

Surface Water SuDS Maintenance Manual

Boorley Green



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Site Description

The existing site comprises a series of commercial units and storage yards, accessed from Winchester Road (B3354) via a tarmac road opposite Oatlands Road. The site comprises approximately 0.41Ha and is bounded by two existing dwellings to the east and a railway line to the west. To the north and south are open fields. The site extent is noted on the SuDS Elements plan drawing 11909/D20 (Appendix A). The site benefits from an existing connection to the public foul sewer; no formal infrastructure exists for managing storm water run-off.

Site Proposals

The proposed development seeks to demolish the existing commercial units and construct 7 new dwellings, with associated driveways, parking and gardens. The development will retain the existing entrance onto Winchester Road, with minor amendments. The existing access road will be removed and realigned to suit the estate layout.

Surface water strategy and SuDS at Boorley Green

A strategy document has been prepared separately by Messrs *Aqua Calidus Consulting* for the purposes of gaining planning approval. AWA have followed this ethos in order to bring the project to technical detail stage.

A summary of the strategy is listed below:

- The existing site currently has no volume or water quality control and discharges run-off to an existing ditch to the south.
- Soakage testing indicated impermeable strata with no infiltration potential, precluding Tier 1 discharge of the SuDS hierarchy.
- A Tier 2 strategy of attenuated, controlled discharge to the existing watercourse has been adopted. Volume control will be achieved with attenuation and downstream throttle to 2l/s
- Attenuation volumes were calculated using the event rainfall from a 1 : 100 year event (1%AEP) + 40% climate change + 10% urban creep.
- Attenuation is provided by means of porous paving to the access road and driveways, wherein the coarse graded aggregate sub-base is tanked with an impermeable liner to provide the storage (Type C permeable paving *CIRIA SuDS Manual*)
- The roof runoff from the properties discharge into the coarse graded aggregate by means of shallow plastic crate diffuser units within the sub-base.
- Water quality improvements will be achieved using permeable paving, which captures pollutants at source in the coarse graded aggregate sub-base, and discharges from the roofs will pass through silt traps prior to the diffuser units.
- Final polishing is provided by permanent ponds prior to discharge to the watercourse, via new landscaped channels lined with rip-rap.

The location and type of surface water drainage and SuDS elements are shown on AWA drawings series 11909/D1-D6 and are as follows:

- Porous asphalt – access road with tanked coarse graded aggregate sub-base to store and clean run-off.
- Permeable block paving – driveways and parking bays with coarse graded aggregate sub-base to store and clean run-off.
- Silt traps – to filter run-off from roofs and capture debris and sediment in removable baskets. (Proprietary system)
- ControFlow – Orifice plate in control chamber with integral removable filter, to throttle the outlet to agreed discharge rate.
- Pond – a permanent pool with aquatic vegetation to provide additional treatment to the run-off and settling out of finer sediment.

Managing the surface water and SuDS

The SuDS at Boorley Green are integral to the surface water strategy and their function should be understood by owners and the appointed estate management company (EMC).

Whilst aspects of the SuDS are extensive, their maintenance should not be and the requirements are summarised in Table 1:

Table 1 – Surface Water Maintenance Summary

Operation and maintenance activity	Component			
	Pond	Permeable paving	Silt trap	ControFlow throttle
Regular Maintenance				
Inspection	■	■	■	■
Litter and debris removal	■	■	□	□
Grass cutting	■	□		
Weeds and invasive plant control	□	□		
Shrub management (including pruning)	□	□		
Shoreline vegetation management	■			
Aquatic vegetation management	■			
Mulching				
Scarifying				
Surface brushing		■		
Occasional maintenance				
Sediment management	■	■	■	□
Vegetation replacement	□			
Vacuum sweeping		■		
Jet washing		□	□	□
Remedial maintenance				
Structure rehabilitation/repair	□	□	□	□
Infiltration surface reconditioning		□		
Restore/Replace filter media				
Vegetation replacement				

Key

■ will be required

□ may be required

Inspection & precautions

All aspects of the surface water drainage system are to be inspected as part of a maintenance contract. The surface water features as designed are to be inspected from ground level, along with any rodding or jetting. Larger manholes that permit man access should be maintained from ground level and accessed as a last resort, except where specific proprietary items require mechanical repair.

During inspections the maintenance team should prepare for and allow to carry out any maintenance that is listed or discovered. It is expected that simple clearing of litter and obstructions is undertaken as a matter of course.

There should be no storing or depositing of fine-grained materials (i.e., sands, soil, grits) onto the porous surfaces, to avoid clogging of pores and sub-grade voids.

Descriptive signage of the porous paving is recommended, to remind residents of the function of the SuDS.

Homeowner responsibility

The individual home owners on the estate should be aware of the function of the permeable paving, (both estate roads and parking spaces), and there should be no storing or depositing of fine-grained materials (i.e., sands, soil, grits) onto the porous surfaces, to avoid clogging of pores and sub-grade voids. Any such materials must be stored appropriately away from porous surfaces and accidental spillage should be brushed and vacuumed away as soon as possible.

The silt traps filtering the roof runoff into the sub-base are sited within the individual curtilage of the properties, but all are accessible from the street. If the EMC is limited to work in public areas with no right of access, then the individual homeowners must take responsibility for the maintenance of the silt traps on their land.

Table 2 – Surface Water Maintenance Details

Activity		Frequency
Regular Maintenance		
1	Pond	
1.1	Remove litter and debris	Monthly (or as required)
1.2	Cut the grass - public areas and access routes	Monthly (during growing season)
1.3	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
1.4	Inspect marginal and bankside vegetations and remove nuisance plants (for first 3 years)	Monthly (as start, then as required)
1.5	Inspect inlets, outlets, banksides, rip-rap in outlet channels, pipework etc for evidence of blockage and/or physical damage	Monthly
1.6	Inspect water body for signs of poor water quality	Monthly (May - October)
1.7	Inspect silt accumulation rates in the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly

1.8	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
1.9	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
1.10	Tidy all dead growth (scrub clearance) before start of growing season (tree maintenance as part of landscape management contract)	Annually
1.11	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years or as required
2	Pervious Pavements - Blocks & Asphalt	
2.1	Brush regularly and remove litter and sweepings from all hard surfaces - pay attention to areas where adjacent impermeable surfaces drain as silt accumulation is more likely in these locations	3 Monthly, then reduced based on site specific observations
2.2	Maintain adjacent planted areas to ensure washout of soil onto permeable surface does not occur. Clean and remediate any spillage to prevent clogging	3 Monthly, then as required under general landscape maintenance
2.3	Snow removal, standard road salt used as de-icing medium; no abrasives such as sands, grits or cinders shall be applied	As required in winter months
3	Chambers, Flow control and Pipes	
3.1	Check orifice unit is free of obstruction and remove debris from screen	Monthly for 3 months, then every 6 months
3.2	Remove cover and inspect chambers, ensuring water is flowing freely and exit routes are unobstructed. Remove and litter and debris.	3 monthly and following leaf fall
4	Silt traps	
4.1	Remove cover and inspect chambers, ensuring water is flowing freely and exit routes are unobstructed. Undertake inspection after leaf fall in autumn	Monthly and following heavy storms
4.2	Clear roof guttering and surfaces of leaves and debris	Autumn following leaf fall
Occasional tasks		
5	Pond	
5.1	Remove sediment from the main body when pool volume is reduced by 20%	Given effective pre-treatment this should be required very rarely (20-25 years)
5.2	Replenish water levels	As required during drought
6	Pervious Pavements - Blocks & Asphalt	
6.1	Brush and vacuum surface once a year to prevent silt blockage and enhance design life	Annually following leaf fall
6.2	Inspect diffuser units with CCTV to check for siltation; review upstream silt management if required	Every 5 years, or as required
7	Chambers Flow control and Pipes	
7.1	Inspect channel bases, sumps, gullies and inspection chambers for silt accumulation. Vacuum suction removal of silt in ControFlow sumps. Jet wash pipes as required to maintain flow.	Annually

8	Silt traps	
8.1	Remove and empty filter basket of any silt and debris, empty any additional build up within the sump unit.	Monthly for 3 months, then every 6 months
Remedial Work		
9	Pond	
9.1	Repair erosion or other damage	As required
9.2	Replant, where necessary	As required
9.3	Aerate pond when signs of eutrophication are detected	As required
9.4	Realign/replace rip-rap in outlet channels or repair other damage	As required
9.5	Repair/rehabilitate inlets, outlets and overflows	As required
10	Pervious Pavements - Blocks	
10.1	Remedial works to correct rutting, depressions, cracked/broken blocks which are hazardous, replacement of jointing material	As required
10.2	Rehabilitation of surface and upper substructure layers - jet washing and suction cleaning to improve pavement efficiency. Monitor effectiveness and advise client of any areas which do not infiltrate immediately	10 - 15 years depending on performance and efficiency of regular maintenance regime
11	Pervious Pavements - Asphalt	
11.1	Remedial works to correct rutting, depressions which are hazardous. Small areas of patch repair can be carried out with porous mix or standard asphalt	As required
11.2	Rehabilitation of surface and upper substructure layers - jet washing and suction cleaning to improve pavement efficiency. Monitor effectiveness and advise client of any areas which do not infiltrate immediately	10 - 15 years depending on performance and efficiency of regular maintenance regime
12	Chambers and Pipes	
12.1	Repair physical damage to below ground pipes, manholes and inspection chambers	As required
13	Silt traps	
13.1	Repair physical damage to manhole, cover and internal filter units	As required

Health & Safety

Generally, all aspects of the surface water drainage system are designed are to be inspected from ground level, along with any rodding or jetting. Larger manholes that permit man access should be maintained from ground level and accessed as a last resort, except where specific proprietary items require mechanical repair.

The silt trap components are designed to capture and filter roof runoff and so the presence of pollution and contaminants in the silt will be negligible. Similarly, these pollutants deposited on the roads will be captured in the sub-base of the permeable paving. However, those responsible for maintenance on the site should be aware of the possibility that gratings in traps and sumps may contain pollution and contaminants. When inspecting, handling and cleaning these components appropriate precautions should be taken to protect the health and safety of operatives.

All those responsible for maintenance shall take safety precautions for all activities, (including lone working) and risk assessments always carried out. Man access, if required, shall be carried out by operatives suitably trained for working in confined spaces.

