COAST
CONSULTING ENGINEERS

Parkside Road
Cleator Moor

Flood Risk Assessment
and Drainage Strategy

Issue Date:
23 July 2025

Report Number:
23098-01

Client:
Genesis Homes

Revision:
B

Contents

Revision	Date	Comments	Prepared by	Checked by
A	13.12.2024	Initial issue	JM	KR
B	23.07.2025	Revised to suit latest architects layout	JM	KR

Executive Summary

Site Location	Land north-west of Parkside Road, Cleator Moor, CA25 5HD
Site Proposals	Construction of 95 residential dwellings and associated infrastructure.
Ground Conditions	The site is located in an area likely to be underlain by clay/clayey loam. Bedrock comprises of sandstone and mudstone.
Nearest Watercourse	River Ehen is located approx. 335m South-East of the development.
Nearest Surface Water Sewer	None within vicinity of the site.
Nearest Foul Water Sewer	None within vicinity of the site.
Nearest Combined Sewer	A 225mm diameter combined sewer is located south within Frizington Road.
Flood Zone	EA flood maps indicate that the development boundary is located entirely within an area classified as a **Flood Zone 1**.
Surface Water Flooding	Risk of surface water flooding is **low**
Ground Water	The risk of flooding due to ground water is **low**.
Surface Water Discharge Rate	Surface water should be restricted to 42 litres/sec (Qbar) peak discharge for all events up to and including the 100 year +50% climate change.
SUDS	Detention basin Vortex flow control

The above summary should not be used in isolation and reference should be made the full report.

1. Introduction

Coast Consulting Engineers have been commissioned by Genesis Homes to assess the flood risk associated with a proposed development on land to the north-west of Parkside Road, Cleator Moor, CA25 5HD. This Flood Risk Assessment is reviewed in accordance with the National Planning Policy Framework (NPPF) for Development and Flood Risk. In conjunction with assessing the site for flood risk a proposed drainage strategy has been prepared.

This site-specific Flood Risk Assessment (FRA) has been undertaken to determine the risk of flooding to the proposed development from all sources in accordance with the National Planning Policy Framework (NPPF) and to assess the flood risk to others as a result of the development. The assessment will recommend how the risk can be managed in line with planning policy requirements.

One of the key aims of the National Planning Policy Framework (NPPF) is to ensure that flood risk is considered at all stages of the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk. Where new development is necessary in such areas, the policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

1.1 National Planning Policy Framework (NPPF)

The NPPF requires that:

- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.

- A site-specific flood risk assessment is required for proposals greater than 1 ha in size in a Flood Zone 1; all proposals for new development in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as identified in the Strategic Flood Risk Assessment).

The following definitions for flood zones are derived from NPPF:

FLOOD ZONE 1:

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

FLOOD ZONE 2:

This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

FLOOD ZONE 3:

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

In addition to the risk of flooding from rivers or sea, consideration must also be given to surface water flooding, flooding due to ground water and flooding from artificial sources such as sewer failure or overtopping of reservoirs.

2. Site location, Existing Topography and Proposals

2.1 Site Location

The proposed development is located north-west of Parkside Road, Cleator Moor, CA25 5HD, site location is indicated in figure 2.0.1 below.

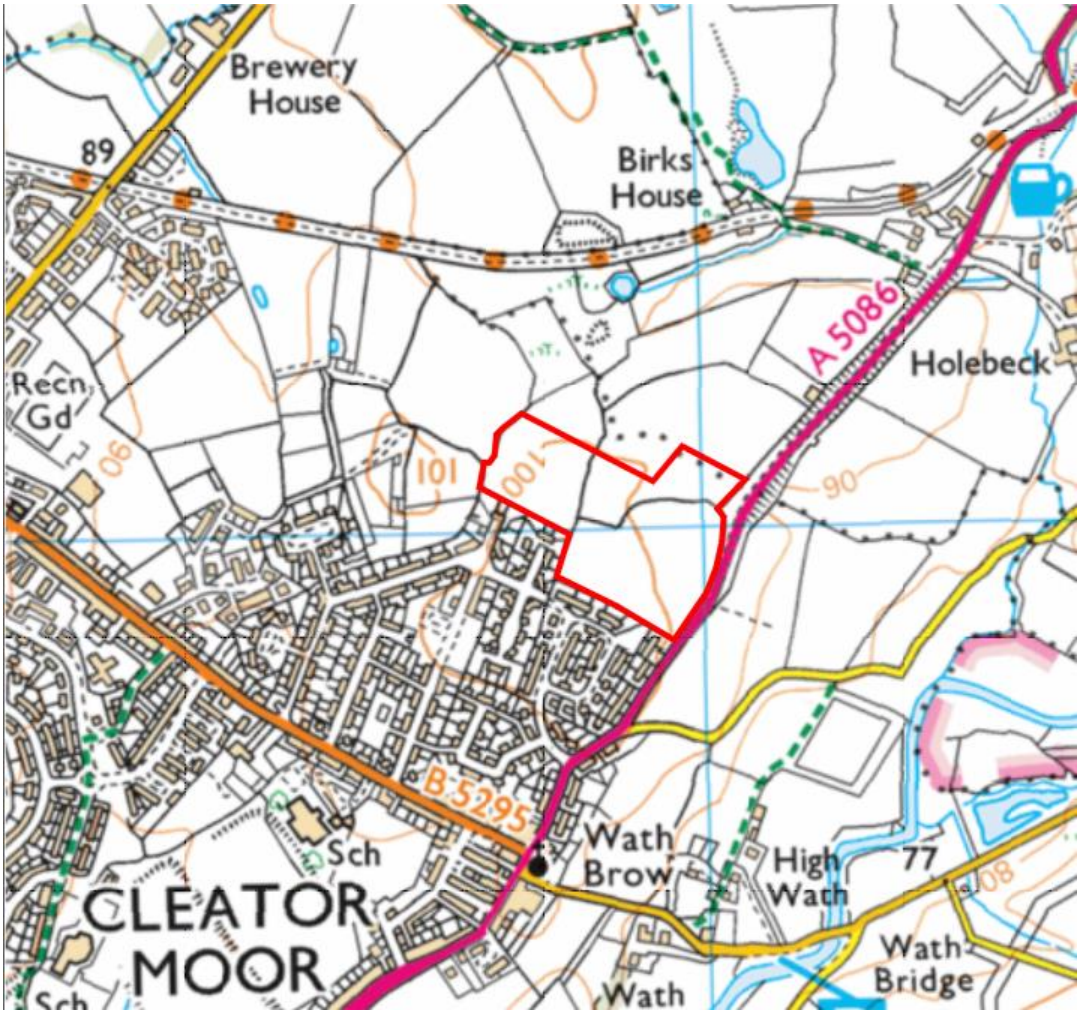

Figure 2.1.1 – Site location Plan.

2.2 Topography

A topographical survey has been completed which shows relatively steep slopes across the site, a high point is located around the south-western boundary at c.101.80, falling generally north-east at c.90.00 and north-west c91.65.

The site is bounded to the north by further undeveloped land to the north and west, the A5086 to the east and a residential estate to the south.

The topographical survey can be found in Appendix A.

2.3 Development Proposals

A copy of the proposed architectural site layout comprising of a residential development of 95 units and associated infrastructure can be found in Appendix B. An exact is also shown below in figure 2.3.1.

Figure 2.3.1 – Development proposals.

3. Potential Sources of Flooding and Proposed Mitigation

As required by the National Planning Policy Framework (NPPF) and Technical Guidance to the NPPF, each potential source of flooding needs to be considered; rivers and sea, land, groundwater, sewers and artificial sources (such as reservoirs and canals). Consideration also needs to be given to the flood risk vulnerability classification for this type of development.

3.1 Flood Zone Mapping

Environment Agency flood maps have been acquired to assist with this assessment. The flood maps indicate that the development boundary is located entirely within an area classified as a **Flood Zone 1**. Land located within a flood zone 1 is defined as having less than a 1 in 1,000 annual probability of river flooding (low risk). Environment Agency maps also confirm that the site does not lie within an area served by their flood warning scheme. Refer to the extract below which identifies the Flood Zones within and in proximity to the development site. The site is not considered to be at risk of flooding from rivers or sea.

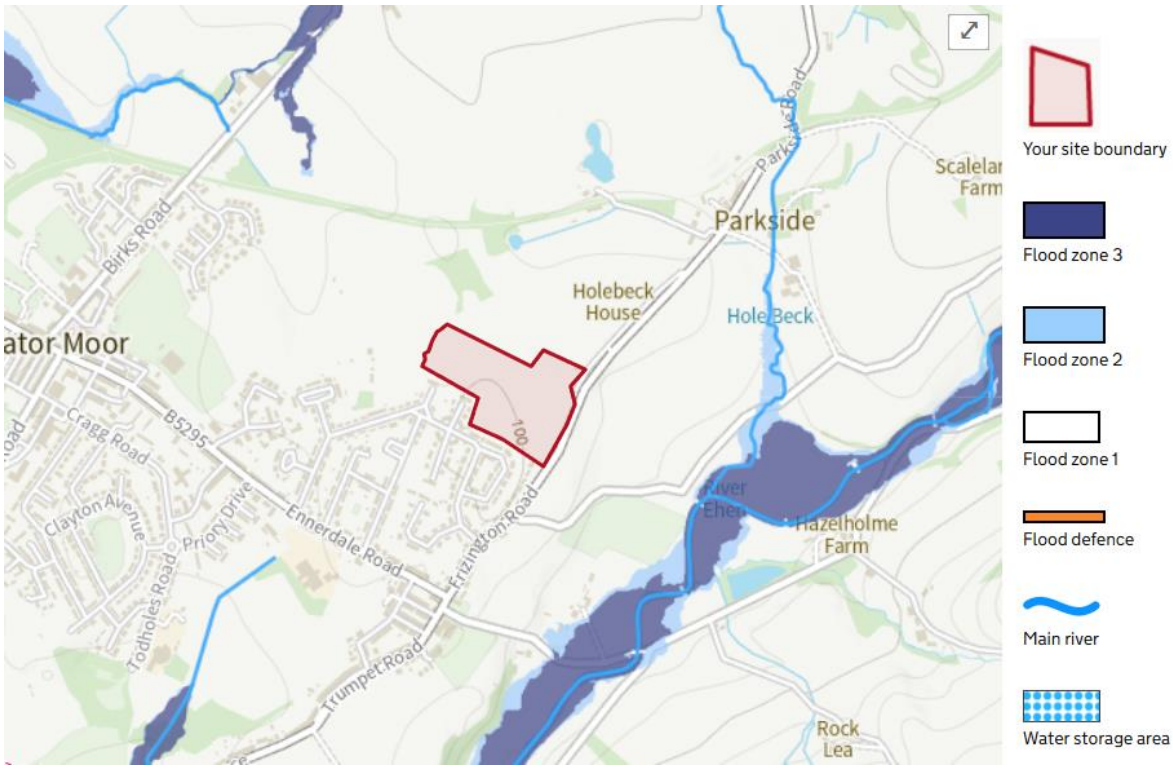

Figure 3.1.1 – Flood zone map.

3.2 Flood Risk Vulnerability Classification

Table 2 of the Technical Guidance to the National Planning Policy Framework states the following with respect to flood risk vulnerability classification.

