DRAINAGE NOTES

1. All private drainage must comply with the current edition of DTLR Building Regulations approved document H.
2. Where drainage is to be adopted it should meet with the requirements of Sewers for Adoption 8th edition.
3. Drainage design to be to BS EN 752-3
4. Any intended changes to the drainage design must be discussed with the Engineer. If changes are made the Engineer must be supplied with as-constructed information to enable drawings to be suitably updated for the Health & safety file.
5. Before works commence the contractor should satisfy themselves that the details of the drainage system to be connected into are correct i.e. cover, invert levels, line, condition and type of sewer.
6. Private access chambers are to be appropriate to the depths and loadings as follows:-

Depth to invert	Access size
Up to 600mm	Mini access chamber 300mmØ
Up to 1200mm	Inspection chamber 475mm Ø (PPIC) 600mmx450mm Brick/P.C.C units
1200 to 1500mm	P.C.C ring manhole 1050mmØ
1500 to 3000mm	P.C.C ring manhole 1200mmØ (ring diameter increased if sewer greater than 475mmØ).

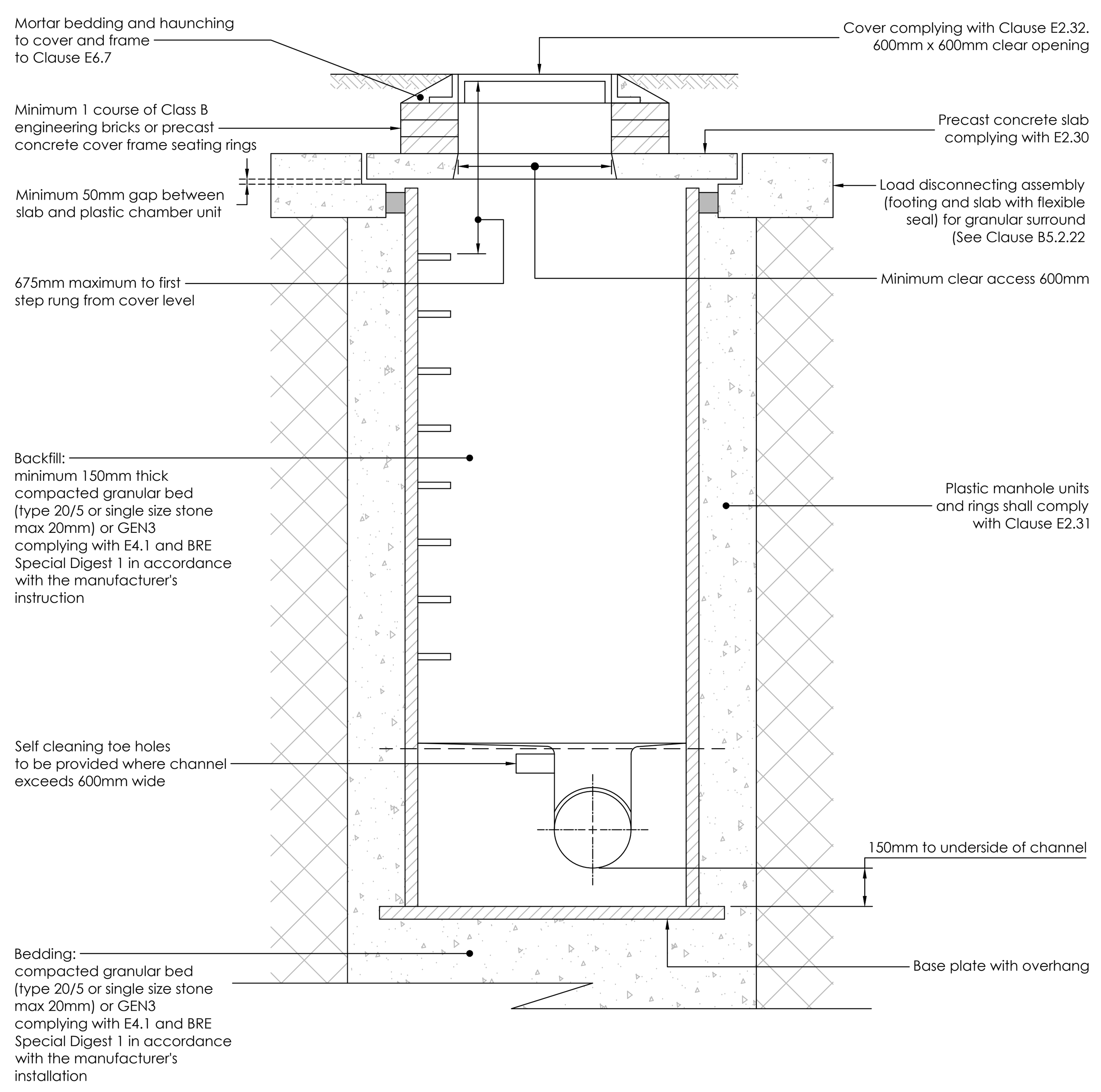
7. All manholes shall have a flexible joint within 150mm of the face of the structure and a "rocker pipe " which should not exceed 600mm in length.
8. Pipe materials shall be -
Vitrified clayware to BS EN 295
Cast iron to BS EN 545:2010
UPVC - BS EN 1401 PP - BS EN 1852
Structure wall -BS EN 13476
9. For private sewers having 900mm or less cover beneath carriageways & hardstanding or 600mm in landscape areas then they shall have concrete surround or slab protection. Slab protection to be 100mm thick C20concrete slab with mesh reinforcement and a bearing of 150mm each side of the trench. Concrete surround to be 150mm C20 with flexible joints.
10. Trenches within 1.2m of load bearing walls should be filled with concrete at least to the underside of the foundation. Where the distance is more than 1.2m from the foundations the concrete should be taken at least up to a 45degree line from the bottom of the foundations. Alternatively, the foundations could be taken to a deeper level to avoid undermining by the drainage trench (check with the Engineer where this is required).
11. Pipe bed and surround to be granular Type S unless otherwise noted.
12. Drains passing through walls or foundations should have either an arched or lintelled opening to give 50mm clearance around the pipe. The opening shall be masked both sides with a rigid non-perishable material, or alternatively a short length of pipe may be built in solid if it is connected within 150mm to rocker pipes (max 600mm long) with flexible joints.
13. Drainage under buildings should be bedded and surrounded by at least 100mm of granular material.
14. Unless otherwise stated on the drawings or in the schedules then all private drainage shall be 100mmØ.
15. All road gully connections to be 150mmØ and surrounded with 150mm C20 concrete surround.
16. Where schemes require soakaways they shall not be positioned closer than 5m from the nearest dwelling or structure. Where solution features can occur in the underlying strata such as chalk then this distance will need to be increased to 10m.
17. New connections to existing public sewers should be carried in accordance with appropriate Section 106 (Water Industry Act) 'connection consent' and also under the supervision of the Water Authority.
18. Covers shall be to B.S. EN 124

