Details of Surface Water Drainage Maintenance to support Planning Application

for

Residential Development at
117 Canterbury Road
Westgate-On-Sea
Kent CT8 8NW

on behalf of

AGI Architecture

1.0 OPERATION & MAINTENANCE STATEMENT

1.1 The foul and surface water disposal systems as indicated on drawings T-2023-081-02 Rev A, -03 Rev A, -04 Rev A, -05A and -06A are designed assuming they will remain as privately owned and be maintained by the owner of the new property or the Management Company. The new owners will be informed of their responsibilities for the inspection and maintenance of these systems.

1.2 It is recommended that manhole chambers, drainage channels, catch-pit chambers and Flow Control Chamber are to be inspected as part of the general planned inspection and maintenance regime for the development, but certainly at no greater intervals than once per year.

1.3 Annual Inspection to include;

- Lift all access covers to inspection chambers, drainage channels and catch-pit chambers to check general condition and empty any debris/silt as required by licensed carrier.
- Review quantities of silt removed and consider whether inspections should be increased or possibly reduced to every two years.
- Carry out works as identified from inspection.
- Maintenance inspection records to be kept and updated accordingly.

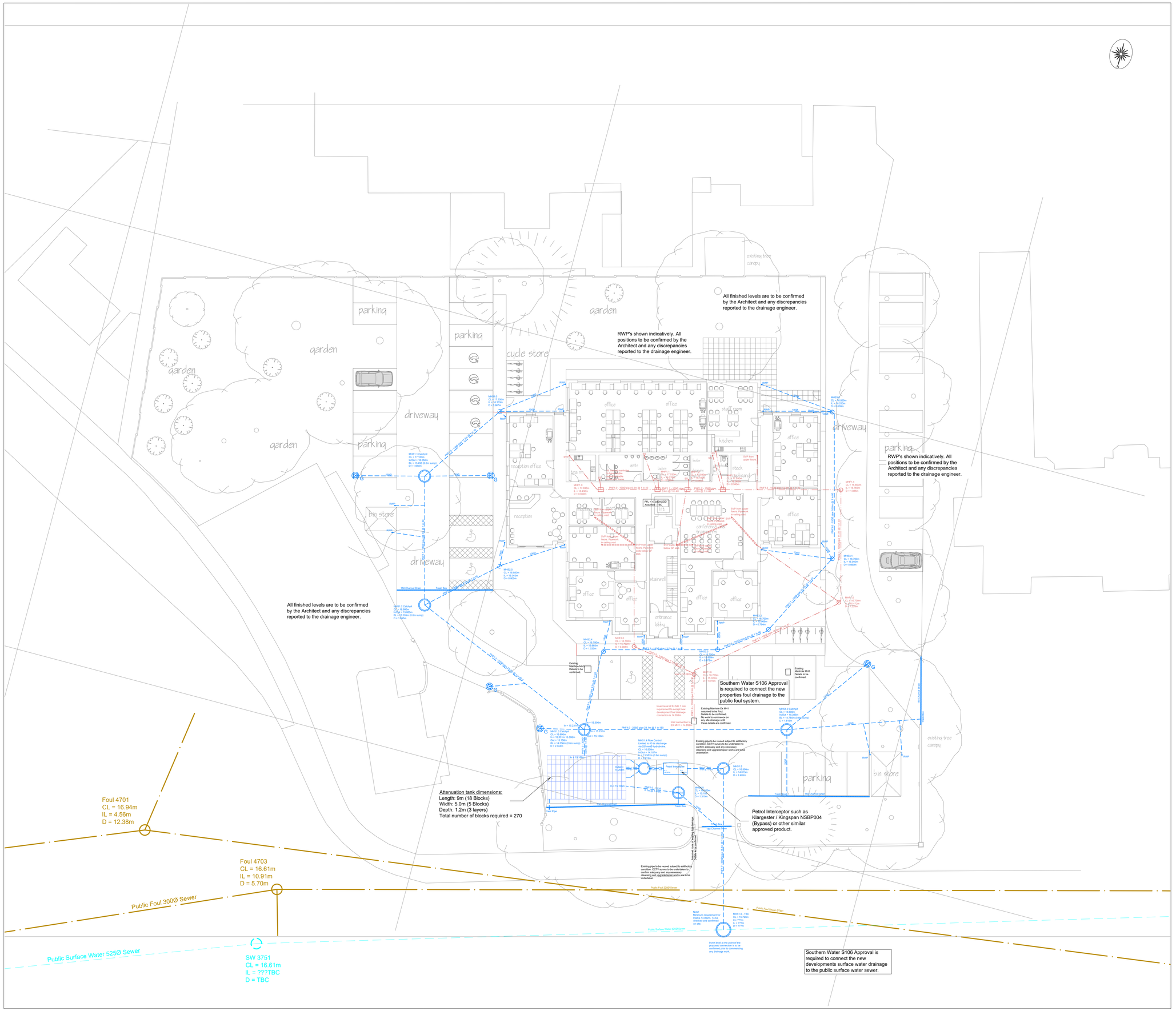
1.4 Five year Inspection / Five Year Anniversary

- Rod and flush all pipe work to ensure no blockages and free flow of water to the attenuation tank and to check overall integrity and remove any silt.
- Carry out a rapid 'Flush' through of the system (works during a dry period).

1.5 The property owner should keep records of when annual inspections are carried out with details of the works carried out. Note that the removed silt will need to be disposed of by a Licensed Carrier and receipts kept.

APPENDIX A

Tridax Drawings
T-2023-081-02 Rev A - Drainage Plan 1:200
T-2023-081-03 Rev A - Drainage Plan 1:100
T-2023-081-04 Rev A - Drainage Plan 1:100
T-2023-081-05 Rev A - Drainage Details
T-2023-081-06 Rev A - Drainage Details



DRAWING LEGEND

Site boundary line

PROPOSED PRIVATE FOUL DRAINAGE

Private foul water drainage

MH ◯ □ MH — Private foul water manhole

SVP — Soil vent pipe

SS — Stub stack

PROPOSED PRIVATE FOUL DRAINAGE

Private surface water drainage

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SA — Private surface water soakaway

RWP — Rainwater pipe

TD — Threshold drain (details by others)

Surface Water Strategy
Current surface water runoof rates:
2yr = 31.5l/s
30yr = 79.1l/s
100yr = 95.1l/s

Surface water will have a controlled discharge to the public surface water sewer.

