

21st October 2022

Birch Business Park Unit B – Technical Note to Support Request for Compliance Condition for Drainage for Planning Application 22/01148/FUL

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Ridge have prepared this technical note to support a request for a compliance condition on Planning Application 22/01148/FUL. The technical note is based the information required to discharge the proposed draft Planning Condition 7 of Planning Ref 21/014789/FUL (of which 22/01148/FUL is a resubmission of). This note should be read in conjunction with the approved drainage strategy submitted at planning.

Notwithstanding the details shown on the approved plans, no development other than demolition of the existing buildings shall take place until a scheme for the discharge of surface water from the site, including surface water from the paved areas incorporating sustainable drainage details, and a scheme for the disposal of foul water, have been submitted to and approved in writing by the Local Planning Authority. . Unless otherwise agreed in writing with the Local Planning Authority the drainage scheme for the development shall be in general accordance with the Drainage Strategy by Ridge Consultants dated Sept 2021. The submission shall include:

- (i) Sustainable Drainage Design Details;*
- (ii) The provision of background calculations of the MicroDrainage® model or any other software or calculations that have been used for the drainage design;*
- (iii) Construction level details for permeable paving, if this forms part of the sustainable drainage system; and*
- (iv) Provision of a Maintenance Document explaining how the surface water scheme will be maintained and managed after completion.*

The duly approved scheme shall be implemented prior to the first occupation of the development hereby permitted and shall be retained and maintained as such thereafter.

Reason: To prevent an increased risk of flooding as a result of the development and to ensure satisfactory disposal of surface water from the site in accordance with Policy G8 of the adopted Rochdale Core Strategy, saved Policy EM/7 of the adopted Rochdale Unitary Development Plan and the National Planning Policy Framework.

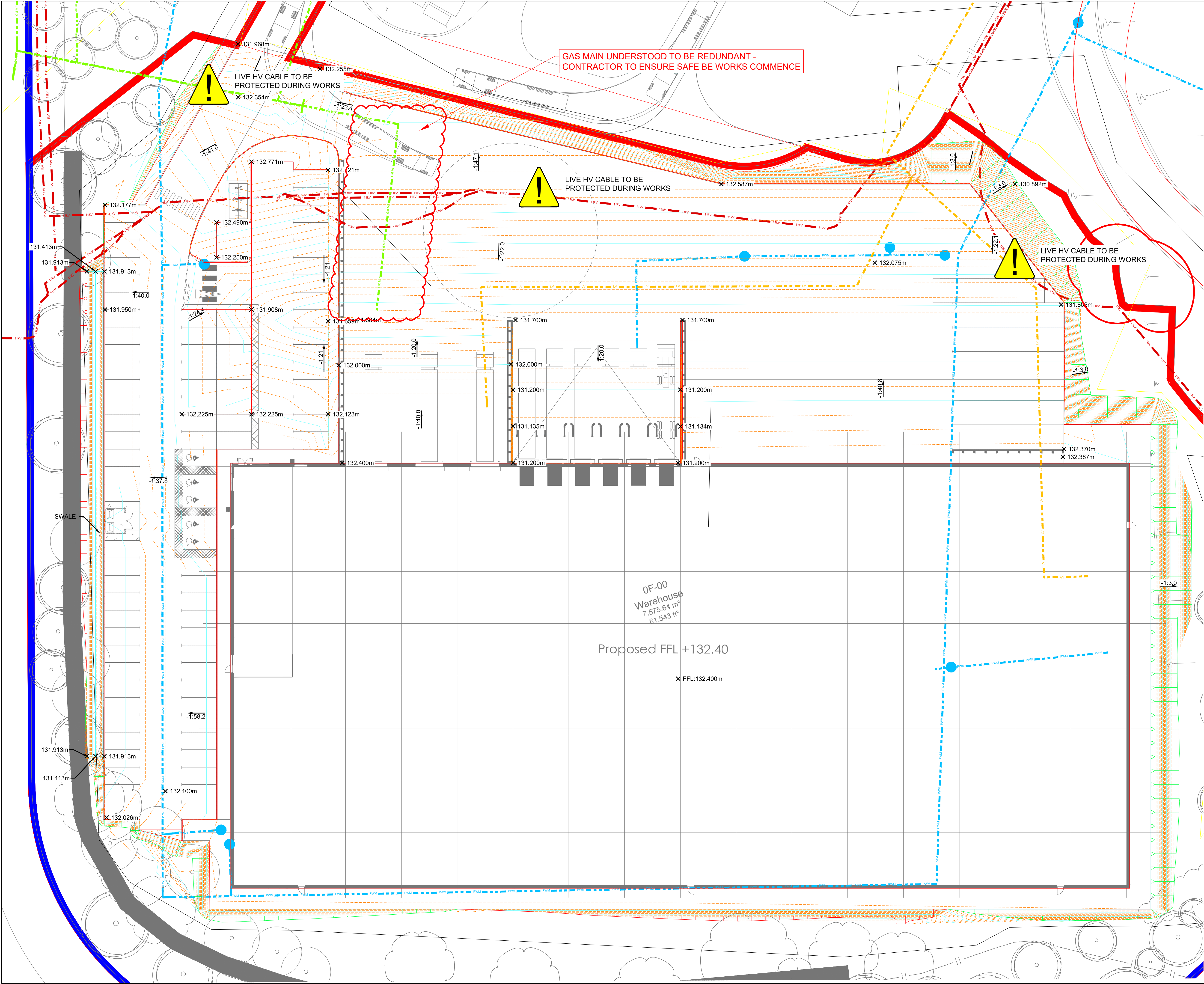
Reason for pre-commencement condition: Drainage infrastructure will need to be implemented prior to commencement of above ground works and a scheme therefore needs to be agreed in advance of the same.

Element	Information
Scheme for the discharge of SW from the site Scheme for the discharge of Surface Water from the site	- A drainage layout and details for both the foul and surface water drainage design are included within Appendix A of this Technical Note.
Sustainable Drainage Details	- The sustainable Drainage details are included in Appendix A of this Technical Note.
The provision of background calculations of the MicroDrainage® model or any other software or calculations that have been used for the drainage Design.	- The calculations have been carried out using Microdrainage and are included in Appendix B of this Note. - A40% allowance for climate change has been included for the 100 year event.
Construction level details for permeable paving, if this forms part of the sustainable drainage system; and	- The provision of permeable paving was discounted during detailed design. This main reasons for discounting permeable paving were increased maintenance of the permeable paving as a result of the industrial nature of the site (vs permeable paving use in a commercial car park). It was considered that the nature of use at the site and additional maintenance burden, could increase flood risk at the site. - Following a review of the proposed levels during detailed design it was considered that a swale within the car park area would be more appropriate in this instance, this has been taken forward into the design.
Provision of a Maintenance Document explaining how the surface water scheme will be maintained and managed after completion. The duly approved scheme shall be implemented prior to the first occupation of the development hereby permitted and shall be retained and maintained as such thereafter.	- A management and maintenance document has been provided in Appendix C and will be included within the O&M manual at the site.

PROPERTY & CONSTRUCTION CONSULTANTS

RIDGE

APPENDIX A



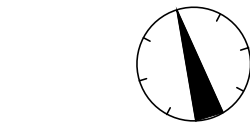
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CDM REGULATIONS 2015
SIGNIFICANT OR NON-OBVIOUS RISKS AND RISKS WHICH ARE DIFFICULT TO MANAGE ARE IDENTIFIED ON THIS DRAWING USING THE FOLLOWING SYMBOL, IDENTIFIED TO THE RIGHT WITH BRIEF ACCOMPANYING TEXT. FOR FURTHER DETAILS OF THE RISKS IDENTIFIED BY DESIGNERS, REFERENCE SHOULD BE MADE TO CDM HAZARD REGISTER.



- MINOR CONTOUR (0.05m)
- MAJOR CONTOUR (0.20m)
- FFL:51.150m FINISHED FLOOR LEVEL (mAOD)
- GRADIENT
- SPOT HEIGHT (mAOD)
- EXISTING SPOT HEIGHT (mAOD)
- RETAINED HEIGHT
- RETAINING WALL



2 0 2 4 6 8 10
SCALE 1:250 m

P6	12.05.22	AP	PB	LAYOUT UPDATE
P5	27.04.22	AP	PB	AMENDED FFL
P4	31.03.22	AP	PB	MINOR AMENDMENTS
P3	03.03.22	AP	PB	BOUNDARY UPDATE
P2	21.02.22	AP	PB	TENDER ISSUE
P1	19.01.22	AP	PB	PRELIMINARY ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT

STATUS	PURPOSE OF ISSUE
D2	TENDER

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CLIENT	YEARGATE LIMITED		
PROJECT	UNIT B BIRCH BUSINESS PARK		
DRAFTER	AP	ENGINEER	PB
TITLE	UNIT B PROPOSED FINISHED LEVELS		
SCALE	1:250	SHEET	A1
DRAWING No	BUB-RDG-00-ZZ-DR-C-0001		REV
		P6	



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4. INFORMATION CONTAINED ON THIS DRAWING IS SCHEME DESIGN ONLY AND REQUIRES FURTHER DETAILED DESIGN AND CO-ORDINATION WITH THE CONTRACTOR, DESIGN TEAM AND APPROPRIATE SUB-CONTRACTORS.

Parcel Table		
Parcel #	Area	Pipe Ref.
1	2714.400	1.001
2	1390.965	1.003
3	2714.400	1.002
4	2750.950	1.000
5	516.626	3.000
6	2403.749	5.000
7	586.173	1.004
8	991.350	1.001
9	217.453	2.000
10	838.369	1.003
11	518.909	1.002

P2	12.05.22	AP	PB	LAYOUT UPDATE
P1	14.09.21	JF	PB	PRELIMINARY ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT

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S2	FOR INFORMATION

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CLIENT
YEARGATE LIMITED

PROJECT
UNIT B
BIRCH BUSINESS PARK

DRAFTER
PB

ENGINEER
PB

TITLE
UNIT B -
PROPOSED
DRAINAGE AREAS

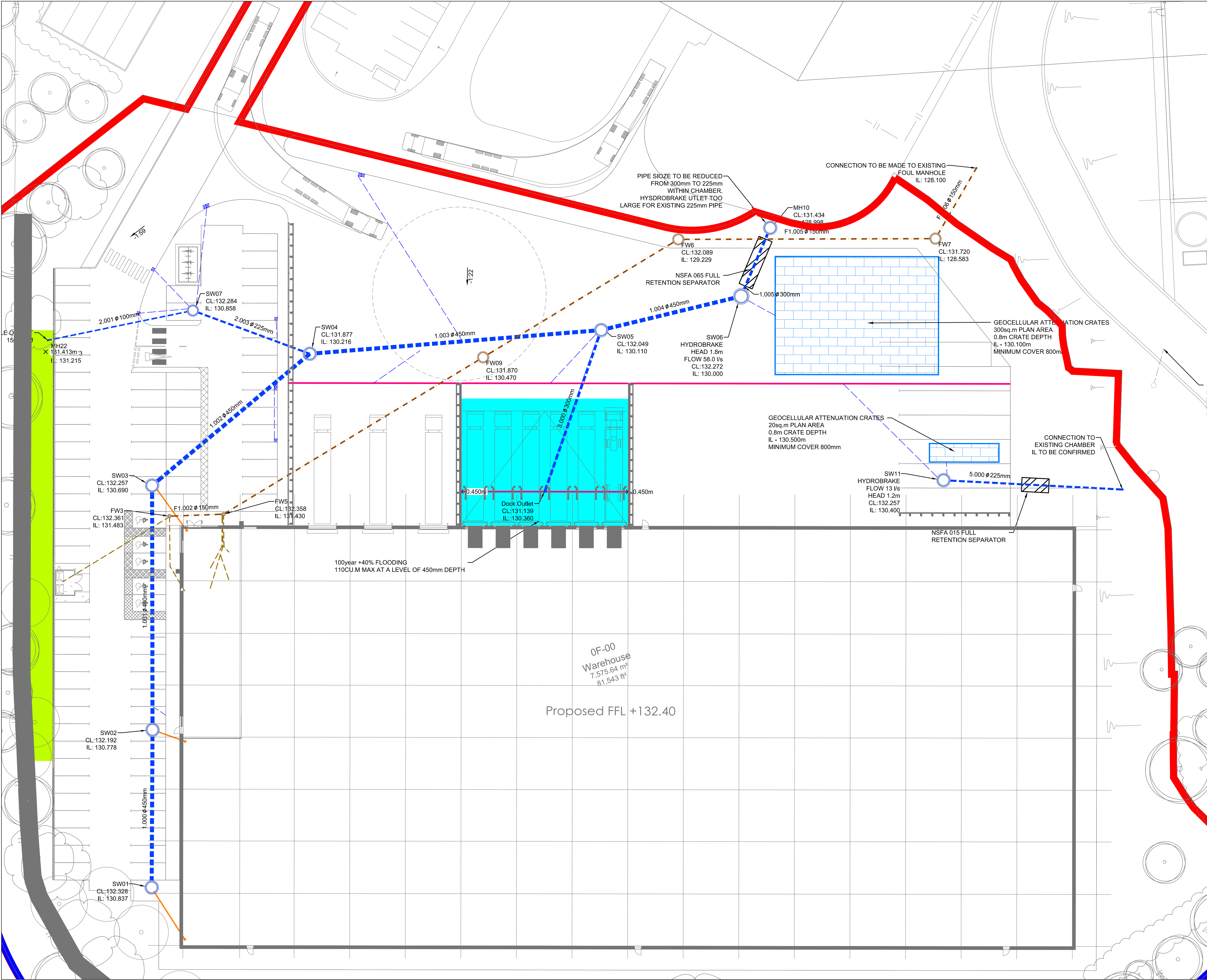
PROJECT REFERENCE:

SCALE
1:250

SHEET
A1

DRAWING No
BUB-RDG-00-ZZ-DR-C-0103

REV
P2



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DRAINAGE KEY

- PROPOSED FW SEWER
- PROPOSED FW MANHOLE
- PROPOSED LATERAL FW DRAIN
- PROPOSED LATERAL FW PPIC
- PROPOSED FW RISING MAIN
- PROPOSED SW SEWER
- PROPOSED SW MANHOLE
- PROPOSED LATERAL SW DRAIN
- PROPOSED LATERAL SW PPIC
- PROPOSED DRAINAGE CHANNEL
- PROPOSED GEOCELLULAR ATTENUATION
- PROPOSED SWALE

P5	12.05.22	AP	PB	LAYOUT UPDATE
P4	10.05.22	AP	PB	TENDER ISSUE
P3	11.04.22	AP	PB	ATTENUATION REVIEW
P2	03.03.22	AP	PB	BOUNDARY UPDATE
P1	21.02.22	AP	PB	TENDER ISSUE
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PROJECT
UNIT B
BIRCH BUSINESS PARK

DRAFTER
AP

ENGINEER
PB

TITLE
UNIT B
PROPOSED
DRAINAGE GA

PROJECT REFERENCE:

SCALE
1:500

SHEET
A1

DRAWING No
BUB-RDG-00-ZZ-DR-C-0501

REV
P5

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MANHOLE SCHEDULE									
MANHOLE NO.	MANHOLE CO-ORDINATES	COVER LEVEL (m)	DEPTH TO INVERT (m)	MANHOLE SIZE	MANHOLE TYPE	PIPE IN NAME, INVERT LEVEL (m) & DIA	PIPE OUT NAME, INVERT LEVEL (m) & DIA	COVER SIZE (mm) & GRADE	COMMENTS
FW3	E:384033.862 N:408235.332	132.361	0.878	450	IC		F1.002, IL=131.483, 150mmØ	450 B125	
FW5	E:384041.378 N:408233.362	132.358	0.928	450	IC	F1.002, IL=131.430, 150mmØ	F1.004, IL=131.430, 150mmØ	450 B125	
FW6	E:384115.476 N:408252.304	132.089	2.860	1,200	Type-B	F1.004 (1), IL=130.500, 150mmØ	F1.005, IL=128.700, 150mmØ	600x600 D400	
FW7	E:384150.929 N:408241.700	131.720	3.136	1,200	Type-B	F1.005, IL=128.500, 150mmØ	F1.006, IL=128.500, 150mmØ	600x600 D400	
FW8	E:384159.516 N:408249.718	129.723	1.623	???		F1.006, IL=128.100, 150mmØ			EXISTING CHAMBER
FW09	E:384083.674 N:408244.174	131.870	1.400	1,200	Type-B	F1.004, IL=130.750, 150mmØ	F1.004 (1), IL=130.750, 150mmØ	600x600 D400	

MANHOLE SCHEDULE									
MANHOLE NO.	MANHOLE CO-ORDINATES	COVER LEVEL (m)	DEPTH TO INVERT (m)	MANHOLE SIZE	MANHOLE TYPE	PIPE IN NAME, INVERT LEVEL (m) & DIA	PIPE OUT NAME, INVERT LEVEL (m) & DIA	COVER SIZE (mm) & GRADE	COMMENTS
MH10	E:384128.614 N:408250.062	131.434	2.437	1,500	Type-B	From SW06, IL=129.000, 300mmØ		600x600 D400	
SW01	E:384015.934 N:408184.904	132.328	1.668	1,500	Type-B		To SW02, IL=130.837, 450mmØ	600x600 D400	
SW02	E:384022.614 N:408206.593	132.192	2.264	1,500	Type-B	From SW01, IL=130.778, 450mmØ	To SW03, IL=130.778, 450mmØ	600x600 D400	
SW03	E:384032.734 N:408240.287	132.257	1.400	1,500	Type-B	From SW02, IL=130.690, 450mmØ	To , IL=130.690, 450mmØ	600x600 D400	
SW04	E:384059.945 N:408251.876	131.877	1.662	1,500	Type-B		To SW05, IL=130.216, 450mmØ	600x600 D400	
SW05	E:384101.079 N:408243.010	132.049	3.201	1,500	Type-B	From SW04, IL=130.110, 450mmØ From Dock Outlet, IL=130.260, 300mmØ	To SW06, IL=130.110, 450mmØ	600x600 D400	
SW06	E:384121.763 N:408241.842	132.272	3.384	1,800	Flow Control	From SW05, IL=130.000, 450mmØ	To MH10, IL=130.000, 300mmØ	1200 x 675 D400	HYDROBRAKE HEAD 1.8m FLOW 58.0 l/s
SW07	E:384045.636 N:408262.705	132.284	1.426	1,200	TYPE B	From MH22, IL=130.983, 150mmØ	To , IL=130.858, 225mmØ	600 x 600 D400	
SW11	E:384141.984 N:408208.065	132.257	2.235	1,500	Flow Control		To MH12, IL=130.400, 225mmØ	1200 x 675 D400	HYDROBRAKE FLOW - 13l/s HEAD - 1.2m

P4	12.05.22	AP	PB	LAYOUT UPDATE
P3	10.05.22	AP	PB	TENDER ISSUE
P2	11.04.22	AP	PB	TENDER ISSUE
P1	21.02.22	AP	PB	TENDER ISSUE
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CLIENT

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PROJECT

UNIT B
BIRCH BUSINESS PARK

DRAFTER

AP

ENGINEER

PB

TITLE

UNIT B
MANHOLE
SCHEDULE

PROJECT REFERENCE:

SCALE

1:50

SHEET

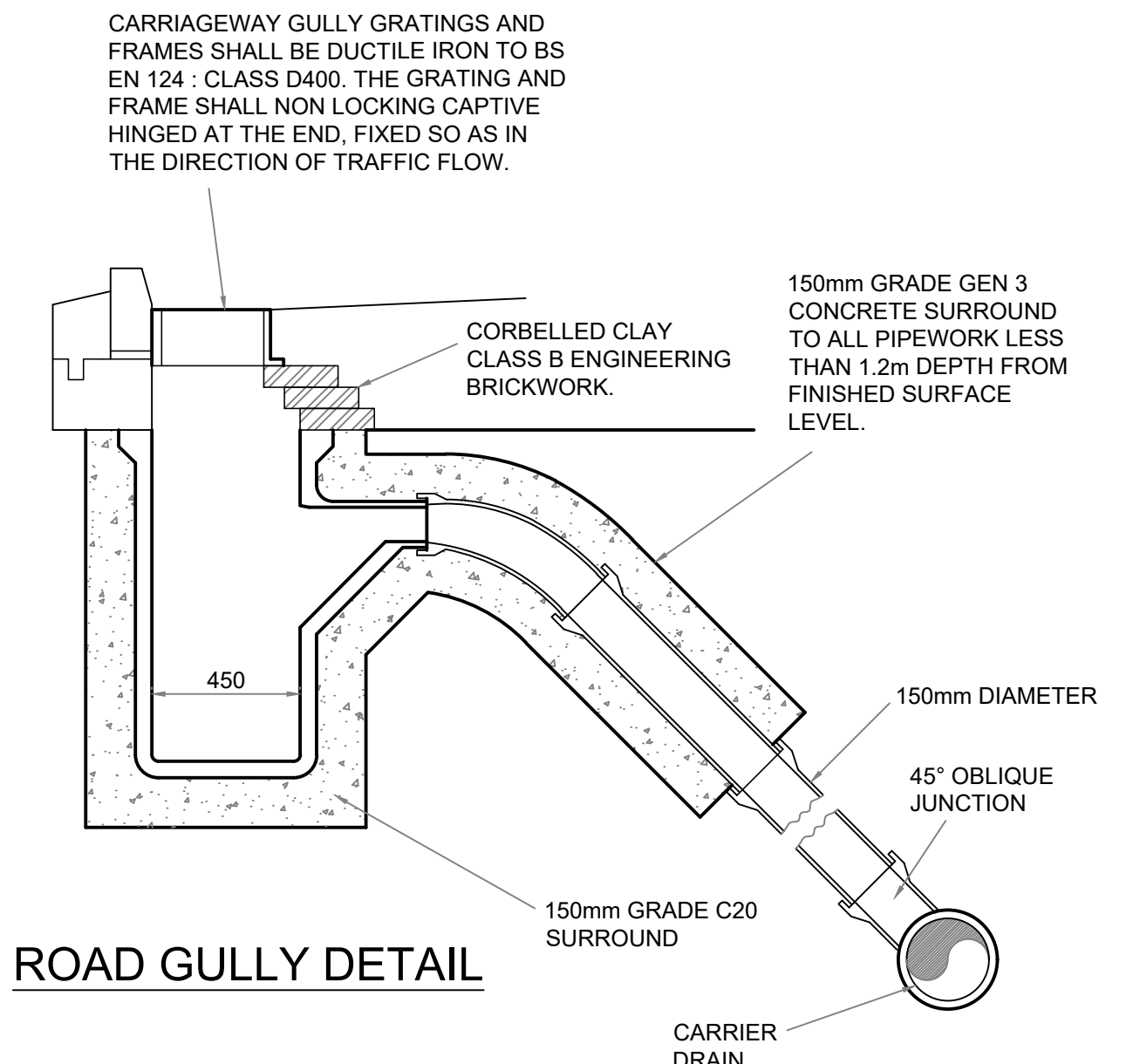
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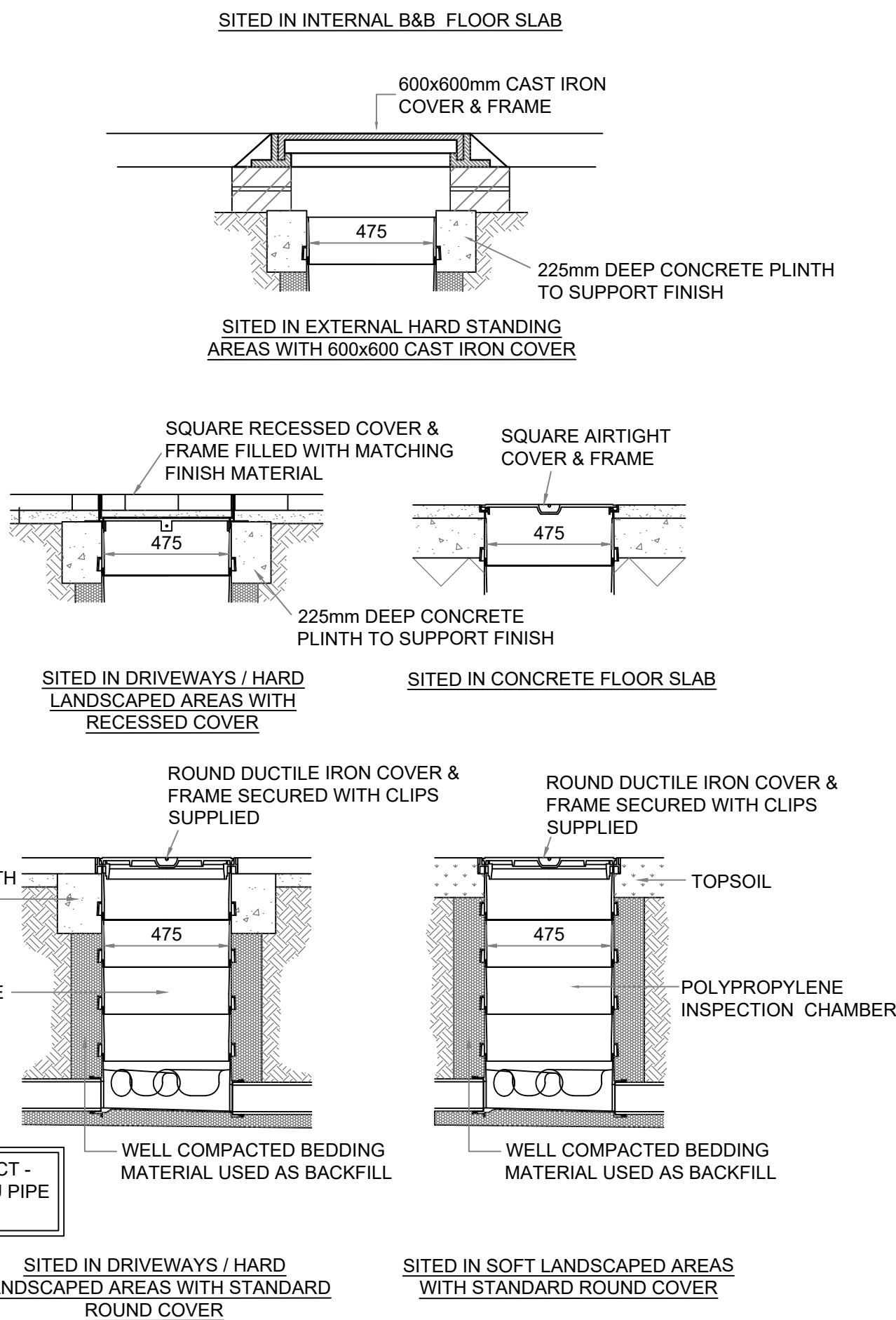
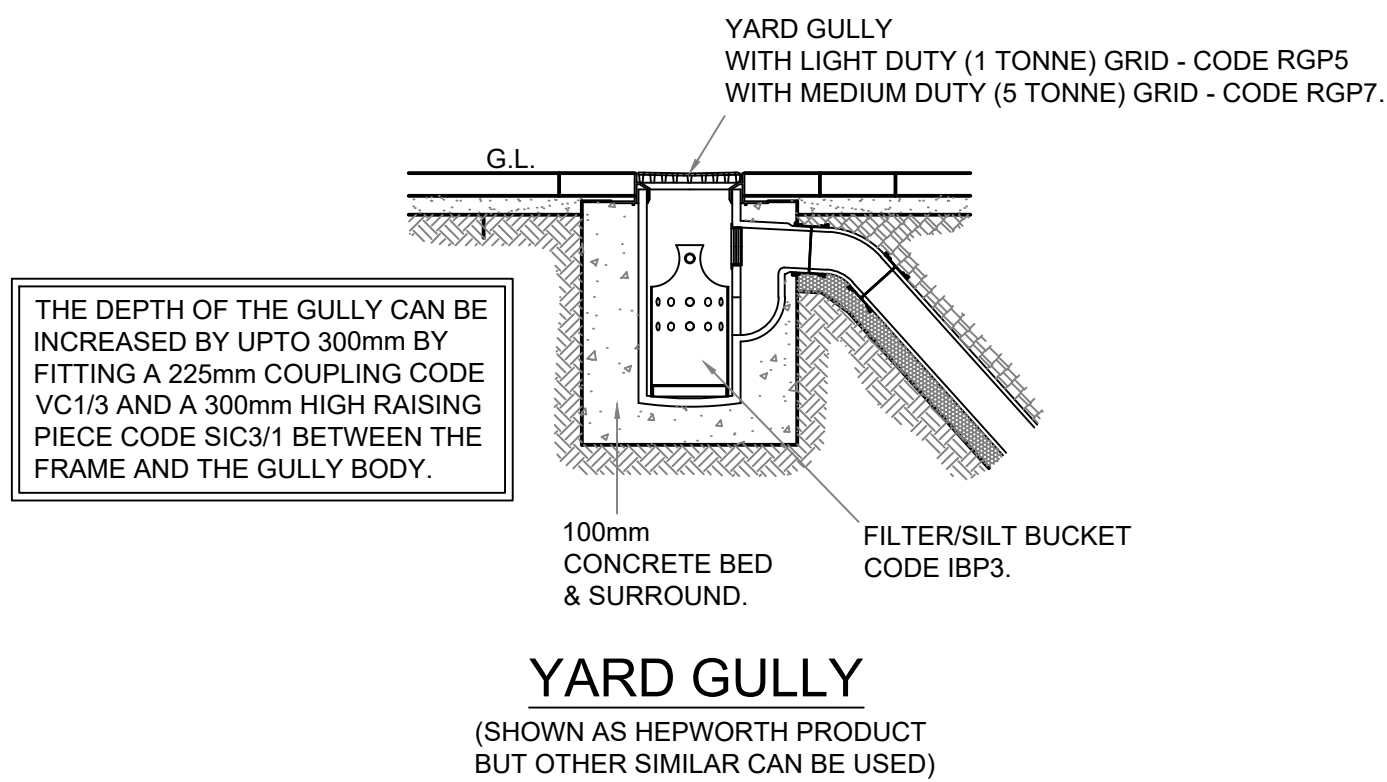
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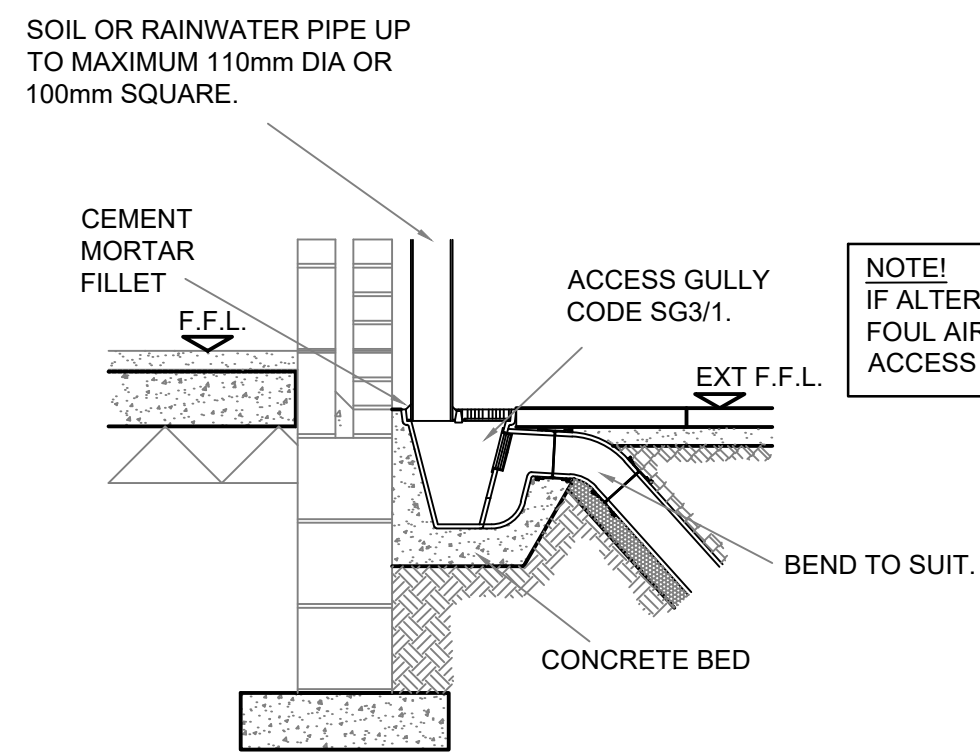
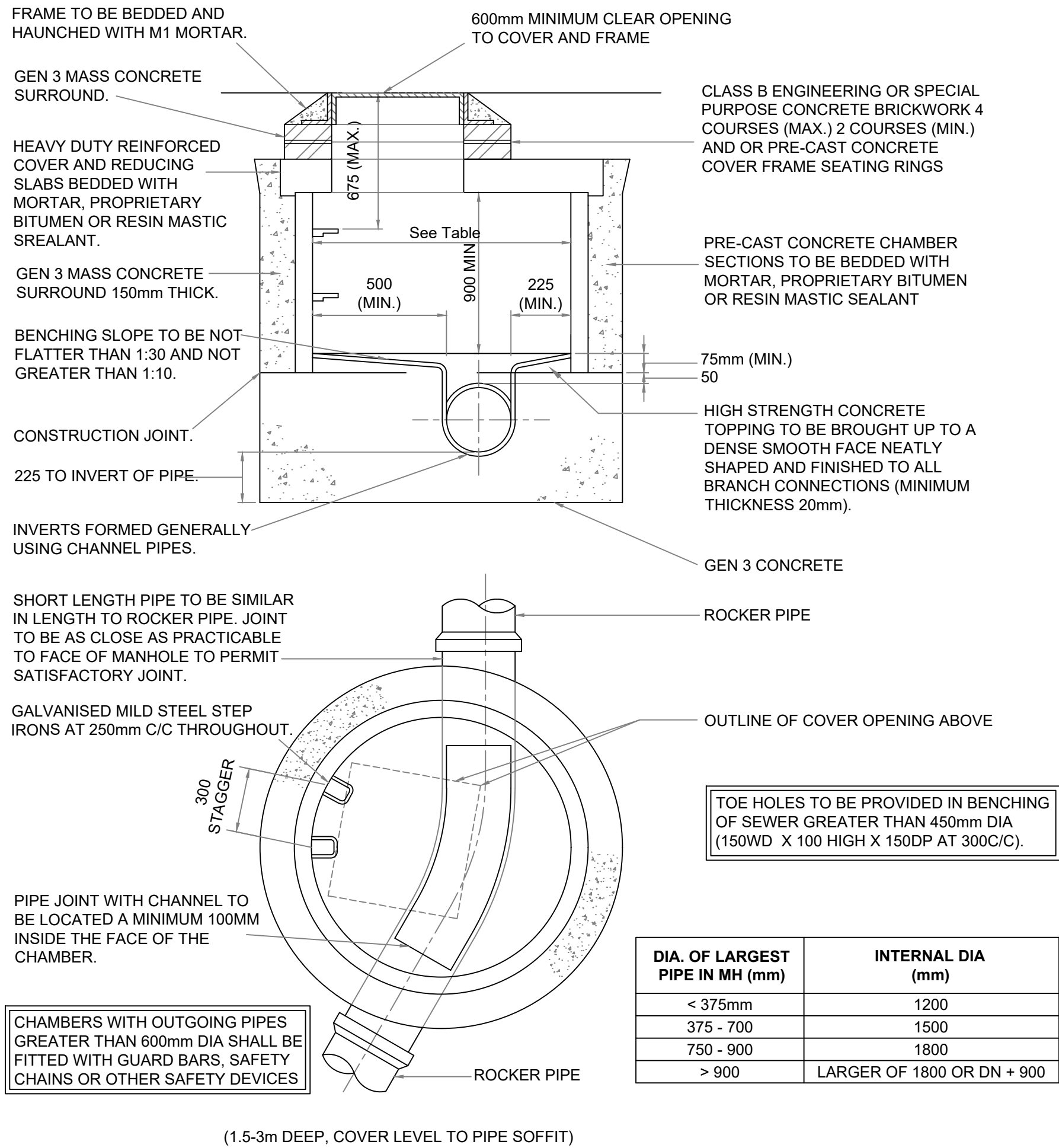
P4



ROAD GULLY DETAIL

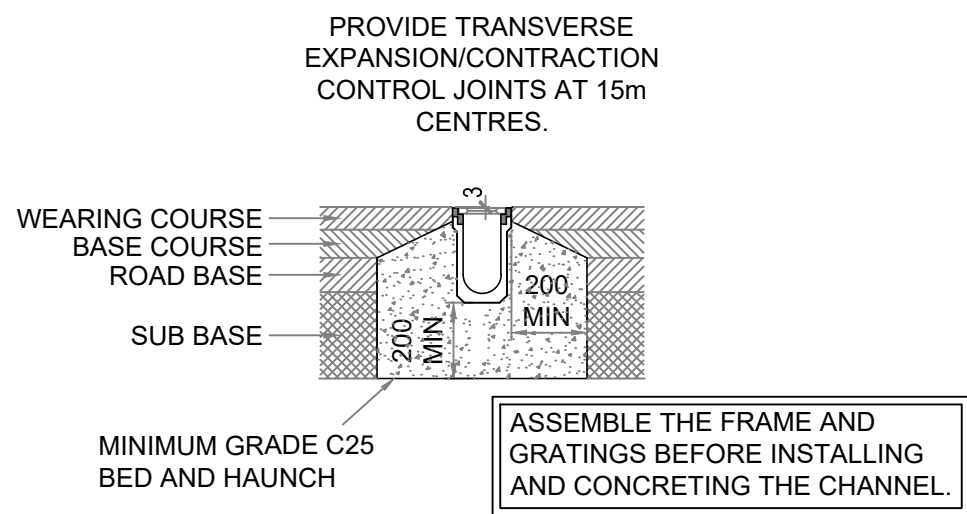


POLYPROPYLENE INSPECTION CHAMBER INSTALLATION DETAIL

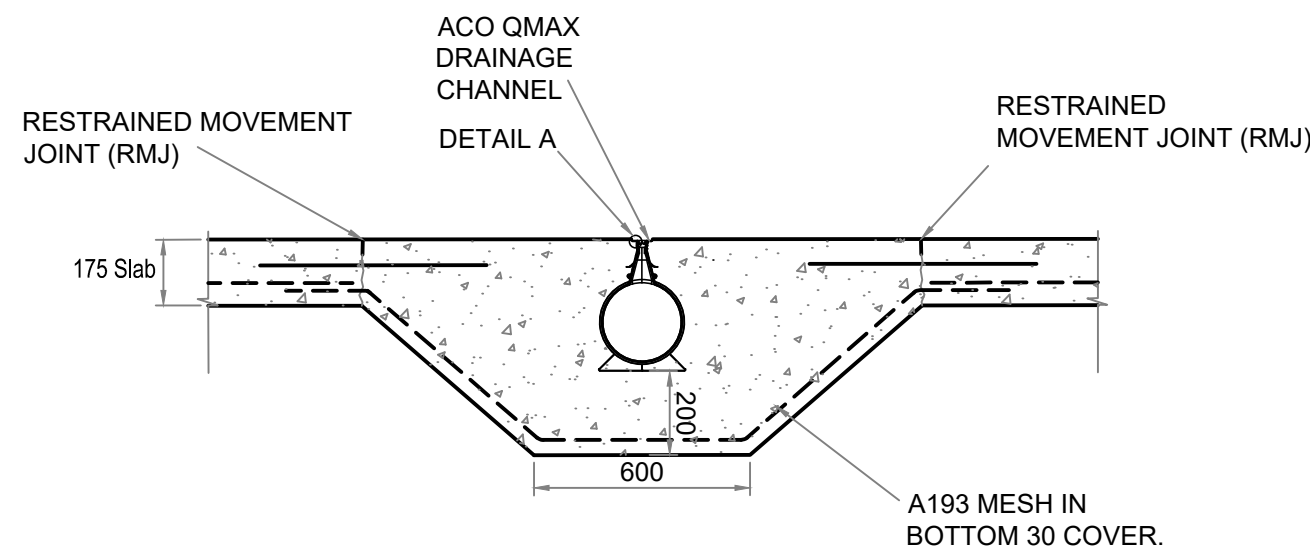


EXTERNAL RWP / SVP CONNECTION AND GULLY (SHOWN AS HEPWORTH BUT SIMILAR CAN BE USED)

- NOTES
- GULLY POTS: HIGHWAY GULLIES P.C.C. TO B.S. 5911 GULLY POT TO BE OF 100 LITRES CAPACITY.
 - MAXIMUM TRENCH WIDTH FOR 150mm GULLY LEAD IS 600mm.
 - NUMBER OF BENDS MAY VARY DUE TO SITE DIFFERENCES - SEE DRAINAGE SCHEDULE.
 - CONCRETE SURROUND TO PIPES SHALL ALWAYS FINISH AT A JOINT.
 - HEAVY DUTY, CAST IRON, LAMPHOLE TYPE COVER IN HARDSTANDING AND AREAS ACCESSIBLE TO VEHICULAR TRAFFIC, TO B.S. EN 124. 1994 CLASS D400, C250, OR B125 DEPENDANT ON LOCATION.
 - COVER SLAB TO BE 200MM THICK GRADE C20 CONCRETE.



