Report Title	# Drainage Report
Property Address	Land Adj 6 Rose Gardens Gilgarren Workington Cumbria CA14 4RB
Client	Mr Kevin Wirga
Our Reference	22-320r001
Date	August 2022
Prepared by	Colin Aimers BEng Hons CEng MICE CEnv Director colin.aimers@kingmoorconsulting.co.uk

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Contents

Introduction

The purpose of this report is to present the detailed design of the proposed foul and surface water drainage design for the development of residential development at land adjacent to 6 Rose Gardens, Gillgarren, Workington, (thereafter referred to as 'The Site'). The report has been commissioned by owners, for the purposes of discharging planning conditions and providing engineering design for surface and foul water drainage on the site.

Research has been undertaken on the site and observations made regarding the existing site and its former history.

The report should be read in conjunction with the documents referenced to it, generally appended to this report, and all works has been designed in accordance with the following standards :

- CIRIA Publication C753 The SuDS Manual
- CIRIA Publication C768 Guidance on the Construction of SuDS

Calculations associated with the drainage have been performed using analysis packages and where appropriate copies of calculations are provided in this report.

Site Description

The site currently comprises an existing wall area adjacent to no 6 Rose Gardens, Gilgarren. It is presently scrub land and is approximately 450m2 in area. The site is bounded to the north by 6 Rose Gardens, to the east by the U4006 Unclassified Road, fields to the south and woodland to the west.

A small quarry is present along the western boundary of the site, and it would appear this has been used for stone quarrying for local building work. It is approx 4-6m deep and the extents are unmapped on published mapping.

Geology

Superficial Deposits

The published superficial geology by The British Geological Survey shows the site is composed of

Devensian Till. This is typically a silty clay.

Solid Geology

The solid geology as published by the British Geological Survey shows the site to be underlain by the Whitehaven Sandstones. This was verified in the adjacent quarry where outcrops of the Whitehaven Sandstone are present.

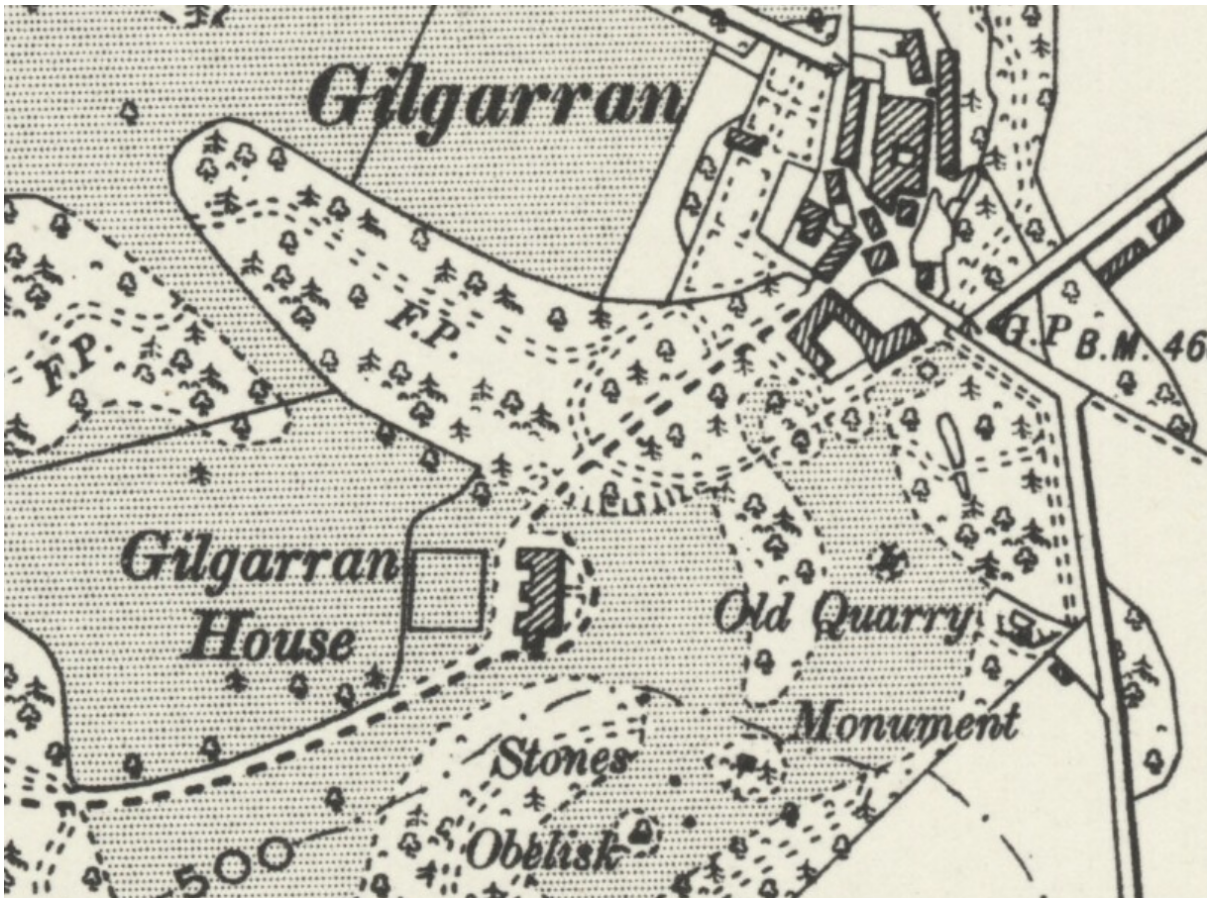
Published geology maps from the BGS are appended to this report.

Surface Water

The site is generally flat and enclosed by the walled garden.

The site has an extensive history associated with its management of water across a wider estate of Gilgarran House. The woodland adjacent to the site was planted and managed, with a number of surface water features present to regulate flows of water which eventually discharge to the Gilgarran Beck.

An extract of the Ordnance Survey map of 1896 indicating the grounds and local arrangements is presented below.



It is understood that the outfall from the ornamental ponds below the site was disturbed by the construction of a dwelling (Corner Wood) which replaced a former box drain with a modern pipe, limiting the flow from the ponds to Gilgarran Beck.

In addition, it is understood that as a consequence of works upstream of the engineered aquifer to the drainage on the public road have resulted in additional flows into the site. These activities are outside the control of the applicant but have an ongoing impact on the wider area of Gilgarran.

Foul Water

The site is not serviced by the United Utilities Public Sewer network and it is believed that adjacent properties on Rose Gardens are serviced by a private sewer which is piped to a treatment system in Home Farm. It is not known if this is an adopted system or remains private.

Records obtained from UU indicate that the public sewer services areas of the village including Gilgarran Park to the west of the site and the foul network are pumped from the village to a nearby sewage works.

Proposed Drainage Strategy

Foul Water

It is proposed that the proposed development shall consider dealing with the foul waste from the property via a packaged treatment plant discharging to the adjacent culvert to the site.

Surface Water

It is proposed that the development shall discharge any surface water from hard surfaces of the property shall be carried around the property and discharge to the existing arrangements present on site. Attenuation proposed on the system shall limit the discharge rates to the quarry area at the Greenfield runoff rates.

Any roads, pavements and other landscaped features will discharge to ground adjacent and naturally percolate to the quarry area.

