

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

Table of Contents

Document Revisions.....	2
Table of Contents.....	3
Appendices.....	3
1. Introduction	4
2. Drains / Sewers.....	6
3. Manholes / Access Chambers.....	6
4. Silt Trap Chambers	6
5. Drainage Channels and Kerb Drains	7
6. Road Gullies.....	7
7. Oil Separators.....	8
8. Funding.....	9
9. Health and Safety.....	9
10. Record History.....	9

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 MSE 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 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 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.

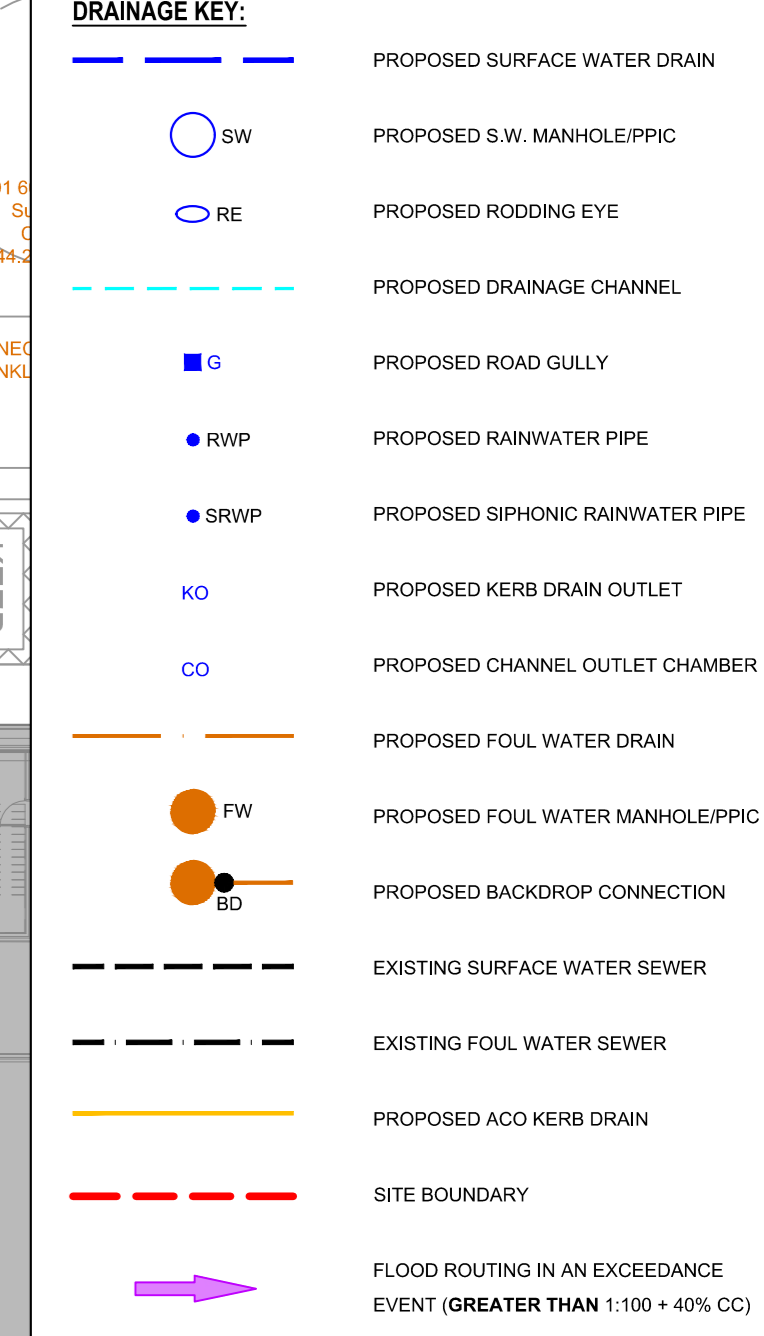
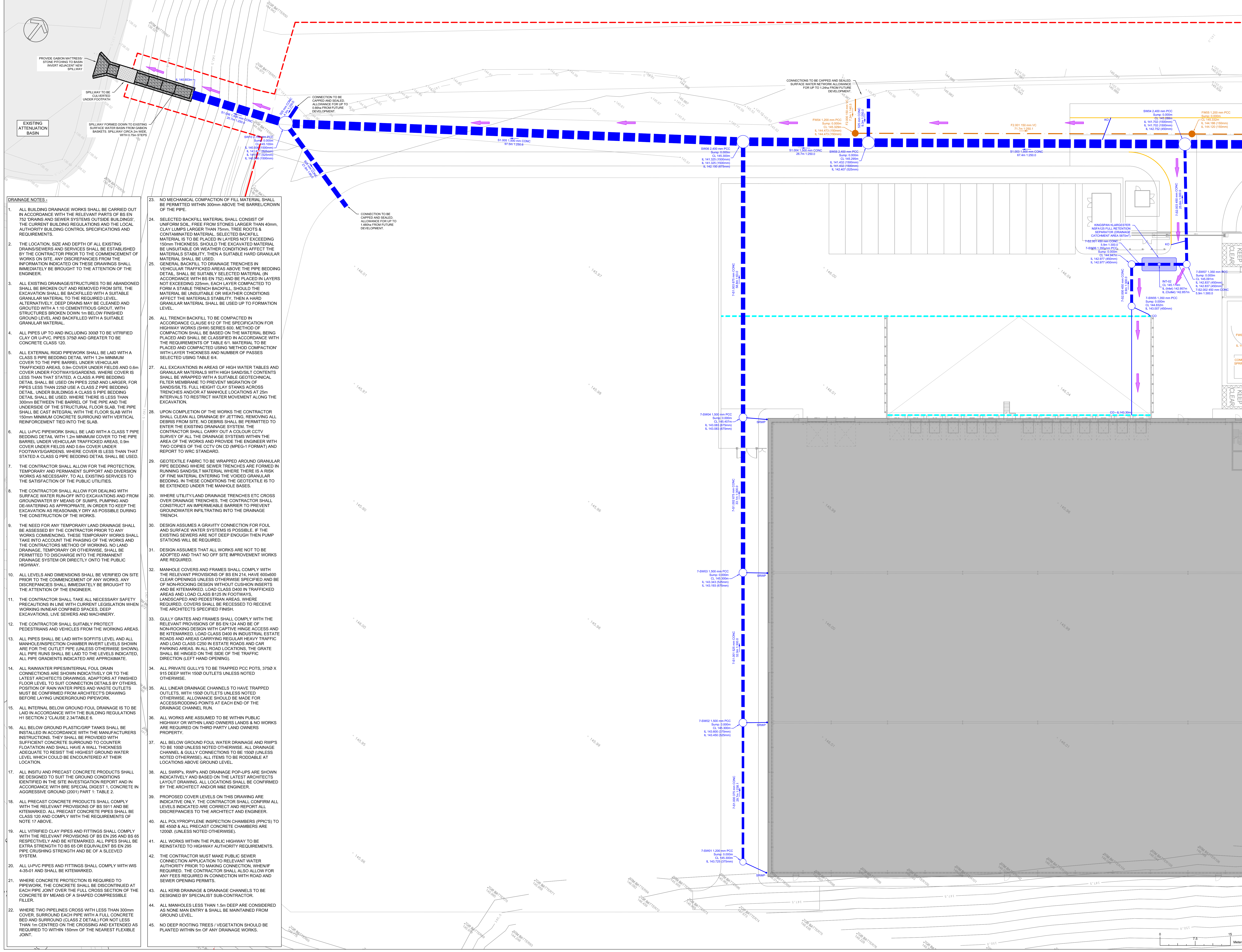


Table with 3 columns: POI, DATE, INITIAL ISSUE, DM, AF. Includes a REVISIONS table and PROJECT information: UNIT 7 - GATEWAY 36, ROCKINGHAM, BARNESLEY.

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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 CEMENT/SAND 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 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

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.