TYPICAL DRAINAGE CHANNEL IN FLEXIBLE PAVEMENT

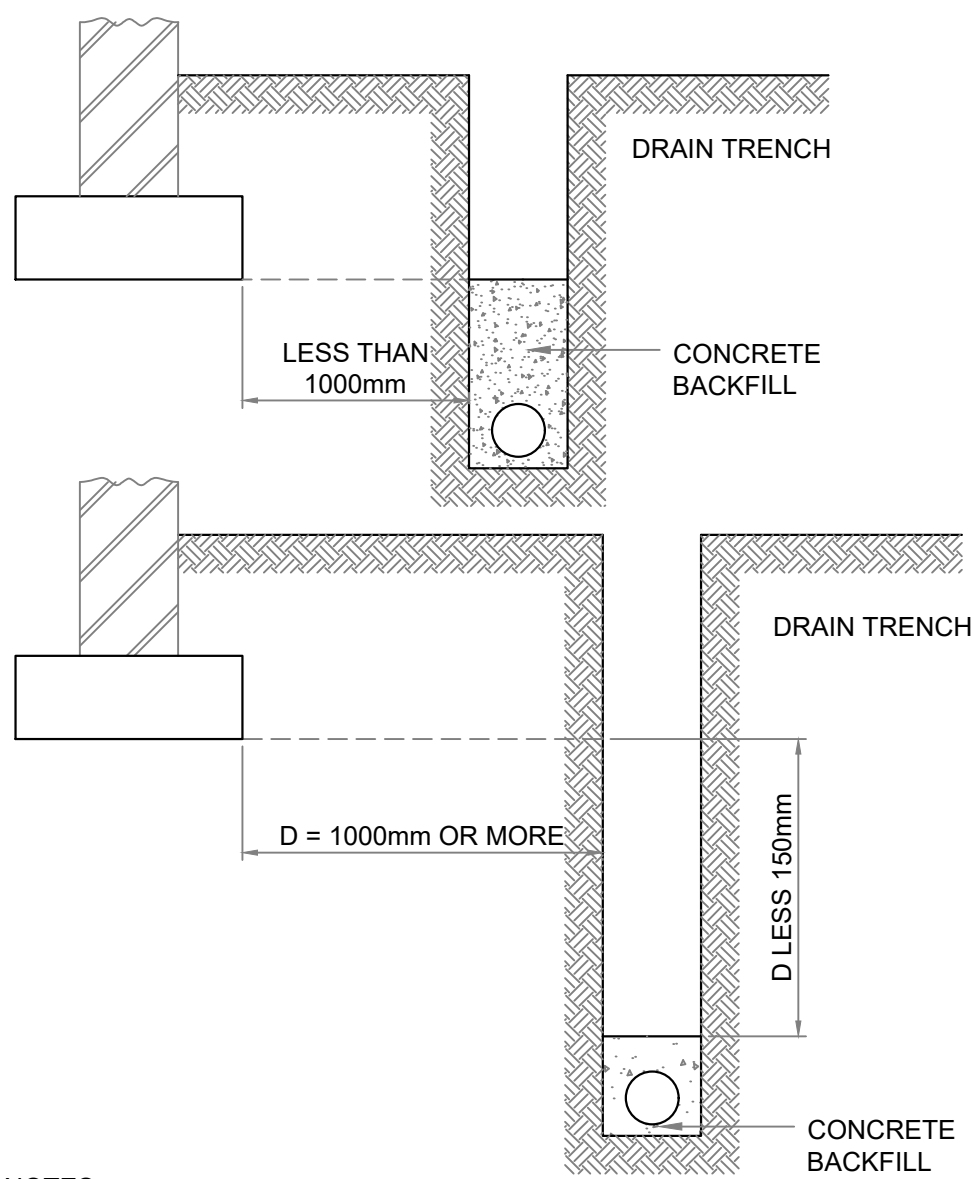


DRAINAGE CHANNEL IN CONCRETE SLAB

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P1	17.02.22	AP	PB	TENDER ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT
STATUS		PURPOSE OF ISSUE		
D2		TENDER		
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PROJECT UNIT B BIRCH BUSINESS PARK				
DRAFTER AP		ENGINEER PB		
TITLE		PROJECT REFERENCE:		
DRAINAGE DETAILS SHEET 1 OF 4				
SCALE 1:50	SHEET A1	DRAWING No BUB-RDG-00-ZZ-DR-C-0503		REV P1

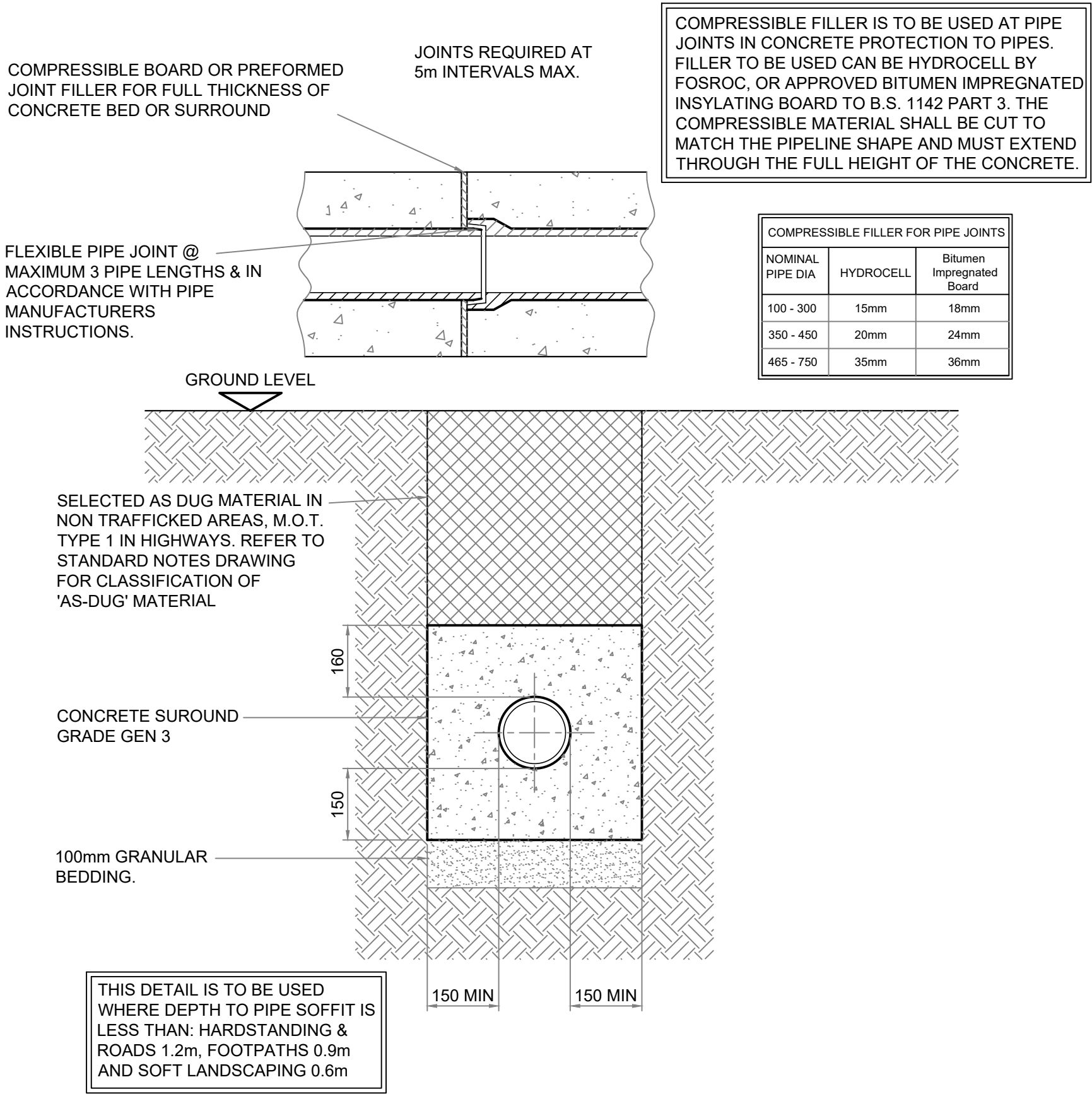


- NOTES
1. CONCRETE TO BE GRADE GEN 3
 2. JOINTS TO BE PROVIDED IN CONCRETE SURROUND AT NOT GREATER THAN 5.0m CENTRES. BUILDING REGULATIONS PART H1 PARA A11
 3. WHERE THE TRENCH IS WITHIN 1m OF THE BUILDING THE TRENCH SHALL BE FILLED WITH CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATIONS. WHERE THE TRENCH IS FURTHER THAN 1000mm FROM THE BUILDING, THE TRENCH SHALL BE FILLED WITH CONCRETE UP TO A LEVEL, BELOW THE LOWEST LEVEL OF THE FOUNDATION, EQUAL TO THE DISTANCE FROM THE BUILDING LESS 150mm.

PIPE RUNS ADJACENT TO BUILDING

BSEN 13242, COARSE AGGREGATE (CLAUSE 4.3.2)		
CATEGORY FOR GENERAL GRADING REQUIREMENTS		
CATEGORY FOR TOLERANCES AT MID-SIZE SIEVES		
CATEGORY OF MAXIMUM VALUES OF FINES CONTENTS		
NOMINAL PIPE DIAMETER (mm)	AGGREGATE SIZE	
	GRADED SIZE	SINGLE
NOT EXCEEDING 140	-	4/10
EXCEEDING 140 BUT NOT EXCEEDING 400	2/14 or 4/20	4/10, 6/10 or 10/20
EXCEEDING 400	2/14, 4/20 or 4/40	4/10, 6/14, 10/20 or 20/40

TABLE 5/3 BSEN 13242 COURSE AGGREGATE TO CLAUSE 4.3.2 FOR PIPE BEDDING, HAUNCHING AND SURROUNDING MATERIAL



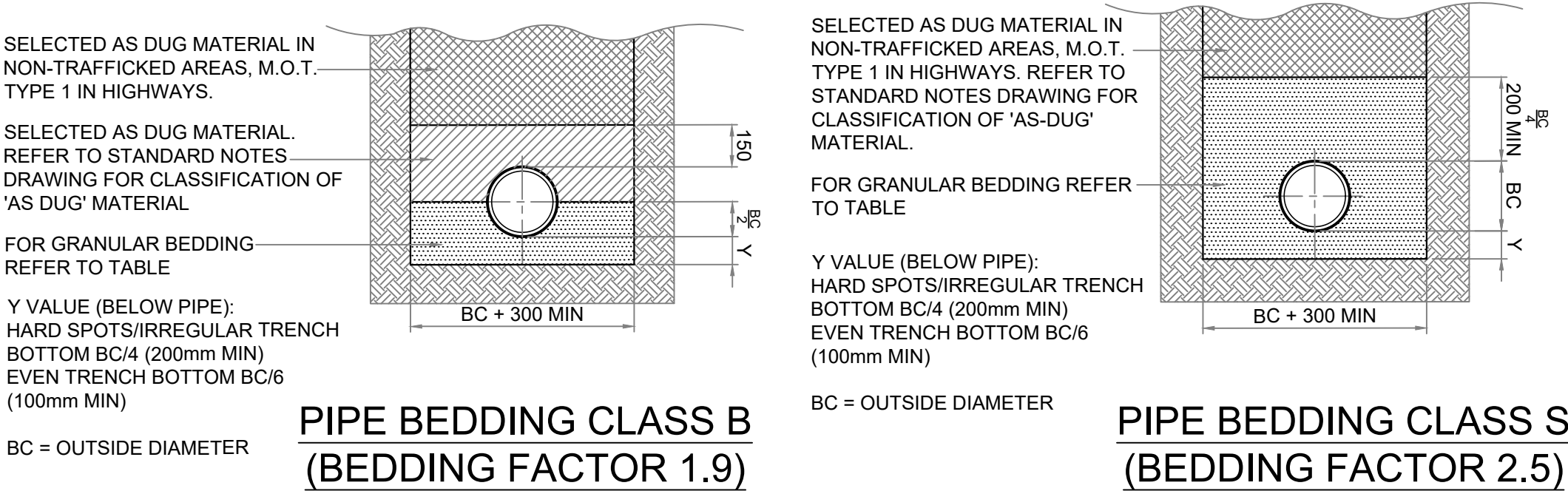
CLASS 'Z' PIPE BEDDING

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

RIGID PIPES BEDDING GRADING

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

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



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4. INFORMATION CONTAINED ON THIS DRAWING IS TENDER DESIGN ONLY. FURTHER DETAILED DESIGN AND CO-ORDINATION WITH THE CONTRACTOR, DESIGN TEAM AND APPROPRIATE SUB-CONTRACTORS WILL BE REQUIRED TO FULLY DEVELOP AND DETAIL THE FINAL CONSTRUCTION DETAILS. CONTRACTOR TO USE THEIR EXPERIENCE AND JUDGEMENT TO MAKE SUFFICIENT ALLOWANCES FOR DETAILED DESIGN DEVELOPMENT.

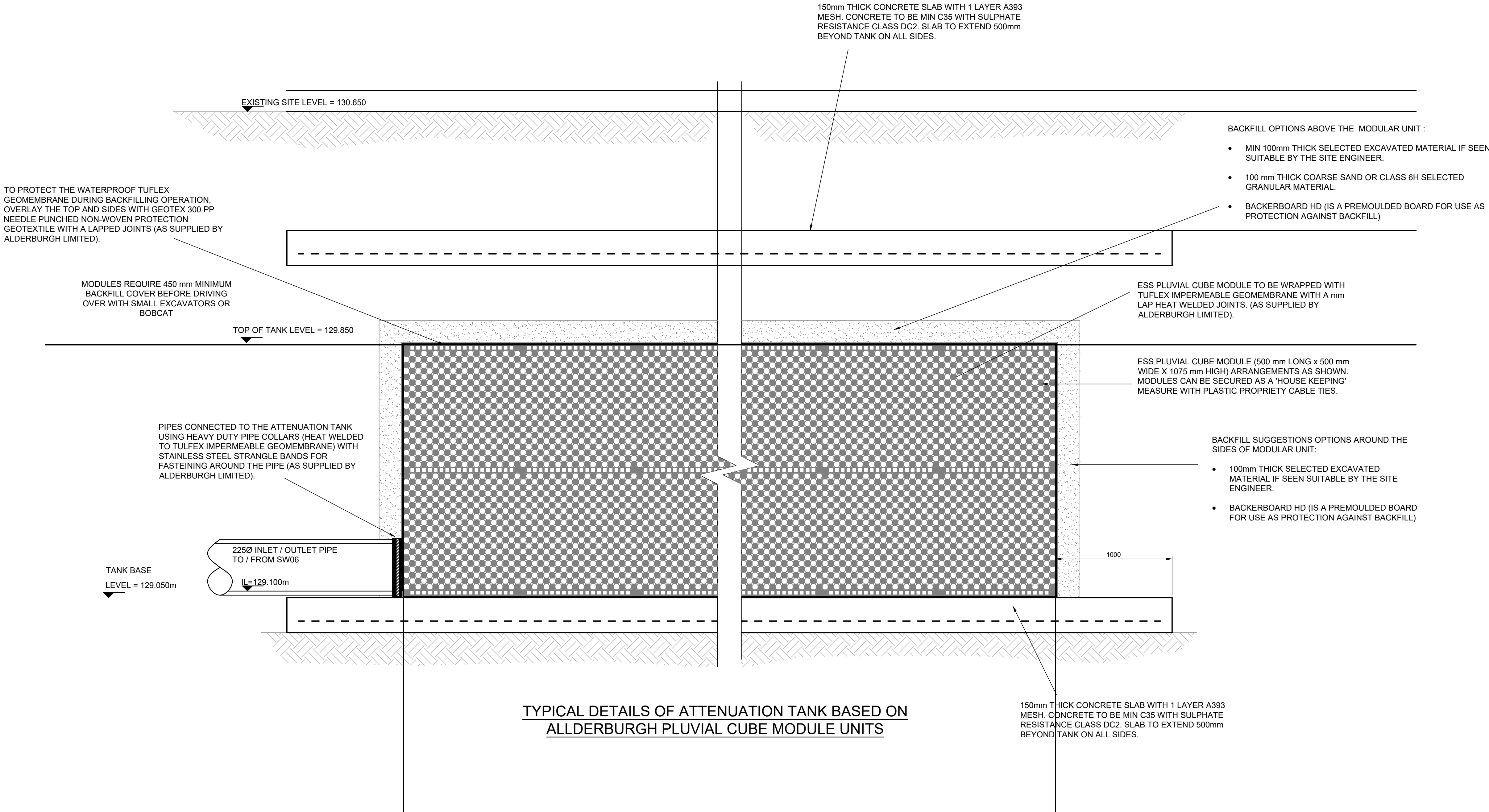
GENERAL NOTES

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.

