

EXTRACT FROM C.E.P. FLOOD RISK
ASSESSMENT DATED JULY 2016.

6 Development Proposals

6.1 Description

6.1.1 The development proposal is for the construction of a new processing, preparation, packaging and distribution unit for fresh foods together with accommodation associated with the existing horticultural business and the revision of internal access road, car parking and hard standing areas and landscaping.

6.1.2 As part of the proposed works the existing staff car park will be relocated eastwards and the existing temporary buildings and associated hard surface will be removed.

6.1.3 The roof area of the new building will be approximately 7,300m² and the external hard standing areas will cover approximately 11,475m² comprising a service road, loading yard area including approximately 1,830m² of existing hard standing.

6.1.4 As part of the proposed development approximately 1,520m² of existing outbuildings and associated paved areas will be removed.

6.1.5 A copy of the proposed site layout plan is located in Appendix 8 at the rear of this report.

6.2 Drainage Strategy

6.2.1 Surface water collected from the loading yard together with surface water from the access road will be passed through a suitable petrol interceptor and will be discharged into the existing reservoir north west of the proposed new building.

6.2.2 Surface water from the roof of the new building will be discharged directly into the same reservoir.

6.2.3 The total new impermeable surface area, taking account of the existing hard standing and removal of outbuildings, is 15,440m². The additional volume of runoff generated is thus approximately 1,220m³.

6.2.4 This additional volume will be discharged into the reservoir to the north west of the proposed new building. The surface area of the reservoir at its maximum capacity is approximately 10,000m². The additional surface water runoff volume generated by the new impermeable surface will result in less than 125mm increase in water level.

6.2.5 The reservoir is an artificial water body supplying part of the water requirements for the farm operational and irrigation activities. The reservoir is fed by abstracting water from the Pagham Rife.

- 6.2.6 The level of water within the reservoir is artificially maintained to allow a minimum freeboard of 500mm.
- 6.2.7 The proposed new development will not change the operation of the reservoir and will not result in a reduction of the operational freeboard level.
- 6.2.8 Foul drainage will be discharged to the existing private foul drainage system at Sefter Farm.
- 6.2.9 The full extent of the drainage infrastructure will be confirmed during detailed design and may also include other suitable sustainable drainage techniques.
- 6.2.10 Layouts showing the existing and new impermeable areas (drawings 6 and 7) together with preliminary storage volume calculations and a preliminary drainage strategy plan (drawing 8) are located in Appendix 9 at the rear of this report.



Barfoots of Botley Ltd.

Sefter Farm
Pagham
Bognor Regis
West Sussex
PO21 3PX

12th January 2018

Dear Paul Cann,

Reservoir level management procedure

Aim

To take available roof / yard water and collect in the existing reservoir system for summer irrigation purposes and simultaneously provide flood attenuation for the new build.

Method

Water will be collected from both the roof of the new build and the yard area and directed through pipes to reservoir 1 sited to the rear of Sefter farm. Reservoir 1 will be kept with 1 m of freeboard. The surface area of the reservoir being 10000 sq. m creates 10000 cubic meters of storm event capacity.

Water level in reservoir 1 would be maintained at 1m freeboard by pumping water to reservoirs 2 and 3 to help fill these reservoirs for summer irrigation purposes on the farm. All the reservoirs are interconnected by an underground 15cm diameter main and water can be moved by electric pump from location to location as required.

The farm management team measures water levels daily and monitoring of all reservoir water levels is maintained to avoid overfilling. A balance between field irrigation requirements and reservoir capacity will enable the capture of water for farm use and to mitigate storm event rainfall.

The reservoir system has a total capacity of 105,000 cubic meters.

The ability to fill the reservoirs is complemented by an additional approved abstraction of water from the Pagham Rife up to a total of 91,000 cubic meters.

The highest rainfall event occurred in June 2012 when 106mm rain fell in 24 hours. This would have created 1060 cubic meters of water off the new build site comfortably fitting into the strategy of space described above. Any ability to capture rainfall water is both a benefit financially and environmentally for the business.

Yours Sincerely

Nathan Dellicott
Farm Director



Google

Where kerb crosses the line of outlet pipe, kerb shall be bedded on polyester resin mortar to CL2601 and backed as shown using min. 150 mix ST1 concrete
Min. 2 courses, max. 5 courses of solid type 225 radial brickwork in class B eng. bricks to BS3921. all brickwork laid on class (i) mortar to CL2404

Cover to outlet pipe shall be:-

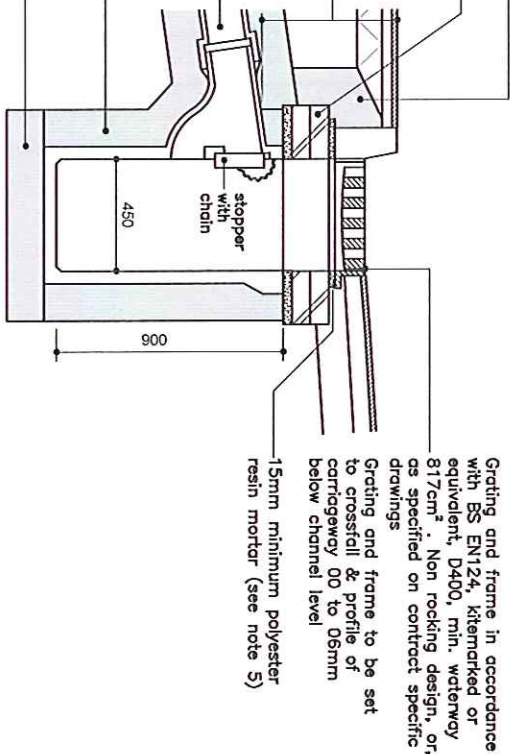
c) 600 minimum for main road locations. (i.e. where pipe is under carriageway or where pipe is under verge, within 2m of the carriageway edge).

b) 450 minimum for field locations. (i.e. where pipe is under verge, greater than 2m from carriageway edge).

150 Ø outlet pipe. Where cover is less than 900 for main road locations or 600 for field locations, pipe bedding shall be type Z Outlet position to be as indicated on drainage layout plan.

Backfill shall be mix ST2 concrete of minimum thickness 150mm

100 minimum mix ST4 concrete bed



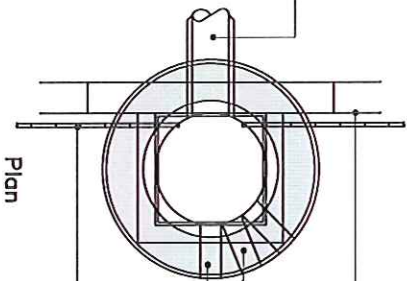
Grating and frame in accordance with BS EN124, kitemarked or equivalent, D400, min. waterway 817cm². Non rocking design, or as specified on contract specific drawings

Grating and frame to be set to crossfall & profile of carriageway 00 to 06mm below channel level

15mm minimum polyester resin mortar (see note 5)

Section

Outlet position to be as indicated on drainage layout plan

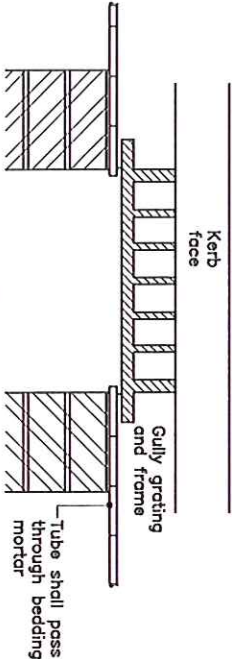


Kerb face

Plan

Radial brickwork bedding to frame with bolster cut wedges and mortar infill. Grating omitted for clarity

Hydraulic relief tube to provide drainage for sand laying course (see note 4) where surfacing material is of block paving



Hydraulic Relief Tube Detail
(for use where surfacing material is block paving)

Notes

1. All dimensions are in millimetres.
2. Detail shown using pre-cast concrete gully. The following alternative materials may be used:
 - (i) Clayware.
 - (ii) Cast in situ using plastic or re-usable former and mix ST4 concrete of minimum thickness 150. Finish shall be class F2 to clause 1708.
3. Gully type 1T shown with trapped pot, Gully type 1 as detailed but with untrapped pot.
4. The hydraulic relief tube shall be formed from 12mm copper pipe with half vertical saw cuts at 100mm centres, each pipe shall be 1000mm in length, stop ended and surrounded with a geo-textile material having a size distribution of pore openings such that the apparent opening size when determined in accordance with BS:6906 : part 2, or other appropriate test is 180 microns maximum.
5. Where constructed in trafficked roads, brickwork to be laid on polyester resin mortar.