Site Permeability

Testing has been carried out on the site and the site is unsuitable for natural percolation, therefore we consider the options to discharge to the adjacent watercourse are the only option based on the hierarchy of drainage as defined in the National Planning Practice Guidelines

Detailed Assessment and Design

Foul Water

A design has been conducted associated with the proposed foul network and analysis undertaken in Causeway Flow. Results are appended to this report.

Drawing 22-320 DWG001 indicates the proposed arrangements for the foul drainage on the site and will be subject to final detailed design to comply with the requirements of the Building Regulations.

Surface Water

Principally the surface water drainage has been calculated on the impermeable areas of the site, including roofs, hard surfacing, parking areas and roads. Areas are subdivided into zones and drainage runs, manholes and drains to allow each area to discharge into the system.

Modelling has been conducted on the following rainfall events:

- 1 in 1 year
- 1 in 30 years
- 1 in 100 years plus 40 % increase due to climate change over a 6 hour period

The following allowances associated with rainfall events have been obtained from UK Suds Online Tools.

SAAR	1225mm
M5-60 Rainfall Depth :	20mm
'r' Ratio M5-60/M5-2 day:	0.4
Hydro Region:	10

The following parameters were adopted in the analysis.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	x
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Calculations have been conducted to assess the requirements for attenuation on the site to prevent flooding based on the 1 in 100 year event + 40% climate change allowance based on the greenfield runoff rates for the site.

The following sections provide a summary output from the Causeway Flow analysis performed on the site system.

Pre-Development Discharge Rate

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	10
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.115	Betterment (%)	0
SAAR (mm)	1225	QBar	1.1
Soil Index	4	Q 100 year (l/s)	
SPR	0.47		

Pre-Development Discharge Volume

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.115	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	0.520
CWI	125.563	Runoff Volume (m³)	42

Attenuation Design

Node 12 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	143.469	Depth (m)	0.900
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	244	Inf Depth (m)	
Safety Factor	1.0	Pit Width (m)	1.800	Number Required	1
Porosity	0.95	Pit Length (m)	6.000		

Flow Controls

Node 12 Online Head/Flow Control

Flap Valve	x	Replaces Downstream Link	✓	Invert Level (m) 143.469

Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.450	0.800	1.200	1.100

Outfall Rates / Volume

1 in 100 Y + 40% Climate Change

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	1	1.000	2	0.6	0.531	0.076	0.0405	
240 minute winter	2	1.001	3	0.8	0.604	0.100	0.0382	
240 minute winter	3	1.002	5	0.7	0.454	0.086	0.0301	
240 minute winter	4	2.000	5	0.2	0.416	0.025	0.0143	
240 minute winter	5	1.003	6	1.2	0.593	0.152	0.0583	
240 minute winter	6	1.004	7	1.4	0.471	0.180	0.0723	
240 minute winter	7	1.005	12	2.8	0.851	0.355	0.0530	
240 minute winter	8	3.000	9	0.6	0.580	0.076	0.0335	
240 minute winter	9	3.001	10	0.6	0.376	0.076	0.0702	
240 minute winter	10	3.002	7	1.6	0.576	0.158	0.0841	
240 minute winter	11	4.000	10	0.6	0.460	0.034	0.0210	
240 minute winter	12	Head/Flow		1.0				21.0

Maintenance of Drainage

Operation and Maintenance Requirements

As with all traditional drainage systems, SuDS need to be inspected and maintained regularly to ensure that they operate correctly and efficiently. If SuDS are not properly maintained then there is a risk that the systems will become overloaded during periods of prolonged heavy rainfall, potentially resulting in localised flooding of the development. Recommendations for the SuDS maintenance activities for the privately maintained areas are detailed below.

All maintenance activities should be detailed in the Health and Safety Plan and a risk assessment should be undertaken in accordance with CDM regulations.

- Inlets and outlets structures may be surface structures or conveyance pipes with guards or headwalls. They must be free from obstruction at all times.
- SuDS flow control structures can be protected orifices, slots weirs or other controls at or near the surface to be accessible and easy to maintain. They may be in baskets, in small chambers or in the open.
- Inspection Chambers and rodding eyes are used on bends or where pipes come together and allow cleaning of the system if necessary. They should be designed out of the system where possible.

Inlets, Outlets, Controls and Inspection Chambers	Frequency
Regular Maintenance • Inspect surface structures removing obstructions and silt as necessary. • Check there is no physical damage. • Strim vegetation 1m min. surround structures and keep hard aprons free from silt and debris. • Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. • Remove debris and silt. • Undertake inspection after leaf fall in autumn	Monthly
Occasional Tasks	Annual

Check topsoil levels are 20mm above edges of manholes and chambers to avoid mower damage	
Remedial Works Monitor effectiveness of the system and advise / inspect / clean and test if water is standing in the system. This may require specialist cleaning.	As Required

Planning Conditions

In respect to the discharge of planning conditions associated with the proposed development addressed by this report, the following conditions were applied to the project under consent reference 19/2125 by Copeland Borough Council..

Condition 5

No development shall commence until a surface water drainage scheme has been submitted to and approved in writing by the Local Planning Authority. The drainage scheme must include :

i) An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of the ground conditions and the potential for infiltration of surface water.

ii) A restricted rates of discharge of surface water agreed with local planning authority (if it is agreed that infiltration is discounted by the investigations); and

iii) a timetable for its implementation

The approved scheme shall also be in accordance with the Non Statutory Technical Standards for Sustainable Drainage Systems [March h2015] or any subsequent replacement national standard.

The development hereby permitted shall be carried out only in accordance with the approved drainage scheme.

Condition 6

Foul and surface water shall be drained on separate systems.

Condition 7

Prior to occupation of the development a suitable drainage management and maintenance plan for the lifespan of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum :

a. Arrangements for adoption by an appropriate public body or statutory undertaker,
b. management maintenance by a residents management company
c. arrangements for inspection and ongoing maintenance if all aspects of the drainage system to secure the operation of the surface water drainage scheme throughout its lifespan.

