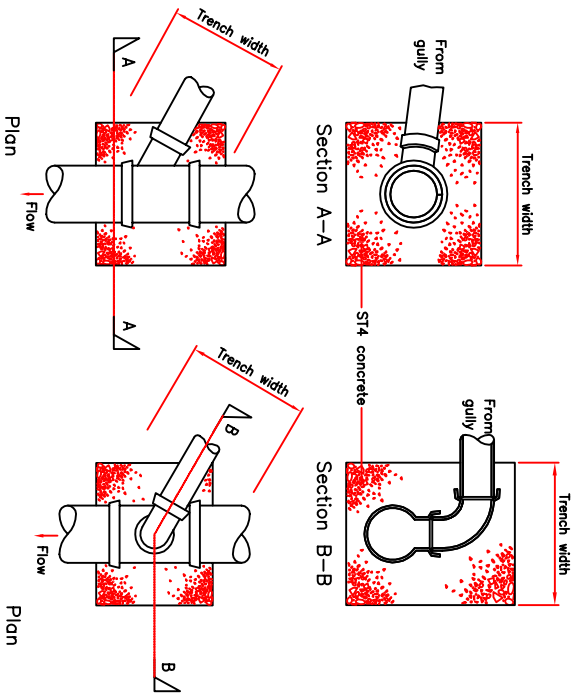


CARRIAGEWAY DRAIN TYPE D1 ALL PIPES
More than 1200 cover
Bedding Factor 2.2

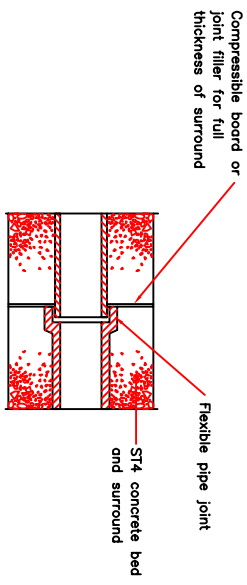
CARRIAGEWAY DRAIN TYPE D2 PVCU
Less than 1200 cover

CARRIAGEWAY DRAIN TYPE D3 CONCRETE, CLAY OR PVCU
Less than 1200 cover
Bedding Factor 2.6

FOOTWAY / CYCLEWAY DRAIN TYPE D4
Less than 1200 cover
Bedding Factor 2.6



GULLY CONNECTION DETAILS (see note 12)



FLEXIBLE JOINT FOR CONCRETE SURROUND (Reinforced slab similar)

Safe supporting strength of pipe $W_s = \frac{W_t F_m}{F_s}$
Where
Wt = Crushing strength – see British Standards
Fm = Bedding Factor
Fs = Factor of Safety = 1.25

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Project
STANDARD DRAWINGS
Title
PIPES UNDER PAVED AREAS

Drawing Number
SD/500/01

- Notes**
- All dimensions are in millimetres
 - Water Authorities Association guide Sewers for Adoption applies except where modified by this drawing.
 - Pipes shall be :
Verified clay pipes to BS 65 and BS EN 295
Concrete pipes to BS 5911
PVCU Ultratub pipes to BS EN 1401-1
SR 34 min.
 - Minimum cover without concrete protection is 1200
 - Concrete protection to terminate at suitable pipe joint.
 - Flexible joints must be provided in concrete bed and surround or reinforced slab

- CONCRETE AND CLAY PIPES**
- Determination of pipe and bedding combinations shall be in accordance with DfT advice Note HA 40/01
 - If maximum trench width is exceeded it may be necessary to increase the strength of the pipe
- PVCU PIPES**
- PVCU Pipes must be laid in accordance with BS 5955 PART 6.
 - RC 30 concrete slab with A193 (or equivalent) mesh reinforcement may be used as alternative to concrete surround with the approval of the Engineer.
- ALL PIPES**
- Pipe and bedding must be adequate for the worst conditions and materials must not be changed between chambers.
 - Minimum pipe diameter to be 225 for carrier drains.
 - Saddle connections may only be used with the approval of the Engineer.
 - Carrier drains will not normally be permitted in footways or cycleways.
 - Existing carriageway shall be reinstated in accordance with HA/LC Specification for Reinstatement of Openings in Highways.

