



Verification Report and Operation & Maintenance Plan

for

Planning condition 14

Planning Reference 133576/FO/2022

Oakwood Lodge

Wythenshawe

Planning Condition

Planning condition 14 of the approved planning application states the following.

No development hereby permitted shall be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme have been submitted to and approved by the local planning authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details.

Those details shall include:

- o Verification report providing photographic evidence of construction as per design drawings.*
- o As built construction drawings if different from design construction drawings;*
- o Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime*

Reason - To manage flooding and pollution and to ensure that a managing body is in place for the sustainable drainage system and there is funding and maintenance mechanism for the lifetime of the development, in light of national policies within the NPPF and NPPG and Policies EN08 and EN14 in the Manchester Core Strategy.

Response

To comply with condition 14 a Verification Report and Operation and Maintenance Plan shall be submitted to the Planners and approved to allow condition 14 to be discharged.

This Verification Report and Operation and Maintenance Plan shall demonstrate that the sustainable drainage system has been constructed in accordance the agreed scheme, pertaining to the surface water drainage system.

The principle of surface water design is that all storm events up to and including the 100 year rainfall events, including an allowance for climate change of 45%, and 10% urban creep, are restricted to an allowable surface water discharge rate of 23.5 l/s.

The sewers located within the road will be adopted by United Utilities and maintained by them thereafter for the lifetime of the development. United Utilities are only responsible for managing storm events up to and including the 30 year rainfall event. For storm events in excess of the 30 year rainfall event it will be the responsibility of the developer to ensure that surface water volumes are managed to ensure that the discharge rate is maintained at the allowable discharge rate and that no flooding that may occur will affect any dwellings, as set out in planning approvals, and managed for the lifetime of the development.

Photographic Evidence

As visual proof of the construction of the drainage system photographs are included in Appendix A

The following photographs have been provided by the Contractor.

- Installation of cellular attenuation
- Installation of cellular attenuation
- Installation of cellular attenuation
- Installation of cellular attenuation
- Installation of 100-year loop and non-return valve
- Typical Oversized Pipe photo
- Typical Oversized Pipe photo
- Typical Oversized Pipe photo
- Hydro-Brake MH S6
- Permeable Driveways
- Permeable Driveways
- Permeable Driveways

Details and Locations of Sustainable Drainage Elements

There are SuDS provided on this development as part of the drainage design.

The following features have been provided.

Oversized Pipes

Oversized pipes have been provided within the road constructed within the development to attenuate surface water in accordance with Section 104 design requirements, as required by United Utilities, who will adopt the drainage network located within the new road

Details of the oversized pipes are (refer to drawing in appendix for layout);

Location (manholes):	MH S1	x: 383393	y: 389507
	MH S2	x: 383424	y: 389481
	MH S3	x: 383426	y: 389475
	MH S4	x: 383417	y: 389463
	MH S5	x: 383410	y: 389436
	MH S6	x: 383401	y: 389425 (Flow Control)

Material type (manholes): Concrete

Material (diameter & pipe): 600mm diameter / Concrete

Pipe access requirements: Via upstream and downstream manholes as located above

The pipes and manholes will be adopted by United Utilities via a Section 104 Agreement and will become the responsibility of United Utilities to maintain in accordance with their own maintenance regime.

Hydro-Brake

The Hydro-Brake is provided to ensure that the surface water discharge from the site is restricted to the agreed maximum discharge rate, as set out in planning.

The Hydro-Brake is located within MHS6

Details of the Hydro-Brake are(refer to drawing in appendix for layout);

Location:	x: 383401	y: 389425
Manufacturer:	Hydro International	
Manufacturer reference:	MD-SHE-0194-2350-2300-2350	
Design criteria:	Maximum discharge rate, Q=23.5 l/s	
	Design head = 2.3m	
Access requirements:	Via MHS6	

The hydro-brake will be adopted by United Utilities via a Section 104 Agreement and, will become the responsibility of United Utilities to maintain in accordance with their own maintenance regime.

Off line cellular attenuation

To ensure that storm events in excess of the United Utility requirement to manage off line cellular attenuation is provided to manage storm events up to and including 100 year storm events plus a climate change allowance of 40% and also for urban creep in accordance with design guidance at the time of design.

Details of the cellular attenuation is;

Location (centre):	x: 383442	y: 389465
Manufacturer:	Polystorm-R Modular Cells	
Size of attenuation:	8m x 7.5m x 1.4m deep	
Invert Level of attenuation:	33.436m AOD	
Non-return valve:	x: 383436	y: 389468

Loop overflow: 150mm diameter

Loop location / invert: Start x: 383426 y: 389475 @ IL:34.000 AOD
End x: 386436 y: 389468 @ IL:33.407 AOD

Access requirements: Via manhole MHS3 and Chamber S11 (x: 386436 y: 389468).