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TYPICAL DETAILS OF ATTENUATION TANK BASED ON ALLDERBURGH PLUVIAL CUBE MODULE UNITS

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.,

P1	17.02.22	AP	PB	PRELIMINARY ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT

STATUS	PURPOSE OF ISSUE
D2	TENDER

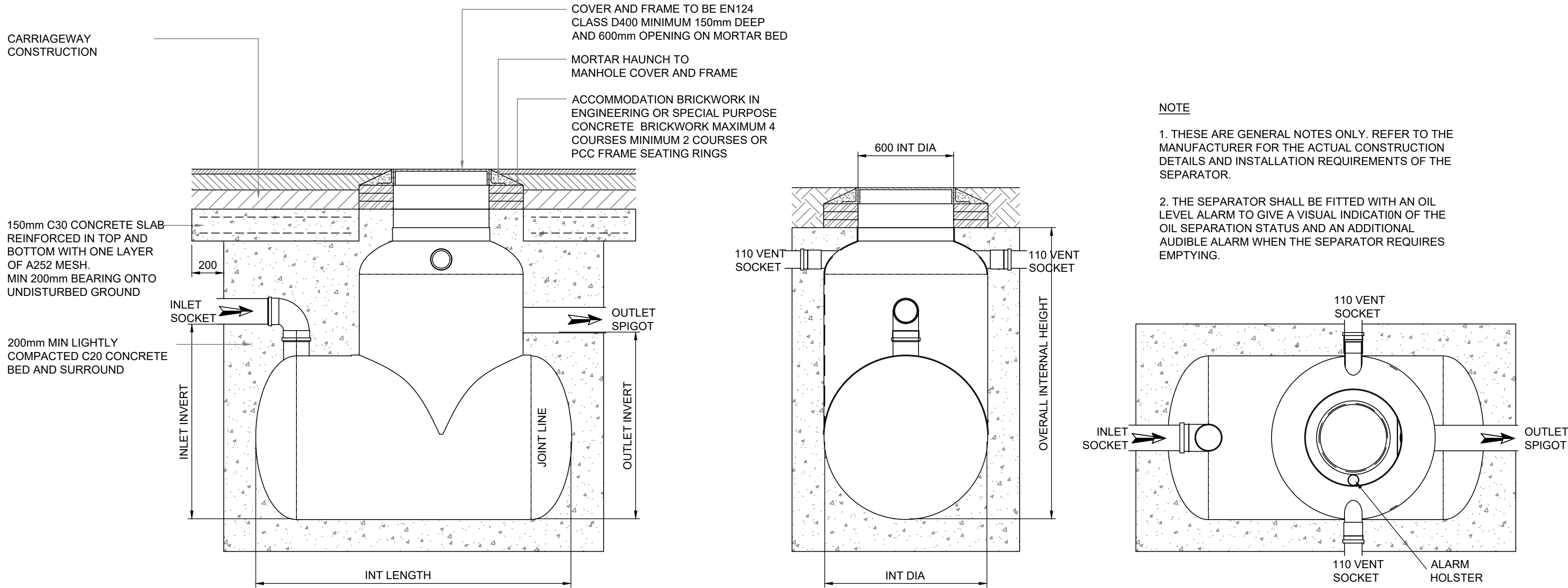
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RIDGE

CLIENT	YEARGATE LIMITED		
PROJECT	UNIT B BIRCH BUSINESS PARK		
DRAFTER	AP	ENGINEER	PB
TITLE	PROJECT REFERENCE: DRAINAGE DETAILS SHEET 3 OF 4		
SCALE	SHEET	DRAWING No	REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0505	P1

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NOTE

1. THESE ARE GENERAL NOTES ONLY. REFER TO THE MANUFACTURER FOR THE ACTUAL CONSTRUCTION DETAILS AND INSTALLATION REQUIREMENTS OF THE SEPARATOR.
2. THE SEPARATOR SHALL BE FITTED WITH AN OIL LEVEL ALARM TO GIVE A VISUAL INDICATION OF THE OIL SEPARATION STATUS AND AN ADDITIONAL AUDIBLE ALARM WHEN THE SEPARATOR REQUIRES EMPTYING.

TYPICAL SEPARATOR DETAIL

P1	17.02.22	AP	PB	TENDER ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT

STATUS	PURPOSE OF ISSUE
D2	TENDER

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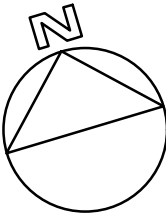
RIDGE			
CLIENT	YEARGATE LIMITED		
PROJECT	UNIT B BIRCH BUSINESS PARK		
DRAFTER	AP	ENGINEER	PB
TITLE	PROJECT REFERENCE: DRAINAGE DETAILS SHEET 4 OF 4		
SCALE	SHEET	DRAWING No	REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0506	P1

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KERBING KEY

- HB2 KERB (125mm)
- PIN KERB
- DROP KERB
- TRIEF HIGH CONTAINMENT KERB



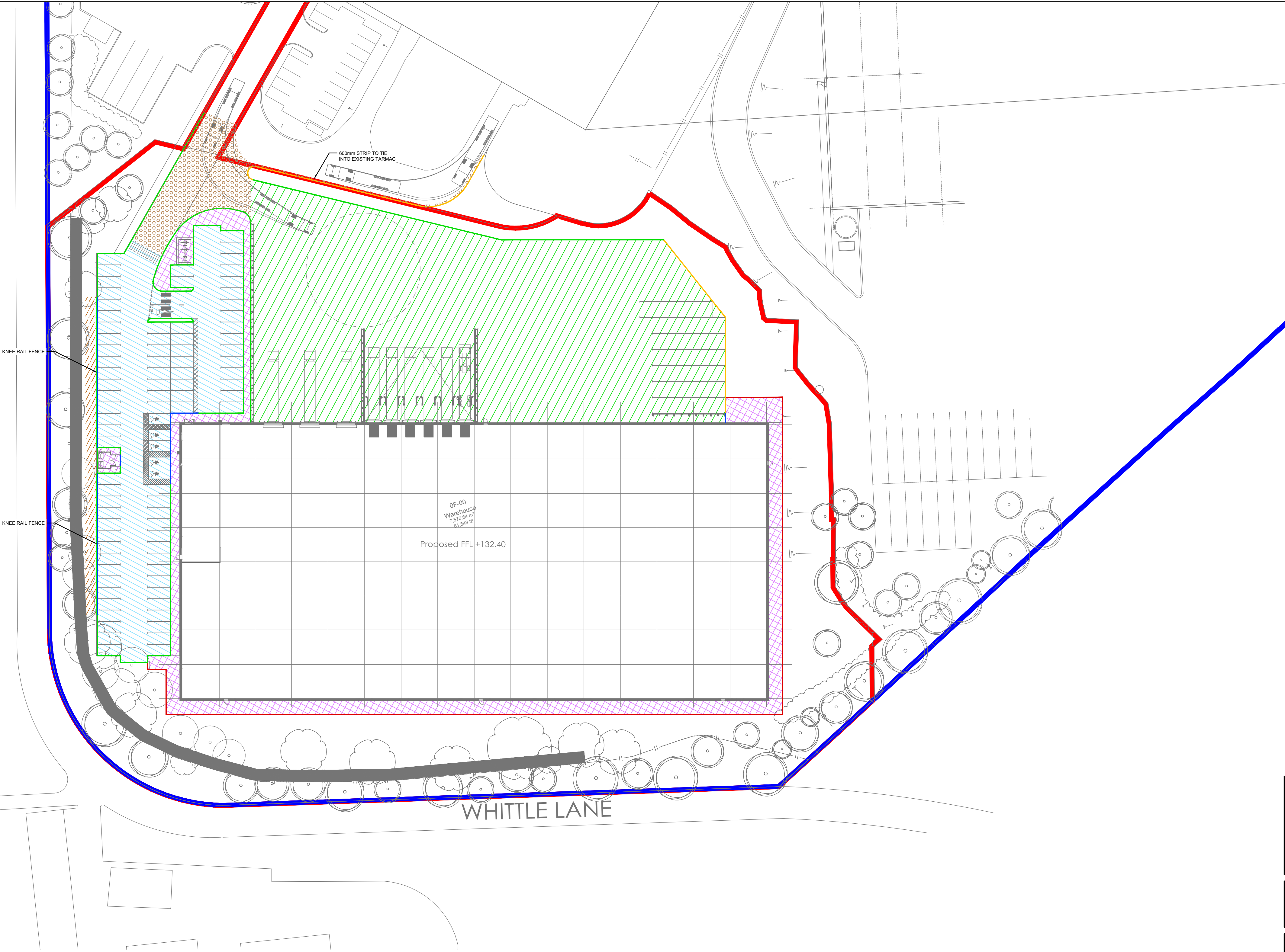
P4	12.05.22	AP	PB	LAYOUT UPDATE
P3	31.03.22	AP	PB	MINOR AMENDMENT
P2	03.03.22	AP	PB	BOUNDARY AMENDMENTS
P1	17.02.22	AP	PB	TENDER ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT

STATUS	PURPOSE OF ISSUE
D2	TENDER

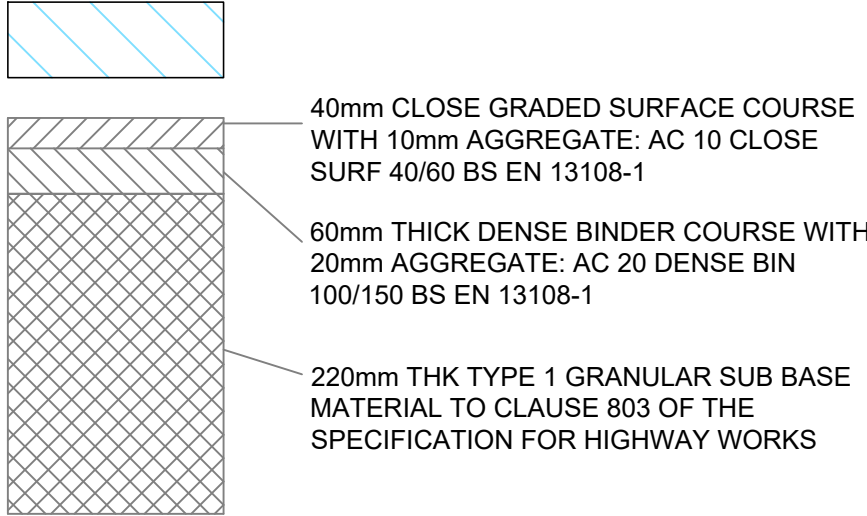
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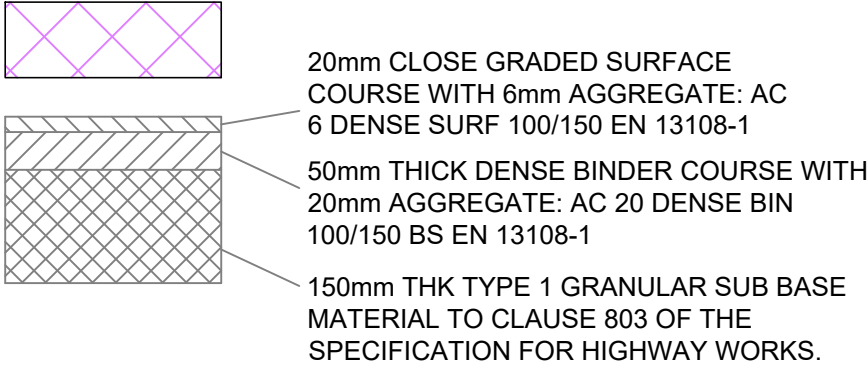
CLIENT	YEARGATE LIMITED		
PROJECT	UNIT B BIRCH BUSINESS PARK		
DRAFTER	AP	ENGINEER	PB
TITLE	UNIT B PROPOSED KERBING AND SURFACES		
SCALE	1:500	SHEET	DRAWING No
		A1	BUB-RDG-00-ZZ-DR-C-1101
			REV
			P4



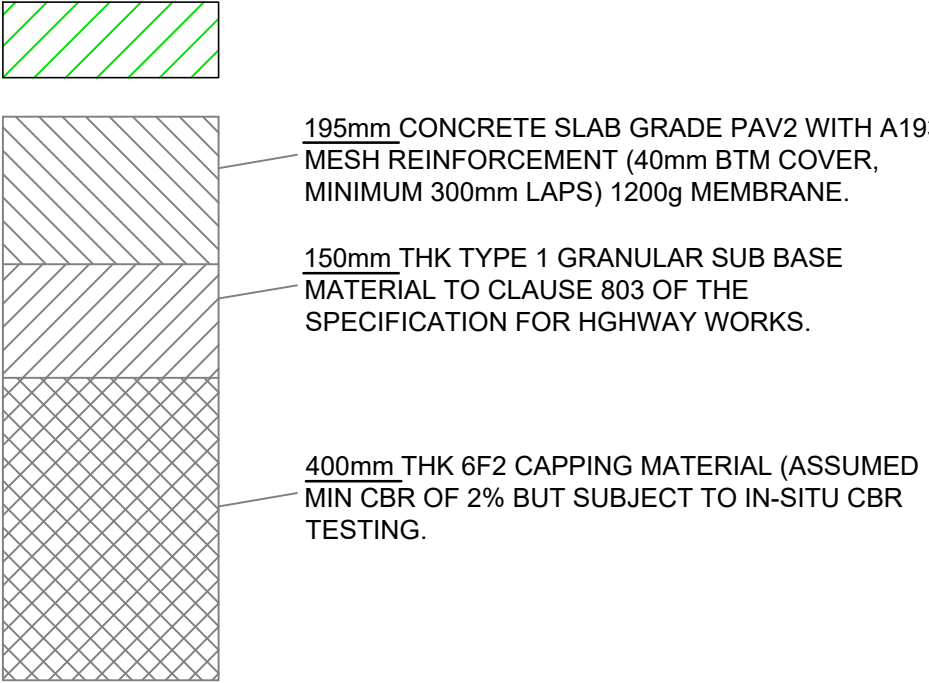
TARMAC ROAD



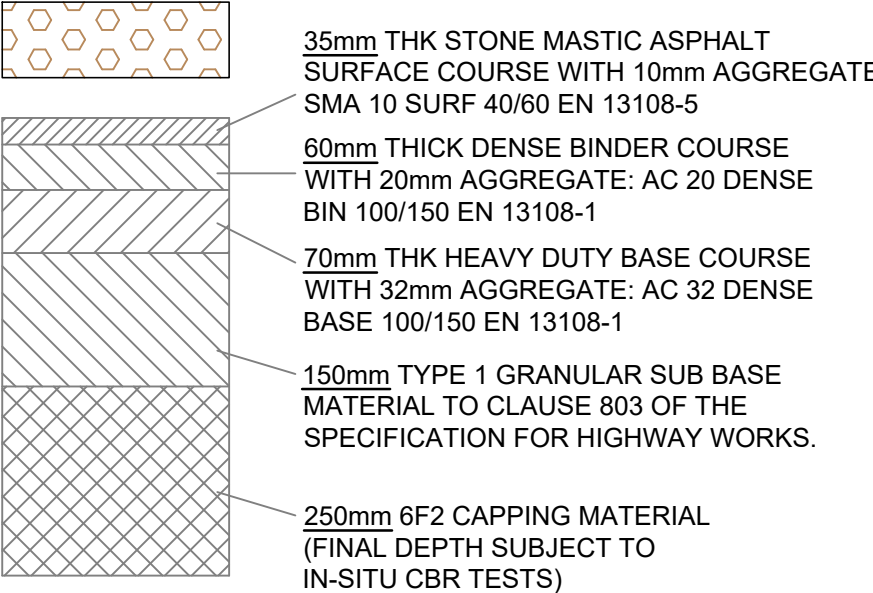
TARMAC FOOTPATH



IN-SITU CONCRETE SLAB



HEAVY DUTY TARMAC HIGHWAY



TOPSOIL



PROPERTY & CONSTRUCTION CONSULTANTS

RIDGE

APPENDIX B

Scott Hughes Design Ltd		Page 0
The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Main)	
Date 11/05/2022 File SW Drainage Network.mdx	Designed by P Barrett Checked by	
Micro Drainage Network 2018.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW Proposed

Pipe Sizes Pipe Manhole Sizes Manhole

FSR Rainfall Model - England and Wales

Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	0.000
M5-60 (mm)	19.000	Volumetric Runoff Coeff.	0.840	Min Design Depth for Optimisation (m)	0.900
Ratio R	0.308	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	80	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	300
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.000		

Designed with Level Soffits

Time Area Diagram for SW Proposed

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.599	4-8	0.443	8-12	0.131	12-16	0.059	16-20	0.015	20-24	0.040	24-28	0.040
												28-32	0.004

Total Area Contributing (ha) = 1.331

Total Pipe Volume (m³) = 164.002

Network Design Table for SW Proposed

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Scott Hughes Design Ltd		Page 6
The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Main)	
Date 11/05/2022 File SW Drainage Network.mdx	Designed by P Barrett Checked by	
Micro Drainage	Network 2018.1	

PIPELINE SCHEDULES for SW Proposed

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
1.003	o	450	SW04	131.877	130.216	1.211	Open Manhole	1200
3.000	o	300	Dock Outlet	131.139	130.360	0.479	Open Manhole	1200
1.004	o	450	SW05	132.049	130.110	1.489	Open Manhole	1200
1.005	o	450	SW06	132.272	130.000	1.822	Open Manhole	1800

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
1.003	42.802	403.8	SW05	132.049	130.110	1.489	Open Manhole	1200
3.000	23.404	234.0	SW05	132.049	130.260	1.489	Open Manhole	1200
1.004	24.324	221.1	SW06	132.272	130.000	1.822	Open Manhole	1800
1.005	23.000	115.0	SW06	132.400	129.800	2.150	Open Manhole	1500

