

Jonathan Millar

From: Atkins , Wayne (ASSET MANAGER) <WayneAtkins@barnsley.gov.uk>
Sent: 19 February 2021 09:46
To: Jonathan Millar
Subject: RE: RE 4848 - Barnsley West, SW Drainage discharge points and off site drainage
Attachments: Redbrook Plan.BMP

Hi Jonathan,

My apologies for not getting back to you sooner, things have been rather hectic at this end.

I understand your issues, I have had a look at the proposals. I think we could compromise on this one, most of the flooding issues have been associated with the culvert between point A and point C on the attached plan. I would look more favourably on the development discharging into this watercourse if point C was used as the outfall. There is an existing manhole on the culvert at point C. If this option is to be explored then I would require a CCTV survey of the culvert from point C to point B to be carried out at the developer's expense so that we can assess its condition and agree any necessary repairs or up sizing for existing assets and any developer contributions. I am aware of Manholes on the culvert between point C and point B, however I am unsure of their exact location, however, I would assume they are in the access road through the Industrial Estate.

If your client is agreeable to this please let me know. If you wish to discuss then please contact me, my mobile number is 07748181374.

Regards

Wayne Atkins F.I.H.E.
Principal Engineer – Highways Asset Management
Environment & Transport
Place Directorate
Barnsley Metropolitan Borough Council

E-mail: wayneatkins@barnsley.gov.uk

From: Jonathan Millar <Jonathan.Millar@jpg.group>
Sent: 12 February 2021 07:41
To: Atkins , Wayne (ASSET MANAGER) <WayneAtkins@barnsley.gov.uk>
Subject: RE 4848 - Barnsley West, SW Drainage discharge points and off site drainage

Wayne,

We had our discussion on the 11th January 2021 and sent through some note for you to review on the 13th January 2021. Don't seem to have had a response on the email dated the 13th.

I then sent you a further an email on the 29th January 2021 and subsequently tried to call you on 9th February 2021 on the number I have for you and left a message.

We need to have a further dialog with you with regards to the surface water discharge locations. Please could you get back to me on the above two emails.

Regards,



Jonathan Millar

Associate

✉ Jonathan.Millar@jpg.group

☎ 07599 535381 ☎ 0113 2631155

📍 5 John Charles Way, Leeds LS12 6QA



*** Barnsley MBC Disclaimer: This e-mail and any files attached are confidential for the use of the intended recipient. If you have received this e-mail in error please notify the sender as soon as possible and delete the communication from your system without copying, disseminating or distributing the same in any way by any means. Any views or opinions expressed belong solely to the author and do not necessarily represent those of the Council. In particular, the Council will not accept liability for any defamatory statements made by email communications. Recipients are responsible for ensuring that all e-mails and files sent are checked for viruses. The Council will not accept liability for damage caused by any virus transmitted by this e-mail. No guarantees are offered on the security, content and accuracy of any e-mails and files received. Be aware that this e-mail communication may be intercepted for regulatory, quality control, or crime detection purposes unless otherwise prohibited. The content of this email and any attachment may be stored for future reference.



Appendix F YW Responses

Mr J Millar
JPG Consulting Engineers
5 John Charles Way
Leeds
LS12 6QA
jonathan.millar@jpg.group

Yorkshire Water Services
Developer Services
Pre-Development Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482

Fax:

Your Ref:

Our Ref: X001148

Email:

technical.sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

3rd February 2021

Dear Mr Millar,

Land Between Baugh Green & Higham Common, Barnsley, S75 2RW – Pre-Planning Sewerage Enquiry U111900 (MIXED)

Thank you for your recent enquiry. Our charge of £157.00 will be added to your account with us, reference JPG027. You will receive an invoice for your account in due course.

Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:

Existing Infrastructure

The local Waste Water Treatment Works (WWTW) is Lundwood. It is understood that this WWTW may only have limited spare capacity, if any, available. We have contacted the respective treatment team for more information regarding the impact of proposed development and will contact you when an assessment has been made.

Foul Water

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

The closest practicable point of discharge for foul will be the 600 mm combined public sewer in Baugh Green Road, but at present there is no spare capacity available to accept the foul discharge from all the proposed development. Further investigation in the form of modelling, at the developers cost, will be required to understand the impact on the public sewer network along with a build programme of the development. Please contact us on the above number to discuss this further.

Foul water from kitchens and/or food preparation areas of any restaurants and/or canteens etc. must pass through a fat and grease trap of adequate design before any discharge to the public sewer network.

Surface Water

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate authorities.

It is understood that all surface water will discharge to watercourses located on the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable). Please note Yorkshire Water cannot provide plans of culverted watercourses or highway drains. To obtain plans please contact the Lead Local Flood Authority for more details.

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Surface water run-off from communal parking (greater than 800 sq metres or more than 50 car parking spaces) and hardstanding must pass through an oil, petrol and grit interceptor/separator of adequate design before any discharge to the public sewer network. Roof water should not pass through the traditional 'stage' or full retention type of interceptor/separator. It is good drainage practice for any interceptor/separator to be located upstream of any on-site balancing, storage or other means of flow attenuation that may be required.

Other Observations

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may apply on line or obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

Under the provisions of section 111 of the Water Industry Act 1991 it is unlawful to pass into any public sewer (or into any drain or private sewer communicating with the public sewer network) any items likely to cause damage to the public sewer network interfere with the free flow of its contents or affect the treatment and disposal of its contents. Amongst other things this includes fat, oil, nappies, bandages, syringes, medicines, sanitary towels and incontinence pants. Contravention of the provisions of section 111 is a criminal offence.

An off-site foul and surface water sewer may be required which may be provided by the developer and considered for adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991 for which an application must be made in writing. For further information, please telephone 0345 120 84 82.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

The site is within an area that may be affected by river, coastal or estuarine flooding. We would advise you to contact the Environment Agency for details.

Yorkshire Water's Trade Effluent team must be consulted in respect of any proposed trade effluent discharge to the public sewer.

All the above comments are based upon the information and records available at the present time and is subject to formal planning approval agreement. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith. Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours sincerely

Chris Roberts
Development Services Technician



YorkshireWater



Jonathan Millar

From: Wendy Mullaney <wendy.mullaney@yorkshirewater.co.uk>
Sent: 23 February 2021 12:42
To: Jonathan Millar
Subject: Pre Design Discussion Meeting for Barnsley West, land between Baugh Green and Highan Common

S104 (Codes) - 1b. Pre Design Discussion Meeting Notes (April 20)

Pre Design Discussion Meeting Notes

Please find enclosed a record of the discussions held in relation to your design proposals for prospectively adoptable sewers and associated assets.

This meeting has been held in accordance with the Design and Construction Guidance, Local Practices and Technical Standards contained within the Code for Adoption (2020).

Reference Number	U133060
Site Name	Barnsley West, land between Baugh Green and Highan Common
Site Address	Barnsley West, land between Baugh Green and Highan Common
Developer Name / Company	
Designer Name / Company	Jonathon Millar
Yorkshire Water Adoptions Technician	Wendy Mullaney
Date / Time / Location of Meeting	22/2/21 2pm

Meeting Attendees

- Jonathon Millar
- Wendy Mullaney

Yorkshire Water Response

Design Acceptance Comments	Yorkshire Water Comments
	We will have another meeting when we have a more detailed site design.
	The 225mm foul sewers should not be laid flatter than 1 in 150
	Surface water storage to be in adoptable detention basins subject to the design criteria stipulated in the Ciria SuDS Manual. With the maximum water depth off 1m.
	YW will not allow a management company to maintain the basins.
Flow control MH design main points	<ul style="list-style-type: none">• A detailed scaled drawing is required.• Minimum diameter of 1800mm.• Double twin cover with a hinged fall arrest grille (may need to be upsized to if the flow control unit is large than 1200mm.• No ladders/step irons required (winch access only).• 450mm sump from edge of the slope to the front of the unit.

Description of Prospective Adoptable Network	Yorkshire Water Comments
Gravity Network	Foul and surface water
Pumping Stations	Potentially 2 foul pump stations
Flow control devices	yes
Headwall / Inlet / Outlet Structures	yes
Storage Tank	no
SUDS Components	Detention basins
Access Requirements	Tanker access to within 5m of the flow controls and tanker access to park on the pump station compound.
Private storage facilities	n/a
Any other site specific information	

Legal Requirements (necessary to facilitate development)	Yorkshire Water Comments
	A land transfer will be required for the detention basins and the pump station.

Point of Connection	Yorkshire Water Comments
	A S106 sewer connection application will be required.

If you have any queries regarding the content of these meeting notes, please get in touch. Otherwise, we look forward to receiving your S104 application in due course.

If you feel you would benefit from a further pre design meeting to discuss your proposals before submitting your S104 application, please let us know.

Kind regards

Adoptions Technician
Sewer Adoption, Diversion and Requisition Team
Developer Services



Wendy Mullaney
 Sewer Adoption & Diversion Senior Engineer
 Developer Services (Customer Experience)
 07790 616925
yorkshirewater.com/developers

Yorkshire Water customers can get in touch for free via live chat or by requesting a free call back at <https://www.yorkshirewater.com>

Save money on your utility bills and help conserve water by requesting a free water saving pack <https://www.yorkshirewater.com/savewater>

The information in this e-mail, and any files transmitted with it, is confidential and may also be legally privileged. The contents are intended solely for the addressee only and are subject to the legal notice available at

<http://www.keldagroup.com/email.htm>. This email does not constitute a binding offer, acceptance, amendment, waiver or other agreement, or create any obligation whatsoever, unless such intention is clearly stated in the body of the email. If you are not the intended recipient, please return the message by replying to it and then delete the message from your computer. Any disclosure, copying, distribution or action taken in reliance on its contents is prohibited and may be unlawful.