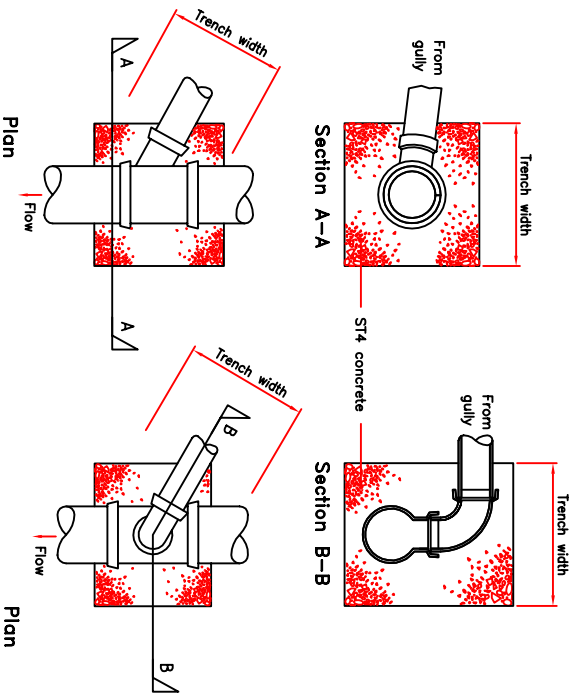
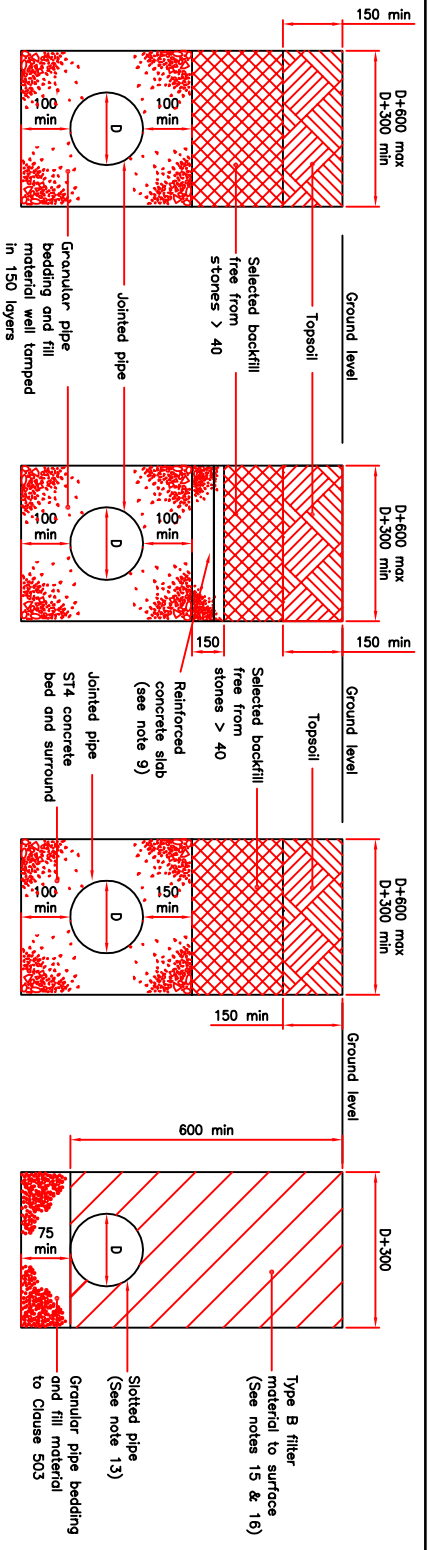
Do not scale this drawing
A 08/06 Notes revised and updated RB

Rev	Date	Checked
A	08/06	RB

Drawing No.	Revision
SD/500/01	A

Scale	NOT TO SCALE
Drawn	RWJY
Checked	RB
Approved	JR
Date	AUG 06

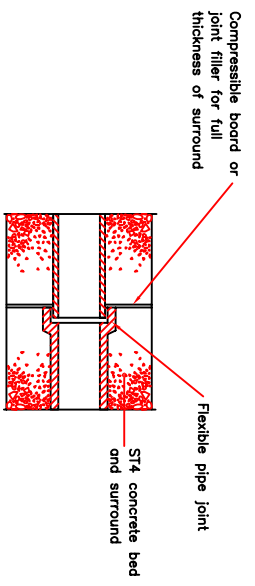
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GULLY CONNECTION DETAILS (see note 12)

DRAIN TYPE D7
CONCRETE, CLAY AND
ALTERNATIVE FOR PVCU
Less than 900 cover
Bedding Factor 2.6

DRAIN TYPE D8
Filter drain
Bedding Factor 2.2



FLEXIBLE JOINT FOR CONCRETE SURROUND
(Reinforced slab similar)

Safe supporting strength of pipe $Ws = \frac{Wt \cdot Fm}{Fs}$

Where
 Wt = Crushing strength – see British Standards
 Fm = Bedding Factor
 Fs = Factor of Safety = 1.25

Project
STANDARD DRAWINGS

Title
PIPES AND FILTER DRAINS UNDER VERGES

Drawing Number
SD/500/02

- Notes
- All dimensions are in millimetres.
 - Water Authorities Association guide Sewers for Adoption applies except where modified by this drawing.
 - Pipes shall be :
 Vitrified clay pipes to BS 65 and BS EN 295
 Concrete pipes to BS 5911
 PCU Ultrarib pipes to BS EN 1401-1
 SDR (Highway drainage) 34 min
 SDR (and drainage) 41 min
 - Minimum cover without concrete protection is 900
 Concrete protection to terminate at suitable pipe joint.
 Flexible joints must be provided in concrete bed and surround or reinforced slab.
 - Determination of pipe and bedding combinations shall be in accordance with DfT advice Note HA 40/01.
 - If maximum trench width is exceeded it may be necessary to increase the strength of the pipe.

- PCU PIPES
- PCU Pipes must be laid in accordance with BS 5955 PART 6.
 - RC 30 concrete slab with A193 (or equivalent) mesh reinforcement may be used as alternative to concrete surround with the approval of the Engineer.

