

Drainage Planning Conditions

Subject: Oldham Road, Newton Heath

Ref: 074031/DPC Rev V01

Date: 04.11.2021

The Planning Permission Ref: 125990/2020
Condition 6a relates to drainage proposals for the development.

Condition 16

6) Notwithstanding the flood risk and drainage strategy prepared by Curtins (ref. 074031-CUR-00-XX-RE-C-92000) stamped as received by the City Council, as Local Planning Authority, on the 22 January 2020 (a) the development shall not commence until a scheme for the drainage of surface water for the development has been submitted for approval in writing by the City Council as the Local Planning Authority. This shall include: • Maximise use of green SuDS solution. • Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e., at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within a Critical Drainage Area. • 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 a 1 in 100-year rainfall event with allowance for climate change in any part of a building. • Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site. • Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice. • As proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) evidence of pollution control measures (preferably through SuDS) is required. • Hydraulic calculation of the proposed drainage system. • Construction details of flow control and SuDS elements.	Pre-Commencement
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Proposed Drainage:

The proposed drainage system consists of a separate foul and surface water network. Reference should be made to the following drainage design documents:

- 074031- CUR-00-XX-DR-C-92500 _ P04 DRAINAGE LAYOUT SITE 1
- 074031- CUR-00-XX-DR-C-92501 _ P04 DRAINAGE LAYOUT SITE 2
- 074031- CUR-00-XX-DR-C-92510 _ P01 MANHOLE SCHEDULE (SW)
- 074031- CUR-00-XX-DR-C-92511 _ P01 MANHOLE SCHEDULE (FW)
- 074031- CUR-00-XX-DR-C-92520 _ P01 DETAILS SHEET 1

- 074031- CUR-00-XX-DR-C-92521_P01 DETAILS SHEET 2
- 074031- CUR-00-XX-DR-C-92522_P01 DETAILS SHEET 3
- 074031- CUR-00-XX-DR-C-92523_P01 DETAILS SHEET 4
- 074031-CUR-00-XX-DR-C-92050_P01 OVERLAND FLOW ROUTES
- Micro-Drainage Calculations 1, 30 and 100 Year +40%cc events (Site 1 and Site 2)

With specific reference to the conditioned points:

Maximise use of green SuDS solution

As noted within the submitted FRA and Drainage Strategy, in following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration. An assessment was completed to establish the most sustainable method of discharge and is summarised below:

Surface Water Disposal	Potential	Description
Infiltration	X	The Site Investigation works highlight that the underlying ground largely consists of made ground and includes contaminants such as heavy metals and hydrocarbons. Draining the site via infiltration may result in contamination to the underlying aquifer. The Site Investigation Study includes groundwater records at several locations across the site. The records show that the groundwater levels on the site vary from 0.20-2.79m bgl. It is assumed that the site will not be suitable for infiltration SuDS.
Watercourse	X	The Rochdale Canal is located approximately 56m north of the site. A new connection to the watercourse is not considered a viable option as it would have to pass through third-party land.
Surface Water Public Sewer	X	There are no surface water sewers in the vicinity of the site.
Combined Public Sewer	✓	There are various combined water sewers in the vicinity of the sites. It is therefore proposed to connect to the existing combined sewers located on Dulverton St and Holyoak St.

Based on the above, the proposals are to discharge surface water to the combined public sewers at a restricted rate. Use of SuDS would be limited to localised attenuation features due to the limited infiltration potential. A range of SuDS features were considered in the design:

Solution	
Green Roof	Pitched roof and PV Panels proposed on roof therefore green roof not compatible.
Blue Roof	Pitched roof and PV Panels proposed on roof therefore blue not compatible.
Permeable Paving	Permeable Paving has been specified in all parking areas and driveways.
Tree Pits	Minimal trees on site, generally in small, landscaped zones adjacent to car parking – which drain to permeable paving.
Rain Gardens	Limited landscaping zones on site, landscaped zones adjacent to car parking – which drain to permeable paving. Landscaping adjacent to playground area likely to capture minimal run - off to play areas – no formal rain garden proposed.
Swales	Limited Space to incorporate swales. Attenuation Basin/Pond not deemed compatible with the site use and open space area is proposed for children's play area. Incorporation of water body would require segregation of communal land, 24-hour mitigation/management of the areas would be required and therefore potential health and safety concern.
Attenuation Basin / Pond	Limited Space to incorporate Attenuation Basin/Pond. Attenuation Basin/Pond not deemed compatible with the site use and open space area is proposed for children's play area. Incorporation of water body would require segregation of communal land, 24-hour mitigation/management of the areas would be required and therefore potential health and safety concern. Shallow groundwater would limit use and impermeable base would be required to prevent groundwater flooding.
Filter Drain	Limited Landscaping zones to provide filter trenches.

Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e., at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within a Critical Drainage Area.

Discharge rates were initially assessed within the submitted FRA and Drainage Strategy Report confirming discharge rates were based on existing brownfield run-off rate for hardstanding areas plus greenfield run-off rates for landscaped areas. However subsequent discussions with Manchester City Council (MCC) Lead Local Flood Authority (LLFA) confirmed that proposed discharge rates should be restricted to a maximum of 50% of existing brownfield rates only. Existing discharge rates are as follows:

- 1-year storm: 30.5 l/s
- 30-year storm: 84.4 l/s
- 100-year storm: 104.8 l/s

Proposed discharge rates have therefore been agreed with MCC LLFA to a maximum of:

- 1-year storm: 15.3 l/s
- 30-year storm: 42.2 l/s
- 100-year storm +40%cc: 52.4 l/s

Please refer to the email confirmation (Appendix B) from MCC LLFA (Oliver Timmins) dated 08 January 2021 and the email confirmation from United Utilities (Josephine Wong) dated 4th February 2021.

Latest Drainage Layouts (Appendix A) confirm that flow rates achieved in current design are:

- 1-year storm: 15.5 l/s
- 30-year storm: 24.1 l/s
- 100-year storm +40%cc: 52.3 l/s

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 a 1 in 100-year rainfall event with allowance for climate change in any part of a building.

The proposed drainage has been designed to accommodate up to the 100 year + 40% climate change rainfall event. Refer to the Micro-Drainage Calculations enclosed in Appendix C.

Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.

Refer to the Overland Flow Routes drawings enclosed in Appendix A.

Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.

Refer to the United Utilities correspondence enclosed in Appendix B.

As proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) evidence of pollution control measures (preferably through SuDS) is required.

All car parking areas and driveways are proposed to be drainage via a permeable paving construction, pollution treatment is therefore provided via treatment through its filter layers prior to discharge to the piped drainage network.

Hydraulic calculation of the proposed drainage system.

Refer to the Micro-Drainage Calculations enclosed in Appendix C.

Construction details of flow control and SuDS elements

Site 1

Drainage Layout Site 1 shows Drainage proposals for the eastern plot. There is a Flow Control chamber (referenced FCC1) which is located along the western boundary, prior to the combined outfall into Dulverton Street. The Flow Control Chamber is a 1500mm Dia. Manhole with 2 No. Orifice Plates.

Orifice Plate 1 – 95mm Dia. set at Invert Level 83.028 – which is the outlet pipe.

Orifice Plate 2 – 65mm Dia. Set at Invert Level 83.773 – which requires a high-level overflow connecting to the outlet pipe.

Please refer to Drainage Details drawings.

Site 2

Drainage Layout Site 2 shows Drainage proposals for the western plot. There is a Flow Control chamber (referenced FCC2) which is located along the southern boundary, prior to the combined outfall into Holyoak Street. The Flow Control Chamber is a 1500mm Dia. Manhole with 1 No. Orifice Plate.

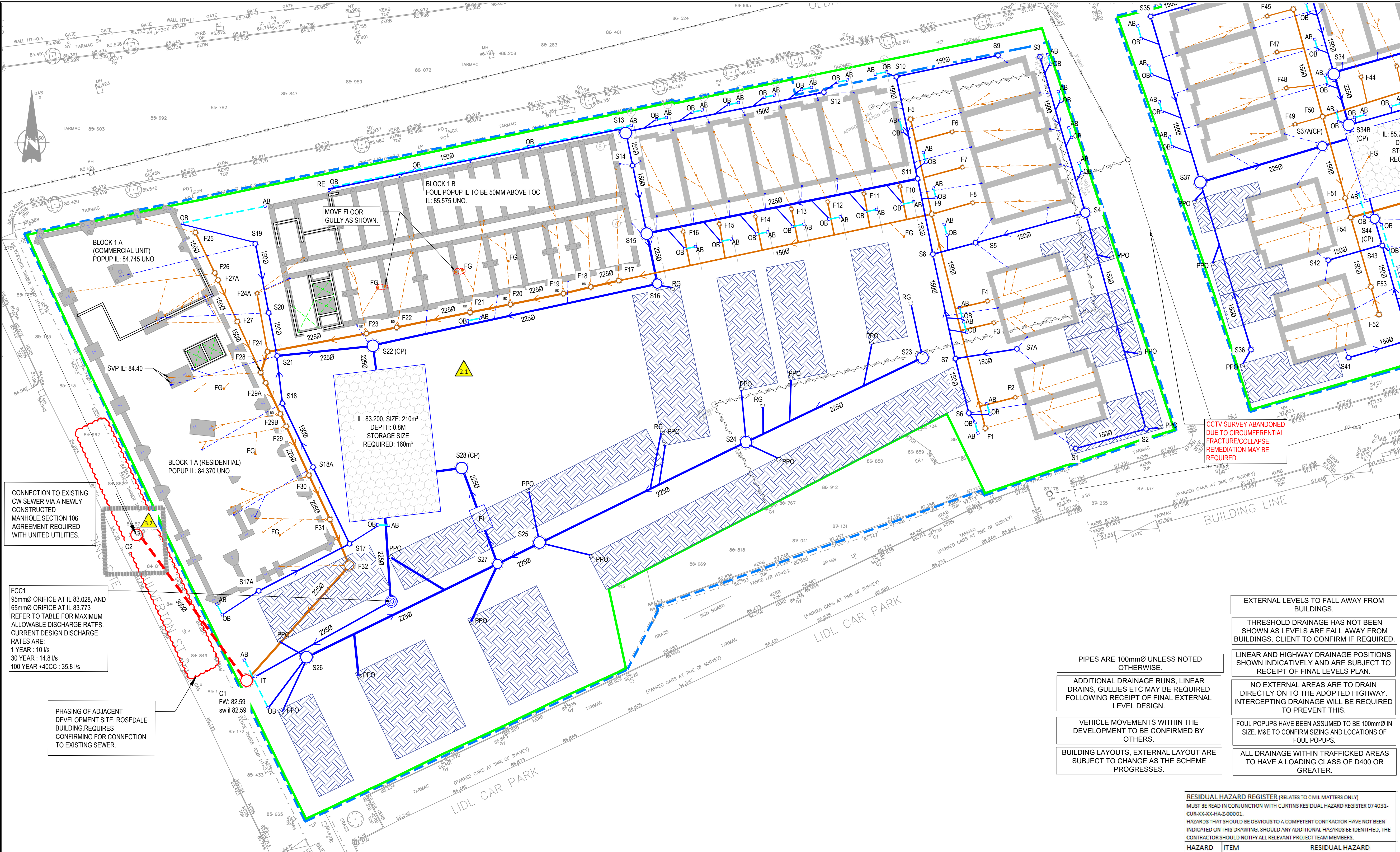
Orifice Plate – 81mm Dia. set at Invert Level 85.690 – which is the outlet pipe.

Please refer to Drainage Details drawings.

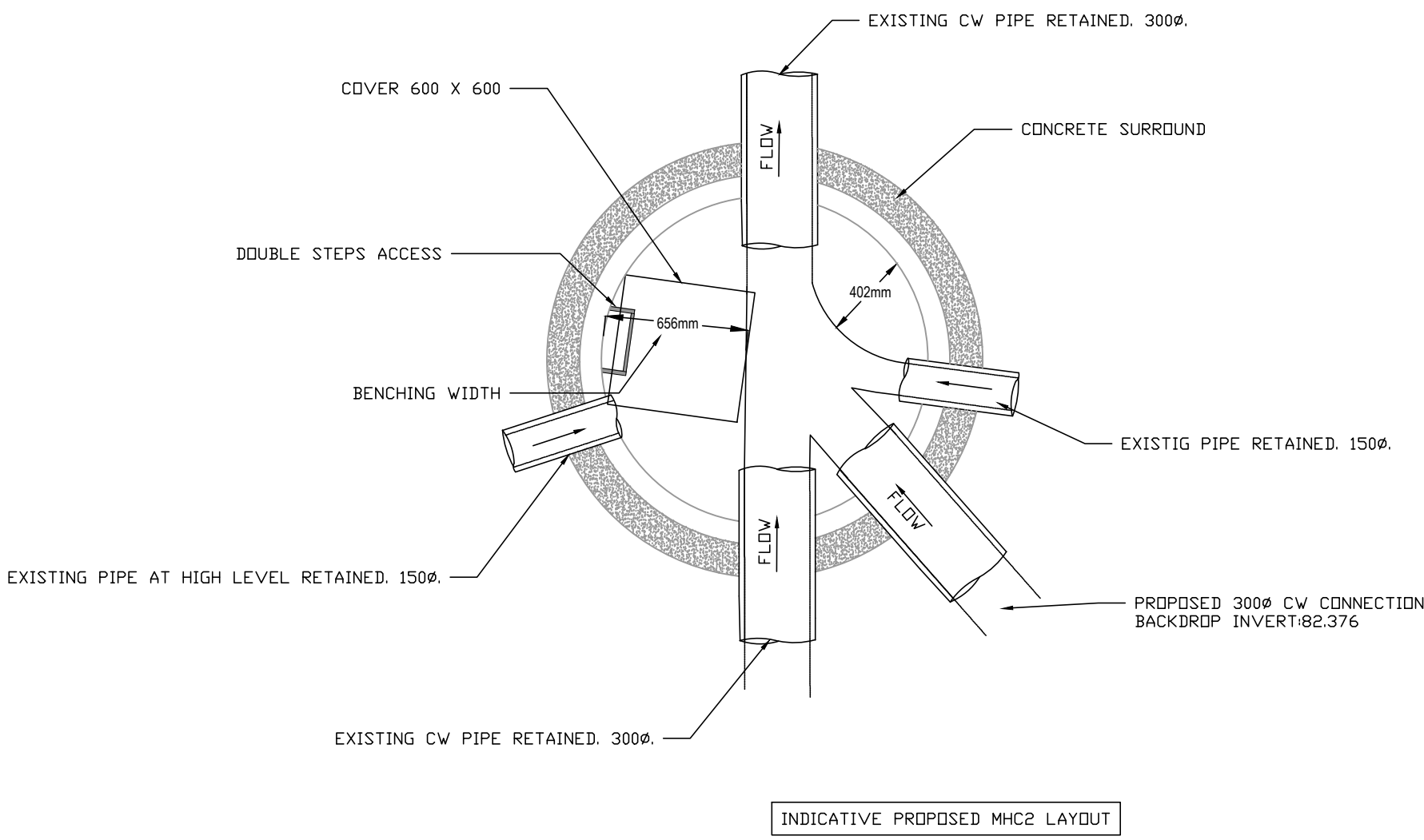
Appendix A

Proposed Drawings:

- 074031- CUR-00-XX-DR-C-92500_ P04 DRAINAGE LAYOUT SITE 1
- 074031- CUR-00-XX-DR-C-92501_ P04 DRAINAGE LAYOUT SITE 2
- 074031- CUR-00-XX-DR-C-92510_ P01 MANHOLE SCHEDULE (SW)
- 074031- CUR-00-XX-DR-C-92511_ P01 MANHOLE SCHEDULE (FW)
- 074031- CUR-00-XX-DR-C-92520_ P01 DETAILS SHEET 1
- 074031- CUR-00-XX-DR-C-92521_ P01 DETAILS SHEET 2
- 074031- CUR-00-XX-DR-C-92522_ P01 DETAILS SHEET 3
- 074031- CUR-00-XX-DR-C-92523_ P01 DETAILS SHEET 4
- 074031- CUR-00-XX-DR-C-92050_ P01 OVERLAND FLOW ROUTES



KEY:	
INDICATIVE HIGHWAY BOUNDARY	
SITE BOUNDARY (TAKEN FROM T8130G0020 12.10.20)	
EXISTING PRIVATE SURFACE WATER SEWER/RAIN	
EXISTING PRIVATE FOUL WATER SEWER/RAIN	
EXISTING PRIVATE COMBINED WATER SEWER/RAIN	
EXISTING COMBINED PUBLIC SEWER AND MANHOLE	
PROPOSED PRIVATE COMBINED DRAIN	
PROPOSED PRIVATE FOUL DRAIN	
PROPOSED PRIVATE SURFACE DRAIN	
PROPOSED ATTENUATION SYSTEM (TYPE TO BE CONFIRMED)	
PETROL INTERCEPTOR	
PERMEABLE BLOCK PAVING	
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)	
FLOOR GULLY	
ROAD GULLY	
PERMEABLE PAVING OUTLET	
INTERCEPTOR TRAP	
PROPOSED RODDING EYE	



- EXTERNAL LEVELS TO FALL AWAY FROM BUILDINGS.
- THRESHOLD DRAINAGE HAS NOT BEEN SHOWN AS LEVELS ARE FALL AWAY FROM BUILDINGS. CLIENT TO CONFIRM IF REQUIRED.
- LINEAR AND HIGHWAY DRAINAGE POSITIONS SHOWN INDICATIVELY AND ARE SUBJECT TO RECEIPT OF FINAL LEVELS PLAN.
- NO EXTERNAL AREAS ARE TO DRAIN DIRECTLY ON TO THE ADOPTED HIGHWAY. INTERCEPTING DRAINAGE WILL BE REQUIRED TO PREVENT THIS.
- FOUL POPUPS HAVE BEEN ASSUMED TO BE 100mmØ IN SIZE. M&E TO CONFIRM SIZING AND LOCATIONS OF FOUL POPUPS.
- ALL DRAINAGE WITHIN TRAFFICKED AREAS TO HAVE A LOADING CLASS OF D400 OR GREATER.
- PIPES ARE 100mmØ UNLESS NOTED OTHERWISE.
- ADDITIONAL DRAINAGE RUNS, LINEAR DRAINS, GULLIES ETC MAY BE REQUIRED FOLLOWING RECEIPT OF FINAL EXTERNAL LEVEL DESIGN.
- VEHICLE MOVEMENTS WITHIN THE DEVELOPMENT TO BE CONFIRMED BY OTHERS.
- BUILDING LAYOUTS, EXTERNAL LAYOUT ARE SUBJECT TO CHANGE AS THE SCHEME PROGRESSES.

RESIDUAL HAZARD REGISTER (RELATES TO CIVIL MATTERS ONLY)		
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER 074031-CUR-XX-XX-HA-Z-00001.		
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
	Discarded used needles found across the site by surveyors.	Injury from discarded needles.
	Existing deep drainage	Falls from height.

- DRAWING BASED ON:
- TOPOGRAPHICAL SURVEY BY: SEP, SEP11190L, DATED NOVEMBER 2019.
 - CCTV SURVEY BY: LAYER SURVEYS, LAY0243, DATED NOVEMBER 2019.
 - UU RECORDS UU REF: UUPS-ORD-122012, DATED 06.09.19.
 - LANDSCAPE EXTERNAL LEVELS: TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
 - ARCHITECT SITE LAYOUT: TP BENNETT, T8130-G-0-020-P01, DATED 12/10/20.
 - POPUP LOCATIONS BASED ON SITE SERVICES PLAN; TP BENNETT, T8130-R-0-042-P01 DATED 12/10/20.
 - FOUNDATIONS: CURTINS, CUR-1A-FN-DR-S-16001, CUR-1B-FN-DR-S-16002 AND CUR-ZZ-FN-DR-S-16201 TO 16205, DATED 29.10.20.

- 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 TO BE CONFIRMED BY THE ARCHITECT AND M&E ENGINEER.
 - COVER LEVELS AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
 - OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
 - ALL PROPOSED DRAINAGE IS TO REMAIN PRIVATE AND IS NOT TO BE ADOPTED.
 - ALL DRAINAGE TO BE CONFIRMED REDUNDANT PRIOR TO ANY WORKS
 - DRAINAGE ENGINEER TO BE MADE AWARE OF ANY EXISTING LIVE DRAINAGE WITHIN THE SITE BOUNDARY.
 - FOR DRAINAGE NOTES REFER TO DRAWING 074031-CUR-00-XX-DR-C-92512.

PROPOSED FLOW RATES (50% EXISTING) AS AGREED UULLFA			
SITE	FLOW RATE 1:1 YEAR (L/S)	FLOW RATE 1:30 YEAR (L/S)	FLOW RATE 1:100 YEAR (L/S)
PROPOSED SITE (SITE 1 + SITE 2)	15.3	42.2	52.4

P04

UPDATED WITH AGREED FLOW RATES

04/11/21

CG

CG

P03

STAGE 3 ISSUE

16/11/20

AH

AH

P02

ISSUED FOR PLANNING

24/01/20

AH

CD

P01

DRAFT ISSUE FOR COMMENT

17/01/20

AH

CD

Rev:

Description:

Date:

By:

Chkd:

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STAGE 3 ISSUE

Project:

OLDHAM ROAD, NEWTON HEATH

Orig Title:

DRAINAGE LAYOUT SHEET 1

Size:

Date:

Drawn By:

Designed By:

Checked By:

Scale:

1:250

AH

AH

CD

Project No:

Originator:

Volume:

Level:

Type:

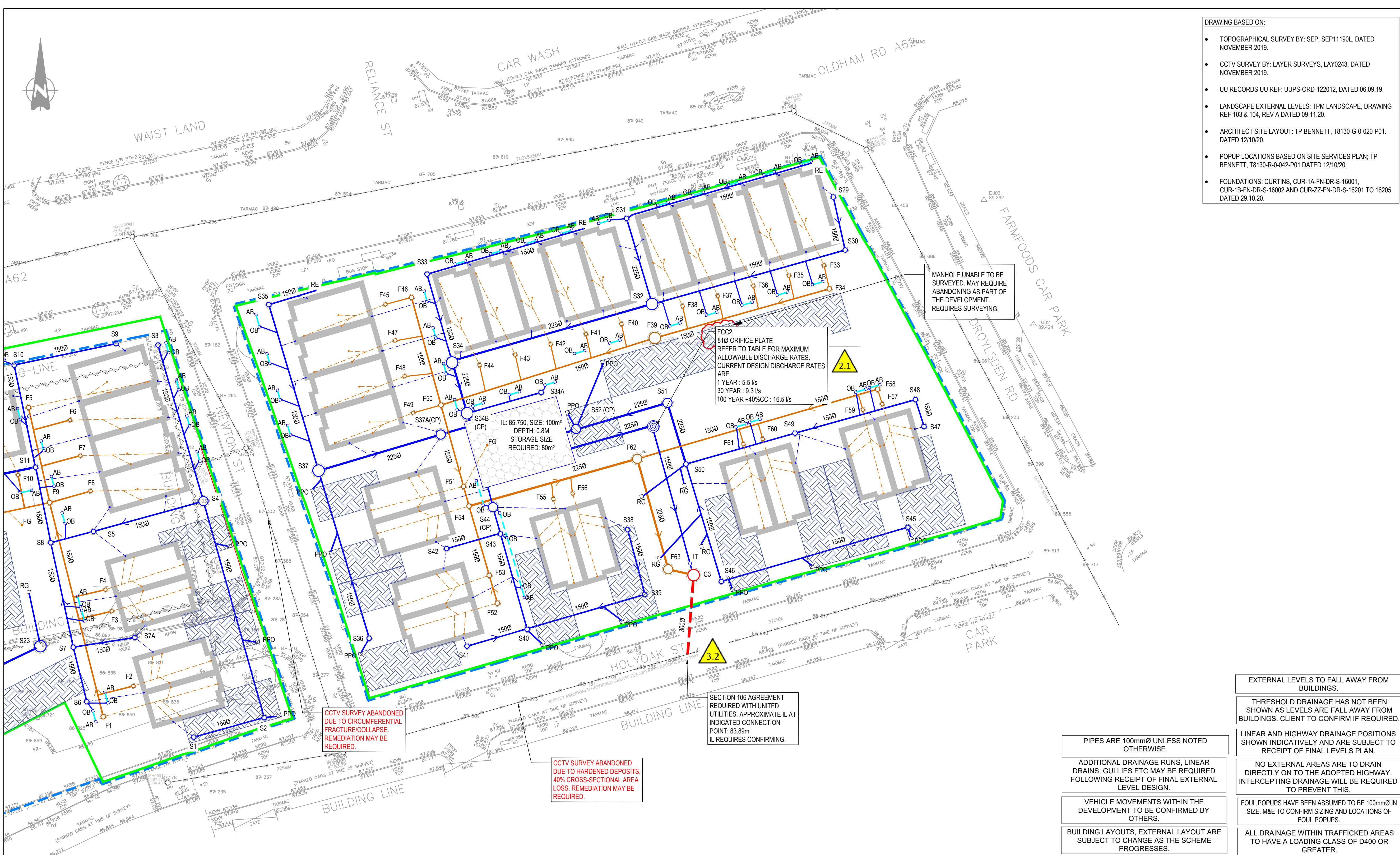
Role:

Category / Number:

Rev:

074031 - CUR - 00 - XX - DR - C - 92500 - P04

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 7. 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.
 8. ALL RAINWATER AND FOUL POP UPS LOCATIONS AND SIZES TO BE CONFIRMED BY THE ARCHITECT AND M&E ENGINEER.
 9. COVER LEVELS AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
 10. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
 11. ALL PROPOSED DRAINAGE IS TO REMAIN PRIVATE AND IS NOT TO BE ADOPTED.
 12. ALL DRAINAGE TO BE CONFIRMED REDUNDANT PRIOR TO ANY WORKS
 13. DRAINAGE ENGINEER TO BE MADE AWARE OF ANY EXISTING LIVE DRAINAGE WITHIN THE SITE BOUNDARY.
 14. FOR DRAINAGE NOTES REFER TO DRAWING 074031-CUR-00-XX-DR-C-92512.