Yorkshire Water Services Limited

Registered Office Western House, Halifax Road, Bradford, BD6 2SZ

Registered in England and Wales No 2366682

Hi Jonathan,

Apologies for the delay in responding but there has been a change to the process since my last email.

The closest practicable point of discharge for foul will be the 600 mm combined public sewer in Baugh Green Road, but at present it does not have adequate capacity available to accommodate the anticipated foul water discharge from the proposed site. Subject to the submission of a Formal Planning Application Yorkshire Water will look to carry out a feasibility study to determine, any available capacity in the public sewer network, together with timescales for any potential upgrading works required. All cost will be borne by Yorkshire Water up-front and recouped via the Infrastructure Charges at a later date.

Please when submitting your formal planning state you wish to connect to the 600 mm combined public sewer in Baugh Green Road along with your required pumped rate along with your build schedule and start date.

Kind Regards

(Embedded image moved to file: pic12994.gif)

*** Please note, all correspondence must be sent to technical.sewerage@yorkshirewater.co.uk and will be responded to within 10 working days ***

|----->

| From: |

|----->

>-----
-----|

| Jonathan Millar <Jonathan.Millar@jpg.group>

|

>-----
-----|

|----->

| To: |

|----->

>-----
-----|

| Technical Sewerage@NotesMail

|

>-----
-----|

|----->

| Cc: |

|----->

>-----
-----|

| Chris Roberts/Water Business Unit/YWS/Yorkshire Water@O365

|

>-----
-----|

|----->

| Date: |

|----->

>-----
-----|

| 08/04/2021 09:25

|

>-----
-----|

|----->

| Subject: |

|----->

>-----
-----|

| RE: 4848 - Land Between Baugh Green & Higham Common, Barnsley, S75 2RW - Pre-Planning
Sewerage Enquiry U111900 (MIXED) |

>-----
-----|

VR 516208440010000

08/04/2021

Chris,

Further to your email below and pre planning advice YW reference U111900 or X001148 our client would like to instruct YW to carry out the capacity check on the foul water network. Please see below

On behalf of Strata Sterling Barnsley West Limited, please take this e-mail as an instruction to proceed with the agreed scope of service and fee attached.

Please note that on completion of your services, your invoice should be made out to Strata Sterling Barnsley West Limited address and sent to Rex Procter and Partners for processing, which occurs at the end of each calendar month:

Fee Proposal: £2,000 (ex VAT). Please confirm as soon as possible if this fee will be more than the suggested £2,000 + vat so that we can inform our client of any additional costs.

Address your invoice should be made out to:

Strata Sterling Barnsley West Limited

Quay Point

Lakeside

Doncaster

United Kingdom

DN4 5PL

E-mail Address your invoice should be sent to for processing; r.owen@rpp.co.uk

Please confirm what is required form our client to enable you to carry out the capacity study.

Please confirm receipt of this e-mail.

Regards,

Jonathan Millar

Associate

Jonathan.Millar@jpg.group

07599 535381

0113 2631155

5 John Charles Way, Leeds LS12 6QA



Appendix G Greenfield Runoff Calculations

5 John Charles Way
Leeds
LS12 6QA



Date 28/04/2020 11:48
File

Designed by jonathan.millar
Checked by

Innovyze

Source Control 2017.1.2

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	636	Region Number	Region 3

Results 1/s

QBAR Rural 3.9
QBAR Urban 3.9

Q1 year 3.4

Q1 year 3.4
Q30 years 6.9
Q100 years 8.2

5 John Charles Way
Leeds
LS12 6QA



Date 28/04/2020 11:51
File

Designed by jonathan.millar
Checked by

Innovyze

Source Control 2017.1.2

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	50.000	Urban	0.000
SAAR (mm)	636	Region Number	Region 3

Results 1/s

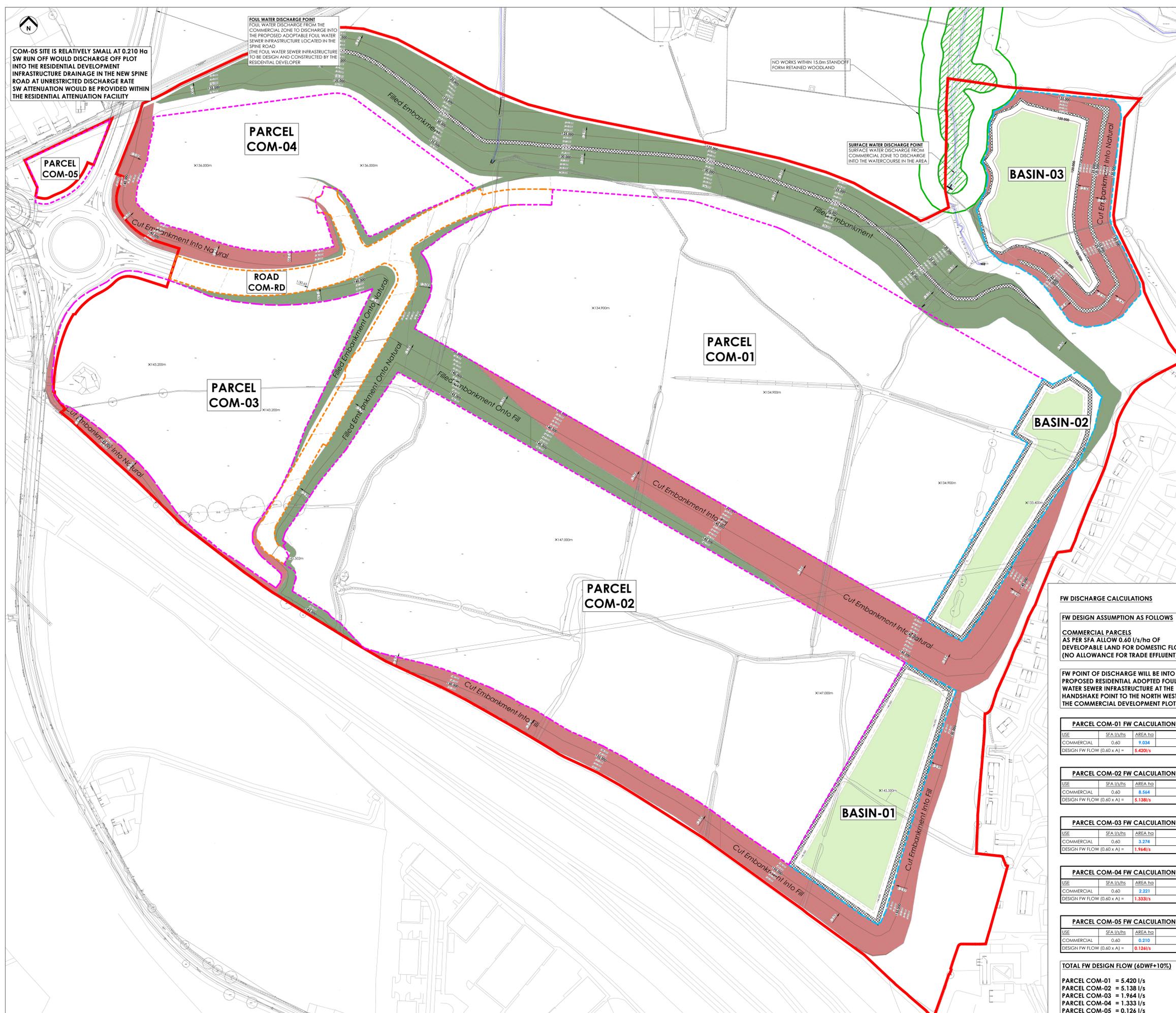
QBAR Rural 196.3
QBAR Urban 196.3

Q1 year 168.9

Q1 year 168.9
 Q2 years 185.3
 Q5 years 245.4
 Q10 years 284.7
 Q20 years 322.4
 Q25 years 335.0
 Q30 years 345.1
 Q50 years 371.9
 Q100 years 408.4
 Q200 years 463.4
 Q250 years 481.0
 Q1000 years 596.9



Appendix H Preliminary FW & SW Drainage Strategy Calculations



COM-05 SITE IS RELATIVELY SMALL AT 0.210 Ha SW RUN OFF WOULD DISCHARGE OFF PLOT INTO THE RESIDENTIAL DEVELOPMENT INFRASTRUCTURE DRAINAGE IN THE NEW SPINE ROAD AT UNRESTRICTED DISCHARGE RATE SW ATTENUATION WOULD BE PROVIDED WITHIN THE RESIDENTIAL ATTENUATION FACILITY

PARCEL COM-04

PARCEL COM-05

PARCEL COM-03

ROAD COM-RD

PARCEL COM-01

BASIN-03

BASIN-02

PARCEL COM-02

BASIN-01

FW & SW STRATEGY CALCULATIONS PLAN
SCALE 1:1000

SW DISCHARGE CALCULATIONS

ATTENUATION VOLUMES ARE BASED ON THE FOLLOWING ASSUMPTIONS
COMMERCIAL PARCELS ASSUMED 90% MAX. IMPERMEABLE AREA OF TOTAL DEVELOPMENT PARCEL AREA ALLOWANCE FOR CLIMATE CHANGE 40%

PARCEL COM-01 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	9.034
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	1224.333l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

PARCEL COM-02 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	8.564
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	1160.636l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

PARCEL COM-03 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	3.274
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	443.709l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

PARCEL COM-04 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	2.221
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	301.001l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

PARCEL COM-05 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	0.210
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	28.401l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

PARCEL COM-RD SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	1.020
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	138.234l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

BASIN-01 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	1.225
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	166.018l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

BASIN-02 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	0.938
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	127.122l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