B	"Manufactured or equivalent" note added to gully grating specification.	PR-10-12-06
A	Gully grating & frame note revised.	VC-04-06-06
REV	DESCRIPTION	DATE

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PROJECT
Standard Detail
Gully Type 1 and 1T

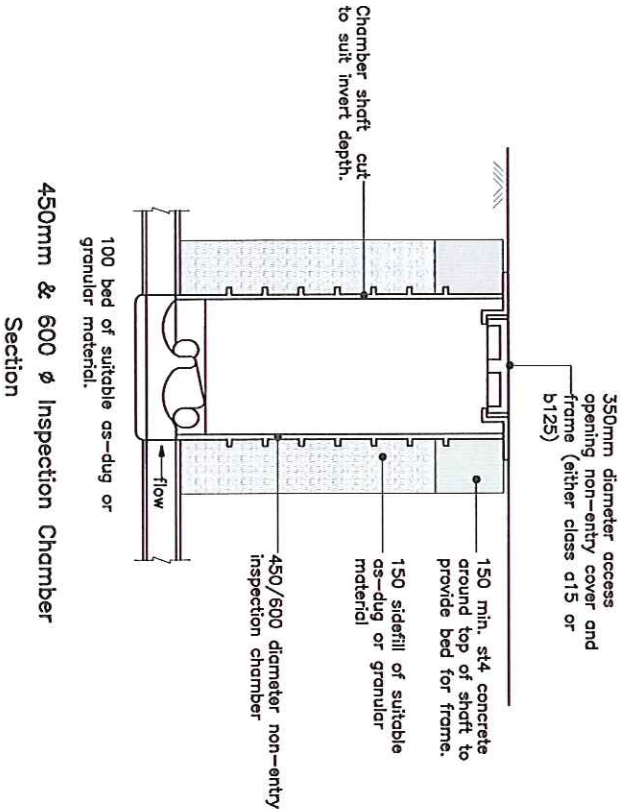
DRAWN BY	CHECKED BY	DESIGNED BY
PEF	VC	VC
SCALE	DATE	
N.T.S.	AUG95	
STD NO.	REVISION	
STD.01.05	B	

Notes

- 1. All dimensions are in millimetres.
- 2. Permitted materials :

Material	British Standards
Plastics :	
Pvc-u	BS 4660
Polypropylene	BS 5254
Verified clay	BS 65, BS EN295

For use in pedestrian or lightly
trafficked areas only



A 4500 INSPECTION CHAMBER ADDED RL-12-06-08

REV DESCRIPTION DATE

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PROJECT

Standard Detail
Ø450mm & Ø600 Inspection Chambers - 1.2m to 3.0m deep

DRAWN BY PEF CHECKED BY PEF DECISION BY PEF

SCALE DATE AUG04

STD NO. STD.01.19 REVISION A

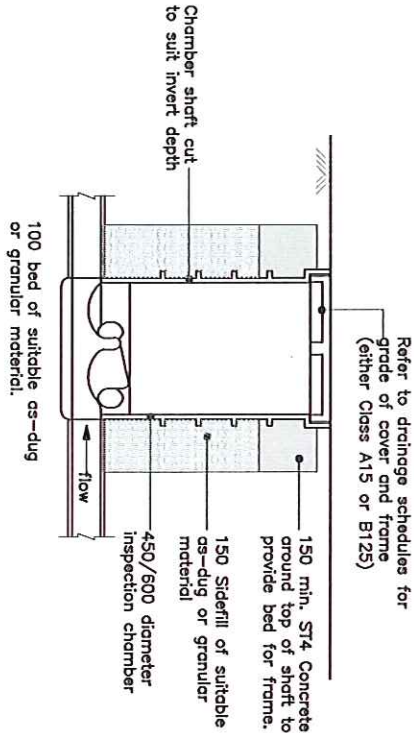
Notes

1. All dimensions are in millimetres.
2. Permitted materials :

Material	British Standards
Plastics :	
PVC-U	BS 4560
Polypropylene	BS 5254
Vitrified clay	BS 65, BS EN295

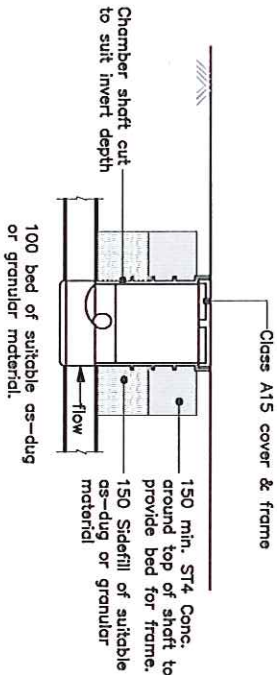
3. Diameter / depth table :

Type	Internal diameter	Depth to i.l. (m)
Inspection chamber	600mm ϕ	1.2 or less
Inspection chamber	450mm ϕ	1.2 or less
Inspection chamber	250mm ϕ	0.6 or less



600 & 450mm ϕ Inspection Chambers Section

For use in pedestrian or lightly trafficked areas only



250mm ϕ Inspection Chamber Section

Pedestrian areas only

D	DRAWING TITLE AMENDED TO SHOW 600 MANHOLE	GB-12-12-11
C	4500 INSPECTION CHAMBERS ADDED	RL-13-06-08
B	NOTE 3 REVISED - 4500 TO 1.2M OR LESS.	PF-28-05-02
A	250 ϕ INSPECTION CHAMBER DETAILS ADDED.	PF-17-12-06
	NOTES 2 AND 3 ADDED.	
REV	DESCRIPTION	DATE



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PROJECT
Standard Detail
250mm, 450mm & 600mm Diameter Inspection Chambers

DRAWN BY	CHEKED BY	DESIGNED BY
FEF	VC	VC

SCALE	DATE
N.T.S.	AUG.95

STD NO.	REVISION
STD.01.20	D

Notes

1. All dimensions are in millimetres.

2. Not used.

3. Rocker pipe lengths:-

Pipe dia. (mm)	Rocker pipe length
150-600	0.60m

4. The use of precast rectangular concrete manhole units with 150mm C20 sulphate resisting concrete surround is permitted.

