

Drainage Strategy
Unit 7, Gateway 36
Dearne Valley Parkway, Barnsley

Prepared For

EOS Inc. Limited

Report: 9466-HJCE-00-XX-RP-C-3000.v1

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Document Revisions

Revision	Date	Written by	Checked by
P01	04.09.2025	AF	MH



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1. Introduction

- 1.1. This Drainage Strategy report (DS) has been produced by HJ Consulting Engineers on behalf of EOS Inc. Limited to support a reserved matters planning application for the proposed development of Unit 7 at the Gateway 36 development site adjacent the Dearne Valley Parkway in Barnsley. For clarity in this report, the development shall be referred to as ‘the site’.
- 1.2. This report is in provided response to the specific requirements of condition 30 of Barnsley Metropolitan Borough Council outline planning consent ref: 2019/1573.
- 1.3. This report is the property of Holloway Jennings Consulting Engineers (HJCE) and is produced for the exclusive use of the client, EOS Inc. Limited. The contents may not be made use of by any third party without the express written consent of HJCE. Without such consent HJCE can accept no responsibility to any third party. By receiving this report and acting on it, the client, or any third party relying on it, accepts that no individual is personally liable in contract, tort, or breach of statutory duty (including negligence).

2. Planning Condition No. 30 – Outline Planning Application Consent 2019/1573.

2.1. Planning condition No. 30 states.

'Each reserved matters application shall be accompanied by a scheme which sets out.

1. *Full foul and surface water details*
2. *Works to provide outfall of surface water*
3. *Full details of the relevant phases of Sustainable Urban Drainage including attenuation, storage, and treatment capacities as detailed in the CIRIA SUD Manual (C697)*
4. The scheme shall include the following detail;- 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 groundwater and/or surface waters;- A timetable for its implementation;- and – A management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by the public authority of statutory undertaker or any other arrangements to secure the operation of the scheme throughout its lifetime.

The development of each phase shall thereafter be implemented in accordance with the approved sustainable urban drainage scheme and maintained thereafter in accordance with the approved management and maintenance plan.

Reason: To ensure proper, sustainable drainage of the area in accordance with Local Plan Policy CC3 and CC4 and to reduce the risk of contaminating surface water run-off and to reduce the risk of localised flooding and downstream flooding in accordance with Local Plan policy Poll1 Pollution Control and Prevention.'

3. HJCE Response to Planning Condition No.30

HJCE response to condition ref '1. Full foul and surface water details'

Foul and surface water drainage is detailed on HJCE drainage layout drawings 9466-HJCE-00-XX-DR-C-3100 & 3101 provided in Appendix A and is summarised below.

Foul water

Foul water from the new buildings will discharge to the foul infrastructure sewer at the northeast corner of the site, which was constructed under BMDC planning consent ref: 2021/1005. A copy of the infrastructure drainage drawings covered under this planning consent are included in Appendix B.

Surface water

The principles of surface water drainage for the site are in accordance with the details set out in JPG Consulting Engineers Drainage and Flood Risk Statement (ref: 4652-2-JPG-XX-XX-RP-D-0620-S2-PO1) which accompanied the outline planning application. A copy of the report is provided in Appendix C.

Surface water discharge from the Gateway 36 development site is restricted to the equivalent greenfield discharge rate of 62.2 litres/second discharging to a tributary of Short Wood Dike to the west of the site. Due to the surface water flow restriction surface water attenuation will be provided in the form of an open attenuation basin located to the west of the site adjacent to the watercourse. Details of the attenuation basin are presented on JPG drawing no. 4652-2-SW-00-DR-D-1451-S2-PO3 provided in Appendix D.

As advised in the JPG Drainage and Flood Risk Statement the attenuation basin has been designed to accommodate up to and including a 1:100-year return period storm including an allowance of 30% for the future effects of climate change.

The attenuation basin was constructed under a site infrastructure works contract.

The attenuation basin will be retained by the site developer and maintained under an agreement with a facilities management company.

Unit 7 covered under the reserved matters planning application, will be drained to the attenuation basin via new surface water sewers as indicated on HJCE drainage drawings in Appendix A.

HJCE response to condition ref '2. Works to provide outfall of surface water.'

As noted above surface water will discharge to a tributary of Short Wood Dike to the west of the site via a reinforced concrete headwall. Details of which are basin are presented on JPG drawing no. 4652-2-SW-00-DR-D-1451-S2-PO3 provided in Appendix D.

HJCE response to condition ref '3. Full details of the relevant phases of Sustainable Urban Drainage including attenuation, storage, and treatment capacities as detailed in the CIRIA SUD Manual (C697)'

The attenuation basin was constructed under a site infrastructure works contract which was completed in 2021.

As advised in the JPG Drainage and Flood Risk Statement the attenuation basin has been designed to accommodate up to and including a 1:100-year return period storm including an allowance of 30% for the future effects of climate change.

HJCE response to condition ref '4. The scheme shall include the following detail;- 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 groundwater and/or surface waters;- A timetable for its implementation;- and – A management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by the public authority of statutory undertaker or any other arrangements to secure the operation of the scheme throughout its lifetime.'

As advised in the JPG Drainage and Flood Risk Statement the attenuation basin has been designed to accommodate up to and including a 1:100-year return period storm including an allowance of 30% for the future effects of climate change. Flows from the basin will be restricted by a proprietary flow control device located in a chamber before connection to the watercourse.

The Environment Agency updated climate change allowances in May 2022, which indicates a climate change allowance of 40% for the area.

The Unit 7 site drainage system shall be designed in accordance with the requirements of Codes for Adoption and shall demonstrate that:

No surcharge of pipes occurs in the 1 in 2-year rainfall event.

No surface flooding occurs in 1 in 30-year rainfall event.

No flooding to buildings and adjacent properties occurs in 1 in 100-year rainfall event (including an allowance of 40% for the effects of future climate change), as defined in NPPF Technical Guidance.

As this development is for commercial end-use, urban creep has been excluded, as any future amendments or extensions of the site will require a further planning application.

Flood routing is indicated on the HJCE drainage layout drawings included in Appendix A.

Surface water runoff from the service yard and car parking area will be passed through a full retention/bypass separator before discharging to the infrastructure surface water drainage system. The location of the separators is indicated on the drainage layout drawings provided in Appendix A.

A 'Drainage Management and Maintenance plan is included in Appendix E providing details of maintenance procedures for various elements of the drainage along with recommended timescales for maintenance activities.

Appendix A

THIS DRAWING SHOULD NOT BE SCALED. DIMENSIONS TO BE VERIFIED ON SITE. ANY DISCREPANCIES SHOULD BE REFERRED TO THE ENGINEER PRIOR TO WORK COMMENCING.

NOTES

- GENERAL NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT HJCE, ARCHITECTS AND M&E ENGINEERS' DRAWINGS AND SPECIFICATIONS.
2. DRAWING NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
3. EXISTING GROUND LEVELS BASED ON A TOPOGRAPHICAL SURVEY BY ELLAM SURVEYS SURVEYS LTD REF 8846_2D/1.
4. PLOT BOUNDARIES, BUILDING AND EXTERNAL WORKS FOOTPRINTS SHOWN ON THIS DRAWING ARE INDICATIVE ONLY, BASED ON THE LATEST MASTERPLAN DRAWING.
5. ALL DRAINAGE CHANNELS SHALL BE PROVIDED WITH A ROADABLE ACCESS COVER AT THE UPSTREAM END AND A CUTOFF WALL WITH SILT COLLECTION LOAD CLASS TO BE F900 TO SERVICE YARD AND C250 TO CAR PARK. CHANNELS INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. CHANNELS TO CAR PARK TO BE BIRCO LINEAR DRAINAGE SYSTEM BY MARSHALLS OR GATIC LINEAR DRAINAGE SYSTEM. DRAINAGE TO SERVICE YARD TO BE GATIC HEAVY DUTY LINEAR DRAINAGE SYSTEM.
6. FULL RETENTION/BYPASS SEPARATORS TO BE PROVIDED WITH OIL LEVELS MONITORS AND VISUAL ALARMS.
7. SIPHONIC ROOF DRAINAGE DESIGNED TO ON A 50 YEAR DESIGN LIFE (CAT 3 RISK FACTOR), WITH A PRIMARY/SECONDARY ARRANGEMENT AND WEB OVERFLOWS. SECONDARY OVERFLOW NOT ALLOWED ADJACENT CAR PARK/OFFICE AREAS.
8. ALL INTERNAL MANHOLES TO HAVE DOUBLE SEALED/RECESSED A LOCKABLE TYPE COVERS.
9. ON COMPLETION OF THE WORKS INCLUDING ANY DEFECTS RECTIFICATION, ALL DRAINS ARE TO BE SURVEYED USING A CCTV SYSTEM.
10. FOR DRAINAGE NOTES SEE DRAWING 3101.

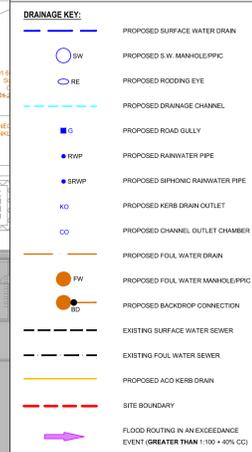


Table with 3 columns: POI, DATE, INITIAL ISSUE, DM, AF. Includes a REVISIONS table with columns for NO, DATE, DESCRIPTION, DRN, CHK.

PROJECT: UNIT 7 - GATEWAY 36, ROCKINGHAM, BARNESLEY

TITLE: DRAINAGE LAYOUT SHEET 1

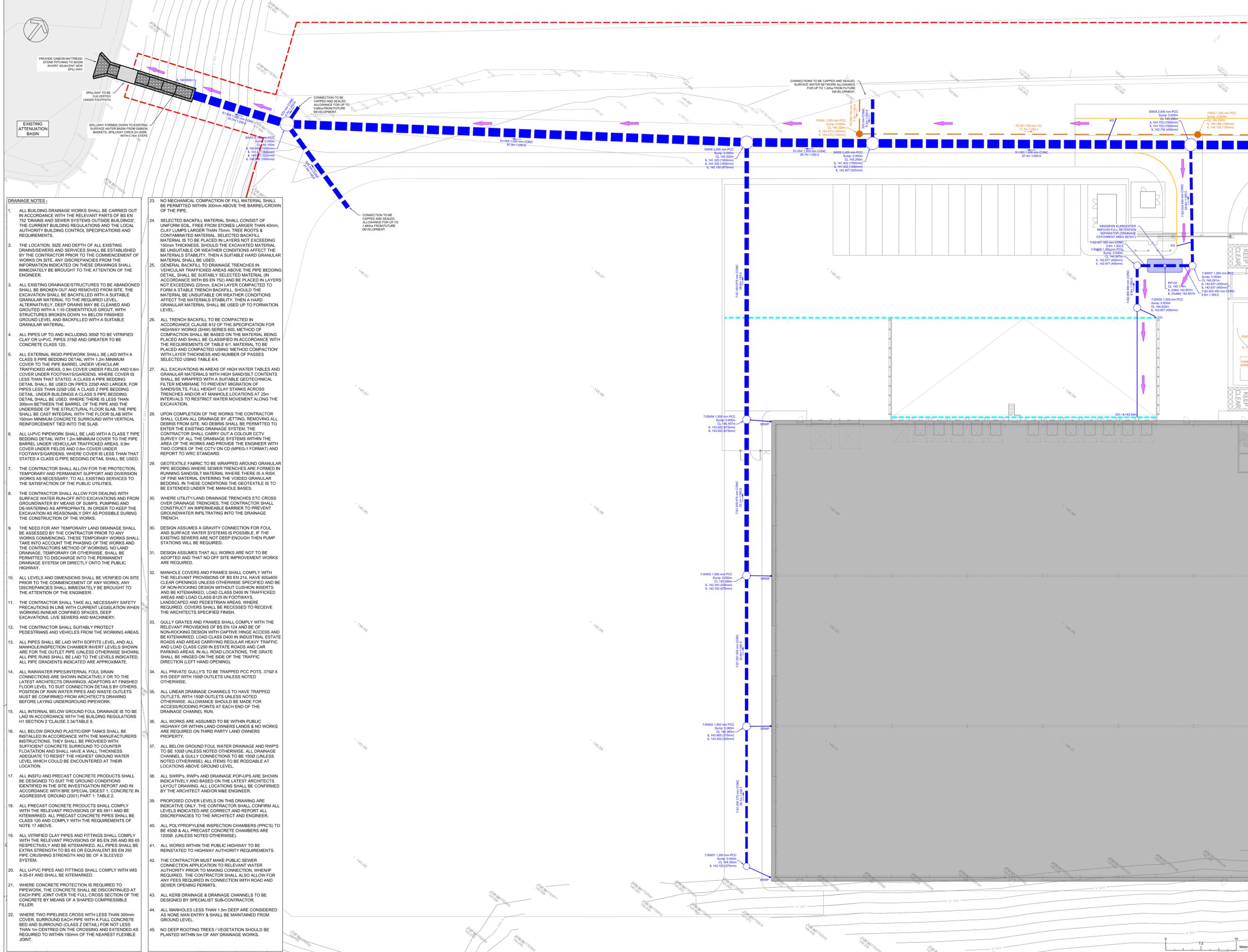
CLIENT: EOS INC LIMITED

CONSULTING CIVIL & STRUCTURAL ENGINEERS logo and contact information for HJCE.

STATUS: PRELIMINARY

Table with columns: DRAWN BY, CHECKED BY, APPROVED BY, HJCE REF., DATE, SCALES @ AC.