BASIN-03 SW RUN OFF	
VOLUME RUN OFF (Cv)	0.750
ROUTING COEFFICIENT (Ct)	1.300
AVERAGE RAINFALL (I) IN mm/hr	50.000
AREA IN HECTARES (A)	1.668
FLOW RATE (Q) = 2.78 x Cv x Cr x I x A	226.056l/s
Rough Flow Rate Calc = Area in Hectares x (1.40 for 50mm/hr) / (210 for 75mm/hr)	

FW DISCHARGE CALCULATIONS

FW DESIGN ASSUMPTION AS FOLLOWS
COMMERCIAL PARCELS AS PER SFA ALLOW 0.60 l/s/ha OF DEVELOPABLE LAND FOR DOMESTIC FLOW (NO ALLOWANCE FOR TRADE EFFLUENT)

FW POINT OF DISCHARGE WILL BE INTO THE PROPOSED RESIDENTIAL ADOPTED FOUL WATER SEWER INFRASTRUCTURE AT THE HANDSHAKE POINT TO THE NORTH WEST OF THE COMMERCIAL DEVELOPMENT PLOT

PARCEL COM-01 FW CALCULATION			
USE	SFA l/s/ha	AREA ha	
COMMERCIAL	0.60	9.034	
DESIGN FW FLOW (0.60 x A) =			5.420l/s

PARCEL COM-02 FW CALCULATION			
USE	SFA l/s/ha	AREA ha	
COMMERCIAL	0.60	8.564	
DESIGN FW FLOW (0.60 x A) =			5.138l/s

PARCEL COM-03 FW CALCULATION			
USE	SFA l/s/ha	AREA ha	
COMMERCIAL	0.60	3.274	
DESIGN FW FLOW (0.60 x A) =			1.964l/s

PARCEL COM-04 FW CALCULATION			
USE	SFA l/s/ha	AREA ha	
COMMERCIAL	0.60	2.221	
DESIGN FW FLOW (0.60 x A) =			1.333l/s

PARCEL COM-05 FW CALCULATION			
USE	SFA l/s/ha	AREA ha	
COMMERCIAL	0.60	0.210	
DESIGN FW FLOW (0.60 x A) =			0.126l/s

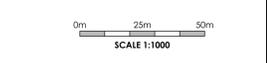
TOTAL FW DESIGN FLOW (6DWF+10%)
 PARCEL COM-01 = 5.420 l/s
 PARCEL COM-02 = 5.138 l/s
 PARCEL COM-03 = 1.964 l/s
 PARCEL COM-04 = 1.333 l/s
 PARCEL COM-05 = 0.126 l/s
TOTAL DESIGN FLOW = 13.981 l/s (6DWF+10%) = 2.097 l/s (1DWF)

DO NOT SCALE (A0)

GENERAL NOTES
 1. ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, S&L CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
 3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.



LEVELS AND DETAILS OF THE EXISTING SEWER NETWORK ARE TO BE SURVEYED TO CONFIRM COVER AND INVERT LEVELS AND CONDITION OF THE RECEIVING SEWERS



POINT OF DISCHARGE FOR SW RUN OFF WILL BE INTO THE EXISTING WATER COURSE/LAND DRAINAGE SYSTEM AT LOCATION TO BE AGREED WITH THE LLFA INDICATIVE LOCATION IS SHOWN ON THIS DRAWING

THE PROPOSED DISCHARGE RATES ARE BASED ON GREENFIELD RUNOFF RATES CALCULATED USING A RECOGNISED METHOD ICP-SUDS AS AGREED WITH THE LLFA

CALCULATED RATE = 3.900 l/s/ha
TOTAL RESTRICTED DISCHARGE FROM THE COMMERCIAL DEVELOPMENT BASED ON THE DEVELOPMENT PLOT AREA AND BASIN CATCHMENT AREA IS AS FOLLOWS:
 DEV. PLOTS (1-4) = 23.093 Ha x 90% = 20.784 Ha
 ACCESS ROAD = 1.020 Ha
 BASIN CATCHMENTS = 3.831 Ha
TOTAL SW DISCHARGE = 25.635 x 3.900 = 99.977 l/s
 (SHOULD THE DEVELOPMENT LAYOUT/AREAS CHANGE THEN THE DISCHARGE RATE WOULD BE AMENDED ACCORDINGLY TO SUIT BASED ON THE AGREED GREENFIELD RATES)

RESTRICTED DISCHARGE PER PLOT

BASED ON 3.900l/s/ha AND IMPERMEABLE AREA OF 90% OF THE TOTAL PLOT AREA
 PARCEL COM-01 = 31.700 l/s
 PARCEL COM-02 = 30.060 l/s
 PARCEL COM-03 = 11.500 l/s
 PARCEL COM-04 = 7.800 l/s

TOTAL RESTRICTED DISCHARGE FROM THE PLOTS TO THE EXISTING WATERCOURSE = 81.060 l/s

RESTRICTED DISCHARGE ACCESS ROAD AND BASINS

BASED ON 3.900l/s/ha AND IMPERMEABLE AREA OF 100%
 ACCESS ROAD = 3.978 l/s
 BASIN-01 = 4.778 l/s
 BASIN-02 = 3.658 l/s
 BASIN-03 = 6.505 l/s

TOTAL RESTRICTED DISCHARGE FROM ACCESS ROAD AND BASINS = 18.919 l/s

ATTENUATION VOLUMES FOR 1 IN 100 YEAR STORM EVENT PLUS 40% CLIMATE CHANGE

PARCEL COM-01 = 5753.0 m3
 PARCEL COM-02 = 5508.0 m3
 PARCEL COM-03 = 2119.0 m3
 PARCEL COM-04 = 1425.0 m3
 ACCESS ROAD = 733.0m3
 BASIN-01 = 897.0m3
 BASIN-02 = 674.0m3
 BASIN-03 = 1192.0m3

TOTAL VOLUME TO BE PROVIDED = 18301.0m3

REV	DESCRIPTION	DATE	CHK	BY
P02	UPDATED WITH DESIGN TEAM PLANNING COMMENTS	05/10/23	CPH	JDM
P01	INITIAL ISSUE	03/04/23	CPH	JDM

Project: BARNESLEY WEST

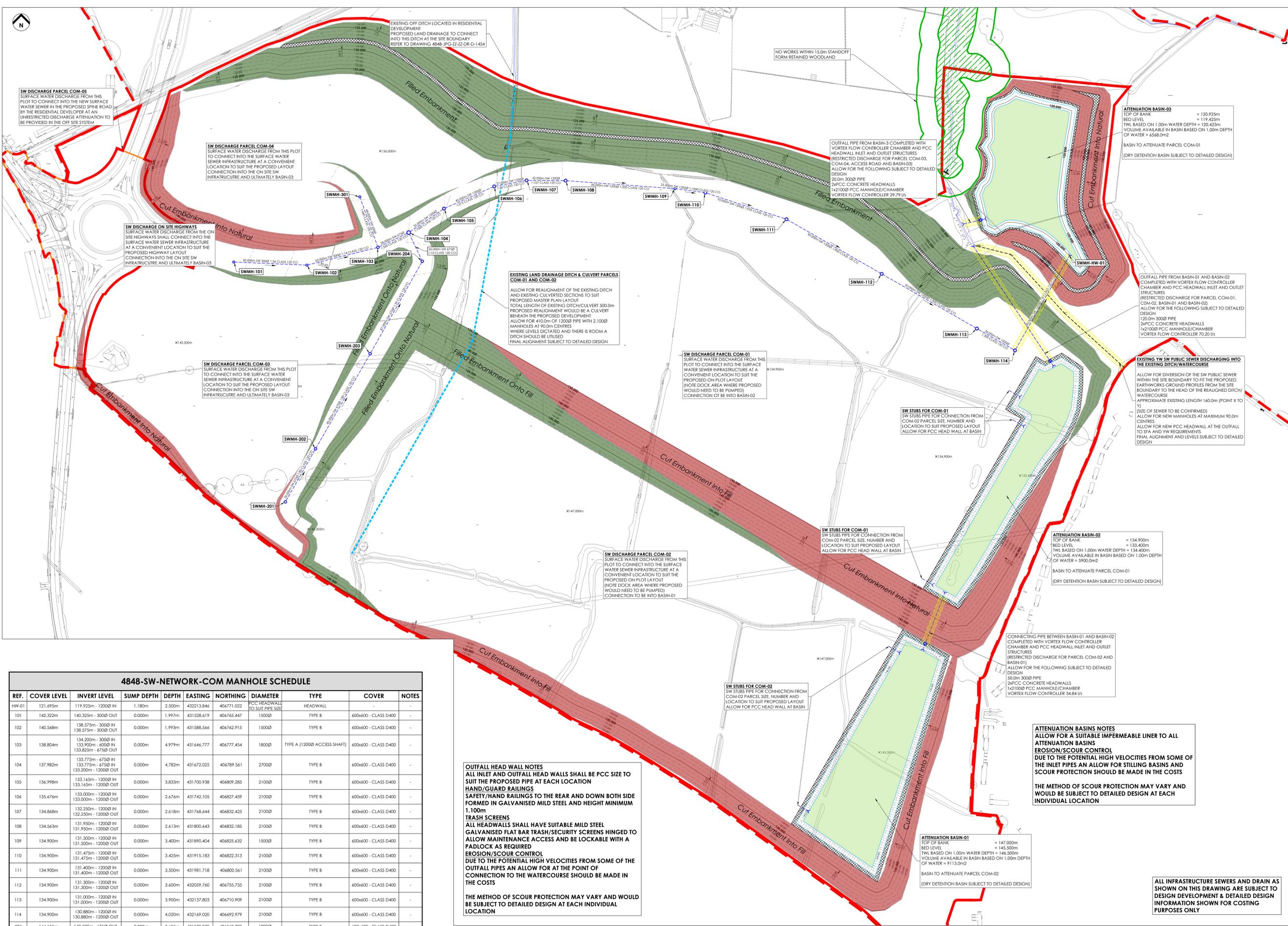
Drawing Title: FW & SW DRAINAGE STRATEGY CALCULATIONS PLAN COMMERCIAL DEVELOPMENT