3.2.1 More vulnerable

- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- **Buildings used for dwelling houses**, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan

Table 3 of the Technical Guidance to the National Planning Policy Framework states the following with respect to appropriate land uses:

Table 3: flood risk vulnerability and flood zone 'compaibility'

Flood Risk Vulnerability Classification (See Table 2)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	x	Exception Test required	✓
Zone 3b functional floodplain	Exception Test required	✓	x	x	x

Key: ✓ Development is appropriate.
X Development should not be permitted.

An exception test will not be required in this instance as development is located outside of a flood zone 2 or flood zone 3.

3.3 Surface Water Flood Risk

Surface water flood risk mapping shows the site is at **low** risk of surface water flooding. See figure 3.3.1 below.

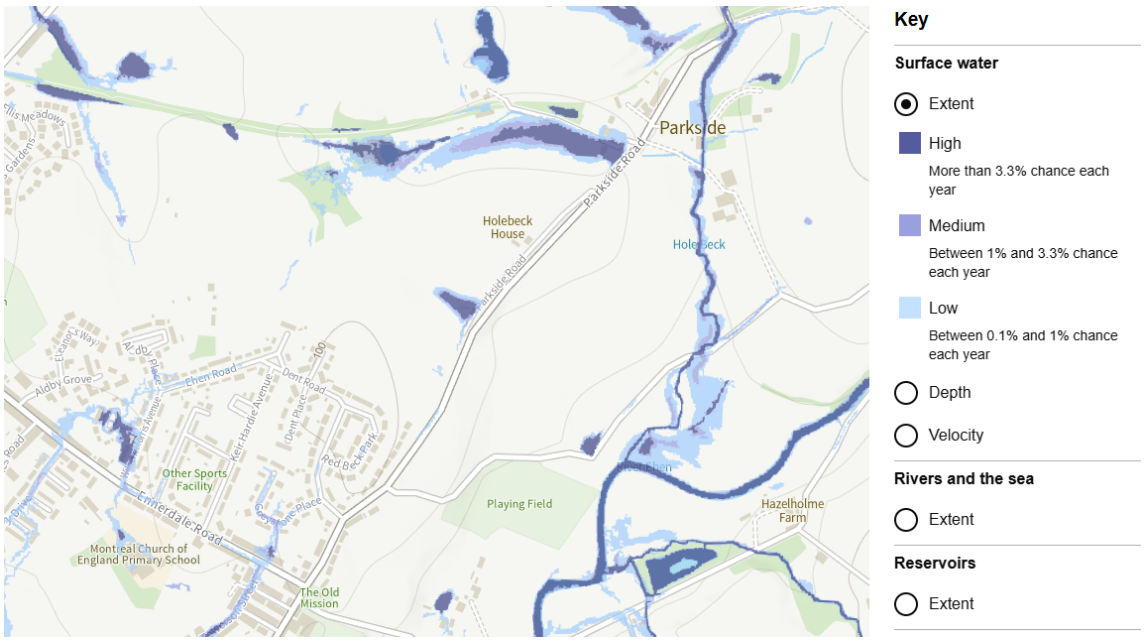

Figure 3.3.1 – Surface Water flood risk map.

3.4 Ground Water Flooding

Flooding due to ground water occurs when the levels of water below the ground rise and emanate above finished ground level.

Government published long term flood risk service states that flooding from ground water is unlikely in this area.

Based upon the information outlined above the risk of flooding due to ground water rise can be considered as **low** throughout the site.

3.5 Sewer Flooding

Sewer record drawings show existing combined sewers are present to the south of the development site. Due to the relativley steeply sloping topography any flooding from existing sewer would trend away from proposed development. Risk to the develoment from sewerflooding is considered **low.**

Figure 3.5.1 - Sewer Record Drawing.

3.6 Reservoir Flood Risk

Artificial sources of flood risk such as man-made ponds or reservoirs can cause a potential risk of flooding. The flood map below shows that there is no potential flooding of the site from reservoirs, therefore the risk of flooding due to this source can be deemed **low**.

Figure 3.6.1 – Reservoir flood risk map.

The proposed development is considered appropriate within a Flood Zone 1 in line with the guidance contained within the National Planning Policy Framework for flooding.

4. Surface and Foul Water Disposal

National guidance and regulations including Part H of the Building Regulations provides a hierarchy for surface water disposal as follows:

1. By infiltration
2. To watercourse
3. To surface water sewer
4. To combined sewer

4.1 Infiltration

In order for infiltration drainage to provide an effective means of dealing with surface water run off from development the natural ground needs to be sufficiently permeable. This should be tested and proven by means of intrusive site investigation including soak-away testing to determine the natural soil's permeability. In addition, soak aways need to be positioned sufficient distance from buildings and roads in line with building regulations. At the time of writing a site investigation has not been undertaken.

Although a site investigation has not yet been undertaken for proposed development it is anticipated that soil conditions are likely to be underlain by clay/clayey loam. Bedrock comprises of sandstone and mudstone.

British geological survey data records superficial deposits as clay, see figure 5.1.1 below.

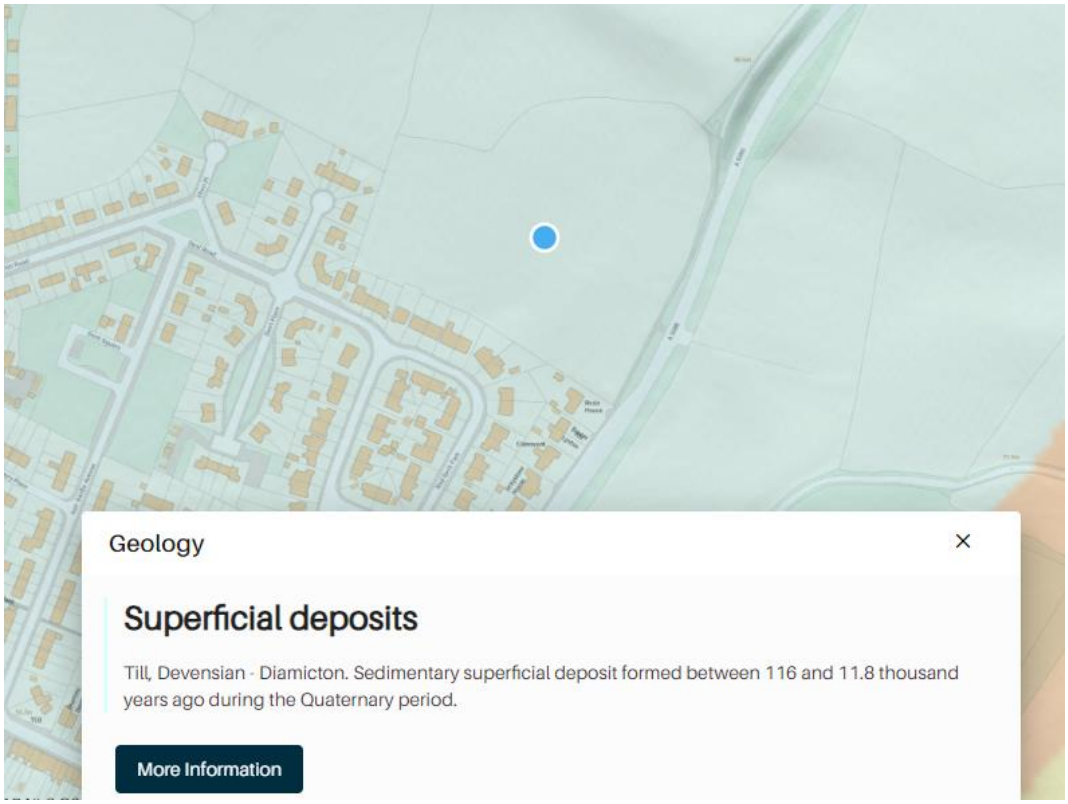

Figure 4.1.1 – Superficial deposits recorded on British Geological Survey.

Without a site specific site investigation detailing ground conditions at the site, including permeability testing and water table levels it is not possible to conclude that infiltration drainage would be an effective means of dealing with surface water run off for proposed development.

4.2 Watercourse

The nearest watercourse to the proposed development site is River Ehen located approximately 335m to the south-east of the development. The site is separated from the watercourse by third party land. A culverted drainage ditch leading to a watercourse is located at the north-east corner of the site boundary.

4.3 Sewer

The nearest recorded adopted combined sewer is located in Frizington Road with manhole at the head of the public sewer located approximately 245m from the site boundary. Extract from public sewer record drawing is included in Figure 3.5.1 above.

4.4 Proposed Discharge Rate

In line with national and local standards surface water discharge from development should match the natural greenfield run off.

Calculated Qbar discharge rate using greenfield run off estimation tool on HR Wallingford website https://www.uksuds.com/tools/greenfield-runoff-rate-estimation are indicated in figure 4.4.1 below and in Appendix C.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	42.28	42.28
1 in 1 year (l/s):	36.78	36.78
1 in 30 years (l/s):	71.87	71.87
1 in 100 year (l/s):	87.93	87.93
1 in 200 years (l/s):	100.19	100.19

Figure 4.4.1 – Calculated greenfield runoff rates.

By restricting the peak rate of discharge from the site to 42l/s for all rainfall events up to the 1 in 100 year return period with a 50% allowance for climate change, the proposed development will provide betterment from the existing regime in line with the table below:

Return Period	Existing	Proposed	Betterment
Qbar	42.2 l/s	42.2 l/s	0%
1	36.7 l/s	42.2 l/s	-15%
30	71.8 l/s	42.2 l/s	70%
100	87.9 l/s	42.2 l/s	108%

4.5 Proposed Surface Water Drainage

The proposed surface water drainage network will include an online detention basin to provide temporary storage for run-off from the proposed impermeable areas up to the 1 in 100 year rainfall event with an allowance of 50% for climate change, and discharge to an existing culverted drainage ditch leading to a watercourse.

The required volume of surface water attenuation in the basin has been calculated to be 1997m^3 based on a discharge rate of 42l/s.

A detailed drainage strategy can be found in Appendix D, Hydraulic calculations for the proposed drainage network are included in Appendix E.

Hydraulic calculations are based on the following criteria:

- Climate change allowance of 50% applied to account for current predicted increase in peak rainfall intensity.

- Volumetric runoff coefficient (Cv value) of 1.0 of measured impermeable areas.
- FSR rainfall data used. M5-60 = 17.6. R = 0.256.
- Storm duration up to 1440 minutes analysed.

4.6 SuDS Techniques

In line with National Planning Policy, SuDS techniques are to be utilised as part of the design of the surface water network. The appliable techniques and the benefits that they bring to the development are outlined below. Proposed basin details are included in Appendix F.

- Detention basin or ponds: An online detention basin will be installed to contain flows up to and including the 100 year event with a 50% allowance for climate change. Detention basins are effective in peak flow reduction, water quality treatment in the settlement of solids and have good amenity and ecological potential.
- Peak flow control: A vortex flow control will be utilised to restrict flows to no greater than pre-development greenfield runoff rates.

