

Title: Drainage Strategy Technical Note
 Date: 10th July 2024
 Author: Rob Lowe
 Reference: 23339-JUBB-XX-XX-RP-C-003
 Revision: P2

1.0 Introduction

1.1.1 Jubb have prepared this Technical Note to address the Drainage requirements for a reserved matters planning application in relation to planning condition 12 for the proposed redevelopment of Land at Coldharbour Farm Road, Emsworth.

1.1.2 The wording for condition 12 is as follows:

'No development hereby permitted shall commence until a surface water drainage scheme for the site has been submitted to, and approved in writing by the Local Planning Authority. The surface water drainage scheme for the site, shall be based on the principles within the Flood Risk Assessment "MT-5314/FRA.5R" dated September 2022 which includes the updated "West Brook, Emsworth fluvial flood risk modelling report" by JBA consulting dates September 2022 and shall include

- A. a technical summary highlighting any changes to the design from that within the approved Flood Risk Assessment.
- B. Detailed engineering drainage plans to include type, layout and dimensions of drainage features including references to link to the drainage calculations.
- C. Exceedance plans demonstrating the flow paths and areas of ponding in the event of blockages or storms exceeding design criteria.
- D. Details of how the SuDS features and outfalls will be designed to be as natural as possible and maximise ecological benefit.
- E. Material Plans.
- F. Cross Sections for all attenuation ponds, swales, headwalls, underground attenuation (cellular storage) and outfalls into a main river.
- G. Information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving surface waters.
- H. A scheme to treat and remove suspended solids from surface water run-off during construction works.

The development shall be carried out strictly in accordance with the approved details. Reason: To safeguard the amenities of the locality and ensure that all such drainage and flood provision is constructed to an appropriate standard and quality and having due regard to policies and proposals CS16 and DM10 of the Havant Borough Local Plan (Core Strategy) 2011 and the National Planning Policy Framework.

1.1.3 The site is located on land to the west of Coldharbour Farm Road, Emsworth. The Ordnance Survey National Grid Reference (NGR) for the centre of the site is 474517, 106524.

1.1.4 There are no existing surface and foul water networks located within the development. There is an existing surface water body that runs along the eastern boundary of the site before turning south and cutting through the southeast corner. This watercourse is called the West Brook.

2.0 Condition 11

2.1 Part A

2.1.1 The design submitted to satisfy condition 11 maintains the principles of the design within Bellamy Roberts drawing 5314/1002 Rev B which is contained within the approved report.

- 2.1.2 The main departure from this design is the combining of roof and road drainage into a single system. This change provides efficiencies to both designs and reduces the amount of pipework required within the roads. This change also reduces the amount of pipework within private properties which reduces the risk of pipes being built over or damaged as part of garden maintenance works.

2.2 Part B

- 2.2.1 All drainage plans are contained within Appendix A. All drainage calculations are included within Appendix B.

2.3 Part C

- 2.3.1 Exceedance Plans are included within Appendix A.

2.4 Part D

- 2.4.1 The headwall has been designed to Environment Agency requirements. It is limited in height to 2/3 of that of the existing bank and is constructed of Tied back bag work. This will allow vegetation to ground around the headwall but not obstruct the pipe.
- 2.4.2 The attenuation has been designed as below ground cellular storage, as per the approved design. Ground levels where it is located have been designed to accommodate sufficient cover for the tank whilst incorporating it within the wider landscape design. It is located within an area of planting.
- 2.4.3 The drainage construction detail drawings which show the necessary cross sections of these features is included within Appendix A.

2.5 Part E

- 2.5.1 A copy of the surfacing materials plans is included within Appendix C. This plan details the proposed surface materials to be used across the site.

2.6 Part F

- 2.6.1 The drainage construction detail drawings which show the necessary cross sections of these features is included within Appendix A.

2.7 Part G

- 2.7.1 A copy of the surface water drainage calculations are included within Appendix B. These detail the following storm periods:

1 in 1 year, 1 in 30 year, & 1 in 100 + 40% climate change

The calculation pack details the storm intensities used.

- 2.7.2 A hydrobrake has been proposed to restrict the flow of surface water from the site. A copy of the hydrobrake drawing and specification are included within Appendix A.

2.8 Part H

- 2.8.1 To ensure suspended solids are treated and removed from surface water run-off during construction works, the following measures have been proposed within the CEMP:

1. Areas of hardstanding and associated with development will be constructed as soon as possible as well as extending the hardstanding to minimise the risk of mud being travelled around the site.
2. All processing plant and vehicles carrying loose aggregates and workings will be covered or shielded to reduce/avoid dust emissions.

3. In periods of dry weather and where practicable, all soil stockpiles and surfaces will be dampened down with water to reduce dust emissions.
4. All earthworks will be sealed or replanted as early as practicable to minimise dust.
5. Where practicable, on-site aggregate handling will be carried out in enclosed areas.
6. Any identified recurring generators of dust will be replaced or improved.
7. Soil stockpiles and the exposed excavation may generate silt run off which may harm animals and the existing water habitat. Discharge points will be identified, and water run off settlement used. To help reduce silt the following measures will be taken:
 - a. Minimise topsoil stripping onsite and only in keeping to the construction areas.
 - b. Keep existing stockpiles covered.

2.8.2 The above measures are considered sufficient to keep suspended solids out of the surface water drainage system.

3.0 Maintenance and Management

- 3.1.1 To ensure that any proposed SuDS features operate effectively for its lifetime a detailed management plan for the operation and maintenance of the SuDS will be produced, prior to construction, based on Chapter 32 of Ciria C753.
- 3.1.2 It is anticipated that drainage for the dwellings, carparking, landscaping, etc in private ownership will be managed and maintained privately by a management company.
- 3.1.3 The surface water and foul water drainage networks will not be offered to Southern Water for adoption. The onsite pipework and attenuation structures will be the responsibility of the site owners.
- 3.1.4 Proposed SuDS features will remain private and will be maintained by a management company.
- 3.1.5 Details for the management and maintenance of any SuDS and other drainage features are below.

General Requirements

Regular Maintenance	Frequency
Litter Collect all litter or other debris and remove from site at each site visit.	Monthly or when deemed necessary
Grass maintenance Amenity Grass – Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. All cuttings to remain in situ.	Monthly or when deemed necessary
Flood Routes Make visual inspection of proposed overland flow routes. Check that the route is not obstructed by rubbish, new features etc. Remove obstructions as necessary.	Monthly

Manholes

Regular Maintenance	Frequency
Silt Trap, Inspection chambers Remove cover and inspect ensuring water is flowing freely and that the existing route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn in which silt build up is more likely to occur.	Annually
Reactive Maintenance	Frequency
Replace gully grating and manhole if physical damage has occurred. If a blockage in the drainage system occurs rod the necessary region within the system to ensure the blockage is removed.	As required

Catch Pit

Regular Maintenance	Frequency
Silt Trap, Inspection chambers Open cover to inspect level of silt present, where required remove the excess silt.	Monthly within first year, annually thereafter
Reactive Maintenance	Frequency
If the level of silt is above the level of the pipes it may be necessary to mechanically extract the silt and jets the drains both upstream and downstream to ensure continued performance.	As required

Hydrobrake

Regular Maintenance	Frequency
Inspection Chamber Remove cover to inspect and note any high-water levels, re-inspect 24hrs later to evaluate reduction of water levels. Inspect ensuring that water is flowing appropriately through the flow control device and there are no obstructions to the flow of water immediately upstream or within the device. Remove debris and silt where necessary.	Monthly or following severe storms, within first year. Monthly for 3 months, then every 6 months.
Reactive Maintenance	Frequency

If a blockage within the hydrobrake unit occurs, it will need to be either jetted or replaced depending on the severity of the blockage.	As required
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Attenuation Tanks

Regular Maintenance	Frequency
Inspect and Identify areas that are no operating correctly. If required take remedial action	Monthly or following severe storms, within first year. The annually.
Remove debris from the catchment surface.	Monthly
Remove sediment from pre treatment structures	Annually
Check inlets, outlets etc they are in good working condition	Annually
Survey inside of tank for sediment build up and remove as necessary	5 Years
Remedial Actions	Frequency
Repair/Rehab of inlets, outlets, overflows and vents	As required

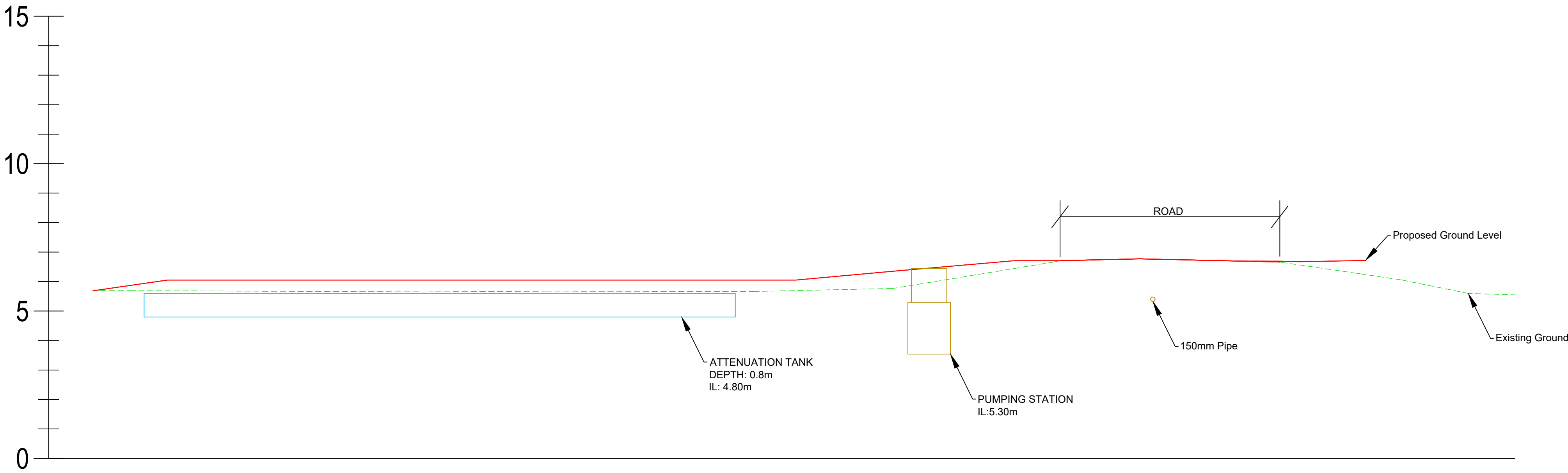
4.0 Conclusions

- 4.1.1 It has been demonstrated through development of our proposed drainage strategy and maintenance schedule that the proposed development complies with the requirements of the planning authority condition 12.

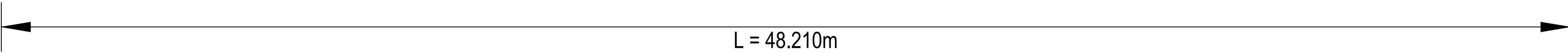
Appendix A: Surface Water Drainage Design Drawings



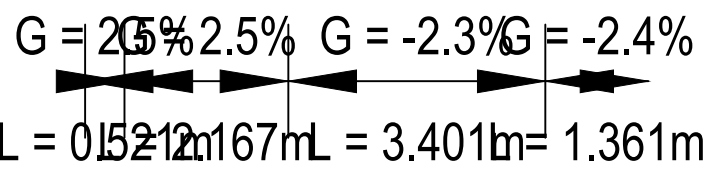
LEVEL



HORIZONTAL GEOMETRY



VERTICAL GEOMETRY



EXISTING LEVELS						6.666	
PROPOSED LEVELS	5.695	5.656	5.666	6.240	6.666	5.546	
CHAINAGE	-01.500 00.000	10.000	20.000	30.000	40.000	48.210	

SECTION LONGSECTION (1)
SCALE: H 1:200,V 1:200. DATUM: 0.000

T1	31.05.24	Tender Issue	SS	RL
Rev	Date	Description	By	Apvd

PROJECT:
COLDHARBOUR FARM ROAD,
EMSWORTH

TITLE:
SECTION

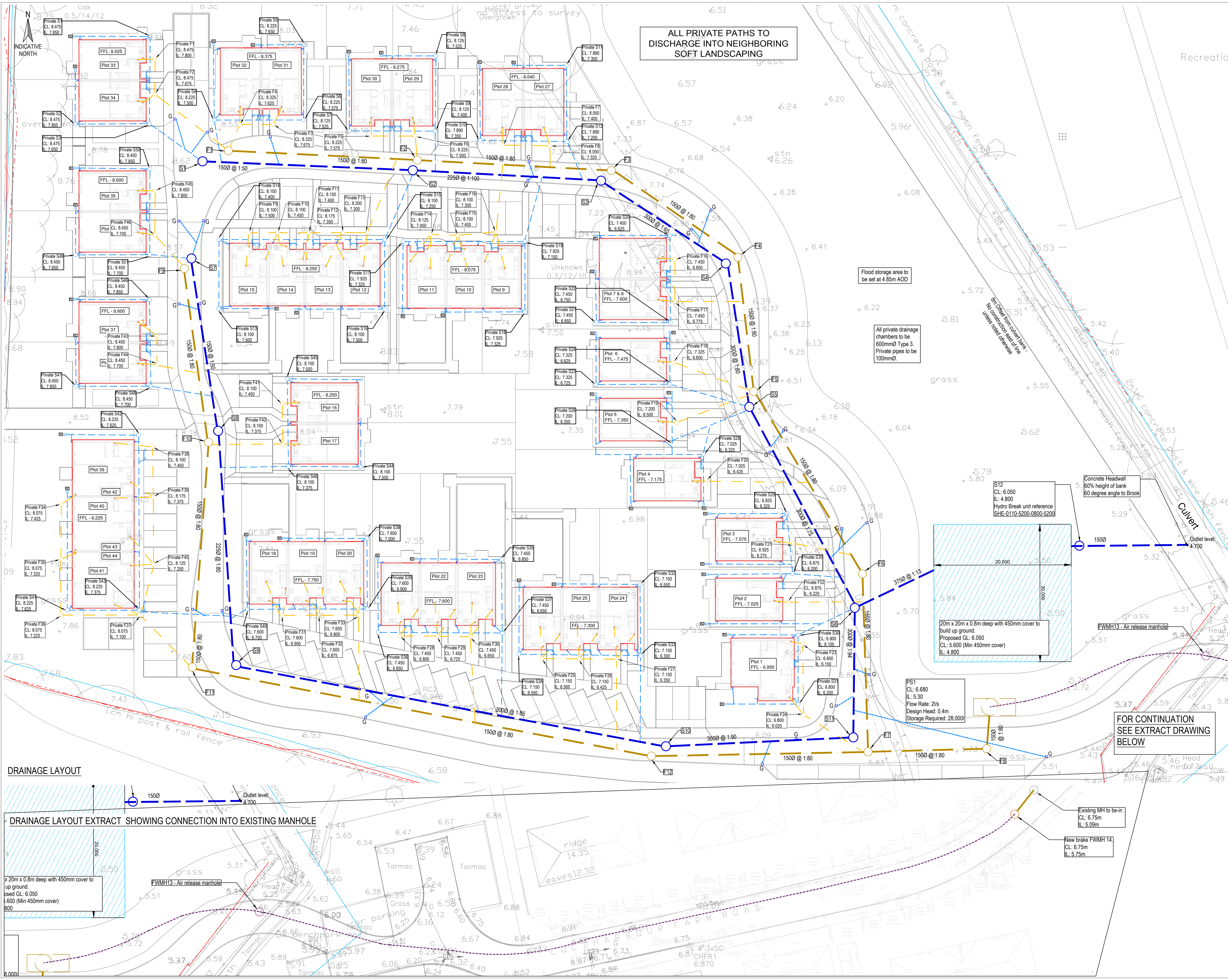
CLIENT:
DOSWELL PROJECT

SCALE@A1:
1:200

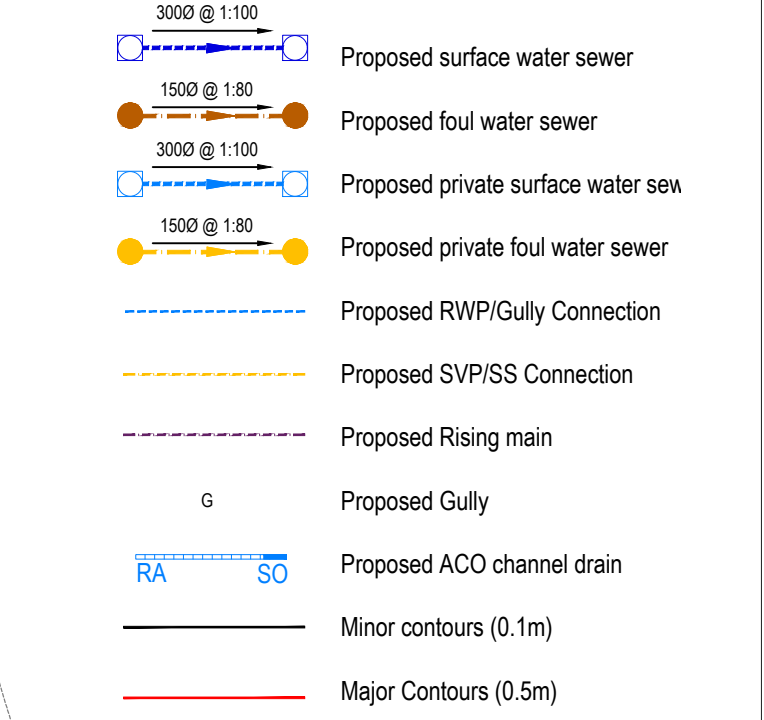
PROJECT REF:
23339
DRAWING No:
JUBB_XX_XX_DR_C_150
REV:
T1

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction





- NOTES**
- Do not scale from this drawing.
 - Location of existing utilities and drainage are indicative. Contractor to confirm location/depth of utilities on site before undertaking any construction activities.
 - Attenuation is provided to accommodate the 1 in 100 year including 40% climate change allowance rainfall event.
 - Proposed tanks are shown indicatively. The size, shape and position is subject to detail design.
 - Onsite ground investigation works including infiltration testing in accordance with BRE365 guidance should be undertaken across the site to inform the drainage proposals.
 - All proposed foul sewer to be 1500 and laid at 1:80 unless noted otherwise.
 - All Proposed surface water sewer to be laid at 1:100 unless noted otherwise.
 - ACOs at door threshold to be confirmed by architect. Not required when levels fall away from entrance.



FOR MAIN RUN DRAINAGE - SEE MANHOLE SCHEDULES (DRAWING '510')

ALL PRIVATE DRAINAGE CHAMBERS TO BE 600mmØ TYPE 3. PRIVATE PIPES TO BE 100Ømm.