9466-HJCE-00-XX-DR-C-3100 PO1



DRAINAGE NOTES

- 1. ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT PARTS OF BS EN 752 DRAINS AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
2. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/SEWERS 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.
3. ALL EXISTING DRAINAGE/STRUCTURES TO BE ABANDONED SHALL BE BROKEN OUT AND REMOVED FROM SITE. THE EXCAVATION SHALL BE BACKFILLED WITH A SUITABLE GRANULAR MATERIAL TO THE REQUIRED LEVEL. ALTERNATIVELY, DEEP DRAINS MAY BE CLEANED AND GROUTED WITH A 1:10 CEMENTITIOUS GROUT. WITH STRUCTURES BROKEN DOWN 1m BELOW FINISHED GROUND LEVEL AND BACKFILLED WITH A SUITABLE GRANULAR MATERIAL.
4. ALL PIPES UP TO AND INCLUDING 3000 TO BE VITRIFIED CLAY OR U-PVC. PIPES 3750 AND GREATER TO BE CONCRETE CLASS 120.
5. ALL EXTERNAL RIGID PIPEWORK SHALL BE LAID WITH A CLASS S PIPE BEDDING DETAIL WITH 1.2m MINIMUM COVER TO THE PIPE BARREL UNDER VEHICULAR TRAFFICKED AREAS, 0.9m COVER UNDER FIELDS AND 0.6m COVER UNDER FOOTWAYS/GARDENS, WHERE COVER IS LESS THAN THAT STATED, A CLASS A PIPE BEDDING DETAIL SHALL BE USED ON PIPES 2250 AND LARGER, FOR PIPES LESS THAN 2250 USE A CLASS Z PIPE BEDDING DETAIL. UNDER BUILDINGS A CLASS S PIPE BEDDING DETAIL SHALL BE USED, WHERE THERE IS LESS THAN 300mm BETWEEN THE BARREL OF THE PIPE AND THE UNDERSIDE OF THE STRUCTURAL FLOOR SLAB, THE PIPE SHALL BE CAST INTEGRAL WITH THE FLOOR SLAB WITH 150mm MINIMUM CONCRETE SURROUND WITH VERTICAL REINFORCEMENT TIED INTO THE SLAB.
6. ALL U-PVC PIPEWORK SHALL BE LAID WITH A CLASS T PIPE BEDDING DETAIL WITH 1.2m MINIMUM COVER TO THE PIPE BARREL UNDER VEHICULAR TRAFFICKED AREAS, 0.9m COVER UNDER FIELDS AND 0.6m COVER UNDER FOOTWAYS/GARDENS, WHERE COVER IS LESS THAN THAT STATED A CLASS O PIPE BEDDING DETAIL SHALL BE USED.
7. 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 PUBLIC UTILITIES.
8. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUNOFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
9. THE NEED FOR ANY TEMPORARY LAND DRAINAGE SHALL BE ASSESSED BY THE CONTRACTOR PRIOR TO ANY WORKS COMMENCING. THESE TEMPORARY WORKS SHALL TAKE INTO ACCOUNT THE PHASING OF THE WORKS AND THE CONTRACTORS METHOD OF WORKING. NO LAND DRAINAGE, TEMPORARY OR OTHERWISE, SHALL BE PERMITTED TO DISCHARGE INTO THE PERMANENT DRAINAGE SYSTEM OR DIRECTLY ONTO THE PUBLIC HIGHWAY.
10. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN NEAR CONFINED SPACES, DEEP EXCAVATIONS, LIVE SEWERS AND MACHINERY.
12. THE CONTRACTOR SHALL SUITABLY PROTECT PEDESTRIANS AND VEHICLES FROM THE WORKING AREAS.
13. ALL PIPES SHALL BE LAID WITH SOFFITS LEVEL AND ALL MANHOLE/INSPECTION CHAMBER INVERT LEVELS SHOWN ARE FOR THE OUTLET PIPE (UNLESS OTHERWISE SHOWN). ALL PIPE RUNS SHALL BE LAID TO THE LEVELS INDICATED, ALL PIPE GRADIENTS INDICATED ARE APPROXIMATE.
14. ALL RAINWATER PIPES/INTERNAL FOUL DRAIN CONNECTIONS ARE SHOWN INDICATIVELY OR TO THE LATEST ARCHITECTS DRAWINGS, ADAPTORS AT FINISHED FLOOR LEVEL TO SUIT CONNECTION DETAILS BY OTHERS. POSITION OF RAIN WATER PIPES AND WASTE OUTLETS MUST BE CONFIRMED FROM ARCHITECTS DRAWING BEFORE LAYING UNDERGROUND PIPEWORK.
15. ALL INTERNAL BELOW GROUND FOUL DRAINAGE IS TO BE LAID IN ACCORDANCE WITH THE BUILDING REGULATIONS H1 SECTION 2 CLAUSE 2.34/TABLE 6.
16. ALL BELOW GROUND PLASTIC/GRP TANKS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. THEY SHALL BE PROVIDED WITH SUFFICIENT CONCRETE SURROUND TO COUNTER FLOATION AND SHALL HAVE A WALL THICKNESS ADEQUATE TO RESIST THE HIGHEST GROUND WATER LEVEL WHICH COULD BE ENCOUNTERED AT THEIR LOCATION.
17. ALL INSITU AND PRECAST CONCRETE PRODUCTS SHALL BE DESIGNED TO SUIT THE GROUND CONDITIONS IDENTIFIED IN THE SITE INVESTIGATION REPORT AND IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.
18. ALL PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE KITEMARKED. ALL PRECAST CONCRETE PIPES SHALL BE CLASS 120 AND COMPLY WITH THE REQUIREMENTS OF NOTE 17 ABOVE.
19. ALL VITRIFIED CLAY PIPES AND FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 296 AND BS 65 RESPECTIVELY AND BE KITEMARKED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT BS EN 296 PIPE CRUSHING STRENGTH AND BE OF A SLEEVED SYSTEM.
20. ALL U-PVC PIPES AND FITTINGS SHALL COMPLY WITH BS 4570 AND SHALL BE KITEMARKED.
21. WHERE CONCRETE PROTECTION IS REQUIRED TO PIPEWORK, THE CONCRETE SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL CROSS SECTION OF THE CONCRETE BY MEANS OF A SHAPED COMPRESSIBLE FILLER.
22. WHERE TWO PIPELINES CROSS WITH LESS THAN 300mm COVER, SURROUND EACH PIPE WITH A FULL CONCRETE BED AND SURROUND (CLASS Z DETAIL) FOR NOT LESS THAN 1m CENTRED ON THE CROSSING AND EXTENDED AS REQUIRED TO WITHIN 150mm OF THE NEAREST FLEXIBLE JOINT.

Appendix B

Appendix C



DRAINAGE & FLOOD RISK STATEMENT

Rockingham Phase 2 and 3 Barnsley

Reference	4652-2-JPG-XX-XX-RP-D-0620-S2-P01
Date	December 2019
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Appendix A Site Location Plan

Appendix B Topographic Survey

Appendix C Yorkshire Water Sewer Records

Appendix D Proposed Development Plan

Appendix E Environment Agency Flood Map

Appendix F Micro Drainage Greenfield Discharge Calculations

Appendix G Foul Water Drainage Calculations



CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

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This report has been prepared for the sole use and reliance of the above named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Rev	Date	Revision Details	Status	Author(s)	Approved
P01	16.12.2019	First Issue	Information	JDM	



1.0 INTRODUCTION

JPG (Leeds) Limited has been instructed by Harworth Group to carry out a Drainage and Flood Risk Assessment for a proposed commercial development on land immediately to the north and south of Dearne Valley Parkway.

The report will review the drainage and flood risk issues associated with the proposed development and recommend any mitigation which should take place as part of the development.

This document is prepared in accordance with the requirements of and in response to the Planning Practice Guidance & National Planning Policy Framework (NPPF) which states that those proposing particular developments are responsible for:

- Providing an assessment of whether any proposed development is likely to be affected by flooding and whether it will increase the flood risk elsewhere and of the measures proposed to deal with these effects and risks; and
- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect, to ensure that the site can be developed and occupied safely.

NPPF defines flood zones as follows:

- Zone 1 – Low Probability – less than 1 in 1000 annual probability (< 0.1%) of river or sea flooding in any year.
- Zone 2 – Medium Probability – between a 1 in 100 and 1 in 1000 annual probability (1% - 0.1%) of river flooding or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.
- Zone 3a – High Probability – 1 in 100 or greater annual probability (> 1%) of river flooding or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Zone 3b – Functional Floodplain – 1 in 20 or greater annual probability (5%) of river flooding in any year. This is land on which water has to flow or be stored in times of flood.

A Flood Risk Assessment is required for all sites in excess of 1ha within Zone 1 and all sites within Zones 2 and 3.



2.0 THE SITE

The site is located to the north east of Junction 36 of the M1 motorway, on both the north and south side of Dearne Valley Parkway, approximately 1.75km northwest of Hoyland town centre. The approximate centre of the site is located at NGR E435470, N401042.

Phase 2

The site is located to the south of Dearne Valley Parkway and is an irregular shape covering an area of approximately 28.037ha.

The site is bounded by Dearne Valley Parkway to the north, a bridle track running from the east around the southern boundary and beyond this is open fields.

To the west is a watercourse/ditch running from south to north including a small pond in the north west corner. Further over to the west is future development land.

The site comprises of restored former opencast working and currently is a mixture of fields interspaced with woodland areas.

The site generally falls from south to north in the order of 36.5m.

Phase 3

The site is located to the north of Dearne Valley Parkway and is an irregular shape covering an area of approximately 9.72ha.

The site is bounded by Dearne Valley Parkway to the south, open agricultural land to the north, an existing business park to the east and to the west is a watercourse/ditch, pond and further over an existing business park.

The site comprises of restored former opencast working and currently is a mixture of fields and interspaced with woodland areas.

The site generally falls from south to north in the order of 21.0m.

A Site Location Plan is located in Appendix A and topographic survey in Appendix B.



3.0 EXISTING DRAINAGE AND SEWER NETWORK

A Yorkshire Water public sewer plan is provided in Appendix C, this indicates the following public sewers in close proximity to the site:

- There is a 150 mm diameter public foul water sewer recorded to the north located within the phase 3 development land.

An open watercourse and pond exist running adjacent to the west of phase 2 which flows in a south to north direction.

This passes beneath Dearne Valley Parkway in a culvert and becomes open watercourse again with a further pond located to the west of Phase 3 development land.

This watercourse is understood to be a tributary of the downstream watercourse known as Short Wood Dike which is located to the north of the phase 3.



4.0 DEVELOPMENT PROPOSALS

It is proposed to develop both phase 2 and phase 3 sites for commercial development.

Proposed development area for phase 2 is approximately 28.00 Ha.
Impermeable area for Phase 2 is approximately 15.00 Ha.

Proposed development area for phase 3 is approximately 10.00 Ha.
Impermeable area for Phase 3 is approximately 6.500 Ha.

A proposed site plan is provided in Appendix D.



5.0 FLOOD RISK ASSESSMENT

Publicly available information on flooding obtained from the Environment Agency (EA) website database is provided in Appendix E.

The site is indicated to fall within Flood Zone 1 which comprises land assessed as having a low risk of flooding from watercourse and/or sea with less than a 1:1000 annual probability of river or sea flooding.

NPPF Technical Guidance states all uses of land are appropriate in Flood Zone 1.

As the site area is greater than 1ha other sources of flooding need to be considered.

These include:

- Adjoining land.
- Ground water.
- Flooding from sewers.
- Flooding from reservoirs, canals and other artificial sources.

5.1 Flooding from Adjoining Land

Phase 2

The site sits in an elevated position above land to the north (Dearne Valley Parkway).

To the south land is of a similar elevation to the site at the boundary.

The ground generally falls away to the south and west outside of the site boundary.

There is an area of higher ground in the south east corner, but this generally falls towards the east. Any overland flows from this area would pass the site to the east.

To the west is the existing watercourse/ditch which is at a considerably lower level than the proposed site. Therefore, overland flooding from this location is considered unlikely.

Phase 3

The site sits in an elevated position above the land to the north which is open fields and generally falls in a north east direction.

To the south land is of a similar elevation to the site at the boundary and is public highway (Dearne Valley Parkway).

Any runoff from the public highway would be contained within the confines of the highway and associated drainage system.

Land to both the east and west of the site generally falls from the south to the north and is of similar level to the proposed phase 3 development at the boundary.



Any overland flows from here would generally pass the site in a south to north direction. Therefore, overland flooding from these locations is considered unlikely.

The risk of flooding from adjoining land is considered to be **low**.

5.2 Flooding from Groundwater

The proposed sites will be in an elevated position in relation to the nearest watercourses, thus it is unlikely there will be an issue with groundwater effecting the site.

The risk of flooding from ground water is considered to be **low**.

5.3 Flooding from Sewers

The sewers in proximity to the site are public sewers owned by Yorkshire Water and will be subject to regular maintenance and inspection, therefore blockage of these sewers is unlikely.

The risk of flooding from sewers is considered to be **low**.

5.4 Flooding from Reservoirs, Canals and Other Artificial Sources

A surface water balancing pond is located to the west of the phase 3 site. This feature is understood to be a facility associated with the adjacent public highway (Dearne Valley Parkway), which is owned/maintained by the highway authority and will be subject to regular maintenance and inspection therefore blockage/overtopping of this facility unlikely.

There are no other known reservoirs, canals or artificial sources within the vicinity of the site. The site is therefore not at risk from such sources.

The risk of flooding from sewers is considered to be **low**.



6.0 SURFACE AND FOUL WATER DRAINAGE

The proposed site drainage will comprise of a separate surface and foul water drainage system.