Scott Hughes Design Ltd		Page 7																																																																																						
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<u>Free Flowing Outfall Details for SW Proposed</u> <table border="1"> <thead> <tr> <th>Outfall Pipe Number</th> <th>Outfall Name</th> <th>C. Level (m)</th> <th>I. Level (m)</th> <th>Min I. Level (m)</th> <th>D,L (mm)</th> <th>W (mm)</th> </tr> </thead> <tbody> <tr> <td>1.005</td> <td>SW06</td> <td>132.400</td> <td>129.800</td> <td>0.000</td> <td>1500</td> <td>0</td> </tr> </tbody> </table> <u>Simulation Criteria for SW Proposed</u> <table border="1"> <tbody> <tr> <td>Volumetric Runoff Coeff</td> <td>0.840</td> <td>Manhole Headloss Coeff (Global)</td> <td>0.500</td> <td>Inlet Coeffiecient</td> <td>0.800</td> </tr> <tr> <td>Areal Reduction Factor</td> <td>1.000</td> <td>Foul Sewage per hectare (l/s)</td> <td>0.000</td> <td>Flow per Person per Day (l/per/day)</td> <td>0.000</td> </tr> <tr> <td>Hot Start (mins)</td> <td>0</td> <td>Additional Flow - % of Total Flow</td> <td>0.000</td> <td>Run Time (mins)</td> <td>60</td> </tr> <tr> <td>Hot Start Level (mm)</td> <td>0</td> <td>MADD Factor * 10m³/ha Storage</td> <td>2.000</td> <td>Output Interval (mins)</td> <td>1</td> </tr> <tr> <td colspan="2">Number of Input Hydrographs</td> <td>0</td> <td colspan="2">Number of Offline Controls</td> <td>0</td> </tr> <tr> <td colspan="2">Number of Online Controls</td> <td>1</td> <td colspan="2">Number of Storage Structures</td> <td>1</td> </tr> <tr> <td colspan="2"></td> <td></td> <td colspan="2">Number of Time/Area Diagrams</td> <td>0</td> </tr> <tr> <td colspan="2"></td> <td></td> <td colspan="2">Number of Real Time Controls</td> <td>0</td> </tr> </tbody> </table> <u>Synthetic Rainfall Details</u> <table border="1"> <tbody> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>M5-60 (mm)</td> <td>19.000</td> <td>Cv (Summer)</td> <td>0.840</td> </tr> <tr> <td>Return Period (years)</td> <td>1</td> <td>Ratio R</td> <td>0.308</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td colspan="2">Region</td> <td>England and Wales</td> <td>Profile Type</td> <td>Summer Storm</td> <td>Duration (mins)</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td>30</td> </tr> </tbody> </table>			Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)	1.005	SW06	132.400	129.800	0.000	1500	0	Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800	Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000	Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60	Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1	Number of Input Hydrographs		0	Number of Offline Controls		0	Number of Online Controls		1	Number of Storage Structures		1				Number of Time/Area Diagrams		0				Number of Real Time Controls		0	Rainfall Model	FSR	M5-60 (mm)	19.000	Cv (Summer)	0.840	Return Period (years)	1	Ratio R	0.308	Cv (Winter)	0.840	Region		England and Wales	Profile Type	Summer Storm	Duration (mins)						30
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Online Controls for SW Proposed Hydro-Brake® Optimum Manhole: SW06, DS/PN: 1.005, Volume (m³): 9.4 <table><tr><td>Unit Reference</td><td>MD-SHE-0304-5800-1800-5800</td><td>Sump Available</td><td>Yes</td></tr><tr><td>Design Head (m)</td><td>1.800</td><td>Diameter (mm)</td><td>304</td></tr><tr><td>Design Flow (l/s)</td><td>58.0</td><td>Invert Level (m)</td><td>130.000</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td><td>Minimum Outlet Pipe Diameter (mm)</td><td>375</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td><td>Suggested Manhole Diameter (mm)</td><td>2100</td></tr><tr><td>Application</td><td>Surface</td><td></td><td></td></tr></table> <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.800</td><td>58.0</td><td>Kick-Flo®</td><td>1.241</td><td>48.5</td></tr><tr><td>Flush-Flo™</td><td>0.571</td><td>58.0</td><td>Mean Flow over Head Range</td><td>-</td><td>49.4</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>9.3</td><td>0.600</td><td>58.0</td><td>1.600</td><td>54.8</td><td>2.600</td><td>69.3</td><td>5.000</td><td>95.2</td><td>7.500</td><td>116.0</td></tr><tr><td>0.200</td><td>31.2</td><td>0.800</td><td>57.0</td><td>1.800</td><td>58.0</td><td>3.000</td><td>74.3</td><td>5.500</td><td>99.7</td><td>8.000</td><td>119.7</td></tr><tr><td>0.300</td><td>53.3</td><td>1.000</td><td>55.0</td><td>2.000</td><td>61.0</td><td>3.500</td><td>80.0</td><td>6.000</td><td>104.0</td><td>8.500</td><td>123.3</td></tr><tr><td>0.400</td><td>56.8</td><td>1.200</td><td>50.3</td><td>2.200</td><td>63.9</td><td>4.000</td><td>85.4</td><td>6.500</td><td>108.2</td><td>9.000</td><td>126.8</td></tr><tr><td>0.500</td><td>57.8</td><td>1.400</td><td>51.4</td><td>2.400</td><td>66.7</td><td>4.500</td><td>90.4</td><td>7.000</td><td>112.1</td><td>9.500</td><td>130.2</td></tr></table>								Unit Reference	MD-SHE-0304-5800-1800-5800	Sump Available	Yes	Design Head (m)	1.800	Diameter (mm)	304	Design Flow (l/s)	58.0	Invert Level (m)	130.000	Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	375	Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	2100	Application	Surface			Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.800	58.0	Kick-Flo®	1.241	48.5	Flush-Flo™	0.571	58.0	Mean Flow over Head Range	-	49.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	9.3	0.600	58.0	1.600	54.8	2.600	69.3	5.000	95.2	7.500	116.0	0.200	31.2	0.800	57.0	1.800	58.0	3.000	74.3	5.500	99.7	8.000	119.7	0.300	53.3	1.000	55.0	2.000	61.0	3.500	80.0	6.000	104.0	8.500	123.3	0.400	56.8	1.200	50.3	2.200	63.9	4.000	85.4	6.500	108.2	9.000	126.8	0.500	57.8	1.400	51.4	2.400	66.7	4.500	90.4	7.000	112.1	9.500	130.2
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0.100	9.3	0.600	58.0	1.600	54.8	2.600	69.3	5.000	95.2	7.500	116.0																																																																																																														
0.200	31.2	0.800	57.0	1.800	58.0	3.000	74.3	5.500	99.7	8.000	119.7																																																																																																														
0.300	53.3	1.000	55.0	2.000	61.0	3.500	80.0	6.000	104.0	8.500	123.3																																																																																																														
0.400	56.8	1.200	50.3	2.200	63.9	4.000	85.4	6.500	108.2	9.000	126.8																																																																																																														
0.500	57.8	1.400	51.4	2.400	66.7	4.500	90.4	7.000	112.1	9.500	130.2																																																																																																														
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The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Main)																			
Date 11/05/2022 File SW Drainage Network.mdx	Designed by P Barrett Checked by																			
Micro Drainage		Network 2018.1																		
<u>Storage Structures for SW Proposed</u> <u>Cellular Storage Manhole: SW06, DS/PN: 1.005</u> Invert Level (m) 130.100 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 <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> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>300.0</td> <td>0.0</td> <td>0.800</td> <td>300.0</td> <td>0.0</td> <td>0.801</td> <td>0.0</td> <td>0.0</td> </tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	300.0	0.0	0.800	300.0	0.0	0.801	0.0	0.0
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)												
0.000	300.0	0.0	0.800	300.0	0.0	0.801	0.0	0.0												
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u>																			
<table><thead><tr><th></th><th>US/MH</th><th></th><th>Level</th></tr><tr><th>PN</th><th>Name</th><th>Status</th><th>Exceeded</th></tr></thead><tbody><tr><td>1.000</td><td>SW01</td><td>OK</td><td></td></tr><tr><td>1.001</td><td>SW02</td><td>OK</td><td>5</td></tr></tbody></table>					US/MH		Level	PN	Name	Status	Exceeded	1.000	SW01	OK		1.001	SW02	OK	5
	US/MH		Level																
PN	Name	Status	Exceeded																
1.000	SW01	OK																	
1.001	SW02	OK	5																
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)
1.002	SW03	15 Winter	1	+0%	100/15 Summer				130.831	-0.309	0.000	0.21
2.000	swale	30 Winter	1	+0%					131.374	-0.517	0.000	0.02
2.001	Swale 2	30 Winter	1	+0%					131.345	-0.546	0.000	0.02
2.002	Swale Outlet	60 Winter	1	+0%	30/15 Summer				131.292	-0.023	0.000	0.95
2.003	SW07	60 Winter	1	+0%	100/15 Summer				130.906	-0.177	0.000	0.10
1.003	SW04	15 Winter	1	+0%	30/15 Summer	100/30 Winter			130.487	-0.179	0.000	0.66
3.000	Dock Outlet	15 Winter	1	+0%	30/15 Winter	100/30 Summer			130.412	-0.248	0.000	0.07
1.004	SW05	15 Winter	1	+0%	30/15 Summer	100/30 Winter			130.353	-0.207	0.000	0.56
1.005	SW06	60 Winter	1	+0%	30/15 Winter	100/30 Winter			130.261	-0.189	0.000	0.18

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
1.002	SW03	72.9	OK	
2.000	swale	8.0	OK	
2.001	Swale 2	10.9	OK	
2.002	Swale Outlet	5.9	OK	
2.003	SW07	6.4	OK	
1.003	SW04	94.0	OK	5
3.000	Dock Outlet	4.3	OK	10
1.004	SW05	101.8	OK	3
1.005	SW06	45.7	OK	1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

Synthetic Rainfall Details

```
Margin for Flood Risk Warning (mm)                300.0      DVD Status ON
      Analysis Timestep 2.5 Second Increment (Extended) Inertia Status ON
      DTS Status                                     ON
```

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded			Pipe
									Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)
1.000	SW01	15 Winter	30	+0%	100/15 Summer				131.190	-0.097	0.000	0.48		60.3
1.001	SW02	15 Winter	30	+0%	100/15 Summer	100/15 Summer			131.145	-0.083	0.000	0.82		119.5

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PN	Name	Status	Exceeded																
1.000	SW01	OK																	
1.001	SW02	OK	5																
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Micro Drainage	Network 2018.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow (1/s)
									Level (m)	Depth (m)	Volume (m³)		
1.002	SW03	15 Winter	30	+0%	100/15 Summer				131.087	-0.053	0.000	0.52	
2.000	swale	30 Winter	30	+0%					131.440	-0.451	0.000	0.04	
2.001	Swale 2	30 Winter	30	+0%					131.407	-0.484	0.000	0.05	
2.002	Swale Outlet	60 Winter	30	+0%	30/15 Summer				131.396	0.081	0.000	1.17	
2.003	SW07	15 Winter	30	+0%	100/15 Summer				130.975	-0.108	0.000	0.13	
1.003	SW04	15 Winter	30	+0%	30/15 Summer	100/30 Winter			130.956	0.290	0.000	1.64	
3.000	Dock Outlet	60 Winter	30	+0%	30/15 Winter	100/30 Summer			130.725	0.065	0.000	0.12	
1.004	SW05	60 Winter	30	+0%	30/15 Summer	100/30 Winter			130.722	0.162	0.000	1.02	
1.005	SW06	60 Winter	30	+0%	30/15 Winter	100/30 Winter			130.614	0.164	0.000	0.23	

PN	US/MH Name	Pipe Flow (1/s)	Status	Level Exceeded
1.002	SW03	178.9	OK	
2.000	swale	19.7	OK	
2.001	Swale 2	25.4	OK	
2.002	Swale Outlet	7.3	SURCHARGED	
2.003	SW07	8.4	OK	
1.003	SW04	234.7	SURCHARGED	5
3.000	Dock Outlet	7.8	SURCHARGED	10
1.004	SW05	183.7	SURCHARGED	3
1.005	SW06	57.9	SURCHARGED	1

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u>																		
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	US/MH		Level															
PN	Name	Status	Exceeded															
1.000	SW01	FLOOD RISK																
1.001	SW02	FLOOD	5															
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

										Water	Surcharged	Flooded		
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow
PN	Name	Storm		Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)
1.002	SW03	60 Winter		100	+40%	100/15 Summer				132.133	0.993	0.000	0.64	
2.000	swale	120 Winter		100	+40%					131.606	-0.285	0.000	0.04	
2.001	Swale 2	120 Winter		100	+40%					131.605	-0.286	0.000	0.04	
2.002	Swale Outlet	120 Winter		100	+40%	30/15 Summer				131.605	0.290	0.000	1.46	
2.003	SW07	120 Winter		100	+40%	100/15 Summer				131.924	0.841	0.000	0.28	
1.003	SW04	60 Winter		100	+40%	30/15 Summer	100/30 Winter			131.897	1.231	22.140	1.99	
3.000	Dock Outlet	120 Winter		100	+40%	30/15 Winter	100/30 Summer			131.249	0.589	109.835	0.59	
1.004	SW05	60 Winter		100	+40%	30/15 Summer	100/30 Winter			132.054	1.494	5.890	1.72	
1.005	SW06	60 Winter		100	+40%	30/15 Winter	100/30 Winter			132.272	1.822	0.367	0.23	

PN	US/MH Name	Pipe Flow (1/s)	Status	Level Exceeded
1.002	SW03	220.2	FLOOD RISK	
2.000	swale	19.0	FLOOD RISK*	
2.001	Swale 2	23.9	FLOOD RISK*	
2.002	Swale Outlet	9.2	FLOOD RISK	
2.003	SW07	17.7	SURCHARGED	
1.003	SW04	284.7	FLOOD	5
3.000	Dock Outlet	38.0	FLOOD	10
1.004	SW05	311.6	FLOOD	3
1.005	SW06	58.5	FLOOD	1

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Micro Drainage Network 2018.1																																																																							
<u>STORM SEWER DESIGN by the Modified Rational Method</u> <u>Network Design Table for SW Proposed</u> # - Indicates pipe length does not match coordinates <table><thead><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT (mm)</th><th>DIA</th><th>Section Type</th><th>Auto Design</th></tr></thead><tbody><tr><td>1.000</td><td>24.685#</td><td>0.200</td><td>123.4</td><td>0.240</td><td>10.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.001</td><td>24.685</td><td>0.176</td><td>140.3</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>225</td><td>Pipe/Conduit</td><td></td></tr></tbody></table> <u>Network Results Table</u> <table><thead><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>E I.Area (ha)</th><th>E Base Flow (l/s)</th><th>Foul Add (l/s)</th><th>Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>1.000</td><td>32.80</td><td>10.29</td><td>130.600</td><td>0.240</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.41</td><td>99.9</td><td>23.9</td></tr><tr><td>1.001</td><td>32.66</td><td>10.37</td><td>130.400</td><td>0.000</td><td>10.0</td><td>0.0</td><td>0.0</td><td>1.10</td><td>43.8</td><td>10.0</td></tr></tbody></table>			PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA	Section Type	Auto Design	1.000	24.685#	0.200	123.4	0.240	10.00	0.0	0.600	o	300	Pipe/Conduit		1.001	24.685	0.176	140.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul Add (l/s)	Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	1.000	32.80	10.29	130.600	0.240	0.0	0.0	0.0	1.41	99.9	23.9	1.001	32.66	10.37	130.400	0.000	10.0	0.0	0.0	1.10	43.8	10.0
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA	Section Type	Auto Design																																																												
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Micro Drainage					Network 2018.1						
<u>Manhole Schedules for SW Proposed</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
Channel Outlet	132.085	1.485	Open Manhole	1200	1.000	130.600	300				
SW11	132.635	2.235	Open Manhole	1500	1.001	130.400	225	1.000	130.400	300	
SW06	131.385	1.161	Open Manhole	1500		OUTFALL		1.001	130.224	225	

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The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Secondary)																																																																									
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<u>PIPELINE SCHEDULES for SW Proposed</u> <u>Upstream Manhole</u> # - Indicates pipe length does not match coordinates <table><tr><th>PN</th><th>Hyd</th><th>Diam</th><th>MH</th><th>C.Level</th><th>I.Level</th><th>D.Depth</th><th>MH</th><th>MH DIAM., L*W</th></tr><tr><th></th><th>Sect</th><th>(mm)</th><th>Name</th><th>(m)</th><th>(m)</th><th>(m)</th><th>Connection</th><th>(mm)</th></tr><tr><td>1.000</td><td>o</td><td>300</td><td>Channel Outlet</td><td>132.085</td><td>130.600</td><td>1.185</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.001</td><td>o</td><td>225</td><td>SW11</td><td>132.635</td><td>130.400</td><td>2.010</td><td>Open Manhole</td><td>1500</td></tr></table> <u>Downstream Manhole</u> <table><tr><th>PN</th><th>Length</th><th>Slope</th><th>MH</th><th>C.Level</th><th>I.Level</th><th>D.Depth</th><th>MH</th><th>MH DIAM., L*W</th></tr><tr><th></th><th>(m)</th><th>(1:X)</th><th>Name</th><th>(m)</th><th>(m)</th><th>(m)</th><th>Connection</th><th>(mm)</th></tr><tr><td>1.000</td><td>24.685</td><td># 123.4</td><td>SW11</td><td>132.635</td><td>130.400</td><td>1.935</td><td>Open Manhole</td><td>1500</td></tr><tr><td>1.001</td><td>24.685</td><td>140.3</td><td>SW06</td><td>131.385</td><td>130.224</td><td>0.936</td><td>Open Manhole</td><td>1500</td></tr></table>			PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W		Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)	1.000	o	300	Channel Outlet	132.085	130.600	1.185	Open Manhole	1200	1.001	o	225	SW11	132.635	130.400	2.010	Open Manhole	1500	PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W		(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)	1.000	24.685	# 123.4	SW11	132.635	130.400	1.935	Open Manhole	1500	1.001	24.685	140.3	SW06	131.385	130.224	0.936	Open Manhole	1500
PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W																																																																		
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Micro Drainage		Network 2018.1														
<u>Free Flowing Outfall Details for SW Proposed</u> <table border="1"> <thead> <tr> <th>Outfall Pipe Number</th> <th>Outfall C. Name</th> <th>Level (m)</th> <th>I. Level (m)</th> <th>Min I. Level (mm)</th> <th>D,L (mm)</th> <th>W (mm)</th> </tr> </thead> <tbody> <tr> <td>1.001</td> <td>SW06</td> <td>131.385</td> <td>130.224</td> <td>0.000</td> <td>1500</td> <td>0</td> </tr> </tbody> </table> <u>Simulation Criteria for SW Proposed</u> Volumetric Runoff Coef 0.840 Manhole Headloss Coeff (Global) 0.500 Inlet Coefficient 0.800 Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000 Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 0.000 Output Interval (mins) 1 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.840 Return Period (years) 1 Ratio R 0.308 Cv (Winter) 0.840 Region England and Wales Profile Type Summer Storm Duration (mins) 30			Outfall Pipe Number	Outfall C. Name	Level (m)	I. Level (m)	Min I. Level (mm)	D,L (mm)	W (mm)	1.001	SW06	131.385	130.224	0.000	1500	0
Outfall Pipe Number	Outfall C. Name	Level (m)	I. Level (m)	Min I. Level (mm)	D,L (mm)	W (mm)										
1.001	SW06	131.385	130.224	0.000	1500	0										
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Page 4

The Flint Glass Works
64 Jersey Street
Manchester M4 6JW

Birch Business Park
Unit B
SW Drainage (Secondary)

Date 11/05/2022
File SW Network Secondary.MDX

Designed by P Barrett
Checked by

Micro Drainage

Network 2018.1

Online Controls for SW Proposed

Hydro-Brake® Optimum Manhole: SW11, DS/PN: 1.001, Volume (m³): 5.6

Unit ReferenceMD-SHE-0161-1300-1200-1300

Sump Available

Yes

Design Head (m)

1.200

Diameter (mm)

161

Design Flow (l/s)

13.0

Invert Level (m)

130.400

Flush-Flo™

Calculated

Minimum Outlet Pipe Diameter (mm)

225

Objective

Minimise upstream storage

Suggested Manhole Diameter (mm)

1200

Application

Surface

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)

1.200

13.0

Flush-Flo™

0.362

13.0

Control Points

Head (m)

Flow (l/s)

Kick-Flo®

0.796

10.7

Mean Flow over Head Range

-

11.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations be invalidated.