4.7 Proposed Foul Water Drainage

There are no foul or combined sewers within the site boundary. A 225mm diameter combined sewer is located south of the development boundary and flows south. UU records confirm a gravity connection would not be achievable and therefore a pumping station and rising main will be required. Proposed foul water drainage layout is included in Appendix G.

4.8 Water Quality Treatment

SuDS provided are used to mitigate against pollution from runoff of different land types within the development proposals. An assessment of the suitability of SuDS proposed has been undertaken utilising Simple Index Approach published by CIRIA and HR Wallingford. The pollution hazard level varies between land types, figure 4.8.1 shows the proposed SuDS features to have greater mitigation indices than the pollution hazard indices therefore providing adequate water treatment.

Pollution Hazard Indices				
Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roof	Very Low	0.2	0.2	0.05
Residential Parking	Low	0.5	0.4	0.4
Low Traffic Highways	Low	0.5	0.4	0.4
Mitigation Indices				
Detention Basins		0.5	0.5	0.6

Figure 4.8.1 – Pollution hazard matrix based on SIA.

Appendix A –
Topographic Survey

Legend

Building	Spot height in metres
Barrier	Post Box
Bottom of Bank	Borehole
British Telecom	Bus Stop
Concrete	Cable TV
Canopy	Electricity Pole
Drop Kerb	Earth Rod
Drain	Fire Hydrant
Fence	Floor Level
Flower Bed	Flag Pole
Fence - Birdsmouth	Gas Valve
Foliage	Gas Marker
Footpath	Gate Post
Fence - Security	Gully
Fence - Wire	Inspection Chamber
Grass	Invert Level
Gate	Lamp Post
Hedge	Manhole
Kerb	Marker
Kerb Top	Rodding Eye
Lake / Pond	Road Sign
Marsh	Stop Cock
Overhead Electricity Line	Septic Tank
Overhead Telephone Line	Survey Station
Ramp	Sign Post
Sign Post	Stop Valve
Tarmac	Traffic Light
Top of Bank	Telegraph Pole
Track	Water Meter
Verge	Tree (deciduous)
Road Markings	Tree (coniferous)
Wall	Tree (unsurveyed)
Contours	Shrub
Steep Slope	

amr geomatics

SURVEY STATIONS MARKED WITH ROAD NAILS AND PEGS WITH COORDINATES RELATING TO OSGB36 NATIONAL GRID

SITE LEVELS MARKED AT STATIONS RELATE TO ORDNANCE DATUM OSGM15, VIA DIFFERENTIAL GPS.

DRAWING REVISION RECORD

No.	Detail	DWG No.	Date	Intl.
1				
2				
3				
4				

amrGeomatics
Chartered Land Surveyors
www.amrGeomatics.co.uk

Site: "CLEATOR MOOR"
CUMBRIA

Drawing
TOPOGRAPHICAL SURVEY

Date	30 AUG 2023	Drawing No.	P11140/amr/1 Subm. 01
Scale	1: 500 @ A1		
Drawn By	LR	Checked By	MH

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Chartered Land Surveyors
mail@amrGeomatics.co.uk

amrGeomatics Northern Ltd
1 Fore Street
Hexham
Northumberland
NE46 1ND
T: 01434 600320
M: 07971 672071

Grid North

Field

Field

Approx 1.00m Dia culvert pipe

'A5086'

Main culvert pipe outfall inaccessible (Approx location)

0.30m Dia Pipe

Field

Field

Grid North

0.30m Dia Pipe

Field

0.30m Dia Pipe

Field

Field

Field

'A5086'

Access

Grid North

'A5086'

Legend

- Building
- Barrier
- Bottom of Bank
- British Telecom
- Concrete
- Canopy
- Drop Kerb
- Drain
- Fence
- Flower Bed
- Fence - Birdsmouth
- Foliage
- Footpath
- Fence - Security
- Fence - Wire
- Grass
- Gate
- Hedge
- Kerb
- Kerb Top
- Lake / Pond
- Marsh
- Overhead Electricity Line
- Overhead Telephone Line
- Ramp
- Sign Post
- Tarmac
- Top of Bank
- Track
- Verge
- Road Markings
- Wall
- Contours
- Steep Slope
- Spot height in metres
- Post Box
- Borehole
- Bus Stop
- Cable TV
- Electricity Pole
- Earth Rod
- Fire Hydrant
- Floor Level
- Flag Pole
- Gas Valve
- Gas Marker
- Gate Post
- Gully
- Inspection Chamber
- Invert Level
- Lamp Post
- Manhole
- Marker
- Rodding Eye
- Road Sign
- Stop Cock
- Septic Tank
- Survey Station
- Sign Post
- Stop Valve
- Traffic Light
- Telegraph Pole
- Water Meter
- Tree (deciduous)
- Tree (coniferous)
- Tree (unsurveyed)
- Shrub

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SURVEY STATIONS MARKED WITH ROAD NAILS AND PEGS WITH COORDINATES RELATING TO OSGB36 NATIONAL GRID

SITE LEVELS MARKED AT STATIONS RELATE TO ORDNANCE DATUM OSGM15, VIA DIFFERENTIAL GPS.

DRAWING REVISION RECORD

No.	Detail	DWG No.	Date	Intl.
1				
2				
3				
4				

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Chartered Land Surveyors
www.amrGeomatics.co.uk

Site: "CLEATOR MOOR", CUMBRIA

Drawing: **TOPOGRAPHICAL SURVEY**

Date	30 AUG 2023	Drawing No.	**P11140/amr/2** Subm. 01
Scale	1: 500 @ A1		
Drawn By	LR	Checked By	MH

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Appendix B –
Proposed Layout

NOTES

ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE

ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT BEFORE ANY WORK COMMENCES

THIS DRAWING SHALL NOT BE SCALED TO ASCERTAIN ANY DIMENSIONS WORK TO FIGURED DIMS ONLY

Key

Site Boundary Redline

rev	date/ints	description
P13	15-07-25 PS	Plot 32 path adjusted.
P12	15-07-25 PS	Amendments to client request.
P11	09-07-25 PS	Amendments to client request.
P10	01-07-25 GB	Proposed planning amendments.
P9	12-06-25 GB	Proposed planning amendments - draft.
P8	09-01-25 DC	Site entrances adjusted following feedback from transport consultants.
P7	13-12-24 GB	Suds basin and adjacent site red line boundary amended.
P6	02-12-24 DC	Minor changes to plan following feedback from client.
P5	28-11-24 DC	Plan updated following feedback from client and consultants. Issued for comment.
P4	14-11-24 DC	Plan updated following feedback from client. Further consultant commentary required.
P3	25-09-24 GB	Update following comments from Genesis
P2	19-09-24 GB	Update following comments from Genesis
P1	17-09-24 GB	Revised layout
P0	05-03-24 DC	First Issue

project
PARKSIDE ROAD

location
PARKSIDE ROAD, CLEATOR MOOR

client
GENESIS HOMES

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key plan

drawing title
PARKSIDE ROAD, CLEATOR MOOR
SITE FRAMEWORK PLAN

dwg purpose
PLANNING

scale 1:500 drawn DC checked GB
@ sheet size A1 rev date 09-01-2025

244102 job number | AFL-ZZ-XX-DR-A-20112 drawing number | P13 revision

Appendix C –
Flood Risk Map

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**302884/514999**	**12 Dec 2024 13:19**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

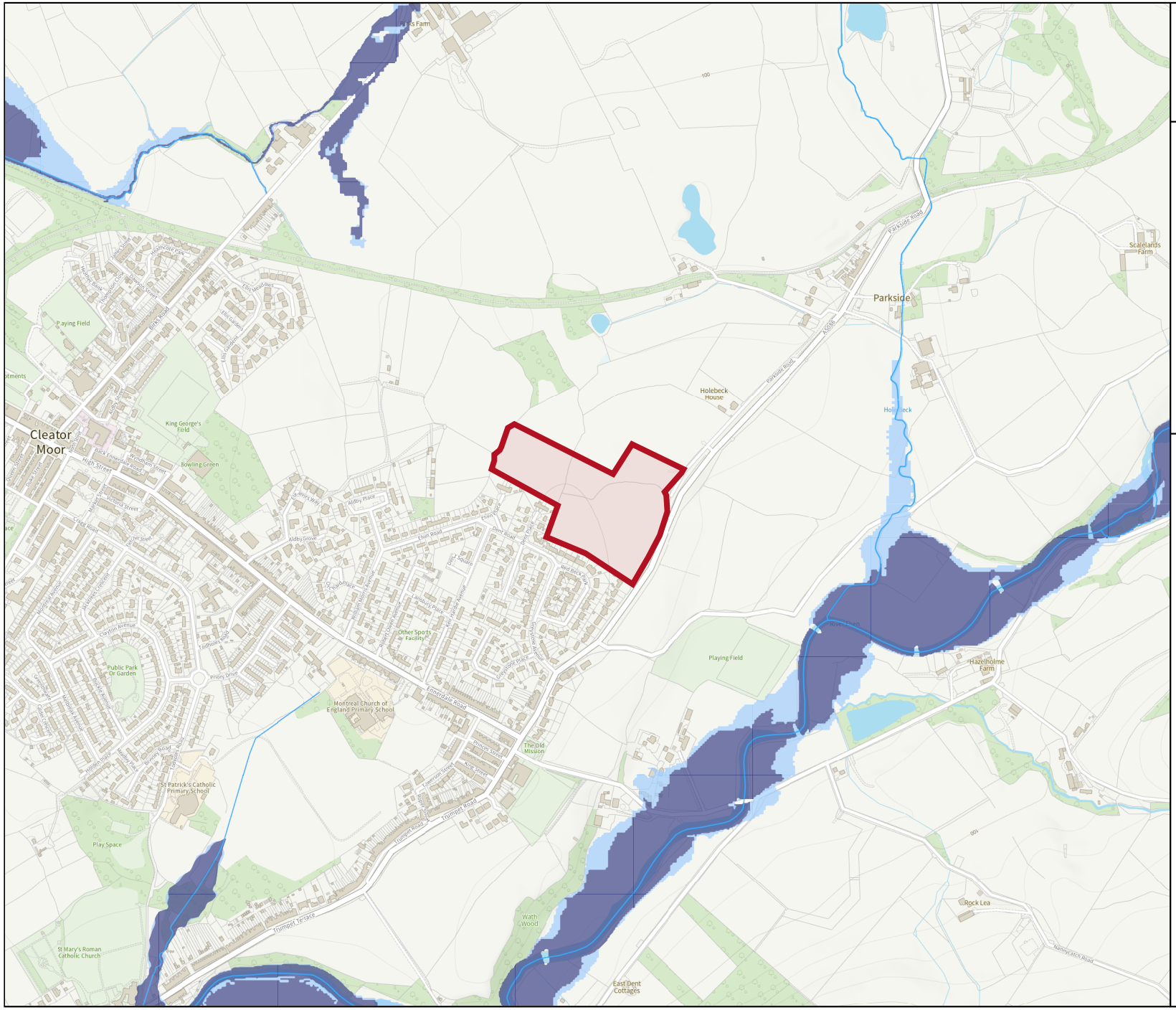
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2024 OS AC0000807064. https://flood-map-for-planning.service.gov.uk/os-terms



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
302884/514999

Scale
1:10000

Created
12 Dec 2024 13:19

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 100 200 300m

Appendix C –
Greenfield Run Off Estimation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Jason McNeil
Site name:	Cleator
Site location:	Cleator

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:	54.52076° N
Longitude:	3.50104° W
Reference:	2079146768
Date:	Oct 03 2024 11:06

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 4.107

Methodology

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

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	1337	1337
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

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.