The proposed drainage will be designed in accordance with current Building Regulations, SFA and industry best practice as required.

The following summarises the requirements for the discharge of surface and foul water from the site.

6.1 Sustainable Urban Drainage Systems (SUDS)

Initial investigations indicate the sites are underlain by significant depths of made ground/fill due to former mine workings in the area, therefore the disposal of surface water by infiltration methods is not deemed feasible.

Given the underlying ground strata the use of infiltration methods for the discharge of surface water is deemed unsuitable due to potential settlement issues associated with the made ground becoming inundated with surface water.

Sustainable Urban Drainage System (SUDS) may be used in conjunction with conventional drainage systems to improve water quality as well as manage surface water discharge.

The following audit has been carried out relating to suitability of SUD's systems.

Drainage Method	Description/Suitability	Proposal/Feasibility
1. Infiltration.	Methods not deemed suitable due to underlying ground strata	Not applicable.
2. Ponds and wetlands.	May be suitable if land is allocated	Applicable.
3. Infiltration Basins.	Methods not deemed suitable due to underlying ground strata	Not applicable.
4. Detention Basins.	May be suitable if land is allocated.	Applicable.
5. Swale.	May be utilised convey water.	Applicable.
6. French/Filter drain.	May be utilised convey water.	Applicable.
7. Pervious/Permeable Pavement.	Methods not deemed suitable due to underlying ground strata	Not applicable.
8. Geocellular Systems/Tank systems.	May be used as surface water attenuation.	Applicable.
9. Oversized pipes.	May be used as surface water attenuation.	Applicable.
10. Box culverts.	May be used as surface water attenuation.	Applicable.
11. Purpose designed tanks.	May be used as surface water attenuation.	Applicable.

6.2 Surface Water Drainage

The disposal of surface water shall be in accordance with the Requirement H3 of Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway/infiltration system, watercourse and public sewer in that priority order.

As noted in Section 6.1 the discharge of surface water drainage via infiltration methods is not feasible, therefore the second consideration should be discharge to watercourse.



The nearest watercourse is a tributary of the downstream watercourse known as Short Wood Dike. Short Wood Dike is located within land to the north of phase 3.

The tributary which passes adjacent to both phases of the development is located to the west and runs in a south to north direction passing beneath Dearne Valley Parkway.

This is the proposed location for discharge of surface water from both phases. Surface water discharge from the both sites would be restricted to agreed rates with the LLFA (Barnsley).

In previous consultation with Barnsley MDC land drainage department as part of the Hoyland Master Plan Strategy which cover phase 2 of the development. BMDC confirmed a greenfield discharge rate of 4.4 litres/second/hectare is applicable for the area which covers phase 2.

Based on the above figure the greenfield run off for the two phases would be as follows:

- Phase 2 impermeable area approximately 15.00Ha x 4.4l/s/ha = 66.0 l/s.
- Phase 3 impermeable area approximately 6.50Ha x 4.4l/s/ha = 28.6 l/s.

In addition, greenfield run-off calculations have also been prepared using Windes Micro Drainage software and results are located in Appendix F.

Greenfield run off based on the Micro Drainage calculations would be as follows:

- Phase 2 impermeable area approximately 15.00Ha (QBAR) = 62.2 l/s.
- Phase 3 impermeable area approximately 6.50Ha (QBAR) = 26.9 l/s.

The lower of the above figures will be used to calculate preliminary attenuation volumes.

Phase 2 Attenuation Volumes

Given the restricted surface water discharge rate on-plot surface water attenuation will be required, it is proposed this will be provided in a detention basin to the west of the site.

The following provides a brief calculation of the approximate volumes of attenuation using the 'Quick Storage Estimate' element of Windes Microdrainage:

Storage Design Parameters

- Restricted discharge rate = 62.2 litres/second.
- Site area to be developed = 28.00Ha.
- Proposed Impermeable area = 15.00 Ha. (53.5% impermeable).
- M5-60 = 19.0.
- Ratio R = 0.363



- 1:2 Year Return Period = 2089-3366 m³.
- 1:30 Year Return Period = between 4736-6916 m³.
- 1:100 Year Return Period (+30% cc) = between 9280-12909 m³.

The proposed onsite drainage system shall be designed in accordance with the requirements of Building Regulations and Sewers for Adoption and shall demonstrate that:

- No surcharge of pipes occurs in the 1 in 2-year rainfall event.
- No surface flooding occurs in 1 in 30-year rainfall event.
- No flooding to buildings and adjacent properties occurs in 1 in 100-year rainfall event (including an allowance of 30% for the effects of future climate change), as defined in NPPF Technical Guidance.

Phase 3 Attenuation Volumes

Given the restricted surface water discharge rate on-plot surface water attenuation will be required, it is proposed this will be provided in a detention basin to the north of the site.

The following provides a brief calculation of the approximate volumes of attenuation using the 'Quick Storage Estimate' element of Windes Microdrainage:

Storage Design Parameters

- Restricted discharge rate = 28.6 litres/second.
- Site area to be developed = 10.00Ha.
- Proposed Impermeable area = 6.50 Ha. (65.0% impermeable).
- M5-60 = 19.0.
- Ratio R = 0.363
- 1:2 Year Return Period = 884-1420 m³.
- 1:30 Year Return Period = between 2010-2939 m³.
- 1:100 Year Return Period (+30% cc) = between 3953-5511 m³.

The proposed onsite drainage system shall be designed in accordance with the requirements of Building Regulations and Sewers for Adoption and shall demonstrate that:

- No surcharge of pipes occurs in the 1 in 2-year rainfall event.
- No surface flooding occurs in 1 in 30-year rainfall event.
- No flooding to buildings and adjacent properties occurs in 1 in 100-year rainfall event (including an allowance of 30% for the effects of future climate change), as defined in NPPF Technical Guidance.



6.3 Foul Water Drainage

The proposed foul water discharge has been calculated for both phases and is detailed below:

- Phase 2 foul water discharge – 16.80 l/s (design flow 6xDWF+10%).
- Phase 3 foul water discharge – 6.00 l/s (design flow 6xDWF+10%).

Calculations have been carried out using the method as detailed in SFA.

Foul Water drainage calculations are in Appendix G.

Discharge from both sites is proposed to drain into the existing 150 diameter public foul water sewer located in phase 3 land.

Discharge from Phase 3 will be directly into the public sewer at a convenient location to suit the proposed development.

Discharge from Phase 2 would be via a new section of sewer/drain to be constructed from the south to the north of Dearne Valley Parkway.

The pipe would pass beneath Dearne Valley Parkway via a method to be agreed with BMBC Highways. Possibly directional drilling.

This sewer/drain is to be sized to take Phase 2 along with foul water discharge from the Waddington and Gregory developments to the west.

The drain is been designed and precured by Waddingtons as their development will come on line first. Details are to be finalised by Waddingtons.

The proposed drain will be designed to SFA and Yorkshire Water Requirement and have sufficient capacity to serve all three developments.

The drain will be put forward for adoption at such a time that the criteria for adoption is met.

At the time of writing the drainage and flood risk assessment correspondence from YW had not been received. The report will be reviewed and updated as necessary once correspondence has been received from YW who are the local Sewerage/Water Company.



7.0 DRAINAGE MAINTENANCE AND MANAGEMENT

The proposed foul and surface water drainage systems including the detention basin will remain private in the short term.

The following maintenance and management guidance is provided.

7.1 Introduction

Pipe sizes and gradients are designed to be self-cleansing albeit regular maintenance and inspections are required to ensure the long-term efficiency of the systems.

All works should be undertaken by suitably qualified personnel and waste should be treated and removed by an appropriately registered company.

7.2 Drains/Sewers

The main objective of maintenance guidance is to establish procedures to ensure the sewer system functions appropriately in the long term within an environment of fiscal control.

Maintenance includes:

- Local repair or local replacement of damaged pipes or other structures in order to maintain the functioning of the sewer.
- Cleaning and removal of sediments, obstructions etc. to restore hydraulic capacity.
- Jetting/vacuum of sewers to be undertaken as often as necessary to remove silts and/or ordinary debris.
- In the event that any extraordinary issues are encountered during an inspection, further information may be required such as a CCTV survey report.
- Maintenance to be undertaken on a six monthly schedule.

To avoid damaging the pipe, PSI pressures need to be verified before jetting of plastic twin wall sewers. Cleaning of drainage systems may require the temporary sealing of the system and careful collection of the effluent for disposal off site.



7.3 Detention Basin

Regular inspection and maintenance is important for the effective operation of the detention basin. CIRIA's SUDS manual C753 Table 23.1 recommends the following maintenance regime for detention basins:

Maintenance schedule	Required action	Typical Frequency
Regular Maintenance	Remove litter and debris.	Monthly (or as required).
	Cut the grass – public areas.	Monthly (during growing season).
	Cut the meadow grass.	Half yearly (spring, before nesting season, and autumn).
	Inspect marginal and bankside vegetation and remove nuisance plants (first 3 years).	Monthly (at start, then as required).
	Inspect inlets, outlets, bankside, structures, pipework, etc. for evidence of blockage and/or physical damage.	Monthly.
	Inspect water body for signs of poor water quality.	Monthly (May – October).
	Inspect silt accumulation rates in any dry weather channel and in main body of the basin and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly.
	Check any mechanical devices, e.g. flow controls.	Half yearly.
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above basin base; include 25% of basin surface).	Annually.
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level.	Annually.
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually.
	Remove sediment from any dry weather channel.	Every 1-5 years, or as required.
	Remove sediment and planting from one quadrant of the main body of basins.	Every 5 years, or as required.
	Occasional maintenance	Remove sediment from the main body of big basins when pool volume is reduced by 20%.
Remedial actions	Repair erosion or other damage.	As required.
	Replant, where necessary.	As required.
	Repair/rehabilitation of inlets, outlets and overflows.	As required.

This regime can be tailored to suit the detention basin dependant on final landscaping details and many of the maintenance activities may be undertaken as landscaping maintenance.

7.4 Flow Control Chamber

The surface water drainage network has a discharge restriction imposed by Barnsley MBC; this is controlled by a flow control device.



Regular inspections of the flow control chamber should be carried out to ensure that debris that may obstruct the inlet to the flow control is not present. The frequency of inspection will depend on the location of the unit, it is recommended initial inspections should be on a three-month basis for the first year of operation followed by a six-monthly basis thereafter.

In the event that the inlet to the control unit becomes blocked, the pivoting bypass door may be operated by pulling the wire rope attached upwards to drain down the chamber and provide access for maintenance.

7.5 Manholes/Access Chambers

All manhole covers should be lifted, and the manholes visually inspected for silt, debris and signs of blockages within the drainage system. Check manhole covers and frames for damage and ensure correctly bolted together. This should be undertaken on a six monthly basis.

Should any debris or blockages be detected, the manholes should be cleaned along with associated pipe runs which should be high pressure jetted and CCTV surveyed to verify/identify that no further remedial works are required.



8.0 CONCLUSIONS

This assessment has looked at the drainage and flood risk issues to support a proposed commercial development on land adjacent to Dearne Valley Parkway.

The site lies within Flood Zone 1 and is therefore at low risk of flooding from river or sea. NPPF Technical Guidance states all uses of land are appropriate in Flood Zone 1.

Other sources of flooding have been assessed and the risk of flooding from these sources is considered to be low.

Surface water shall discharge to tributary of the downstream watercourse known as Short Wood Dike which passes through the west of the site.

Discharge from both phases will be restricted to greenfield run off rate as detailed in the report.

Surface water attenuation will be provided in a detention basin located to the west of the phase 2 development and to the north of the phase 3 development.

Foul water drainage will discharge to the existing 150 diameter public foul water sewer located in phase 3 land subject to agreement by YW.

Jonathan Millar
For and behalf of JPG (Leeds) Limited

December 2019



Appendix A Site Location Plan

DO NOT SCALE

NOTES

GENERAL NOTES

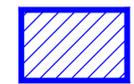
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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.