50% of the 30yr runoff 79.1l/s. Therefore controlled to 40l/s

1:200 METRIC

0m 5m 10m 15m 20m

DRAINAGE NOTES

- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
- All materials, workmanship and construction to be in accordance with the requirements of 'Sewers for Adoption - 7th Edition' and published addendum and corrigendum.
- Channel drains shown are only to collect surface water run-off from hard paved areas and door thresholds and are not intended to collect groundwater or run-off from gardens and landscaped areas.
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NOTES

- The Contractor should check all dimensions on site.
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Rev	Description	Date
A	First issue to client	25/10/2023

PROJECT
Proposed residential development at St Peters Presbytery, 117 Canterbury Road, Westgate-On-Sea, Kent CT8 8NW

CLIENT
AGI Architecture

tridax
Studio 23 Tridax Business Park, Honeywood Parkway, Whitfield, Dover, Kent CT16 3QX
Tel: 01304 820777

DRAWING
Drainage Plan - Overall Site

SCALES: 1:200 | DATE: 25/10/2023 | SIZE: A1

STATUS
PRELIMINARY

Dwg No.: **T-2023-081-02** | REV: A

All finished levels are to be confirmed by the Architect and any discrepancies reported to the drainage engineer.

RWP's shown indicatively. All positions to be confirmed by the Architect and any discrepancies reported to the drainage engineer.

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FFL = 17.030mAOD
Assumed - TBC

MHS1.0
CL = 17.300m
IL = 16.333m
D = 0.967m

MHS1.1 Catchpit
CL = 17.100m
In/Out = 16.050m
BL = 15.450 (0.6m sump)
D = 1.650m

MHS1.2 Catchpit
CL = 16.900m
In/Out = 15.805m
BL = 15.205m (0.6m sump)
D = 1.695m

MHS1.3 Catchpit
CL = 16.600m
In = 15.231m 15.306m
Out = 15.156m
BL = 14.556m (0.6m sump)
D = 2.044m

MHS1.4 Flow Control
Limited to 40 l/s discharge via 251mmØ hydrobrake.
CL = 16.500m
In/Out = 14.187m
IL = 13.587m (0.6m sump)
D = 2.913m

MHS1.5
CL = 16.500m
IL = 14.015m
D = 2.485m

MHS2.0
CL = 16.850m
IL = 16.045m
D = 0.805m

MHS3.0
CL = 16.850m
IL = 16.250m
D = 0.600m

MHS3.1
CL = 16.700m
IL = 16.040m
D = 0.660m

MHS3.2
CL = 16.700m
IL = 15.906m
D = 0.794m

MHS3.3
CL = 16.700m
IL = 15.828m
D = 0.872m

MHS3.4
CL = 16.700m
IL = 15.665m
D = 1.035m

MHS4.0 Catchpit
CL = 16.600m
In/Out = 15.385m
BL = 14.785m (0.6m sump)
D = 1.815m

MHS5.0
CL = 16.500m
IL = 15.181
D = 1.319m

MHF1.0
CL = 17.030m
IL = 16.430m
D = 0.600m

MHF1.1
CL = 17.030m
IL = 16.270m
D = 0.760m

MHF1.2
CL = 17.030m
IL = 16.185m
D = 0.845m

MHF1.3
CL = 17.030m
IL = 16.085m
D = 0.945m

MHF1.4
CL = 16.850m
IL = 15.765m
D = 1.085m

MHF1.5
CL = 16.700m
IL = 15.472m
D = 1.228m

MHF1.6
CL = 16.700m
IL = 15.022m
D = 1.678m

MHF2.0
CL = 16.700m
IL = 15.792m
D = 0.908m

PNF1.0 - 100Ø pipe 6.4m @ 1 in 40
PNF1.1 - 100Ø pipe 3.4m @ 1 in 40
PNF1.2 - 100Ø pipe 4.0m @ 1 in 40
PNF1.3 - 100Ø pipe 12.8m @ 1 in 40
PNF1.4 - 100Ø pipe 11.7m @ 1 in 40
PNF1.5 - 100Ø pipe 18.0m @ 1 in 40
PNF1.6 - 100Ø pipe 6.5m @ 1 in 40
PNF2.0 - 100Ø pipe 7.1m @ 1 in 40
PNF2.1 - 225Ø pipe 23.2m @ 1 in 40
PNF3.0 - 150Ø pipe 16.8m @ 1 in 60
PNF3.1 - 150Ø pipe 10.7m @ 1 in 80
PNF3.2 - 150Ø pipe 6.2m @ 1 in 80
PNF3.3 - 150Ø pipe 13.0m @ 1 in 80
PNF3.4 - 150Ø pipe 9.2m @ 1 in 80
PNF4.0 - 225Ø pipe 23.1m @ 1 in 150
PNF5.0 - 150Ø 6.1m @ 1 in 80

All internal manholes to have double sealed lockable cover and frame

Invert level of Ex MH 1 min requirement to accept new development foul drainage connection is 14.859m

Inlet connection to EX MH1 = 14.859m

Existing Manhole Ex MH1 assumed to be Foul. Details to be confirmed. No work to commence on any site drainage until these details are confirmed.

Southern Water S106 Approval is required to connect the new properties foul drainage to the public foul system.

Existing Manhole MH2 Details to be confirmed.

Existing Manhole MH3 Details to be confirmed.

Existing pipe to be reused subject to satisfactory condition. CCTV survey to be undertaken to confirm adequacy and any necessary cleansing and upgrade/repair works are to be undertaken

Petrol Interceptor such as Klargester / Kingspan NSBP004 (Bypass) or other similar approved product.

Southern Water S106 Approval is required to connect the new developments surface water drainage to the public surface water sewer.

Attenuation tank dimensions:
Length: 9m (18 Blocks)
Width: 5.0m (5 Blocks)
Depth: 1.2m (3 layers)
Total number of blocks required = 270

Attenuation Tank

Vent Pipe

150 Channel Drain

Trash Box

SVP from upper floors. Pipework in ceiling void.

SVP Exits at below GF slab

SVP from upper floors. Pipework exits below GF slab.

SVP from upper floors.