(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.

(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
Q_{BAR} (l/s):	42.28	42.28
1 in 1 year (l/s):	36.78	36.78
1 in 30 years (l/s):	71.87	71.87
1 in 100 year (l/s):	87.93	87.93
1 in 200 years (l/s):	100.19	100.19

Appendix D –
Proposed Drainage Strategy Layout

ADDITIONAL SURVEY INFO REQUIRED TO DETERMINE FULL EXTENT OF BATTERS

VOL = 2269m3
SIDE SLOPES 1:3
TOP = 93.650m
BASE = 92.150m

S27 Hydrobrake
CL93.55
IL92.150
ORIFICE 265mm
DESIGN FLOW 42l/s
DESIGN HEAD 1.7m

Approx 1.00m Dia culvert pipe

3.000

90.6m

A 5086

'A5086'

Rosia House

Drop bollard for emergency access

Access

SUDS MAINTENANCE TRACK

RISING MAIN

EXISTING WATER MAIN TAKEN FROM RECORDS

ALL DRIVEWAYS TO BE CONSTRUCTED WITH A FILTER DRAIN

KEY PLAN

Highways
1. All excavations below adopted highways to be backfilled with Type 1 and compacted in layers not exceeding 150mm.
2. Highway Authority to be contacted as soon as Contractor is on site to enable early discussions with the Clerk of Works.

General Drainage
3. Manhole/inspespectionchamber covers in trafficked areas to be loading type D400 and B125 in non-trafficked areas.
4. All gullies to be trapped as shown on the details drawings.

Adopted Drainage
5. Position and levels of existing manholes and sewers are to be checked on site as soon as possible and preferably before site activities commence.
6. The sewer connection is to be carried out by an NWL Approved Contractor.
7. This drawing is to be read in conjunction with the drainage details drawings.
8. For proposed adopted drainage pipes with less than 900mm cover in areas not subjected to vehicular loading and less than 1200mm in vehicular loading areas to be concrete protected.
9. Adopted drainage is to comply with 'Sewers for Adoption 6th Edition'.
10. Pipe surround to be granular type 's' unless noted otherwise.

Private Drainage
11. Private drainage is to comply with all statutory requirements and accord with BS EN 752 and Building Regulations Approved Document H.
12. Pipe bedding should granular unless noted otherwise and the granular material to be to BS882:Pt 2 and to Building Regulations Part H.
13. Pipe sizes to be 100mm u.n.o..
14. For drainage pipes to be cast in concrete to have rocker pipes either side of concrete.

Layout Key
- Highway gully and 150mmØ lead (connection of lead to carrier pipe to be at 45° in the direction of surface water flow, where possible).

Surface Water Drainage
- Adopted manhole - Concrete Ring (see manhole schedule for further detail).
- Adopted surface water sewer.

Foul Drainage
- Adopted Manhole - Concrete Ring .
- Adopted foul water sewer .

Existing Drainage
- Existing Manhole .
- Existing sewer .

External Works Notes
× 9.000 - Proposed external level.
×EX9.000m - Existing level.
13.60 - Proposed finished floor level.
RET 600 - Proposed retaining wall with retained height.
- Exposed brickwork.
- Tanking/Double DPC
- Flag on edge up to 450mm high.
H - Proposed steps
- Proposed batter

Issue	Date	Description	By	Chkd	Appd
P4	23.07.25	Updated to suit latest layout	JM	KR	RH
P3	13.12.24	Planning issue	JM	KR	RH
P2	15.08.24	Updated to suit latest layout	JM	RH	RH
P1	07.12.23	Preliminary Issue	JM	RH	PL

COAST CONSULTING ENGINEERS
7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977879

Client: GENESIS HOMES

Job Title: PARKSIDE ROAD CLEATOR MOOR

Drawing Title: ENGINEERING LAYOUT SHEET 1

Scale at A0: 1:250

Drawing Status: **PRELIMINARY**

Job No: 23098 | Drawing No: 01 | Issue: P4

Highways

1. All excavations below adopted highways to be backfilled with Type 1 and compacted in layers not exceeding 150mm.
2. Highway Authority to be contacted as soon as Contractor is on site to enable early discussions with the Clerk of Works.

General Drainage

3. Manhole/inspespectionchamber covers in trafficked areas to be loading type D400 and B125 in non-trafficked areas.
4. All gullies to be trapped as shown on the details drawings.

Adopted Drainage

5. Position and levels of existing manholes and sewers are to be checked on site as soon as possible and preferably before site activities commence.
6. The sewer connection is to be carried out by an NWL Approved Contractor.
7. This drawing is to be read in conjunction with the drainage details drawings.
8. For proposed adopted drainage pipes with less than 900mm cover in areas not subjected to vehicular loading and less than 1200mm in vehicular loading areas to be concrete protected.
9. Adopted drainage is to comply with 'Sewers for Adoption 6th Edition'.
10. Pipe surround to be granular type 's' unless noted otherwise.

Private Drainage

11. Private drainage is to comply with all statutory requirements and accord with BS EN 752 and Building Regulations Approved Document H.
12. Pipe bedding should granular unless noted otherwise and the granular material to be to BS882:Pt 2 and to Building Regulations Part H.
13. Pipe sizes to be 100mm u.n.o..
14. For drainage pipes to be cast in concrete to have rocker pipes either side of concrete.

Layout Key

- Highway gully and 150mmØ lead (connection of lead to carrier pipe to be at 45° in the direction of surface water flow, where possible).

Surface Water Drainage

- Adopted manhole - Concrete Ring (see manhole schedule for further detail).
- Adopted surface water sewer.
- Private PVC-U 100mm (unless noted otherwise) drainage pipe.
- Connection chamber, 475mmØ. Non man entry.
- Inspection chamber, 475mmØ. Non man entry.
- Rodding Eye.
- 300 wide x 600 Dp filter drain.
- ACO channel with heelsafe grate (B125) and sump.
- Yard gully by Hepworth or similar (B125 grate).

Foul Drainage

- Adopted Manhole - Concrete Ring .
- Adopted foul water sewer .
- Private PVC-U 100mm (unless noted otherwise) drainage pipe.
- Connection chamber, 475mmØ. Non man entry.
- Inspection chamber, 475mmØ. Non man entry.
- Inspection chamber, 300mmØ. Non man entry.

Existing Drainage

- Existing Manhole .
- Existing sewer .

Issue	Date	Description	By	Chkd	Appd
P4	23.07.25	Updated to suit latest layout	JM	KR	RH
P3	13.12.24	Planning issue	JM	KR	RH
P2	15.08.24	Updated to suit latest layout	JM	RH	RH
P1	07.12.23	Preliminary Issue	JM	RH	PL

COAST CONSULTING ENGINEERS
7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977879

Client: GENESIS HOMES

Job Title: PARKSIDE ROAD CLEATOR MOOR

Drawing Title: ENGINEERING LAYOUT SHEET 2

Scale at A0: 1:250

Drawing Status: PRELIMINARY

Job No: 23098

Drawing No: 02

Issue: P4

A0

DENT ROAD

RED BECK PARK

RED BECK PARK

Petteril

Gelt

Wreay

Derwent

Ellen

Whillan

Petteril

Dee

Eden

Derwent

Ellen

Wreay

Eden

Drop bollard for emergency access

Drop bollard for emergency access

Rosia House

Claremont

Breeze Hill

Lynton

RISING MAIN

RISING MAIN

7702
97.31
95.67

8703
97.54
96.03

8601
97.41
95.55

ALL DRIVEWAYS TO BE CONSTRUCTED WITH A FILTER DRAIN

KEY PLAN

Highways
1. All excavations below adopted highways to be backfilled with Type 1 and compacted in layers not exceeding 150mm.
2. Highway Authority to be contacted as soon as Contractor is on site to enable early discussions with the Clerk of Works.

General Drainage
3. Manhole/inspespectionchamber covers in trafficked areas to be loading type D400 and B125 in non-trafficked areas.
4. All gullies to be trapped as shown on the details drawings.

Adopted Drainage
5. Position and levels of existing manholes and sewers are to be checked on site as soon as possible and preferably before site activities commence.
6. The sewer connection is to be carried out by an NWL Approved Contractor.
7. This drawing is to be read in conjunction with the drainage details drawings.
8. For proposed adopted drainage pipes with less than 900mm cover in areas not subjected to vehicular loading and less than 1200mm in vehicular loading areas to be concrete protected.
9. Adopted drainage is to comply with 'Sewers for Adoption 6th Edition'.
10. Pipe surround to be granular type 's' unless noted otherwise.

Private Drainage
11. Private drainage is to comply with all statutory requirements and accord with BS EN 752 and Building Regulations Approved Document H.
12. Pipe bedding should granular unless noted otherwise and the granular material to be to BS882:Pt 2 and to Building Regulations Part H.
13. Pipe sizes to be 100mm u.n.o..
14. For drainage pipes to be cast in concrete to have rocker pipes either side of concrete.

Layout Key

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- Adopted manhole - Concrete Ring (see manhole schedule for further detail).
- Adopted surface water sewer.

Foul Drainage

- Adopted Manhole - Concrete Ring .
- Adopted foul water sewer .

Existing Drainage

- Existing Manhole .
- Existing sewer .

External Works Notes

× 9.000 - Proposed external level.
×EX9.000m - Existing level.
13.60 - Proposed finished floor level.
RET 600 - Proposed retaining wall with retained height.
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- Tanking/Double DPC
- Flag on edge up to 450mm high.
H - Proposed steps
- Proposed batter

Issue	Date	Description	By	Chkd	Appd
P2	23.07.25	Updated to suit latest layout	JM	KR	RH
P1	13.12.24	Planning issue	JM	KR	RH

COAST CONSULTING ENGINEERS
7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977879