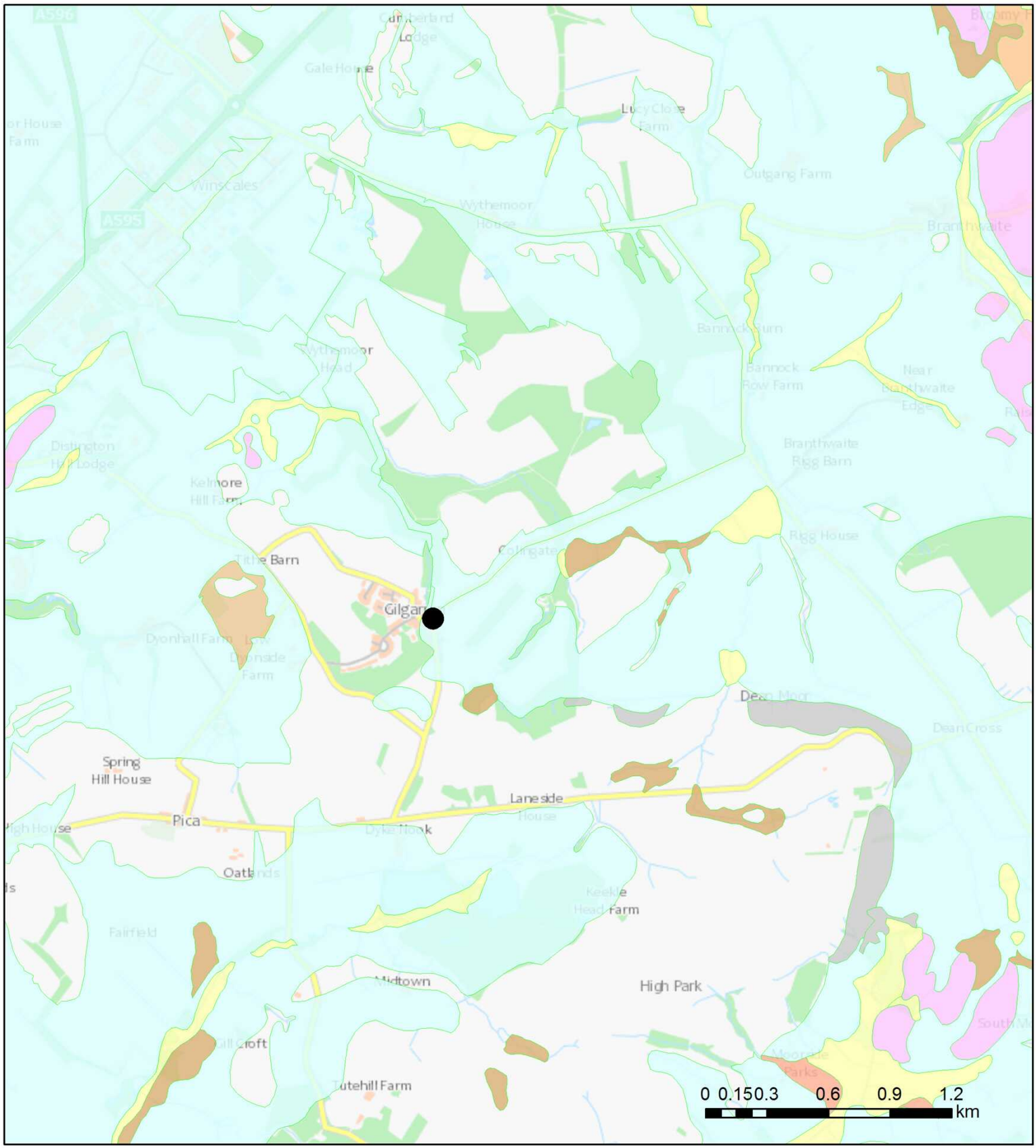
The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

We consider that this report fulfils the requirements of the above planning conditions.

Appendices

BGS Records

Drift Geology



Map Key

Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- RAISED MARINE DEPOSITS - CLAY AND SILT
- RAISED MARINE BEACH DEPOSITS - SAND AND GRAVEL
- RIVER TERRACE DEPOSITS, 1 - CLAY, SAND AND GRAVEL
- ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL
- LACUSTRINE ALLUVIUM - CLAY AND SILT
- MARINE BEACH DEPOSITS - SAND AND GRAVEL
- PEAT - PEAT
- SUPERFICIAL THEME NOT MAPPED [FOR DIGITAL MAP USE ONLY] - UNKNOWN/UNCLASSIFIED ENTRY

Solid Geology

GEOINDEX ONSHORE

GeoIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Bedrock geology 1:50,000 scale

- KIRK STILE FORMATION - MUDSTONE AND SILTSTONE
- FIRST SHALE MEMBER - SANDSTONE, SILTSTONE AND MUDSTONE
- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- FIRST LIMESTONE (CUMBRIA) - LIMESTONE
- LOWESWATER FORMATION - WACKE
- SKIDDAW GROUP - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- STAINMORE FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- OREBANK SANDSTONE - SANDSTONE
- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE
- WHITEHAVEN SANDSTONE FORMATION - SANDSTONE
- HENSINGHAM GRIT - SANDSTONE
- BROCKRAM - BRECCIA

Hydraulic Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	x
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.005	4.00	144.800	225	40.781	51.017	0.700
2	0.002	4.00	144.800	225	41.458	56.152	0.788
3			144.800	225	38.354	59.917	0.870
4	0.002	4.00	144.800	225	35.957	57.292	0.700
5	0.005	4.00	144.800	225	34.727	58.639	0.935
6	0.004	4.00	144.800	225	27.930	61.700	1.061
7			144.800	225	19.165	58.760	1.217
8	0.005	4.00	144.800	225	35.160	46.276	0.700
9			144.800	225	31.800	43.613	0.773
10	0.005	4.00	144.800	225	26.122	50.563	0.924
11	0.005	4.00	144.800	225	27.711	52.730	0.700
12			144.800	225	14.180	63.340	1.331

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	1	2	5.179	0.600	144.100	144.012	0.088	58.9	100	4.09	50.0
1.001	2	3	4.880	0.600	144.012	143.930	0.082	59.5	100	4.17	50.0
1.002	3	5	3.846	0.600	143.930	143.865	0.065	59.2	100	4.23	50.0
2.000	4	5	1.824	0.600	144.100	144.069	0.031	58.8	100	4.03	50.0
1.003	5	6	7.454	0.600	143.865	143.739	0.126	59.2	100	4.35	50.0
1.004	6	7	9.245	0.600	143.739	143.583	0.156	59.3	100	4.51	50.0
1.005	7	12	6.770	0.600	143.583	143.469	0.114	59.4	100	4.62	50.0
3.000	8	9	4.287	0.600	144.100	144.027	0.073	58.7	100	4.07	50.0
3.001	9	10	8.975	0.600	144.027	143.876	0.151	59.4	100	4.22	50.0
4.000	11	10	2.687	0.600	144.100	143.876	0.224	12.0	100	4.02	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	1.006	7.9	0.9	0.600	0.688	0.005	0.0	24	0.683
1.001	1.000	7.9	1.3	0.688	0.770	0.007	0.0	28	0.742
1.002	1.003	7.9	1.3	0.770	0.835	0.007	0.0	28	0.744
2.000	1.006	7.9	0.4	0.600	0.631	0.002	0.0	15	0.518
1.003	1.003	7.9	2.7	0.835	0.961	0.014	0.0	40	0.908
1.004	1.002	7.9	3.4	0.961	1.117	0.018	0.0	46	0.963
1.005	1.001	7.9	6.3	1.117	1.231	0.033	0.0	68	1.111
3.000	1.007	7.9	0.9	0.600	0.673	0.005	0.0	23	0.670
3.001	1.001	7.9	0.9	0.673	0.824	0.005	0.0	24	0.680
4.000	2.243	17.6	0.9	0.600	0.824	0.005	0.0	16	1.199

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)
3.002	10	7	10.751	0.600	143.876	143.583	0.293	36.7	100	4.36	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)
3.002	1.277	10.0	2.8	0.824	1.117	0.015	0.0	36	1.098

Pipeline Schedule

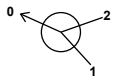
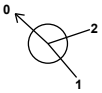
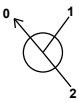
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	5.179	58.9	100	Circular	144.800	144.100	0.600	144.800	144.012	0.688
1.001	4.880	59.5	100	Circular	144.800	144.012	0.688	144.800	143.930	0.770
1.002	3.846	59.2	100	Circular	144.800	143.930	0.770	144.800	143.865	0.835
2.000	1.824	58.8	100	Circular	144.800	144.100	0.600	144.800	144.069	0.631
1.003	7.454	59.2	100	Circular	144.800	143.865	0.835	144.800	143.739	0.961
1.004	9.245	59.3	100	Circular	144.800	143.739	0.961	144.800	143.583	1.117
1.005	6.770	59.4	100	Circular	144.800	143.583	1.117	144.800	143.469	1.231
3.000	4.287	58.7	100	Circular	144.800	144.100	0.600	144.800	144.027	0.673
3.001	8.975	59.4	100	Circular	144.800	144.027	0.673	144.800	143.876	0.824
4.000	2.687	12.0	100	Circular	144.800	144.100	0.600	144.800	143.876	0.824
3.002	10.751	36.7	100	Circular	144.800	143.876	0.824	144.800	143.583	1.117

