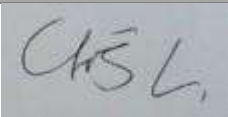




Land at Pilsworth Road, Heywood,
OL10 3ET

Stage 4 Drainage pack
23-511

Revision	Description	Issued by	Checked	Date
P01	First issue	CL	MN	09/02/2024

Prepared by:	Signed:	Date
CL		09/02/2023

Approved by:	Signed:	Date
MN		09/02/2024

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3	Surface Water Drainage Strategy	6
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Appendices

Appendix A – Architect Plans and topographical survey

Appendix B – Drainage strategy

Appendix C – Calculations

Appendix D – Sewer Records

Appendix E - Site Investigation

1 Introduction

QED Structures has prepared this Surface Water Drainage Strategy (SWDS) for the land at Pilsworth Road, Heywood, OL10 3ET.

It is understood the proposed development is comprised of a residential development for a specialist supported living complex (Use Class C3(b)) comprising 8no. flats with ancillary worker facilities, refuse store and landscaping.

The site is currently a greenfield site, consisting of a grassed field with trees and is on a platform raised relative to existing ground levels.

Site investigation, carried out by Soiltechnics, discovered infiltration rates on site to be “effectively impermeable for the purposes of drainage design”.

Sewer records, obtained from United Utilities, show there to be a nearby surface water sewer running along Pilsworth Road. This strategy proposes an offsite connection be made into it, given infiltration is considered unfeasible.

A network model has been created to assess the required storage capacities for the proposed development. The rainfall model used for detailed storage calculations is the FEH22 rainfall model. Storms have been modelled up to, and including, the 1in100yr rainfall event with 45% climate change allowance in accordance with best practice. Peak offsite runoff is to be discharged into a nearby United Utilities surface water sewer at as close to greenfield rates as possible.

A strategy based on attenuation and controlled discharge is proposed with a geocellular tank providing attenuation storage and a hydrobrake limiting runoff. In line with the drainage strategy runoff would be limited via a 50mm aperture Hydrobrake in line with the Code for Adoption DCG for foul and storm sewers. The detailed design shown peak rate storm runoff would be limited to a maximum of 1.3l/s for all events up to and including the 1 in 100 year+45%CC event using a 50mm aperture hydrobrake.

This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and the CIRIA SuDS Manual and drainage strategy issued to support the planning application.

2 Site Location and Proposed Development

The site location is land at Pilsworth Road, Heywood, OL10 3ET.

It is understood the proposed development is comprised of a residential development for a specialist supported living complex (Use Class C3(b)) comprising 8no. flats with ancillary worker facilities, refuse store and landscaping.

The site is currently a greenfield site, consisting of a grassed field with trees and is on a platform raised relative to existing ground levels.

Architectural plans are included in Appendix A as well as a site-specific topographic survey.

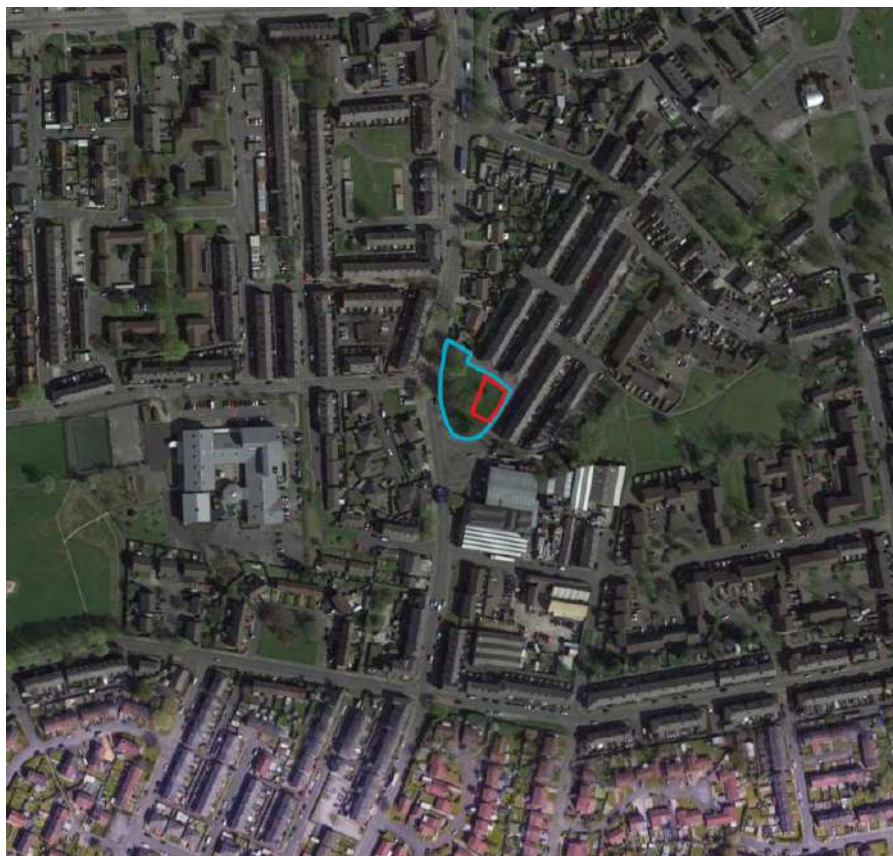


Figure 1 Site Location. Blueline shows the site. Redline shows the extent of the development

Site Investigation conducted by Soiltechnics (Appendix E) found infiltration rates on site to be “effectively impermeable for the purposes of drainage design”.

United Utilities sewer records (Appendix D) show there to be a surface water sewer to the North West of the site.

Based on the information above, a strategy based on attenuation of surface water and controlled discharge to a surface water sewer is proposed.

3 Surface Water Drainage Strategy

This detailed drainage submission has been produced in line with the CIRIA SuDS manual and follows the drainage hierarchy.

The proposed surface water drainage strategy is based around attenuating storm water and discharging it at a controlled rate to a nearby surface water sewer.

A geocellular tank is proposed to provide all necessary attenuation storage. It will be 4x20m in plan area with a depth of 0.8m and a porosity of 0.95, giving a storage volume of 60.8m³. A hydrobrake with a minimum orifice diameter of 50mm, as outlined by the CIRIA SUDS manual, will control runoff from the tank.

Runoff rates will be limited to a maximum of 1.3l/s for all events up to and including the 1 in 100 year+45%CC event.

Calculations have been undertaken using the Causeway Flow+ software, using the FEH22 rainfall data, and runoff rates are shown in the table below

SURFACE WATER DISCHARGE RATES SUMMARY					
	Area (ha)	Discharge Rates (l/s)			
		2 year/ Q_{BAR}	30 year	100 year	100 year +45%CC
Greenfield Rates (site area)	0.1911	1.52	2.59	3.17	-
Proposed Runoff Rates (proposed hardstanding)	0.056	1.0	1.1	1.2	1.3

Table 1: Calculated runoff rates

These calculations consider a hardstanding area of 0.056ha. However, there is additional capacity in the design for up to 0.043ha additional hardstanding to be drained.

Calculations have been included in Appendix C. The proposed drainage layout plan is included in Appendix B.

As the only pollution hazard onsite is residential roofs, pollution treatment measures are not considered necessary. In line with pollution prevention guidance set out within the Ciria SuDS manual C753

4 Foul Water Drainage Strategy

It can be seen from the United Utilities sewer records(Appendix D) that there is a combined sewer running along Tower Street, to the East of the site. It is proposed that foul drainage from the site discharges into this sewer via a new sewer connection. Any new connections offsite would need to be approved by United Utilities prior to construction.

The foul water soil vent pipes will drain externally connecting into it. Then it will head east under Tower Street to make the offsite connection. The proposed Foul Water Drainage layout plan is included in Appendix B.

5 Schedule of Maintenance

All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owners before adoption.

In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.

The property owner will be responsible for the management and maintenance of SuDS devices. Therefore, the proposed SuDS features will not be adoptable. Typical key suds components operation and maintenance activities are provided below.

Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Surface Water Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Foul Drainage System	5 years	10 years	10 years	Cleansing to be carried as necessary
Soakaway/Attenuation crates	See Comments	See Comments	See Comments	Maintained in accordance with manufacturer's recommendation
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried as necessary
Hydrobrake	6 monthly	As required	N/A	Cleansing to be carried as necessary. Inspect after heavy rainfall event
Catchpits	1 year	1 year	N/A	Cleansing to be carried as necessary
Permeable Block Paving	1 year	'Swept' clean of debris every 2 years.	N/A	Lift blocks and remove sand bedding and replace and re-bed paving – refer to individual manufacturers recommendations.

Table 2: Schedule of maintenance for below ground drainage

The maintenance of the soakaway and/or geocellular systems should be in accordance with the manufacturer's recommendations

6 CONCLUSION

QED Structures has prepared this Surface Water Drainage Strategy (SWDS) for the land at Pilsworth Road, Heywood, OL10 3ET.

It is understood the proposed development is comprised of a residential development for a specialist supported living complex (Use Class C3(b)) comprising 8no. flats with ancillary worker facilities, refuse store and landscaping.

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Sewer records, obtained from United Utilities, show there to be a nearby surface water sewer running along Pilsworth Road. This strategy proposes an offsite connection be made into it, given infiltration is considered unfeasible.

A network model has been created to assess the required storage capacities for the proposed development. The rainfall model used for detailed storage calculations is the FEH22 rainfall model. Storms have been modelled up to, and including, the 1in100yr rainfall event with 40% climate change allowance in accordance with best practice. Peak offsite runoff is to be discharged into a nearby United Utilities surface water sewer at as close to greenfield rates as possible.

A strategy based on attenuation and controlled discharge is proposed with a geocellular tank providing attenuation storage and a hydrobrake limiting runoff. Runoff will be limited to a maximum of 1.3l/s for all events up to and including the 1 in 100 year+45%CC event.

This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and the CIRIA SuDS Manual.



APPENDIX A – ARCHITECT PLANS AND TOPOGRAPHICAL SURVEY



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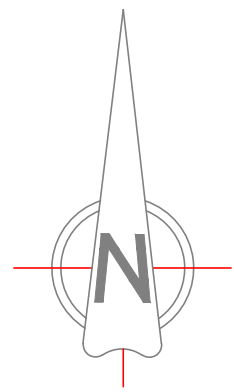
■ WHERE AN ITEM IS COVERED BY DRAWINGS OF DIFFERENT SCALE, THE LARGER SCALE DRAWING TO BE WORKED TO, DO NOT SCALE FROM THE DRAWING. FIGURED DIMENSIONS TO BE WORKED TO IN ALL CASES.

■ CHECK ALL DIMENSIONS ON SITE.