- ALL PIPES
- Pipe and bedding must be adequate for the worst conditions and materials must not be changed between chambers.
 - Minimum pipe diameter to be 225 for carrier drains.
 - Saddle connections may only be used with the approval of the Engineer.
 - Slotted pipes to be laid with slots upwards unless otherwise directed.
 - Filter drain trenches may only be covered by topsoil where approved by the Engineer.
 - Filter material must be separated from surrounding soil by a geotextile filter membrane.
 - Narrow filter drains or fin drains must be used to drain the sub-base where necessary. They must be installed in accordance with the DfT requirements.

Do not scale this drawing

Rev	Date	Checked
A	08/06	Notes revised and updated
		RB

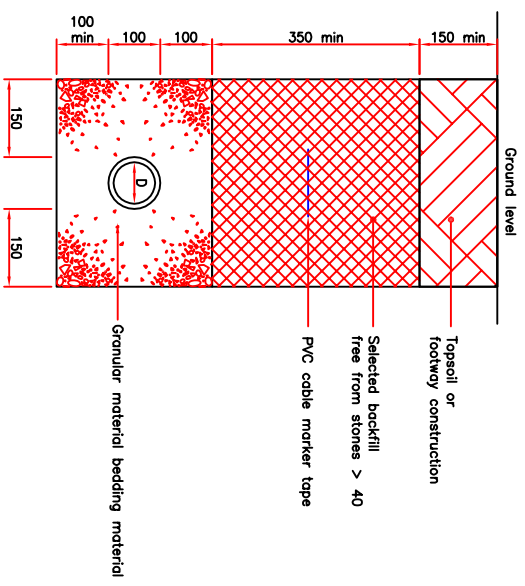
Drawing No.	Revision
SD/500/02	A
Scale NOT TO SCALE	Date AUG 06

Drawn	Checked	Approved
RW/JY	RB	JR

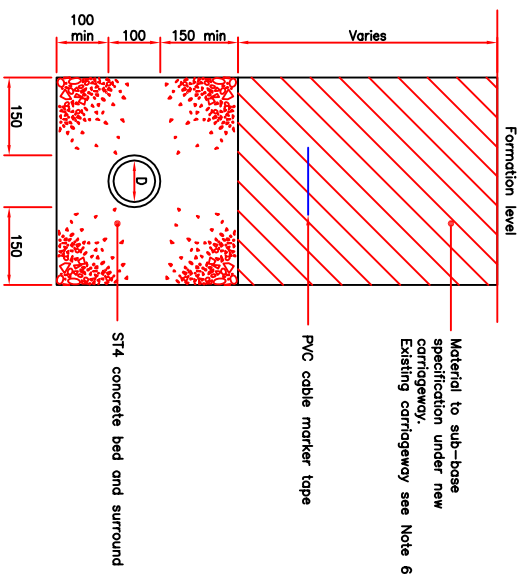
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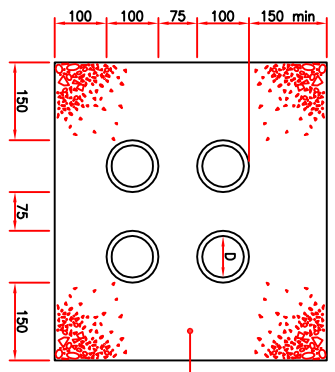




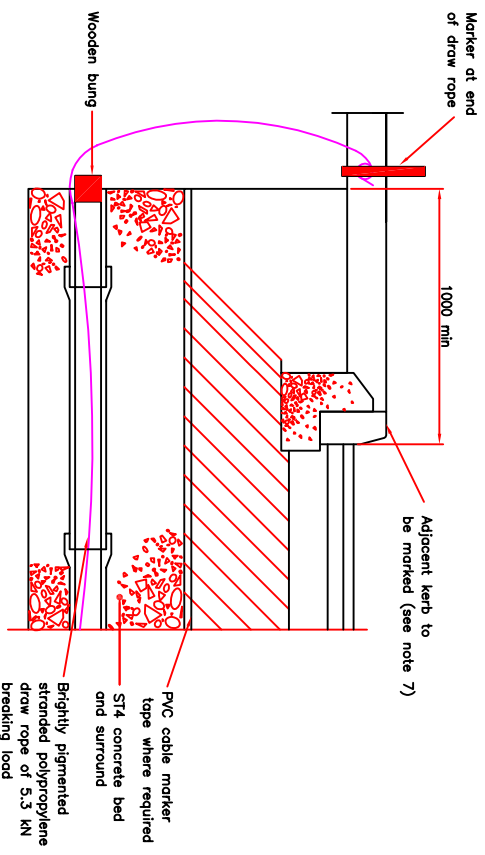
**VERGE or FOOTWAY
More than 600 cover**



**CARRIAGEWAY
(and verge or footway where
depth of cover is less than 600)**



**TYPICAL LAYOUT FOR 4-WAY DUCTS
6-way layout similar**



**DETAIL AT END OF DUCT
UNDER CARRIAGEWAY**

ST4 concrete or granular pipe bedding and fill material well tamped in 150 layers (see note 11)

Adjacent kerb to be marked (see note 7)