DRAWING LEGEND

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CLIENT
AGI Architecture

DRAWING
Drainage Plan - Overall Site

STATUS
PRELIMINARY

SCALES 1:100 | DATE 25/10/2023 | SIZE A1

Dwg No. **T-2023-081-02** | REV A

tridax
Studio 23 Tridax Business Park, Honeywood Parkway, Whitfield, Dover, Kent CT16 3QX
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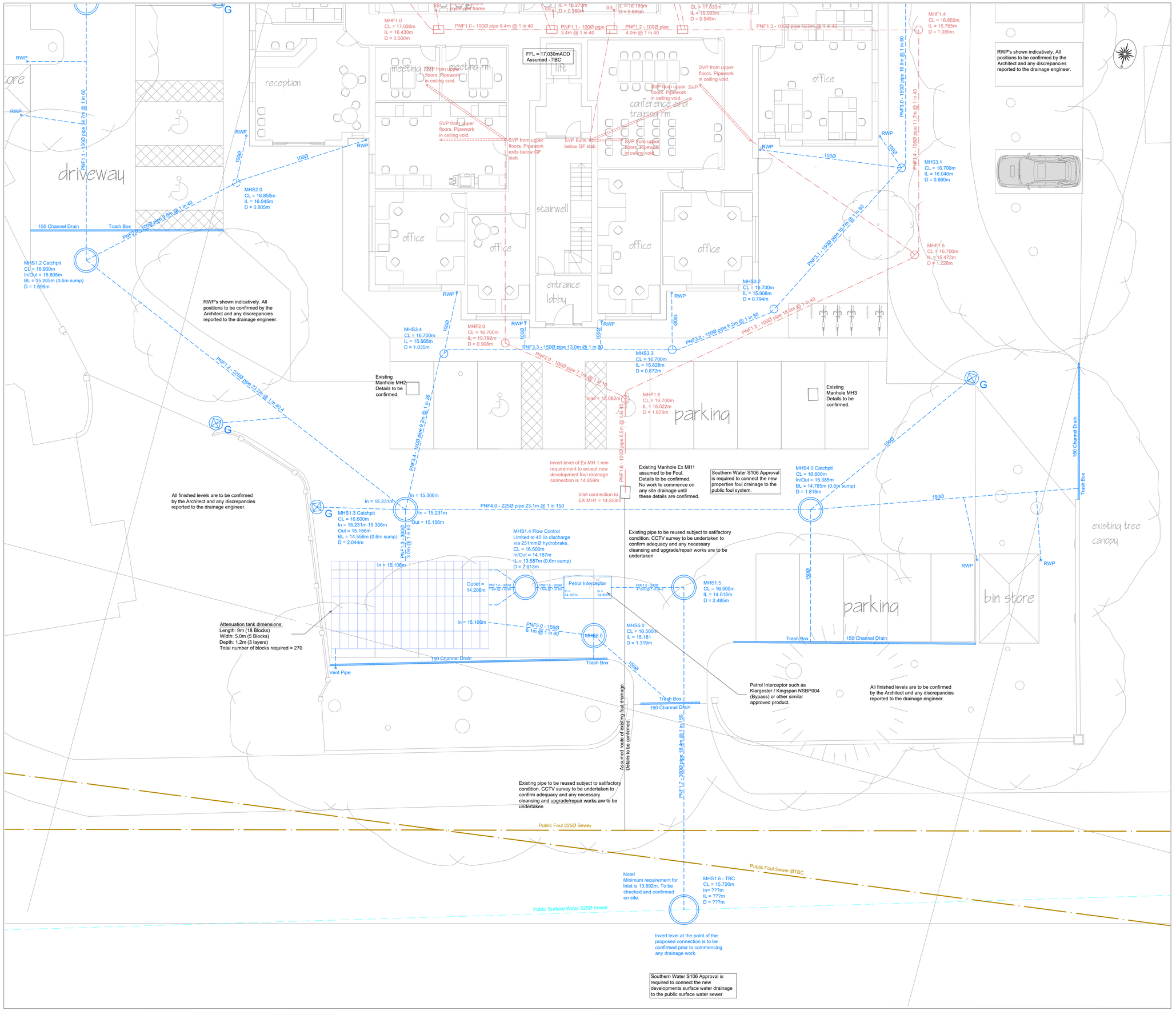

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STATUS
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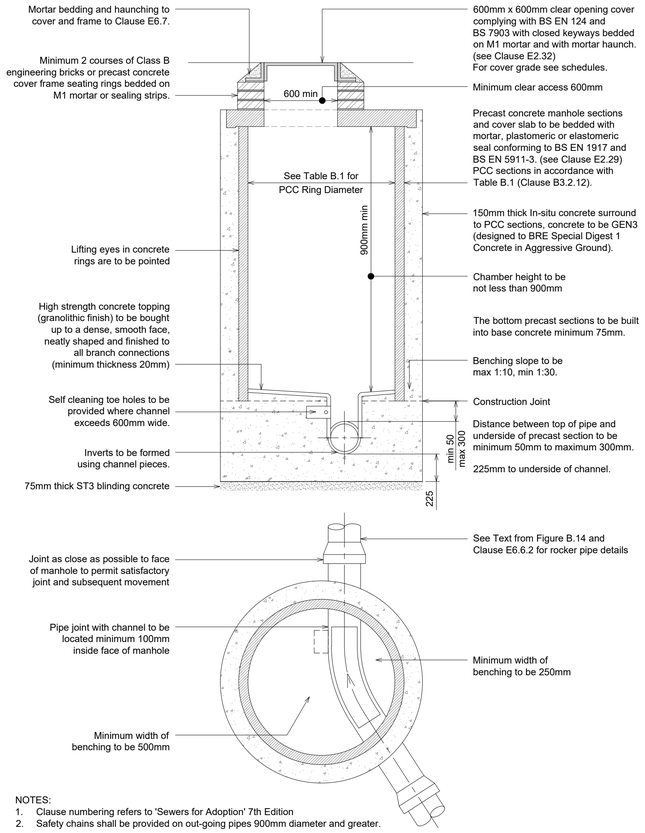
Dwg No. **T-2023-081-02** | REV: A

Typical Type 2 Chamber Detail

scale 1:25

- **Maximum depth from cover level to soffit of pipe 3.0m**



NOTES:
1. Clause numbering refers to 'Sewers for Adoption' 7th Edition
2. Safety chains shall be provided on out-going pipes 900mm diameter and greater.

Table B.1 - Clause B3.2.12 - Manhole Diameters

Nominal internal diameter of largest pipe in manhole (mm)	Minimum nominal internal dimension of manhole (mm)
Less than 375	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
Greater than 900	Pipe diameter + 900

Clause E6.6 - Pipes and Joints Adjacent to Structures
1. Where rigid pipes are used, a flexible joint (rocker pipe) shall be provided as close as is feasible to the outside face of any structure into which a pipe is built, within 150mm for pipe diameters less than 300mm. The design of the joints shall be compatible with any subsequent movement.
2. The recommended length of the next pipe (rocker pipe) away from the structure shall be as shown in Table E.12.

Table E.12 Rocker Pipes

Nominal Diameter (mm)	Effective length of Rocker Pipe (mm)
150 to 600	600
600 to 750	1000
Over 750	1250

Clause E2.29 - Precast Concrete Manholes
1. Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3. Units which bed into bases shall be manufactured so that imposed vertical loads are transmitted directly via the full wall thickness of the unit. The profiles of joints between units and the underside of slabs, shall be capable of withstanding applied loadings from such slabs and spigot-ended sections shall only be used where the soffit of the slab is recessed to receive them.
2. Precast concrete chamber sections for valves and meters shall be interlocking and comply with BS EN 1917 and BS 5911-3.

Clause E2.32 - Manhole Covers and Frames
1. Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highways Agency Guidance Document HA 104/09. They shall be of a non rocking design which does not rely on the use of cushion inserts.
2. Manhole covers on foul-only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
3. As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
4. Minimum frame depths for NRSWA road categories I to IV shall be as table E.6.
5. Class B125 covers shall be used in footways, pedestrian areas and comparable locations.
6. In situations where traffic loading is anticipated to be heavier than would occur on a typical residential estate distributor road (i.e. braking or turning near a junction). higher specification E600 covers shall be used.
7. All Manholes shall be the non ventilating type and shall have closed keyways.