■ DRAWING TO BE READ IN CONJUNCTION WITH THE HEALTH & SAFETY PLAN, AND ALL RELEVANT RISK ASSESSMENTS AND THE FOLLOWING DRAWINGS:

- SITE PLAN LEGEND**
- Existing tree retained
 - Existing tree relocated
 - Existing tree removed
 - New tree
 - New hedgerow / shrub planting
 - Public footpath
 - Grass
 - Paving to front gardens
 - Gravel or bark chipping border
 - Half height metal railings
 - Half height metal railings on masonry retaining wall
 - Sloped ground

A	20.12.23	JS	Issued for full planning application.		
Rev	Date	By	Remarks		
Client:					
Cornerstone Place					
Project Name:					
Pilsworth Road Heywood					
Drawing Name:					
Proposed Site Plan					
Drawing Purpose:					
PLANNING					
Project Number:		Drawing Number:		Revision:	
23-030		02		A	
Scale @ A2	Drawn:	Checked:	Date:		
1 : 200	JS	AJD	December 2023		



Abbreviations/Symbols (Measured Building Surveys):

C:	Window Cill Height
H:	Window Head Height
BH:	Beam Height
DH:	Door Height
COL:	Column
SVP:	Soil Vent Pipe
FL:	Floor Level
TH:	Threshold Level
FL to Ceiling Height	
⤴	Vaulted Ceiling