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

Depth (m)

Flow (l/s)

0.100

5.8

0.300

12.9

0.500

12.8

0.800

10.7

1.200

13.0

1.600

14.9

0.200

12.2

0.400

13.0

0.600

12.5

1.000

11.9

1.400

14.0

1.800

15.8

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The Flint Glass Works 64 Jersey Street Manchester M4 6JW					Birch Business Park Unit B SW Drainage (Secondary)																																																						
Date 11/05/2022					Designed by P Barrett																																																						
File SW Network Secondary.MDX					Checked by																																																						
Micro Drainage					Network 2018.1																																																						
<u>Hydro-Brake® Optimum Manhole: SW11, DS/PN: 1.001, Volume (m³): 5.6</u> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>2.000</td><td>16.6</td><td>2.600</td><td>18.8</td><td>4.000</td><td>23.1</td><td>5.500</td><td>26.9</td><td>7.000</td><td>30.2</td><td>8.500</td><td>33.2</td></tr><tr><td>2.200</td><td>17.3</td><td>3.000</td><td>20.1</td><td>4.500</td><td>24.4</td><td>6.000</td><td>28.0</td><td>7.500</td><td>31.2</td><td>9.000</td><td>34.1</td></tr><tr><td>2.400</td><td>18.1</td><td>3.500</td><td>21.6</td><td>5.000</td><td>25.7</td><td>6.500</td><td>29.1</td><td>8.000</td><td>32.2</td><td>9.500</td><td>35.0</td></tr></table>												Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	2.000	16.6	2.600	18.8	4.000	23.1	5.500	26.9	7.000	30.2	8.500	33.2	2.200	17.3	3.000	20.1	4.500	24.4	6.000	28.0	7.500	31.2	9.000	34.1	2.400	18.1	3.500	21.6	5.000	25.7	6.500	29.1	8.000	32.2	9.500	35.0
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																
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2.400	18.1	3.500	21.6	5.000	25.7	6.500	29.1	8.000	32.2	9.500	35.0																																																
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Scott Hughes Design Ltd		Page 6																		
The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Secondary)																			
Date 11/05/2022 File SW Network Secondary.MDX	Designed by P Barrett Checked by																			
Micro Drainage		Network 2018.1																		
<u>Storage Structures for SW Proposed</u> <u>Cellular Storage Manhole: SW11, DS/PN: 1.001</u> Invert Level (m)130.500 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> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>20.0</td> <td>0.0</td> <td>0.800</td> <td>20.0</td> <td>0.0</td> <td>0.801</td> <td>0.0</td> <td>0.0</td> </tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	20.0	0.0	0.800	20.0	0.0	0.801	0.0	0.0
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)												
0.000	20.0	0.0	0.800	20.0	0.0	0.801	0.0	0.0												
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The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Secondary)	
Date 11/05/2022	Designed by P Barrett	
File SW Network Secondary.MDX	Checked by	
Micro Drainage	Network 2018.1	
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u> <u>Simulation Criteria</u> Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 0.000 Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750 Region England and Wales Ratio R 0.308 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 0, 40		
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The Flint Glass Works 64 Jersey Street Manchester M4 6JW				Birch Business Park Unit B SW Drainage (Secondary)			
Date 11/05/2022				Designed by P Barrett			
File SW Network Secondary.MDX				Checked by			
Micro Drainage				Network 2018.1			
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u>							
						Water SurchargedFlooded	
PN	US/MH Name	Storm	Return Climate Period Change	First (X) Surge Charge	First (Y) Flood	First (Z) Overflow Act.	Level Depth Volume Flow / (m)(m)(m³) Cap.
1.000 Channel Outlet	15 Winter	1	+0% 30/15 Summer	100/15 Summer			130.696 -0.204 0.000 0.22
1.001	SW11 30 Winter	1	+0% 1/15 Winter				130.661 0.036 0.000 0.32
Pipe							
PN	US/MH Name	Overflow Flow (l/s)	Status	Level Exceeded			
1.000 Channel Outlet		19.9	OK	12			
1.001	SW11	12.7	SURCHARGED				
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The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Secondary)	
Date 11/05/2022	Designed by P Barrett	
File SW Network Secondary.MDX	Checked by	
Micro Drainage	Network 2018.1	
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u>		
<u>Simulation Criteria</u>		
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 0.000 Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000		
Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0		
<u>Synthetic Rainfall Details</u>		
Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750 Region England and Wales Ratio R 0.308 Cv (Winter) 0.840		
Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON		
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The Flint Glass Works 64 Jersey Street Manchester M4 6JW					Birch Business Park Unit B SW Drainage (Secondary)								
Date 11/05/2022					Designed by P Barrett								
File SW Network Secondary.MDX					Checked by								
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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u>													

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The Flint Glass Works 64 Jersey Street Manchester M4 6JW	Birch Business Park Unit B SW Drainage (Secondary)	
Date 11/05/2022 File SW Network Secondary.MDX	Designed by P Barrett Checked by	
Micro Drainage		Network 2018.1
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed</u> <u>Simulation Criteria</u> Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 0.000 Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR M5-60 (mm) 19.000 Cv (Summer) 0.750 Region England and Wales Ratio R 0.308 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 0, 40		
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The Flint Glass Works

64 Jersey Street

Manchester M4 6JW

Birch Business Park

Unit B

SW Drainage (Secondary)

Date 11/05/2022

File SW Network Secondary.MDX

Designed by P Barrett

Checked by

Micro Drainage

Network 2018.1

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW Proposed

										Water SurchargedFlooded	
PN	US/MH Name	Storm	Return Climate	First (X) Period Change	First (Y) Surcharge	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.
1.000	Channel Outlet	60 Winter	100	+40% 30/15 Summer	100/15 Summer			132.122	1.222	36.740	0.58
1.001	SW11	60 Winter	100	+40% 1/15 Winter				132.323	1.698	0.000	0.38

				Pipe			
PN	US/MH Name	Overflow Flow (l/s)	Flow (l/s)	Status	Level Exceeded		
1.000	Channel Outlet	51.5	FLOOD	12			
1.001	SW11	15.3	SURCHARGED				

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PROPERTY & CONSTRUCTION CONSULTANTS

RIDGE

APPENDIX C

BIRCH BUSINESS AUNIT B DRAINAGE MAINTENANCE SCHEDULE

Organisation responsible for maintenance: _____ Contact Details – Name: _____

Number: _____ Documents:

- Drainage Layout
- Drainage Details 1
- Drainage Details 2
- Drainage Details 3

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

Table 1: Pipes and Manholes Maintenance Schedule

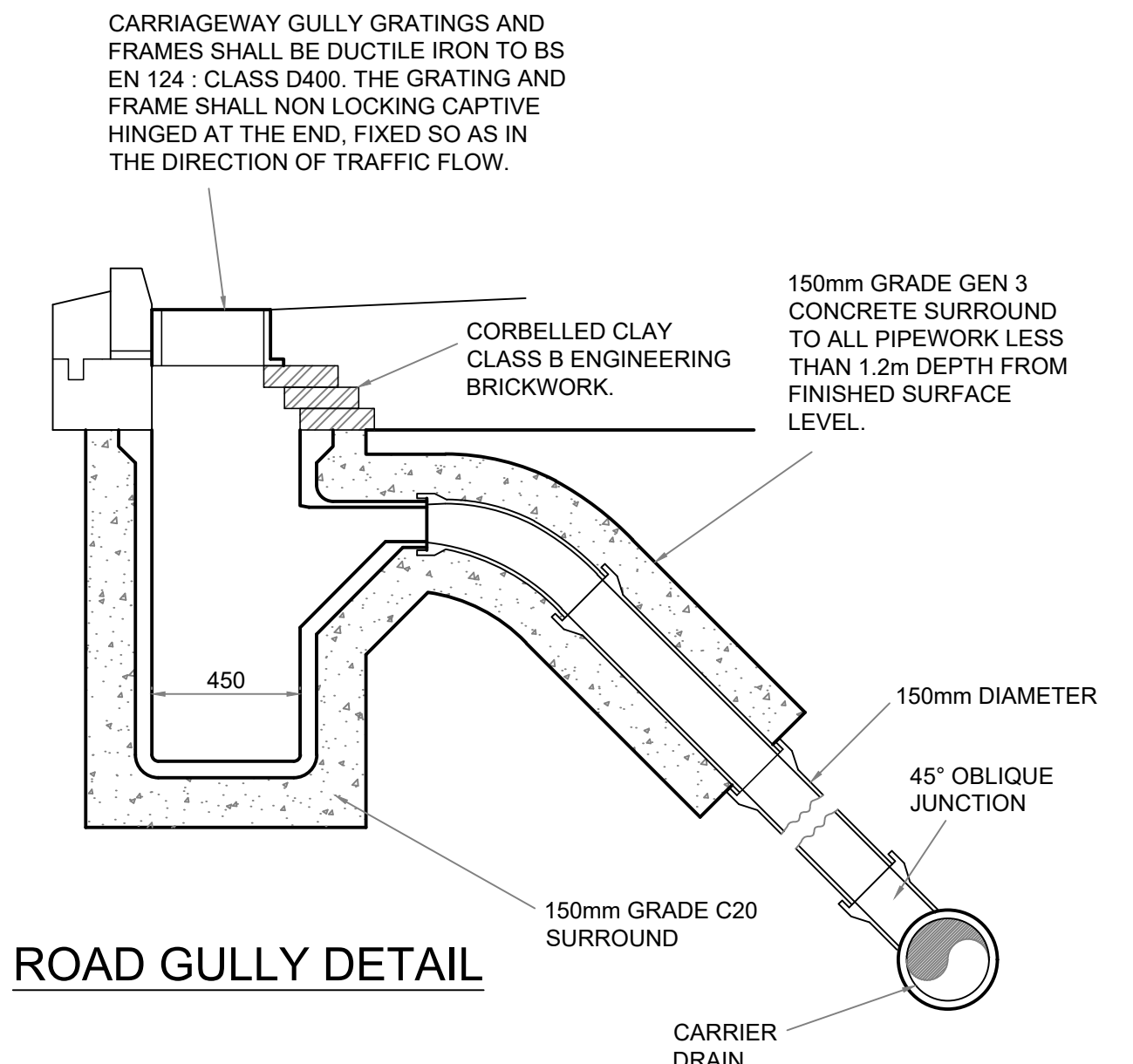
Maintenance schedule	Required Action	Recommended Frequency
Occasional maintenance	Visual inspection of covers, gratings and manhole chambers.	Annually or as required.
	Cleaning out manholes.	Annually or as required.
	CCTV inspection of drainage pipes.	Annually or as required.
Remedial actions	Reactive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

Table 2: Geocellular Tank Maintenance Schedule

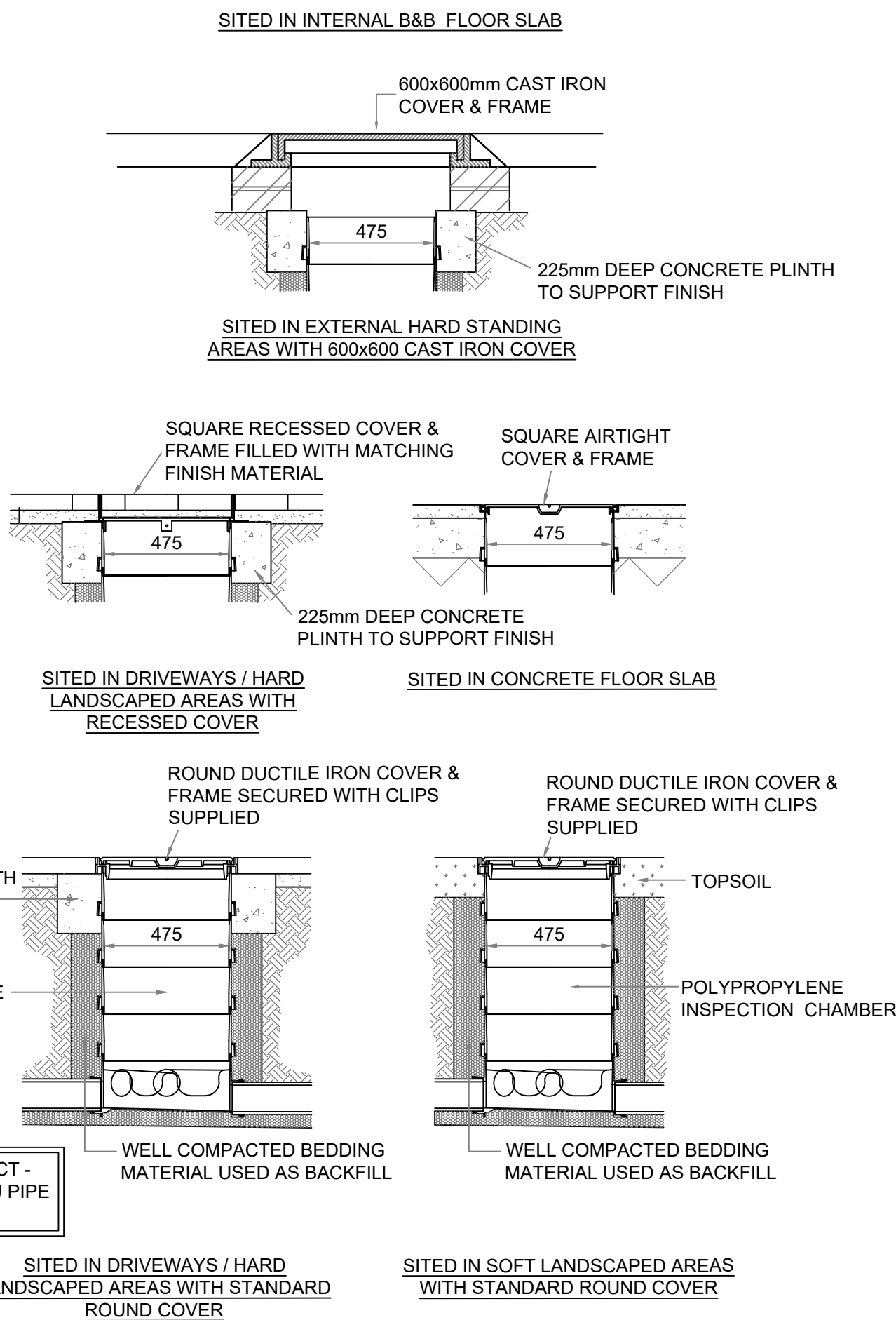
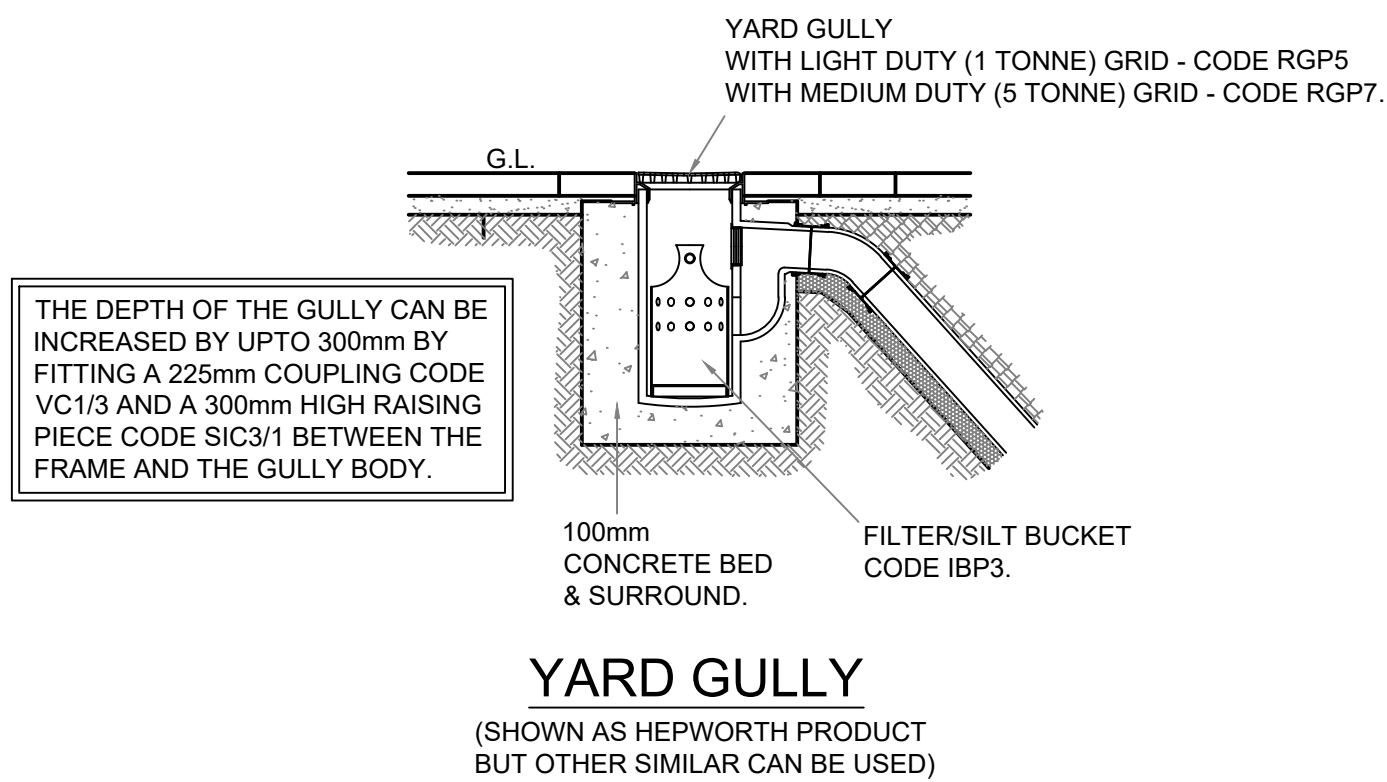
Maintenance Schedule	Required Action	Recommended Frequency
Regular Maintenance	Inspect and identify areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually or as required
	Remove debris from the catchment surface	Monthly
	Remove sediment from pre-treatment structures	Annually
Remedial Actions	Repair / rehabilitate inlets/outlet and vents	As required
Monitoring	Inspect inlets, outlets and vents to ensure they are in good condition and operating as designed.	Annually
	Survey Inside of tank for sediment build up and remove is necessary	Every 5 years or where concerned about operation

Table 3: Swales (to be read in conjunction with landscape maintenance strategy)