SITE INFORMATION

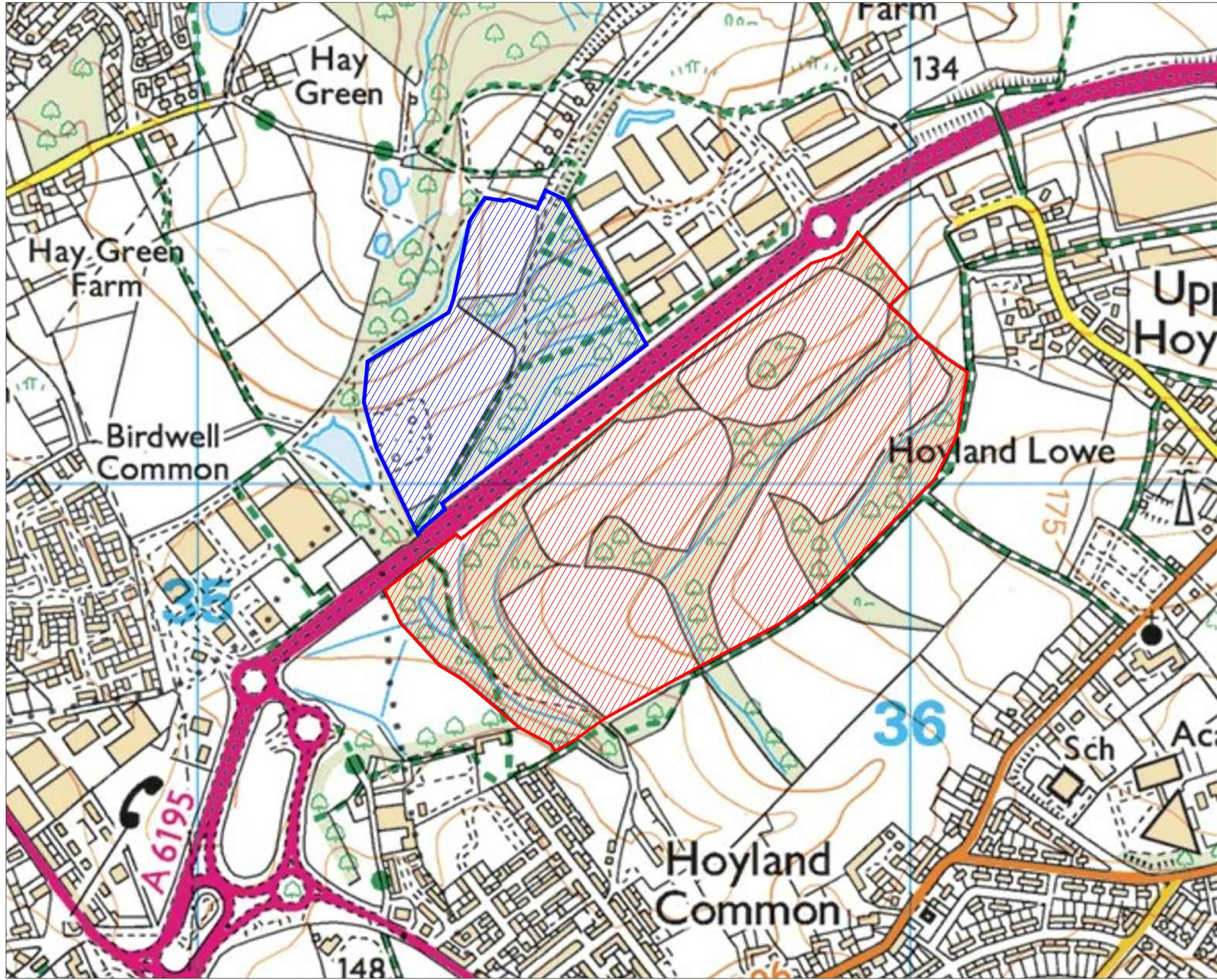
SITE ADDRESS
 ADDRESS - DEARNE VALLEY PARKWAY
 NEAREST POSTCODE - S74 9LH
 OS SHEET/TILE - SE354010
 OS CO-ORDINATES - E435470, N401042



SITE LOCATION PHASE 2



SITE LOCATION PHASE 3



REV	DESCRIPTION	DATE	BY
-----	-------------	------	----

Project
 ROCKINGHAM PHASES 2 AND 3

Drawing Title
 LOCATION PLAN

INFORMATION ISSUE

Architect
 THE HARRIS PARTNERSHIP



JPG Project Ref	Scale at A1	Date	Checked	Drawn
4652-2	1:2500	DEC 2019	JDM	JDM



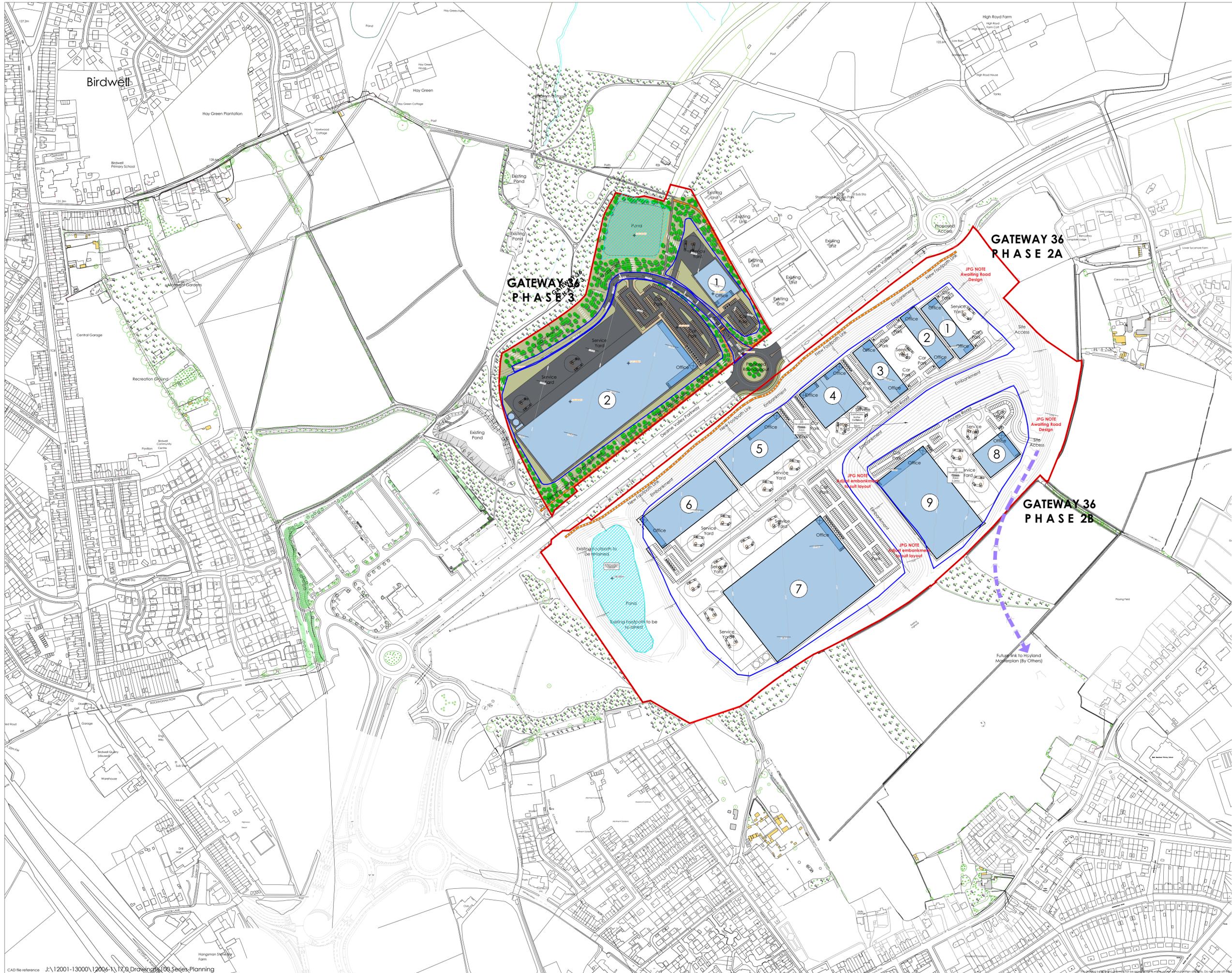
Appendix B Topographic Survey



Appendix C Yorkshire Water Sewer Records



Appendix D Proposed Development Plan



Schedule of Accommodation

Phase 2		
Unit	ft ²	m ²
Unit 1	26,000	2,415.5
Unit 2	26,000	2,415.5
Unit 3	30,000	2,787.1
Unit 4	50,000	4,645.2
Unit 5	60,000	5,574.2
Unit 6	80,000	7,432.3
Unit 7	250,000	23,225.8
Unit 8	25,000	2,322.6
Unit 9	130,000	12,077.4

Phase 3		
Unit	ft ²	m ²
Unit 1	25,000	2,322.6
Unit 2	250,000	23,225.8

Total 952,000 ft² 88,443.8 m²

Office content (10% of upper levels)
95,200 ft² 8,844.4 m²

Development Total (inc Office content)
1,047,200 ft² 97,288.2 m²

Note:
Information is based on OS map and received information and is subject to full topographical and building survey.
Assumed site boundary and site constraints subject to confirmation.
All Legal easements and extent of existing underground services locations are subject to confirmation.



DRAFT

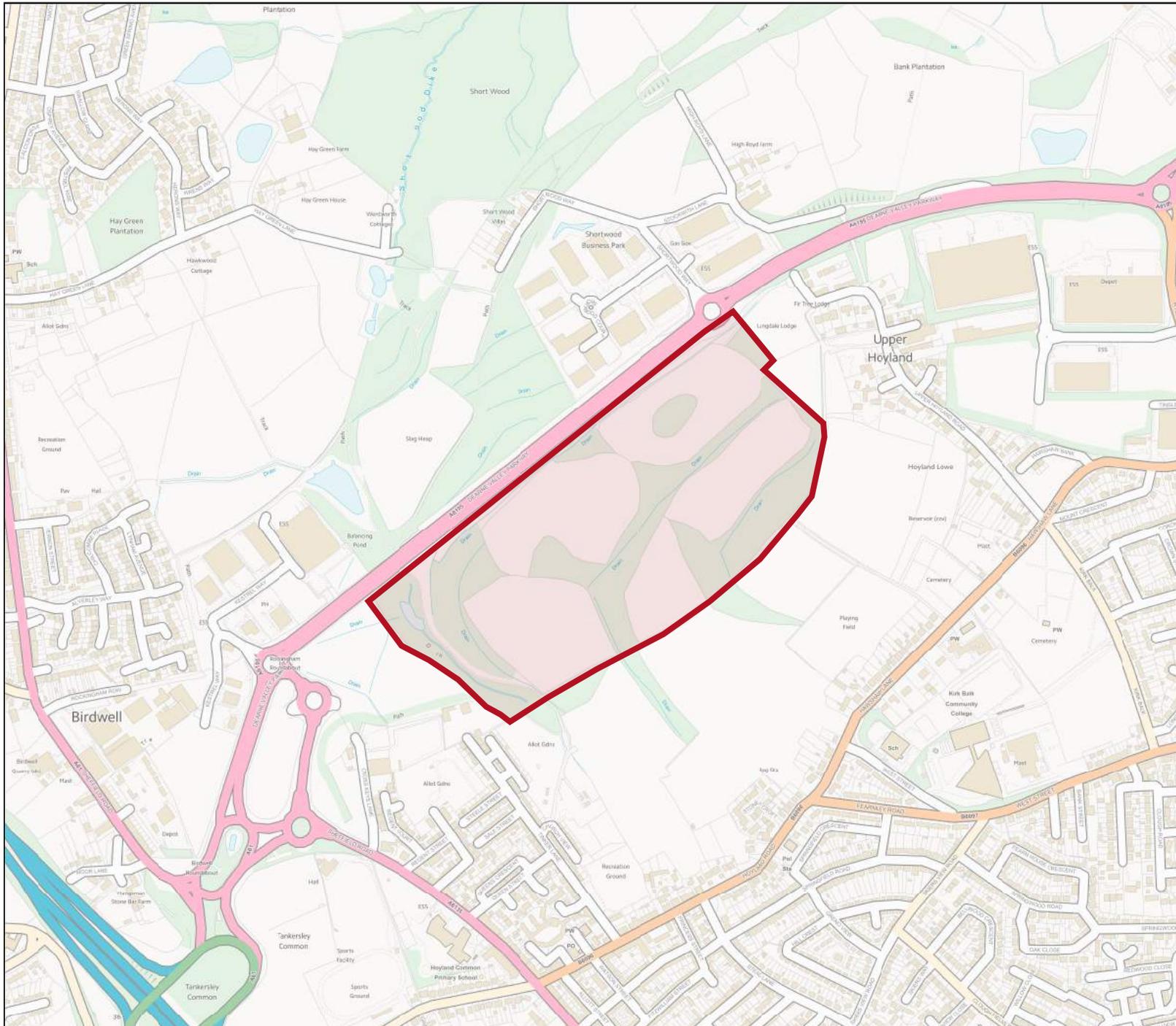
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Status: FOR PLANNING						
Scale: 1:2500			Drawing Size: A1			
Date:	11.2019	Drawn By:	NBB	Checked:	JMR	
Drawing title: PROPOSED MASTERPLAN						
Job-Dwg No:	12006-1-110				Rev:	-

- 21, Johns North, Wakefield, WF1 3GA t. 01924 291800
- Carvers Warehouse, 77 Dale Street, Manchester, M1 2HG t. 0161 238855
- The Old Rectory, 79 High Street, Newport Pagnall, MK16 8AB t. 01788 211377
- 101 London Road, Reading, RG1 5BT t. 0118 9507700
- 10 Gae Court, St Christophers Place, London, W1U 1JJ t. 0207 4091215