Line types

~~~~~	Hedge Lines
---	Drainage Runs
- - - - -	Overhead Electricity Cables
- - - - -	Overhead Telephone Cables

Symbols

⊙	Tree/Bush	⊞	Glass House
⚡	Control Station	⬆	Ostom
⊙	Borehole		
⊞	Tril Hole		

Abbreviations (Topographic Survey):

AH:	Arch Height
AV:	Air Valve
BB:	Belted Beacon
BOB:	Electricity Box, Cables Box, Etc.
BOL:	Bollard
BS:	British Telecom Inspection Chamber
BS:	Bus Stop
BS/LP:	Bus Stop / Lamp Post
CAIV:	CAIV Inspection Chamber
CCIV:	Closed Circuit Television
CL:	Cellar Light
CLP:	Catch Pit
ER:	Earth Road
EC:	Electricity Inspection Chamber
EP:	Electricity Pole
FI:	Fire Hydrant
FP:	Flag Pole
GV:	Gas Valve
G:	Gully
IC:	Inspection Chamber
KO:	Kerb Outlet
LP:	Lamp Post
LB:	Letter Box
LC:	Lighting Column
MR:	Marker
MH:	Manhole
MP:	Mooring Point
MS:	Mile Stone
NYNEX:	Nynex Inspection Chamber
O/H:	Over Hang
P:	Post
PO/IC:	Post Office Inspection Chamber
R/S:	Road Sign
RE:	Rodding Eye
RTW:	Retaining Wall
S/P:	Sign Post
SNP:	Street Name Plate
ST:	Stop Tap
SV:	Stop Valve
T:	Telecom Inspection Chamber
TCB:	Telephone Call Box
TH:	Threshold Level
TL:	Traffic Light
TP:	Telegraph Pole
TROUGH:	Trough
WO:	Water Outlet
WM:	Water Meter

Fence Descriptions:

B/W:	Barbed Wire
C/B:	Close Boarded
C/BARRIER:	Crash Barrier
C/L:	Chain Link
C/P:	Chestnut Paving
C/I:	Corrugated Iron
I/R:	Iron Rolling
MIS/C:	Miscellaneous
P/R:	Post & Rail
P/W:	Post & Wire
P/C:	Post & Chain
S/PAL:	Steel Palisade
W/M:	Wire Mesh

Survey Notes:

Coordinates and Levels related to Ordnance Survey Datum - GPS OSGB36

Revision	Date	Description



Chris Partington Land Surveyors

56a Carrington Lane

Sale

Cheshire

M33 5NR

T: 0161 976 1194

www.cpls.co.uk esurvey@cpls.co.uk

Client

Triangle Architects

Project

Pilsworth Road, Heywood

Site Survey

Scale 1:200

Surveyed By J C

Date 09.10.23

Drawing No. C/PLS

Checked By

Date 10.10.23

091023JC-01

Drawn By J C

Date 10.10.23

Station	Easting	Northing	Level
1	384967.777	410472.403	112.461
2	384941.437	410463.764	110.161

0 2 4 6 8 10 20m

SCALE 1:200

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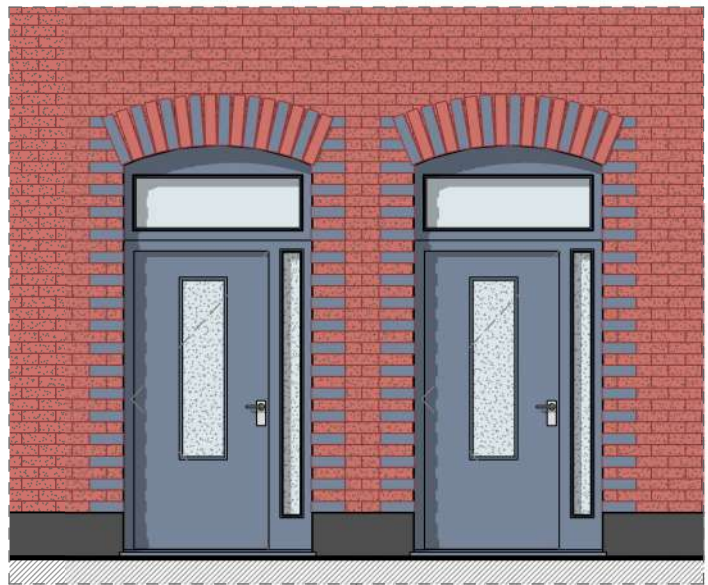
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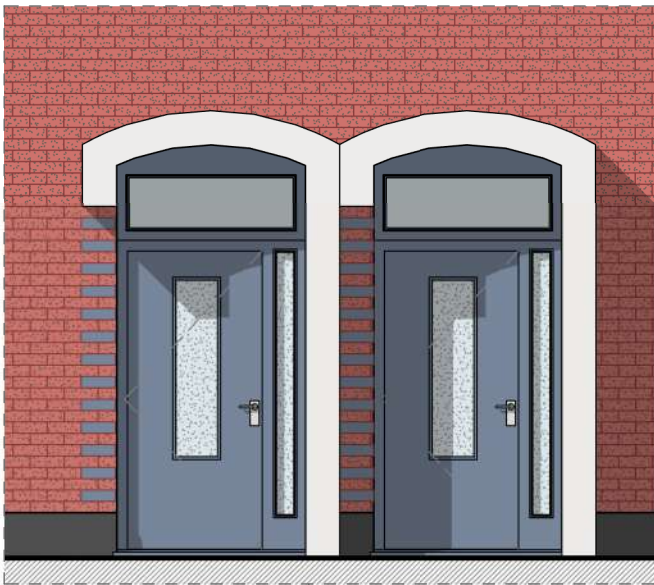
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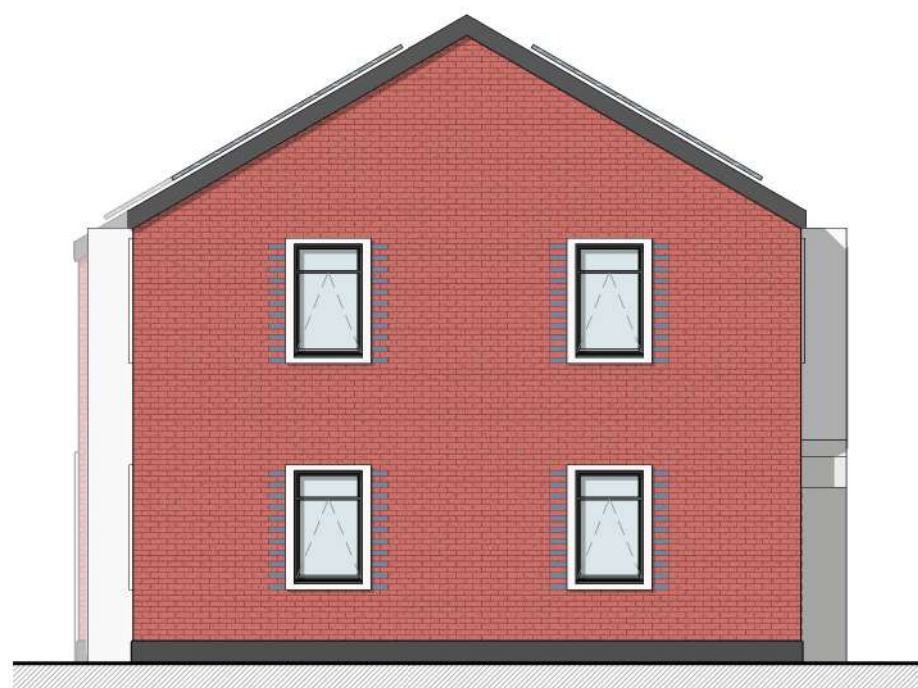
Entrance Door Detailing  
Option 1



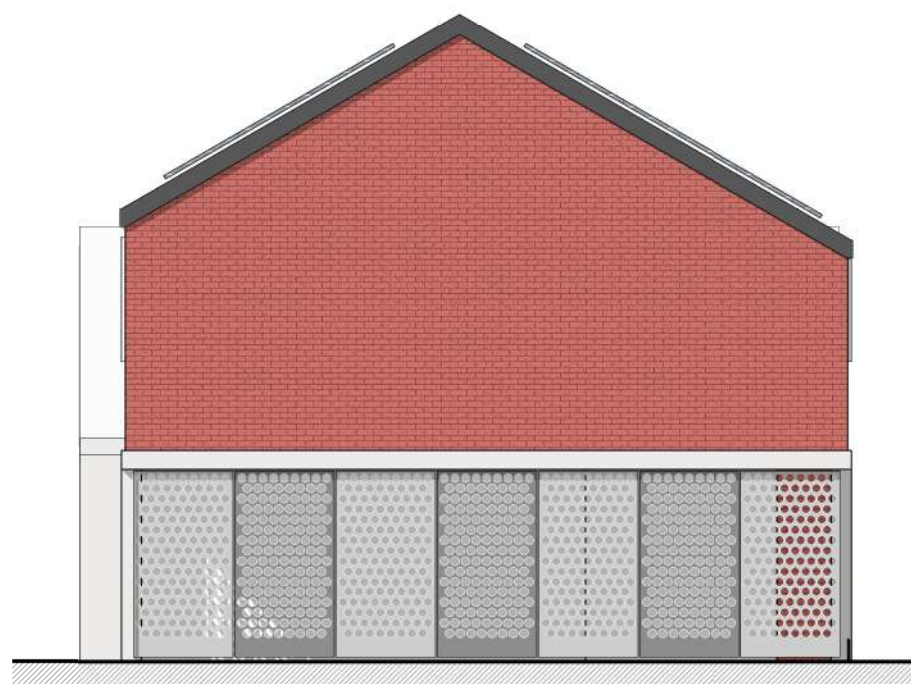
Entrance Door Detailing  
Option 2



FRONT ELEVATION



SIDE ELEVATION 1



SIDE ELEVATION 2



REAR ELEVATION

Scale 1:100

0m 1m 2m 5m



Precedent 1 - Existing Context

The Victorian terraces along Tower Street demonstrate the attention to detail and craftsmanship of the bricklayers of the time, with decorative arch features accentuating the doors and windows. The tall, narrow proportions of the properties create a dense rhythm of fenestration. These features, along with the deep red Victorian brick, inspire the design, which re-interprets these features in a contemporary manner.



Precedent 2 - Port Loop, Birmingham

This precedent recreates similar tall, narrow proportions to the Victorian terraces, and accentuates the portrait windows with surround features. A similar feature is incorporated in the design to accentuate the fenestration and provide depth to the facade.



Precedent 3 - Seven Acres, Cambridge

The monolithic brick forms cantilever over the timber clad undercrofts, concealing the service spaces below the main building. A similar principle is adopted for the cycle and bin stores, with the brick mass extending over the cycle and bin stores, which are enclosed with perforated metal panels.

P02	07.12.23	JS	Drawings amended with two emergency accommodation, extended undercroft space, and developed elevational detailing.
P01	24.11.23	JS	Draft floor plans & elevations issued for comment.
Rev	Date	By	Remarks

Client:	Cornerstone Place		
Project Name:	Pilsworth Road		
Drawing Name:	Proposed Elevations		
Drawing Purpose:	INFORMATION		
Project Number:	Drawing Number:	Revision:	
23-030	SK16	P02	
Scale @ A1	Drawn:	Checked:	Date:
As indicated	JS	AJD	November 2023



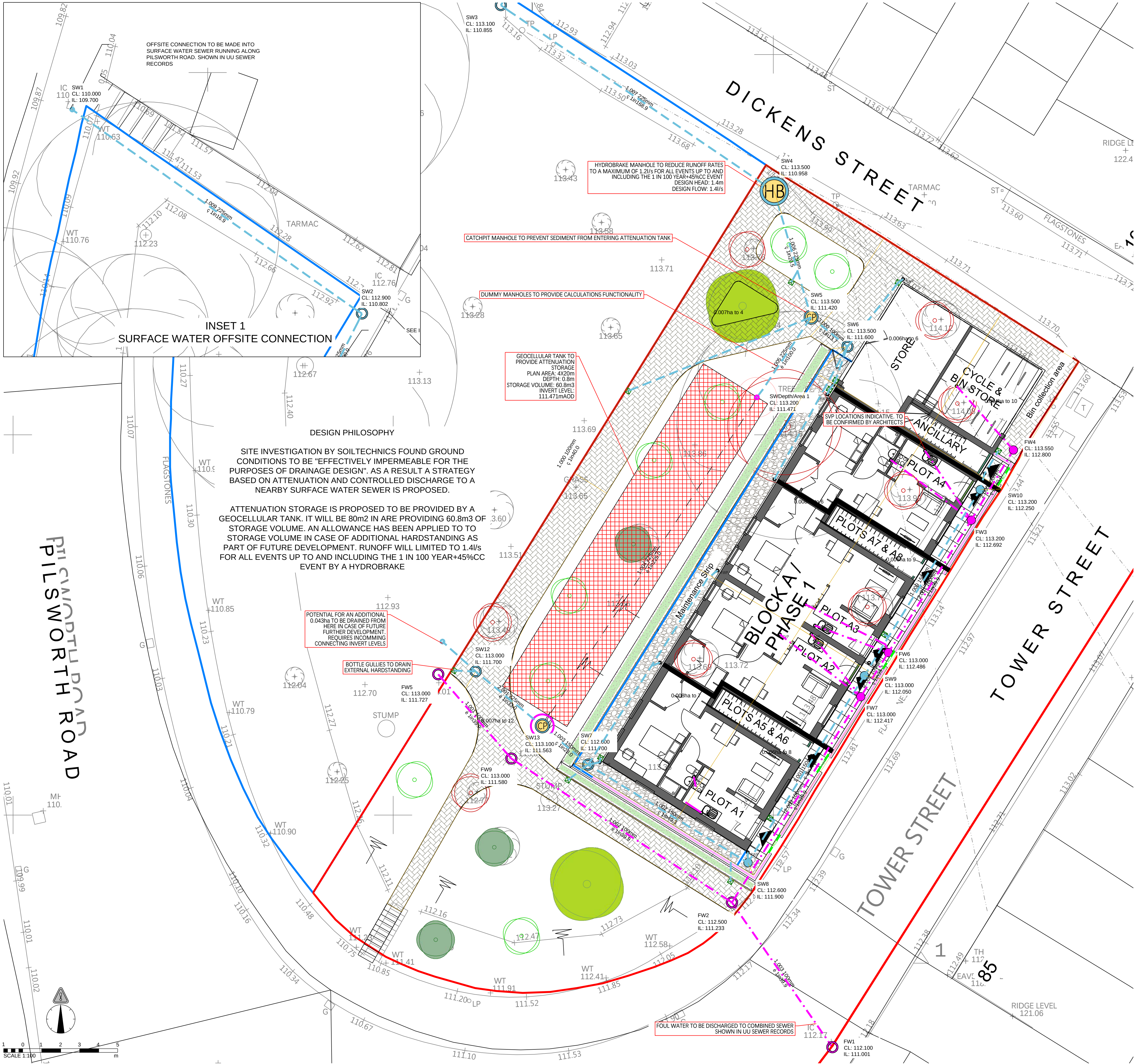
## **APPENDIX B – DRAINAGE STRATEGY**

NOTES

- This drawing shall be read in conjunction with the civil engineering specification, and all relevant Architect's and Engineer's drawings.
- This document must not be altered, reproduced or distributed without prior written consent of the originator.