PROPOSED FLOW RATES (50% EXISTING) AS AGREED U/I/LFA			
SITE	FLOW RATE 1:1 YEAR (L/S)	FLOW RATE 1:30 YEAR (L/S)	FLOW RATE 1:100 YEAR (L/S)
PROPOSED SITE (SITE 1 + SITE 2)	15.3	42.2	52.4

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- BUILDING LAYOUTS, EXTERNAL LAYOUT ARE SUBJECT TO CHANGE AS THE SCHEME PROGRESSES.

- KEY:
- INDICATIVE HIGHWAY BOUNDARY
- SITE BOUNDARY
(TAKEN FROM T8130G0020 12.10.20)
- EXISTING PRIVATE SURFACE WATER SEWER/DRAIN
- EXISTING PRIVATE FOUL WATER SEWER/DRAIN
- EXISTING PRIVATE COMBINED WATER SEWER/DRAIN
- EXISTING COMBINED PUBLIC SEWER AND MANHOLE
- PROPOSED PRIVATE COMBINED DRAIN
- PROPOSED PRIVATE FOUL DRAIN
- PROPOSED PRIVATE SURFACE DRAIN
- PROPOSED ATTENUATION SYSTEM
(TYPE TO BE CONFIRMED)
- PERMEABLE BLOCK PAVING
- 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)
- FLOOR GULLY
- ROAD GULLY
- PERMEABLE PAVING OUTLET
- INTERCEPTOR TRAP
- PROPOSED RODDING EYE
- FCC
- F1
- S1
- C1
- AB
- OB
- FG
- RG
- PPO
- IT
- RE

RESIDUAL HAZARD REGISTER (RELATES TO CIVIL MATTERS ONLY)		
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER 074031-CUR-XX-XX-HA-Z-00001. 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
2.1	Discarded used needles found across the site by surveyors.	Injury from discarded needles.
3.2	Existing deep drainage	Falls from height.

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Status: STAGE 3 ISSUE

Project: OLDHAM ROAD, NEWTON HEATH

Orig Title: DRAINAGE LAYOUT SHEET 2

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	17/01/20	AH	AH	CD

Scale: 1:250

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
074031 - CUR - 00 - XX - DR - C -	92501	- P04					

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Manhole schedule- Surface Water														
MH REF	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	87.220	85.870	1.200		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S2	87.220	85.755	1.315		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S3	87.220	86.170	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S4	87.180	85.474	1.556		150	1200	TYPE 2	750 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S5	87.130	85.332	1.648		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S6	87.140	85.790	1.200		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S7A	87.230	86.180	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S7	87.020	85.670	1.200		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S8	87.100	85.277	1.673		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S9	87.220	86.170	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S10	86.950	85.900	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S11	87.130	85.168	1.737		225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.770	ACCESS RESTRICTED TO MAX. 350
S12	86.860	85.810	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S13	86.200	84.850	1.200		150	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S14	86.200	84.808	1.242		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S15	86.200	84.717	1.258		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S16	86.470	84.400	1.845		225	1200	TYPE 2	600 X 600	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S17A	85.150	84.100	0.900		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S17	85.110	83.940	1.020		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S18A	85.110	83.805	1.155		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S18	85.110	83.695	1.265		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S19	85.750	84.300	1.300		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S20	86.200	84.213	1.837		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S21	85.110	83.632	1.253		225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S22	86.160	83.300	2.635		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	N/A	N	BD IL: 84.036	CATCHPIT WITH 500mm SUMP
S23	86.960	85.535	1.200		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S24	86.440	85.015	1.200		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S25	85.790	84.365	1.200		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S26	85.290	83.865	1.200		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S27	85.750	83.598	1.927		225	1200	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S28	85.800	83.340	2.235		225	1500	TYPE 2	600 X 600	D400	SINGLE SEALED	N/A	N	N/A	CATCHPIT WITH 500mm SUMP
FCC1	85.300	83.028	2.122		150	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
C1	85.230	82.590	2.340		300	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
C2	AS EXISTING	AS EXISTING	AS EXISTING		300	1500	TYPE 1B	1200 X 675	D400	SINGLE SEALED	N/A	N	BD IL: 82.376	TO BE BUILT ON EXISTING MH9602 LEVELS TBC ON SITE. PROPOSED CONNECTION BD IL: 82.376
S29	88.250	87.200	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S30	88.250	87.000	1.100		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S31	88.050	87.000	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S32	88.050	86.687	1.138		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	N/A	N	N/A	N/A
S33	87.420	86.370	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S34	87.440	85.830	1.385		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S34A	87.900	86.850	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S34B	87.420	85.790	1.405		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	BD IL: 86.754	CATCHPIT WITH 500mm SUMP
S35	87.500	86.450	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
S36	87.640	86.290	1.200		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S37	87.500	85.938	1.337		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S37A	87.450	85.778	1.447		225	1500	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	CATCHPIT WITH 500mm SUMP
S38	88.220	86.870	1.200		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S39	88.220	86.764	1.306		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S40	87.750	86.576	1.024		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S41	87.800	86.750	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S42	87.800	86.200	1.450		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S43	87.700	86.111	1.439		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S44	87.700	85.850	1.700		150	1200	TYPE 2	1200 X 675	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	CATCHPIT WITH 500mm SUMP
S45	88.950	87.600	1.200		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S46	88.600	87.213	1.237		150	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
S47	89.090	88.040	0.900		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S48	89.090	87.976	0.964		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S49	88.790	87.659	0.981		150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S50	88.400	87.186	0.989		225	600	PPIC	450 X 450	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S51	88.280	86.855	1.200		225	1200	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
S52	87.880	85.800	1.855		225	1200	TYPE 2	600 X 600	D400	SINGLE SEALED	LA TO CONFIRM	N	BD IL 86.637	CATCHPIT WITH 500mm SUMP
FCC2	88.200	85.690	2.360		150	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
C3	88.400	85.420	2.755		225	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL ADAPTABLE 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 BASED ON LANDSCAPE GENERAL ARRANGEMENTS TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
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 AREASANY 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.

P01	STAGE 3 ISSUE	16/11/20	AH	CD
Rev:	Description:	Date:	By:	Chkd:

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Status:

STAGE 3 ISSUE

Project: OI DHAM ROAD, NEWTON HEATH

Drg Title: MANHOLE SCHEDULE
SURFACE WATER

Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	16/11/20	AH	AH	CD			
Scale: NTS							
Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:

074031 - CUR - 00 - XX - DR - C - 92510 - P01

Manhole schedule- Foul Water													
MH REF	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	87.140	86.180	0.810	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F2	87.220	86.300	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F3	87.230	86.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F4	87.230	86.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F5	87.140	86.190	0.800	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F6	87.230	86.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F7	87.230	86.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F8	87.230	86.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F9	87.100	85.710	1.240	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F10	86.940	86.000	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F11	86.860	85.920	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F12	86.790	85.850	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F13	86.710	85.770	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F14	86.640	85.700	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F15	86.540	85.620	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F16	86.540	85.620	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F17	86.140	84.660	1.255	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F18	86.260	84.600	1.435	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.130	ACCESS RESTRICTED TO MAX. 350
F19	86.190	84.540	1.425	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.120	ACCESS RESTRICTED TO MAX. 350
F20	86.190	84.420	1.545	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.130	ACCESS RESTRICTED TO MAX. 350
F21	86.190	84.330	1.635	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.090	ACCESS RESTRICTED TO MAX. 350
F22	86.190	84.170	1.795	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.090	ACCESS RESTRICTED TO MAX. 350
F23	86.190	84.100	1.865	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 85.090	ACCESS RESTRICTED TO MAX. 350
F24A	86.200	84.520	1.530	150	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F24	85.150	83.325	1.600	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL: 84.40	ACCESS RESTRICTED TO MAX. 350
F25	85.750	84.240	1.360	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F26	85.270	84.050	1.070	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F27A	85.260	84.030	1.080	150	600	PPIC	450 X450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F27	85.150	83.940	1.060	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F28	85.130	83.280	1.625	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F29A	85.130	83.255	1.650	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F29B	85.130	83.183	1.722	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL 83.946	ACCESS RESTRICTED TO MAX. 350
F29	85.130	83.155	1.750	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL 83.946	ACCESS RESTRICTED TO MAX. 350
F30	85.130	83.040	1.865	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL 83.950	ACCESS RESTRICTED TO MAX. 350
F31	85.130	82.940	1.965	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	BD IL 83.910	ACCESS RESTRICTED TO MAX. 350
F32	85.030	82.830	1.975	225	1200	TYPE 2	600 X 600	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F33	88.230	87.290	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F34	88.200	87.240	0.810	150	600	PPIC	450 X 450	D400	SINGLE SEALED	N/A	N	N/A	N/A
F35	88.160	87.210	0.850	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F36	88.160	87.210	0.850	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F37	88.080	87.140	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F38	88.080	87.140	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F39	87.970	86.860	0.960	150	1500	TYPE 2	1200 X 675	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F40	88.010	87.090	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F41	87.940	87.010	0.830	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F42	87.940	87.010	0.830	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F43	87.940	86.940	0.900	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F44	87.860	86.940	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F45	87.560	86.620	0.840	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F46	87.480	86.560	0.770	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F47	87.560	86.620	0.840	100	400	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F48	87.560	86.620	0.840	100	400	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F49	87.560	86.620	0.840	100	400	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F50	87.480	86.320	1.010	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F51	87.750	86.140	1.460	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F52	87.750	86.820	0.780	150	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F53	87.750	86.760	0.840	150	600	PPIC	450 X 450	B125	SINGLE SEALED	N/A	N	N/A	N/A
F54	87.750	86.090	1.435	225	600	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	Y	N/A	ACCESS RESTRICTED TO MAX. 350
F55	88.210	87.210	0.900	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F56	88.210	87.290	0.820	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F57	89.090	88.140	0.850	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F58	88.950	88.100	0.700	150	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F59	89.090	88.060	0.930	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F60	88.790	87.840	0.850	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F61	88.790	87.770	0.920	100	450	PPIC	450 X 450	B125	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A
F62	88.220	85.720	2.275	225	1200	TYPE 2	600 X 600	D400	SINGLE SEALED	LA TO CONFIRM	N	BD IL: 86.50	N/A
F63	88.220	85.480	2.515	225	1200	TYPE 2	600 X 600	D400	SINGLE SEALED	LA TO CONFIRM	N	N/A	N/A

- GENERAL NOTES:
1.

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

ALL ADAPTABLE 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 BASED ON LANDSCAPE GENERAL ARRANGEMENTS TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
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.

P01	STAGE 3 ISSUE	16/11/20	AH	CD
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Status:

STAGE 3 ISSUE

Project:

OLDHAM ROAD, NEWTON HEATH

Orig Title:

MANHOLE SCHEDULE
FOUL WATER

Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	16/11/20	AH	AH	CD			
Scale: NTS							
Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:

074031 - CUR - 00 - XX - DR - C - 92511 - P01

GENERAL NOTES:

- | | | | |
|-----|---|-----|---|
| 1. | THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS. | 20. | PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION. |
| 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. | 29. | 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. |
| 3. | ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTAINS 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'. | 30. | THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS. |
| 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. | 31. | ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL. |
| 5. | DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN. | 32. | ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES. |
| 6. | OUTFALL CONNECTIONS SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY. | 33. | UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
<ul style="list-style-type: none"> • B125 LOAD CLASS IN PEDESTRIAN AREAS • D400 LOAD CLASS IN VEHICULAR AREAS. |
| 7. | ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED. | 35. | ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS. |
| 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, R/WP'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 SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED. | | |
| 16. | INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY. | | |
| 17. | ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. | | |
| 18. | ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
<ul style="list-style-type: none"> • 100mm to 300mm DIA TO BE VITRIFIED CLAY. • 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES. | | |
| 19. | AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER. | | |
| 20. | SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS. | | |
| 21. | 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. | | |
| 22. | ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED. | | |
| 23. | 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. | | |
| 24. | 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 2). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS 3. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES. | | |
| 25. | WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS 2). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE. | | |
| 26. | WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS 3 BEDDING IS ACCEPTABLE. | | |
| 27. | 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. | | |

P01	STAGE 3 ISSUE	16/11/20	AH	CD
Rev:	Description:	Date:	By:	Chkd:



Status:

STAGE 3 ISSUE

Project

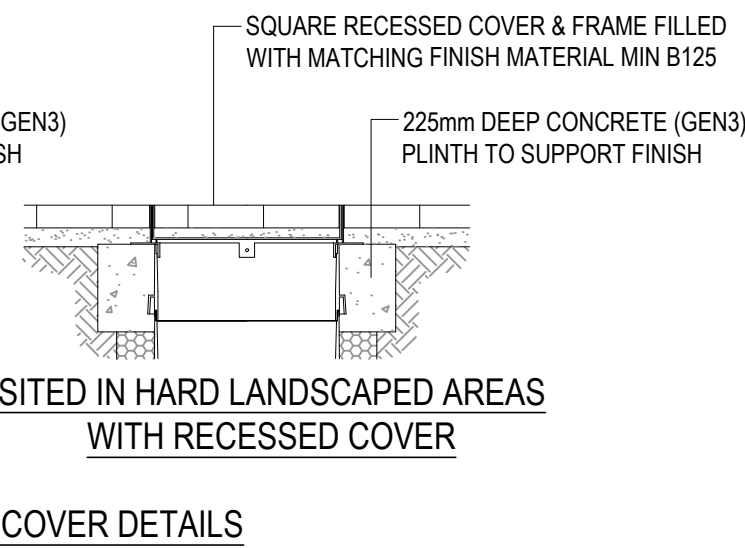
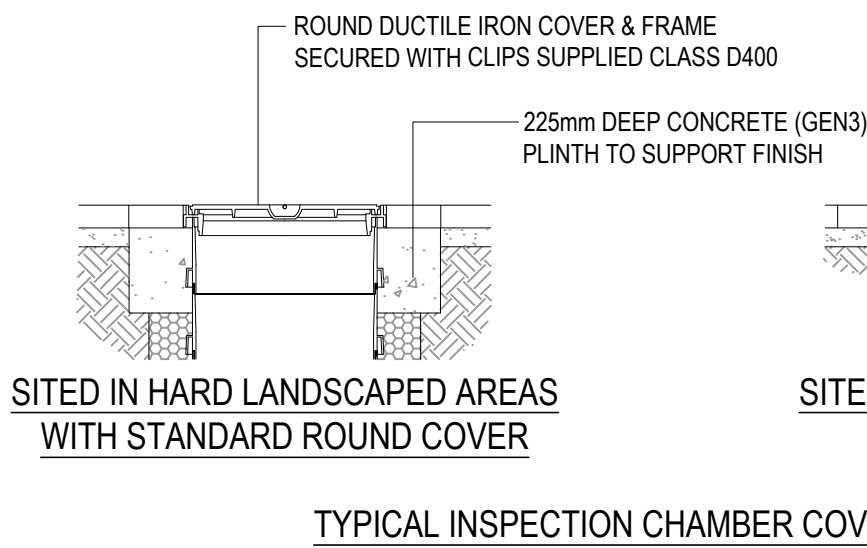
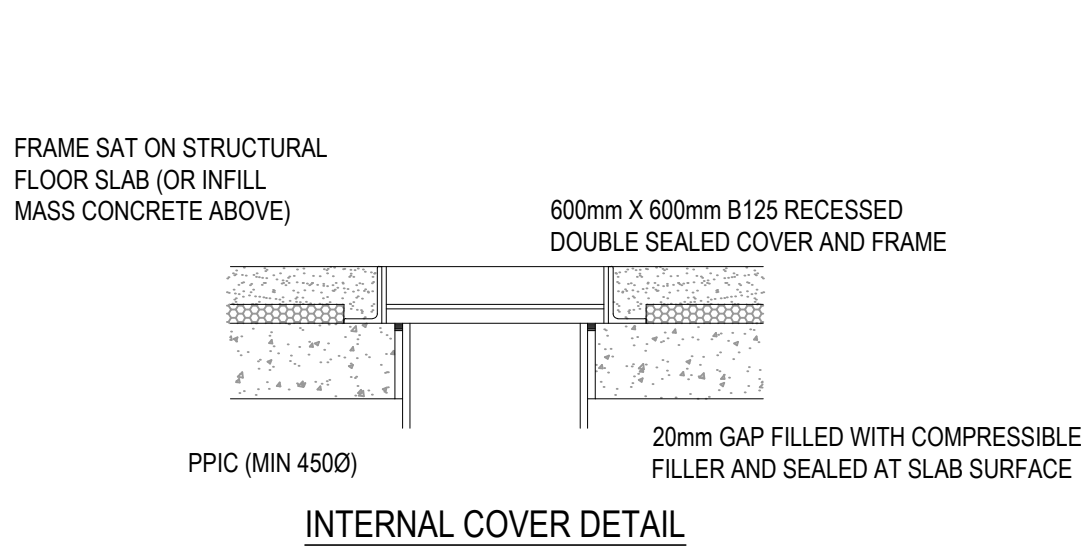
OLDHAM ROAD, NEWTON HEATH

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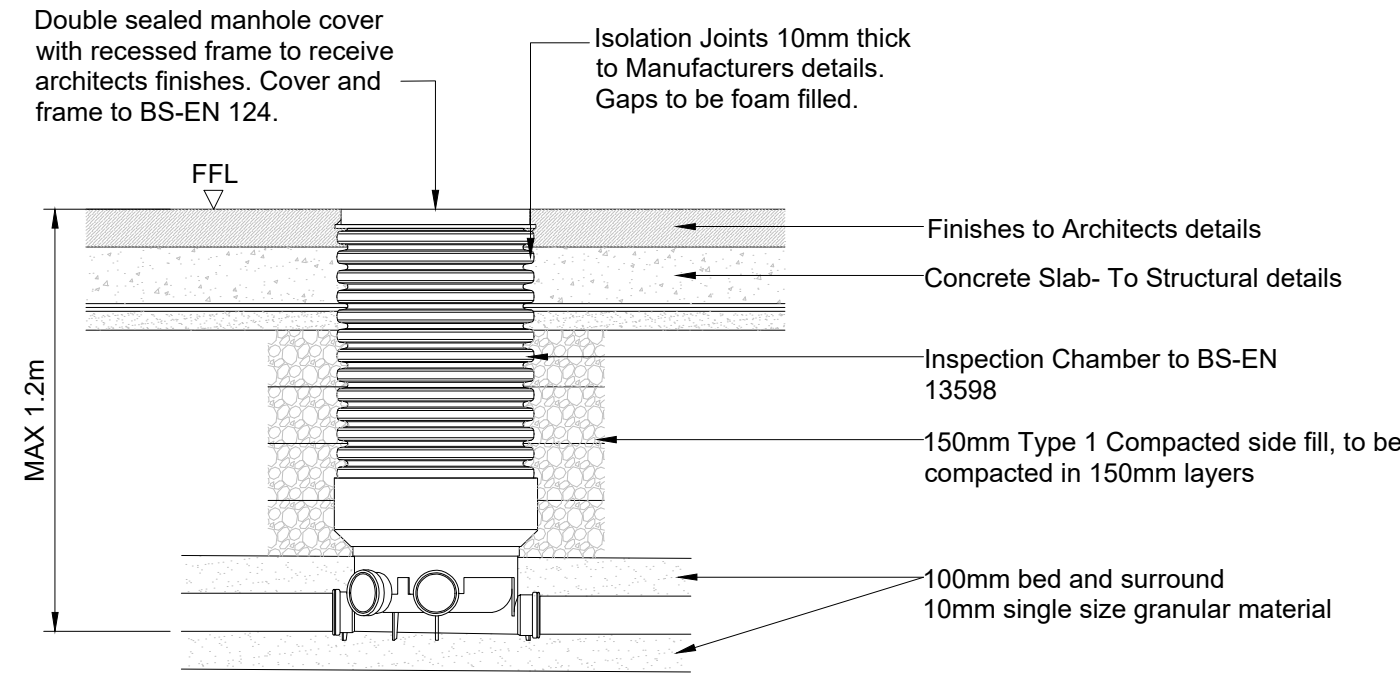
DRAINAGE NOTES

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Scale: NTS							
Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:

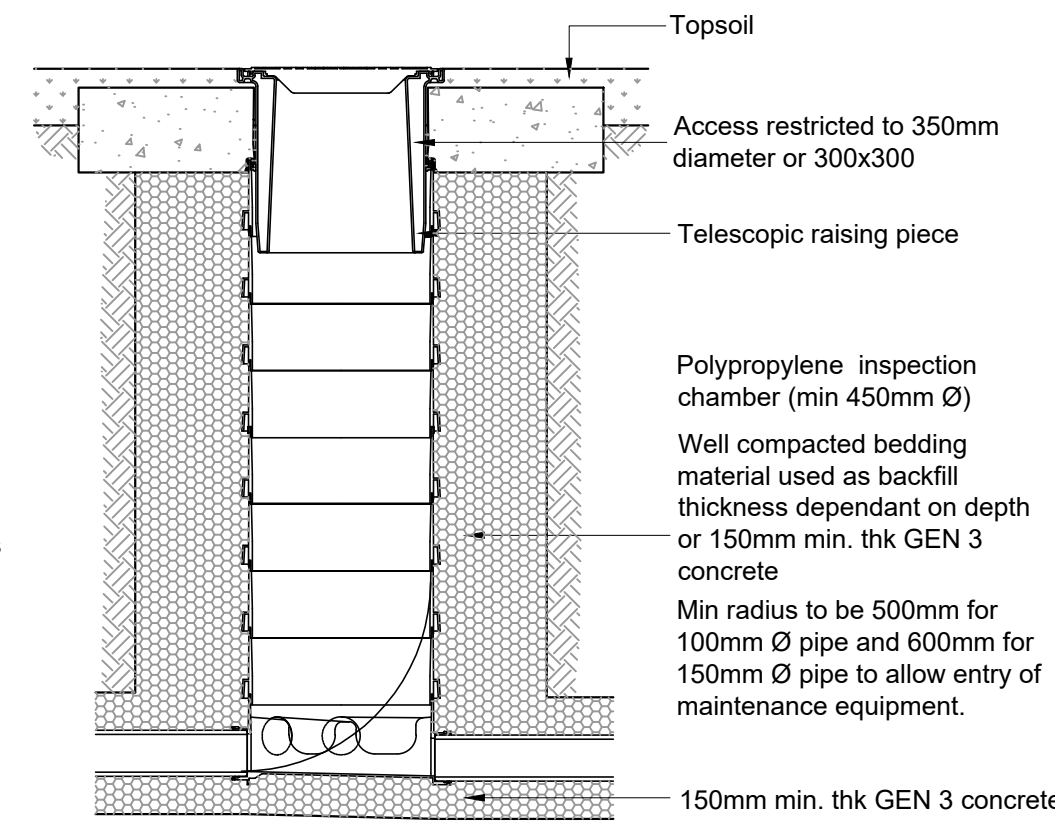
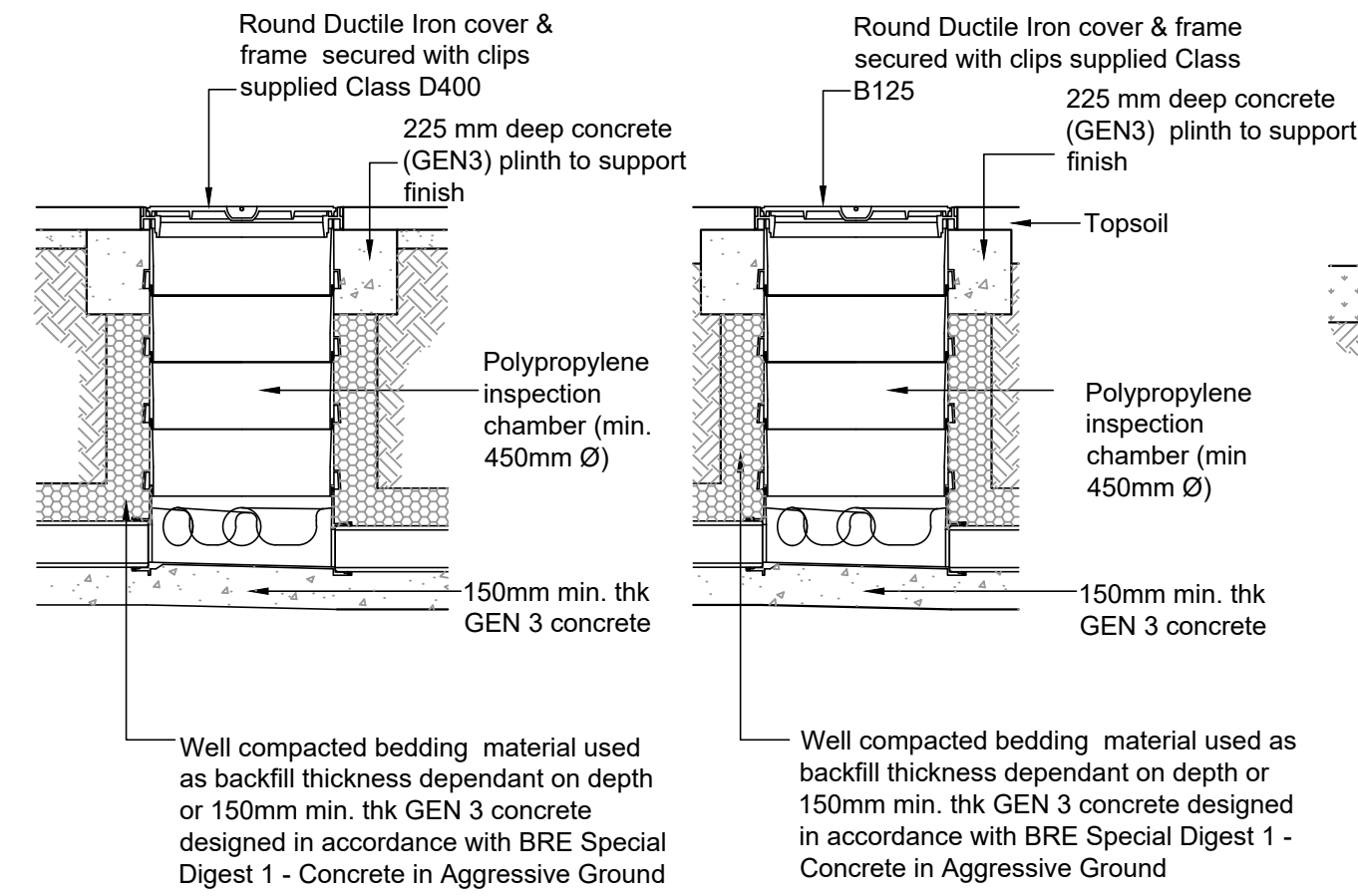
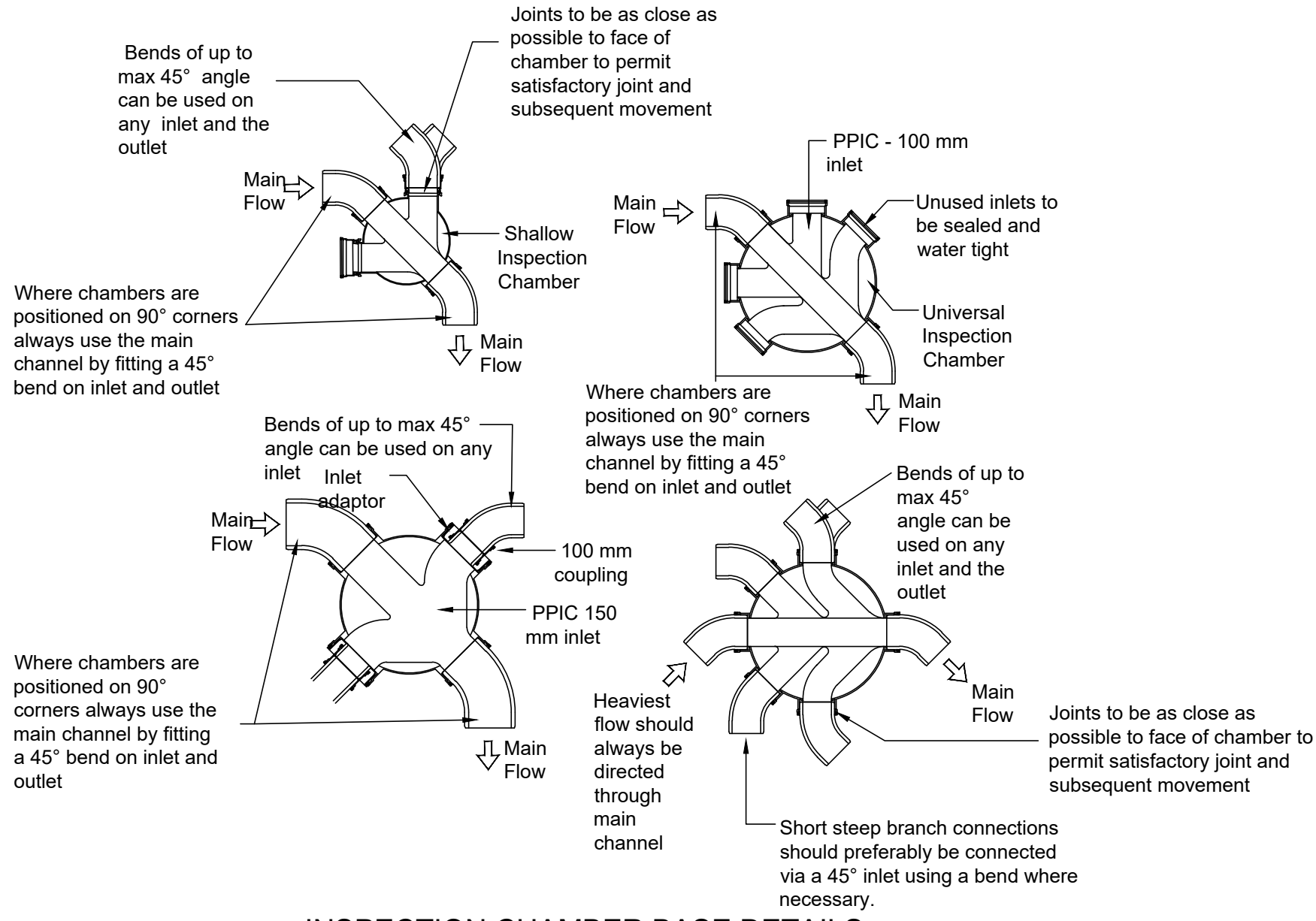
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TYPICAL INSPECTION CHAMBER COVER DETAILS

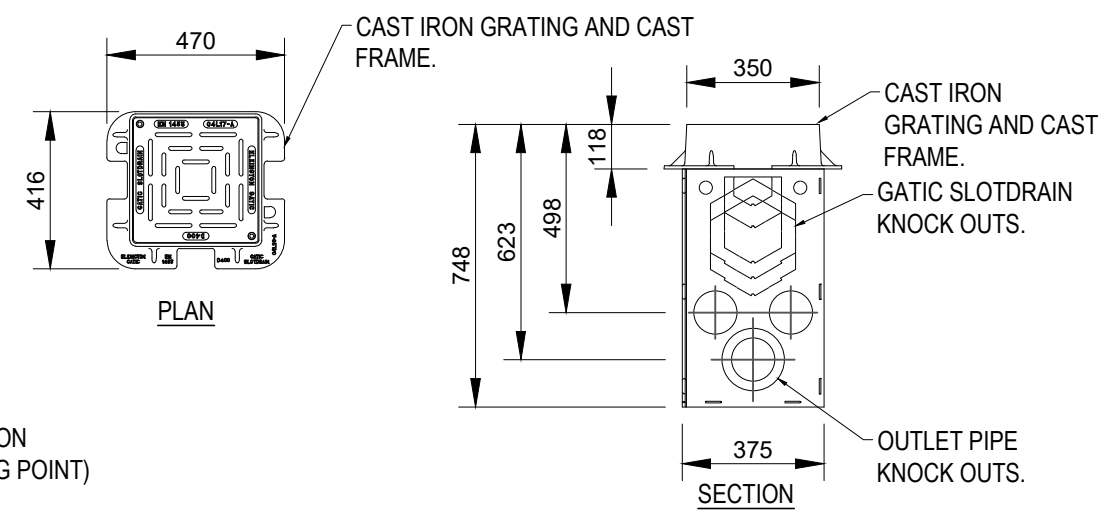
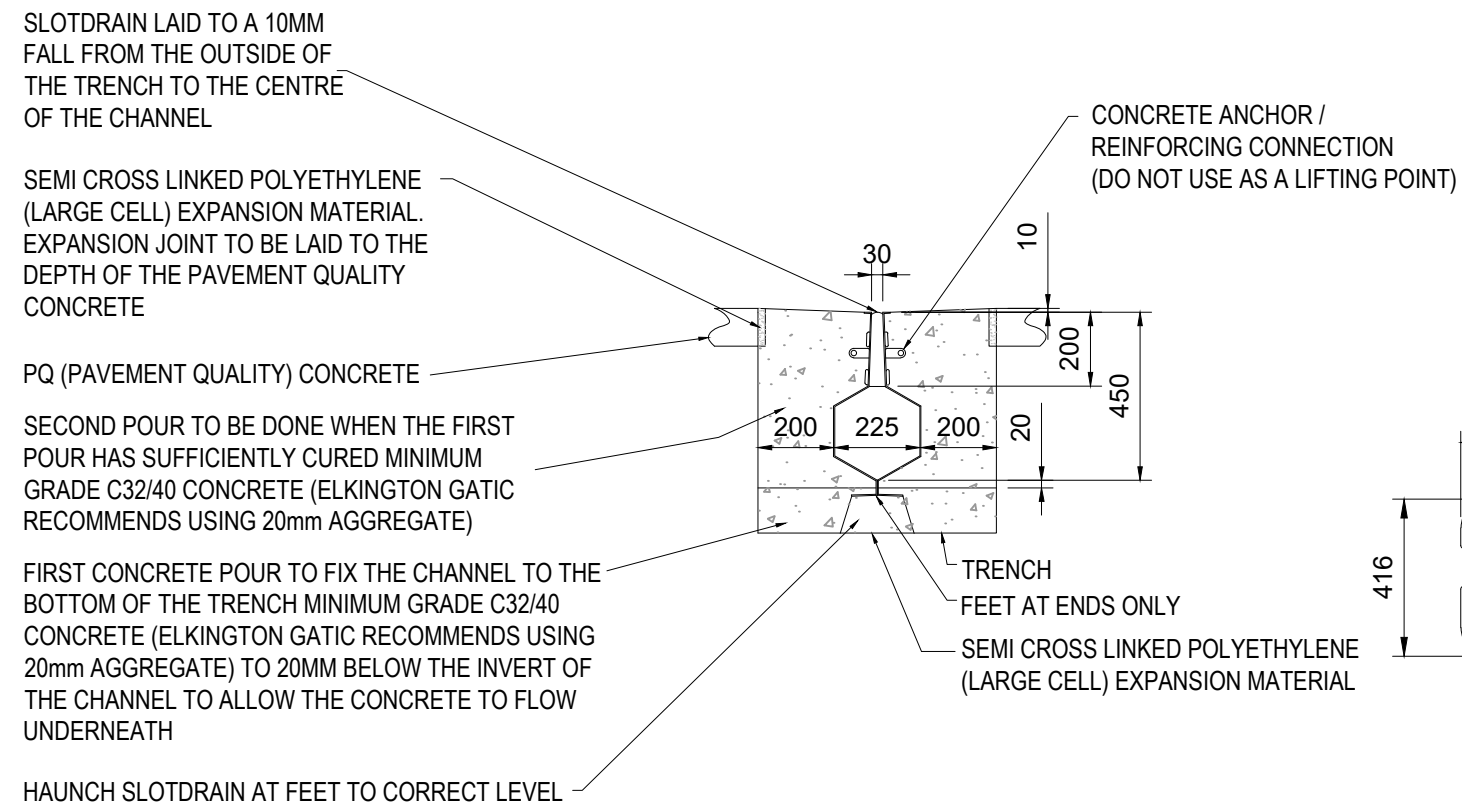
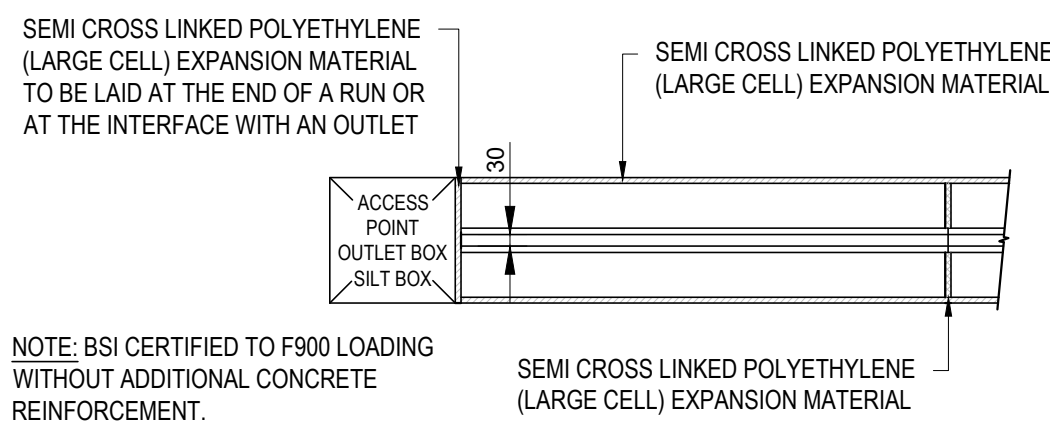
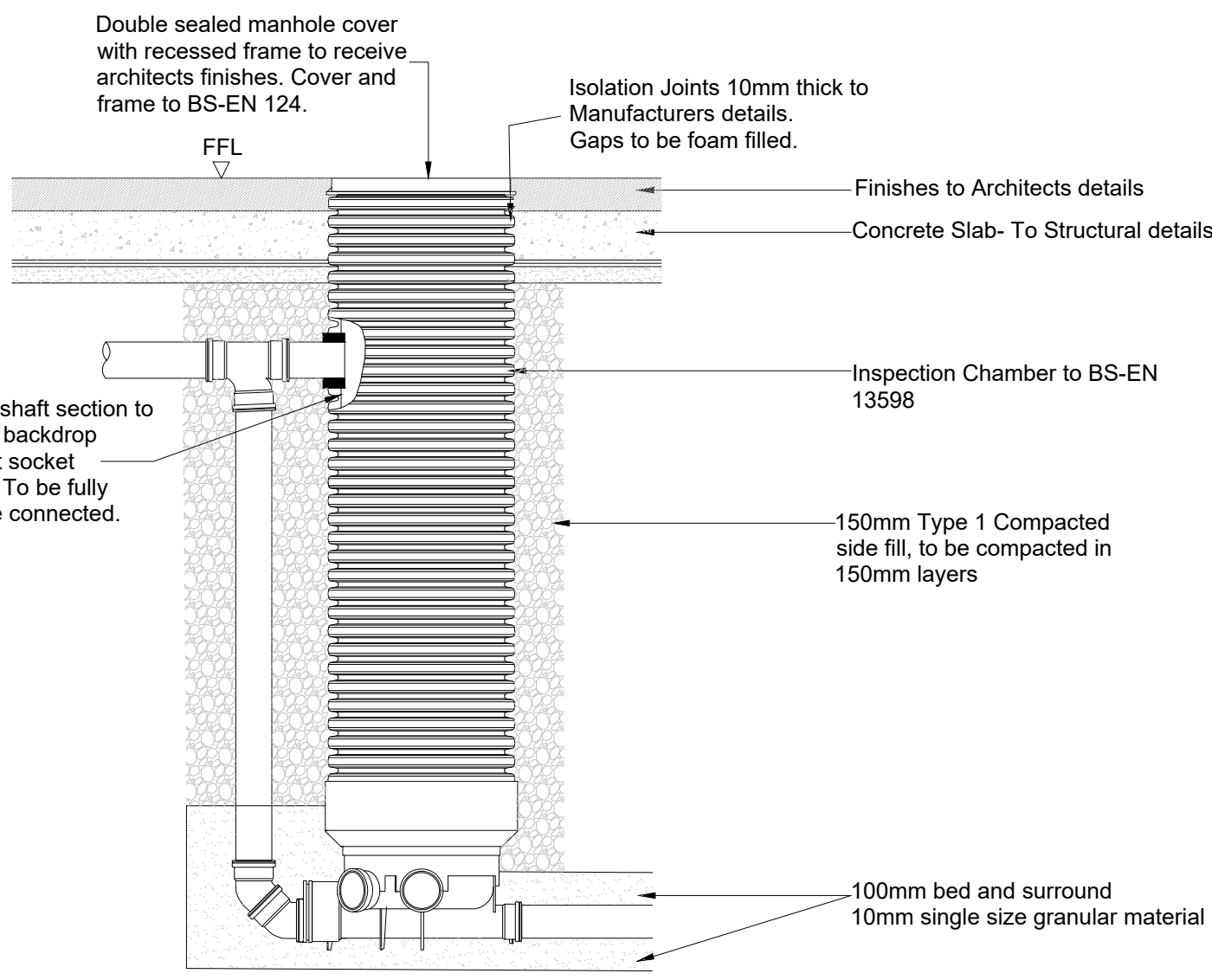


TYPICAL INTERNAL INSPECTION CHAMBER DETAIL



DEEP INSPECTION CHAMBER (IC) DETAIL

DEPTHS BETWEEN 1.2m AND 3.0m (SCALE 1:20)



- UNLESS NOTED OTHERWISE, ALL MORTAR TO BE CLASS 1 (1:3 CEMENT:SAND).
 - LIMESTONE PIPE BEDDING WILL NOT BE PERMITTED IN ACIDIC GROUNDWATER CONDITIONS. REFER TO CONTRACT SPECIFICATION FOR SPECIFIC DETAILS.
 - CUT ENDS OF ANY REINFORCED CONCRETE PIPES ARE TO BE TREATED WITH EPOXY RESIN PAINT/MORTAR.
 - CONSTRUCTION JOINTS IN CONCRETE SURROUND MUST NOT BE WITHIN 150MM OF CHAMBER RING JOINTS.
 - FLEXIBLE JOINTS SHALL BE PROVIDED AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF ANY STRUCTURE INTO WHICH IT IS BUILT. (SEE TABLE BELOW).
- | PIPE DIAMETER (mm) | MAX DIM "A" (mm) | MAX DIM "B" (mm) |
|--------------------|------------------|------------------|
| 150 | 150 | 500-750 |
| 225-450 | DIA | 500-750 |
| 525-600 | DIA | < 1000 |
- IN CLAY, SOIL, PIPE TRENCHES ARE TO BE BACKFILLED WITH CLEAN GRANULAR HARDWARE 75MM DOWN.
 - CONNECTIONS INTO MANHOLES SHALL BE CONSTRUCTED AT SOFFIT LEVEL, UNLESS DETAILED DIFFERENTLY ON CONSTRUCTION DRAWINGS.
 - SUITABLE MATERIAL/SELECTED FILL SHOULD BE READILY COMPACTABLE, FREE FROM TIMBER, FROZEN MATERIAL, VEGETATION AND FOREIGN MATTER. IT SHOULD EXCLUDE ANY LUMPS OF CLAY RETAINED ON A 100MM SIEVE AND STONES RETAINED ON A 40MM SIEVE.
 - CONCRETE BENCHING AND PIPE SURROUND SHALL BE PLACED IN A SINGLE CONTINUOUS OPERATION FROM THE TOP OF THE BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND.
 - PCC COVER SLABS AND MANHOLE RINGS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 AND KITEMARKED.
 - PCC COVER SLABS TO HAVE 600X750MM CLEAR OPENING UNLESS STATED OTHERWISE WITHIN THIS SCHEDULE AND BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3.
 - CORBEL SEATING UNITS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 TO BE USED ECCENTRIC OVER SLAB OPENING TO REDUCE FRO. 600X600MM OPENING IN IRONWORK TO 600X750MM OPENING IN COVER SLAB WHERE APPLICABLE.
 - ALL CONCRETE PIPEWORK TO BE MANUFACTURED TO BS-EN 1916 AND BS 5911:1 AND STRENGTH CLASS 120 AND KITEMARKED.
 - ALL CLAY PIPEWORK SHALL BE EXTRA STRENGTH CLAYWARE TO BS 295 AND BS 65 (SW PIPES ONLY).
 - THE CONTRACTOR MAY ELECT TO USE REINFORCES UPVC PIPES COVERED BY BS-EN 1401:1 FOR DIAMETERS UP TO AND INCLUDING 300MM.