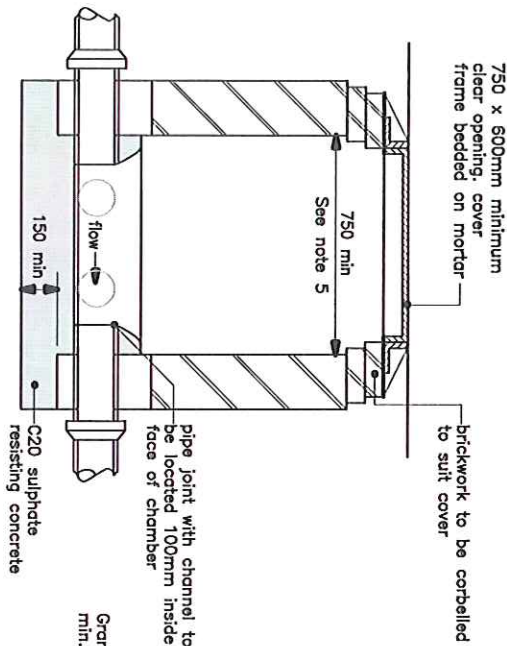
5. Chamber sizes shall be in accordance with table below :-

Dia. of largest pipe in m.h.(mm)	Length x width (mm)
≤ 150	750 x 675
225	1200 x 675
300	1200 x 750
greater than 300	1800 x (dn+450)

6. Minimum clear opening size :-

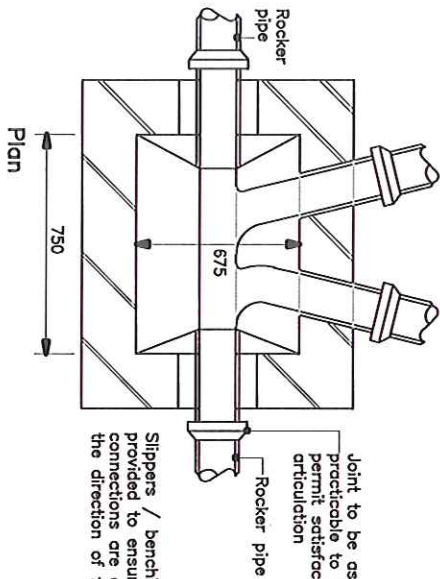
Dia. of largest pipe in m.h. (mm)	Length & width (mm)
≤ 150mm	750 x 675*
≥ 225mm	1200 x 675*

* cover sizes may be reduced where noted on site specific drawings.



Section

Section

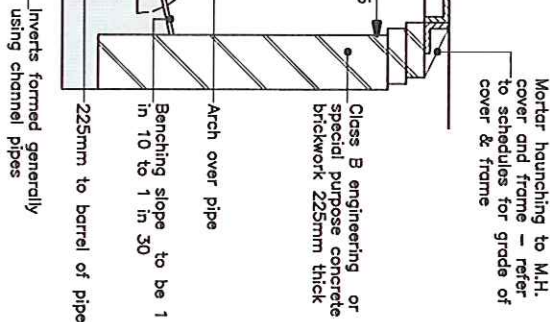


Plan

Joint to be as close as practicable to face of m.h. to permit satisfactory joint and articulation

Rocker pipe

Slippers / benching shall be provided to ensure that connections are angled into the direction of flow



Section

PROJECT

Standard Detail

Private Manhole - Type P2

Depth to Soffit less than 1.50m

DRAWN BY

PEF

CHECKED BY

VC

DESIGNED BY

VC

SCALE

N.T.S.

DATE

MAY/02

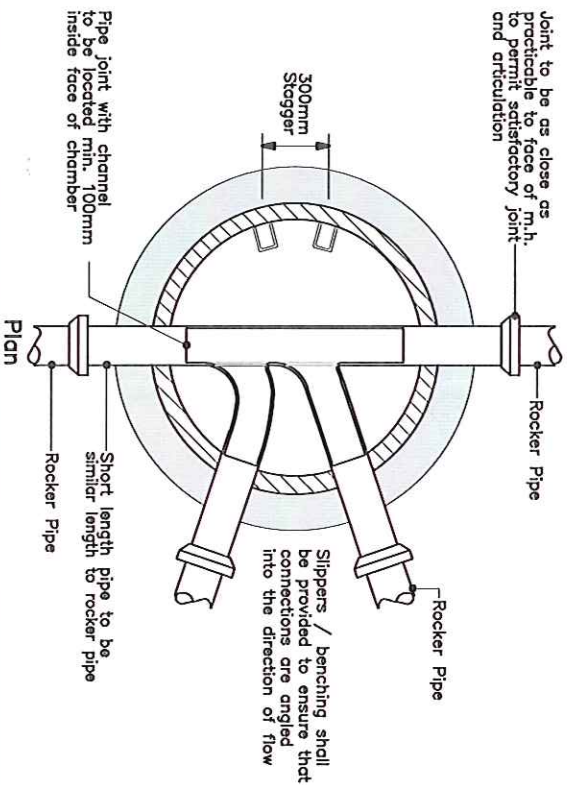
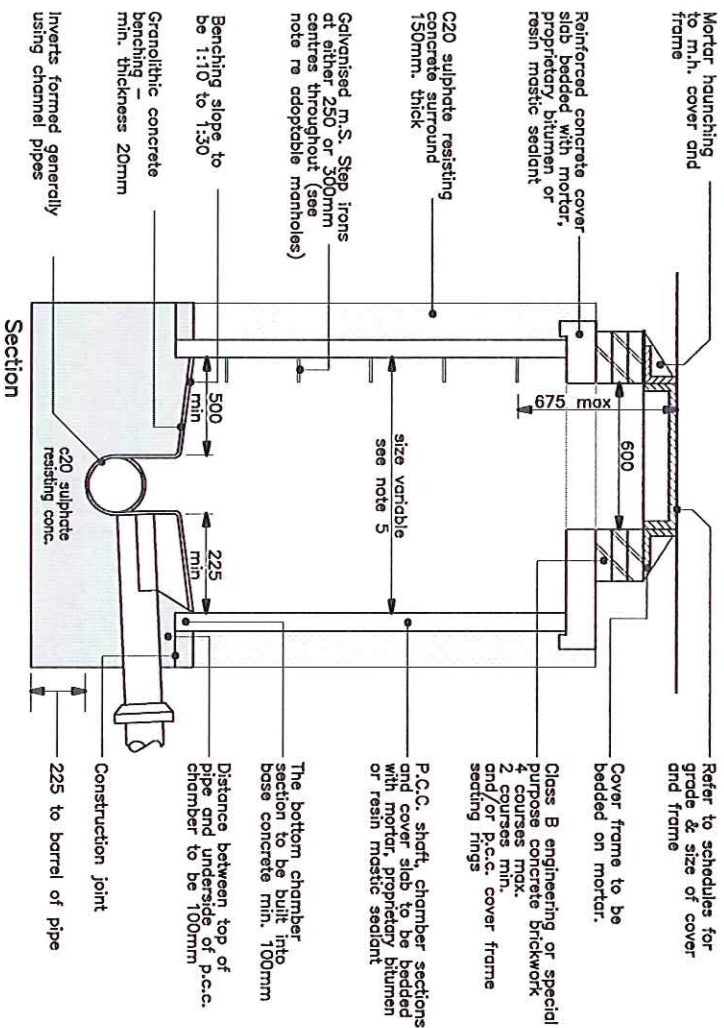
REVISION

A

STD.01.22

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REV DESCRIPTION DATE
B PLAN DETAIL UPDATED TO SHOW LATERAL CONNECTIONS. 17-10-08
A COVER SIZE REDUCED. 17-21-07-04



Notes

- 1 All dimensions are in millimetres.
- 2 Chambers with outgoing pipes greater than 600mm dia. shall be fitted with guard rails, safety chains or other safety devices.
- 3 Rocker pipe lengths:

Pipe Dia. (mm)	Rocker Pipe Length
150-600	0.60m
675-750	1.00m
>750	1.25m

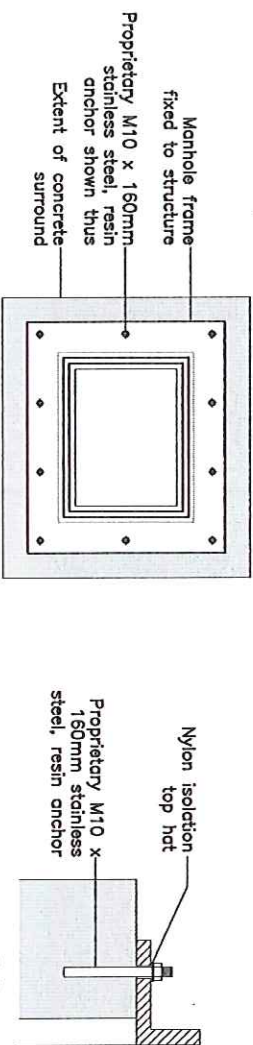
- 4 Self cleaning toe holes to be provided where chamber exceeds 600mm width.
- 5 Chamber diameters to be in accordance with table below:

Dia. of Largest Pipe in M.H. (mm)	Chamber Section Dia. (mm)
less than 375mm	1200
375-450	1200
greater than 450mm	the larger of 1800 or (DN+775)

A PLAN DETAIL UPDATED TO SHOW LATERAL CONNECTIONS. PF-19-06-09
REV DESCRIPTION DATE

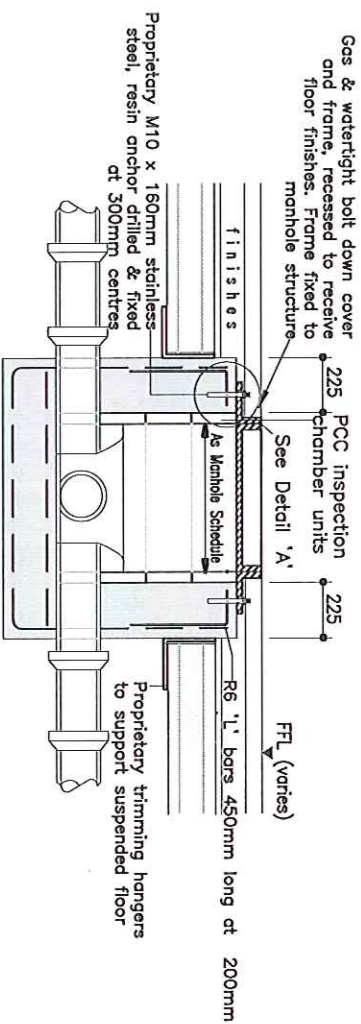
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PRODUCT
Standard Detail
Private Manhole - Type P4
Depth to Soffit 1.50 to 3.00m
DRAWN BY PEF
CHECKED BY VC
DESIGNED BY VC
DATE N.T.S.
MAY/02
STD NO. STD.01.24
REVISION A

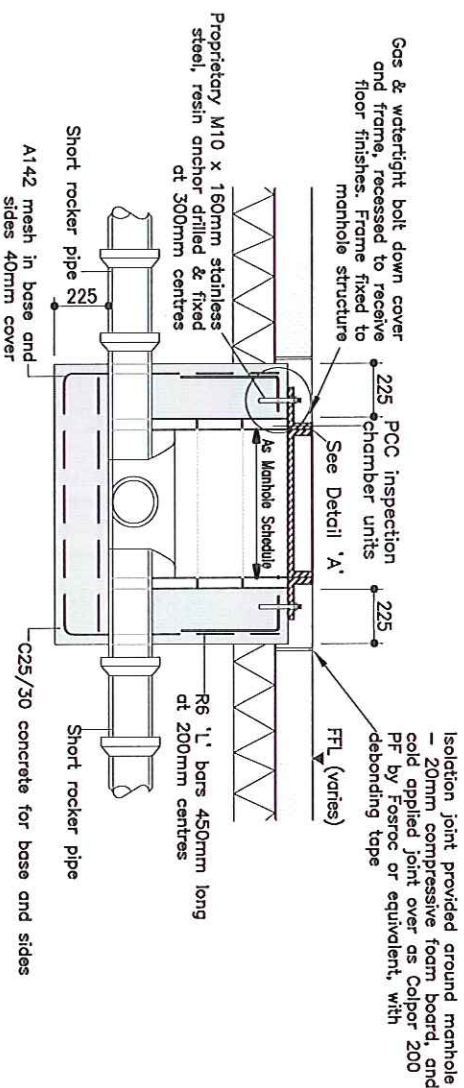


PLAN
Pipework not shown

Detail 'A'



Section showing Suspended Floor
Manhole details as below



Section showing Ground Bearing Slab

Notes

1. All dimensions are in millimetres.
2. Rocker pipe lengths:

Pipe Dia. (mm)	Rocker Pipe Length
150-600	0.60m

3. Inspection Chamber section sizes available from Milton & ARC :

Internal Dims (mm)	Cover Size (Clear Opening)
600 x 450	600 x 450
750 x 600	750 x 600
1000 x 675	1000 x 675

4. Double sealed gas and watertight covers and frames. Proprietary covers shall withstand at least 1.0m working head of water, and be capable of withstanding a 3.0m test head of water.

PROJECT			
Standard Detail			
Internal Manholes			
DRAWN BY	CHECKED BY	DESIGNED BY	
PF	VC	PF	
SCALE	DATE		
N.T.S.	NOV/12		
STD NO.	REVISION		
STD.01.42	-		

Min 2 courses, max 4 courses
225 solid type brickwork in
class b engineering bricks to
b.s.3921 laid on class (i)
mortar to clause 2404

15 min. polyester resin mortar bed to cover & frame

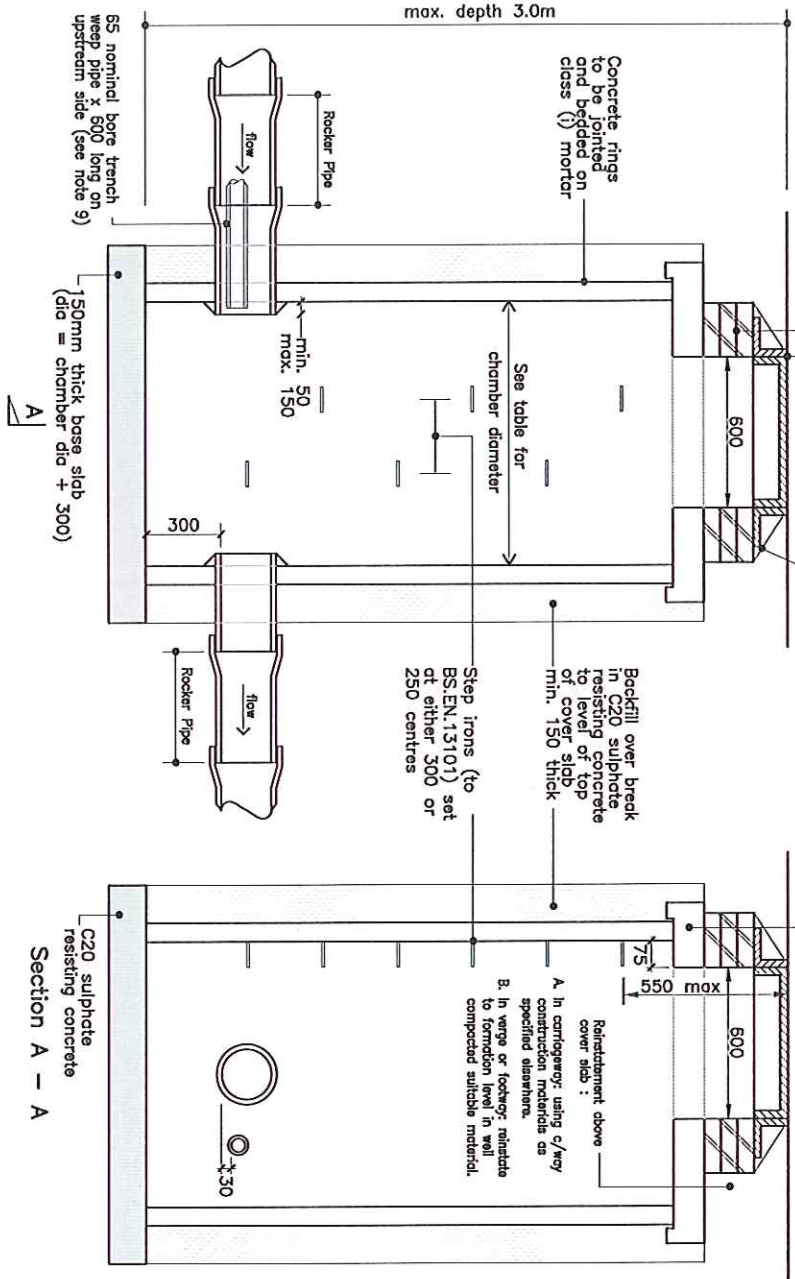
Precast reinforced concrete heavy duty cover slab with 600mm dia. access bedded on 10mm class (i) mortar bed

