



13 July 2023

**Varley Street – Miles Platting**

Belvedere House, 5th Floor  
12 Booth Street  
Manchester  
M2 4AW

**Technical Note to Support Request for Compliance Condition for Drainage for Planning Application 136645/VO/2023 (30/03/2023)** 0161 833 9579  
[www.ridge.co.uk](http://www.ridge.co.uk)

Ridge have prepared this technical note to support a request for a compliance condition on Planning Application 136645/VO/2023. The technical note is based on the information required to discharge the proposed Planning Conditions 12 and 13 of the Planning Ref 136645/VO/2023. The conditions are listed below in tabular form, with proposed actions facilitating their discharge presented alongside. This note should be read in conjunction with the approved drainage strategy submitted at planning.



| No. | Condition                                                                                                                                                                                                                                                                                                         | Proposed Action to Discharge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| 12  | No development shall take place until surface water drainage works, designed in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards, have been submitted to and approved in writing by the Local Planning Authority. | <p>Proposed design and the subsequent construction are intended to be in full compliance with the Ridge report on Flood Risk Assessment and Drainage Strategy Ref: 5020683 Version 2.0 Dated 15.03.23 (included in the Appendix F of this TN).</p> <p>Please refer to the following documents in the Appendix A of this TN:</p> <p>VAR-RDG-XX-XX -DR-C-00500_P03 - Proposed FWS Layout<br/> VAR-RDG-XX-XX -DR-C-00501_P05 - Proposed SWS Layout<br/> VAR-RDG-XX-XX -DR-C-00505_P01 - Drainage Details SH1<br/> VAR-RDG-XX-XX -DR-C-00506_P01 - Drainage Details SH2<br/> VAR-RDG-XX-XX -DR-C-00507_P01 - Drainage Details SH3<br/> VAR-RDG-XX-XX -DR-C-00508_P01 - Drainage Details SH4<br/> VAR-RDG-XX-XX -DR-C-00510_P02 - FWS MH Schedules<br/> VAR-RDG-XX-XX -DR-C-00511_P03 - SWS MH Schedules<br/> VAR-RDG-XX-XX -DR-C-00515_P02 - Hydrobrake Chamber GA</p> <p>Please refer to the Appendix B of this TN for MICRODRAINAGE printouts (foul and storm drainage design calculations including design criteria, network details, pipe and manhole schedules, critical storm simulation summary).</p> |

|    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| 12 |  | <p>In accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) various scenarios have been discussed and agreed with the United Utilities, to ensure compliance with SUDS discharge hierarchy. It has been agreed that the proposed flows will be accepted into the public sewer network (please refer to the United Utilities email in the Appendix C).</p> <p>This acceptance was conditional upon the on-site soil properties and their inability to operate adequately under a soakaway scenario. Please refer to Appendix D for the soil permeability test results (BRE365 Testing undetraken test failed), confirming permeability values as inadequate for soakaways. The Falling Head test is in accordance with the NW SUDS Proforma, Section 7b, Hierarchy Level 1.</p> <p>Further points considered were:</p> <p>S1 – Flood Risk Outside Development – Drainage system does not discharge into a surface water body. Therefore this element is not relevant.</p> <p>Peak Flow Control</p> <p>S2 – Peak runoff rate from the development does not exceed the peak greenfield runoff rate (please refer to Appendix B). QBAR is calculated at 7.0 l/s only taking account of proposed impermeable areas. Proposed discharge is 7.0 l/s</p> <p>S3 – N/A (site was not previously developed)</p> <p>S4 – Since no infiltration is feasible, it is not attainable to discharge the greenfield volume once the site has been developed. Therefore please see S6.</p> <p>S5 – N/A (site was not previously developed)</p> <p>S6 – Since it is not reasonably practicable to constrain the volume of runoff to greenfield, proposed discharge at Qbar is used so the flood risk is not adversely affected (please refer to Appendix B). This is in accordance with the NW SUDS Proforma, Section 2 – Approach 2, Technical Standards S6)</p> |
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|  |  | <p>S7, S8 – Drainage system has been designed to prevent any flooding within the site for 1 in 30 year and 1 in 100 year rainfall events – see calculations showing no flooding up to 100 year + climate change.</p> <p>S9 – N/A (no exceedance routes required)</p> <p>S10 – System is designed to ensure structural integrity of itself and that of the adjacent structures.</p> <p>S11 – Specified materials are of suitable nature and quality for their intended use</p> <p>S12 – no pumping is envisaged.</p> <p>S13 – Mode of construction and communication not prejudicial to the structural integrity and functionality of the existing sewers is anticipated from a reputable contractor.</p> <p>S14 – Any damage to the existing sewers resulting from the associated construction activities are anticipated to be minimised and rectified prior to completion of the drainage system by a reputable contractor.</p> |
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| 13 | <p>No development hereby permitted shall be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme have been submitted to and approved by the local planning authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:</p> <ul style="list-style-type: none"><li>o Verification report providing photographic evidence of construction as per design drawings;</li><li>o As built construction drawings if different from design construction drawings;</li><li>o Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.</li></ul> | <p>Please refer to the Appendix E of this TN for the Proposed Management and Maintenance plan.</p> <p>Verification report with photographic evidence of construction and As-built drawings shall be provided in due course upon completion.</p> |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                 |

**PROPERTY & CONSTRUCTION CONSULTANTS**

**RIDGE**

**APPENDIX A**

DRAINAGE KEY

- PROPOSED PRIVATE FW DRAIN
- PROPOSED PRIVATE FW PPIC
- PROPOSED WASTE POINT CONNECTION
- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED COMBINED SEWER
- EXISTING UU COMBINED SEWER
- ASSUMED LIMIT OF WORKS
- SITE BOUNDARY

ALL SVP AND RWP DROP LOCATIONS  
TO BE CONFIRMED BY OTHERS

ALL CONNECTIONS TO HAVE ABOVE  
GROUND RODDABLE ACCESS

DRAINAGE NOTES

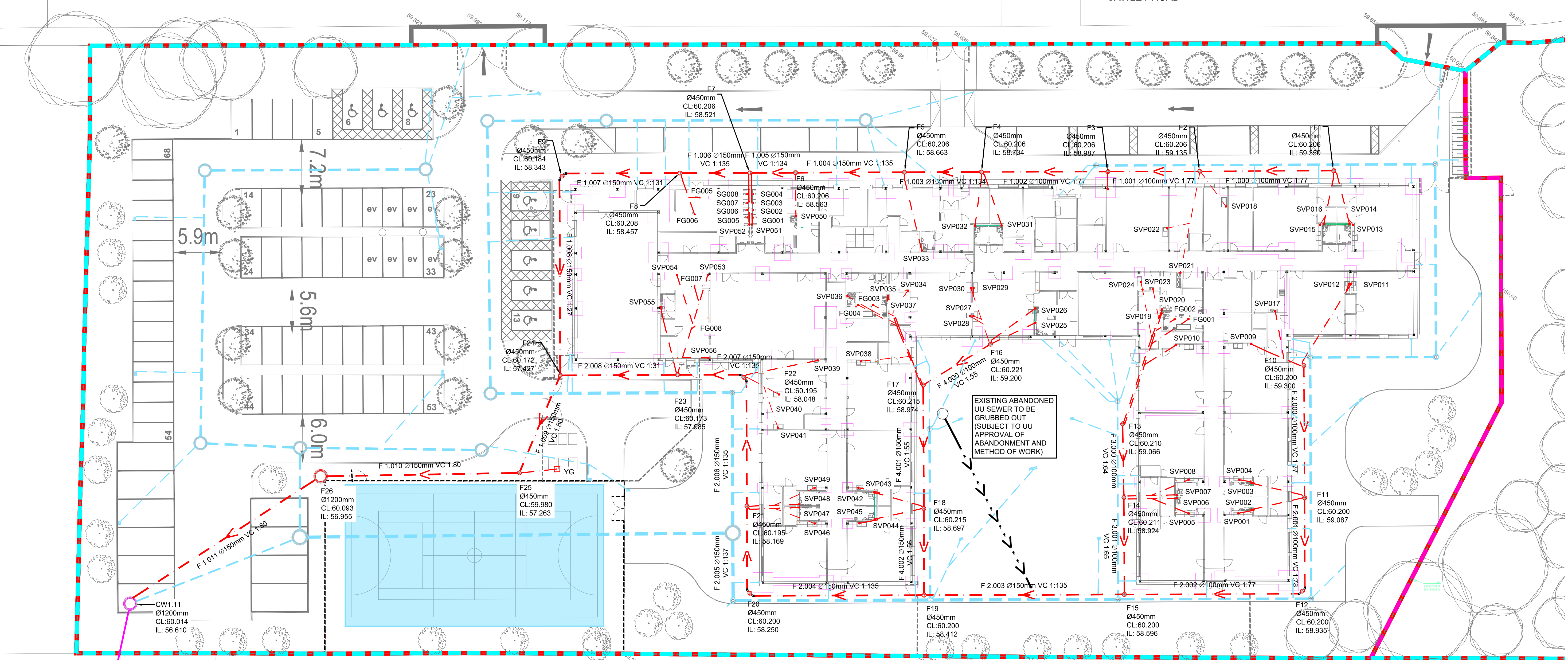
- THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES.
- THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN-OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
- ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN 752 AND BUILDING REGULATIONS PART H, WHERE APPROPRIATE, ALL ADOPTED DRAINAGE SHALL BE DESIGN AND CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION 6th EDITION AND THE ADOPTING AUTHORITIES STANDARD REQUIREMENTS.
- ALL PRIVATE DRAINAGE PIPES TO BE LAID IN TRENCHES BEDDED CLASS 'B' ON SINGLE SIZED AGGREGATE AND BACKFILLED WITH APPROVED SELECTED FILL (40mm DOWN) REUSED FROM EXCAVATED MATERIAL UNDER BUILDINGS AND WHERE COVER TO INVERT IS LESS THAN 1200mm UNDER TRAFFICKED AREAS PIPES TO BE CAST IN CONCRETE (CLASS Z BEDDING), CLASS 'S' BED AND SURROUND MAY BE REQUIRED FOR SEWERS TO BE ADOPTED. REFER TO SPECIFIC DRAWINGS FOR FURTHER INFORMATION.
- SELECTED BACKFILL MATERIAL SHALL CONSIST OF UNIFORM EXCAVATED MATERIAL, 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. THE MATERIAL SHALL BE COMPACTED TO ACHIEVE NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN LABORATORY COMPACTION TESTS. SUFFICIENT TESTING SHALL BE CARRIED OUT, BY THE CONTRACTOR, TO DEMONSTRATE THIS IS ACHIEVED (NUMBER AND FREQUENCY OF TESTING TO BE AGREED WITH SHD). WHERE THE MOISTURE CONTENT OF THE MATERIAL PROHIBITS COMPLIANCE WITH THE ABOVE 6F1 OR SIMILAR IMPORTED MATERIAL SHALL BE USED.
- CONCRETE PROTECTION TO PIPEWORK IS TO BE PROVIDED AS FOLLOWS:  
a) ALL PIPEWORK WITHIN PEDESTRIANS/OFT AREAS WITH LESS THAN 600mm COVER.  
b) ALL PIPEWORK SUBJECT TO VEHICULAR OVERRUN WITH LESS THAN 1.2m COVER.
- ALL PIPEWORK WITHIN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT (U.N.O). ALL CHAMBER INVERT LEVELS ARE FOR THE OUTGOING PIPE LEVELS. BACKDROP PIPEWORK SHALL BE CONNECTED AT SOFFIT TO SOFFIT WITH THE RODDING ACCESS LEVEL SPECIFIED.
- ALL DRAINS TO BE LAID ACCURATELY TO LINE AND LEVEL IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

- ANY GRADIENTS OF DRAINS INDICATED ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL THE DRAINS TO THE SPECIFIED LEVELS SHOWN FOR EACH MANHOLE (U.N.O). CATCHPIT INVERT LEVELS ARE FOR THE OUTGOING PIPE WITH THE SUMP LEVEL SPECIFIED SEPARATELY.
- CO-ORDINATE SETTING OUT INFORMATION FOR MANHOLES IS TO THE INTERSECTION THE DRAINS AND NOT THE CENTRE OF THE MANHOLE.
- COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS. ALL EXTERNAL WORKS CONSTRUCTION AREAS TO BE AS LOCATED BY THE ARCHITECT.
- MANHOLE COVERS AND FRAMES ARE TO BE IN ACCORDANCE WITH BS EN 124 AND THE FOLLOWING:  
a) VEHICULAR AREAS: CLASS D400 (E600 IN VULNERABLE SE RVICE YARD LOCATIONS), DOUBLE TRIANGULAR, 150mm DEEP DUCTILE IRON COVER AND FRAME WITH THREE POINT COVER SEATING, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.  
b) PEDESTRIAN AREAS: CLASS B125, 100mm DEEP, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
- POSITIONS AND SIZES OF ABOVE GROUND FOUL AND SURFACE WATER DRAINAGE CONNECTIONS ARE TO BE CONFIRMED PRIOR TO CONSTRUCTION WITH THE ARCHITECT & M&E ENGINEER.
- GULLY GRATINGS AND STEEL CHANNEL COVERS ARE TO BE IN ACCORDANCE WITH BS EN 124 AS FOLLOWS:  
a) AREAS SUBJECT TO VEHICULAR OVERRUN: CLASS D400 MINIMUM.  
b) AREAS NOT SUBJECT TO REGULAR VEHICLE OVERRUN (ADJACENT TO KERBS ETC): CLASS C250.  
c) GULLY GRATINGS ADJACENT TO KERBS SHALL BE HINGED ON THE SIDE OF THE TRAFFIC DIRECTION (LEFT HAND SIDE).
- ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS TO BE SOLID CLASS B ENGINEERING BRICK TO BS 3921.
- ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO BS 5911 AND BE KITEMARKED.
- ALL DRAINAGE INSITU CONCRETE SHALL BE GEN 3 (U.N.O).
- ALL INSITU AND CONCRETE PRODUCTS SHALL COMPLY WITH THE REQUIREMENTS FOR SULPHATE EXPOSURE IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.
- 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.
- CONSTRUCTION JOINTS IN CONCRETE SURROUND MUST NOT BE WITHIN 150mm OF CHAMBER/SHAFT RING JOINTS.
- ROCKER PIPES TO BE SURROUNDED WITH CONCRETE LOCATED 150mm MINIMUM 200mm MAXIMUM FROM THE FIRST

- FLEXIBLE JOINT TO THE MANHOLE WALL.
- SOFT SPOTS IN THE TRENCH FORMATION SHALL BE REMOVED AND REPLACED WITH GRANULAR BEDDING UNLESS INSTRUCTED OTHERWISE.
- LATERAL CONNECTIONS IN BETWEEN MANHOLE RUNS SHALL BE FORMED BY USING PURPOSE MADE JUNCTION FITTINGS. BEND FITTINGS SHALL BE PROVIDED WHERE APPROPRIATE TO DIRECT THE FLOW INTO MAIN RUNS.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO LIAISE WITH BUILDING CONTROL FOR APPROVALS, INTERIM INSPECTION, SNAGGING AND FINAL INSPECTIONS OF THEIR WORK.
- THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING STATUTORY UNDERTAKERS APPARATUS AND SERVICE CONNECTIONS ADJACENT TO AND CROSSING THE WORKS BY TRIAL PITS PRIOR TO COMMENCING MACHINE DIG.
- AT THE CONCLUSION OF THE WORKS THE CONTRACTOR SHALL PROVIDE A MARKED UP DRAWING TO RECORD ANY AS BUILT VARIATIONS NOT SHOWN ON THE DRAWINGS.
- THE DRAINAGE SYSTEM IS NOT DESIGNED TO ACCEPT UNTREATED EFFLUENT FROM A COMMERCIAL KITCHEN CONTAINING GREASE AND OILS. REMOVAL OF GREASE AND OIL SHOULD BE MADE AT SOURCE USING A FLOOR MOUNTED ABOVE GROUND GREASE REMOVAL SYSTEM. IT IS RECOMMENDED THAT A MECHANICAL GREASE REMOVAL SYSTEM BE EMPLOYED FOR THIS PURPOSE NOT A PASSIVE SYSTEM.
- PIPEWORK TO BE OF THE FOLLOWING MANUFACTURER: 100 / 150 / 225MM DIAMETER HEPPWORTH SUPERSLEEVE VITRIFIED CLAY PIPES (40kN/m CRUSHING STRENGTH), 300mm+ TO BE CONCRETE CLASS M. ALTERNATIVELY 'POLYSEWER' UPVC DRAINAGE SYSTEM BY POLYPIPE WHEN INSTALLED IN LINE WITH THE MANUFACTURERS RECOMMENDATIONS. FILTER DRAINAGE TO BE PERFORMED HDPE.
- ALL RWP, WPC & GULLY CONNECTIONS TO BE 100mm DIA UNO & ARE RODDABLE AT LOCATIONS ABOVE GROUND LEVEL.
- ALL INSPECTION CHAMBERS WITH A DEPTH GREATER THAN 1.2m TO HAVE A 350mm DIAMETER REDUCING PLATE LOCATED BENEATH COVER AND FRAME TO PREVENT ACCESS.

DISCLAIMER NOTES:

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- THIS DOCUMENT MUST NOT BE ALTERED - THE ORIGINATOR ACCEPTS NO RESPONSIBILITY FOR ANY DISCREPANCIES ARISING AS A RESULT OF THE ORIGINATOR'S INFORMATION BEING ALTERED BY OTHERS.
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- DO NOT SCALE THIS DOCUMENT - USE FIGURED DIMENSIONS ONLY.
- ALL DIMENSIONS MUST BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF ANY RELATED WORKS.
- THIS DOCUMENT MUST BE READ IN CONJUNCTION WITH ALL SUPPORTING DOCUMENTS PRODUCED BY THE ORIGINATOR AND OTHER PROJECT DISCIPLINES.
- THE ORIGINATOR ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF BACKGROUND INFORMATION PRODUCED BY THIRD PARTIES - THIS MUST BE TREATED AS INDICATIVE ONLY.
- USERS OF THIS DOCUMENT ARE RESPONSIBLE FOR CHECKING WHICH REVISION IS CURRENT.
- THE DOCUMENT STATUS "INFORMATION" OR "PRELIMINARY", INDICATES THAT THIS DRAWING IS FOR REFERENCE PURPOSES ONLY - THE ORIGINATOR WILL ACCEPT NO RESPONSIBILITY FOR THE COMPLETENESS OF INFORMATION UNDER THIS STATUS.
- THE DOCUMENT STATUS "RECORD" OR "AS BUILT" HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ORIGINATOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS 'RECORD' OR 'AS BUILT' DOCUMENT OR FOR ANY ERRORS OR OMISSIONS THAT MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT OF INCORRECT INFORMATION PROVIDED TO THE ORIGINATOR. THOSE RELYING ON THE 'RECORD' OR 'AS BUILT' DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY.



PROPOSED POINT OF CONNECTION INTO THE EXISTING 300mm DIA COMBINED NETWORK CL 58.41 (TBC) IL 54.74 (TBC) (LEVELS AND CONDITION OF EXISTING PUBLIC SEWER TO BE CONFIRMED BY CCTV SURVEY) MIN IL TO ACHIEVE A SURFACE WATER GRAVITY CONNECTION IS 54.437m AOD. S106 AGREEMENT WILL BE REQUIRED ALLOWANCE SHOULD BE MADE FOR THE EXISTING MANHOLE 0503 TO BE REBUILT TO UU STANDARDS.

RISK ITEM - DISCUSSIONS WITH UNITED UTILITIES ARE ONGOING AS TO THE FINAL OUTFALL FOR SURFACE WATER DRAINAGE. THERE IS A UU REQUIREMENT TO INVESTIGATE DISCHARGE TO THE CANAL; 100m OFF SITE.