- Do not scale from this document – use figured dimensions only. All dimensions must be checked on site prior to commencement of any related works.
- Contractor to provide and have an approved method statement prior to works.
- All setting out to be in accordance with the Architects drawings. Any discrepancies between QED Structures and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
- All levels are in metres above ordnance datum.
- The Contractor is to comply full with CDM regulations in the course of constructing the works.
- At the commencement of the works, the Contractor is to carry out trial pits and liaise with utility companies in order to establish the exact position of all existing utility plant in the vicinity of the works and take adequate precautions for their protection.
- The Contractor is to refer to Health and Safety Executive 'Note 47 – Avoiding Danger from Underground Services' and 'Document C56 – Avoiding Danger from Overhead Electric Lines'.
- Works on or adjacent to existing public highway will be executed in accordance with the Traffic Safety Code for Road Works and Traffic Signs Manual: Chapter 8.
- The Contractor will ascertain the CBR value of the subgrade in order to determine the required sub-base / capping thickness. Prior to laying any material, the subgrade must be inspected and any soft spots removed and filled with 6F2 capping material.
- Prior to the construction of any drainage works, the Contractor is to confirm the invert levels of existing manholes, drains and sewers. Any variations from the designed levels shown on the drawings must be reported to the Drainage Engineer in advance of construction works commencing. All new sewers and drains are to be laid in sequence starting from the outfall location.
- All drainage to be installed in accordance with relevant Building Regulation documents and current Sewers for Adoption. Connections to public sewers are to be agreed and inspection by the Water Authority.
- All drain and sewer pipes are Ø100mm and laid soffit to soffit, unless shown otherwise.
- Invert to base of soil stack bends to be 450mm below lowest branch connection for up to three storey buildings; for buildings up to five storeys, the invert to the base of soil stack bends should not be less than 750mm. All foul and surface water drainage stocks are to have above ground ridding access. Refer to above ground drainage layout(s) by others.
- All below ground connections are to match above ground outlet size, minimum Ø100mm. SVPs are to project 100mm above finished floor level.
- All internal manholes and inspection chambers to have double sealed recessed covers to suit floor finishes as defined by the Architect.
- All external covers in non-asphalt areas are to have recessed covers to suit the paving material.
- A CCTV survey and report in WINCAN format for all new drainage will be required prior to 'as built' drawing being issued.
- The Contractor is responsible for the traffic safety and management associated with the construction of the works. Works will not commence on the existing highway until their traffic management proposals have been agreed with Highway Authority.
- Where the works involve the obstruction of a footway, the Contractor will provide an alternative safe footway properly signed, guarded and lit.
- Where one-way traffic is unavoidable, traffic will be controlled by a proper system of vehicle-actuated traffic signals or manual stop / go signs and during the hours of darkness, by a proper system of vehicle-actuated traffic signals, all to the approval of Highway Authority.
- 65mm Minimum thickness tactile paving, coloured buff will be incorporated at all pedestrian crossings in accordance with the Department for Transport and Regions document "Guidance on the Use of Tactile Paving Surfaces." (DETR No. 1998)
- All signs and road markings will be in accordance with the "Traffic Signs Regulations and General Directions 2016". (TSRGD 2016)
- All excavation and backfilling work in the existing highway to be in accordance with the provisions of the New Street Works Act 1991 or that specified on the working drawings.
- All highways works to be carried out in accordance with Highway Authority's highway standards, to the satisfaction of the Highway Authority Section 278 Inspector and in accordance with the Specification for Highway Works.
- Gullies, gully connections, drains, manholes, catch pit, soakaways, headwalls and other drainage structures intended to convey only highway water are to be constructed in accordance with the specification of Highway Authority and to the satisfaction of the Highway Inspector.