INFORMATION





Appendix I Preliminary SW Drainage Strategy Drawing



4848-SW-NETWORK-COM MANHOLE SCHEDULE

REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTING	NORTHING	DIAMETER	TYPE	COVER	NOTES
HW-01	121.695m	119.925m - 12000 IN	1.180m	2.500m	432213.846	406771.022	PCC HEADWALL TO SUIT PIPE SIZE	HEADWALL	-	-
101	142.322m	140.325m - 3000 OUT	0.000m	1.997m	431528.619	406765.447	15000	TYPE B	600x600 - CLASS D400	-
102	140.588m	138.575m - 3000 IN 138.575m - 3000 OUT	0.000m	1.993m	431588.566	406762.915	15000	TYPE B	600x600 - CLASS D400	-
103	138.804m	134.200m - 3000 IN 133.900m - 6000 IN 133.825m - 6750 OUT	0.000m	4.979m	431646.777	406777.454	18000	TYPE A (12000 ACCESS SHAFT)	600x600 - CLASS D400	-
104	137.982m	133.775m - 6750 IN 133.775m - 6750 IN 133.200m - 12000 OUT	0.000m	4.782m	431672.025	406789.561	27000	TYPE B	600x600 - CLASS D400	-
105	136.998m	133.165m - 12000 IN 133.165m - 12000 OUT	0.000m	3.833m	431700.938	406809.285	21000	TYPE B	600x600 - CLASS D400	-
106	135.676m	133.000m - 12000 IN 133.000m - 12000 OUT	0.000m	2.676m	431742.105	406827.459	21000	TYPE B	600x600 - CLASS D400	-
107	134.868m	132.250m - 12000 IN 132.250m - 12000 OUT	0.000m	2.618m	431768.644	406832.425	21000	TYPE B	600x600 - CLASS D400	-
108	134.563m	131.950m - 12000 IN 131.950m - 12000 OUT	0.000m	2.613m	431800.643	406832.185	21000	TYPE B	600x600 - CLASS D400	-
109	134.900m	131.500m - 12000 IN 131.500m - 12000 OUT	0.000m	3.400m	431890.404	406825.632	15000	TYPE B	600x600 - CLASS D400	-
110	134.900m	131.475m - 12000 IN 131.475m - 12000 OUT	0.000m	3.425m	431915.183	406822.313	21000	TYPE B	600x600 - CLASS D400	-
111	134.900m	131.400m - 12000 IN 131.400m - 12000 OUT	0.000m	3.500m	431981.718	406800.561	21000	TYPE B	600x600 - CLASS D400	-
112	134.900m	131.300m - 12000 IN 131.300m - 12000 OUT	0.000m	3.600m	432059.760	406755.735	21000	TYPE B	600x600 - CLASS D400	-
113	134.900m	131.000m - 12000 IN 131.000m - 12000 OUT	0.000m	3.900m	432137.803	406710.909	21000	TYPE B	600x600 - CLASS D400	-
114	134.900m	130.880m - 12000 IN 130.880m - 12000 OUT	0.000m	4.020m	432169.020	406692.979	21000	TYPE B	600x600 - CLASS D400	-
201	144.155m	140.500m - 6750 OUT	0.000m	3.655m	431570.872	406568.780	18000	TYPE B	600x600 - CLASS D400	-
202	142.877m	139.875m - 6750 IN 139.875m - 6750 OUT	0.000m	3.002m	431595.595	406612.240	18000	TYPE B	600x600 - CLASS D400	-
203	140.755m	138.750m - 6750 IN 138.750m - 6750 OUT	0.000m	2.005m	431640.415	406690.286	18000	TYPE B	600x600 - CLASS D400	-
204	138.630m	136.500m - 6750 IN 136.500m - 6750 OUT	0.000m	2.130m	431683.155	406766.064	18000	TYPE B	600x600 - CLASS D400	-
301	137.907m	134.000m - 6000 OUT	0.000m	3.907m	431631.913	406818.867	15000	TYPE A (12000 ACCESS SHAFT)	600x600 - CLASS D400	-

OUTFALL HEAD WALL NOTES
 ALL INLET AND OUTFALL HEAD WALLS SHALL BE PCC SIZE TO SUIT THE PROPOSED PIPE AT EACH LOCATION
HAND/GUARD RAILINGS
 SAFETY/HAND RAILINGS TO THE REAR AND DOWN BOTH SIDE FORMED IN GALVANISED MILD STEEL AND HEIGHT MINIMUM 1.100m
TRASH SCREENS
 ALL HEADWALLS SHALL HAVE SUITABLE MILD STEEL GALVANISED FLAT BAR TRASH/SECURITY SCREENS HINGED TO ALLOW MAINTENANCE ACCESS AND BE LOCKABLE WITH A PADLOCK AS REQUIRED
EROSION/SCOUR CONTROL
 DUE TO THE POTENTIAL HIGH VELOCITIES FROM SOME OF THE OUTFALL PIPES AN ALLOW FOR AT THE POINT OF CONNECTION TO THE WATERCOURSE SHOULD BE MADE IN THE COSTS
THE METHOD OF SCOUR PROTECTION MAY VARY AND WOULD BE SUBJECT TO DETAILED DESIGN AT EACH INDIVIDUAL LOCATION

SW DRAINAGE STRATEGY PLAN
 SCALE 1:1000

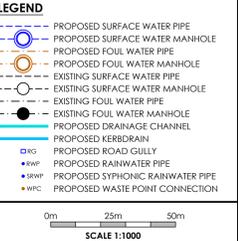
ATTENUATION BASINS NOTES
 ALLOW FOR A SUITABLE IMPERMEABLE LINER TO ALL ATTENUATION BASINS
EROSION/SCOUR CONTROL
 DUE TO THE POTENTIAL HIGH VELOCITIES FROM SOME OF THE INLET PIPES AN ALLOW FOR STILLING BASINS AND SCOUR PROTECTION SHOULD BE MADE IN THE COSTS
THE METHOD OF SCOUR PROTECTION MAY VARY AND WOULD BE SUBJECT TO DETAILED DESIGN AT EACH INDIVIDUAL LOCATION

PIPE SIZING GUIDE

	ROUGHNESS COEFFICIENT (Ks)	MIN. VELOCITY (m/s)	CALCULATION TYPE
SURFACE WATER	0.600	1.000	FULL BORE
FOUL WATER	1.500	0.750	PROPORTIONAL FLOW DEPTH OF FLOW = 1/3 PIPE HEIGHT

DO NOT SCALE (A0)

- GENERAL NOTES**
- ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, S&L CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
 - ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.
- DRAINAGE NOTES**
- ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS EN 752:2008 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
 - ANY DRAINAGE TO BE REFERRED FOR ADOPTION EITHER WITHIN THE SITE OR OUTSIDE SHALL BE CONSTRUCTED TO SERVES FOR ADOPTION LATEST EDITION AND ANY SPECIFIC REQUIREMENTS OF THE ADOPTING SEWERAGE WATER AUTHORITY.
 - THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINAGEWORKS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION PROVIDED IN THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 - THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD ANY EXISTING LIVE DRAINAGE BE FOUND WITHIN THE SITE BOUNDARY.
 - ALL EXISTING DRAINAGE WITHIN THE SITE NOT REQUIRED FOR THE NEW DEVELOPMENT SHALL BE ABANDONED. DRAINS AND SEWERS LESS THAN 1.500m DEEP WHICH ARE IN OPEN GROUND SHOULD AS FAR AS PRACTICABLE BE FULLY REMOVED. ALL OTHER PIPES SHOULD BE SEALED AT BOTH ENDS AND AT ANY POINT OF CONNECTION AND BE GROUNDED TO PREVENT THAT RATS CANNOT GAIN ACCESS. LARGER PIPES 2250 OR ABOVE SHOULD BE GROUT FULLED TO PREVENT SUBSIDENCE OR DAMAGE TO BUILDINGS OR SERVICES IN THE EVENT OF COLLAPSE.
 - THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND OVERSEEN WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE UTILITY COMPANIES.
 - THE CONTRACTOR SHALL ALLOW FOR BEARING WITH SURFACE WATER RUN OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF DRAINAGE PIPING AND DE WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
 - THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN NEARLY CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
 - THE CONTRACTOR SHALL ALLOW FOR OBTAINING ALL APPROVALS FROM THE RELEVANT AUTHORITIES WHEN WORKING IN THE PUBLIC HIGHWAY AND ON THE SEWERAGE SYSTEM.
 - THE CONTRACTOR SHALL SUITABLY PROTECT PEDESTRIANS AND VEHICLES FROM WORKING AREAS.
 - ALL MANHOLE CHAMBER COVER LEVELS SHALL BE APPROPRIATE AND SHALL BE ADJUSTED ON SITE TO SUIT THE PROPOSED FINISHED LEVELS.
 - ALL PIPES SHALL BE LAD WITH LEVEL SOFFITS AND ALL MANHOLES SHALL BE LAD WITH LEVEL SOFFITS. ALL PIPES ARE FOR THE OUT GOING PIPE UNDO. ON THE DRAWING NOTE THAT ALL PIPE GRADIENTS INDICATED ON THE DRAWING ARE APPROXIMATE ONLY.
 - ALL PIPE CONNECTION FROM DRAINAGE CHANNELS AND GULLIES SHALL BE 1000 PIPES AT A MINIMUM GRADE OF 1:100 WITH CLASS 2 BEDDING UNDO. ON THE DRAWING.
 - ALL PIPE CONNECTIONS FROM RWPS TO BE 1000 AT 1:60 MIN. AND ALL PIPE CONNECTIONS FROM RWPS TO FIRST CHAMBER SHALL BE 1000 AT 1:40 MIN. WITH CLASS 3 BEDDING BENEATH THE BUILDING AND CLASS 2 UNDER EXTERIORS WHERE COVER LESS THAN 1.200 UNDO. ON THE DRAWING LOCATION OF RWPS AND RWPS TO BE CONFIRMED BY THE ARCHITECT AND ARE SHOWN INDICATIVELY ONLY.
 - ALL SYNCHRONIC RWP SYSTEMS TO BE DESIGNED BY OTHERS. PREWORK FROM DOWN PIPE TO FIRST MANHOLE TO BE SIZED/DESIGNED BY SYNCHRONIC SYSTEM DESIGNER. THE FIRST MANHOLE TO HAVE AN OPEN GRATE COVER SAFT GOVERN WATERWAY 2000 - 2400 OR SIMILAR APPROVED.
 - SUITABLY SIZED PETROL INTERCEPTORS MUST COMPLY WITH THE REQUIREMENTS OUTLINE IN FP03 THESE INCLUDE SILT STORAGE CAPACITY AND HIGH LEVEL HYDROCARBON ALARM W/RED BACK TO A MANNED OFFICE.
 - UPON COMPLETION OF THE DRAINAGE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAIN RINGS BY JETTING AND REMOVE ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE PUBLIC SEWER AND/OR WATERCOURSE SYSTEM. ONCE THE DRAINAGE SYSTEM HAS BEEN FULLY CLEANED, CUT A CCTV CAMERA CONDITION SURVEY SHALL BE UNDERTAKEN TO ALL CONTROLLED DRAINAGE AND SEWER PIPES WITH THE FOOTAGE ISSUED TO THE ENGINEER FOR VIEW. THE AS BUILT INVERT AND COVER LEVELS SHALL BE RECORDED BY THE CONTRACTOR AND PASSED ON TO THE ENGINEER FOR REVIEW.