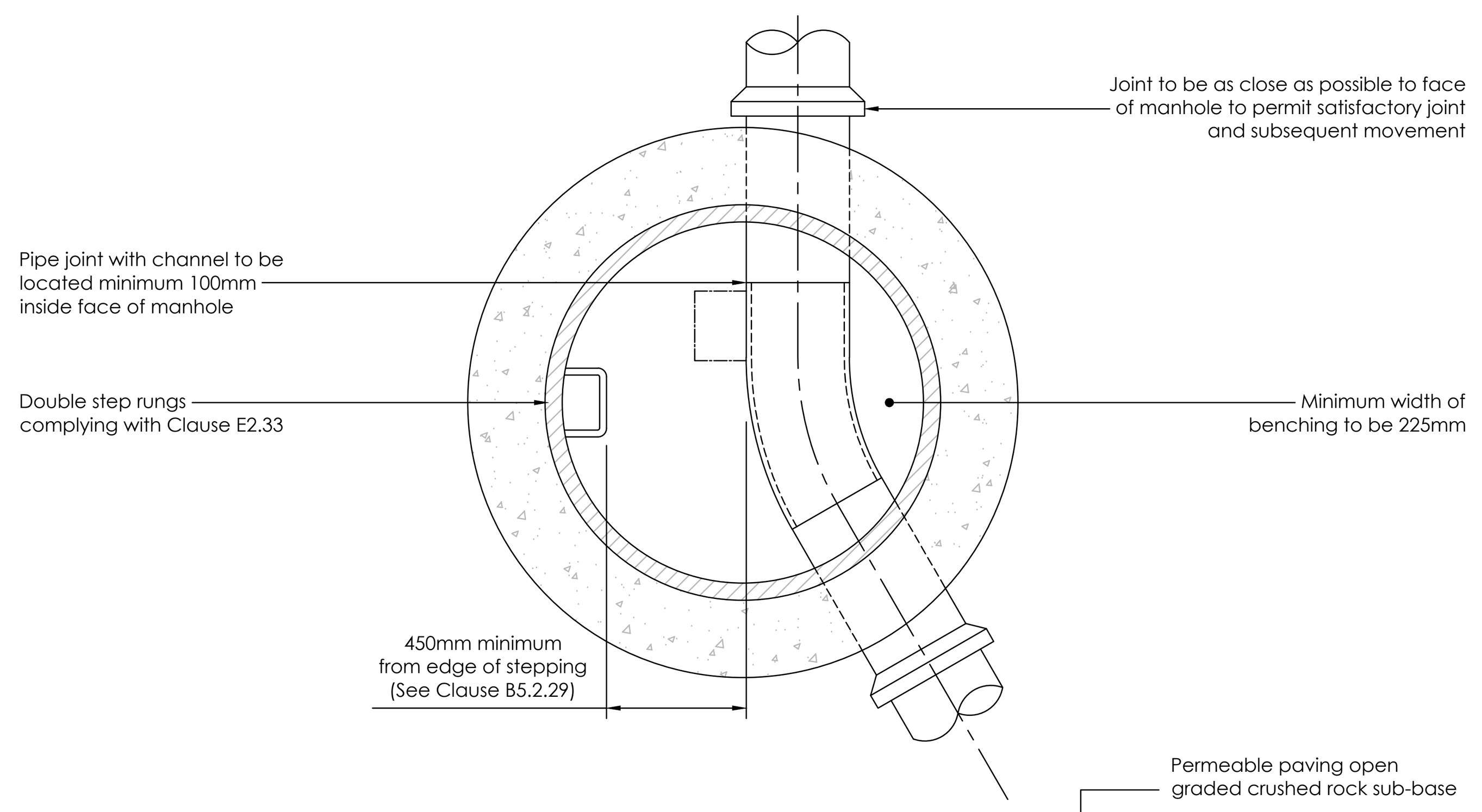
Class A15 - areas where only pedestrians have access.
Class B125 - for use in car parks and pedestrian areas where occasional vehicular access is likely.
Class C250 - areas where not extending more than 500mm from kerb face into the carriageway
Class D400 - areas where cars and lorries have access including carriageways, hard shoulders.
Cover and frames to be 150mm deep except residential cul-de-sacs