Table E.6 Minimum Frame Depths

NRSWA Road Category	Road Description	Minimum Frame Depth (mm)
I	Trunk road and dual carriageways	150
II	All other A roads	150
III	Bus services	150
IV	All other roads except residential cul-de-sacs	150
-	Residential cul-de-sacs	100

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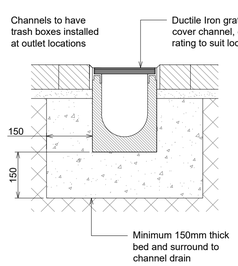
Text taken from Figure B.14
1. Stub pipes into structures shall be of rigid material.
2. No incoming branch is to be less than 90° from the outgoing direction of flow, all pipes entering the bottom of the manhole are to have level soffits.

Clause E6.7 - Setting Manhole Covers and Frames
1. Manhole frames shall be set to level, bedded and haunched externally over the base and sides of the frame in mortar, in accordance with the manufacturers instructions. The frame shall be seated on at least two courses of Class B engineering bricks, on precast masonry units or on precast concrete cover frame seating rings to regulate the distance between the top of the cover and the top rung of the ladder (to be no greater than 675mm). A mortar filler shall be provided where the corners to an opening in a slab are chamfered and the brickwork is not flush with the edges of the opening.
2. Frames for manhole covers shall be bedded in a polyester resin based mortar in all situations where covers are sited in NRSWA Road Categories I,II or III (i.e. all except residential cul-de-sacs).

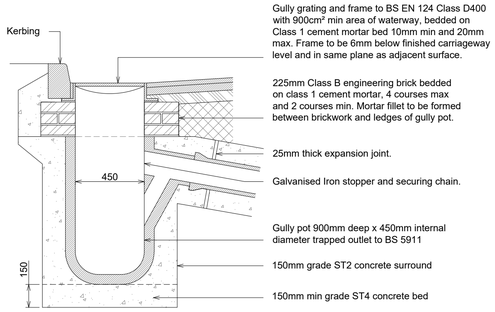
Channel Drain Detail

scale 1:10



Driveway Gully Detail

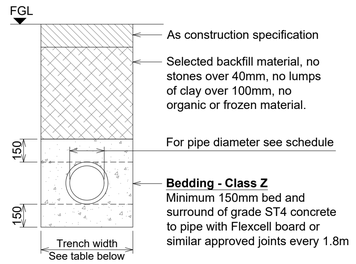
scale 1:20



NOTE: Concrete protection to pipe where depth to soffit is less than 1.2m

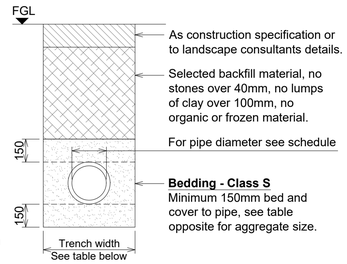
Pipe Bedding - Class Z

Areas subject to vehicle loadings.
Less than 1.2m cover to pipe.



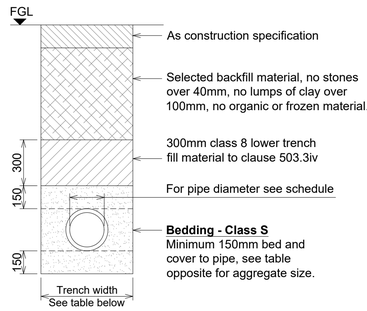
Pipe Bedding - Class S

Areas not subject to vehicle loadings.
Use in private gardens, landscaped areas etc.



Pipe Bedding - Class S

Areas subject to vehicle loadings.
Greater than 1.2m cover to pipe.



PIPE BEDDING MATERIAL - CLASS S	
Pipe Ø (mm)	Suitable Materials: (Aggregate to BS 882)
100	10mm nominal single sized aggregate
150	10 to 14mm nominal single sized aggregate
225 to 525	10 to 14mm or 20mm nominal single sized aggregate
Over 525	10, 14 ,20 or 40mm nominal single sized crushed rock

TRENCH WIDTH	
Pipe Ø (mm)	Trench Width (mm)
100	450
150	450
225	600
300	600
375	750
450	750
525	900
600	900
750	1200
900	1350
1050	1500

Pipe surround material shall where required, be placed and compacted over the full width of the trench in layers not exceeding 150mm before compaction, to a finished thickness of 300mm above the crown of the pipe.

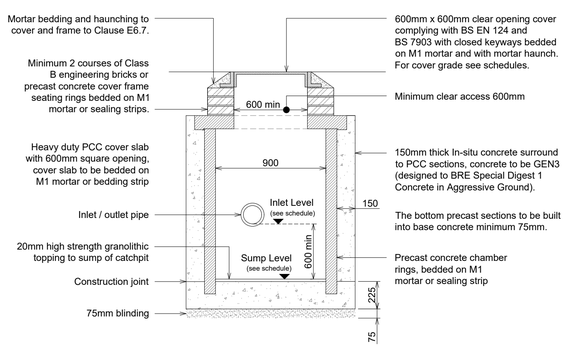
Where excavations have been supported and the supports are removed they shall be withdrawn progressively as backfilling proceeds in a manner that minimises the danger of collapse, all voids formed behind the supports are to be carefully filled and compacted.

Pipe jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled, care should be taken to ensure that there is no ingress of grout or other material into the joint after the joint has been made.

Pipes should be cut in accordance with the manufacturers recommendations to provide a clean square profile without splitting or fracturing the pipe wall and to ensure minimal damage to any protective coatings, where necessary, the cut ends of pipes shall be formed to the tapers and chamfers suitable for the type of joint to be used.

Typical Type 2 Catch Pit Detail

Scale 1:25



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AGI Architecture

tridax
Suite 2, The Powder House, Menzies Road, White Cliffs Business Park, Whitfield, Dover, Kent, CT16 2HQ Tel: 01304 820777

