS components incorporated in the design provide suitable surface water management as close to the source as possible and also provide water quality, amenity and biodiversity benefits.



APPENDIX A: Existing Site Plans



Life PROPERTY GROUP LIFE PROPERTY GROUP LTD 65 STATION ROAD PORT TALBOT NP20 3QZ T - 01792 546666 W - www.lifepropertygroup.com	NOTES	REVISIONS	PROJECT NAME	DRAWING TITLE	DETAILS
			FORMER BARCLAYS BANK PORT TALBOT	EXISTING DRAINAGE TBC ON SITE	Job No. Drawing No. - Revision - Scale 1:100 Date JAN 23





THE SURVEY ASSOCIATION



AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS



Ordnance Survey



Planning Maps - Vector Mapping - Raster Mapping

Abbreviations:

B/RW	brick retaining wall	F/L	finished floor level	RE	rodding eye	ht	height (of feature)
BL	bell-shaped beacon	G/W	gabion wall	RG	road gully	↑	arrow indicates up (unless otherwise stated)
BL	bell-shaped beacon	GP	gate post	RS	reflector post	▲9002	survey control point
BL	bell-shaped beacon	GV	gas valve	RSJ	rolled steel joist		
BL	bell-shaped beacon	HR	handrail	RWP	rain water pipe		
BL	bell-shaped beacon	IC	fire hydrant	S/RW	stone retaining wall		
BL	bell-shaped beacon	IR	inspection cover (general)	SP	sign post		
BL	bell-shaped beacon	IR	inspection cover (general)	SP	sign post		
BL	bell-shaped beacon	IR	inspection cover (general)	SP	sign post		
BL	bell-shaped beacon	IR	inspection cover (general)	SP	sign post		

Notes:

Revisions:



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☐ Topographical Surveys

☐ Engineering Surveys

☐ Measured Building Surveys

☐ Boundary Surveys

☐ OS Mapping and Data Centre

☐ Underground Utility Surveys

Former Bank, Station Road, Port Talbot, SA13 1NW

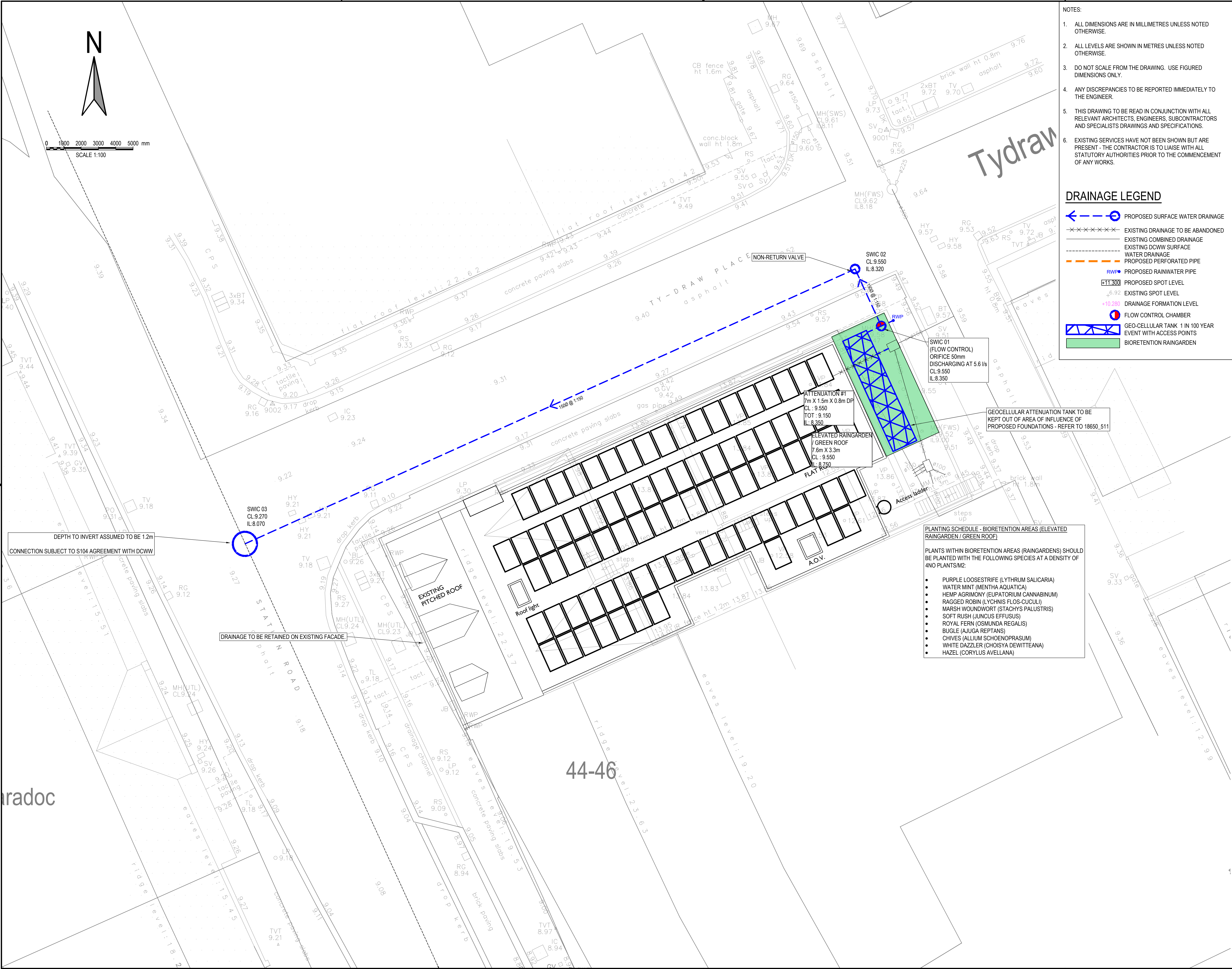
Topographical Survey

Life Property Group

Client	Coord Grid	Plane Grid based on National Grid	Level Datum	Level Datum via Active GPS Network
	Scale	1:200@A2	Date	Nov 2023
	Surveyed	A. Jolliffe	Drawn	L. Rajnohova



APPENDIX B: Proposed Site Plans



NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL LEVELS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
- DO NOT SCALE FROM THE DRAWING. USE FIGURED DIMENSIONS ONLY.
- ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ENGINEER.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, SUBCONTRACTORS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
- EXISTING SERVICES HAVE NOT BEEN SHOWN BUT ARE PRESENT - THE CONTRACTOR IS TO LIAISE WITH ALL STATUTORY AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY WORKS.

DRAINAGE LEGEND

- PROPOSED SURFACE WATER DRAINAGE
- EXISTING DRAINAGE TO BE ABANDONED
- EXISTING COMBINED DRAINAGE
- EXISTING DCWW SURFACE WATER DRAINAGE
- PROPOSED PERFORATED PIPE
- PROPOSED RAINWATER PIPE
- PROPOSED SPOT LEVEL
- EXISTING SPOT LEVEL
- DRAINAGE FORMATION LEVEL
- FLOW CONTROL CHAMBER
- GEO-CELLULAR TANK 1 IN 100 YEAR EVENT WITH ACCESS POINTS
- BIORETENTION RAINGARDEN

GENERAL DRAINAGE NOTES:

- MH COVERS AND FRAMES TO CONFORM TO BS EN 124:
 - D400 - SUITABLE FOR CARRIAGEWAYS, HARD SHOULDERS AND PARKING AREAS FOR ALL TYPES OF FAST MOVING VEHICLES
 - B125 - SUITABLE FOR AREAS WHERE SLOW MOVING DELIVERY VANS AND PUBLIC VEHICLES MAY HAVE ACCESS
 - A15 - SUITABLE FOR AREAS WHICH CAN ONLY BE USED BY PEDESTRIANS AND PEDAL CYCLISTS
- TYPE S BEDDING AND SURROUND TO ALL PIPES EXCEPT IN THE FOLLOWING CIRCUMSTANCES, IN WHICH TYPE Z BEDDING AND SURROUND ARE TO BE USED:
 - DOMESTIC GARDENS AND PATHWAYS WITHOUT ANY POSSIBILITY OF VEHICULAR ACCESS, 0.35m;
 - DOMESTIC DRIVEWAYS, PARKING AREAS AND YARDS WITH HEIGHT RESTRICTIONS TO PREVENT ENTRY BY VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES, 0.5m;
 - DOMESTIC DRIVEWAYS, PARKING AREAS AND NARROW STREETS WITHOUT FOOTWAYS (E.G. MEWS DEVELOPMENT) WITH LIMITED ACCESS FOR VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES, 0.9m;
 - AGRICULTURAL LAND AND PUBLIC OPEN SPACE, 0.9m;
 - HIGHWAYS AND PARKING AREAS WITH UNRESTRICTED ACCESS TO VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES, 1.2m.
- ALL EXISTING MANHOLE INVERTS TO BE CHECKED AND REPORTED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF DRAINAGE WORKS. EXISTING PIPE CONNECTIONS ARE TO BE CCTV SURVEYED AND INSPECTED BY THE ENGINEER AND LOCAL AUTHORITY. IF THE PIPE CONNECTION IS FOUND TO BE DAMAGED OR IN DISTRESS, THE CONTRACTOR IS TO CARRY OUT REMEDIAL WORKS OR PROVIDE A NEW CONNECTION TO THE EXISTING SEWER (PIPE SIZE AND GRADIENT TO BE DETERMINED BY THE ENGINEER).
- THE GRADIENTS INDICATED AGAINST THE DRAIN RUNS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL INSTALL DRAINS TO THE INVERT LEVELS SHOWN FOR EACH MANHOLE OR OTHER INDICATED POSITION.
- ALL PLOT FOUL DRAINAGE TO BE MINIMUM 100mm DIAMETER UNLESS OTHERWISE NOTED.
- ALL JOINING IN ACCORDANCE WITH MANUFACTURERS TECHNICAL ADVICE & SPECIFICATION.
- ALL NON ADAPTABLE DRAINAGE TO BE THE STANDARD UPVC 110mm, 160mm DRAINAGE AND MANUFACTURED TO BS-EN 1401 AND BS 4660 UNLESS NOTED OTHERWISE.
- ALL STORM WATER DRAINAGE TO BE A MINIMUM OF 150mm DIAMETER UNLESS OTHERWISE NOTED.
- SOIL & VENT PIPE LOCATION AND NUMBER TO BE CONFIRMED WITH ARCHITECT.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS, TOGETHER WITH THEIR LATEST SPECIFICATIONS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER (VALE CONSULTANCY) AS SOON AS POSSIBLE.
- FIGURED DIMENSIONS ONLY TO BE USED. ANY QUERIES OR DISCREPANCIES TO BE REFERRED TO THE ENGINEER (VALE CONSULTANCY) IMMEDIATELY.
- TEMPORARY WORKS DESIGN BY OTHERS.
- DESIGN RISK ASSESSMENTS AND METHOD STATEMENTS ARE TO BE PROVIDED TO THE PRINCIPLE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ANY WORKS.