FINAL SURFACE WATER DISCHARGE RATE TO BE CONFIRMED

REFERENCE DRAWINGS:

|                                                                                                                                                                   |                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| VAR-RDG-XX-XX-DR-C-00501 - VAR-RDG-XX-XX-DR-C-00510 - VAR-RDG-XX-XX-DR-C-00511 - VAR-RDG-XX-XX-DR-C-00505 - VAR-RDG-XX-XX-DR-C-00506 - VAR-RDG-XX-XX-DR-C-00515 - | SWS LAYOUT<br>FWS MH SCHEDULE<br>SWS MH SCHEDULE<br>DRAINAGE DETAILS SH1<br>DRAINAGE DETAILS SH2<br>HYDROBRAKE CHAMBER |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

|             |      |       |                            |           |
|-------------|------|-------|----------------------------|-----------|
|             |      |       |                            |           |
| P0312.07.23 | JF   | PR    | CW1.12 BACKDROP IL AMENDED |           |
| P0207.07.23 | JF   | PR    | STAGE 4 ISSUE              |           |
| P0212.01.23 | JF   | PB    | PRELIMINARY ISSUE          |           |
| No          | DATE | DRAWN | REV'D ENG.                 | AMENDMENT |

|        |                  |
|--------|------------------|
| STATUS | PURPOSE OF ISSUE |
| S4     | STAGE 4          |

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RIDGE

CLIENT  
ISG

PROJECT  
VARLEY STREET,  
SEN SCHOOL

DRAFTER  
JF

ENGINEER  
PB

|                        |             |                                        |            |
|------------------------|-------------|----------------------------------------|------------|
| PROPOSED<br>FWS LAYOUT |             |                                        |            |
| SCALE<br>1:250         | SHEET<br>A1 | DRAWING No<br>VAR-RDG-XX-XX-DR-C-00500 | REV<br>P03 |

Legend for the proposed drainage system plan:

- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED SW PPIC
- RWP PROPOSED RAINWATER PIPE
- G PROPOSED PRIVATE ROAD GULLY
- PROPOSED DOOR THRESHOLD ACO
- PROPOSED PRIVATE SW FILTER DRAIN
- PROPOSED ATTENUATION TANK
- PROPOSED PRIVATE FW DRAIN
- EXISTING UU COMBINED SEWER
- PROPOSED DRAINAGE CHANNEL
- ASSUMED LIMIT OF WORKS
- SITE BOUNDARY

1. 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.
2. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN-OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF PUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
3. ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN752 AND BUILDING REGULATIONS PART H. WHERE APPROPRIATE, ALL ADOPTED DRAINAGE SHALL BE DESIGN AND CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION 8th EDITION AND THE ADOPTING AUTHORITIES STANDARD REQUIREMENTS.
4. ALL PRIVATE DRAINAGE PIPES TO BE LAID IN TRENCHES BEDDED CLASS 'B' ON SINGLE SIZED AGGREGATE AND BACKFILLED WITH APPROVED SELECTED FILL (40mm down) REUSED FROM EXCAVATED MATERIAL. UNDER BUILDINGS AND WHERE COVER IS TO BE 200mm OR MORE IN TRAFFICKED AREAS PIPES TO BE CAST IN CONCRETE (CLASS 2 BEDDING), CLASS 'B' BED AND SURROUND MAY BE REQUIRED FOR SEWERS TO BE ADOPTED. REFER TO SPECIFIC DRAWINGS FOR FURTHER INFORMATION.
5. SELECTED BACKFILL MATERIAL SHALL CONSIST OF UNIFORM EXCAVATED MATERIAL, 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. THE MATERIAL SHALL BE COMPACTED TO ACHIEVE NOT LESS THAN 95% OF THE DRY COMPACTION OF THE MATERIAL IN THE FIELD. IN ALL CASES, DRY COMPACTION TESTS, SUFFICIENT TESTING SHALL BE CARRIED OUT, BY THE CONTRACTOR, TO DEMONSTRATE THIS IS ACHIEVED (NUMBER AND FREQUENCY OF TESTING TO BE AGREED WITH SHD). WHERE THE MOISTURE CONTENT OF THE MATERIAL PROHIBITS COMPLIANCE WITH THE ABOVE 6/1 OR SIMILAR IMPORTED MATERIAL SHALL BE USED.
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8. ALL GRASSES TO BE LAID AGAINST EXISTING AND NEW CONSTRUCTION. ACCORDANCE WITH THE MANHOLES COVERS

9. ANY GRADIENTS OF DRAINS INDICATED ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL THE DRAINS TO THE SPECIFIED LEVELS SHOWN FOR EACH MANHOLE (U.N.O). CATCATCH INVERT LEVELS ARE FOR THE OUTGOING PIPE WITH THE SUMP LEVEL SPECIFIED SEPARATELY.
10. CO-ORDINATE SETTING OUT INFORMATION FOR MANHOLES TO BE TO THE INTERSECTION THE DRAINS AND NOT THE CENTRE OF THE MANHOLE.
11. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS. ALL EXTERNAL WORKS CONSTRUCTION AREAS TO BE AS LOCATED BY THE ARCHITECT.
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  - b) AREAS NOT SUBJECT TO REGULAR VEHICLE OVERRUN (ADJACENT TO KERBS ETC): CLASS C250.
  - c) GULLY GRATES ADJACENT TO KERBS SHALL BE HINGED ON THE SIDE OF THE TRAFFIC DIRECTION (LEFT HAND SIDE).
15. ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS TO BE SOLID CLASS B ENGINEERING BRICK TO BS3921.
16. ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO BS5911 AND BE KITEMARKED.
17. ALL DRAINAGE INSITU CONCRETE SHALL BE GEN3 (U.N.O).
18. ALL INSITU AND CONCRETE PRODUCTS SHALL COMPLY WITH THE REQUIREMENTS FOR SULPHATE EXPOSURE IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.
19. 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.

22. SOFT SPOTS IN THE TRENCH FORMATION SHALL BE REMOVED AND REPLACED WITH GRANULAR BEDDING UNLESS INSTRUCTED OTHERWISE.

23. LATERAL CONNECTIONS IN BETWEEN MANHOLE RUNS SHALL BE FORMED BY USING PURPOSE MADE JUNCTION FITTINGS. BEND FITTINGS SHALL BE PROVIDED WHERE APPROPRIATE TO DIRECT THE FLOW INTO MAIN RUNS.

24. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO LIAISE WITH BUILDING CONTROL FOR APPROVALS, INTERIM INSPECTION, SNAGGING AND FINAL INSPECTIONS OF THEIR WORK.

25. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING STATUTORY UNDERTAKERS APPARATUS AND SERVICE CONNECTIONS ADJACENT TO AND CROSSING THE WORKS BY TRIAL PITS PRIOR TO COMMENCING MACHINE DIG

26. AT THE CONCLUSION OF THE WORKS THE CONTRACTOR SHALL PROVIDE A MARKED UP DRAWING TO RECORD ANY AS BUILT VARIATIONS NOT SHOWN ON THE DRAWINGS.

27. THE DRAINAGE SYSTEM IS NOT DESIGNED TO ACCEPT UNTREATED EFFLUENT FROM A COMMERCIAL KITCHEN CONTAINING GREASE AND OILS. REMOVAL OF GREASE AND OIL SHOULD BE MADE AT SOURCE USING A FLOOR MOUNTED ABOVE

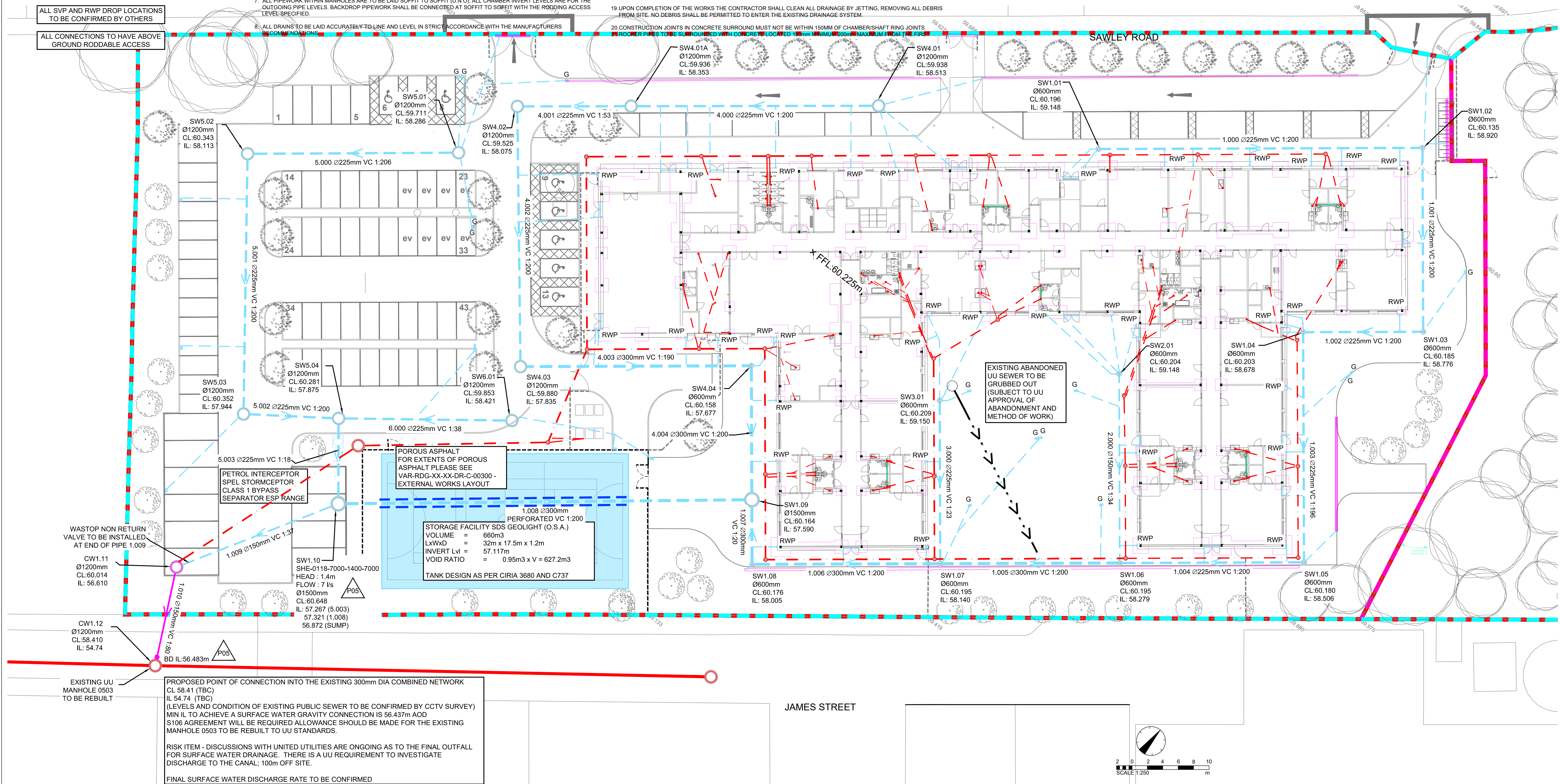
GROUND GREASE REMOVAL SYSTEM. IT IS RECOMMENDED THAT A MECHANICAL GREASE REMOVAL SYSTEM BE EMPLOYED FOR THIS PURPOSE NOT A PASSIVE SYSTEM.

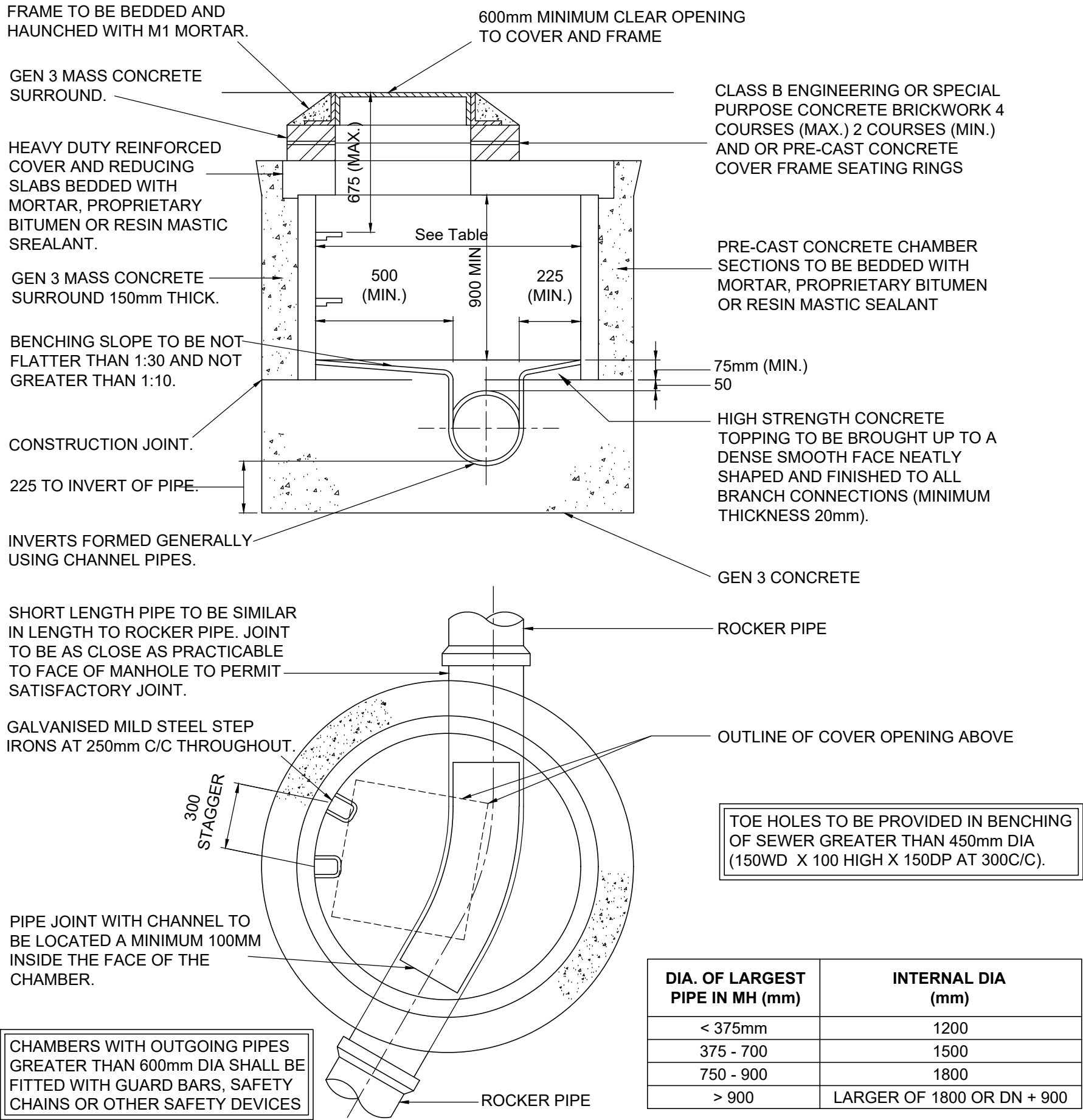
28. PIPEWORK TO BE OF THE FOLLOWING MANUFACTURER: 100 / 150 / 225MM DIAMETER HEPWORTH SUPERSLEEVE VITRIFIED CLAY PIPES (40KN/MM CRUSHING STRENGTH), 300mm + TO BE CONCRETE CLASS M. ALTERNATIVELY 'POLYSEWER' UPVC DRAINAGE SYSTEM BY POLYPIPE WHEN INSTALLED IN LINE WITH THE MANUFACTURERS RECOMMENDATIONS. FILTER DRAINAGE TO BE PERFORMED HDPE.

29. ALL RWP, WPC & GULLY CONNECTIONS TO BE 100mm DIA UNO & ARE RODDABLE AT LOCATIONS ABOVE GROUND LEVEL.

30. ALL INSPECTION CHAMBERS WITH A DEPTH GREATER THAN 1.2m TO HAVE A 350mm DIAMETER REDUCING PLATE LOCATE BENEATH COVER AND FRAME TO PREVENT ACCESS.

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[illegible]



## MANHOLE TYPE B

| BS EN 1610:1997 ANNEX B TABLE B.15<br>COARSE AGGREGATE - PIPE BEDDING |                                               |         |         |                             |        |        |        |
|-----------------------------------------------------------------------|-----------------------------------------------|---------|---------|-----------------------------|--------|--------|--------|
| SIEVE SIZE (mm)                                                       | % BY MASS PASSING BS SIEVES FOR NOMINAL SIZES |         |         | SINGLE SIZED AGGREGATE (mm) |        |        |        |
|                                                                       | GRADED AGGREGATE (mm)                         |         |         |                             |        |        |        |
| ----                                                                  | 40 to 5                                       | 20 to 5 | 14 to 5 | 40                          | 20     | 14     | 10     |
| 50.0                                                                  | 100                                           | ----    | ----    | 100                         | ----   | ----   | ----   |
| 37.5                                                                  | 90-100                                        | 100     | ----    | 85-100                      | 100    | ----   | ----   |
| 20.0                                                                  | 35-70                                         | 90-100  | 100     | 0-25                        | 85-100 | 100    | ----   |
| 14.0                                                                  | ----                                          | ----    | 90-100  | ----                        | ----   | 85-100 | 100    |
| 10.0                                                                  | 10-40                                         | 30-60   | 50-85   | 0-5                         | 0-25   | 0-50   | 85-100 |
| 5.0                                                                   | 0-5                                           | 0-10    | 0-10    | ----                        | 0-5    | 0-10   | 0-25   |
| 2.36                                                                  | ----                                          | ----    | ----    | ----                        | ----   | ----   | 0-5    |

## RIGID PIPES BEDDING GRADING

BASED ON BS EN 1610 : 1997 TABLE B.15  
FOR RIGID PIPES THE BEDDING SHOULD BE SINGLE SIZE MATERIAL OR GRADED MATERIAL FROM 5MM UP TO A MAX SIZE OF 10mm FOR 100mm PIPES; 14mm FOR 150mm PIPES; 20mm FOR 225mm TO 600mm PIPES; 40mm FOR OVER 675mm PIPES.

| MAXIMUM TRENCH WIDTHS |            |
|-----------------------|------------|
| PIPE DIA (mm)         | WIDTH (mm) |
| 100                   | 600        |
| 150                   | 700        |
| 225                   | 800        |
| 300                   | 900        |
| 375                   | 1050       |
| 450                   | 1150       |
| 525                   | 1200       |
| 600                   | 1350       |
| 750                   | 1450       |
| 825                   | 1500       |
| 950                   | 1600       |
| 1050                  | 1900       |

COMPRESSIBLE BOARD OR PREFORMED JOINT FILLER FOR FULL THICKNESS OF CONCRETE BED OR SURROUND

FLEXIBLE PIPE JOINT @ MAXIMUM 3 PIPE LENGTHS & IN ACCORDANCE WITH PIPE MANUFACTURERS INSTRUCTIONS.

JOINTS REQUIRED AT 5m INTERVALS MAX.

COMPRESSIBLE FILLER IS TO BE USED AT PIPE JOINTS IN CONCRETE PROTECTION TO PIPES. FILLER TO BE USED CAN BE HYDROCELL BY FOSROC, OR APPROVED BITUMEN IMPREGNATED INSULATING BOARD TO B.S. 1142 PART 3. THE COMPRESSIBLE MATERIAL SHALL BE CUT TO MATCH THE PIPELINE SHAPE AND MUST EXTEND THROUGH THE FULL HEIGHT OF THE CONCRETE.

| COMPRESSIBLE FILLER FOR PIPE JOINTS |           |
|-------------------------------------|-----------|
| NOMINAL PIPE DIA                    | HYDROCELL |
| 100 - 300                           | 15mm      |
| 350 - 450                           | 20mm      |
| 465 - 750                           | 35mm      |

SELECTED AS DUG MATERIAL IN NON-TRAFFICKED AREAS, M.O.T. TYPE 1 IN HIGHWAYS.

SELECTED AS DUG MATERIAL. REFER TO STANDARD NOTES DRAWING FOR CLASSIFICATION OF 'AS DUG' MATERIAL

FOR GRANULAR BEDDING REFER TO TABLE

Y VALUE (BELOW PIPE):  
HARD SPOTS/IRREGULAR TRENCH BOTTOM BC/4 (200mm MIN)  
EVEN TRENCH BOTTOM BC/6 (100mm MIN)

BC = OUTSIDE DIAMETER

## PIPE BEDDING CLASS B (BEDDING FACTOR 1.9)

SELECTED AS DUG MATERIAL IN NON-TRAFFICKED AREAS, M.O.T. TYPE 1 IN HIGHWAYS. REFER TO STANDARD NOTES DRAWING FOR CLASSIFICATION OF 'AS-DUG' MATERIAL.