Appendix E Environment Agency Flood Map



Flood map for planning

Your reference
4652-2-Ph2

Location (easting/northing)
435669/400991

Scale
1:10000

Created
16 Dec 2019 8:32

-  Selected area
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area



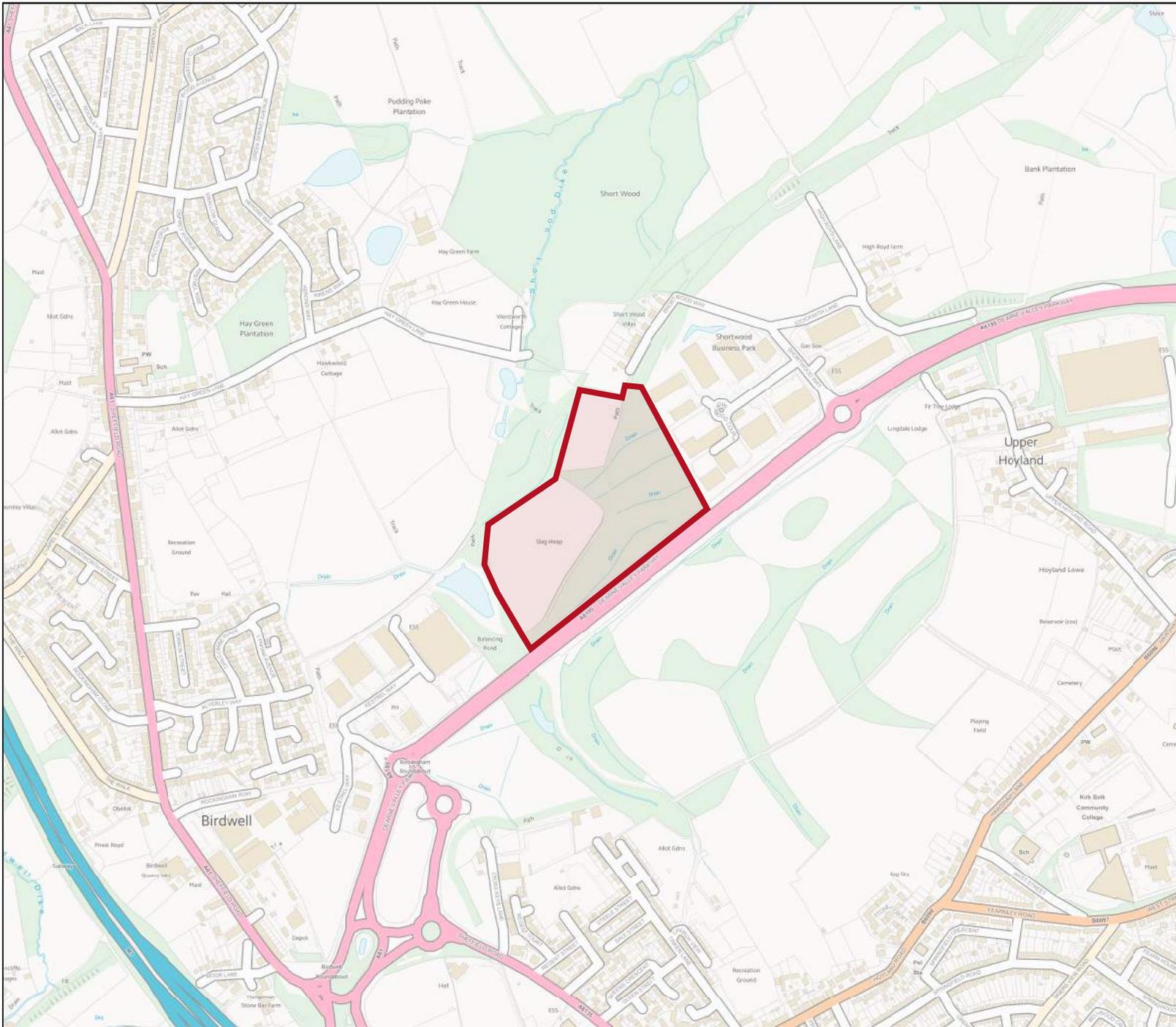
Flood map for planning

Your reference
4652-2-Ph3

Location (easting/northing)
435431/401175

Scale
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Created
16 Dec 2019 8:34



-  Selected area
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area





Appendix F Micro Drainage Greenfield Discharge Calculations

5 John Charles Way
Leeds
LS12 6QA



Date 16/12/2019 10:54
File 180808-5377-BASIN-01-10...

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)	15.000	Urban	0.000
SAAR (mm)	666	Region Number	Region 3

Results 1/s

QBAR Rural	62.2
QBAR Urban	62.2

Q1 year 53.5

Q1 year	53.5
Q30 years	109.3
Q100 years	129.3

5 John Charles Way
Leeds
LS12 6QA



Date 16/12/2019 11:03
File 180808-5377-BASIN-01-10...

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)	6.500	Urban	0.000
SAAR (mm)	666	Region Number	Region 3

Results 1/s

QBAR Rural 26.9
QBAR Urban 26.9

Q1 year 23.2

Q1 year 23.2
Q30 years 47.4
Q100 years 56.0



Appendix G Foul Water Drainage Calculations

Project: ROCKINGHAM PHASES 2 AND 3			
Date: 09.12.2019	Job No. 4652-2	Sheet No. 1	Rev A
By: JDM			
Checked:			
Title: Preliminary FW Calculations Phase 2			



Residential Developments

Based on SFA rate of 4000.0 Litres/dwelling/day

Use	L/Day	No.	Total (L/day)
General Housing	4000 per dwelling	0.0	0.00

Design Flow = Total/86400 Second = 0.000 l/s (6DWF+10%)
0.000 l/s (1xDWF)

Commercial/Industrial Developments

Based on SFA allow 0.6 litres/second/hectare of developable land for domestic flow

Domestic Flow	Area (ha)	Flow l/s
Commercial	28.000	16.800

Based on SFA allow 0.5 litres/second/hectare of developable land for trade effluent normal process and 1.0 litres/second/hectare of developable land for wet process

Trade Effluent	Area (ha)	Flow l/s
Normal	0.000	0.000
Wet	0.000	0.000

Total flow domestic + trade effluent = 16.800 l/s

Based on SFA allow 0.7 litres/second/hectare of developable land where proportion of wet industry is not known

Domestic +Trade	Area (ha)	Flow l/s
Commercial	0.000	0.000

Design Assumptions based on HCA drawing
671.60 (90) 001 & 671.60 (90) 002

Project: ROCKINGHAM PHASES 2 AND 3				
Date:	09.12.2019	Job No.	Sheet No.	Rev
By:	JDM	4652-2	1	A
Checked:				
Title: Preliminary FW Calculations Phase 3				



Residential Developments

Based on SFA rate of 4000.0 Litres/dwelling/day

Use	L/Day	No.	Total (L/day)
General Housing	4000 per dwelling	0.0	0.00

Design Flow = Total/86400 Second = 0.000 l/s (6DWF+10%)
0.000 l/s (1xDWF)

Commercial/Industrial Developments

Based on SFA allow 0.6 litres/second/hectare of developable land for domestic flow

Domestic Flow	Area (ha)	Flow l/s
Commercial	10.000	6.000

Based on SFA allow 0.5 litres/second/hectare of developable land for trade effluent normal process and 1.0 litres/second/hectare of developable land for wet process

Trade Effluent	Area (ha)	Flow l/s
Normal	0.000	0.000
Wet	0.000	0.000

Total flow domestic + trade effluent = 6.000 l/s

Based on SFA allow 0.7 litres/second/hectare of developable land where proportion of wet industry is not known

Domestic +Trade	Area (ha)	Flow l/s
Commercial	0.000	0.000

Design Assumptions based on HCA drawing
671.60 (90) 001 & 671.60 (90) 002

5 John Charles Way
LEEDS
LS12 6QA

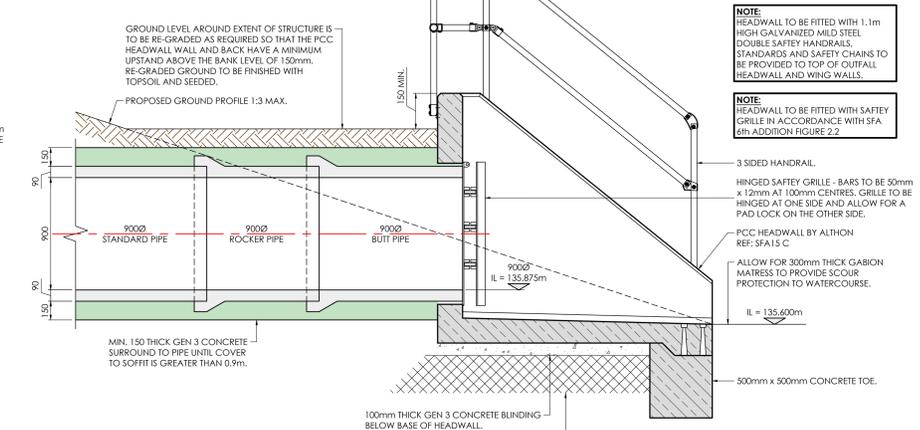
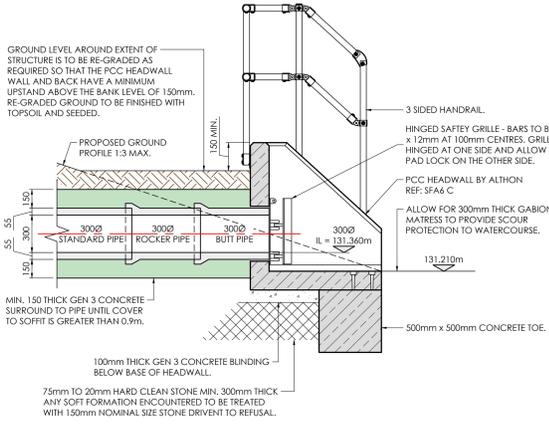
Tel: 0113 263 1155
admin@jpg.group
www.jpg.group



Appendix D

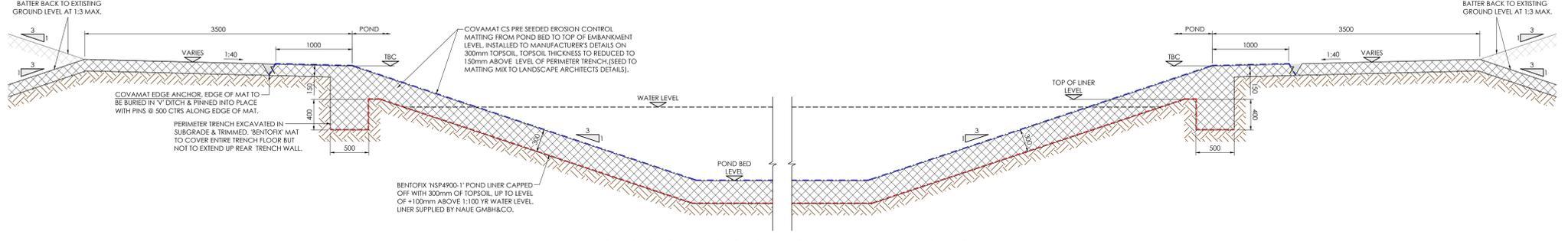
DO NOT SCALE
NOTES

- LEGEND:**
- PROPOSED SITE BOUNDARY
 - EXISTING FW DRAINS/SEWERS
 - EXISTING SW DRAINS/SEWERS
 - PROPOSED FW DRAINS/SEWERS
 - PROPOSED SW DRAINS/SEWERS
 - PROPOSED FW RISING MAIN
 - PROPOSED SW RISING MAIN
 - EXISTING FW MANHOLE
 - EXISTING SW MANHOLE
 - PROPOSED FW MANHOLE
 - PROPOSED SW MANHOLE
 - PROPOSED FW PUMPING STATION
 - PROPOSED SW PUMPING STATION
 - PROPOSED SW INTERCEPTOR
 - WPC
 - RWP
 - RG
 - RE
 - PROPOSED WASTE PIPE CONNECTION SIZE & LOCATION IBC BY OTHERS
 - PROPOSED RAINWATER DOWN PIPE SIZE & LOCATION IBC BY OTHERS
 - PROPOSED TRADITIONAL TYPE ROAD GULLY WITH 1500mm OUTLET PIPE
 - PROPOSED RODDING EYE
 - PROPOSED DRAINAGE CHANNEL
 - PROPOSED KERB DRAINAGE
- 1. 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 PUT FORWARD FOR ADOPTION EITHER WITHIN THE SITE OR OUTSIDE SHALL BE CONSTRUCTED TO SPECIFICATIONS FOR ADOPTION 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 OBTAINED 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 ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE UTILITY COMPANIES.
 5. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPS AND DE WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS READABLE AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
 6. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 7. ALL EXISTING DRAINAGE LOCATIONS AND LEVELS ARE TO BE CONFIRMED BY THE CONTRACTOR AND THE ENGINEER NOTIFIED BEFORE ANY DRAIN RUNS ARE CONSTRUCTED.
 8. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD ANY EXISTING LIVE DRAINAGE BE FOUND WITHIN THE SITE BOUNDARY SERVING ADJACENT PROPERTIES.
 9. ALL EXISTING DRAINAGE WITHIN THE SITE NOT REQUIRED FOR THE NEW DEVELOPMENT SHALL BE ABANDONED. DRAINS AND SEWERS LESS THAN 1500mm DEEP WHICH ARE IN OPEN GROUND SHOULD AS FAR AS PRACTICABLE BE FULLY COVERED. OTHER PIPES SHOULD BE SEALED AT BOTH ENDS AND AT ANY POINT OF CONNECTION, AND BE GROUT FILLED TO ENSURE THAT RATS CANNOT GAIN ACCESS. LARGER PIPES 225mm OR ABOVE SHOULD BE GROUT FILLED TO PREVENT SUBSIDIANCE OR DAMAGE TO BUILDINGS OR SERVICES IN THE EVENT OF COLLAPSE.
 10. ALL MANHOLE/CHAMBER COVER LEVELS ARE APPROXIMATE AND SHALL BE ADJUSTED ON SITE TO SUIT THE PROPOSED FINISHED LEVELS.
 11. CONNECTIONS FROM WPC TO BE LAID AT 1/40 MINIMUM AND 1/10 MAXIMUM GRADIENTS WHERE CONSTRUCTED UNDER THE BUILDING.
 12. ALL PIPE CONNECTION FROM DRAINAGE CHANNELS AND GULLIES SHALL BE 1500mm PIPES AT A MINIMUM GRADIENT OF 1/100 WITH CLASS 5 BEDDING UNLESS OTHERWISE INDICATED ON THE DRAWING.
 13. ALL PIPE CONNECTIONS FROM RWPTS TO BE 1000mm AT 1/40 MIN. WITH CLASS 5 BEDDING BENEATH THE BUILD AND CLASS 2 UNDER EXTERNALS WHERE COVER IS LESS THAN 1.20m. ON THE DRAWING LOCATION OF RWPTS TO BE CONFIRMED BY THE ARCHITECT SHOWN INDICATIVELY ON THE DRAWING.
 14. ALL SYNTHETIC RWP SYSTEMS TO BE DESIGNED BY OTHERS. PIPES FROM DOWN PIPE TO FIRST MANHOLE TO BE SIZED/DESIGNED BY SYNTHETIC SYSTEM DESIGNER. THE FIRST MANHOLE TO HAVE AN OPEN GRADE COVER SAFTER WATERWAY 2000 - D400 OR SIMILAR APPROVED.
 15. ALL PIPE CONNECTIONS FROM RWPTS TO FIRST CHAMBER SHALL BE 1000mm AT 1/40 MIN. WITH CLASS 5 BEDDING BENEATH THE BUILD AND CLASS 2 UNDER EXTERNALS WHERE COVER IS LESS THAN 1.20m. ON THE DRAWING LOCATION OF RWPTS TO BE CONFIRMED BY THE ARCHITECT AND TENANT (NOTE ADDITIONAL CHAMBERS AND PIPE WORK MAYBE REQUIRED TO SUIT THE TENANT'S LAYOUT).
 16. LOCATION SIZE AND SETTING OUT OF ALL RAINWATER AND WASTE PIPE CONNECTIONS REFER TO THE RELEVANT ARCHITECT'S DRAWING FOR DESIGN PURPOSES THESE HAVE BEEN ASSUMED.
 17. SUITABLY SIZED PERCOL INTERCEPTORS MUST COMPLY WITH THE REQUIREMENTS OUTLINE IN PP103 THESE INCLUDE SILT STORAGE CAPACITY AND HIGH LEVEL HYDROCARBON ALARM, WIRED BACK TO A MANNED OFFICE.
 18. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN NEAR CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
 19. THE CONTRACTOR SHALL ALLOW FOR OBTAINING ALL APPROVALS FROM THE RELEVANT AUTHORITIES WHEN WORKING IN THE PUBLIC HIGHWAY AND ON THE SEWERAGE SYSTEM.
 20. THE CONTRACTOR SHALL SUITABLY PROTECT PEDESTRIANS AND VEHICLES FROM WORKING AREAS.
 21. ALL PIPES SHALL BE LAID WITH LEVEL SOFFITS AND ALL MANHOLE/INSPECTION CHAMBER INVERT LEVELS SHOWN ARE FOR THE OUT GOING PIPE UNLESS OTHERWISE INDICATED IN THE DRAWING. PIPE RUNS SHALL BE LAID TO THE INVERT LEVELS AS DETAIL ON THE CONTRACT DRAWINGS. NOTE THAT ALL PIPE GRADIENTS INDICATED ON THE DRAWINGS ARE APPROXIMATE.
 22. ALL RAINWATER PIPES AND INTERNAL FOUL DRAIN CONNECTIONS POINTS ARE TO BE SIZED & POSITIONED AS SHOWN ON THE ARCHITECT'S DRAWINGS. THE CONTRACTOR SHALL SUITABLY ADAPTORS AT PROPOSED GROUND LEVELS OR FINISHED FLOOR LEVEL TO ALLOW CONNECTION OF THE ABOVE DRAINAGE SYSTEM (DETAILS OF THE ABOVE GROUND DRAINAGE SYSTEM ARE ADAPTOR ALL BY OTHERS).
 23. UPON COMPLETION OF THE DRAINAGE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAIN RUNS 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 CITY 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.