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	225	Manhole	Adoptable	2	225	Manhole	Adoptable
1.001	2	225	Manhole	Adoptable	3	225	Manhole	Adoptable
1.002	3	225	Manhole	Adoptable	5	225	Manhole	Adoptable
2.000	4	225	Manhole	Adoptable	5	225	Manhole	Adoptable
1.003	5	225	Manhole	Adoptable	6	225	Manhole	Adoptable
1.004	6	225	Manhole	Adoptable	7	225	Manhole	Adoptable
1.005	7	225	Manhole	Adoptable	12	225	Manhole	Adoptable
3.000	8	225	Manhole	Adoptable	9	225	Manhole	Adoptable
3.001	9	225	Manhole	Adoptable	10	225	Manhole	Adoptable
4.000	11	225	Manhole	Adoptable	10	225	Manhole	Adoptable
3.002	10	225	Manhole	Adoptable	7	225	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	40.781	51.017	144.800	0.700	225	 0	1.000	144.100	100
2	41.458	56.152	144.800	0.788	225	 1	1.000	144.012	100
						0	1.001	144.012	100
3	38.354	59.917	144.800	0.870	225	 1	1.001	143.930	100
						0	1.002	143.930	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
4	35.957	57.292	144.800	0.700	225				
						0	2.000	144.100	100
5	34.727	58.639	144.800	0.935	225		1	2.000	144.069	100
							2	1.002	143.865	100
						0	1.003	143.865	100
6	27.930	61.700	144.800	1.061	225		1	1.003	143.739	100
						0	1.004	143.739	100
7	19.165	58.760	144.800	1.217	225		1	3.002	143.583	100
							2	1.004	143.583	100
						0	1.005	143.583	100
8	35.160	46.276	144.800	0.700	225				
						0	3.000	144.100	100
9	31.800	43.613	144.800	0.773	225		1	3.000	144.027	100
						0	3.001	144.027	100
10	26.122	50.563	144.800	0.924	225		1	4.000	143.876	100
							2	3.001	143.876	100
						0	3.002	143.876	100
11	27.711	52.730	144.800	0.700	225				
						0	4.000	144.100	100
12	14.180	63.340	144.800	1.331	225		1	1.005	143.469	100

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	100 year (l/s)	2.2
Winter CV	0.840	Check Discharge Volume	✓
Analysis Speed	Normal	100 year 360 minute (m³)	42

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 %)
10	0	0	0
30	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	10
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.115	Betterment (%)	0
SAAR (mm)	1225	QBar	1.1
Soil Index	4	Q 100 year (l/s)	
SPR	0.47		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.115	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	0.520
CWI	125.563	Runoff Volume (m^3)	42

Node 12 Online Head/Flow Control

Flap Valve	x	Replaces Downstream Link	✓	Invert Level (m)	143.469

Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.450	0.800	1.200	1.100

Node 12 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	143.469	Depth (m)	0.900
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	244	Inf Depth (m)	
Safety Factor	1.0	Pit Width (m)	1.800	Number Required	1
Porosity	0.95	Pit Length (m)	6.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Maximum Cover Depth (m)	3.000
Node Losses	✓	Backdrops	✓
Link Size	✓	Minimum Backdrop Height (m)	
Minimum Diameter (mm)	150	Maximum Backdrop Height (m)	1.500
Link Length	✓	Full Bore Velocity	✓
Maximum Length (m)	100.000	Minimum Full Bore Velocity (m/s)	
Coordinates	✓	Maximum Full Bore Velocity (m/s)	3.000
Accuracy (m)	1.000	Proportional Velocity	✓
Crossings	✓	Return Period (years)	
Cover Depth	✓	Minimum Proportional Velocity (m/s)	0.750
Minimum Cover Depth (m)		Maximum Proportional Velocity (m/s)	3.000

Approval Settings

Surcharged Depth	✓	Time to Half Empty	x
Return Period (years)		Discharge Rates	✓
Maximum Surcharged Depth (m)	0.100	Discharge Volume	✓
Flooding	✓	100 year 360 minute (m^3)	
Return Period (years)	30		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
10 year 15 minute summer	192.806	54.557	30 year 360 minute summer	35.178	9.053
10 year 15 minute winter	135.303	54.557	30 year 360 minute winter	22.867	9.053
10 year 30 minute summer	130.321	36.876	30 year 480 minute summer	27.920	7.379
10 year 30 minute winter	91.453	36.876	30 year 480 minute winter	18.550	7.379
10 year 60 minute summer	90.826	24.003	30 year 600 minute summer	23.001	6.291
10 year 60 minute winter	60.342	24.003	30 year 600 minute winter	15.716	6.291
10 year 120 minute summer	57.664	15.239	30 year 720 minute summer	20.598	5.520
10 year 120 minute winter	38.311	15.239	30 year 720 minute winter	13.843	5.520
10 year 180 minute summer	44.990	11.577	30 year 960 minute summer	17.043	4.488
10 year 180 minute winter	29.245	11.577	30 year 960 minute winter	11.289	4.488
10 year 240 minute summer	35.975	9.507	30 year 1440 minute summer	12.485	3.346
10 year 240 minute winter	23.901	9.507	30 year 1440 minute winter	8.390	3.346
10 year 360 minute summer	27.947	7.192	100 year +40% CC 15 minute summer	441.486	124.925
10 year 360 minute winter	18.166	7.192	100 year +40% CC 15 minute winter	309.815	124.925
10 year 480 minute summer	22.300	5.893	100 year +40% CC 30 minute summer	304.460	86.152
10 year 480 minute winter	14.816	5.893	100 year +40% CC 30 minute winter	213.656	86.152
10 year 600 minute summer	18.452	5.047	100 year +40% CC 60 minute summer	214.603	56.713
10 year 600 minute winter	12.608	5.047	100 year +40% CC 60 minute winter	142.577	56.713
10 year 720 minute summer	16.587	4.446	100 year +40% CC 120 minute summer	135.791	35.885
10 year 720 minute winter	11.148	4.446	100 year +40% CC 120 minute winter	90.216	35.885
10 year 960 minute summer	13.811	3.637	100 year +40% CC 180 minute summer	104.615	26.921
10 year 960 minute winter	9.149	3.637	100 year +40% CC 180 minute winter	68.003	26.921
10 year 1440 minute summer	10.216	2.738	100 year +40% CC 240 minute summer	82.776	21.875
10 year 1440 minute winter	6.866	2.738	100 year +40% CC 240 minute winter	54.994	21.875
30 year 15 minute summer	243.818	68.992	100 year +40% CC 360 minute summer	63.377	16.309
30 year 15 minute winter	171.101	68.992	100 year +40% CC 360 minute winter	41.197	16.309
30 year 30 minute summer	166.387	47.082	100 year +40% CC 480 minute summer	50.006	13.215
30 year 30 minute winter	116.763	47.082	100 year +40% CC 480 minute winter	33.223	13.215
30 year 60 minute summer	116.589	30.811	100 year +40% CC 600 minute summer	40.997	11.214
30 year 60 minute winter	77.459	30.811	100 year +40% CC 600 minute winter	28.011	11.214
30 year 120 minute summer	73.902	19.530	100 year +40% CC 720 minute summer	36.560	9.799
30 year 120 minute winter	49.099	19.530	100 year +40% CC 720 minute winter	24.571	9.799
30 year 180 minute summer	57.313	14.749	100 year +40% CC 960 minute summer	30.041	7.911
30 year 180 minute winter	37.255	14.749	100 year +40% CC 960 minute winter	19.900	7.911
30 year 240 minute summer	45.598	12.050	100 year +40% CC 1440 minute summer	21.775	5.836
30 year 240 minute winter	30.295	12.050	100 year +40% CC 1440 minute winter	14.634	5.836