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES.
- ALL ADAPTABLE 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.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 "DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS" AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
- THE SIZES OF MANHOLES STATED ARE MINIMUM. IF TWO OR MORE PIPES ENTER THE MANHOLE, THE CHAMBER SIZE MUST BE SUFFICIENT TO ACCOMMODATE THE ADEQUATE BENCHING WIDTHS. ALL PIPES BUILT INTO THE MANHOLE INVERT SHOULD BE INSTALLED WITH SOFFITS LEVEL.
- THE CONTRACTOR SHALL GIVE AT LEAST ONE WORKING DAYS NOTICE TO THE ENGINEER TO ALLOW OPPORTUNITY TO EXAMINE ANY FORMATION OR ANY WITNESS TESTING.
- ALL SOFT SPOTS TO BE REMOVED FROM THE BOTTOM OF EXCAVATIONS AND TO BE REFILLED TO FORMATION LEVEL WITH THE SAME MATERIAL AS PERMANENT WORKS WHICH REST IN IT.
- ALL CONCRETE AND CONCRETE PRODUCTS SHALL SATISFY THE SULPHATE CLASSIFICATION ADVISED IN THE SITE INVESTIGATION (BS-EN 206 STATES PORTLAND LIMESTONE CEMENT IS NOT PERMITTED). ALL CONCRETE GRADES STATED ON THIS DRAWING ARE THE MINIMUM STRENGTH REQUIREMENTS. THEY MUST BE CAPABLE OF RESISTING THE REQUIRED SULPHATE CLASSIFICATION.
- MANHOLE COVER CLASSIFICATION TO BE IN ACCORDANCE WITH BS-EN 124 AS SHOWN IN THE TABLE BELOW.

COVER TYPES TO EN124		
CLASS	LOAD (T)	APPLICATIONS
A	1.5	PEDESTRIAN ONLY AREAS
B	12.5	CAR PARKS
C	25	SERVICE ROADS NOT EXTENDING MORE THAN 500mm FROM KERB FACE INTO THE CARRIAGEWAY.
D	40	ROADS, LOADING AREAS AND CONCRETE HARDSTANDINGS.

COVER SIZES		
TYPE	LENGTH AND WIDTH (mm)	CIRCULAR (mm)
SMALL ACCESS FITTING	150 x 100	150
LARGE ACCESS FITTING	225 x 100	-
INSPECTION CHAMBER	450 x 450	450
MANHOLE FOR TYPE B MANHOLE WITH <1.8m INTERNAL HEIGHT	600 x 600 685 x 1220 MULTIPLE	600

CONCRETE TYPES			
LOCATION	TYPE	MAX AGGREGATE	NOMINAL SLUMP
ALL CONCRETE FOR DRAINAGE	GEN 3	20mm	S3

RATE OF SAMPLING FOR COMPRESSIVE STRENGTH TEST ONE SET OF CUBES PER 20cu m OR 10 BATCHES OF CONCRETE WHICHEVER REPRESENTS THE LESSER VOLUME, BUT NOT LESS THAN ONE FOR EACH DAY OR USE.

A SET OF CUBES IS TO COMPRISE THREE CUBES, ONE FOR TESTINE AT 28 DAYS, ONE FOR TESTING AT 7 DAYS AND A SPARE. THE NUMBER OF SPARE CUBES AND CUBES FOR TESTING AT 7 DAYS MAY BE REDUCED AT THE CONTRACTORS RISK.

P01	STAGE 3 ISSUE	16/11/20	AH	CD
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STAGE 3

Project:

OLDHAM ROAD, NEWTON HEATH

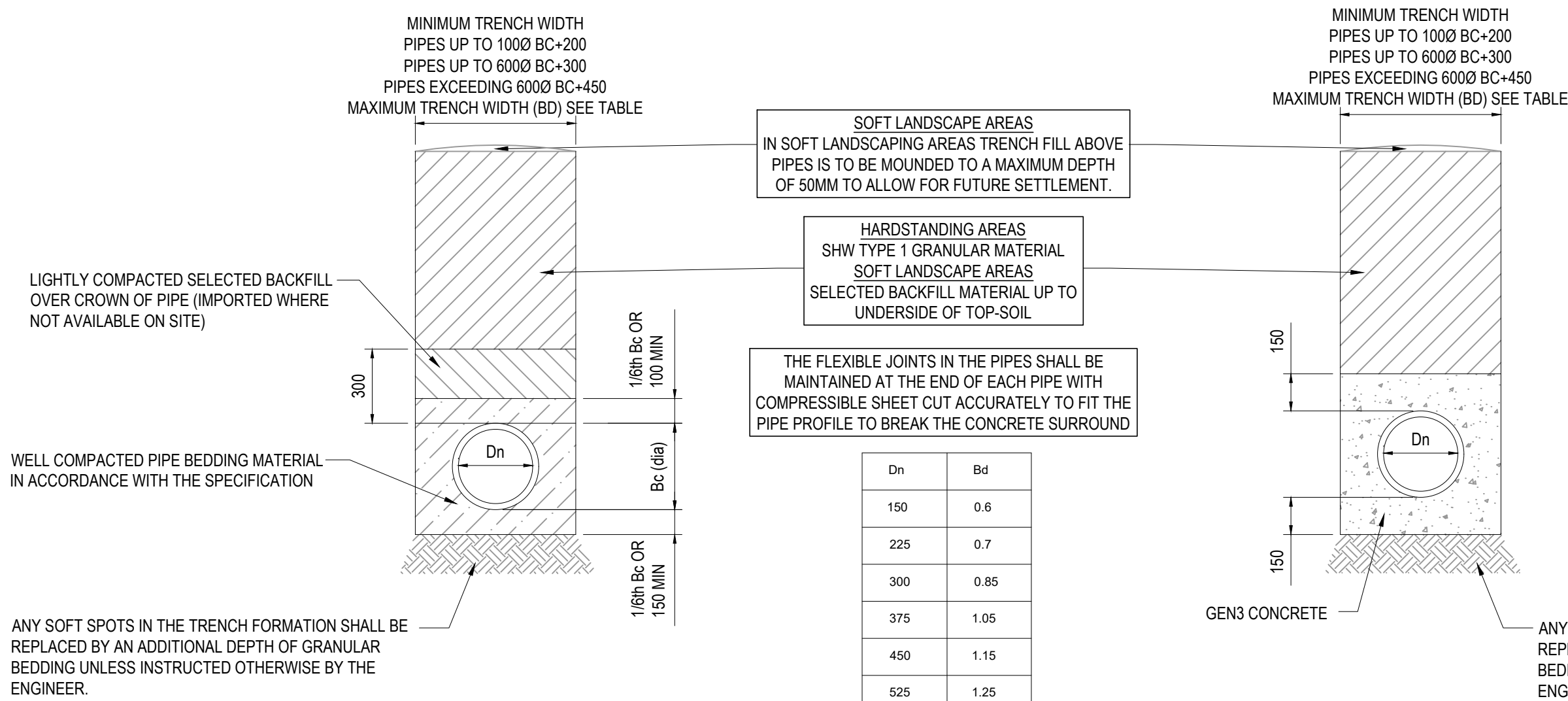
Dig Title:

DRAINAGE DETAILS SHEET 1

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
Scale: NTS					
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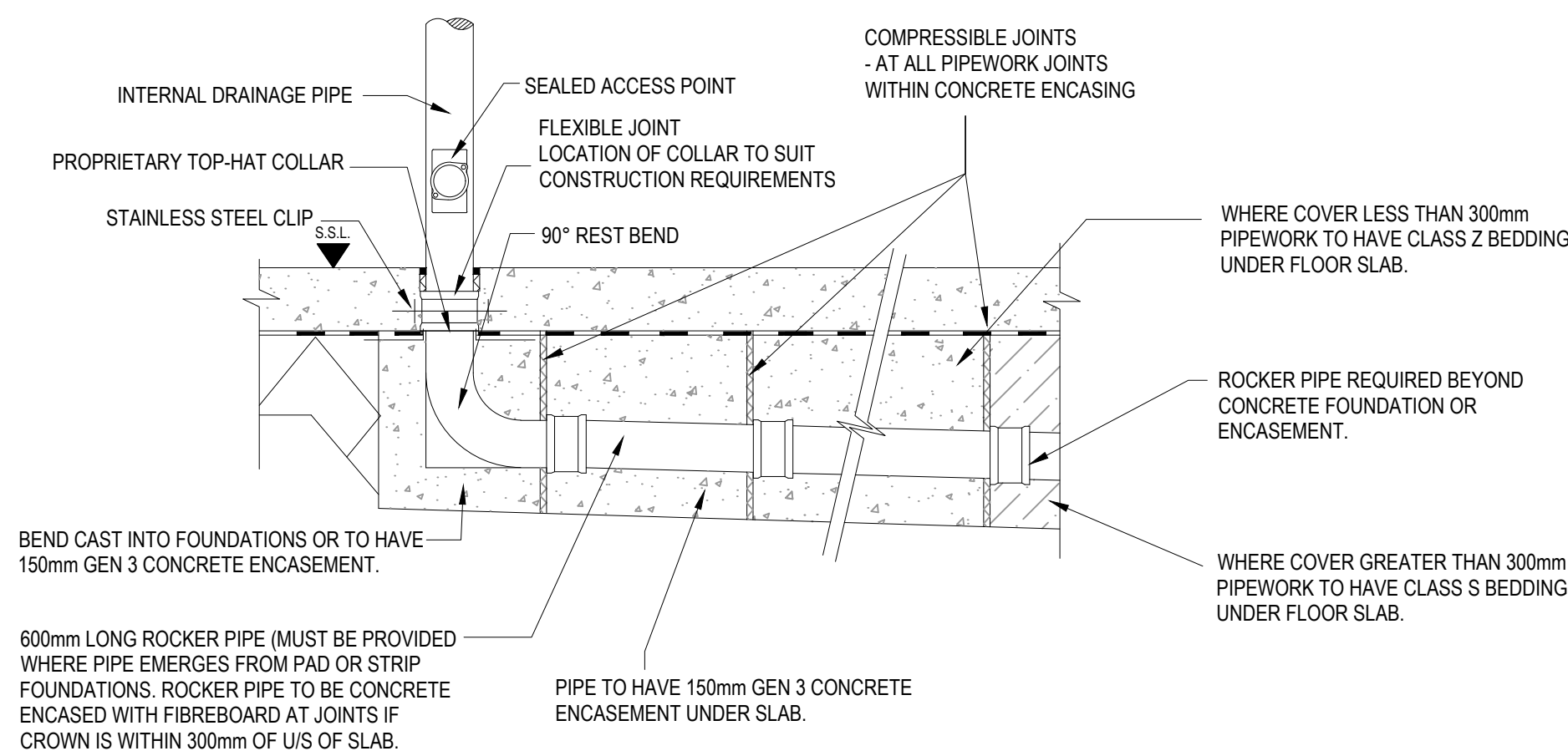
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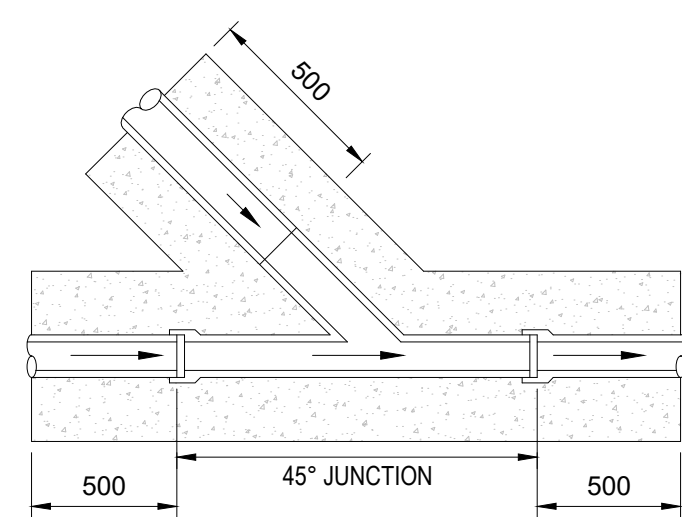
CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD,
COVER < 600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)

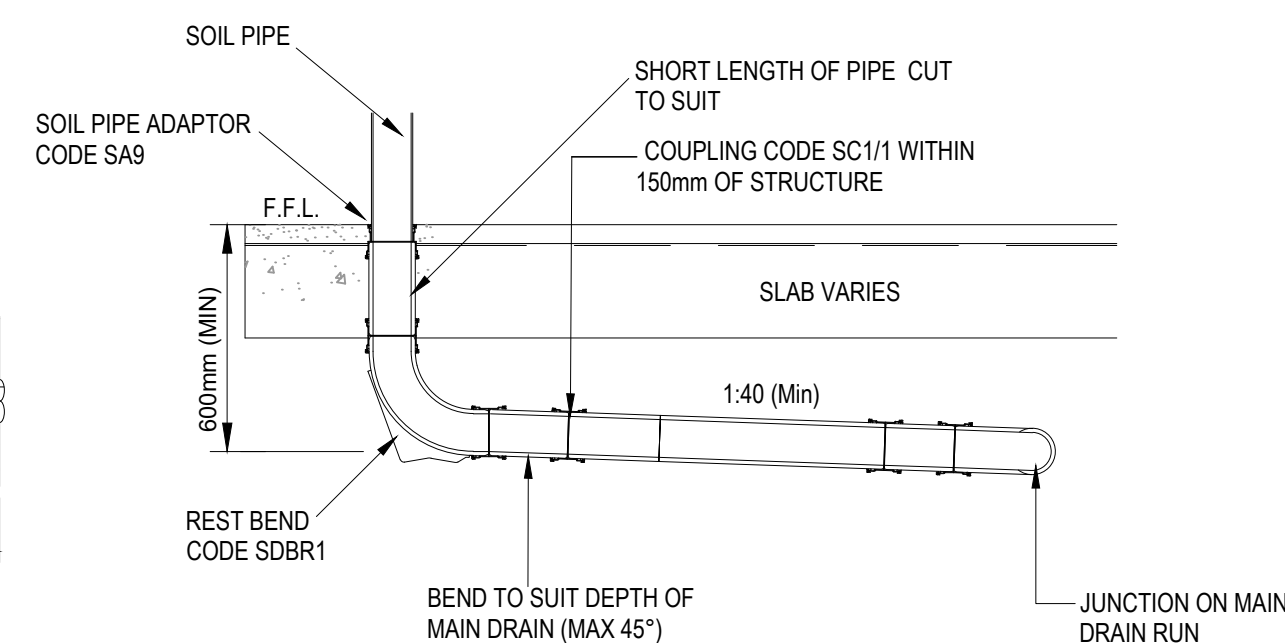
MAXIMUM TRENCH WIDTH



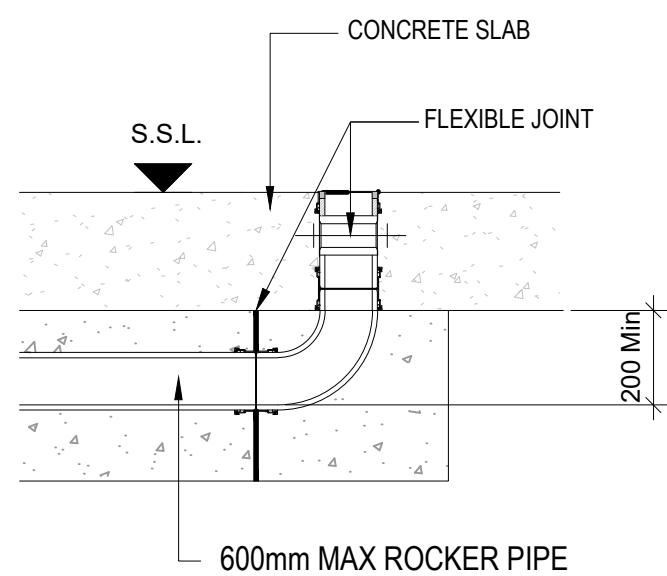
DRAINAGE UNDER BUILDINGS



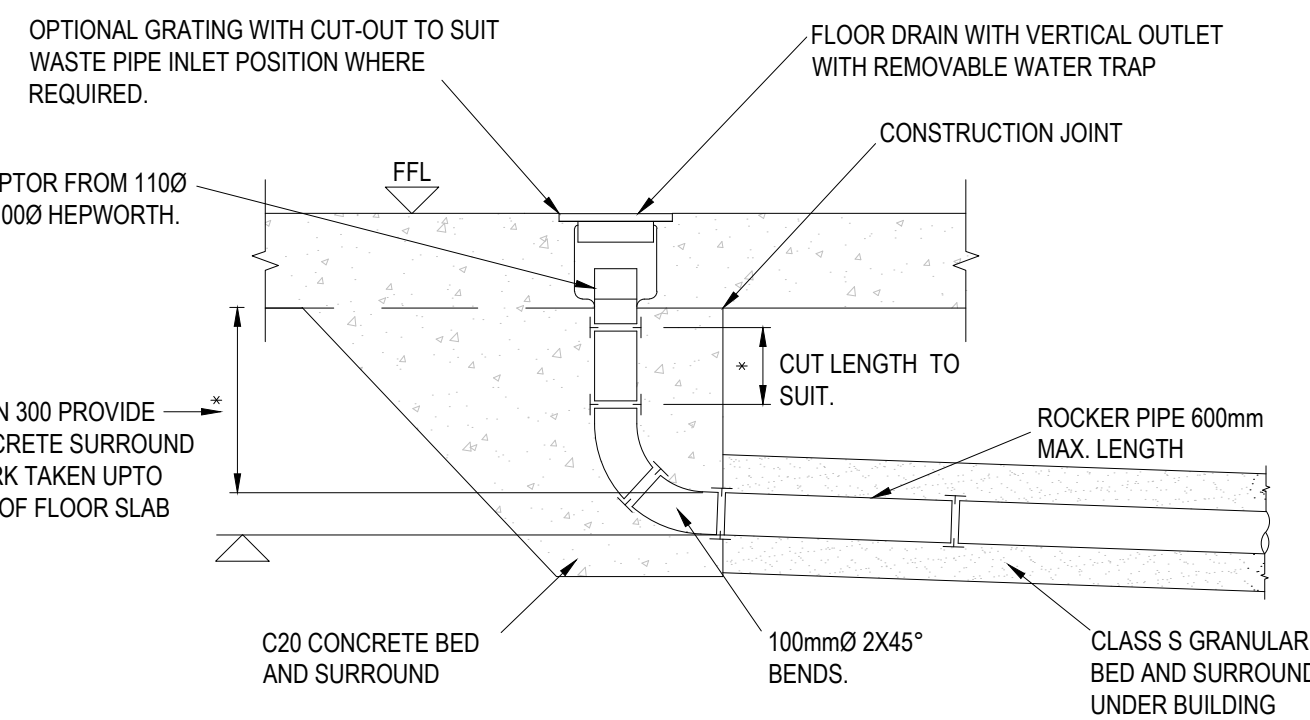
TYPICAL SADDLE CONNECTION



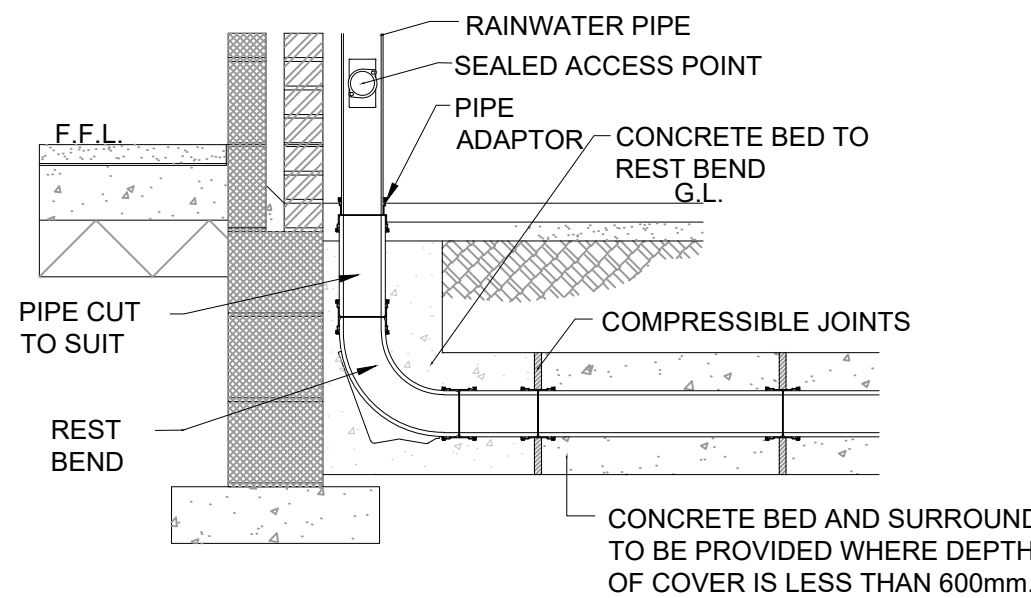
TYPICAL SVP CONNECTION TO
MAIN RUN



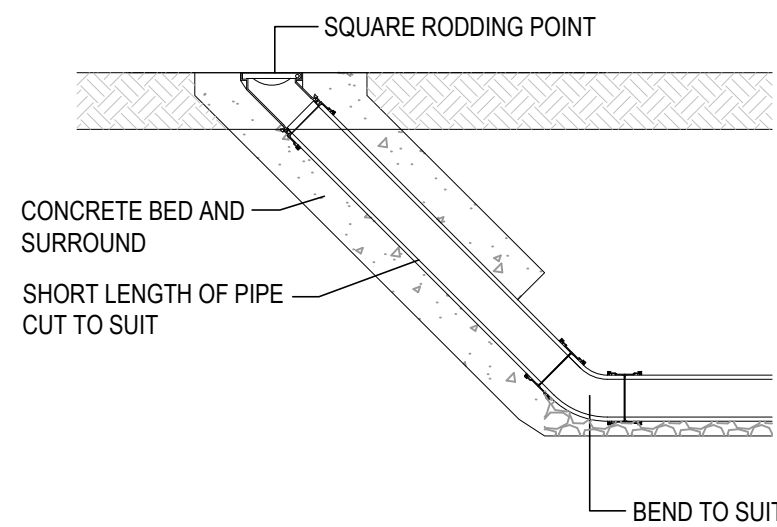
TYPICAL SECTION THROUGH SLAB
(100mmØ downpipe)