Notes

- 1 All dimensions are in millimetres.
- 2 Chambers shall be constructed in accordance with Clause 507.
- 3 Precast units shall be installed in accordance with manufacturers instructions.
- 4 The Contractor may either construct the chamber base in precast units or in situ C20 sulphate resisting concrete.
- 5 Where chambers are sited in verge chamber access shall be located furthest from carriageway edge.
- 6 Where chambers are sited in carriageway chamber access shall be located close to the edge of carriageway but leaving a clear drainage channel of kerb on low side of carriageway.
- 7 For invert details and grade of cover & frame see drainage schedules.
- 8 Where constructed on trafficked roads brickwork shall be laid on polyester resin mortar.
- 9 Pipe shall be built into chamber to ditch lower portion of trench pipe is to be placed above any concrete bed to filter drain.
- 10 Sump depth (300mm) is relative to the lowest pipe invert.

11 Rocker Pipe Lengths:

Pipe Dia.	Rocker Pipe Length
150-450	0.50-0.75m
451-750	0.75-1.00m
>750	Seak Guidance



Type	Largest Pipe Dia.	Chamber Dia.
C1A	375	1200
C1B	380 – 450	1200
C1C	500 – 700	1350
C1D	750 – 900	1500

Where depth to soffit is between 1.35 & 1.50m chamber dia. shall be 1050

PROJECT

Standard Detail

P.C.C. Catchpit Chamber

Types C1A, C1B, C1C & C1D

AWN BY

CHECKED BY

	PEF	VC
Pre	1.0	1.0
1st	1.0	1.0
2nd	1.0	1.0
3rd	1.0	1.0
4th	1.0	1.0
5th	1.0	1.0
6th	1.0	1.0
7th	1.0	1.0
8th	1.0	1.0
9th	1.0	1.0
10th	1.0	1.0
11th	1.0	1.0
12th	1.0	1.0
13th	1.0	1.0
14th	1.0	1.0
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16th	1.0	1.0
17th	1.0	1.0
18th	1.0	1.0
19th	1.0	1.0
20th	1.0	1.0
21st	1.0	1.0
22nd	1.0	1.0
23rd	1.0	1.0
24th	1.0	1.0
25th	1.0	1.0
26th	1.0	1.0
27th	1.0	1.0
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93rd	1.0	1.0
94th	1.0	1.0
95th	1.0	1.0
96th	1.0	1.0
97th	1.0	1.0
98th	1.0	1.0
99th	1.0	1.0
100th	1.0	1.0

DATE	ODATE
N.T.S.	AUG.

STD NO.

STD

A

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Notes

1. All dimensions are in millimetres.
2. Not used.

3. Rocker pipe lengths:-

Pipe dia. (mm)	Rocker pipe length
150-600	0.60m

4. The use of precast rectangular concrete manhole units with 150mm C20 sulphate resisting concrete surround is permitted.

5. Chamber sizes shall be in accordance with table below :-

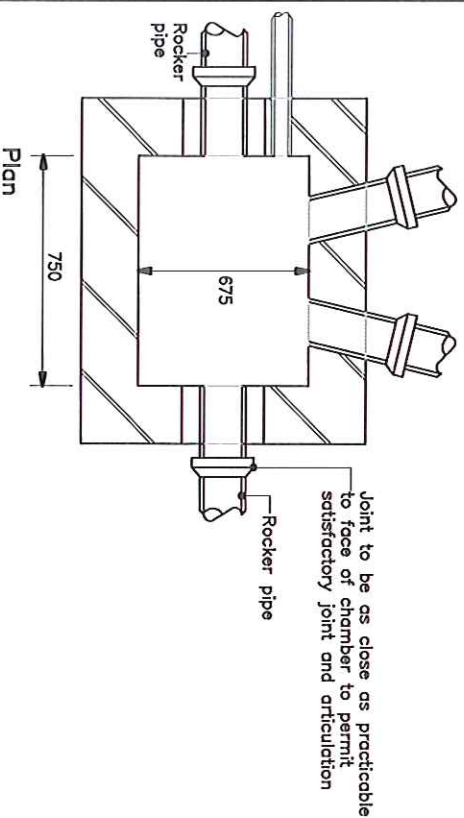
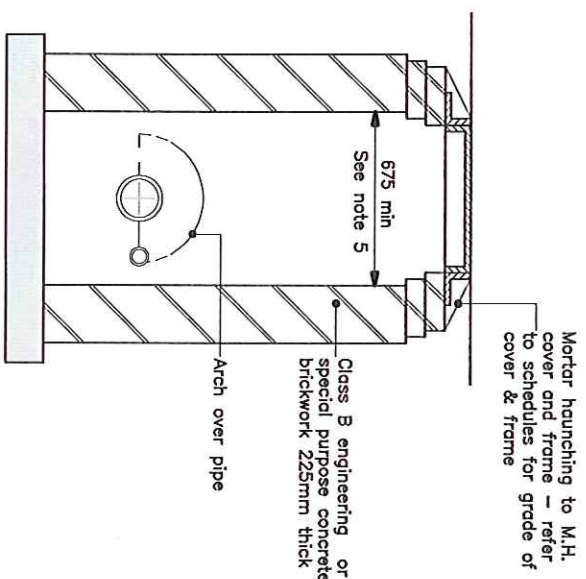
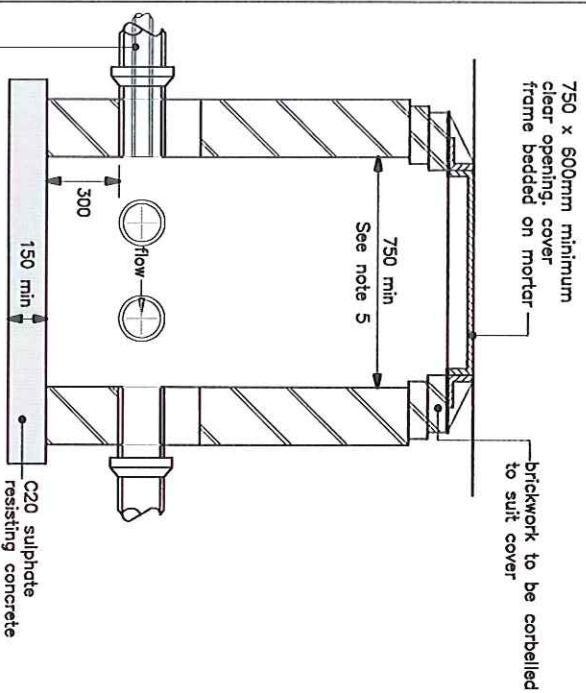
Dia. of largest pipe in m(h)(mm)	Length x width (mm)
≤ 150	750 x 675
225	1200 x 675
300	1200 x 750
greater than 300	1800 x (dn+450)

6. Minimum clear opening size :-

Dia. of largest pipe in m.h. (mm)	Length & width (mm)
≤ 150mm	750 x 675*
≥ 225mm	1200 x 675*

* cover sizes may be reduced where noted on site specific drawings.