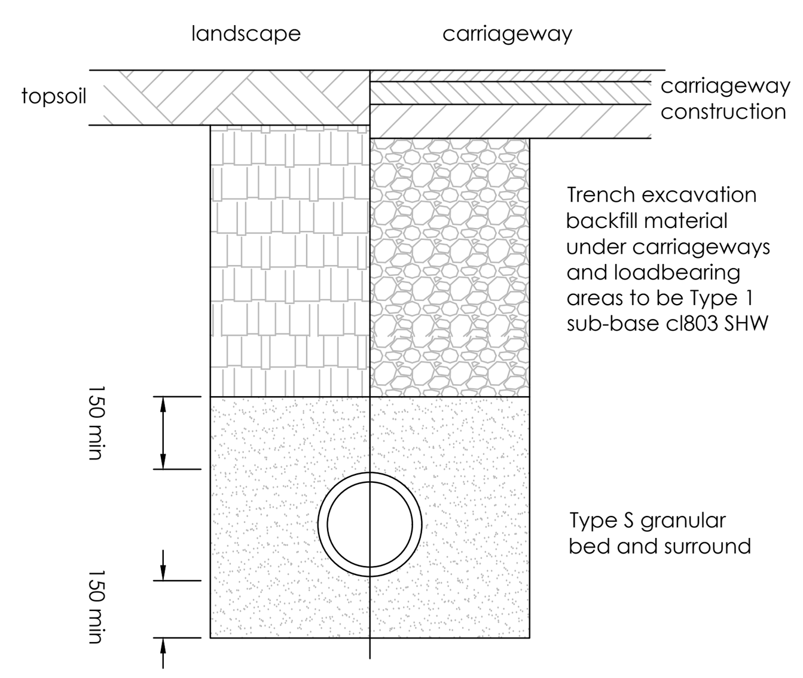
19. It is recommended that drainage works should be constructed from the outfall particularly where the outfall depth is relatively shallow. If it is not possible to commence works from the outfall the contractor should satisfy themselves that the invert, line, position and type of existing outfall are correct.
20. Drainage works should be protected from possible damage by construction traffic loadings during the construction period. Protection may be provided by barriers. materials should not be stored over drainage works.
21. Buildings up to 3 storeys shall have a rest bend at the base of the soil stack 450mm min below the invert of the lowest incoming drain.
22. Where piling works are undertaken the positions of existing sewers must be accurately located before piling takes place.