Spillage & emergency action

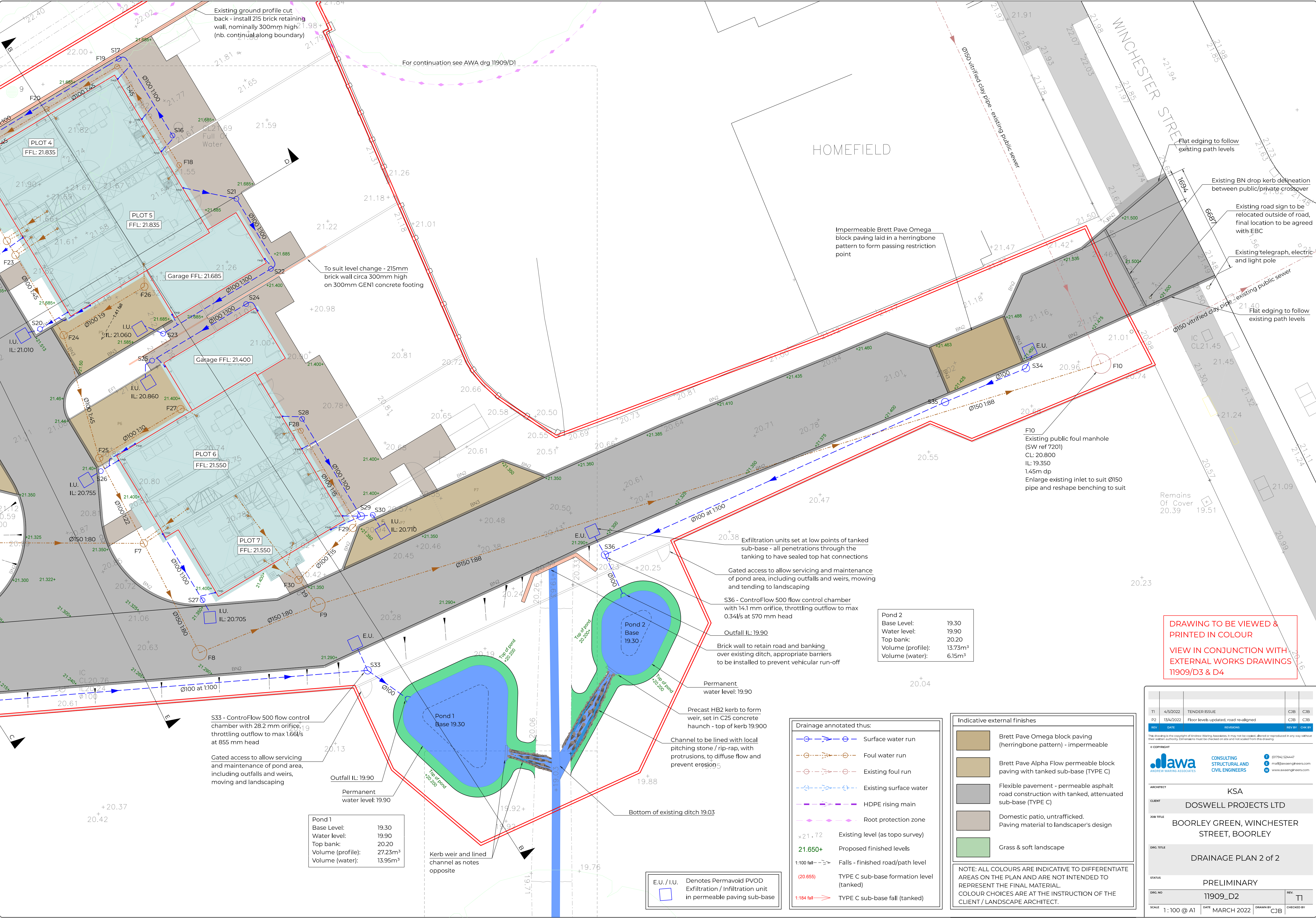
Small spillages of organic substances should be removed where possible using soak mats as recommended by the Environment Agency.

Fine-grained materials must be stored appropriately away from porous surfaces and accidental spillage should be brushed and vacuumed away as soon as possible.

APPENDIX A – PLAN ON SuDS ELEMENTS 11909/D20



APPENDIX B – AWA DRAINAGE DRAWINGS 11909/D1 – D7 & D10



TI	4/5/2022	TENDER ISSUE	CJB	CJB
P2	13/4/2022	Floor levels updated, road re-aligned	CJB	CJB
REV	DATE	REVISIONS	REV BY	CHE BY
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ARCHITECT		KSA		
CLIENT		DOSWELL PROJECTS LTD		
JOB TITLE		BOORLEY GREEN, WINCHESTER STREET, BOORLEY		
DRG. TITLE		DRAINAGE PLAN 2 of 2		
STATUS		PRELIMINARY		
DRG. NO		11909_D2	REV	11
SCALE		1:100 @ A1	DATE	MARCH 2022
		DRAWN BY	CJB	CHECKED BY



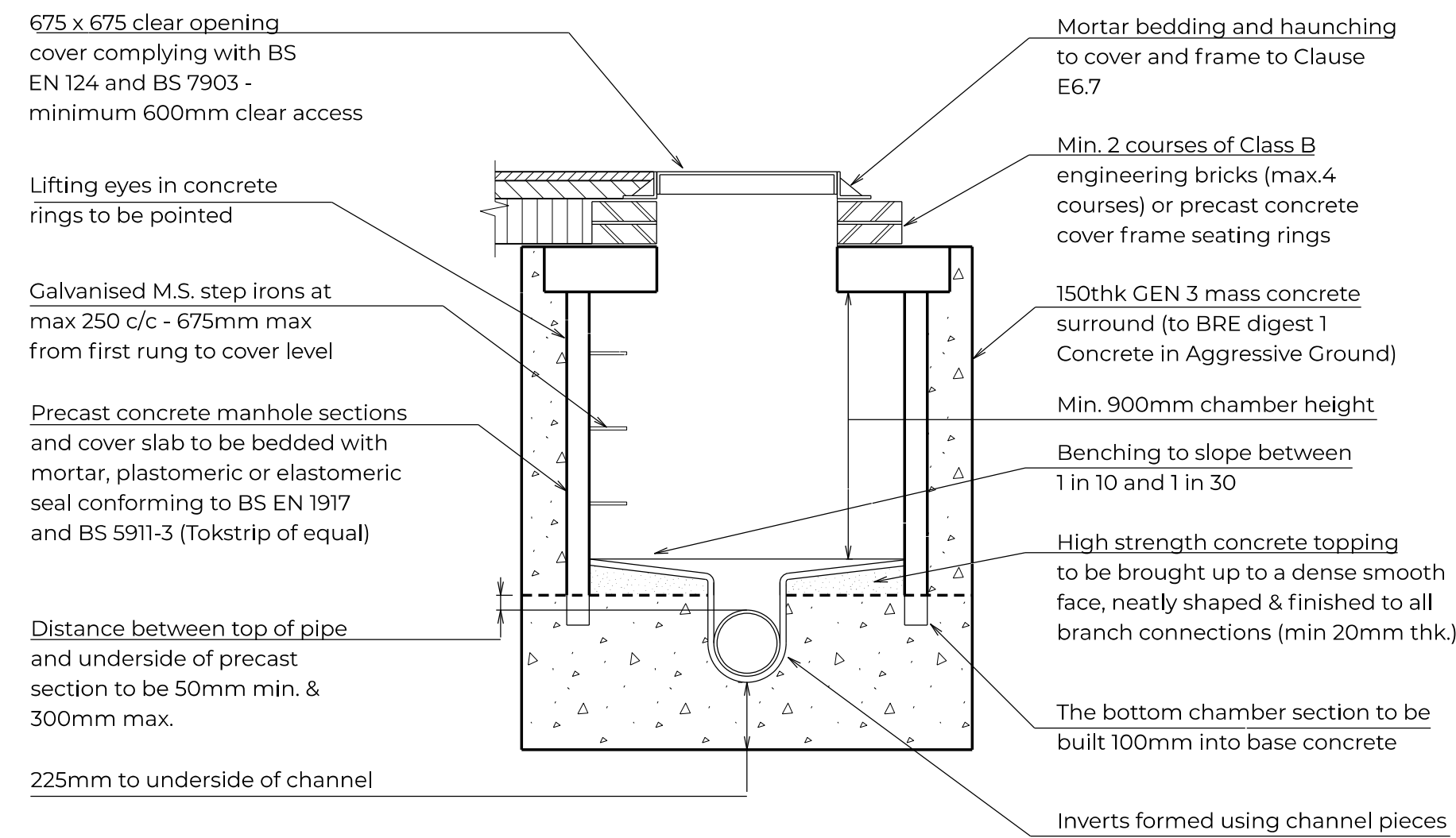
FOUL RUN						
Node	Cover Level	Invert Level	Depth (m)	Type	Cover size	Cover Class
F1	21.200	20.738	0.462	450Ø poly	450Ø	B125
F2	21.200	20.632	0.568	450Ø poly	450Ø	B125
F3	21.200	20.523	0.677	450Ø poly	450Ø	B125
F4	21.200	20.416	0.784	450Ø poly	450Ø	B125
F5	21.250	20.355	0.895	450Ø poly	450Ø	B125
F6	21.250	20.239	1.011	450Ø poly	450Ø	B125
F7	21.400	20.115	1.285	450Ø poly deep	450Ø	B125
F8	21.310	20.021	1.289	900Ø conc	600 x 600	D400
F9	21.335	19.924	1.411	1050Ø conc	600 x 600	D400
F10	20.800	19.350	1.450	Existing Public	Existing	Existing
F11	21.200	20.798	0.402	300Ø poly	300Ø	A15
F12	21.200	20.707	0.493	450Ø poly	450Ø	A15
F13	21.200	20.760	0.440	300Ø poly	300Ø	A15
F14	21.200	20.579	0.621	450Ø poly	450Ø	A15
F15	21.250	20.726	0.524	450Ø poly	450Ø	B125
F16	21.250	20.751	0.499	300Ø poly	300Ø	A15
F17	21.250	20.595	0.655	450Ø poly	450Ø	A15
F18	21.685	21.234	0.451	450Ø poly	450Ø	A15
F19	21.685	21.072	0.613	450Ø poly	450Ø	A15
F20	21.685	20.957	0.728	450Ø poly	450Ø	A15
F21	21.685	20.819	0.867	450Ø poly	450Ø	A15
F22	21.685	20.704	0.981	450Ø poly	450Ø	A15
F23	21.685	20.681	1.004	450Ø poly	450Ø	A15
F24	21.510	20.555	0.956	450Ø poly	450Ø	B125
F25	21.400	20.381	1.019	450Ø poly	450Ø	B125
F26	21.685	21.198	0.487	450Ø poly	450Ø	B125
F27	21.400	20.950	0.450	450Ø poly	450Ø	B125
F28	21.400	20.950	0.450	300Ø poly	300Ø	A15
F29	21.400	20.493	0.907	450Ø poly	450Ø	B125
F30	21.375	20.177	1.198	450Ø poly	450Ø	B125
All foul pipes to be 100 dia. laid 1 : 40 unless noted otherwise						
All cover levels are approximate. Cover classes to be in accordance with BS EN 124.						
Cover types assumed: Recessed in paved landscape, solid in soft, solid in gravel drives						
(all subject to final design by landscape architect)						
Poly = Polypropylene manhole Conc = Precast concrete box/ring as appropriate						