DRAWING
Proposed Drainage Details Sheet 1

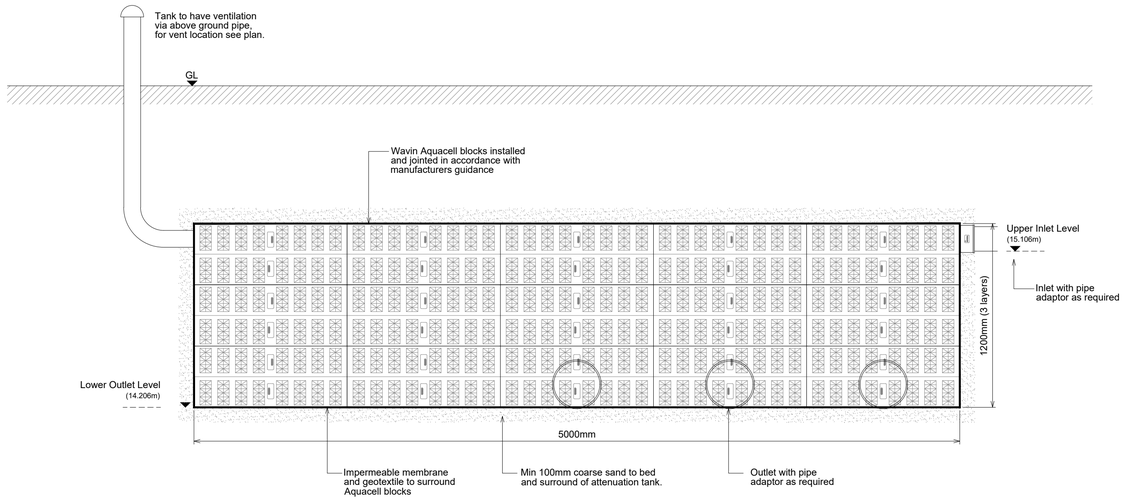
SCALES: As Noted | DATE: 25/10/2023 | SIZE: A1

STATUS: **PRELIMINARY**

Dwg No.: **T-2023-081-05** | REV: A

Section Cellular Attenuation Tank *(Aquacell)*

scale 1:20



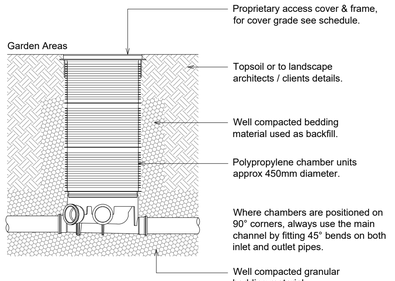
Aquacell Installation Notes: (Contractor to consult manufacturers literature for full details)

1. Excavate the trench to the required depth ensuring that the plan area is slightly greater than that of the AquaCell units.
2. Lay 100mm bed of coarse sand, level and compact.
3. Lay the geotextile over the base and up the sides of the trench.
4. Lay the impermeable membrane on top of the geotextile over the base and up the sides of the trench.
5. Lay the AquaCell units parallel with each other. In multiple layer applications, wherever possible, continuous vertical joints should be avoided. AquaCell units can be laid in a 'brick bonded' formation (i.e. to overlap the joints below). For single layer applications use AquaCell Clips and for multi layers use AquaCell Clips and AquaCell Shear Connectors (vertical rods).
6. Wrap the Impermeable membrane around the AquaCell structure and seal in accordance with the manufacturers recommendations.
7. If side connections into the AquaCell units are required, (other than the preformed socket), use the appropriate Flange Adaptor. Fix the flange adaptor to the unit using self-tapping screws. Drill a hole through the Flange Adaptor and connect the pipework.
6. In order to prevent silt from entering the tank, clogging the inlet pipework and reducing the tank capacity, it is recommended that a silt trap / catchpit is installed upstream of the tank inlet.
7. Wrap and overlap the geotextile to cover the entire AquaCell structure protecting the impermeable membrane.
8. Lay 100mm of coarse sand between the trench walls and the AquaCell structure and compact being careful not to damage the blocks or either of the membranes.
9. Lay 100mm bed of coarse sand over the geotextile and compact.
10. Backfill tank with suitable clean material, free of organic matter and debris.

Polypropylene Inspection Chamber (PPIC)

Use on private drainage works only

scale 1:20



NOTE:
Maximum diameter of main channel 150/160mm
Maximum pipe diameter of inlets 100/110mm

Unused inlets are to be sealed and made watertight.

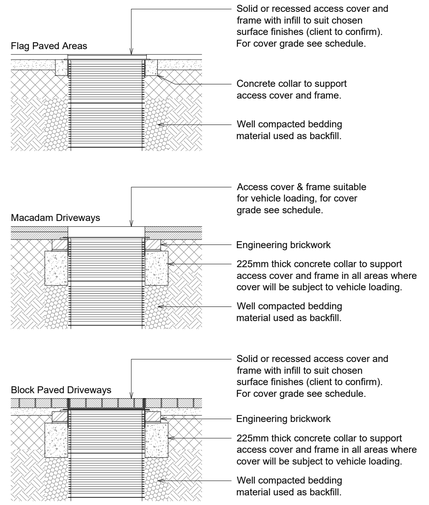
Backfill to be well compacted around shaft of chamber.

No incoming branch is to be less than 90° from the outgoing direction of flow, all pipes entering the bottom of the manhole are to have level soffits.

Alternate Access Cover Details (PPIC)

Use on private drainage works only

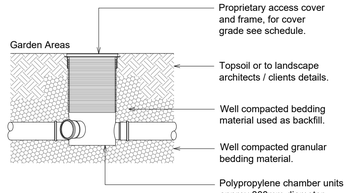
scale 1:20



Shallow Inspection Chamber (SIC)

Use on private drainage works only

scale 1:20



NOTE:
Where chambers are positioned on 90° corners, always use the main channel by fitting 45° bends on both inlet and outlet pipes.

Maximum diameter of main channel 150/160mm
Maximum pipe diameter of inlets 100/110mm

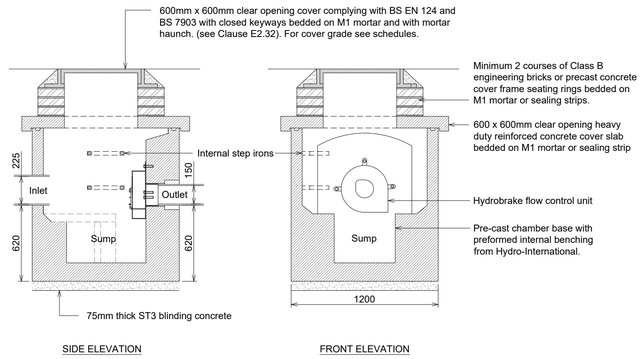
Unused inlets are to be sealed and made watertight.

Backfill to be well compacted around shaft of chamber.

No incoming branch is to be less than 90° from the outgoing direction of flow.