FIGURE B12
TYPICAL MANHOLE DETAIL – TYPE B

Depth from cover level to soffit of pipe 1.5m to 3m
Flexible material construction

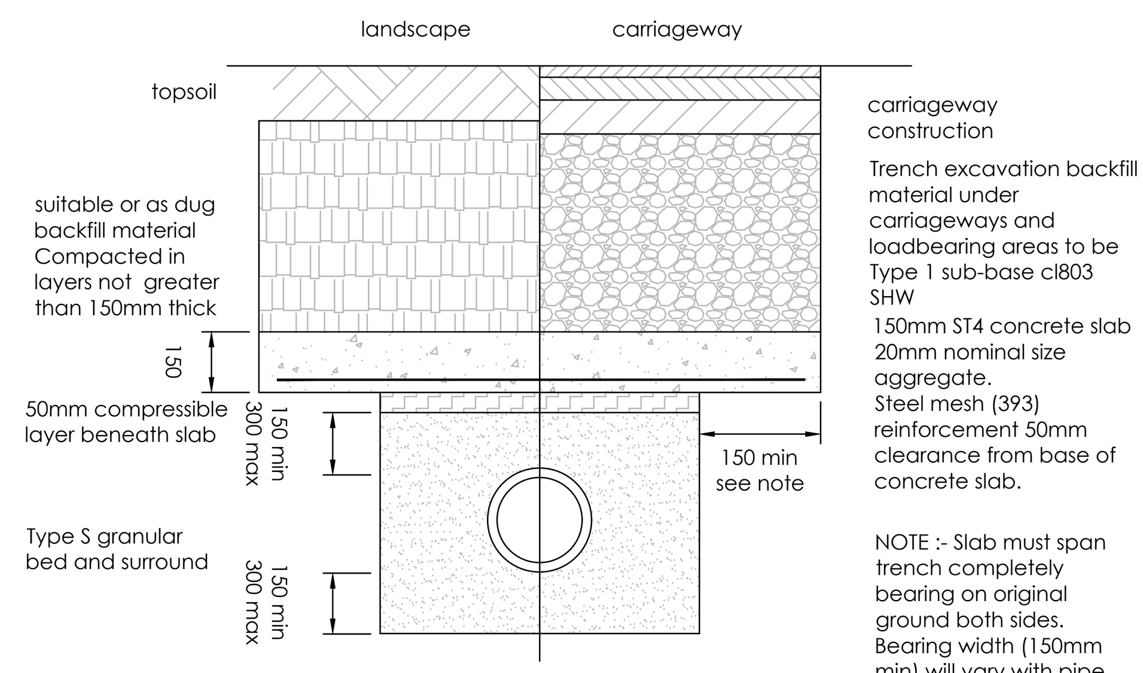






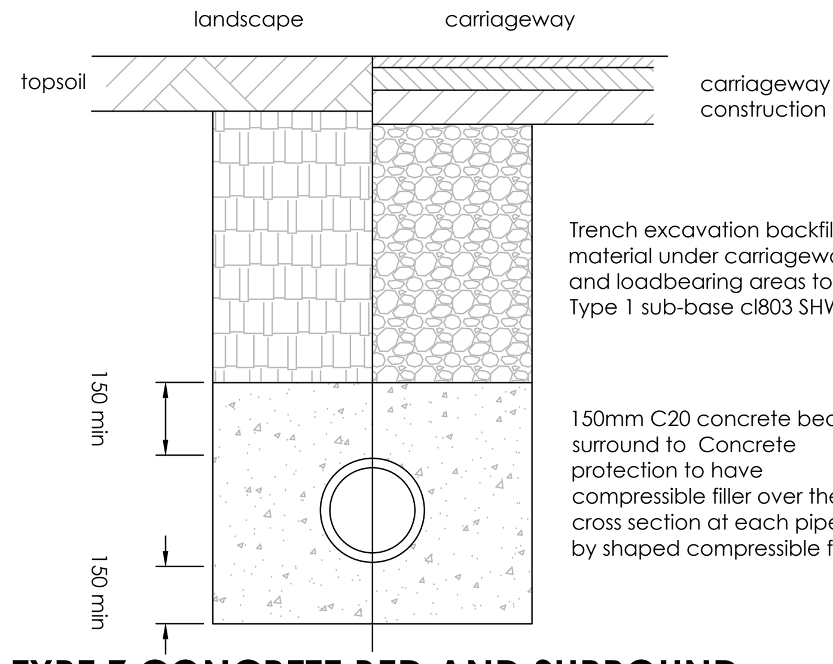
TYPE S GRANULAR SURROUND BED

To be used where cover to pipe soffit is greater than 1200mm in vehicular areas and greater than 900mm in non-trafficked areas (ie footpaths, verges, etc)



CONCRETE SLAB PROTECTION

To be used where cover to pipe soffit is less than 1200mm in vehicular areas and 900mm in non-trafficked areas (ie footpaths, verges, etc)



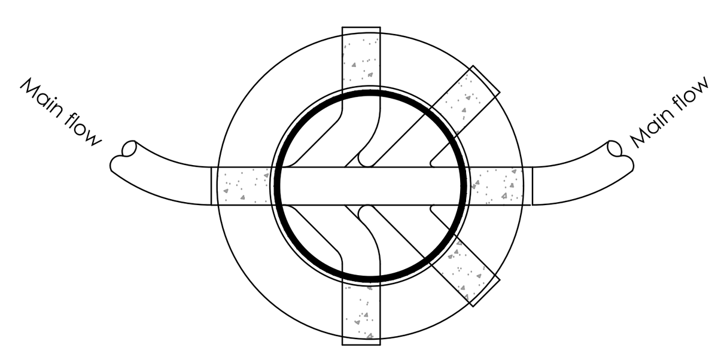
TYPE Z CONCRETE BED AND SURROUND