SURFACE WATER RUN							
Node	Cover Level	Invert Level	Outlet	Depth (m)	Type	Cover size	Cover Class
S1	21.200	20.765		0.435	300Ø poly	300Ø	A15
S2	21.200	20.689	20.634	0.511	Silt trap	300Ø	B125
S3	21.200	20.695	20.640	0.505	Silt trap	300Ø	B125
S4	21.200	20.782		0.418	300Ø poly	300Ø	A15
S5	21.200	20.680	20.625	0.520	Silt trap	300Ø	B125
S6	21.200	20.794		0.406	300Ø poly	300Ø	A15
S7	21.200	20.726	20.671	0.474	Silt trap	300Ø	B125
S8	21.200	20.695	20.640	0.505	Silt trap	300Ø	B125
S9	21.200	20.782		0.418	300Ø poly	300Ø	A15
S10	21.200	20.680	20.625	0.520	Silt trap	300Ø	A15
S11	21.250	20.845		0.406	300Ø poly	300Ø	A15
S12	21.250	20.775	20.720	0.475	Silt trap	300Ø	A15
S13	21.250	20.850		0.400	Rodding Eye	250 x 250	A15
S14	21.250	20.750		0.500	300Ø poly	300Ø	A15
S15	21.250	20.687	20.632	0.563	Silt trap	300Ø	B125
S16	21.685	21.274		0.411	300Ø poly	300Ø	A15
S17	21.685	21.215		0.470	300Ø poly	300Ø	A15
S18	21.685	21.078	21.023	0.607	Silt trap	300Ø	A15
S19	21.685	21.180	21.125	0.505	Silt trap	300Ø	A15
S20	21.587	21.082	21.027	0.505	Silt trap	300Ø	A15
S21	21.685	21.252		0.433	300Ø poly	300Ø	A15
S22	21.685	21.205		0.480	300Ø poly	300Ø	A15
S23	21.685	21.131	21.076	0.554	Silt trap	300Ø	A15
S24	21.400	20.993		0.407	300Ø poly	300Ø	A15
S25	21.400	20.926	20.871	0.474	Silt trap	300Ø	A15
S26	21.500	20.995	20.940	0.505	Silt trap	300Ø	A15
S27	21.400	20.895	20.840	0.505	Silt trap	300Ø	A15
S28	21.400	20.989		0.411	300Ø poly	300Ø	A15
S29	21.400	20.918		0.482	300Ø poly	300Ø	A15
S30	21.400	20.895	20.840	0.505	Silt trap	300Ø	A15
S31	21.000	20.406		0.595	450Ø poly	450Ø	B125
S32	21.000	20.374		0.627	450Ø poly	450Ø	B125
S33	21.230	20.080		1.150	Flow control	450Ø	B125
S34	21.300	20.700		0.600	450Ø poly	450Ø	B125
S35	21.300	20.646		0.654	450Ø poly	450Ø	B125
S36	21.200	20.419		0.781	Flow control	450Ø	B125
All surface water pipes to be 100 dia. laid 1 : 100 unless noted otherwise							
All cover levels are approximate. Cover classes to be in accordance with BS EN 124.							
Cover types assumed: Recessed in paved landscape, solid in soft, solid in gravel drives							
(all subject to final design by landscape architect)							
Poly = Polypropylene manhole Conc = Precast concrete box/ring as appropriate							
Silt traps to have 275mm (min) sump below noted outlet level							

DRAINAGE NOTES:

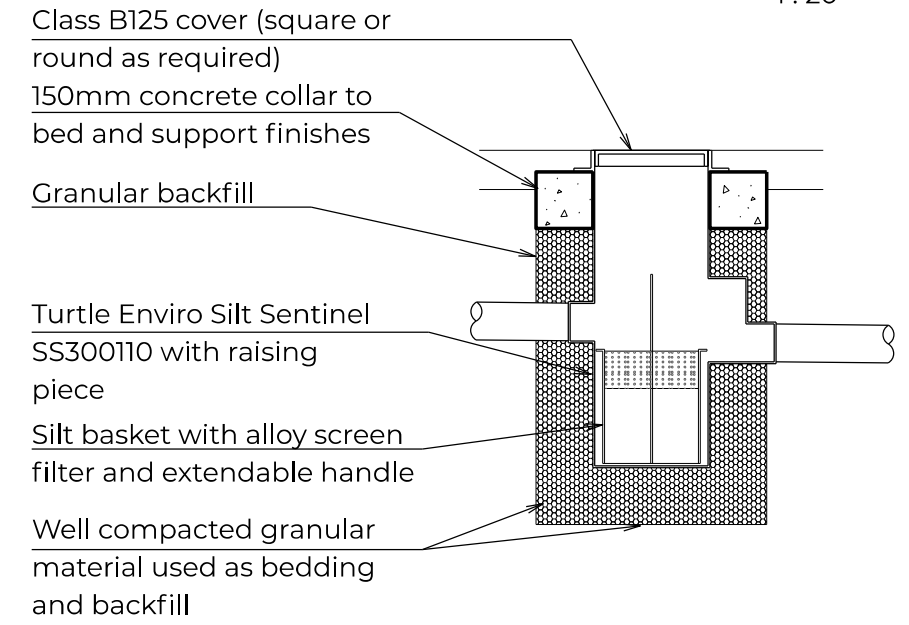
1. All work to be in accordance with BS EN 752, BS 4660, BS EN 1401, BS 65 BS EN 124 & to be to the Local Authority approval.
2. All private drainage to comply with current Building Regulations, BS EN 752, and other relevant Eurocodes, British Standards and Codes of Practice.
3. Private inspection chambers and manholes to be constructed in accordance with tables 11 & 12 of the Building Regulations Approved Document H.
4. Manhole covers and frames to BS EN 124 to be as follows:
D400 in Carriageway
B125/C250 in Other Trafficked Areas
A15 in Landscaped Areas
Covers lockable where noted.
5. Private drainage to be constructed using Osma Plastic Drainage System or similar approved, laid to manufacturer's instructions.
All private drainage 100mm dia. unless shown otherwise on table.
6. AWA are responsible for below ground drainage terminating at slab level. All above ground drainage is the responsibility of the architect/M&E designer, inclusive of stand alone pump units (e.g. Saniflo).
7. Private drains located adjacent to dwellings are to be constructed in accordance with diagram 8 of the Building Regulations Approved Document H.
8. Foul popup positions are to be checked against the architec's drawings to ensure compatibility. The venting requirements are the responsibility of others and any notation of 'SVP' on AWA drawings does not constitute design input of vent locations.
9. Rainwater downpipes are to be connected direct to drain via suitable adaptor removable to permit access for rodding.
10. Rainwater downpipe positions are to be checked against Architect's drawings to ensure compatibility (any discrepancies to be referred to the Architect).
11. Any external linear channels shall have their grating style and material choice agreed by the architect/landscape architect to suit the client's aesthetic preference. Loading categories to be in accordance with Note 4. In hygiene sensitive environments such as commercial kitchens, hospitals etc, the material, finish and grating performance requirements are to be specified by the architect/M&E designer. AWA input is strictly limited to the hydraulic performance of channels.
12. The Main Contractor is to provide all necessary sleeves or lintels where drainage pipes pass through walls or foundations.
13. Drainage runs adjacent to or through foundations may result in deepening the foundations locally. Where pipelines pass within 1m of buildings or walls the foundations are to be taken down below the bottom of the trench.
14. The back filling of drainage trenches which are in the proximity of foundations must be in accordance with any special requirements as set out or requested by the Structural Engineer and the Building Regulations.
15. Use of this drawing does not absolve the Client or Contractor from their responsibilities under Health and Safety: The Construction (Design & Management) Regulations 2015.
16. Unless noted otherwise all levels are in metres.
17. Unless noted otherwise, this drawing including the existing site levels, foul and surface water invert levels, have been produced with reference to survey information compiled by others and supplied to AWA. No responsibility is taken for any inaccuracies and/or omissions in the information as supplied
18. Where new connections are to be made to existing manholes/sewers, the invert levels should be checked prior to commencement of works and any variance reported to the Engineer immediately.
19. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and Specialist Sub-contractor's drawings and The Specification.
20. All setting-out is to be in accordance with the architects drawings. Any discrepancies between the Engineer's and Architect's drawings to be referred to the Architect before proceeding.
Dimensions must not be scaled.
21. Where drains pass through foundations or connect to manholes, flexible pipe joints are to be provided within 150mm of the of the face of the structure and within a further 600mm to form a rocker pipe.
22. Where depth to invert does not exceed 600mm and the pipe size does not exceed 100mm diameter, 300mm dia. polypropylene mini access chambers (MACs) may be used. Elsewhere, proprietary polypropylene or precast concrete manholes are to be used. Refer to manhole schedule for full details.
23. Where pipelines cross, each is to be surrounded with grade C16/20 mass concrete for a distance not less than 1m centred on the crossing point. Length of surround to be extended as necessary to within 150mm of the next nearest flexible joint.
24. All pipework with less than 600mm of effective cover is to be surrounded with grade C16/20 mass concrete as follows:
100mm dia. = 100mm thick surround
150mm dia. = 150mm thick surround
Flexible joints are to be provided at all pipe joints.
25. 'Effective cover' is the minimum depth of cover over the pipe crown at any time during the construction process.
26. The Contractor is to ensure that protective measurers are taken to ensure that drainage pipework and fittings are not damaged by site traffic prior to oversite filling operations being completed around buildings.
27. The top run of each foul private network is to be laid no slacker than 1:60.
28. All surface water drainage to be 100Ø and all foul water drainage to be 100Ø U.N.O
29. Pipeline arrangements shown are indicative only, Contractor is to ensure all pipework connections are arranged to ensure flows are directed down or into the main channel in the direction of the main flow. Where necessary, bends are to be used on oblique connections inside the manhole benching where sufficient room exists or the pipelines on oblique connections are arranged outside the chamber to be able to divert flows down the main channel. Connection bought in perpendicular to the main channel are not acceptable. Where possible the main channel flow shall be from any connections with WCs to ensure a flush through the main channel is achieved.
30. The Contractor's attention is drawn to the need to ensure any trenches excavated through previously compacted filled areas in particular under the building footprint and immediately around the outside are re-compacted to ensure localised differential settlement does not occur.
31. Unless noted otherwise, the services indicated are taken from information supplied by the relevant statutory authority or groundscan survey. No guarantee is given as to their accuracy and the Contractor is responsible for locating all existing services prior to the commencement of the works.