PLANTING SCHEDULE - BIORETENTION AREAS (ELEVATED RAINGARDEN / GREEN ROOF)

PLANTS WITHIN BIORETENTION AREAS (RAINGARDENS) SHOULD BE PLANTED WITH THE FOLLOWING SPECIES AT A DENSITY OF 4NO PLANTS/M²:

- PURPLE LOOSESTRIPE (LYTHRUM SALICARIA)
- WATER MINT (MENTHA AQUATICA)
- HEMP AGRI-MONY (EUPATORIUM CANNABINUM)
- RAGGED ROBIN (LYCHNIS FLOS-CUCULLI)
- MARSH WOUNDWORT (STACHYS PALUSTRIS)
- SOFT RUSH (JUNCUS EFFUSUS)
- ROYAL FERN (OSMUNDA REGALIS)
- BUGLE (AJUGA REPTANS)
- CHIVES (ALLIUM SCHOENOPRASUM)
- WHITE DAZZLER (CHOISYA DEWITTEANA)
- HAZEL (CORYLUS AVELLANA)

04	PN	JP	PG	06.03.26	AMENDED SITE LAYOUT
03	PN	JP	PG	07.01.25	AMENDED TO SAB COMMENTS
02	PN	JP	PG	03.06.25	GREEN ROOF ADDED
01	PN	JP	PG	29.07.25	FIRST ISSUE

rev.	drawn	chd.	appd.	date	description
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Client
LIFE PROPERTIES

Project
**BARCLAYS
STATION ROAD
SA13 1NW**

Title
DRAINAGE STRATEGY



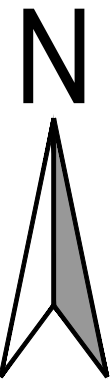
29 Bocam Park, Old Field Road, Pencoed, Bridgend CF35 5LJ.
Phone: 01656 863794 Email: enquiries@vale-consultancy.co.uk

date	drawn	checked	approved
29.07.25	PN	JP	PG

scale @ A1	project no.
1:100	18650

status	drg. no.	rev.
A	18650_500	04

DRAWING STATUS
A - Approval, AB - As-Built, C - Construction, D - Draft, P - Preliminary, T - Tender



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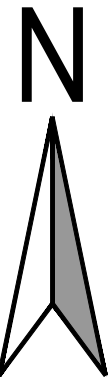


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LEGEND

CATCHMENT AREA A = 353m²

01	PN	JP	PG	29.07.25	FIRST ISSUE
rev.	drawn	chd.	IP	PG	description
Client					
LIFE PROPERTIES					
Project					
BARCLAYS STATION ROAD SA13 1NW					
Title					
EXISTING CATCHMENTS					
 CONSULTING CIVIL & STRUCTURAL ENGINEERS 29 Bocam Park, Old Field Road, Pencoed, Bridgend CF35 5LJ. Phone: 01656 863794 Email: enquiries@vale-consultancy.co.uk					
date	drawn	checked	approved		
29.07.25	PN	JP	PG	29.07.25	29.07.25
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status	drg. no.				rev.
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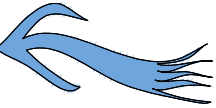


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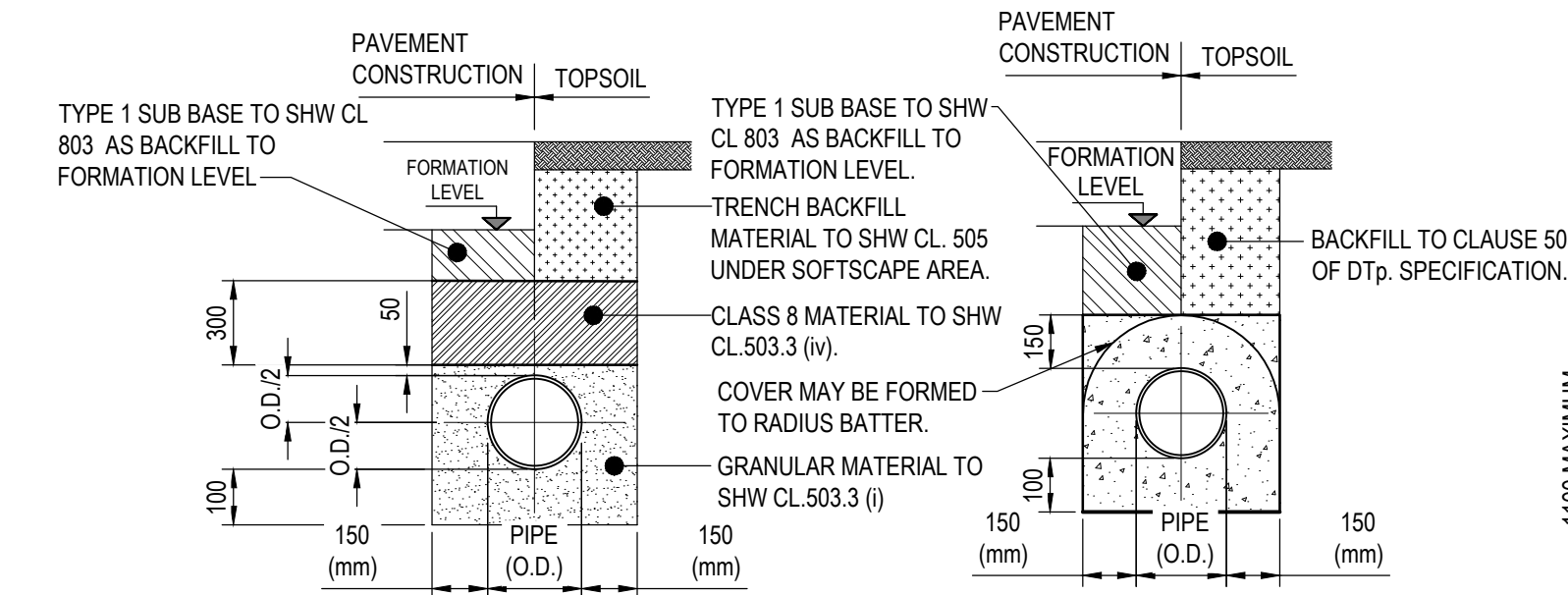


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LEGEND

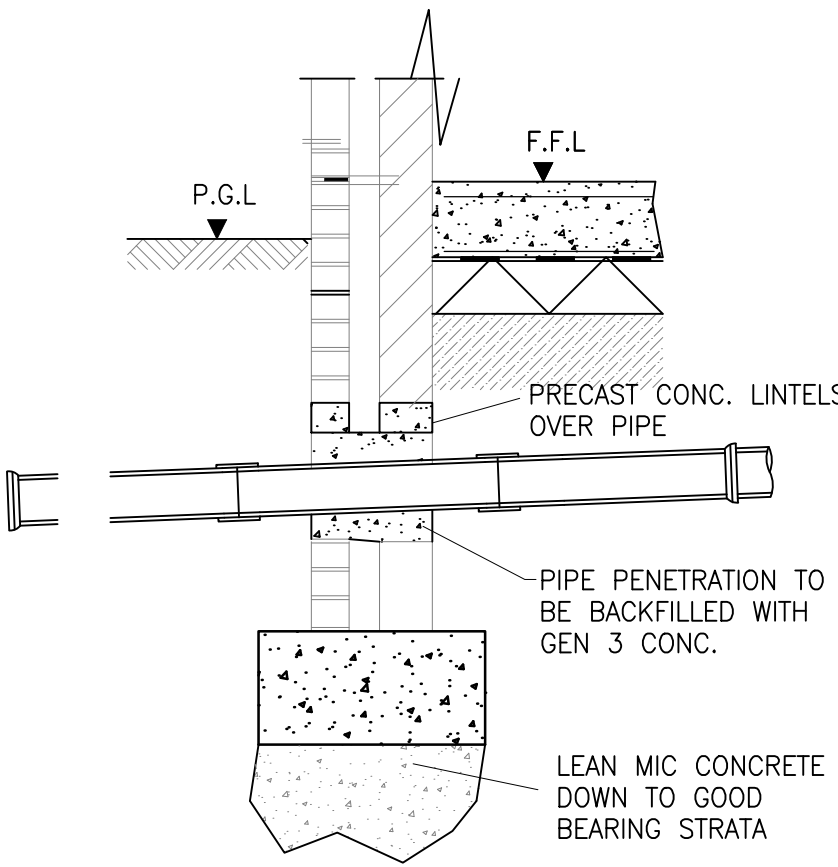
-  FLOW EXCEEDANCE ARROW
-  EXISTING SYSTEM RETAINED
CATCHMENT AREA A = 46m²
-  CATCHMENT AREA B = 346m²