Rev	Date	Description	By	Apvd
T4	10.07.24	FWMH 13 & 14 named	AK	RL
T3	02/07/24	Tender issue - See Clouds	AH	RL
T2	19.06.24	Amended to Client's comments	SS	RL
T1	31.05.24	Tender Issue	SS	RL
P2	10.05.24	Preliminary Issue	AH	RL
P1	19.04.24	Preliminary issue	RJ	RL

PROJECT:
COLDHARBOUR FARM ROAD,
EMSWORTH

TITLE:
DRAINAGE ARRANGEMENT

CLIENT:
DOSWELL PROJECTS

SCALE@A1:
1:250

PROJECT REF:
23339
DRAWING No:
JUBB-XX-XX-DR-C-500
Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction

REV:
T4



FW Network MANHOLE SCHEDULE							
MANHOLE NUMBER	COVER LEVEL (m)	INVERT LEVEL (m)	MANHOLE TYPE	MANHOLE SIZE (m)	COVER SIZE	COVER GRADE	NOTES
FWMH 1	8.500	7.505	Type 2	1.2 Dia	675x675	D400	
FWMH 2	8.375	7.150	Type 2	1.2 Dia	675x675	D400	
FWMH 3	7.900	6.815	Type 2	1.2 Dia	675x675	D400	
FWMH 4	7.550	6.540	Type 2	1.2 Dia	675x675	D400	
FWMH 5	7.325	6.330	Type 2	1.2 Dia	675x675	D400	
FWMH 6	7.050	5.985	Type 2	1.2 Dia	675x675	D400	
FWMH 7	6.900	5.670	Type 2	1.2 Dia	675x675	D400	
FWMH 8	6.675	5.400	Type 2	1.2 Dia	675x675	D400	
FWMH 9	8.500	7.500	Type 2	1.2 Dia	675x675	D400	
FWMH 10	8.400	7.210	Type 2	1.2 Dia	675x675	D400	
FWMH 11	7.450	6.640	Type 2	1.2 Dia	675x675	D400	
FWMH 12	7.150	6.060	Type 2	1.2 Dia	675x675	D400	
FWMH 13	6.220	5.600	Type 2	1.2 Dia	675x675	D400	Air Release Vale Manhole
FWMH 14	7.750	6.750	Type 2	1.2 Dia	675x675	D400	Rising Main Break Manhole

SW Network MANHOLE SCHEDULE							
MANHOLE NUMBER	COVER LEVEL (m)	INVERT LEVEL (m)	MANHOLE TYPE	MANHOLE SIZE	COVER SIZE	COVER GRADE	NOTES
SW 1	8.486	7.200	Type 2	1.2 Dia	675x675	D400	
SW 2	8.300	6.600	Type 2	1.2 Dia	675x675	D400	
SW 3	8.024	6.350	Type 2	1.2 Dia	675x675	D400	
SW 4	7.612	6.050	Type 2	1.2 Dia	675x675	D400	
SW 5	7.345	5.800	Type 2	1.2 Dia	675x675	D400	
SW 6	7.009	5.400	Type 2	1.2 Dia	675x675	D400	
SW 7	8.513	7.500	Type 2	1.2 Dia	675x675	D400	
SW 8	8.350	7.000	Type 2	1.2 Dia	675x675	D400	
SW 9	7.919	6.600	Type 2	1.2 Dia	675x675	D400	
SW 10	7.150	5.900	Type 2	1.2 Dia	675x675	D400	
SW 11	6.959	5.600	Type 2	1.2 Dia	675x675	D400	
SW 12	6.050	4.800	Type 2	1.2 Dia	675x675	D400	

T3	10.07.24	FWMH 13 & 14 added	AK	RL
T2	12.06.24	Drawing Name Update	RL	RL
T1	31.05.24	Drainage updates	SS	AH
P1	10.05.24	Preliminary issue	AH	RL

Rev	Date	Description	By	Apvd
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PROJECT:
COLDHARBOUR FARM ROAD,
EMSWORTH

TITLE:
DRAINAGE
MANHOLE SCHEDULE

CLIENT:
DOSWELL PROJECTS

SCALE@A1:
NTS

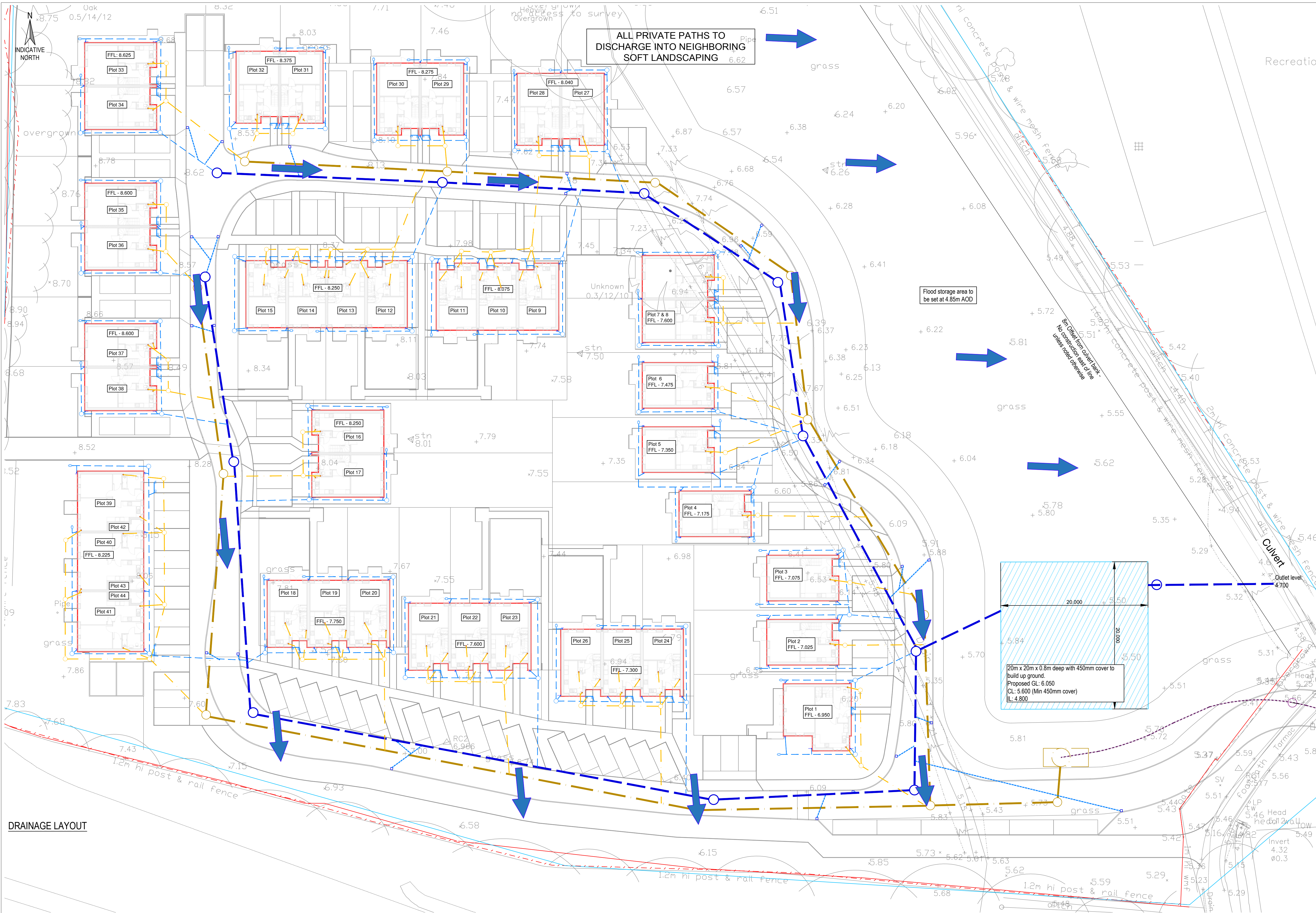
PROJECT REF:
23339

DRAWING No: JUBB-XX-XX-DR-C-510

REV: T3

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction





DRAINAGE LAYOUT

- NOTES
1. Do not scale from this drawing.
 2. Location of existing utilities and drainage are indicative. Contractor to confirm location/depth of utilities on site before undertaking any construction activities.
 3. Attenuation is provided to accommodate the 1 in 100 year including 40% climate change allowance rainfall event.
 4. Proposed tanks are shown indicatively. The size, shape and position is subject to detail design.
 5. Onsite ground investigation works including infiltration testing in accordance with BRE365 guidance should be undertaken across the site to inform the drainage proposals.
 6. All proposed foul sewer to be 1500 and laid at 1:80 unless noted otherwise.
 7. All Proposed surface water sewer to be laid at 1:100 unless noted otherwise.
 8. ACOs at door threshold to be confirmed by architect. Not required when levels fall away from entrance.

- 3000 @ 1:100 Proposed surface water sewer
- 1500 @ 1:80 Proposed foul water sewer
- 3000 @ 1:100 Proposed private surface water sewer
- 1500 @ 1:80 Proposed private foul water sewer
- Proposed RWP/Gully Connection
- Proposed SVP/SS Connection
- Proposed Rising main
- Proposed Gully
- Proposed ACO channel drain
- Minor contours (0.1m)
- Major Contours (0.5m)
- Overland Flow Route

FOR MAIN RUN DRAINAGE - SEE MANHOLE SCHEDULES (DRAWING '510')

FOR DRAINAGE LAYOUT SEE DRAWING 500

T1	10.07.24	Tender Issue	SS	RL
Rev	Date	Description	By	Apvd

PROJECT: COLDHARBOUR FARM ROAD, EMSWORTH

TITLE: DRAINAGE OVERLAND FLOW ROUTING

CLIENT: DOSWELL PROJECTS

SCALE@A1: 1:250

PROJECT REF: 23339

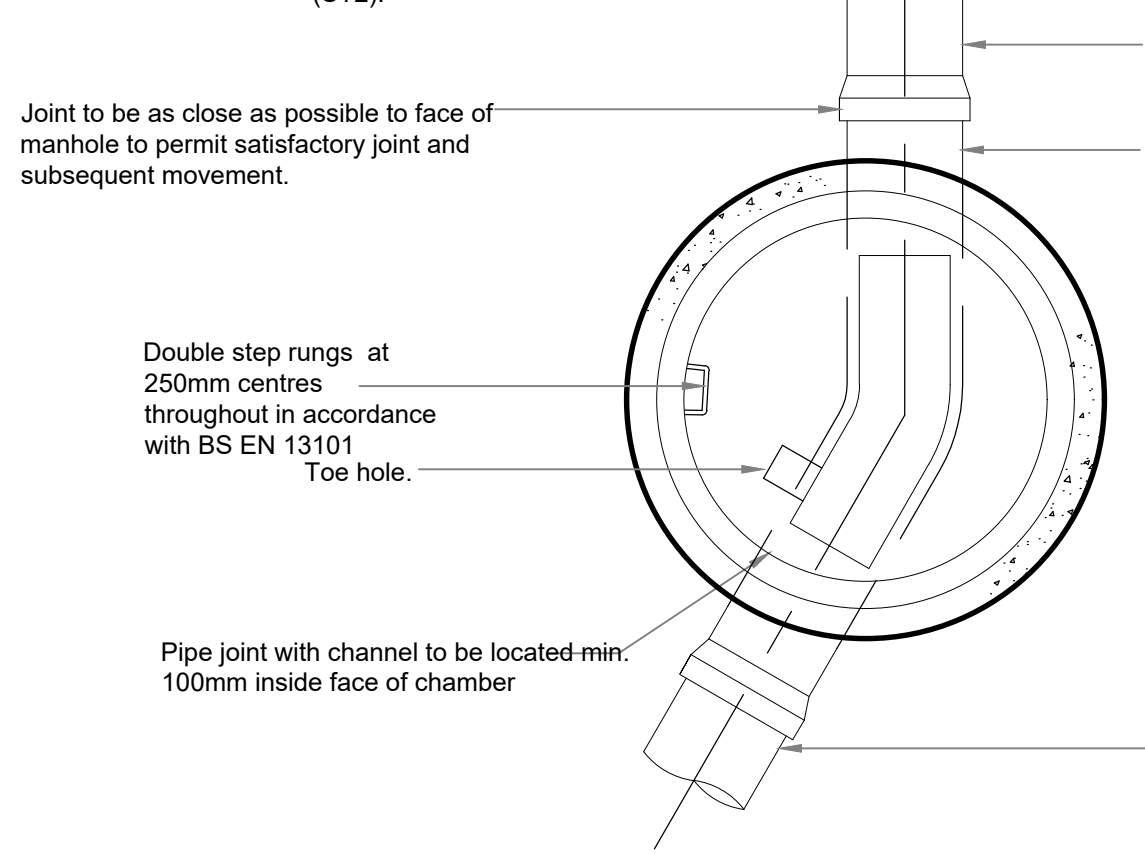
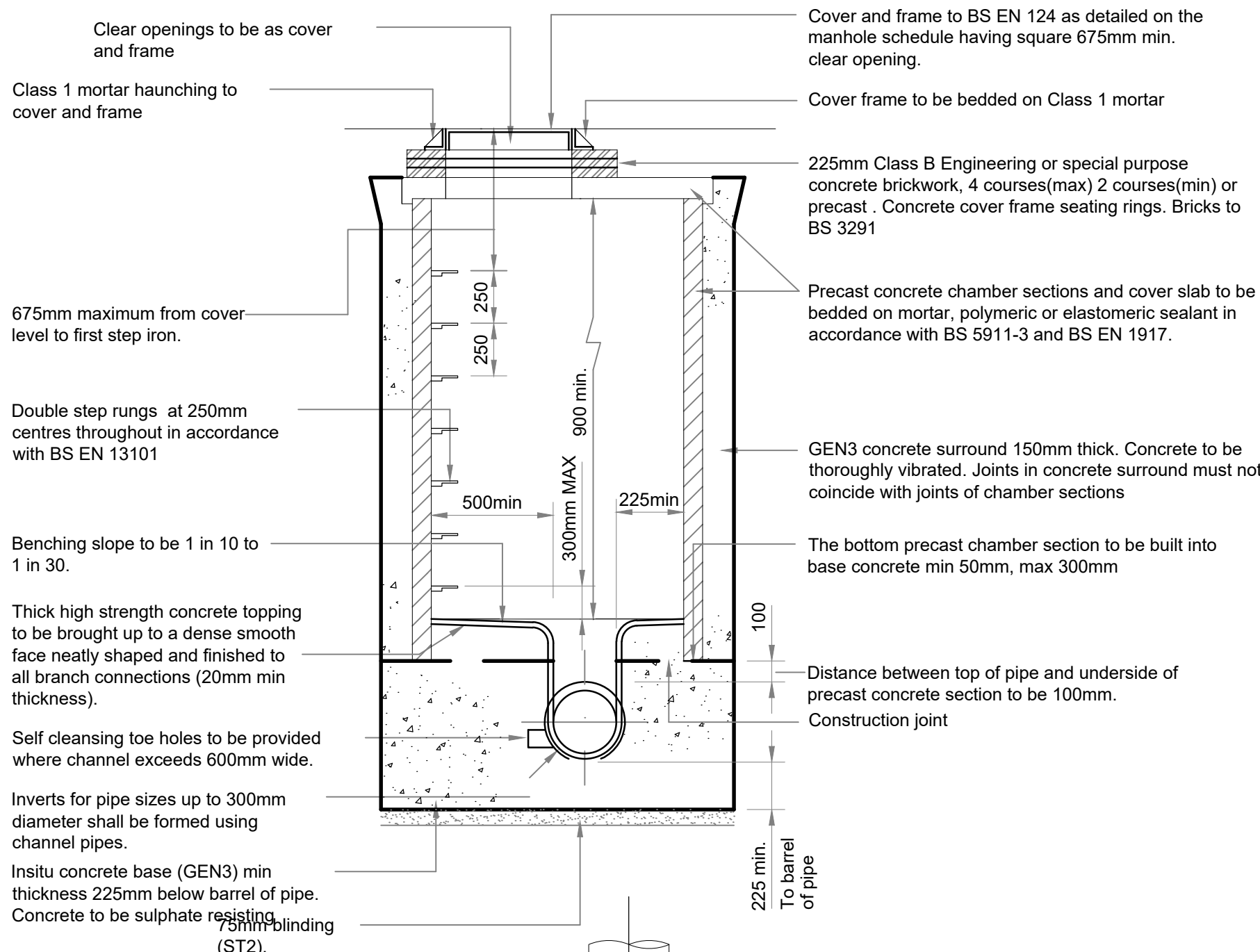
DRAWING No: JUBB-XX-XX-DR-C-520

REV: T1

Revision Referencing

P = Preliminary A = Approval T = Tender C = Construction

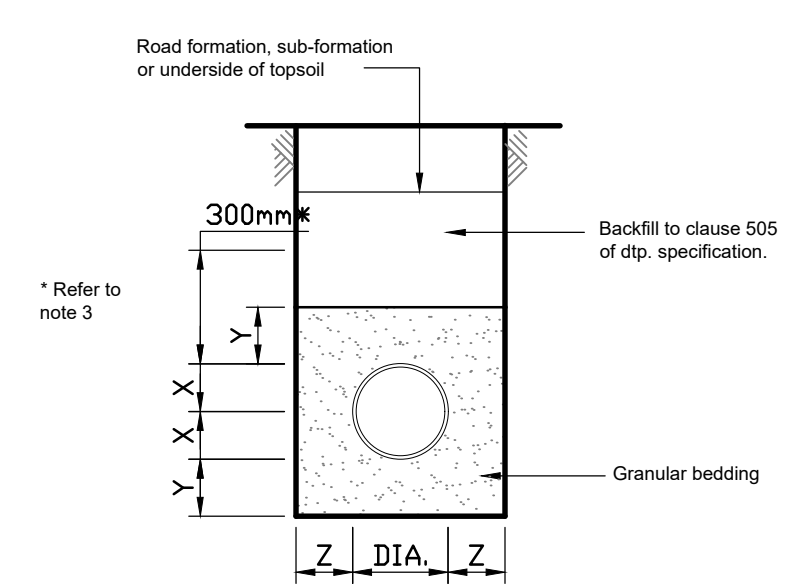




- GENERAL NOTES:**
1. Outgoing pipes greater than 600mm diameter are to be fitted with safety chains
 2. Sulphate resisting portland cement shall be used for all concretes and mortars having equivalent compressive strength of 20N/mm² or greater (including precast concrete products).
 3. Refer to manhole schedules for details of covers, pipe sizes, invert levels, manhole diameter etc.