To be used where cover to pipe soffit is less than 1200mm in vehicular areas and 900mm in non-trafficked areas (ie footpaths, verges, etc)

Pipe nominal size (DN)	Pipe Bedding Requirement (mm)
100	10 nominal single size
over100 150	10 or 14mm nominal single size or 14mm to 5mm graded
over150-300	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded 20mm to 5mm graded
over 300 to 550	14, 20 or 40mm nominal single-size crushed rock or 14mm to 5mm graded or 20mm to 5mm graded
over 550	14, 20 or 40mm nominal single-size crushed rock or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded

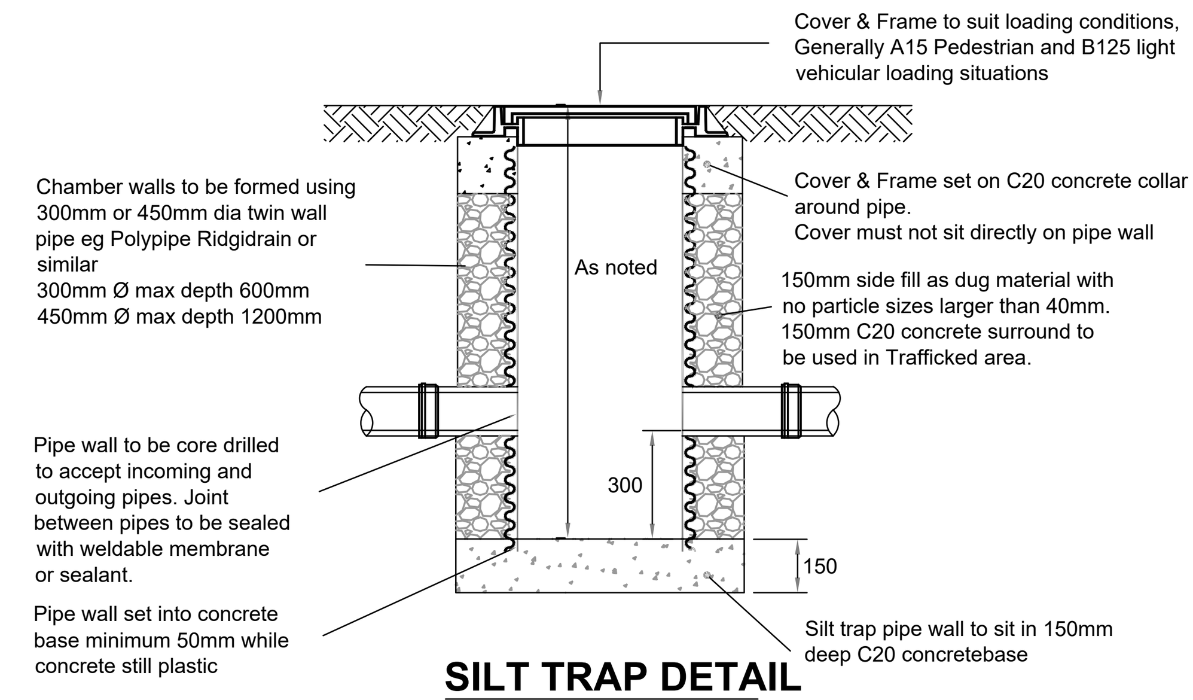
GRANULAR BEDDING AND SIDEFILL MATERIAL GRADINGS