02	PN	JP	PG	29.07.25	AMENDED SITE LAYOUT
01	PN	JP	PG	29.07.25	FIRST ISSUE
rev.	drawn	chd.	appd.	date	description
Client					
LIFE PROPERTIES					
Project					
BARCLAYS STATION ROAD SA13 1NW					
Title					
FLOW EXCEEDANCE AND CATCHMENT AREAS					
 CONSULTING CIVIL & STRUCTURAL ENGINEERS 29 Bocam Park, Old Field Road, Pencoed, Bridgend CF35 5LJ. Phone: 01656 863794 Email: enquiries@vale-consultancy.co.uk					
date	drawn	checked	approved		
29.07.25	PN	JP	PG	29.07.25	29.07.25
scale @ A1			project no.		
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status	drg. no.				rev.
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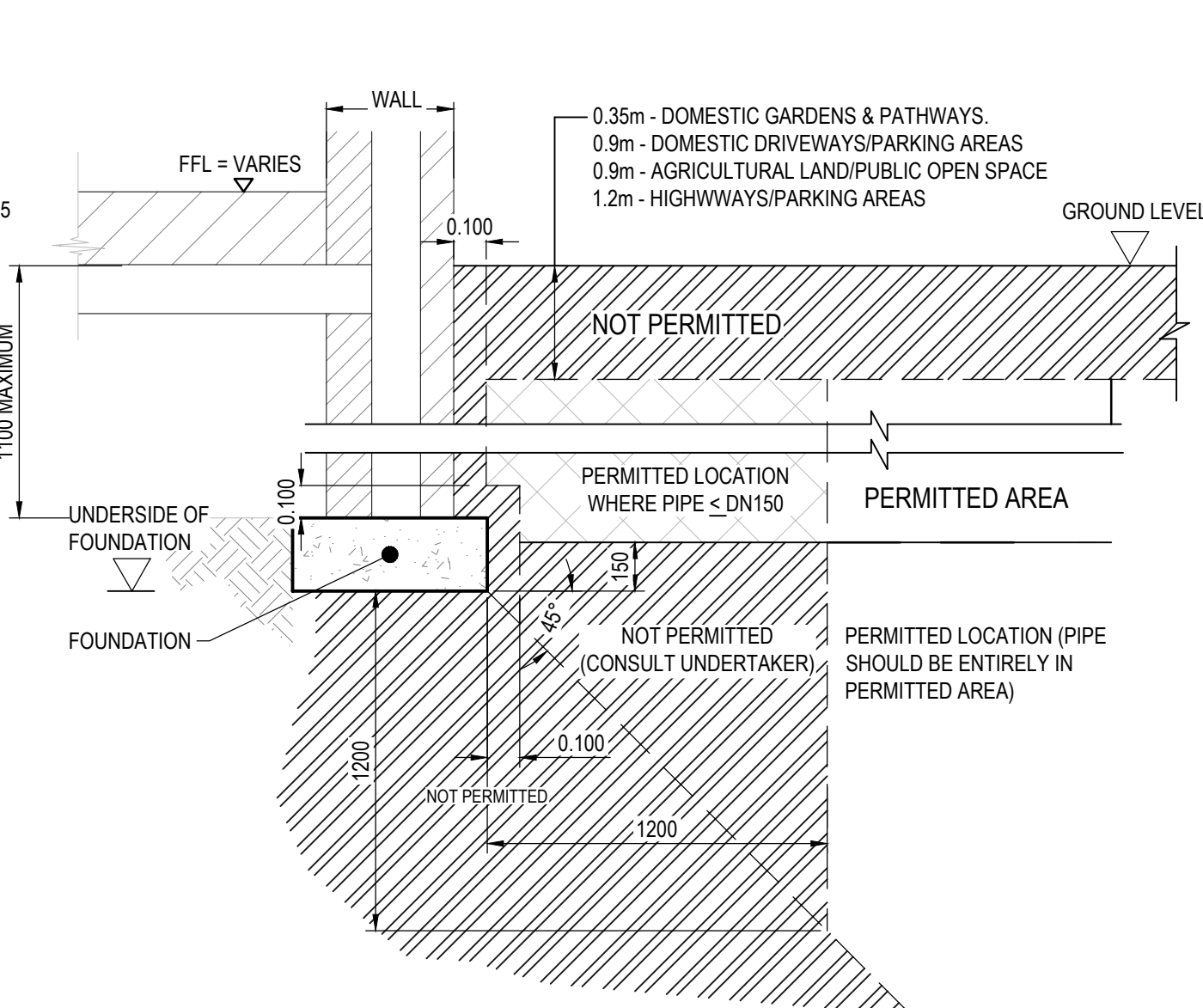


- NOTES:
1. REFER TO SHW TABLE 5/3 AND SHW TABLE 6/1
 2. BEDDING BENEATH AND AT SIDES OF THE PIPE TO BE WELL COMPACTED IN ACCORDANCE WITH CL 505.
 3. CONCRETE CRADLES AND ARCHES MAY BE EXTENDED TO THE SIDES OF THE TRENCH.
 4. GEOTEXTILES MAY BE USED WHERE DIRECTED OR APPROVED BY THE ENGINEER TO CONTAIN BEDDING MATERIAL IN CERTAIN SOILS E.G. RUNNING SAND.
 5. IN VERY WET CONDITIONS, WHERE DIRECTED OR APPROVED BY THE ENGINEER A TEMPORARY LAND DRAIN MAY BE LAID WITHIN THE GRANULAR BED.
- NOTES: (TYPE Z ONLY)
6. WHERE PIPES WITH FLEXIBLE JOINTS ARE USED, THE CONCRETE PROTECTION IS TO BE INTERRUPTED OVER ITS FULL CROSS SECTION AT INTERVALS NOT EXCEEDING 5 METRES (OR AS DIRECTED BY THE ENGINEER) BY A SHAPED FORMER OF BITUMEN IMPREGNATED COMPRESSIBLE FILLER. THESE INTERRUPTIONS SHALL COINCIDE WITH PIPE JOINTS. SEE DIMENSIONS FOR PIPE BEDDING TABLE FOR THICKNESS OF COMPRESSIBLE FILLER
 7. CONCRETE TO BE GRADE GEN 3. WHERE FLEXIBLE PIPES ARE USED, CARE MUST BE TAKEN
 8. TO PREVENT THE PIPES FROM FLOATING.