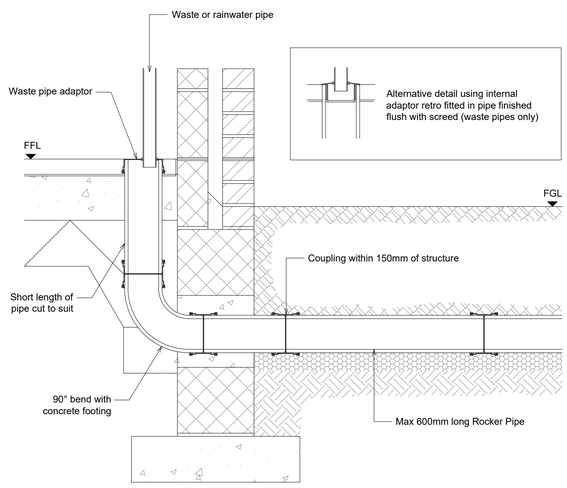
Hydrobrake Flow Control Chamber Detail (Manufactured)

scale 1:25



Typical Internal Waste Pipe Connection Detail

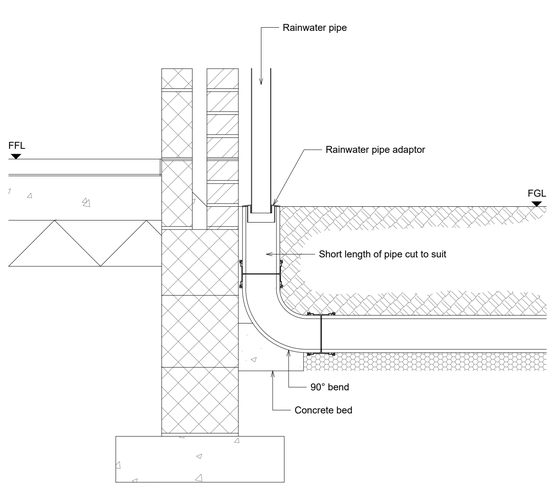
scale 1:10



NOTE: Substructure design by others.

Typical External Rainwater Pipe Connection Detail

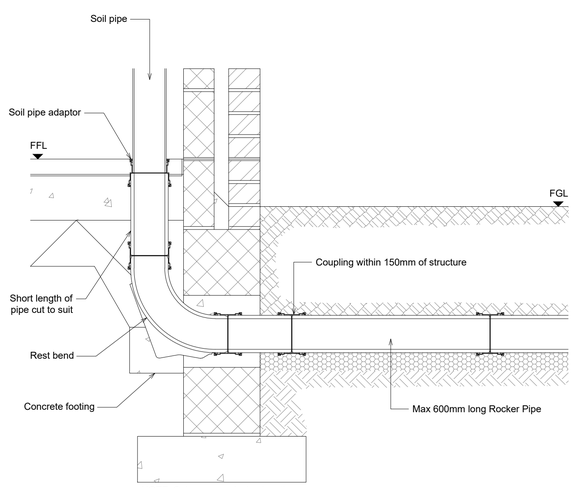
scale 1:10



NOTE: Substructure design by others.

Typical Soil Vent Pipe / Stub Stack Connection Detail

scale 1:10



NOTE: Substructure design by others.

DRAINAGE NOTES

- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
- All materials, workmanship and construction to be in accordance with the requirements of 'Sewers for Adoption - 7th Edition' and published addendum and corrigendum.
- Channel drains shown are only to collect surface water run-off from hard paved areas and door thresholds and are not intended to collect groundwater or run-off from gardens and landscaped areas.
- All abandoned pipework to be completely removed or grout filled unless stated otherwise.

NOTES

- The Contractor should check all dimensions on site.
- It is the Contractors responsibility to ensure compliance with building regulations and current codes of practice.
- Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
- Commencement of any building works prior to full building regulation approval is entirely at the clients risk.

Rev	Description	Date
A	First issue to client	25/10/2023

PROJECT
Proposed residential development at St Peters Presbytery, 117 Canterbury Road, Westgate-On-Sea, Kent CT8 8NW

CLIENT
AGI Architecture

tridax
Suite 2, The Powder House, Menzies Road, White Cliffs Business Park, Whitfield, Dover, Kent, CT16 2HQ. Tel: 01304 820777

DRAWING
Proposed Drainage Details Sheet 2

SCALES: As Noted | DATE: 25/10/2023 | SIZE: A1

STATUS: **PRELIMINARY**

Dwg No. **T-2023-081-04** | REV. A

APPENDIX B

Windes Design Calculations

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	18.400	0.230	80.0	0.170	5.00	0.600	o	225	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	EX	16.500	14.409	1.866	16.500	14.179	2.096		1200

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

Simulation Criteria

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 1 year Winter I+0%	16.500	14.536	0.000	0.60	14.782	31.5	OK

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

Simulation Criteria

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

Synthetic Rainfall Details

Rainfall Model		FSR M5-60 (mm)	26.250	Cv (Summer)	0.750
Region	England and Wales	Ratio R	0.400	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 30 year Winter I+0%	16.500	15.123	0.000	1.42	36.137	74.1	SURCHARGED

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

Simulation Criteria

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 26.250 Cv (Summer) 0.750
Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 100 year Winter I+0%	16.500	15.614	0.000	1.82	47.338	95.1	SURCHARGED

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250		

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Sensitivity flows(s) (%)	0, +40

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 100 year Winter Q+40%	17.300	17.111	0.000	1.24	5.473	11.2	FLOOD RISK
1.001	15 minute 100 year Winter Q+40%	17.100	16.836	0.000	1.55	18.765	32.7	FLOOD RISK
2.000	30 minute 100 year Winter Q+40%	16.850	16.592	0.000	0.42	8.126	10.4	FLOOD RISK
1.002	30 minute 100 year Winter Q+40%	16.900	16.580	0.000	0.76	47.738	57.5	SURCHARGED
3.000	15 minute 100 year Winter Q+40%	16.850	16.677	0.000	0.50	5.473	9.2	FLOOD RISK
3.001	30 minute 100 year Winter Q+40%	16.700	16.625	0.000	0.91	15.235	16.2	FLOOD RISK
3.002	30 minute 100 year Winter Q+40%	16.700	16.606	0.000	0.97	15.235	16.2	FLOOD RISK
3.003	30 minute 100 year Winter Q+40%	16.700	16.593	0.000	1.21	20.821	22.0	FLOOD RISK
3.004	30 minute 100 year Winter Q+40%	16.700	16.565	0.000	0.90	26.412	27.9	FLOOD RISK
4.000	30 minute 100 year Winter Q+40%	16.600	16.570	0.000	0.97	29.965	37.5	FLOOD RISK
1.003	30 minute 100 year Winter Q+40%	16.600	16.539	0.000	2.14	111.225	131.1	FLOOD RISK
5.000	30 minute 100 year Winter Q+40%	16.500	16.458	0.000	0.43	13.204	16.9	FLOOD RISK
1.004	30 minute 100 year Winter Q+40%	16.500	16.453	0.000	0.88	113.599	49.2	FLOOD RISK
1.005	30 minute 100 year Winter Q+40%	16.500	16.375	0.000	0.83	113.143	46.2	FLOOD RISK
1.006	30 minute 100 year Winter Q+40%	16.500	14.343	0.000	0.53	112.857	46.2	OK
1.007	30 minute 100 year Winter Q+40%	16.500	14.181	0.000	0.59	112.566	46.2	OK