Results for 10 year Critical Storm Duration. Lowest mass balance: 98.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	144.128	0.028	1.3	0.0011	0.0000	OK
15 minute summer	2	10	144.046	0.034	1.8	0.0014	0.0000	OK
15 minute summer	3	10	143.965	0.035	1.8	0.0014	0.0000	OK
15 minute summer	4	10	144.118	0.018	0.5	0.0007	0.0000	OK
120 minute winter	5	90	143.924	0.059	1.2	0.0024	0.0000	OK
120 minute winter	6	90	143.924	0.185	1.6	0.0074	0.0000	SURCHARGED
120 minute winter	7	90	143.923	0.340	2.8	0.0136	0.0000	SURCHARGED
15 minute summer	8	10	144.129	0.029	1.3	0.0012	0.0000	OK
15 minute summer	9	10	144.055	0.028	1.3	0.0011	0.0000	OK
120 minute winter	10	90	143.923	0.047	1.2	0.0019	0.0000	OK
15 minute summer	11	10	144.119	0.018	1.3	0.0007	0.0000	OK
120 minute winter	12	90	143.922	0.453	2.5	4.6614	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 winter	1	1.000	2	1.3	0.625	0.165	0.0108	
15 minute summer	2	1.001	3	1.8	0.753	0.229	0.0117	
15 minute summer	3	1.002	5	1.8	0.575	0.227	0.0121	
15 minute summer	4	2.000	5	0.5	0.538	0.063	0.0017	
120 minute winter	5	1.003	6	1.2	0.664	0.153	0.0472	
120 minute winter	6	1.004	7	1.6	0.526	0.202	0.0723	
120 minute winter	7	1.005	12	2.5	0.864	0.316	0.0530	
15 minute summer	8	3.000	9	1.3	0.720	0.164	0.0078	
15 minute summer	9	3.001	10	1.3	0.523	0.165	0.0224	
120 minute winter	10	3.002	7	1.2	0.519	0.120	0.0617	
15 minute summer	11	4.000	10	1.3	0.648	0.074	0.0057	
120 minute winter	12	Head/Flow		0.8				7.9

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.86%

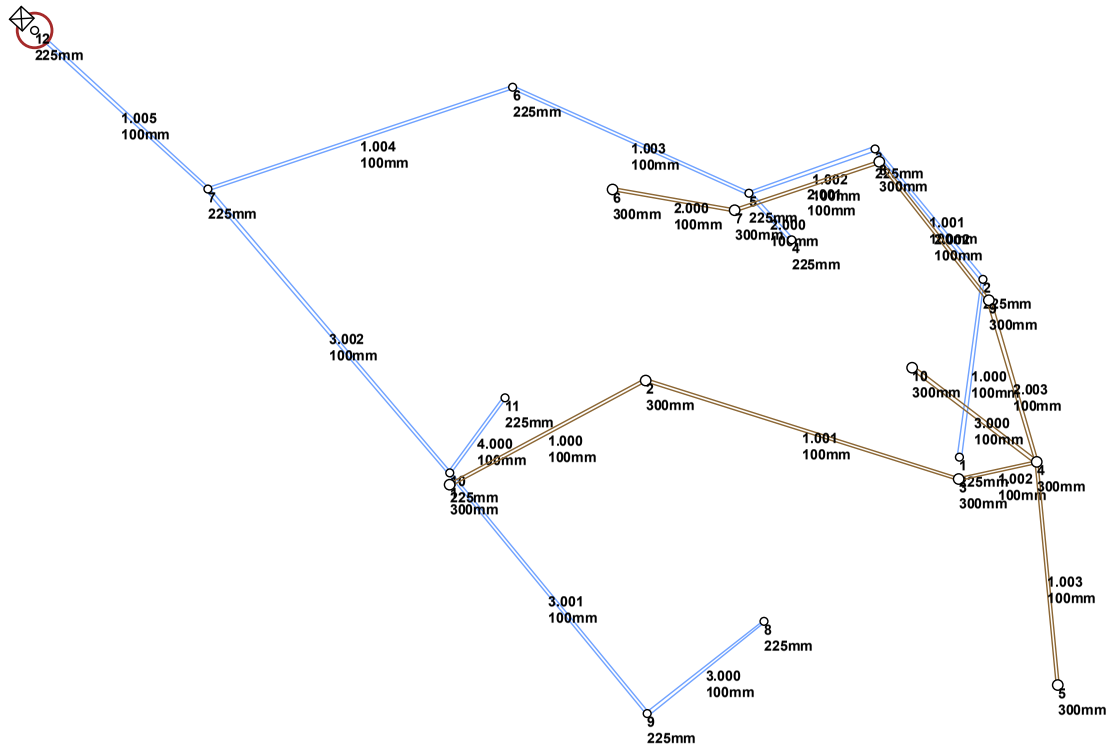
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	144.133	0.033	1.7	0.0013	0.0000	OK
15 minute summer	2	10	144.052	0.040	2.4	0.0016	0.0000	OK
180 minute winter	3	132	144.045	0.115	0.6	0.0046	0.0000	SURCHARGED
15 minute winter	4	10	144.122	0.022	0.7	0.0009	0.0000	OK
180 minute winter	5	132	144.045	0.180	1.2	0.0072	0.0000	SURCHARGED
180 minute winter	6	132	144.045	0.306	1.5	0.0122	0.0000	SURCHARGED
180 minute winter	7	132	144.044	0.461	2.5	0.0184	0.0000	SURCHARGED
15 minute winter	8	10	144.134	0.033	1.7	0.0013	0.0000	OK
15 minute summer	9	10	144.059	0.032	1.7	0.0013	0.0000	OK
180 minute winter	10	132	144.044	0.168	1.2	0.0067	0.0000	SURCHARGED
15 minute winter	11	10	144.121	0.021	1.7	0.0008	0.0000	OK
180 minute winter	12	132	144.042	0.573	2.3	5.9027	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 winter	1	1.000	2	1.7	0.660	0.215	0.0134	
15 minute summer	2	1.001	3	2.4	0.801	0.305	0.0146	
180 minute winter	3	1.002	5	0.6	0.454	0.076	0.0301	
15 minute winter	4	2.000	5	0.7	0.590	0.088	0.0022	
180 minute winter	5	1.003	6	1.2	0.613	0.152	0.0583	
180 minute winter	6	1.004	7	1.3	0.481	0.167	0.0723	
180 minute winter	7	1.005	12	2.3	0.818	0.295	0.0530	
15 minute winter	8	3.000	9	1.7	0.772	0.215	0.0095	
15 minute summer	9	3.001	10	1.7	0.561	0.216	0.0273	
180 minute winter	10	3.002	7	1.2	0.482	0.120	0.0841	
15 minute winter	11	4.000	10	1.7	0.692	0.096	0.0069	
180 minute winter	12	Head/Flow		0.8				11.7