Client: GENESIS HOMES

Job Title: PARKSIDE ROAD CLEATOR MOOR

Drawing Title: ENGINEERING LAYOUT SHEET 3

Scale at A0: 1:250

Drawing Status: **PRELIMINARY**

Job No: 23098

Drawing No: 03

Issue: P2

Appendix E –
Surface Water Drainage Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1	0.161	1.200	Type B	100.296	98.387	1.684	302775.815	515063.611
S2	0.098	1.350	Type C	99.567	97.767	1.500	302792.068	515093.516
S3	0.073	1.350	Type C	98.896	97.246	1.275	302806.537	515124.312
S4	0.076	1.350	Type B	100.237	97.006	2.781	302853.477	515102.258
S5	0.097	1.200	Type B	101.303	99.235	1.843	302817.519	515040.756
S6	0.063	1.200	Type B	101.123	99.072	1.826	302832.403	515032.600
S7	0.058	1.200	Type B	101.151	98.867	2.059	302842.002	515050.116
S8	0.000	1.350	Type A	100.832	96.971	3.411	302853.835	515090.571
S9	0.000	1.350	Type B	99.949	96.894	2.605	302883.118	515091.238
S10	0.172	1.350	Type C	100.759	99.184	1.350	302863.515	515003.831
S11	0.083	1.350	Type C	100.133	98.432	1.401	302877.618	515038.710
S12	0.136	1.350	Type C	99.809	98.102	1.407	302887.760	515052.999
S13	0.000	1.350	Type C	98.473	96.800	1.223	302917.819	515074.246
S14	0.141	1.350	Type C	101.711	100.061	1.350	302849.469	514956.815
S15	0.161	1.350	Type C	101.146	99.495	1.351	302897.589	514936.246
S16	0.049	1.350	Type C	100.148	98.498	1.350	302923.012	514925.424
S17	0.093	1.350	Type C	99.577	97.870	1.407	302931.723	514929.335
S18	0.076	1.350	Type C	98.181	96.456	1.350	302945.003	514967.842
S19	0.056	1.350	Type C	97.484	95.609	1.500	302953.709	514991.851
S20	0.137	1.350	Type C	96.813	94.830	1.608	302956.318	515011.986
S21	0.047	1.350	Type C	95.973	94.320	1.278	302954.571	515034.227
S22	0.000	1.500	Type B	97.285	94.017	2.668	302950.240	515052.760
S23	0.049	1.350	Type C	96.835	95.410	1.200	302985.870	514961.731
S24	0.196	1.350	Type B	96.619	94.819	1.500	303004.509	514954.587
S25	0.055	1.200	Type B	96.303	94.499	1.504	303017.705	514976.086
S26	0.061	1.200	Type B	95.200	93.222	1.678	303019.657	515016.841
S27 - HB	0.000	2.100	Unknown	93.650	92.150	0.900	303034.231	515052.682
OUTFALL	0.000	0.000	Unknown	89.190	89.000	-0.410	303051.678	515053.512

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1	98.387	S2	97.842	Circ	0.225mØ	34.036	62.5	0.600	1.684	1.500
1.001	S2	97.767	S3	97.321	Circ	0.3mØ	34.026	76.3	0.600	1.500	1.275
1.002	S3	97.246	S4	97.081	Circ	0.375mØ	51.863	314.3	0.600	1.275	2.781
1.003	S4	97.006	S8	96.971	Circ	0.45mØ	11.692	334.1	0.600	2.781	3.411
2.000	S5	99.235	S6	99.072	Circ	0.225mØ	16.972	104.1	0.600	1.843	1.826
2.001	S6	99.072	S7	98.867	Circ	0.225mØ	19.974	97.4	0.600	1.826	2.059
2.002	S7	98.867	S8	97.196	Circ	0.225mØ	42.150	25.2	0.600	2.059	3.411
1.004	S8	96.971	S9	96.894	Circ	0.45mØ	29.291	380.4	0.600	3.411	2.605
1.005	S9	96.894	S13	96.800	Circ	0.45mØ	38.638	411.0	0.600	2.605	1.223
3.000	S10	99.184	S11	98.507	Circ	0.225mØ	37.622	55.6	0.600	1.350	1.401
3.001	S11	98.432	S12	98.102	Circ	0.3mØ	17.522	53.1	0.600	1.401	1.407
3.002	S12	98.102	S13	96.950	Circ	0.3mØ	36.810	32.0	0.600	1.407	1.223
1.006	S13	96.800	S22	94.167	Circ	0.45mØ	38.894	14.8	0.600	1.223	2.668
4.000	S14	100.061	S15	99.495	Circ	0.3mØ	52.332	92.5	0.600	1.350	1.351
4.001	S15	99.495	S16	98.498	Circ	0.3mØ	27.631	27.7	0.600	1.351	1.350
4.002	S16	98.498	S17	97.870	Circ	0.3mØ	9.549	15.2	0.600	1.350	1.407
4.003	S17	97.870	S18	96.531	Circ	0.3mØ	40.733	30.4	0.600	1.407	1.350
4.004	S18	96.456	S19	95.609	Circ	0.375mØ	25.539	30.2	0.600	1.350	1.500
4.005	S19	95.609	S20	94.830	Circ	0.375mØ	20.303	26.1	0.600	1.500	1.608
4.006	S20	94.830	S21	94.320	Circ	0.375mØ	22.310	43.7	0.600	1.608	1.278
4.007	S21	94.320	S22	94.242	Circ	0.375mØ	19.032	244.0	0.600	1.278	2.668
1.007	S22	94.017	S27 - HB	92.150	Circ	0.6mØ	83.991	45.0	0.600	2.668	0.900
5.000	S23	95.410	S24	94.894	Circ	0.225mØ	19.961	38.7	0.600	1.200	1.500
5.001	S24	94.819	S25	94.499	Circ	0.3mØ	25.226	78.8	0.600	1.500	1.504
5.002	S25	94.499	S26	93.222	Circ	0.3mØ	40.802	32.0	0.600	1.504	1.678
5.003	S26	93.222	S27 - HB	92.450	Circ	0.3mØ	38.691	50.1	0.600	1.678	0.900
1.008	S27 - HB	92.150	OUTFALL	89.000	Circ	0.6mØ	17.467	5.5	0.600	0.900	-0.410

Outfall Details

Outfall Manhole OUTFALL : Free Discharge

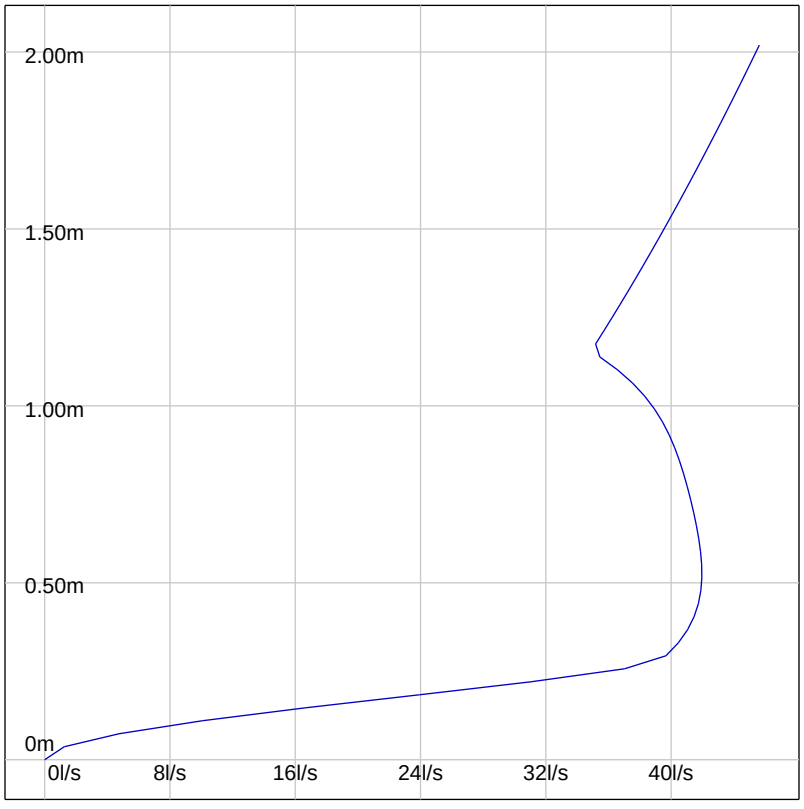
Flow Control Details

Controls within Manhole S27 - HB

Hydro-Brake® Optimum Control at Manhole S27 - HB

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0265-4200-1700-4200	1.700	42.000	0.000	0.526	41.964	1.153	34.860

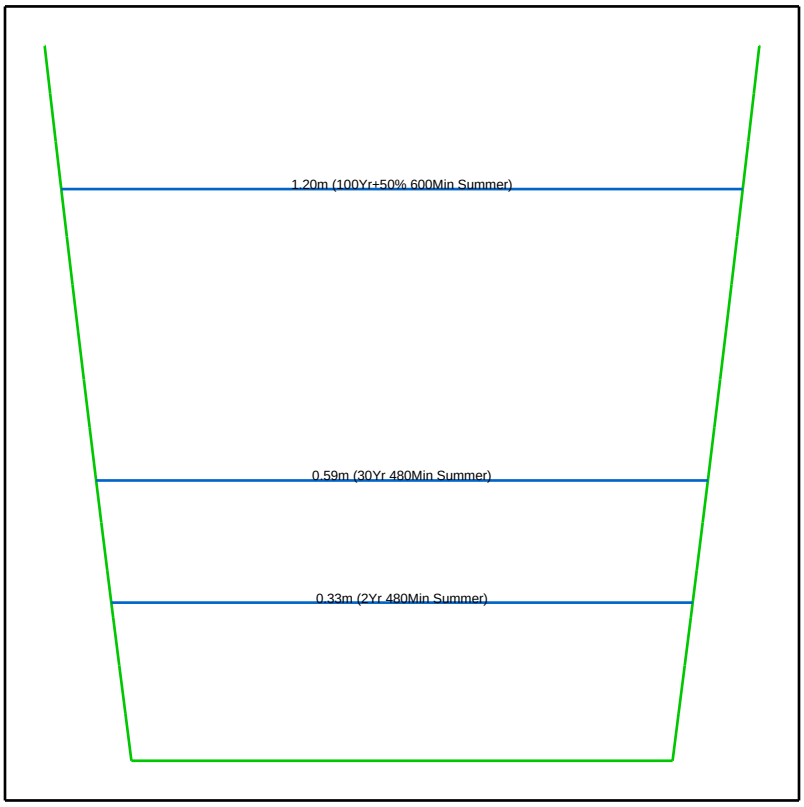
Hydro-Brake® Optimum Control at S27 - HB



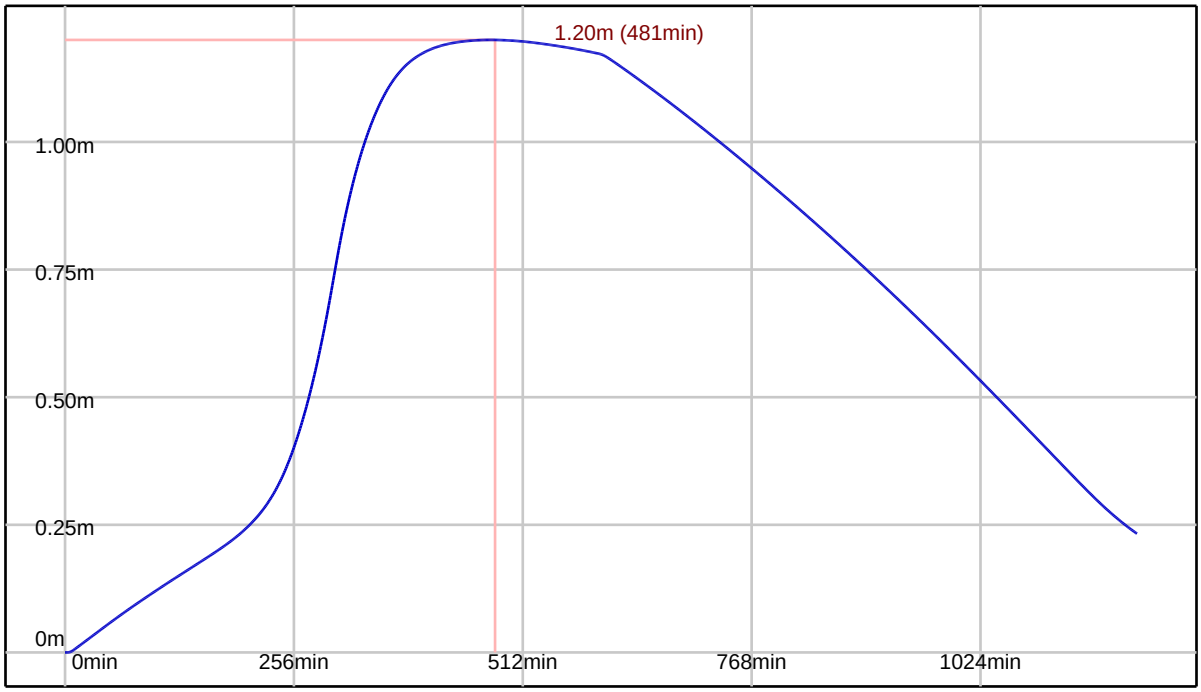
Pond Structure at Manhole S27 - HB

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
92.150	1.500	1714.960	93.350	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S27 - HB