The offline cellular attenuation, loop and non-return valve will remain private and will be maintained by the management company.

Permeable Paving

To intercept some of the rainfall permeable paving has been provided to all private driveways . The provision of permeable paving will also provide water quality and remove hydrocarbons prior to being discharged to the adopted surface water drainage.

To ensure that storm events in excess of the United Utility requirement to manage offline cellular attenuation is provided to manage storm events up to and including 100 year storm events plus a climate change allowance of 40% and also for urban creep in accordance with design guidance at the time of design.

Details of the cellular attenuation is;

Location (centre): x: 383442 y: 389465

Manufacturer: Polystorm-R Modular Cells

Size of attenuation: 8m x 7.5m x 1.4m deep

Invert Level of attenuation: 33.436m AOD

Operation and Maintenance

As previously stated, the adopted sewers will be maintained by United Utilities in accordance with their own maintenance procedures.

Details of the management company to operate and maintain the private drainage elements are;

Name: Wythenshawe Community Housing Group.

Address: 8 Poundswick Ln, Wythenshawe, Manchester M22 9TA.

Telephone number: 0300 111 0000

The management company will be responsible for maintaining the following elements of drainage.

- Overflow Loop
- Non-Return Valve
- Offline Cellular Attenuation
- Permeable Paving
- Road Gulleys

The maintenance regime should, where applicable, follow the guidance of C753, The SuDS Manual.

Maintenance requirements are recommended as follows.

Overflow Loop

A visual inspection of the loop, at both the start and end of the loop, should be made every 3 months for the first 12 months to ensure that it is still capable of functioning as designed and that construction of the loop pipe has not failed. Thereafter, the loop pipe can be inspected annually or prior to a known storm event that may have been predicted.

Non-return Valve

A visual inspection of the non-return valve should be made every 3 months for the first 12 months to ensure that it is still functioning as installed and that construction of the non-return has not failed. Thereafter, the loop pipe can be inspected annually or prior to a known storm event that may have been predicted.

Cellular Attenuation

In accordance with C753, The SuDS Manual we would recommend that the operation and maintenance requirements be followed, as per table below.

TABLE 21.3 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

Table 21.3, C753, The SuDS Manual

Permeable Paving

In accordance with C753, The SuDS Manual we would recommend that the operation and maintenance requirements be followed, as per table below.

TABLE 20.15 Operation and maintenance requirements for pervious pavements		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 20.15, C753, The SuDS Manual

Appendix A

Photographic Evidence of Surface Water Drainage Construction.

Installation of Cellular Attenuation Photographs



Installation of cellular attenuation



Installation of impermeable wrapping



Installation of venting pipe to attenuation



Installation of fabric protection to impermeable wrapping



Installation of 100 year loop and non return valve

Hydro-Brake Manhole



View of incoming pipe into Hydro-Brake MH



View of Outgoing Pipe to Hydro-Brake MH
(Hydro-Brake to be installed upon completion of
Site Works.

Oversized Pipes



Photo of MH S1



Photo of MH S3



Photo of MH S5

Permeable Paving



Permavoid block



Voided Stone

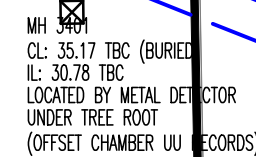


Permeable driveway base course

Appendix B

Plan annotated with coordinates of key surface water drainage items

- Inlets / Outlets
- Storage Structures (Pipes and cellular attenuation)
- Flow controls



DO NOT SCALE OFF THIS DRAWING

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS
REFER TO THE ARCHITECT'S DRAWINGS.

ALL FLOOR LEVELS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION

ALL COVER LEVELS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION

ALL DRAINAGE PENETRATING THOUGH FLOOR SLABS AND RAINWATER PIPE LOCATIONS
TAKEN FROM ARCHITECTS DRAWINGS. ARCHITECT TO CONFIRM LOCATIONS PRIOR TO
CONSTRUCTION.

EXISTING SERVICES

ROAD SIGNS AND LAMP COLUMNS ON THE SITE PERIPHERY TO BE RE-SITED IF REQUIRED BY, AND TO THE APPROVAL OF, THE LOCAL AUTHORITY.