7. Pipe shall be built into chamber to drain lower portion of trench. Pipe is to be placed above any concrete bed to filter drain.



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PRODUCT
Standard Detail
Brickwork
Catchpit Chamber

DRAWN BY
PEF

CHECKED BY
VC

DESIGNED BY
VC

SCALE
N.T.S.

DATE
DEC.16

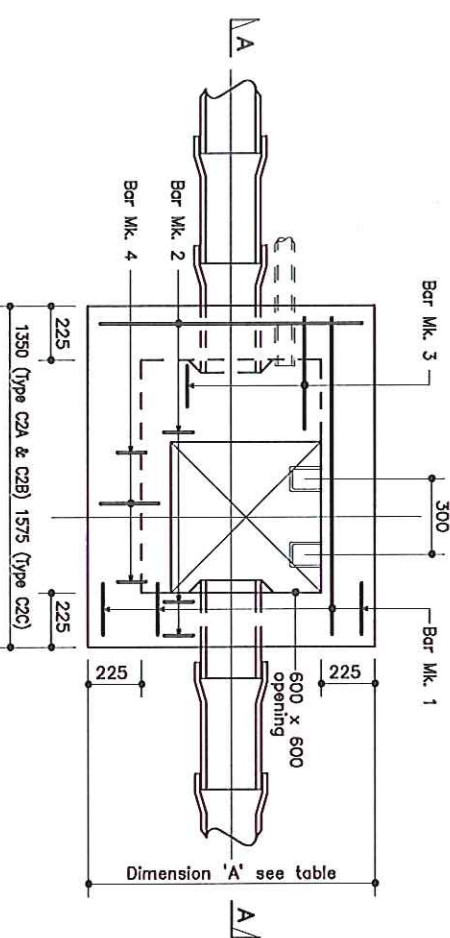
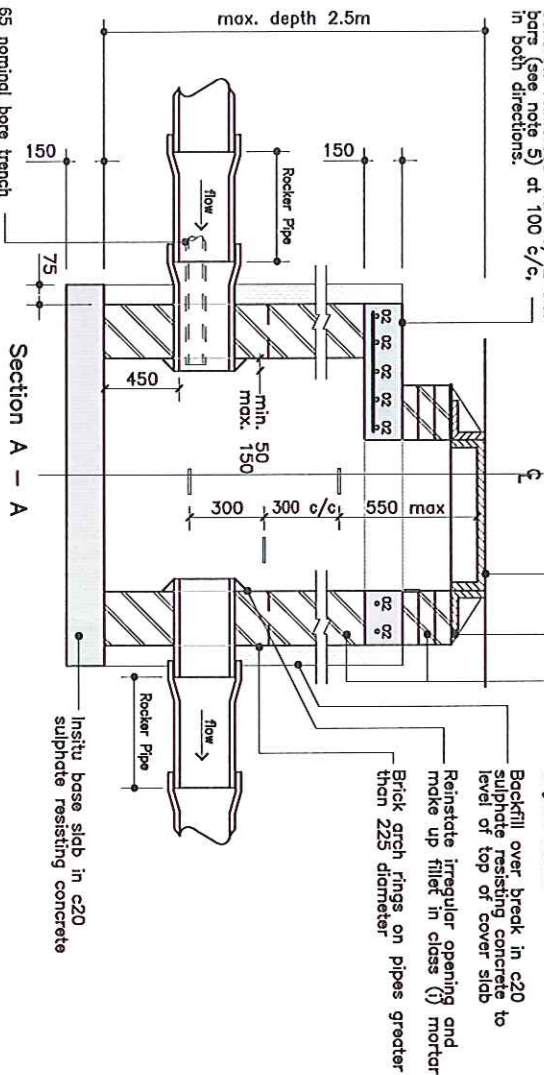
STD NO.

REVISION

STD.01.47

Reinstatement Above Cover Slab :

- A. In carriageway: using carriageway construction materials as specified elsewhere.
- B. In verge or footway: reinstate to formation level in compacted suitable material.
- Cover slab 30/20 sulphate resisting concrete reinforced with 16/12 dia. bars (see note 5) at 100 c/c.



Plan

Cover & Frame Omitted for Clarity

Notes

- 1 All dimensions are in millimetres.
- 2 Overall chamber dimensions based on brick module.
- 3 Where constructed on trafficked roads brickwork shall be laid on polyester resin mortar.
- 4 Pipe to be built into chamber to drain lower portion of trench. Pipe is to be placed above any concrete bed to filter drain.
- 5 Width / reinforcement schedule :
All bars are high yield steel (straight) - 40mm cover

Type	Nominal Pipe	Width 'A' Dimensions	Mk	Dia.	Length	No.
C2A UP TO 375	1125		1	16	1250	5
			2	12	1040	7
			3	16	450	6
			4	Not Required	-	-
C2B 450	1350		1	16	1250	7
			2	12	1270	7
			3	16	450	6
			4	12	450	6
C2C up to 750	1575		1	16	1475	10
			2	12	1500	10
			3	16	670	6
			4	12	670	6

6 Sump depth (300mm) is relative to the lowest pipe invert.

7 Rocker Pipe Lengths:-

Pipe Dia.	Rocker Pipe Length
150-450	0.50-0.75m
451-750	0.75-1.00m
>750	Seek Guidance

A INSITU CONCRETE REINFORCED TO C20 SULPHATE RESISTING.

PF-14-01-07

REV DESCRIPTION DATE

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PRODUCT

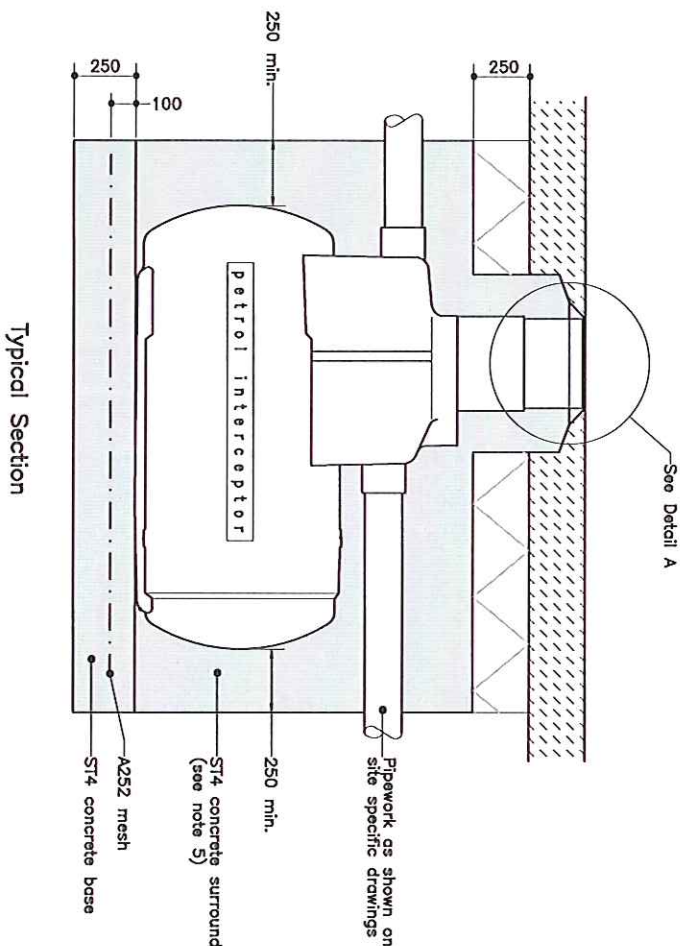
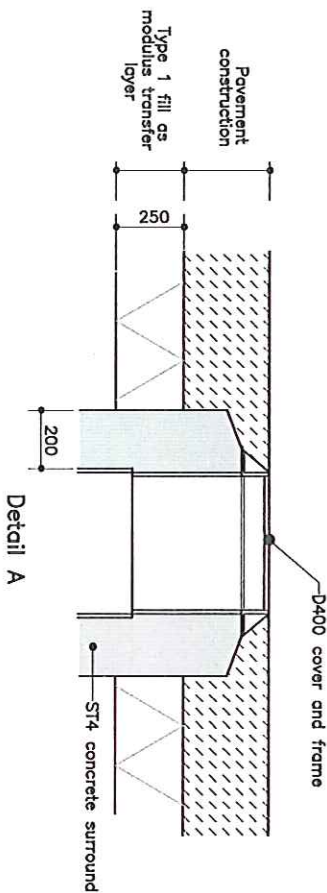
Standard Detail
Brickwork Catchpit Chamber
Types C2A, C2B & C2C