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	11.300	0.283	39.9	0.014	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	14.700	0.245	60.0	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	9.600	0.240	40.0	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	23.200	0.574	40.4	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit
3.000	16.800	0.210	80.0	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit
3.001	10.700	0.134	79.9	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit
3.002	6.200	0.078	79.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
3.003	13.000	0.163	79.8	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit
3.004	9.200	0.359	25.6	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit
4.000	23.100	0.154	150.0	0.059	5.00	0.0	0.600	o	225	Pipe/Conduit
1.003	3.000	0.050	60.0	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit
5.000	6.100	0.076	80.3	0.026	5.00	0.0	0.600	o	225	Pipe/Conduit
1.004	1.500	0.000	0.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.005	1.600	0.019	84.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.006	4.150	0.120	34.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.007	18.400	0.123	149.6	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)
1.000	16.333	0.014	0.0	1.22	9.6
1.001	16.050	0.048	0.0	1.30	23.0
2.000	16.045	0.016	0.0	1.60	28.2
1.002	15.805	0.094	0.0	2.06	82.1
3.000	16.250	0.014	0.0	1.12	19.9
3.001	16.040	0.030	0.0	1.13	19.9
3.002	15.906	0.030	0.0	1.13	19.9
3.003	15.828	0.041	0.0	1.13	19.9
3.004	15.665	0.052	0.0	2.00	35.3
4.000	15.385	0.059	0.0	1.07	42.4
1.003	15.156	0.219	0.0	2.03	143.7
5.000	15.182	0.026	0.0	1.46	58.1
1.004	14.206	0.245	0.0	0.00	0.0
1.005	14.206	0.245	0.0	1.71	121.2
1.006	14.187	0.245	0.0	2.68	189.6
1.007	14.015	0.245	0.0	1.28	90.7

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
MHS1.0	17.300	0.967	Open Manhole	1200	1.000	16.333	100				
MHS1.1	17.100	1.050	Open Manhole	1200	1.001	16.050	150	1.000	16.050	100	
MHS2.0	16.850	0.805	Open Manhole	1200	2.000	16.045	150				
MHS1.2	16.900	1.095	Open Manhole	1200	1.002	15.805	225	1.001	15.805	150	
								2.000	15.805	150	
MHS3.0	16.850	0.600	Open Manhole	1200	3.000	16.250	150				
MHS3.1	16.700	0.660	Open Manhole	1200	3.001	16.040	150	3.000	16.040	150	
MHS3.2	16.700	0.794	Open Manhole	1200	3.002	15.906	150	3.001	15.906	150	
MHS3.3	16.700	0.872	Open Manhole	1200	3.003	15.828	150	3.002	15.828	150	
MHS3.4	16.700	1.035	Open Manhole	1200	3.004	15.665	150	3.003	15.665	150	
MHS4.0	16.600	1.215	Open Manhole	1200	4.000	15.385	225				
MHS1.3	16.600	1.444	Open Manhole	1200	1.003	15.156	300	1.002	15.231	225	
								3.004	15.306	150	
								4.000	15.231	225	
MHS5.0	16.500	1.318	Open Manhole	1200	5.000	15.182	225				
TANK	16.500	2.294	Open Manhole	1200	1.004	14.206	300	1.003	15.106	300	900
								5.000	15.106	225	825
Flow Control	16.500	2.294	Open Manhole	1200	1.005	14.206	300	1.004	14.206	300	
Interceptor	16.500	2.313	Open Manhole	1200	1.006	14.187	300	1.005	14.187	300	
MHS1.7	16.500	2.485	Open Manhole	1200	1.007	14.015	300	1.006	14.067	300	52
Public Sewer	15.720	1.828	Open Manhole	0		OUTFALL		1.007	13.892	300	

No coordinates have been specified, layout information cannot be produced.

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	100	MHS1.0	17.300	16.333	0.867	Open Manhole	1200
1.001	o	150	MHS1.1	17.100	16.050	0.900	Open Manhole	1200
2.000	o	150	MHS2.0	16.850	16.045	0.655	Open Manhole	1200
1.002	o	225	MHS1.2	16.900	15.805	0.870	Open Manhole	1200
3.000	o	150	MHS3.0	16.850	16.250	0.450	Open Manhole	1200
3.001	o	150	MHS3.1	16.700	16.040	0.510	Open Manhole	1200
3.002	o	150	MHS3.2	16.700	15.906	0.644	Open Manhole	1200
3.003	o	150	MHS3.3	16.700	15.828	0.722	Open Manhole	1200
3.004	o	150	MHS3.4	16.700	15.665	0.885	Open Manhole	1200
4.000	o	225	MHS4.0	16.600	15.385	0.990	Open Manhole	1200
1.003	o	300	MHS1.3	16.600	15.156	1.144	Open Manhole	1200
5.000	o	225	MHS5.0	16.500	15.182	1.093	Open Manhole	1200
1.004	o	300	TANK	16.500	14.206	1.994	Open Manhole	1200
1.005	o	300	Flow Control	16.500	14.206	1.994	Open Manhole	1200
1.006	o	300	Interceptor	16.500	14.187	2.013	Open Manhole	1200
1.007	o	300	MHS1.7	16.500	14.015	2.185	Open Manhole	1200

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	11.300	39.9	MHS1.1	17.100	16.050	0.950	Open Manhole	1200
1.001	14.700	60.0	MHS1.2	16.900	15.805	0.945	Open Manhole	1200
2.000	9.600	40.0	MHS1.2	16.900	15.805	0.945	Open Manhole	1200
1.002	23.200	40.4	MHS1.3	16.600	15.231	1.144	Open Manhole	1200
3.000	16.800	80.0	MHS3.1	16.700	16.040	0.510	Open Manhole	1200
3.001	10.700	79.9	MHS3.2	16.700	15.906	0.644	Open Manhole	1200
3.002	6.200	79.5	MHS3.3	16.700	15.828	0.722	Open Manhole	1200
3.003	13.000	79.8	MHS3.4	16.700	15.665	0.885	Open Manhole	1200
3.004	9.200	25.6	MHS1.3	16.600	15.306	1.144	Open Manhole	1200
4.000	23.100	150.0	MHS1.3	16.600	15.231	1.144	Open Manhole	1200
1.003	3.000	60.0	TANK	16.500	15.106	1.094	Open Manhole	1200
5.000	6.100	80.3	TANK	16.500	15.106	1.169	Open Manhole	1200
1.004	1.500	0.0	Flow Control	16.500	14.206	1.994	Open Manhole	1200
1.005	1.600	84.2	Interceptor	16.500	14.187	2.013	Open Manhole	1200
1.006	4.150	34.6	MHS1.7	16.500	14.067	2.133	Open Manhole	1200
1.007	18.400	149.6	Public Sewer	15.720	13.892	1.528	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	Public Sewer	15.720	13.892	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	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 1	Number of Storage Structures 1	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: Flow Control, DS/PN: 1.005, Volume (m³): 2.6