PROPOSED FINISHED LEVELS FOR THE COMMERCIAL ZONE ARE TO BE CONFIRMED AS PART OF THE ON GOING PLOT DESIGN DEVELOPMENT EXERCISE AND WILL BE TAILORED TO SUIT THE AGREE PLOT LAYOUTS

REV	DESCRIPTION	DATE	CHK	BY
001	INITIAL ISSUE	14/07/23	CPH	JDM
002	UPDATED IN LINE WITH DESIGN TEAM PLANNING COMMENTS	05/10/23	CPH	JDM

Project: **BARNSELY WEST**
 Drawing Title: **SW DRAINAGE STRATEGY PLAN COMMERCIAL DEVELOPMENT ZONE**

PLANNING

JPG
 www.jpg.group
 t admin@jpg.group | t +44 (0)113 263 1155

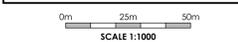
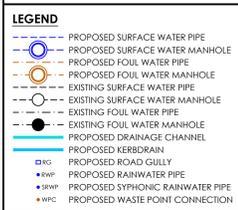
4848-JPG-ZZ-ZR-D-1453 **S4** **P02**



Appendix J Preliminary Land Drainage Strategy Drawing

NOTES

- GENERAL NOTES**
1. ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH JPC CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, S&L CONSULTANTS AND JPC CONSULTANTS DRAWINGS.
 3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.
- DRAINAGE NOTES**
1. ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS EN 752:2008 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
 2. ANY DRAINAGE TO BE FORWARDED FOR APPROVAL EITHER WITHIN THE SITE OR OUTSIDE SHALL BE CONSTRUCTED TO SPECIFICATIONS FOR ADOPTED LATEST EDITION AND ANY SPECIFIC REQUIREMENTS OF THE ADOPTING SEWERAGE WATER AUTHORITY.
 3. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINAGE WORKS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 4. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD ANY EXISTING LIVE DRAINAGE BE FOUND WITHIN THE SITE SECONDARY SERVING ADJACENT PROPERTIES.
 5. ALL EXISTING DRAINAGE WITHIN THE SITE NOT REQUIRED FOR THE NEW DEVELOPMENT SHALL BE ABANDONED. DRAINS AND SEWERS LESS THAN 1.000m DEEP WHICH ARE IN OPEN GROUND SHOULD AS FAR AS IS PRACTICABLE BE FULLY REMOVED. ALL OTHER PIPES SHOULD BE SEALED AT BOTH ENDS AND AT ANY POINT OF CONNECTION AND BE GRADED TO ENSURE THAT RATS CANNOT GAIN ACCESS. LARGER PIPES 2250 OR ABOVE SHOULD BE GROUT FULLED TO PREVENT SUBSIDENCE OR DAMAGE TO BUILDINGS OR SERVICES IN THE EVENT OF COLLAPSE.
 6. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND OVERSEEN WORKS AS NECESSARY TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE UTILITY COMPANIES.
 7. THE CONTRACTOR SHALL ALLOW FOR BEARING WITH SURFACE WATER RUN OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF DUMPS, PUMPING AND DE WATERING AS APPROPRIATE IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
 8. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING NEAR COHBERSED PIPES, DEEP EXCAVATIONS AND MACHINERY.
 9. THE CONTRACTOR SHALL ALLOW FOR OBTAINING ALL APPROVALS FROM THE RELEVANT AUTHORITIES FOR WORKING IN THE PUBLIC HIGHWAY AND ON THE SEWERAGE SYSTEM.
 10. THE CONTRACTOR SHALL SUFABLY PROTECT PEDESTRIANS AND VEHICLES FROM WORKING AREAS.
 11. ALL MANHOLE CHAMBER COVER LEVELS ARE APPROXIMATE AND SHALL BE ADJUSTED ON SITE TO SUIT THE PROPOSED FINISHED LEVELS.
 12. ALL PIPES SHALL BE LAD WITH LEVEL SLOTTES AND ALL MANHOLE CHAMBER INVERT LEVELS SHOWN ARE FOR THE CUT GOING PIPE LINE. ON THE DRAWING NOTE THAT ALL PIPE GRADIENTS INDICATED ON THE DRAWING ARE APPROXIMATE ONLY.
 13. ALL PIPE CONNECTION FROM DRAINAGE CHANNELS AND GULLIES SHALL BE 1500 PIPES AT A MINIMUM GRADE OF 1:100 WITH CLASS 2 BEDDING UNDO. ON THE DRAWING.
 14. ALL PIPE CONNECTIONS FROM RWPS TO BE 1000 AT 1:60 MIN. AND ALL PIPE CONNECTIONS FROM RWPS TO FIRST CHAMBER SHALL BE 1000 AT 1:40 MIN. WITH CLASS 3 BEDDING BENEATH THE BUILDING AND CLASS 2 UNDER EXTERNALS WHERE COVER LESS THAN 1.200m UNDO. ON THE DRAWING LOCATION OF RWPS AND RWCS TO BE CONFIRMED BY THE ARCHITECT AND ARE SHOWN INDICATIVELY ONLY.
 15. ALL SYNCHRONIC RWP SYSTEMS TO BE DESIGNED BY OTHERS. PREWORK FROM DOWN PIPE TO FIRST MANHOLE TO BE SIZED/DESIGNED BY SYNCHRONIC SYSTEM DESIGNER. THE FIRST MANHOLE TO HAVE AN OPEN GRATE COVER SAFT GOVERN WATERWAY 2000 - 2400 OR SIMILAR APPROVED.
 16. SUFABLY SIZED PERCOL INTERCEPTORS MUST COMPLY WITH THE REQUIREMENTS OUTLINE IN PFD03 THESE INCLUDE Silt STORAGE CAPACITY AND HIGH LEVEL HYDROCARBON ALARM W/RED BACK TO A MANNED OFFICE.
 17. UPON COMPLETION OF THE DRAINAGE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAIN RIGS BY JETTING AND REMOVE ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE PUBLIC SEWER AND/OR WATERCOURSE SYSTEM. ONCE THE DRAINAGE SYSTEM HAS BEEN FULLY CLEANED OUT A CCTV CAMERA CONDITION SURVEY SHALL BE UNDERTAKEN TO ALL CONSTRUCTED DRAINAGE AND SEWER PIPES WITH THE FOOTAGE ISSUED TO THE ENGINEER FOR VIEW. THE AS BUILT INVERT AND COVER LEVELS SHALL BE RECORDED BY THE CONTRACTOR AND PASSED ON TO THE ENGINEER FOR REVIEW.



PROPOSED FINISHED LEVELS FOR THE COMMERCIAL ZONE ARE TO BE CONFIRMED AS PART OF THE ON GOING PLOT DESIGN DEVELOPMENT EXERCISE AND WILL BE TAILORED TO SUIT THE AGREE PLOT LAYOUTS

LEVELS AND DETAILS OF THE EXISTING LAND DRAINAGE AND WATERCOURSE NETWORK ARE BASED ON THE TOPOGRAPHICAL SURVEY OF THE SITE.