Pipe dia	Effective length
150 - 600	0.60
675 - 750	1.00
825 & over	1.25

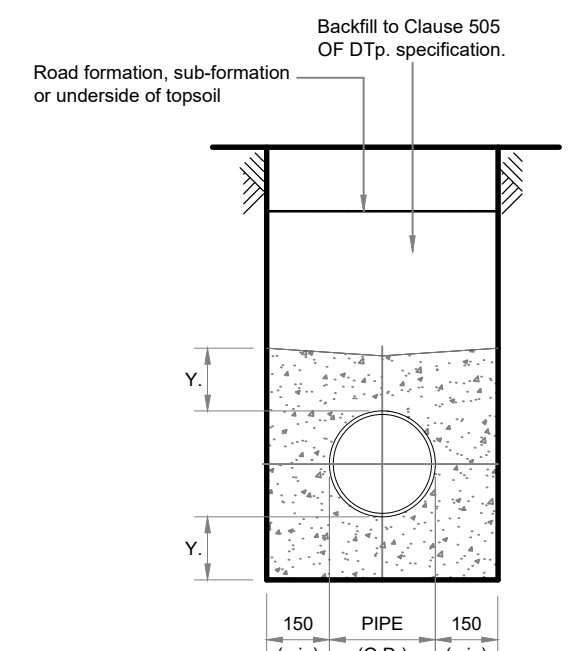
MANHOLE - TYPE 2
DEPTH TO SOFFIT = 3.0m MAXIMUM



CLASS S BEDDING
GRANULAR BED AND SURROUND
(Bedding factor = 2.2)

X = Half of outside diameter of pipe
Y = Refer to pipe bedding dimension table
Z = Minimum 150mm

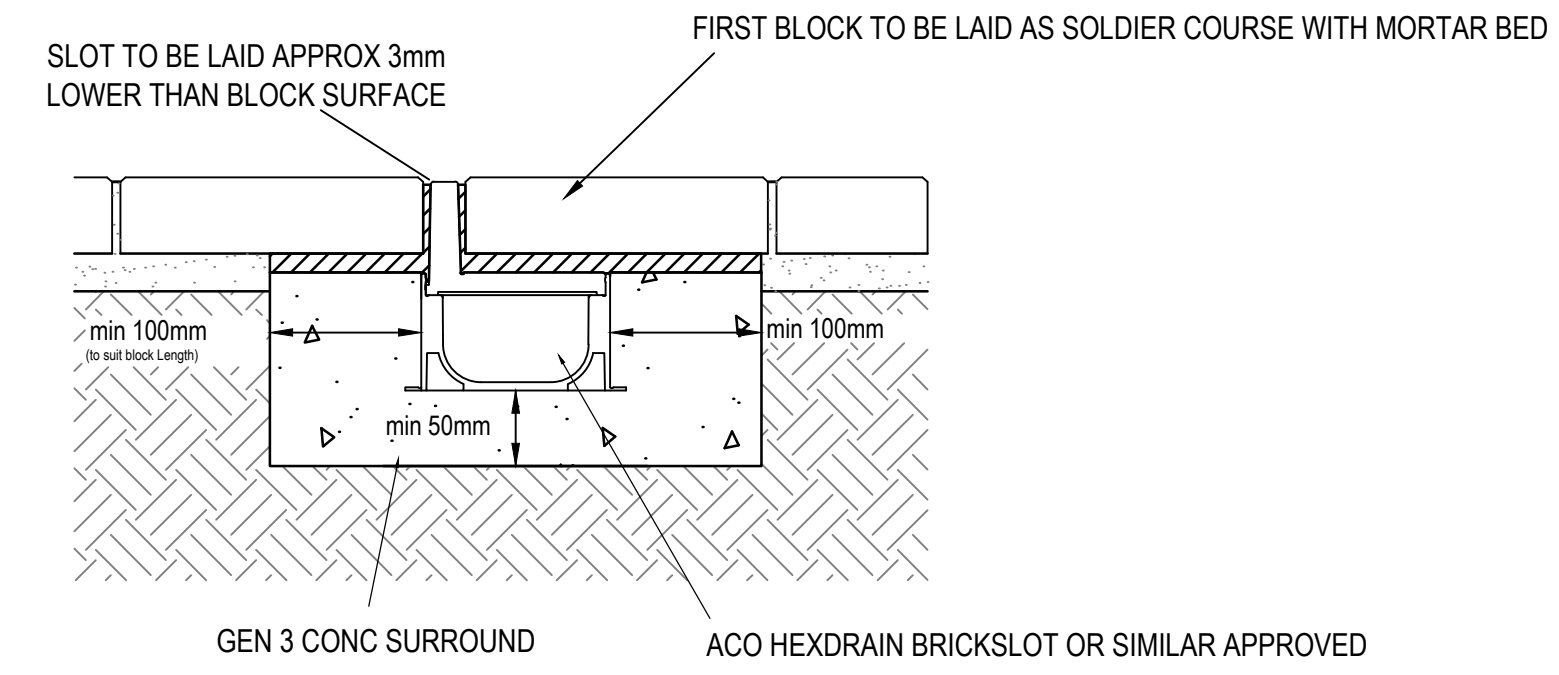
- NOTES:**
1. Bedding to be used where depth of cover to pipe is minimum:
 - 1.1. 1.2m under trafficked areas (adoptable roads),
 - 1.2. 0.9m under agricultural land, public open space, domestic driveways, parking areas and narrow streets without footways with limited access for vehicles with a gross vehicle weight in excess of 7.5 tonnes.
 - 1.3. 0.6m under soft landscaping.
 2. Refer to tables for dimensions and bedding details
 3. Bedding beneath and at the sides of the pipe to be well compacted
 4. The first 300mm of fill above the crown of the pipe is to be lightly tamped by hand. Mechanical compaction may be used only above this level.
 5. Geotextiles may be used where directed or approved by the engineer to contain bedding material in certain soils e.g. running sand
 6. In very wet conditions, where directed or approved by the engineer a temporary land drain may be laid within the granular bed.



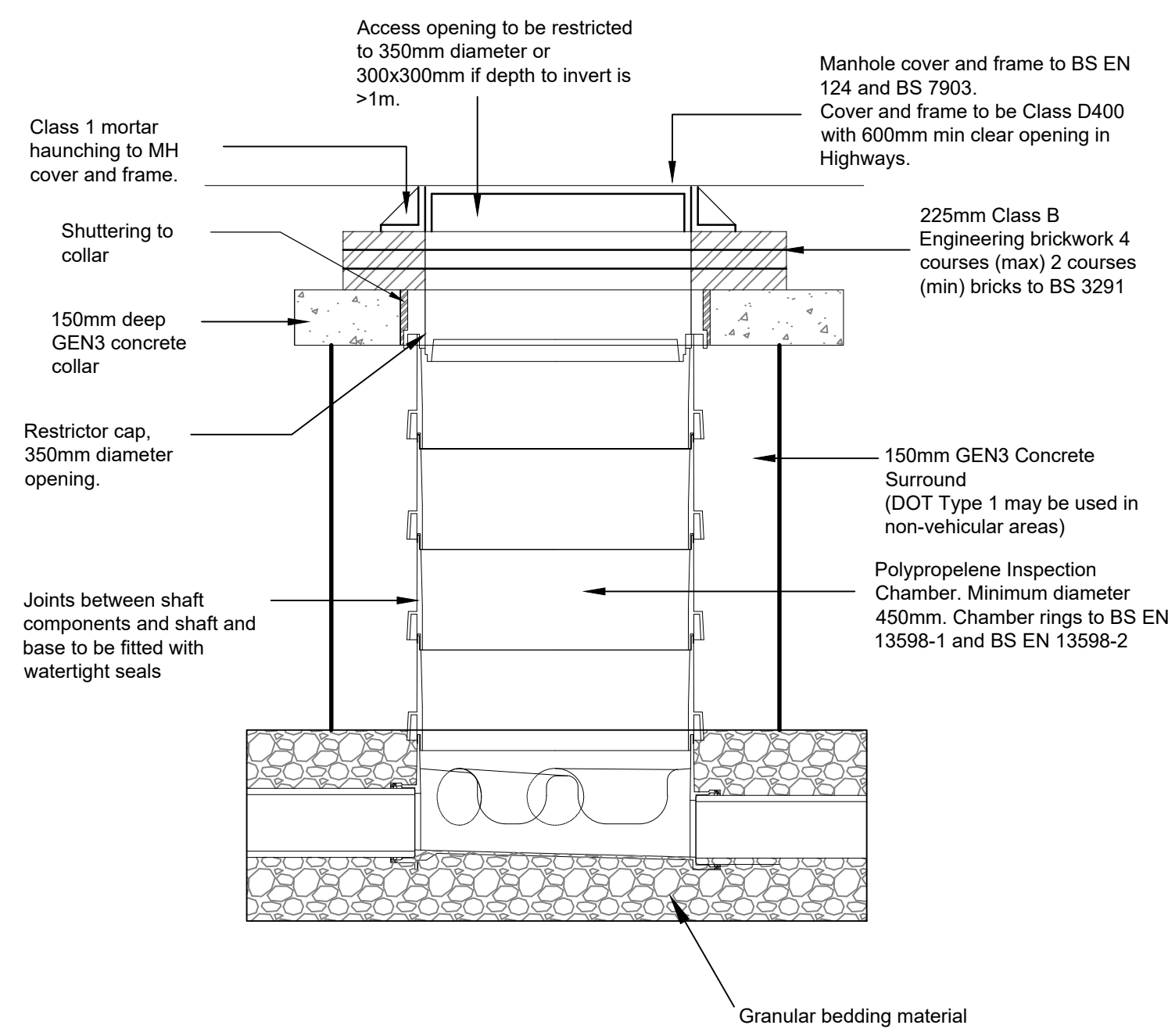
CLASS Z BEDDING
PLAIN CONCRETE BED AND SURROUND

- NOTES:**
1. Bedding to be used where Class S surround is not suitable.
 2. Bedding beneath and at sides of the pipe to be well compacted.
 3. Geotextiles may be used where directed or approved by the engineer to contain bedding material in certain soils e.g. running sand.
 4. In very wet conditions, where directed or approved by the engineer a temporary land drain may be laid within the granular bed.
 5. Where pipes with flexible joints are used, the concrete protection is to be interrupted over its full cross-section at intervals not exceeding 5 metres (or as directed by the engineer) by a shaped former of bitumen impregnated compressible filler; these interruptions shall coincide with pipe joints. see dimensions for pipe bedding table for thickness of compressible filler.
 6. Concrete to be Class 2; sulphate resisting ST4 concrete.
 7. Where flexible pipes are used. care must be taken to prevent the pipes from floating.

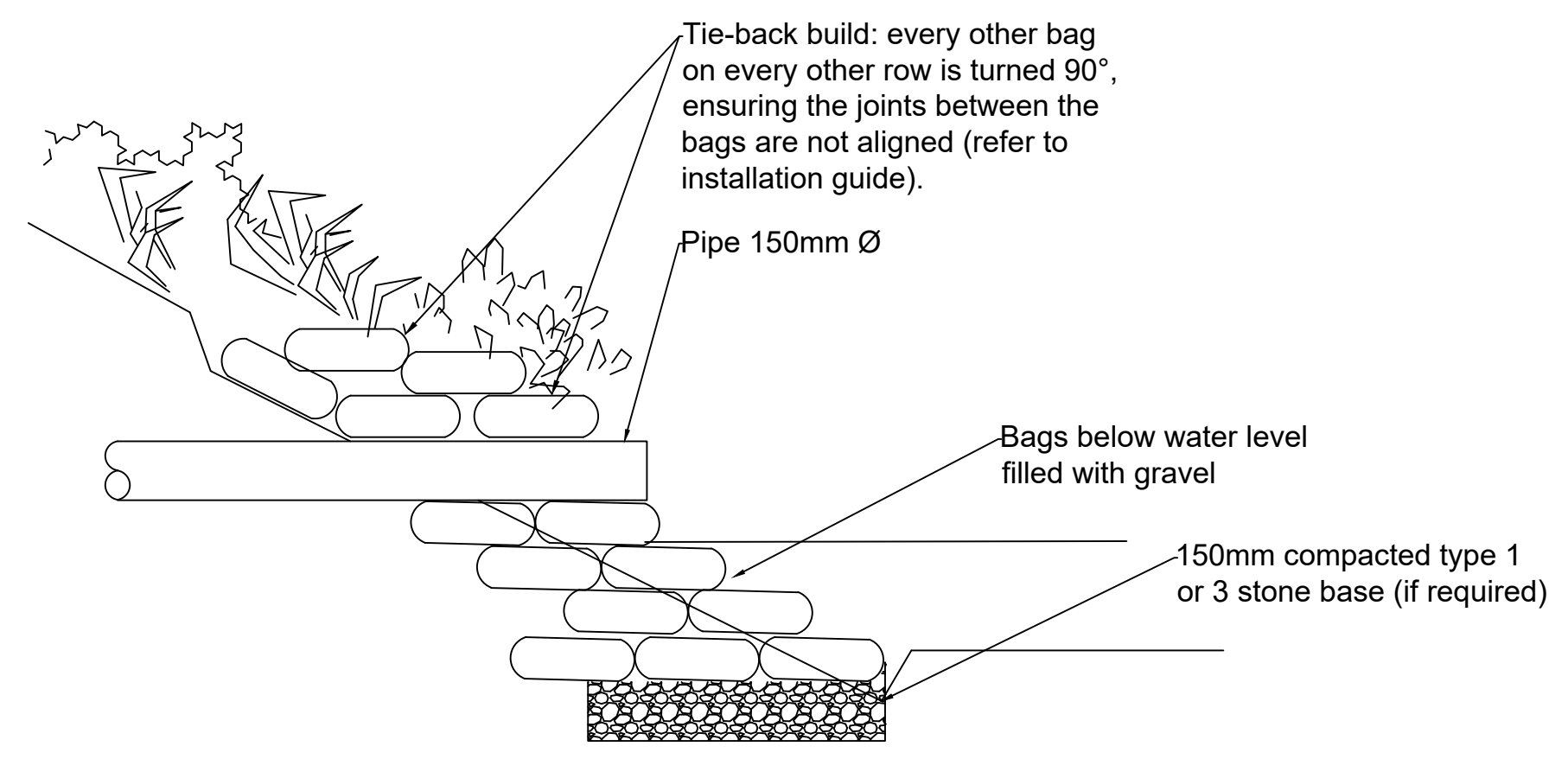
BEDDING AND SURROUND DETAILS



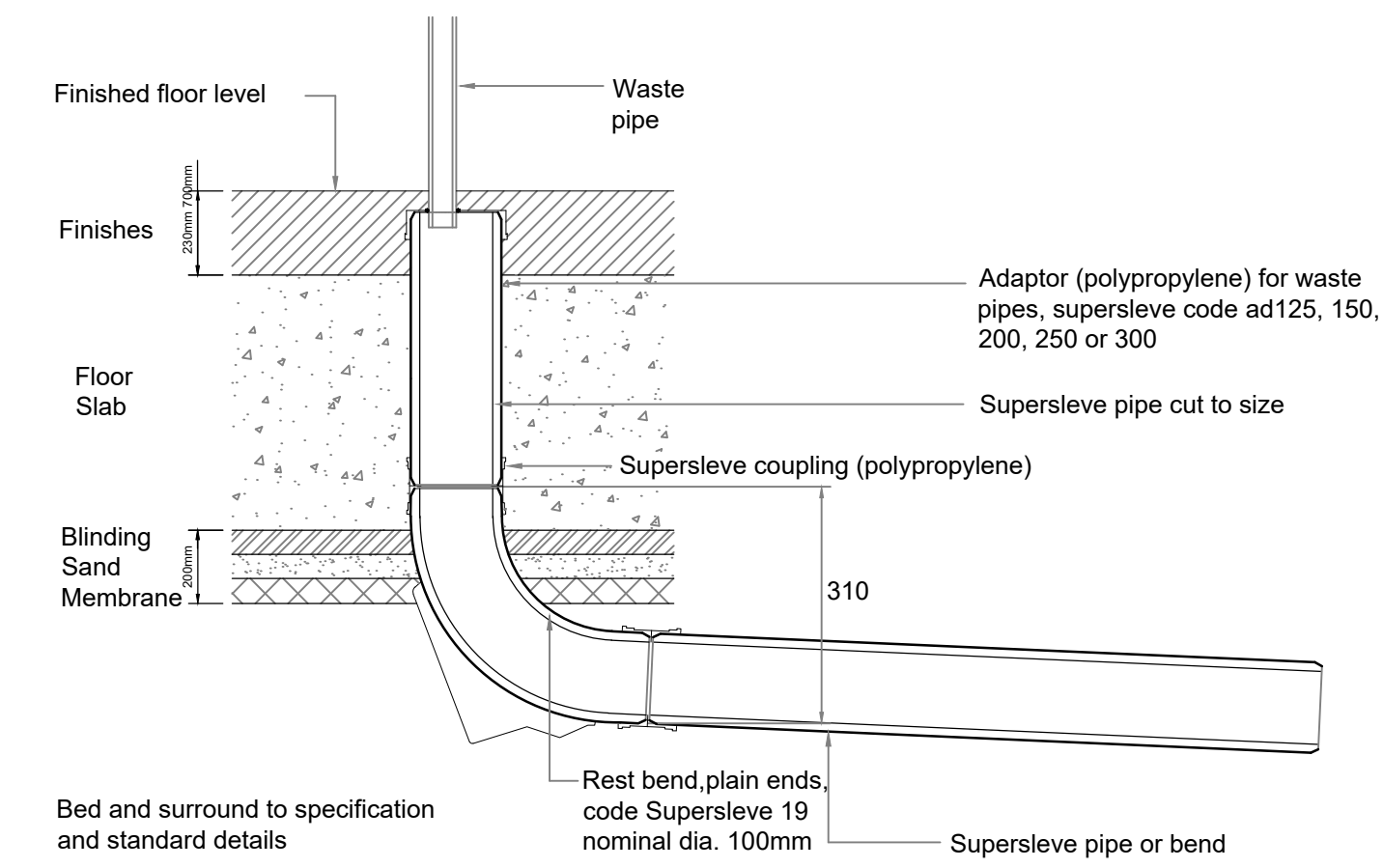
PEDESTRIAN SLOTDRAIN DETAIL N.T.S.