Pond at S27 - HB (100Yr+50% 600Min Summer)



Simulation Settings

FSR: M5-60=19.10, R=0.25, Locale=England and Wales

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (2, +0%), (30, +0%), (100, +50%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	34.947	0.00	-0.19	30Yr 360Min Summer	9.361	0.00	-0.03
2Yr 15Min Summer	34.947	0.00	-0.18	30Yr 360Min Winter	9.361	0.00	-0.03
2Yr 30Min Winter	23.927	0.00	-0.16	30Yr 480Min Summer	7.721	0.00	-0.02
2Yr 30Min Summer	23.927	0.00	-0.16	30Yr 480Min Winter	7.721	0.00	-0.02
2Yr 60Min Winter	15.906	0.00	-0.14	30Yr 600Min Summer	6.644	0.00	-0.01
2Yr 60Min Summer	15.906	0.00	-0.14	30Yr 600Min Winter	6.644	0.00	-0.01
2Yr 120Min Summer	10.441	0.00	-0.08	30Yr 720Min Summer	5.872	0.00	-0.01
2Yr 120Min Winter	10.441	0.00	-0.08	30Yr 720Min Winter	5.872	0.00	-0.01
2Yr 180Min Winter	8.159	0.00	-0.05	30Yr 960Min Summer	4.828	0.00	-0.01
2Yr 180Min Summer	8.159	0.00	-0.05	30Yr 960Min Winter	4.828	0.00	-0.01
2Yr 240Min Winter	6.844	0.00	-0.04	30Yr 1440Min Summer	3.656	0.00	-0.01
2Yr 240Min Summer	6.844	0.00	-0.04	30Yr 1440Min Winter	3.656	0.00	-0.00
2Yr 360Min Winter	5.336	0.00	-0.02	100Yr+50% 15Min Summer	119.377	0.00	-0.29
2Yr 360Min Summer	5.336	0.00	-0.02	100Yr+50% 15Min Winter	119.377	0.00	-0.20
2Yr 480Min Summer	4.471	0.00	-0.01	100Yr+50% 30Min Summer	84.970	0.00	-0.12
2Yr 480Min Winter	4.471	0.00	-0.01	100Yr+50% 30Min Winter	84.970	0.00	-0.09
2Yr 600Min Winter	3.898	0.00	-0.01	100Yr+50% 60Min Summer	57.936	0.00	0.21
2Yr 600Min Summer	3.898	0.00	-0.01	100Yr+50% 60Min Winter	57.936	0.00	0.21
2Yr 720Min Summer	3.484	0.00	-0.01	100Yr+50% 120Min Summer	37.940	0.00	0.27
2Yr 720Min Winter	3.484	0.00	-0.01	100Yr+50% 120Min Winter	37.940	0.00	0.27
2Yr 960Min Summer	2.920	0.00	-0.01	100Yr+50% 180Min Summer	28.951	0.00	0.23
2Yr 960Min Winter	2.920	0.00	-0.00	100Yr+50% 180Min Winter	28.951	0.00	0.23
2Yr 1440Min Winter	2.277	0.00	0.00	100Yr+50% 240Min Summer	23.803	0.00	0.17
2Yr 1440Min Summer	2.277	0.00	0.00	100Yr+50% 240Min Winter	23.803	0.00	0.17
30Yr 15Min Winter	61.778	0.00	-0.10	100Yr+50% 360Min Summer	18.028	0.00	0.02
30Yr 15Min Summer	61.778	0.00	-0.11	100Yr+50% 360Min Winter	18.028	0.00	0.02
30Yr 30Min Summer	43.449	0.00	-0.11	100Yr+50% 480Min Summer	14.766	0.00	-0.06
30Yr 30Min Winter	43.449	0.00	-0.12	100Yr+50% 480Min Winter	14.766	0.00	-0.05
30Yr 60Min Summer	29.395	0.00	-0.12	100Yr+50% 600Min Summer	12.632	0.00	-0.04
30Yr 60Min Winter	29.395	0.00	-0.14	100Yr+50% 600Min Winter	12.632	0.00	-0.04
30Yr 120Min Summer	19.264	0.00	-0.10	100Yr+50% 720Min Summer	11.109	0.00	-0.03
30Yr 120Min Winter	19.264	0.00	-0.10	100Yr+50% 720Min Winter	11.109	0.00	-0.02
30Yr 180Min Winter	14.808	0.00	-0.07	100Yr+50% 960Min Summer	9.056	0.00	-0.02
30Yr 180Min Summer	14.808	0.00	-0.07	100Yr+50% 960Min Winter	9.056	0.00	-0.01
30Yr 240Min Summer	12.250	0.00	-0.05	100Yr+50% 1440Min Winter	6.769	0.00	-0.01
30Yr 240Min Winter	12.250	0.00	-0.05	100Yr+50% 1440Min Summer	6.769	0.00	-0.01

Simulation Results

Return Period Yrs: 2.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	98.499	0.112	33.264		OK
S2	15 min Summer	8	97.900	0.133	53.109		OK
S3	15 min Summer	9	97.450	0.204	66.916		OK
S4	15 min Summer	9	97.257	0.251	82.966		OK
S5	15 min Summer	8	99.333	0.098	20.040		OK
S6	15 min Summer	8	99.200	0.128	32.919		OK
S7	15 min Summer	8	98.969	0.102	44.636		OK
S8	15 min Summer	9	97.247	0.276	127.367		OK
S9	15 min Summer	9	97.149	0.255	127.820		OK
S10	15 min Summer	8	99.296	0.112	35.536		OK
S11	15 min Summer	8	98.551	0.119	52.224		OK
S12	15 min Summer	8	98.233	0.131	80.139		OK
S13	15 min Summer	9	96.949	0.149	206.610		OK
S14	15 min Summer	8	100.162	0.101	29.132		OK
S15	15 min Summer	8	99.606	0.111	62.034		OK
S16	15 min Summer	8	98.599	0.101	71.564		OK
S17	15 min Summer	8	98.008	0.138	90.506		OK
S18	15 min Summer	9	96.592	0.136	105.029		OK
S19	15 min Summer	9	95.747	0.138	116.388		OK
S20	15 min Summer	9	95.009	0.179	143.949		OK
S21	15 min Summer	9	94.641	0.321	153.743		OK
S22	15 min Summer	9	94.295	0.278	361.034		OK
S23	15 min Summer	8	95.462	0.052	10.124		OK
S24	15 min Summer	8	94.951	0.132	50.556		OK
S25	15 min Summer	8	94.612	0.113	61.547		OK
S26	15 min Summer	9	93.364	0.142	72.476		OK
S27 - HB	480 min Summer	295	92.482	0.332	38.743		OK
OUTFALL	480 min Summer	295	89.047	0.047	39.003		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.111	1.674	32.862	0.499	OK
1.001	15 min Summer	8	S2	S3	0.133	1.750	52.521	0.413	OK
1.002	15 min Summer	9	S3	S4	0.197	1.155	67.901	0.606	OK
1.003	15 min Summer	9	S4	S8	0.264	0.859	83.152	0.473	OK
2.000	15 min Summer	8	S5	S6	0.113	1.000	19.903	0.391	OK
2.001	15 min Summer	8	S6	S7	0.115	1.603	32.653	0.621	OK
2.002	15 min Summer	9	S7	S8	0.102	2.538	44.215	0.425	OK
1.004	15 min Summer	9	S8	S9	0.266	1.309	127.820	0.777	OK
1.005	15 min Summer	9	S9	S13	0.202	1.865	127.628	0.807	OK
3.000	15 min Summer	8	S10	S11	0.112	1.778	35.075	0.502	OK
3.001	15 min Summer	8	S11	S12	0.125	1.864	52.041	0.341	OK
3.002	15 min Summer	8	S12	S13	0.131	2.683	79.289	0.402	OK
1.006	15 min Summer	9	S13	S22	0.149	4.496	206.196	0.244	OK
4.000	15 min Summer	8	S14	S15	0.106	1.290	28.770	0.249	OK
4.001	15 min Summer	8	S15	S16	0.106	2.751	61.440	0.290	OK
4.002	15 min Summer	8	S16	S17	0.120	2.710	71.291	0.249	OK
4.003	15 min Summer	9	S17	S18	0.138	2.827	89.963	0.445	OK
4.004	15 min Summer	9	S18	S19	0.137	2.892	105.288	0.288	OK
4.005	15 min Summer	9	S19	S20	0.158	2.632	116.792	0.297	OK
4.006	15 min Summer	9	S20	S21	0.250	1.852	144.426	0.476	OK
4.007	15 min Summer	9	S21	S22	0.305	1.608	154.838	1.215	OK
1.007	480 min Summer	278	S22	S27 - HB	0.205	2.003	86.343	0.084	OK
5.000	15 min Summer	8	S23	S24	0.055	1.373	10.062	0.120	OK
5.001	15 min Summer	8	S24	S25	0.123	1.845	50.183	0.401	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
5.002	15 min Summer	8	S25	S26	0.127	2.136	61.099	0.310	OK
5.003	15 min Summer	9	S26	S27 - HB	0.142	2.230	73.507	0.467	OK
1.008	480 min Summer	295	S27 - HB	OUTFALL	0.047	3.762	39.003	0.013	OK