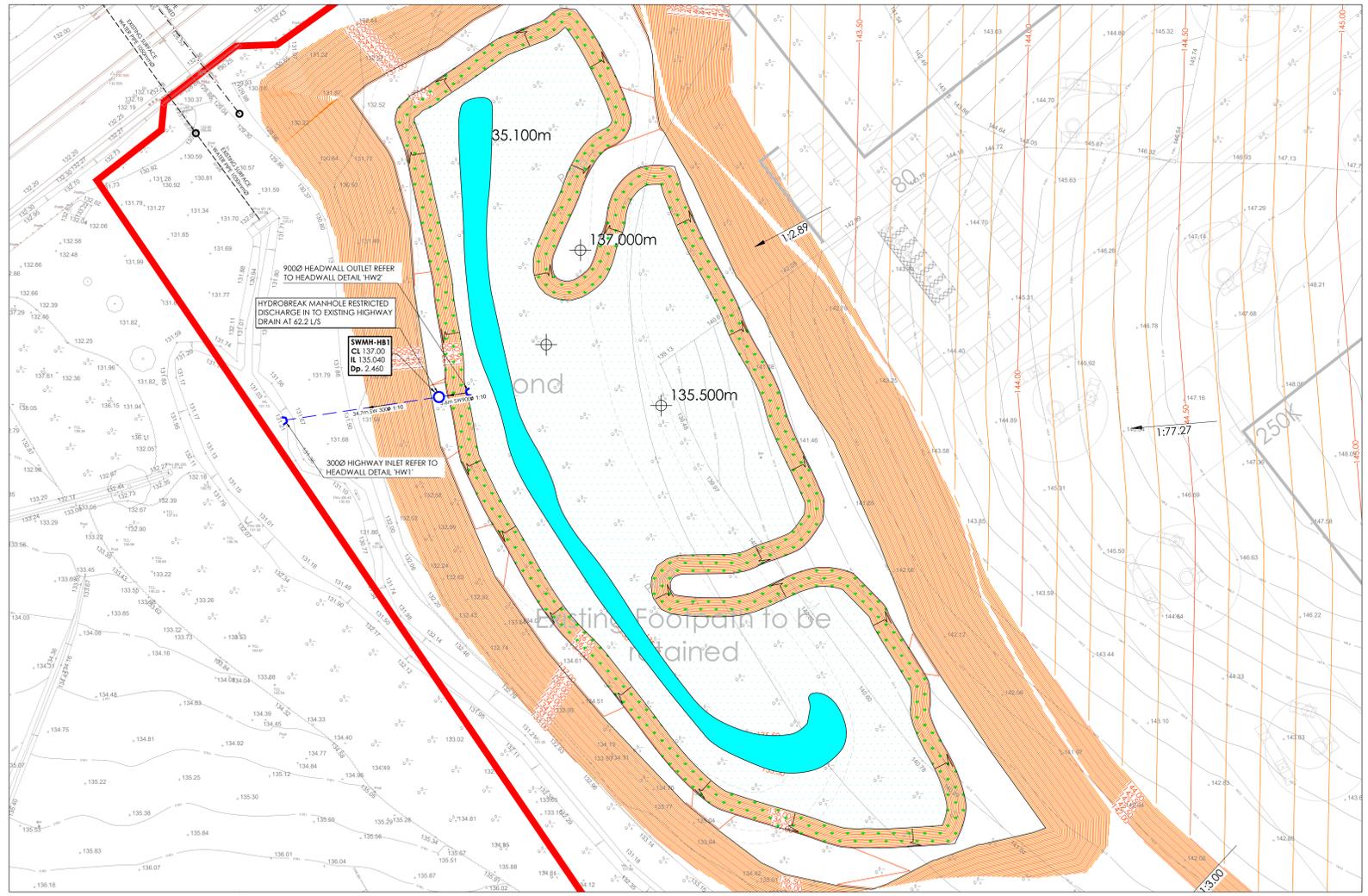


HW1
SECTION THROUGH 3000 SURFACE WATER OUTLET PIPE TO WATERCOURSE
SCALE 1:20

HW2
SECTION THROUGH 9000 SURFACE WATER OUTLET PIPE TO WATERCOURSE
SCALE 1:20



TYPICAL SECTION THROUGH SURFACE WATER ATTENUATION POND
SCALE 1:25



ATTENUATION / OUTFALL LAYOUT
SCALE 1:500

SURFACE WATER MANHOLE SCHEDULE										
REF.	COVER LEVEL	INVERT LEVEL	SUMP DEPTH	DEPTH	EASTINGS	NORTHINGS	DIAMETER	TYPE	COVER	NOTES
HB1	137.00m	135.04m	0.500m	2.460m	435373.794	40827.606	2100mm	TYPE B	1200x600 - CLASS D400	FLOW CONTROL CHAMBER

NOTE: ALL INVERT LEVELS SHOWN ARE FOR THE OUT GOING PIPE. ALL PIPES SHALL BE LAID WITH LEVEL SOFFITS (UNLESS OTHERWISE INDICATED ON THE DRAWING)

REV	DESCRIPTION	DATE	BY
P03	TYPICAL SECTION THROUGH ATTENUATION POND ADDED.	13.05.20	JAC
P02	FURTHER DETAIL ADDED TO DRAINAGE LAYOUT	30.04.20	RWR
P01	FIRST ISSUE.	28.02.20	LSG

Project
ROCKINGHAM PHASE 2A & 2B HOYLAND

Drawing Title
PHASE 2 ATTENUATION POND OUTFALL DETAILS

Information Issue
Architect
THE HARRIS PARTNERSHIP



Appendix E

Drainage Management & Maintenance Plan

Unit 7, Gateway 36

Dearne Valley Parkway, Barnsley

Prepared For

EOS Inc. Limited

Report: 9466-HJCE-00-XX-RP-C-3001.v1

Date: September 2025

Document Revisions

Revision	Date	Written by	Checked by
P01	04.09.25	AF	MH

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Appendices

- Appendix A HJCE Drainage Layout Drawings
- Appendix B Maintenance Schedule

1. Introduction

- 1.1. This report is the property of HJ Consulting Engineers (HJCE) and is produced for the exclusive use of the client, EOS Inc. Limited. The contents may not be made use of by any third party without the express written consent of HJCE. Without such consent HJCE can accept no responsibility to any third party. By receiving this report and acting on it, the client, or any third party relying on it, accepts that no individual is personally liable in contract, tort, or breach of statutory duty (including negligence).
- 1.2. The purpose of this document is to establish the correct procedures to ensure the drainage system continues to function as designed throughout the design life of the development, while providing relative assurance that any work will be undertaken to satisfactory standard.
- 1.3. Management information provided is based on the drainage design as shown within the drawings included in Appendix A.
- 1.4. All aspects of the drainage system form part of the development, and as such must be maintained throughout the life of the development to ensure continued operation to the specification as designed. This report relates to drainage aspects within the boundaries of Unit 7.
- 1.5. Off-plot infrastructure is to remain privately owned by EOS Inc. Limited and will be their responsibility via an appointed management company.
- 1.6. Drainage conduits are designed to be self-cleansing where they are not assumed to be utilised as part of the long-term surface water attenuation system. However, regular inspections should still be undertaken, as isolated occurrences of obstructions within the system remain a possibility.
- 1.7. No work on the drainage system will be undertaken without the permission of the nominated persons who have access to information and working knowledge of the system. All operatives working on the system will have had appropriate training for the work.
- 1.8. All work on the system should be preceded by a risk assessment, with the appropriate measures recommended within the assessment undertaken prior to work starting.

- 1.9. Maintenance and inspections will be carried out in a safe manner, by competent persons following training on the task to be completed and in accordance with current safe working policies.
- 1.10. Confined work is to be minimised where possible, with any confined operations done so following appropriate training and only when suitably equipped to do so.
- 1.11. Welfare facilities must be available for the purpose of ensuring high levels of hygiene.

2. Drains / Sewers

- 2.1. Maintenance of the piped drainage system includes the following items:
 - 2.1.1. Repair or replacement of pipework or structures in the event of damage occurring, to provide continued operation.
 - 2.1.2. Cleansing and removal of debris, detritus and sediment for the maintenance of the expected hydraulic performance.
 - 2.1.3. Vacuuming and jetting where required, including the removal of rootlets in the case of ingress.
 - 2.1.4. Inspection and maintenance are to be carried out in line with the intervals shown withing the maintenance schedule in Appendix B.
- 2.2. Jetting pressures should be limited to the maximum recommended values as prescribed by the original equipment manufacturer.
- 2.3. Effluent and material arising from the cleansing is to be isolated to the area of works and disposed of appropriately.

3. Manholes / Access Chambers

- 3.1. All covers should be lifted, with chambers inspected for debris, damage and indications of blockages elsewhere in the system.
- 3.2. Debris is to be removed from the chamber, and not washed downstream.
- 3.3. Benching should be assessed where damage has occurred. This should be removed from the chamber and appropriate repairs undertaken to return the chamber to the original condition.
- 3.4. Covers and frames are to be inspected for degradation. Connecting bolts should be present and haunching in a good condition.
- 3.5. Any replacement components of the chamber should be original equipment manufacturer specification only.
- 3.6. Interfacing surfaces are to be cleared of debris and corrosion. Grease to be applied, bolts and seals to be replaced and tightened to specification.

4. Silt Trap Chambers

- 4.1. As denoted on the drainage layout drawings, some chambers have been designated as silt trap chambers. They are intended to collect silt and debris in

specific locations to isolate materials prior to the entering attenuation structures. Treatment of these should be as per other chambers on site, although the clearance of silt may be required more often. Intervals for inspections should be as per the maintenance schedule.

5. Drainage Channels and Kerb Drains

- 5.1. Inspection of these assets should be regular, as the hydraulic performance may be easily impeded by build-up of sediment.
- 5.2. Annual cleaning of the channels and drains is incorporated into the maintenance schedule. Interim inspections and maintenance may be required depending on the environment and end user situation.
- 5.3. Channels and drains should be cleansed by use of proprietary equipment.
- 5.4. The throat of the channel should be kept clear to maintain a continued discharge from the unit.
- 5.5. Seating surfaces are to be cleared, and any corrosion treated; grease applied and covers refitted. Hardware is to be replaced where required and torqued to specification.
- 5.6. Damaged components are to be replaced with original equipment manufacturer parts
- 5.7. Traps are to be cleared of debris regularly to maintain hydraulic performance.
- 5.8. During prolonged dry periods, the traps should be replenished to prevent the release of odours.