- Drawing Number**
SD/500/03
- Notes**
- All dimensions are in millimetres.
 - Pipes shall be :
Vitrified clay to BS 65 and BS EN 295
Glass reinforced plastic to BS 5480
PVCU ducts to BS EN 1401-1 and a British Board of Agreement Certification in accordance with Electricity Board Council ESI 12-24, SDR 41 min.
 - The position of duct routes and the number of ducts in each trench must be shown on the 'As Built' drawings.
 - Ducts under embankments shall extend 1000 beyond the toe of embankment.
 - Internal diameter of all service ducts shall be 100 unless otherwise stated.
 - Existing carriageway shall be reinstated in accordance with HA/C Specification for Reinstatement of Openings in Highways.
 - The line of all duct road crossings must be marked with a suitable physical marker.
 - Orange ducts to be used for street lighting and traffic signal cables.
 - PVC cable marker tape to be used with street lighting and traffic signal cable ducts.
 - Concrete protection required to ducts under carriageway and where depth of cover is less than 600.
 - Concrete protection required to ducts in verge or footway where depth of cover is less than 600.
 - Flexible joints must be provided in reinforced concrete surround.

Do not scale this drawing

Rev	Date	Notes revised and updated	RB
A	08/06		

Drawing No.
SD/500/03

Scale NOT TO SCALE

Drawn	Checked	Approved
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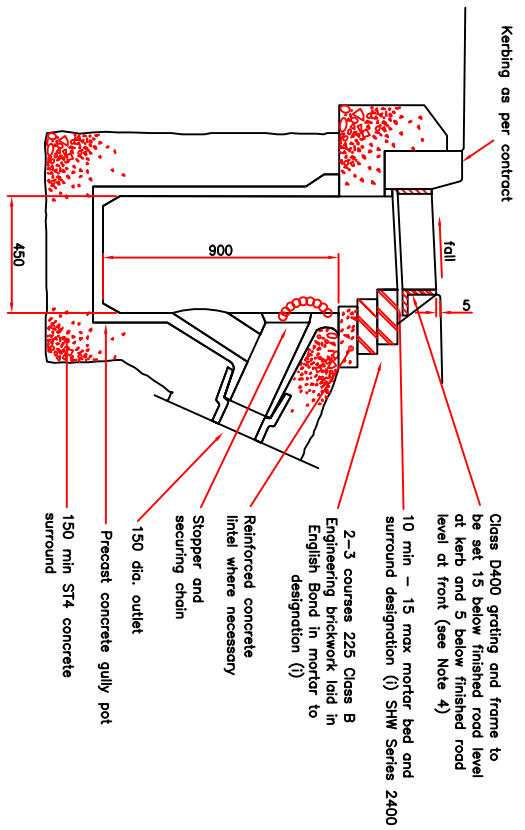
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Project
STANDARD DRAWINGS

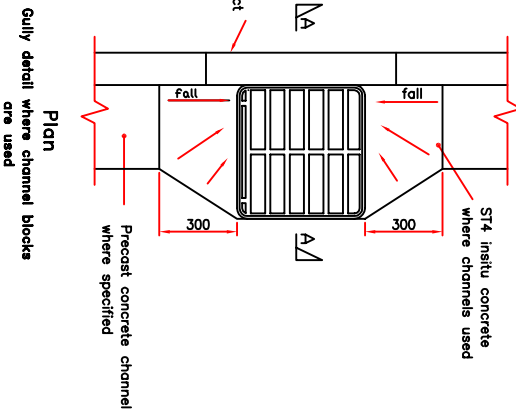
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SERVICE DUCTS

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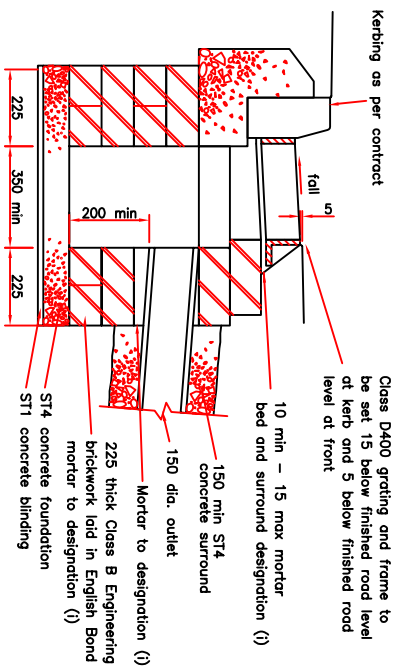
Section A-A

PREFORMED TRAPPED GULLY POT
 TYPE 1 - 450 dia x 900 deep
 TYPE 2 - 375 dia x 750 deep
 (See Notes 2 and 3)