CONTRACTOR TO SATISFY THEMSELVES THAT EXISTING AND PROPOSED SERVICES DO NOT CLASH WITH PROPOSED DRAINAGE

KNOWN EXISTING SERVICES ARE INDICATED ON THE PLAN WHERE THEY CROSS THE PROPOSED DRAINAGE. THE EXACT TYPE AND LOCATION SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO START OF WORKS TO ENSURE THAT PROPOSED DRAINAGE LEV DO NOT INTERFERE WITH SERVICES. ALL DISCREPANCIES SHALL BE REPORTED TO ENGINEER IMMEDIATELY.

THE CONTRACTOR SHALL CHECK ALL EXISTING COVER / INVERT LEVELS AND PIPE / SEWER SIZES ON SITE PRIOR TO START OF WORKS TO ENSURE PROPOSED DRAINAGE CAN BE CONSTRUCTED AS INDICATED ON THE DRAWING. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

ALL REDUNDANT DRAINAGE WITHIN SITE TO BE GRUBBED UP, CHASED AND SEALED TO APPROVAL OF LOCAL AUTHORITY

PROPOSED DRAINAGE

OUTSIDE EDGE OF ADOPTED SEWER SHALL NOT ENCROACH WITHIN 1M OF KERB FACE.
OUTSIDE EDGE OF ADOPTED MANHOLES SHALL NOT ENCROACH WITHIN 0.5M OF KERB FACE.

ALL DRAINAGE IN HIGHWAYS/CAR PARKING AREAS/DRIVEWAYS LESS THAN 1.2M DEEP
BE CONCRETE ENCASED.

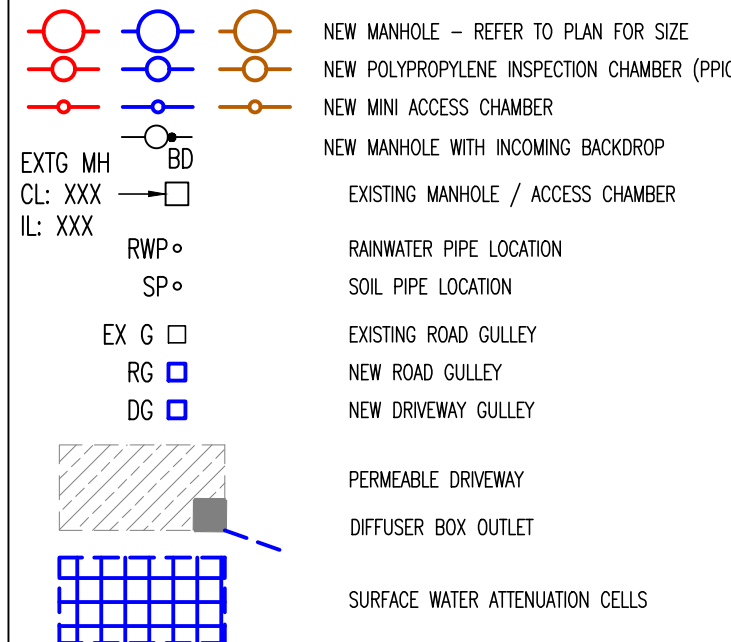
ALL PPIC'S GREATER THAN 1.2M DEEP TO HAVE REDUCED ACCESS COVERS TO PREVENT MAN ENTRY.

SURFACE WATER DRAINAGE:
ALL PRIVATE SURFACE WATER DRAINAGE TO BE 100MM Ø AT 1:80 GRADIENT UNLESS
NOTED OTHERWISE.
ALLOWANCE TO BE MADE FOR DRIVEWAY GULLIES AND ASSOCIATED DRAIN RUNS WHERE
APPLICABLE

FOUL WATER / COMBINED DRAINAGE:
ALL UNDERSLAB FOUL WATER DRAINAGE TO BE 100MM Ø AT 1:40 GRADIENT UNLESS
NOTED OTHERWISE ALL OTHER PRIVATE FOUL WATER DRAINAGE TO BE 100MM Ø AT 1:
GRADIENT UNLESS NOTED OTHERWISE
INTERNAL VENTING OF DRAINAGE SYSTEM TO ARCHITECTS DETAILS
ALL INTERNAL SP/SYP POSITIONS TO BE CONFIRMED BY ARCHITECT PRIOR TO
CONSTRUCTION OF GROUND FLOOR SLAB

	NEW COMBINED PRIVATE DRAIN
	ADOPTED COMBINED SEWER
	EXISTING COMBINED DRAIN / SEWER
	NEW SURFACE WATER PRIVATE DRAIN
	ADOPTED SURFACE WATER SEWER
	EXISTING SURFACE WATER DRAIN / SEWER
	NEW FOUL WATER PRIVATE DRAIN
	ADOPTED FOUL WATER SEWER
	EXISTING FOUL WATER DRAIN / SEWER