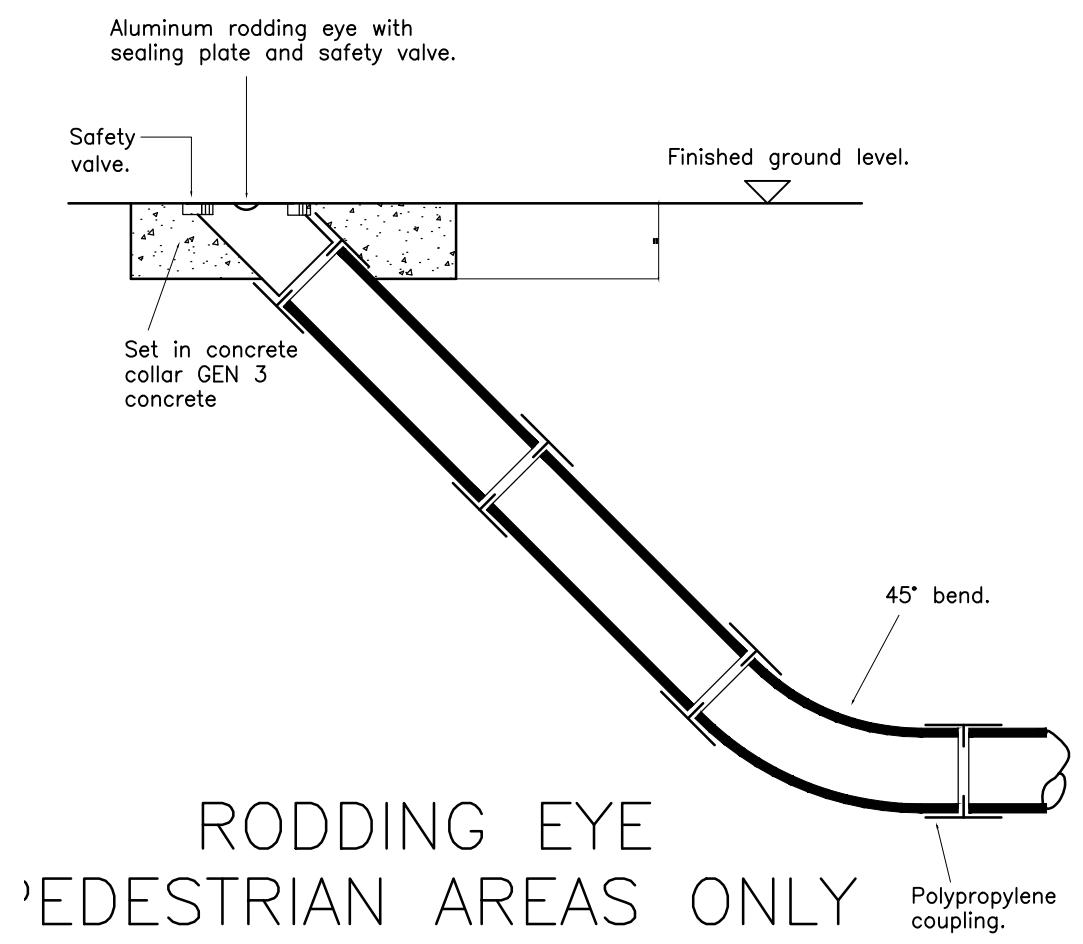
MANHOLE TYPE 3 (non-entry) NOT TO SCALE
MAX DEPTH TO SOFFIT 3.0m



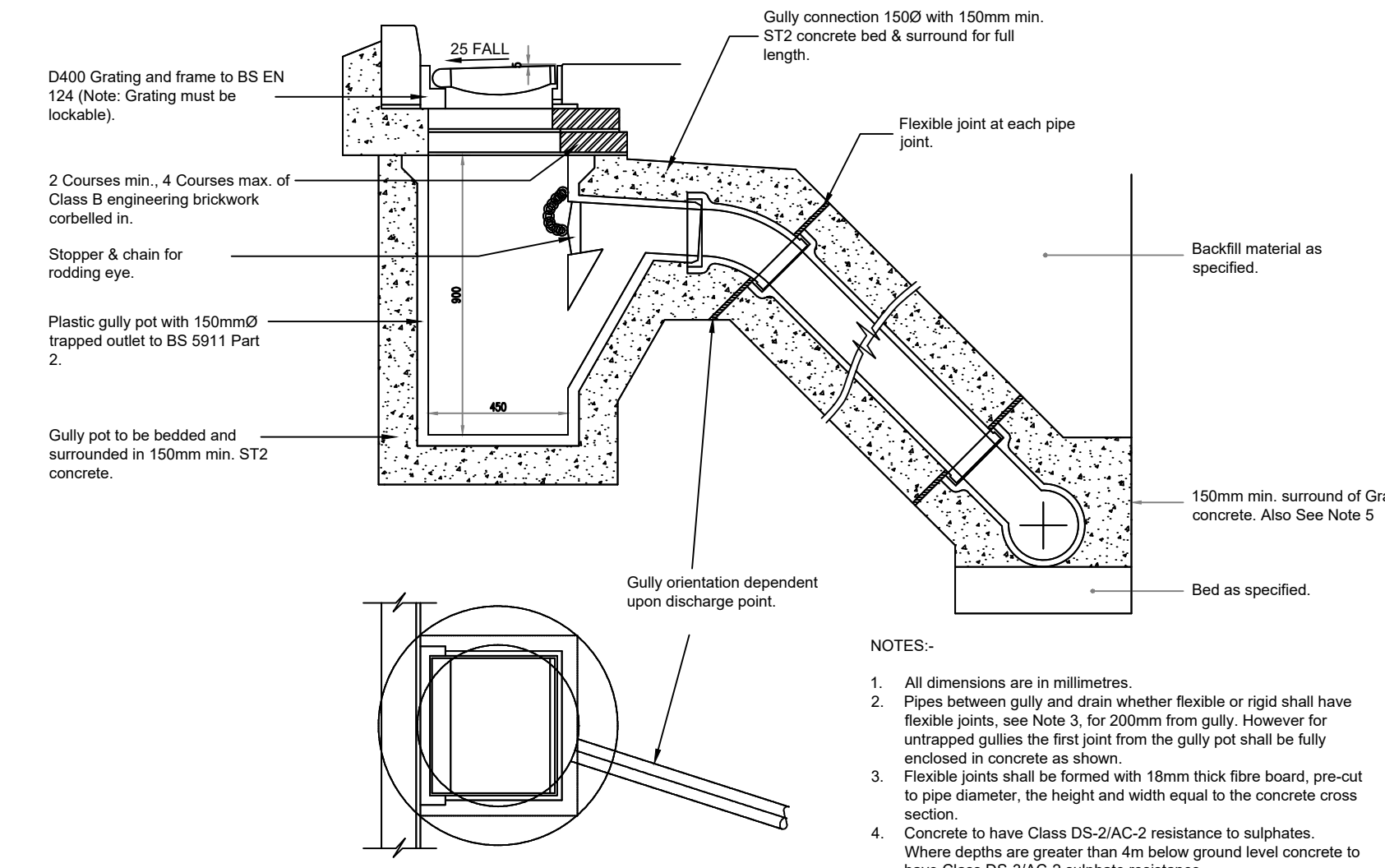
INDICATIVE HEADWALL SECTION



CONNECTION TO WASTE OR RAINWATER PIPES

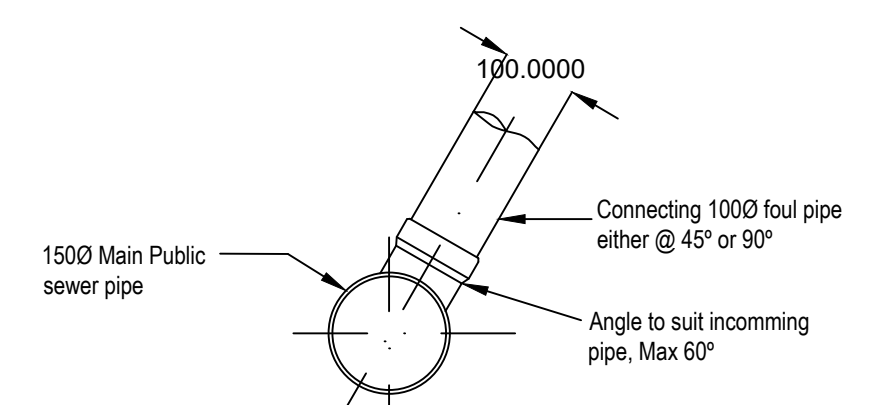


RODDING EYE
PEDESTRIAN AREAS ONLY

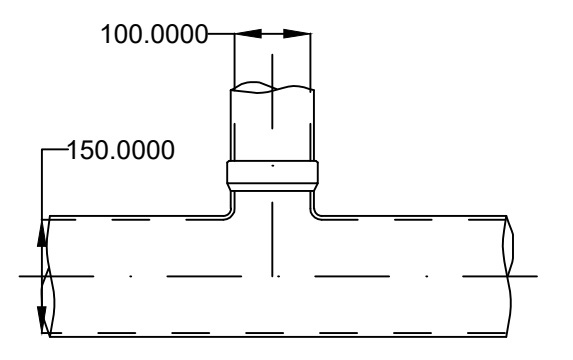


GULLY DETAIL

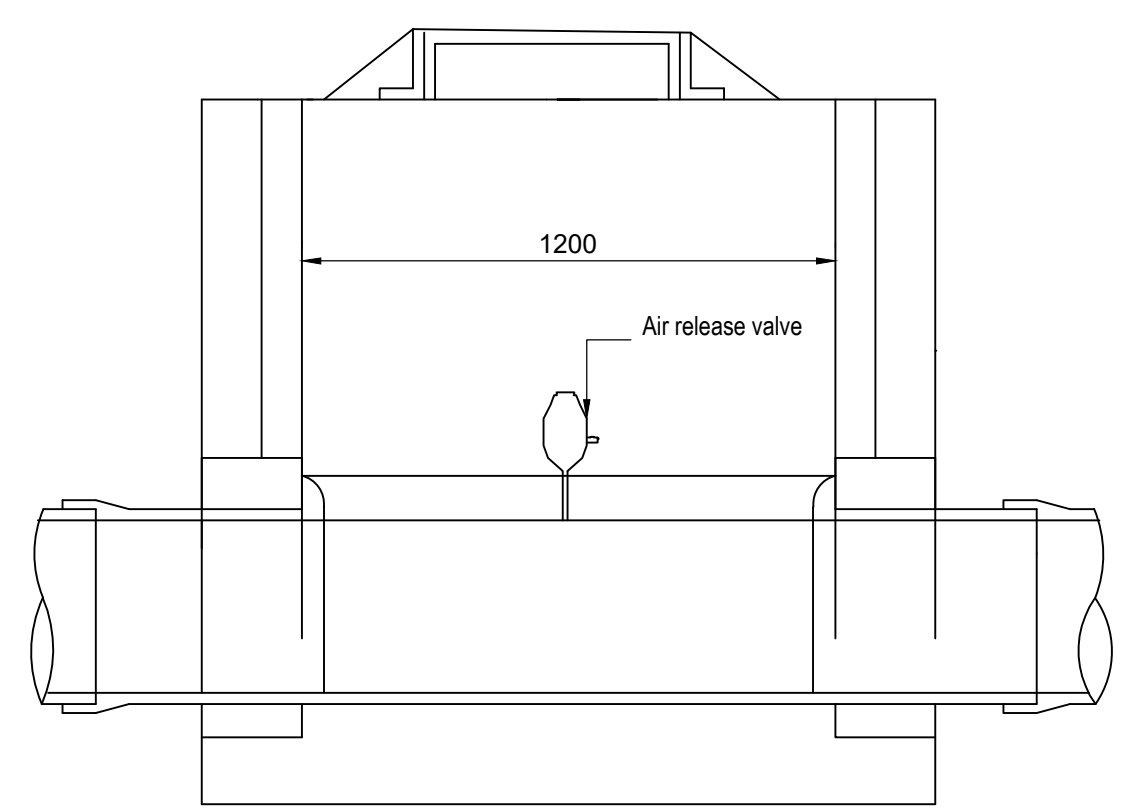
- NOTES:-**
1. All dimensions are in millimetres.
 2. Pipes between gully and drain whether flexible or rigid shall have flexible joints, see Note 3, for 200mm from gully. However for untrapped gullies the first joint from the gully pot shall be fully enclosed in concrete as shown.
 3. Flexible joints shall be formed with 18mm thick fibre board, pre-cut to pipe diameter, the height and width equal to the concrete cross section.
 4. Concrete to have Class DS-2/AC-2 resistance to sulphates. Where depths are greater than 4m below ground level concrete to have Class DS-3/AC-2 sulphate resistance.
 5. Where a prefabricated junction is used, the concrete surround to the drain junction may be omitted.



SECTION OF PUBLIC SEWER WITH CONNECTING FOUL PIPE



PUBLIC SEWER CONNECTION @ 90°



AIR RELEASE MANHOLE DETAIL

T1	31.05.24	Tender issue	AH	RL
P1	19.04.24	Preliminary Issue	AH	RL
Rev	Date	Description	By	Apvd

PROJECT:
COLDHARBOUR FARM ROAD, EMSWORTH

TITLE:
DRAINAGE DETAILS

CLIENT:
DOSWELL PROJECT

SCALE@A1:
NTS

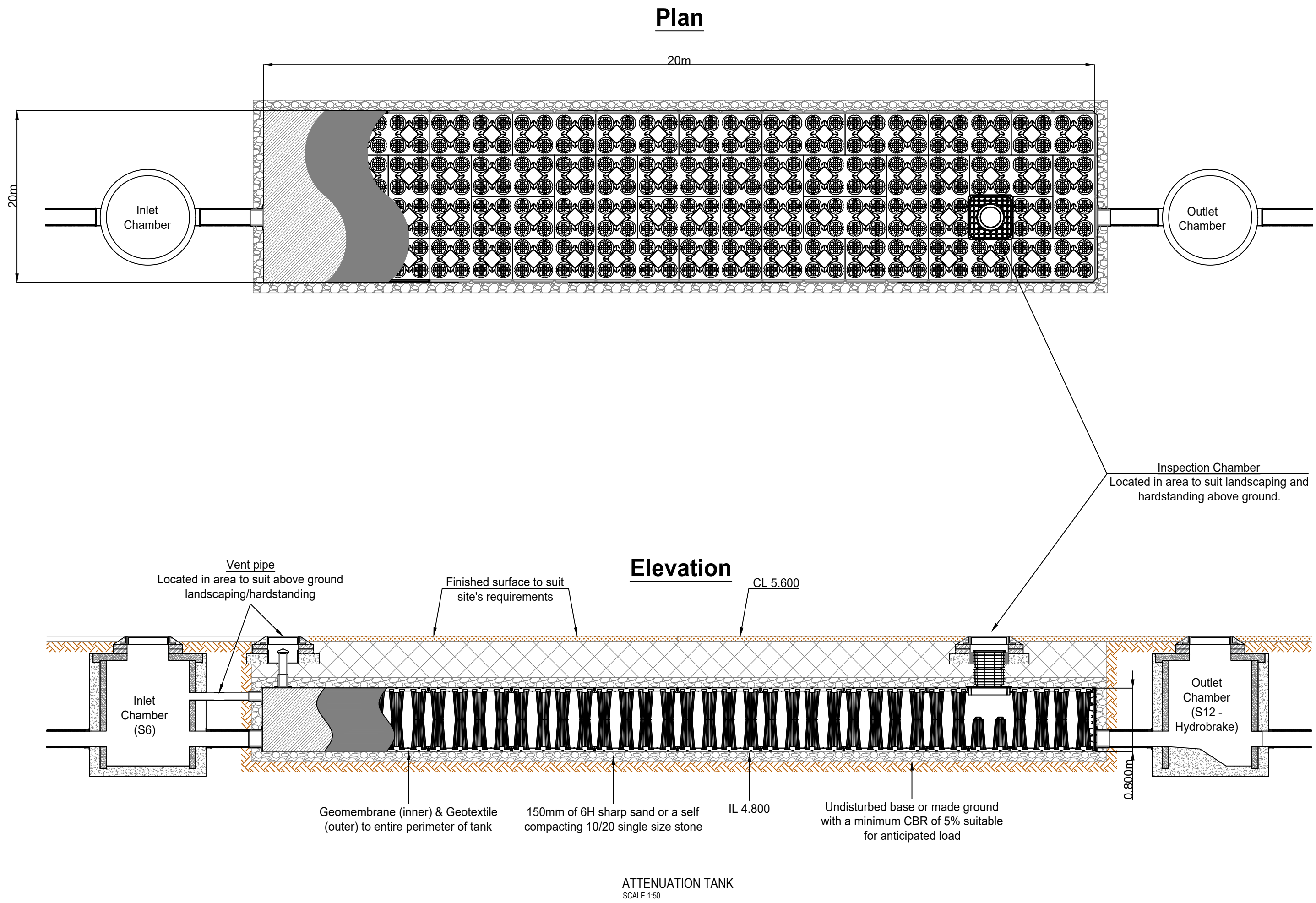
PROJECT REF:
23339

DRAWING No:
JUBB_XX_XX_DR_C_550

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction

REV:
T1





T1	10.07.24	Tender issue	AH	RL
Rev	Date	Description	By	Apvd

PROJECT:
COLDHARBOUR FARM ROAD,
EMSWORTH

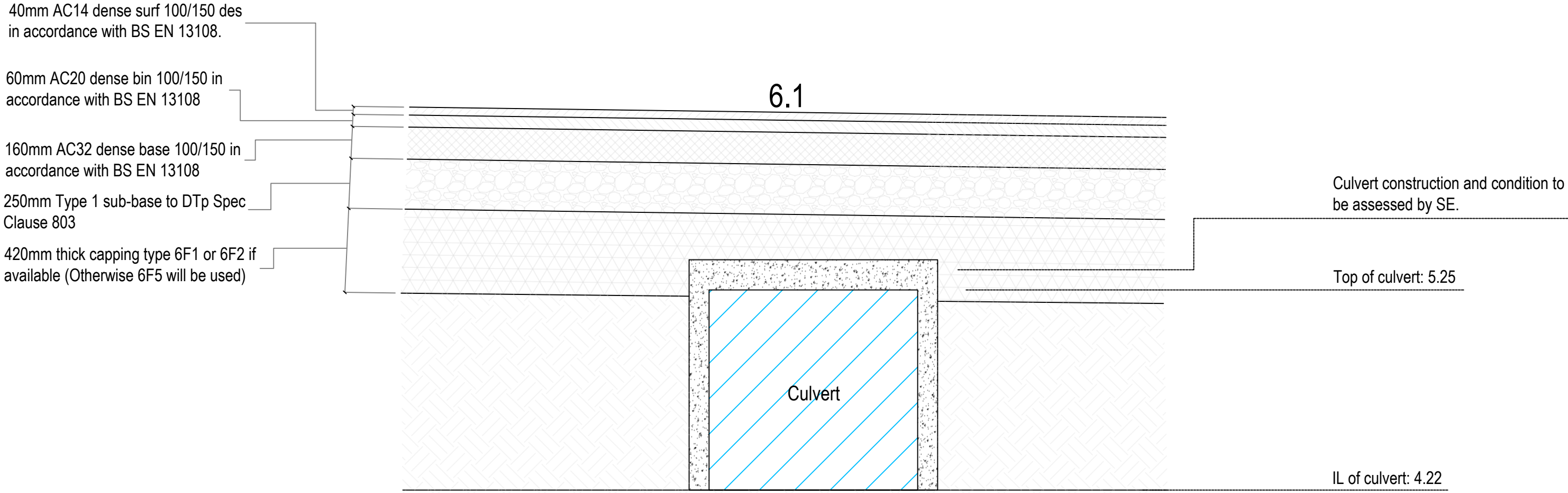
TITLE:
DRAINAGE DETAILS
SHEET 2

CLIENT:
DOSWELL PROJECTS

SCALE@A1:
NTS

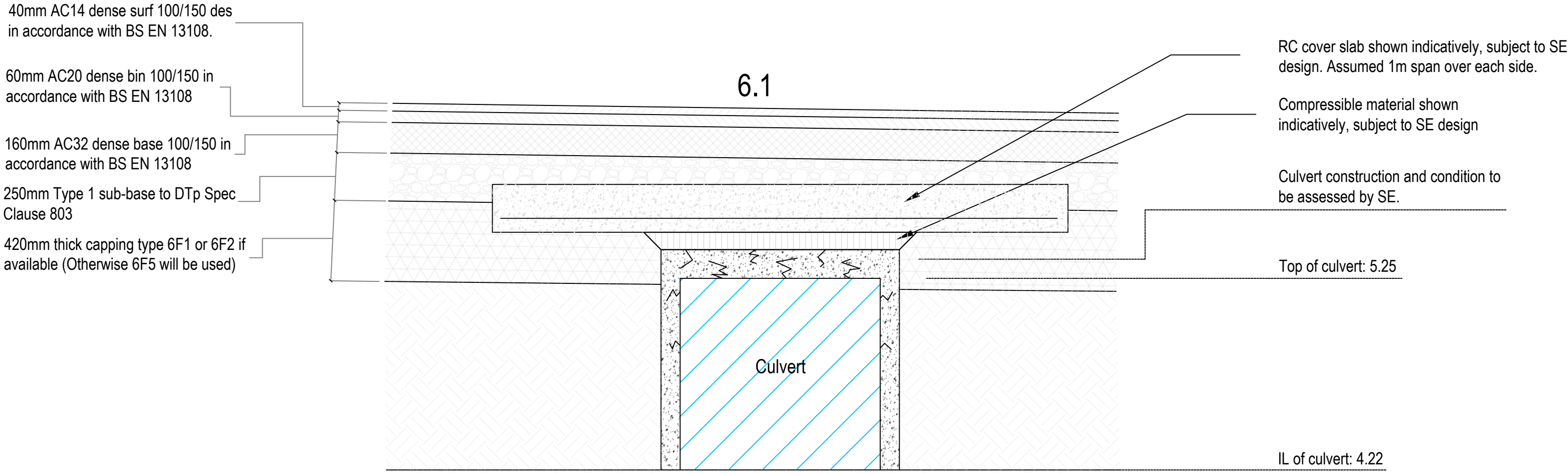
PROJECT REF:
23339
DRAWING No:
JUBB_XX_XX_DR_C_551
REV:
T1

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction



TYPICAL CULVERT SECTION
OPTION 1 - Culvert in good condition with no defects (Approved by SE)

Culvert must be exposed and assessed before construction commences.
It is advised the SE to review the condition and advise on action taken.