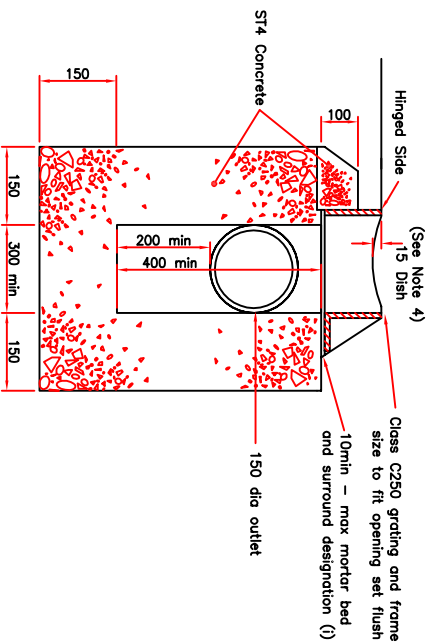
Plan

Gully detail where channel blocks are used



BRICK GULLY

TYPE 3 (see Note 3)
 Shown with carriage way grating



CAST INSITU CONCRETE GULLY
 TYPE 4 - (see Note 3)
 Shown with footway grating

Drawing Number
 SD/500/04

- Notes**
- All dimensions are in millimetres
 - Gully pots shall normally be: Concrete to BS 5911 part 230 Vitrified clay to BS 65 and BS EN 295 PVCU Ultrarib to BS EN 1401-1 Pots shall be: 450 dia. x 900 deep in carriageways 375 dia. x 750 deep in footways
 - Brick gullies and cast - insitu concrete gullies may only be used with the approval of the engineer where space is limited.
 - Gratings and frames to be to BS EN 124 1994. Ref. Class D400 Trafficbed areas. Large gratings may only be used by the approval of the engineer. Dishd gratings permissible in footways only.
 - All gratings to be Kite Marked and coated with a protective coating in accordance with BS EN 124: 1994.
 - Hinged captive gratings must be used.
 - End hinged gratings must be set with hinge towards approaching traffic.
 - Slots in gratings shall not be parallel to the direction of the traffic.
 - Bricks to be Engineering Class B to BS 3921.
 - A maximum of 25mm overhang permitted on each course of brick corbelling.
 - Reinforced concrete gully cover slabs to BS 5911 Part 230 or reinforced concrete lintels must be used where brick corbelling gives insufficient to support frame.
 - Connections to carrier drains to be by means of 'Y' junctions.
 - Finish to internal concrete to be F1 on formed surfaces and U2 on unformed surfaces.
 - Polyester, epoxy or ultra-rapid hardening cementitious mortar systems shall be used in making up and bedding framework in carriageways to be opened to traffic within 2 days.
 - Brick gullies must only be used where the use of prefabricated pots is impossible.
 - Each gully must have a separate connection to the carrier drain or chamber.

Do not scale this drawing

A 08/06 (Notes revised and updated) RB

Rev	Date	Checked

Drawing No.
 SD/500/04

Scale	NOT TO SCALE	Revision
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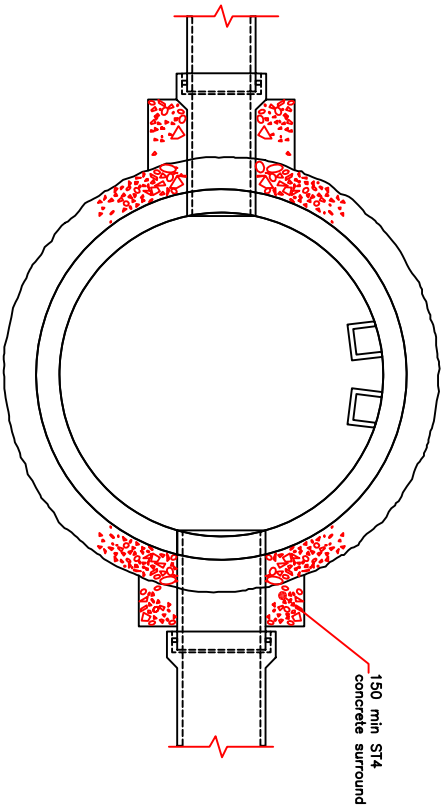
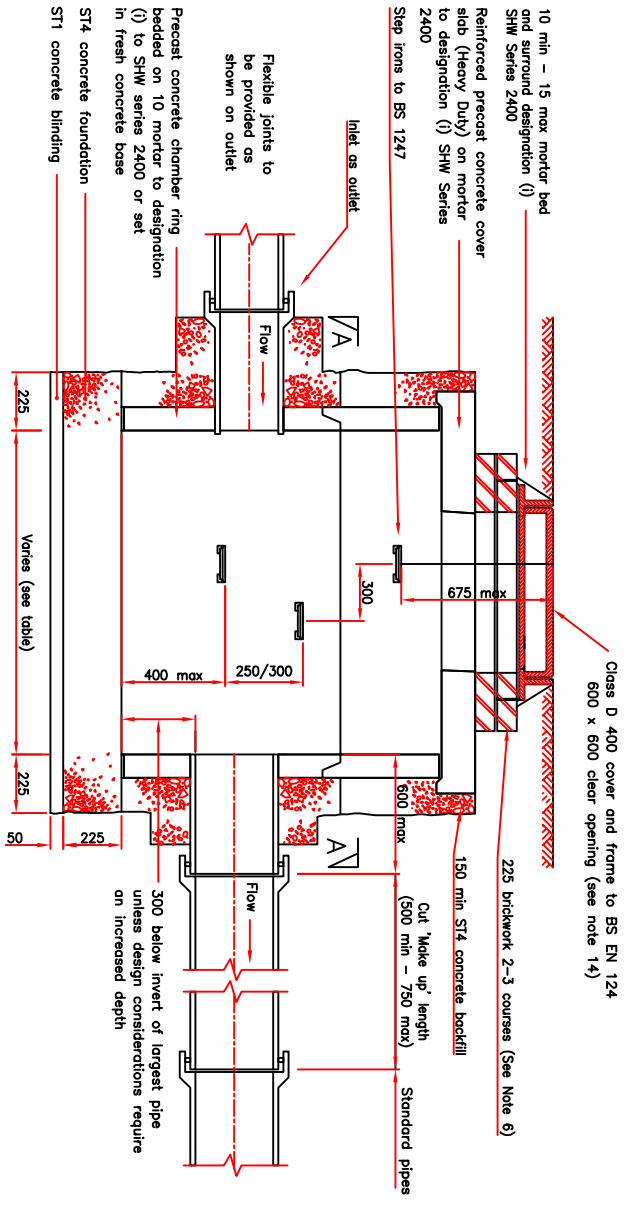
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Project
 STANDARD DRAWINGS