POLYPROPYLENE INSPECTION CHAMBER - PPIC

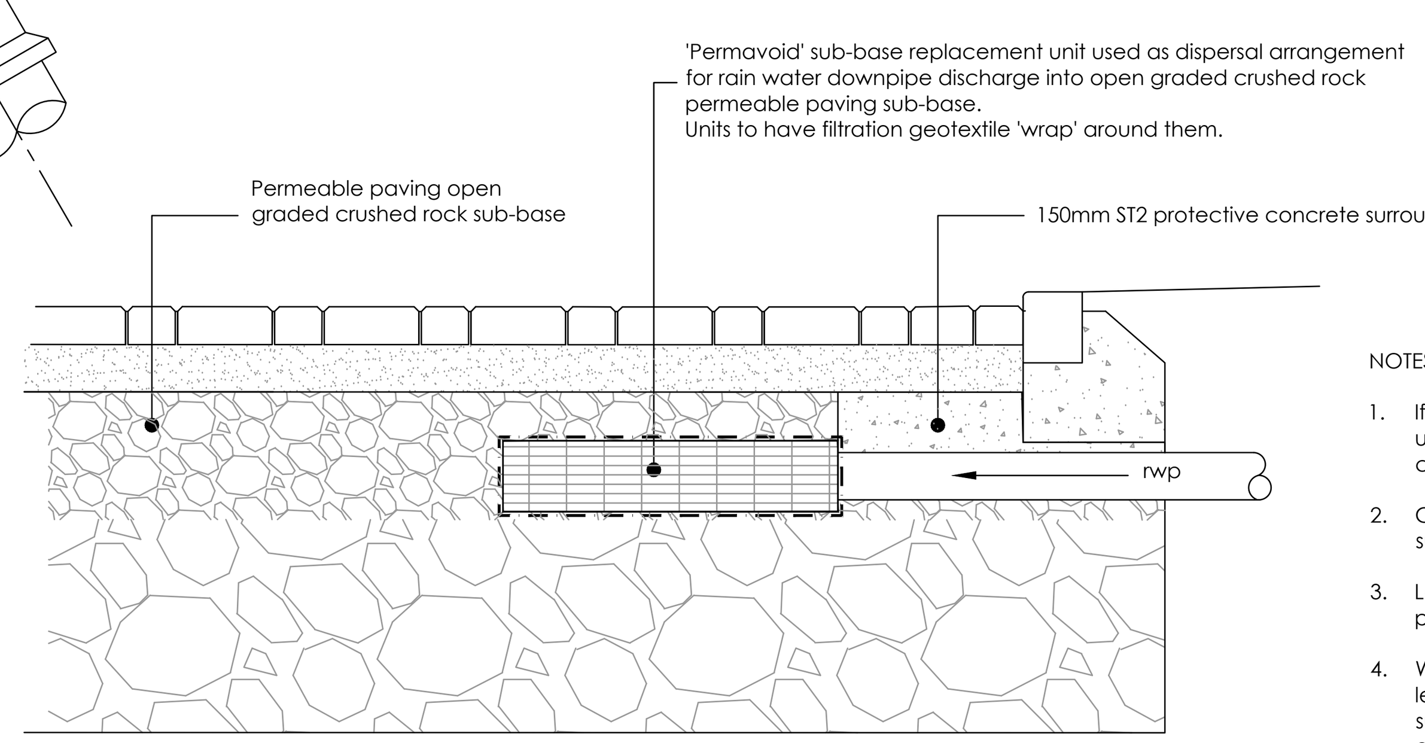


Chamber Type	Internal Diameter (mm)	Max. No. Inlets	Max. Depth (mm)
Polypropylene Inspection Chamber (PPIC)	475	5	1200