TI	4/5/2022	TENDER ISSUE		CJB	CJB
REV	DATE	REVISIONS		REV BY	CHEK BY
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ARCHITECT KSA					
CLIENT DOSWELL PROJECTS LTD					
JOB TITLE BOORLEY GREEN, WINCHESTER STREET, BOORLEY					
DRG. TITLE DRAINAGE TABLES & NOTES					
STATUS PRELIMINARY					
DRG. NO		11909_D5			REV. TI
SCALE	1 : 100 @ A1	DATE	MARCH 2022	DRAWN BY	CJB
				CHECKED BY	



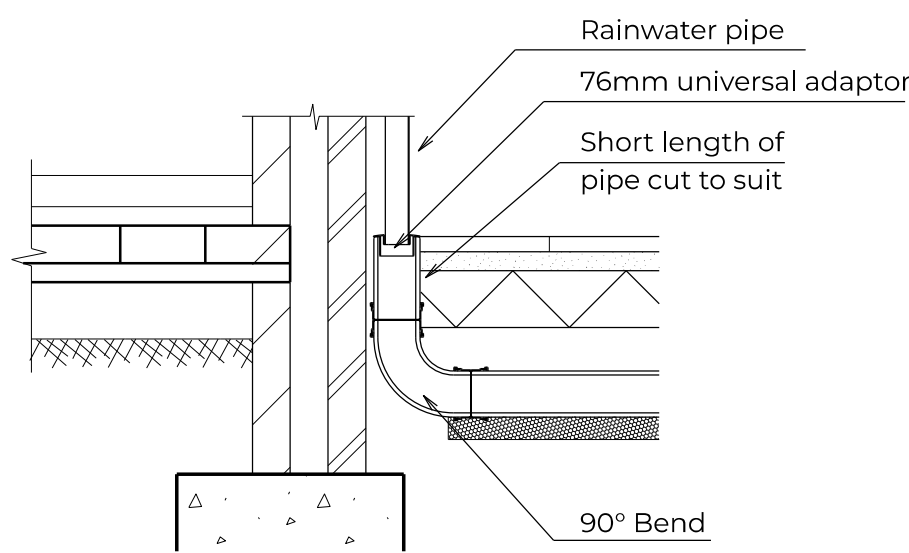
TYPE 2 MANHOLE - PC RINGS

Max depth 3.0m CL to Pipe soffit
1:20



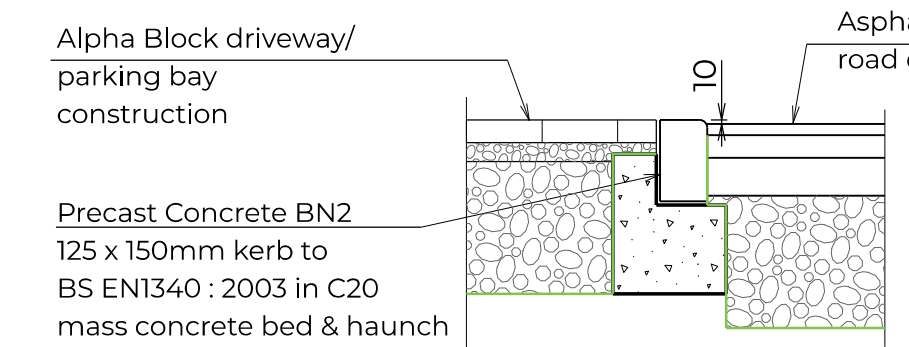
TURTLE ENVIRO SILT SENTINEL

SS300110 - 300Ø
1:20



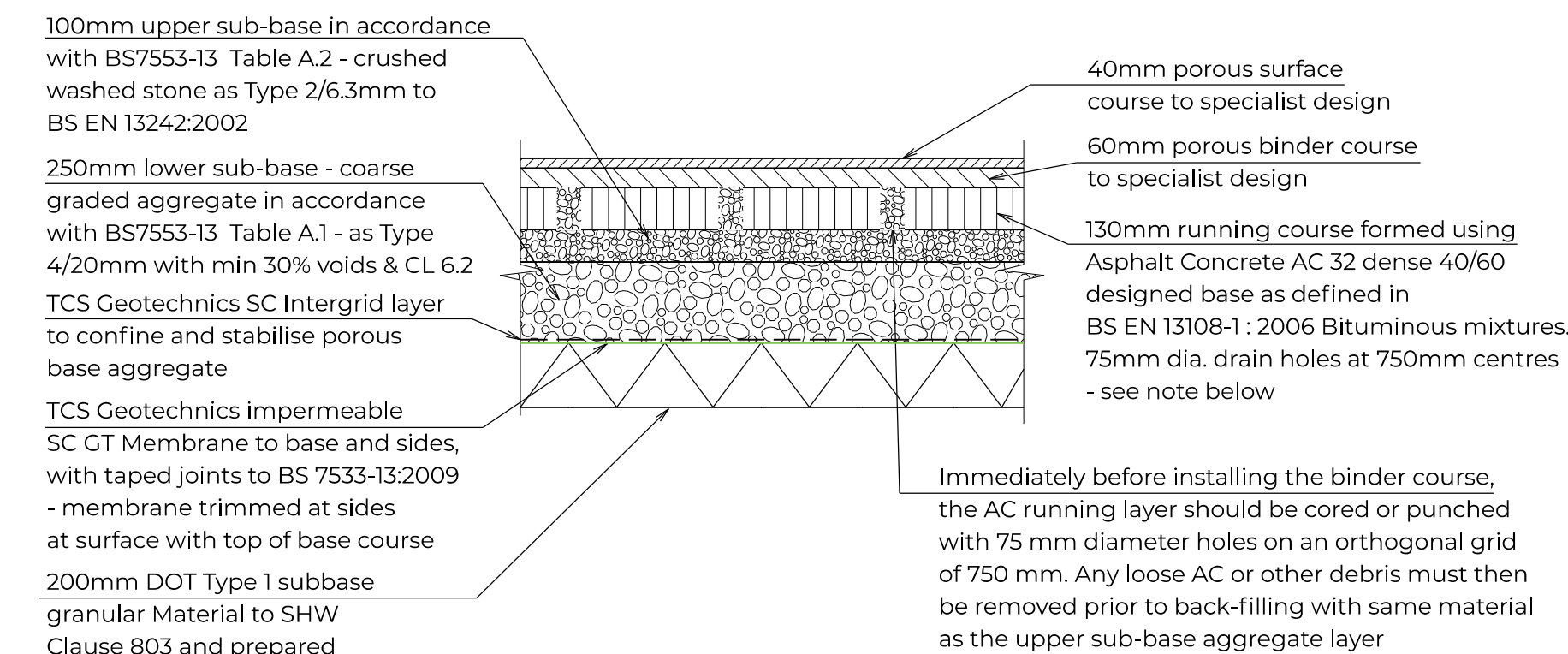
RWP DETAIL

1:20



BULL NOSED CHANNEL BN2 - DELINIATION

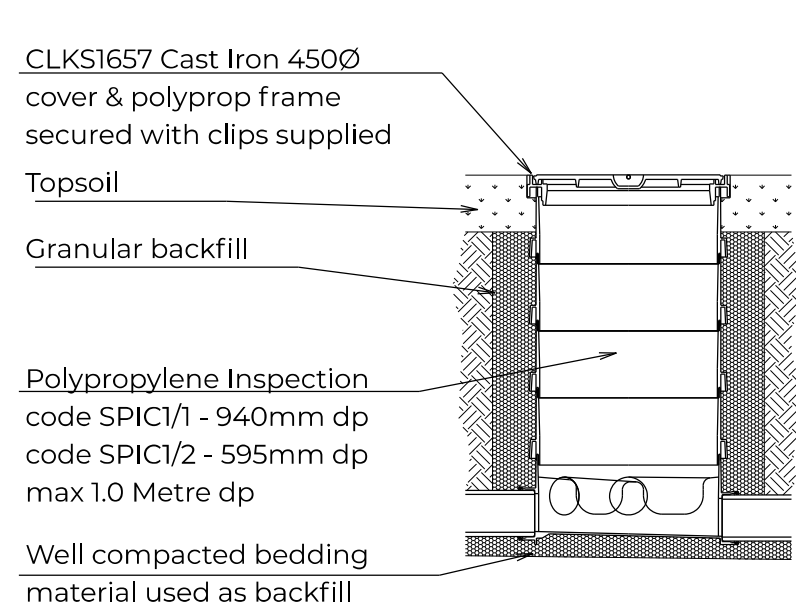
1:20



POROUS ASPHALT ACCESS ROAD CONSTRUCTION