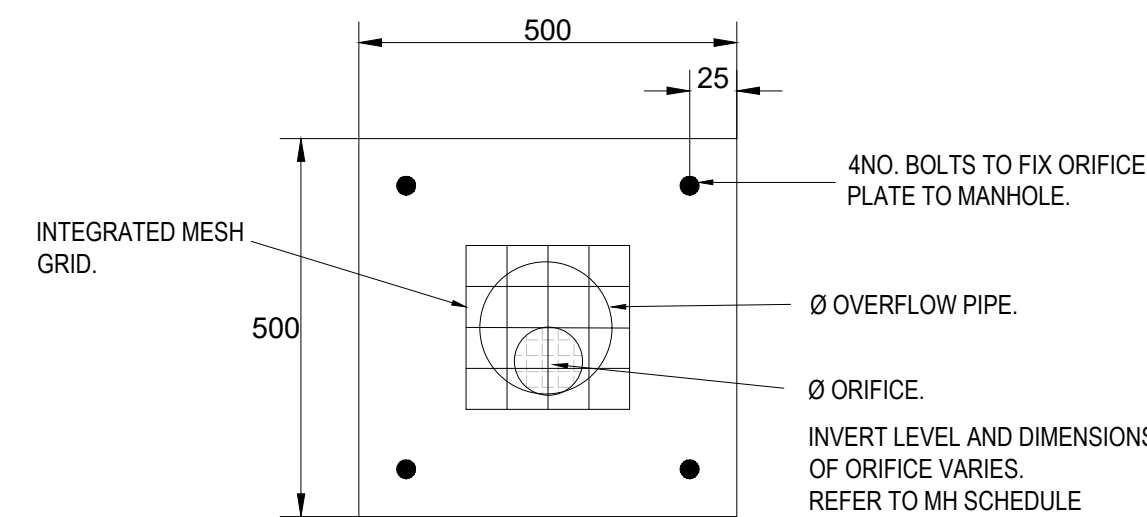
INTERNAL FLOOR DRAIN



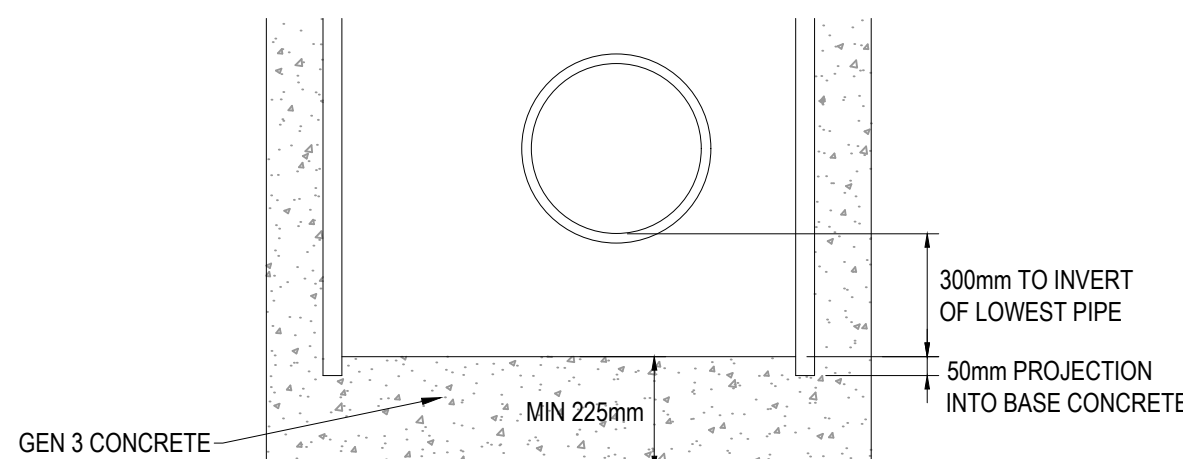
RWP CONNECTION DETAIL
(SCALE 1:20)



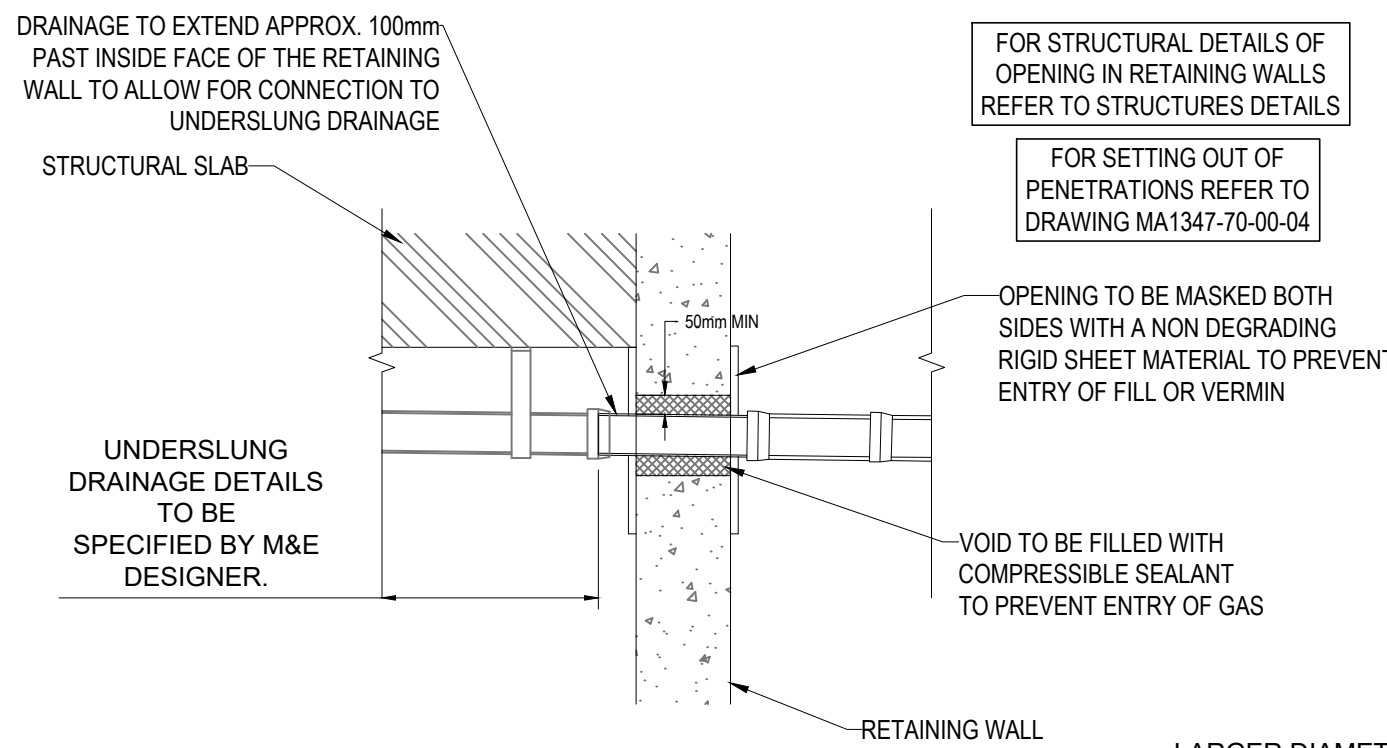
RODDING POINT DETAIL (RE)



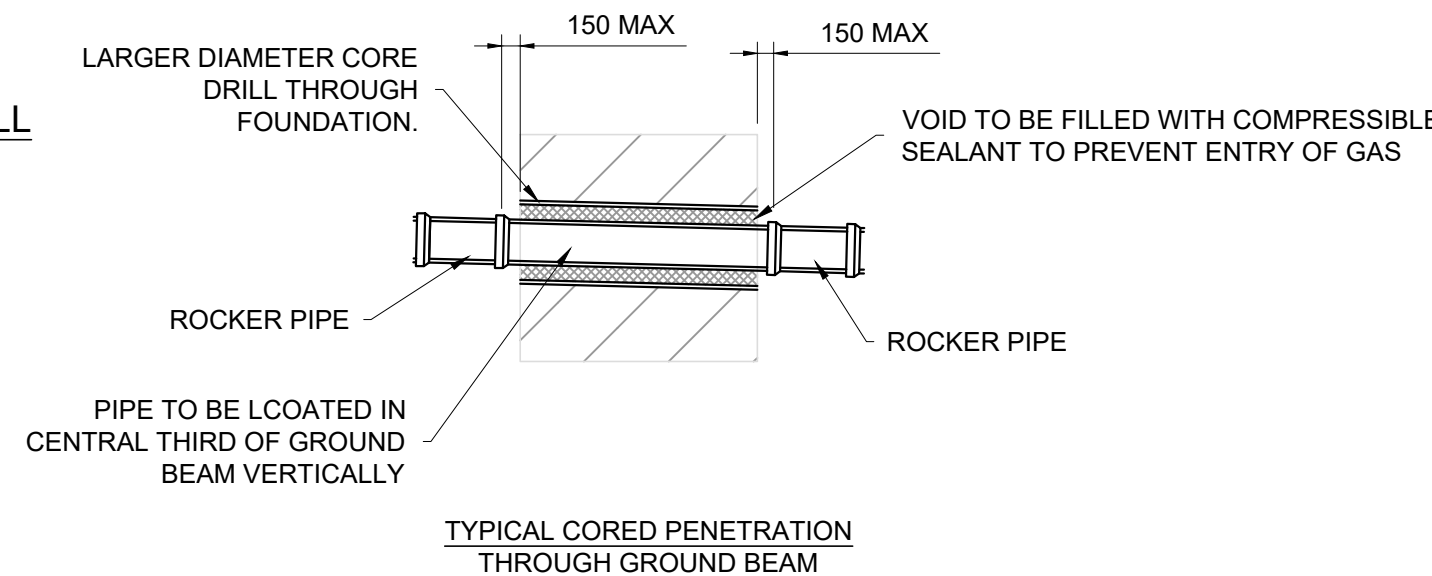
TYPICAL ORIFICE PLATE DETAIL



CATCH PIT DETAIL



PENETRATION DETAIL THROUGH RETAINING WALL



- UNLESS NOTED OTHERWISE, ALL MORTAR TO BE CLASS 1 (1:3 CEMENT:SAND).
 - LIMESTONE PIPE BEDDING WILL NOT BE PERMITTED IN ACIDIC GROUNDWATER CONDITIONS. REFER TO CONTRACT SPECIFICATION FOR SPECIFIC DETAILS.
 - CUT ENDS OF ANY REINFORCED CONCRETE PIPES ARE TO BE TREATED WITH EPOXY RESIN PAINT/MORTAR.
 - CONSTRUCTION JOINTS IN CONCRETE SURROUND MUST NOT BE WITHIN 150MM OF CHAMBER RING JOINTS.
 - FLEXIBLE JOINTS SHALL BE PROVIDED AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF ANY STRUCTURE INTO WHICH IT IS BUILT. (SEE TABLE BELOW).
- | PIPE DIAMETER (mm) | MAX DIM "A" (mm) | MAX DIM "B" (mm) |
|--------------------|------------------|------------------|
| 150 | 150 | 500-750 |
| 225-450 | DIA | 500-750 |
| 525-600 | DIA | < 1000 |
- IN CLAY, SOIL, PIPE TRENCHES ARE TO BE BACKFILLED WITH CLEAN GRANULAR HARD CORE 75MM DOWN.
 - CONNECTIONS INTO MANHOLES SHALL BE CONSTRUCTED AT SOFFIT LEVEL, UNLESS DETAILED DIFFERENTLY ON CONSTRUCTION DRAWINGS.
 - SUITABLE MATERIAL/SELECTED FILL SHOULD BE READILY COMPACTABLE, FREE FROM TIMBER, FROZEN MATERIAL, VEGETATION AND FOREIGN MATTER. IT SHOULD EXCLUDE ANY LUMPS OF CLAY RETAINED ON A 100MM SIEVE AND STONES RETAINED ON A 40MM SIEVE.
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 - PCC COVER SLABS TO HAVE 600X750MM CLEAR OPENING UNLESS STATED OTHERWISE WITHIN THIS SCHEDULE AND BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3.
 - CORBEL SEATING UNITS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 TO BE USED ECCENTRIC OVER SLAB OPENING TO REDUCE FRO. 600X600MM OPENING IN IRONWORK TO 600X750MM OPENING IN COVER SLAB WHERE APPLICABLE.
 - ALL CONCRETE PIPEWORK TO BE MANUFACTURED TO BS-EN 1916 AND BS 5911:1 AND STRENGTH CLASS 120 AND KITEMARKED.
 - ALL CLAY PIPEWORK SHALL BE EXTRA STRENGTH CLAYWARE TO BS 295 AND BS 65 (SW PIPES ONLY).
 - THE CONTRACTOR MAY ELECT TO USE REINFORCES UPVC PIPES COVERED BY BS-EN 1401:1 FOR DIAMETERS UP TO AND INCLUDING 300MM.

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES.
- ALL ADAPTABLE 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.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
- THE SIZES OF MANHOLES STATED ARE MINIMUM. IF TWO OR MORE PIPES ENTER THE MANHOLE, THE CHAMBER SIZE MUST BE SUFFICIENT TO ACCOMMODATE THE ADEQUATE BENCHING WIDTHS. ALL PIPES BUILT INTO THE MANHOLE INVERT SHOULD BE INSTALLED WITH SOFFITS LEVEL.
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- MANHOLE COVER CLASSIFICATION TO BE IN ACCORDANCE WITH BS-EN 124 AS SHOWN IN THE TABLE BELOW.

COVER TYPES TO EN124		
CLASS	LOAD (T)	APPLICATIONS
A	1.5	PEDESTRIAN ONLY AREAS
B	12.5	CAR PARKS
C	25	SERVICE ROADS NOT EXTENDING MORE THAN 500mm FROM KERB FACE INTO THE CARRIAGEWAY.
D	40	ROADS, LOADING AREAS AND CONCRETE HARDSTANDINGS.

COVER SIZES		
TYPE	LENGTH AND WIDTH (mm)	CIRCULAR (mm)
SMALL ACCESS FITTING	150 x 100	150
LARGE ACCESS FITTING	225 x 100	-
INSPECTION CHAMBER	450 x 450	450
MANHOLE FOR TYPE B MANHOLE WITH <1.8m INTERNAL HEIGHT	600 x 600 685 x 1220 MULTIPLE	600

CONCRETE TYPES			
LOCATION	TYPE	MAX AGGREGATE	NOMINAL SLUMP
ALL CONCRETE FOR DRAINAGE	GEN 3	20mm	S3

RATE OF SAMPLING FOR COMPRESSIVE STRENGTH TEST ONE SET OF CUBES PER 20cu m or 10 BATCHES OF CONCRETE WHICHEVER REPRESENTS THE LESSER VOLUME, BUT NOT LESS THAN ONE FOR EACH DAY OR USE.
A SET OF CUBES IS TO COMPRISE THREE CUBES, ONE FOR TESTINE AT 28 DAYS, ONE FOR TESTING AT 7 DAYS AND A SPARE. THE NUMBER OF SPARE CUBES AND CUBES FOR TESTING AT 7 DAYS MAY BE REDUCED AT THE CONTRACTORS RISK.

P01	STAGE 3 ISSUE	16/11/20	AH	CD
Rev:	Description:	Date:	By:	Chkd:

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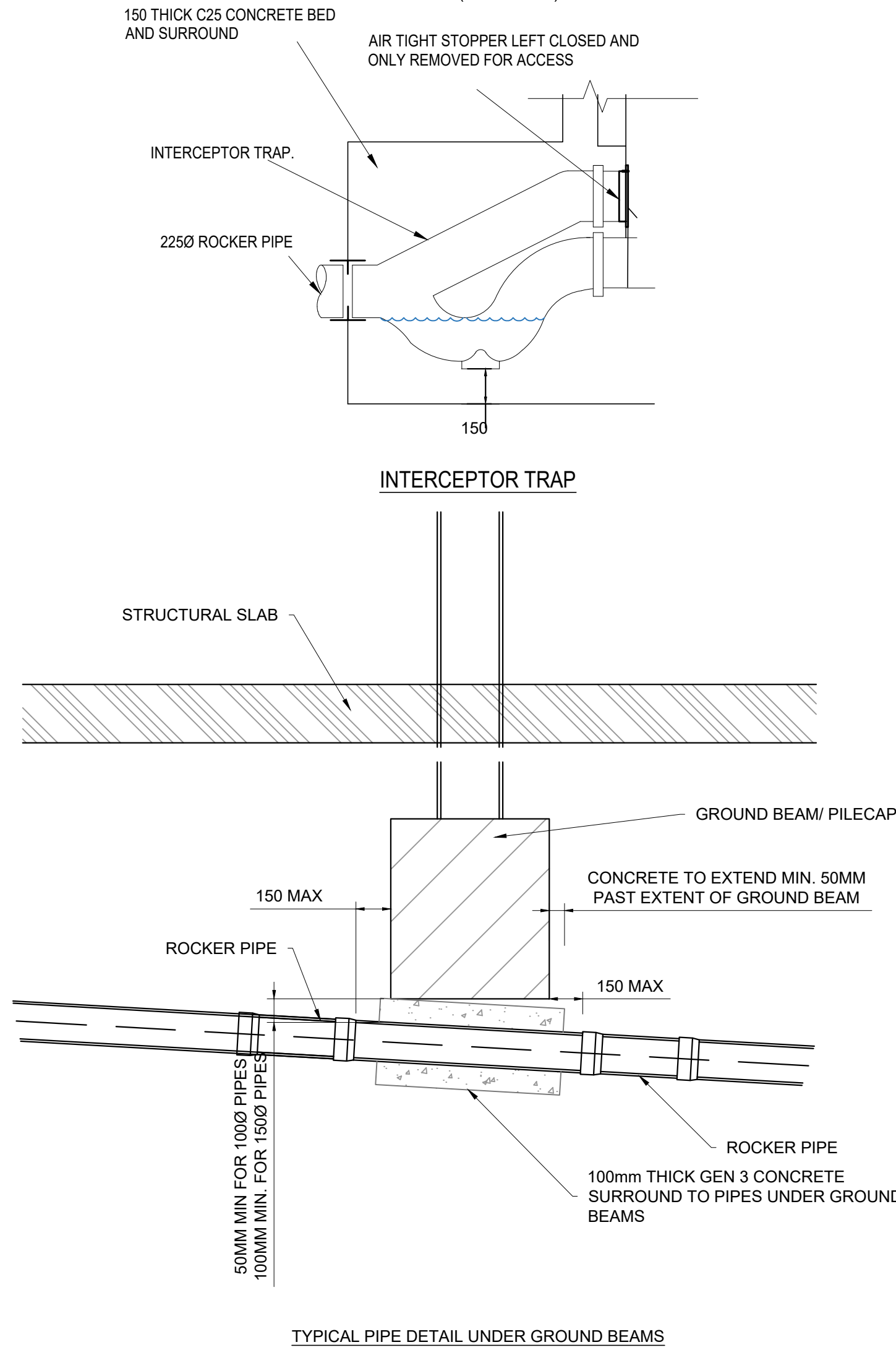
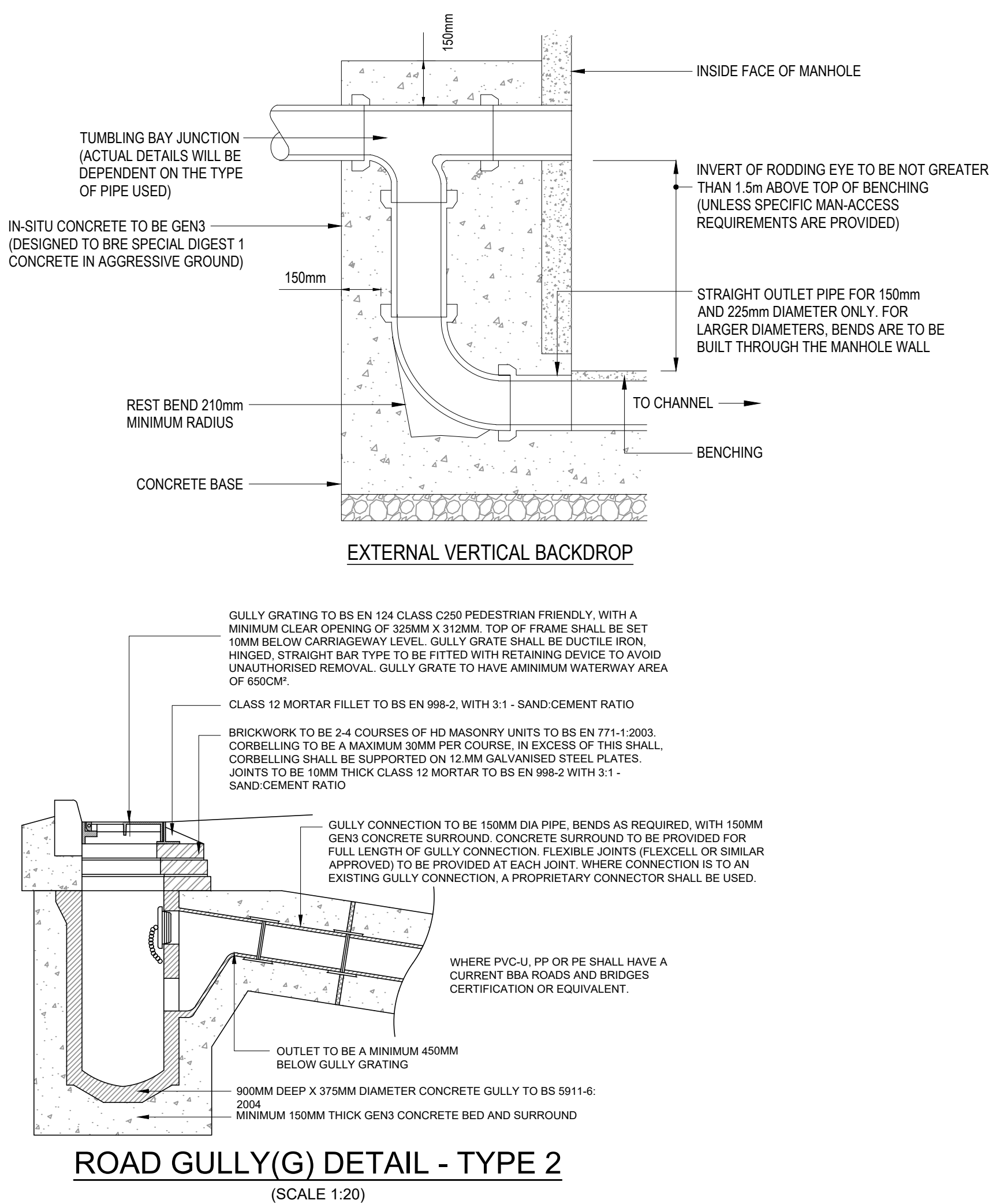
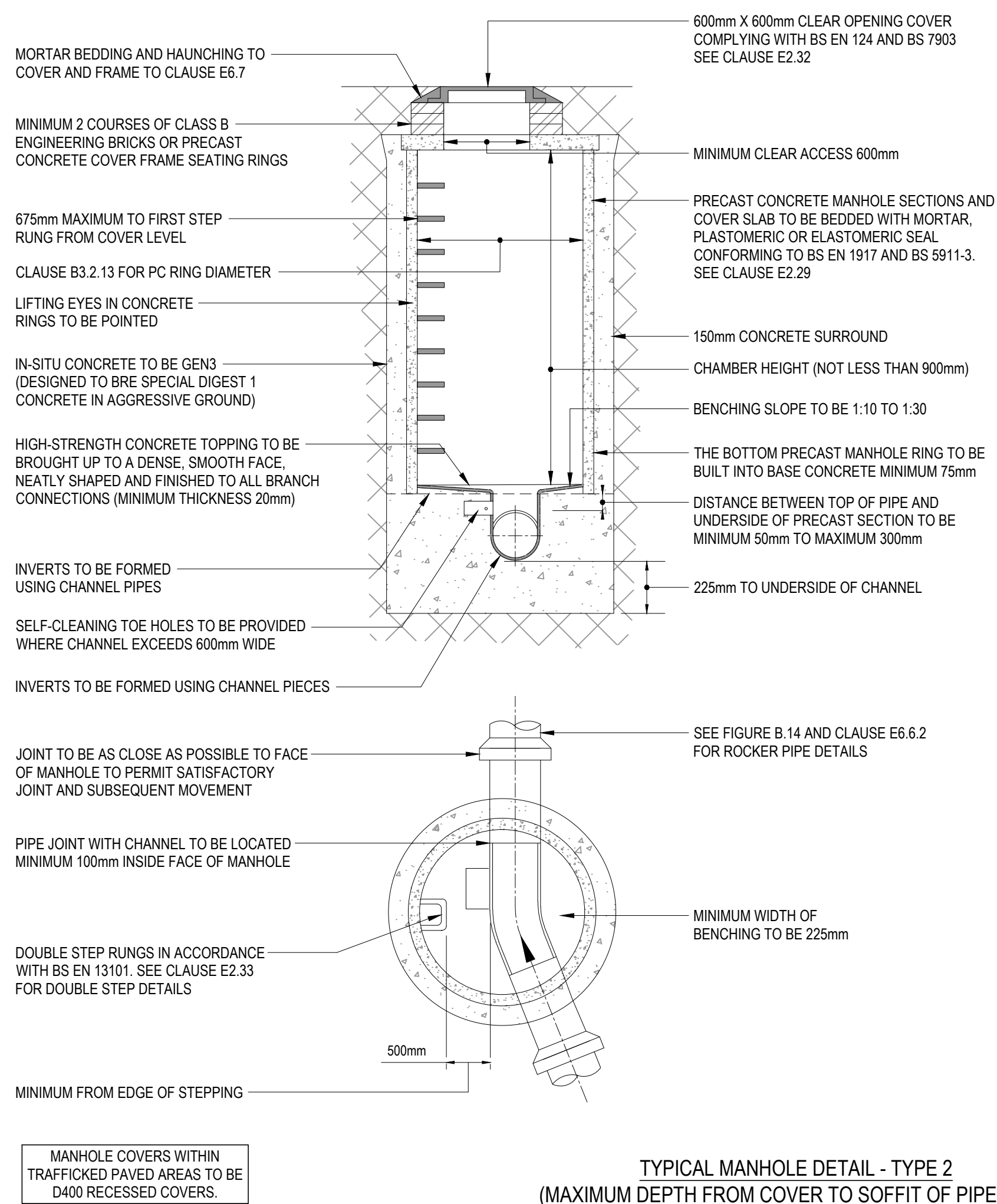
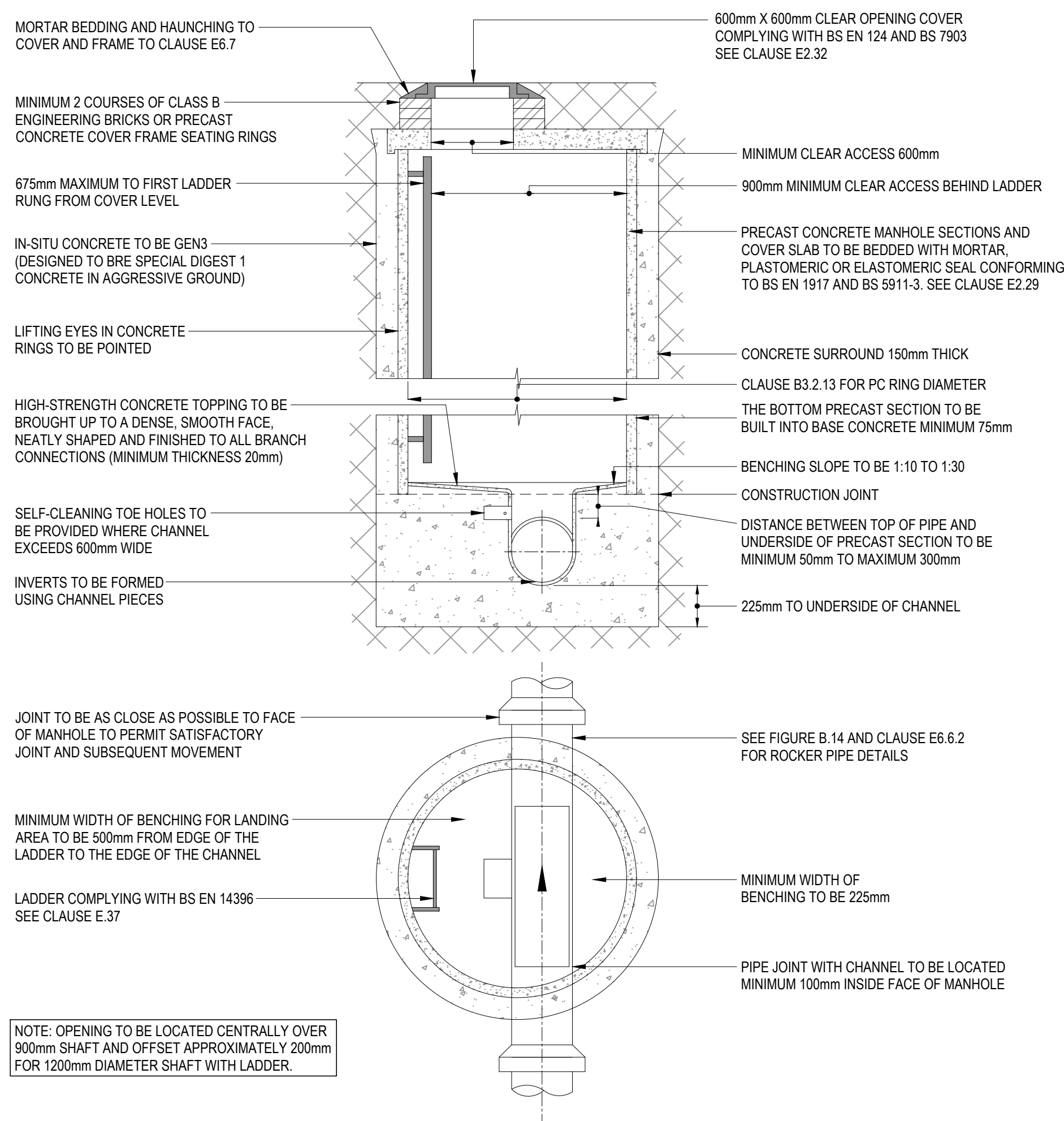
Status:

STAGE 3

Project:
OLDHAM ROAD, NEWTON HEATH

Dig Title:
DRAINAGE DETAILS
SHEET 2

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
Scale: NTS					
Project Code:	Originator:	Zone:	Level:	Type:	Discipline: Category / Number: Rev:
074031 - CUR - 00 - XX - DR - C -	92521	-P01			



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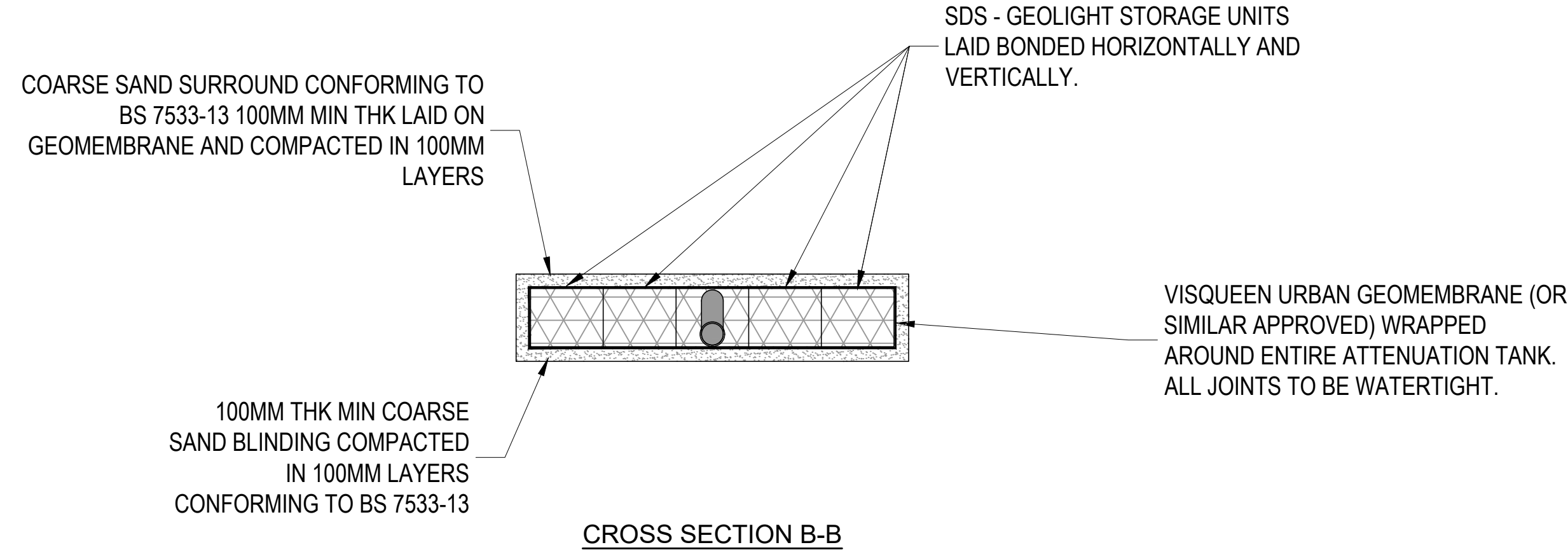
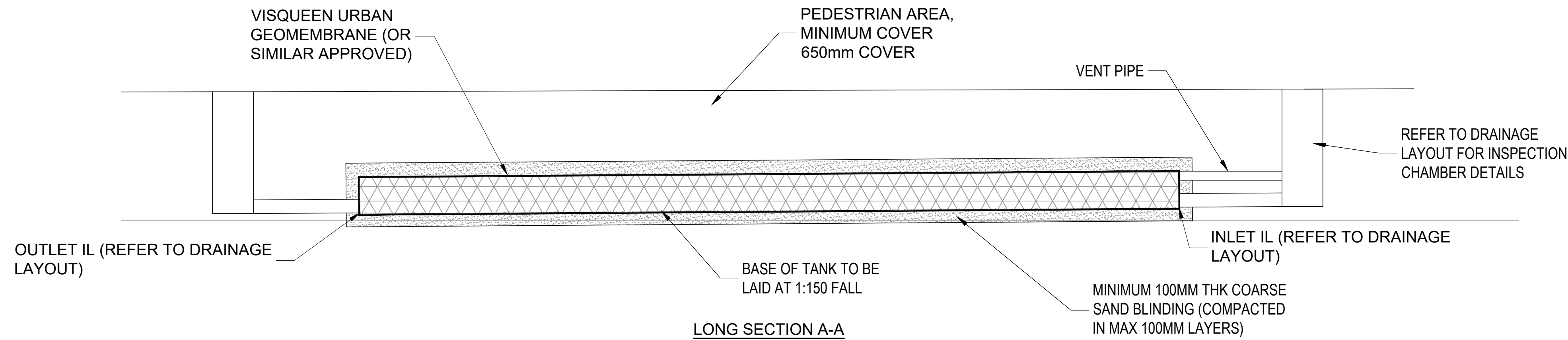
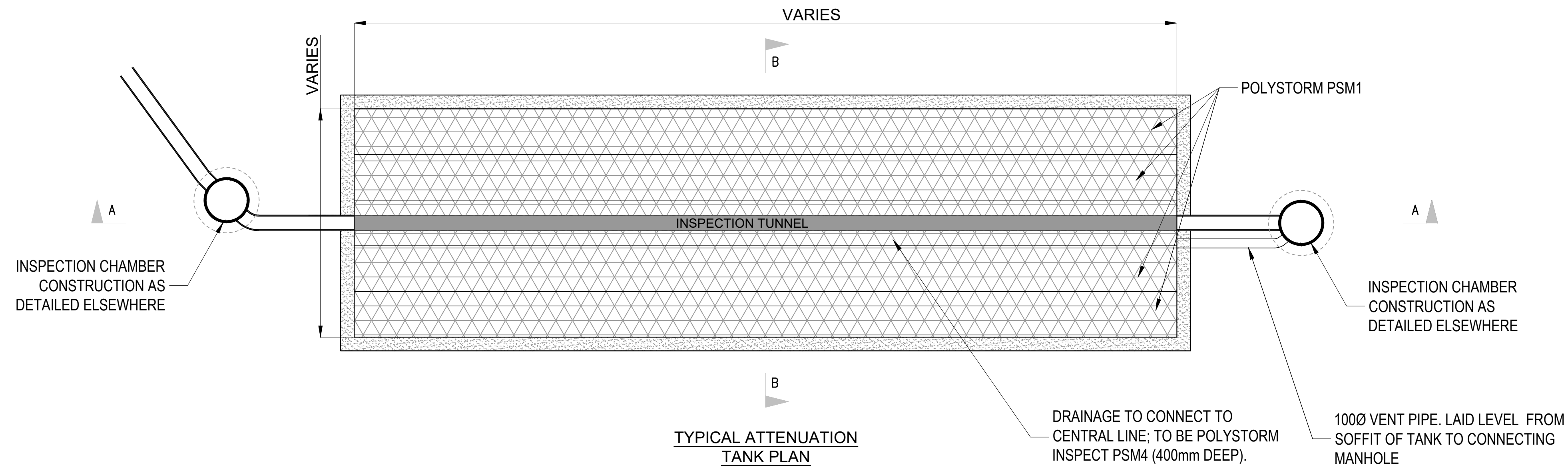
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WATER



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P01	STAGE 3 ISSUE	16/11/20	AH	CD
Rev:	Description:	Date:	By:	Chkd:



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Status: **STAGE 3**

Project: **OLDHAM ROAD, NEWTON HEATH**

Orig Title: **DRAINAGE DETAILS SHEET 4**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
Scale:	NTS				
Project Code:	Originator:	Zone:	Level:	Type:	Discipline:
074031 - CUR - 00 - XX - DR - C -					

Rev: 92523 -P01

\\media02\Projects\072001 - 076000\076166 - Rotherham Phase 2\04-Production\04-Model-Drawing\CD\02



DRAWING BASED ON:
CCTV SURVEY: LAYER SURVEYS LTD, LAY0243-01, DATED NOVEMBER 2019
TOPOGRAPHICAL SURVEY: SEP, SEP11190L-01, DATED NOVEMBER 2019
ARCHITECT LAYOUT: T8130D0020P1, DATED 16/01/2020

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 MILLIMETRES UNLESS NOTED OTHERWISE.

KEY

- INDICATES THE FLOW ROUTE BASED ON FULL INLET CAPACITY OF COMPONENTS . i.e FALLS AT SURFACE
- INDICATES THE GENERAL GROUND LEVEL FALLS TO THE DRAINAGE SYSTEM
- EXISTING GULLY LOCATIONS TAKEN FROM TOPOGRAPHICAL SURVEY

GROUND LEVELS TO FALL AWAY FROM THE PROPOSED BUILDING

P01	ISSUED FOR PLANNING CONDITION DISCHARGE	04/11/21	CG	CG
Rev:	Description:	Date:	By:	Chkd:



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Status: PRELIMINARY

Project: OLDHAM ROAD, NEWTON HEATH

Orig Title: PROPOSED OVERLAND FLOW ROUTES

Size:	Date:	Drawn By:	Designed By:	Checked By:			
A1	04/11/21	CG	CG	CG			
Scale: 1:500							
Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:

074031 - CUR - 00 - XX - DR - C - 92050 - P01

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Appendix B

Email Correspondence:

- MCC LLFA (Oliver Timmins) dated 08 January 2021
- United Utilities (Josephine Wong) dated 4th February 2021.

Chloé Grimsley

From: Adam Hogan
Sent: 27 January 2021 09:39
To: Adam Hogan
Subject: FW: Development at 1290 Oldham Road, Newton Heath

Sent: 08 January 2021 09:47
To: Flood Risk Management
Cc: Adam Hogan
Subject: RE: Development at 1290 Oldham Road, Newton Heath

Thanks for the confirmation.

Kind regards

Carl Dawson Senior Engineer
[Curtins](#)
T. 0161 236 2394 | carl.dawson@curtins.com

From: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Sent: 08 January 2021 09:37
To: Carl Dawson <Carl.Dawson@curtins.com>; Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Cc: Adam Hogan <Adam.Hogan@curtins.com>
Subject: RE: Development at 1290 Oldham Road, Newton Heath

Good Morning Carl,

The comment that MCC 'have no objection to a combination of both brownfield rates and greenfield rates' was made under the assumption that you would be providing a betterment of more than 50% of brownfield run-off rates.

As mentioned in my previous email, for this site, by using a 50% betterment on brownfield rates plus the additional greenfield rates (which is assumed to be draining via infiltration) you are actually not creating a 50% betterment to the UU system as you are adding the additional flows from the greenspace.

In addition, as mentioned in my previous email, United Utilities continue to highlight their concerns regarding the capacity of the combined network throughout Manchester. Therefore, to adopt a more sustainable approach, where large new developments (which are building over areas of greenspace) are proposing to connect to CW sewers we are encouraging developers to offer a greater reduction on the 50% betterment where possible.

Based on this, we will not be accepting the addition greenfield rates as part of the proposed rates. We would accept the MD model calculations of 104.8l/s (as specified in Adam's email), including the 50% betterment = 52.4l/s.

Kind Regards,

Oliver Timmins
Engineer (Flood Risk Management)
Mobile: 07814082200
Email: oliver.timmins@manchester.gov.uk

Lead Local Flood Authority
Highways
Growth & Development and Neighbourhoods Directorate
Manchester City Council
PO Box 532 Town Hall
Manchester
M60 2LA

Web: <http://www.manchester.gov.uk>

Chloé Grimsley

Subject: RE: Demolition of existing building and Redevelopment of 134 Dwellings at 1290 Oldham Road, Newton Heath (Grid ref: 388048, 400670) - UU Reference: 4200028725

From: Wong , Josephine <Josephine.Wong@uuplc.co.uk>
Sent: 04 February 2021 13:53
To: Carl Dawson <Carl.Dawson@curtins.com>
Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>; floodriskmanagement@manchester.gov.uk
Subject: Demolition of existing building and Redevelopment of 134 Dwellings at 1290 Oldham Road, Newton Heath (Grid ref: 388048, 400670) - UU Reference: 4200028725

Good afternoon, Carl

Demolition of existing building and Redevelopment of 134 Dwellings at 1290 Oldham Road, Newton Heath (Grid ref: 388048, 400670)
UU Reference: 4200028725

I refer to my telephone conversation this morning with Mr Oliver Timmins of the Lead Local Flood Authority regarding the surface water drainage of the above development.

We can confirm that we accept in principle the surface water drainage proposal agreed by Mr Timmins which was mentioned in Mr Timmins' email (attached) of the 08 January 2021 at 09:37.

Sewer Adoptions

If you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer), United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/>

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

<https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/>

A free copy of the new Design & Construction Guidance can be downloaded via the link below:

Should you have any query, please feel free to contact me.

Many thanks.

Kind regards,



Josephine Wong
Wastewater Developer Engineer
Developer Services & Metering
Customer Services
M: 07880308880 (from 7am to 1pm)
unitedutilities.com

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Coronavirus

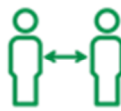
Prevent the spread



Wash your
hands



Disinfect
common surfaces



Practise social
distancing



FEVER +
COUGH

Stay home if you
have symptoms

[Click for our message to customers](#)

From: Carl Dawson [<mailto:Carl.Dawson@curtins.com>]

Sent: 27 January 2021 09:58

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Cc: Adam Hogan <Adam.Hogan@curtins.com>

Subject: Repeat PDE 270121

Hi Josephine,

We were already in correspondence with Matthew Dodd prior to his departure in which we had established a couple of things already:

In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

Infiltration

The Phase 2 Site Investigation report indicates that generally the geology of the site is made ground/topsoil, with superficial deposits comprising of Glacial Till. The Site Investigation works highlight that the underlying ground largely consists of made ground and includes contaminants such as heavy metals and hydrocarbons. Draining the site via infiltration may result in contamination to the underlying aquifer. The Site Investigation Study includes groundwater records at several locations across the site. The records show that the groundwater levels on the site vary from 0.20-2.79m bgl.

Draining the site via infiltration may result in the raising of the groundwater table; which could lead to localised groundwater flooding on site. Based on this evidence it is recommended that the site should not drain via infiltration.

Watercourse

The watercourse shown on the United Utilities sewer records is located approximately 56m south of site. No further watercourses are recorded in the vicinity of the site. To drain to this watercourse would not be feasible due to the distance from the site and the requirement to cross third party land. The routes would require c.120m lengths of excavation within the public highway, coordination and potential diversions of existing services and public sewers located within Holyoak st, Droyslden Road, Dulverton st and Old Church St. Access would also be required to other third party land in order to achieve this. This option was therefore deemed not feasible and instead, in line with the drainage hierarchy, proposed to connect to the adjacent combined sewers.

Surface Water Sewer

There are no surface water sewers in the vicinity of the site.

Combined Water sewer

It is therefore proposed to discharge both SW and FW to the public sewer via the 375mm pipe sewer on Holyoak Street and the 300mm sewer on Dulverton St. Existing connections will be used where possible.

The LLFA have reviewed and agreed to the above drainage hierarchy assessment.

With regards to discharge rates, please see the attached correspondence we issued to yourselves. I have summarised this below:

The site has existing buildings which discharges to pubic sewer and the remainder of the site is undeveloped greenfield site with no discharge to the public sewer.

The most accurate way to understand/determine the existing flow rates being discharged from a development is to create a hydraulic model of the existing drainage network within the site. Using Micro drainage software we have included all hardstanding areas to each pipe and run the 1, 30 and 100 year simulations to provide an accurate discharge rate from the existing site. This is a much more accurate way to determine this existing discharge rate, as it takes into consideration all storm events up to the 100 year event, existing pipe sizes, pipe lengths and gradients etc.

The existing brownfield part of the site discharges to public sewer (see attached);

1-year storm: 30.5 l/s

30-year storm: 84.4 l/s

100-year storm: 106.9 l/s

Therefore for the proposed development we intend to reduce flows by 50% to provide a betterment. See below total proposed discharge rates;

1 year: 15.25 l/s

30 year: 42.2 l/s

100 year plus CC: 53.45 l/s

The LLFA have reviewed the existing network calculations and catchment plans and have agreed to the proposed 50% betterment of brownfield rates.

Matthew Dodd's last correspondence was requesting a copy of the catchment plan, which is in the attached email, and also re-attached to this email.

Please can you review the above and provide your acceptance.

Kind Regards,

Adam Hogan Project Engineer

Curtins

T. 0161 236 2394 | adam.hogan@curtins.com

From: Carl Dawson <Carl.Dawson@curtins.com>

Sent: 26 January 2021 15:28

To: Adam Hogan <Adam.Hogan@curtins.com>

Cc: Chloé Grimsley <Chloe.Grimmsley@curtins.com>

Subject: FW: Proposed dwelling at 1290 Oldham Road, Newton Heath - UU Ref: 4200028725

Adam. See below. Can you prepare a response.

Thanks

Carl Dawson Senior Engineer

Curtins

T. 0161 236 2394 | carl.dawson@curtins.com

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Sent: 26 January 2021 15:21

To: Carl Dawson <Carl.Dawson@curtins.com>

Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Subject: Proposed dwelling at 1290 Oldham Road, Newton Heath - UU Ref: 4200028725

Good afternoon, Carl

Demolition of existing building and Redevelopment of 134 Dwellings at 1290 Oldham Road, Newton Heath (Grid ref: 388048, 400670)

UU Reference: 4200028725

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:
<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 375mm diameter public combined sewer within crossing the site. If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

- 1. into the ground (infiltration);**
- 2. to a surface waterbody;**
- 3. to a surface water sewer or highway drain;**
- 4. to a combined sewer.**

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the culverted/open ordinary watercourse/canal/main river/waterbody/pond (with onward flow) located to the south of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 375mm diameter public combined sewer crossing the site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 8.4 l/s for any storm event.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

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, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Sewer Adoptions

If you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer), United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/>

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

<https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/>

A free copy of the new Design & Construction Guidance can be downloaded via the link below:

<https://www.water.org.uk/wp-content/uploads/2020/03/SSG-App-C-Des-Con-Guide-v-2-100320-C.pdf>

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 10m which is measured 5m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:
<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

Sewer Map

United Utilities offer a fully supported mapping service at a modest cost for our water mains and sewerage assets. This is a service, which is constantly updated by our Property Searches Team (Tel No: 0870 7510101) and I recommend that the applicant give early consideration in project design as it is better value than traditional methods of data gathering. It is, however, the applicant's responsibility to demonstrate the exact relationship on site between any assets that may cross the site and any proposed development.