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	1	188	144.454	0.354	0.6	0.0141	0.0000	SURCHARGED
240 minute winter	2	188	144.454	0.442	0.8	0.0177	0.0000	SURCHARGED
240 minute winter	3	188	144.453	0.523	0.8	0.0209	0.0000	SURCHARGED
240 minute winter	4	188	144.453	0.353	0.3	0.0141	0.0000	SURCHARGED
240 minute winter	5	188	144.453	0.588	1.4	0.0235	0.0000	SURCHARGED
240 minute winter	6	188	144.453	0.714	1.6	0.0285	0.0000	SURCHARGED
240 minute winter	7	188	144.452	0.869	2.9	0.0347	0.0000	SURCHARGED
240 minute winter	8	188	144.452	0.352	0.6	0.0141	0.0000	SURCHARGED
240 minute winter	9	188	144.452	0.425	0.6	0.0170	0.0000	SURCHARGED
240 minute winter	10	188	144.452	0.576	1.8	0.0230	0.0000	SURCHARGED
240 minute winter	11	188	144.452	0.352	0.6	0.0141	0.0000	SURCHARGED
240 minute winter	12	188	144.449	0.980	2.8	9.2783	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	1	1.000	2	0.6	0.531	0.076	0.0405	
240 minute winter	2	1.001	3	0.8	0.604	0.100	0.0382	
240 minute winter	3	1.002	5	0.7	0.454	0.086	0.0301	
240 minute winter	4	2.000	5	0.2	0.416	0.025	0.0143	
240 minute winter	5	1.003	6	1.2	0.593	0.152	0.0583	
240 minute winter	6	1.004	7	1.4	0.471	0.180	0.0723	
240 minute winter	7	1.005	12	2.8	0.851	0.355	0.0530	
240 minute winter	8	3.000	9	0.6	0.580	0.076	0.0335	
240 minute winter	9	3.001	10	0.6	0.376	0.076	0.0702	
240 minute winter	10	3.002	7	1.6	0.576	0.158	0.0841	
240 minute winter	11	4.000	10	0.6	0.460	0.034	0.0210	
240 minute winter	12	Head/Flow		1.0				21.0

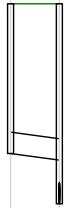


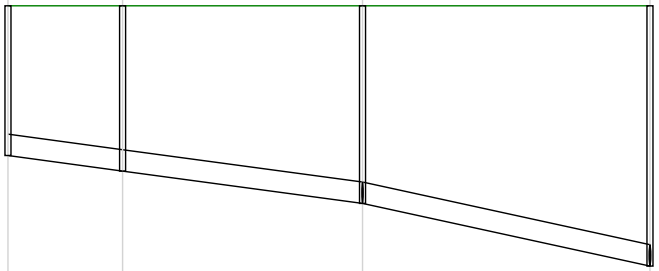
A3 drawing

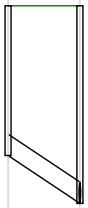
Hor Scale 200
Ver Scale 25

Datum (m) 142.000

Node Name	1	2	3	5	6	7	12
Link Name	1.000	1.001	1.002	1.003	1.004	1.005	
Section Type	100mm	100mm	100mm	100mm	100mm	100mm	
Slope (1:X)	58.9	59.5	59.2	59.2	59.3	59.4	
Cover Level (m)	144.800	144.800	144.800	144.800	144.800	144.800	144.800
Invert Level (m)	144.100	144.012 / 144.012	143.930 / 143.930	143.865 / 143.865	143.739 / 143.739	143.583 / 143.583	143.469
Length (m)	5.179	4.880	3.846	7.454	9.245	6.770	

Node Name		4	5
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000			
Link Name		2.000	
Section Type		100mr	
Slope (1:X)		58.8	
Cover Level (m)		144.800	144.800
Invert Level (m)		144.100	144.069
Length (m)		1.824	

Node Name		8	9	10	7
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000					
Link Name		3.000	3.001	3.002	
Section Type		100mm	100mm	100mm	
Slope (1:X)		58.7	59.4	36.7	
Cover Level (m)		144.800	144.800	144.800	144.800
Invert Level (m)		144.100	144.027 / 144.027	143.876 / 143.876	143.583
Length (m)		4.287	8.975	10.751	

Node Name		11	10
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000			
Link Name		4.000	
Section Type		100mm	
Slope (1:X)		12.0	
Cover Level (m)		144.800	144.800
Invert Level (m)		144.100	143.876
Length (m)		2.687	

Design Settings

Frequency of use (kDU)	1.00	Minimum Velocity (m/s)	1.00
Flow per dwelling per day (l/day)	150	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	0.450
Additional Flow (%)	0	Include Intermediate Ground	x

Nodes

Name	Dwellings	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
1	1	144.800	Adoptable	26.118	50.222	0.550
2		144.800	Adoptable	31.757	53.230	0.630
3	1	144.800	Adoptable	40.760	50.386	0.749
4		144.800	Adoptable	43.005	50.881	0.778
5		144.800	Adoptable	43.610	44.437	0.859
6	1	144.800	Adoptable	30.805	58.747	0.550
7	2	144.800	Adoptable	34.316	58.148	0.595
8		144.800	Adoptable	38.476	59.547	0.650
9		144.800	Adoptable	41.628	55.549	0.714
10	1	144.800	Adoptable	39.421	53.600	0.550

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	1	2	6.391	1.500	144.250	144.170	0.080	79.9	100
1.001	2	3	9.442	1.500	144.170	144.051	0.119	79.3	100
1.002	3	4	2.299	1.500	144.051	144.022	0.029	79.3	100
1.003	4	5	6.472	1.500	144.022	143.941	0.081	79.9	100
2.000	6	7	3.562	1.500	144.250	144.205	0.045	79.1	100
2.001	7	8	4.389	1.500	144.205	144.150	0.055	79.8	100
2.002	8	9	5.091	1.500	144.150	144.086	0.064	79.5	100
2.003	9	4	4.867	1.500	144.086	144.022	0.064	76.0	100
3.000	10	4	4.499	1.500	144.250	144.022	0.228	19.7	100

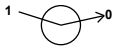
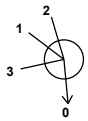
Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.044	0.744	5.8	0.0	0.450	0.530	0.000	1	0.0	0.0	2	0.074
1.001	0.044	0.747	5.9	0.0	0.530	0.649	0.000	1	0.0	0.0	2	0.074
1.002	0.044	0.747	5.9	0.0	0.649	0.678	0.000	2	0.0	0.0	2	0.074
1.003	0.074	0.744	5.8	0.0	0.678	0.759	0.000	6	0.0	0.0	4	0.124
2.000	0.044	0.748	5.9	0.0	0.450	0.495	0.000	1	0.0	0.0	2	0.074
2.001	0.074	0.745	5.8	0.0	0.495	0.550	0.000	3	0.0	0.0	3	0.100
2.002	0.074	0.746	5.9	0.0	0.550	0.614	0.000	3	0.0	0.0	3	0.100
2.003	0.076	0.763	6.0	0.0	0.614	0.678	0.000	3	0.0	0.0	3	0.103
3.000	0.093	1.503	11.8	0.0	0.450	0.678	0.000	1	0.0	0.0	1	0.093