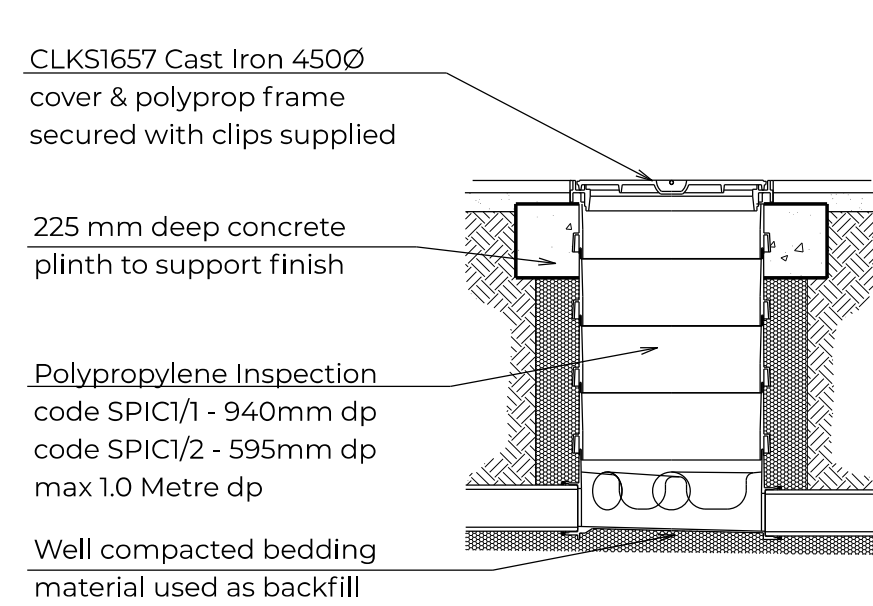
TYPE C PERMEABLE PAVING

1:20



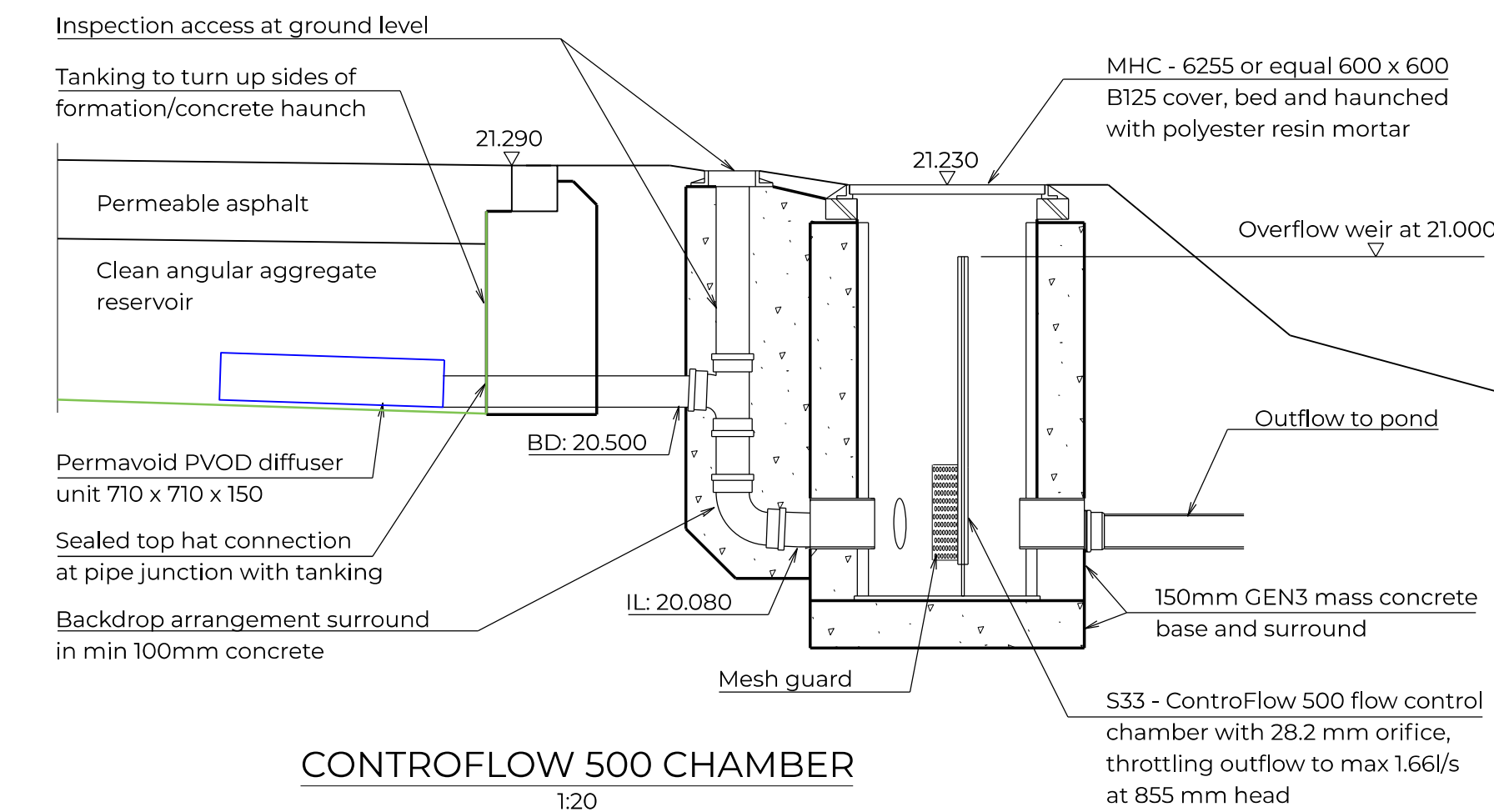
POLYPROPYLENE IC 450Ø IN SOFT LANDSCAPE

1:20



POLYPROPYLENE IC 450Ø IN HARD LANDSCAPE

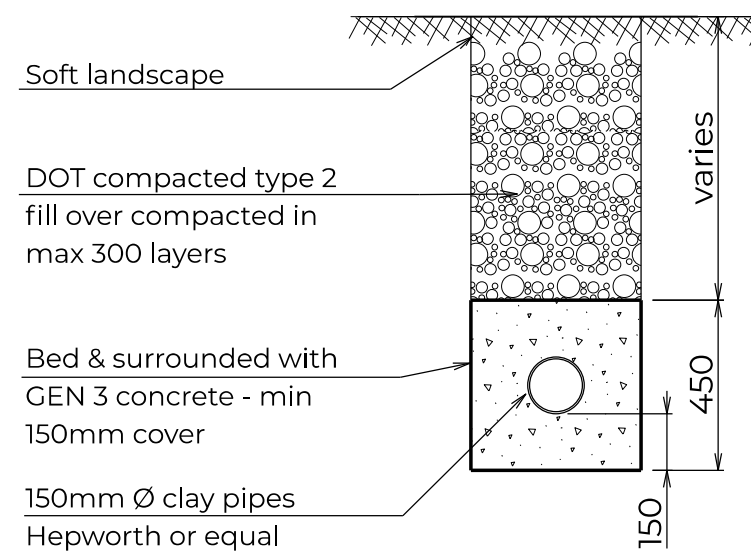
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CONTROFLOW 500 CHAMBER

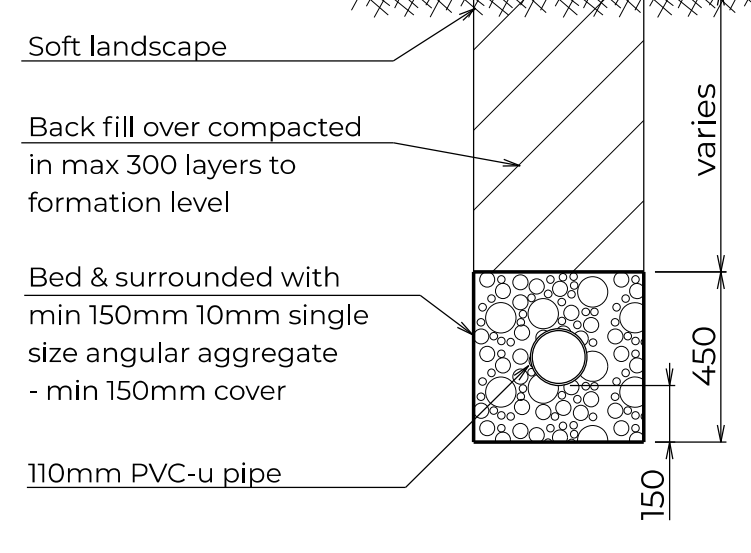
1:20

Flexible construction joints through the concrete to be provided at pipe joints. The joint material shall be at least 18mm thick and made from bitumen impregnated insulating board to B.S. 1142 Part 3, or equally compressible material such as expanded polystyrene. Board cut to fit pipes and placed at the face of the pipe sockets or at one end of sleeved joints, placed at 5.0m c/c max.