If we can be of any further assistance please don't hesitate to contact us further.

Many thanks.

Kind regards,



Josephine Wong

Wastewater Developer Engineer
Developer Services & Metering
Customer Services
M: 07880308880 (from 7am to 1pm)
[unitedutilities.com](https://www.unitedutilities.com)

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Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at WastewaterDeveloperServices@uuplc.co.uk

Coronavirus

Prevent the spread



Wash your
hands



Disinfect
common surfaces



Practise social
distancing



FEVER +
COUGH

Stay home if you
have symptoms

[Click for our message to customers](#)

From: Carl Dawson [<mailto:Carl.Dawson@curtins.com>]

Sent: 15 January 2021 15:47

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>; Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>

Cc: Adam Hogan <Adam.Hogan@curtins.com>; Chloé Grimsley <Chloe.Grimmsley@curtins.com>

Subject: RE: REPEAT 2: Proposed dwelling at 1290 Oldham Road, Newton Heath 4200028725 Due date 19/1

Hi.

As requested please see attached, existing catchment plan and existing drainage network.

Kind regards

Carl Dawson Senior Engineer

[Curtins](#)

T. 0161 236 2394 | carl.dawson@curtins.com

From: Wastewater Developer Services

Sent: 15 January 2021 12:15

To: Carl Dawson

Cc: Wastewater Developer Services

Subject: RE: REPEAT 2: Proposed dwelling at 1290 Oldham Road, Newton Heath 4200028725 Due date 19/1

Good Morning Carl

Thank you for providing the information. Can I please request that you provide an existing drainage plan, showing existing connectivity and the catchments areas draining to each length, with pipe sizes and cover/invert levels for each connecting length?

Please be aware that I will be leaving United Utilities on 18th January, so any future correspondence will need to go through WastewaterDeveloperServices@uuplc.co.uk

Kind regards



Matthew Dodd
Developer Engineer
Developer Services & Metering
Customer Services
T: 07468 758244
unitedutilities.com

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We now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at developerserviceswater@uuplc.co.uk

From: Wastewater Developer Services

Sent: 08 January 2021 09:57

To: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>

Subject: REPEAT 2: Proposed dwelling at 1290 Oldham Road, Newton Heath 4200028725 Due date 19/1

<https://uusp/asset/DSDD/Development%20Documents/Forms/AllItems.aspx?RootFolder=%2Fasset%2FDSDD%2FDevelopment%20Documents%2FManchester%2FPre%20Enquiry%2F2019%2F4200028725%20%201290%20%20Oldham%20Road%2C%20Newton%20Heath&FolderCTID=0x01200076B6A51D6F7F51478D46DE066F31A39C&View=%7B012D10BC%2D8A6E%2D465F%2D9704%2D60731F4571F6%7D>

Thanks sue



Sue King
Customer Services Advanced
Developer Services & Metering
Customer Services
T: 0345 072 6067
unitedutilities.com

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Please note that as from the 1 April 2020 the fee for the administration of a Building Over Agreement will be £153.00 (this fee is none vatable) <http://www.unitedutilities.com/build-over-sewer.aspx>).

Please send postal applications to the following address:

Wastewater Developer Services and Planning, 2nd floor Grasmere House, Lingley Mere Business Park, Lingley Green Ave, Great Sankey, Warrington WA5 3LP

Any applications sent to Gatewarth Industrial Estate will result in delays in your application.

From: Carl Dawson [<mailto:Carl.Dawson@curtins.com>]

Sent: 07 January 2021 11:57

To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Cc: Adam Hogan <Adam.Hogan@curtins.com>

Subject: RE: REPEAT 2: Proposed dwelling at 1290 Oldham Road, Newton Heath 4200028725 Due date 31/10/2019

Hi.

Thank you for your response.

The site has existing buildings which discharges to pubic sewer and the remainder of the site is undeveloped greenfield site with no discharge to the public sewer.

The most accurate way to understand/determine the existing flow rates being discharged from a development is to create a hydraulic model of the existing drainage network within the site. Using Micro drainage software we have included all hardstanding areas to each pipe and run the 1, 30 and 100 year simulations to provide an accurate discharge rate from the existing site. This is a much more accurate way to determine this existing discharge rate, as it takes into consideration all storm events up to the 100 year event, existing pipe sizes, pipe lengths and gradients etc.

The existing brownfield part of the site discharges to public sewer (see attached);

1-year storm: 30.5 l/s

30-year storm: 84.4 l/s

100-year storm: 106.9 l/s

The Greenfield run-off rates have also been added, calculated using the Qbar method (see below). Totalling;

1-year storm: 35.0 l/s

30-year storm: 93.2 l/s

100-year storm: 117.7 l/s

ICPSUDS

ICP SUDS Input (FSR Method)

Return Period (Years) **Partly Urbanised Catchment (QBAR)**

Area (ha) Urban

SAAR (mm) Region

Soil

Growth Curve

Results

QBAR rural (l/s)

QBAR urban (l/s)

Return Period Flood

Region	QBAR (l/s)	Q (1 yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	5.2	4.4	4.4	9.8	12.8
Region 2	5.2	4.5	4.5	9.8	13.6
Region 3	5.2	4.4	4.4	9.1	10.8
Region 4	5.2	4.3	4.3	10.1	13.3
Region 5	5.2	4.5	4.5	12.4	18.4
Region 6/Region 7	5.2	4.4	4.4	11.7	16.5
Region 8	5.2	4.0	4.0	9.9	12.5
Region 9	5.2	4.6	4.6	9.1	11.3
Region 10	5.2	4.5	4.5	8.8	10.8

OK Cancel Help

Enter Return Period between 1 and 1000

Therefore for the proposed development we intend to reduce flows by 50% to provide a betterment. See below total proposed discharge rates;

1 year: 17.5 l/s

30 year: 46.6 l/s

100 year plus CC: 58.85 l/s

Please can you review the above and provide your acceptance.

Kind regards

Carl Dawson Senior Engineer

[Curtins](#)

T. 0161 236 2394 | carl.dawson@curtins.com

EMGateway3.uuplc.co.uk made the following annotations

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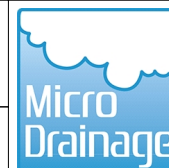
T. 0161 236 2394
manchester@curtins.com
www.curtins.com



Appendix C

Proposed Surface Water Drainage Calculations – 1 year, 30 year and 100 year +40%cc events.

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Designed by grimsley c

Checked by

Network 2017.1.2

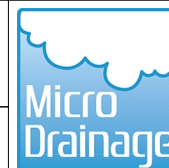
	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
	1.000	9.174	0.115	80.0	0.001	5.00	0.0	0.600	o	150	Pipe/Conduit
	1.001	28.112	0.281	100.0	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit
	2.000	20.237	0.696	29.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
	1.002	14.226	0.142	100.0	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit
	1.003	5.534	0.055	100.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
	3.000	7.034	0.120	58.6	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit
	4.000	7.770	0.510	15.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
	3.001	13.301	0.393	33.8	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit
	1.004	9.699	0.109	88.8	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit
	5.000	12.876	0.270	47.7	0.002	5.00	0.0	0.600	o	150	Pipe/Conduit
	5.001	12.988	0.130	100.0	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit
	1.005	34.639	0.451	76.8	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit
	6.000	25.422	0.960	26.5	0.004	5.00	0.0	0.600	o	150	Pipe/Conduit

	PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
	1.000	85.870	0.001	0.0	1.12	19.9
	1.001	85.755	0.006	0.0	1.00	17.8
	2.000	86.170	0.000	0.0	1.87	33.1
	1.002	85.474	0.025	0.0	1.00	17.8
	1.003	85.332	0.029	0.0	1.00	17.8
	3.000	85.790	0.015	0.0	1.32	23.3
	4.000	86.180	0.000	0.0	2.59	45.8
	3.001	85.670	0.029	0.0	1.74	30.7
	1.004	85.277	0.066	0.0	1.07	18.9
	5.000	86.170	0.002	0.0	1.46	25.8
	5.001	85.900	0.004	0.0	1.00	17.8
	1.005	85.168	0.091	0.0	1.49	59.4
	6.000	85.810	0.004	0.0	1.96	34.7

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Date 04/11/2021 23:50
File Site 1 proposed drainag...
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Designed by grimsley_c
Checked by



Innovyze

Network 2017.1.2

Existing Network Details for Storm

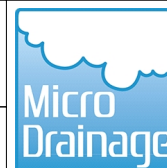
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
6.001	4.166	0.042	100.0	0.047	0.00		0.0 0.600	o	150	Pipe/Conduit
6.002	9.102	0.091	100.0	0.000	0.00		0.0 0.600	o	150	Pipe/Conduit
1.006	5.967	0.317	18.8	0.036	0.00		0.0 0.600	o	225	Pipe/Conduit
1.007	36.439	0.364	100.0	0.019	0.00		0.0 0.600	o	225	Pipe/Conduit
7.000	12.801	0.160	80.0	0.000	5.00		0.0 0.600	o	150	Pipe/Conduit
7.001	10.694	0.135	79.4	0.024	0.00		0.0 0.600	o	150	Pipe/Conduit
7.002	8.790	0.110	80.0	0.000	0.00		0.0 0.600	o	150	Pipe/Conduit
7.003	5.986	0.063	95.0	0.033	0.00		0.0 0.600	o	150	Pipe/Conduit
8.000	8.681	0.087	100.0	0.040	5.00		0.0 0.600	o	150	Pipe/Conduit
8.001	5.531	0.581	9.5	0.000	0.00		0.0 0.600	o	150	Pipe/Conduit
7.004	11.974	0.332	36.1	0.024	0.00		0.0 0.600	o	225	Pipe/Conduit
1.008	14.458	0.100	144.6	0.027	0.00		0.0 0.600	o	225	Pipe/Conduit
9.000	24.345	0.520	46.8	0.018	5.00		0.0 0.600	o	225	Pipe/Conduit
9.001	28.800	0.650	44.3	0.045	0.00		0.0 0.600	o	225	Pipe/Conduit
9.002	6.021	0.767	7.9	0.057	0.00		0.0 0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I. Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
6.001	84.850	0.051	0.0	1.00	17.8
6.002	84.808	0.051	0.0	1.00	17.8
1.006	84.717	0.179	0.0	3.03	120.5
1.007	84.400	0.198	0.0	1.31	52.0
7.000	84.100	0.000	0.0	1.12	19.9
7.001	83.940	0.024	0.0	1.13	20.0
7.002	83.805	0.024	0.0	1.12	19.9
7.003	83.695	0.057	0.0	1.03	18.2
8.000	84.300	0.040	0.0	1.00	17.8
8.001	84.213	0.040	0.0	3.29	58.1
7.004	83.632	0.121	0.0	2.19	86.9
1.008	83.300	0.346	0.0	1.09	43.2
9.000	85.535	0.018	0.0	1.92	76.2
9.001	85.015	0.063	0.0	1.97	78.4
9.002	84.365	0.120	0.0	4.70	186.9

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Designed by grimsley_c
Checked by



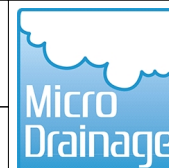
Network 2017.1.2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
10.000	26.660	0.267	100.0	0.050	5.00	0.0	0.600	o	225	Pipe/Conduit
9.003	14.020	0.258	54.3	0.054	0.00	0.0	0.600	o	225	Pipe/Conduit
9.004	10.318	0.140	73.7	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	17.180	0.172	99.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	20.648	0.438	47.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.011	21.259	0.214	99.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	2.416	0.012	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
10.000	83.865	0.050	0.0	1.31	52.0
9.003	83.598	0.225	0.0	1.78	70.7
9.004	83.340	0.238	0.0	1.53	60.6
1.009	83.200	0.584	0.0	1.31	52.0
1.010	83.028	0.584	0.0	1.47	26.0
1.011	82.590	0.584	0.0	1.31	52.2
1.012	81.539	0.584	0.0	0.92	36.6

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Upstream Manhole

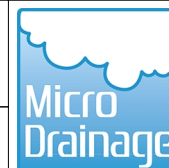
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	o	150	1	87.220	85.870	1.200	Open Manhole		600
1.001	o	150	2	87.220	85.755	1.315	Open Manhole		600
2.000	o	150	3	87.220	86.170	0.900	Open Manhole		600
1.002	o	150	4	87.180	85.474	1.556	Open Manhole		1200
1.003	o	150	5	87.130	85.332	1.648	Open Manhole		600
3.000	o	150	6	87.140	85.790	1.200	Open Manhole		600
4.000	o	150	7A	87.230	86.180	0.900	Open Manhole		600
3.001	o	150	7	87.020	85.670	1.200	Open Manhole		600
1.004	o	150	8	87.100	85.277	1.673	Open Manhole		600
5.000	o	150	9	87.220	86.170	0.900	Open Manhole		600
5.001	o	150	10	86.950	85.900	0.900	Open Manhole		600
1.005	o	225	11	87.130	85.168	1.737	Open Manhole		600

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	9.174	80.0	2	87.220	85.755	1.315	Open Manhole		600
1.001	28.112	100.0	4	87.180	85.474	1.556	Open Manhole		1200
2.000	20.237	29.1	4	87.180	85.474	1.556	Open Manhole		1200
1.002	14.226	100.0	5	87.130	85.332	1.648	Open Manhole		600
1.003	5.534	100.0	8	87.100	85.277	1.673	Open Manhole		600
3.000	7.034	58.6	7	87.020	85.670	1.200	Open Manhole		600
4.000	7.770	15.2	7	87.020	85.670	1.200	Open Manhole		600
3.001	13.301	33.8	8	87.100	85.277	1.673	Open Manhole		600
1.004	9.699	88.8	11	87.130	85.168	1.812	Open Manhole		600
5.000	12.876	47.7	10	86.950	85.900	0.900	Open Manhole		600
5.001	12.988	100.0	11	87.130	85.770	1.210	Open Manhole		600
1.005	34.639	76.8	15	86.300	84.717	1.358	Open Manhole		1500

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PIPELINE SCHEDULES for Storm

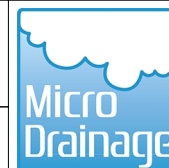
Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
6.000	o	150	12	86.860	85.810	0.900	Open Manhole		600
6.001	o	150	13	86.200	84.850	1.200	Open Manhole		1500
6.002	o	150	14	86.200	84.808	1.242	Open Manhole		600
1.006	o	225	15	86.300	84.717	1.358	Open Manhole		1500
1.007	o	225	16	86.470	84.400	1.845	Open Manhole		1200
7.000	o	150	17A	85.150	84.100	0.900	Open Manhole		600
7.001	o	150	17	85.110	83.940	1.020	Open Manhole		600
7.002	o	150	18A	85.110	83.805	1.155	Open Manhole		600
7.003	o	150	18	85.110	83.695	1.265	Open Manhole		600
8.000	o	150	19	85.750	84.300	1.300	Open Manhole		600
8.001	o	150	20	86.200	84.213	1.837	Open Manhole		600
7.004	o	225	21	85.110	83.632	1.253	Open Manhole		600
1.008	o	225	22	86.160	83.300	2.635	Open Manhole		1500
9.000	o	225	23	86.960	85.535	1.200	Open Manhole		1500
9.001	o	225	24	86.440	85.015	1.200	Open Manhole		1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
6.000	25.422	26.5	13	86.200	84.850	1.200	Open Manhole		1500
6.001	4.166	100.0	14	86.200	84.808	1.242	Open Manhole		600
6.002	9.102	100.0	15	86.300	84.717	1.433	Open Manhole		1500
1.006	5.967	18.8	16	86.470	84.400	1.845	Open Manhole		1200
1.007	36.439	100.0	22	86.160	84.036	1.899	Open Manhole		1500
7.000	12.801	80.0	17	85.110	83.940	1.020	Open Manhole		600
7.001	10.694	79.4	18A	85.110	83.805	1.155	Open Manhole		600
7.002	8.790	80.0	18	85.110	83.695	1.265	Open Manhole		600
7.003	5.986	95.0	21	85.110	83.632	1.328	Open Manhole		600
8.000	8.681	100.0	20	86.200	84.213	1.837	Open Manhole		600
8.001	5.531	9.5	21	85.110	83.632	1.328	Open Manhole		600
7.004	11.974	36.1	22	86.160	83.300	2.635	Open Manhole		1500
1.008	14.458	144.6	TANK	85.600	83.200	2.175	Open Manhole		1200
9.000	24.345	46.8	24	86.440	85.015	1.200	Open Manhole		1500
9.001	28.800	44.3	25	85.790	84.365	1.200	Open Manhole		1500

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Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	I*W
9.002	o	225	25	85.790	84.365	1.200	Open Manhole		1500
10.000	o	225	26	85.290	83.865	1.200	Open Manhole		1500
9.003	o	225	27	85.750	83.598	1.927	Open Manhole		1200
9.004	o	225	28	85.800	83.340	2.235	Open Manhole		1500
1.009	o	225	TANK	85.600	83.200	2.175	Open Manhole		1200
1.010	o	150	FCC1	85.300	83.028	2.122	Open Manhole		1500
1.011	o	225	C1	85.230	82.590	2.415	Open Manhole		1500
1.012	o	225	C2	85.045	81.539	3.281	Open Manhole		1200

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	I*W
9.002	6.021	7.9	27	85.750	83.598	1.927	Open Manhole		1200
10.000	26.660	100.0	27	85.750	83.598	1.927	Open Manhole		1200
9.003	14.020	54.3	28	85.800	83.340	2.235	Open Manhole		1500
9.004	10.318	73.7	TANK	85.600	83.200	2.175	Open Manhole		1200
1.009	17.180	99.9	FCC1	85.300	83.028	2.047	Open Manhole		1500
1.010	20.648	47.1	C1	85.230	82.590	2.490	Open Manhole		1500
1.011	21.259	99.3	C2	85.045	82.376	2.444	Open Manhole		1200
1.012	2.416	200.0		84.859	81.527	3.107	Open Manhole		0

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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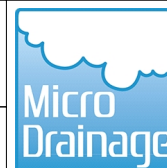
1.012	84.859	81.527	0.000	0	0
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Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	0.000	5	0.000	9	0.000	13	0.000	17	0.000	21	0.000
2	0.000	6	0.000	10	0.000	14	0.000	18	0.000	22	0.000
3	0.000	7	0.000	11	0.000	15	0.000	19	0.000	23	0.000
4	0.000	8	0.000	12	0.000	16	0.000	20	0.000	24	0.000

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Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth	Time	Depth
(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)	(mins)	(m)
25	0.000	31	0.000	37	0.000	43	0.000	49	0.000	55	0.000
26	0.000	32	0.000	38	0.000	44	0.000	50	0.000	56	0.000
27	0.000	33	0.000	39	0.000	45	0.000	51	0.000	57	0.000
28	0.000	34	0.000	40	0.000	46	0.000	52	0.000	58	0.000
29	0.000	35	0.000	41	0.000	47	0.000	53	0.000	59	0.000
30	0.000	36	0.000	42	0.000	48	0.000	54	0.000	60	0.000

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Date 04/11/2021 23:50	Designed by grimsley_c	
File Site 1 proposed drainag...	Checked by	
Innovyze	Network 2017.1.2	
<u>Online Controls for Storm</u> <u>Complex Manhole: FCC1, DS/PN: 1.010, Volume (m³): 4.6</u> <u>Orifice</u> Diameter (m) 0.095 Discharge Coefficient 0.600 Invert Level (m) 83.028 <u>Orifice</u> Diameter (m) 0.065 Discharge Coefficient 0.600 Invert Level (m) 83.773		
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Date 04/11/2021 23:50	Designed by grimsley_c																			
File Site 1 proposed drainag...	Checked by																			
Innovyze	Network 2017.1.2																			
<u>Storage Structures for Storm</u> <u>Cellular Storage Manhole: TANK, DS/PN: 1.009</u> Invert Level (m) 83.200 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>210.0</td> <td>0.0</td> <td>0.801</td> <td>0.0</td> <td>0.0</td> </tr> <tr> <td>0.800</td> <td>210.0</td> <td>0.0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	210.0	0.0	0.801	0.0	0.0	0.800	210.0	0.0			
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)															
0.000	210.0	0.0	0.801	0.0	0.0															
0.800	210.0	0.0																		
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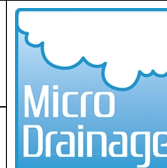


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PN	US/MH	Depth	Surcharged	Flooded	Flow / Overflow	Pipe	Status	Level Exceeded
	Name	(m)	Volume (m³)	Cap.	(l/s)	Flow (l/s)		
1.000	1	-0.143	0.000	0.01		0.2	OK	
1.001	2	-0.131	0.000	0.04		0.7	OK	
2.000	3	-0.149	0.000	0.00		0.1	OK	
1.002	4	-0.110	0.000	0.16		2.6	OK	
1.003	5	-0.104	0.000	0.20		3.0	OK	
3.000	6	-0.119	0.000	0.09		1.8	OK	
4.000	7A	-0.150	0.000	0.00		0.0	OK	
3.001	7	-0.116	0.000	0.12		3.3	OK	
1.004	8	-0.082	0.000	0.42		7.1	OK	
5.000	9	-0.143	0.000	0.01		0.2	OK	
5.001	10	-0.133	0.000	0.03		0.4	OK	
1.005	11	-0.162	0.000	0.17		9.6	OK	
6.000	12	-0.140	0.000	0.01		0.5	OK	
6.001	13	-0.082	0.000	0.41		5.3	OK	
6.002	14	-0.089	0.000	0.34		5.3	OK	
1.006	15	-0.152	0.000	0.23		18.5	OK	
1.007	16	-0.124	0.000	0.41		20.3	OK	
7.000	17A	-0.150	0.000	0.00		0.0	OK	
7.001	17	-0.113	0.000	0.14		2.5	OK	
7.002	18A	-0.112	0.000	0.14		2.5	OK	

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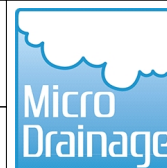
Summary of Critical Results by Maximum Level (Rank 1) for Storm

								Water
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.
								Level
								(m)
7.003	18	15	Winter	1	+0%			83.760
8.000	19	15	Winter	1	+0%			84.357
8.001	20	15	Winter	1	+0%			84.245
7.004	21	15	Winter	1	+0%			83.696
1.008	22	15	Winter	1	+0%			83.474
9.000	23	15	Winter	1	+0%			85.561
9.001	24	15	Winter	1	+0%			85.061
9.002	25	15	Winter	1	+0%			84.413
10.000	26	15	Winter	1	+0%			83.918
9.003	27	15	Winter	1	+0%			83.696
9.004	28	15	Winter	1	+0%			83.454
1.009	TANK	120	Winter	1	+0%			83.377
1.010	FCC1	60	Winter	1	+0%	1/15	Summer	83.370
1.011	C1	60	Winter	1	+0%			82.661
1.012	C2	120	Winter	1	+0%			81.633