Pipeline Schedule

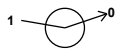
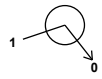
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	6.391	79.9	100	Circular	144.800	144.250	0.450	144.800	144.170	0.530
1.001	9.442	79.3	100	Circular	144.800	144.170	0.530	144.800	144.051	0.649
1.002	2.299	79.3	100	Circular	144.800	144.051	0.649	144.800	144.022	0.678
1.003	6.472	79.9	100	Circular	144.800	144.022	0.678	144.800	143.941	0.759
2.000	3.562	79.1	100	Circular	144.800	144.250	0.450	144.800	144.205	0.495
2.001	4.389	79.8	100	Circular	144.800	144.205	0.495	144.800	144.150	0.550
2.002	5.091	79.5	100	Circular	144.800	144.150	0.550	144.800	144.086	0.614
2.003	4.867	76.0	100	Circular	144.800	144.086	0.614	144.800	144.022	0.678
3.000	4.499	19.7	100	Circular	144.800	144.250	0.450	144.800	144.022	0.678

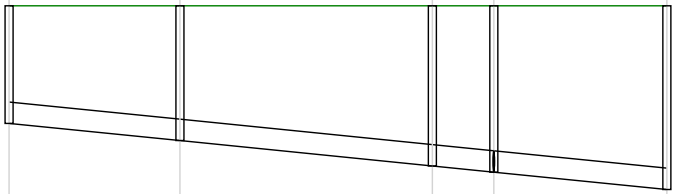
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	300	Manhole	Adoptable	2	300	Manhole	Adoptable
1.001	2	300	Manhole	Adoptable	3	300	Manhole	Adoptable
1.002	3	300	Manhole	Adoptable	4	300	Manhole	Adoptable
1.003	4	300	Manhole	Adoptable	5	300	Manhole	Adoptable
2.000	6	300	Manhole	Adoptable	7	300	Manhole	Adoptable
2.001	7	300	Manhole	Adoptable	8	300	Manhole	Adoptable
2.002	8	300	Manhole	Adoptable	9	300	Manhole	Adoptable
2.003	9	300	Manhole	Adoptable	4	300	Manhole	Adoptable
3.000	10	300	Manhole	Adoptable	4	300	Manhole	Adoptable

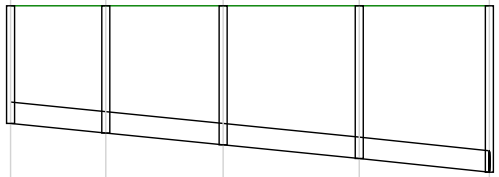
Manhole Schedule

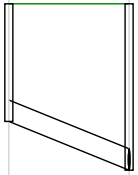
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	26.118	50.222	144.800	0.550	300				
						0	1.000	144.250	100
2	31.757	53.230	144.800	0.630	300	1	1.000	144.170	100
									
						0	1.001	144.170	100
3	40.760	50.386	144.800	0.749	300	1	1.001	144.051	100
									
						0	1.002	144.051	100
4	43.005	50.881	144.800	0.778	300	1	3.000	144.022	100
						2	2.003	144.022	100
							3	1.002	144.022	100
						0	1.003	144.022	100
5	43.610	44.437	144.800	0.859	300		1	1.003	143.941	100
6	30.805	58.747	144.800	0.550	300				
						0	2.000	144.250	100

Manhole Schedule

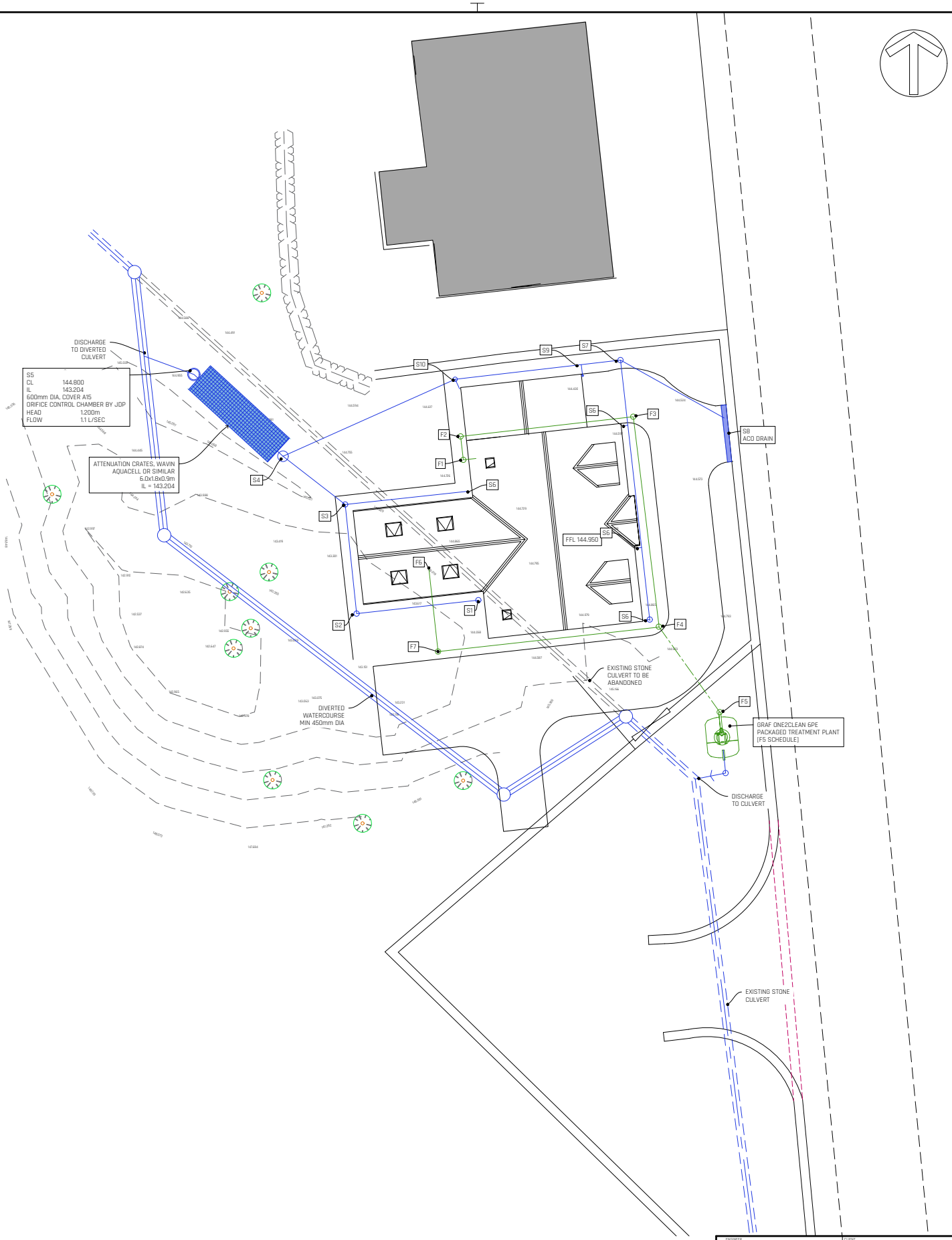
Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
7	34.316	58.148	144.800	0.595	300	1	2.000	144.205	100
									