DRAWN BY PEF CHECKED BY VC DESIGNED BY VC

SCALE DATE AUG.95

STD NO. STD.01.50

REVISION A



Notes

- 1 All dimensions are in millimetres unless noted otherwise.
- 2 Steel reinforcement shall be in accordance with BS.4449 or BS.4483.
- 3 Concrete shall be in accordance with bs.5328.
- 4 Whilst concrete is plastic, the tank shall be placed into the concrete base.
- 5 Whilst backfilling tank note that buoyancy forces will tend to lift tank. make provision for this.
- 6 The Contractor shall consult with the interceptor supplier prior to construction.

REV	DESCRIPTION	DATE
B	PETROL INTERCEPTOR DETAIL UPDATED.	RL-20-09-02
A	250mm CONCRETE COVER SPECIFIED OVER TANK.	PF-03-09-01

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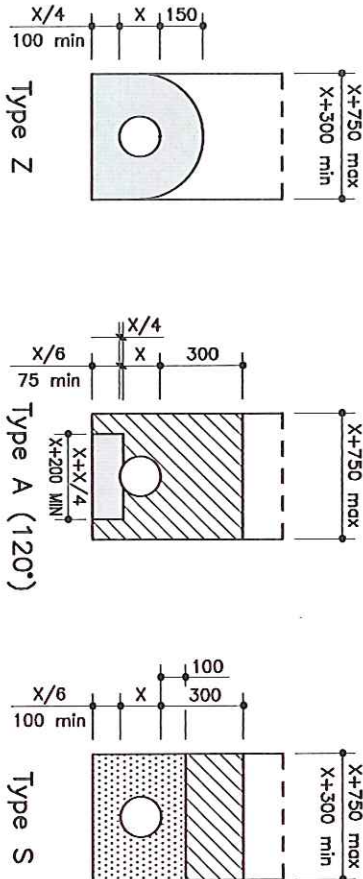
PROJECT	
Standard Detail	
Petrol Interceptor	
Beneath Trafficked Area	
DRAWN BY	CHECKED BY
PEE	VC
SCALE	DATE
N.T.S.	NOV/99
STD NO.	REVISION
STD.01.57	B

Notes

- 1 All dimensions are in millimetres.
- 2 Dimension X is the external diameter of the pipe.
- 3 The minimum or maximum width of the trench applies on and below a line 300mm above the outside top of the pipe, above the 300mm line the backfill material shall be as described in the contract.
- 4 The concrete bed or surround may extend to the sides of the trench or be of minimum width, class 8 material shall be used to fill any voids so formed.
- 5 For Type Z bed and surround the concrete cover may be formed to a radius batter or horizontal surface, minimum cover of concrete shall be 150.
- 6 Types X & Y are special protection details to be used for building drainage only – non adoptable sewers.

Key –

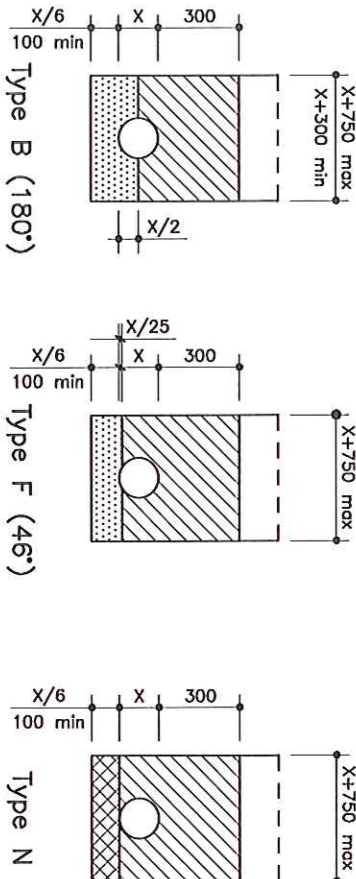
	Granular Material to S.H.W. Clause 503.3 (i)
	Concrete to S.H.W. Clause 503.3 (iii)
	Material to S.H.W. Clause 503.3 (ii) eg. Sand
	Class 8 Material to S.H.W. Clause 503.3 (iv)



Type Z

Type A (120°)

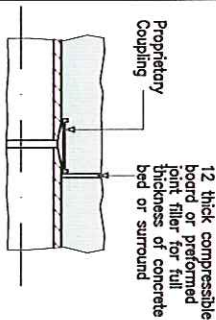
Type S



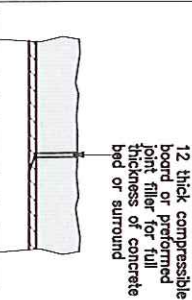
Type B (180°)

Type F (46°)

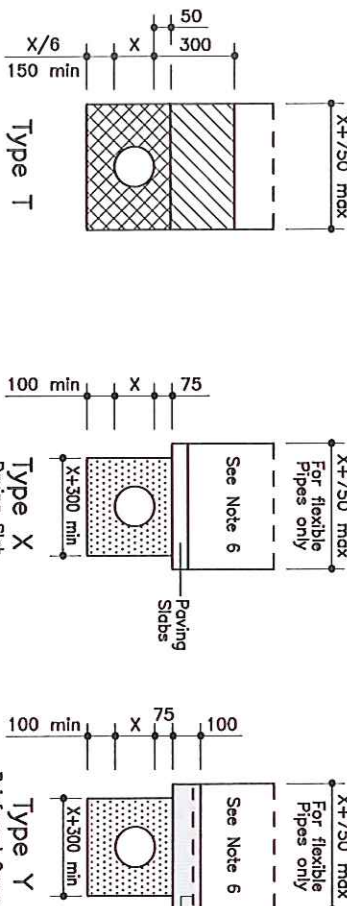
Type N



Proprietary Coupling



Detail of Expansion Joint for Concrete Bed or Surround (See Note 5)