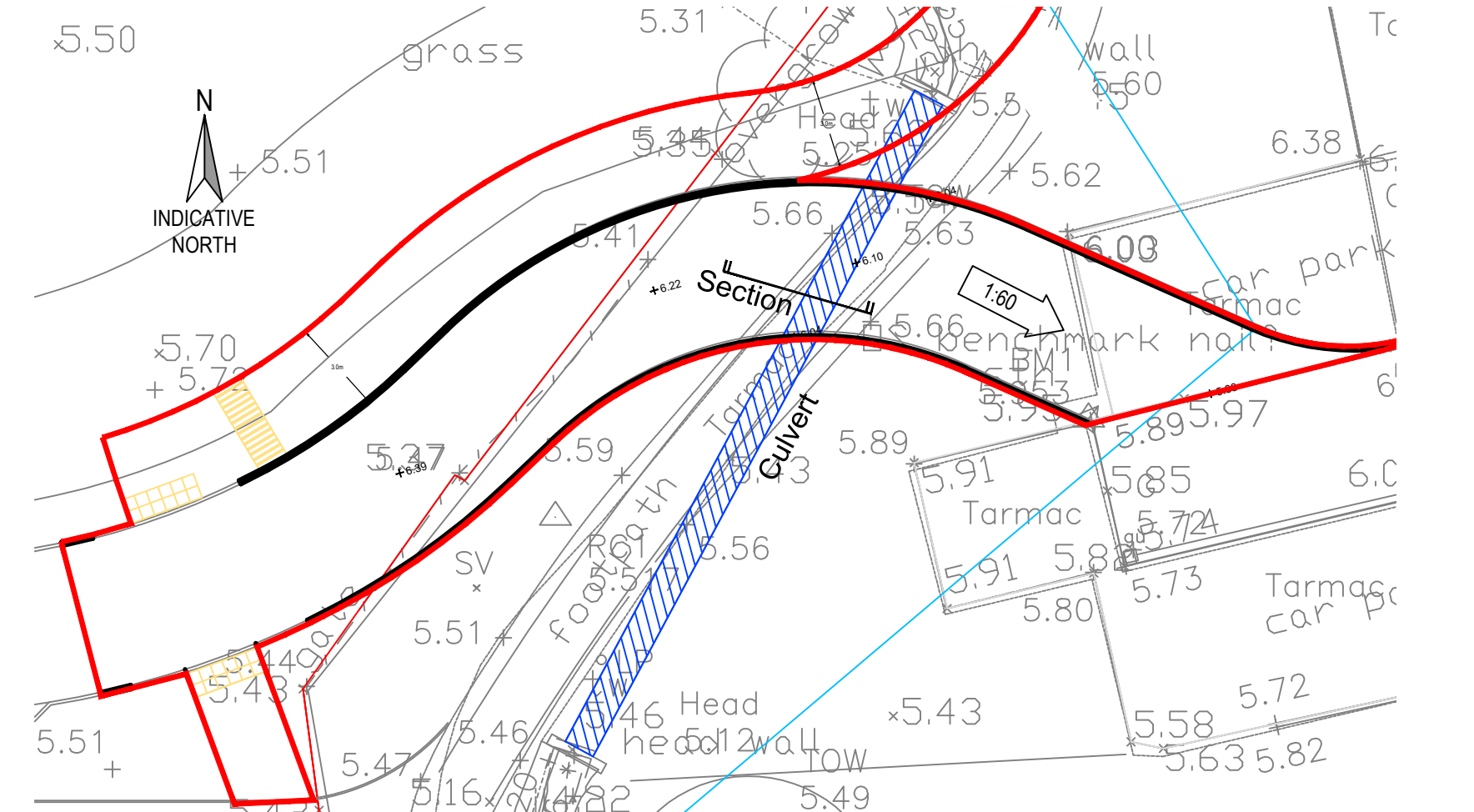


TYPICAL CULVERT SECTION
OPTION 2 - SE deems culvert inadequate

- NOTES
- Do not scale from this drawing.
 - Location of existing utilities and drainage are indicative. Contractor to confirm location/depth of utilities on site before undertaking any construction activities.
 - Culvert shape and depths extracted from topo and picture information. To be confirmed on site.



SITE LOCATION PLAN



P1	04.07.24	Preliminary issue	AH	RL
Rev	Date	Description	By	Apvd

PROJECT:
COLDHARBOUR FARM ROAD,
EMSWORTH

TITLE:
CULVERT SECTIONS

CLIENT:
DOSWELL PROJECTS

SCALE@A1:
1:200

PROJECT REF:
23339
DRAWING No: JUBB-XX-XX-DR-C-575
REV: P1

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction

Jubb

Technical Specification

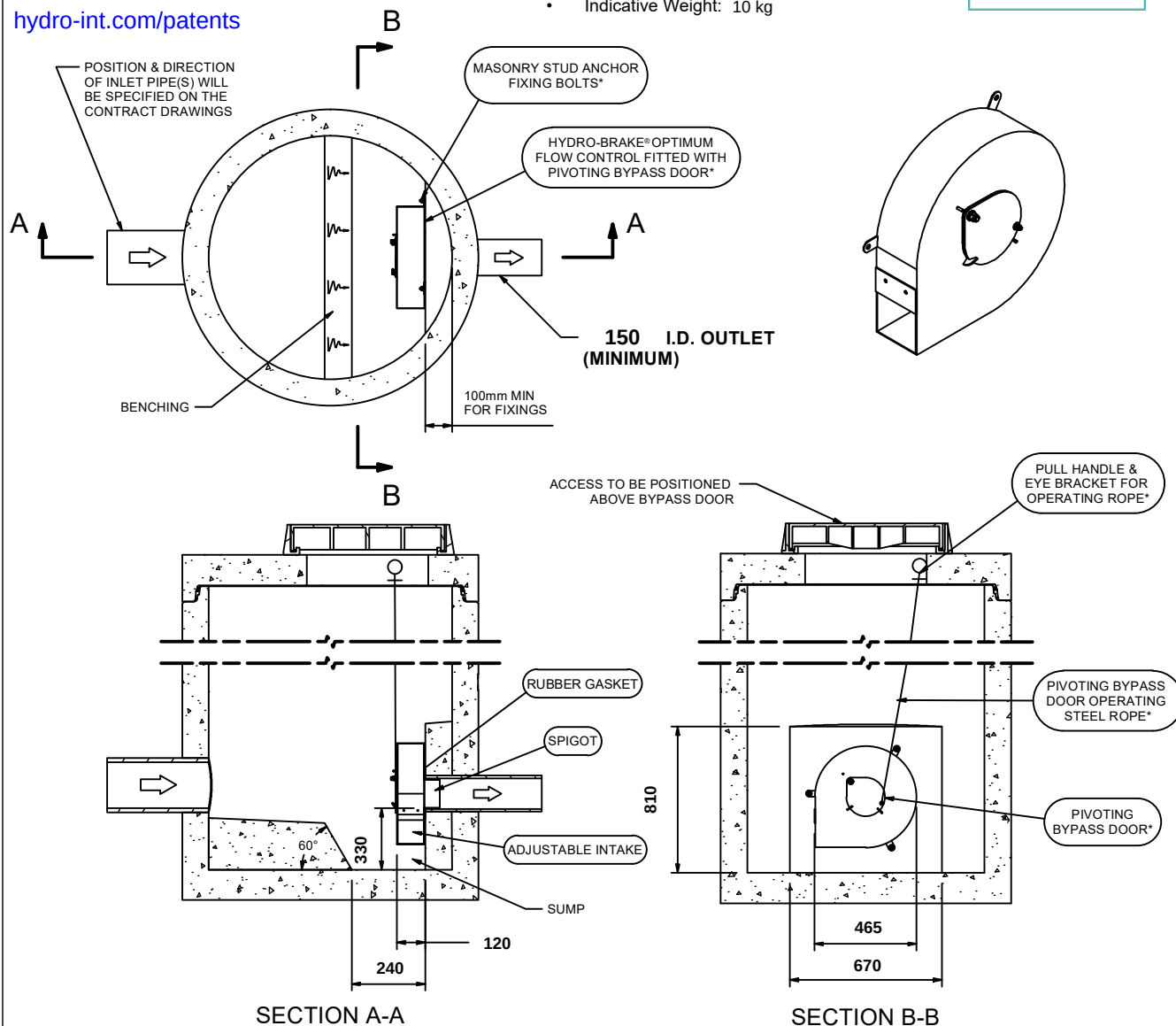
Control Point	Head (m)	Flow (l/s)
Primary Design	0.800	5.200
Flush-Flo™	0.241	5.196
Kick-Flo®	0.537	4.326
Mean Flow		4.471

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 10 kg



hydro-int.com/patents



IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
 CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0110-5200-0800-5200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**
 A CRH COMPANY

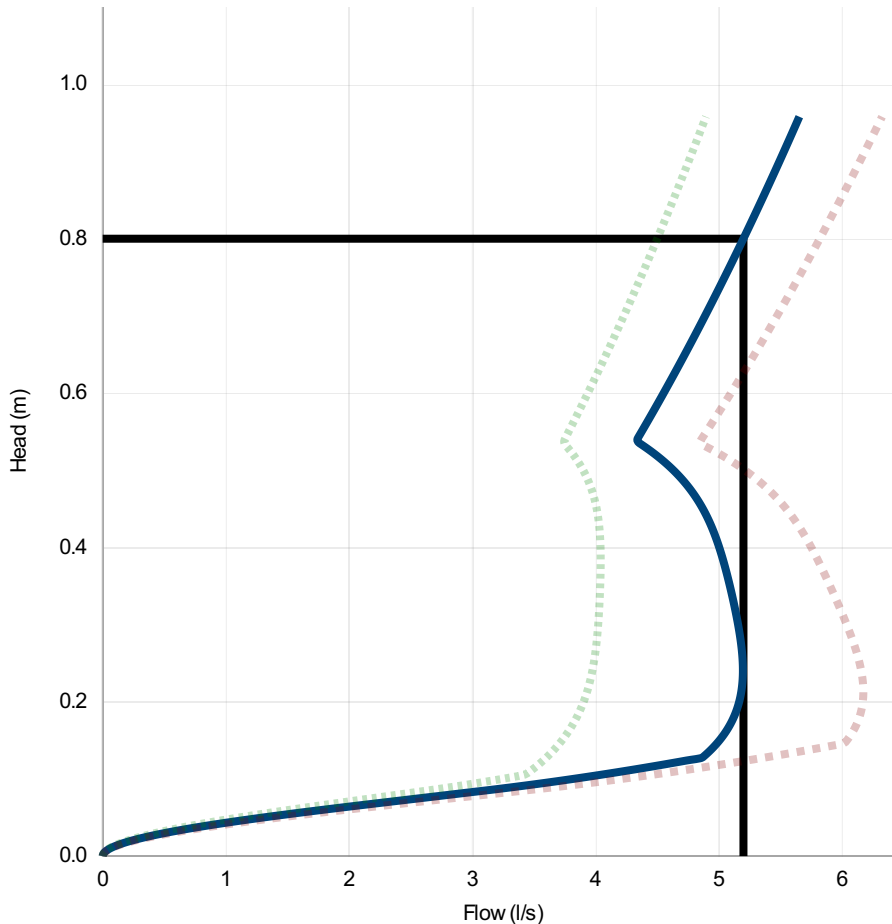
DATE	19/04/2024 08:30	SHE-0110-5200-0800-5200 Hydro-Brake® Optimum
SITE	Coldharbour Farm Road	
DESIGNER	Aaron Hunt	
REF	23339	

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	0.800	5.200	0.800	4.500	0.800	5.819
Flush-Flo™	0.241	5.196	0.384	4.041	0.213	6.173
Kick-Flo®	0.537	4.326	0.535	3.734	0.535	4.836
Mean Flow		4.471		3.664		5.110



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.028	0.431
0.055	1.545
0.083	2.984
0.110	4.240
0.138	4.937
0.166	5.074
0.193	5.153
0.221	5.189
0.248	5.195
0.276	5.180
0.303	5.153
0.331	5.117
0.359	5.077
0.386	5.030
0.414	4.973
0.441	4.899
0.469	4.797
0.497	4.653
0.524	4.454
0.552	4.380
0.579	4.479
0.607	4.576
0.634	4.671
0.662	4.764
0.690	4.854
0.717	4.943
0.745	5.030
0.772	5.116
0.800	5.200

DESIGN ADVICE



The head/flow characteristics of this SHE-0110-5200-0800-5200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

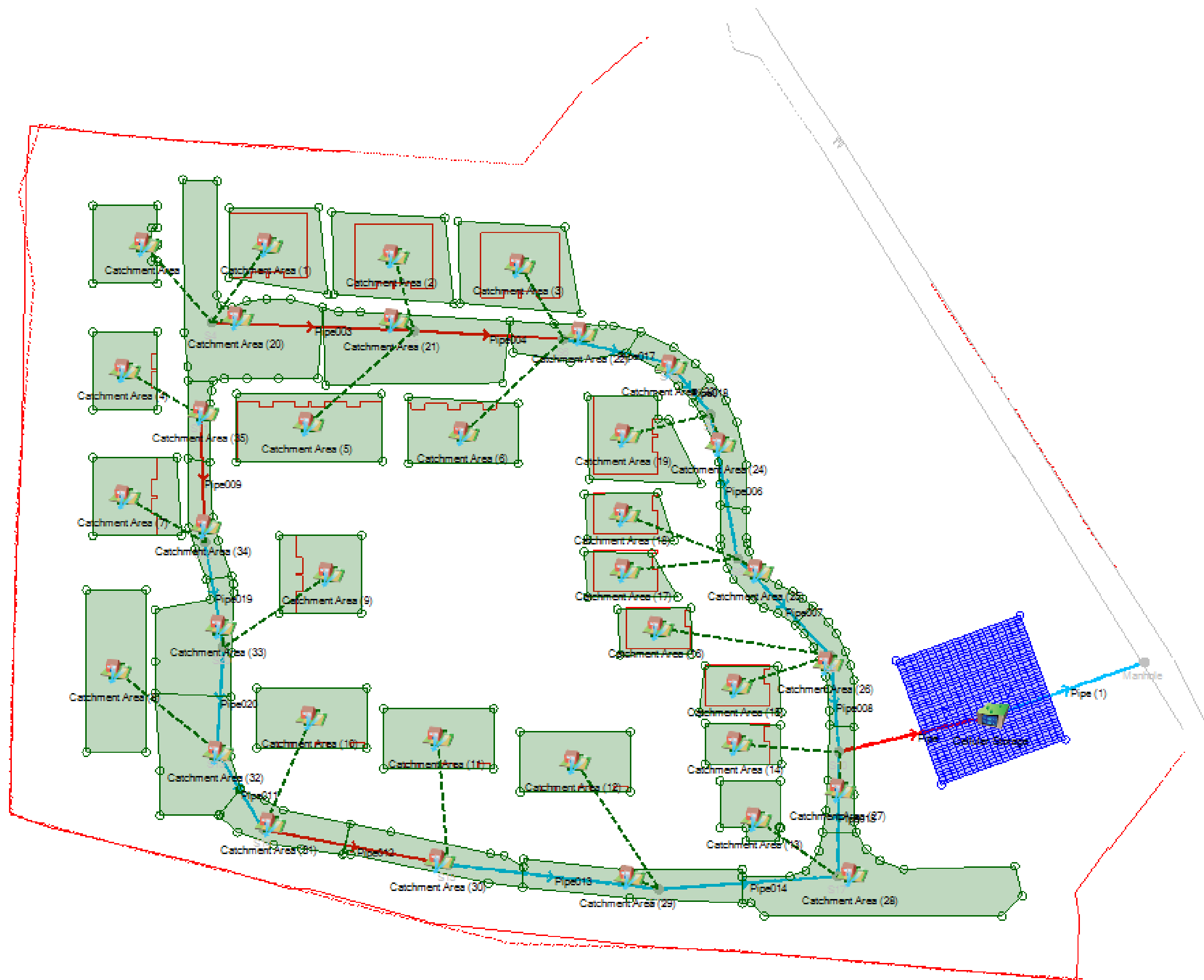
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International
A CRH COMPANY

DATE	19/04/2024 08:30
Site	Coldharbour Farm Road
DESIGNER	Aaron Hunt
Ref	23339

SHE-0110-5200-0800-5200
Hydro-Brake® Optimum

Appendix B: Surface Water Design Calculations



Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: SW	Company Address:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)
S11	Manhole	474471.080	106546.602	8.513	1.013
S4	Manhole	474472.681	106560.738	8.539	1.339
S12	Manhole	474471.676	106527.485	8.454	1.204
S20	Manhole	474474.428	106511.640	8.350	1.350
S5	Manhole	474503.293	106559.449	8.300	1.700
S13	Manhole	474473.459	106495.965	8.149	1.399
S6	Manhole	474525.865	106558.215	8.024	1.674
S14	Manhole	474480.579	106483.950	7.919	1.319
S19	Manhole	474542.022	106554.599	7.768	1.618
S7	Manhole	474548.190	106546.828	7.612	1.562
S15	Manhole	474508.442	106478.643	7.500	1.250
S8	Manhole	474552.278	106524.998	7.345	1.545
S16	Manhole	474540.327	106474.963	7.150	1.250
S9	Manhole	474566.351	106510.271	7.139	1.539
S10	Manhole	474567.625	106495.753	7.009	1.609
S17	Manhole	474567.406	106476.896	6.959	1.359
Manhole	Manhole	474613.862	106509.307	5.500	0.900

Name	Invert Level (m)	Chamber Shape	Diameter (m)	Manhole Locked
S11	7.500	Circular	1.200	☐
S4	7.200	Circular	1.200	☐
S12	7.250	Circular	1.200	☐
S20	7.000	Circular	1.200	☐
S5	6.600	Circular	1.200	☐
S13	6.750	Circular	1.200	☐
S6	6.350	Circular	1.200	☐
S14	6.600	Circular	1.200	☐
S19	6.150	Circular	1.200	☐
S7	6.050	Circular	1.200	☐
S15	6.250	Circular	1.200	☐
S8	5.800	Circular	1.200	☐
S16	5.900	Circular	1.200	☐
S9	5.600	Circular	1.200	☐
S10	5.400	Circular	1.350	☐
S17	5.600	Circular	1.200	☐
Manhole	4.600	Circular	1.350	☐

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: SW	Company Address:		



Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S11	Inlet	Catchment Area (35)	(None)	No Restriction
	Inlet (1)	Catchment Area (4)	(None)	No Restriction
S4	Inlet	Catchment Area (20)	(None)	No Restriction
	Inlet (1)	Catchment Area	(None)	No Restriction
	Inlet (2)	Catchment Area (1)	(None)	No Restriction
S12	Inlet	Pipe009	(None)	No Restriction
	Inlet (1)	Catchment Area (34)	(None)	No Restriction
	Inlet (2)	Catchment Area (7)	(None)	No Restriction
S20	Inlet	Pipe019	(None)	No Restriction
	Inlet (1)	Catchment Area (33)	(None)	No Restriction
	Inlet (2)	Catchment Area (9)	(None)	No Restriction
S5	Inlet	Pipe003	(None)	No Restriction
	Inlet (1)	Catchment Area (21)	(None)	No Restriction
	Inlet (2)	Catchment Area (5)	(None)	No Restriction
	Inlet (3)	Catchment Area (2)	(None)	No Restriction
S13	Inlet	Pipe020	(None)	No Restriction
	Inlet (1)	Catchment Area (32)	(None)	No Restriction
	Inlet (2)	Catchment Area (8)	(None)	No Restriction
S6	Inlet	Pipe004	(None)	No Restriction
	Inlet (1)	Catchment Area (22)	(None)	No Restriction
	Inlet (2)	Catchment Area (6)	(None)	No Restriction
	Inlet (3)	Catchment Area (3)	(None)	No Restriction
S14	Inlet	Pipe011	(None)	No Restriction
	Inlet (1)	Catchment Area (31)	(None)	No Restriction
	Inlet (2)	Catchment Area (10)	(None)	No Restriction
S19	Inlet	Pipe017	(None)	No Restriction
	Inlet (1)	Catchment Area (23)	(None)	No Restriction
S7	Inlet	Pipe018	(None)	No Restriction
	Inlet (1)	Catchment Area (24)	(None)	No Restriction
	Inlet (2)	Catchment Area (19)	(None)	No Restriction
S15	Inlet	Pipe012	(None)	No Restriction
	Inlet (1)	Catchment Area (30)	(None)	No Restriction
	Inlet (2)	Catchment Area (11)	(None)	No Restriction
S8	Inlet	Pipe006	(None)	No Restriction
	Inlet (1)	Catchment Area (25)	(None)	No Restriction
	Inlet (2)	Catchment Area (17)	(None)	No Restriction
	Inlet (3)	Catchment Area (18)	(None)	No Restriction
S16	Inlet	Pipe013	(None)	No Restriction
	Inlet (1)	Catchment Area (29)	(None)	No Restriction
	Inlet (2)	Catchment Area (12)	(None)	No Restriction
S9	Inlet	Pipe007	(None)	No Restriction
	Inlet (1)	Catchment Area (26)	(None)	No Restriction
	Inlet (2)	Catchment Area (15)	(None)	No Restriction
	Inlet (3)	Catchment Area (16)	(None)	No Restriction
S10	Inlet	Pipe008	(None)	No Restriction
	Inlet (1)	Pipe015	(None)	No Restriction
	Inlet (2)	Catchment Area (27)	(None)	No Restriction
	Inlet (3)	Catchment Area (14)	(None)	No Restriction
S17	Inlet	Pipe014	(None)	No Restriction
	Inlet (1)	Catchment Area (28)	(None)	No Restriction
	Inlet (2)	Catchment Area (13)	(None)	No Restriction
Manhole	Inlet	Pipe (1)	(None)	No Restriction

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: SW	Company Address:		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S11	Outlet	Pipe009	Free Discharge
S4	Outlet	Pipe003	Free Discharge
S12	Outlet	Pipe019	Free Discharge
S20	Outlet	Pipe020	Free Discharge
S5	Outlet	Pipe004	Free Discharge
S13	Outlet	Pipe011	Free Discharge
S6	Outlet	Pipe017	Free Discharge
S14	Outlet	Pipe012	Free Discharge
S19	Outlet	Pipe018	Free Discharge
S7	Outlet	Pipe006	Free Discharge
S15	Outlet	Pipe013	Free Discharge
S8	Outlet	Pipe007	Free Discharge
S16	Outlet	Pipe014	Free Discharge
S9	Outlet	Pipe008	Free Discharge
S10	Outlet	Pipe	Free Discharge
S17	Outlet	Pipe015	Free Discharge

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: SW	Company Address:		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedence Level (m)	6.800
Depth (m)	0.800
Base Level (m)	4.800
Number of Crates Long	20
Number of Crates Wide	40
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	305.200

Inlets

Inlet (1)

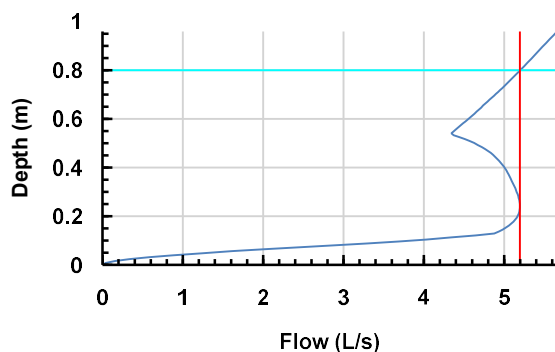
Inlet Type	Point Inflow
Incoming Item(s)	Pipe
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (1)
Outlet Type	Hydro-Brake®
Invert Level (m)	5.022
Design Depth (m)	0.800
Design Flow (L/s)	5.2
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☒

Unit Reference SHE-0110-5200-0800-5200



Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Connections Storm Phase: SW	Company Address:		



Name	From	To	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)
Pipe003	S4	S5	30.639	Pipe	51.065		0.6	150
Pipe004	S5	S6	22.606	Pipe	90.423		0.6	225
Pipe006	S7	S8	22.210	Pipe	88.838		0.6	300
Pipe007	S8	S9	20.370	Pipe	101.851		0.6	300
Pipe008	S9	S10	14.574	Pipe	72.870		0.6	300
Pipe009	S11	S12	19.127	Pipe	76.506		0.6	100
Pipe011	S13	S14	13.966	Pipe	93.109		0.6	225
Pipe012	S14	S15	28.364	Pipe	81.040		0.6	225
Pipe013	S15	S16	32.096	Pipe	91.704		0.6	300
Pipe014	S16	S17	27.148	Pipe	90.493		0.6	300
Pipe015	S17	S10	18.858	Pipe	94.288		0.6	300
Pipe017	S6	S19	16.557	Pipe	82.785		0.6	300
Pipe018	S19	S7	9.920	Pipe	99.201		0.6	300
Pipe019	S12	S20	16.082	Pipe	64.329		0.6	150
Pipe020	S20	S13	15.704	Pipe	62.817		0.6	225
Pipe (1)	Cellular Storage	Manhole	24.248	Pipe	57.516		0.6	375
Pipe	S10	Cellular Storage	24.005	Pipe	160.036		0.6	375

Name	Upstream Cover Level (m)	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Flow Restriction (L/s)
Pipe003	8.539	7.200	8.300	6.600	
Pipe004	8.300	6.600	8.024	6.350	
Pipe006	7.612	6.050	7.345	5.800	
Pipe007	7.345	5.800	7.139	5.600	
Pipe008	7.139	5.600	7.009	5.400	
Pipe009	8.513	7.500	8.454	7.250	
Pipe011	8.149	6.750	7.919	6.600	
Pipe012	7.919	6.600	7.500	6.250	
Pipe013	7.500	6.250	7.150	5.900	
Pipe014	7.150	5.900	6.959	5.600	
Pipe015	6.959	5.600	7.009	5.400	
Pipe017	8.024	6.350	7.768	6.150	
Pipe018	7.768	6.150	7.612	6.050	
Pipe019	8.454	7.250	8.350	7.000	
Pipe020	8.350	7.000	8.149	6.750	
Pipe (1)	6.800	5.022	5.500	4.600	5.2
Pipe	7.009	5.400	6.800	5.250	

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: SW	Company Address:		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (m²)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (m²)
Catchment Area	S4		Time of Concentration	111.128444	100	0	100	111.128444
Catchment Area (1)	S4		Time of Concentration	168.497135	100	0	100	168.497135
Catchment Area (2)	S5		Time of Concentration	223.114131	100	0	100	223.114131
Catchment Area (3)	S6		Time of Concentration	218.511960	100	0	100	218.511960
Catchment Area (4)	S11		Time of Concentration	115.398944	100	0	100	115.398944
Catchment Area (5)	S5		Time of Concentration	226.159961	100	0	100	226.159961
Catchment Area (6)	S6		Time of Concentration	159.724109	100	0	100	159.724109
Catchment Area (7)	S12		Time of Concentration	154.426283	100	0	100	154.426283
Catchment Area (8)	S13		Time of Concentration	220.389850	100	0	100	220.389850
Catchment Area (9)	S20		Time of Concentration	146.491491	100	0	100	146.491491
Catchment Area (10)	S14		Time of Concentration	151.465757	100	0	100	151.465757
Catchment Area (11)	S15		Time of Concentration	151.465757	100	0	100	151.465757
Catchment Area (12)	S16		Time of Concentration	151.693320	100	0	100	151.693320
Catchment Area (13)	S17		Time of Concentration	75.450677	100	0	100	75.450677
Catchment Area (14)	S10		Time of Concentration	69.487122	100	0	100	69.487122
Catchment Area (15)	S9		Time of Concentration	82.713434	100	0	100	82.713434
Catchment Area (16)	S9		Time of Concentration	76.123937	100	0	100	76.123937
Catchment Area (17)	S8		Time of Concentration	80.918334	100	0	100	80.918334
Catchment Area (18)	S8		Time of Concentration	85.473584	100	0	100	85.473584
Catchment Area (19)	S7		Time of Concentration	173.621484	100	0	100	173.621484
Catchment Area (20)	S4		Time of Concentration	331.042439	100	0	100	331.042439
Catchment Area (21)	S5		Time of Concentration	286.786866	100	0	100	286.786866
Catchment Area (22)	S6		Time of Concentration	91.737299	100	0	100	91.737299
Catchment Area (23)	S19		Time of Concentration	51.868741	100	0	100	51.868741
Catchment Area (24)	S7		Time of Concentration	77.894386	100	0	100	77.894386
Catchment Area (25)	S8		Time of Concentration	84.323689	100	0	100	84.323689
Catchment Area (26)	S9		Time of Concentration	71.962635	100	0	100	71.962635
Catchment Area (27)	S10		Time of Concentration	64.631498	100	0	100	64.631498
Catchment Area (28)	S17		Time of Concentration	330.427980	100	0	100	330.427980
Catchment Area (29)	S16		Time of Concentration	150.123664	100	0	100	150.123664
Catchment Area (30)	S15		Time of Concentration	120.290812	100	0	100	120.290812
Catchment Area (31)	S14		Time of Concentration	100.777193	100	0	100	100.777193
Catchment Area (32)	S13		Time of Concentration	201.409900	100	0	100	201.409900

Project:			Date:					
			04/04/2024					
Designed by:		Checked by:		Approved By:				
KGyba								
Report Details:			Company Address:					
Type: Inflow Summary								
Storm Phase: SW								

Catchment Area (33)	S20		Time of Concentration	174.073344	100	0	100	174.073344
Catchment Area (34)	S12		Time of Concentration	65.945331	100	0	100	65.945331
Catchment Area (35)	S11		Time of Concentration	40.781212	100	0	100	40.781212
TOTAL		0.0		5086.332701				5086.332701

Project:	Date: 04/04/2024			
	Designed by:	Checked by:	Approved By:	
Report Details: Type: Outfall Details Storm Phase: SW	Company Address: KGyba			

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Manhole	Free Discharge		

Project:	Date: 04/04/2024			
	Designed by:	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	Company Address: KGyba			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR	Type: FSR
-----	-----------

Region	England and Wales
M5-60 (mm)	19.2
Ratio R	0.350
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40
1.0	0
30.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: SW	Company Address:		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Inflow	Storm Event	Inflow Area (m²)	Max. Inflow (L/s)	Total Inflow (m³)
Catchment Area	FSR: 100 years: +40 %: 15 mins: Winter	111.13	6.3	2.953
Catchment Area (1)	FSR: 100 years: +40 %: 15 mins: Winter	168.50	9.6	4.477
Catchment Area (2)	FSR: 100 years: +40 %: 15 mins: Winter	223.11	12.7	5.931
Catchment Area (3)	FSR: 100 years: +40 %: 15 mins: Winter	218.51	12.4	5.802
Catchment Area (4)	FSR: 100 years: +40 %: 15 mins: Winter	115.40	6.5	3.065
Catchment Area (5)	FSR: 100 years: +40 %: 15 mins: Winter	226.16	12.8	6.006
Catchment Area (6)	FSR: 100 years: +40 %: 15 mins: Winter	159.72	9.1	4.245
Catchment Area (7)	FSR: 100 years: +40 %: 15 mins: Winter	154.43	8.8	4.101
Catchment Area (8)	FSR: 100 years: +40 %: 15 mins: Winter	220.39	12.5	5.853
Catchment Area (9)	FSR: 100 years: +40 %: 15 mins: Winter	146.49	8.3	3.890
Catchment Area (10)	FSR: 100 years: +40 %: 15 mins: Winter	151.47	8.6	4.025
Catchment Area (11)	FSR: 100 years: +40 %: 15 mins: Winter	151.47	8.6	4.025
Catchment Area (12)	FSR: 100 years: +40 %: 15 mins: Winter	151.69	8.6	4.028
Catchment Area (13)	FSR: 100 years: +40 %: 15 mins: Winter	75.45	4.3	2.008
Catchment Area (14)	FSR: 100 years: +40 %: 15 mins: Winter	69.49	3.9	1.846
Catchment Area (15)	FSR: 100 years: +40 %: 15 mins: Winter	82.71	4.7	2.198
Catchment Area (16)	FSR: 100 years: +40 %: 15 mins: Winter	76.12	4.3	2.026
Catchment Area (17)	FSR: 100 years: +40 %: 15 mins: Winter	80.92	4.6	2.150
Catchment Area (18)	FSR: 100 years: +40 %: 15 mins: Winter	85.47	4.8	2.270
Catchment Area (19)	FSR: 100 years: +40 %: 15 mins: Winter	173.62	9.8	4.612
Catchment Area (20)	FSR: 100 years: +40 %: 15 mins: Winter	331.04	18.8	8.794
Catchment Area (21)	FSR: 100 years: +40 %: 15 mins: Winter	286.79	16.3	7.620
Catchment Area (22)	FSR: 100 years: +40 %: 15 mins: Winter	91.74	5.2	2.439
Catchment Area (23)	FSR: 100 years: +40 %: 15 mins: Winter	51.87	2.9	1.379
Catchment Area (24)	FSR: 100 years: +40 %: 15 mins: Winter	77.89	4.4	2.068
Catchment Area (25)	FSR: 100 years: +40 %: 15 mins: Winter	84.32	4.8	2.240
Catchment Area (26)	FSR: 100 years: +40 %: 15 mins: Winter	71.96	4.1	1.912
Catchment Area (27)	FSR: 100 years: +40 %: 15 mins: Winter	64.63	3.7	1.719
Catchment Area (28)	FSR: 100 years: +40 %: 15 mins: Winter	330.43	18.7	8.776
Catchment Area (29)	FSR: 100 years: +40 %: 15 mins: Winter	150.12	8.5	3.989
Catchment Area (30)	FSR: 100 years: +40 %: 15 mins: Winter	120.29	6.8	3.197

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: SW	Company Address:		



Catchment Area (31)	FSR: 100 years: +40 %: 15 mins: Winter	100.78	5.7	2.680
Catchment Area (32)	FSR: 100 years: +40 %: 15 mins: Winter	201.41	11.4	5.350
Catchment Area (33)	FSR: 100 years: +40 %: 15 mins: Winter	174.07	9.9	4.627
Catchment Area (34)	FSR: 100 years: +40 %: 15 mins: Winter	65.95	3.7	1.752
Catchment Area (35)	FSR: 100 years: +40 %: 15 mins: Winter	40.78	2.3	1.084

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: SW	Company Address:		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Inflow	Storm Event	Inflow Area (m²)	Max. Inflow (L/s)	Total Inflow (m³)
Catchment Area	FSR: 1 years: +0 %: 15 mins: Winter	111.13	1.4	0.665
Catchment Area (1)	FSR: 1 years: +0 %: 15 mins: Winter	168.50	2.2	1.006
Catchment Area (2)	FSR: 1 years: +0 %: 15 mins: Winter	223.11	2.9	1.330
Catchment Area (3)	FSR: 1 years: +0 %: 15 mins: Winter	218.51	2.8	1.303
Catchment Area (4)	FSR: 1 years: +0 %: 15 mins: Winter	115.40	1.5	0.686
Catchment Area (5)	FSR: 1 years: +0 %: 15 mins: Winter	226.16	2.9	1.348
Catchment Area (6)	FSR: 1 years: +0 %: 15 mins: Winter	159.72	2.1	0.955
Catchment Area (7)	FSR: 1 years: +0 %: 15 mins: Winter	154.43	2.0	0.923
Catchment Area (8)	FSR: 1 years: +0 %: 15 mins: Winter	220.39	2.8	1.315
Catchment Area (9)	FSR: 1 years: +0 %: 15 mins: Winter	146.49	1.9	0.872
Catchment Area (10)	FSR: 1 years: +0 %: 15 mins: Winter	151.47	1.9	0.905
Catchment Area (11)	FSR: 1 years: +0 %: 15 mins: Winter	151.47	1.9	0.905
Catchment Area (12)	FSR: 1 years: +0 %: 15 mins: Winter	151.69	1.9	0.905
Catchment Area (13)	FSR: 1 years: +0 %: 15 mins: Winter	75.45	1.0	0.449
Catchment Area (14)	FSR: 1 years: +0 %: 15 mins: Winter	69.49	0.9	0.413
Catchment Area (15)	FSR: 1 years: +0 %: 15 mins: Winter	82.71	1.1	0.494
Catchment Area (16)	FSR: 1 years: +0 %: 15 mins: Winter	76.12	1.0	0.449
Catchment Area (17)	FSR: 1 years: +0 %: 15 mins: Winter	80.92	1.0	0.482
Catchment Area (18)	FSR: 1 years: +0 %: 15 mins: Winter	85.47	1.1	0.512
Catchment Area (19)	FSR: 1 years: +0 %: 15 mins: Winter	173.62	2.2	1.030
Catchment Area (20)	FSR: 1 years: +0 %: 15 mins: Winter	331.04	4.2	1.971
Catchment Area (21)	FSR: 1 years: +0 %: 15 mins: Winter	286.79	3.7	1.710
Catchment Area (22)	FSR: 1 years: +0 %: 15 mins: Winter	91.74	1.2	0.548
Catchment Area (23)	FSR: 1 years: +0 %: 15 mins: Winter	51.87	0.7	0.309
Catchment Area (24)	FSR: 1 years: +0 %: 15 mins: Winter	77.89	1.0	0.464
Catchment Area (25)	FSR: 1 years: +0 %: 15 mins: Winter	84.32	1.1	0.500
Catchment Area (26)	FSR: 1 years: +0 %: 15 mins: Winter	71.96	0.9	0.428
Catchment Area (27)	FSR: 1 years: +0 %: 15 mins: Winter	64.63	0.8	0.383
Catchment Area (28)	FSR: 1 years: +0 %: 15 mins: Winter	330.43	4.2	1.968
Catchment Area (29)	FSR: 1 years: +0 %: 15 mins: Winter	150.12	1.9	0.893
Catchment Area (30)	FSR: 1 years: +0 %: 15 mins: Winter	120.29	1.5	0.719

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
	Company Address:		
Report Details: Type: Inflows Summary Storm Phase: SW			



Catchment Area (31)	FSR: 1 years: +0 %: 15 mins: Winter	100.78	1.3	0.599
Catchment Area (32)	FSR: 1 years: +0 %: 15 mins: Winter	201.41	2.6	1.198
Catchment Area (33)	FSR: 1 years: +0 %: 15 mins: Winter	174.07	2.2	1.039
Catchment Area (34)	FSR: 1 years: +0 %: 15 mins: Winter	65.95	0.8	0.392
Catchment Area (35)	FSR: 1 years: +0 %: 15 mins: Winter	40.78	0.5	0.243