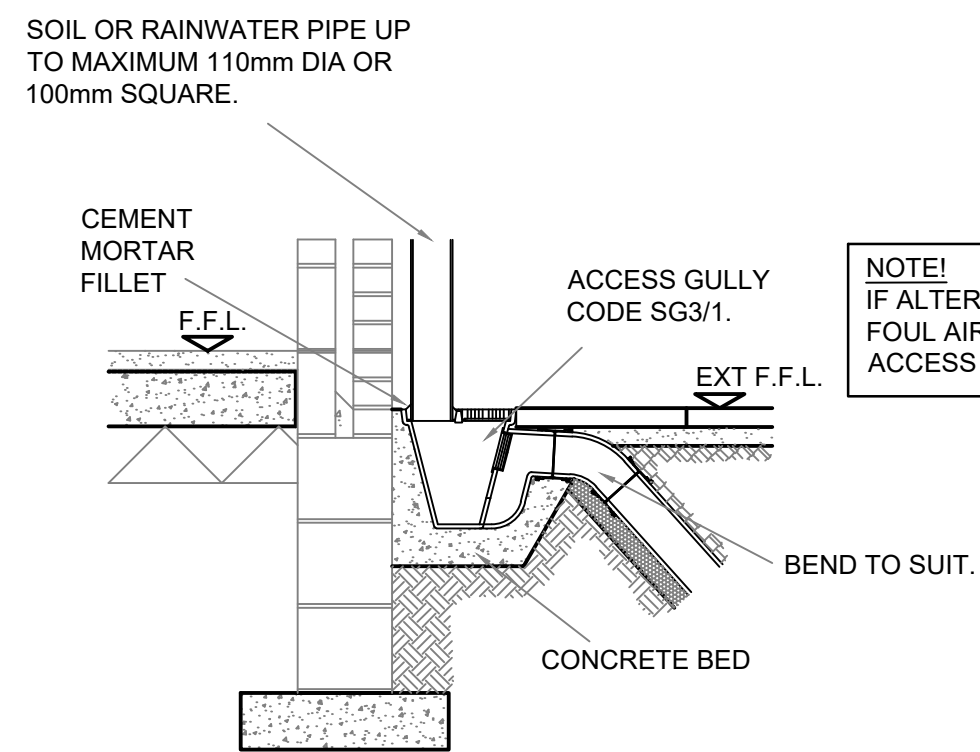
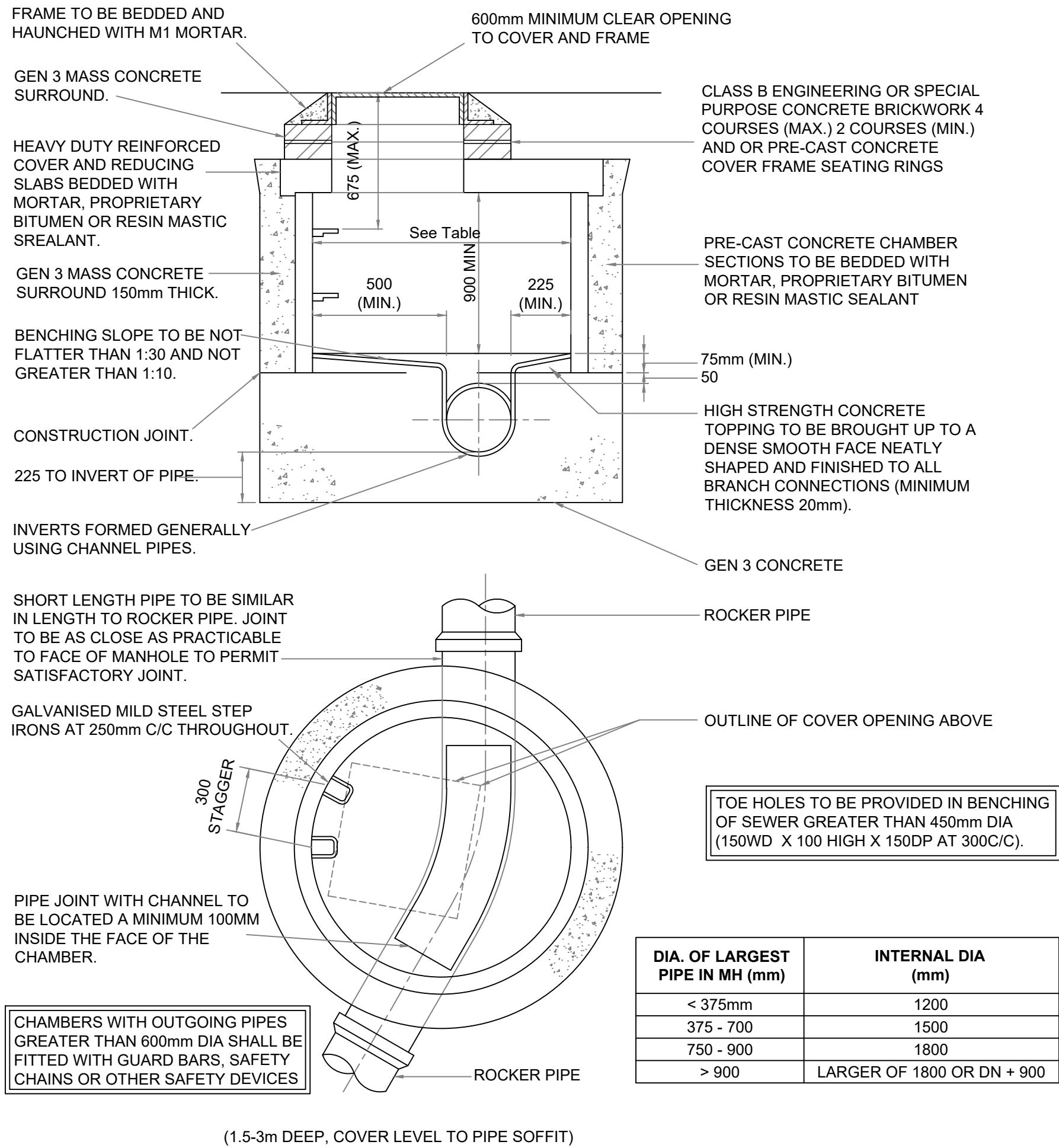
Maintenance schedule	Required Action	Recommended Frequency
Regular maintenance	Remove litter and debris	Monthly or as required.
	Cut grass – to maintain a range of 100mm-200mm	Monthly during growing season or as required.
	Inspect vegetation coverage	Monthly for first 6 months then quarterly for 2 years
	Manage other vegetation and remove nuisance plants	Monthly or as required.
	Inspect inlets and Outlets	Twice annually
Occasional Maintenance	Reseed areas of poor vegetation growth	.As required or if base soil is present across more than 10% of base area
Remedial Actions	Repair erosion by returfing / reseeding	As Required
	Relevel uneven surfaces and reinstate design levels	As Required
	Remove build-up of sediment at outlet	As Required
	Remove and dispose of oil or petrol residues using safe standard practices	As Required As Required



ROAD GULLY DETAIL

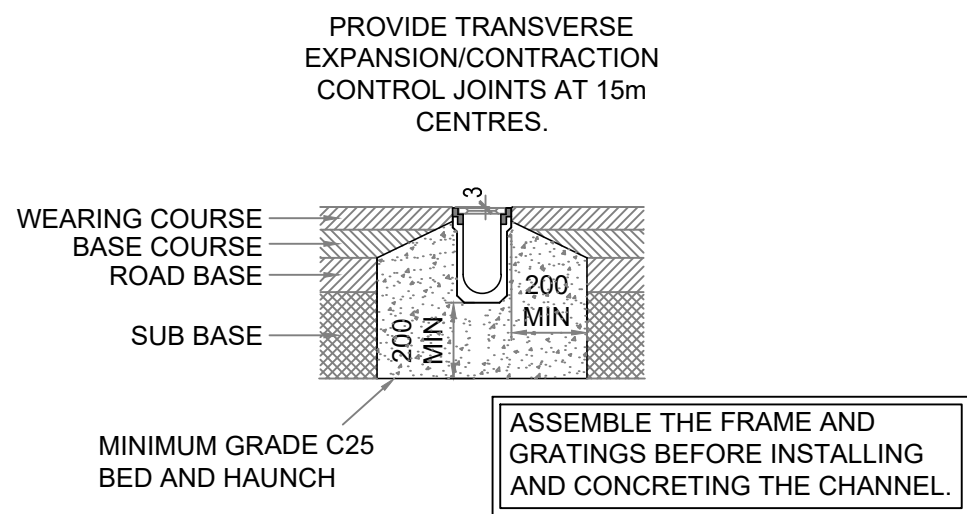


POLYPROPYLENE INSPECTION CHAMBER INSTALLATION DETAIL

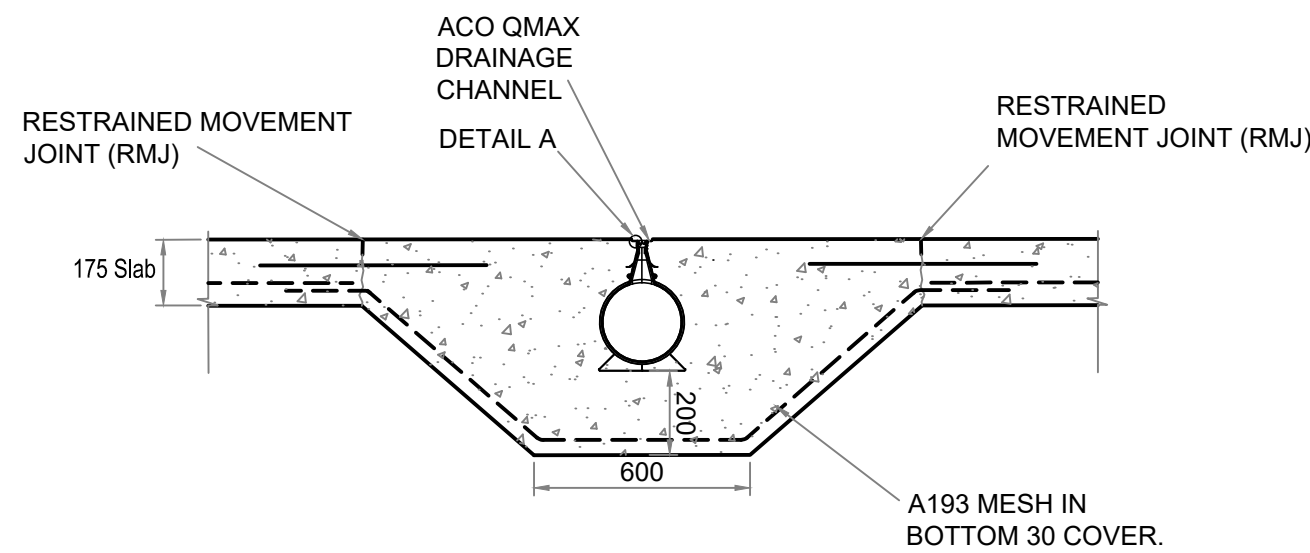


EXTERNAL RWP / SVP CONNECTION AND GULLY (SHOWN AS HEPWORTH BUT SIMILAR CAN BE USED)

- NOTES
- GULLY POTS: HIGHWAY GULLIES P.C.C. TO B.S. 5911 GULLY POT TO BE OF 100 LITRES CAPACITY.
 - MAXIMUM TRENCH WIDTH FOR 150mm GULLY LEAD IS 600mm.
 - NUMBER OF BENDS MAY VARY DUE TO SITE DIFFERENCES - SEE DRAINAGE SCHEDULE.
 - CONCRETE SURROUND TO PIPES SHALL ALWAYS FINISH AT A JOINT.
 - HEAVY DUTY, CAST IRON, LAMPHOLE TYPE COVER IN HARDSTANDING AND AREAS ACCESSIBLE TO VEHICULAR TRAFFIC, TO B.S. EN 124. 1994 CLASS D400, C250, OR B125 DEPENDANT ON LOCATION.
 - COVER SLAB TO BE 200MM THICK GRADE C20 CONCRETE.



TYPICAL DRAINAGE CHANNEL IN FLEXIBLE PAVEMENT



DRAINAGE CHANNEL IN CONCRETE SLAB

GENERAL NOTES

- DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- DO NOT SCALE FROM THIS DRAWING, WORK TO DIMENSIONS OR CO-ORDINATES PROVIDED. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS, SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
- INFORMATION CONTAINED ON THIS DRAWING IS TENDER DESIGN ONLY. FURTHER DETAILED DESIGN AND CO-ORDINATION WITH THE CONTRACTOR, DESIGN TEAM AND APPROPRIATE SUB-CONTRACTORS WILL BE REQUIRED TO FULLY DEVELOP AND DETAIL THE FINAL CONSTRUCTION DETAILS. CONTRACTOR TO USE THEIR EXPERIENCE AND JUDGEMENT TO MAKE SUFFICIENT ALLOWANCES FOR DETAILED DESIGN DEVELOPMENT.

P1	17.02.22	AP	PB	TENDER ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT
STATUS		PURPOSE OF ISSUE		
D2		TENDER		
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RIDGE				
CLIENT YEARGATE LIMITED				
PROJECT UNIT B BIRCH BUSINESS PARK				
DRAFTER AP		ENGINEER PB		
TITLE		PROJECT REFERENCE:		
DRAINAGE DETAILS		SHEET 1 OF 4		
SCALE	SHEET	DRAWING No		REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0503		P1

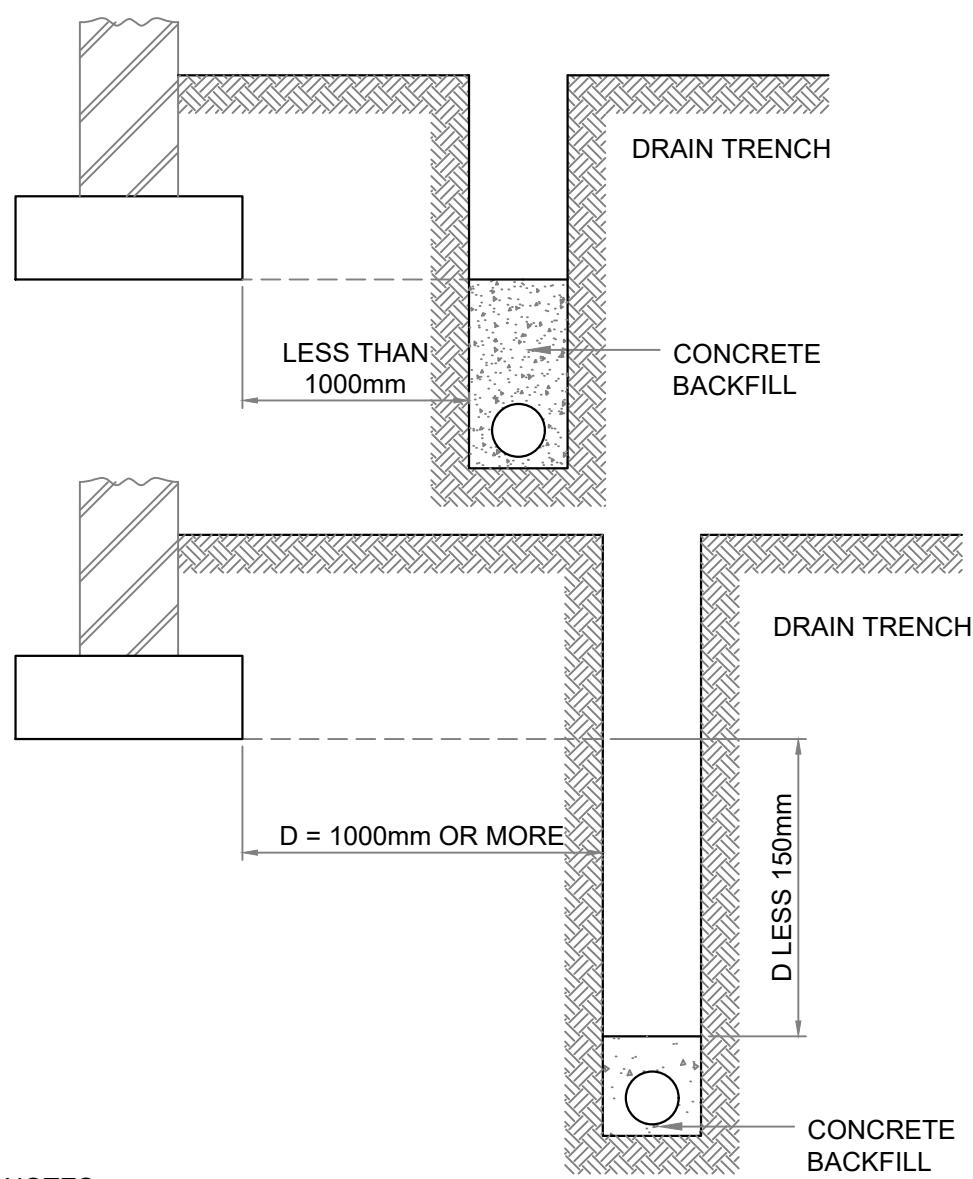
GENERAL NOTES

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.

2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

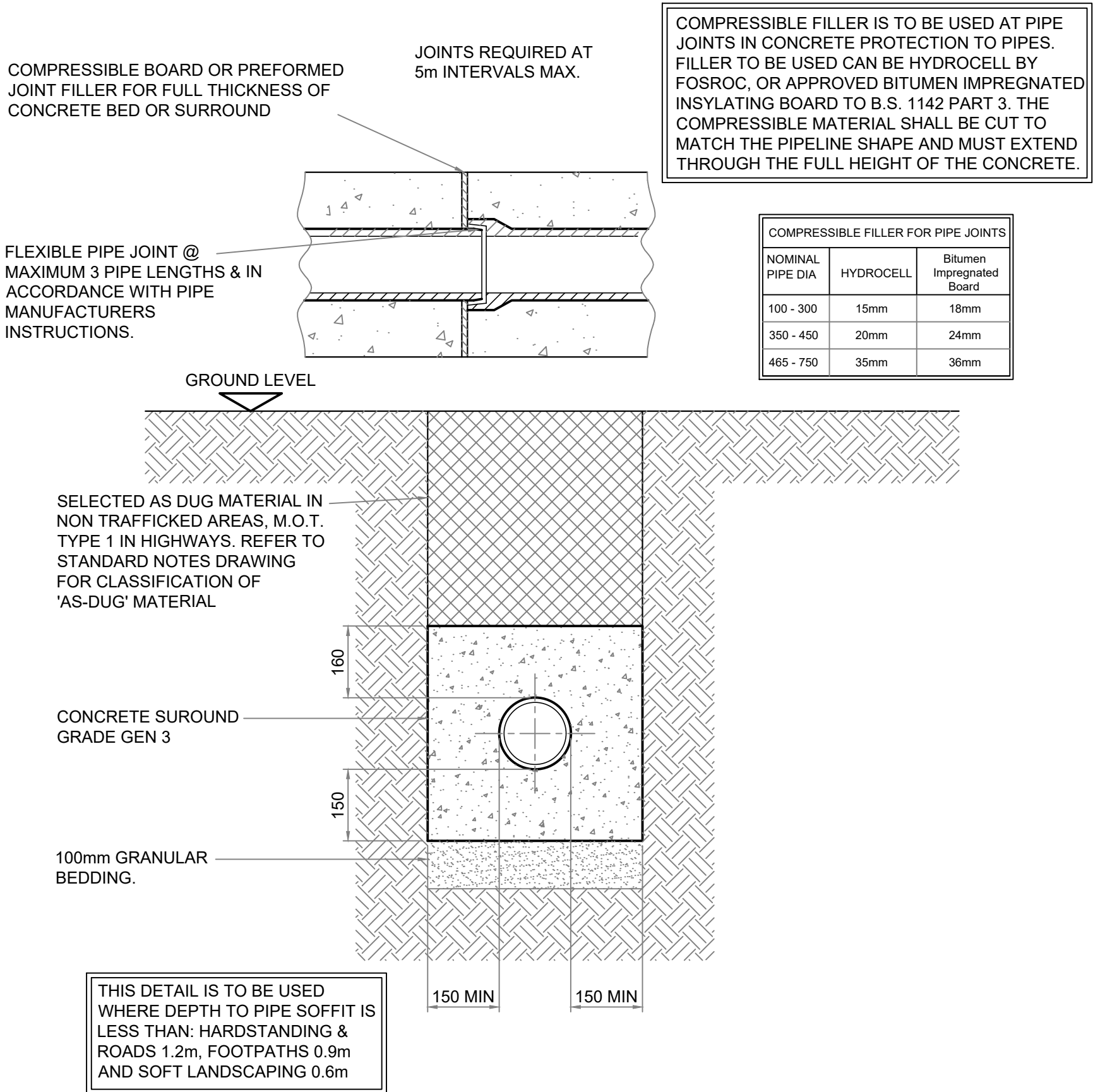
3. DO NOT SCALE FROM THIS DRAWING, WORK TO DIMENSIONS OR CO-ORDINATES PROVIDED. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS, SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.