- Where existing junctions and accesses are to remain in operation within the works during the construction process, the Contractor will ensure that access to these units remains available at all times.
- Highways in the vicinity of the works must be kept free from mud, debris and dust falling from vehicles or wheels of vehicles connected with the works. Where the deposits of debris and mud are unavoidable, warning signs must be displayed whilst work is in progress and affected carriageways / footways must be regularly cleaned.

Source:

- Topographical survey by ? Drawing No. ? dated ?
- Architect's layout by ? Drawing No. ? dated ?



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  - THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS

LEGEND			
	PROPOSED SW PIPE RUN		
	PROPOSED TYPE 3 SW INSPECTION CHAMBER		
	PROPOSED TYPE 4 SW INSPECTION CHAMBER		
	PROPOSED HYDROBRAKE MANHOLE		
	CATCHPIT CHAMBER/MANHOLE		
	PROPOSED SW RAINWATER PIPE		
	PROPOSED SW BOTTLE GULLY		
	JUNCTION/DUMMY SW MANHOLE - NEEDED TO RUN MODEL		
	GEOCELLULAR ATTENUATION - TANKED		
	DUMMY SW RUN - NEEDED TO RUN MODEL		
	PROPOSED FW PIPE RUN		
	PROPOSED TYPE 3 FW INSPECTION CHAMBER		
	JUNCTION / DUMMY FW MANHOLE - NEEDED TO RUN MODEL		
	EXISTING PUBLIC COMBINED RUN - RETAINED		
	PROPOSED FW BIN GULLY		

P01	Issued for information	N.Y.I.		
REV	DESCRIPTION	DATE	BY	APP



QED PROJECT No.  
23-511

CLIENT  
Cornerstone Place

PROJECT  
Pilsworth Road  
Heywood  
OL10 3BT

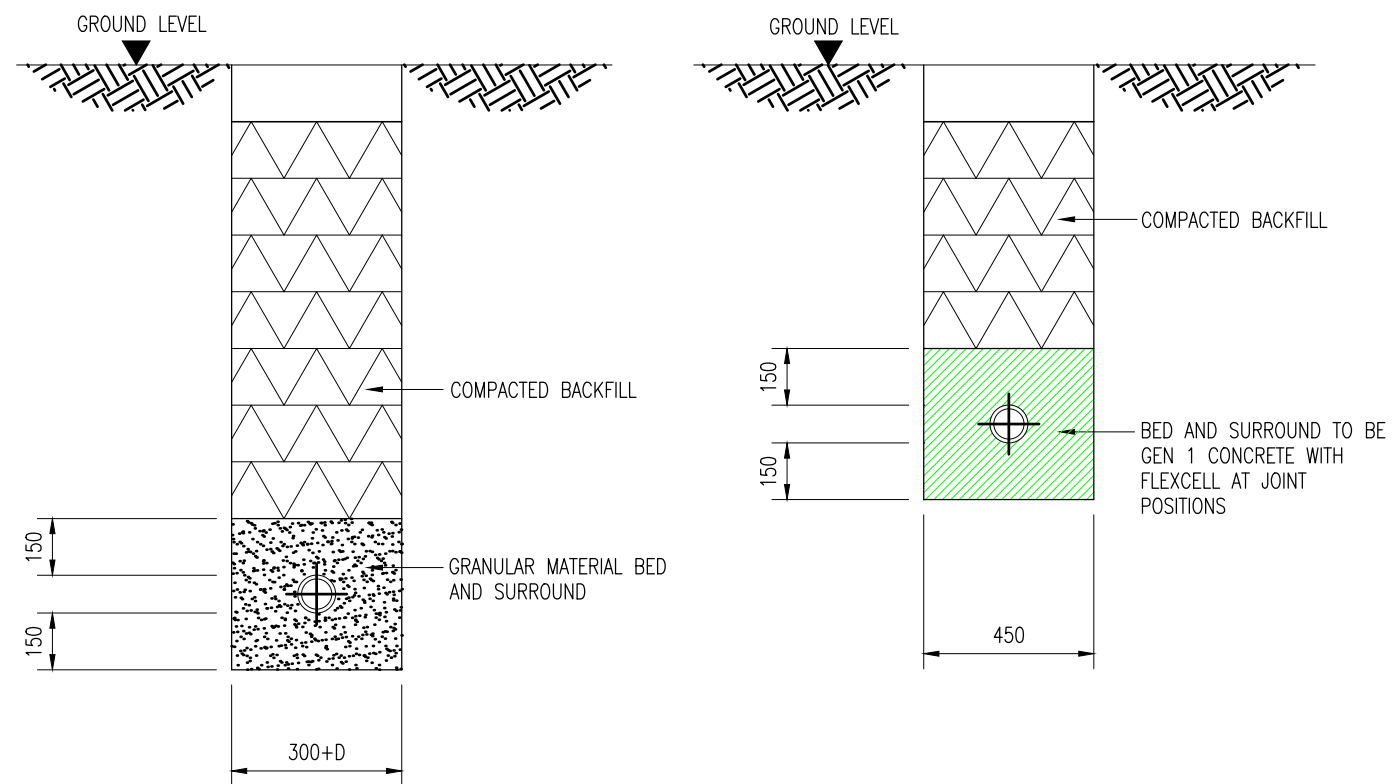
TITLE  
Site Layout  
Surface and Foul Drainage

DRAWN	ENGINEER	CHECKED BY	APPROVED BY
CL	MN	MN	MN

DATE APPROVED 07/02/2024 SCALE @ A1 1:100

STATUS  
S3 - Suitable for Review and Comment

DRAWING No.	REVISION
23-511-QED-XX-XX-DR-C-200	P01



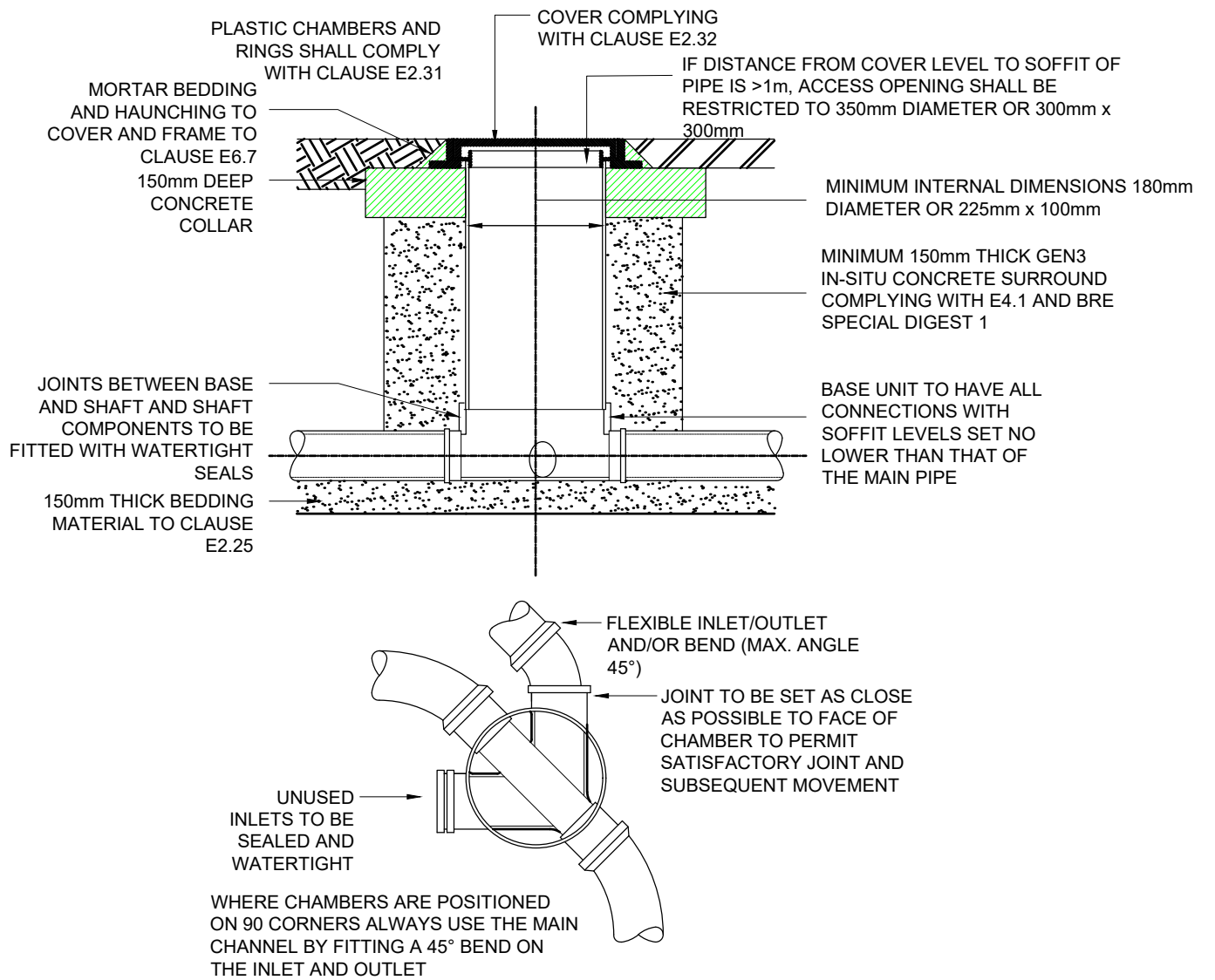
### GRANULAR BEDDING

DETAIL.  
(WHERE COVER  
>600mm)  
(1:20)

### CONCRETE BEDDING

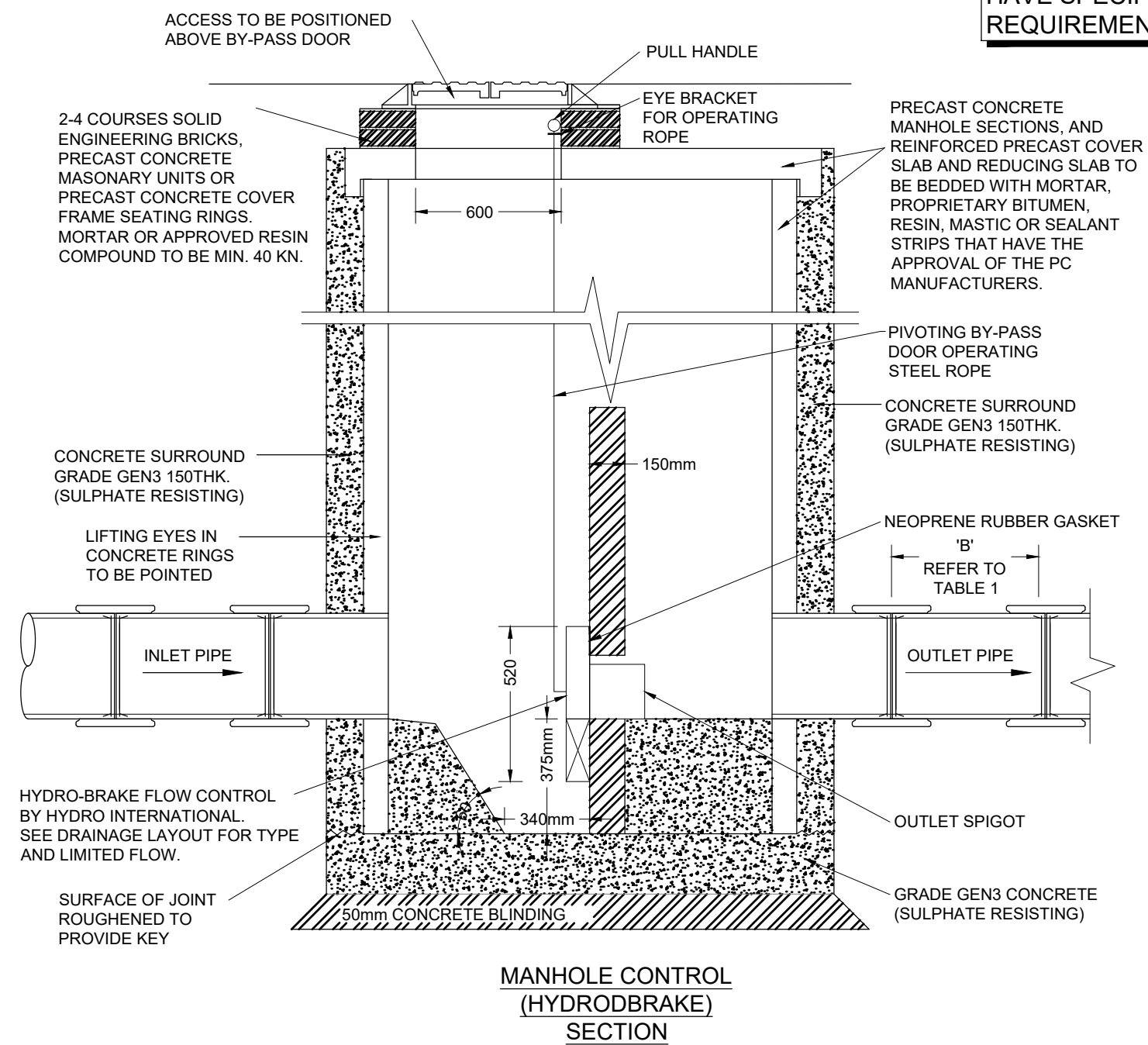
DETAIL.  
(WHERE COVER  
<600mm)  
(1:20)

NOTE  
ALL BACKFILLING AND REINSTATEMENT WITHIN ROADS AND  
STREETS TO BE IN ACCORDANCE WITH THE HIGHWAY  
AUTHORITY AND HAUC SPECIFICATION.

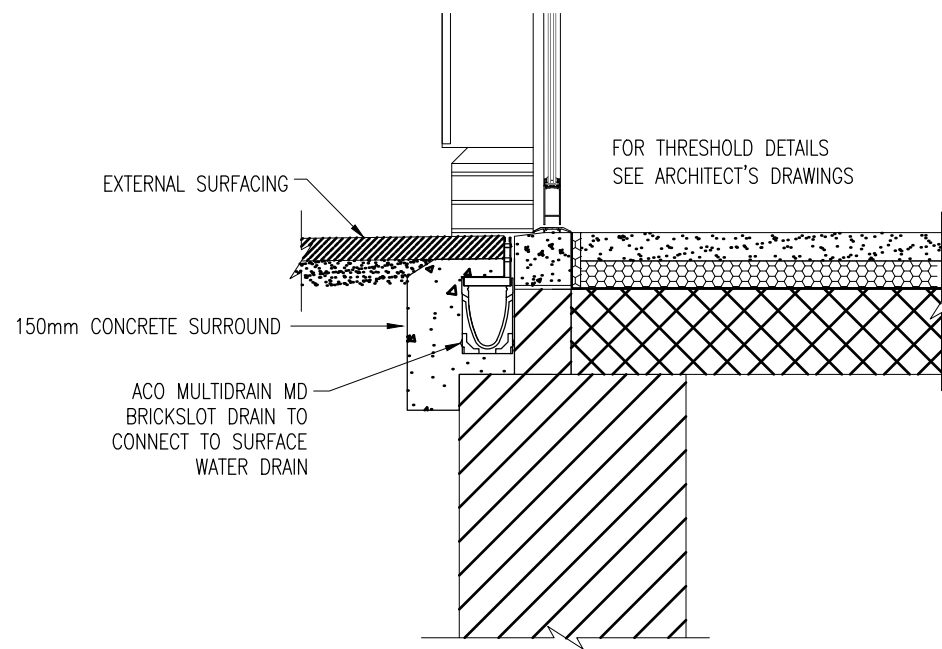


### TYPE E TYPICAL INSPECTION CHAMBER DETAIL - FLEXIBLE MATERIAL (DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE UP TO 2m)

NOTE - WHERE THE  
ACCESS CHAMBER IS IN  
THE HIGHWAY (INCLUDING  
ANY FOOTWAY), THE  
HIGHWAY AUTHORITY CAN  
HAVE SPECIFIC  
REQUIREMENTS



### TRAPPED RWP CONNECTION.



### ACO BRICKSLOT DRAIN. (AT THRESHOLD)

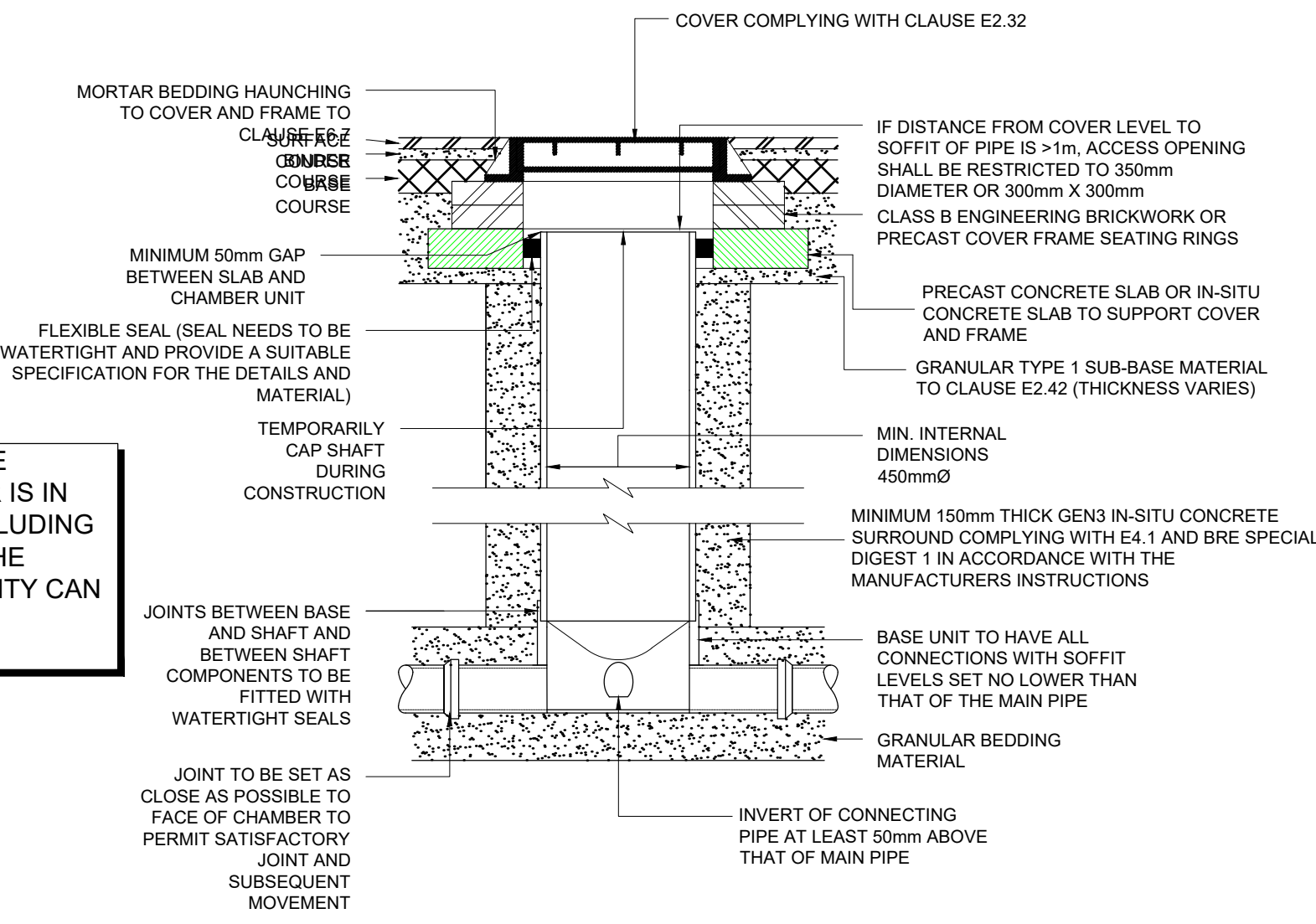
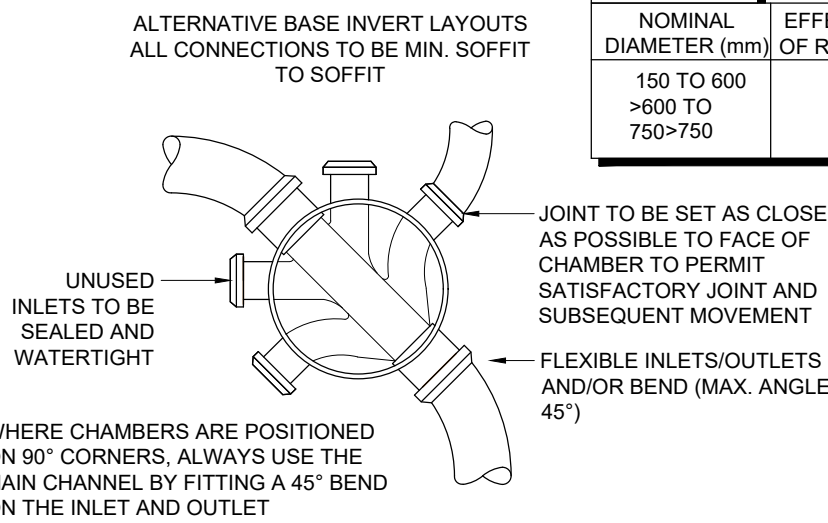
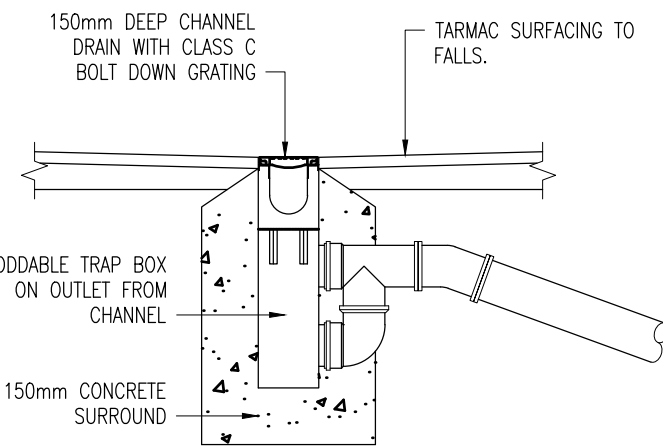


TABLE 1	NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH OF ROCKER PIPE (m)
150 TO 600	0.6	
>600 TO 750	1.0	
750 TO 1000	1.2	

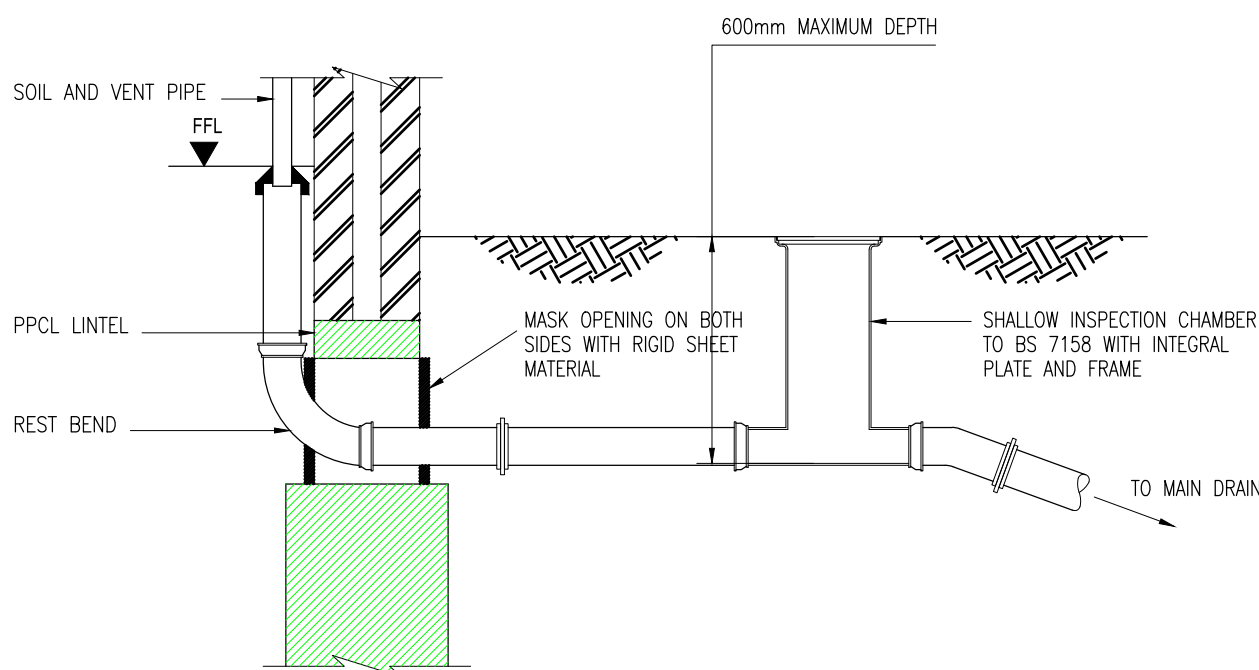


### TYPE D INSPECTION CHAMBER DETAIL - FLEXIBLE MATERIAL.

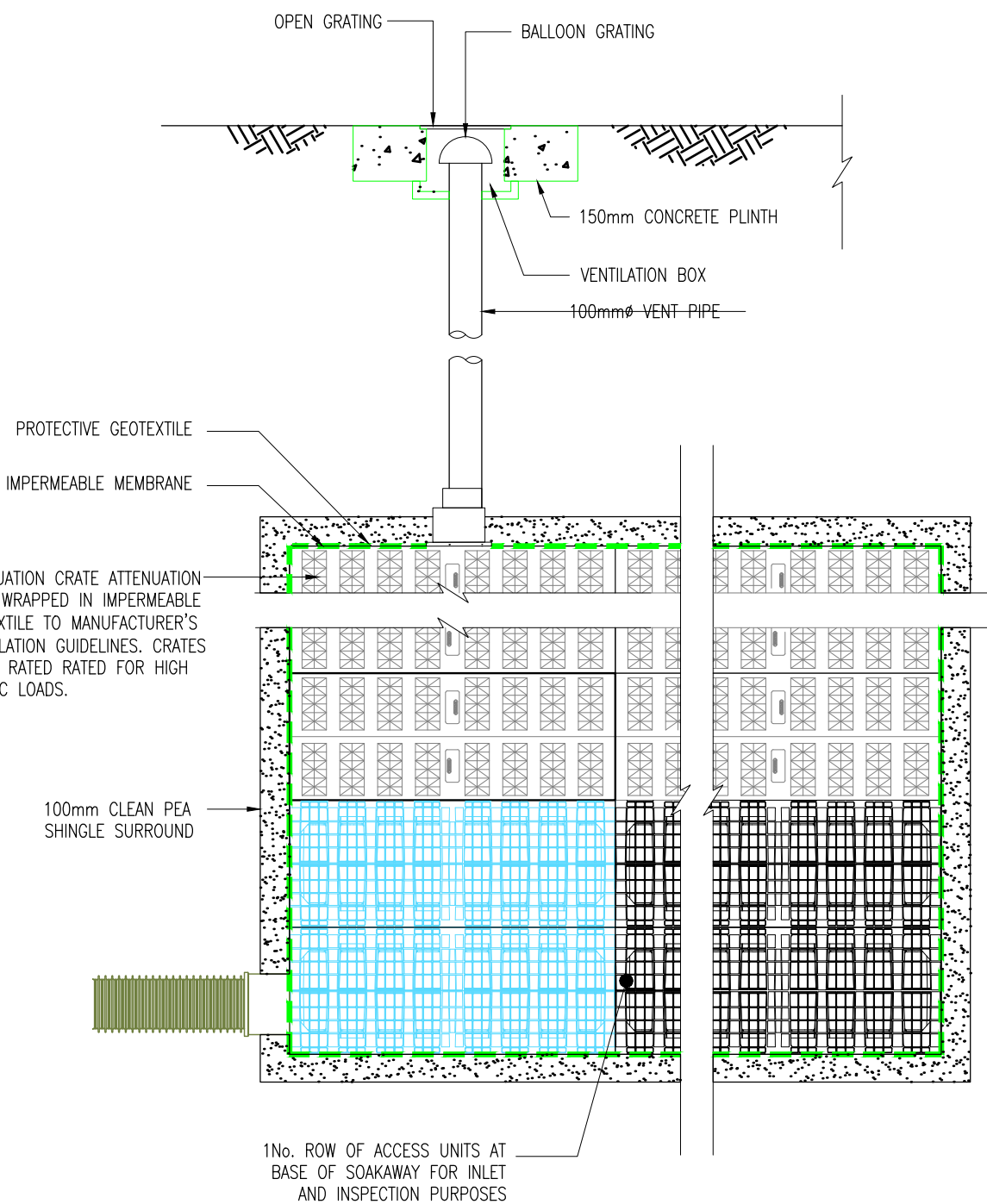
(FOR USE IN AREAS SUBJECT TO VEHICLE LOADING,  
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE UP TO 3M)



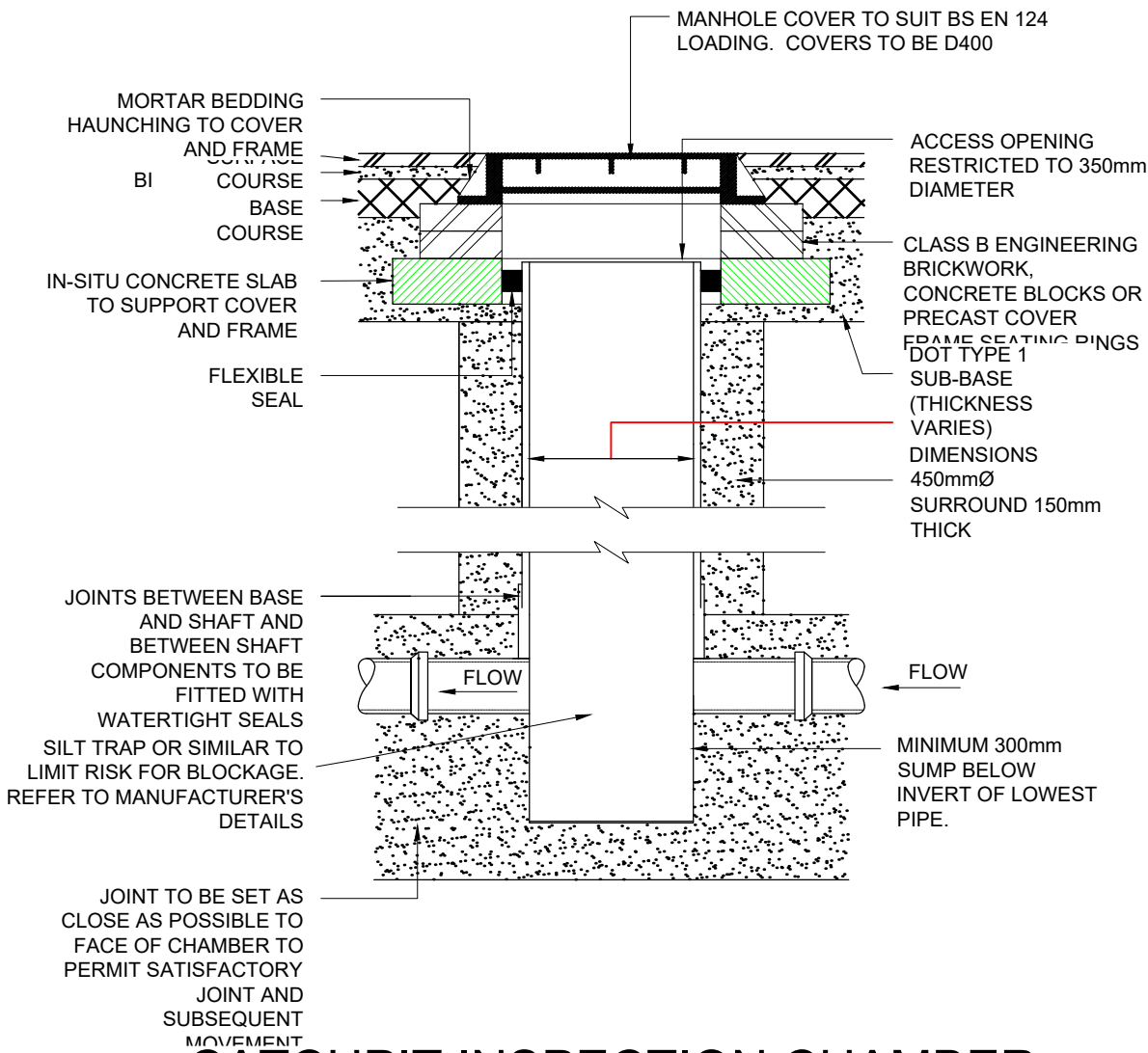
### CHANNEL DRAIN



### FOUL CONNECTION TO MAIN DRAINAGE.



### ATTENUATION TANK DETAIL.



### CATCHPIT INSPECTION CHAMBER. (PREFORMED POLYPIPE RIDGISTORM 450-1500Ø CATCHPIT MANHOLE OR SIMILAR), MAX. DEPTH 3m, NON-ENTRY)

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P01	Issued for information	N.Y.I.		
REV	DESCRIPTION	DATE	BY	APP



CONSULTING CIVIL AND  
STRUCTURAL ENGINEERS  
TEL +44 (0) 1273 033680

QED PROJECT No.  
23-511

CLIENT  
Cornerstone Place

PROJECT  
Pilsworth Road  
Heywood  
OL10 3BT

TITLE  
Design Details

DRAWN CL	ENGINEER MN	CHECKED BY MN	APPROVED BY MN
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DATE APPROVED 07/02/2024 SCALE @ A1 1:100

STATUS  
S3 - Suitable for Review and Comment

DRAWING No. 23-511-QED-XX-XX-DR-C-210	REVISION P01
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## **APPENDIX C – CALCULATIONS**

Calculated by:	Chrisopher Lee
Site name:	MC0390
Site location:	Pilsworth Road

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Site Details

Latitude:	53.59075° N
Longitude:	2.22861° W
Reference:	864497332
Date:	Feb 07 2024 17:09

## Runoff estimation approach

IH124

## Site characteristics

Total site area (ha):	0.1911
-----------------------	--------

## Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