DETAILED DESIGN OF ANY OFF SITE LAND DRAINAGE INFRASTRUCTURE ALL BY THE RESIDENTIAL DEVELOPER

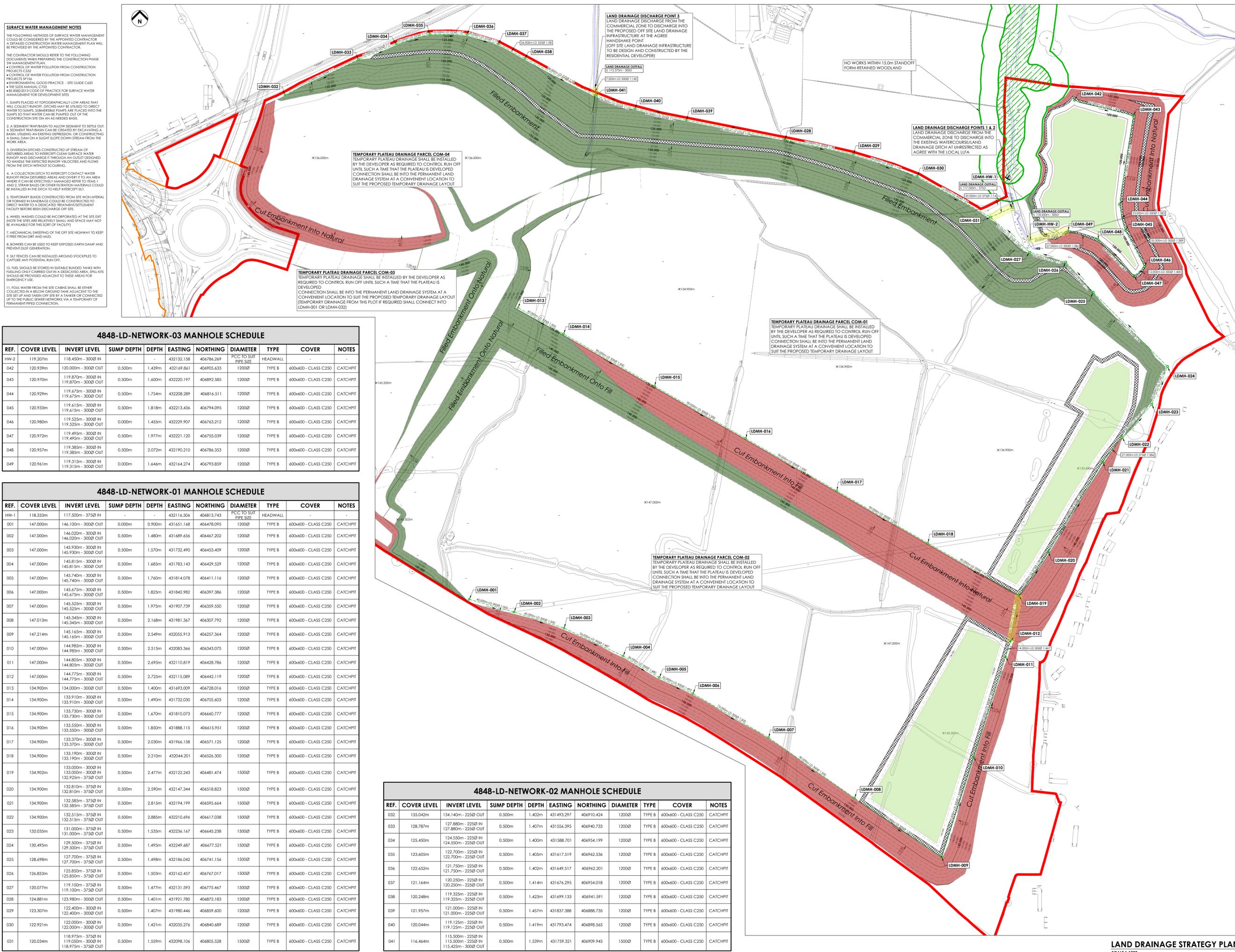
REV	DESCRIPTION	DATE	CHK	BY
P02	UPDATED WITH NEW DESIGN TEAM PLANNING COMMENT	05/10/23	CPH	JDM
P01	INITIAL ISSUE	13/07/23	CPH	JDM

Project: BARNSELY WEST

Drawing Title: LAND DRAINAGE STRATEGY PLAN
COMMERCIAL DEVELOPMENT ZONE

PLANNING
JPG
www.jpg.group
e admin@jpg.group | t +44 (0)113 263 1155

4848-JPG-ZZ-ZR-DR-D-1454 S4 P02



SURFACE WATER MANAGEMENT NOTES

THE FOLLOWING METHODS OF SURFACE WATER MANAGEMENT COULD BE CONSIDERED BY THE APPOINTED CONTRACTOR. A DETAILED CONSTRUCTION WATER MANAGEMENT PLAN WILL BE PROVIDED BY THE APPOINTED CONTRACTOR.

THE CONTRACTOR SHOULD REFER TO THE FOLLOWING DOCUMENTS WHEN PREPARING THE CONSTRUCTION PHASE SW MANAGEMENT PLAN:

- CONTROL OF WATER POLLUTION FROM CONSTRUCTION PROJECTS C252
- CONTROL OF WATER POLLUTION FROM CONSTRUCTION PROJECTS SP154
- ENVIRONMENTAL GOOD PRACTICE - SITE GUIDE C450
- THE SUDS MANUAL C733
- BS 8002:2013 CODE OF PRACTICE FOR SURFACE WATER MANAGEMENT FOR DEVELOPMENT SITES

1. SUMPS PLACED AT TOPOGRAPHICALLY LOW AREAS THAT WILL COLLECT RUNOFF. DITCHES MAY BE PLACED TO DIRECT WATER TO SUMPS. SUBMERSIBLE PUMPS ARE PLACED INTO THE SUMPS SO THAT WATER CAN BE PUMPED OUT OF THE CONSTRUCTION SITE ON AN AS NEEDED BASIS.
2. A SEDIMENT TRAP BASIN TO ALLOW SEDIMENT TO SETTLE OUT. A SEDIMENT TRAP BASIN CAN BE CREATED BY EXCAVATING AN EXISTING DEPRESSION, OR CONSTRUCTING A SMALL DAM ON A SLIGHT SLOPE DOWN STREAM FROM THE WORKING AREA.
3. DIVERSION DITCHES CONSTRUCTED UP STREAM OF DISTURBED AREAS TO INTERCEPT CLEAN SURFACE WATER RUNOFF AND DISCHARGE THROUGH AN OUTLET DESIGNED TO HANDLE THE EXPECTED RUNOFF VOLUMES AND FLOWS FROM THE DITCH WITHOUT SCOURING.
4. A COLLECTION DITCH TO INTERCEPT CONTACT WATER RUNOFF FROM DISTURBED AREAS AND DIVERT IT TO AN AREA WHERE IT CAN BE EFFECTIVELY MANAGED REFER TO IETS 1 AND 2. STREAM BARRIERS OR OTHER FLEXIBLE MATERIALS COULD BE INSTALLED IN THE DITCH TO HELP INTERCEPT SITS.
5. TEMPORARY BUNDING CONSTRUCTED FROM SITE WORN MATERIALS USING SAND BAGS COULD BE CONSTRUCTED TO DIRECT WATER TO A DEDICATED TREATMENT/SETTLEMENT FACILITY BEFORE BEING DISCHARGED OFF SITE.
6. WHERE WADEABLE COULDS BE INCORPORATED AT THE SITE BUT (NOTE THE SITES ARE RELATIVELY SMALL AND SPACE MAY NOT BE AVAILABLE FOR THIS SORT OF FACILITY).
7. MECHANICAL SWEEPING OF THE OFF SITE HIGHWAY TO KEEP IT FREE FROM DIRT AND MUD.
8. BOWERS CAN BE USED TO KEEP EXPOSED EARTH DAMP AND PREVENT DUST GENERATION.
9. Silt FENCES CAN BE INSTALLED AROUND STOCKPILES TO CAPTURE ANY POTENTIAL RUN OFF.
10. FUEL SHOULD BE STORED IN SUITABLE BUNDED TANKS WITH FILLING ONLY CARRIED OUT IN A DEDICATED AREA. SPILLS SHOULD BE PROVIDED ADJACENT TO THESE AREAS FOR EMERGENCY USE.
11. FOUL WATER FROM THE SITE CABINS SHALL BE EITHER COLLECTED IN A BELOW GROUND TANK ADJACENT TO THE SET UP AND TAKEN OFF SITE BY A TANKER OR CONNECTED UP TO THE PUBLIC SEWER NETWORKS VIA A TEMPORARY PERMANENT PIPED CONNECTION.