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe	Status	Level
		Depth (m)	Volume (m ³)			Flow (l/s)		Exceeded
7.003	18	-0.085	0.000	0.38		5.8	OK	
8.000	19	-0.093	0.000	0.31		4.8	OK	
8.001	20	-0.118	0.000	0.10		4.7	OK	
7.004	21	-0.161	0.000	0.17		13.0	OK	
1.008	22	-0.051	0.000	0.94		35.6	OK	
9.000	23	-0.199	0.000	0.03		2.2	OK	
9.001	24	-0.179	0.000	0.09		6.7	OK	
9.002	25	-0.177	0.000	0.10		12.5	OK	
10.000	26	-0.172	0.000	0.12		6.0	OK	
9.003	27	-0.127	0.000	0.39		24.1	OK	
9.004	28	-0.111	0.000	0.50		25.6	OK	
1.009	TANK	-0.048	0.000	0.25		11.6	OK	
1.010	FCC1	0.192	0.000	0.41		10.0	SURCHARGED	
1.011	C1	-0.154	0.000	0.21		10.0	OK	
1.012	C2	-0.131	0.000	0.36		10.0	OK	

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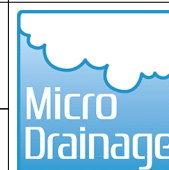
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Surcharged Flooded					Pipe	Level		
PN	US/MH	Depth	Volume	Flow /	Overflow	Flow	Status	Exceeded
	Name	(m)	(m³)	Cap.	(l/s)	(l/s)		
1.000	1	-0.135	0.000	0.02		0.4	OK	
1.001	2	-0.116	0.000	0.11		1.9	OK	
2.000	3	-0.147	0.000	0.00		0.1	OK	
1.002	4	-0.077	0.000	0.48		7.8	OK	
1.003	5	0.004	0.000	0.60		8.7	SURCHARGED	
3.000	6	-0.102	0.000	0.23		4.5	OK	
4.000	7A	-0.150	0.000	0.00		0.0	OK	
3.001	7	-0.092	0.000	0.32		8.9	OK	
1.004	8	0.039	0.000	1.18		19.7	SURCHARGED	
5.000	9	-0.134	0.000	0.02		0.6	OK	
5.001	10	-0.123	0.000	0.08		1.2	OK	
1.005	11	-0.114	0.000	0.48		26.8	OK	
6.000	12	-0.132	0.000	0.03		1.1	OK	
6.001	13	0.022	0.000	1.23		15.8	SURCHARGED	
6.002	14	0.000	0.000	0.99		15.5	OK	
1.006	15	-0.073	0.000	0.65		51.5	OK	
1.007	16	0.112	0.000	1.15		56.4	SURCHARGED	
7.000	17A	-0.073	0.000	0.01		0.2	OK	
7.001	17	0.089	0.000	0.41		7.3	SURCHARGED	
7.002	18A	0.204	0.000	0.45		7.8	SURCHARGED	

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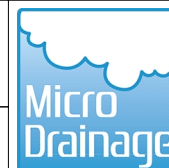
Summary of Critical Results by Maximum Level (Rank 1) for Storm

									Water
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.
7.003	18	15 Winter	30	+0%	30/15	Summer			84.141
8.000	19	15 Winter	30	+0%					84.398
8.001	20	15 Winter	30	+0%					84.263
7.004	21	15 Winter	30	+0%	30/15	Summer			84.089
1.008	22	15 Winter	30	+0%	30/15	Summer			84.032
9.000	23	15 Winter	30	+0%					85.576
9.001	24	15 Winter	30	+0%					85.094
9.002	25	15 Winter	30	+0%					84.450
10.000	26	15 Winter	30	+0%					83.971
9.003	27	15 Winter	30	+0%	30/15	Summer			83.941
9.004	28	120 Winter	30	+0%	30/15	Summer			83.725
1.009	TANK	120 Winter	30	+0%	30/15	Summer			83.717
1.010	FCC1	120 Winter	30	+0%	30/15	Summer			83.712
1.011	C1	120 Winter	30	+0%					82.676
1.012	C2	120 Winter	30	+0%					81.655

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Flow (l/s)		
7.003	18	0.296	0.000	0.96		14.6	SURCHARGED	
8.000	19	-0.052	0.000	0.75		11.7	OK	
8.001	20	-0.100	0.000	0.24		11.6	OK	
7.004	21	0.232	0.000	0.41		30.1	SURCHARGED	
1.008	22	0.507	0.000	2.45		92.7	SURCHARGED	
9.000	23	-0.184	0.000	0.08		5.3	OK	
9.001	24	-0.146	0.000	0.27		19.3	OK	
9.002	25	-0.140	0.000	0.30		37.4	OK	
10.000	26	-0.119	0.000	0.30		14.2	OK	
9.003	27	0.118	0.000	1.04		64.0	SURCHARGED	
9.004	28	0.160	0.000	0.47		23.8	SURCHARGED	
1.009	TANK	0.292	0.000	0.33		15.5	SURCHARGED	
1.010	FCC1	0.534	0.000	0.60		14.8	SURCHARGED	
1.011	C1	-0.139	0.000	0.31		14.7	OK	
1.012	C2	-0.109	0.000	0.53		14.8	OK	

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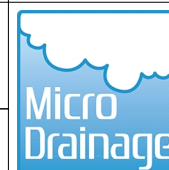
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PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (1/s)	Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)			Flow (1/s)		Exceeded
000	1	85.989	-0.031	0.000	0.04		0.7	OK	
001	2	85.987	0.082	0.000	0.20		3.3	SURCHARGED	
000	3	86.176	-0.144	0.000	0.01		0.3	OK	
002	4	85.976	0.352	0.000	0.78		12.7	SURCHARGED	
003	5	85.942	0.460	0.000	1.00		14.7	SURCHARGED	
000	6	86.003	0.063	0.000	0.40		8.0	SURCHARGED	
000	7A	86.180	-0.150	0.000	0.00		0.0	OK	
001	7	85.985	0.165	0.000	0.53		14.9	SURCHARGED	
004	8	85.921	0.494	0.000	1.59		26.6	SURCHARGED	
000	9	86.190	-0.130	0.000	0.04		1.0	OK	
001	10	85.937	-0.113	0.000	0.14		2.2	OK	
005	11	85.722	0.329	0.000	0.68		38.2	SURCHARGED	
000	12	85.834	-0.126	0.000	0.06		2.0	OK	
001	13	85.760	0.760	0.000	1.45		18.5	SURCHARGED	
002	14	85.681	0.723	0.000	1.14		17.9	SURCHARGED	
006	15	85.568	0.626	0.000	0.80		63.3	SURCHARGED	
007	16	85.375	0.750	0.000	1.40		68.8	SURCHARGED	
000	17A	85.112	0.862	0.000	0.02		0.4	FLOOD RISK	
001	17	85.112	1.022	1.778	0.54		9.7	FLOOD	1
002	18A	85.111	1.156	0.612	0.55		9.6	FLOOD	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

	US/MH		Return Climate		First (X)		First (Y)		First (Z)		Overflow
PN	Name	Storm	Period	Change		Surcharge		Flood		Overflow	Act.
7.003	18	120 Winter	100	+40%	100/15	Summer	100/120	Winter			
8.000	19	120 Winter	100	+40%	100/15	Summer					
8.001	20	120 Winter	100	+40%	100/15	Summer					
7.004	21	120 Winter	100	+40%	100/15	Summer	100/120	Winter			
1.008	22	120 Winter	100	+40%	100/15	Summer					
9.000	23	15 Winter	100	+40%							
9.001	24	120 Winter	100	+40%							
9.002	25	120 Winter	100	+40%	100/15	Summer					
10.000	26	120 Winter	100	+40%	100/15	Summer					
9.003	27	120 Winter	100	+40%	100/15	Summer					
9.004	28	120 Winter	100	+40%	100/15	Summer					
1.009	TANK	120 Winter	100	+40%	100/15	Summer					
1.010	FCC1	120 Winter	100	+40%	100/15	Summer					
1.011	C1	120 Winter	100	+40%							
1.012	C2	120 Winter	100	+40%	100/60	Winter					

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
							Flow (l/s)		
7.003	18	85.113	1.268	2.508	0.83		12.6	FLOOD	1
8.000	19	85.134	0.684	0.000	0.48		7.6	SURCHARGED	
8.001	20	85.121	0.758	0.000	0.16		7.6	SURCHARGED	
7.004	21	85.115	1.258	4.737	0.29		21.2	FLOOD	1
1.008	22	85.132	1.607	0.000	1.66		62.8	SURCHARGED	
9.000	23	85.591	-0.169	0.000	0.14		9.6	OK	
9.001	24	85.194	-0.046	0.000	0.16		11.9	OK	
9.002	25	85.180	0.590	0.000	0.19		22.9	SURCHARGED	
10.000	26	85.182	1.092	0.000	0.19		9.1	FLOOD RISK	
9.003	27	85.171	1.348	0.000	0.65		40.0	SURCHARGED	
9.004	28	85.135	1.570	0.000	0.82		41.6	SURCHARGED	
1.009	TANK	85.106	1.681	0.000	0.79		36.6	SURCHARGED	
1.010	FCC1	85.004	1.826	0.000	1.46		35.8	FLOOD RISK	
1.011	C1	82.737	-0.078	0.000	0.75		35.8	OK	
1.012	C2	81.805	0.041	0.000	1.28		35.8	SURCHARGED	

Curtins Consulting Ltd		Page 1
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	6.743	0.200	33.7	0.002	5.00	0.0	0.600	o	150	Pipe/Conduit
1.001	25.047	0.313	80.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.246	0.313	35.9	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	26.098	0.261	100.0	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit
3.000	11.238	0.112	100.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit
1.003	6.785	0.140	48.5	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit
4.000	9.619	0.096	100.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
1.004	1.986	0.040	49.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
5.000	24.381	0.244	100.0	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit
5.001	15.353	0.154	100.0	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit
6.000	3.527	0.064	55.3	0.002	5.00	0.0	0.600	o	150	Pipe/Conduit
6.001	15.591	0.318	49.1	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit
6.002	14.174	0.457	31.0	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	87.200	0.002	0.0	1.74	30.7
1.001	87.000	0.008	0.0	1.12	19.9
2.000	87.000	0.017	0.0	1.68	29.8
1.002	86.687	0.040	0.0	1.31	52.0
3.000	86.370	0.027	0.0	1.00	17.8
1.003	85.930	0.081	0.0	1.88	74.9
4.000	86.850	0.000	0.0	1.00	17.8
1.004	85.790	0.081	0.0	1.86	74.0
5.000	87.600	0.012	0.0	1.00	17.8
5.001	87.356	0.033	0.0	1.00	17.8
6.000	88.040	0.002	0.0	1.36	24.0
6.001	87.976	0.010	0.0	1.44	25.4
6.002	87.659	0.012	0.0	1.81	32.1

Curtins Consulting Ltd		Page 2
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

Existing Network Details for Storm

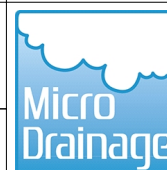
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
5.002	7.996	0.331	24.2	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit
5.003	11.777	0.218	54.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
5.004	13.201	0.050	264.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
7.000	21.692	0.512	42.4	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit
8.000	27.496	0.352	78.1	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit
7.001	15.977	0.160	99.9	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit
7.002	3.828	0.028	136.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
9.000	8.451	0.106	80.0	0.002	5.00	0.0	0.600	o	150	Pipe/Conduit
9.001	15.008	0.188	80.0	0.005	5.00	0.0	0.600	o	150	Pipe/Conduit
10.000	8.176	0.174	47.0	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit
9.002	12.368	0.465	26.6	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit
11.000	7.228	0.089	81.2	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit
9.003	3.496	0.037	94.3	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit
9.004	10.182	0.100	101.8	0.030	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
5.002	87.186	0.068	0.0	2.67	106.3
5.003	86.855	0.068	0.0	1.78	70.9
5.004	85.800	0.068	0.0	0.80	31.8
7.000	86.450	0.020	0.0	1.55	27.4
8.000	86.290	0.008	0.0	1.14	20.1
7.001	85.938	0.038	0.0	1.31	52.0
7.002	85.778	0.038	0.0	1.12	44.4
9.000	86.870	0.002	0.0	1.12	19.9
9.001	86.764	0.007	0.0	1.12	19.9
10.000	86.750	0.012	0.0	1.47	26.0
9.002	86.576	0.023	0.0	1.96	34.6
11.000	86.200	0.009	0.0	1.12	19.7
9.003	86.111	0.035	0.0	1.03	18.3
9.004	85.850	0.065	0.0	1.00	17.6

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Oldham Road
Newton Heath
Site 2 - East



Date 04/11/2021 23:19

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Network 2017.1.2

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.005	22.571	0.060	376.2	0.054	0.00	0.0	0.600	o	225	Pipe/Conduit
1.006	19.402	0.270	71.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.007	9.573	1.530	6.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.005	85.750	0.306	0.0	0.67	26.6
1.006	85.690	0.306	0.0	1.19	21.0
1.007	85.420	0.306	0.0	6.32	447.0

Curtins Consulting Ltd		Page 4
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	29	88.250	87.200	0.900	Open Manhole	600
1.001	o	150	30	88.250	87.000	1.100	Open Manhole	600
2.000	o	150	31	88.050	87.000	0.900	Open Manhole	600
1.002	o	225	32	88.050	86.687	1.138	Open Manhole	1500
3.000	o	150	33	87.420	86.370	0.900	Open Manhole	600
1.003	o	225	34	87.440	85.930	1.285	Open Manhole	1500
4.000	o	150	34A	87.900	86.850	0.900	Open Manhole	600
1.004	o	225	34B	87.420	85.790	1.405	Open Manhole	1500
5.000	o	150	45	88.950	87.600	1.200	Open Manhole	600
5.001	o	150	46	88.600	87.356	1.094	Open Manhole	600
6.000	o	150	47	89.090	88.040	0.900	Open Manhole	600
6.001	o	150	48	89.090	87.976	0.964	Open Manhole	600
6.002	o	150	49	88.790	87.659	0.981	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	6.743	33.7	30	88.250	87.000	1.100	Open Manhole	600
1.001	25.047	80.0	32	88.050	86.687	1.213	Open Manhole	1500
2.000	11.246	35.9	32	88.050	86.687	1.213	Open Manhole	1500
1.002	26.098	100.0	34	87.440	86.426	0.789	Open Manhole	1500
3.000	11.238	100.0	34	87.440	86.258	1.032	Open Manhole	1500
1.003	6.785	48.5	34B	87.420	85.790	1.405	Open Manhole	1500
4.000	9.619	100.0	34B	87.420	86.754	0.516	Open Manhole	1500
1.004	1.986	49.6	TANK	88.000	85.750	2.025	Open Manhole	1500
5.000	24.381	100.0	46	88.600	87.356	1.094	Open Manhole	600
5.001	15.353	100.0	50	88.400	87.202	1.048	Open Manhole	600
6.000	3.527	55.3	48	89.090	87.976	0.964	Open Manhole	600
6.001	15.591	49.1	49	88.790	87.659	0.982	Open Manhole	600
6.002	14.174	31.0	50	88.400	87.202	1.048	Open Manhole	600

Curtins Consulting Ltd		Page 5
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.002	o	225	50	88.400	87.186	0.989	Open Manhole	600
5.003	o	225	51	88.280	86.855	1.200	Open Manhole	1200
5.004	o	225	52	87.880	85.800	1.855	Open Manhole	1200
7.000	o	150	35	87.500	86.450	0.900	Open Manhole	600
8.000	o	150	36	87.640	86.290	1.200	Open Manhole	600
7.001	o	225	37	87.500	85.938	1.337	Open Manhole	1500
7.002	o	225	37A	87.450	85.778	1.447	Open Manhole	1200
9.000	o	150	38	88.220	86.870	1.200	Open Manhole	600
9.001	o	150	39	88.220	86.764	1.306	Open Manhole	600
10.000	o	150	41	87.800	86.750	0.900	Open Manhole	600
9.002	o	150	40	87.750	86.576	1.024	Open Manhole	600
11.000	o	150	42	87.800	86.200	1.450	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.002	7.996	24.2	51	88.280	86.855	1.200	Open Manhole	1200
5.003	11.777	54.0	52	87.880	86.637	1.018	Open Manhole	1200
5.004	13.201	264.0	TANK	88.000	85.750	2.025	Open Manhole	1500
7.000	21.692	42.4	37	87.500	85.938	1.412	Open Manhole	1500
8.000	27.496	78.1	37	87.500	85.938	1.412	Open Manhole	1500
7.001	15.977	99.9	37A	87.450	85.778	1.447	Open Manhole	1200
7.002	3.828	136.7	TANK	88.000	85.750	2.025	Open Manhole	1500
9.000	8.451	80.0	39	88.220	86.764	1.306	Open Manhole	600
9.001	15.008	80.0	40	87.750	86.576	1.024	Open Manhole	600
10.000	8.176	47.0	40	87.750	86.576	1.024	Open Manhole	600
9.002	12.368	26.6	43	87.700	86.111	1.439	Open Manhole	600
11.000	7.228	81.2	43	87.700	86.111	1.439	Open Manhole	600

Curtins Consulting Ltd		Page 6
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
9.003	o	150	43	87.700	86.111	1.439	Open Manhole	600
9.004	o	150	44	87.700	85.850	1.700	Open Manhole	1200
1.005	o	225	TANK	88.000	85.750	2.025	Open Manhole	1500
1.006	o	150	FCC2	88.200	85.690	2.360	Open Manhole	1500
1.007	o	300	C2	88.400	85.420	2.680	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
9.003	3.496	94.3	44	87.700	86.074	1.476	Open Manhole	1200
9.004	10.182	101.8	TANK	88.000	85.750	2.100	Open Manhole	1500
1.005	22.571	376.2	FCC2	88.200	85.690	2.285	Open Manhole	1500
1.006	19.402	71.9	C2	88.400	85.420	2.830	Open Manhole	1500
1.007	9.573	6.3		88.300	83.890	4.110	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.007		88.300	83.890	0.000	0	0

Curtins Consulting Ltd		Page 7
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	
<u>Online Controls for Storm</u> <u>Orifice Manhole: FCC2, DS/PN: 1.006, Volume (m³): 5.3</u> Diameter (m) 0.081 Discharge Coefficient 0.600 Invert Level (m) 85.690		
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Curtins Consulting Ltd		Page 8
. . .	Oldham Road Newton Heath Site 2 - East	
Date 04/11/2021 23:19 File Site 2 proposed drainag...	Designed by AH Checked by CD	
Innovyze	Network 2017.1.2	

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 1.005

Invert Level (m) 85.750 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	100.0	0.0	0.801	0.0	0.0
0.800	100.0	0.0			

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Curtins Consulting Ltd		Page 10
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:19	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	29	-0.143	0.000	0.01		0.2	OK	
1.001	30	-0.129	0.000	0.05		0.9	OK	
2.000	31	-0.123	0.000	0.07		2.0	OK	
1.002	32	-0.179	0.000	0.09		4.4	OK	
3.000	33	-0.104	0.000	0.20		3.2	OK	
1.003	34	-0.162	0.000	0.17		9.0	OK	
4.000	34A	-0.150	0.000	0.00		0.0	OK	
1.004	34B	-0.092	0.000	0.17		5.0	OK	
5.000	45	-0.121	0.000	0.08		1.4	OK	
5.001	46	-0.103	0.000	0.21		3.5	OK	
6.000	47	-0.137	0.000	0.02		0.3	OK	
6.001	48	-0.128	0.000	0.05		1.2	OK	
6.002	49	-0.129	0.000	0.05		1.4	OK	
5.002	50	-0.180	0.000	0.09		7.2	OK	
5.003	51	-0.173	0.000	0.12		7.3	OK	
5.004	52	-0.101	0.000	0.16		4.3	OK	
7.000	35	-0.120	0.000	0.09		2.3	OK	
8.000	36	-0.129	0.000	0.05		0.9	OK	
7.001	37	-0.178	0.000	0.09		4.3	OK	
7.002	37A	-0.081	0.000	0.07		2.2	OK	
9.000	38	-0.140	0.000	0.01		0.2	OK	
9.001	39	-0.130	0.000	0.04		0.8	OK	

Curtins Consulting Ltd		Page 2
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:12	Designed by AH	
File Site 2 proposed drainag...	Checked by CD	
Innovyze	Network 2017.1.2	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	29	-0.134	0.000	0.02		0.6	OK	
1.001	30	-0.113	0.000	0.13		2.5	OK	
2.000	31	-0.107	0.000	0.18		4.9	OK	
1.002	32	-0.149	0.000	0.25		11.9	OK	
3.000	33	-0.075	0.000	0.50		7.9	OK	
1.003	34	0.078	0.000	0.15		7.9	SURCHARGED	
4.000	34A	-0.150	0.000	0.00		0.0	OK	
1.004	34B	0.216	0.000	0.25		7.3	SURCHARGED	
5.000	45	-0.104	0.000	0.20		3.3	OK	
5.001	46	-0.065	0.000	0.60		9.8	OK	
6.000	47	-0.130	0.000	0.04		0.7	OK	
6.001	48	-0.115	0.000	0.12		2.9	OK	
6.002	49	-0.115	0.000	0.12		3.6	OK	
5.002	50	-0.148	0.000	0.25		20.6	OK	
5.003	51	-0.134	0.000	0.34		20.4	OK	
5.004	52	0.208	0.000	0.24		6.7	SURCHARGED	
7.000	35	-0.102	0.000	0.22		5.7	OK	
8.000	36	-0.115	0.000	0.12		2.3	OK	
7.001	37	0.071	0.000	0.07		3.3	SURCHARGED	
7.002	37A	0.228	0.000	0.09		2.6	SURCHARGED	
9.000	38	-0.132	0.000	0.03		0.6	OK	
9.001	39	-0.117	0.000	0.11		2.0	OK	

Curtins Consulting Ltd		Page 2
.	Oldham Road	
.	Newton Heath	
.	Site 2 - East	
Date 04/11/2021 23:05	Designed by AH	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	29	-0.113	0.000	0.01		0.4	OK	
1.001	30	0.096	0.000	0.08		1.6	SURCHARGED	
2.000	31	0.100	0.000	0.12		3.1	SURCHARGED	
1.002	32	0.333	0.000	0.15		7.5	SURCHARGED	
3.000	33	0.729	0.000	0.31		5.0	FLOOD RISK	
1.003	34	1.085	0.000	0.27		14.1	FLOOD RISK	
4.000	34A	0.238	0.000	0.01		0.1	SURCHARGED	
1.004	34B	1.221	0.000	0.44		13.3	FLOOD RISK	
5.000	45	-0.087	0.000	0.36		6.1	OK	
5.001	46	0.015	0.000	1.04		17.1	SURCHARGED	
6.000	47	-0.122	0.000	0.08		1.2	OK	
6.001	48	-0.102	0.000	0.22		5.2	OK	
6.002	49	-0.102	0.000	0.22		6.5	OK	
5.002	50	-0.118	0.000	0.45		36.1	OK	
5.003	51	0.168	0.000	0.21		12.8	SURCHARGED	
5.004	52	1.215	0.000	0.44		12.2	SURCHARGED	
7.000	35	0.649	0.000	0.14		3.7	FLOOD RISK	
8.000	36	0.806	0.000	0.07		1.4	SURCHARGED	
7.001	37	1.078	0.000	0.12		5.5	FLOOD RISK	
7.002	37A	1.232	0.000	0.17		5.1	FLOOD RISK	
9.000	38	0.236	0.000	0.02		0.4	SURCHARGED	
9.001	39	0.341	0.000	0.07		1.3	SURCHARGED	