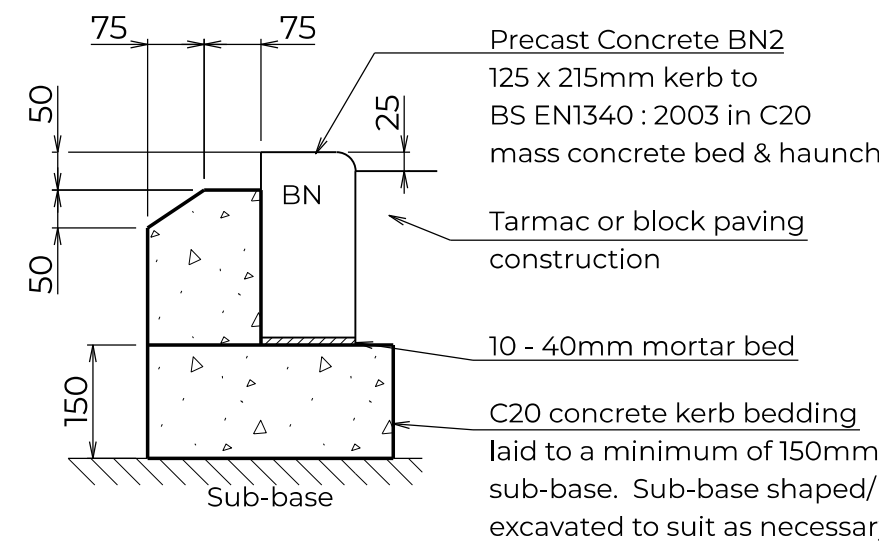
CLASS Z PIPE BEDDING

1:20



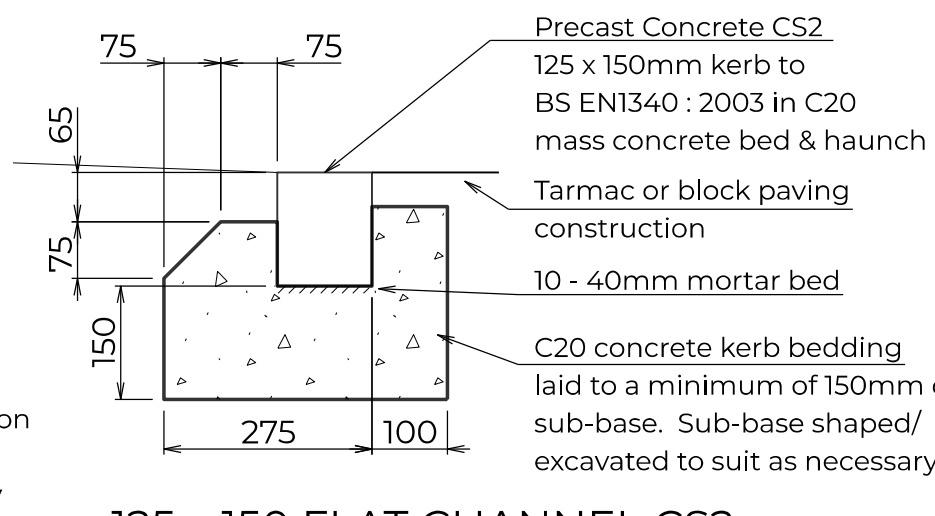
CLASS S PIPE BEDDING

1:20



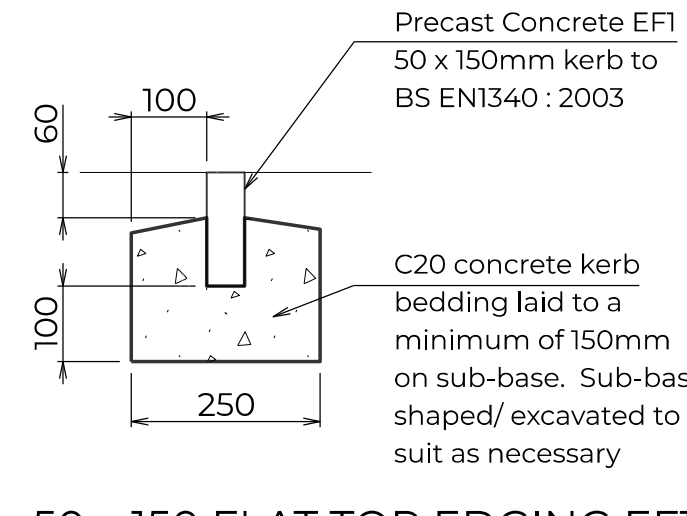
125 x 150 BULLNOSED KERB - BN

1:10



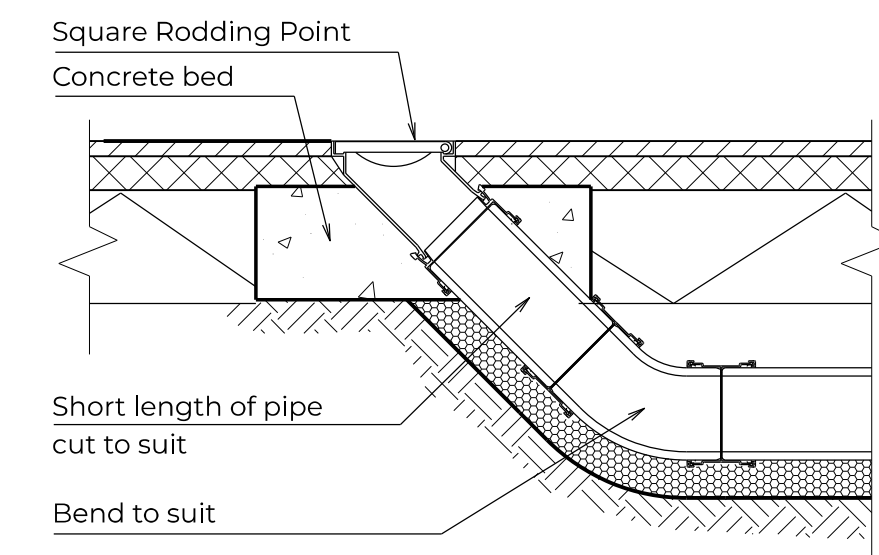
125 x 150 FLAT CHANNEL CS2 FLUSH DROP KERB