4848-LD-NETWORK-03 MANHOLE SCHEDULE

REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTING	NORTHING	DIAMETER	TYPE	COVER	NOTES
HW-2	119.207m	118.450m - 3000 IN	-	-	432132.158	406786.269	R/C TO SUIT PIPE SITE	HEADWALL	-	-
042	120.939m	120.000m - 3000 OUT	0.500m	1.439m	432169.861	406905.633	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
043	120.970m	119.870m - 3000 IN 119.870m - 3000 OUT	0.500m	1.600m	432220.197	406892.585	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
044	120.929m	119.675m - 3000 IN 119.675m - 3000 OUT	0.500m	1.754m	432208.289	406816.511	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
045	120.933m	119.615m - 3000 IN 119.615m - 3000 OUT	0.500m	1.818m	432213.436	406794.095	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
046	120.980m	119.525m - 3000 IN 119.525m - 3000 OUT	0.000m	1.455m	432229.907	406763.212	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
047	120.972m	119.495m - 3000 IN 119.495m - 3000 OUT	0.500m	1.977m	432221.120	406755.039	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
048	120.957m	119.385m - 3000 IN 119.385m - 3000 OUT	0.500m	2.072m	432190.210	406784.353	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
049	120.961m	119.315m - 3000 IN 119.315m - 3000 OUT	0.000m	1.646m	432164.274	406793.859	12000	TYPE B	600x600 - CLASS C250	CATCHPIT

4848-LD-NETWORK-01 MANHOLE SCHEDULE

REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTING	NORTHING	DIAMETER	TYPE	COVER	NOTES
HW-1	118.333m	117.500m - 3750 IN	-	-	432116.506	406813.743	R/C TO SUIT PIPE SITE	HEADWALL	-	-
001	147.000m	146.100m - 3000 OUT	0.000m	0.900m	431651.168	406478.095	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
002	147.000m	146.020m - 3000 IN 146.020m - 3000 OUT	0.500m	1.480m	431689.656	406467.202	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
003	147.000m	145.930m - 3000 IN 145.930m - 3000 OUT	0.500m	1.570m	431732.490	406453.409	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
004	147.000m	145.815m - 3000 IN 145.815m - 3000 OUT	0.500m	1.685m	431783.143	406429.529	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
005	147.000m	145.740m - 3000 IN 145.740m - 3000 OUT	0.500m	1.760m	431814.078	406411.116	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
006	147.000m	145.675m - 3000 IN 145.675m - 3000 OUT	0.500m	1.825m	431842.982	406397.386	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
007	147.000m	145.525m - 3000 IN 145.525m - 3000 OUT	0.500m	1.975m	431907.739	406359.550	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
008	147.013m	145.345m - 3000 IN 145.345m - 3000 OUT	0.500m	2.168m	431981.367	406307.792	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
009	147.214m	145.165m - 3000 IN 145.165m - 3000 OUT	0.500m	2.549m	432055.913	406257.364	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
010	147.000m	144.985m - 3000 IN 144.985m - 3000 OUT	0.500m	2.515m	432083.366	406343.075	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
011	147.000m	144.805m - 3000 IN 144.805m - 3000 OUT	0.500m	2.695m	432110.819	406428.786	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
012	147.000m	144.775m - 3000 IN 144.775m - 3000 OUT	0.500m	2.725m	432115.089	406442.119	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
013	134.900m	134.000m - 3000 OUT	0.500m	1.400m	431693.009	40628.016	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
014	134.900m	133.910m - 3000 IN 133.910m - 3000 OUT	0.500m	1.490m	431732.030	406705.603	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
015	134.900m	133.730m - 3000 IN 133.730m - 3000 OUT	0.500m	1.670m	431810.073	406660.777	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
016	134.900m	133.550m - 3000 IN 133.550m - 3000 OUT	0.500m	1.850m	431888.115	406615.951	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
017	134.900m	133.370m - 3000 IN 133.370m - 3000 OUT	0.500m	2.030m	431966.158	406571.125	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
018	134.900m	133.190m - 3000 IN 133.190m - 3000 OUT	0.500m	2.210m	432044.201	406526.300	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
019	134.902m	133.000m - 3000 IN 133.000m - 3000 IN 132.925m - 3750 OUT	0.500m	2.477m	432122.243	406481.474	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
020	134.900m	132.810m - 3750 IN 132.810m - 3750 OUT	0.500m	2.590m	432147.344	406518.823	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
021	134.900m	132.585m - 3750 IN 132.585m - 3750 OUT	0.500m	2.815m	432194.199	406495.664	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
022	134.900m	132.515m - 3750 IN 132.515m - 3750 OUT	0.500m	2.885m	432210.696	406461.038	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
023	132.035m	131.000m - 3750 IN 131.000m - 3750 OUT	0.500m	1.535m	432236.167	406645.238	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
024	130.495m	129.500m - 3750 IN 129.500m - 3750 OUT	0.500m	1.495m	432249.687	406677.521	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
025	128.498m	127.700m - 3750 IN 127.700m - 3750 OUT	0.500m	1.498m	432186.042	406741.156	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
026	126.853m	125.850m - 3750 IN 125.850m - 3750 OUT	0.500m	1.503m	432162.457	406767.017	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
027	120.077m	119.100m - 3750 IN 119.100m - 3750 OUT	0.500m	1.477m	432131.593	406775.467	15000	TYPE B	600x600 - CLASS C250	CATCHPIT
028	124.881m	123.980m - 3000 OUT	0.500m	1.401m	431921.780	406872.183	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
029	123.307m	122.400m - 3000 IN 122.400m - 3000 OUT	0.500m	1.407m	431980.446	406859.600	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
030	122.921m	122.000m - 3000 IN 122.000m - 3000 OUT	0.500m	1.421m	432035.276	406840.689	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
031	120.034m	118.975m - 3750 IN 118.975m - 3000 IN 118.975m - 3750 OUT	0.500m	1.559m	432098.106	406805.528	15000	TYPE B	600x600 - CLASS C250	CATCHPIT

4848-LD-NETWORK-02 MANHOLE SCHEDULE

REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTING	NORTHING	DIAMETER	TYPE	COVER	NOTES
032	135.042m	134.140m - 2250 OUT	0.500m	1.402m	431493.297	406910.424	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
033	128.787m	127.880m - 2250 IN 127.880m - 2250 OUT	0.500m	1.407m	431556.395	406940.733	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
034	125.450m	124.550m - 2250 IN 124.550m - 2250 OUT	0.500m	1.400m	431588.701	406954.199	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
035	123.405m	122.700m - 2250 IN 122.700m - 2250 OUT	0.500m	1.405m	431617.519	406962.536	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
036	122.452m	121.750m - 2250 IN 121.750m - 2250 OUT	0.500m	1.402m	431649.517	406962.201	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
037	121.164m	120.250m - 2250 IN 120.250m - 2250 OUT	0.500m	1.414m	431676.295	406954.018	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
038	120.248m	119.325m - 2250 IN 119.325m - 2250 OUT	0.500m	1.423m	431699.133	406941.591	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
039	121.957m	121.000m - 2250 IN 121.000m - 2250 OUT	0.500m	1.457m	431837.388	406888.735	12000	TYPE B	600x600 - CLASS C250	CATCHPIT
040	120.044m	119.125m - 2250 IN 1								



Appendix K Preliminary FW Drainage Strategy Drawing

- GENERAL NOTES**
- ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND THE CURRENT BUILDING AND JPG CONSULTANTS DRAWINGS.
 - ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.
- DRAINAGE NOTES**
- ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS EN 752:2008 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
 - ANY DRAINAGE TO BE PUT FORWARD FOR APPROVAL EITHER WITHIN THE SITE OR OUTSIDE SHALL BE CONSTRUCTED TO SERVES FOR APPROXIMATE LATEST EDITION AND ANY SPECIFIC REQUIREMENTS OF THE RECEIVING SEWERAGE WATER AUTHORITY.
 - THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINAGEWORKS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 - THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD ANY EXISTING LIVE DRAINAGE BE FOUND WITHIN THE SITE BOUNDARIES.
 - ALL EXISTING DRAINAGE WITHIN THE SITE NOT REQUIRED FOR THE NEW DEVELOPMENT SHALL BE ABANDONED. DRAINS AND SEWERS LESS THAN 1.500M DEEP WHICH ARE IN OPEN GROUND SHOULD AS FAR AS PRACTICABLE BE FULLY REGRADED. ALL OTHER PIPES SHOULD BE SEALED AT BOTH ENDS AND AT ANY POINT OF CONNECTION AND BE GRADED TO ENSURE THAT RATS CANNOT GAIN ACCESS. LARGER PIPES 2250 OR ABOVE SHOULD BE GROUT FILLED TO PREVENT SUBSIDENCE OR DAMAGE TO BUILDINGS OR SERVICES IN THE EVENT OF COLLAPSE.
 - THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE UTILITY COMPANIES.
 - THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF PUMPS, PIPING AND DE WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
 - THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN NEAR CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
 - THE CONTRACTOR SHALL ALLOW FOR OBTAINING ALL APPROVALS FROM THE RELEVANT AUTHORITIES WHEN WORKING IN THE PUBLIC HIGHWAY AND ON THE SEWERAGE SYSTEM.
 - THE CONTRACTOR SHALL SUABLY PROTECT PEDESTRIANS AND VEHICLES FROM WORKING AREAS.
 - ALL MANHOLE CHAMBER COVER LEVELS ARE APPROXIMATE AND SHALL BE ADJUSTED ON SITE TO SUIT THE PROPOSED FINISHED LEVELS.
 - ALL PIPES SHALL BE LAD WITH LEVEL SLOTTES AND ALL MANHOLE CHAMBER COVER LEVELS SHOWN ARE FOR THE CUT CONDO PIPE END. ON THE DRAWING NOTE THAT ALL PIPE GRADIENTS INDICATED ON THE DRAWING ARE APPROXIMATE ONLY.
 - ALL PIPE CONNECTION FROM DRAINAGE CHANNELS AND GULLIES SHALL BE 1500 PIPES AT A MINIMUM GRADIENT OF 1:100 WITH CLASS 2 BEDDING UNDO. ON THE DRAWING.
 - ALL PIPE CONNECTIONS FROM RWPS TO BE 1000 AT 1:60 MIN. AND ALL PIPE CONNECTIONS FROM RWPS TO FIRST CHAMBER SHALL BE 1000 AT 1:40 MIN. WITH CLASS 3 BEDDING BENEATH THE BUILDING AND CLASS 2 UNDER EXTERNALS WHERE COVER IS LESS THAN 1.200 UNDO. ON THE DRAWING LOCATION OF RWPS AND RWCS TO BE CONFIRMED BY THE ARCHITECT AND ARE SHOWN INDICATIVELY ONLY.
 - ALL SYNPHONIC RWP SYSTEMS TO BE DESIGNED BY OTHERS. PIPING FROM DOWN PIPE TO FIRST MANHOLE TO BE SIZED/DESIGNED BY SYNPHONIC SYSTEM DESIGNER. THE FIRST MANHOLE TO HAVE AN OPEN GRATE COVER SAINT GOBARN WATERWAY 2000 - 2400 OR SIMILAR APPROVED.
 - SUITABLY SIZED PETROL INTERCEPTORS MUST COMPLY WITH THE REQUIREMENTS OUTLINE IN PP03 THESE INCLUDE Silt STORAGE CAPACITY AND HIGH LEVEL HYDROCARBON ALARM WIRRED BACK TO A MANNED OFFICE.
 - UPON COMPLETION OF THE DRAINAGE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAIN RINGS BY JETTING AND REMOVE ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE PUBLIC SEWER AND/OR WATERCOURSE SYSTEM. ONCE THE DRAINAGE SYSTEM HAS BEEN FULLY CLEANED OUT A CCTV CAMERA CONDITION SURVEY SHALL BE UNDERTAKEN TO ALL CONSTRUCTED DRAINAGE AND SEWER PIPES WITH THE FOOTAGE ISSUED TO THE ENGINEER FOR VIEW. THE AS BUILT INVERT AND COVER LEVELS SHALL BE RECORDED BY THE CONTRACTOR AND PASSED ON TO THE ENGINEER FOR REVIEW.