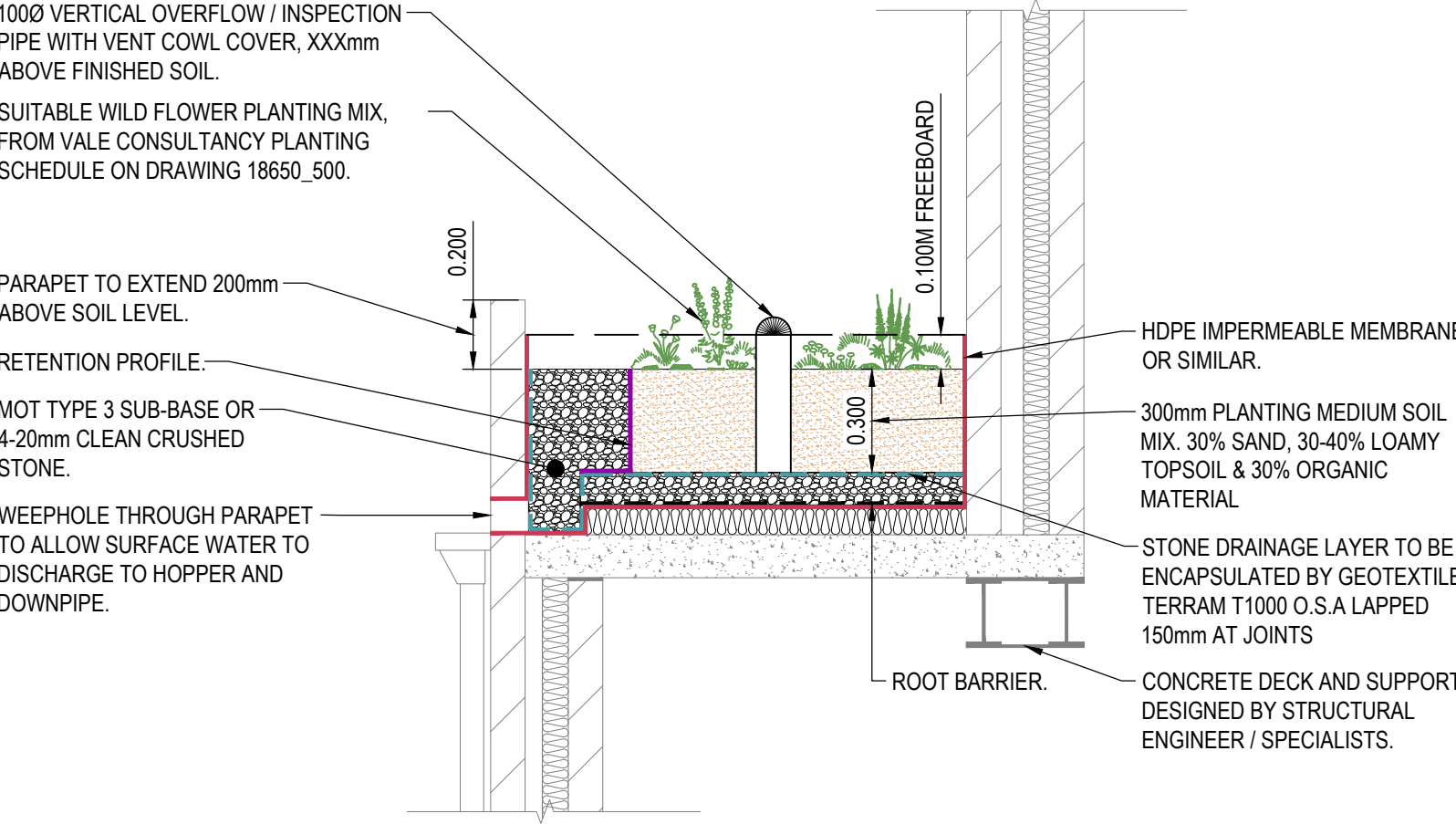
BEDDING DETAILS
SCALE 1:20



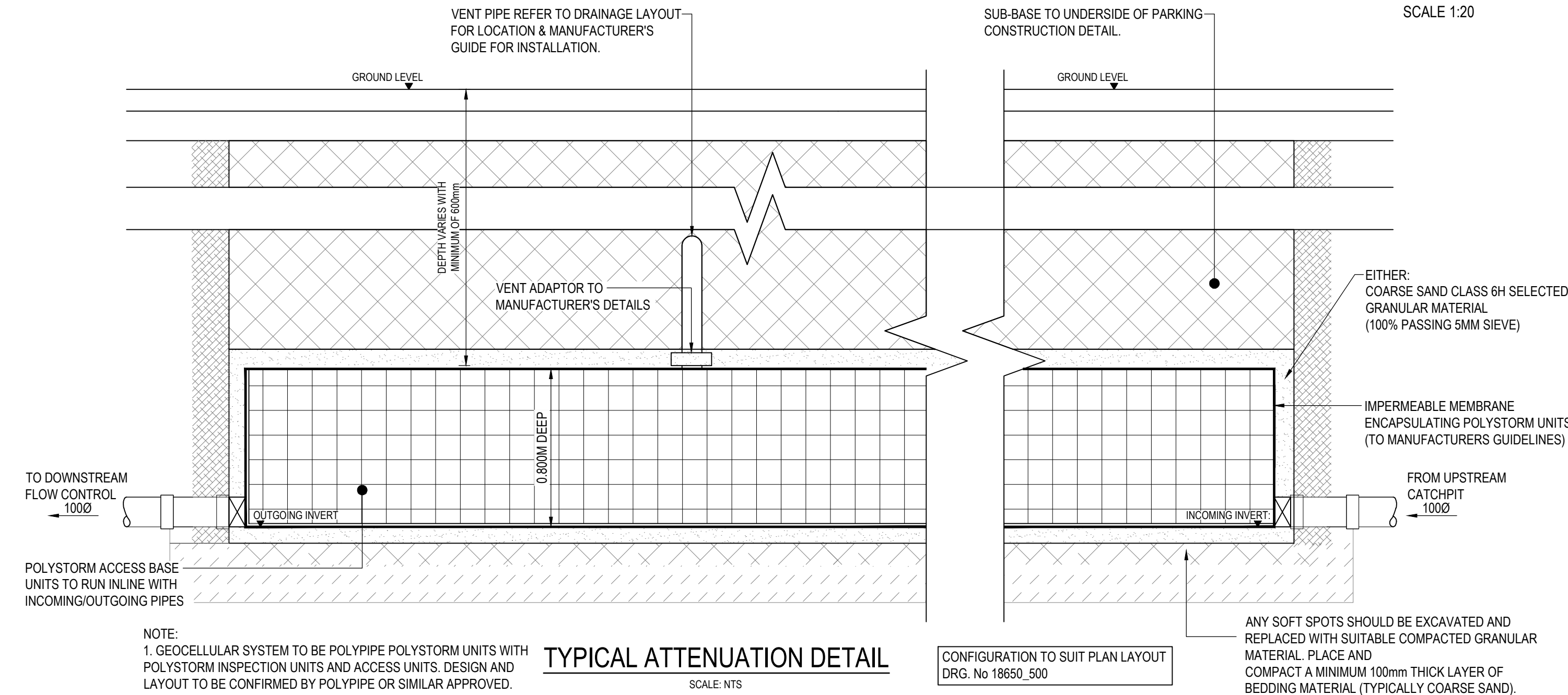
**TYPICAL SECTION WHERE DRAINAGE
PASSES OVER FOUNDATION**



**TYPICAL DRAINAGE DETAIL IN CLOSE
PROXIMITY OF FOUNDATIONS
(DETAIL IN ACCORDANCE WITH SFA FIGURE B1)**
SCALE 1:20



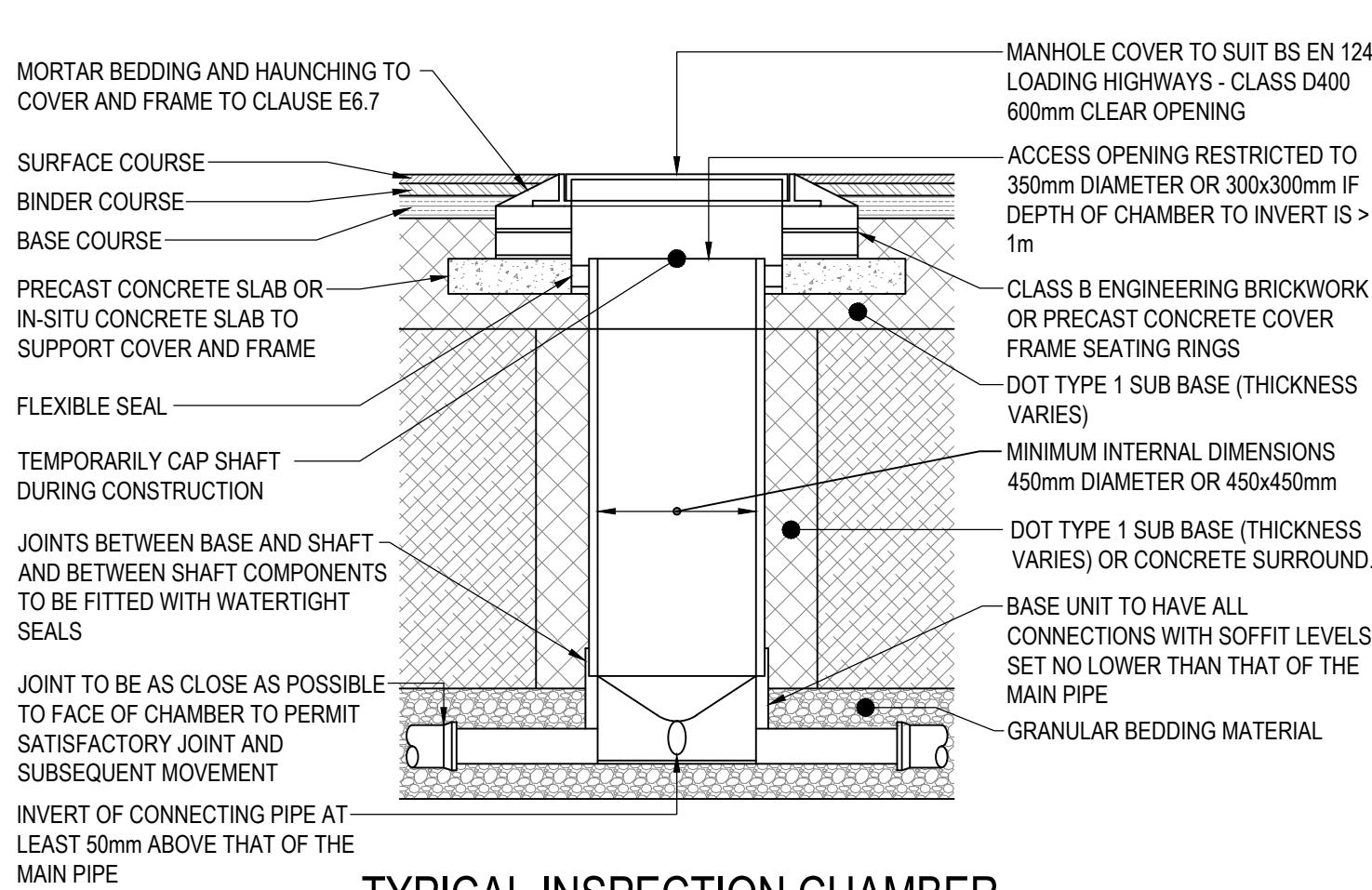
**ELEVATED RAINGARDEN / GREEN ROOF
TYPICAL DETAIL**
SCALE 1:20