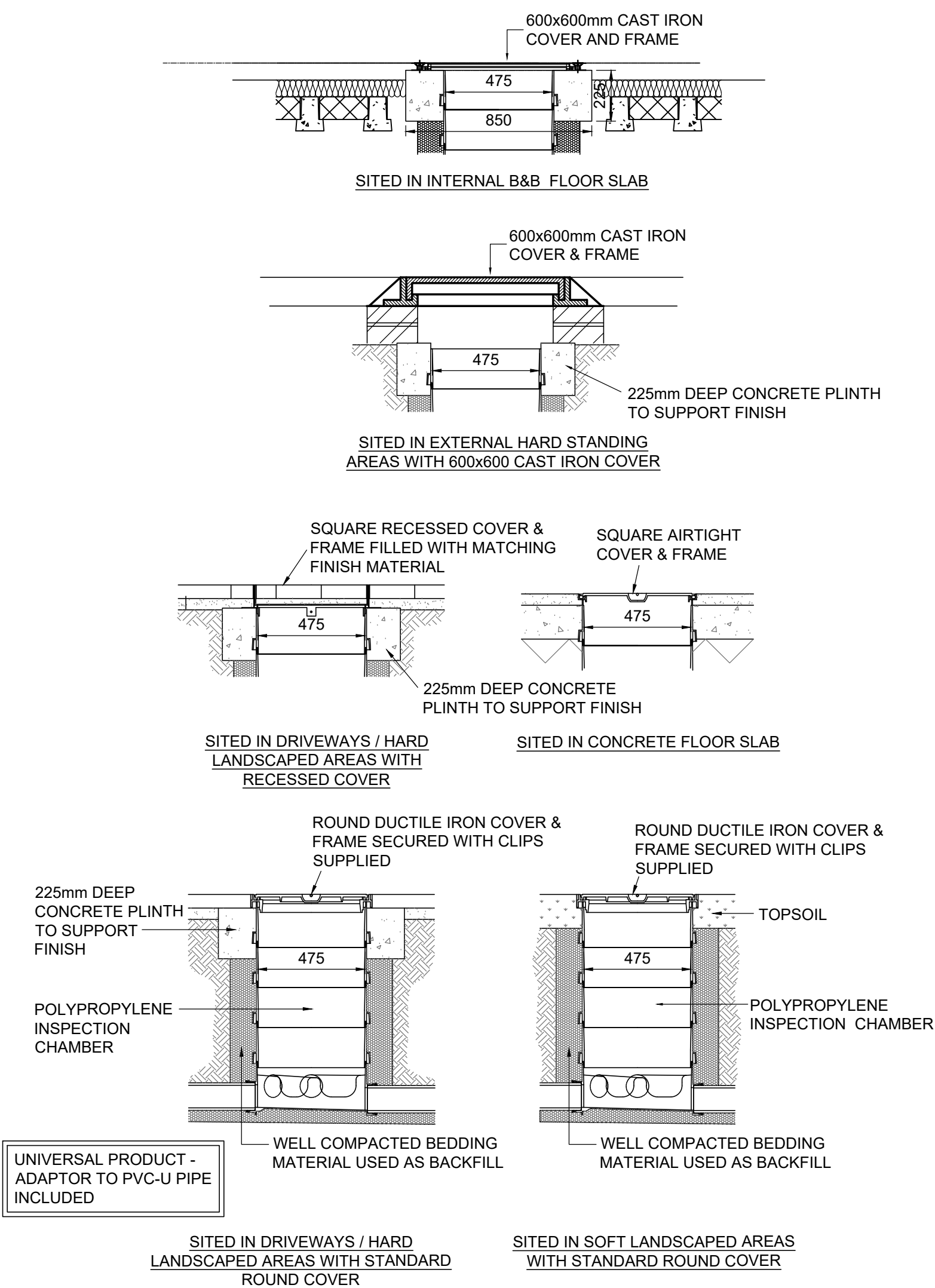
FOR GRANULAR BEDDING REFER TO TABLE

Y VALUE (BELOW PIPE):  
HARD SPOTS/IRREGULAR TRENCH BOTTOM BC/4 (200mm MIN)  
EVEN TRENCH BOTTOM BC/6 (100mm MIN)

BC = OUTSIDE DIAMETER

## PIPE BEDDING CLASS S (BEDDING FACTOR 2.5)

## POLYPROPYLENE INSPECTION CHAMBER INSTALLATION DETAIL



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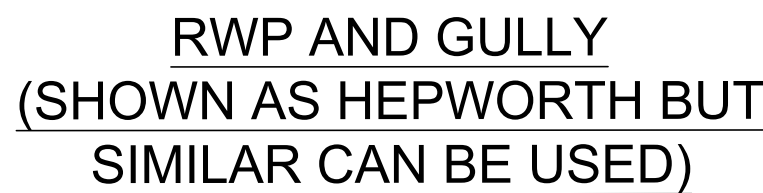
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| PROJECT  | VARLEY STREET, SEN SCHOOL |
| DRAFTER  | JF                        |
| ENGINEER | PR                        |

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| PROPOSED DRAINAGE DETAILS SH1 |       |                          |     |
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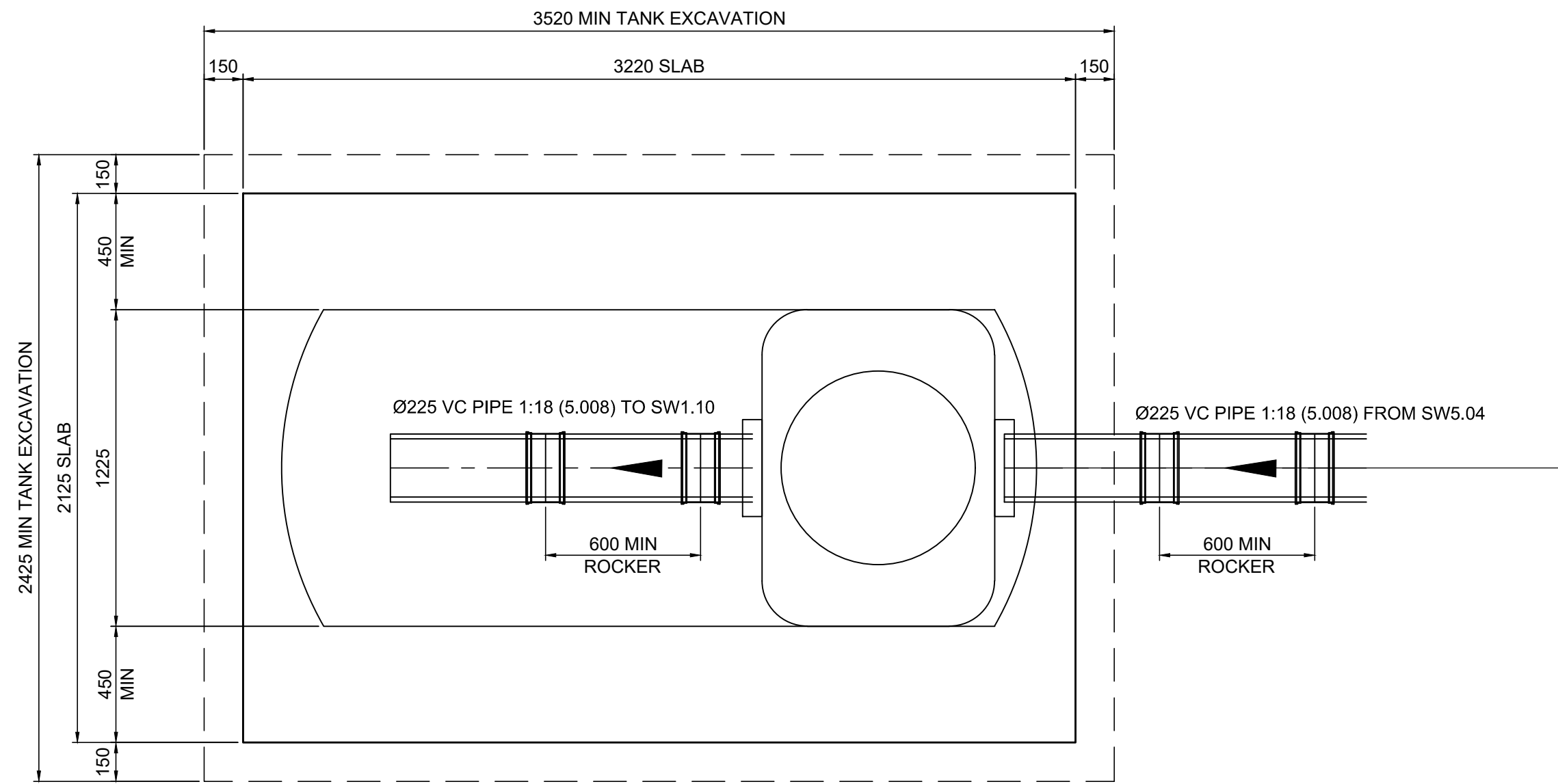
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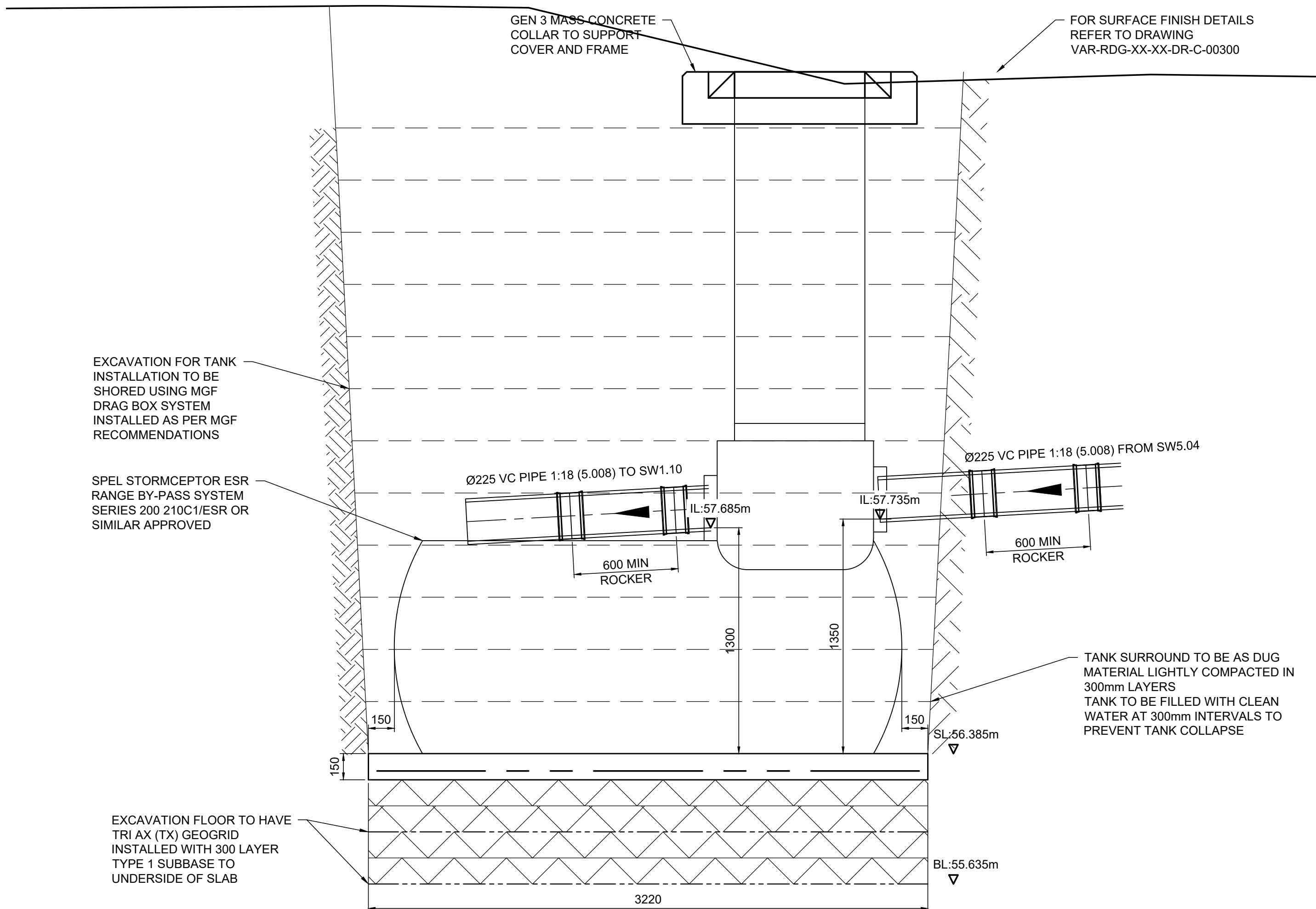
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| PROJECT |    | VARLEY STREET,<br>SEN SCHOOL |    |
| DRAFTER | JF | ENGINEER                     | PR |

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| PROPOSED<br>DRAINAGE DETAILS<br>SH2 |             |                                        |            |
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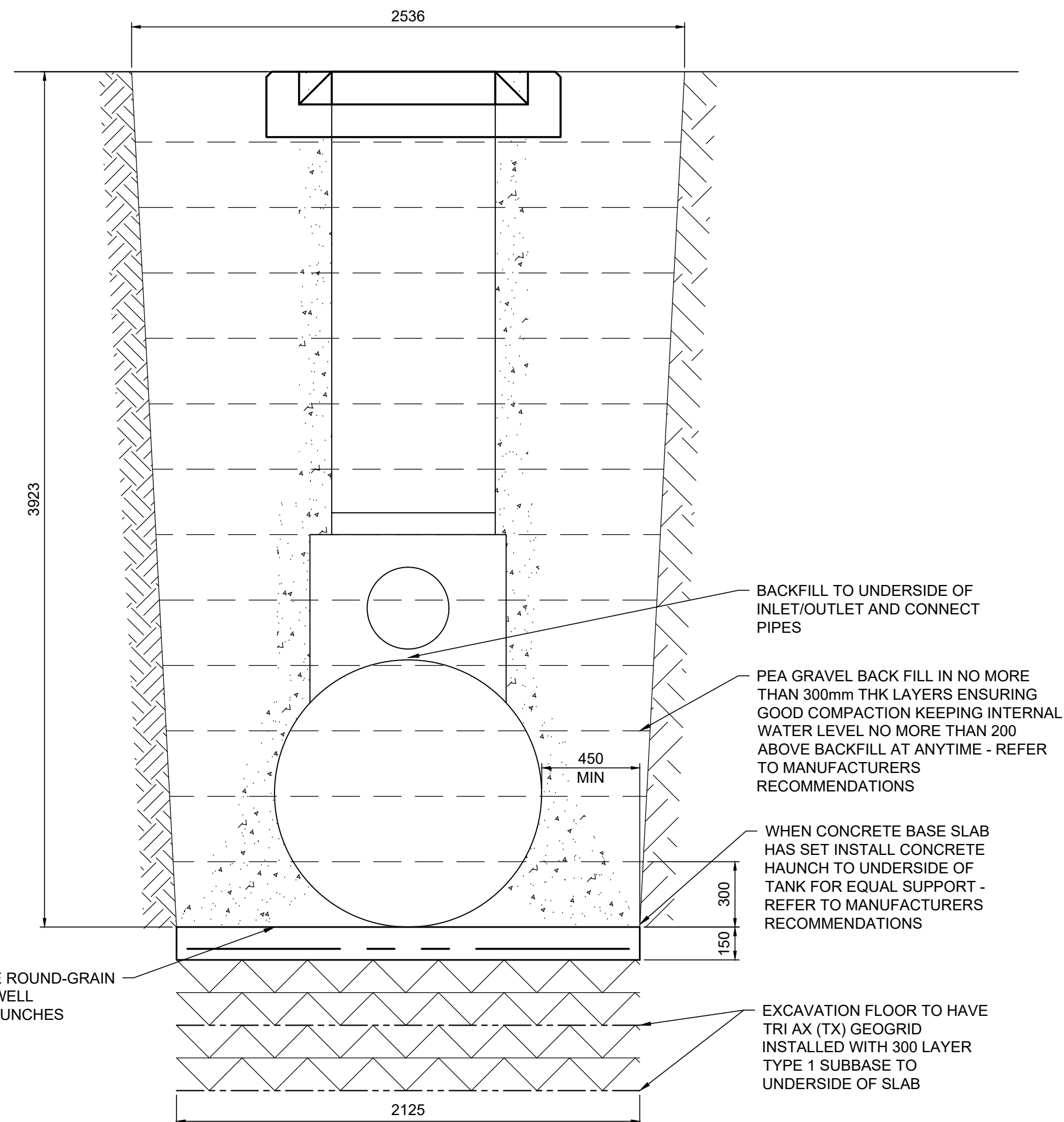




PETROL INTERCEPTOR PLAN  
SCALE 1:20



SECTION A-A  
SCALE 1:20

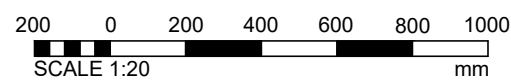


SECTION B-B  
SCALE 1:20

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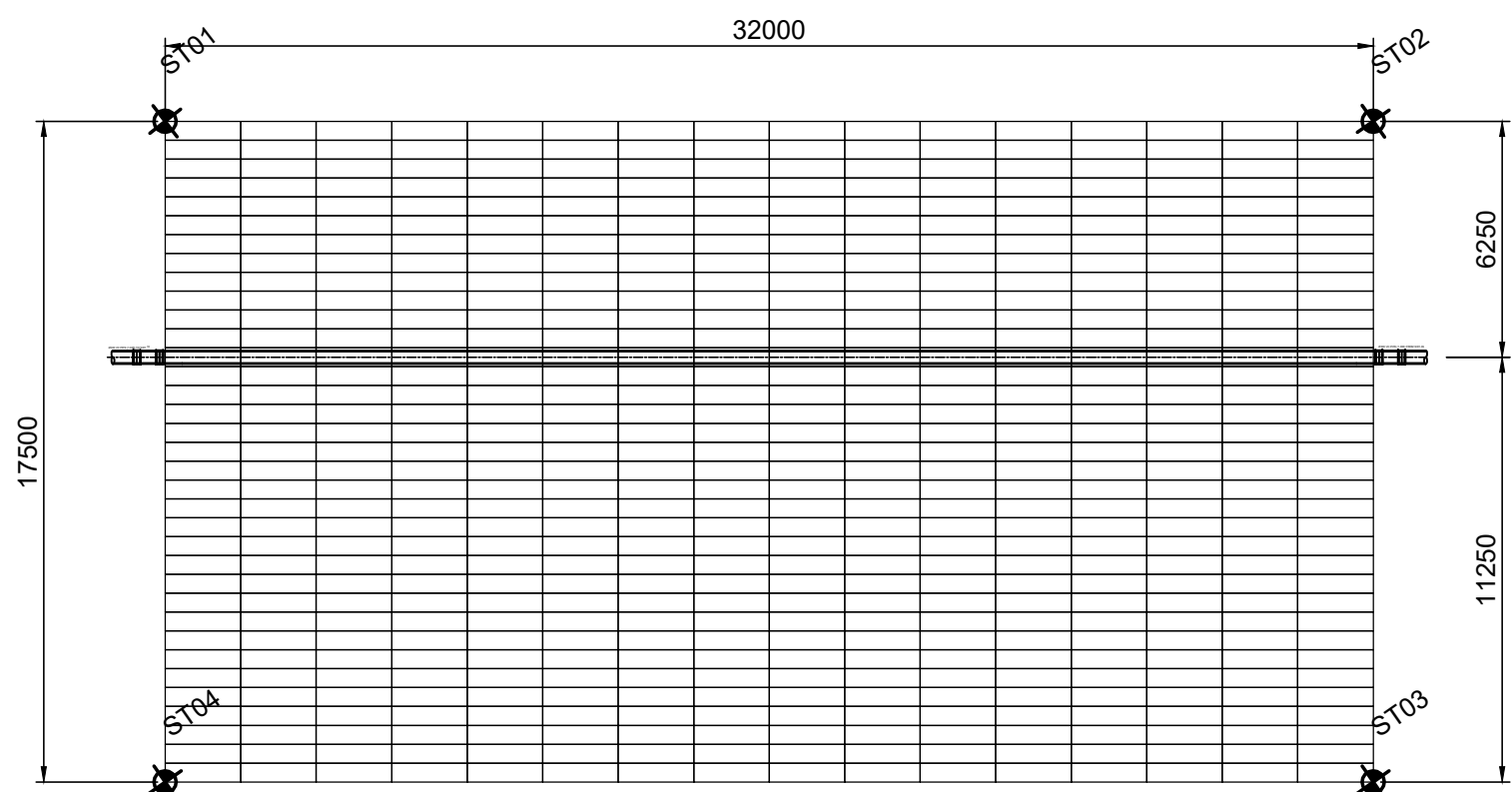
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| PROJECT  | VARLEY STREET,<br>SEN SCHOOL |
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| ENGINEER | PR                           |