Title

ROAD AND FOOTPATH GULLY DETAILS



Internal diameter of chamber	Diameter of largest pipe in chamber
1200	Less than 375
1350	375 - 450
1500	500 - 700
1800	750 - 900

CATCHPIT SIZES

Section A-A

STANDARD DRAWINGS

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Drawing Number
SD/500/05

Notes

- All dimensions are in millimetres
- Water Authorises Association guide Sewers for Adoption applies except where modified by this drawing.
- Cover and frame to be Class D400 Bordenmarked HD and Kitemarked and have a protective coating complying with BS EN 124: 1994.
- Catchpits to be positioned so that no part of the structure is under the kerb.
- Entrance to catchpits to be positioned with consideration for safety.
- Bricks to be Engineering Class B to BS 3921 laid in English Bond in mortar to designation (1) SHW Series 2400.
- Precast concrete chambers shall comply with BS 5911 Part 200.
- Mortar to designation (1) SHW Series 2400 or a proprietary sealer shall be used in all joints between precast concrete units.
- Finish to internal concrete to be F1 on formed surfaces and U2 on unformed surfaces.
- All voids beneath the catchpit structure shall be backfilled with ST1 concrete.
- Ends of pipes shall be neatly built into the chamber and finished flush with mortar to designation (1) SHW Series 2400.
- The nearest joints to chamber shall not be restricted by concrete
- Safety chains or grills must be provided where pipe diameter exceeds 600.
- Surface level tolerance +6 -15 in paved areas -15 min. -50 max. in verges.