						0	2.001	144.205	100
8	38.476	59.547	144.800	0.650	300	1	2.001	144.150	100
									
						0	2.002	144.150	100
9	41.628	55.549	144.800	0.714	300	1	2.002	144.086	100
									
						0	2.003	144.086	100
10	39.421	53.600	144.800	0.550	300				
									
						0	3.000	144.250	100

Node Name		1		2		3	4		5
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000									
Link Name		1.000		1.001		1.002	1.003		
Section Type		100mm		100mm		100mm	100mm		
Slope (1:X)		79.9		79.3		79.3	79.9		
Cover Level (m)		144.800		144.800		144.800	144.800		144.800
Invert Level (m)		144.250	144.170	144.170		144.051	144.051	144.022	144.022	143.941
Length (m)		6.391		9.442		2.299	6.472		

Node Name		6		7		8		9		4
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000										
Link Name		2.000		2.001		2.002		2.003		
Section Type		100mm		100mm		100mm		100mm		
Slope (1:X)		79.1		79.8		79.5		76.0		
Cover Level (m)		144.800		144.800		144.800		144.800		144.800
Invert Level (m)		144.250	144.205	144.205	144.150	144.150	144.086	144.086	144.022	
Length (m)		3.562		4.389		5.091		4.867		

Node Name		10	4
A3 drawing Hor Scale 200 Ver Scale 25 Datum (m) 142.000			
Link Name		3.000	
Section Type		100mm	
Slope (1:X)		19.7	
Cover Level (m)		144.800	144.800
Invert Level (m)		144.250	144.022
Length (m)		4.499	

Drawings



PLAN

SCALE 1:100

GENERAL NOTES

1. ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED AND NOT TO BE SCALED FROM DRAWINGS. USE WRITTEN DIMENSIONS ONLY AND CHECK ON SITE BEFORE ORDERING MATERIALS OR STEELWORK.
2. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH DRAWINGS PRODUCED BY OTHERS AND ANY ERRORS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO COMMENCEMENT OR INSTALLATION OF THE WORKS.
3. ALL MATERIALS AND WORKMANSHIP TO BE UNDERTAKEN IN ACCORDANCE WITH BEST PRACTICE AND THE RELEVANT CODES INCLUDING BRITISH STANDARDS AND BUILDING REGULATIONS.

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CLIENT

PROJECT
LAND ADJ 6 ROSE GARDENS, GILLGARREN, WORKINGTON

TITLE
PROPOSED DRAINAGE LAYOUT FOUL AND SURFACE WATER

SCALE	STATUS	
1:100	FOR BUILDING CONTROL	
PAPER SIZE	DRAWN BY	CHECKED AND APPROVED
A1	C AIMERS	C AIMERS
PROJECT PHASE	DATE	DATE
BUILD	JULY 2022	JULY 2022
DRAWING NUMBER		REVISION
22-320-DWG001		B

FOUL WATER MANHOLE SCHEDULE

Manhole Number / Coordinates	Cover Level / Depth To Soffit	Connections	Pipe: Code	Pipe: Inverts	Pipe: Diams	Manhole Size	Types: Manhole	Types: Cover
F1 E. 23.815 N. 25.031	144.800 0.450		0	1.000 144.250	100	300	4	A15
F2 E. 26.664 N. 26.345	144.800 0.490		1 0	1.000 1.001 144.210 144.210	100 100	300	4	A15
F3 E. 33.328 N. 27.452	144.800 0.575		1 0	1.001 1.002 144.125 144.125	100 100	300	4	A15
F4 E. 34.774 N. 15.672	144.800 0.724		1 0	1.002 1.003 143.976 143.976	100 100	300	4	A15
F5 E. 38.168 N. 10.912	144.800 0.798		1	1.003 143.902	100	300	4	A15
F6 E. 21.800 N. 18.885	144.800 0.450		0	2.000 144.250	100	300	Unknown	A15
F7 E. 22.400 N. 14.300	144.800 0.508		1	2.000 144.192	100	300	Unknown	A15

SURFACE WATER MANHOLE SCHEDULE

S1 E. 24.660 N. 17.181	144.800 0.800		0	3.000 143.900	100	225	4	A15
S2 E. 17.842 N. 16.425	144.800 0.916		1 0	3.000 3.001 143.784 143.784	100 100	225	4	A15
S3 E. 17.200 N. 22.537	144.800 1.020		1 0	3.001 3.002 143.680 143.680	100 100	225	4	A15
S4 E. 13.723 N. 25.235	144.800 1.382		1 2 0	3.002 1.003 1.004 143.606 143.318 143.318	100 100 100	225	4	A15
S5 E. 8.739 N. 29.815	144.800 1.496		1	1.004 143.204	100	225	4	A15
S6 E. 34.249 N. 16.093	144.800 0.800		0	1.000 143.900	100	225	4	A15
S7 E. 32.611 N. 30.622	144.800 1.045		1 2 0	1.000 2.000 1.001 143.654 143.654 143.654	100 100 100	225	4	A15
S8 E. 38.416 N. 27.380	144.800 0.800		0	2.000 143.900	100	225	4	A15
S9 E. 30.417 N. 30.366	144.800 1.084		1 0	1.001 1.002 143.616 143.616	100 100	225	4	A15
S10 E. 23.361 N. 29.543	144.800 1.204		1 0	1.002 1.003 143.496 143.496	100 100	225	4	A15

SURFACE WATER PIPE SCHEDULE

STORM Network 1

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Length	Upstream Manhole: Number	Upstream Manhole: Invert	Upstream Manhole: Cover	Downstream Manhole: Number	Downstream Manhole: Invert	Downstream Manhole: Cover
1.000	100	59	14.621	S6	143.900	144.800	S7	143.654	144.800
1.001	100	58	2.209	S7	143.654	144.800	S9	143.616	144.800
1.002	100	59	7.104	S9	143.616	144.800	S10	143.496	144.800
1.003	100	59	10.557	S10	143.496	144.800	S4	143.318	144.800
1.004	100	59	6.769	S4	143.318	144.800	S5	143.204	144.800
2.000	100	27	6.649	S8	143.900	144.800	S7	143.654	144.800
3.000	100	59	6.860	S1	143.900	144.800	S2	143.784	144.800
3.001	100	59	6.146	S2	143.784	144.800	S3	143.680	144.800
3.002	100	59	4.401	S3	143.680	144.800	S4	143.606	144.800

FOUL WATER PIPE SCHEDULE

FOUL Network 1

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Length	Upstream Manhole: Number	Upstream Manhole: Invert	Upstream Manhole: Cover	Downstream Manhole: Number	Downstream Manhole: Invert	Downstream Manhole: Cover
1.000	100	78	3.137	F1	144.250	144.800	F2	144.210	144.800
1.001	100	79	6.755	F2	144.210	144.800	F3	144.125	144.800
1.002	100	80	11.868	F3	144.125	144.800	F4	143.976	144.800
1.003	100	79	5.846	F4	143.976	144.800	F5	143.902	144.800
2.000	100	80	4.624	F6	144.250	144.800	F7	144.192	144.800

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CLIENT

PROJECT
LAND ADJ 6 ROSE GARDENS, GILLGARREN, WORKINGTON

TITLE
PROPOSED DRAINAGE LAYOUT
DRAINAGE SCHEDULES

SCALE	STATUS
NOT TO SCALE	FOR BUILDING CONTROL

PAPER SIZE	DRAWN BY	CHECKED AND APPROVED
A1	C AIMERS	C AIMERS

PROJECT PHASE	DATE	DATE
BUILD	JULY 2022	JULY 2022

DRAWING NUMBER	REVISION
22-320-DWG002	B

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