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| PROPOSED DRAINAGE DETAILS SH3 |       |                          |     |
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| SETTING OUT |             |             |
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| ST02        | 386120.2435 | 399569.3269 |
| ST03        | 386130.9766 | 399555.5048 |
| ST04        | 386105.7019 | 399535.8785 |

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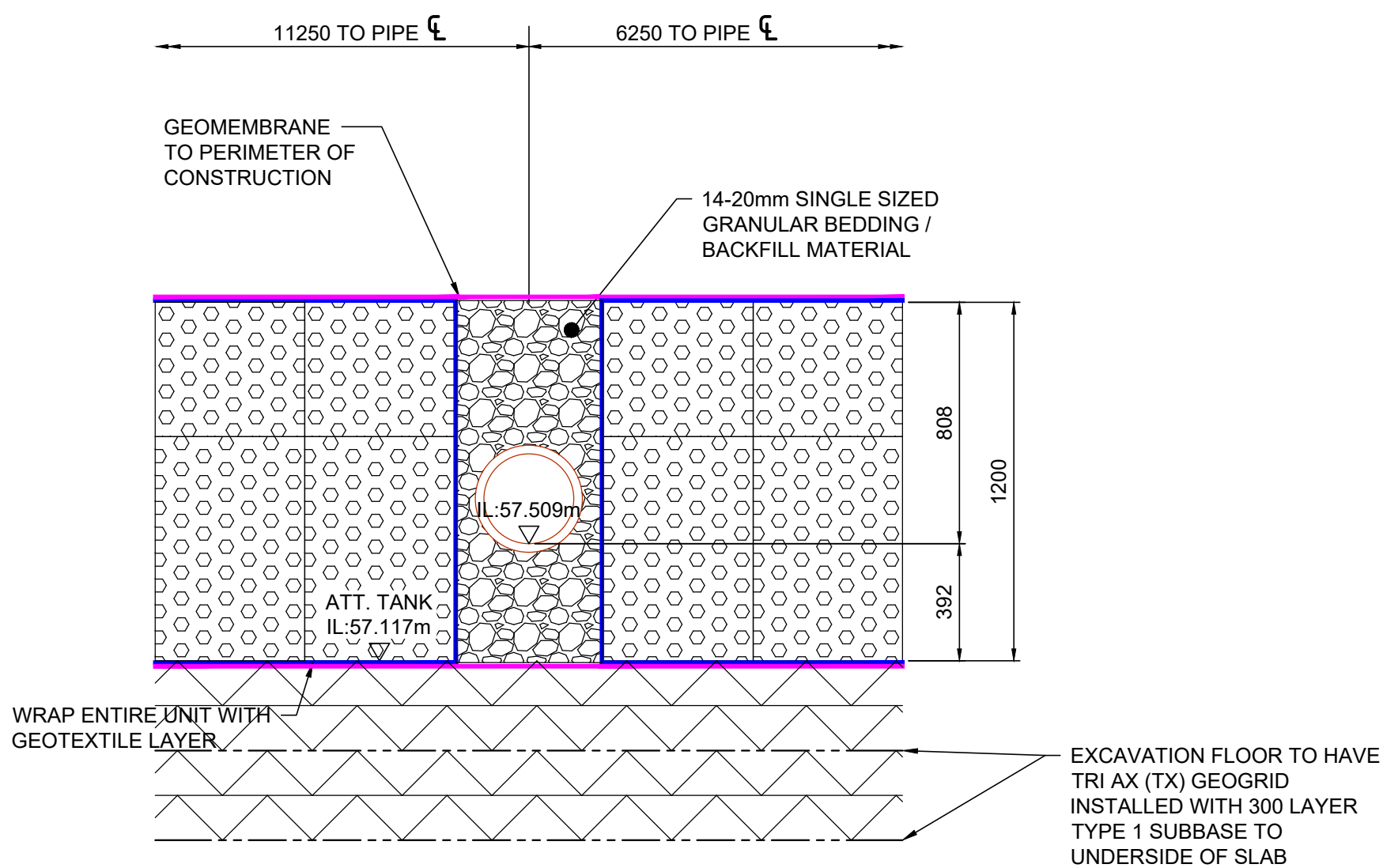
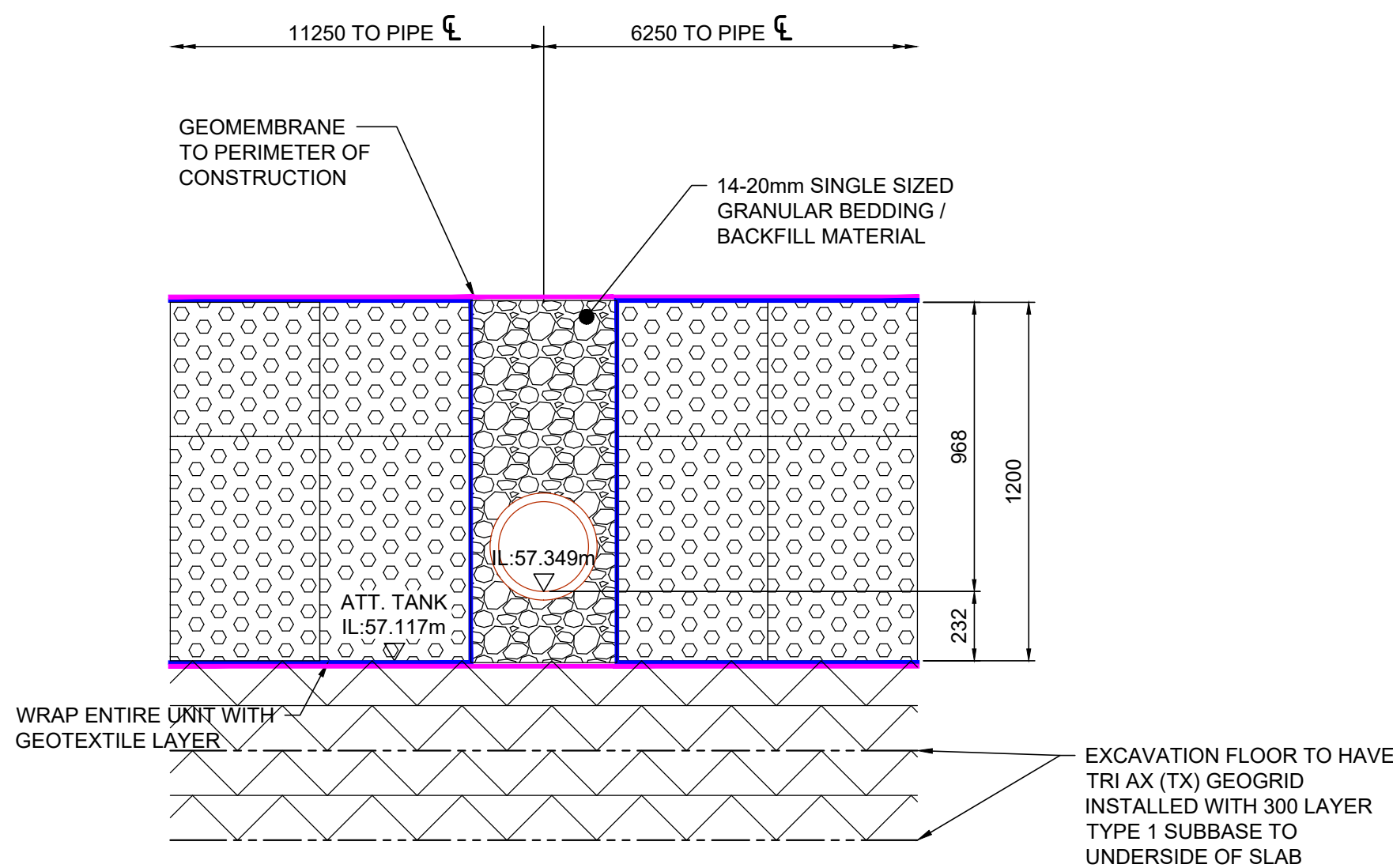
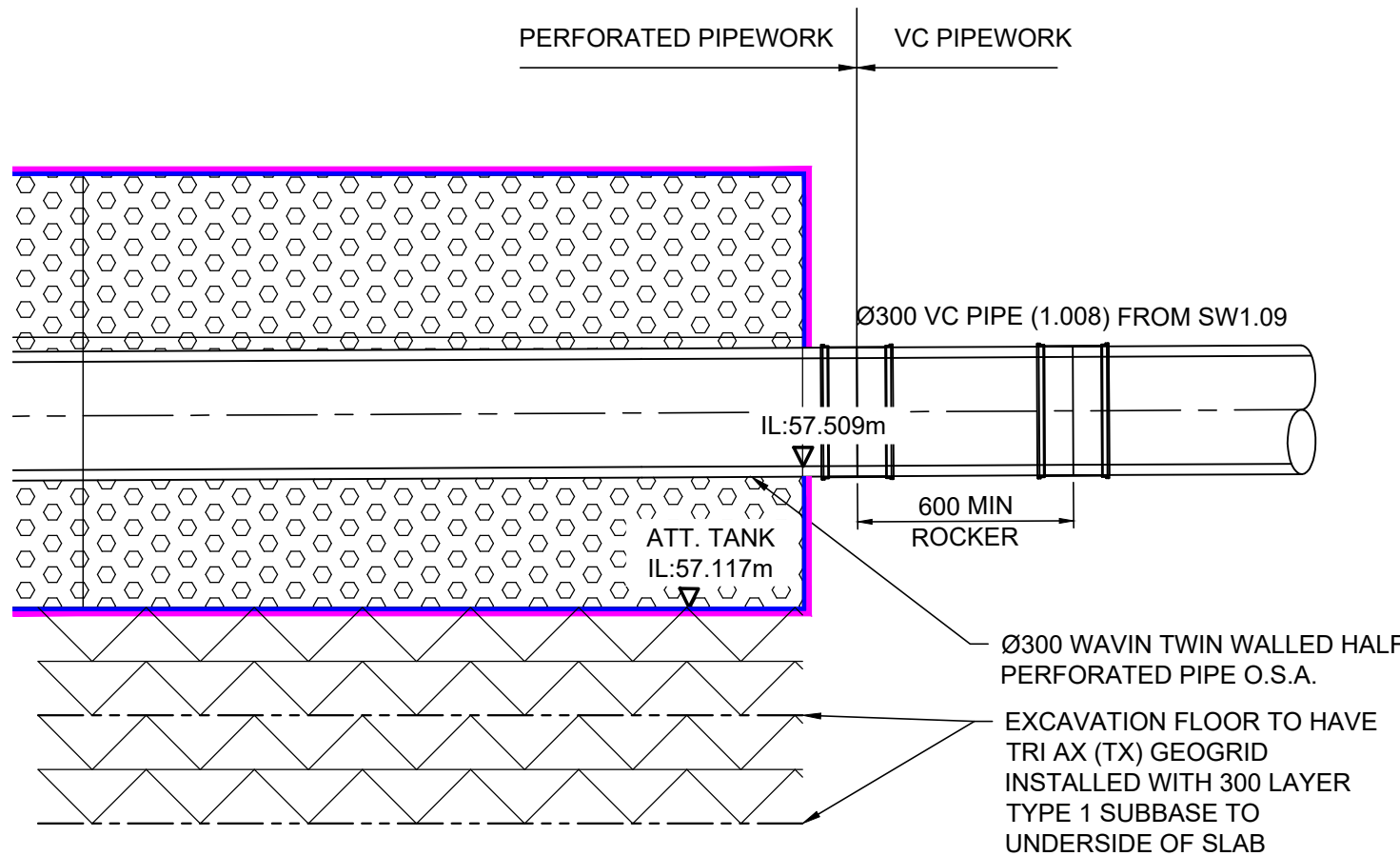
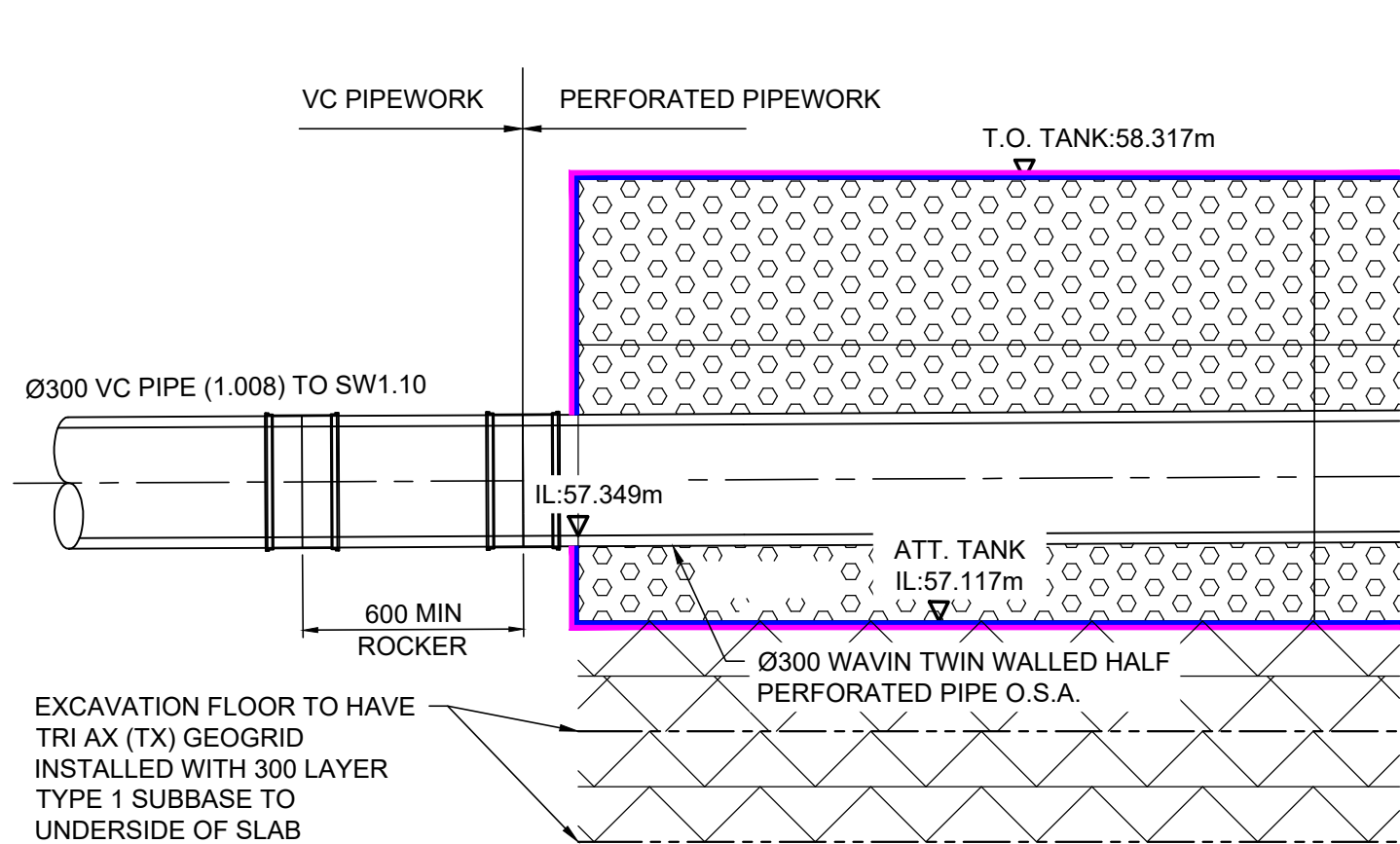
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#### STORMWATER STORAGE TANK - SDS GEOLIGHT (O.S.A.)

- DESIGN TO BE UNDERTAKEN BY GEOLIGHT TO SUIT GROUND CONDITIONS AND DESIGN SHOULD BE IN ACCORDANCE WITH C680 AND C737.
- CONTRACTOR TO CONFIRM CONSTRUCTION TRAFFIC REQUIREMENTS FOR GEOLIGHT TO CONFIRM ANY TEMPORARY WORKS REQUIRED TO FACILITATE CONSTRUCTION TRAFFIC OVERRUNNING THE ATTENUATION FOLLOWING INSTALL
- TANK SIZE : 32m(L) x 17.5m(W) x 1.2m(H)
- TANK VOLUME : 660m3 (OVERALL)
- VOID RATIO : 0.95 x V = 627.2m3 (EFFECTIVE)
- TANK INVERT LEVEL : 57.117m
- MINIMUM COVER : 1.21m (AS PER MANUFACTURERS RECOMMENDATIONS)
- BOTTOM LEVEL OF PERFORATIONS/SLOTS OF THE PERFORATED PIPE TO COINCIDE WITH THE TANK IL AT THE DOWNSTREAM END



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| DRAFTER  | JF                        |
| ENGINEER | PR                        |

| SCALE      | 1:20                     |
|------------|--------------------------|
| SHEET      | A1                       |
| DRAWING No | VAR-RDG-XX-XX-DR-C-00508 |
| REV        | P01                      |

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| MANHOLE SCHEDULE |                              |                 |                     |              |              |                                                          |                                       |                         |                         |
|------------------|------------------------------|-----------------|---------------------|--------------|--------------|----------------------------------------------------------|---------------------------------------|-------------------------|-------------------------|
| MANHOLE NO.      | MANHOLE CO-ORDINATES         | COVER LEVEL (m) | DEPTH TO INVERT (m) | MANHOLE SIZE | MANHOLE TYPE | PIPE IN NAME, INVERT LEVEL (m) & DIA                     | PIPE OUT NAME, INVERT LEVEL (m) & DIA | COVER SIZE (mm) & GRADE | COMMENTS                |
| F1               | E:386167.853<br>N:399655.377 | 60.206          | 0.856               | 450          | IC           |                                                          | F 1.000, IL=59.350, 100mmØ            | 450<br>A15              |                         |
| F2               | E:386154.806<br>N:399645.148 | 60.206          | 1.071               | 450          | IC           | F 1.000, IL=59.135, 100mmØ                               | F 1.001, IL=59.135, 100mmØ            | 450<br>A15              |                         |
| F3               | E:386145.847<br>N:399638.133 | 60.206          | 1.219               | 450          | IC           | F 1.001, IL=58.987, 100mmØ                               | F 1.002, IL=58.987, 100mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F4               | E:386133.502<br>N:399628.500 | 60.206          | 1.472               | 450          | IC           | F 1.002, IL=58.784, 100mmØ                               | F 1.003, IL=58.734, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F5               | E:386126.001<br>N:399622.632 | 60.206          | 1.543               | 450          | IC           | F 1.003, IL=58.663, 150mmØ                               | F 1.004, IL=58.663, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F6               | E:386115.380<br>N:399614.320 | 60.206          | 1.643               | 450          | IC           | F 1.004, IL=58.563, 150mmØ                               | F 1.005, IL=58.563, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F7               | E:386110.937<br>N:399610.836 | 60.206          | 1.685               | 450          | IC           | F 1.005, IL=58.521, 150mmØ                               | F 1.006, IL=58.521, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F8               | E:386104.114<br>N:399605.507 | 60.208          | 1.751               | 450          | IC           | F 1.006, IL=58.457, 150mmØ                               | F 1.007, IL=58.457, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F9               | E:386092.823<br>N:399596.257 | 60.184          | 1.841               | 450          | IC           | F 1.007, IL=58.343, 150mmØ                               | F 1.008, IL=58.343, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F10              | E:386179.749<br>N:399634.055 | 60.200          | 0.900               | 450          | IC           |                                                          | F 2.000, IL=59.300, 100mmØ            | 450<br>A15              |                         |
| F11              | E:386189.870<br>N:399621.177 | 60.200          | 1.113               | 450          | IC           | F 2.000, IL=59.087, 100mmØ                               | F 2.001, IL=59.087, 100mmØ            | 450<br>A15              |                         |
| F12              | E:386196.724<br>N:399611.885 | 60.200          | 1.265               | 450          | IC           | F 2.001, IL=58.935, 100mmØ                               | F 2.002, IL=58.935, 100mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F13              | E:386166.443<br>N:399614.603 | 60.210          | 1.144               | 450          | IC           |                                                          | F 3.000, IL=59.066, 100mmØ            | 450<br>A15              |                         |
| F14              | E:386172.167<br>N:399607.491 | 60.211          | 1.287               | 450          | IC           | F 3.000, IL=58.924, 100mmØ                               | F 3.001, IL=58.924, 100mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F15              | E:386179.561<br>N:399598.041 | 60.200          | 1.604               | 450          | IC           | F 2.002, IL=58.646, 100mmØ<br>F 3.001, IL=58.740, 100mmØ | F 2.003, IL=58.596, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F16              | E:386147.471<br>N:399612.338 | 60.221          | 1.021               | 450          | IC           |                                                          | F 4.000, IL=59.200, 100mmØ            | 450<br>A15              |                         |
| F17              | E:386143.992<br>N:399603.264 | 60.215          | 1.241               | 450          | IC           | F 4.000, IL=59.024, 100mmØ                               | F 4.001, IL=58.974, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F18              | E:386153.443<br>N:399591.206 | 60.215          | 1.518               | 450          | IC           | F 4.001, IL=58.697, 150mmØ                               | F 4.002, IL=58.697, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F19              | E:386160.044<br>N:399582.772 | 60.200          | 1.788               | 450          | IC           | F 2.003, IL=58.412, 150mmØ<br>F 4.002, IL=58.506, 150mmØ | F 2.004, IL=58.412, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |

| MANHOLE SCHEDULE |                              |                 |                     |              |              |                                                          |                                       |                         |                         |
|------------------|------------------------------|-----------------|---------------------|--------------|--------------|----------------------------------------------------------|---------------------------------------|-------------------------|-------------------------|
| MANHOLE NO.      | MANHOLE CO-ORDINATES         | COVER LEVEL (m) | DEPTH TO INVERT (m) | MANHOLE SIZE | MANHOLE TYPE | PIPE IN NAME, INVERT LEVEL (m) & DIA                     | PIPE OUT NAME, INVERT LEVEL (m) & DIA | COVER SIZE (mm) & GRADE | COMMENTS                |
| F20              | E:386142.844<br>N:399569.732 | 60.200          | 1.950               | 450          | IC           | F 2.004, IL=58.250, 150mmØ                               | F 2.005, IL=58.250, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F21              | E:386135.952<br>N:399578.011 | 60.195          | 2.026               | 450          | IC           | F 2.005, IL=58.169, 150mmØ                               | F 2.006, IL=58.169, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F22              | E:386125.866<br>N:399590.372 | 60.195          | 2.147               | 450          | IC           | F 2.006, IL=58.048, 150mmØ                               | F 2.007, IL=58.048, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F23              | E:386119.199<br>N:399585.594 | 60.173          | 2.188               | 450          | IC           | F 2.007, IL=57.985, 150mmØ                               | F 2.008, IL=57.985, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F24              | E:386107.766<br>N:399576.628 | 60.172          | 2.745               | 450          | IC           | F 1.008, IL=57.427, 150mmØ<br>F 2.008, IL=57.521, 150mmØ | F 1.009, IL=57.427, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F25              | E:386111.169<br>N:399548.559 | 59.980          | 2.650               | 450          | IC           | F 1.009, IL=57.263, 150mmØ                               | F 1.010, IL=57.263, 150mmØ            | 450<br>A15              | ACCESS REDUCED TO 350mm |
| F26              | E:386092.001<br>N:399548.559 | 60.093          | 2.945               | 1,200        | Type-B       | F 1.010, IL=56.955, 150mmØ                               | F 1.011, IL=56.955, 150mmØ            | 600x600<br>D400         |                         |
| CW1.11           | E:386083.050<br>N:399521.659 | 60.014          | 3.071               | 1,200        | Type-B       | 1.009, IL=56.610, 150mmØ<br>F1.009, IL=56.610, 150mmØ    | 1.010, IL=56.610, 150mmØ              | 600x600<br>D400         |                         |

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

|     |          |       |            |                   |
|-----|----------|-------|------------|-------------------|
|     |          |       |            |                   |
| P02 | 07.07.23 | JF    | PR         | STAGE 4 ISSUE     |
| P01 | 21.02.23 | JF    | PB         | PRELIMINARY ISSUE |
| No  | DATE     | DRAWN | REV'D ENG. | AMENDMENT         |

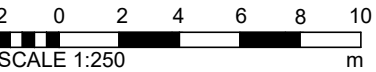
|                                                                                                                                                                                                                                                                          |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| STATUS                                                                                                                                                                                                                                                                   | PURPOSE OF ISSUE |
| S4                                                                                                                                                                                                                                                                       | STAGE 4          |
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|          |                              |
|----------|------------------------------|
| CLIENT   | ISG                          |
| PROJECT  | VARLEY STREET,<br>SEN SCHOOL |
| DRAFTER  | JF                           |
| ENGINEER | PB                           |

|                            |                      |
|----------------------------|----------------------|
| REFERENCE DRAWINGS :       |                      |
| VAR-RDG-XX-XX-DR-C-00500 - | FWS LAYOUT           |
| VAR-RDG-XX-XX-DR-C-00501 - | SWS LAYOUT           |
| VAR-RDG-XX-XX-DR-C-00511 - | SWS MH SCHEDULE      |
| VAR-RDG-XX-XX-DR-C-00505 - | DRAINAGE DETAILS SH1 |
| VAR-RDG-XX-XX-DR-C-00506 - | DRAINAGE DETAILS SH2 |
| VAR-RDG-XX-XX-DR-C-00515 - | HYDROBRAKE CHAMBER   |

|                                  |       |                          |     |
|----------------------------------|-------|--------------------------|-----|
| PROPOSED<br>FWS MANHOLE SCHEDULE |       |                          |     |
| SCALE                            | SHEET | DRAWING No               | REV |
| 1:250                            | A1    | VAR-RDG-XX-XX-SH-C-00510 | P02 |



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| MANHOLE SCHEDULE |                 |                     |              |              |                                                      |                                       |                         |                            |
|------------------|-----------------|---------------------|--------------|--------------|------------------------------------------------------|---------------------------------------|-------------------------|----------------------------|
| MANHOLE NO.      | COVER LEVEL (m) | DEPTH TO INVERT (m) | MANHOLE SIZE | MANHOLE TYPE | PIPE IN NAME, INVERT LEVEL (m) & DIA                 | PIPE OUT NAME, INVERT LEVEL (m) & DIA | COVER SIZE (mm) & GRADE | COMMENTS                   |
| SW1.01           | 60.196          | 1.048               | 600          | IC           |                                                      | 1.000, IL=59.148, 225mmØ              | 600 x 600 B125          |                            |
| SW1.02           | 60.135          | 1.215               | 600          | IC           | 1.000, IL=58.941, 225mmØ                             | 1.001, IL=58.920, 225mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.03           | 60.185          | 1.409               | 600          | IC           | 1.001, IL=58.801, 225mmØ                             | 1.002, IL=58.776, 225mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.04           | 60.203          | 1.525               | 600          | IC           | 1.002, IL=58.698, 225mmØ                             | 1.003, IL=58.678, 225mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.05           | 60.180          | 1.674               | 600          | IC           | 1.003, IL=58.526, 225mmØ                             | 1.004, IL=58.506, 225mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.06           | 60.195          | 1.916               | 600          | IC           | 1.004, IL=58.386, 225mmØ<br>2.000, IL=58.429, 150mmØ | 1.005, IL=58.279, 300mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.07           | 60.195          | 2.055               | 600          | IC           | 1.005, IL=58.163, 300mmØ<br>3.000, IL=58.215, 225mmØ | 1.006, IL=58.140, 300mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW1.08           | 60.176          | 2.171               | 600          | IC           | 1.006, IL=58.018, 300mmØ                             | 1.007, IL=58.005, 300mmØ              | 600x600 B125            | ACCESS RESTRICTED TO 350mm |
| SW1.09           | 60.164          | 2.590               | 1,500        | Type-B       | 1.007, IL=57.590, 300mmØ<br>4.004, IL=57.590, 300mmØ | 1.008, IL=57.590, 300mmØ              | 600x600 B125            |                            |
| SW1.10           | 60.648          | 3.381               | 1,500        | FLOW CONTROL | 1.008, IL=57.321, 300mmØ<br>5.003, IL=57.267, 225mmØ | 1.009, IL=57.267, 150mmØ              | 1200 x 675 B125         |                            |
| SW2.01           | 60.204          | 1.056               | 600          | IC           |                                                      | 2.000, IL=59.148, 150mmØ              | 600 x 600 B125          |                            |
| SW3.01           | 60.209          | 1.059               | 600          | IC           |                                                      | 3.000, IL=59.150, 225mmØ              | 600 x 600 B125          |                            |
| SW4.01           | 59.938          | 1.425               | 1,200        | Type-B       |                                                      | 4.000, IL=58.513, 225mmØ              | 600x600 D400            |                            |
| SW4.01A          | 59.936          | 1.584               | 1,200        | Type-B       | 4.000, IL=58.353, 225mmØ                             | 4.001, IL=58.353, 225mmØ              | 600x600 D400            |                            |
| SW4.02           | 59.525          | 1.425               | 1,200        | Type-B       | 4.001, IL=58.075, 225mmØ                             | 4.002, IL=58.075, 225mmØ              | 600x600 D400            |                            |
| SW4.03           | 59.880          | 2.045               | 1,200        | Type-B       | 4.002, IL=57.906, 225mmØ                             | 4.003, IL=57.834, 300mmØ              | 600x600 D400            |                            |
| SW4.04           | 60.158          | 2.482               | 600          | IC           | 4.003, IL=57.677, 300mmØ                             | 4.004, IL=57.677, 300mmØ              | 600 x 600 B125          | ACCESS RESTRICTED TO 350mm |
| SW5.01           | 59.711          | 1.425               | 1,200        | Type-B       |                                                      | 5.000, IL=58.246, 225mmØ              | 600x600 D400            |                            |
| SW5.02           | 60.343          | 1.774               | 1,200        | Type-B       | 5.000, IL=58.113, 225mmØ                             | 5.001, IL=58.113, 225mmØ              | 600x600 D400            |                            |
| SW5.03           | 60.352          | 1.955               | 1,200        | Type-B       | 5.001, IL=57.944, 225mmØ                             | 5.002, IL=57.945, 225mmØ              | 600x600 D400            |                            |

| MANHOLE SCHEDULE |                 |                     |              |              |                                                      |                                       |                         |          |
|------------------|-----------------|---------------------|--------------|--------------|------------------------------------------------------|---------------------------------------|-------------------------|----------|
| MANHOLE NO.      | COVER LEVEL (m) | DEPTH TO INVERT (m) | MANHOLE SIZE | MANHOLE TYPE | PIPE IN NAME, INVERT LEVEL (m) & DIA                 | PIPE OUT NAME, INVERT LEVEL (m) & DIA | COVER SIZE (mm) & GRADE | COMMENTS |
| SW5.04           | 60.281          | 2.406               | 1,200        | Type-B       | 5.002, IL=57.883, 225mmØ<br>6.000, IL=57.875, 225mmØ | 5.003, IL=57.875, 225mmØ              | 600x600 D400            |          |
| SW6.01           | 59.853          | 1.432               | 1,200        | Type-B       |                                                      | 6.000, IL=58.421, 225mmØ              | 600x600 D400            |          |

| MANHOLE SCHEDULE |                 |                     |              |              |                                                                   |                                       |                         |                          |
|------------------|-----------------|---------------------|--------------|--------------|-------------------------------------------------------------------|---------------------------------------|-------------------------|--------------------------|
| MANHOLE NO.      | COVER LEVEL (m) | DEPTH TO INVERT (m) | MANHOLE SIZE | MANHOLE TYPE | PIPE IN NAME, INVERT LEVEL (m) & DIA                              | PIPE OUT NAME, INVERT LEVEL (m) & DIA | COVER SIZE (mm) & GRADE | COMMENTS                 |
| CW1.11           | 60.014          | 3.071               | 1,200        | Type-B       | 1.009, IL=56.610, 150mmØ<br>F1.009, IL=56.610, 150mmØ             | 1.010, IL=56.610, 150mmØ              | 600x600 D400            |                          |
| CW1.12           | 58.410          | 3.670               | 1,200        | Type-B       | 1.010, 150mmØ<br>BACKDROP IL 56.483<br>EXISTING UU SEWER IL:54.74 | EXISTING UU SEWER IL:54.74            | 600x600 D400            | NEW MH ON EXISTING SEWER |

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

|    |      |       |            |           |
|----|------|-------|------------|-----------|
|    |      |       |            |           |
| No | DATE | DRAWN | REV'D ENG. | AMENDMENT |

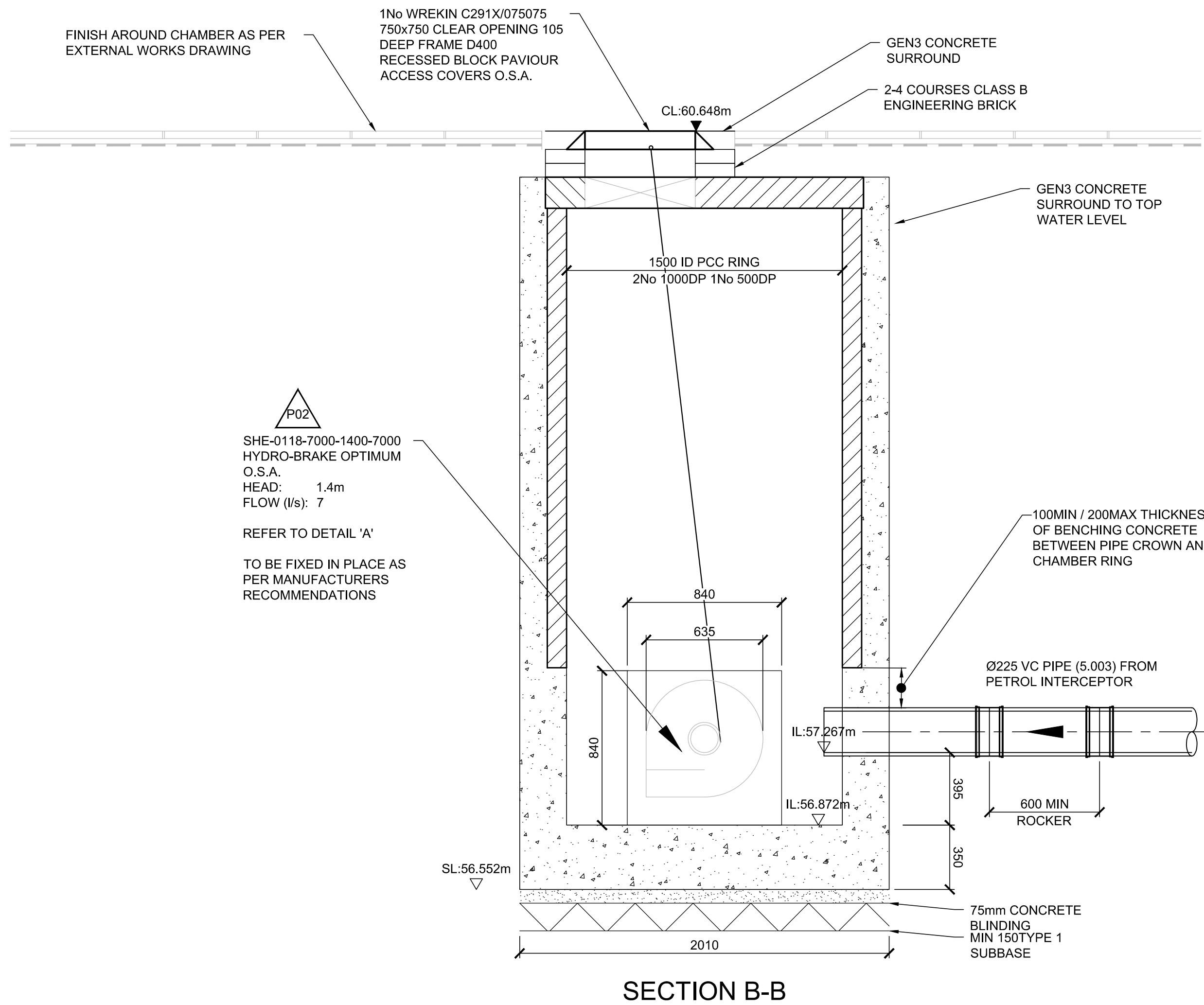
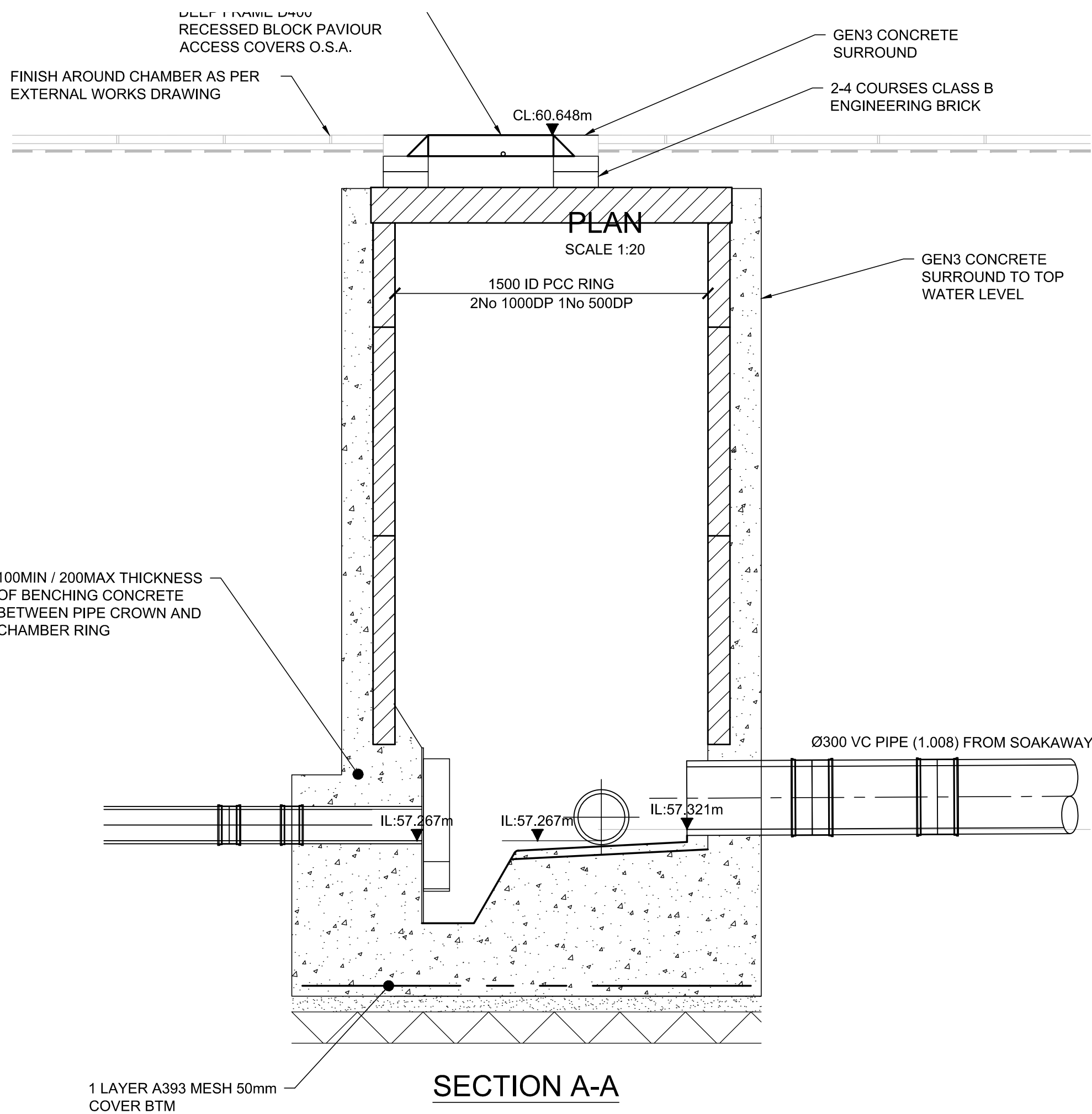
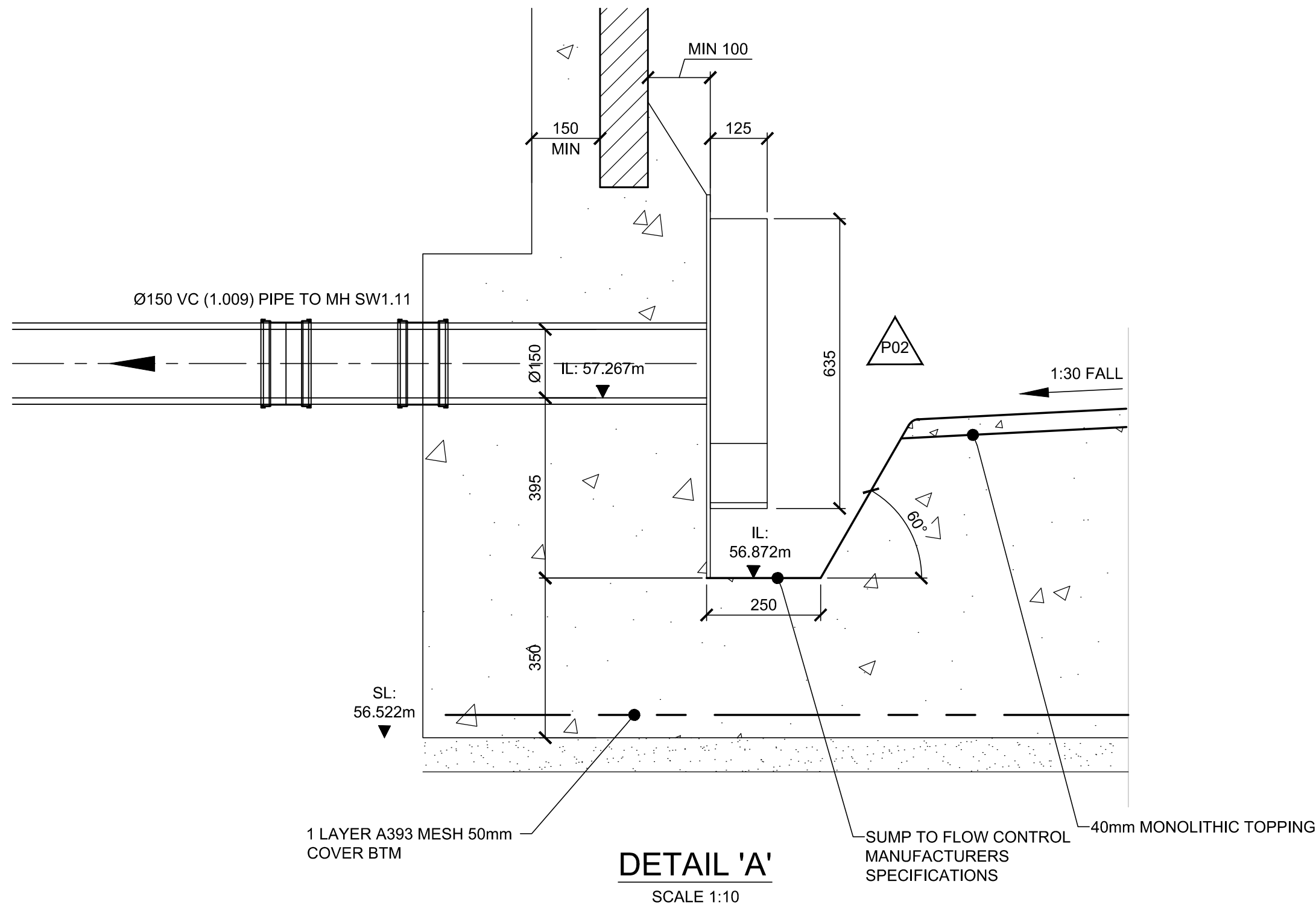
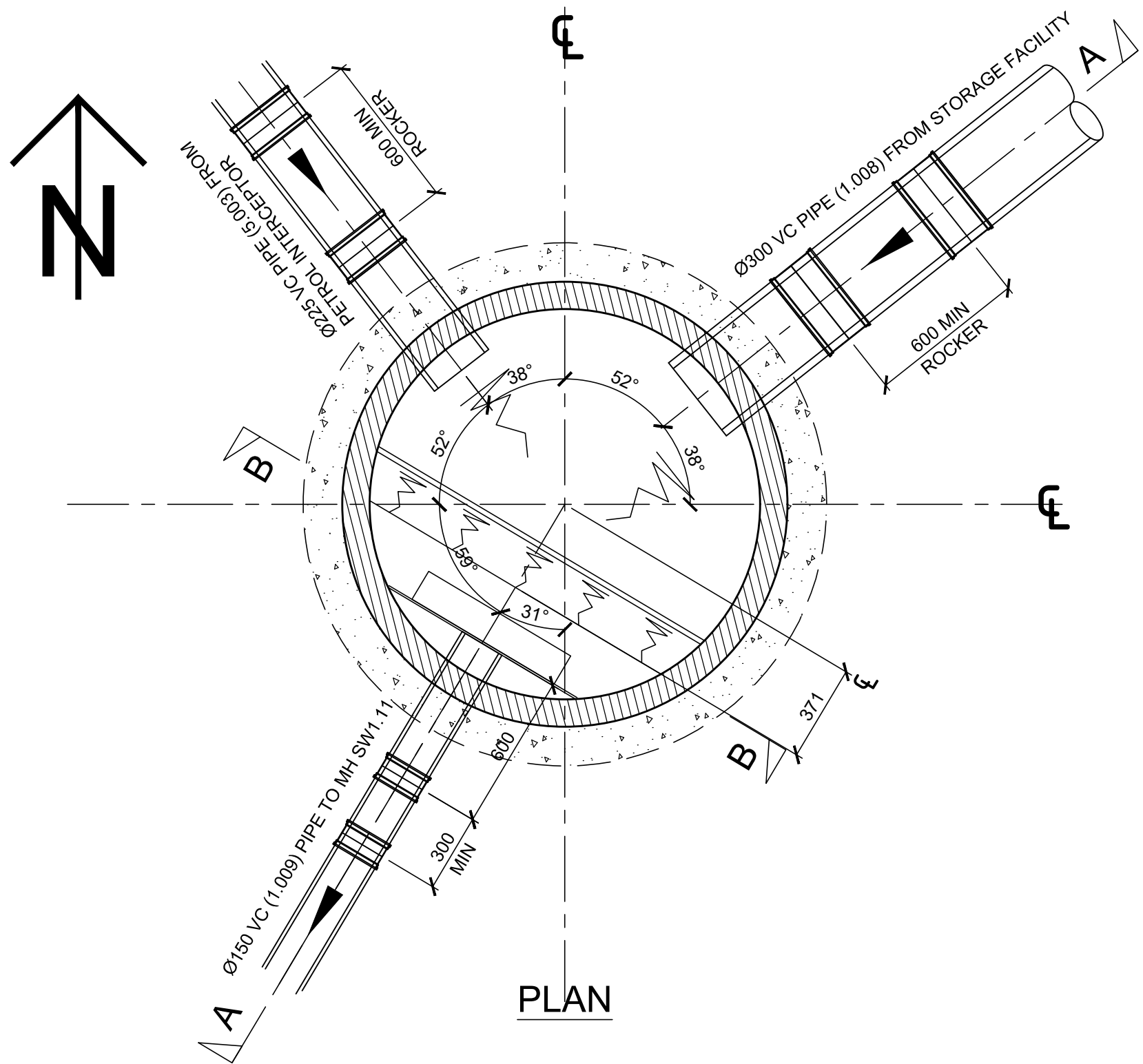
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|     |          |       |            |                            |
| P03 | 12.07.23 | JF    | PR         | CW1.12 BACKDROP IL AMENDED |
| P02 | 07.07.23 | JF    | PB         | STAGE 4 ISSUE              |
| P01 | 21.02.23 | JF    | PR         | PRELIMINARY ISSUE          |
| No  | DATE     | DRAWN | REV'D ENG. | AMENDMENT                  |

|                                                                                                                                                                                                                                                                          |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| STATUS                                                                                                                                                                                                                                                                   | PURPOSE OF ISSUE |
| S4                                                                                                                                                                                                                                                                       | STAGE 4          |
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|          |                           |
|----------|---------------------------|
| CLIENT   | ISG                       |
| PROJECT  | VARLEY STREET, SEN SCHOOL |
| DRAFTER  | JF                        |
| ENGINEER | PB                        |

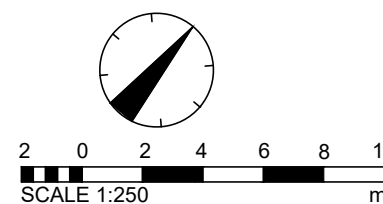
|                               |       |                          |     |
|-------------------------------|-------|--------------------------|-----|
| PROPOSED SWS MANHOLE SCHEDULE |       |                          |     |
| SCALE                         | SHEET | DRAWING No               | REV |
| 1:250                         | A1    | VAR-RDG-XX-XX-SH-C-00511 | P03 |



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| No  | DATE     | DRAWN | REV'D<br>ENG. | AMENDMENT               |
|-----|----------|-------|---------------|-------------------------|
| P02 | 12.07.23 | JF    | PR            | HYDROBRAKE SPEC AMENDED |
| P01 | 07.07.23 | JF    | PR            | STAGE 4 ISSUE           |

| STATUS                                                                                                                                                                                                                                                                   | PURPOSE OF ISSUE |
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| S4                                                                                                                                                                                                                                                                       | STAGE 4          |
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| PROJECT  | VARLEY STREET,<br>SEN SCHOOL |
| DRAFTER  | JF                           |
| ENGINEER | PR                           |

|                                |             |                                        |            |
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| PROPOSED<br>HYDROBRAKE CHAMBER |             |                                        |            |
| SCALE<br>1:20                  | SHEET<br>A1 | DRAWING No<br>VAR-RDG-XX-XX-DR-C-00515 | REV<br>P02 |

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**APPENDIX B**

# Greenfield runoff rate estimation for sites

www.uksud.com | Greenfield runoff tool

Calculated by: Predrag Rajkovic

Site name: Varley Street

Site location: Manchester

## Site Details

Latitude: 53.49155° N

Longitude: 2.21044° W

Reference: 53007637

Date: Feb 15 2023 07:55

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Runoff estimation approach IH124

### Site characteristics

Total site area (ha): 1.071

### Methodology

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

SPR estimation method: Calculate from SOIL type

### Soil characteristics

SOIL type: Default 4 Edited 4

HOST class: Default N/A Edited N/A

SPR/SPRHOST: Default 0.47 Edited 0.47

### Hydrological characteristics

SAAR (mm): Default 916 Edited 916

Hydrological region: Default 10 Edited 10

Growth curve factor 1 year: Default 0.87 Edited 0.87

Growth curve factor 30 years: Default 1.7 Edited 1.7

Growth curve factor 100 years: Default 2.08 Edited 2.08

Growth curve factor 200 years: Default 2.37 Edited 2.37

## Notes

### (1) Is $Q_{BAR} < 2.0$ l/s/ha?

When  $Q_{BAR}$  is  $< 2.0$  l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

### (2) Are flow rates $< 5.0$ l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

### (3) Is $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

|                       | Default | Edited |
|-----------------------|---------|--------|
| $Q_{BAR}$ (l/s):      | 7.08    | 7.08   |
| 1 in 1 year (l/s):    | 6.16    | 6.16   |
| 1 in 30 years (l/s):  | 12.04   | 12.04  |
| 1 in 100 year (l/s):  | 14.73   | 14.73  |
| 1 in 200 years (l/s): | 16.79   | 16.79  |

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.













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## Manhole Schedules for Foul - Main

| MH<br>Name   | Manhole<br>Easting<br>(m) | Manhole<br>Northing<br>(m) | Intersection<br>Easting<br>(m) | Intersection<br>Northing<br>(m) | Manhole<br>Access | Layout<br>(North) |
|--------------|---------------------------|----------------------------|--------------------------------|---------------------------------|-------------------|-------------------|
| F26          | 386092.001                | 399548.559                 | 386092.168                     | 399548.441                      | Required          | .                 |
| FCOMBINED MH | 386082.896                | 399522.495                 |                                |                                 | No Entry          |                   |

|                                                                  |                                           |                                                                                     |
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### FOUL SEWERAGE DESIGN

#### Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

|                             |        |                                       |       |
|-----------------------------|--------|---------------------------------------|-------|
| Industrial Flow (l/s/ha)    | 0.00   | Add Flow / Climate Change (%)         | 0     |
| Industrial Peak Flow Factor | 0.00   | Minimum Backdrop Height (m)           | 0.825 |
| Flow Per Person (l/per/day) | 222.00 | Maximum Backdrop Height (m)           | 1.500 |
| Persons per House           | 3.00   | Min Design Depth for Optimisation (m) | 1.200 |
| Domestic (l/s/ha)           | 0.00   | Min Vel for Auto Design only (m/s)    | 0.75  |
| Domestic Peak Flow Factor   | 6.00   | Min Slope for Optimisation (1:X)      | 500   |

Designed with Level Soffits

#### Network Design Table for Foul - Main

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | Area<br>(ha) | Houses | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|--------|---------------|-------------|----------------|--------------|--------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| F1.000 | 16.579        | 0.215       | 77.1           | 0.000        | 2      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |
| F1.001 | 11.378        | 0.148       | 76.9           | 0.000        | 1      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |
| F1.002 | 15.659        | 0.203       | 77.1           | 0.000        | 1      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |
| F1.003 | 9.524         | 0.071       | 134.1          | 0.000        | 2      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.004 | 13.487        | 0.100       | 134.9          | 0.000        | 1      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.005 | 5.646         | 0.042       | 134.4          | 0.000        | 1      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.006 | 8.657         | 0.064       | 135.3          | 0.000        | 2      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.007 | 14.920        | 0.114       | 130.9          | 0.000        | 1      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.008 | 24.994        | 0.916       | 27.3           | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
|        |               |             |                |              |        |                    |           |             |             |              |                                                                                       |
| F2.000 | 16.379        | 0.213       | 76.9           | 0.000        | 3      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |
| F2.001 | 11.718        | 0.152       | 77.1           | 0.000        | 2      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |
| F2.002 | 22.226        | 0.289       | 76.9           | 0.000        | 0      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |  |

#### Network Results Table

| PN     | US/IL<br>(m) | E Area<br>(ha) | E Base<br>Flow (l/s) | E Hse | Add Flow<br>(l/s) | P.Dep<br>(mm) | P.Vel<br>(m/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|--------------|----------------|----------------------|-------|-------------------|---------------|----------------|--------------|--------------|---------------|
| F1.000 | 59.350       | 0.000          | 0.0                  | 2     | 0.0               | 9             | 0.26           | 0.76         | 6.0          | 0.1           |
| F1.001 | 59.135       | 0.000          | 0.0                  | 3     | 0.0               | 11            | 0.30           | 0.76         | 6.0          | 0.1           |
| F1.002 | 58.987       | 0.000          | 0.0                  | 4     | 0.0               | 12            | 0.33           | 0.76         | 6.0          | 0.2           |
| F1.003 | 58.734       | 0.000          | 0.0                  | 6     | 0.0               | 15            | 0.29           | 0.76         | 13.4         | 0.3           |
| F1.004 | 58.663       | 0.000          | 0.0                  | 7     | 0.0               | 16            | 0.31           | 0.75         | 13.3         | 0.3           |
| F1.005 | 58.563       | 0.000          | 0.0                  | 8     | 0.0               | 17            | 0.32           | 0.75         | 13.3         | 0.4           |
| F1.006 | 58.521       | 0.000          | 0.0                  | 10    | 0.0               | 19            | 0.34           | 0.75         | 13.3         | 0.5           |
| F1.007 | 58.457       | 0.000          | 0.0                  | 11    | 0.0               | 20            | 0.36           | 0.76         | 13.5         | 0.5           |
| F1.008 | 58.343       | 0.000          | 0.0                  | 11    | 0.0               | 14            | 0.61           | 1.68         | 29.7         | 0.5           |
|        |              |                |                      |       |                   |               |                |              |              |               |
| F2.000 | 59.300       | 0.000          | 0.0                  | 3     | 0.0               | 11            | 0.30           | 0.76         | 6.0          | 0.1           |
| F2.001 | 59.087       | 0.000          | 0.0                  | 5     | 0.0               | 14            | 0.36           | 0.76         | 6.0          | 0.2           |
| F2.002 | 58.935       | 0.000          | 0.0                  | 5     | 0.0               | 14            | 0.36           | 0.76         | 6.0          | 0.2           |

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Network Design Table for Foul - Main

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | Area<br>(ha) | Houses | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|--------|---------------|-------------|----------------|--------------|--------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| F3.000 | 9.129         | 0.142       | 64.3           | 0.000        | 3      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |    |
| F3.001 | 11.848        | 0.184       | 64.4           | 0.000        | 2      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |    |
| F2.003 | 24.780        | 0.184       | 134.7          | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F4.000 | 9.718         | 0.176       | 55.2           | 0.000        | 3      | 0.0                | 1.500     | o           | 100         | Pipe/Conduit |    |
| F4.001 | 15.320        | 0.277       | 55.3           | 0.000        | 6      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F4.002 | 10.560        | 0.191       | 55.3           | 0.000        | 2      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F2.004 | 21.907        | 0.162       | 135.2          | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F2.005 | 10.945        | 0.081       | 135.1          | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F2.006 | 16.278        | 0.121       | 134.5          | 0.000        | 2      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F2.007 | 8.520         | 0.063       | 135.2          | 0.000        | 1      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |    |
| F2.008 | 14.530        | 0.464       | 31.3           | 0.000        | 3      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |   |
| F1.009 | 13.088        | 0.164       | 80.0           | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.010 | 24.608        | 0.308       | 80.0           | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |
| F1.011 | 27.608        | 0.345       | 80.0           | 0.000        | 0      | 0.0                | 1.500     | o           | 150         | Pipe/Conduit |  |

Network Results Table

| PN     | US/IL<br>(m) | Σ Area<br>(ha) | Σ Base<br>Flow (l/s) | Σ Hse<br>Add Flow (l/s) | P.Dep<br>(mm) | P.Vel<br>(m/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |     |
|--------|--------------|----------------|----------------------|-------------------------|---------------|----------------|--------------|--------------|---------------|-----|
| F3.000 | 59.066       | 0.000          | 0.0                  | 3                       | 0.0           | 10             | 0.32         | 0.83         | 6.5           | 0.1 |
| F3.001 | 58.924       | 0.000          | 0.0                  | 5                       | 0.0           | 13             | 0.38         | 0.83         | 6.5           | 0.2 |
| F2.003 | 58.596       | 0.000          | 0.0                  | 10                      | 0.0           | 19             | 0.34         | 0.75         | 13.3          | 0.5 |
| F4.000 | 59.200       | 0.000          | 0.0                  | 3                       | 0.0           | 10             | 0.34         | 0.90         | 7.0           | 0.1 |
| F4.001 | 58.974       | 0.000          | 0.0                  | 9                       | 0.0           | 15             | 0.45         | 1.18         | 20.8          | 0.4 |
| F4.002 | 58.697       | 0.000          | 0.0                  | 11                      | 0.0           | 16             | 0.48         | 1.18         | 20.8          | 0.5 |
| F2.004 | 58.412       | 0.000          | 0.0                  | 21                      | 0.0           | 28             | 0.43         | 0.75         | 13.3          | 1.0 |
| F2.005 | 58.250       | 0.000          | 0.0                  | 21                      | 0.0           | 28             | 0.43         | 0.75         | 13.3          | 1.0 |
| F2.006 | 58.169       | 0.000          | 0.0                  | 23                      | 0.0           | 29             | 0.45         | 0.75         | 13.3          | 1.1 |
| F2.007 | 58.048       | 0.000          | 0.0                  | 24                      | 0.0           | 30             | 0.45         | 0.75         | 13.3          | 1.1 |
| F2.008 | 57.985       | 0.000          | 0.0                  | 27                      | 0.0           | 22             | 0.78         | 1.57         | 27.7          | 1.2 |
| F1.009 | 57.427       | 0.000          | 0.0                  | 38                      | 0.0           | 32             | 0.62         | 0.98         | 17.3          | 1.8 |
| F1.010 | 57.263       | 0.000          | 0.0                  | 38                      | 0.0           | 32             | 0.62         | 0.98         | 17.3          | 1.8 |
| F1.011 | 56.955       | 0.000          | 0.0                  | 38                      | 0.0           | 32             | 0.62         | 0.98         | 17.3          | 1.8 |

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

| PN     | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| F1.000 | o        | 100       | F1      | 60.206      | 59.350      | 0.756       | Open Manhole  | 450                |
| F1.001 | o        | 100       | F2      | 60.206      | 59.135      | 0.971       | Open Manhole  | 450                |
| F1.002 | o        | 100       | F3      | 60.206      | 58.987      | 1.119       | Open Manhole  | 450                |
| F1.003 | o        | 150       | F4      | 60.206      | 58.734      | 1.322       | Open Manhole  | 450                |
| F1.004 | o        | 150       | F5      | 60.206      | 58.663      | 1.393       | Open Manhole  | 450                |
| F1.005 | o        | 150       | F6      | 60.206      | 58.563      | 1.493       | Open Manhole  | 450                |
| F1.006 | o        | 150       | F7      | 60.206      | 58.521      | 1.535       | Open Manhole  | 450                |
| F1.007 | o        | 150       | F8      | 60.208      | 58.457      | 1.601       | Open Manhole  | 450                |
| F1.008 | o        | 150       | F9      | 60.184      | 58.343      | 1.691       | Open Manhole  | 450                |
| F2.000 | o        | 100       | F10     | 60.208      | 59.300      | 0.808       | Open Manhole  | 450                |
| F2.001 | o        | 100       | F11     | 60.208      | 59.087      | 1.021       | Open Manhole  | 450                |
| F2.002 | o        | 100       | F12     | 60.194      | 58.935      | 1.159       | Open Manhole  | 450                |
| F3.000 | o        | 100       | F13     | 60.210      | 59.066      | 1.044       | Open Manhole  | 450                |
| F3.001 | o        | 100       | F14     | 60.211      | 58.924      | 1.187       | Open Manhole  | 450                |
| F2.003 | o        | 150       | F15     | 60.200      | 58.596      | 1.454       | Open Manhole  | 450                |
| F4.000 | o        | 100       | F16     | 60.221      | 59.200      | 0.921       | Open Manhole  | 450                |
| F4.001 | o        | 150       | F17     | 60.215      | 58.974      | 1.091       | Open Manhole  | 450                |

Downstream Manhole

| PN     | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| F1.000 | 16.579     | 77.1        | F2      | 60.206      | 59.135      | 0.971       | Open Manhole  | 450                |
| F1.001 | 11.378     | 76.9        | F3      | 60.206      | 58.987      | 1.119       | Open Manhole  | 450                |
| F1.002 | 15.659     | 77.1        | F4      | 60.206      | 58.784      | 1.322       | Open Manhole  | 450                |
| F1.003 | 9.524      | 134.1       | F5      | 60.206      | 58.663      | 1.393       | Open Manhole  | 450                |
| F1.004 | 13.487     | 134.9       | F6      | 60.206      | 58.563      | 1.493       | Open Manhole  | 450                |
| F1.005 | 5.646      | 134.4       | F7      | 60.206      | 58.521      | 1.535       | Open Manhole  | 450                |
| F1.006 | 8.657      | 135.3       | F8      | 60.208      | 58.457      | 1.601       | Open Manhole  | 450                |
| F1.007 | 14.920     | 130.9       | F9      | 60.184      | 58.343      | 1.691       | Open Manhole  | 450                |
| F1.008 | 24.994     | 27.3        | F24     | 60.172      | 57.427      | 2.595       | Open Manhole  | 450                |
| F2.000 | 16.379     | 76.9        | F11     | 60.208      | 59.087      | 1.021       | Open Manhole  | 450                |
| F2.001 | 11.718     | 77.1        | F12     | 60.194      | 58.935      | 1.159       | Open Manhole  | 450                |
| F2.002 | 22.226     | 76.9        | F15     | 60.200      | 58.646      | 1.454       | Open Manhole  | 450                |
| F3.000 | 9.129      | 64.3        | F14     | 60.211      | 58.924      | 1.187       | Open Manhole  | 450                |
| F3.001 | 11.848     | 64.4        | F15     | 60.200      | 58.740      | 1.360       | Open Manhole  | 450                |
| F2.003 | 24.780     | 134.7       | F19     | 60.200      | 58.412      | 1.638       | Open Manhole  | 450                |
| F4.000 | 9.718      | 55.2        | F17     | 60.215      | 59.024      | 1.091       | Open Manhole  | 450                |
| F4.001 | 15.320     | 55.3        | F18     | 60.215      | 58.697      | 1.368       | Open Manhole  | 450                |

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## Manhole Schedules for SW (PB)

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|----------------|
| SW5.02  | 386057.327          | 399570.258           | 386057.327               | 399570.258                | Required       |                |
| SW5.03  | 386077.620          | 399543.269           | 386077.620               | 399543.269                | Required       |                |
| SW6.01  | 386105.621          | 399563.940           | 386105.621               | 399563.940                | Required       |                |
| SW5.04  | 386088.858          | 399551.470           | 386088.858               | 399551.470                | Required       |                |
| SW1.10  | 386095.467          | 399542.364           | 386095.467               | 399542.364                | Required       |                |
| SW1.11  | 386083.088          | 399521.407           | 386083.088               | 399521.407                | Required       |                |
| SW1.12  | 386085.827          | 399511.674           |                          |                           | No Entry       |                |

|                                                                  |                                           |                                                                                     |
|------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|
| Ridge and Partners LLP                                           |                                           | Page 0                                                                              |
| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR |                                           |  |
| Date 12/07/2023 08:47<br>File PB Drainage PR 11 07 23.MDX        | Designed by Predragrajkovic<br>Checked by |                                                                                     |
| Innovyze                                                         | Network 2020.1                            |                                                                                     |

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes STANDARD Manhole Sizes STANDARD

Designed with Level Soffits

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 1.000 | 41.474        | 0.207       | 200.4          | 0.063          | 15.00          | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.000 | 26.02           | 15.75          | 59.148       | 0.063            | 0.0                  | 0.0           | 0.0               | 0.92         | 36.6         | 4.4           |









Micro  
Drainage

|                             |
|-----------------------------|
| Designed by Predragrajkovic |
|-----------------------------|

Checked by

---

Network 2020.1

## Network Design Table for SW (PB)

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                      |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|-------------------------------------------------------------------------------------|
| 1.009 | 24.341        | 0.658       | 37.0           | 0.069          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 1.010 | 10.111        | 0.126       | 80.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |

## Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.009 | 26.51           | 15.24          | 57.267       | 0.000            | 7.0                  | 0.0           | 0.0               | 1.66         | 29.3         | 7.0           |
| 1.010 | 26.36           | 15.39          | 56.609       | 0.000            | 7.0                  | 0.0           | 0.0               | 1.12         | 19.9         | 7.0           |

| Ridge and Partners LLP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                | Page 5                                                                              |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|---------------------------|----------------|------------|------------|----------------|-----------|------------|---------------------------|------------|-----------|------------|-----------|------------|------------|-------|-------|---------------------------|-------|-----|-------|-----|-------|------|-------|------|-------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|------|-------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|------|-------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|------|-------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|------|
| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |  |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| Date 12/07/2023 08:47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| File PB Drainage PR 11 07 23.MDX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Network 2020.1 |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <div>Online Controls for SW (PB)</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <div>Hydro-Brake® Optimum Manhole: SW1.10, DS/PN: 1.009, Volume (m³): 8.9</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <div><div><div>Unit Reference MD-SHE-0118-7000-1400-7000</div><div>Design Head (m) 1.400</div><div>Design Flow (l/s) 7.0</div><div>Flush-Flo™</div><div>Objective Minimise upstream storage</div><div>Application Surface</div></div><div><div>Sump Available Yes</div><div>Diameter (mm) 118</div><div>Invert Level (m) 57.267</div><div>Calculated Minimum Outlet Pipe Diameter (mm) 150</div><div>Suggested Manhole Diameter (mm) 1200</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.400</td><td>7.0</td><td>Kick-Flo®</td><td>0.868</td><td>5.6</td></tr><tr><td>Flush-Flo™</td><td>0.415</td><td>7.0</td><td>Mean Flow over Head Range</td><td>-</td><td>6.1</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                                                                                     |                           | Control Points | Head (m)   | Flow (l/s) | Control Points | Head (m)  | Flow (l/s) | Design Point (Calculated) | 1.400      | 7.0       | Kick-Flo®  | 0.868     | 5.6        | Flush-Flo™ | 0.415 | 7.0   | Mean Flow over Head Range | -     | 6.1 |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| Control Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Head (m)       | Flow (l/s)                                                                          | Control Points            | Head (m)       | Flow (l/s) |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.400          | 7.0                                                                                 | Kick-Flo®                 | 0.868          | 5.6        |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.415          | 7.0                                                                                 | Mean Flow over Head Range | -              | 6.1        |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <div>The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>4.2</td><td>0.600</td><td>6.8</td><td>1.600</td><td>7.4</td><td>2.600</td><td>9.4</td><td>5.000</td><td>12.8</td><td>7.500</td><td>15.5</td></tr><tr><td>0.200</td><td>6.4</td><td>0.800</td><td>6.1</td><td>1.800</td><td>7.9</td><td>3.000</td><td>10.0</td><td>5.500</td><td>13.4</td><td>8.000</td><td>16.0</td></tr><tr><td>0.300</td><td>6.9</td><td>1.000</td><td>6.0</td><td>2.000</td><td>8.3</td><td>3.500</td><td>10.8</td><td>6.000</td><td>13.9</td><td>8.500</td><td>16.5</td></tr><tr><td>0.400</td><td>7.0</td><td>1.200</td><td>6.5</td><td>2.200</td><td>8.7</td><td>4.000</td><td>11.5</td><td>6.500</td><td>14.5</td><td>9.000</td><td>16.9</td></tr><tr><td>0.500</td><td>7.0</td><td>1.400</td><td>7.0</td><td>2.400</td><td>9.0</td><td>4.500</td><td>12.1</td><td>7.000</td><td>15.0</td><td>9.500</td><td>17.4</td></tr></table> |                |                                                                                     |                           | Depth (m)      | Flow (l/s) | Depth (m)  | Flow (l/s)     | Depth (m) | Flow (l/s) | Depth (m)                 | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100      | 4.2   | 0.600 | 6.8                       | 1.600 | 7.4 | 2.600 | 9.4 | 5.000 | 12.8 | 7.500 | 15.5 | 0.200 | 6.4 | 0.800 | 6.1 | 1.800 | 7.9 | 3.000 | 10.0 | 5.500 | 13.4 | 8.000 | 16.0 | 0.300 | 6.9 | 1.000 | 6.0 | 2.000 | 8.3 | 3.500 | 10.8 | 6.000 | 13.9 | 8.500 | 16.5 | 0.400 | 7.0 | 1.200 | 6.5 | 2.200 | 8.7 | 4.000 | 11.5 | 6.500 | 14.5 | 9.000 | 16.9 | 0.500 | 7.0 | 1.400 | 7.0 | 2.400 | 9.0 | 4.500 | 12.1 | 7.000 | 15.0 | 9.500 | 17.4 |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Flow (l/s)     | Depth (m)                                                                           | Flow (l/s)                | Depth (m)      | Flow (l/s) | Depth (m)  | Flow (l/s)     | Depth (m) | Flow (l/s) | Depth (m)                 | Flow (l/s) |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.2            | 0.600                                                                               | 6.8                       | 1.600          | 7.4        | 2.600      | 9.4            | 5.000     | 12.8       | 7.500                     | 15.5       |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6.4            | 0.800                                                                               | 6.1                       | 1.800          | 7.9        | 3.000      | 10.0           | 5.500     | 13.4       | 8.000                     | 16.0       |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6.9            | 1.000                                                                               | 6.0                       | 2.000          | 8.3        | 3.500      | 10.8           | 6.000     | 13.9       | 8.500                     | 16.5       |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7.0            | 1.200                                                                               | 6.5                       | 2.200          | 8.7        | 4.000      | 11.5           | 6.500     | 14.5       | 9.000                     | 16.9       |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7.0            | 1.400                                                                               | 7.0                       | 2.400          | 9.0        | 4.500      | 12.1           | 7.000     | 15.0       | 9.500                     | 17.4       |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                                                                     |                           |                |            |            |                |           |            |                           |            |           |            |           |            |            |       |       |                           |       |     |       |     |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |       |     |       |     |       |     |       |      |       |      |       |      |

| Ridge and Partners LLP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        | Page 6                                                                              |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|-------|-------|-----|-------|-------|-----|-------|-----|-----|
| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |  |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |
| Date 12/07/2023 08:47<br>File PB Drainage PR 11 07 23.MDX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |                                                                                     |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |
| Designed by Predragrajkovic<br>Checked by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |                                                                                     |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        | Network 2020.1                                                                      |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |
| <p style="text-align: center;"><u>Storage Structures for SW (PB)</u></p> <p style="text-align: center;"><u>Complex Manhole: SW1.10, DS/PN: 1.009</u></p> <p style="text-align: center;"><u>Cellular Storage</u></p> <p style="text-align: center;">           Invert Level (m) 57.117    Infiltration Coefficient Side (m/hr) 0.00000    Porosity 0.95<br/>           Infiltration Coefficient Base (m/hr) 0.00000    Safety Factor 2.0         </p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Depth (m)</th> <th>Area (m<sup>2</sup>)</th> <th>Inf. Area (m<sup>2</sup>)</th> <th>Depth (m)</th> <th>Area (m<sup>2</sup>)</th> <th>Inf. Area (m<sup>2</sup>)</th> <th>Depth (m)</th> <th>Area (m<sup>2</sup>)</th> <th>Inf. Area (m<sup>2</sup>)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>550.0</td> <td>0.0</td> <td>1.200</td> <td>550.0</td> <td>0.0</td> <td>1.201</td> <td>0.0</td> <td>0.0</td> </tr> </tbody> </table> <p style="text-align: center;"><u>Porous Car Park</u></p> <p style="text-align: center;">           Infiltration Coefficient Base (m/hr) 0.00000    Porosity 0.30    Slope (1:X) 0.0<br/>           Membrane Percolation (mm/hr) 1000    Invert Level (m) 59.447    Depression Storage (mm) 5<br/>           Max Percolation (l/s) 185.0    Width (m) 18.0    Evaporation (mm/day) 3<br/>           Safety Factor 2.0    Length (m) 37.0    Cap Volume Depth (m) 0.225         </p> |                        |                                                                                     | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | 0.000 | 550.0 | 0.0 | 1.200 | 550.0 | 0.0 | 1.201 | 0.0 | 0.0 |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> )                                                         | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |           |                        |                             |       |       |     |       |       |     |       |     |     |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 550.0                  | 0.0                                                                                 | 1.200     | 550.0                  | 0.0                         | 1.201     | 0.0                    | 0.0                         |           |                        |                             |       |       |     |       |       |     |       |     |     |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                                                                                     |           |                        |                             |           |                        |                             |           |                        |                             |       |       |     |       |       |     |       |     |     |









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| Ridge and Partners LLP                                                                                                 |                                           | Page 0                                                                              |
| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR                                                       |                                           |  |
| Date 12/07/2023 08:46<br>File PB Drainage PR 11 07 23.MDX                                                              | Designed by Predragrajkovic<br>Checked by |                                                                                     |
| Innovyze                                                                                                               | Network 2020.1                            |                                                                                     |
|                                                                                                                        |                                           |                                                                                     |
| <u>Summary of Critical Results by Maximum Level (Rank 1) for SW (PB)</u>                                               |                                           |                                                                                     |
| <u>Simulation Criteria</u>                                                                                             |                                           |                                                                                     |
| Areal Reduction Factor 1.000    Manhole Headloss Coeff (Global) 0.500    MADD Factor * 10m³/ha Storage 2.000           |                                           |                                                                                     |
| Hot Start (mins) 0    Foul Sewage per hectare (l/s) 0.000    Inlet Coefficient 0.800                                   |                                           |                                                                                     |
| Hot Start Level (mm) 0    Additional Flow - % of Total Flow 0.000    Flow per Person per Day (l/per/day) 0.000         |                                           |                                                                                     |
| Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0                        |                                           |                                                                                     |
| Number of Online Controls 1    Number of Storage Structures 1    Number of Real Time Controls 0                        |                                           |                                                                                     |
| <u>Synthetic Rainfall Details</u>                                                                                      |                                           |                                                                                     |
| Rainfall Model    FSR M5-60 (mm) 18.000    Cv (Summer) 0.750                                                           |                                           |                                                                                     |
| Region England and Wales    Ratio R 0.360    Cv (Winter) 0.840                                                         |                                           |                                                                                     |
| Margin for Flood Risk Warning (mm) 300.0    DTS Status OFF    Inertia Status ON                                        |                                           |                                                                                     |
| Analysis Timestep    Fine DVD Status ON                                                                                |                                           |                                                                                     |
| Profile(s)    Summer and Winter                                                                                        |                                           |                                                                                     |
| Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080 |                                           |                                                                                     |
| Return Period(s) (years) 1, 30, 100                                                                                    |                                           |                                                                                     |
| Climate Change (%) 0, 40, 45                                                                                           |                                           |                                                                                     |
| WARNING: Half Drain Time has not been calculated as the structure is too full.                                         |                                           |                                                                                     |
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| Ridge and Partners LLP                                            |               |            |                  |                   |                        |                                           |                       |                  |                       |                            |                           | Page 2                                                                              |                   |                              |
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| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR  |               |            |                  |                   |                        |                                           |                       |                  |                       |                            |                           |  |                   |                              |
| Date 12/07/2023 08:46<br>File PB Drainage PR 11 07 23.MDX         |               |            |                  |                   |                        | Designed by Predragrajkovic<br>Checked by |                       |                  |                       |                            |                           |                                                                                     |                   |                              |
| Innovyze                                                          |               |            |                  |                   |                        | Network 2020.1                            |                       |                  |                       |                            |                           |                                                                                     |                   |                              |
| Summary of Critical Results by Maximum Level (Rank 1) for SW (PB) |               |            |                  |                   |                        |                                           |                       |                  |                       |                            |                           |                                                                                     |                   |                              |
| PN                                                                | US/MH<br>Name | Storm      | Return<br>Period | Climate<br>Change | First (X)<br>Surcharge | First (Y)<br>Flood                        | First (Z)<br>Overflow | Overflow<br>Act. | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m³) | Flow /<br>Cap.                                                                      | Overflow<br>(l/s) | Half Drain<br>Time<br>(mins) |
| 1.000                                                             | SW1.01        | 30 Winter  | 100              | +45%              | 100/15 Summer          |                                           |                       |                  | 59.978                | 0.605                      | 0.000                     | 0.59                                                                                |                   |                              |
| 1.001                                                             | SW1.02        | 30 Winter  | 100              | +45%              | 100/15 Summer          |                                           |                       |                  | 59.918                | 0.773                      | 0.000                     | 0.70                                                                                |                   |                              |
| 1.002                                                             | SW1.03        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.870                | 0.869                      | 0.000                     | 0.90                                                                                |                   |                              |
| 1.003                                                             | SW1.04        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.795                | 0.892                      | 0.000                     | 1.23                                                                                |                   |                              |
| 1.004                                                             | SW1.05        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.599                | 0.868                      | 0.000                     | 1.19                                                                                |                   |                              |
| 2.000                                                             | SW2.01        | 30 Winter  | 100              | +45%              | 100/15 Summer          |                                           |                       |                  | 59.607                | 0.309                      | 0.000                     | 0.51                                                                                |                   |                              |
| 1.005                                                             | SW1.06        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.444                | 0.865                      | 0.000                     | 0.80                                                                                |                   |                              |
| 3.000                                                             | SW3.01        | 30 Winter  | 100              | +45%              | 100/15 Winter          |                                           |                       |                  | 59.503                | 0.128                      | 0.000                     | 0.43                                                                                |                   |                              |
| 1.006                                                             | SW1.07        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.350                | 0.910                      | 0.000                     | 1.41                                                                                |                   |                              |
| 1.007                                                             | SW1.08        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.134                | 0.829                      | 0.000                     | 0.61                                                                                |                   |                              |
| 4.000                                                             | SW4.01        | 30 Winter  | 100              | +45%              | 30/15 Winter           |                                           |                       |                  | 59.487                | 0.749                      | 0.000                     | 0.67                                                                                |                   |                              |
| 4.001                                                             | SW4.01A       | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.435                | 0.858                      | 0.000                     | 0.39                                                                                |                   |                              |
| 4.002                                                             | SW4.02        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.402                | 1.102                      | 0.000                     | 1.38                                                                                |                   |                              |
| 4.003                                                             | SW4.03        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.096                | 0.963                      | 0.000                     | 0.66                                                                                |                   |                              |
| 4.004                                                             | SW4.04        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 59.001                | 1.024                      | 0.000                     | 0.94                                                                                |                   |                              |
| 1.008                                                             | SW1.09        | 30 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 58.911                | 1.021                      | 0.000                     | 2.19                                                                                |                   |                              |
| 5.000                                                             | SW5.01        | 15 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 58.896                | 0.425                      | 0.000                     | 0.79                                                                                |                   |                              |
| 5.001                                                             | SW5.02        | 15 Winter  | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 58.854                | 0.516                      | 0.000                     | 1.28                                                                                |                   |                              |
| 5.002                                                             | SW5.03        | 720 Winter | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 58.698                | 0.529                      | 0.000                     | 0.34                                                                                |                   |                              |
| 6.000                                                             | SW6.01        | 720 Winter | 100              | +45%              | 100/720 Winter         |                                           |                       |                  | 58.697                | 0.051                      | 0.000                     | 0.05                                                                                |                   |                              |
| 5.003                                                             | SW5.04        | 720 Winter | 100              | +45%              | 100/180 Winter         |                                           |                       |                  | 58.696                | 0.596                      | 0.000                     | 0.14                                                                                |                   |                              |
| 1.009                                                             | SW1.10        | 720 Winter | 100              | +45%              | 30/15 Summer           |                                           |                       |                  | 58.693                | 1.276                      | 0.000                     | 0.25                                                                                |                   |                              |
| 1.010                                                             | SW1.11        | 720 Winter | 100              | +45%              |                        |                                           |                       |                  | 56.675                | -0.084                     | 0.000                     | 0.40                                                                                |                   |                              |
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| Ridge and Partners LLP                                                   |  |                                           | Page 3 |                                                                                     |
| The Cowyards<br>Blenheim Park, Oxford Road<br>Woodstock OX20 1QR         |  |                                           |        |  |
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| Innovyze                                                                 |  | Network 2020.1                            |        |                                                                                     |
| <u>Summary of Critical Results by Maximum Level (Rank 1) for SW (PB)</u> |  |                                           |        |                                                                                     |
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**APPENDIX C**

## Predrag Rajkovic

---

**From:** wastewaterdeveloperservices@uuplc.co.uk  
**Sent:** 03 April 2023 16:49  
**To:** Predrag Rajkovic  
**Cc:** Philip Barrett  
**Subject:** RE: Pre Development Enquiry for: Varley Street SEN School UU Reference Number : 03453598

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Predrag,

Thanks for the update. It is noted and accepted that a surface water outfall to the canal is not feasible.

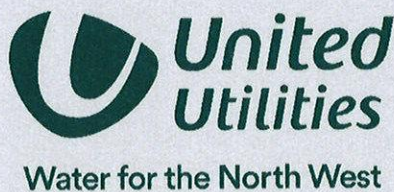
Please could you advise of the outcome for the infiltration tests you mentioned, yes it seems that due to ground water levels infiltration is unlikely to be feasible, but we would need to confirm this. It is also noted that the provided the ground investigation logs showing high ground water levels, which would preclude the use of infiltration methods in anycase in your site.

In principle the rate and surface water drainage discharge to the combined sewer would be acceptable, but we would need to assess the point of connection and proposed levels of the development and connection further as the sewer in James St shows as being surcharged/predicted to flood in certain events, therefore would need to assess the risk to your site based on our modelled top water levels. Please could you provide this information when possible.

Also please consider the comments on the initial pre-development enquiry response specifically regarding the existing sewers crossing your site (there is a small section of abandoned sewer also shown - this should be investigated to confirm it is abandoned and method of abandonment i.e. grubbed or grouted) before building over it.

Many thanks,

Shoaib.



**Shoaib Tauqeer**  
Developer Engineer  
Developer Services & Metering  
**M:** 07876745601  
[unitedutilities.com](http://unitedutilities.com)

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----- Original Message -----

**From:** Predrag Rajkovic [predragrajkovic@ridge.co.uk]  
**Sent:** 29/03/2023 06:57  
**To:** pbarrett@ridge.co.uk; seweradoptions@uuplc.co.uk

**Subject:** RE: Pre Development Enquiry for: Varley Street SEN School UU Reference Number : 03453598

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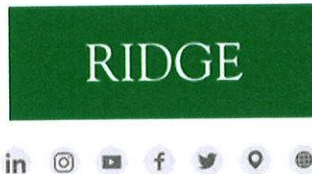
Dear Shoaib,

Further to my previous mail, please note the latest correspondence received from the CRT, confirming their non-acceptance of discharge from our site into the Rochdale Canal.

I trust you will take this into consideration whilst addressing our application.

Best Regards and many thanks,

**Predrag Rajkovic** BEng CEng MICE  
Technical Associate  
Ridge and Partners LLP  
07553 883227  
0161 833 9579  
Predragrajkovic@ridge.co.uk



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**From:** Predrag Rajkovic  
**Sent:** Monday, March 20, 2023 11:50 AM  
**To:** seweradoptions@uuplc.co.uk; Philip Barrett <PBarrett@ridge.co.uk>  
**Subject:** RE: Pre Development Enquiry for: Varley Street SEN School UU Reference Number : 03453598

Hi Shoaib,

Thank you for your reply, all your points are well noted.

We contacted the CRT again to enquire about their timescale for the Canal capacity detailed assessment and for any consequent remedies. In their response (copy attached) they were unable to confirm any timescale for this work. They reiterated that for the last two years no additional discharge has been allowed into Rochdale Canal. We therefore do not feel that any assessment, let alone remediation work, will be made within the timescale envisaged for our project. Consequently, we do not consider discharging into the Canal in its current state to be a likely scenario.

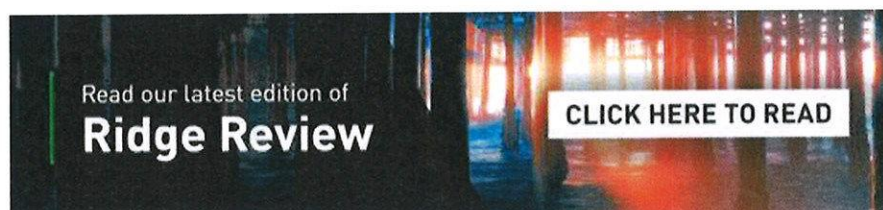
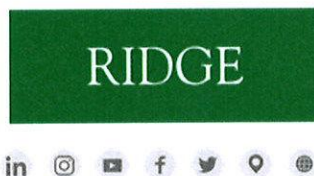
On the subject of infiltration, I attach extracts from the SI report here, from which you may note predominantly low permeability soil (clay) with slow seepage noted in several trial pits. Ground water was also encountered at shallow depths (0.85m BGL) at locations. Disturbance to contaminants within the soil should also be considered under the infiltration scenario. Whilst we did request some additional infiltration in-situ tests, we do not hold much hope this will yield significantly different results, and do not feel that infiltration will prove to be a viable option.

As you can appreciate, our project needs to progress at its own pace. We would therefore like to agree with the UU / yourself an acceptable discharge rate into the existing combined public sewer located on James Street. Proposed discharge rate is currently 7ls, which is calculated as greenfield runoff from the proposed hardstanding area only (1.07Ha), not from the entire site.

Please confirm (even provisionally) if this would be acceptable, since we do not feel that other mentioned scenarios are likely.

Best regards and many thanks,

Predrag Rajkovic BEng CEng MICE  
Technical Associate  
Ridge and Partners LLP  
07553 883227  
0161 833 9579  
[Predragrajkovic@ridge.co.uk](mailto:Predragrajkovic@ridge.co.uk)



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**From:** [seweradoptions@uuplc.co.uk](mailto:seweradoptions@uuplc.co.uk) <[seweradoptions@uuplc.co.uk](mailto:seweradoptions@uuplc.co.uk)>  
**Sent:** Tuesday, March 7, 2023 1:06 PM  
**To:** Philip Barrett <[PBarrett@ridge.co.uk](mailto:PBarrett@ridge.co.uk)>; Predrag Rajkovic <[Predragrajkovic@ridge.co.uk](mailto:Predragrajkovic@ridge.co.uk)>  
**Subject:** Pre Development Enquiry for: Varley Street SEN School UU Reference Number : 03453598

Hi Predrag,

Thanks for your email and attached correspondence from the LLFA. We would insist that any possibility of draining surface water from your site to the Canal is further explored with CaRT. The email made clear there are issues currently with flooding and capacity, but mentions that there may be the possibility of a connection if mitigation were to be provided.

Given the nature and scale of the development this would introduce a large volume of flows (even though restricted) to the combined sewer system. We are not ruling a potential connection out to the public sewer, but in line with the surface water hierarchy would request that the Canal, being a more sustainable way of draining surface water is further explored.

Please could you the possibility of draining to the canal considering mitigation measures resulting from the CaRT detailed impact assessment be explored further please.

Please could this also be discussed with the LLFA?

Please could further information on infiltration be provided - this has not yet been agreed to be unfeasible.

If a surface water connection to the combined sewer were to be agreed we would request a restricted rate to QBar based on the positively drained impermeable area.

We would need to assess the site levels and drainage levels as the combined sewer in James Street to the south currently shows as modelled flood risk for certain return periods, please provide points of connection and levels information for assessment.

Please also provide further information on the proposed sports pitch - is this to have under attenuation storage? If being positively drained to the public sewer this pitch would need further assessment.

Kind regards,

Shoaib.



**United  
Utilities**  
Water for the North West

**Shoaib Tauqeer**  
Developer Engineer  
Developer Services & Metering  
**M:** 07876745601  
[unitedutilities.com](https://unitedutilities.com)

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----- Original Message -----

**From:** Philip Barrett [pbarrett@ridge.co.uk]

**Sent:** 24/02/2023 15:51

**To:** [seweradoptions@uuplc.co.uk](mailto:seweradoptions@uuplc.co.uk)

**Subject:** Automatic reply: Pre Development Enquiry for: Varley Street SEN School UU Reference Number : 03453598

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---

I am away from the office and will return on 27.02.23

I will get back to you on my return.

If there is anything Urgent, please contact Adam Matadar (07469 378701, [adammatadar@ridge.co.uk](mailto:adammatadar@ridge.co.uk))

Thanks

Phil

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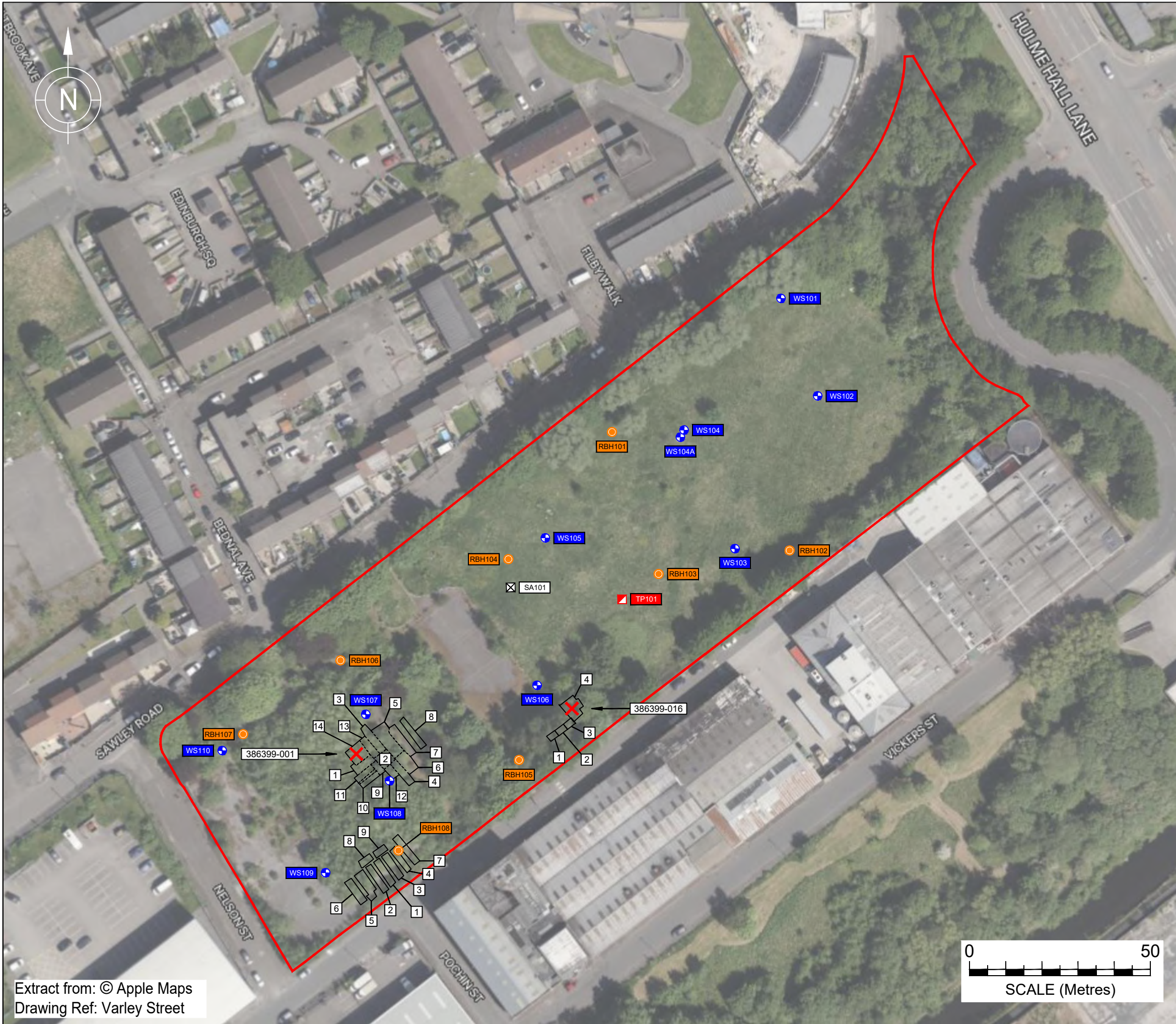
[www.unitedutilities.com/subsidiaries](http://www.unitedutilities.com/subsidiaries)



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**APPENDIX D**



## KEY

- Site Boundary
- Mine Entry
- Window Sample Borehole (WS)
- Trial Pit (TP)
- Rotary Borehole (RBH)
- Soakaway Test (SA)
- Excavation
- Excavation Identification Number

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



|           |             |                                    |               |
|-----------|-------------|------------------------------------|---------------|
| Client:   |             | ISG Ltd                            |               |
| Site:     |             | Varley & Nelson Street, Manchester |               |
| Title:    |             | Site Investigation Location Plan   |               |
| Job No.:  | LKC 22 1670 | Scale (See Scale Bar):             | See Scale Bar |
| Drawn By: | AC          | Checked By:                        | EM            |
| Figure:   |             | Revision:                          |               |
| 3         |             | Jun 2023                           |               |

**Site** : Varley and Nelson Street, Manchester

**Client** : ISG Ltd

**Engineer**: LKC

**Job Number**

LKC 22 1670

**Sheet**

1 / 1

| Location | Date       | Level     | Location            |
|----------|------------|-----------|---------------------|
| SA101    | 10/05/2023 | 59.61 mOD | 386091.3E 399579.6N |

|                       |      |
|-----------------------|------|
| <b>Pit Width (m)</b>  | 0.60 |
| <b>Pit Depth (m)</b>  | 2.40 |
| <b>Pit Length (m)</b> | 2.00 |

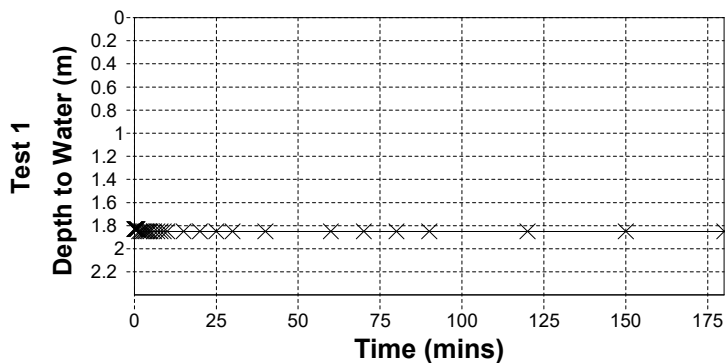
|                                 |                                             |
|---------------------------------|---------------------------------------------|
| <b>Soil type at test level</b>  | slightly gravelly slightly sandy silty CLAY |
| <b>Groundwater</b>              | Dry                                         |
| <b>Drain discharge depth</b>    | Unknown                                     |
| <b>Sidewall stability</b>       | Stable                                      |
| <b>Stone filled or open pit</b> | Stone filled                                |

|                                                            |             |
|------------------------------------------------------------|-------------|
|                                                            | <b>1</b>    |
| <b>Effective depth (m)</b>                                 | 0.57        |
| <b>Volume outflowing between 75% &amp; 25% (m3)*</b>       |             |
| <b>Mean surface area through which outflow occurs (m2)</b> |             |
| <b>Time for outflow between 75% &amp; 25% (min)</b>        |             |
| <b>SOIL INFILTRATION RATE (ms-1), f</b>                    | Test Failed |

**Remarks**

\* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

| Elapsed time<br>(mins) | Depth to Water<br>Test 1 |
|------------------------|--------------------------|
| 0                      | 1.83                     |
| 0.083                  | 1.83                     |
| 0.167                  | 1.83                     |
| 0.333                  | 1.83                     |
| 0.5                    | 1.83                     |
| 0.667                  | 1.83                     |
| 0.833                  | 1.83                     |
| 1                      | 1.83                     |
| 1.5                    | 1.85                     |
| 2                      | 1.85                     |
| 2.5                    | 1.85                     |
| 3                      | 1.85                     |
| 3.5                    | 1.85                     |
| 4                      | 1.85                     |
| 4.5                    | 1.85                     |
| 5                      | 1.85                     |
| 6                      | 1.85                     |
| 7                      | 1.85                     |
| 8                      | 1.85                     |
| 9                      | 1.85                     |
| 10                     | 1.85                     |
| 15                     | 1.85                     |
| 20                     | 1.85                     |
| 25                     | 1.85                     |
| 30                     | 1.85                     |
| 40                     | 1.85                     |
| 60                     | 1.85                     |
| 70                     | 1.85                     |
| 80                     | 1.85                     |
| 90                     | 1.85                     |
| 120                    | 1.85                     |
| 150                    | 1.85                     |
| 180                    | 1.85                     |



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**APPENDIX E**

## VARLEY STREET SEN DRAINAGE MAINTENANCE SCHEDULE

Organisation responsible for maintenance: \_\_\_\_\_

Contact Details – Name: \_\_\_\_\_

Number: \_\_\_\_\_

Documents:

- Drainage Layout
- Drainage Details

SUDS have been specified for the site to promote sustainable management of surface water for both flow attenuation and water quality. This document outlines the maintenance schedules for each system in order to maintain the efficiency of the drainage network. The schedules have been created based on guidance from CIRIA C753.

**Table 1: Pipes and Manholes Maintenance Schedule**

| Maintenance schedule   | Required Action                                             | Recommended Frequency         |
|------------------------|-------------------------------------------------------------|-------------------------------|
| Occasional maintenance | Visual inspection of covers, gratings and manhole chambers. | Annually or as required.      |
|                        | Cleaning out manholes.                                      | Annually or as required.      |
|                        | CCTV inspection of drainage pipes.                          | Annually or as required.      |
| Remedial actions       | Reactive cleaning of manholes and drains.                   | During flooding events.       |
|                        | Cleaning out drains by water jetting.                       | As required.                  |
|                        | Replace damaged covers, grating and manhole components.     | As required.                  |
|                        | Rehabilitation – repairs, relining or replacement.          | As determined by inspections. |

**Table 2: Geocellular Tank Maintenance Schedule**

| Maintenance Schedule | Required Action                                                                                | Recommended Frequency                              |
|----------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Regular Maintenance  | Inspect and identify areas that are not operating correctly. If required, take remedial action | Monthly for 3 months, then annually or as required |
|                      | Remove debris from the catchment surface                                                       | Monthly                                            |
|                      | Remove sediment from pre-treatment structures                                                  | Annually                                           |

|                  |                                                                                                   |                                                  |
|------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Remedial Actions | Repair / rehabilitate inlets/outlet and vents                                                     | As required                                      |
| Monitoring       | Inspect inlets, outlets and vents to ensure they are in good condition and operating as designed. | Annually                                         |
|                  | Survey Inside of tank for sediment build up and remove is necessary                               | Every 5 years or where concerned about operation |

**Table 3: Filter Drains**

| Maintenance schedule   | Required Action                                                                                                | Recommended Frequency              |
|------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------|
| Regular maintenance    | Remove litter and debris                                                                                       | Monthly or as required.            |
|                        | Inspect Filter Material                                                                                        | Monthly or as required.            |
|                        | Inspect inlets and Outlets and Pipework for Silt Accumulation and establish suitable silt removal frequencies. | Six Monthly                        |
|                        | Remove Sediment from Inlets, Outlets and Pipework                                                              | As Required                        |
| Occasional Maintenance | Remove or Control Tree Roots                                                                                   | See landscape maintenance strategy |
|                        | Remove surface geotextile and replace geotextile and filter medium                                             | 5 yearly.                          |
|                        | Clear perforated pipework of blockages                                                                         | As Required                        |