TYPICAL ATTENUATION DETAIL
SCALE: NTS

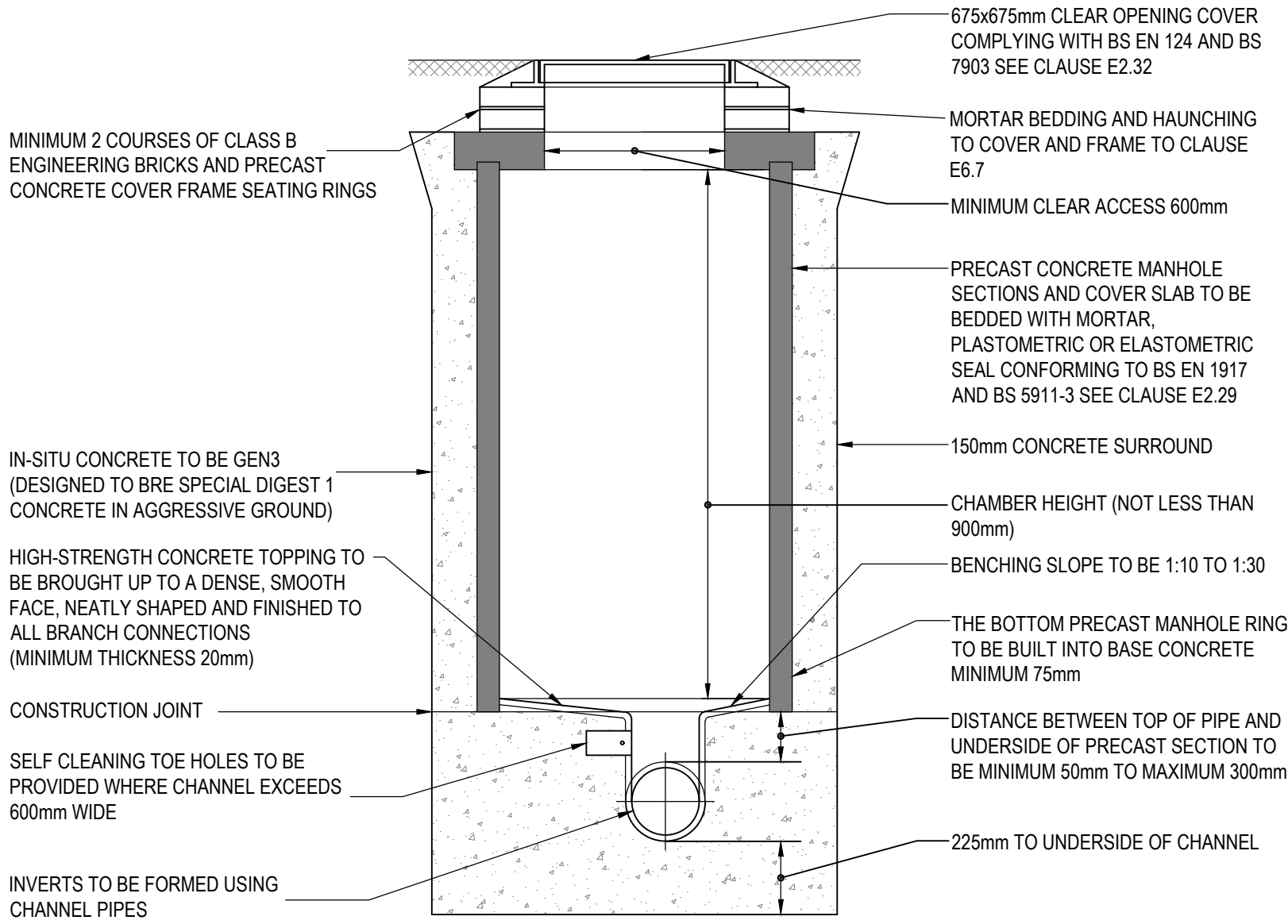
CONFIGURATION TO SUIT PLAN LAYOUT
DRG. No 18650_500

ANY SOFT SPOTS SHOULD BE EXCAVATED AND REPLACED WITH SUITABLE COMPACTED GRANULAR MATERIAL. PLACE AND COMPACT A MINIMUM 100mm THICK LAYER OF BEDDING MATERIAL (TYPICALLY COARSE SAND).



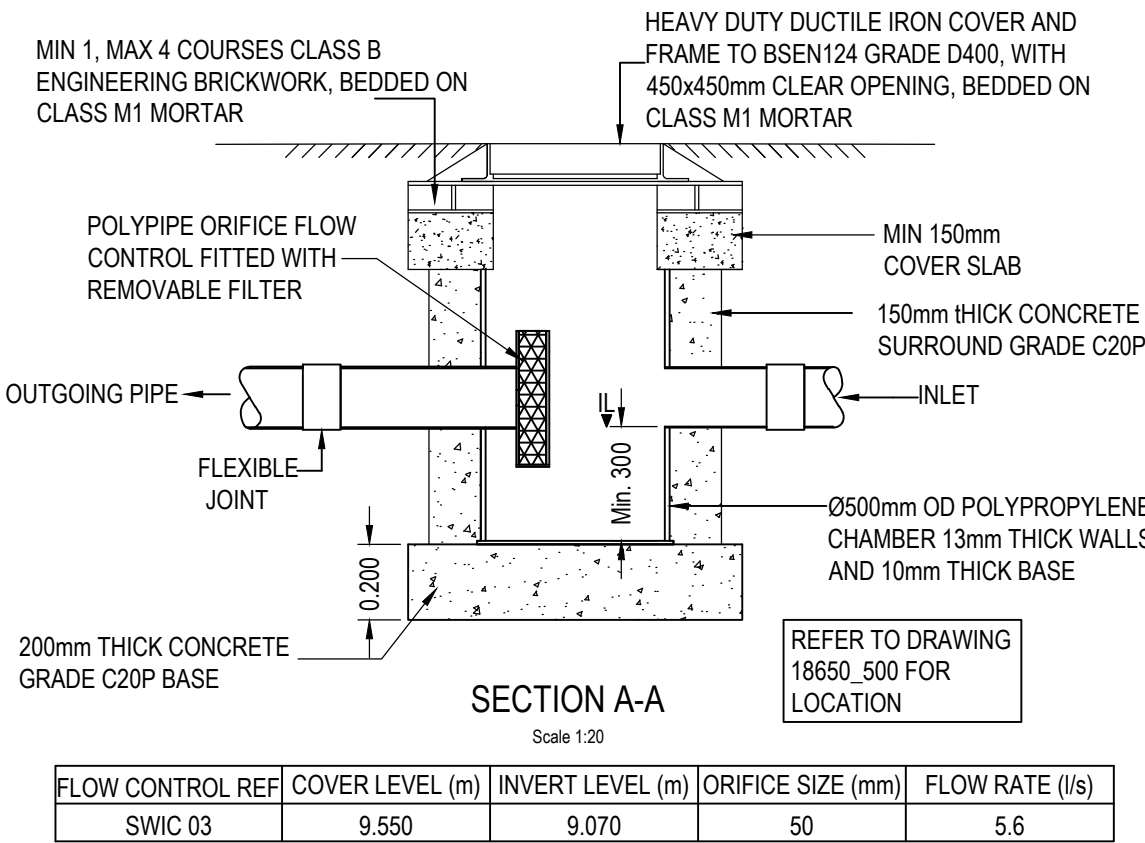
**TYPICAL INSPECTION CHAMBER
DETAIL - TYPE 3**

(REFER TO FIG. B.16 OF SEWERS FOR ADOPTION 7th ED)
(DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3m)
(FLEXIBLE MATERIAL DETAIL)



TYPICAL MANHOLE DETAIL TYPE 2 - Ø900

(REFER TO FIG. B.12 OF SEWERS FOR ADOPTION 7th ED)
(MAXIMUM DEPTH FROM COVER TO SOFFIT LEVEL OF PIPE - 3.0m)
SCALE 1:20

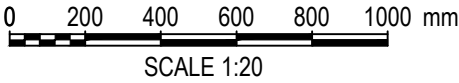


**Ø500MM POLYPIPE CATCHPIT INSPECTION
CHAMBER INCORPORATING FLOW
CONTROL AND DEBRIS DEVICE**
SCALE 1:20

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
 3. DO NOT SCALE FROM THE DRAWING. USE FIGURED DIMENSIONS ONLY.
 4. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ENGINEER.
 5. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, SUBCONTRACTORS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
 6. EXISTING SERVICES HAVE NOT BEEN SHOWN BUT ARE PRESENT - THE CONTRACTOR IS TO LIAISE WITH ALL STATUTORY AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY WORKS.