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: SW	Company Address:		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Inflow	Storm Event	Inflow Area (m²)	Max. Inflow (L/s)	Total Inflow (m³)
Catchment Area	FSR: 30 years: +0 %: 15 mins: Winter	111.13	3.5	1.624
Catchment Area (1)	FSR: 30 years: +0 %: 15 mins: Winter	168.50	5.3	2.463
Catchment Area (2)	FSR: 30 years: +0 %: 15 mins: Winter	223.11	7.0	3.257
Catchment Area (3)	FSR: 30 years: +0 %: 15 mins: Winter	218.51	6.9	3.188
Catchment Area (4)	FSR: 30 years: +0 %: 15 mins: Winter	115.40	3.6	1.681
Catchment Area (5)	FSR: 30 years: +0 %: 15 mins: Winter	226.16	7.1	3.302
Catchment Area (6)	FSR: 30 years: +0 %: 15 mins: Winter	159.72	5.0	2.331
Catchment Area (7)	FSR: 30 years: +0 %: 15 mins: Winter	154.43	4.9	2.256
Catchment Area (8)	FSR: 30 years: +0 %: 15 mins: Winter	220.39	6.9	3.218
Catchment Area (9)	FSR: 30 years: +0 %: 15 mins: Winter	146.49	4.6	2.139
Catchment Area (10)	FSR: 30 years: +0 %: 15 mins: Winter	151.47	4.8	2.211
Catchment Area (11)	FSR: 30 years: +0 %: 15 mins: Winter	151.47	4.8	2.211
Catchment Area (12)	FSR: 30 years: +0 %: 15 mins: Winter	151.69	4.8	2.211
Catchment Area (13)	FSR: 30 years: +0 %: 15 mins: Winter	75.45	2.4	1.100
Catchment Area (14)	FSR: 30 years: +0 %: 15 mins: Winter	69.49	2.2	1.013
Catchment Area (15)	FSR: 30 years: +0 %: 15 mins: Winter	82.71	2.6	1.211
Catchment Area (16)	FSR: 30 years: +0 %: 15 mins: Winter	76.12	2.4	1.112
Catchment Area (17)	FSR: 30 years: +0 %: 15 mins: Winter	80.92	2.5	1.181
Catchment Area (18)	FSR: 30 years: +0 %: 15 mins: Winter	85.47	2.7	1.249
Catchment Area (19)	FSR: 30 years: +0 %: 15 mins: Winter	173.62	5.5	2.535
Catchment Area (20)	FSR: 30 years: +0 %: 15 mins: Winter	331.04	10.4	4.830
Catchment Area (21)	FSR: 30 years: +0 %: 15 mins: Winter	286.79	9.0	4.189
Catchment Area (22)	FSR: 30 years: +0 %: 15 mins: Winter	91.74	2.9	1.339
Catchment Area (23)	FSR: 30 years: +0 %: 15 mins: Winter	51.87	1.6	0.755
Catchment Area (24)	FSR: 30 years: +0 %: 15 mins: Winter	77.89	2.5	1.136
Catchment Area (25)	FSR: 30 years: +0 %: 15 mins: Winter	84.32	2.7	1.231
Catchment Area (26)	FSR: 30 years: +0 %: 15 mins: Winter	71.96	2.3	1.049
Catchment Area (27)	FSR: 30 years: +0 %: 15 mins: Winter	64.63	2.0	0.944
Catchment Area (28)	FSR: 30 years: +0 %: 15 mins: Winter	330.43	10.4	4.824
Catchment Area (29)	FSR: 30 years: +0 %: 15 mins: Winter	150.12	4.7	2.190
Catchment Area (30)	FSR: 30 years: +0 %: 15 mins: Winter	120.29	3.8	1.759

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
	Company Address:		
Report Details: Type: Inflows Summary Storm Phase: SW			



Catchment Area (31)	FSR: 30 years: +0 %: 15 mins: Winter	100.78	3.2	1.471
Catchment Area (32)	FSR: 30 years: +0 %: 15 mins: Winter	201.41	6.3	2.942
Catchment Area (33)	FSR: 30 years: +0 %: 15 mins: Winter	174.07	5.5	2.538
Catchment Area (34)	FSR: 30 years: +0 %: 15 mins: Winter	65.95	2.1	0.962
Catchment Area (35)	FSR: 30 years: +0 %: 15 mins: Winter	40.78	1.3	0.596

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: SW	Company Address:		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FSR: 100 years: +40 %: 15 mins: Winter	8.513	7.500	7.654	0.154	8.9	0.175	0.000	7.3	4.165	Surcharged
S4	FSR: 100 years: +40 %: 15 mins: Winter	8.539	7.200	7.804	0.604	34.6	0.683	0.000	27.9	16.280	Surcharged
S12	FSR: 100 years: +40 %: 15 mins: Winter	8.454	7.250	7.368	0.118	19.8	0.134	0.000	19.8	10.028	OK
S20	FSR: 100 years: +40 %: 15 mins: Winter	8.350	7.000	7.165	0.165	38.0	0.187	0.000	29.0	18.619	OK
S5	FSR: 100 years: +40 %: 15 mins: Winter	8.300	6.600	7.030	0.430	69.6	0.487	0.000	63.3	36.055	Surcharged
S13	FSR: 100 years: +40 %: 15 mins: Winter	8.149	6.750	7.111	0.361	52.9	0.408	0.000	50.7	29.835	Surcharged
S6	FSR: 100 years: +40 %: 15 mins: Winter	8.024	6.350	6.658	0.308	89.9	0.348	0.000	76.7	47.653	Surcharged
S14	FSR: 100 years: +40 %: 15 mins: Winter	7.919	6.600	6.943	0.343	65.0	0.388	0.000	63.8	36.549	Surcharged
S19	FSR: 100 years: +40 %: 15 mins: Winter	7.768	6.150	6.556	0.406	79.6	0.459	0.000	74.8	51.725	Surcharged
S7	FSR: 100 years: +40 %: 15 mins: Winter	7.612	6.050	6.492	0.442	89.1	0.499	0.000	86.1	56.042	Surcharged
S15	FSR: 100 years: +40 %: 960 mins: Winter	7.500	6.250	6.449	0.199	6.8	0.225	0.000	6.8	154.751	OK
S8	FSR: 100 years: +40 %: 960 mins: Winter	7.345	5.800	6.448	0.648	9.8	0.733	0.000	9.8	223.235	Surcharged
S16	FSR: 100 years: +40 %: 960 mins: Winter	7.150	5.900	6.449	0.549	8.1	0.620	0.000	8.1	183.200	Surcharged
S9	FSR: 100 years: +40 %: 960 mins: Winter	7.139	5.600	6.448	0.848	10.7	0.960	0.000	10.7	245.052	Surcharged
S10	FSR: 100 years: +40 %: 960 mins: Winter	7.009	5.400	6.448	1.048	21.0	1.500	0.000	21.0	478.711	Surcharged
S17	FSR: 100 years: +40 %: 960 mins: Winter	6.959	5.600	6.448	0.848	9.7	0.959	0.000	9.7	221.385	Surcharged
Manhole	FSR: 100 years: +40 %: 360 mins: Winter	5.500	4.600	4.638	0.038	5.7	0.000	0.000	5.7	168.089	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: SW	Company Address:		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FSR: 1 years: +0 %: 15 mins: Winter	8.513	7.500	7.536	0.036	2.0	0.041	0.000	1.9	0.926	OK
S4	FSR: 1 years: +0 %: 15 mins: Winter	8.539	7.200	7.257	0.057	7.8	0.064	0.000	7.6	3.641	OK
S12	FSR: 1 years: +0 %: 15 mins: Winter	8.454	7.250	7.296	0.046	4.7	0.053	0.000	4.5	2.236	OK
S20	FSR: 1 years: +0 %: 15 mins: Winter	8.350	7.000	7.054	0.054	8.6	0.061	0.000	8.3	4.142	OK
S5	FSR: 1 years: +0 %: 15 mins: Winter	8.300	6.600	6.688	0.088	17.0	0.099	0.000	16.2	8.018	OK
S13	FSR: 1 years: +0 %: 15 mins: Winter	8.149	6.750	6.831	0.081	13.7	0.091	0.000	13.2	6.646	OK
S6	FSR: 1 years: +0 %: 15 mins: Winter	8.024	6.350	6.440	0.090	22.2	0.102	0.000	21.4	10.814	OK
S14	FSR: 1 years: +0 %: 15 mins: Winter	7.919	6.600	6.683	0.083	16.4	0.094	0.000	15.7	8.134	OK
S19	FSR: 1 years: +0 %: 15 mins: Winter	7.768	6.150	6.248	0.098	22.1	0.111	0.000	21.3	11.105	OK
S7	FSR: 1 years: +0 %: 15 mins: Winter	7.612	6.050	6.146	0.096	24.6	0.108	0.000	23.7	12.581	OK
S15	FSR: 1 years: +0 %: 15 mins: Winter	7.500	6.250	6.332	0.082	19.2	0.093	0.000	18.1	9.730	OK
S8	FSR: 1 years: +0 %: 15 mins: Winter	7.345	5.800	5.905	0.105	26.9	0.118	0.000	25.6	14.051	OK
S16	FSR: 1 years: +0 %: 15 mins: Winter	7.150	5.900	5.988	0.088	21.9	0.100	0.000	20.6	11.494	OK
S9	FSR: 1 years: +0 %: 15 mins: Winter	7.139	5.600	5.702	0.102	28.6	0.115	0.000	27.5	15.398	OK
S10	FSR: 1 years: +0 %: 15 mins: Winter	7.009	5.400	5.555	0.155	53.7	0.222	0.000	48.9	29.991	OK
S17	FSR: 1 years: +0 %: 15 mins: Winter	6.959	5.600	5.696	0.096	25.8	0.109	0.000	24.5	13.883	OK
Manhole	FSR: 1 years: +0 %: 1440 mins: Winter	5.500	4.600	4.620	0.020	1.5	0.000	0.000	1.5	57.798	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: SW	Company Address:		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FSR: 30 years: +0 %: 15 mins: Winter	8.513	7.500	7.561	0.061	4.9	0.069	0.000	4.7	2.274	OK
S4	FSR: 30 years: +0 %: 15 mins: Winter	8.539	7.200	7.298	0.098	19.2	0.110	0.000	18.7	8.917	OK
S12	FSR: 30 years: +0 %: 15 mins: Winter	8.454	7.250	7.329	0.079	11.6	0.089	0.000	11.2	5.485	OK
S20	FSR: 30 years: +0 %: 15 mins: Winter	8.350	7.000	7.092	0.092	21.3	0.104	0.000	20.6	10.155	OK
S5	FSR: 30 years: +0 %: 15 mins: Winter	8.300	6.600	6.758	0.158	41.8	0.179	0.000	40.4	19.648	OK
S13	FSR: 30 years: +0 %: 15 mins: Winter	8.149	6.750	6.893	0.143	33.9	0.162	0.000	32.7	16.304	OK
S6	FSR: 30 years: +0 %: 15 mins: Winter	8.024	6.350	6.507	0.157	55.2	0.177	0.000	53.5	26.491	OK
S14	FSR: 30 years: +0 %: 15 mins: Winter	7.919	6.600	6.746	0.146	40.6	0.165	0.000	39.0	19.965	OK
S19	FSR: 30 years: +0 %: 15 mins: Winter	7.768	6.150	6.323	0.173	55.2	0.195	0.000	53.5	27.220	OK
S7	FSR: 30 years: +0 %: 15 mins: Winter	7.612	6.050	6.218	0.168	61.4	0.190	0.000	59.5	30.866	OK
S15	FSR: 30 years: +0 %: 15 mins: Winter	7.500	6.250	6.388	0.138	47.6	0.156	0.000	45.5	23.899	OK
S8	FSR: 30 years: +0 %: 15 mins: Winter	7.345	5.800	5.986	0.186	67.4	0.210	0.000	64.6	34.493	OK
S16	FSR: 30 years: +0 %: 15 mins: Winter	7.150	5.900	6.052	0.152	55.0	0.172	0.000	52.1	28.258	OK
S9	FSR: 30 years: +0 %: 15 mins: Winter	7.139	5.600	5.784	0.184	71.8	0.209	0.000	69.3	37.829	OK
S10	FSR: 30 years: +0 %: 15 mins: Winter	7.009	5.400	5.686	0.286	135.2	0.409	0.000	126.0	73.828	OK
S17	FSR: 30 years: +0 %: 15 mins: Winter	6.959	5.600	5.775	0.175	64.9	0.198	0.000	61.6	34.141	OK
Manhole	FSR: 30 years: +0 %: 960 mins: Winter	5.500	4.600	4.636	0.036	5.1	0.000	0.000	5.1	176.733	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: SW	Company Address:		




FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +40 %: 960 mins: Winter	6.448	6.448	1.648	1.648	21.0	304.938	0.000	0.000	5.7	379.305	487	0	OK

Project:	Date: 04/04/2024			
	Designed by: KGyba	Checked by:	Approved By:	
Report Details:	Company Address:			
Type: Stormwater Controls Summary Storm Phase: SW				



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Cellular Storage	FSR: 1 years: +0 %: 1440 mins: Winter	5.097	5.097	0.297	0.297	4.3	112.917	0.000	0.000	1.5	57.802	1242	63	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: SW	Company Address:		




FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
Cellular Storage	FSR: 30 years: +0 %: 960 mins: Winter	5.246	5.246	0.446	0.446	11.8	169.306	0.000	0.000	5.1	176.740	551	45	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: SW	Company Address:		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe003	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S4	S5	8.5	7.804	0.150	16.280	1.6	1.12	27.9	Surcharged
Pipe004	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S5	S6	8.3	6.969	0.225	31.897	1.6	1.16	63.6	Surcharged
Pipe006	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S7	S8	7.6	6.492	0.300	55.936	1.2	0.73	86.1	Surcharged
Pipe007	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S8	S9	7.3	6.324	0.300	62.641	1.3	0.87	95.4	Surcharged
Pipe008	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S9	S10	7.1	6.123	0.300	68.821	1.5	0.8	104.4	Surcharged
Pipe009	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S11	S12	8.5	7.654	0.100	4.165	0.9	1.05	7.3	Surcharged
Pipe011	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S13	S14	8.1	7.075	0.225	26.521	1.3	0.96	51.6	Surcharged
Pipe012	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S14	S15	7.9	6.943	0.225	36.549	1.6	1.1	63.8	Surcharged
Pipe013	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S15	S16	7.5	6.436	0.237	38.963	1.3	0.66	76.3	OK
Pipe014	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S16	S17	7.2	6.342	0.300	51.953	1.1	0.69	80.9	Surcharged
Pipe015	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S17	S10	7.0	6.144	0.300	62.699	1.4	0.85	96.9	Surcharged

Project:		Date: 04/04/2024			
		Designed by: KGyba	Checked by:	Approved By:	
Report Details: Type: Connections Summary Storm Phase: SW		Company Address:			

Pipe017	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S6	S19	8.0	6.576	0.265	42.680	1.3	0.73	89.0	OK
Pipe018	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S19	S7	7.8	6.556	0.300	51.619	1.1	0.67	74.8	Surcharged
Pipe019	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S12	S20	8.5	7.368	0.142	10.028	1.1	0.89	19.8	OK
Pipe020	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S20	S13	8.4	7.117	0.221	16.522	0.9	0.52	34.1	OK
Pipe (1)	FSR: 100 years: +40 %: 360 mins: Winter	Pipe	Cellular Storage	Manhole	6.8	6.210	0.038	168.089	1.0	0.02	5.7	Surcharged
Pipe	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S10	Cellular Storage	7.0	5.937	0.375	135.087	1.8	1.28	202.7	Surcharged

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: SW	Company Address:		



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe003	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S4	S5	8.5	7.257	0.072	3.641	0.9	0.3	7.6	OK
Pipe004	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S5	S6	8.3	6.688	0.089	8.018	1.1	0.3	16.2	OK
Pipe006	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S7	S8	7.6	6.146	0.100	12.581	1.1	0.2	23.7	OK
Pipe007	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S8	S9	7.3	5.905	0.103	14.051	1.2	0.23	25.6	OK
Pipe008	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S9	S10	7.1	5.702	0.128	15.398	1.0	0.21	27.5	OK
Pipe009	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S11	S12	8.5	7.536	0.041	0.926	0.6	0.27	1.9	OK
Pipe011	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S13	S14	8.1	6.831	0.082	6.646	1.0	0.24	13.2	OK
Pipe012	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S14	S15	7.9	6.683	0.083	8.134	1.2	0.27	15.7	OK
Pipe013	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S15	S16	7.5	6.332	0.085	9.730	1.1	0.16	18.1	OK
Pipe014	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S16	S17	7.2	5.988	0.092	11.494	1.1	0.18	20.6	OK
Pipe015	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S17	S10	7.0	5.696	0.126	13.883	0.9	0.21	24.5	OK

Project:				Date: 04/04/2024						
				Designed by: KGyba	Checked by:	Approved By:				
Report Details: Type: Connections Summary Storm Phase: SW				Company Address:						

Pipe017	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S6	S19	8.0	6.440	0.094	10.814	1.1	0.18	21.4	OK
Pipe018	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S19	S7	7.8	6.248	0.097	11.105	1.1	0.19	21.3	OK
Pipe019	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S12	S20	8.5	7.296	0.050	2.236	0.9	0.2	4.5	OK
Pipe020	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S20	S13	8.4	7.054	0.067	4.142	0.8	0.13	8.3	OK
Pipe (1)	FSR: 1 years: +0 %: 1440 mins: Winter	Pipe	Cellular Storage	Manhole	6.8	5.097	0.020	57.798	0.6	0.01	1.5	OK
Pipe	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S10	Cellular Storage	7.0	5.555	0.149	29.991	1.2	0.31	48.9	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: SW	Company Address:		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S4	S5	8.5	7.298	0.128	8.917	1.2	0.75	18.7	OK
Pipe004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S5	S6	8.3	6.758	0.158	19.648	1.4	0.74	40.4	OK
Pipe006	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S7	S8	7.6	6.218	0.177	30.866	1.4	0.5	59.5	OK
Pipe007	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S8	S9	7.3	5.986	0.185	34.493	1.4	0.59	64.6	OK
Pipe008	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S9	S10	7.1	5.784	0.235	37.829	1.2	0.53	69.3	OK
Pipe009	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S11	S12	8.5	7.561	0.070	2.274	0.8	0.68	4.7	OK
Pipe011	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S13	S14	8.1	6.893	0.144	16.304	1.2	0.61	32.7	OK
Pipe012	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S14	S15	7.9	6.746	0.142	19.965	1.5	0.68	39.0	OK
Pipe013	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S15	S16	7.5	6.388	0.145	23.899	1.3	0.39	45.5	OK
Pipe014	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S16	S17	7.2	6.052	0.164	28.258	1.3	0.45	52.1	OK
Pipe015	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S17	S10	7.0	5.775	0.230	34.141	1.1	0.54	61.6	OK

Project:				Date: 04/04/2024						
				Designed by: KGyba	Checked by:	Approved By:				
Report Details: Type: Connections Summary Storm Phase: SW				Company Address:						