## Notes

### (1) Is Q_{BAR} < 2.0 l/s/ha?

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

## Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

### (2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

## Hydrological characteristics

	Default	Edited
SAAR (mm):	1075	1075
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

### (3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

Default

Edited

<b>Q_{BAR} (l/s):</b>	1.52	1.52
<b>1 in 1 year (l/s):</b>	1.33	1.33
<b>1 in 30 years (l/s):</b>	2.59	2.59
<b>1 in 100 year (l/s):</b>	3.17	3.17
<b>1 in 200 years (l/s):</b>	3.61	3.61

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
✓ 12	0.007	4.00	113.000	Manhole	Adoptable	1200	203.225	-107.883	1.300
✓ 10	0.004	4.00	113.200	Manhole	Adoptable	1200	229.771	-98.324	0.950
✓ 9	0.006	4.00	113.000	Manhole	Adoptable	1200	223.679	-108.109	0.950
✓ 8	0.006	4.00	112.600	Manhole	Adoptable	1200	217.555	-117.945	0.700
✓ 7	0.008	4.00	112.600	Manhole	Adoptable	1200	209.142	-112.784	0.900
✓ 6	0.014	4.00	113.500	Manhole	Adoptable	1200	222.789	-90.800	1.900
✓ 5			113.500	Manhole	Adoptable	1200	220.878	-89.251	2.205
✓ 4	0.007	4.00	113.500	Manhole	Adoptable	1200	218.934	-82.626	2.542
✓ 3			113.100	Manhole	Adoptable	1200	204.553	-72.836	2.245
✓ 2			112.900	Manhole	Adoptable	1200	207.003	-68.102	2.098
✓ 1			110.000	Junction			191.760	-57.380	0.300
✓ Depth/Area 1			113.200	Junction			218.020	-93.466	1.729
✓ 13			113.100	Manhole	Adoptable	1200	206.730	-110.748	1.537
✓ 11		4.00	113.000	Manhole	Adoptable	1200	200.427	-105.367	0.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	0.950	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.950	Drain Down Time (mins)	1440	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0
30	0	10	0
100	0	10	0
100	45	10	0

Node 4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.007	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0051-1400-1400-1400
Invert Level (m)	110.958	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.400	Min Node Diameter (mm)	1200
Design Flow (l/s)	1.4		

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	111.471
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	80.0	0.0	0.800	80.0	0.0	0.801	0.0	0.0

**Results for 2 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	12	10	111.719	0.019	1.3	0.0213	0.0000	OK
15 minute summer	10	10	112.268	0.018	0.7	0.0202	0.0000	OK
15 minute summer	9	10	112.080	0.030	1.8	0.0341	0.0000	OK
15 minute summer	8	10	111.935	0.035	2.9	0.0396	0.0000	OK
15 minute summer	7	10	111.735	0.035	4.3	0.0400	0.0000	OK
15 minute summer	6	10	111.629	0.029	2.5	0.0327	0.0000	OK
120 minute summer	5	102	111.532	0.237	4.0	0.2680	0.0000	SURCHARGED
120 minute summer	4	102	111.536	0.577	2.3	0.6532	0.0000	SURCHARGED
360 minute winter	3	176	110.879	0.024	1.0	0.0268	0.0000	OK
480 minute winter	2	248	110.817	0.015	1.0	0.0166	0.0000	OK
480 minute winter	1	248	109.715	0.015	1.0	0.0000	0.0000	OK
180 minute summer	Depth/Area 1	120	111.518	0.047	2.4	3.5874	0.0000	OK
15 minute summer	13	10	111.629	0.066	5.6	0.0743	0.0000	OK
15 minute summer	11	1	112.500	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	12	2.001	13	1.3	0.441	0.014	0.0254	
15 minute summer	10	1.000	9	0.7	0.385	0.030	0.0213	
15 minute summer	9	1.001	8	1.8	0.635	0.088	0.0327	
15 minute summer	8	1.002	7	2.9	0.914	0.113	0.0310	
15 minute summer	7	1.003	13	4.3	0.816	0.114	0.0167	
15 minute summer	6	3.000	5	2.5	1.418	0.152	0.0059	
120 minute summer	5	1.006	4	2.2	0.251	0.019	0.2746	
120 minute summer	4	1.007	3	1.0	0.446	0.026	0.0406	
360 minute winter	3	1.008	2	1.0	0.642	0.020	0.0088	
480 minute winter	2	1.009	1	1.0	0.965	0.008	0.0201	13.2
180 minute summer	Depth/Area 1	1.005	5	3.6	0.535	0.068	0.0602	
15 minute summer	13	1.004	Depth/Area 1	5.5	1.242	0.159	0.1059	
15 minute summer	11	2.000	12	0.0	0.000	0.000	0.0000	

Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	12	10	111.729	0.029	3.2	0.0327	0.0000	OK
15 minute summer	10	10	112.278	0.028	1.8	0.0318	0.0000	OK
15 minute summer	9	10	112.100	0.050	4.6	0.0562	0.0000	OK
15 minute summer	8	10	111.958	0.058	7.5	0.0656	0.0000	OK
15 minute summer	7	10	111.766	0.066	11.1	0.0744	0.0000	OK
15 minute summer	6	10	111.650	0.050	6.4	0.0566	0.0000	OK
120 minute winter	5	114	111.628	0.333	4.6	0.3770	0.0000	SURCHARGED
120 minute winter	4	114	111.629	0.671	2.6	0.7587	0.0000	SURCHARGED
720 minute winter	3	300	110.879	0.024	1.0	0.0268	0.0000	OK
720 minute winter	2	300	110.817	0.015	1.0	0.0166	0.0000	OK
720 minute winter	1	300	109.715	0.015	1.0	0.0000	0.0000	OK