0m 25m 50m
SCALE 1:1000

PROPOSED FINISHED LEVELS FOR THE COMMERCIAL ZONE ARE TO BE CONFIRMED AS PART OF THE ON GOING PLOT DESIGN DEVELOPMENT EXERCISE AND WILL BE TAILORED TO SUIT THE AGREE PLOT LAYOUTS

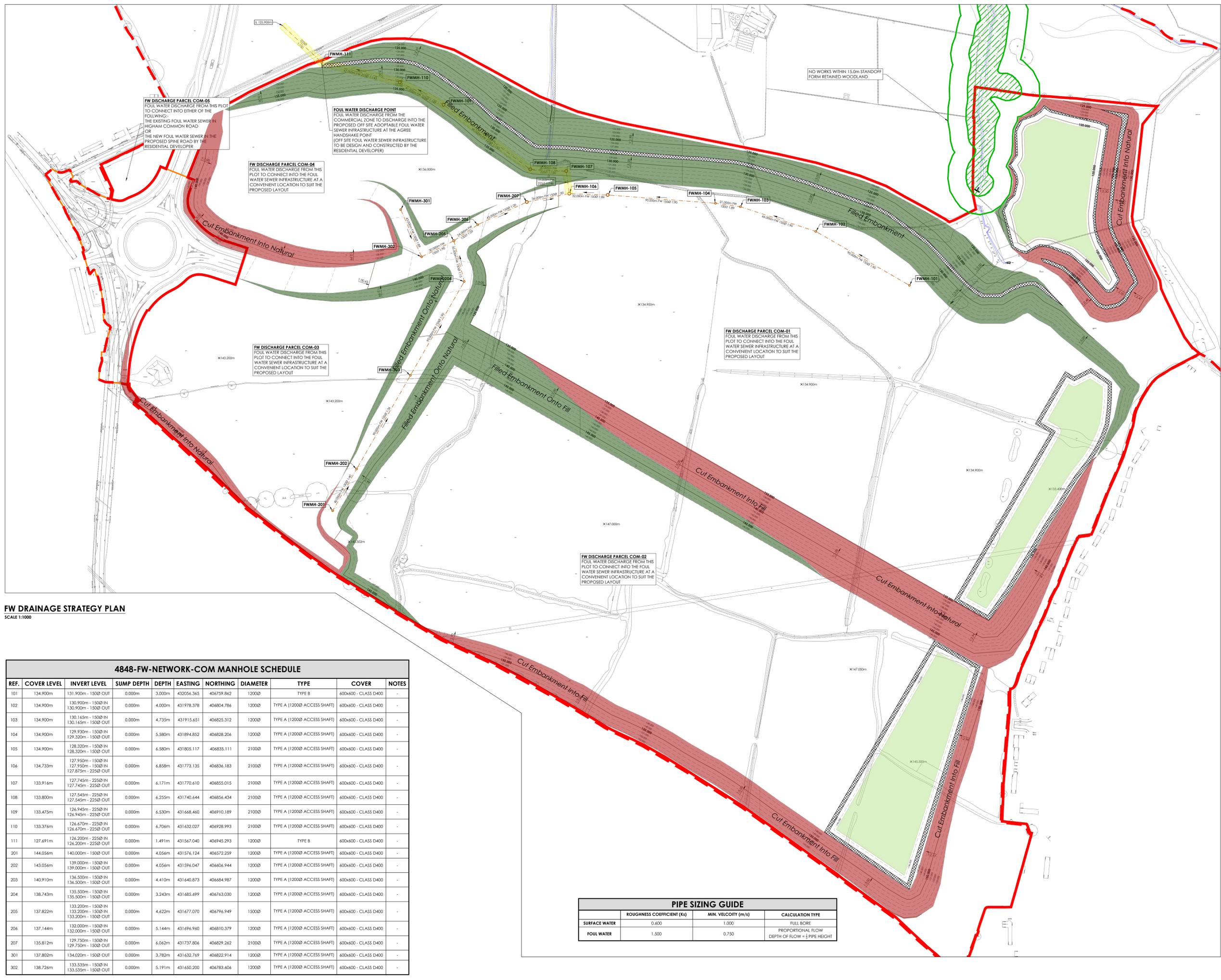
LEVELS AND DETAILS OF THE EXISTING SEWER NETWORK ARE TO BE SURVEYED TO CONFIRM COVER AND INVERT LEVELS AND CONDITION OF THE RECEIVING SEWERS

DETAILED DESIGN OF THE OFF SITE FW DRAINAGE INFRASTRUCTURE ALL BY THE RESIDENTIAL DEVELOPER THIS INFRASTRUCTURE SHALL BE PUT FORWARD OF ADAPTABLE TO YW VIA S104 OR OTHER AGREEMENTS

REV	DESCRIPTION	DATE	CHK	BY
P02	UPDATED WITH DESIGN TEAM PLANNING COMMENTS	10/10/23	CPH	JDM
P01	INITIAL ISSUE	12/06/23	CPH	JDM

Project: BARNSELY WEST

Drawing Title: FW DRAINAGE STRATEGY PLAN COMMERCIAL DEVELOPMENT ZONE



FW DRAINAGE STRATEGY PLAN
SCALE 1:1000

REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTING	NORTHING	DIAMETER	TYPE	COVER	NOTES
101	134.900m	131.900m - 1500 OUT	0.000m	3.000m	432056.365	406759.862	1200Ø	TYPE B	600x600 - CLASS D400	-
102	134.900m	130.900m - 1500 IN 130.900m - 1500 OUT	0.000m	4.000m	431978.378	406804.786	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
103	134.900m	130.165m - 1500 IN 130.165m - 1500 OUT	0.000m	4.735m	431915.651	406825.312	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
104	134.900m	129.930m - 1500 IN 129.930m - 1500 OUT	0.000m	5.580m	431894.852	406828.206	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
105	134.900m	128.320m - 1500 IN 128.320m - 1500 OUT	0.000m	6.580m	431805.117	406835.111	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
106	134.733m	127.950m - 1500 IN 127.950m - 1500 IN 127.875m - 2250 OUT	0.000m	6.858m	431773.135	406836.183	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
107	133.916m	127.745m - 2250 IN 127.745m - 2250 OUT	0.000m	6.171m	431770.610	406855.015	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
108	133.800m	127.545m - 2250 IN 127.545m - 2250 OUT	0.000m	6.255m	431740.644	406856.434	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
109	133.475m	126.945m - 2250 IN 126.945m - 2250 OUT	0.000m	6.530m	431668.460	406910.189	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
110	133.376m	126.670m - 2250 IN 126.670m - 2250 OUT	0.000m	6.706m	431632.027	406928.993	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
111	127.691m	126.200m - 2250 IN 126.200m - 2250 OUT	0.000m	1.491m	431567.040	406945.293	1200Ø	TYPE B	600x600 - CLASS D400	-
201	144.056m	140.000m - 1500 OUT	0.000m	4.056m	431576.124	406572.259	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
202	143.056m	139.000m - 1500 IN 139.000m - 1500 OUT	0.000m	4.056m	431596.047	406606.944	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
203	140.910m	136.500m - 1500 IN 136.500m - 1500 OUT	0.000m	4.410m	431640.873	406684.987	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
204	138.743m	135.500m - 1500 IN 135.500m - 1500 OUT	0.000m	3.243m	431685.699	406763.030	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
205	137.822m	133.200m - 1500 IN 133.200m - 1500 OUT	0.000m	4.622m	431677.070	406796.949	1500Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
206	137.144m	132.000m - 1500 IN 132.000m - 1500 OUT	0.000m	5.144m	431696.960	406810.379	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
207	135.812m	129.750m - 1500 IN 129.750m - 1500 OUT	0.000m	6.062m	431737.806	406829.282	2100Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
301	137.802m	134.020m - 1500 OUT	0.000m	3.782m	431632.769	406822.914	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-
302	138.726m	133.535m - 1500 IN 133.535m - 1500 OUT	0.000m	5.191m	431650.200	406783.606	1200Ø	TYPE A (1200Ø ACCESS SHAFT)	600x600 - CLASS D400	-

	ROUGHNESS COEFFICIENT (ks)	MIN. VELOCITY (m/s)	CALCULATION TYPE
SURFACE WATER	0.600	1.000	FULL BORE
FOUL WATER	1.500	0.750	PROPORTIONAL FLOW DEPTH OF FLOW = PIPE HEIGHT

5 John Charles Way
LEEDS
LS12 6QA

Tel: 0113 263 1155
admin@jpg.group
www.jpg.group