1:10



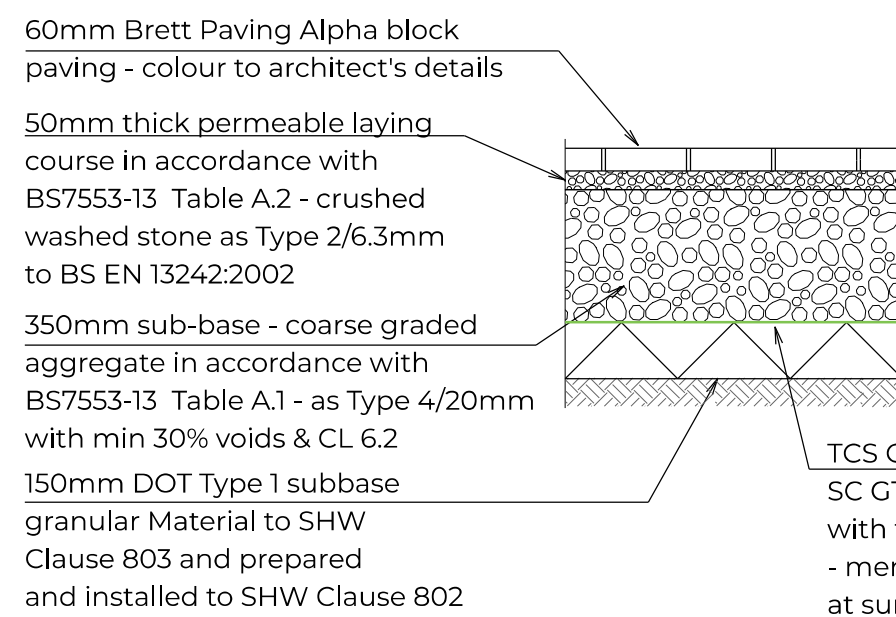
50 x 150 FLAT TOP EDGING EFT

1:10



RODDING EYE DETAIL

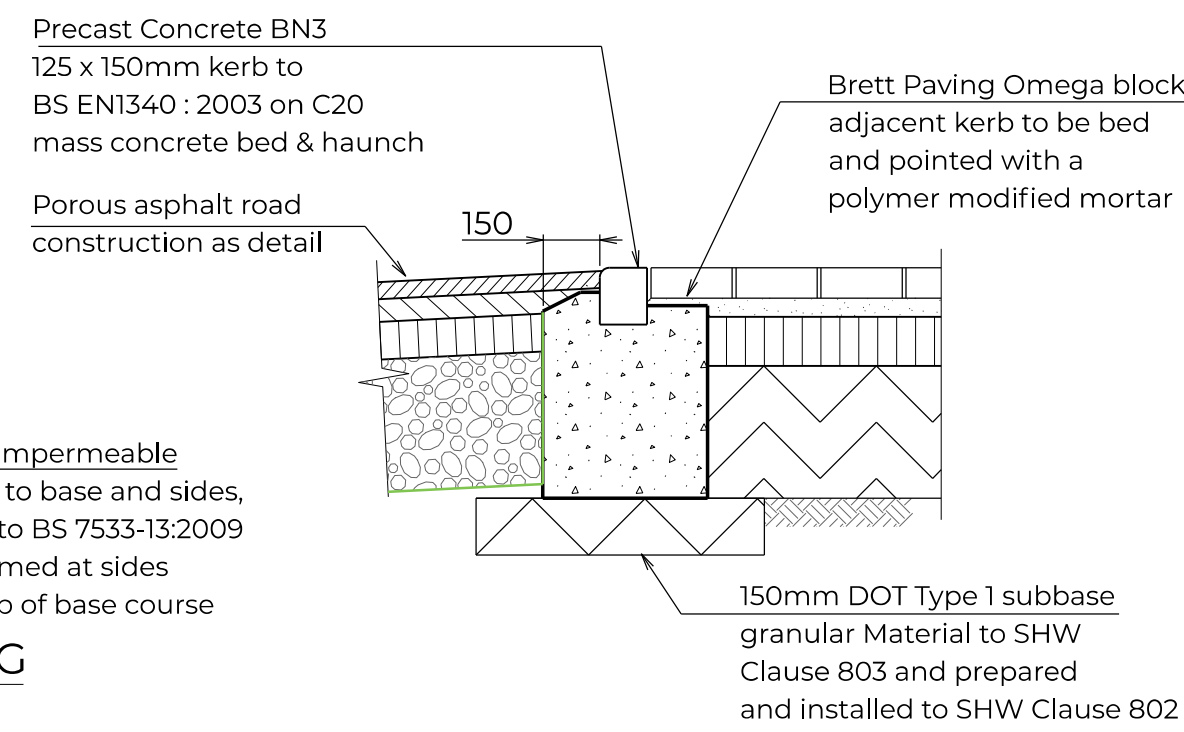
1:10



ALPHA BLOCK TYPE C PERMEABLE PAVING

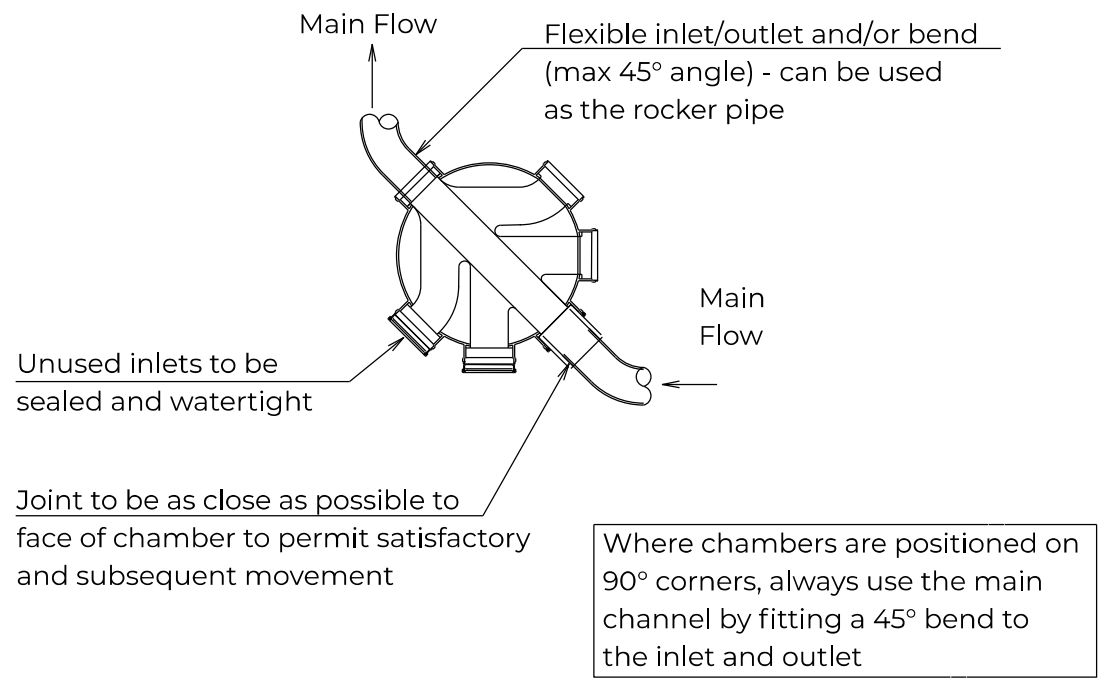
DRIVEWAYS / PARKING BAYS

1:20



TRANSITION MAIN ACCESS BN3

1:20



PLASTIC IC BASE LAYOUT PRICIPLES

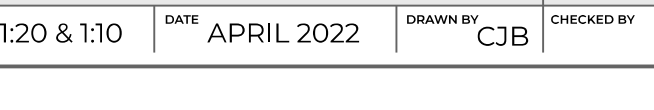
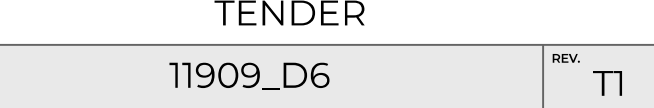
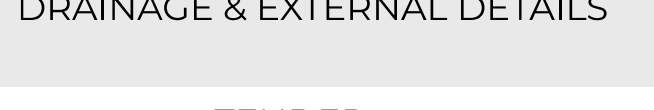
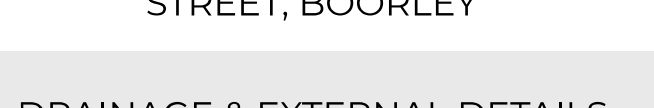
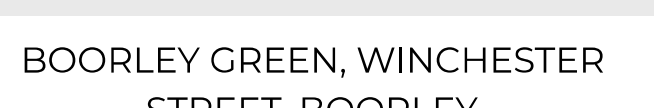
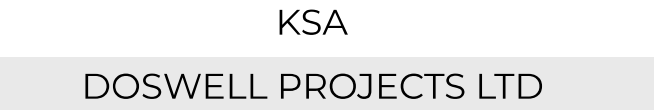
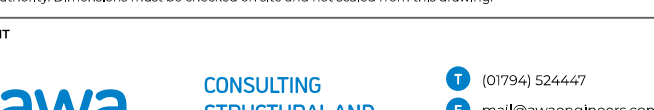
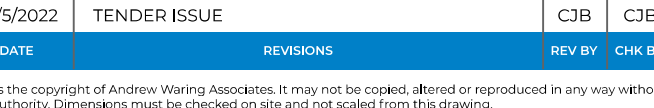
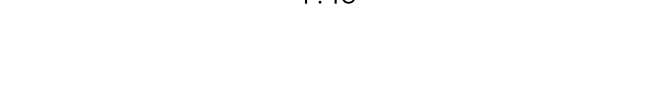
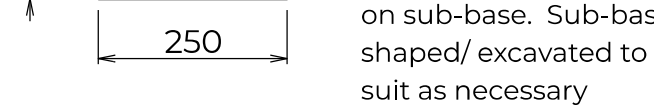
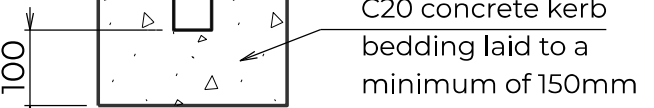
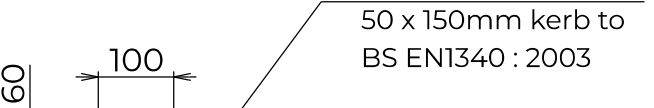
(a) Short length of pipe bedded in wall, joints formed within 150mm of either wallface. Adjacent rocker pipes of max. length 600mm with flexible joints

(b) Arch or lintelled opening to give 50mm space all round the pipe. Mask opening both sides with rigid sheet material to prevent entry of fill or vermin