- Where chambers are positioned on 90° corners always use the main channel by fitting a 45° angle bend on the inlet and outlet.
- Bends up to a max 45° angle can be used on any inlet
- Heaviest flow should always be directed through the main channel.
- Short steep connections should preferably be connected via a 45 ° inlet using a bend where necessary.
- In buildings up to 3 storey's the rest bend at the base of the soil stack should be 450mm below the invert of the lowest incoming drain.In buildings over 3 storeys this should be increased to 750mm.In buildings over 5 storey's the ground floor drainage connections should have their own connections to the external drain.



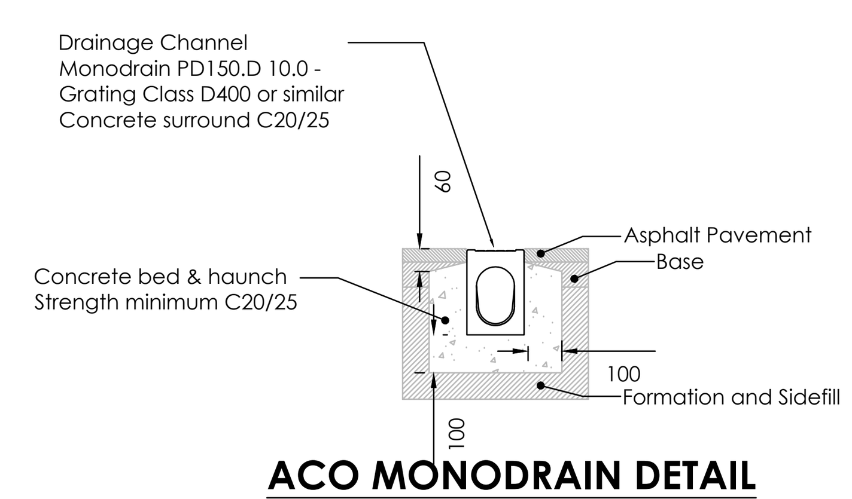
SILT TRAP DETAIL



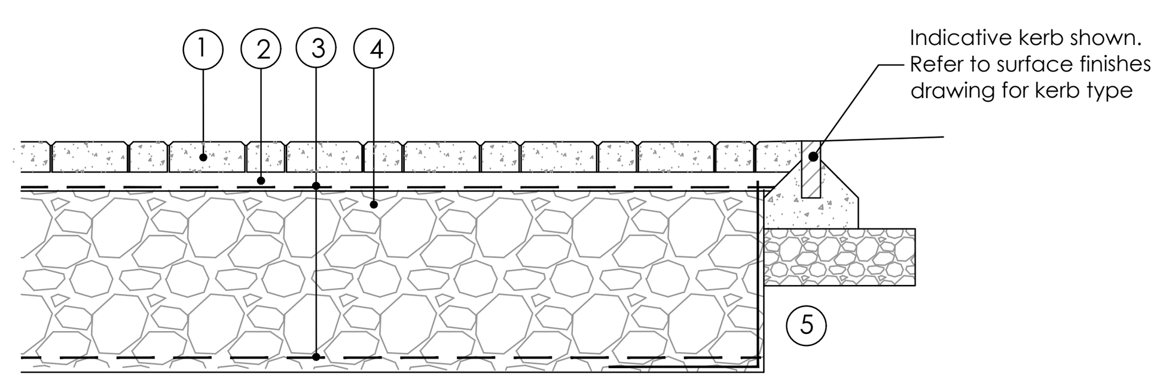
PERMEABLE PAVING RAINWATER DOWNPIPE DISCHARGE DISPERSAL

NOTES -

1. If Permavoid units are not used it is important that alternative unit used has similar structural strength characteristics. If in doubt contact the Engineer.
2. Cellular unit to be located within open graded crushed rock sub-base.
3. Last chamber upstream of discharge units must be a catchpit to prevent silt and debris from entering discharge unit.
4. Where the invert level of the discharge unit is below the formation level of the open graded sub-base then local deepening of the sub-base should take place to give a minimum surround of 300mm each side and bed of 100mm. A filtration geotextile should be placed at the new formation level beneath the discharge unit.