EXTG DRAINAGE TO BE
ABANDONED TO L.A. APPROVAL



C01	FOR DRAINAGE VALIDATION REPORT	29.08.23	AJB	DS
Rev	Description	Date	By	Ch

Drawing Status
PRELIMINARY DRAWING



Client
GARDEN CITY DESIGN AND BUILD

Project
OAKWOOD LODGE
WYTHENSHAW

Drawing Title DRAINAGE LAYOUT SuDS FEATURES & COORDINATES

Date AUG. 2023	Drawn By AJB	Checked By DS
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Scale at A1 1:200	Project Number 33266
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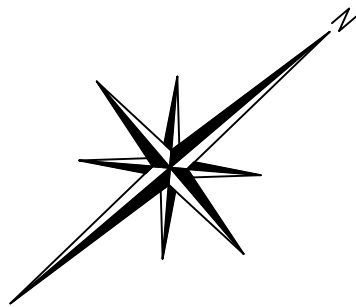
Sheet Number	Revision
33266 SUT 33 XY DB C 6310	C01

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Appendix C

As-Built Drainage Drawing



NOTE: INTERNAL SVP/SP POSITIONS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION OF GROUND FLOOR SLAB.

NOTE: OUTFALL LEVEL TO BE CONFIRMED PRIOR TO CONSTRUCTION OF ANY DRAINAGE

"AS-CONSTRUCTED" DRAWING

THIS DRAWING REPRESENTS THE WORKS AS DESIGNED BY SUTCLIFFE PROJECTS. THIS DRAWING HAS BEEN PRODUCED BASED ON THE ADVICE FROM THE PRINCIPAL CONTRACTOR. SUTCLIFFE HAVE NOT CARRIED OUT A SITE SUPERVISION ROLE THROUGHOUT THE DURATION OF THIS PROJECT AND AS SUCH WE CANNOT GUARANTEE THAT THE WORKS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH THIS DRAWING.

General Notes

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

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INTERNAL VENTING OF DRAINAGE SYSTEM TO ARCHITECT'S DETAILS
ALL INTERNAL SP/SVP POSITIONS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION OF GROUND FLOOR SLAB

DRAINAGE KEY

- NEW COMBINED PRIVATE DRAIN
- ADOPTED COMBINED SEWER
- EXISTING COMBINED DRAIN / SEWER
- NEW SURFACE WATER PRIVATE DRAIN
- ADOPTED SURFACE WATER SEWER
- EXISTING SURFACE WATER DRAIN / SEWER
- NEW FOUL WATER PRIVATE DRAIN
- ADOPTED FOUL WATER SEWER
- EXISTING FOUL WATER DRAIN / SEWER

EXISTING DRAINAGE TO BE ABANDONED TO L.A. APPROVAL

- NEW MANHOLE - REFER TO PLAN FOR SIZE
- NEW POLYPROPYLENE INSPECTION CHAMBER (PPIC)
- NEW MINI ACCESS CHAMBER
- NEW MANHOLE WITH INCOMING BACKDROP
- EXISTING MANHOLE / ACCESS CHAMBER
- RAINWATER PIPE LOCATION
- SOIL PIPE LOCATION
- EXISTING ROAD GULLY
- NEW ROAD GULLY
- NEW DRIVEWAY GULLY
- PERMEABLE DRIVEWAY
- DIFFUSER BOX OUTLET
- SURFACE WATER ATTENUATION CELLS

F01	AS-BUILT ISSUE	23.10.24	MJB	DS
Rev	Description	Date	By	Chkd

AS CONSTRUCTED DRAWING



Client
GARDEN CITY DESIGN AND BUILD

Project
**OAKWOOD LODGE
WYTHENSHAW**

Drawing Title
PRIVATE DRAINAGE LAYOUT

Date AUG. 2023	Drawn By AJB	Checked By DS
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Scale at A1
1:200

Sheet Number
33266

Revision
F01

8m x 7.5m x 1.4m DEEP SURFACE WATER ATTENUATION @ IL: 33.436
POLYSTYROM CELLS (OR SIMILAR). SYSTEM TO BE VENTED & INSTALLED TO MANUFACTURERS DETAILS.
CELLULAR ATTENUATION TO BE BBA CERTIFIED.
CONTRACTOR TO ALLOW FOR CONSTRUCTION LOADING DURING CONSTRUCTION PERIOD OR PROVIDE ADEQUATE PROTECTION TO PREVENT EXCESS LOADING OF CELLULAR ATTENUATION.