120 minute winter	Depth/Area 1	114	111.627	0.156	5.7	11.8289	0.0000	OK
15 minute summer	13	10	111.664	0.101	14.3	0.1147	0.0000	OK
15 minute summer	11	1	112.500	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	12	2.001	13	3.2	0.513	0.035	0.0460	
15 minute summer	10	1.000	9	1.8	0.497	0.077	0.0425	
15 minute summer	9	1.001	8	4.6	0.809	0.227	0.0659	
15 minute summer	8	1.002	7	7.5	1.092	0.295	0.0677	
15 minute summer	7	1.003	13	11.1	1.098	0.297	0.0317	
15 minute summer	6	3.000	5	6.4	1.670	0.390	0.0144	
120 minute winter	5	1.006	4	2.6	0.209	0.022	0.2746	
120 minute winter	4	1.007	3	1.0	0.446	0.026	0.0406	
720 minute winter	3	1.008	2	1.0	0.642	0.020	0.0088	
720 minute winter	2	1.009	1	1.0	0.965	0.008	0.0201	28.8
120 minute winter	Depth/Area 1	1.005	5	4.6	0.545	0.089	0.1724	
15 minute summer	13	1.004	Depth/Area 1	14.3	1.537	0.416	0.2380	
15 minute summer	11	2.000	12	0.0	0.000	0.000	0.0000	

**Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	12	10	111.732	0.032	4.0	0.0363	0.0000	OK
15 minute summer	10	10	112.282	0.032	2.3	0.0359	0.0000	OK
15 minute summer	9	10	112.107	0.057	5.8	0.0641	0.0000	OK
15 minute summer	8	10	111.966	0.066	9.4	0.0748	0.0000	OK
15 minute summer	7	10	111.778	0.078	14.0	0.0880	0.0000	OK
120 minute summer	6	120	111.684	0.084	3.5	0.0951	0.0000	OK
120 minute summer	5	120	111.684	0.389	4.6	0.4395	0.0000	SURCHARGED
120 minute summer	4	120	111.684	0.726	2.6	0.8212	0.0000	SURCHARGED
480 minute summer	3	192	110.879	0.024	1.0	0.0268	0.0000	OK
480 minute summer	2	192	110.817	0.015	1.0	0.0166	0.0000	OK
480 minute summer	1	192	109.715	0.015	1.0	0.0000	0.0000	OK
120 minute winter	Depth/Area 1	118	111.683	0.212	7.7	16.1224	0.0000	OK
120 minute winter	13	118	111.683	0.120	5.3	0.1358	0.0000	OK
15 minute summer	11	1	112.500	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	12	2.001	13	4.0	0.558	0.044	0.0532	
15 minute summer	10	1.000	9	2.3	0.532	0.098	0.0507	
15 minute summer	9	1.001	8	5.8	0.855	0.287	0.0786	
15 minute summer	8	1.002	7	9.4	1.125	0.370	0.0824	
15 minute summer	7	1.003	13	14.0	1.181	0.375	0.0371	
120 minute summer	6	3.000	5	3.5	1.137	0.212	0.0183	
120 minute summer	5	1.006	4	2.6	0.277	0.022	0.2746	
120 minute summer	4	1.007	3	1.0	0.446	0.026	0.0407	
480 minute summer	3	1.008	2	1.0	0.642	0.020	0.0088	
480 minute summer	2	1.009	1	1.0	0.965	0.008	0.0201	36.5
120 minute winter	Depth/Area 1	1.005	5	3.9	0.543	0.075	0.2002	
120 minute winter	13	1.004	Depth/Area 1	5.3	0.729	0.154	0.6232	
15 minute summer	11	2.000	12	0.0	0.000	0.000	0.0000	

**Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 100.00%**

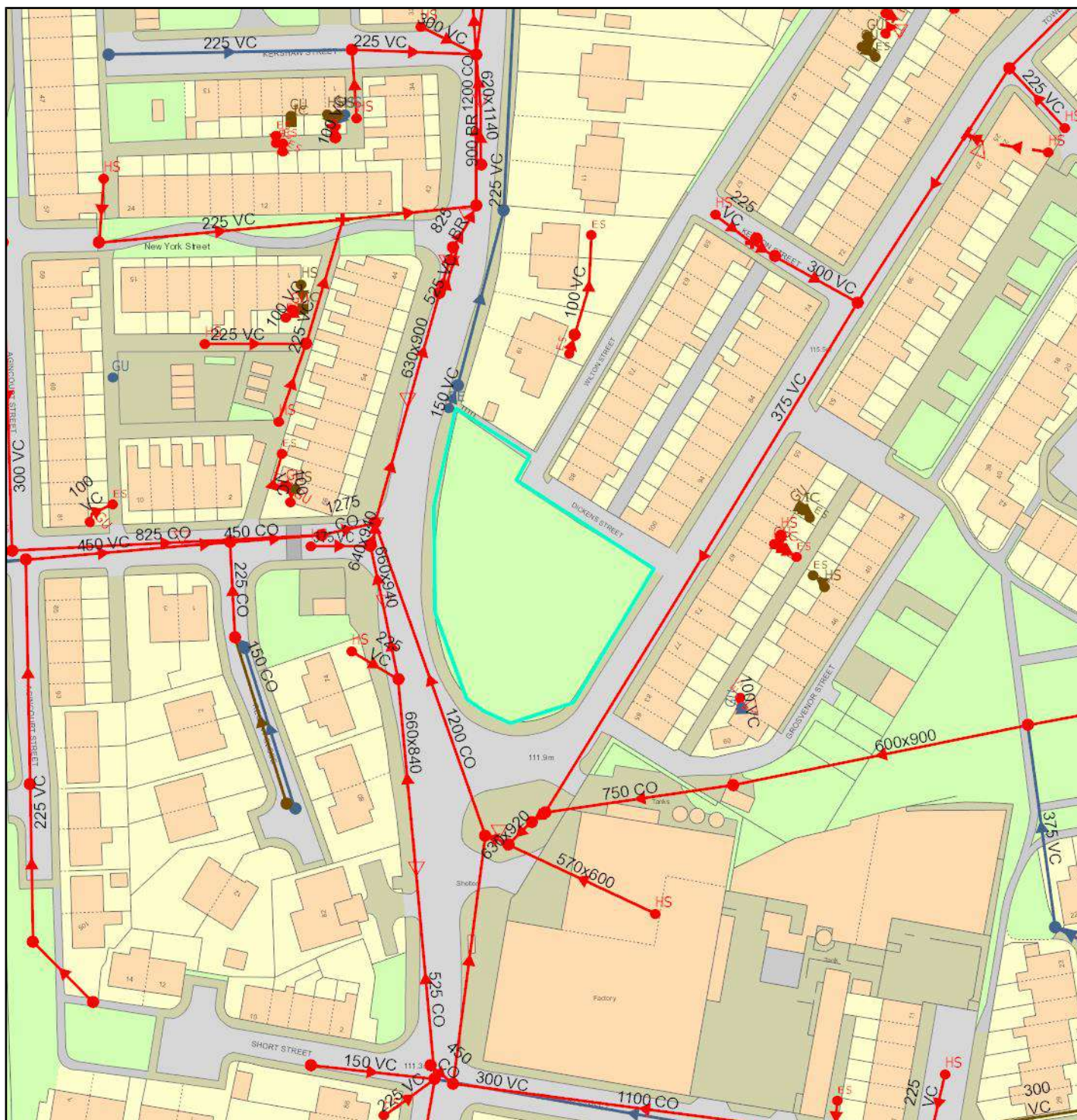
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	12	228	111.815	0.115	3.5	0.1300	0.0000	OK
15 minute summer	10	10	112.288	0.038	3.3	0.0430	0.0000	OK
15 minute summer	9	10	112.121	0.071	8.4	0.0799	0.0000	OK
15 minute summer	8	10	111.984	0.084	13.7	0.0952	0.0000	OK
240 minute winter	7	228	111.815	0.115	3.5	0.1300	0.0000	OK
240 minute winter	6	224	111.815	0.215	2.0	0.2428	0.0000	SURCHARGED
240 minute winter	5	224	111.815	0.520	3.4	0.5880	0.0000	SURCHARGED
240 minute winter	4	228	111.815	0.857	1.8	0.9688	0.0000	SURCHARGED
240 minute winter	3	228	110.880	0.025	1.1	0.0277	0.0000	OK
240 minute winter	2	228	110.817	0.015	1.1	0.0171	0.0000	OK
240 minute winter	1	228	109.715	0.015	1.1	0.0000	0.0000	OK
240 minute winter	Depth/Area 1	228	111.815	0.344	5.8	26.1364	0.0000	SURCHARGED
240 minute winter	13	228	111.815	0.252	6.7	0.2849	0.0000	SURCHARGED
15 minute summer	11	1	112.500	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	12	2.001	13	-2.9	0.282	-0.032	0.1361	
15 minute summer	10	1.000	9	3.3	0.574	0.141	0.0672	
15 minute summer	9	1.001	8	8.4	0.917	0.415	0.1061	
15 minute summer	8	1.002	7	13.7	1.171	0.540	0.1152	
240 minute winter	7	1.003	13	6.7	0.830	0.179	0.0506	
240 minute winter	6	3.000	5	2.0	1.007	0.121	0.0192	
240 minute winter	5	1.006	4	1.8	0.210	0.015	0.2746	
240 minute winter	4	1.007	3	1.1	0.454	0.028	0.0426	
240 minute winter	3	1.008	2	1.1	0.656	0.021	0.0092	
240 minute winter	2	1.009	1	1.1	0.985	0.009	0.0210	43.3
240 minute winter	Depth/Area 1	1.005	5	3.4	0.516	0.065	0.2026	
240 minute winter	13	1.004	Depth/Area 1	4.2	0.651	0.121	0.8210	
15 minute summer	11	2.000	12	0.0	0.000	0.000	0.0000	



## **APPENDIX D – SEWER RECORDS**

## Land at Pilsworth Road



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## Wastewater Symbolology

Abandoned	Foul	Surface Water	Combined	
				Public Sewer
				Private Sewer
				Section 104
				Rising Main