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- NOTES
1. CONCRETE TO BE GRADE GEN 3
 2. JOINTS TO BE PROVIDED IN CONCRETE SURROUND AT NOT GREATER THAN 5.0m CENTRES. BUILDING REGULATIONS PART H1 PARA A11
 3. WHERE THE TRENCH IS WITHIN 1m OF THE BUILDING THE TRENCH SHALL BE FILLED WITH CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATIONS. WHERE THE TRENCH IS FURTHER THAN 1000mm FROM THE BUILDING, THE TRENCH SHALL BE FILLED WITH CONCRETE UP TO A LEVEL, BELOW THE LOWEST LEVEL OF THE FOUNDATION, EQUAL TO THE DISTANCE FROM THE BUILDING LESS 150mm.

PIPE RUNS ADJACENT TO BUILDING



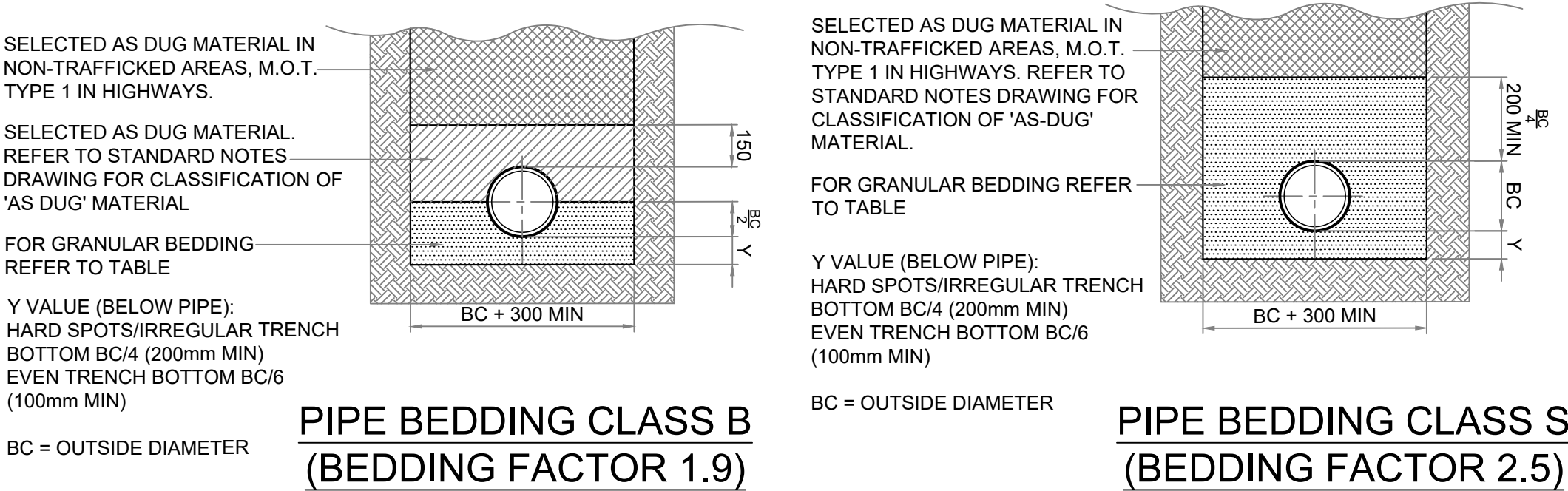
CLASS 'Z' PIPE BEDDING

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

RIGID PIPES BEDDING GRADING

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

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



PIPE BEDDING CLASS B (BEDDING FACTOR 1.9)

PIPE BEDDING CLASS S (BEDDING FACTOR 2.5)

P1	17.02.22	AP	PB	TENDER ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT
STATUS		PURPOSE OF ISSUE		
D2		TENDER		

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CLIENT		YEARGATE LIMITED	
PROJECT		UNIT B BIRCH BUSINESS PARK	
DRAFTER		AP	ENGINEER PB
TITLE		PROJECT REFERENCE:	
		DRAINAGE DETAILS SHEET 2 OF 4	
SCALE	SHEET	DRAWING No	REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0504	P1

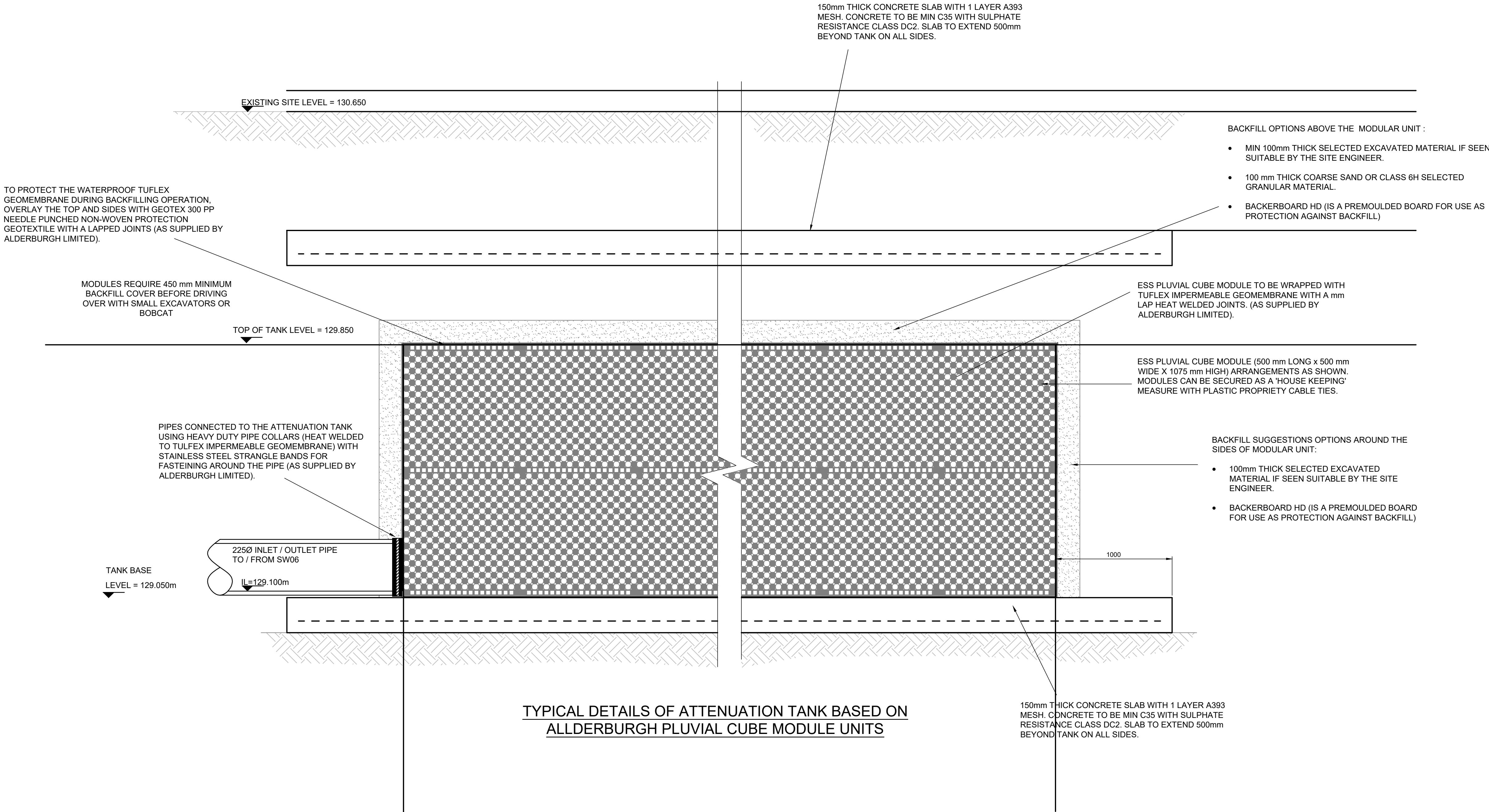
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TYPICAL DETAILS OF ATTENUATION TANK BASED ON ALLDERBURGH PLUVIAL CUBE MODULE UNITS

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.,

P1	17.02.22	AP	PB	PRELIMINARY ISSUE
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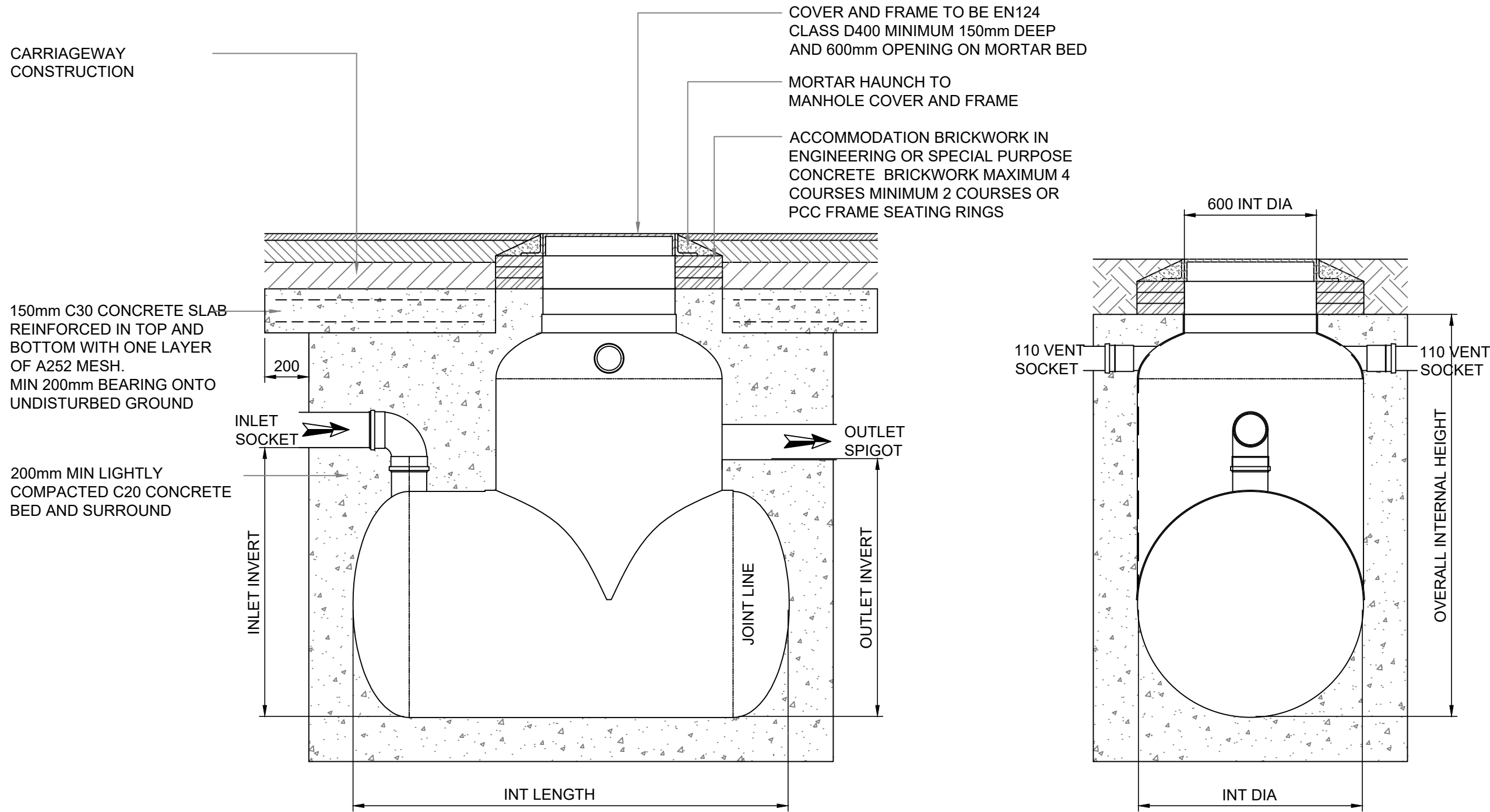
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PROJECT	UNIT B BIRCH BUSINESS PARK		
DRAFTER	AP	ENGINEER	PB
TITLE	PROJECT REFERENCE: DRAINAGE DETAILS SHEET 3 OF 4		
SCALE	SHEET	DRAWING No	REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0505	P1

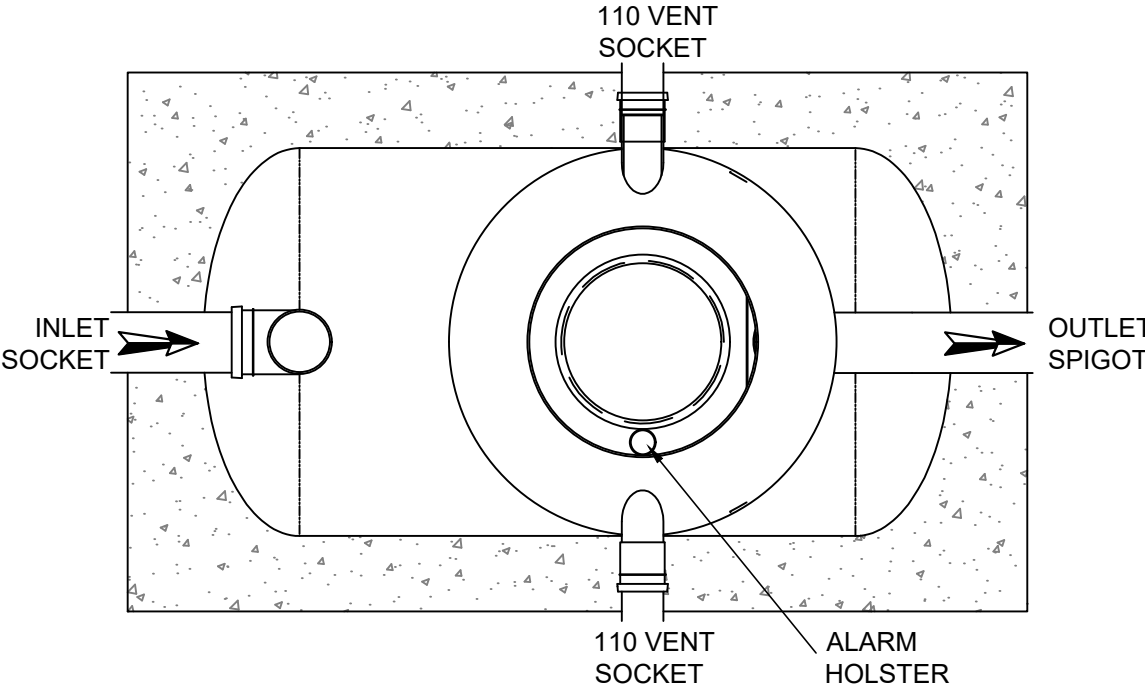
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NOTE

1. THESE ARE GENERAL NOTES ONLY. REFER TO THE MANUFACTURER FOR THE ACTUAL CONSTRUCTION DETAILS AND INSTALLATION REQUIREMENTS OF THE SEPARATOR.
2. THE SEPARATOR SHALL BE FITTED WITH AN OIL LEVEL ALARM TO GIVE A VISUAL INDICATION OF THE OIL SEPARATION STATUS AND AN ADDITIONAL AUDIBLE ALARM WHEN THE SEPARATOR REQUIRES EMPTYING.



TYPICAL SEPARATOR DETAIL

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TITLE	PROJECT REFERENCE: DRAINAGE DETAILS SHEET 4 OF 4		
SCALE	SHEET	DRAWING No	REV
1:50	A1	BUB-RDG-00-ZZ-DR-C-0506	P1

21st October 2022

Birch Business Park Unit B – Technical Note to Support Request for Compliance Condition for Drainage for Planning Application 22/01148/FUL

5018558

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Ridge have prepared this technical note to support a request for a compliance condition on Planning Application 22/01148/FUL. The technical note is based the information required to discharge the proposed draft Planning Condition 7 of Planning Ref 21/014789/FUL (of which 22/01148/FUL is a resubmission of). This note should be read in conjunction with the approved drainage strategy submitted at planning.

Notwithstanding the details shown on the approved plans, no development other than demolition of the existing buildings shall take place until a scheme for the discharge of surface water from the site, including surface water from the paved areas incorporating sustainable drainage details, and a scheme for the disposal of foul water, have been submitted to and approved in writing by the Local Planning Authority. . Unless otherwise agreed in writing with the Local Planning Authority the drainage scheme for the development shall be in general accordance with the Drainage Strategy by Ridge Consultants dated Sept 2021. The submission shall include:

- (i) Sustainable Drainage Design Details;*
- (ii) The provision of background calculations of the MicroDrainage® model or any other software or calculations that have been used for the drainage design;*
- (iii) Construction level details for permeable paving, if this forms part of the sustainable drainage system; and*
- (iv) Provision of a Maintenance Document explaining how the surface water scheme will be maintained and managed after completion.*

The duly approved scheme shall be implemented prior to the first occupation of the development hereby permitted and shall be retained and maintained as such thereafter.

Reason: To prevent an increased risk of flooding as a result of the development and to ensure satisfactory disposal of surface water from the site in accordance with Policy G8 of the adopted Rochdale Core Strategy, saved Policy EM/7 of the adopted Rochdale Unitary Development Plan and the National Planning Policy Framework.

Reason for pre-commencement condition: Drainage infrastructure will need to be implemented prior to commencement of above ground works and a scheme therefore needs to be agreed in advance of the same.

Element	Information
Scheme for the discharge of SW from the site Scheme for the discharge of Surface Water from the site	- A drainage layout and details for both the foul and surface water drainage design are included within Appendix A of this Technical Note.
Sustainable Drainage Details	- The sustainable Drainage details are included in Appendix A of this Technical Note.
The provision of background calculations of the MicroDrainage® model or any other software or calculations that have been used for the drainage Design.	- The calculations have been carried out using Microdrainage and are included in Appendix B of this Note. - A40% allowance for climate change has been included for the 100 year event.
Construction level details for permeable paving, if this forms part of the sustainable drainage system; and	- The provision of permeable paving was discounted during detailed design. This main reasons for discounting permeable paving were increased maintenance of the permeable paving as a result of the industrial nature of the site (vs permeable paving use in a commercial car park). It was considered that the nature of use at the site and additional maintenance burden, could increase flood risk at the site. - Following a review of the proposed levels during detailed design it was considered that a swale within the car park area would be more appropriate in this instance, this has been taken forward into the design.
Provision of a Maintenance Document explaining how the surface water scheme will be maintained and managed after completion. The duly approved scheme shall be implemented prior to the first occupation of the development hereby permitted and shall be retained and maintained as such thereafter.	- A management and maintenance document has been provided in Appendix C and will be included within the O&M manual at the site.

PROPERTY & CONSTRUCTION CONSULTANTS

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APPENDIX A