ACO MONODRAIN DETAIL
Access Road Only



1. 80mm Block Paving.
2. 50mm depth of coarse 6mm aggregate (see Table 2)
3. Filtration/separation geotextile eg Polypipe Permafilter or similar
4. 500mm Open Graded Crushed Rock (OGCR) no fines sub-base (see table 1 for gradings).
5. Note where permeable paving is adjacent to a structure then an impermeable membrane such as Marshalls Tanking membrane M380 shall be laid to the sides of the permeable paving sub-base to reduce lateral movement.

Sieve size mm	Percentage by mass passing % 4/20
80	-
63	-
40	100
31.5	98 - 100
20	90 - 99
10	25 - 70
4	0 - 15
2.8	0 - 5

Grading for sub-base material for permeable paving pavements (BS EN 12620:2002 Gc 4/20 coarse aggregate)

TABLE 1

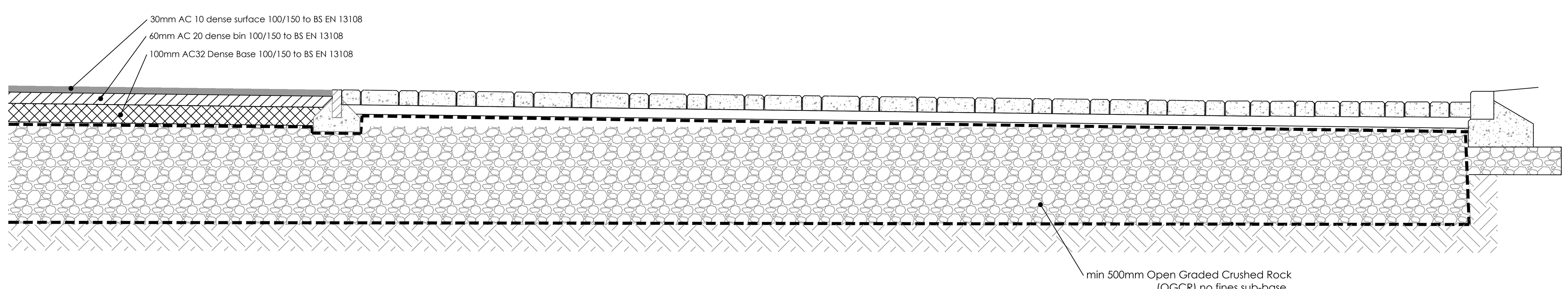
SINGLE SIZED AGGREGATE	Percentage by mass passing
SIEVE SIZE (mm)	%
14mm	100
10mm	98-100
6.3mm	80-99
2mm	0-25
1mm	0-5
0.063mm	0-2 *

* (BS EN 12620:2002 fines category f2)

Grading for laying course material for permeable paving (BS EN 12620:2002 Gc 80/20 2/6.3 coarse aggregate)

TABLE 2

PERMEABLE PAVEMENT TYPICAL SECTION



Bitmac/Permeable Paving Interfase Construction

NOTES

1. All dimensions and levels are in metres unless otherwise noted
2. This drawing is to be read in conjunction with the relevant Architect's/Engineer's drawings, specifications and CDM documentation
3. This drawing has been produced electronically and may have been photo reduced or enlarged when copied. Work to figured dimensions only (DO NOT SCALE - EXCEPT FOR PLANNING PURPOSES). All dimensions to be checked on site. Any errors or omissions to be reported to the engineer immediately.
4. This drawing contains coloured lines / information that may not be clear if reproduced in black and white.
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REV	DRAWN	CHECK	REVISION COMMENTS	ISSUE DATE
P01	RSI	MBD	Initial issue	16/08/22

DRAWING TITLE: Typical Construction Details
SHEET NO.: 1/1

PROJECT: Oxford Technology Park, Unit 6 (A & B)

CLIENT: SWJ STRUCTURING PROJECTS THROUGH ENGINEERING EXCELLENCE

Infrastruct CS Ltd

SCALE @ A1: Not To Scale
ENGINEER: MBD
DRAFT: SNN
APPROVED: RJW

PROJECT NUMBER	STATUS	ISSUE PURPOSE
5052	S2	INFORMATION

PROJECT	ORIGIN	PHASE	LEVEL	TYPE	ROLE	NO.	REVISION
OTP6	ICS	01	XX	DR	C	0400	P01

5052-OTP6-ICS-01-XX-M2-C-0200_Drainage Design