03	PN	JP	PG	02.07.25	AMENDED TO SAB COMMENTS
02	PN	JP	PG	03.06.25	GREEN ROOF ADDED
01	PN	JP	PG	03.06.25	FIRST ISSUE
rev.	drawn	chkd	approved	date	description
Client					
LIFE PROPERTIES					
Project					
BARCLAYS STATION ROAD SA13 1NW					
Title					
DRAINAGE DETAILS					

29 Bocam Park, Old Field Road, Pencoed, Bridgend CF35 5LJ. Phone: 01656 863794 Email: enquiries@vale-consultancy.co.uk					
date	drawn	checked	approved		
29.07.25	PN	JP	PG	29.07.25	29.07.25
scale @ A1				project no.	
AS SHOWN				18650	
status	drg. no.				rev.
A	18650_510				03



- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
 3. DO NOT SCALE FROM THE DRAWING. USE FIGURED DIMENSIONS ONLY.
 4. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ENGINEER.
 5. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, SUBCONTRACTORS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
 6. EXISTING SERVICES HAVE NOT BEEN SHOWN BUT ARE PRESENT - THE CONTRACTOR IS TO LIAISE WITH ALL STATUTORY AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY WORKS.

RAINWATER PIPE CONNECTION DETAIL SHOWN INDICATIVELY

OUTGOING PIPE FITTED WITH 50mm ORIFICE PLATE

PROPOSED ATTENUATION CRATES

45° ANGLE OF INFLUENCE FOR FOUNDATIONS

SECTION OF THE PROPOSED SYSTEM

SCALE 1:20



02	PN	JP	PG	04.08.25	RAINGARDEN REMOVED	
01	PN	JP	PG	29.07.25	FIRST ISSUE	
rev.	drawn	chkd.	apprvd.	date	description	
Client						
LIFE PROPERTIES						
Project						
BARCLAYS STATION ROAD SA13 1NW						
Title						
SECTIONS						
 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS 29 Bocam Park, Old Field Road, Pencoed, Bridgend CF35 5LJ. Phone: 01656 863794 Email: enquiries@vale-consultancy.co.uk						
date		drawn		checked		approved
29.07.25		PN		JP	29.07.25	PG 29.07.25
scale @ A2 1:20				project no. 18650		
status		drg. no.				rev.
P		18650_511				02



APPENDIX C: Management & Maintenance Plan

+

Vale Consultancy

CONSULTING CIVIL & STRUCTURAL ENGINEERS

MANAGEMENT & MAINTENANCE PLAN

Former Barclays
46 Station Rd
Port Talbot
Neath Port Talbot
SA13 1NW

Prepared for: Life Properties
Project Ref: 18650 MP

(Head Office) 01656 863 794

| enquiries@vale-consultancy.co.uk

| vale-consultancy.co.uk



DOCUMENT CONTROL

Project:	Former Barclays, Station Rd, SA13 1NW
Client:	Life Properties
Vale Consultancy Ref:	18650 DSR

Issue	Prepared by	Approved by	Date	Status
01	Peter Nattrass BEng (Hons)	Paul Graham BSc (Hons) MSc GMICE	29.07.25	First issue
02	Peter Nattrass BEng (Hons)	Paul Graham BSc (Hons) MSc GMICE	03.10.25	Second issue



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1	INTRODUCTION.....	3
2	MANAGEMENT RESPONSIBILITIES.....	3
3	MANAGEMENT OBJECTIVES.....	3
4	INSPECTION AND MAINTENANCE ACCESS.....	4
5	MAINTENANCE VISITS OR INSPECTIONS.....	4
6	GENERAL.....	4
9	TRADITIONAL DRAINAGE.....	6
10	SUMMARY OF INSPECTION AND MAINTENANCE FOR SUDS.....	6
11	LIFETIME MANAGEMENT AND MAINTENANCE COSTS FOR SUDS.....	11



1 INTRODUCTION

- 1.1 This SuDS Management and Maintenance Plan has been prepared by Vale Consultancy in support of a SuDS scheme for the proposed development at Former Barclays, Station Road, Port Talbot, SA13 1NW.
- 1.2 The proposed project consists of an apartment block incorporating a raingarden into the scheme to provide interception, amenity & biodiversity across the site.
- 1.3 The scheme incorporates a sustainable drainage system for surface water runoff, which consists of raingardens, geo-cellular attenuation and a flow control chamber.
- 1.4 The method for disposal of surface water runoff is to discharge via a surface water sewer.
- 1.5 The purpose of this document is to set out the overall management and maintenance objectives for the proposed SuDS components and to describe the long-term maintenance required to allow the system to continue operating as is intended.
- 1.6 All references to SuDS components are based on the SAB submission drawings:

- **18650_500_r03 Drainage Layout**
- **18650_510_r03 Drainage Details**
- **18650_509_r01 FECA**
- **18650_511_r02 Sections**

2 MANAGEMENT RESPONSIBILITIES

- 2.1 The current site owner(s) shall be responsible for the implementation of the Management and Maintenance Plan. If deemed necessary, all maintenance operations shall be undertaken by suitable and qualified contractor appointed by the site owner.
- 2.2 All inspections and maintenance work must be recorded. This allows for future assessment of the maintenance activities and their response to the system. It can also provide protection against legal claims should the system be exceeded in a storm event leading to flooding elsewhere.

3 MANAGEMENT OBJECTIVES

- 3.1 The site shall be managed and maintained as an attractive, tidy, and safe finish to all landscape elements.
- 3.2 The proposed planting shall enhance the biodiversity and nature conservation interests.
- 3.3 The Site Owner(s) shall ensure establishment and long-term health of all landscape elements for the benefit of the tenants and visual amenity of the area.
- 3.4 Best Health & Safety practices shall always be used.
- 3.5 To monitor standards and make amendments where required, it is expected that the Site Owner will review the management work (with reference to this document) at least quarterly for the first year and annually thereafter.



4 INSPECTION AND MAINTENANCE ACCESS

- 4.1 Access to the site(s) for inspection and maintenance can be gained via the proposed junction accessed off of station road can be accessed off the A48.
- 4.2 Maintenance vehicles can park in the car park areas for maintenance of the various SuDS features as required.

5 MAINTENANCE VISITS OR INSPECTIONS

- 5.1 The Site Owner or appointed maintenance contractor shall carry out a minimum of 12 maintenance visits or inspections per year to check drainage SuDS components. Visits shall be monthly. Additional visits may be needed to deal with extreme weather conditions or specific horticultural requirements.

6 GENERAL

- 6.1 All materials and workmanship are to be to the highest possible standards and shall be in accordance with relevant British Standards, good horticultural and arboricultural practices, and the landscape specification.
- 6.2 The Site Owner shall employ suitably qualified staff for all work and when using sprays and mechanical equipment. All equipment shall be kept in a sound condition, fit for use and purpose.
- 6.3 The Site Owner and their appointed contractors shall comply with all relevant Health and Safety regulations and good working practices.
- 6.4 The Site Owner shall take care when work is beside any structure or paved area and will, at their own cost, be responsible for making good any damage caused.
- 6.5 Weeds, pruning's, leaves, rubbish and other arisings shall be removed from site for composting, where possible. No material shall be left on site, and the area shall be left in a neat and tidy condition after each visit.

7 LITTER COLLECTION

- 7.1 All hard surfacing shall be swept as necessary, and all rubbish removed from site.
- 7.2 Litter picking/clearance shall take place during each maintenance visit and all waste shall be removed from site.
- 7.3 During autumn maintenance visits all fallen leaves shall be collected and removed from site.



8 ORNAMENTAL PLANTING

Specific objectives:

- To ensure early establishment and healthy growth
- To maintain a dense canopy cover
- To maintain year-round appearance and visual interest

Maintenance Operations:

- 8.1 All shrub beds in the raingardens & detention basins shall be maintained substantially free of weeds. Work shall be done either manually or with appropriate selective weed killer in accordance with manufacturer's recommendations. If weed killer is used the dead weeds shall be removed at the next maintenance visit. Care must be taken to avoid damage to adjacent planting and grass and replaced immediately if affected by weed killer.
- 8.2 Once established, shrubs shall be selectively thinned or reduced in height as appropriate by removal or pruning to allow room for growth and avoid overcrowding/overshadowing and create a natural form rather than cube or cloud shapes. Care shall be taken to avoid over pruning and so creating obvious gaps in the shrub beds.
- 8.3 Ground cover plants shall be clipped or pruned if necessary, to give a neat and tidy finish and contained within the planting bed. Work to remove dead vegetation shall be carried out during the winter months.
- 8.4 Pruning of herbaceous planting:
- 8.5 In spring cut stems close to the 'crown' or 'dormant' top of the plant, avoiding the removal of new shoots.
 - Tidy up the base of the plant, removing dead foliage and debris.
 - Remove all material from site.
 - If necessary, apply a 50mm layer of fine horticultural mulch. This will help moisture retention in the soil, contribute to weed suppression and allow delicate stems to grow.
 - Leave dried flower head over winter for relevant species e.g. ornamental grasses.
- 8.6 Fertilising:
 - One application, just before or at the time of spring growth.
 - A balanced fertiliser is required, one high in Phosphorus (which encourages blooming as well as strong roots and disease resistance). Fertilisers high in nitrogen should not be used as nitrogen promotes excess foliage at the expense of flowers and roots which can result in weak stems



9 TRADITIONAL DRAINAGE

- 9.1 A bi-monthly site inspection should be carried out, checking for any areas that are not operating correctly and collecting/removing litter and debris.
- 9.2 All rainwater pipes, channel drains, gullies and inspection chambers should be inspected biannually, typically spring and autumn.
- 9.3 Any excessive sediment build-up in rainwater pipes, channel drains, gullies or inspection chambers causing blockage or poor performance shall be cleared and cleaned as required.
- 9.4 Geo-cellular attenuation tanks require little to no maintenance. They should however be inspected after every major storm event. For traditional drainage systems it is recommended that a slit trap is incorporated into the pipework at the inlet to the tank. However, in SuDS applications silt and debris is usually removed by upstream SuDS components so there is less need for a silt trap.
- 9.5 Flow control devices provide customised water quantity management for surface water across a wide range of flows and for a variety of applications. The flow control has no moving parts and no power requirements and provides reliable, low-maintenance, engineered flood management. The two most common flow control devices are vortex and orifice plate flow controls. This scheme will incorporate orifice flow controls only and maintenance requirements are as detailed in section 9.