Type T

Type X

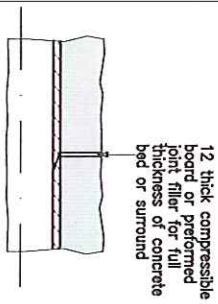
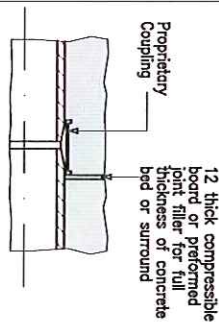
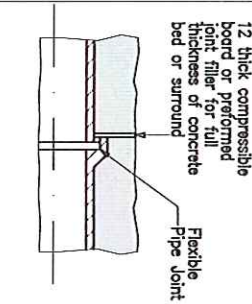
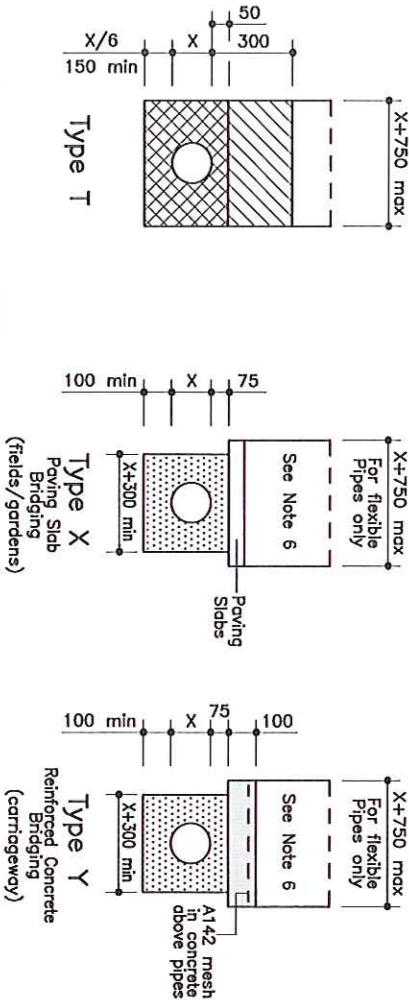
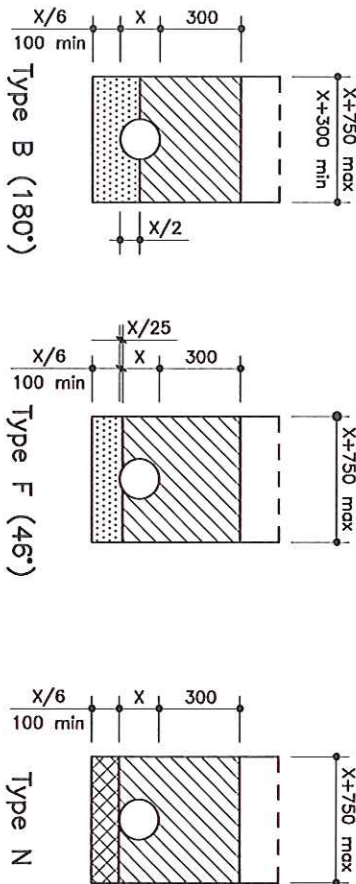
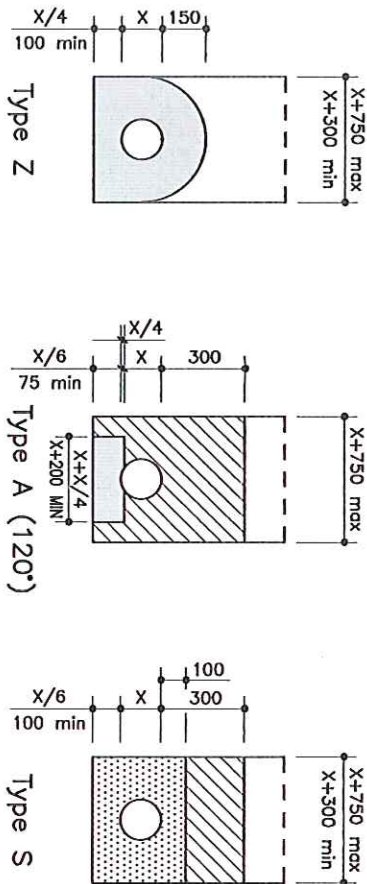
Type Y

Paving Slab Bridging (fields/gardens)

Reinforced Concrete Bridging (carriageway)

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PROJECT	Standard Detail
PRODUCT	Carrier Drains
Bed Details	
DRAWN BY	CHECKED BY
PEF	VC
SCALE	DATE
N.T.S.	AUG/05
STD NO.	REVISION
STD 01.85	A



Notes

- 1 All dimensions are in millimetres.
- 2 Dimension X is the external diameter of the pipe.
- 3 The minimum of maximum width of the trench applies on and below a line 300mm above the outside top of the pipe, above the 300mm line the backfill material shall be as described in the contract.
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- 5 For Type Z bed and surround the concrete cover may be formed to a radius batter or horizontal surface, minimum cover of concrete shall be 150.
- 6 Types X & Y are special protection details to be used for building drainage only – non adoptable sewers.

Key –

- Granular Material to S.H.W. Clause 503.3 (i)
- Concrete to S.H.W. Clause 503.3 (ii)
- Material to S.H.W. Clause 503.3 (iv) eg. Sand
- Class 8 Material to S.H.W. Clause 503.3 (iv)

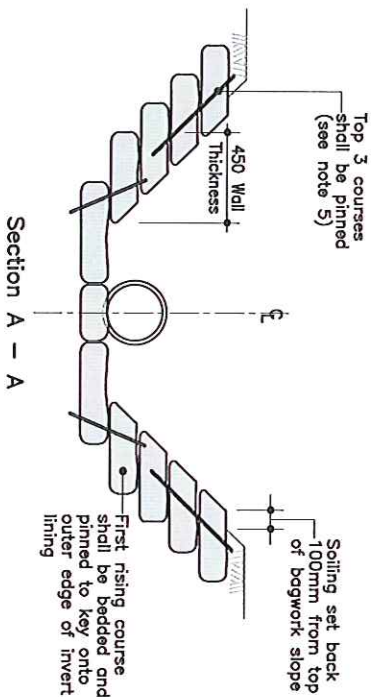
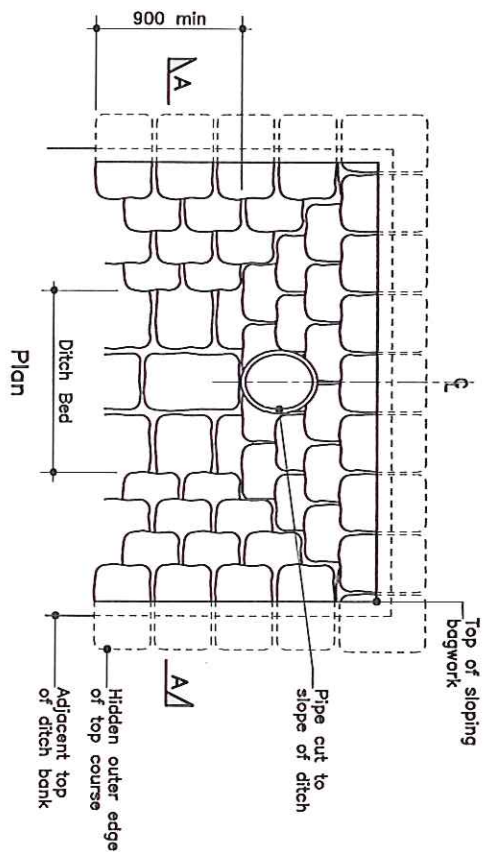
A TYPE 5 BED REINSED TO SHOW 100mm GRANULAR MATERIAL ABOVE PIPE. PF-12-02-07

REV DESCRIPTION DATE

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PROJECT
Standard Detail
Carrier Drains
Bed Details

DRAWN BY	CHECKED BY	DESIGNED BY
PEF	VC	VC
SCALE	DATE	
N.T.S.	AUG/05	
STD NO.	STD 01.85	REVISION
		A



Notes

- 1 All dimensions are in millimetres.
- 2 Bogs shall be of hessian or canvas and shall be of a size to provide a minimum wall thickness of 450mm.
- 3 The bogs shall be not more than three quarters filled with mix S15 concrete immediately prior to placing and the ends sewn.
- 4 The bogs shall be placed so as to 'break joint' with the mouths away from the surface and tamped into the position to form a rectangular block.
- 5 The top three courses of bogs shall be spiked together with mild steel bar 10mm ϕ , 900 long at 500mm intervals along the top of the wall.

REV	DESCRIPTION	DATE
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PROJECT
 Standard Detail
 Headwall

Type 5

DRAWN BY	CHECKED BY	DESIGNED BY
PEF	VC	VC

SCALE	DATE
N.T.S.	AUG.95

STD NO.	REVISION
STD.01.110	