Return Period Yrs: 30.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	98.550	0.163	58.814		OK
S2	15 min Summer	8	97.955	0.188	93.890		OK
S3	15 min Summer	9	97.561	0.315	117.662		OK
S4	15 min Summer	9	97.402	0.396	145.162		OK
S5	15 min Summer	8	99.373	0.138	35.434		OK
S6	15 min Summer	8	99.270	0.198	58.221		OK
S7	15 min Summer	8	99.012	0.145	79.525		OK
S8	15 min Summer	9	97.385	0.414	223.650		OK
S9	15 min Summer	9	97.247	0.353	224.387		OK
S10	15 min Summer	8	99.347	0.163	62.832		OK
S11	15 min Summer	8	98.598	0.166	92.315		OK
S12	15 min Summer	8	98.287	0.185	141.703		OK
S13	15 min Summer	9	97.002	0.202	364.034		OK
S14	15 min Summer	8	100.198	0.137	51.508		OK
S15	15 min Summer	8	99.648	0.153	109.785		OK
S16	15 min Summer	8	98.636	0.138	126.769		OK
S17	15 min Summer	8	98.068	0.198	160.350		OK
S18	15 min Summer	8	96.642	0.186	186.678		OK
S19	15 min Summer	9	95.798	0.189	205.532		OK
S20	15 min Summer	9	95.246	0.416	254.251		Surcharged
S21	15 min Summer	9	94.911	0.591	270.284		Surcharged
S22	15 min Summer	9	94.391	0.374	631.850		OK
S23	15 min Summer	8	95.480	0.070	17.900		OK
S24	15 min Summer	8	95.004	0.185	89.408		OK
S25	15 min Summer	8	94.656	0.157	109.026		OK
S26	15 min Summer	8	93.426	0.204	130.554		OK
S27 - HB	480 min Summer	317	92.738	0.588	41.848		OK
OUTFALL	240 min Summer	185	89.049	0.049	41.960		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.162	1.896	58.090	0.882	OK
1.001	15 min Summer	9	S2	S3	0.213	1.818	93.324	0.733	OK
1.002	15 min Summer	9	S3	S4	0.318	1.207	118.536	1.057	OK
1.003	15 min Summer	9	S4	S8	0.405	0.971	146.233	0.832	OK
2.000	15 min Summer	8	S5	S6	0.168	1.108	35.207	0.692	OK
2.001	15 min Summer	8	S6	S7	0.172	1.793	58.338	1.109	OK
2.002	15 min Summer	9	S7	S8	0.166	2.817	78.602	0.756	OK
1.004	15 min Summer	9	S8	S9	0.384	1.554	224.387	1.363	OK
1.005	15 min Summer	9	S9	S13	0.278	2.200	224.511	1.419	OK
3.000	15 min Summer	8	S10	S11	0.163	2.013	61.994	0.888	OK
3.001	15 min Summer	8	S11	S12	0.175	2.146	92.021	0.602	OK
3.002	15 min Summer	8	S12	S13	0.185	3.084	140.402	0.712	OK
1.006	15 min Summer	9	S13	S22	0.213	5.002	364.177	0.431	OK
4.000	15 min Summer	8	S14	S15	0.145	1.503	50.971	0.441	OK
4.001	15 min Summer	8	S15	S16	0.145	3.205	108.869	0.514	OK
4.002	15 min Summer	8	S16	S17	0.168	3.105	126.377	0.441	OK
4.003	15 min Summer	8	S17	S18	0.198	3.231	158.914	0.786	OK
4.004	15 min Summer	8	S18	S19	0.188	3.363	186.206	0.509	OK
4.005	15 min Summer	9	S19	S20	0.282	2.699	206.253	0.525	OK
4.006	15 min Summer	9	S20	S21	0.375	2.319	253.818	0.837	Surcharged
4.007	15 min Summer	9	S21	S22	0.364	2.446	267.673	2.100	OK
1.007	480 min Summer	295	S22	S27 - HB	0.335	2.326	149.217	0.145	OK
5.000	15 min Summer	8	S23	S24	0.090	1.388	17.809	0.212	OK
5.001	15 min Summer	8	S24	S25	0.171	2.139	88.934	0.710	OK
5.002	15 min Summer	8	S25	S26	0.180	2.443	108.270	0.549	OK
5.003	15 min Summer	9	S26	S27 - HB	0.204	2.540	129.751	0.825	OK
1.008	240 min Summer	185	S27 - HB	OUTFALL	0.049	3.846	41.960	0.014	OK

Return Period Yrs: 100.0

Climate Change %: 50

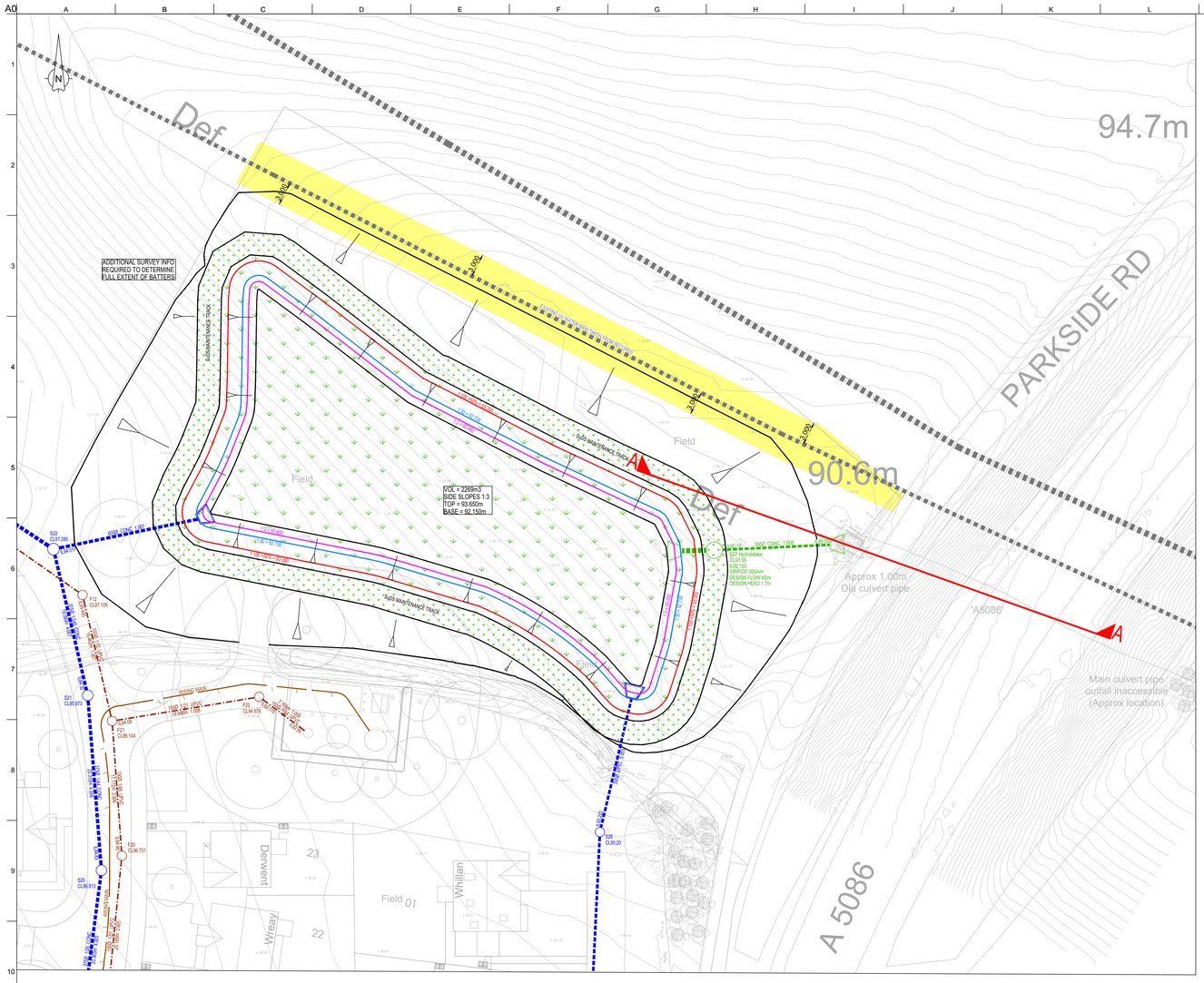
Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	10	100.019	1.632	91.275		Flood Risk
S2	15 min Summer	10	98.895	1.128	152.149		Surcharged
S3	15 min Summer	10	98.299	1.053	192.495		Surcharged
S4	15 min Summer	10	97.870	0.864	230.898		Surcharged
S5	15 min Summer	10	100.582	1.347	54.992		Surcharged
S6	15 min Summer	10	100.404	1.332	90.400		Surcharged
S7	15 min Summer	10	99.849	0.982	121.349		Surcharged
S8	15 min Summer	10	97.817	0.846	343.017		Surcharged
S9	15 min Summer	11	97.525	0.631	336.035		Surcharged
S10	15 min Summer	10	100.558	1.374	97.511		Flood Risk
S11	15 min Summer	10	99.106	0.674	151.305		Surcharged
S12	15 min Summer	10	98.789	0.687	230.562		Surcharged
S13	15 min Summer	10	97.063	0.263	566.943		OK
S14	15 min Summer	10	100.300	0.239	79.936		OK
S15	15 min Summer	10	100.084	0.589	172.796		Surcharged
S16	15 min Summer	10	99.452	0.954	200.798		Surcharged
S17	15 min Summer	10	99.163	1.293	251.114		Surcharged
S18	15 min Summer	10	97.236	0.780	291.084		Surcharged
S19	15 min Summer	10	96.736	1.127	320.216		Surcharged
S20	15 min Summer	10	96.249	1.419	397.012		Surcharged
S21	15 min Summer	10	95.422	1.102	424.578		Surcharged
S22	15 min Summer	10	94.507	0.490	991.160		OK
S23	15 min Summer	10	95.592	0.182	27.779		OK
S24	15 min Summer	10	95.534	0.715	142.088		Surcharged
S25	15 min Summer	10	95.121	0.622	177.920		Surcharged
S26	15 min Summer	10	94.105	0.883	214.767		Surcharged
S27 - HB	600 min Summer	476	93.350	1.200	35.416		Surcharged
OUTFALL	720 min Winter	325	89.049	0.049	41.960		Outfall

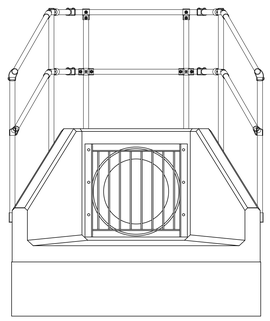
Conduits

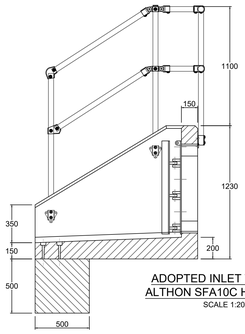
Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	17	S1	S2	0.225	2.406	95.673	1.453	OK
1.001	30 min Summer	17	S2	S3	0.300	2.090	147.760	1.161	Surcharged
1.002	30 min Summer	18	S3	S4	0.375	1.669	184.343	1.644	Surcharged
1.003	30 min Summer	17	S4	S8	0.450	1.399	222.528	1.266	OK
2.000	30 min Summer	16	S5	S6	0.225	1.420	56.452	1.110	OK
2.001	30 min Summer	17	S6	S7	0.225	2.202	87.544	1.664	OK
2.002	30 min Summer	18	S7	S8	0.225	2.888	114.846	1.105	OK
1.004	30 min Summer	18	S8	S9	0.450	2.111	335.759	2.040	OK
1.005	15 min Summer	11	S9	S13	0.357	2.512	339.320	2.144	OK
3.000	30 min Summer	17	S10	S11	0.225	2.572	102.280	1.464	OK
3.001	30 min Summer	17	S11	S12	0.300	2.291	149.138	0.976	Surcharged
3.002	30 min Summer	17	S12	S13	0.300	3.260	226.850	1.150	Surcharged
1.006	15 min Summer	10	S13	S22	0.302	5.367	565.849	0.670	OK
4.000	15 min Summer	10	S14	S15	0.269	1.710	98.453	0.852	OK
4.001	30 min Summer	17	S15	S16	0.300	3.529	195.686	0.924	Surcharged
4.002	30 min Summer	16	S16	S17	0.300	3.236	203.109	0.709	Surcharged
4.003	30 min Summer	18	S17	S18	0.300	3.479	245.916	1.217	Surcharged
4.004	30 min Summer	18	S18	S19	0.375	3.440	287.716	0.787	Surcharged
4.005	30 min Summer	19	S19	S20	0.375	2.898	320.115	0.814	Surcharged
4.006	30 min Summer	17	S20	S21	0.375	3.551	392.156	1.294	Surcharged
4.007	30 min Summer	17	S21	S22	0.375	3.790	418.600	3.285	Surcharged
1.007	60 min Summer	35	S22	S27 - HB	0.495	4.259	881.251	0.857	OK
5.000	15 min Summer	10	S23	S24	0.203	1.361	33.509	0.400	OK
5.001	30 min Summer	16	S24	S25	0.300	2.258	153.261	1.224	Surcharged
5.002	15 min Winter	9	S25	S26	0.300	2.669	180.138	0.913	Surcharged
5.003	30 min Summer	18	S26	S27 - HB	0.300	2.966	209.670	1.333	Surcharged
1.008	720 min Winter	325	S27 - HB	OUTFALL	0.049	3.846	41.960	0.014	OK