10 SUMMARY OF INSPECTION AND MAINTENANCE FOR SUDS

- 10.1 The following briefly summarises the frequency and type of inspections and maintenance required for the SuDS components and drainage system used in this scheme:

10.2 General

Operation and maintenance requirements for traditional drainage components		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspection of traditional drainage including rainwater pipes, channel drains, gullies and inspection chambers (as applicable).	Bi-annually
	Remove litter or build-up of foliage	Bi-annually (or as required)
Occasional maintenance	Clear channel drains and gullies of silt build up	Every 5 years (or as required)
Remedial Actions	Jet/vac inspection chambers and below ground pipework when blocked or performance is affected due to partial blockages	Every 20 years (or as required)



10.3 Flow control devices / chambers

Operation and maintenance requirements for orifice flow control		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspection of flow control device including litter and debris removal	Routine maintenance should be undertaken on completion of drainage works and then annually thereafter
	Check emergency drain down (if fitted) is in good working order	
	Check and clean orifice screening device and replace if damaged	
	Check component fixings are secure	
Occasional maintenance	De-silting / sediment removal	As required upon inspection
Remedial Actions	Damage repair	As required upon inspection

10.4 Attenuation Storage Tanks

Operation and maintenance requirements for Attenuation Storage Tanks		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required



10.5 Green roofs

Operation and maintenance requirements for green roofs		
Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where >5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required



11 LIFETIME MANAGEMENT AND MAINTENANCE COSTS FOR SUDS

11.1 Lifetime management and maintenance costs have been broken down for each SuDS drainage system. Costs are based on a 60-year design life.

11.2 The costs associated with the management and maintenance of the SuDS system over the 60-year design life of the scheme has been estimated based on the inspection and maintenance activities in section 10, as follows:

11.3 General

- General monthly inspection by the site owner (incl. litter removal) – no cost as is incorporated in general site maintenance undertaken by site owner
- Biannual check of traditional drainage - no cost as is incorporated in general site maintenance undertaken by site owner
- Annual check of flow control chamber - no cost as is incorporated in general site maintenance undertaken by site owner

11.4 Geo-cellular Attenuation

- Annual inspection - no cost as is incorporated in general site maintenance undertaken by site owner.
- Bi-Annual de-silting £200 x every 2 years = £6,000

11.5 Bioretention areas (Raingardens)

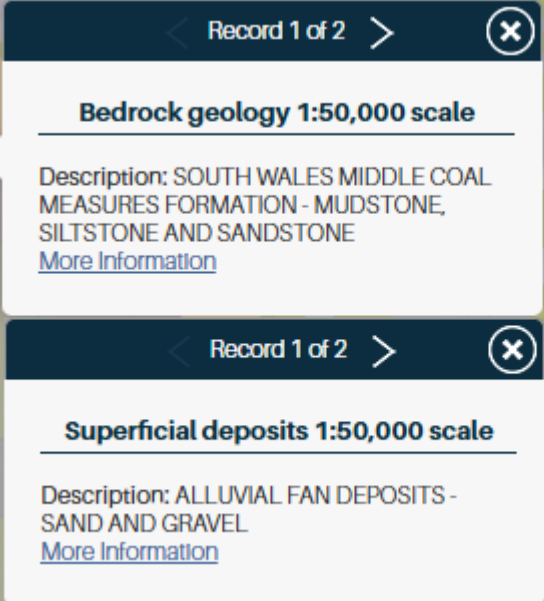
- Annual inspection - no cost as is incorporated in general site maintenance undertaken by site owner.
- Annual pruning/fertilising - no cost as is incorporated in general site maintenance undertaken by site owner.
- Plant replacement over 60 years, assuming plants need to be replaced each year with Meadowmat SuDS & Slopes seed mix (20% of 25 m² = 5 m²) @ £2 / m² / year - £600

11.6 The total sum of management and maintenance costs for the proposed SuDS over a 60-year design life - £6,600 or circa £110 a year.



APPENDIX D:

British Geological Survey Records, NRW Development Advice Map (DAM)



**Flood Map for Planning - Detail
18650**

Legend

TAN15 Defended Zones

-  Rivers
-  Sea
-  Rivers and Sea

Rivers

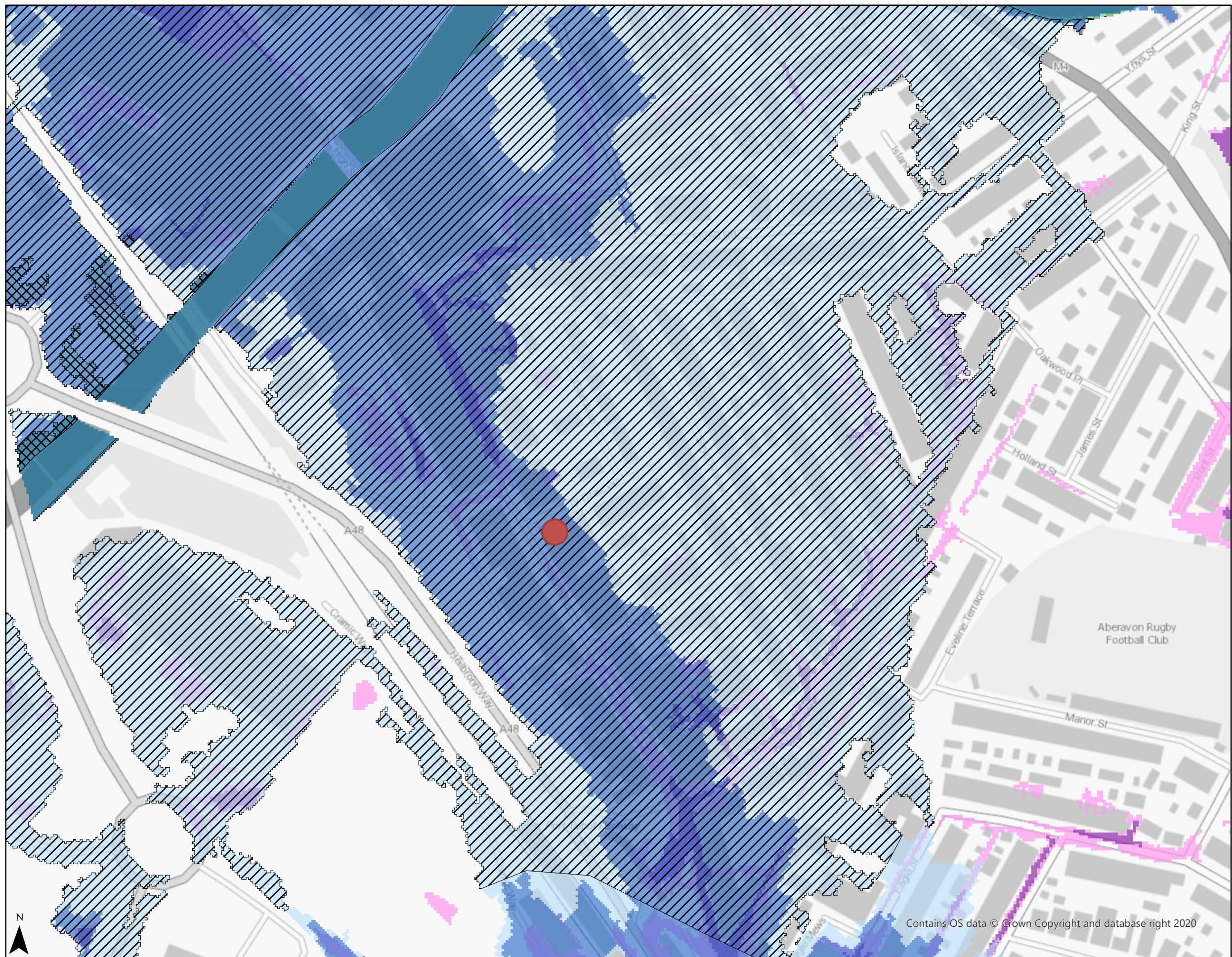
-  Flood Zone 3
-  Flood Zone 2

Sea

-  Flood Zone 3
-  Flood Zone 2

Surface Water and Small Watercourses

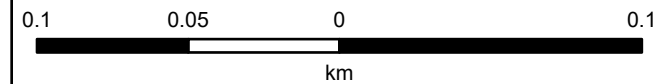
-  Flood Zone 3
-  Flood Zone 2



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Scale at A3: 1:2,500

Date: 24/07/2025



British National Grid

Disclaimer

<https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en>

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APPENDIX E: Design Calculations



Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	x
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWIC 02	0.035	5.00	9.550	450	276696.957	189918.264	1.200
Attenuation #1		5.00	9.550		276695.266	189917.632	1.200
SWIC 03			9.500	450	276695.180	189922.141	1.180
SWIC 04			9.270	600	276659.935	189906.258	1.200

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Attenuation #1	SWIC 02	1.805	0.600	8.350	8.350	0.000	0.0	100	5.03	50.0
1.001	SWIC 02	SWIC 03	4.265	0.600	8.350	8.320	0.030	142.2	150	5.11	50.0
1.002	SWIC 03	SWIC 04	38.659	0.600	8.320	8.070	0.250	154.6	150	5.91	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.000	7.9	0.0	1.100	1.100	0.000	0.0	0	0.000
1.001	0.841	14.9	8.9	1.050	1.030	0.035	0.0	83	0.877
1.002	0.805	14.2	8.9	1.030	1.050	0.035	0.0	86	0.849

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	1.805	0.0	100	Circular	9.550	8.350	1.100	9.550	8.350	1.100
1.001	4.265	142.2	150	Circular	9.550	8.350	1.050	9.500	8.320	1.030
1.002	38.659	154.6	150	Circular	9.500	8.320	1.030	9.270	8.070	1.050

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Attenuation #1		Junction		SWIC 02	450	Manhole	Junction
1.001	SWIC 02	450	Manhole	Junction	SWIC 03	450	Manhole	Junction
1.002	SWIC 03	450	Manhole	Junction	SWIC 04	600	Manhole	Junction

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SWIC 02	276696.957	189918.264	9.550	1.200	450		1	1.000	8.350	100
							0	1.001	8.350	150
Attenuation #1	276695.266	189917.632	9.550	1.200			0	1.000	8.350	100
							1	1.001	8.320	150
SWIC 03	276695.180	189922.141	9.500	1.180	450		0	1.002	8.320	150
							1	1.002	8.070	150
SWIC 04	276659.935	189906.258	9.270	1.200	600		1			

Simulation Settings

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

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	40	0	0
30	0	0	0	200	40	0	0

Node SWIC 02 Online Orifice Control

Flap Valve	x	Replaces Downstream Link	✓	Diameter (m)	0.050
Downstream Link	1.001	Invert Level (m)	8.350	Discharge Coefficient	0.600

Node Attenuation #1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.350
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	31

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	10.5	0.0	0.800	10.5	0.0	0.801	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	SWIC 02	72	8.512	0.162	3.2	0.0257	0.0000	SURCHARGED
120 minute summer	Attenuation #1	72	8.512	0.162	1.5	1.6142	0.0000	SURCHARGED
120 minute summer	SWIC 03	72	8.358	0.038	1.9	0.0060	0.0000	OK
120 minute summer	SWIC 04	72	8.107	0.037	1.9	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	SWIC 02	Orifice	SWIC 03	1.9				
15 minute summer	Attenuation #1	1.000	SWIC 02	-4.0	-0.841	-0.504	0.0141	
120 minute summer	SWIC 03	1.002	SWIC 04	1.9	0.564	0.136	0.1323	6.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWIC 02	40	8.801	0.451	9.8	0.0717	0.0000	SURCHARGED
60 minute summer	Attenuation #1	40	8.801	0.451	6.4	4.5003	0.0000	SURCHARGED
60 minute summer	SWIC 03	41	8.370	0.050	3.4	0.0080	0.0000	OK
60 minute summer	SWIC 04	41	8.120	0.050	3.4	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWIC 02	Orifice	SWIC 03	3.4				
15 minute summer	Attenuation #1	1.000	SWIC 02	-9.5	-1.211	-1.206	0.0141	
60 minute summer	SWIC 03	1.002	SWIC 04	3.4	0.662	0.239	0.1991	10.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.72%

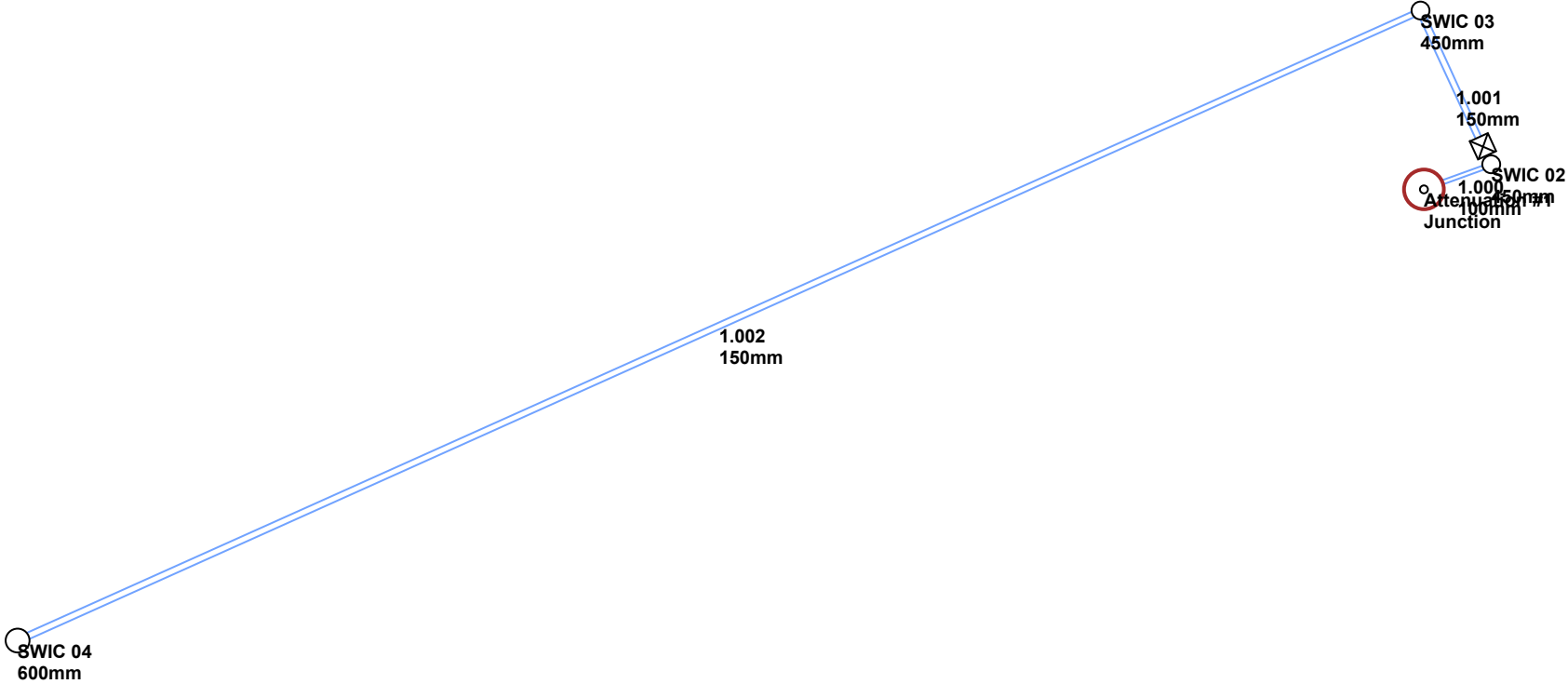
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWIC 02	41	9.525	1.175	17.2	0.1869	0.0000	FLOOD RISK
60 minute summer	Attenuation #1	41	9.526	1.176	11.8	7.9850	0.0000	FLOOD RISK
60 minute summer	SWIC 03	41	8.386	0.066	5.6	0.0105	0.0000	OK
60 minute summer	SWIC 04	41	8.135	0.065	5.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWIC 02	Orifice	SWIC 03	5.6				
15 minute summer	Attenuation #1	1.000	SWIC 02	-16.6	-2.127	-2.119	0.0141	
60 minute summer	SWIC 03	1.002	SWIC 04	5.6	0.754	0.391	0.2852	18.2

Results for 200 year +40% CC Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	SWIC 02	36	9.550	1.200	19.3	0.1908	1.2417	FLOOD
60 minute summer	Attenuation #1	37	9.550	1.200	13.4	7.9850	0.2488	FLOOD
60 minute summer	SWIC 03	37	8.386	0.066	5.6	0.0106	0.0000	OK
60 minute summer	SWIC 04	38	8.135	0.065	5.6	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	SWIC 02	Orifice	SWIC 03	5.6				
15 minute summer	Attenuation #1	1.000	SWIC 02	-18.5	-2.360	-2.351	0.0141	
60 minute summer	SWIC 03	1.002	SWIC 04	5.6	0.757	0.396	0.2877	19.1

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APPENDIX F: DCWW Asset Plans



Scale: 1: 742



LEGEND

Clean Water

-  Sluce Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

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Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

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Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation