

## Drainage Planning Conditions

**Subject:** Eliza Yard – Land on the corner of Poland Street and Jersey Street, Manchester M4 6JW

**Ref:** 076740/DPC Rev V01

**Date:** 31/01/2023

The Planning Permission Ref: 130354/FO/2021  
Condition 5 relates to drainage proposals for the development.

### Condition 5

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <p>Notwithstanding the Flood Risk Assessment and Drainage Strategy by Curtins stamped as received by the City Council, as Local Planning Authority, on the 11 May 2021 and drawings 9033-CUR-XX-00-DR-C-92501-T02, 515-100XR-40CC-50F network results, 9033-CUR-XX-00-DR-C-92520-T01, 9033-CUR-XX-00-DR-C-92514-T01, 9033-CUR-XX-00-DR-C-92513-T01, 9033-CUR-XX-00-DR-C-92512-T01, 9033-CUR-XX-00-DR-C-92511-T01, 9033-CUR-XX-00-DR-C-92500-T01 and 2672-PLA-XX-XX-DR-L-3000 stamped as received by the City Council, as Local Planning Authority, on the 9 July 2021:</p> <p>(a) the development shall not commence until a scheme for the drainage of surface water from that phase of the new development shall be submitted for approval in writing by the City Council as the Local Planning Authority. This shall include:</p> <ul style="list-style-type: none"><li>• Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during the critical 1 in 100-year rainfall event with allowance for 40% climate change in any part of a building; - some discrepancies between drainage layout, Windes model and manhole schedule (some pipe sizes differ), clarification needed.</li><li>• Hydraulic calculation of the proposed drainage system; to be updated as per above; and</li><li>• Construction details of tree pits.</li></ul> | <b>Pre-Commencement</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|

**The development shall not commence until a scheme for the drainage of surface water from that phase of the new development shall be submitted for approval in writing by the City Council as the Local Planning Authority.**

The proposed drainage system consists of a separate foul and surface water network which combines prior to outfall into the combined public sewer south-east of the site within Jersey Street.

Reference should be made to the following drainage design documents in Appendix A:

- 9033-CUR-XX-00-DR-C-92500-P03 Drainage Strategy
- 9033-CUR-XX-00-DR-C-92510-P02\_Drainage Notes
- 9033-CUR-XX-00-DR-C-92511-P02\_Drainage Details Sheet 1
- 9033-CUR-XX-00-DR-C-92512-P02\_Drainage Details Sheet 2
- 9033-CUR-XX-00-DR-C-92513-P02\_Drainage Details Sheet 3
- 9033-CUR-XX-00-DR-C-92514-P01\_Drainage Details Sheet 4
- 9033-CUR-XX-00-DR-C-92520-P02\_Manhole Schedule
- Proposed Surface Water Calculations - 1 Year, 30 Year, 100 Year +40%
- Proposed Surface Water Calculations - 100 Year +40% with 1m Surcharge on Public Sewer

**Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during the critical 1 in 100-year rainfall event with allowance for 40% climate change in any part of a building; - some discrepancies between drainage layout, Windes model and manhole schedule (some pipe sizes differ), clarification needed.**

The proposed surface water drainage is restricted to a maximum of 5l/s for storms up to and including the 1 in 100-year plus 40% climate change event, as agreed with the Lead Local Flood Authority (LLFA) and United Utilities.

The system has been designed to accommodate the 100-year event with an allowance of 40% climate change within the below ground drainage system. The drainage system has been modelled under non-surcharged and surcharged (1m about soffit) outfall conditions.

The calculations have been reviewed and discrepancies with pipe sizes have been rectified to align with the modelled information.

Refer to calculations enclosed in Appendix A.

United Utilities have approved the outfall connection proposals under a Section 106 Agreement – refer to the approval notice enclosed in Appendix B.

#### **Hydraulic calculation of the proposed drainage system; to be updated as per above.**

The system has been designed to accommodate the 100-year event with an allowance of 40% climate change within the below ground drainage system. The drainage system has been modelled under non-surcharged and surcharged (1m about soffit) outfall conditions.

The calculations have been reviewed and discrepancies with pipe sizes have been rectified to align with the modelled information.

Refer to calculations enclosed in Appendix A.

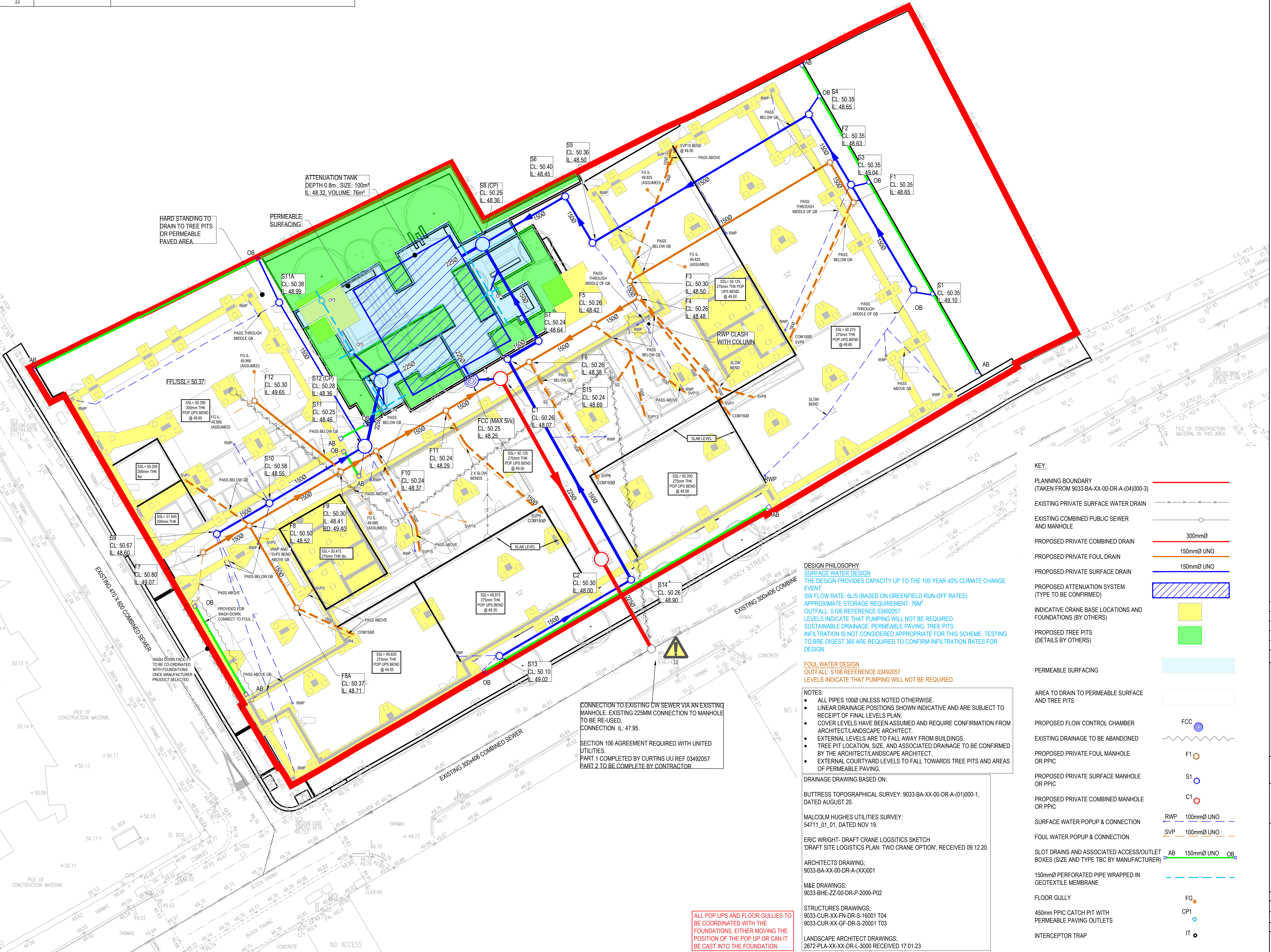
#### **Construction details of tree pits.**

Refer to Landscape Architect Landscaping sections through the Garden Area enclosed in Appendix C which details permeable construction and tree pit details. We have also included construction details of main drainage components within Appendix A (Flow control, attenuation tanks etc).

## Appendix A

- 9033-CUR-XX-00-DR-C-92500-P03 Drainage Strategy
- 9033-CUR-XX-00-DR-C-92510-P02\_Drainage Notes
- 9033-CUR-XX-00-DR-C-92511-P02\_Drainage Details Sheet 1
- 9033-CUR-XX-00-DR-C-92512-P02\_Drainage Details Sheet 2
- 9033-CUR-XX-00-DR-C-92513-P02\_Drainage Details Sheet 3
- 9033-CUR-XX-00-DR-C-92514-P01\_Drainage Details Sheet 4
- 9033-CUR-XX-00-DR-C-92520-P02\_Manhole Schedule
- Proposed Surface Water Calculations - 1 Year, 30 Year, 100 Year +40%
- Proposed Surface Water Calculations - 100 Year +40% with 1m Surcharge on Public Sewer

| RESIDUAL HAZARD REGISTER                                                                                                                                                                                       |                                     |                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------|
| HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS. |                                     |                                                             |
| HAZARD REF No.                                                                                                                                                                                                 | ITEM (FEATURE, ELEMENT OR ACTIVITY) | RESIDUAL HAZARD                                             |
|  3.0                                                                                                                            | SERVICES                            | EXISTING SERVICES TO REMAIN ARE TO BE PROTECTED OR DIVERTED |



| KEY:                                                                               |  |
|------------------------------------------------------------------------------------|--|
| PLANNING BOUNDARY<br>(TAKEN FROM 9033-BA-XX-00-DR-A-(04)000-3)                     |  |
| EXISTING PRIVATE SURFACE WATER DRAIN                                               |  |
| EXISTING COMBINED PUBLIC SEWER AND MANHOLE                                         |  |
| PROPOSED PRIVATE COMBINED DRAIN                                                    |  |
| PROPOSED PRIVATE FOUL DRAIN                                                        |  |
| PROPOSED PRIVATE SURFACE DRAIN                                                     |  |
| PROPOSED ATTENUATION SYSTEM<br>(TYPE TO BE CONFIRMED)                              |  |
| INDICATIVE CRANE BASE LOCATIONS AND FOUNDATIONS (BY OTHERS)                        |  |
| PROPOSED TREE PITS<br>(DETAILS BY OTHERS)                                          |  |
| PERMEABLE SURFACING                                                                |  |
| AREA TO DRAIN TO PERMEABLE SURFACE AND TREE PITS                                   |  |
| PROPOSED FLOW CONTROL CHAMBER                                                      |  |
| EXISTING DRAINAGE TO BE ABANDONED                                                  |  |
| PROPOSED PRIVATE FOUL MANHOLE OR PPIC                                              |  |
| PROPOSED PRIVATE SURFACE MANHOLE OR PPIC                                           |  |
| PROPOSED PRIVATE COMBINED MANHOLE OR PPIC                                          |  |
| SURFACE WATER POPUP & CONNECTION                                                   |  |
| FOUL WATER POPUP & CONNECTION                                                      |  |
| SLOT DRAINS AND ASSOCIATED ACCESS/OUTLET BOXES (SIZE AND TYPE TBC BY MANUFACTURER) |  |
| 150mmØ PERFORATED PIPE WRAPPED IN GEOTEXTILE MEMBRANE                              |  |
| FLOOR GULLY                                                                        |  |
| 450mm PPIC CATCH PIT WITH PERMEABLE PAVING OUTLETS                                 |  |
| INTERCEPTOR TRAP                                                                   |  |

**DESIGN PHILOSOPHY**  
**SURFACE WATER DESIGN**  
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 40% CLIMATE CHANGE EVENT.  
SW FLOW RATE: SLS (BASED ON GREENFIELD RUN-OFF RATES)  
APPROXIMATE STORAGE REQUIREMENT: 76M³  
OUTFALL: S106 REFERENCE 03492057  
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.  
SUSTAINABLE DRAINAGE: PERMEABLE PAVING, TREE PITS  
INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME. TESTING TO BRE DIGEST 365 ARE REQUIRED TO CONFIRM INFILTRATION RATES FOR DESIGN.

**FOUL WATER DESIGN**  
OUTFALL: S106 REFERENCE 03492057  
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.

- NOTES:**
- ALL PIPES 1000 UNLESS NOTED OTHERWISE.
  - LINEAR DRAINAGE POSITIONS SHOWN INDICATIVE AND ARE SUBJECT TO RECEIPT OF FINAL LEVELS PLAN.
  - COVER LEVELS HAVE BEEN ASSUMED AND REQUIRE CONFIRMATION FROM ARCHITECT/LANDSCAPE ARCHITECT.
  - EXTERNAL LEVELS ARE TO FALL AWAY FROM BUILDINGS.
  - TREE PIT LOCATION, SIZE, AND ASSOCIATED DRAINAGE TO BE CONFIRMED BY THE ARCHITECT/LANDSCAPE ARCHITECT.
  - EXTERNAL COURTYARD LEVELS TO FALL TOWARDS TREE PITS AND AREAS OF PERMEABLE PAVING.

**DRAINAGE DRAWING BASED ON:**

BUTTRISS TOPOGRAPHICAL SURVEY: 9033-BA-XX-00-DR-A-(01)000-1, DATED AUGUST 20.

MALCOLM HUGHES UTILITIES SURVEY: 54711\_01\_01, DATED NOV 19.

ERIC WRIGHT- DRAFT CRANE LOGISTICS SKETCH 'DRAFT SITE LOGISTICS PLAN: TWO CRANE OPTION', RECEIVED 09.12.20.

**ARCHITECTS DRAWING:**  
9033-BA-XX-00-DR-A-(XX)001

**M&E DRAWINGS:**  
9033-BHE-ZZ-00-DR-P-2000-P02

**STRUCTURES DRAWINGS:**  
9033-CUR-XX-FN-DR-S-16001 T04  
9033-CUR-XX-GF-DR-S-20001 T03

**LANDSCAPE ARCHITECT DRAWINGS:**  
2672-PLA-XX-XX-DR-L-3000 RECEIVED 17.01.23

ALL POP UPS AND FLOOR GULLIES TO BE COORDINATED WITH THE FOUNDATIONS. EITHER MOVING THE POSITION OF THE POP UP OR CAN IT BE CAST INTO THE FOUNDATION

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
- ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- ALL RAINWATER AND FOUL POP UPS LOCATIONS AND SIZES INDICATIVE ONLY AND TO BE CONFIRMED BY THE ARCHITECT AND M&E ENGINEER.
- COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH UNITED UTILITIES. S106 AGREEMENT TO BE COMPLETED. PART 1 COMPLETED BY CURTINS UU REF 03492057. PART 2 TO BE COMPLETED BY CONTRACTOR.

|      |                                      |          |     |       |
|------|--------------------------------------|----------|-----|-------|
| P03  | UPDATED FOR PLANNING CONDITION ISSUE | 01/02/23 | CS  | CG    |
| T02  | TENDER UPDATE TO SUIT REVISED LEVELS | 27/05/22 | CS  | CG    |
| T01  | FOR TENDER                           | 02/07/21 | CS  | CD    |
| P02  | UPDATED TO LANDSCAPE LAYOUT          | 01/04/21 | VC  | CG    |
| P01  | ISSUED FOR STAGE 3                   | 11/01/21 | AH  | MW    |
| Rev: | Description:                         | Date:    | By: | Chkd: |



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Status: **SUITABLE FOR INFORMATION** **S2**

Project: **BACK OF ANCOATS ELIZA YARD**

Orig Title: **PROPOSED DRAINAGE LAYOUT**

| Size:                           | Date:       | Drawn By: | Designed By: | Checked By: |
|---------------------------------|-------------|-----------|--------------|-------------|
| A1                              | 11/01/21    | AH        | AH           | MW          |
| Scale: 1:150                    |             |           |              |             |
| Project No:                     | Originator: | Volume:   | Level:       | Type:       |
| 9033 - CUR - XX - 00 - DR - C - |             |           |              |             |
| 92500 - P03                     |             |           |              |             |

GENERAL NOTES:

1.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2.

ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
3.

ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
4.

DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5.

DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
6.

OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
7.

ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
8.

COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
9.

ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
10.

ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
11.

ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
12.

LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
13.

ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
14.

WHERE NO WC'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.
15.

ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING
16.

SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
17.

INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.
18.

ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
19.

ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
  - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
  - 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
20.

AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
21.

SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
22.

THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
23.

ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.
24.

ALL ADOPTABLE DRAINAGE PIPES WILL REQUIRE A MINIMUM OF 1200mm COVER, IN ACCORDANCE WITH SEWERAGE UNDERTAKERS REQUIREMENTS. WHERE THIS IS NOT ACHIEVED, IT WILL BE NECESSARY TO AGREE THE BED AND SURROUND DETAIL.
25.

ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
26.

WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
27.

WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.
28.

SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
29.

WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSEOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
30.

ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.
31.

THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
32.

ALL MANHOLE COVERS IN BLOCK/SLAB AND
- EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
32.

ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.

33.

UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
  - B125 LOAD CLASS IN PEDESTRIAN AREAS
  - D400 LOAD CLASS IN VEHICULAR AREAS.

35.

ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

36.

GREASE TRAPS SHOULD BE PROVIDED ABOVE GROUND WITHIN AN ENZYME TREATMENT SYSTEM, BY APPROPRIATE SPECIALIST DESIGNER.

37.

THE DESIGN IS BASED ON A GRAVITY RAINWATER SYSTEM.

GENERAL NOTES:

1.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2.

FOR THE PROPOSED DRAINAGE LAYOUT PLEASE REFER TO DRAWING 9033-CUR-XX-00-DR-C-92500.

|      |                                       |          |     |       |
|------|---------------------------------------|----------|-----|-------|
| P02  | UPDATED FOR PLANNING CONDITIONS ISSUE | 01/02/23 | CS  | CG    |
| T01  | ISSUED FOR TENDER                     | 02/07/21 | CS  | CD    |
| P01  | ISSUED FOR STAGE 3                    | 11/01/21 | AH  | MW    |
| Rev: | Description:                          | Date:    | By: | Chkd: |



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Status:

SUITABLE FOR INFORMATION

S2

Project:

BACK OF ANCOATS  
ELIZA YARD

Orig Title:

PROPOSED DRAINAGE NOTES

|             |             |                 |              |             |       |                    |      |
|-------------|-------------|-----------------|--------------|-------------|-------|--------------------|------|
| Size:       | Date:       | Drawn By:       | Designed By: | Checked By: |       |                    |      |
| A1          | 11/01/21    | AH              | AH           | MW          |       |                    |      |
| Scale:      | NTS         |                 |              |             |       |                    |      |
| Project No: | Originator: | Volume:         | Level:       | Type:       | Role: | Category / Number: | Rev: |
| 9033        | - CUR - 00  | - XX - DR - C - | 92510        | - P02       |       |                    |      |

\\msb02\Projects\078001 - 077000\078740 - Main Life Back of Ancoats\QA-Production\A-Mobile Drawings\CC04950

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.



MAXIMUM TRENCH WIDTH



PERMEABLE PAVEMENT

SUBBASE TO SLOPE 1:100  
TOWARDS PERFORATED PIPE

100 mm

215

215

600 mm

PERMEABLE GEOTEXTILE

TRENCH LINED WITH IMPERMEABLE  
MEMBRANE VIS QUEEN URBAN  
(OR SIMILAR APPROVED)

FULLY PERFORATED PIPE  
(UNLESS OTHERWISE NOTED)  
REFER TO DRAINAGE LAYOUT

SINGLE SIZED STONE 14-20MM  
(30% VOIDS RATIO), OR 4/20  
GRADED MATERIAL  
CONFORMING TO BS 7533-13

### PERMEABLE SURFACE AND PERFORATED PIPE DETAIL



(SCALE 1:20)



Technical drawing of a square manhole cover, showing Plan and Section views.

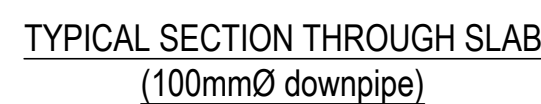
**PLAN**

- Overall width: 470
- Overall height: 416
- Labels: CAST IRON GRATING AND CAST FRAME.

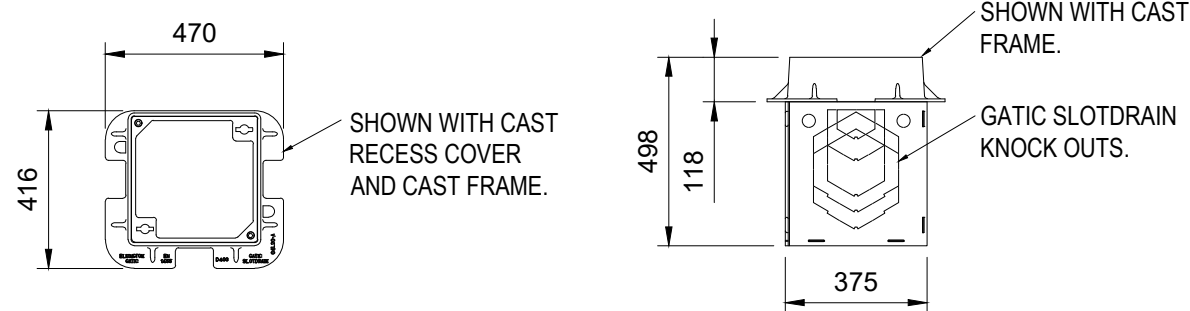
**SECTION**

- Overall height: 748
- Grating thickness: 18
- Frame height: 623
- Frame height (excluding grating): 498
- Top width: 350
- Bottom width: 375
- Labels: CAST IRON GRATING AND CAST FRAME., GATIC SLOTDRAIN KNOCK OUTS., OUTLET PIPE KNOCK OUTS.

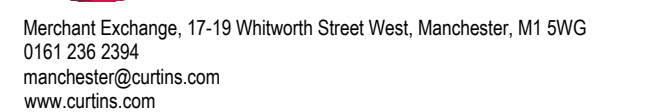
GATIC SLOTDRAIN 350mm OUTLET UNIT  
SECTION AND PLAN DETAILS  
NTS



## INSTALLATION



350 ACCESS BOX  
SECTION AND PLAN DETAILS  
NTS



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Status: CC

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Project: BACK OF ANCOATS

BACK OF ANCOATS  
ELIZABETH

ELIZA YARD

Dr. Title:

## DRAINAGE DETAILS

SHEET 1

SHEET 1

\_\_\_\_\_

|       |          |           |              |             |
|-------|----------|-----------|--------------|-------------|
| Size: | Date:    | Drawn By: | Designed By: | Checked By: |
| 1:1   | 11/21/21 |           |              |             |

|    |          |    |    |    |
|----|----------|----|----|----|
| A1 | 11/01/21 | AH | AH | MW |
|----|----------|----|----|----|

Scale: NTS

|             |             |         |        |       |       |                    |      |
|-------------|-------------|---------|--------|-------|-------|--------------------|------|
| Project No: | Originator: | Volume: | Level: | Type: | Role: | Category / Number: | Rev: |
|-------------|-------------|---------|--------|-------|-------|--------------------|------|

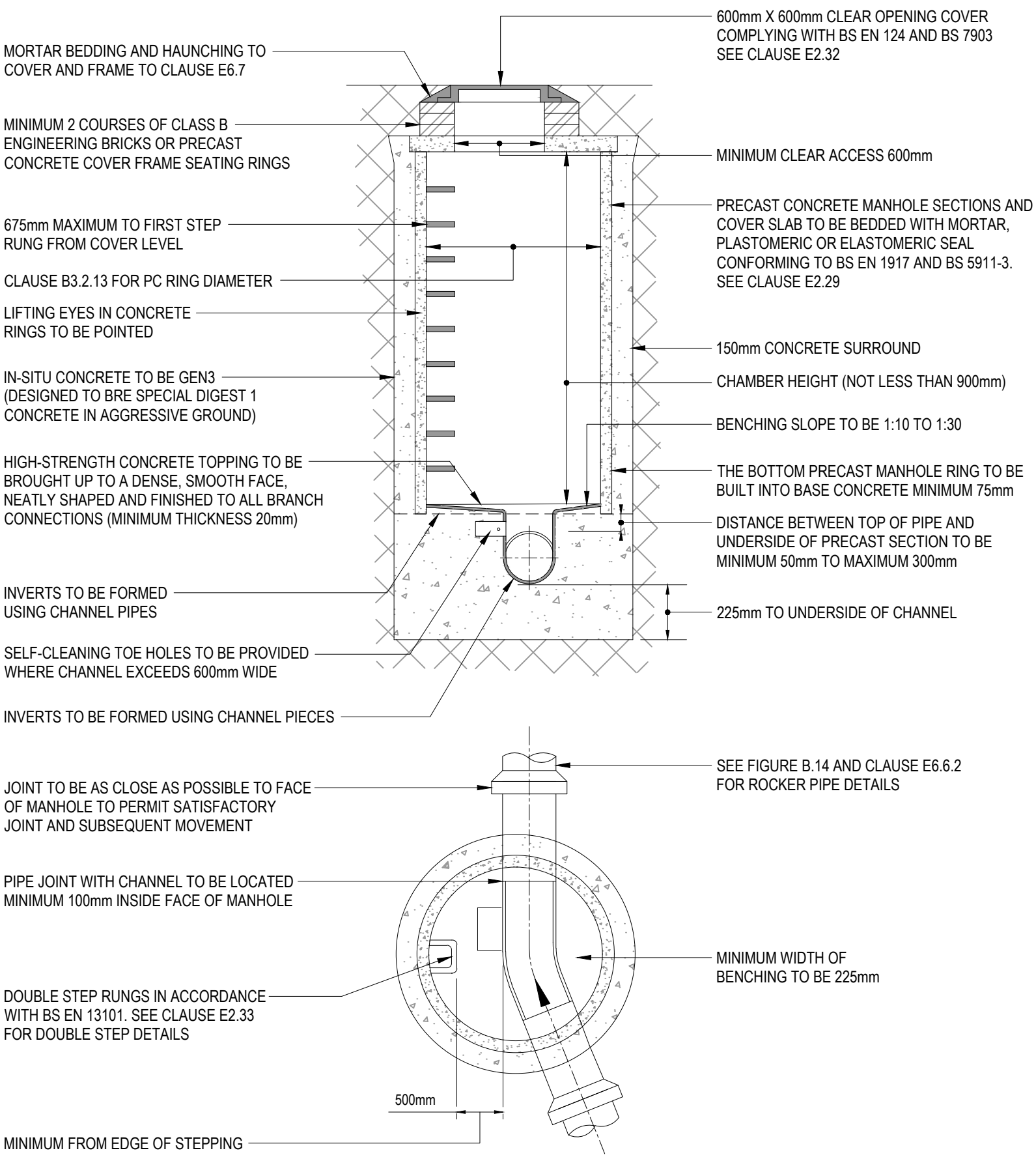
9033 - CUR - XX - 00 - DR - C - 92511 - P02

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|                                                                                                               |
|---------------------------------------------------------------------------------------------------------------|
| 11mfs02\Projects\076001 - 077000\076740 - Man Life Back of Ancoats\Q4-Production\4A-Models-Drawings\C\CAD\92\ |
|---------------------------------------------------------------------------------------------------------------|

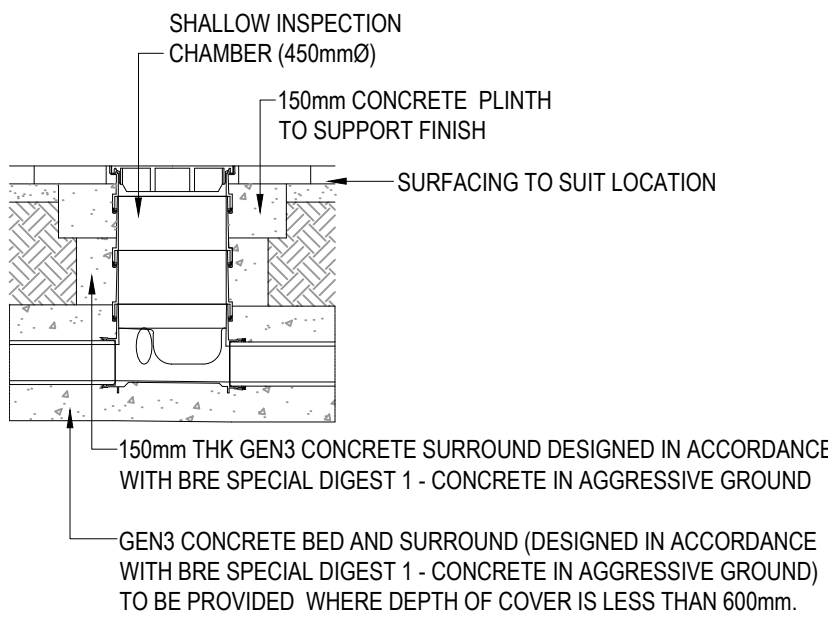
GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

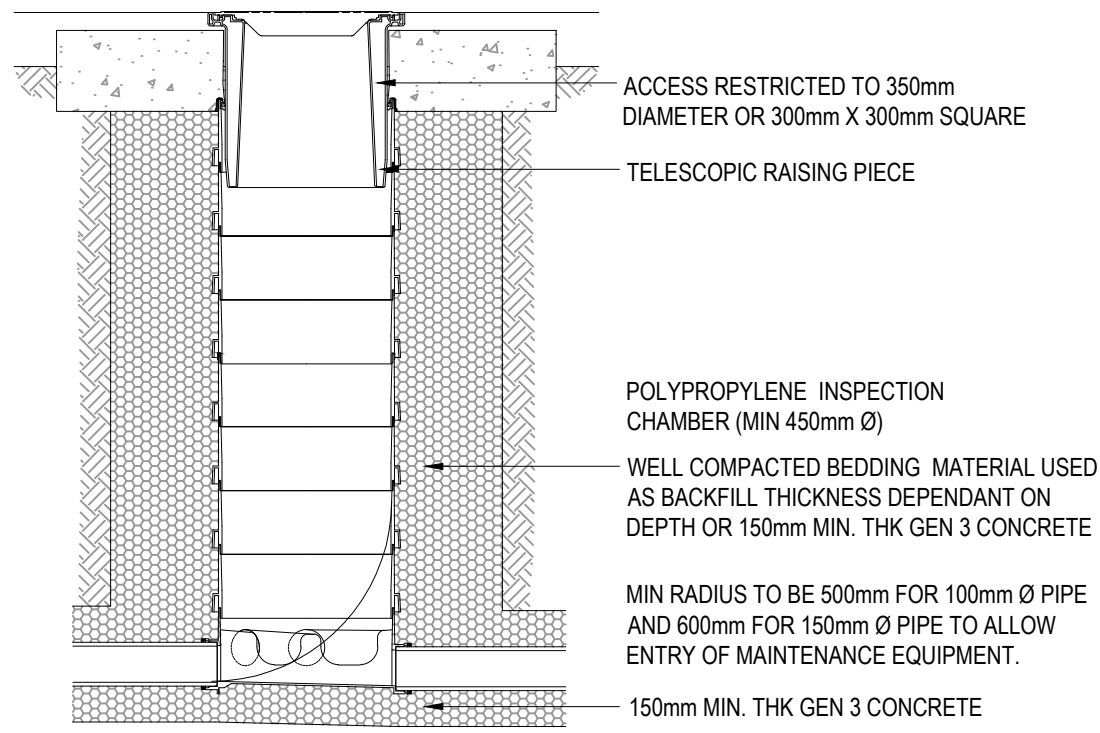


MANHOLE COVERS WITHIN TRAFFICKED PAVED AREAS TO BE D400 RECESSED COVERS.

TYPICAL MANHOLE DETAIL - TYPE 2  
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 m)

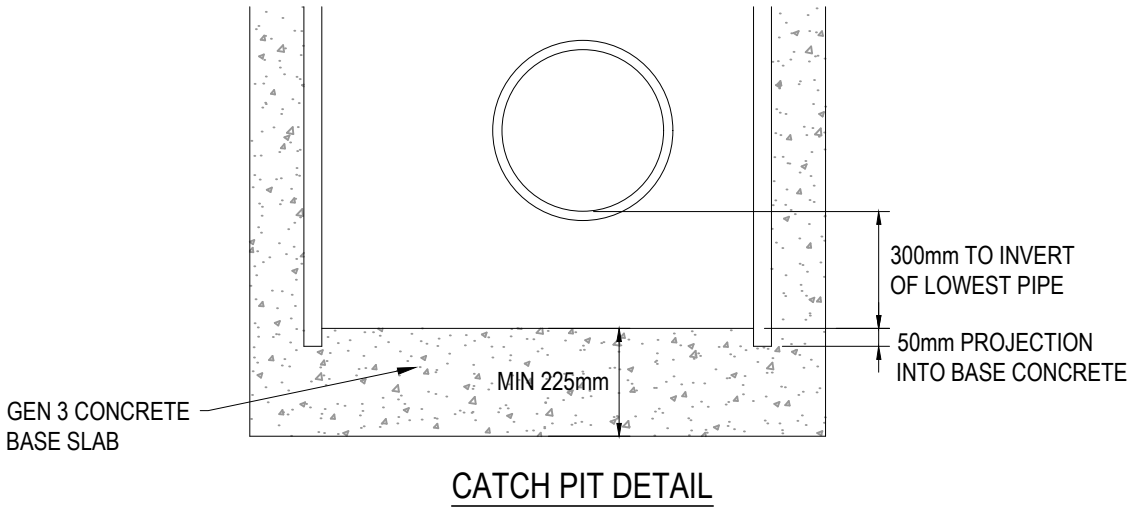


SHALLOW INSPECTION CHAMBER  
MAX DEPTH 0.6m



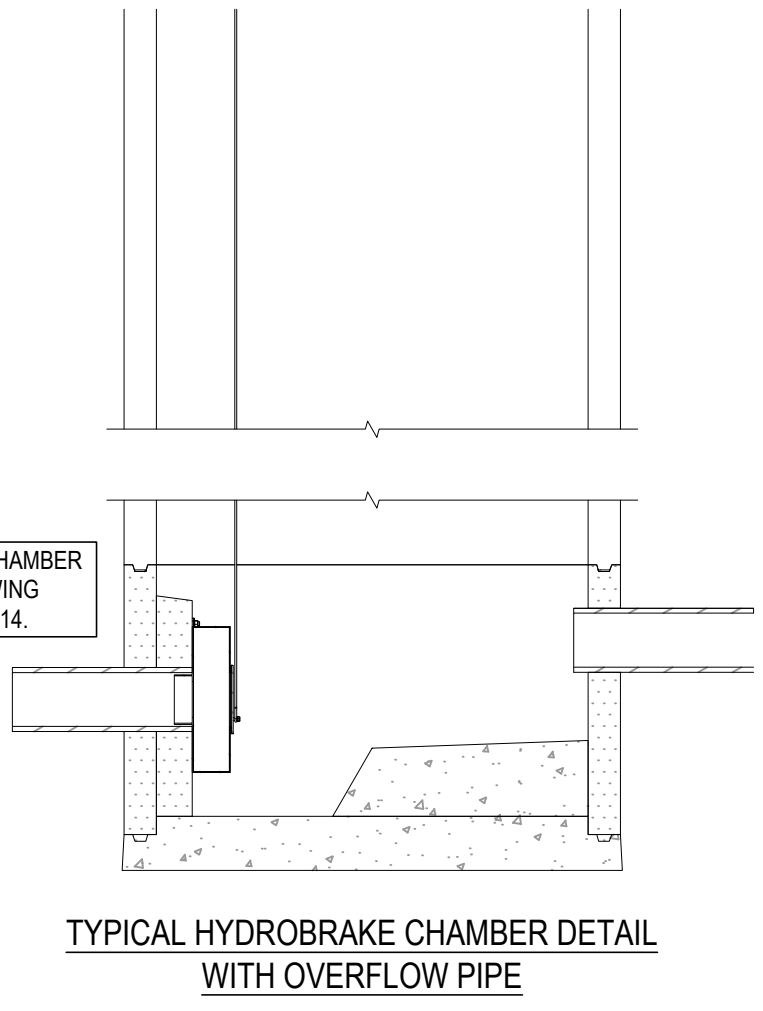
DEEP INSPECTION CHAMBER  
DEPTHS BETWEEN 1.2m AND 3.0m

TYPICAL INSPECTION CHAMBER DETAILS - PPIC

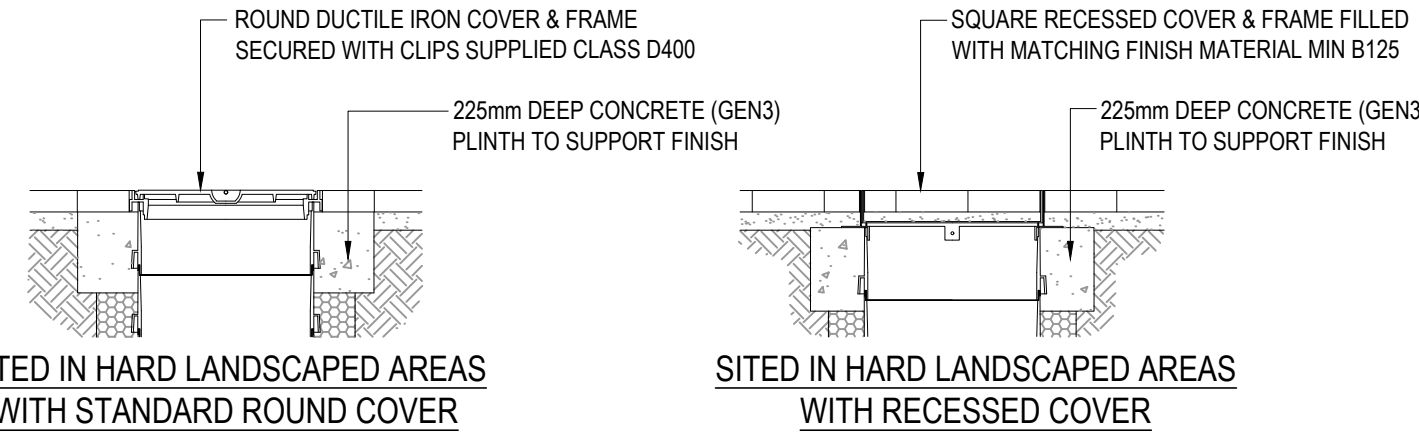


CATCH PIT DETAIL

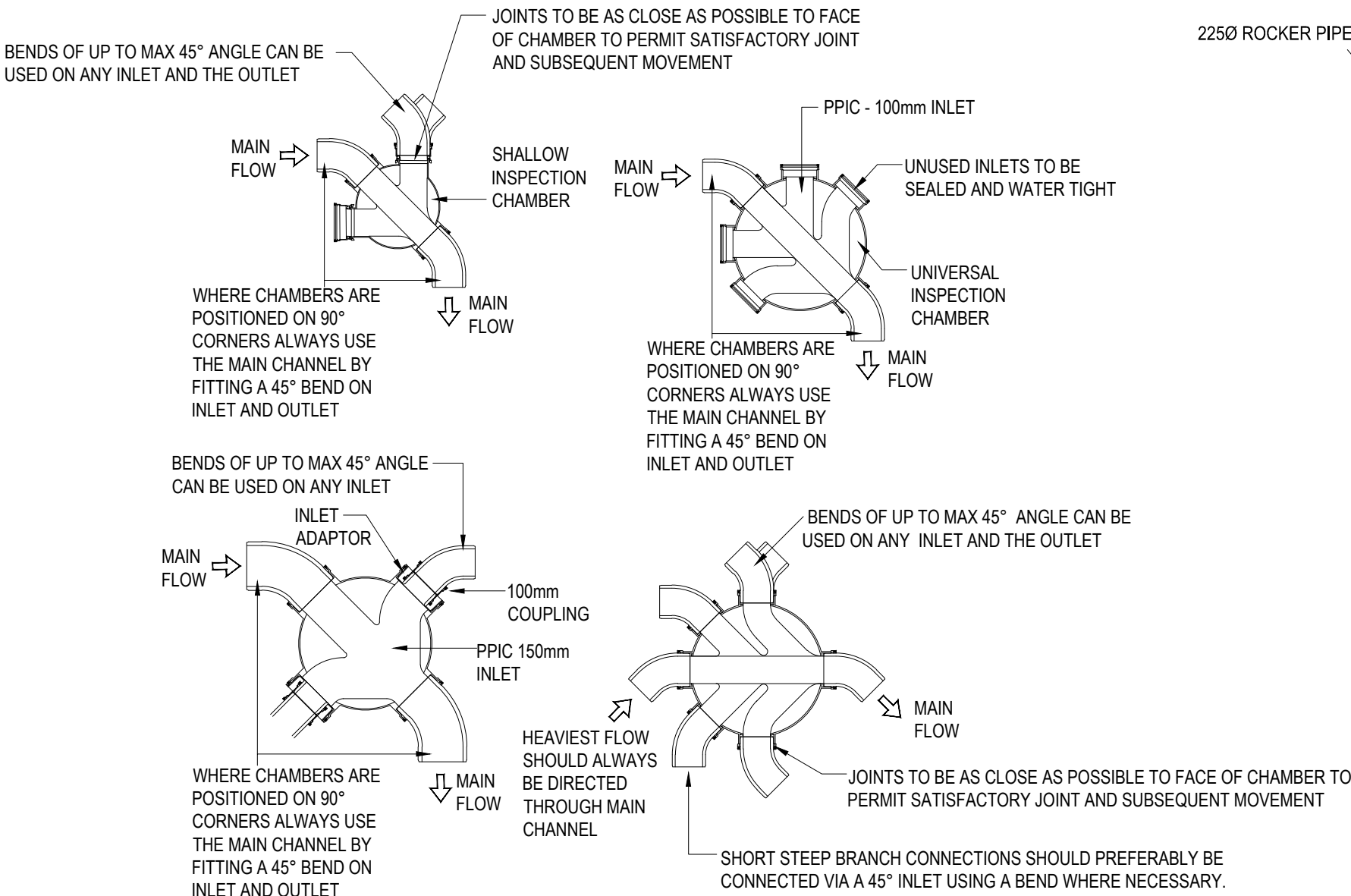
FOR ALL HYDROBRAKE CHAMBER DETAILS REFER TO DRAWING 9033-CUR-XX-00-DR-C-92514.



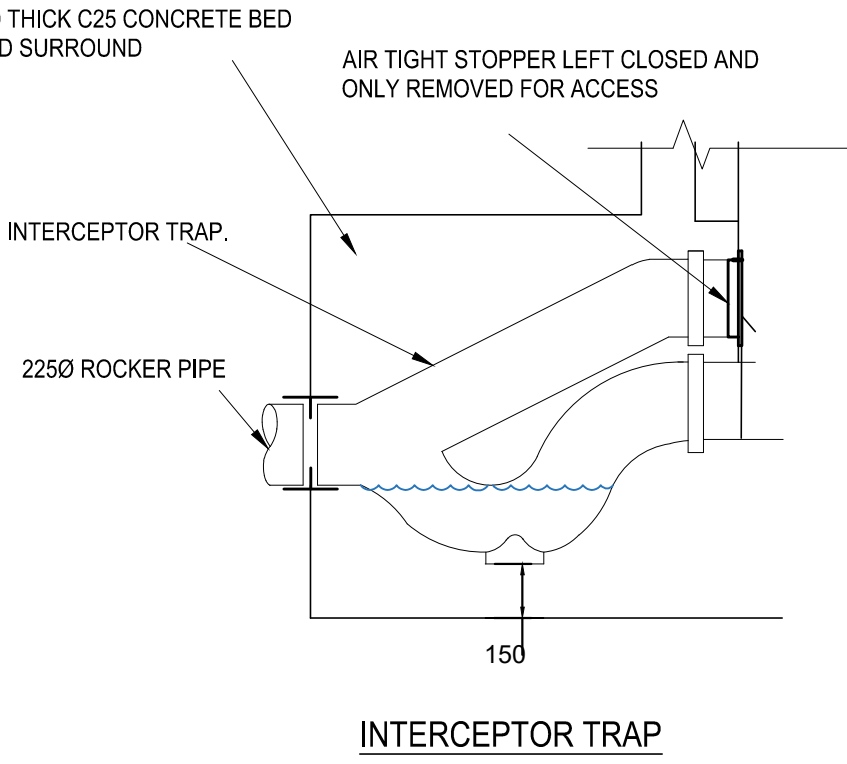
TYPICAL HYDROBRAKE CHAMBER DETAIL  
WITH OVERFLOW PIPE



TYPICAL INSPECTION CHAMBER COVER DETAILS



INSPECTION CHAMBER BASE DETAILS



INTERCEPTOR TRAP

|      |                                       |          |     |       |
|------|---------------------------------------|----------|-----|-------|
| P02  | UPDATED FOR PLANNING CONDITIONS ISSUE | 01/02/23 | CS  | CG    |
| T01  | ISSUED FOR TENDER                     | 02/07/21 | CS  | CD    |
| P01  | ISSUED FOR STAGE 3                    | 11/01/21 | AH  | MW    |
| Rev: | Description:                          | Date:    | By: | Chkd: |

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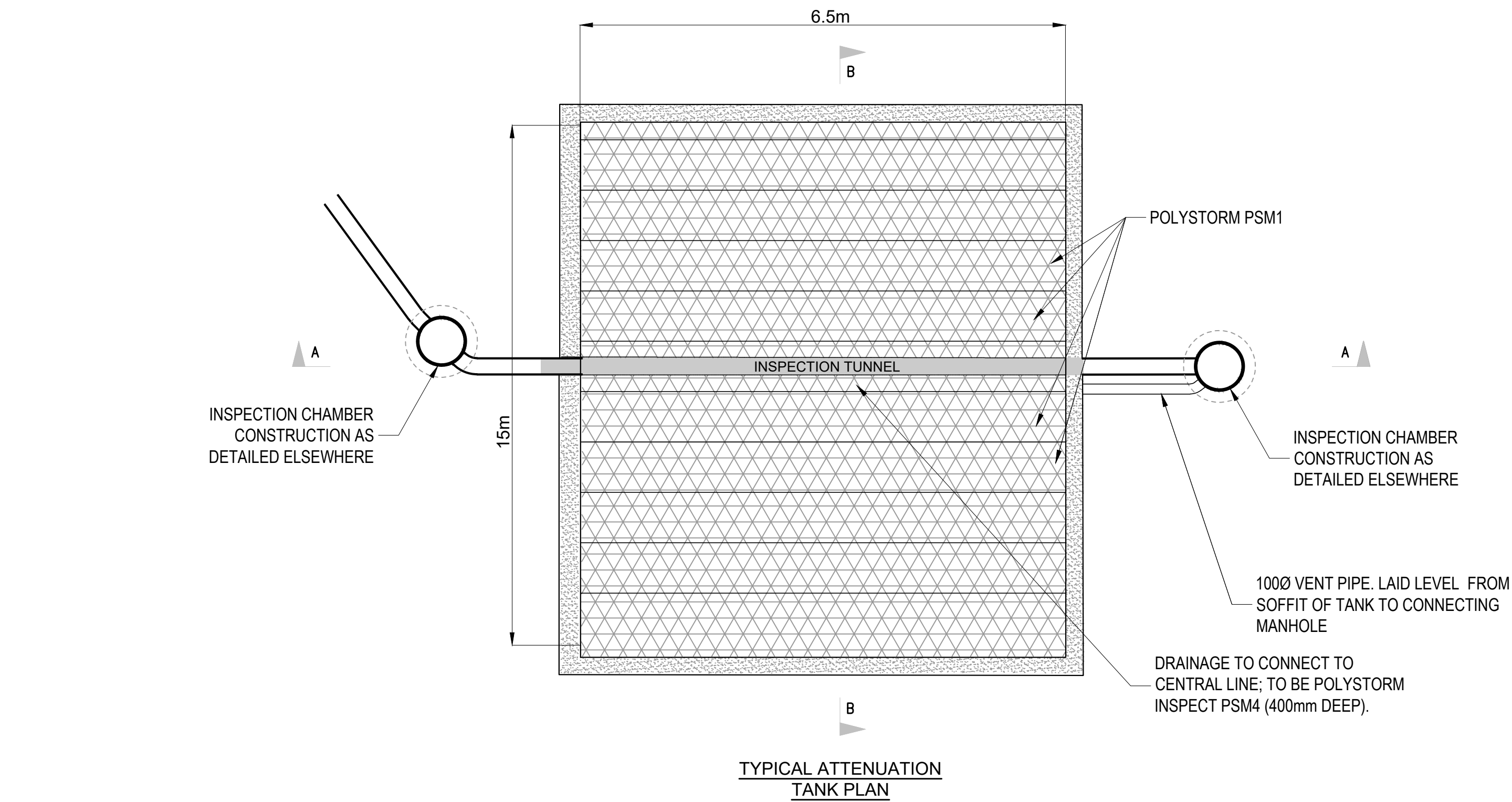
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Status: **SUITABLE FOR INFORMATION** **S2**

Project: **BACK OF ANCOATS  
ELIZA YARD**

Orig Title: **DRAINAGE DETAILS  
SHEET 2**

|                                             |             |           |              |             |       |                    |      |
|---------------------------------------------|-------------|-----------|--------------|-------------|-------|--------------------|------|
| Size:                                       | Date:       | Drawn By: | Designed By: | Checked By: |       |                    |      |
| A1                                          | 11/01/21    | AH        | AH           | MW          |       |                    |      |
| Scale: NTS                                  |             |           |              |             |       |                    |      |
| Project No:                                 | Originator: | Volume:   | Level:       | Type:       | Role: | Category / Number: | Rev: |
| 9033 - CUR - XX - 00 - DR - C - 92512 - P02 |             |           |              |             |       |                    |      |



**CURRENT DESIGN ASSUMPTIONS**

DESIGN BASED POLYSTORM DEEP (PSM1) 0.50m (W) 0.40m (H), 1m (L)

TANK IS LOCATED IN AN AREA SUBJECT TO PEDESTRIAN LOADING ONLY. DETAILED STRUCTURAL CALCULATIONS REQUIRED TO PROVE TANK HAS SUFFICIENT STRENGTH.

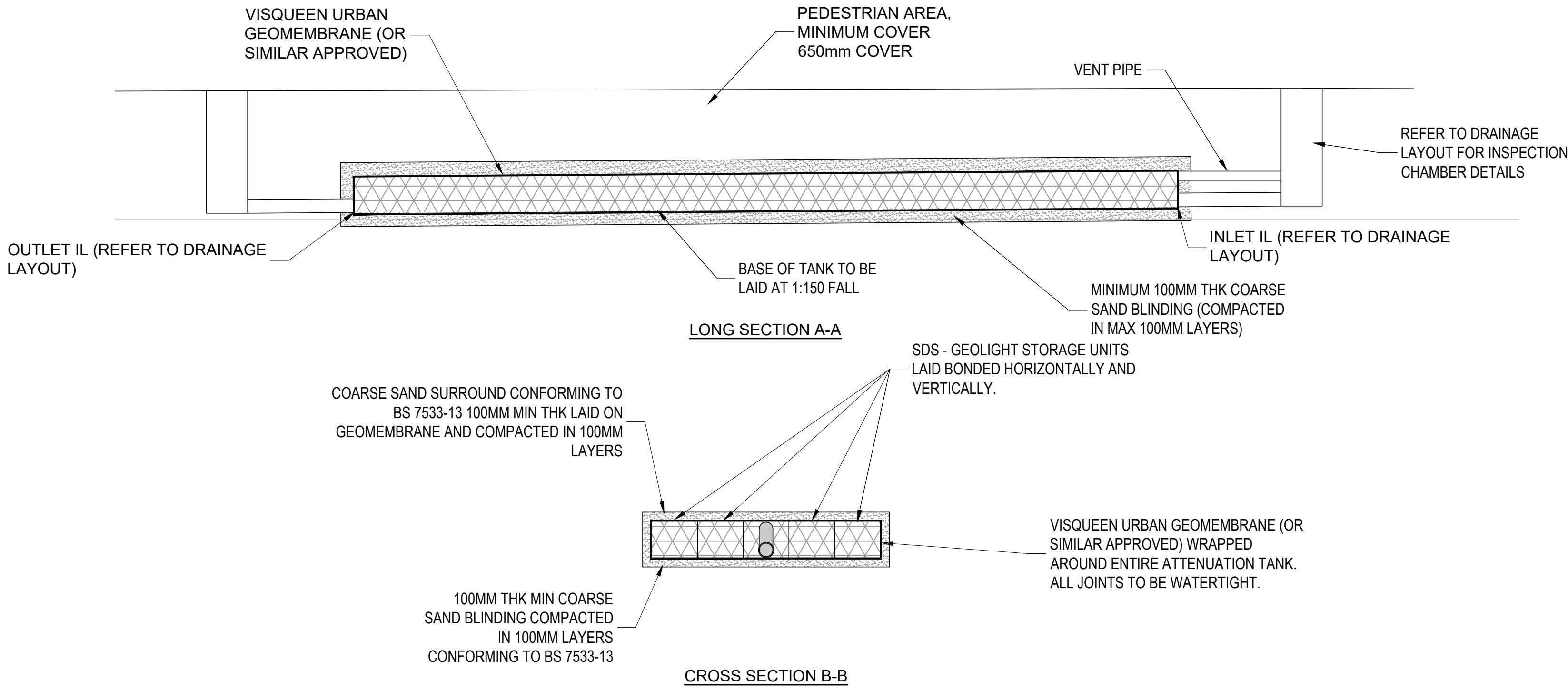
THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

MINIMUM GROUND LEVEL IS APPROX 50.40 ,  
TOP OF TANK VARIED  
BASE OF TANK 48.32

DIMENSIONS OF TOTAL UNIT ARE AS SHOWN.  
PLAN AREA OF TANK IS 100m²  
TOTAL DEPTH OF TANK IS 0.8m.  
ATTENUATION VOLUME, BASED ON 95% VOID RATIO IS 76 m³

IMPERMEABLE MEMBRANE, BED AND SURROUND TO BE CONFIRMED WITH THE MANUFACTURER.  
HIGH WATER GROUND LEVEL

REFER TO DRAINAGE LAYOUT FOR TANK & INLET/OUTLET LOCATIONS.



GENERAL NOTES:

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- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

|      |                                      |          |     |       |
|------|--------------------------------------|----------|-----|-------|
| P02  | UPDATE FOR PLANNING CONDITIONS ISSUE | 01/02/23 | CS  | CG    |
| T01  | ISSUED FOR TENDER                    | 01/07/21 | CS  | CD    |
| P01  | ISSUED FOR STAGE 3                   | 11/01/21 | AH  | MW    |
| Rev: | Description:                         | Date:    | By: | Chkd: |



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Status:

SUITABLE FOR INFORMATION

S2

Project:

BACK OF ANCOATS  
ELIZA YARD

Orig Title:

DRAINAGE DETAILS  
SHEET 3

|             |             |           |              |             |       |                    |       |
|-------------|-------------|-----------|--------------|-------------|-------|--------------------|-------|
| Size:       | Date:       | Drawn By: | Designed By: | Checked By: |       |                    |       |
| A1          | 11/01/21    | AH        | AH           | MW          |       |                    |       |
| Scale:      | NTS         |           |              |             |       |                    |       |
| Project No: | Originator: | Volume:   | Level:       | Type:       | Role: | Category / Number: | Rev:  |
| 9033        | - BA        | - XX      | - 00         | - DR        | - C   | - 92513            | - P02 |



| Manhole schedule- Surface Water |             |            |           |           |                     |                  |             |         |                 |             |               |           |                   |           |                               |
|---------------------------------|-------------|------------|-----------|-----------|---------------------|------------------|-------------|---------|-----------------|-------------|---------------|-----------|-------------------|-----------|-------------------------------|
| MH REF                          | EASTING     | NORTHING   | CL (mAOD) | IL (mAOD) | DEPTH TO SOFFIT (m) | DS PIPE DIA (mm) | MH DIA (mm) | MH TYPE | COVER SIZE (mm) | COVER CLASS | COVER TYPE    | RECESSED  | RESTRICTED ACCESS | BACK DROP | COMMENTS                      |
| S1                              | 385258.175  | 398805.240 | 50.35     | 49.10     | 1.10                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S2                              |             |            |           |           |                     |                  |             |         |                 |             |               |           |                   |           | MH OMITTED                    |
| S3                              | 385253.018  | 398813.948 | 50.35     | 49.04     | 1.16                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S4                              | 385249.523  | 398819.788 | 50.35     | 48.65     | 1.55                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S5                              | 385231.560  | 398809.121 | 50.36     | 48.50     | 1.71                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S6                              | 385229.290  | 398812.978 | 50.40     | 48.45     | 1.80                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S7                              | 385227.088  | 398800.982 | 50.24     | 48.64     | 1.45                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S8                              | 385222.441  | 398809.008 | 50.25     | 48.36     | 1.67                | 225              | 1200        | TYPE 2  | 600 X 600       | B125        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| S9                              | 385200.385  | 398784.961 | 50.67     | 48.60     | 1.92                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | N/A                           |
| S10                             | 385204.748  | 398787.529 | 50.58     | 48.55     | 1.88                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S11A                            | 385205.559  | 398804.174 | 50.38     | 48.99     | 1.24                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S11                             | 385212.664  | 398792.242 | 50.25     | 48.46     | 1.57                | 225              | 1200        | TYPE 2  | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| S12                             | 385213.999  | 398797.651 | 50.28     | 48.36     | 1.70                | 225              | 1200        | TYPE 2  | 600 X 600       | B125        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| S13                             | 3858223.828 | 398774.847 | 50.10     | 49.02     | 0.93                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         |                               |
| S14                             | 385234.766  | 398781.173 | 50.26     | 48.90     | 1.21                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| S15                             | 385224.506  | 398799.487 | 50.24     | 48.69     | 1.40                | 150              | 600         | PPIC    | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350 |
| CP1                             | 385223.037  | 398804.946 | 50.24     | 49.49     | 0.60                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| CP2                             | 385209.084  | 398804.325 | 50.24     | 49.49     | 0.60                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| CP3                             | 385211.579  | 398800.083 | 50.24     | 49.49     | 0.60                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| CP4                             | 385214.289  | 398795.473 | 50.24     | 49.49     | 0.60                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | CATCHPIT- 300mm SUMP          |
| FCC                             | 385221.518  | 398797.731 | 50.25     | 48.25     | 1.78                | 225              | 1200        | TYPE 2  | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | FLOW CONTROL CHAMBER          |

| Manhole schedule- Foul/Combined Water |             |            |           |           |                     |                  |             |         |                 |             |               |           |                   |           |                                                   |
|---------------------------------------|-------------|------------|-----------|-----------|---------------------|------------------|-------------|---------|-----------------|-------------|---------------|-----------|-------------------|-----------|---------------------------------------------------|
| MH REF                                | EASTING     | NORTHING   | CL (mAOD) | IL (mAOD) | DEPTH TO SOFFIT (m) | DS PIPE DIA (mm) | MH DIA (mm) | MH TYPE | COVER SIZE (mm) | COVER CLASS | COVER TYPE    | RECESSED  | RESTRICTED ACCESS | BACK DROP | COMMENTS                                          |
| F1                                    | 385253.222  | 398812.464 | 50.35     | 48.65     | 1.55                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F2                                    | 385251.263  | 398815.798 | 50.35     | 48.63     | 1.57                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F3                                    | 385234.666  | 398805.965 | 50.30     | 48.50     | 1.65                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F4                                    | 385235.422  | 398804.569 | 50.26     | 48.48     | 1.63                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F5                                    | 385231.705  | 398802.398 | 50.26     | 48.42     | 1.69                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F6                                    | 385226.310  | 398799.247 | 50.26     | 48.38     | 1.73                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F7                                    | 385199.243  | 398783.441 | 50.80     | 49.07     | 1.58                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F8A                                   | 385207.017  | 398778.832 | 50.37     | 48.71     | 1.51                | 150              | 450         | PPIC    | 450 X 450       | D400        | DOUBLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F8                                    | 385203.078  | 398785.654 | 50.50     | 48.52     | 1.83                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F9                                    | 385210.671  | 398790.114 | 50.30     | 48.41     | 1.74                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | Y         | ACCESS RESTRICTED TO MAX. 350. BACKDROP IL = 49.4 |
| F10                                   | 385213.604  | 398791.827 | 50.24     | 48.37     | 1.72                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F11                                   | 385219.391  | 398795.207 | 50.24     | 48.29     | 1.80                | 150              | 450         | PPIC    | 450 X 450       | D400        | SINGLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| F12                                   | 385203.507  | 398796.016 | 50.30     | 49.65     | 0.50                | 150              | 450         | PPIC    | 450 X 450       | D400        | DOUBLE SEALED | TBC BY LA | Y                 | N         | ACCESS RESTRICTED TO MAX. 350                     |
| C1                                    | 385223.934  | 398797.860 | 50.26     | 48.07     | 1.97                | 225              | 1200        | TYPE 2  | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | N/A                                               |
| C2                                    | 385232.2942 | 398782.872 | 50.30     | 48.00     | 2.08                | 225              | 1200        | TYPE 2  | 600 X 600       | D400        | SINGLE SEALED | TBC BY LA | N                 | N         | N/A                                               |

- GENERAL NOTES:
1.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2.

ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
3.

ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
4.

ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5.

ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6.

THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
7.

COVER LEVELS HAVE BEEN ASSUMED AND REQUIRE CONFIRMATION FROM THE LANDSCAPE ARCHITECT.
8.

COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
9.

ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT.
10.

THE LANDSCAPE ARCHITECT MAY REQUIRE THE ORIENTATION OF CHAMBER COVERS TO BE CO-ORDINATED WITH THE PAVING PATTERN. THIS WILL BE SUBJECT TO REVIEW WITH THE MANHOLE INTERNAL BENCHING ARRANGEMENT, LANDING AND STEP LOCATION AND IF REQUIRED, SHOULD BE ADVISED TO US AS SOON AS POSSIBLE.
11.

ALL MANHOLE, GULLY AND CHANNEL (ACCESS/OUTLET) COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
  - B125 LOAD CLASS IN PEDESTRIAN AREAS
  - D400 LOAD CLASS IN VEHICULAR AREAS.ANY AMBIGUITIES ON DRAWINGS/ACCESS AND MAINTENANCE STRATEGY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
13.

ALL SURFACE CHANNEL ACCESS BOXES/OUTLET BOXES IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT AND SUBJECT TO AVAILABILITY FROM MANUFACTURER.
14.

ALL SURFACE CHANNELS TO BE OF THE TREADSAFE TYPE, UNLESS OTHERWISE SPECIFIED.
15.

ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

|      |                                       |          |     |       |
|------|---------------------------------------|----------|-----|-------|
| P02  | UPDATED FOR PLANNING CONDITIONS ISSUE | 01/02/23 | CS  | CG    |
| T02  | TENDER UPDATE TO SUIT REVISED LEVELS  | 27/05/22 | CS  | CG    |
| T01  | ISSUED FOR TENDER                     | 02/07/21 | CS  | CD    |
| P01  | STAGE 3 ISSUE                         | 11/01/21 | AH  | MW    |
| Rev: | Description:                          | Date:    | By: | Chkd: |



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Status:

SUITABLE FOR INFORMATION

S2

Project:

BACK OF ANCOATS  
ELIZA YARD

Orig Title:

MANHOLE SCHEDULE

|       |          |           |              |             |
|-------|----------|-----------|--------------|-------------|
| Size: | Date:    | Drawn By: | Designed By: | Checked By: |
| A1    | 11/01/21 | AH        | AH           | MW          |

|        |     |  |  |  |
|--------|-----|--|--|--|
| Scale: | NTS |  |  |  |
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|             |             |         |            |       |       |                    |      |
|-------------|-------------|---------|------------|-------|-------|--------------------|------|
| Project No: | Originator: | Volume: | Level:     | Type: | Role: | Category / Number: | Rev: |
| 9033        | - CUR - XX  | - 00    | - DR - C - | 92520 | - P02 |                    |      |

\\msb02\Projects\078001 - 077000\076740 - Main Life Back of Ancoats\04-Production\A-Mobile Drawings\CC04920

Design Settings

|                       |                   |                                      |               |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology  | FSR               | Maximum Time of Concentration (mins) | 30.00         |
| Return Period (years) | 1                 | Maximum Rainfall (mm/hr)             | 50.0          |
| Additional Flow (%)   | 0                 | Minimum Velocity (m/s)               | 1.00          |
| FSR Region            | England and Wales | Connection Type                      | Level Soffits |
| M5-60 (mm)            | 18.000            | Minimum Backdrop Height (m)          | 0.600         |
| Ratio-R               | 0.354             | Preferred Cover Depth (m)            | 1.200         |
| CV                    | 0.750             | Include Intermediate Ground          | ✓             |
| Time of Entry (mins)  | 5.00              | Enforce best practice design rules   | x             |

Nodes

| Name   | Area<br>(ha) | T of E<br>(mins) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Easting<br>(m) | Northing<br>(m) | Depth<br>(m) |
|--------|--------------|------------------|-----------------------|------------------|----------------|-----------------|--------------|
| S1     | 0.019        | 5.00             | 50.350                | 600              | 385258.174     | 398805.240      | 1.250        |
| S3     | 0.023        | 5.00             | 50.350                | 600              | 385253.081     | 398813.948      | 1.310        |
| S4     | 0.018        | 5.00             | 50.350                | 600              | 385249.552     | 398819.811      | 1.700        |
| S5     |              |                  | 50.360                | 600              | 385231.691     | 398809.208      | 1.860        |
| S6     | 0.002        | 5.00             | 50.400                | 600              | 385229.199     | 398813.481      | 1.950        |
| S13    | 0.004        | 5.00             | 50.100                | 600              | 385223.650     | 398775.208      | 1.079        |
| S14    | 0.028        | 5.00             | 50.260                | 600              | 385234.500     | 398781.566      | 1.365        |
| S15    |              |                  | 50.240                | 600              | 385224.505     | 398799.486      | 1.550        |
| S7     | 0.004        | 5.00             | 50.240                | 600              | 385226.118     | 398800.506      | 1.600        |
| S8     | 0.014        | 5.00             | 50.250                | 1200             | 385221.309     | 398808.996      | 1.890        |
| S9     | 0.040        | 5.00             | 50.670                | 600              | 385200.384     | 398784.961      | 2.070        |
| S10    |              |                  | 50.580                | 600              | 385204.748     | 398787.528      | 2.030        |
| S11A   | 0.032        | 5.00             | 50.380                | 600              | 385205.559     | 398804.174      | 1.390        |
| S11    | 0.029        | 5.00             | 50.250                | 1200             | 385212.664     | 398792.242      | 1.790        |
| S12    | 0.014        | 5.00             | 50.280                | 1200             | 385213.998     | 398797.650      | 1.920        |
| TANK   |              |                  | 50.240                | 1200             | 385217.642     | 398803.305      | 1.920        |
| FCC    |              |                  | 50.250                | 1200             | 385221.518     | 398797.730      | 2.000        |
| C1     |              |                  | 50.260                | 1200             | 385223.934     | 398797.859      | 2.186        |
| C2     |              |                  | 50.300                | 1200             | 385232.294     | 398782.872      | 2.312        |
| 17_OUT |              |                  | 50.150                |                  | 385237.478     | 398774.953      | 3.904        |

Links

| Name    | US<br>Node | DS<br>Node | Length<br>(m) | ks (mm) /<br>n | US IL<br>(m) | DS IL<br>(m) | Fall<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | T of C<br>(mins) | Rain<br>(mm/hr) |
|---------|------------|------------|---------------|----------------|--------------|--------------|-------------|----------------|-------------|------------------|-----------------|
| 1.000   | S1         | S3         | 10.088        | 0.600          | 49.100       | 49.040       | 0.060       | 168.1          | 150         | 5.17             | 45.8            |
| 1.001   | S3         | S4         | 6.843         | 0.600          | 49.040       | 48.650       | 0.390       | 17.5           | 150         | 5.22             | 45.6            |
| 1.002   | S4         | S5         | 20.772        | 0.600          | 48.650       | 48.500       | 0.150       | 138.5          | 150         | 5.41             | 44.9            |
| 1.003   | S5         | S6         | 4.947         | 0.600          | 48.500       | 48.450       | 0.050       | 98.9           | 150         | 5.49             | 44.6            |
| 1.004   | S6         | S8         | 9.076         | 0.600          | 48.450       | 48.360       | 0.090       | 100.8          | 150         | 5.64             | 44.1            |
| 2.000   | S13        | S14        | 12.576        | 0.600          | 49.021       | 48.895       | 0.126       | 99.8           | 150         | 5.21             | 45.6            |
| 2.001   | S14        | S15        | 20.519        | 0.600          | 48.895       | 48.690       | 0.205       | 100.1          | 150         | 5.55             | 44.4            |
| 2.002   | S15        | S7         | 1.908         | 0.600          | 48.690       | 48.640       | 0.050       | 38.2           | 150         | 5.57             | 44.3            |
| 2.003   | S7         | S8         | 9.757         | 0.600          | 48.640       | 48.435       | 0.205       | 47.6           | 150         | 5.68             | 43.9            |
| 1.005   | S8         | TANK       | 6.770         | 0.600          | 48.360       | 48.320       | 0.040       | 169.3          | 225         | 5.79             | 43.6            |
| 3.000   | S9         | S10        | 5.063         | 0.600          | 48.600       | 48.550       | 0.050       | 101.3          | 150         | 5.08             | 46.1            |
| 3.001   | S10        | S11        | 9.213         | 0.600          | 48.550       | 48.460       | 0.090       | 102.4          | 150         | 5.24             | 45.5            |
| 4.000   | S11A       | S11        | 13.887        | 0.600          | 48.990       | 48.540       | 0.450       | 30.9           | 150         | 5.13             | 45.9            |
| 3.002   | S11        | S12        | 5.570         | 0.600          | 48.460       | 48.360       | 0.100       | 55.7           | 225         | 5.29             | 45.3            |
| 3.003   | S12        | TANK       | 6.727         | 0.600          | 48.360       | 48.320       | 0.040       | 168.2          | 225         | 5.40             | 44.9            |
| 1.006   | TANK       | FCC        | 6.790         | 0.600          | 48.320       | 48.250       | 0.070       | 97.0           | 225         | 5.90             | 43.2            |
| 1.007   | FCC        | C1         | 2.419         | 0.600          | 48.250       | 48.224       | 0.026       | 93.0           | 225         | 5.94             | 43.1            |
| 1.008_1 | C1         | C2         | 17.161        | 0.600          | 48.074       | 47.988       | 0.086       | 200.0          | 225         | 6.25             | 42.1            |
| 1.008   | C2         | 17_OUT     | 26.611        | 0.600          | 47.988       | 46.246       | 1.742       | 15.3           | 225         | 6.36             | 41.8            |

| Name    | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) |
|---------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|
| 1.000   | 0.772        | 13.6         | 2.4           | 1.100              | 1.160              | 0.019          | 0.0                      |
| 1.001   | 2.416        | 42.7         | 5.2           | 1.160              | 1.550              | 0.042          | 0.0                      |
| 1.002   | 0.852        | 15.1         | 7.3           | 1.550              | 1.710              | 0.060          | 0.0                      |
| 1.003   | 1.010        | 17.8         | 7.3           | 1.710              | 1.800              | 0.060          | 0.0                      |
| 1.004   | 1.000        | 17.7         | 7.4           | 1.800              | 1.740              | 0.062          | 0.0                      |
| 2.000   | 1.006        | 17.8         | 0.5           | 0.929              | 1.215              | 0.004          | 0.0                      |
| 2.001   | 1.004        | 17.7         | 3.9           | 1.215              | 1.400              | 0.032          | 0.0                      |
| 2.002   | 1.634        | 28.9         | 3.8           | 1.400              | 1.450              | 0.032          | 0.0                      |
| 2.003   | 1.462        | 25.8         | 4.3           | 1.450              | 1.665              | 0.036          | 0.0                      |
| 1.005   | 1.002        | 39.8         | 13.2          | 1.665              | 1.695              | 0.112          | 0.0                      |
| 3.000   | 0.998        | 17.6         | 5.0           | 1.920              | 1.880              | 0.040          | 0.0                      |
| 3.001   | 0.993        | 17.5         | 4.9           | 1.880              | 1.640              | 0.040          | 0.0                      |
| 4.000   | 1.818        | 32.1         | 4.0           | 1.240              | 1.560              | 0.032          | 0.0                      |
| 3.002   | 1.756        | 69.8         | 12.4          | 1.565              | 1.695              | 0.101          | 0.0                      |
| 3.003   | 1.005        | 40.0         | 14.0          | 1.695              | 1.695              | 0.115          | 0.0                      |
| 1.006   | 1.327        | 52.8         | 26.6          | 1.695              | 1.775              | 0.227          | 0.0                      |
| 1.007   | 1.356        | 53.9         | 26.5          | 1.775              | 1.811              | 0.227          | 0.0                      |
| 1.008_1 | 0.921        | 36.6         | 25.9          | 1.961              | 2.087              | 0.227          | 0.0                      |
| 1.008   | 3.364        | 133.8        | 25.7          | 2.087              | 3.679              | 0.227          | 0.0                      |

Pipeline Schedule

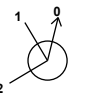
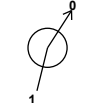
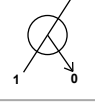
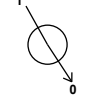
| Link    | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | Link<br>Type | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|---------|---------------|----------------|-------------|--------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 1.000   | 10.088        | 168.1          | 150         | 1 STANDARD   | 50.350       | 49.100       | 1.100           | 50.350       | 49.040       | 1.160           |
| 1.001   | 6.843         | 17.5           | 150         | 1 STANDARD   | 50.350       | 49.040       | 1.160           | 50.350       | 48.650       | 1.550           |
| 1.002   | 20.772        | 138.5          | 150         | 1 STANDARD   | 50.350       | 48.650       | 1.550           | 50.360       | 48.500       | 1.710           |
| 1.003   | 4.947         | 98.9           | 150         | 1 STANDARD   | 50.360       | 48.500       | 1.710           | 50.400       | 48.450       | 1.800           |
| 1.004   | 9.076         | 100.8          | 150         | 1 STANDARD   | 50.400       | 48.450       | 1.800           | 50.250       | 48.360       | 1.740           |
| 2.000   | 12.576        | 99.8           | 150         | 1 STANDARD   | 50.100       | 49.021       | 0.929           | 50.260       | 48.895       | 1.215           |
| 2.001   | 20.519        | 100.1          | 150         | 1 STANDARD   | 50.260       | 48.895       | 1.215           | 50.240       | 48.690       | 1.400           |
| 2.002   | 1.908         | 38.2           | 150         | 1 STANDARD   | 50.240       | 48.690       | 1.400           | 50.240       | 48.640       | 1.450           |
| 2.003   | 9.757         | 47.6           | 150         | 1 STANDARD   | 50.240       | 48.640       | 1.450           | 50.250       | 48.435       | 1.665           |
| 1.005   | 6.770         | 169.3          | 225         | 1 STANDARD   | 50.250       | 48.360       | 1.665           | 50.240       | 48.320       | 1.695           |
| 3.000   | 5.063         | 101.3          | 150         | 1 STANDARD   | 50.670       | 48.600       | 1.920           | 50.580       | 48.550       | 1.880           |
| 3.001   | 9.213         | 102.4          | 150         | 1 STANDARD   | 50.580       | 48.550       | 1.880           | 50.250       | 48.460       | 1.640           |
| 4.000   | 13.887        | 30.9           | 150         | 1 STANDARD   | 50.380       | 48.990       | 1.240           | 50.250       | 48.540       | 1.560           |
| 3.002   | 5.570         | 55.7           | 225         | 1 STANDARD   | 50.250       | 48.460       | 1.565           | 50.280       | 48.360       | 1.695           |
| 3.003   | 6.727         | 168.2          | 225         | 1 STANDARD   | 50.280       | 48.360       | 1.695           | 50.240       | 48.320       | 1.695           |
| 1.006   | 6.790         | 97.0           | 225         | 1 STANDARD   | 50.240       | 48.320       | 1.695           | 50.250       | 48.250       | 1.775           |
| 1.007   | 2.419         | 93.0           | 225         | 1 STANDARD   | 50.250       | 48.250       | 1.775           | 50.260       | 48.224       | 1.811           |
| 1.008_1 | 17.161        | 200.0          | 225         | 1 STANDARD   | 50.260       | 48.074       | 1.961           | 50.300       | 47.988       | 2.087           |
| 1.008   | 26.611        | 15.3           | 225         | 1 STANDARD   | 50.300       | 47.988       | 2.087           | 50.150       | 46.246       | 3.679           |

| Link    | US<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type | DS<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type |
|---------|------------|-------------|--------------|------------|------------|-------------|--------------|------------|
| 1.000   | S1         | 600         | Manhole      | 1 STANDARD | S3         | 600         | Manhole      | 1 STANDARD |
| 1.001   | S3         | 600         | Manhole      | 1 STANDARD | S4         | 600         | Manhole      | 1 STANDARD |
| 1.002   | S4         | 600         | Manhole      | 1 STANDARD | S5         | 600         | Manhole      | 1 STANDARD |
| 1.003   | S5         | 600         | Manhole      | 1 STANDARD | S6         | 600         | Manhole      | 1 STANDARD |
| 1.004   | S6         | 600         | Manhole      | 1 STANDARD | S8         | 1200        | Manhole      | 1 STANDARD |
| 2.000   | S13        | 600         | Manhole      | 1 STANDARD | S14        | 600         | Manhole      | 1 STANDARD |
| 2.001   | S14        | 600         | Manhole      | 1 STANDARD | S15        | 600         | Manhole      | 1 STANDARD |
| 2.002   | S15        | 600         | Manhole      | 1 STANDARD | S7         | 600         | Manhole      | 1 STANDARD |
| 2.003   | S7         | 600         | Manhole      | 1 STANDARD | S8         | 1200        | Manhole      | 1 STANDARD |
| 1.005   | S8         | 1200        | Manhole      | 1 STANDARD | TANK       | 1200        | Manhole      | 1 STANDARD |
| 3.000   | S9         | 600         | Manhole      | 1 STANDARD | S10        | 600         | Manhole      | 1 STANDARD |
| 3.001   | S10        | 600         | Manhole      | 1 STANDARD | S11        | 1200        | Manhole      | 1 STANDARD |
| 4.000   | S11A       | 600         | Manhole      | 1 STANDARD | S11        | 1200        | Manhole      | 1 STANDARD |
| 3.002   | S11        | 1200        | Manhole      | 1 STANDARD | S12        | 1200        | Manhole      | 1 STANDARD |
| 3.003   | S12        | 1200        | Manhole      | 1 STANDARD | TANK       | 1200        | Manhole      | 1 STANDARD |
| 1.006   | TANK       | 1200        | Manhole      | 1 STANDARD | FCC        | 1200        | Manhole      | 1 STANDARD |
| 1.007   | FCC        | 1200        | Manhole      | 1 STANDARD | C1         | 1200        | Manhole      | 1 STANDARD |
| 1.008_1 | C1         | 1200        | Manhole      | 1 STANDARD | C2         | 1200        | Manhole      | 1 STANDARD |
| 1.008   | C2         | 1200        | Manhole      | 1 STANDARD | 17_OUT     |             | Manhole      | 1 STANDARD |

Manhole Schedule

| Node | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Connections                                                                           | Link  | IL<br>(m) | Dia<br>(mm) |
|------|----------------|-----------------|-----------|--------------|-------------|---------------------------------------------------------------------------------------|-------|-----------|-------------|
| S1   | 385258.174     | 398805.240      | 50.350    | 1.250        | 600         |  |       |           |             |
|      |                |                 |           |              |             | 0                                                                                     | 1.000 | 49.100    | 150         |
| S3   | 385253.081     | 398813.948      | 50.350    | 1.310        | 600         |  | 1     | 1.000     | 49.040      |
|      |                |                 |           |              |             | 0                                                                                     | 1.001 | 49.040    | 150         |
| S4   | 385249.552     | 398819.811      | 50.350    | 1.700        | 600         |  | 1     | 1.001     | 48.650      |
|      |                |                 |           |              |             | 0                                                                                     | 1.002 | 48.650    | 150         |
| S5   | 385231.691     | 398809.208      | 50.360    | 1.860        | 600         |  | 1     | 1.002     | 48.500      |
|      |                |                 |           |              |             | 0                                                                                     | 1.003 | 48.500    | 150         |
| S6   | 385229.199     | 398813.481      | 50.400    | 1.950        | 600         |  | 1     | 1.003     | 48.450      |
|      |                |                 |           |              |             | 0                                                                                     | 1.004 | 48.450    | 150         |
| S13  | 385223.650     | 398775.208      | 50.100    | 1.079        | 600         |  |       |           |             |
|      |                |                 |           |              |             | 0                                                                                     | 2.000 | 49.021    | 150         |
| S14  | 385234.500     | 398781.566      | 50.260    | 1.365        | 600         |  | 1     | 2.000     | 48.895      |
|      |                |                 |           |              |             | 0                                                                                     | 2.001 | 48.895    | 150         |
| S15  | 385224.505     | 398799.486      | 50.240    | 1.550        | 600         |  | 1     | 2.001     | 48.690      |
|      |                |                 |           |              |             | 0                                                                                     | 2.002 | 48.690    | 150         |
| S7   | 385226.118     | 398800.506      | 50.240    | 1.600        | 600         |  | 1     | 2.002     | 48.640      |
|      |                |                 |           |              |             | 0                                                                                     | 2.003 | 48.640    | 150         |

Manhole Schedule

| Node   | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections                                                                           | Link | IL (m)  | Dia (mm) |     |
|--------|-------------|--------------|--------|-----------|----------|---------------------------------------------------------------------------------------|------|---------|----------|-----|
| S8     | 385221.309  | 398808.996   | 50.250 | 1.890     | 1200     |    | 1    | 2.003   | 48.435   | 150 |
|        |             |              |        |           |          |                                                                                       | 2    | 1.004   | 48.360   | 150 |
|        |             |              |        |           |          |                                                                                       | 0    | 1.005   | 48.360   | 225 |
| S9     | 385200.384  | 398784.961   | 50.670 | 2.070     | 600      |    | 0    | 3.000   | 48.600   | 150 |
| S10    | 385204.748  | 398787.528   | 50.580 | 2.030     | 600      |    | 1    | 3.000   | 48.550   | 150 |
|        |             |              |        |           |          |                                                                                       | 0    | 3.001   | 48.550   | 150 |
| S11A   | 385205.559  | 398804.174   | 50.380 | 1.390     | 600      |    | 0    | 4.000   | 48.990   | 150 |
| S11    | 385212.664  | 398792.242   | 50.250 | 1.790     | 1200     |    | 1    | 4.000   | 48.540   | 150 |
|        |             |              |        |           |          |                                                                                       | 2    | 3.001   | 48.460   | 150 |
|        |             |              |        |           |          |                                                                                       | 0    | 3.002   | 48.460   | 225 |
| S12    | 385213.998  | 398797.650   | 50.280 | 1.920     | 1200     |   | 1    | 3.002   | 48.360   | 225 |
|        |             |              |        |           |          |                                                                                       | 0    | 3.003   | 48.360   | 225 |
| TANK   | 385217.642  | 398803.305   | 50.240 | 1.920     | 1200     |  | 1    | 3.003   | 48.320   | 225 |
|        |             |              |        |           |          |                                                                                       | 2    | 1.005   | 48.320   | 225 |
| FCC    | 385221.518  | 398797.730   | 50.250 | 2.000     | 1200     |  | 0    | 1.006   | 48.320   | 225 |
|        |             |              |        |           |          |                                                                                       | 1    | 1.006   | 48.250   | 225 |
| C1     | 385223.934  | 398797.859   | 50.260 | 2.186     | 1200     |  | 0    | 1.007   | 48.250   | 225 |
|        |             |              |        |           |          |                                                                                       | 1    | 1.007   | 48.224   | 225 |
| C2     | 385232.294  | 398782.872   | 50.300 | 2.312     | 1200     |  | 0    | 1.008_1 | 48.074   | 225 |
|        |             |              |        |           |          |                                                                                       | 1    | 1.008_1 | 47.988   | 225 |
| 17_OUT | 385237.478  | 398774.953   | 50.150 | 3.904     |          |  | 0    | 1.008   | 47.988   | 225 |
|        |             |              |        |           |          |  | 1    | 1.008   | 46.246   | 225 |

Simulation Settings

|                      |                   |                   |        |                            |      |
|----------------------|-------------------|-------------------|--------|----------------------------|------|
| Rainfall Methodology | FSR               | Summer CV         | 0.750  | Drain Down Time (mins)     | 240  |
| FSR Region           | England and Wales | Winter CV         | 0.840  | Additional Storage (m³/ha) | 20.0 |
| M5-60 (mm)           | 18.000            | Analysis Speed    | Normal | Check Discharge Rate(s)    | x    |
| Ratio-R              | 0.354             | Skip Steady State | x      | Check Discharge Volume     | x    |

Storm Durations

|    |    |    |     |     |     |     |     |     |     |     |      |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) | Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 0                     | 0                     | 0                     | 100                   | 40                    | 0                     | 0                     |
| 30                    | 0                     | 0                     | 0                     |                       |                       |                       |                       |

Node FCC Online Hydro-Brake® Control

|                          |        |                         |                                |
|--------------------------|--------|-------------------------|--------------------------------|
| Flap Valve               | x      | Objective               | (HE) Minimise upstream storage |
| Replaces Downstream Link | x      | Sump Available          | ✓                              |
| Invert Level (m)         | 48.250 | Product Number          | CTL-SHE-0097-5000-1600-5000    |
| Design Depth (m)         | 1.600  | Min Outlet Diameter (m) | 0.150                          |
| Design Flow (l/s)        | 5.0    | Min Node Diameter (mm)  | 1200                           |

Node TANK Depth/Area Storage Structure

|                             |         |               |      |                           |        |
|-----------------------------|---------|---------------|------|---------------------------|--------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 48.320 |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.95 | Time to half empty (mins) | 252    |

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|-----------|-----------|---------------|-----------|-----------|---------------|-----------|-----------|---------------|
| 0.000     | 100.0     | 0.0           | 0.800     | 100.0     | 0.0           | 0.801     | 0.0       | 0.0           |

| Node Event       | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|--------|
| 15 minute winter | S1      | 10          | 49.143    | 0.043     | 2.3          | 0.0252        | 0.0000     | OK     |
| 15 minute winter | S3      | 10          | 49.075    | 0.035     | 5.1          | 0.0221        | 0.0000     | OK     |
| 15 minute winter | S4      | 10          | 48.725    | 0.075     | 7.2          | 0.0372        | 0.0000     | OK     |
| 15 minute winter | S5      | 11          | 48.574    | 0.074     | 7.1          | 0.0209        | 0.0000     | OK     |
| 15 minute winter | S6      | 11          | 48.522    | 0.072     | 7.4          | 0.0219        | 0.0000     | OK     |
| 15 minute winter | S13     | 11          | 49.038    | 0.017     | 0.5          | 0.0062        | 0.0000     | OK     |
| 15 minute winter | S14     | 10          | 48.944    | 0.049     | 3.9          | 0.0340        | 0.0000     | OK     |
| 15 minute winter | S15     | 11          | 48.733    | 0.043     | 3.8          | 0.0121        | 0.0000     | OK     |
| 15 minute winter | S7      | 11          | 48.683    | 0.043     | 4.3          | 0.0144        | 0.0000     | OK     |
| 60 minute winter | S8      | 48          | 48.453    | 0.093     | 7.3          | 0.1188        | 0.0000     | OK     |
| 15 minute winter | S9      | 10          | 48.659    | 0.059     | 4.9          | 0.0392        | 0.0000     | OK     |
| 15 minute winter | S10     | 10          | 48.606    | 0.056     | 4.9          | 0.0159        | 0.0000     | OK     |
| 15 minute winter | S11A    | 10          | 49.026    | 0.036     | 3.9          | 0.0268        | 0.0000     | OK     |
| 15 minute winter | S11     | 10          | 48.531    | 0.071     | 12.1         | 0.1038        | 0.0000     | OK     |
| 15 minute winter | S12     | 6           | 48.485    | 0.125     | 13.7         | 0.1598        | 0.0000     | OK     |
| 60 minute winter | TANK    | 49          | 48.453    | 0.133     | 16.0         | 12.7709       | 0.0000     | OK     |
| 60 minute winter | FCC     | 43          | 48.467    | 0.217     | 8.8          | 0.2460        | 0.0000     | OK     |
| 60 minute winter | C1      | 49          | 48.128    | 0.054     | 4.1          | 0.0607        | 0.0000     | OK     |
| 60 minute winter | C2      | 48          | 48.015    | 0.027     | 4.0          | 0.0306        | 0.0000     | OK     |
| 60 minute winter | 17 OUT  | 48          | 46.273    | 0.027     | 4.0          | 0.0000        | 0.0000     | OK     |

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**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | S1      | 10          | 49.169    | 0.069     | 5.6          | 0.0407        | 0.0000     | OK         |
| 15 minute winter  | S3      | 10          | 49.095    | 0.055     | 12.3         | 0.0349        | 0.0000     | OK         |
| 15 minute winter  | S4      | 11          | 48.889    | 0.239     | 17.6         | 0.1184        | 0.0000     | SURCHARGED |
| 120 minute winter | S5      | 96          | 48.712    | 0.212     | 6.0          | 0.0599        | 0.0000     | SURCHARGED |
| 120 minute winter | S6      | 98          | 48.711    | 0.261     | 6.2          | 0.0791        | 0.0000     | SURCHARGED |
| 15 minute winter  | S13     | 10          | 49.047    | 0.026     | 1.2          | 0.0093        | 0.0000     | OK         |
| 15 minute winter  | S14     | 10          | 48.976    | 0.081     | 9.5          | 0.0559        | 0.0000     | OK         |
| 15 minute winter  | S15     | 11          | 48.763    | 0.073     | 9.3          | 0.0207        | 0.0000     | OK         |
| 120 minute winter | S7      | 98          | 48.713    | 0.073     | 3.6          | 0.0243        | 0.0000     | OK         |
| 120 minute winter | S8      | 98          | 48.711    | 0.351     | 10.8         | 0.4489        | 0.0000     | SURCHARGED |
| 120 minute winter | S9      | 98          | 48.711    | 0.111     | 4.0          | 0.0741        | 0.0000     | OK         |
| 120 minute winter | S10     | 98          | 48.711    | 0.161     | 4.0          | 0.0455        | 0.0000     | SURCHARGED |
| 15 minute winter  | S11A    | 10          | 49.048    | 0.058     | 9.5          | 0.0432        | 0.0000     | OK         |
| 120 minute winter | S11     | 98          | 48.710    | 0.250     | 10.2         | 0.3644        | 0.0000     | SURCHARGED |
| 120 minute winter | S12     | 98          | 48.710    | 0.350     | 11.5         | 0.4473        | 0.0000     | SURCHARGED |
| 120 minute winter | TANK    | 98          | 48.710    | 0.390     | 20.9         | 37.5011       | 0.0000     | SURCHARGED |
| 120 minute winter | FCC     | 98          | 48.709    | 0.459     | 9.6          | 0.5193        | 0.0000     | SURCHARGED |
| 120 minute winter | C1      | 98          | 48.132    | 0.058     | 4.7          | 0.0654        | 0.0000     | OK         |
| 120 minute winter | C2      | 98          | 48.017    | 0.029     | 4.7          | 0.0330        | 0.0000     | OK         |
| 120 minute winter | 17_OUT  | 98          | 46.275    | 0.029     | 4.7          | 0.0000        | 0.0000     | OK         |

| Link Event (Outflow) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|----------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute winter     | S1      | 1.000   | S3      | 5.5           | 0.803          | 0.406    | 0.0697        |                    |
| 15 minute winter     | S3      | 1.001   | S4      | 12.3          | 0.984          | 0.288    | 0.0803        |                    |
| 15 minute winter     | S4      | 1.002   | S5      | 16.2          | 0.931          | 1.075    | 0.3657        |                    |
| 15 minute winter     | S5      | 1.003   | S6      | 15.6          | 0.931          | 0.872    | 0.0871        |                    |
| 15 minute winter     | S6      | 1.004   | S8      | 16.0          | 0.907          | 0.904    | 0.1598        |                    |
| 15 minute winter     | S13     | 2.000   | S14     | 1.2           | 0.208          | 0.066    | 0.0735        |                    |
| 15 minute winter     | S14     | 2.001   | S15     | 9.3           | 1.023          | 0.523    | 0.1861        |                    |
| 15 minute winter     | S15     | 2.002   | S7      | 9.2           | 1.123          | 0.320    | 0.0158        |                    |
| 15 minute winter     | S7      | 2.003   | S8      | 10.4          | 1.265          | 0.404    | 0.1010        |                    |
| 15 minute winter     | S8      | 1.005   | TANK    | 29.6          | 1.462          | 0.742    | 0.2684        |                    |
| 15 minute winter     | S9      | 3.000   | S10     | 11.8          | 0.925          | 0.668    | 0.0645        |                    |
| 15 minute winter     | S10     | 3.001   | S11     | 11.6          | 0.804          | 0.663    | 0.1320        |                    |
| 15 minute winter     | S11A    | 4.000   | S11     | 9.4           | 1.536          | 0.292    | 0.0849        |                    |
| 15 minute winter     | S11     | 3.002   | S12     | 29.3          | 1.094          | 0.420    | 0.1702        |                    |
| 15 minute winter     | S12     | 3.003   | TANK    | 32.9          | 1.585          | 0.823    | 0.2671        |                    |
| 15 minute winter     | TANK    | 1.006   | FCC     | 12.3          | 0.564          | 0.232    | 0.2700        |                    |
| 120 minute winter    | FCC     | 1.007   | C1      | 4.7           | 0.773          | 0.087    | 0.0147        |                    |
| 120 minute winter    | C1      | 1.008_1 | C2      | 4.7           | 0.877          | 0.129    | 0.0949        |                    |
| 120 minute winter    | C2      | 1.008   | 17_OUT  | 4.7           | 1.579          | 0.035    | 0.0794        | 64.7               |

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | S1      | 12          | 49.644    | 0.544     | 10.2         | 0.3195        | 0.0000     | SURCHARGED |
| 15 minute winter  | S3      | 12          | 49.619    | 0.579     | 19.3         | 0.3670        | 0.0000     | SURCHARGED |
| 15 minute winter  | S4      | 12          | 49.527    | 0.877     | 26.2         | 0.4344        | 0.0000     | SURCHARGED |
| 180 minute winter | S5      | 172         | 49.520    | 1.020     | 8.0          | 0.2886        | 0.0000     | SURCHARGED |
| 180 minute winter | S6      | 172         | 49.519    | 1.069     | 8.1          | 0.3240        | 0.0000     | SURCHARGED |
| 180 minute winter | S13     | 172         | 49.519    | 0.498     | 0.5          | 0.1779        | 0.0000     | SURCHARGED |
| 180 minute winter | S14     | 172         | 49.519    | 0.624     | 4.3          | 0.4327        | 0.0000     | SURCHARGED |
| 180 minute winter | S15     | 172         | 49.519    | 0.829     | 4.3          | 0.2346        | 0.0000     | SURCHARGED |
| 180 minute winter | S7      | 172         | 49.519    | 0.879     | 4.5          | 0.2927        | 0.0000     | SURCHARGED |
| 180 minute winter | S8      | 172         | 49.519    | 1.159     | 13.7         | 1.4822        | 0.0000     | SURCHARGED |
| 180 minute winter | S9      | 172         | 49.520    | 0.920     | 5.5          | 0.6151        | 0.0000     | SURCHARGED |
| 180 minute winter | S10     | 172         | 49.519    | 0.969     | 5.3          | 0.2743        | 0.0000     | SURCHARGED |
| 180 minute winter | S11A    | 172         | 49.519    | 0.529     | 4.4          | 0.3932        | 0.0000     | SURCHARGED |
| 180 minute winter | S11     | 172         | 49.519    | 1.059     | 13.4         | 1.5409        | 0.0000     | SURCHARGED |
| 180 minute winter | S12     | 172         | 49.519    | 1.159     | 14.9         | 1.4799        | 0.0000     | SURCHARGED |
| 180 minute winter | TANK    | 172         | 49.519    | 1.199     | 28.0         | 77.4032       | 0.0000     | SURCHARGED |
| 180 minute winter | FCC     | 172         | 49.518    | 1.268     | 9.3          | 1.4339        | 0.0000     | SURCHARGED |
| 30 minute summer  | C1      | 21          | 48.132    | 0.058     | 4.7          | 0.0654        | 0.0000     | OK         |
| 15 minute summer  | C2      | 17          | 48.017    | 0.029     | 4.7          | 0.0330        | 0.0000     | OK         |
| 15 minute summer  | 17_OUT  | 17          | 46.275    | 0.029     | 4.7          | 0.0000        | 0.0000     | OK         |

| Link Event (Outflow) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|----------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer     | S1      | 1.000   | S3      | 9.0           | 0.830          | 0.656    | 0.1776        |                    |
| 15 minute winter     | S3      | 1.001   | S4      | 17.1          | 1.037          | 0.400    | 0.1205        |                    |
| 15 minute winter     | S4      | 1.002   | S5      | 24.2          | 1.374          | 1.607    | 0.3657        |                    |
| 15 minute winter     | S5      | 1.003   | S6      | 23.3          | 1.326          | 1.308    | 0.0871        |                    |
| 15 minute winter     | S6      | 1.004   | S8      | 23.3          | 1.325          | 1.319    | 0.1598        |                    |
| 15 minute winter     | S13     | 2.000   | S14     | 2.1           | 0.227          | 0.117    | 0.1173        |                    |
| 15 minute winter     | S14     | 2.001   | S15     | 16.7          | 1.127          | 0.940    | 0.3110        |                    |
| 15 minute winter     | S15     | 2.002   | S7      | 16.5          | 1.227          | 0.570    | 0.0335        |                    |
| 15 minute winter     | S7      | 2.003   | S8      | 18.2          | 1.304          | 0.706    | 0.1718        |                    |
| 15 minute winter     | S8      | 1.005   | TANK    | 45.4          | 1.539          | 1.141    | 0.2693        |                    |
| 15 minute winter     | S9      | 3.000   | S10     | 19.6          | 1.114          | 1.112    | 0.0891        |                    |
| 15 minute winter     | S10     | 3.001   | S11     | 18.9          | 1.073          | 1.077    | 0.1622        |                    |
| 15 minute winter     | S11A    | 4.000   | S11     | 17.1          | 1.531          | 0.531    | 0.1864        |                    |
| 15 minute winter     | S11     | 3.002   | S12     | 48.3          | 1.215          | 0.692    | 0.2215        |                    |
| 15 minute winter     | S12     | 3.003   | TANK    | 54.4          | 1.686          | 1.361    | 0.2675        |                    |
| 15 minute winter     | TANK    | 1.006   | FCC     | 12.4          | 0.583          | 0.234    | 0.2700        |                    |
| 30 minute summer     | FCC     | 1.007   | C1      | 4.7           | 0.773          | 0.087    | 0.0147        |                    |
| 15 minute summer     | C1      | 1.008_1 | C2      | 4.7           | 0.877          | 0.129    | 0.0949        |                    |
| 15 minute summer     | C2      | 1.008   | 17_OUT  | 4.7           | 1.579          | 0.035    | 0.0794        | 49.2               |

Design Settings

|                       |                   |                                      |               |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology  | FSR               | Maximum Time of Concentration (mins) | 30.00         |
| Return Period (years) | 1                 | Maximum Rainfall (mm/hr)             | 50.0          |
| Additional Flow (%)   | 0                 | Minimum Velocity (m/s)               | 1.00          |
| FSR Region            | England and Wales | Connection Type                      | Level Soffits |
| M5-60 (mm)            | 18.000            | Minimum Backdrop Height (m)          | 0.600         |
| Ratio-R               | 0.354             | Preferred Cover Depth (m)            | 1.200         |
| CV                    | 0.750             | Include Intermediate Ground          | ✓             |
| Time of Entry (mins)  | 5.00              | Enforce best practice design rules   | x             |

Nodes

| Name   | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|--------|-----------|---------------|-----------------|---------------|-------------|--------------|-----------|
| S1     | 0.019     | 5.00          | 50.350          | 600           | 385258.174  | 398805.240   | 1.250     |
| S3     | 0.023     | 5.00          | 50.350          | 600           | 385253.081  | 398813.948   | 1.310     |
| S4     | 0.018     | 5.00          | 50.350          | 600           | 385249.552  | 398819.811   | 1.700     |
| S5     |           |               | 50.360          | 600           | 385231.691  | 398809.208   | 1.860     |
| S6     | 0.002     | 5.00          | 50.400          | 600           | 385229.199  | 398813.481   | 1.950     |
| S13    | 0.004     | 5.00          | 50.100          | 600           | 385223.650  | 398775.208   | 1.079     |
| S14    | 0.028     | 5.00          | 50.260          | 600           | 385234.500  | 398781.566   | 1.365     |
| S15    |           |               | 50.240          | 600           | 385224.505  | 398799.486   | 1.550     |
| S7     | 0.004     | 5.00          | 50.240          | 600           | 385226.118  | 398800.506   | 1.600     |
| S8     | 0.014     | 5.00          | 50.250          | 1200          | 385221.309  | 398808.996   | 1.890     |
| S9     | 0.040     | 5.00          | 50.670          | 600           | 385200.384  | 398784.961   | 2.070     |
| S10    |           |               | 50.580          | 600           | 385204.748  | 398787.528   | 2.030     |
| S11A   | 0.032     | 5.00          | 50.380          | 600           | 385205.559  | 398804.174   | 1.390     |
| S11    | 0.029     | 5.00          | 50.250          | 1200          | 385212.664  | 398792.242   | 1.790     |
| S12    | 0.014     | 5.00          | 50.280          | 1200          | 385213.998  | 398797.650   | 1.920     |
| TANK   |           |               | 50.240          | 1200          | 385217.642  | 398803.305   | 1.920     |
| FCC    |           |               | 50.250          | 1200          | 385221.518  | 398797.730   | 2.000     |
| C1     |           |               | 50.260          | 1200          | 385223.934  | 398797.859   | 2.186     |
| C2     |           |               | 50.300          | 1200          | 385232.294  | 398782.872   | 2.312     |
| 17_OUT |           |               | 50.150          |               | 385237.478  | 398774.953   | 3.904     |

Links

| Name    | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---------|---------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.000   | S1      | S3      | 10.088     | 0.600       | 49.100    | 49.040    | 0.060    | 168.1       | 150      | 5.17          | 45.8         |
| 1.001   | S3      | S4      | 6.843      | 0.600       | 49.040    | 48.650    | 0.390    | 17.5        | 150      | 5.22          | 45.6         |
| 1.002   | S4      | S5      | 20.772     | 0.600       | 48.650    | 48.500    | 0.150    | 138.5       | 150      | 5.41          | 44.9         |
| 1.003   | S5      | S6      | 4.947      | 0.600       | 48.500    | 48.450    | 0.050    | 98.9        | 150      | 5.49          | 44.6         |
| 1.004   | S6      | S8      | 9.076      | 0.600       | 48.450    | 48.360    | 0.090    | 100.8       | 150      | 5.64          | 44.1         |
| 2.000   | S13     | S14     | 12.576     | 0.600       | 49.021    | 48.895    | 0.126    | 99.8        | 150      | 5.21          | 45.6         |
| 2.001   | S14     | S15     | 20.519     | 0.600       | 48.895    | 48.690    | 0.205    | 100.1       | 150      | 5.55          | 44.4         |
| 2.002   | S15     | S7      | 1.908      | 0.600       | 48.690    | 48.640    | 0.050    | 38.2        | 150      | 5.57          | 44.3         |
| 2.003   | S7      | S8      | 9.757      | 0.600       | 48.640    | 48.435    | 0.205    | 47.6        | 150      | 5.68          | 43.9         |
| 1.005   | S8      | TANK    | 6.770      | 0.600       | 48.360    | 48.320    | 0.040    | 169.3       | 225      | 5.79          | 43.6         |
| 3.000   | S9      | S10     | 5.063      | 0.600       | 48.600    | 48.550    | 0.050    | 101.3       | 150      | 5.08          | 46.1         |
| 3.001   | S10     | S11     | 9.213      | 0.600       | 48.550    | 48.460    | 0.090    | 102.4       | 150      | 5.24          | 45.5         |
| 4.000   | S11A    | S11     | 13.887     | 0.600       | 48.990    | 48.540    | 0.450    | 30.9        | 150      | 5.13          | 45.9         |
| 3.002   | S11     | S12     | 5.570      | 0.600       | 48.460    | 48.360    | 0.100    | 55.7        | 225      | 5.29          | 45.3         |
| 3.003   | S12     | TANK    | 6.727      | 0.600       | 48.360    | 48.320    | 0.040    | 168.2       | 225      | 5.40          | 44.9         |
| 1.006   | TANK    | FCC     | 6.790      | 0.600       | 48.320    | 48.250    | 0.070    | 97.0        | 225      | 5.90          | 43.2         |
| 1.007   | FCC     | C1      | 2.419      | 0.600       | 48.250    | 48.224    | 0.026    | 93.0        | 225      | 5.94          | 43.1         |
| 1.008_1 | C1      | C2      | 17.161     | 0.600       | 48.074    | 47.988    | 0.086    | 200.0       | 225      | 6.25          | 42.1         |
| 1.008   | C2      | 17_OUT  | 26.611     | 0.600       | 47.988    | 46.246    | 1.742    | 15.3        | 225      | 6.36          | 41.8         |

| Name    | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) |
|---------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|
| 1.000   | 0.772     | 13.6      | 2.4        | 1.100        | 1.160        | 0.019       | 0.0                |
| 1.001   | 2.416     | 42.7      | 5.2        | 1.160        | 1.550        | 0.042       | 0.0                |
| 1.002   | 0.852     | 15.1      | 7.3        | 1.550        | 1.710        | 0.060       | 0.0                |
| 1.003   | 1.010     | 17.8      | 7.3        | 1.710        | 1.800        | 0.060       | 0.0                |
| 1.004   | 1.000     | 17.7      | 7.4        | 1.800        | 1.740        | 0.062       | 0.0                |
| 2.000   | 1.006     | 17.8      | 0.5        | 0.929        | 1.215        | 0.004       | 0.0                |
| 2.001   | 1.004     | 17.7      | 3.9        | 1.215        | 1.400        | 0.032       | 0.0                |
| 2.002   | 1.634     | 28.9      | 3.8        | 1.400        | 1.450        | 0.032       | 0.0                |
| 2.003   | 1.462     | 25.8      | 4.3        | 1.450        | 1.665        | 0.036       | 0.0                |
| 1.005   | 1.002     | 39.8      | 13.2       | 1.665        | 1.695        | 0.112       | 0.0                |
| 3.000   | 0.998     | 17.6      | 5.0        | 1.920        | 1.880        | 0.040       | 0.0                |
| 3.001   | 0.993     | 17.5      | 4.9        | 1.880        | 1.640        | 0.040       | 0.0                |
| 4.000   | 1.818     | 32.1      | 4.0        | 1.240        | 1.560        | 0.032       | 0.0                |
| 3.002   | 1.756     | 69.8      | 12.4       | 1.565        | 1.695        | 0.101       | 0.0                |
| 3.003   | 1.005     | 40.0      | 14.0       | 1.695        | 1.695        | 0.115       | 0.0                |
| 1.006   | 1.327     | 52.8      | 26.6       | 1.695        | 1.775        | 0.227       | 0.0                |
| 1.007   | 1.356     | 53.9      | 26.5       | 1.775        | 1.811        | 0.227       | 0.0                |
| 1.008_1 | 0.921     | 36.6      | 25.9       | 1.961        | 2.087        | 0.227       | 0.0                |
| 1.008   | 3.364     | 133.8     | 25.7       | 2.087        | 3.679        | 0.227       | 0.0                |

Pipeline Schedule

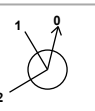
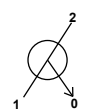
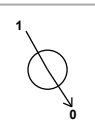
| Link    | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | Link<br>Type | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|---------|---------------|----------------|-------------|--------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 1.000   | 10.088        | 168.1          | 150         | 1 STANDARD   | 50.350       | 49.100       | 1.100           | 50.350       | 49.040       | 1.160           |
| 1.001   | 6.843         | 17.5           | 150         | 1 STANDARD   | 50.350       | 49.040       | 1.160           | 50.350       | 48.650       | 1.550           |
| 1.002   | 20.772        | 138.5          | 150         | 1 STANDARD   | 50.350       | 48.650       | 1.550           | 50.360       | 48.500       | 1.710           |
| 1.003   | 4.947         | 98.9           | 150         | 1 STANDARD   | 50.360       | 48.500       | 1.710           | 50.400       | 48.450       | 1.800           |
| 1.004   | 9.076         | 100.8          | 150         | 1 STANDARD   | 50.400       | 48.450       | 1.800           | 50.250       | 48.360       | 1.740           |
| 2.000   | 12.576        | 99.8           | 150         | 1 STANDARD   | 50.100       | 49.021       | 0.929           | 50.260       | 48.895       | 1.215           |
| 2.001   | 20.519        | 100.1          | 150         | 1 STANDARD   | 50.260       | 48.895       | 1.215           | 50.240       | 48.690       | 1.400           |
| 2.002   | 1.908         | 38.2           | 150         | 1 STANDARD   | 50.240       | 48.690       | 1.400           | 50.240       | 48.640       | 1.450           |
| 2.003   | 9.757         | 47.6           | 150         | 1 STANDARD   | 50.240       | 48.640       | 1.450           | 50.250       | 48.435       | 1.665           |
| 1.005   | 6.770         | 169.3          | 225         | 1 STANDARD   | 50.250       | 48.360       | 1.665           | 50.240       | 48.320       | 1.695           |
| 3.000   | 5.063         | 101.3          | 150         | 1 STANDARD   | 50.670       | 48.600       | 1.920           | 50.580       | 48.550       | 1.880           |
| 3.001   | 9.213         | 102.4          | 150         | 1 STANDARD   | 50.580       | 48.550       | 1.880           | 50.250       | 48.460       | 1.640           |
| 4.000   | 13.887        | 30.9           | 150         | 1 STANDARD   | 50.380       | 48.990       | 1.240           | 50.250       | 48.540       | 1.560           |
| 3.002   | 5.570         | 55.7           | 225         | 1 STANDARD   | 50.250       | 48.460       | 1.565           | 50.280       | 48.360       | 1.695           |
| 3.003   | 6.727         | 168.2          | 225         | 1 STANDARD   | 50.280       | 48.360       | 1.695           | 50.240       | 48.320       | 1.695           |
| 1.006   | 6.790         | 97.0           | 225         | 1 STANDARD   | 50.240       | 48.320       | 1.695           | 50.250       | 48.250       | 1.775           |
| 1.007   | 2.419         | 93.0           | 225         | 1 STANDARD   | 50.250       | 48.250       | 1.775           | 50.260       | 48.224       | 1.811           |
| 1.008_1 | 17.161        | 200.0          | 225         | 1 STANDARD   | 50.260       | 48.074       | 1.961           | 50.300       | 47.988       | 2.087           |
| 1.008   | 26.611        | 15.3           | 225         | 1 STANDARD   | 50.300       | 47.988       | 2.087           | 50.150       | 46.246       | 3.679           |

| Link    | US<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type | DS<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type |
|---------|------------|-------------|--------------|------------|------------|-------------|--------------|------------|
| 1.000   | S1         | 600         | Manhole      | 1 STANDARD | S3         | 600         | Manhole      | 1 STANDARD |
| 1.001   | S3         | 600         | Manhole      | 1 STANDARD | S4         | 600         | Manhole      | 1 STANDARD |
| 1.002   | S4         | 600         | Manhole      | 1 STANDARD | S5         | 600         | Manhole      | 1 STANDARD |
| 1.003   | S5         | 600         | Manhole      | 1 STANDARD | S6         | 600         | Manhole      | 1 STANDARD |
| 1.004   | S6         | 600         | Manhole      | 1 STANDARD | S8         | 1200        | Manhole      | 1 STANDARD |
| 2.000   | S13        | 600         | Manhole      | 1 STANDARD | S14        | 600         | Manhole      | 1 STANDARD |
| 2.001   | S14        | 600         | Manhole      | 1 STANDARD | S15        | 600         | Manhole      | 1 STANDARD |
| 2.002   | S15        | 600         | Manhole      | 1 STANDARD | S7         | 600         | Manhole      | 1 STANDARD |
| 2.003   | S7         | 600         | Manhole      | 1 STANDARD | S8         | 1200        | Manhole      | 1 STANDARD |
| 1.005   | S8         | 1200        | Manhole      | 1 STANDARD | TANK       | 1200        | Manhole      | 1 STANDARD |
| 3.000   | S9         | 600         | Manhole      | 1 STANDARD | S10        | 600         | Manhole      | 1 STANDARD |
| 3.001   | S10        | 600         | Manhole      | 1 STANDARD | S11        | 1200        | Manhole      | 1 STANDARD |
| 4.000   | S11A       | 600         | Manhole      | 1 STANDARD | S11        | 1200        | Manhole      | 1 STANDARD |
| 3.002   | S11        | 1200        | Manhole      | 1 STANDARD | S12        | 1200        | Manhole      | 1 STANDARD |
| 3.003   | S12        | 1200        | Manhole      | 1 STANDARD | TANK       | 1200        | Manhole      | 1 STANDARD |
| 1.006   | TANK       | 1200        | Manhole      | 1 STANDARD | FCC        | 1200        | Manhole      | 1 STANDARD |
| 1.007   | FCC        | 1200        | Manhole      | 1 STANDARD | C1         | 1200        | Manhole      | 1 STANDARD |
| 1.008_1 | C1         | 1200        | Manhole      | 1 STANDARD | C2         | 1200        | Manhole      | 1 STANDARD |
| 1.008   | C2         | 1200        | Manhole      | 1 STANDARD | 17_OUT     |             | Manhole      | 1 STANDARD |

Manhole Schedule

| Node | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Connections                                                                           | Link  | IL<br>(m) | Dia<br>(mm) |
|------|----------------|-----------------|-----------|--------------|-------------|---------------------------------------------------------------------------------------|-------|-----------|-------------|
| S1   | 385258.174     | 398805.240      | 50.350    | 1.250        | 600         |  |       |           |             |
|      |                |                 |           |              |             | 0                                                                                     | 1.000 | 49.100    | 150         |
| S3   | 385253.081     | 398813.948      | 50.350    | 1.310        | 600         |  | 1     | 1.000     | 49.040      |
|      |                |                 |           |              |             | 0                                                                                     | 1.001 | 49.040    | 150         |
| S4   | 385249.552     | 398819.811      | 50.350    | 1.700        | 600         |  | 1     | 1.001     | 48.650      |
|      |                |                 |           |              |             | 0                                                                                     | 1.002 | 48.650    | 150         |
| S5   | 385231.691     | 398809.208      | 50.360    | 1.860        | 600         |  | 1     | 1.002     | 48.500      |
|      |                |                 |           |              |             | 0                                                                                     | 1.003 | 48.500    | 150         |
| S6   | 385229.199     | 398813.481      | 50.400    | 1.950        | 600         |  | 1     | 1.003     | 48.450      |
|      |                |                 |           |              |             | 0                                                                                     | 1.004 | 48.450    | 150         |
| S13  | 385223.650     | 398775.208      | 50.100    | 1.079        | 600         |  |       |           |             |
|      |                |                 |           |              |             | 0                                                                                     | 2.000 | 49.021    | 150         |
| S14  | 385234.500     | 398781.566      | 50.260    | 1.365        | 600         |  | 1     | 2.000     | 48.895      |
|      |                |                 |           |              |             | 0                                                                                     | 2.001 | 48.895    | 150         |
| S15  | 385224.505     | 398799.486      | 50.240    | 1.550        | 600         |  | 1     | 2.001     | 48.690      |
|      |                |                 |           |              |             | 0                                                                                     | 2.002 | 48.690    | 150         |
| S7   | 385226.118     | 398800.506      | 50.240    | 1.600        | 600         |  | 1     | 2.002     | 48.640      |
|      |                |                 |           |              |             | 0                                                                                     | 2.003 | 48.640    | 150         |

Manhole Schedule

| Node   | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Connections                                                                           | Link | IL<br>(m) | Dia<br>(mm) |     |
|--------|----------------|-----------------|-----------|--------------|-------------|---------------------------------------------------------------------------------------|------|-----------|-------------|-----|
| S8     | 385221.309     | 398808.996      | 50.250    | 1.890        | 1200        |    | 1    | 2.003     | 48.435      | 150 |
|        |                |                 |           |              |             |                                                                                       | 2    | 1.004     | 48.360      | 150 |
|        |                |                 |           |              |             |                                                                                       | 0    | 1.005     | 48.360      | 225 |
| S9     | 385200.384     | 398784.961      | 50.670    | 2.070        | 600         |    | 0    | 3.000     | 48.600      | 150 |
| S10    | 385204.748     | 398787.528      | 50.580    | 2.030        | 600         |    | 1    | 3.000     | 48.550      | 150 |
|        |                |                 |           |              |             |                                                                                       | 0    | 3.001     | 48.550      | 150 |
| S11A   | 385205.559     | 398804.174      | 50.380    | 1.390        | 600         |    | 0    | 4.000     | 48.990      | 150 |
| S11    | 385212.664     | 398792.242      | 50.250    | 1.790        | 1200        |    | 1    | 4.000     | 48.540      | 150 |
|        |                |                 |           |              |             |                                                                                       | 2    | 3.001     | 48.460      | 150 |
|        |                |                 |           |              |             |                                                                                       | 0    | 3.002     | 48.460      | 225 |
| S12    | 385213.998     | 398797.650      | 50.280    | 1.920        | 1200        |   | 1    | 3.002     | 48.360      | 225 |
|        |                |                 |           |              |             |                                                                                       | 0    | 3.003     | 48.360      | 225 |
| TANK   | 385217.642     | 398803.305      | 50.240    | 1.920        | 1200        |  | 1    | 3.003     | 48.320      | 225 |
|        |                |                 |           |              |             |                                                                                       | 2    | 1.005     | 48.320      | 225 |
|        |                |                 |           |              |             |                                                                                       | 0    | 1.006     | 48.320      | 225 |
| FCC    | 385221.518     | 398797.730      | 50.250    | 2.000        | 1200        |  | 1    | 1.006     | 48.250      | 225 |
|        |                |                 |           |              |             |                                                                                       | 0    | 1.007     | 48.250      | 225 |
| C1     | 385223.934     | 398797.859      | 50.260    | 2.186        | 1200        |  | 1    | 1.007     | 48.224      | 225 |
| C2     | 385232.294     | 398782.872      | 50.300    | 2.312        | 1200        |  | 0    | 1.008_1   | 48.074      | 225 |
|        |                |                 |           |              |             |                                                                                       | 1    | 1.008_1   | 47.988      | 225 |
| 17_OUT | 385237.478     | 398774.953      | 50.150    | 3.904        |             |  | 1    | 1.008     | 46.246      | 225 |

Simulation Settings

|                      |                   |                   |        |                            |      |
|----------------------|-------------------|-------------------|--------|----------------------------|------|
| Rainfall Methodology | FSR               | Summer CV         | 0.750  | Drain Down Time (mins)     | 240  |
| FSR Region           | England and Wales | Winter CV         | 0.840  | Additional Storage (m³/ha) | 20.0 |
| M5-60 (mm)           | 18.000            | Analysis Speed    | Normal | Check Discharge Rate(s)    | x    |
| Ratio-R              | 0.354             | Skip Steady State | x      | Check Discharge Volume     | x    |

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) | Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 0                     | 0                     | 0                     | 100                   | 40                    | 0                     | 0                     |
| 30                    | 0                     | 0                     | 0                     |                       |                       |                       |                       |

Node 17\_OUT Surcharged Outfall

|                                                                                                |   |                               |   |                              |   |
|------------------------------------------------------------------------------------------------|---|-------------------------------|---|------------------------------|---|
| Overrides Design Area                                                                          | x | Depression Storage Area (m²)  | 0 | Evapo-transpiration (mm/day) | 0 |
| Overrides Design Additional Inflow                                                             | x | Depression Storage Depth (mm) | 0 |                              |   |
| Applies to 100yr+40% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms |   |                               |   |                              |   |

| Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| 0           | 1.300     | 180         | 1.300     | 360         | 1.300     | 540         | 1.300     | 720         | 1.300     | 900         | 1.300     | 1080        | 1.300     | 1260        | 1.300     |
| 60          | 1.300     | 240         | 1.300     | 420         | 1.300     | 600         | 1.300     | 780         | 1.300     | 960         | 1.300     | 1140        | 1.300     | 1320        | 1.300     |
| 120         | 1.300     | 300         | 1.300     | 480         | 1.300     | 660         | 1.300     | 840         | 1.300     | 1020        | 1.300     | 1200        | 1.300     | 1380        | 1.300     |

Node FCC Online Hydro-Brake® Control

|                          |        |                         |                             |
|--------------------------|--------|-------------------------|-----------------------------|
| Flap Valve               | x      | Objective (HE)          | Minimise upstream storage   |
| Replaces Downstream Link | x      | Sump Available          | ✓                           |
| Invert Level (m)         | 48.250 | Product Number          | CTL-SHE-0097-5000-1600-5000 |
| Design Depth (m)         | 1.600  | Min Outlet Diameter (m) | 0.150                       |
| Design Flow (l/s)        | 5.0    | Min Node Diameter (mm)  | 1200                        |

Node TANK Depth/Area Storage Structure

|                             |         |               |      |                           |        |
|-----------------------------|---------|---------------|------|---------------------------|--------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 48.320 |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.95 | Time to half empty (mins) | 252    |

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|-----------|-----------|---------------|-----------|-----------|---------------|-----------|-----------|---------------|
| 0.000     | 100.0     | 0.0           | 0.800     | 100.0     | 0.0           | 0.801     | 0.0       | 0.0           |

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | S1      | 12          | 49.644    | 0.544     | 10.2         | 0.3195        | 0.0000     | SURCHARGED |
| 15 minute winter  | S3      | 12          | 49.619    | 0.579     | 19.3         | 0.3670        | 0.0000     | SURCHARGED |
| 15 minute winter  | S4      | 12          | 49.527    | 0.877     | 26.2         | 0.4344        | 0.0000     | SURCHARGED |
| 180 minute winter | S5      | 172         | 49.520    | 1.020     | 8.0          | 0.2886        | 0.0000     | SURCHARGED |
| 180 minute winter | S6      | 172         | 49.519    | 1.069     | 8.1          | 0.3240        | 0.0000     | SURCHARGED |
| 180 minute winter | S13     | 172         | 49.519    | 0.498     | 0.5          | 0.1779        | 0.0000     | SURCHARGED |
| 180 minute winter | S14     | 172         | 49.519    | 0.624     | 4.3          | 0.4327        | 0.0000     | SURCHARGED |
| 180 minute winter | S15     | 172         | 49.519    | 0.829     | 4.3          | 0.2346        | 0.0000     | SURCHARGED |
| 180 minute winter | S7      | 172         | 49.519    | 0.879     | 4.5          | 0.2927        | 0.0000     | SURCHARGED |
| 180 minute winter | S8      | 172         | 49.519    | 1.159     | 13.7         | 1.4822        | 0.0000     | SURCHARGED |
| 180 minute winter | S9      | 172         | 49.520    | 0.920     | 5.5          | 0.6151        | 0.0000     | SURCHARGED |
| 180 minute winter | S10     | 172         | 49.519    | 0.969     | 5.3          | 0.2743        | 0.0000     | SURCHARGED |
| 180 minute winter | S11A    | 172         | 49.519    | 0.529     | 4.4          | 0.3932        | 0.0000     | SURCHARGED |
| 180 minute winter | S11     | 172         | 49.519    | 1.059     | 13.4         | 1.5409        | 0.0000     | SURCHARGED |
| 180 minute winter | S12     | 172         | 49.519    | 1.159     | 14.9         | 1.4799        | 0.0000     | SURCHARGED |
| 180 minute winter | TANK    | 172         | 49.519    | 1.199     | 28.0         | 77.4032       | 0.0000     | SURCHARGED |
| 180 minute winter | FCC     | 172         | 49.518    | 1.268     | 9.3          | 1.4339        | 0.0000     | SURCHARGED |
| 30 minute summer  | C1      | 21          | 48.132    | 0.058     | 4.7          | 0.0655        | 0.0000     | OK         |
| 15 minute summer  | C2      | 17          | 48.017    | 0.029     | 4.7          | 0.0327        | 0.0000     | OK         |
| 15 minute summer  | 17_OUT  | 1           | 47.546    | 1.300     | 4.7          | 0.0000        | 0.0000     | OK         |

| Link Event (Outflow) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|----------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer     | S1      | 1.000   | S3      | 9.0           | 0.830          | 0.656    | 0.1776        |                    |
| 15 minute winter     | S3      | 1.001   | S4      | 17.1          | 1.037          | 0.400    | 0.1205        |                    |
| 15 minute winter     | S4      | 1.002   | S5      | 24.2          | 1.374          | 1.607    | 0.3657        |                    |
| 15 minute winter     | S5      | 1.003   | S6      | 23.3          | 1.326          | 1.308    | 0.0871        |                    |
| 15 minute winter     | S6      | 1.004   | S8      | 23.3          | 1.325          | 1.319    | 0.1598        |                    |
| 15 minute winter     | S13     | 2.000   | S14     | 2.1           | 0.227          | 0.117    | 0.1173        |                    |
| 15 minute winter     | S14     | 2.001   | S15     | 16.7          | 1.127          | 0.940    | 0.3110        |                    |
| 15 minute winter     | S15     | 2.002   | S7      | 16.5          | 1.227          | 0.570    | 0.0335        |                    |
| 15 minute winter     | S7      | 2.003   | S8      | 18.2          | 1.304          | 0.706    | 0.1718        |                    |
| 15 minute winter     | S8      | 1.005   | TANK    | 45.4          | 1.539          | 1.141    | 0.2693        |                    |
| 15 minute winter     | S9      | 3.000   | S10     | 19.6          | 1.114          | 1.112    | 0.0891        |                    |
| 15 minute winter     | S10     | 3.001   | S11     | 18.9          | 1.073          | 1.077    | 0.1622        |                    |
| 15 minute winter     | S11A    | 4.000   | S11     | 17.1          | 1.531          | 0.531    | 0.1864        |                    |
| 15 minute winter     | S11     | 3.002   | S12     | 48.3          | 1.215          | 0.692    | 0.2215        |                    |
| 15 minute winter     | S12     | 3.003   | TANK    | 54.4          | 1.686          | 1.361    | 0.2675        |                    |
| 15 minute winter     | TANK    | 1.006   | FCC     | 12.4          | 0.583          | 0.234    | 0.2700        |                    |
| 30 minute summer     | FCC     | 1.007   | C1      | 4.7           | 0.773          | 0.087    | 0.0147        |                    |
| 15 minute summer     | C1      | 1.008_1 | C2      | 4.7           | 0.881          | 0.129    | 0.0946        |                    |
| 15 minute summer     | C2      | 1.008   | 17_OUT  | 4.7           | 0.184          | 0.035    | 0.5686        | 49.2               |

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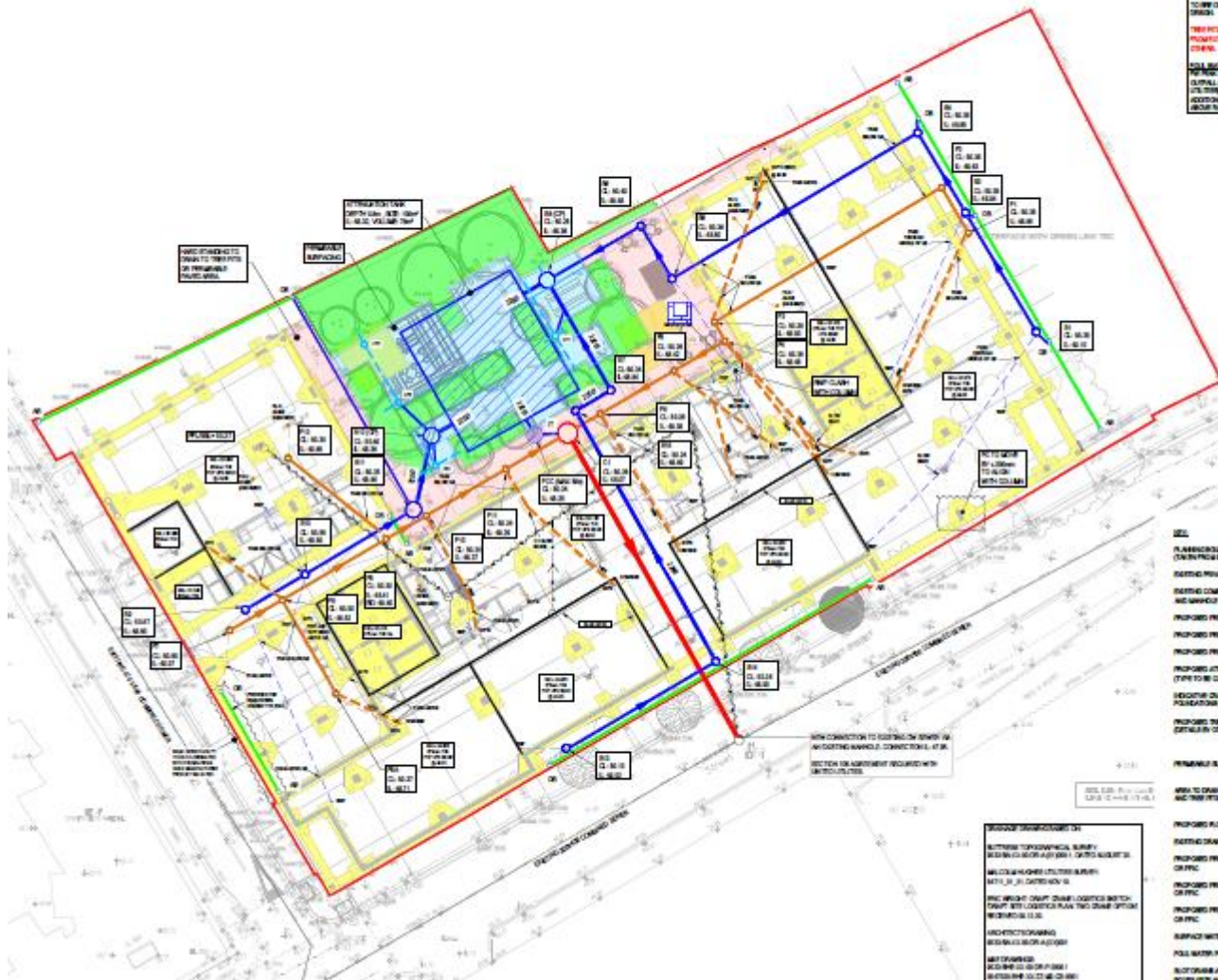
## Appendix B

- United Utilities Section 106 Outfall Approval

# S106 Part 1 'Application to connect to a public sewer' Approval Notice



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------|----------|-------------------------------------|
| United Utilities Reference Number:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 03492057                                                                                                         |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Applicant details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Applicant name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Ian Knight                                                                                                       |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Applicant address<br>(including postcode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Manchester Life Development Company 3 Limited<br>Unit 5 Royal Mills<br>17 Redhill Street<br>Manchester<br>M4 5BA |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Applicant email                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | ian.knight@mclife.co.uk                                                                                          |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Site details: The site / property which is proposed for connection to the public sewer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Site address<br>(including postcode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Eliza Yard<br>Jersey Street/Poland Street<br>Ancoats, Manchester<br>M4 6JW                                       |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| <h2>APPROVED</h2> <p>Your application for connection to the public sewer has been approved, to be made via a new connection:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| To a private drain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <input type="checkbox"/>                                                                                         | You may appoint your contractor and advise your appointed building control body (who should inspect the work).<br>United Utilities should be advised when this work is complete.                                                                                                                                                        |               |                          |          |                                     |
| Direct to the public sewer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | <input checked="" type="checkbox"/>                                                                              | <b>Further action required</b><br>You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer.<br>(The S106 Part 2 application form 'Request for permission to work on a public sewer' is available on our website; unitedutilities.com). |               |                          |          |                                     |
| Mode of connection approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | Connection into existing manhole                                                                                 |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Sewer connection type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Foul                                                                                                             | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                | Surface water | <input type="checkbox"/> | Combined | <input checked="" type="checkbox"/> |
| <p>This approval is valid for 12 months from the date below.</p> <p>This approval does not grant access to third party land, permission should be sought if required between applicant and land owner<br/>If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |
| <p>Approval granted for 300mm combined connection to the existing 300x406mm combined sewer in Jersey Street via an existing manhole ( as indicated on our sewer records as MH2704 )<br/>attenuation indicated with a flow control restricted to 5l/s</p> <p>Any connection to an existing manhole should be made soffit to soffit, with a swept bend in the direction of flow. The connection must not be made in the landing area. The exact condition, location and depth of the existing manhole and surrounding services should be established as early as possible to avoid site delays. If the existing manhole is in poor condition but otherwise the connection would be acceptable, the applicant should be aware they may have to rebuild/renew the manhole if it deteriorates as a result of your contractor working on or near it.</p> <p>For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist it could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.</p> <p>Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developer's responsibility to confirm that it communicates with the Public Sewer.</p> |  |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                         |               |                          |          |                                     |



|                                     |              |
|-------------------------------------|--------------|
| <b>Developer Services Inspector</b> | Lynne Berry  |
| <b>Contact number</b>               | 07881 034558 |
| <b>Date</b>                         | 24/01/2023   |

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www.curtins.com



## Appendix C

- Landscape Architects Section through Garden Areas

KEY

1 Natural Stone Paving

To courtyard pathways

Type: Portuguese granite

Colour: Alpendurada

Size: (L)150-300 x (W)150 x (D)60mm (depth TBC by engineer)

Finish: Flamed

Supplier: Hardscape or similar approved

2 Natural Stone Edging

To courtyard planting

Type: Portuguese granite

Colour: Alpendurada

Size: (L)1000 (modules) x (W)150 x (D)250mm (depth TBC by engineer)

Laid 100mm upstand

Finish: Flamed

Supplier: Hardscape or similar approved

3 Natural Stone Special Unit

Flush, graded/carved unit to planting edge to allow drainage into planters

Type: Portuguese granite

Colour: Alpendurada

Size: (L)500 x (W)500 x (D)100mm (depth TBC by engineer)

Finish: Flamed

Supplier: Hardscape or similar approved

4 Ornamental herbaceous planting

Refer to softworks plan

2672-PLA-XX-XX-DR-L-2000

5 Loose granite gravel mulch/aggregate

6 Semi-mature tree planting

Refer to softworks plan

2672-PLA-XX-XX-DR-L-2000

7 Irrigation Cap

GreenBlue Urban 'RootRain Arborvent 150'

Irrigation/aeration System. Vertical pipe: 60mm diameter polyethylene (PE)perforated pipe.

8 Tree Anchoring System

Deadman Fixing Kit - Plati-Mat - RF2RDMP or equal and approved.

9 Geotextile fabric

Surrounding growing media and filter media in rain garden.

To engineer's details

10 Active drainage

To engineer's details where required within rain gardens and planters.

11 Typical soil build up

Topsoil/subsoil layer to tree pits and planting

12 Proposed timber benches

13 Clay Pavers

Product: OMBER DF

Size: (L)1200 x (W)65 x (D)85mm

Finish: As supplied

Supplier: Hardscape or similar approved

14 Steel edging - 500mm above adjacent FFL

Product: Perimeta - planterline

Size: (L)varies x (H)500mm above ground with 50mm lip return

Finish: Powder coated, RAL to match architectural finish Interpon D2525 Sable, Y23041

Supplier: Kinley or similar approved

Allow for tapered transition sections between two steel edging heights.

15 Proposed pergola structure

16 Permeable resin bound gravel

Product: Natural Aggregate, pedestrian and light vehicular use.

Size: 6mm aggregate, medium texture

Colour: Sterling

Finish: As supplied

Supplier: Sureset or similar approved

17 Active drainage

To engineer's details where required below permeable paving

18 Attenuation Tank

To engineer's details

19 Proposed instant hedge planting

Refer to softworks plan

2672-PLA-XX-XX-DR-L-2000

20 PCC pin kerb

To boundary planter interface

21 Proposed timber fencing to site boundary

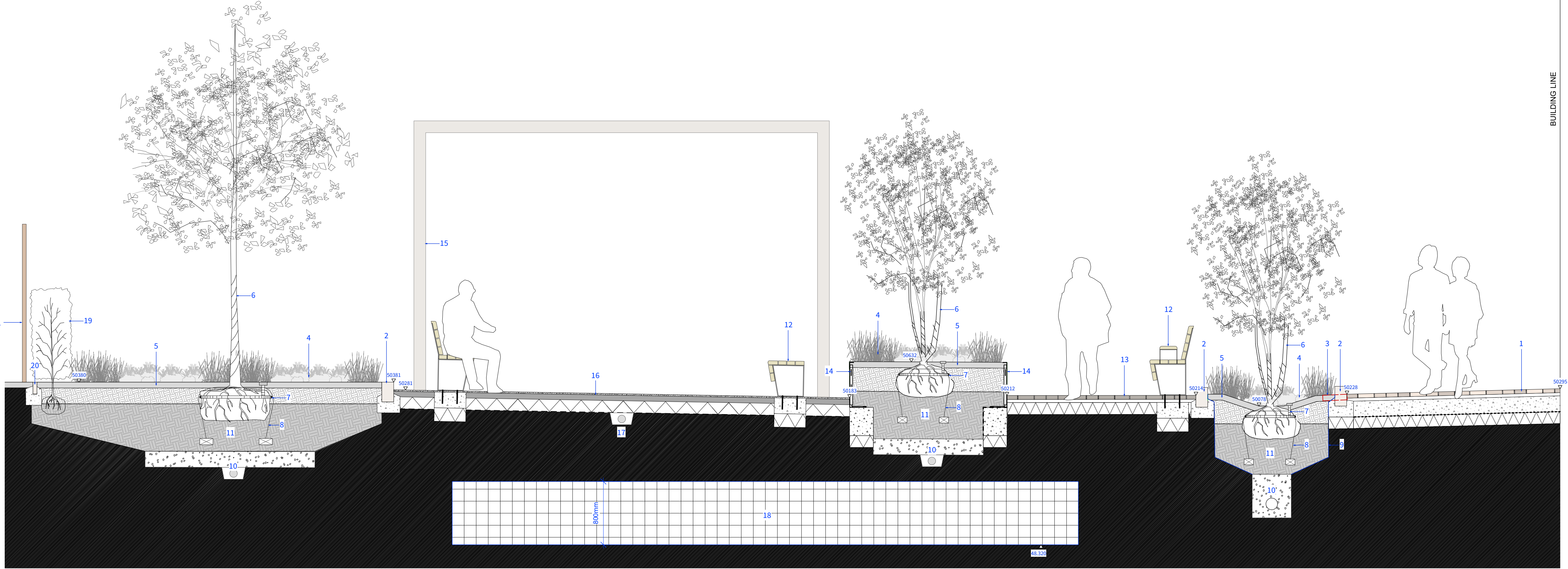
Product : Closeboard timber fencing

Material: Timber

Size: (H) 2000 x (L) 1830 x (W)22mm panels

Finish: Tanalised and pressure treated

Supplier: Jacksons Fencing or similar approved



S1

Typical section through garden space

Scale: 1:30

LOCATION PLAN (SCALE 1:500)

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NOTES:

1. Do not scale from this drawing.
2. Always work to noted dimensions.
3. All dimensions are in millimetres unless otherwise stated.
4. All setting out, levels and dimensions to be agreed on site.
5. The dimensions of all materials must be checked on site before being laid out.
6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.

0 0.5 1.0 2.0  
Scale Bar (m)

| S4-P01   | 17.01.23 | Stage 4     | AS    | SAB     |
|----------|----------|-------------|-------|---------|
| Revision | Date     | Description | Drawn | Apprvd. |



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Client Manchester Life

Project Plot B, Eliza Yard  
Manchester

Drg Title Typical section through garden

|            |            |             |
|------------|------------|-------------|
| Created on | Created by | Approved by |
| 17.01.23   | SAB        | LH          |

|       |      |           |
|-------|------|-----------|
| Scale | Size | Workstage |
| 1:30  | A1   | Stage 4   |

|                          |             |          |
|--------------------------|-------------|----------|
| Drg No.                  | Suitability | Revision |
| 2672-PLA-XX-XX-DR-L-5000 | S4          | P01      |