6. Road Gullies

- 6.1. Regular inspections and maintenance are necessary to ensure effective operation and ensure they are free of debris and blockages.
- 6.2. Gullies require annual cleansing and is integrated into the maintenance schedule. Extreme weather and prolonged periods of dry weather can lead to build up of sediment more promptly as such interim cleansing will be required.
- 6.3. Gully gratings should be kept clear of debris, ensuring an uninterrupted flow into the gully.

- 6.4. Interfacing areas of the gully grating is to be cleaned prior to being reseated. Locking mechanisms should be engaged to prevent the grating being dislodged.
- 6.5. During prolonged dry periods, the gully should be replenished to prevent the release of odours.

7. Oil Separators

- 7.1. Oil separators are installed on the development with the aim of mitigating the risk of contamination release into the environment. In order to function as intended, maintenance must be adhered to in accordance with the manufacturer's recommendations.
- 7.2. Inspections on the units and the telemetry, along with interim evacuation of the units must be done so in accordance with the maintenance schedule.
- 7.3. Fitted telemetry will indicate when the units require emptying, although inspections should be made at regular intervals as a matter of redundancy.
- 7.4. All work undertaken should be done so by qualified and competent personnel, in accordance with EN858-2:2003 Section 6.
- 7.5. Procedures should be as follows:
 - 7.5.1. Determine sludge/silt volume in upstream catchpits and remove.
 - 7.5.2. Access the depth of accumulated oil and silt in the separator.
 - 7.5.3. Check the condition of any coalescing device and replace as necessary.
 - 7.5.4. Service any electrical equipment, i.e. alarms or management systems.
 - 7.5.5. Physically inspect the integrity of the separator and any mechanical parts.
- 7.6. The contents of the separator should be removed when levels have built up significantly. All waste should be removed, the separator washed down and refilled with clean water.
- 7.7. Specialists in interceptor evacuation should be employed for the work, with caution applied in the event of a contaminant spillage on site.
- 7.8. A survey of the condition of the unit should be carried out every 5 years.
- 7.9. Logs should be recorded of all servicing, emptying and surveying of the unit. Additional records of on-site spillages should be kept. Failure to carry out

inspections and maintenance can lead to the release of pollution into the environment.

8. Funding

- 8.1. On completion of the commissioning of the drainage system, the developer will be responsible for the maintenance and inspection of all assets. Funding as such remains within the scope of the developer's responsibility.
- 8.2. Responsibility of maintenance and inspections may be transferred under agreement via tenancy or sale of the development, in whole or in part.

9. Health and Safety

- 9.1. Employers shall, as far as is reasonably practicable, provide and maintain systems of work that are safe, without unnecessary risk. All systems of work shall be covered, inclusive of above and below ground works.

10. Record History

- 10.1. Site management shall be responsible for the recording and updating of all details prior to maintenance operations. This shall be available for future reference.
- 10.2. Future maintenance works shall be scheduled by site management in accordance with the necessary procedures as set out in the maintenance schedule.
- 10.3. Checks that the work has been performed correctly shall follow any maintenance work on site.

Appendix A

THIS DRAWING SHOULD NOT BE SCALED. DIMENSIONS TO BE VERIFIED ON SITE. ANY DISCREPANCIES SHOULD BE REFERRED TO THE ENGINEER PRIOR TO WORK COMMENCING.

NOTES

GENERAL NOTES

- 1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT HJCE, ARCHITECTS AND M&E ENGINEERS' DRAWINGS AND SPECIFICATIONS.
2. DRAWING NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
3. EXISTING GROUND LEVELS BASED ON A TOPOGRAPHICAL SURVEY BY ELLAM SURVEYS SURVEYS LTD REF 8846_2D/1.
4. PLOT BOUNDARIES, BUILDING AND EXTERNAL WORKS FOOTPRINTS SHOWN ON THIS DRAWING ARE INDICATIVE ONLY, BASED ON THE LATEST MASTERPLAN DRAWING.
5. ALL DRAINAGE CHANNELS SHALL BE PROVIDED WITH A ROADABLE ACCESS COVER AT THE UPSTREAM END AND A CUTFALL UNIT WITH SILT COLLECTION LOAD CLASS TO BE F800 TO SERVICE YARD AND C250 TO CAR PARK. CHANNELS INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. CHANNELS TO CAR PARK TO BE BIRCO LINEAR DRAINAGE SYSTEM BY MARSHALLS OR GATIC LINEAR DRAINAGE SYSTEM. DRAINAGE TO SERVICE YARD TO BE GATIC HEAVY DUTY LINEAR DRAINAGE SYSTEM.
6. FULL RETENTION/BYPASS SEPARATORS TO BE PROVIDED WITH OIL LEVELS MONITORS AND VISUAL ALARMS.
7. SIPHONIC ROOF DRAINAGE DESIGNED TO ON A 50 YEAR DESIGN LIFE (CAT 3 RISK FACTOR), WITH A PRIMARY/SECONDARY ARRANGEMENT AND WEB OVERFLOWS. SECONDARY OVERFLOW NOT ALLOWED ADJACENT CAR PARK/OFFICE AREAS.
8. ALL INTERNAL MANHOLES TO HAVE DOUBLE SEALED/RECESSED LOCKABLE TYPE COVERS.
9. ON COMPLETION OF THE WORKS INCLUDING ANY DEFECTS RECTIFICATION, ALL DRAINS ARE TO BE SURVEYED USING A CCTV SYSTEM.
10. FOR DRAINAGE NOTES SEE DRAWING 3101.

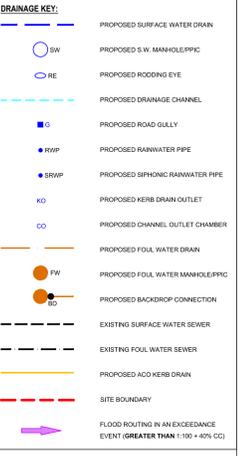
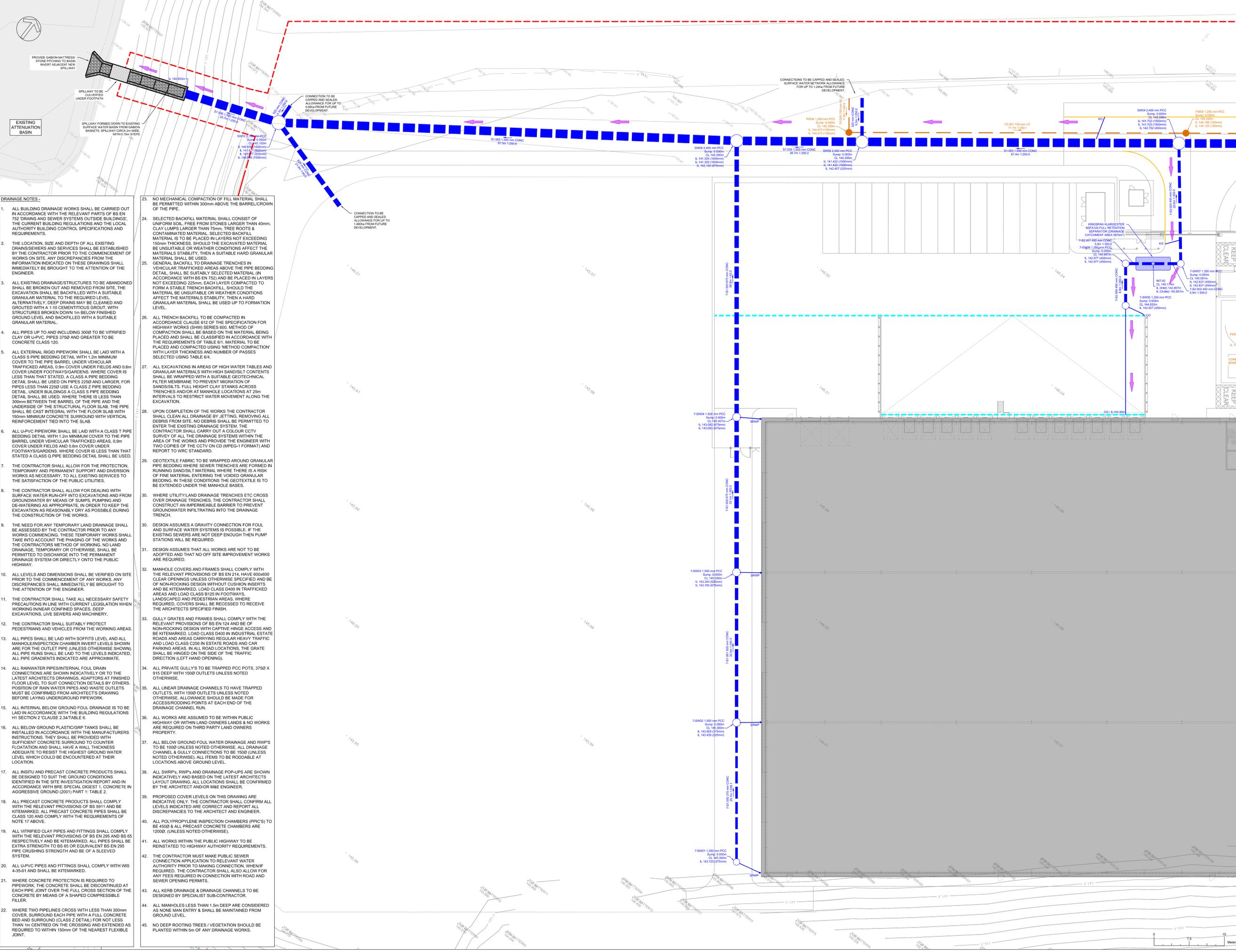


Table with 3 columns: POI, DATE, DESCRIPTION, INITIAL ISSUE, DM, AF. Includes a REVISIONS table and PROJECT information: UNIT 7 - GATEWAY 36, ROCKINGHAM, BARNESLEY.

DRAINAGE LAYOUT SHEET 1

Client information: EOS INC LIMITED, CONSULTING CIVIL & STRUCTURAL ENGINEERS, HJCE logo, website www.HJCE.co.uk, contact details.

STATUS: PRELIMINARY. Table with columns: DRAWN BY, CHECKED BY, APPROVED BY, HJCE REF., DATE, SCALES @ AC. Includes project details: 9466-HJCE-00-XX-DR-C-3100 PO1.