Important:
Fill void with compressible sealant to prevent entry of gas

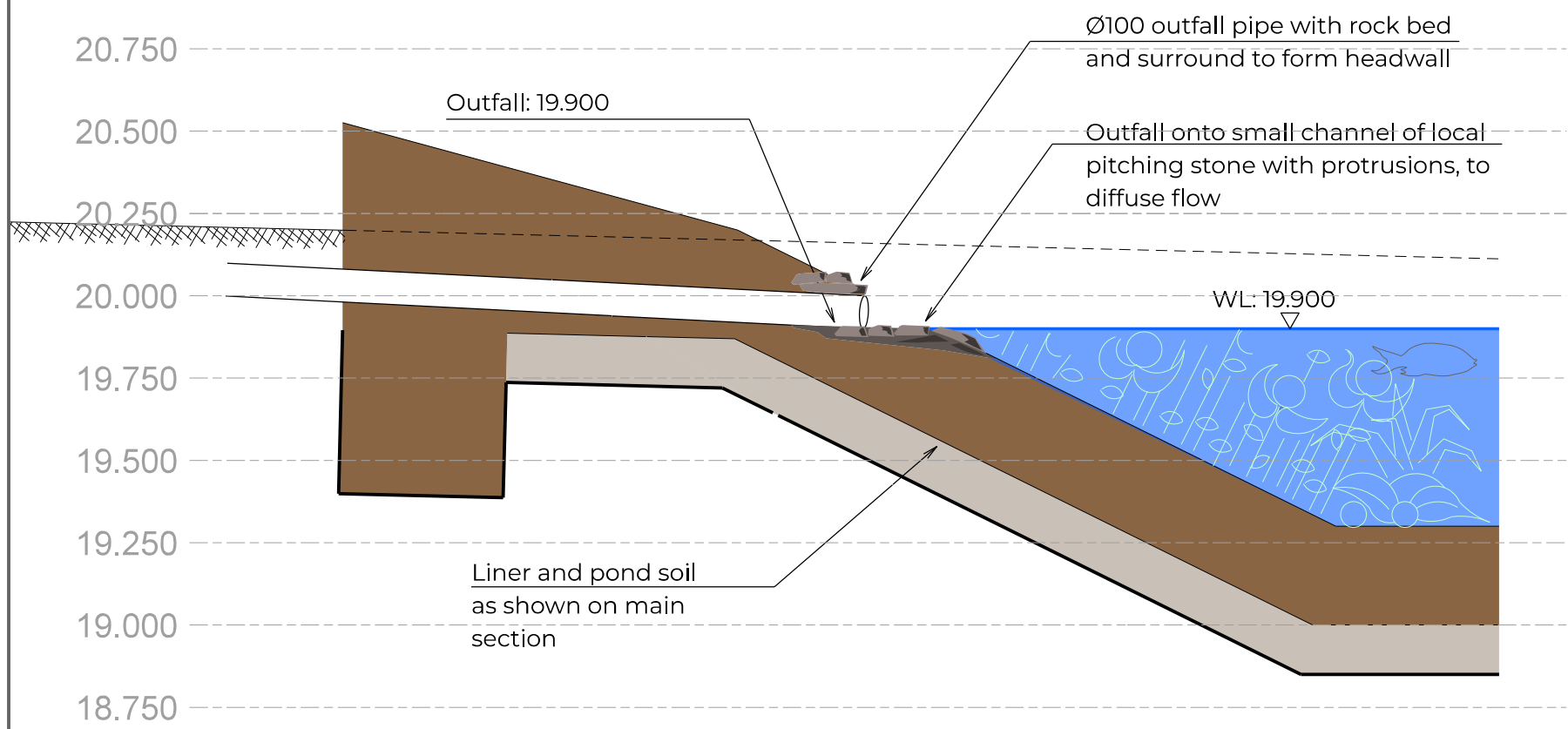
PIPES PASSING THROUGH STRUCTURES

1:20

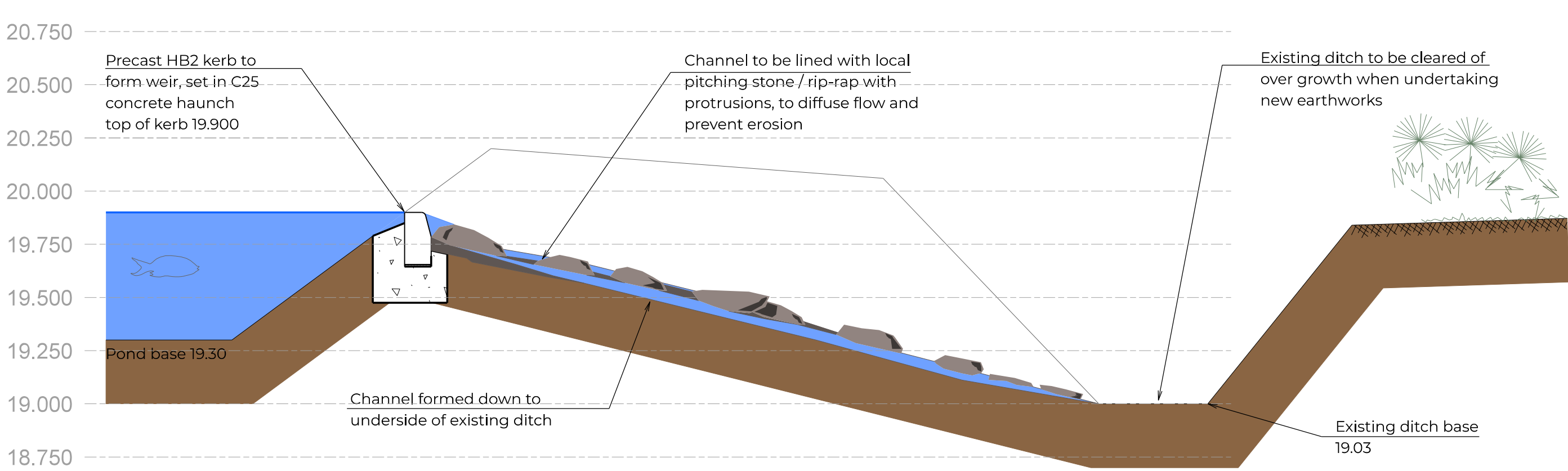


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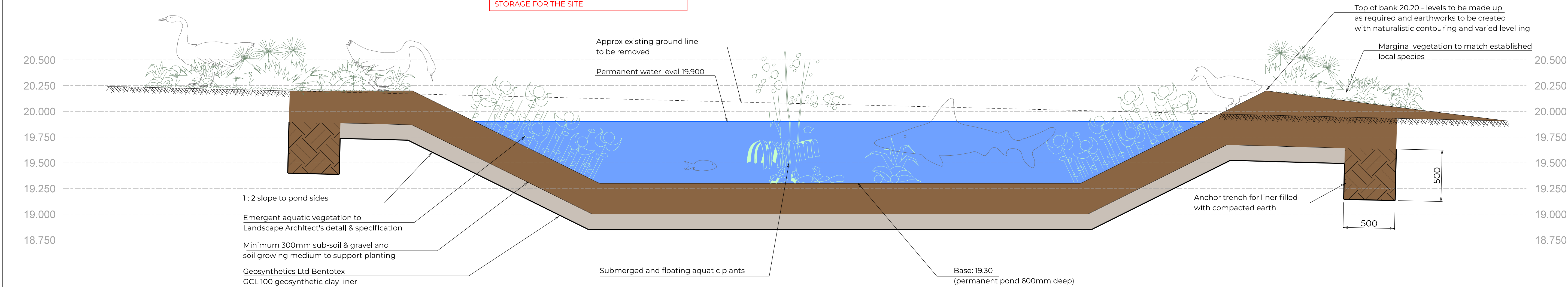


SECTION THROUGH PIPE OUTFALL
1:20

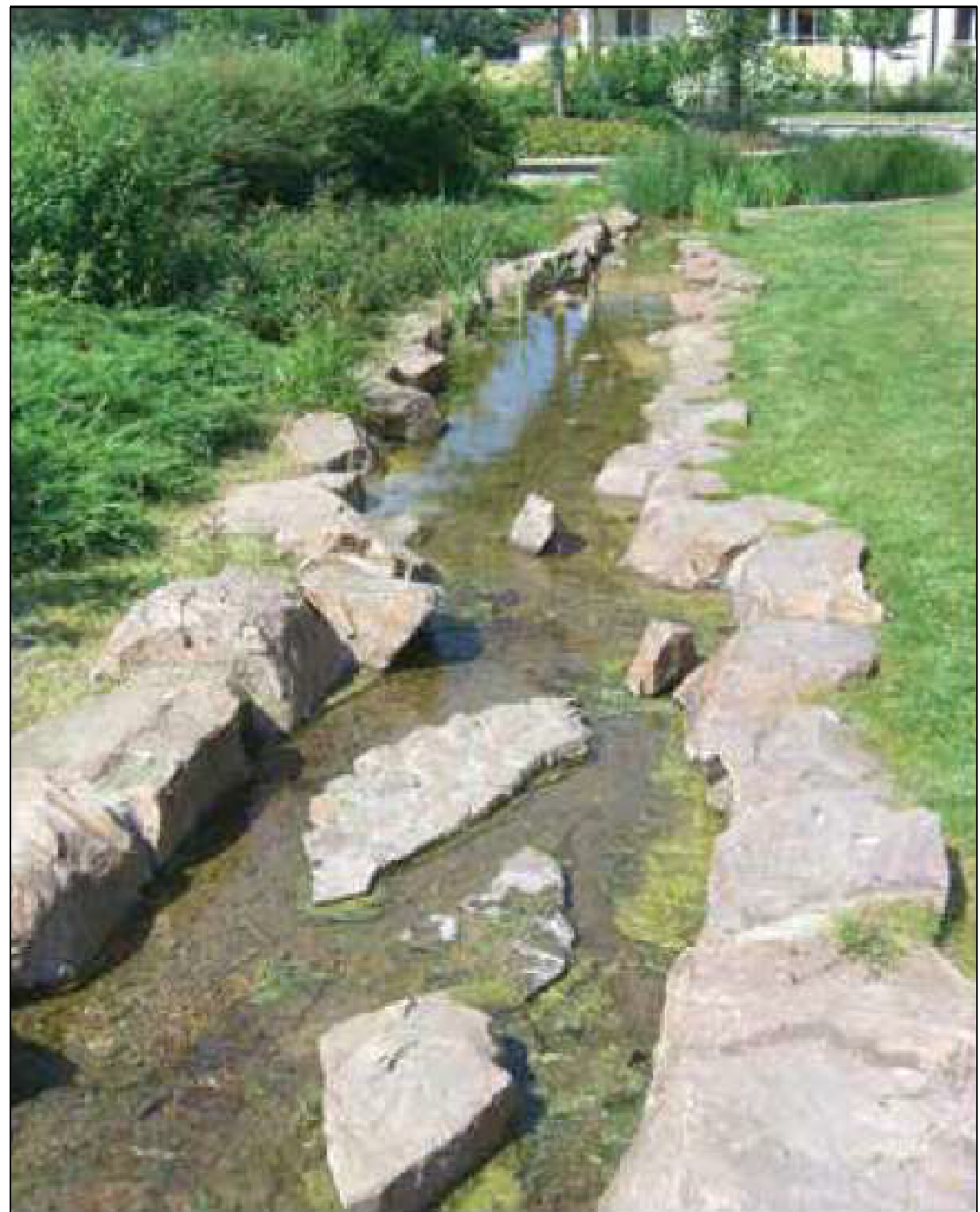


SECTION THROUGH WEIR & CHANNEL TO EXISTING DITCH
1:20

NOTE: THE PONDS PROVIDE FINAL TREATMENT AND POLISHING TO THE SURFACE WATER PRIOR TO DISCHARGE TO EXISTING WATER COURSE AND DO NOT FORM PART OF THE ATTENUATION STORAGE FOR THE SITE



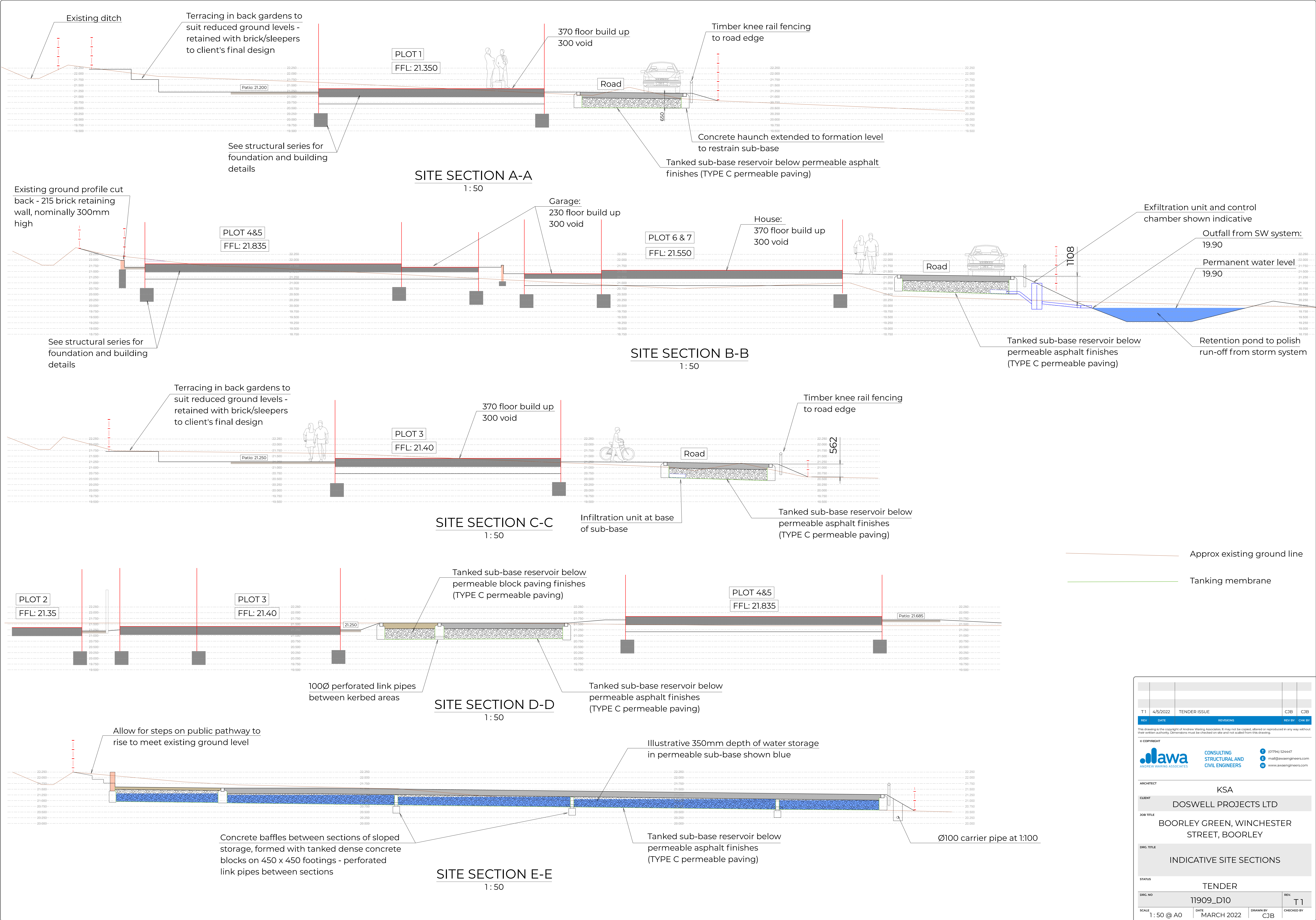
POND CROSS SECTION
1:20



ILLUSTRATIVE VIEW ON ROCK LINED CHANNEL OUTLET
courtesy Graham Fairhurst & Illman Young via CIRIA SuDS manual

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Approx existing ground line

Tanking membrane

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