				Sludge Main
				Overflow
				Water Course
				Highway Drain

All point assets follow the standard colour convention: **red** – combined **brown** - foul  
**blue** – surface water **purple** - overflow

<b>Manhole</b>	<b>Side Entry Manhole</b>
<b>Head of System</b>	<b>Outfall</b>
<b>Extent of Survey</b>	<b>Screen Chamber</b>
<b>Rodding Eye</b>	<b>Inspection Chamber</b>
<b>Inlet</b>	<b>Bifurcation Chamber</b>
<b>Discharge Point</b>	<b>Lamp Hole</b>
<b>Vortex</b>	<b>T Junction / Saddle</b>
<b>Penstock</b>	<b>Catchpit</b>
<b>Washout Chamber</b>	<b>Valve Chamber</b>
<b>Valve</b>	<b>Vent Column</b>
<b>Air Valve</b>	<b>Vortex Chamber</b>
<b>Non Return Valve</b>	<b>Penstock Chamber</b>
<b>Soakaway</b>	<b>Network Storage Tank</b>
<b>Gully</b>	<b>Sewer Overflow</b>
<b>Cascade</b>	<b>Ww Treatment Works</b>
<b>Flow Meter</b>	<b>Ww Pumping Station</b>
<b>Hatch Box</b>	<b>Septic Tank</b>
<b>Oil Interceptor</b>	<b>Control Kiosk</b>
<b>Summit</b>	
<b>Drop Shaft</b>	<b>Change of Characteristic</b>
<b>Orifice Plate</b>	



## **APPENDIX E – SITE INVESTIGATION**

## Non-technical Summary

Topic	Commentary
Site description	The site comprises an area of soft landscaping with mature trees present and a footpath through the centre. The site is currently unoccupied but accessible to the general public. Adjacent land uses are occupied mostly by residential housing.
Development proposals	The scheme comprises the construction of a two-storey residential development, containing 8 No. 1-bedroom flats with a central stair core, ancillary space and soft landscaping. The development is controlled under the Rochdale Borough Council planning regime, under application reference 23/01381/FUL/2023.
Ground conditions	The site is underlain by up to 0.4m of topsoil with Made Ground only encountered within WS04 between depths of 0.25-0.55m. Devensian Till deposits were recorded underlying topsoil/Made Ground to a depth of 1.7m to 2.6m bgl. Bedrock deposits of weathered Pennine Lower Coal Measures Formation comprising clays and gravels were encountered at the base of all boreholes.
Development constraints	Several trees including a high water demand oak tree, 2 No. stumps (unknown species) and younger assumed medium water demand trees are located close to or beneath the proposed building footprint. As such all foundations will need to be deepened within influencing distance of such vegetation.
Mining Risk	The site is recorded within a coal mining reporting area, but outside of a Development High Risk Area. Based on review of mining legacy risks, the risk of instability occurring on site is considered to be very low.
Foundation and slab solution	Trench fill foundations extending onto the natural Devensian Till/weathered Pennine Lower Coal Measures can be adopted for the development. Foundations depth will be dictated by proximity of existing trees/stumps.   Suspended floor slabs should be adopted. Heave protection measures will be necessary within foundation excavations.   It is recommended that a concrete classification of DS-1 AC-1s is recommended for sub-surface concrete.
Drainage potential	Permeability testing was performed within the natural strata, however, very low permeability rates ( $9.27 \times 10^{-7}$ and $1.26 \times 10^{-6}$ m/s) were calculated. Given the cohesive nature of the shallow soils, it is unlikely that shallow soakaway solutions for surface water drainage will be feasible. Assessment of bedrock could be undertaken, which may exhibit permeability, but further testing would be necessary to confirm, or otherwise.
Chemical contamination and remedial requirements	Potential risks from contamination have been identified within shallow topsoil/Made Ground which would require remedial works to progress the development through planning. Given the limited thickness of topsoil/Made Ground across the site (0.3-0.55m), it is recommended that topsoil/Made Ground is removed to natural uncontaminated formation level within proposed soft landscaping areas. These soils should be replaced with a minimum 150mm depth of clean, imported topsoil.
Radon, gas risk and protection measures	The site is at a low risk from ground gas migration associated with off-site areas of infilled ground.   The site is in an area where the above ground radon Affected Area status is classed as a Lower Probability Radon Area therefore no radon protection measures
Recommendation for further works	A Remediation Strategy and subsequent Verification Report.