Do not scale this drawing
A 08/06 Notes revised and updated RB

Rev	Date	Checked

Drawing No. SD/500/05	Revision A
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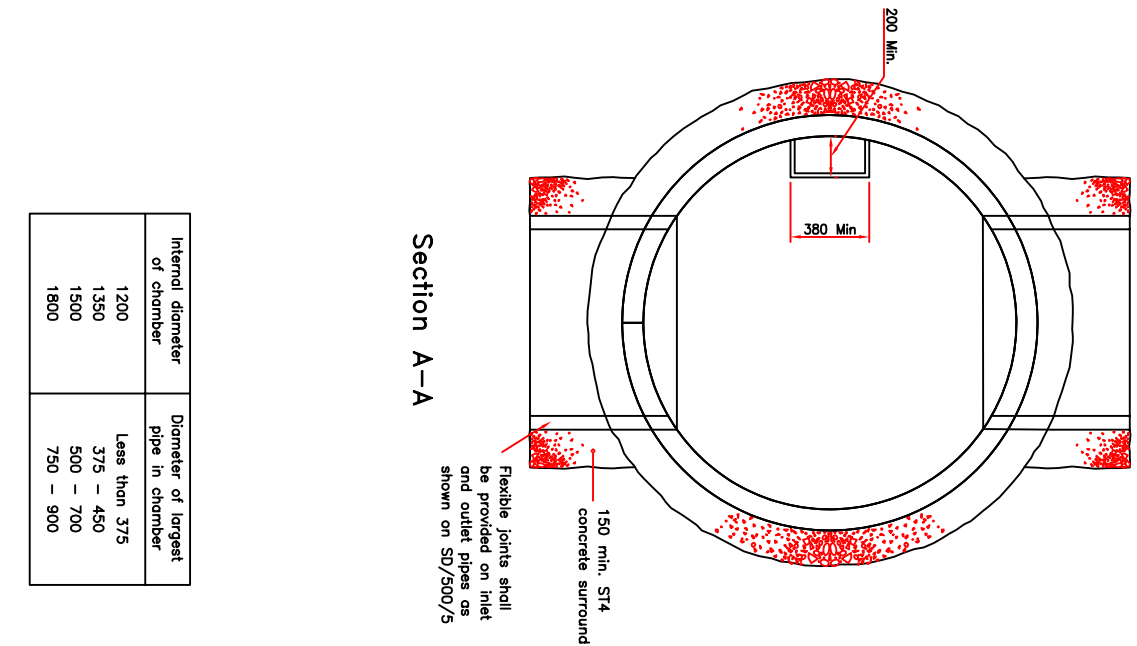
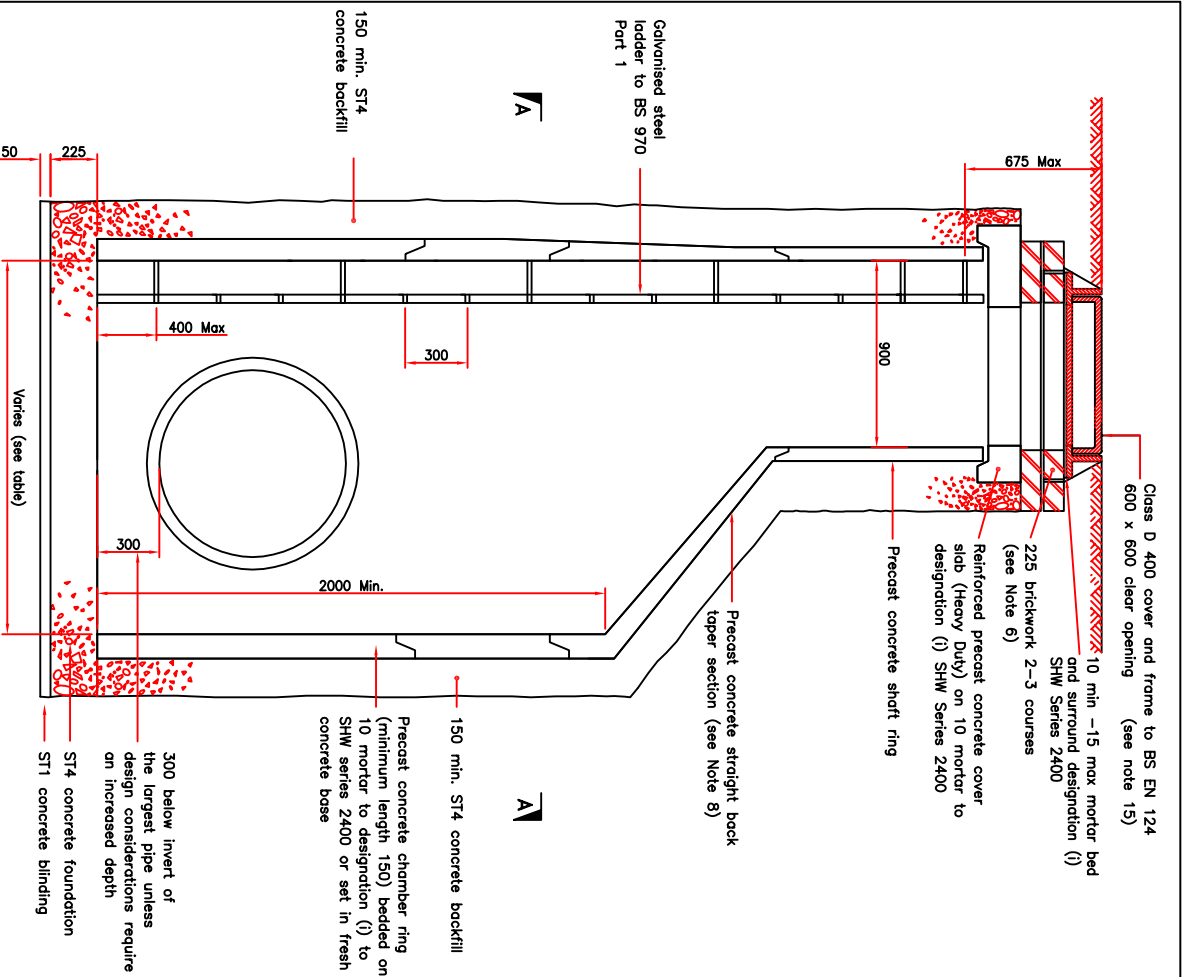
Scale NOT TO SCALE	Date AUG 06
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Drawn RWJY	Checked RB	Approved JR
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CATCHPIT TYPE 1
PRECAST CONCRETE CONSTRUCTION
(Permitted Range of Depths-Cover to sump 1.2m-3.0m)

Project
Title



Section A-A

Internal diameter of chamber	Diameter of largest pipe in chamber
1200	Less than 375
1350	375 – 450
1500	500 – 700
1800	750 – 900

CATCHPIT SIZES

STANDARD DRAWINGS

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Project
Title

CATCHPIT TYPE 2
PRECAST CONCRETE CONSTRUCTION
(Permitted Range of Depths-Cover to sump 3.0m-5.0m)

Drawing Number

SD/500/06

Notes

- All dimensions are in millimetres
- Water Authorities Association guide Sewers for Adoption applies except where modified by this drawing.
- Cover and frame to be Class D400 Badoemerked, HD, and kitemarked and have a protective coating complying with BS EN 124: 1994.
- Catchpits to be positioned so that no part of the structure is under the kerb.
- Entrance to catchpits to be positioned with consideration for safety.
- Bricks to be Engineering Class B to BS 3921 laid in English Bond in mortar to designation (i) SHW Series 2400.
- Precast concrete chambers shall comply with BS 5911-3, 2002.
- Precast concrete heavy duty cover slabs may be used in place of stright back tappers.
- Mortar to designation (i) SHW Series 2400 or a proprietary seadant shall be used in all joints between precast concrete units.
- Finish to internal concrete to be F1 on formed surfaces and U2 on unformed surfaces.
- All voids beneath the catchpit structure shall be backfilled with ST1 concrete.
- Ends of pipes shall be neatly built into the chamber and finished flush with mortar to designation (i) SHW Series 2400.
- The nearest joints to chamber shall not be restricted by concrete
- Safety chains or grilles must be provided where pipe diameter exceeds 600.
- Surface level tolerance +6 -15 in paved areas -15 min. -50 max. in verges.

Do not scale this drawing

Rev	Date	Notes revised and updated	Checked
A	07/06	Notes revised and updated	JW

Drawing No.	SD/500/06	Revision	A
Scale NOT TO SCALE		Date	JULY 06
Drawn/RW/JV	Checked/JW	Approved/R	

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Drawing Number
SD/500/07

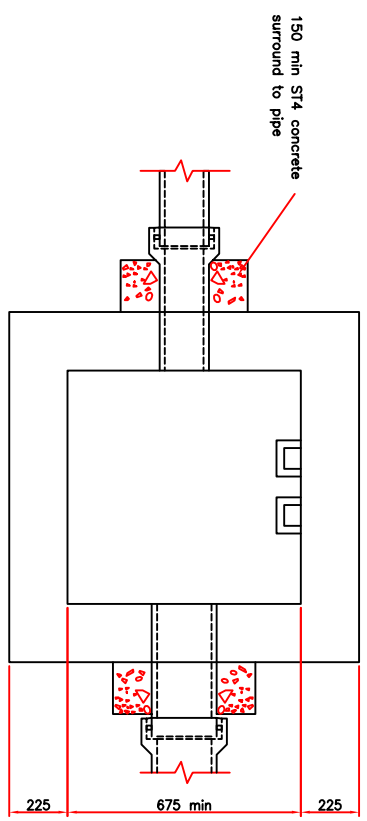
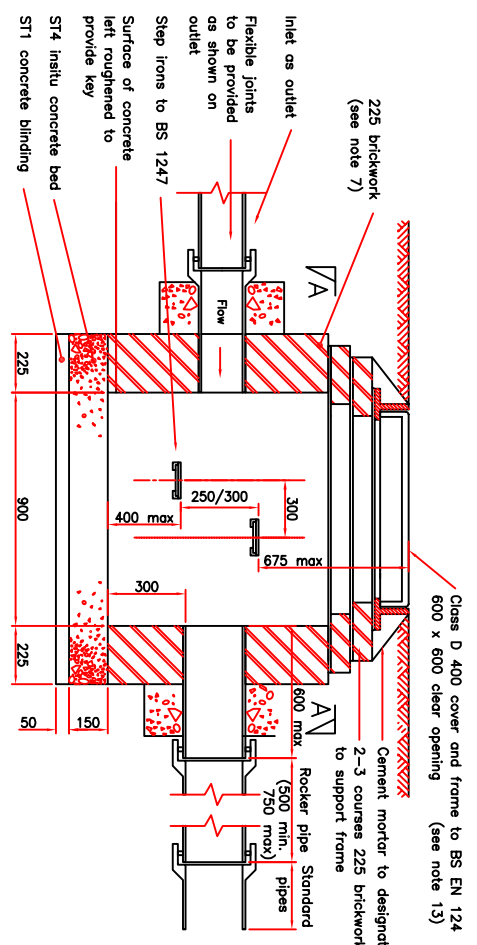
- Notes**
- All dimensions are in millimetres.
 - Water Authorities Association guide Sewers for Adoption applies except where modified by this drawing.
 - Rectangular catchpits may only be used where pipes enter and leave on the same axis. The pipe run must be parallel to the longer wall.
 - Cover and frame to be Class D400 Bodegemerked HD and Kitemarked and have a protective coating complying with BS EN 124: 1994.
 - Catchpits to be positioned so that no part of the structure is under the kerb.
 - Entrances to catchpits to be positioned with consideration to safety.
 - Bricks to be Engineering Class B to BS 3921 laid in English Bond in mortar to designation (1) SHW Series 2400.
 - Finish to internal concrete to be F1 on formed surfaces and U2 on uniformed surfaces.
 - All voids beneath the catchpit structure shall be backfilled with ST1 concrete.
 - Ends of pipes shall be neatly built into the chamber and finished flush with mortar to designation (1) SHW Series 2400.
 - The nearest joints to chamber shall not be restricted by concrete.
 - All pipes to be protected as shown on SD/500/1 and SD/500/2.
 - Surface level tolerance +6 –15 in paved areas, –15 min –30 max in verges.

Do not scale this drawing

Rev	Date	Notes revised and updated	Checked
A	07/06	Notes revised and updated	JW

Drawing No. SD/500/07		Revision	
Scale NOT TO SCALE	Checked JW	A	
Drawn RW/JY	Checked JW	Date JULY 06	Approved JR

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CATCHPIT SIZES

Minimum internal dimensions of chamber	Diameter of largest pipe in chamber
675 x 900	300 or less

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Project
STANDARD DRAWINGS

Title
CATCHPIT TYPE 3
BRICKWORK CONSTRUCTION
Permitted depth-cover to sump up to 1.2m