DRAINAGE NOTES

- 1. ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT PARTS OF BS EN 752 DRAINS AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
2. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/SEWERS 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.
3. ALL EXISTING DRAINAGE/STRUCTURES TO BE ABANDONED SHALL BE BROKEN OUT AND REMOVED FROM SITE. THE EXCAVATION SHALL BE BACKFILLED WITH A SUITABLE GRANULAR MATERIAL TO THE REQUIRED LEVEL. ALTERNATIVELY, DEEP DRAINS MAY BE CLEANED AND GROUTED WITH A 1:10 CEMENTITIOUS GROUT. WITH STRUCTURES BROKEN DOWN 1m BELOW FINISHED GROUND LEVEL AND BACKFILLED WITH A SUITABLE GRANULAR MATERIAL.
4. ALL PIPES UP TO AND INCLUDING 3000 TO BE VITRIFIED CLAY OR U-PVC. PIPES 3750 AND GREATER TO BE CONCRETE CLASS 120.
5. ALL EXTERNAL RIGID PIPEWORK SHALL BE LAID WITH A CLASS S PIPE BEDDING DETAIL WITH 1.2m MINIMUM COVER TO THE PIPE BARREL UNDER VEHICULAR TRAFFICKED AREAS, 0.9m COVER UNDER FIELDS AND 0.6m COVER UNDER FOOTWAYS/GARDENS, WHERE COVER IS LESS THAN THAT STATED, A CLASS A PIPE BEDDING DETAIL SHALL BE USED ON PIPES 2250 AND LARGER, FOR PIPES LESS THAN 2250 USE A CLASS Z PIPE BEDDING DETAIL. UNDER BUILDINGS A CLASS S PIPE BEDDING DETAIL SHALL BE USED, WHERE THERE IS LESS THAN 300mm BETWEEN THE BARREL OF THE PIPE AND THE UNDERSIDE OF THE STRUCTURAL FLOOR SLAB, THE PIPE SHALL BE CAST INTEGRAL WITH THE FLOOR SLAB WITH 150mm MINIMUM CONCRETE SURROUND WITH VERTICAL REINFORCEMENT TIED INTO THE SLAB.
6. ALL U-PVC PIPEWORK SHALL BE LAID WITH A CLASS T PIPE BEDDING DETAIL WITH 1.2m MINIMUM COVER TO THE PIPE BARREL UNDER VEHICULAR TRAFFICKED AREAS, 0.9m COVER UNDER FIELDS AND 0.6m COVER UNDER FOOTWAYS/GARDENS, WHERE COVER IS LESS THAN THAT STATED A CLASS Q PIPE BEDDING DETAIL SHALL BE USED.
7. 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 PUBLIC UTILITIES.
8. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUNOFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
9. THE NEED FOR ANY TEMPORARY LAND DRAINAGE SHALL BE ASSESSED BY THE CONTRACTOR PRIOR TO ANY WORKS COMMENCING. THESE TEMPORARY WORKS SHALL TAKE INTO ACCOUNT THE PHASING OF THE WORKS AND THE CONTRACTORS METHOD OF WORKING. NO LAND DRAINAGE, TEMPORARY OR OTHERWISE, SHALL BE PERMITTED TO DISCHARGE INTO THE PERMANENT DRAINAGE SYSTEM OR DIRECTLY ONTO THE PUBLIC HIGHWAY.
10. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN NEAR CONFINED SPACES, DEEP EXCAVATIONS, LIVE SEWERS AND MACHINERY.
12. THE CONTRACTOR SHALL SUITABLY PROTECT PEDESTRIANS AND VEHICLES FROM THE WORKING AREAS.
13. ALL PIPES SHALL BE LAID WITH SOFFITS LEVEL AND ALL MANHOLE/INSPECTION CHAMBER INVERT LEVELS SHOWN ARE FOR THE OUTLET PIPE (UNLESS OTHERWISE SHOWN). ALL PIPE RUNS SHALL BE LAID TO THE LEVELS INDICATED, ALL PIPE GRADIENTS INDICATED ARE APPROXIMATE.
14. ALL RAINWATER PIPES/INTERNAL FOUL DRAIN CONNECTIONS ARE SHOWN INDICATIVELY OR TO THE LATEST ARCHITECTS DRAWINGS, ADAPTORS AT FINISHED FLOOR LEVEL TO SUIT CONNECTION DETAILS BY OTHERS. POSITION OF RAIN WATER PIPES AND WASTE OUTLETS MUST BE CONFIRMED FROM ARCHITECTS DRAWING BEFORE LAYING UNDERGROUND PIPEWORK.
15. ALL INTERNAL BELOW GROUND FOUL DRAINAGE IS TO BE LAID IN ACCORDANCE WITH THE BUILDING REGULATIONS H1 SECTION 2 CLAUSE 2.34/TABLE 6.
16. ALL BELOW GROUND PLASTIC/GRP TANKS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. THEY SHALL BE PROVIDED WITH SUFFICIENT CONCRETE SURROUND TO COUNTER FLOATION AND SHALL HAVE A WALL THICKNESS ADEQUATE TO RESIST THE HIGHEST GROUND WATER LEVEL WHICH COULD BE ENCOUNTERED AT THEIR LOCATION.
17. ALL INSITU AND PRECAST CONCRETE PRODUCTS SHALL BE DESIGNED TO SUIT THE GROUND CONDITIONS IDENTIFIED IN THE SITE INVESTIGATION REPORT AND IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.
18. ALL PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE KITEMARKED. ALL PRECAST CONCRETE PIPES SHALL BE CLASS 120 AND COMPLY WITH THE REQUIREMENTS OF NOTE 17 ABOVE.
19. ALL VITRIFIED CLAY PIPES AND FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 296 AND BS 65 RESPECTIVELY AND BE KITEMARKED. ALL PIPES SHALL BE EXTRA STRENGTH TO BS 65 OR EQUIVALENT BS EN 296 PIPE CRUSHING STRENGTH AND BE OF A SLEEVED SYSTEM.
20. ALL U-PVC PIPES AND FITTINGS SHALL COMPLY WITH BS EN 438-1 AND SHALL BE KITEMARKED.
21. WHERE CONCRETE PROTECTION IS REQUIRED TO PIPEWORK, THE CONCRETE SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL CROSS SECTION OF THE CONCRETE BY MEANS OF A SHAPED COMPRESSIBLE FILLER.
22. WHERE TWO PIPELINES CROSS WITH LESS THAN 300mm COVER, SURROUND EACH PIPE WITH A FULL CONCRETE BED AND SURROUND (CLASS Z DETAIL) FOR NOT LESS THAN 1m CENTRED ON THE CROSSING AND EXTENDED AS REQUIRED TO WITHIN 150mm OF THE NEAREST FLEXIBLE JOINT.

NO MECHANICAL COMPACTION OF FILL MATERIAL SHALL BE PERMITTED WITHIN 300mm ABOVE THE BARREL/CROWN OF THE PIPE.

- 23. NO MECHANICAL COMPACTION OF FILL MATERIAL SHALL BE PERMITTED WITHIN 300mm ABOVE THE BARREL/CROWN OF THE PIPE.
24. SELECTED BACKFILL MATERIAL SHALL CONSIST OF UNIFORM SOIL, FREE FROM STONES LARGER THAN 40mm, CLAY LUMPS LARGER THAN 75mm, TREE ROOTS & CONTAMINATED MATERIAL. SELECTED BACKFILL MATERIAL IS TO BE PLACED IN LAYERS NOT EXCEEDING 150mm THICKNESS. SHOULD THE EXCAVATED MATERIAL BE UNSUITABLE OR WEATHER CONDITIONS AFFECT THE MATERIALS STABILITY, THEN A SUITABLE HARD GRANULAR MATERIAL SHALL BE USED.
25. GENERAL BACKFILL TO DRAINAGE TRENCHES IN VEHICULAR TRAFFICKED AREAS ABOVE THE PIPE BEDDING DETAIL, SHALL BE SUITABLY SELECTED MATERIAL (IN ACCORDANCE WITH BS EN 752) AND BE PLACED IN LAYERS NOT EXCEEDING 225mm, EACH LAYER COMPACTED TO FORM A STABLE TRENCH BACKFILL, SHOULD THE MATERIAL BE UNSUITABLE OR WEATHER CONDITIONS AFFECT THE MATERIALS STABILITY, THEN A HARD GRANULAR MATERIAL SHALL BE USED UP TO FORMATION LEVEL.
26. ALL TRENCH BACKFILL TO BE COMPACTED IN ACCORDANCE WITH CLAUSE 612 OF THE SPECIFICATION FOR HIGHWAY WORKS (SHW) SERIES 600. METHOD OF COMPACTION SHALL BE BASED ON THE MATERIAL BEING PLACED AND SHALL BE CLASSIFIED IN ACCORDANCE WITH THE REQUIREMENTS OF TABLE 6/1. MATERIAL TO BE PLACED AND COMPACTED USING METHOD COMPACTION WITH LAYER THICKNESS AND NUMBER OF PASSES SELECTED USING TABLE 6/4.
27. ALL EXCAVATIONS IN AREAS OF HIGH WATER TABLES AND GRANULAR MATERIALS WITH HIGH SAND/SILT CONTENTS SHALL BE WRAPPED WITH A SUITABLE GEOTECHNICAL FILTER MEMBRANE TO PREVENT MIGRATION OF SANDS/SILTS. FULL HEIGHT CLAY STAKES ACROSS TRENCHES AND/OR AT MANHOLE LOCATIONS AT 23m INTERVALS TO RESTRICT WATER MOVEMENT ALONG THE EXCAVATION.
28. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE EXISTING DRAINAGE SYSTEM. THE CONTRACTOR SHALL CARRY OUT A COLOUR CCTV SURVEY OF ALL THE DRAINAGE SYSTEMS WITHIN THE AREA OF THE WORKS AND PROVIDE THE ENGINEER WITH TWO COPIES OF THE CCTV ON CD (MPEG-1 FORMAT) AND REPORT TO WRC STANDARD.
29. GEOTEXTILE FABRIC TO BE WRAPPED AROUND GRANULAR PIPE BEDDING WHERE SEWER TRENCHES ARE FORMED IN RUNNING SAND/SILT MATERIAL WHERE THERE IS A RISK OF FINE MATERIAL ENTERING THE VOIDED GRANULAR BEDDING. IN THESE CONDITIONS THE GEOTEXTILE IS TO BE EXTENDED UNDER THE MANHOLE BASES.
30. WHERE UTILITY/LAND DRAINAGE TRENCHES ETC CROSS OVER DRAINAGE TRENCHES, THE CONTRACTOR SHALL CONSTRUCT AN IMPERMEABLE BARRIER TO PREVENT GROUNDWATER INFILTRATING INTO THE DRAINAGE TRENCH.
31. DESIGN ASSUMES A GRAVITY CONNECTION FOR FOUL AND SURFACE WATER SYSTEMS IS POSSIBLE. IF THE EXISTING SEWERS ARE NOT DEEP ENOUGH THEN PUMP STATIONS WILL BE REQUIRED.
32. DESIGN ASSUMES THAT ALL WORKS ARE NOT TO BE ADOPTED AND THAT NO OFF-SITE IMPROVEMENT WORKS ARE REQUIRED.
33. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 214, HAVE 600x600 CLEAR OPENINGS UNLESS OTHERWISE SPECIFIED AND BE OF NOTHOODING DESIGN WITHOUT CUSHION INSERTS AND BE KITEMARKED. LOAD CLASS D400 IN TRAFFICKED AREAS AND LOAD CLASS B125 IN FOOTWAYS, LANDSCAPED AND PEDESTRIAN AREAS, WHERE REQUIRED. COVERS SHALL BE RECESSED TO RECEIVE THE ARCHITECTS SPECIFIED FINISH.
34. GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 121 AND BE OF NOTHOODING DESIGN WITH CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 IN INDUSTRIAL ESTATE ROADS AND AREAS CARRYING REGULAR HEAVY TRAFFIC AND LOAD CLASS C250 IN ESTATE ROADS AND CAR PARKING AREAS. IN ALL ROAD LOCATIONS, THE GRATE SHALL BE HINGED ON THE SIDE OF THE TRAFFIC DIRECTION (LEFT HAND OPENING).
35. ALL PRIVATE GULLY'S TO BE TRAPPED PCC POTS, 3750 X 915 DEEP WITH 1500 OUTLETS UNLESS NOTED OTHERWISE.
36. ALL LINEAR DRAINAGE CHANNELS TO HAVE TRAPPED OUTLETS, WITH 1500 OUTLETS UNLESS NOTED OTHERWISE. ALLOWANCE SHOULD BE MADE FOR ACCESS/RODDING POINTS AT EACH END OF THE DRAINAGE CHANNEL RUN.
37. ALL BELOW GROUND FOUL WATER DRAINAGE AND RWPP'S TO BE 1000 UNLESS NOTED OTHERWISE. ALL DRAINAGE CHANNEL & GULLY CONNECTIONS TO BE 1500 (UNLESS NOTED OTHERWISE). ALL ITEMS TO BE ROADABLE AT LOCATIONS ABOVE GROUND LEVEL.
38. ALL SWPP's, RWPP's AND DRAINAGE POP-UPS ARE SHOWN INDICATIVELY AND BASED ON THE LATEST ARCHITECTS LAYOUT DRAWING. ALL LOCATIONS SHALL BE CONFIRMED BY THE ARCHITECT AND/OR M&E ENGINEER.
39. PROPOSED COVER LEVELS ON THIS DRAWING ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONFIRM ALL LEVELS INDICATED ARE CORRECT AND REPORT ALL DISCREPANCIES TO THE ARCHITECT AND ENGINEER.
40. ALL POLYPROPYLENE INSPECTION CHAMBERS (PPIC'S) TO BE 4000 & ALL PRECAST CONCRETE CHAMBERS ARE 2000 (UNLESS NOTED OTHERWISE).
41. ALL WORKS WITHIN THE PUBLIC HIGHWAY TO BE REINSTATED TO HIGHWAY AUTHORITY REQUIREMENTS.
42. THE CONTRACTOR MUST MAKE PUBLIC SEWER CONNECTION APPLICATION TO RELEVANT WATER AUTHORITY PRIOR TO MAKING CONNECTION, WHENIF REQUIRED. THE CONTRACTOR SHALL ALSO ALLOW FOR ANY FEES REQUIRED IN CONNECTION WITH ROAD AND SEWER OPENING PERMITS.
43. ALL KERB DRAINAGE & DRAINAGE CHANNELS TO BE DESIGNED BY SPECIALIST SUB-CONTRACTOR.
44. ALL MANHOLES LESS THAN 1.5m DEEP ARE CONSIDERED AS NONE MAN ENTRY & SHALL BE MAINTAINED FROM GROUND LEVEL.
45. NO DEEP ROOTING TREES / VEGETATION SHOULD BE PLANTED WITHIN 5m OF ANY DRAINAGE WORKS.

Appendix B

Drainage Asset Maintenance Schedule

Surface
 Foul

Maintenance Activity	Drainage Component	Required Action	Typical Frequency
Visual Inspection	Cully, Sump unit, Catch pit / silt trap, Channel drain outlet chamber	Inspect for sediment and debris	Monthly for first year and twice yearly thereafter, after severe storm
	Pipework		Twice yearly
	Oil interceptor		Twice yearly or after severe storm as a minimum, refer to manufacturer guidance. Forecourt interceptor requires emptying after fuel spillage
Litter and Debris Removal	Manhole All sump units (gullies, channel drains and catch pits)	Remove all litter and debris	Twice yearly (spring, start of winter), or after severe storm
Jet Wash	Pipework	High pressure jet-wash any pipe work which has silt accumulation. Care must be taken that any silts within the pipework are not unnecessarily flushed into the attenuation structures (use of bungs and jet-vac of chamber prior to removal of bungs)	Twice yearly, or as required
Sediment Management and Removal	ALL SUDS	Sediment accumulation should be monitored as part of the inspection regime, rate of sediment accumulation noted	Appropriate frequencies determined upon inspection

Inspection	Pipework Manhole	Check if functioning correctly	Once site is fully operational: twice yearly for 1 st year, annually after
Sediment Removal	Bin Yard Gullies	Inspect for build up of sediment and remove as required.	Quarterly for 1 st year, twice yearly after. Refer to manufacturer guidance

Additional notes:

- Any defects (broken/misaligned pipes, root infestation, damage to soakaways, missing parts, etc.) that are identified during inspections/maintenance should be reported back to the property/site owner so that remedial actions can be undertaken promptly to repair these defects.
- SUDs maintenance based on CIRIA 2015 chapter 32 where further information can also be found.
- Refer to manufacturer guidance for maintenance schedules of all proprietary treatment systems.