Unit Reference	MD-SFP-0251-4000-1500-4000
Design Head (m)	1.500
Design Flow (l/s)	40.0
Flush-Flo™	Calculated
Objective	Future Proof
Application	Surface
Sump Available	Yes
Diameter (mm)	251
Invert Level (m)	14.206
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	40.0	Kick-Flo®	0.958	32.2
Flush-Flo™	0.409	39.8	Mean Flow over Head Range	-	33.4

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

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	8.6	0.800	36.5	2.000	45.9	4.000	64.1	7.000	84.1
0.200	27.1	1.000	32.9	2.200	48.0	4.500	67.9	7.500	87.0
0.300	39.1	1.200	35.9	2.400	50.1	5.000	71.4	8.000	89.8
0.400	39.8	1.400	38.7	2.600	52.1	5.500	74.8	8.500	92.4
0.500	39.5	1.600	41.2	3.000	55.8	6.000	78.0	9.000	95.1
0.600	38.7	1.800	43.6	3.500	60.1	6.500	81.1	9.500	97.6

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 1.004

Invert Level (m) 14.206 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	45.0	0.0	1.200	45.0	0.0	1.201	0.0	0.0

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 1 year Winter I+0%	17.300	16.370	0.000	0.29	1.217	2.6	OK
1.001	15 minute 1 year Winter I+0%	17.100	16.114	0.000	0.37	4.173	7.9	OK
2.000	15 minute 1 year Winter I+0%	16.850	16.079	0.000	0.12	1.391	3.0	OK
1.002	15 minute 1 year Winter I+0%	16.900	15.875	0.000	0.21	8.172	15.6	OK
3.000	15 minute 1 year Winter I+0%	16.850	16.288	0.000	0.14	1.217	2.6	OK
3.001	15 minute 1 year Winter I+0%	16.700	16.095	0.000	0.29	2.608	5.1	OK
3.002	15 minute 1 year Winter I+0%	16.700	15.963	0.000	0.31	2.608	5.1	OK
3.003	15 minute 1 year Winter I+0%	16.700	15.892	0.000	0.38	3.564	6.8	OK
3.004	15 minute 1 year Winter I+0%	16.700	15.718	0.000	0.27	4.521	8.5	OK
4.000	15 minute 1 year Winter I+0%	16.600	15.467	0.000	0.28	5.129	10.8	OK
1.003	15 minute 1 year Winter I+0%	16.600	15.326	0.000	0.61	19.039	37.3	OK
5.000	15 minute 1 year Winter I+0%	16.500	15.235	0.000	0.12	2.260	4.8	OK
1.004	30 minute 1 year Winter I+0%	16.500	14.479	0.000	0.38	27.019	21.4	OK
1.005	30 minute 1 year Winter I+0%	16.500	14.458	0.000	0.39	27.007	21.4	OK
1.006	30 minute 1 year Winter I+0%	16.500	14.288	0.000	0.25	26.995	21.5	OK
1.007	30 minute 1 year Winter I+0%	16.500	14.122	0.000	0.27	26.979	21.5	OK

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 30 year Winter I+20%	17.300	16.483	0.000	0.86	3.572	7.8	SURCHARGED
1.001	15 minute 30 year Winter I+20%	17.100	16.317	0.000	1.20	12.246	25.5	SURCHARGED
2.000	15 minute 30 year Winter I+20%	16.850	16.106	0.000	0.35	4.082	8.7	OK
1.002	15 minute 30 year Winter I+20%	16.900	15.943	0.000	0.68	23.982	50.9	OK
3.000	15 minute 30 year Winter I+20%	16.850	16.317	0.000	0.41	3.572	7.6	OK
3.001	15 minute 30 year Winter I+20%	16.700	16.193	0.000	0.87	7.654	15.5	SURCHARGED
3.002	15 minute 30 year Winter I+20%	16.700	16.100	0.000	0.92	7.654	15.3	SURCHARGED
3.003	15 minute 30 year Winter I+20%	16.700	16.040	0.000	1.11	10.460	20.2	SURCHARGED
3.004	15 minute 30 year Winter I+20%	16.700	15.838	0.000	0.83	13.266	25.9	SURCHARGED
4.000	15 minute 30 year Winter I+20%	16.600	15.708	0.000	0.81	15.052	31.5	SURCHARGED
1.003	15 minute 30 year Winter I+20%	16.600	15.605	0.000	1.86	55.872	114.4	SURCHARGED
5.000	15 minute 30 year Winter I+20%	16.500	15.276	0.000	0.36	6.633	14.2	OK
1.004	30 minute 30 year Winter I+20%	16.500	15.112	0.000	0.75	77.710	41.6	SURCHARGED
1.005	15 minute 30 year Winter I+20%	16.500	15.086	0.000	0.72	61.167	39.7	SURCHARGED
1.006	60 minute 30 year Summer I+20%	16.500	14.329	0.000	0.46	88.136	39.7	OK
1.007	15 minute 30 year Winter I+20%	16.500	14.166	0.000	0.51	61.105	39.7	OK

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 20, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	15 minute 100 year Winter I+20%	17.300	16.815	0.000	1.10	4.678	10.0	SURCHARGED
1.001	15 minute 100 year Winter I+20%	17.100	16.566	0.000	1.41	16.038	29.8	SURCHARGED
2.000	15 minute 100 year Winter I+20%	16.850	16.119	0.000	0.46	5.346	11.4	OK
1.002	15 minute 100 year Winter I+20%	16.900	16.079	0.000	0.81	31.409	60.8	SURCHARGED
3.000	15 minute 100 year Winter I+20%	16.850	16.468	0.000	0.49	4.678	9.1	SURCHARGED
3.001	15 minute 100 year Winter I+20%	16.700	16.428	0.000	0.93	10.024	16.6	FLOOD RISK
3.002	15 minute 100 year Winter I+20%	16.700	16.309	0.000	1.07	10.024	17.9	SURCHARGED
3.003	15 minute 100 year Winter I+20%	16.700	16.240	0.000	1.25	13.700	22.8	SURCHARGED
3.004	15 minute 100 year Winter I+20%	16.700	16.001	0.000	0.93	17.375	28.8	SURCHARGED
4.000	30 minute 100 year Winter I+20%	16.600	15.945	0.000	0.83	25.609	32.1	SURCHARGED
1.003	30 minute 100 year Winter I+20%	16.600	15.921	0.000	1.89	95.048	115.9	SURCHARGED
5.000	30 minute 100 year Winter I+20%	16.500	15.845	0.000	0.37	11.279	14.4	SURCHARGED
1.004	30 minute 100 year Winter I+20%	16.500	15.841	0.000	0.76	99.604	42.5	SURCHARGED
1.005	30 minute 100 year Winter I+20%	16.500	15.766	0.000	0.72	99.349	39.9	SURCHARGED
1.006	30 minute 100 year Winter I+20%	16.500	14.330	0.000	0.46	99.193	40.0	OK
1.007	30 minute 100 year Winter I+20%	16.500	14.167	0.000	0.51	99.030	40.0	OK