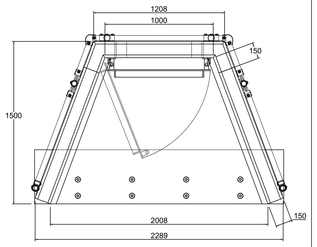
Appendix F –
Detention Basin Details



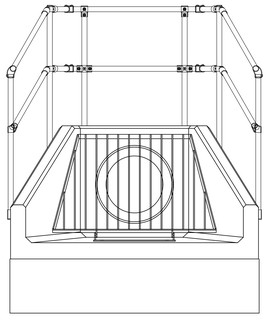
SECTION A-A PRODUCED WITH LIDAR DATA. ADDITIONAL TOPO REQUIRED TO CONFIRM LEVELS

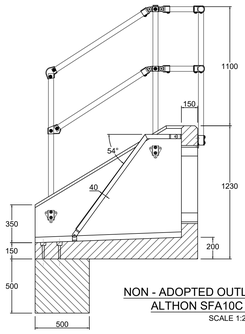


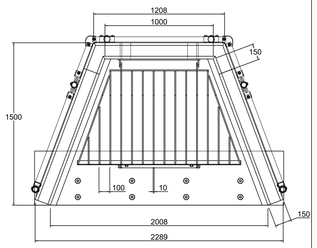




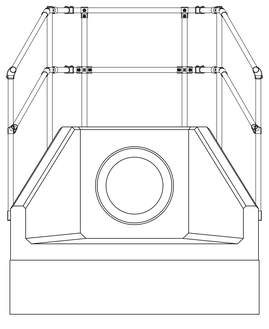
ADOPTED INLET TO BASIN
ALTHON SFA10C HEADWALL
SCALE 1:20

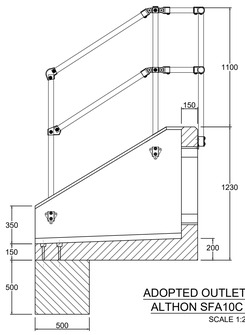


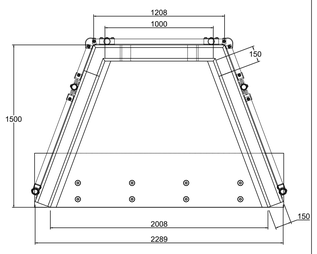




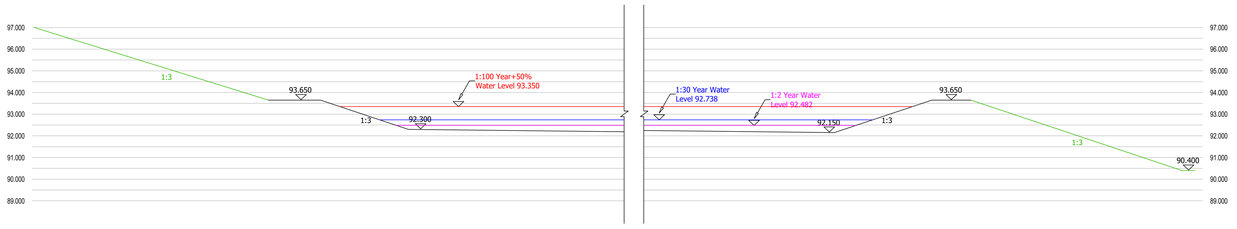
NON - ADOPTED OUTLET FROM BASIN
ALTHON SFA10C HEADWALL
SCALE 1:20

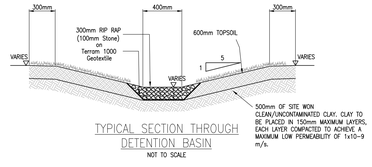




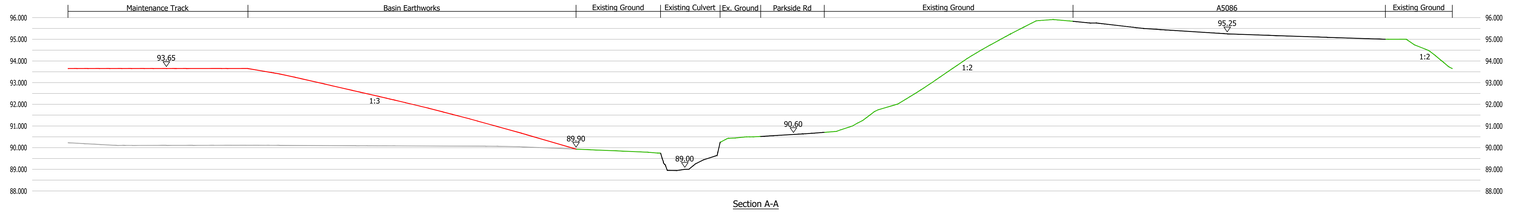


ADOPTED OUTLET (NO GRATE)
ALTHON SFA10C HEADWALL
SCALE 1:20





TYPICAL SECTION THROUGH DETENTION BASIN
NOT TO SCALE



Section A-A

Issue	Date	Description	By	Chkd	Appd
P2	23.07.25	Updated to suit latest layout	JM	KR	RH
P1	13.12.24	Preliminary Issue	JM	KR	RH

COAST CONSULTING ENGINEERS
7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977879

Client
GENESIS HOMES

Job Title
PARKSIDE ROAD
CLEATOR MOOR

Drawing Title
DETENTION BASIN DETAILS

Scale at A0
1:250

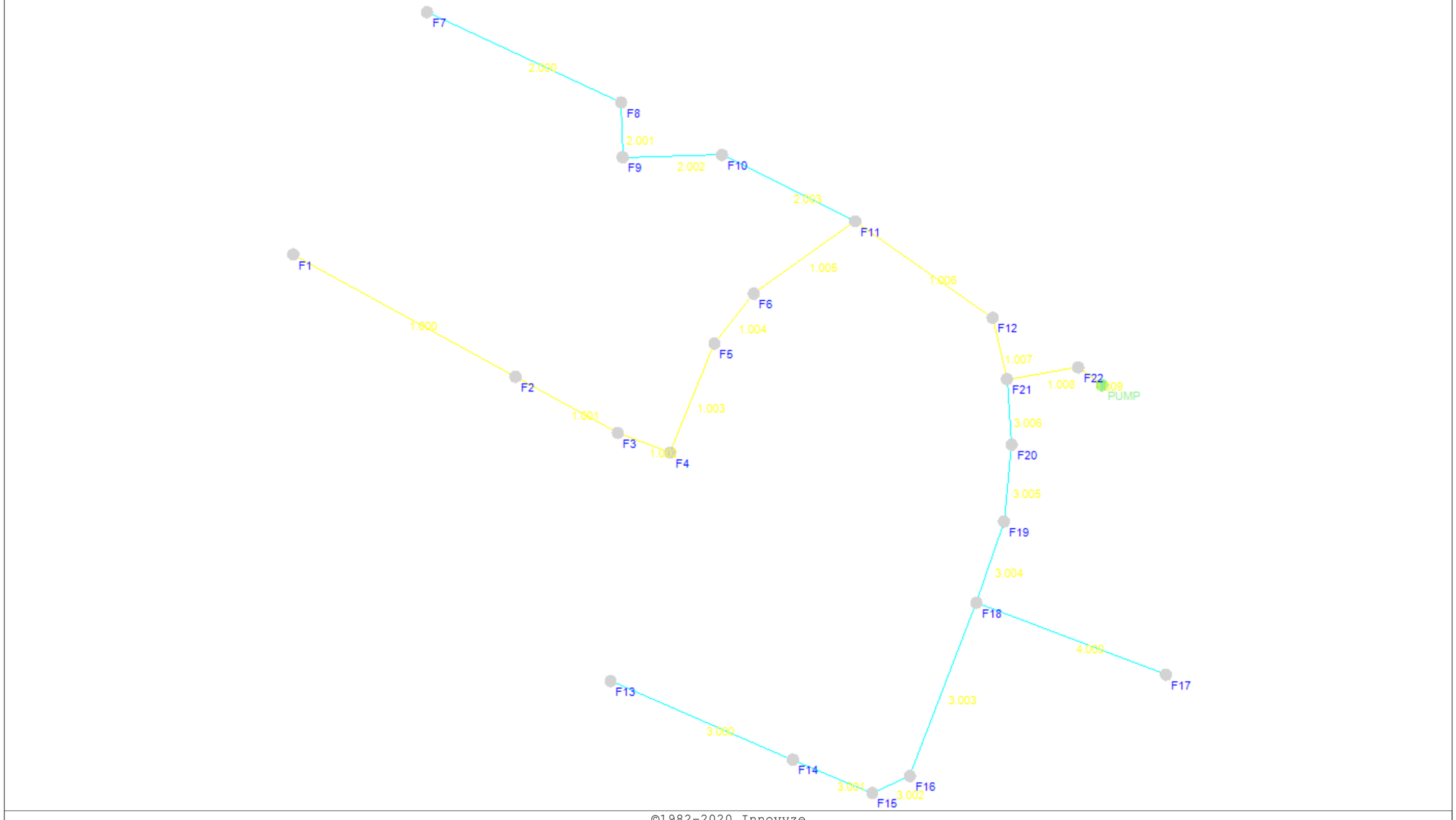
Drawing Status
PRELIMINARY

Job No	Drawing No	Issue
23098	121	P2

Do not scale

Appendix G –
Foul Drainage Layout

Coast Consulting Engineers Ltd		Page 1
Suite 6, Vita House Fish Quay North Shields, NE30 1JA	PARKSIDE ROAD CLEATOR MOOR FOUL WATER NETWORK	
Date 23/07/2025 File 241212 Cleator FW.MDX	Designed by JM Checked by KR	
Innovyze	Network 2020.1.3	



COAST
CONSULTING ENGINEERS

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