Pipe017	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S6	S19	8.0	6.507	0.165	26.491	1.3	0.44	53.5	OK
Pipe018	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S19	S7	7.8	6.323	0.170	27.220	1.3	0.48	53.5	OK
Pipe019	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S12	S20	8.5	7.329	0.086	5.485	1.1	0.5	11.2	OK
Pipe020	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S20	S13	8.4	7.092	0.117	10.155	1.0	0.31	20.6	OK
Pipe (1)	FSR: 30 years: +0 %: 960 mins: Winter	Pipe	Cellular Storage	Manhole	6.8	5.246	0.036	176.733	0.9	0.02	5.1	OK
Pipe	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S10	Cellular Storage	7.0	5.686	0.269	73.828	1.5	0.8	126.0	OK

Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: SW	Company Address:		

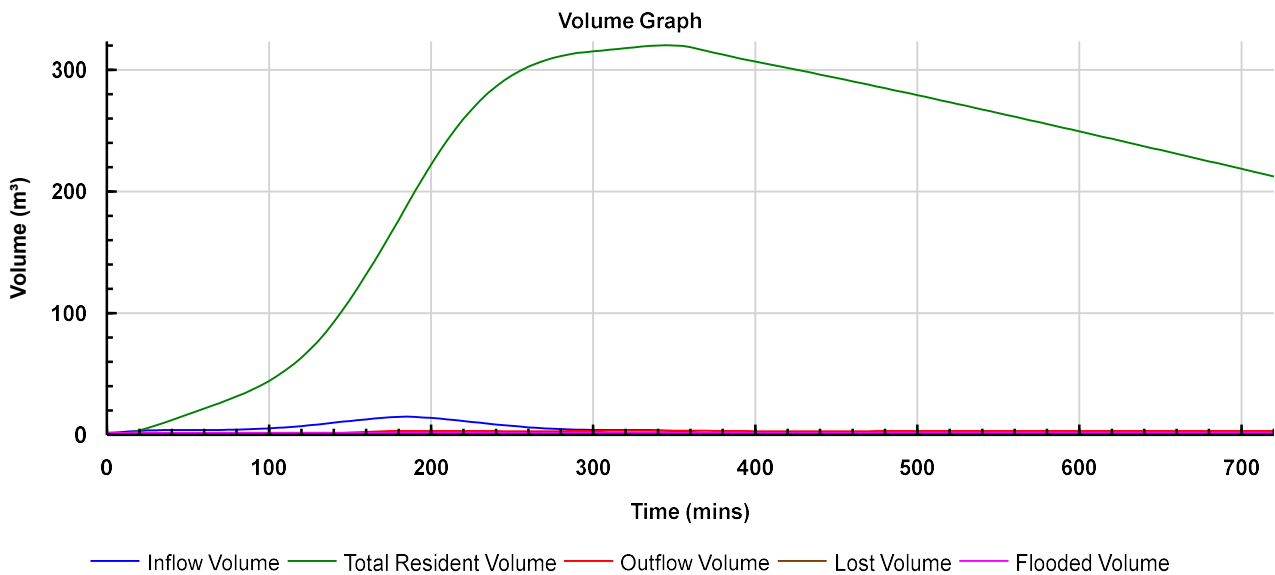
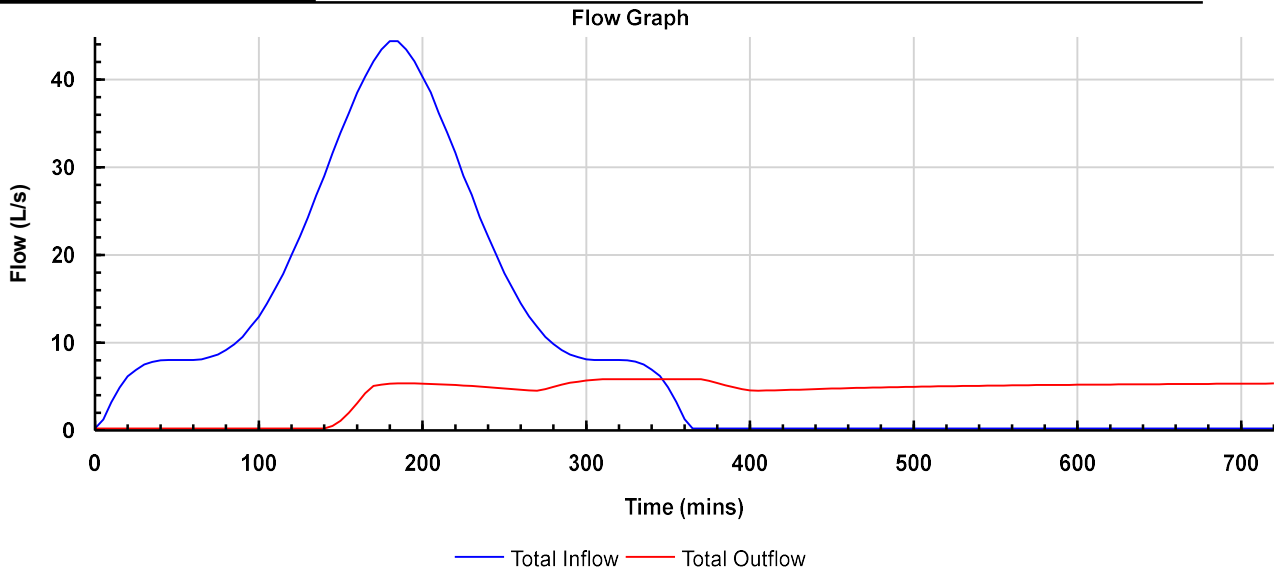


SW
FSR: 100 years: Increase Rainfall (%): +40: 360 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Manhole			5.7	168.089
TOTAL	44.4	380.441	5.7	168.089

Graphs



Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: SW	Company Address:		

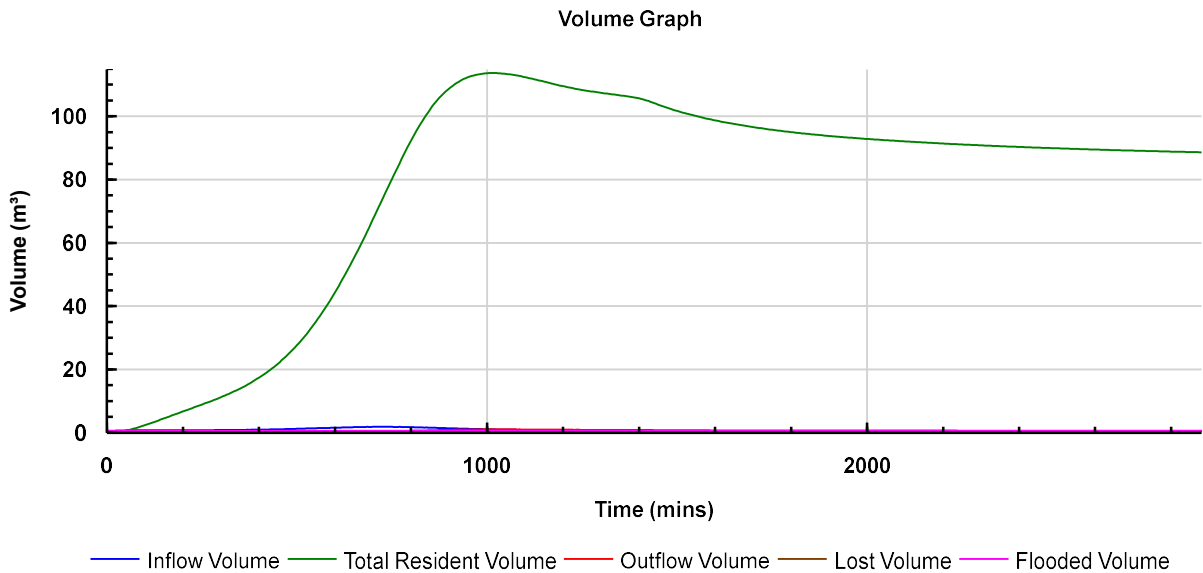
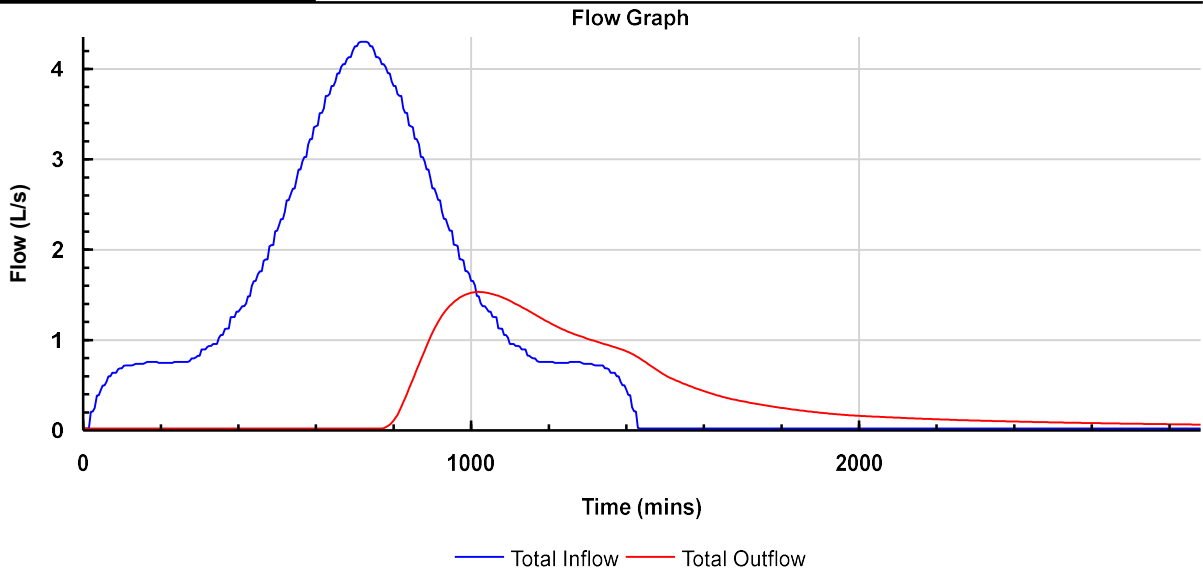


SW
FSR: 1 years: Increase Rainfall (%): +0: 1440 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Manhole			1.5	57.798
TOTAL	4.3	146.430	1.5	57.798

Graphs



Project:	Date: 04/04/2024		
	Designed by: KGyba	Checked by:	Approved By:
Report Details: Type: Phase Management Storm Phase: SW	Company Address:		

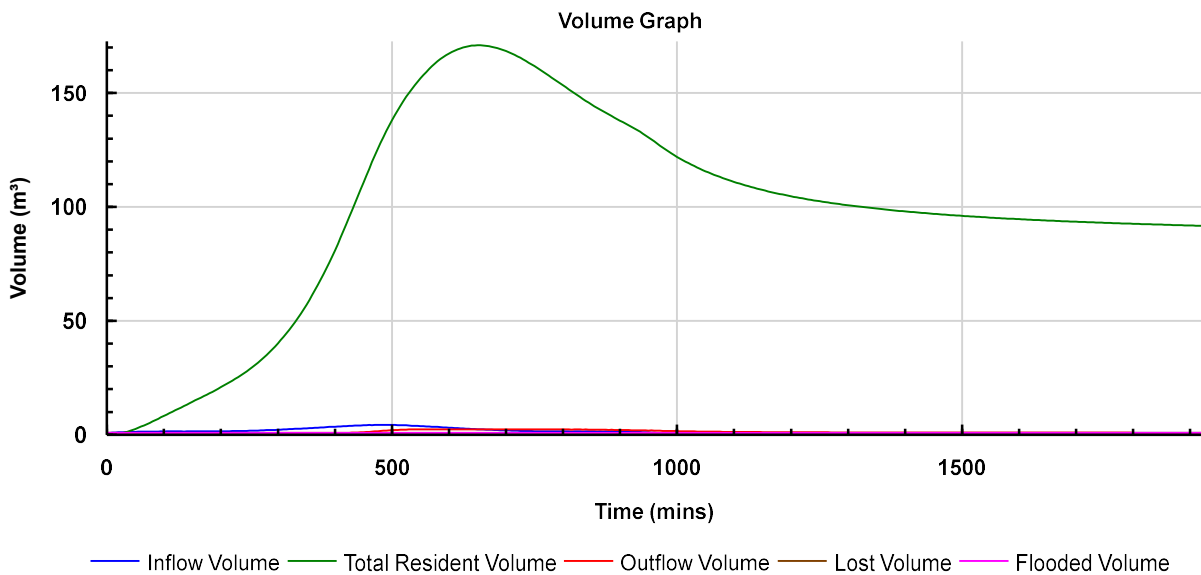
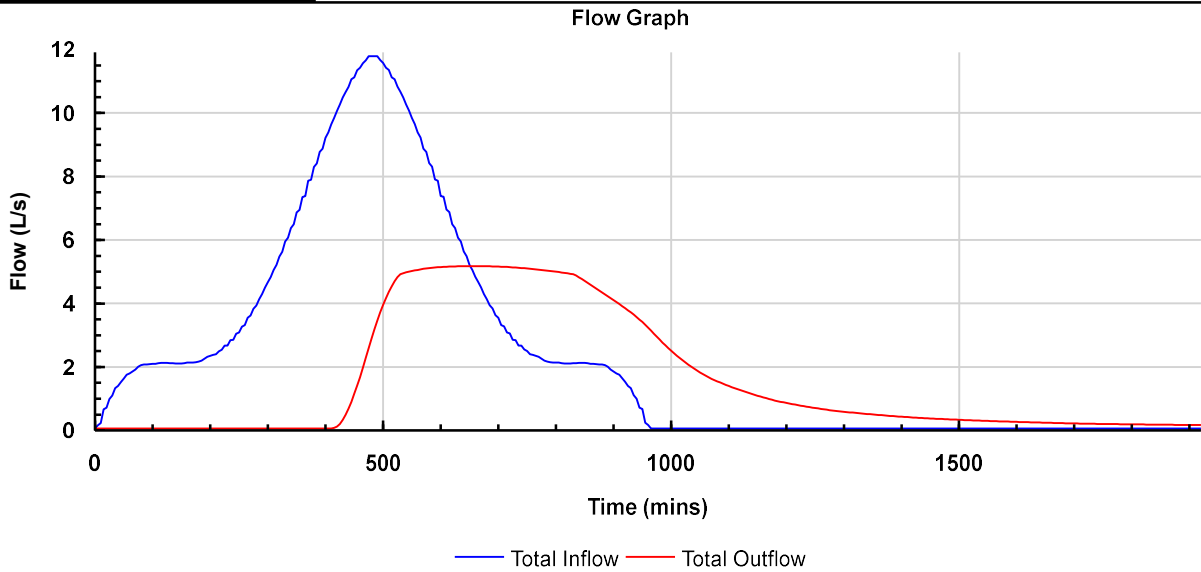


SW
FSR: 30 years: Increase Rainfall (%): +0: 960 mins: Winter

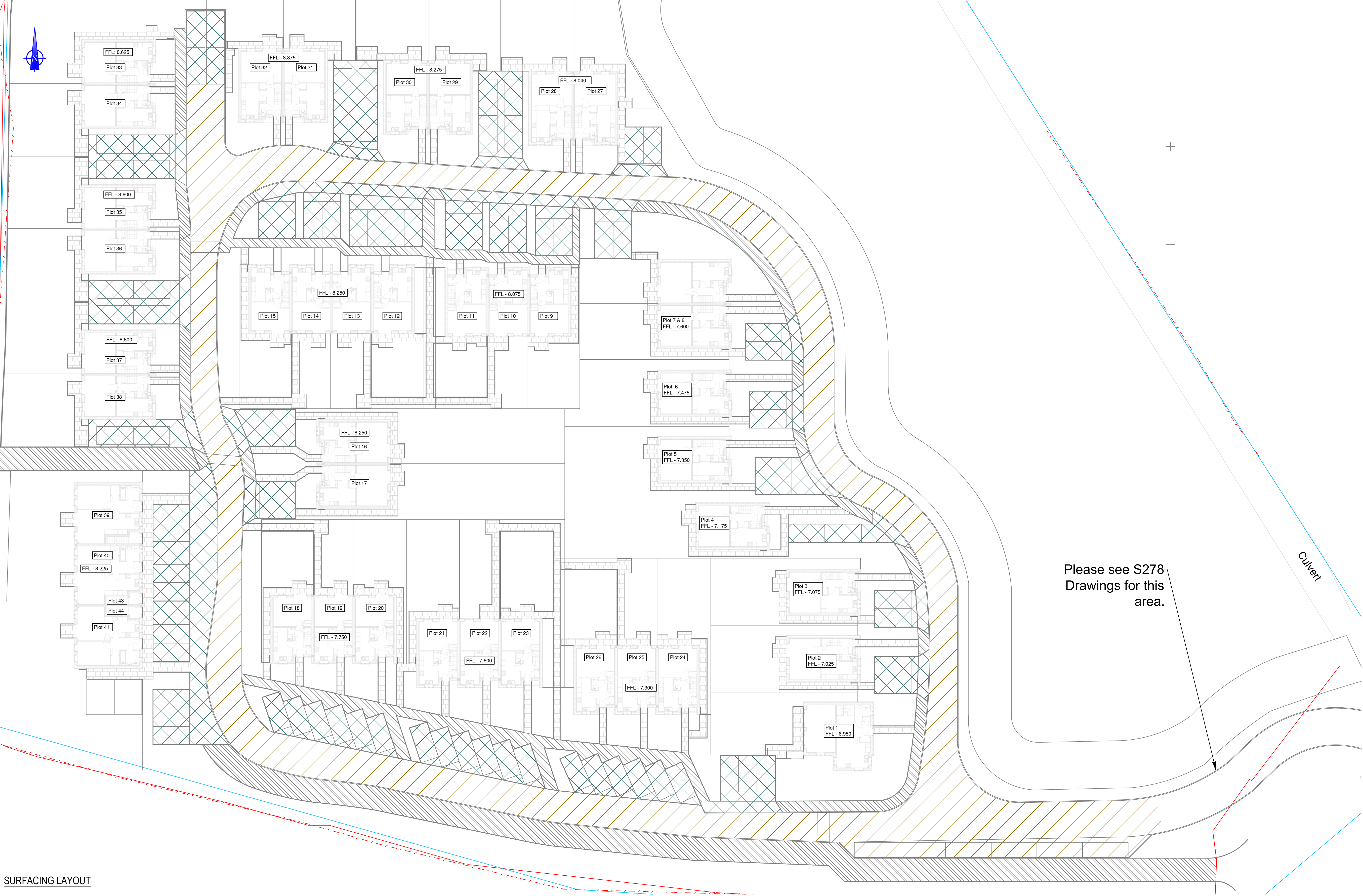
Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Manhole			5.1	176.733
TOTAL	11.8	268.475	5.1	176.733

Graphs



Appendix C: Other Design Drawings



SURFACING LAYOUT

- NOTES
1. Do not scale from this drawing
 2. Drain points to be confirmed at construction phase.
 3. For Surface Materials, please see landscaping archite drawings.
 4. For build up details, please see drawing 750 Highway Details

LEGEND

- Proposed carriage way
- Proposed patio areas
- Parking bay areas
- Footway areas

T1	31:05:24	Tender Issue	SS	RL
P2	13:05:24	Updated to new layout	AH	RL
P1	23:04:24	Preliminary issue	AH	RL
Rev	Date	Description	By	Apvd

PROJECT:
COLD HARBOUR FARM

TITLE:
SURFACING PLAN

CLIENT:
DOSWELL PROJECT

SCALE@A1:
1:200

PROJECT REF:
23339

DRAWING No:
JUBB_XX_XX_DR_C_700

REV:
T1

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction

Jubb