

From: Laura Gibbons [REDACTED]
Sent: 11 May 2021 08:44
To: Planning.Responses <Planning.Responses@arun.gov.uk>
Cc: Simon Davis <Simon.Davis@arun.gov.uk>
Subject: Y/47/21/DOC- Bonhams Field, Yapton

Dear Simon,

We have the following further comments regarding this discharge of conditions application.

Condition 12- surface water drainage design

We recommend discharge of condition 12. Please ensure the following plans are listed on any approval:

1210K Site Layout Proposed Drainage Plan

1501-D Construction Details

2001-E Site Layout Proposed Drainage Ownership Plan (attached)

Condition 14- maintenance and management of SuDS

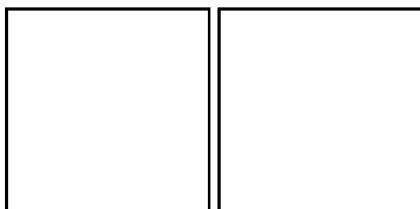
We recommend discharge of condition 14. Please ensure that the latest Maintenance Manual, v1.4 dated 7th May 2021 (attached), is listed on any approval.

Kind regards,

Laura Gibbons

Engineer, Adur & Worthing Councils

[REDACTED]
Address: Facilities & Technical Services, Worthing Town Hall, Chapel Road, Worthing, West Sussex, BN11 1HA



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Drainage Maintenance Manual



The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA



Project	Bonhams Field, Yapton
Project Number	23018

By Martin Kempshall CEng MICE

Date 7 May 2021

1 Schedule of Maintenance

- 1.1 Upon completion of the development the management of the shared drainage facilities will be passed on to a Management Company who will be appointed by the developer on behalf of the new Residents.
- 1.2 The regular and corrective maintenance of all shared elements of the drainage system beneath the road, including the lined voided subbase will be managed by the Management Company on behalf of the Residents.
- 1.3 Regular maintenance of all private drainage, channels, gutters, rainwater pipes, driveways and connections will be the responsibility of the individual homeowner and should be undertaken every 3 months.
- 1.4 Driveways and connections will be the responsibility of the individual homeowner and should be undertaken on an annual basis. Driveways which form part of the wider infiltration system include a legal covenant to ensure these remain part of the wider drainage system in perpetuity.
- 1.5 With adequate maintenance the working design life of permeable paving system is approximately 25 years. The extent of the permeable paving is shown on Drawing 1210 a copy of which is attached as part of this Drainage Maintenance Manual.
- 1.6 At a minimum interval of 25 years the permeable paving blocks shall be lifted and inspection undertaken as follows:
 - 3-6mm gravel bedding to be removed and the voided subbase stone inspected.
 - The subbase shall be replaced as required where blocked or blinded.
 - The permeable geotextile shall be inspected using a series of hand dug trial holes to assess its general condition, where damaged it should be replaced or repaired.
 - Upon completion of the inspection the voided stone subbase shall be replaced to the original specification and level.
 - The 3-6mm bedding shall be replaced with the permeable blocks reinstated after cleaning or where required replaced with new.



- Following block reinstatement 3-6mm grit shall be swept into the joints between the permeable blocks.

- 1.7 Any parts of the drainage management system that are damaged or worn will be repaired to full working order by the Management Company
- 1.8 Any parts of the drainage management system that has reached the end of their useful, serviceable design life and are no longer fit for repair will be replaced by the Management Company on a like for like basis as far as reasonably practicable.
- 1.9 Drawing 2001 shows the drainage ownership responsibilities.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from silt trap chambers, channel drains and inlet chambers	Monthly or as required
	Litter and debris removal – catch pits	Monthly or as required
	Surface and foul water pipework – jetting / rodding	Every 2 years or as required
	Visual inspection of permeable paving for defects, weed growth and settlement	Annually, or after leaf fall.
	Sweeping / brushing / vacuuming of permeable paving, including the removal of weed growth.	Annually, after leaf fall or on a more frequent basis based upon site-specific observations or evidence of clogging.
Corrective Maintenance	Repairs to access chambers / manhole covers	As required
	Replace any broken permeable blocks / surface, remedial works to any depressions or rutting	As required
	Inspect inlet, outlet from downpipe and gullies for blockages, standing water and clear	As required
	Full inspection and service of permeable paving system	Minimum of every 25 years

Table 1: Schedule of Regular and Corrective Maintenance

2 Financing

- 2.1 The regular maintenance of all private drainage, channels, gutters, rainwater pipes, driveways and connections will be the responsibility of the individual homeowner.
- 2.2 The regular and corrective maintenance of all shared elements of the drainage system will be managed and funded through the Management Company on behalf of the Residents who will fund the Management Company via a levied service charge.
- 2.3 In the event that the estate's Management Company becomes unable to discharge its duties within 2 years of first appointment the developer will endeavour to appoint an alternative on behalf of the Residents.

3 Maintenance Summary

Inspection / Action Required	Gullies, Channels and Gutters	Silt Traps, Channel Drainage and Inlet Chambers	Catchpit	Permeable Paving / Surfaces	Surface Water Pipework
Monthly		✓	✓		
3 Months	✓		✓	✓	
1 Year				✓	
After leaf fall in Autumn	✓		✓	✓	
2 Years					✓
5 Years					
25 Years				✓	

Table 2: Drainage System Maintenance Summary



All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.

This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.

The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.

Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

All pipe joints, bends and junctions shall be verified dry in accordance with the current version of BS EN 295-1, with flexible joints and kitemark certified.

All Adoptable sewers shall be in strict accordance with the 7th edition of *Sewers for Adoption*. Unless otherwise specified adoptable sewers shall be 450mm diameter and shall be laid in class G5 bedding. Where the depth of cover is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class 2 bedding.

All private building drainage shall be constructed in strict in accordance with the current version of BS EN 752:2017. Unless otherwise specified all building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.

Where a pipe is within 1m of a foundation the trench shall be filled with class GEN 3 concrete up to the lowest level of the foundation. Where the trench is more than 1m from the foundation, the trench shall be filled with class GEN 3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN 3 concrete.

Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete bedding and be surrounded in 150mm thick class GEN 3 concrete. Where pipes, external to the structures, have a depth to soffit from ground level of 450mm or more, all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.

In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width to provide a complete cross section. A board shall be provided for every 150mm for pipes up to 450mm nominal diameter and 35mm for pipes over 450mm nominal diameter.

All syps shall have rodding access plates fitted at their bases (ground level).

Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

Any discrepancy between the drawing and site should be reported immediately to the Engineer.

0. All manhole and chamber sizes are given as a minimum to meet the 7th Edition of *Sewers for Adoption*.

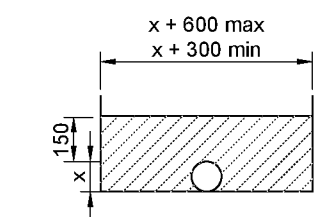
30/04/2021	MJP	Diffuser tanks raised above 1 in 10yr + CC level	MK
17/02/2021	MJP	Subbase thickness to Area F & H	MK
05/02/2021	MJP	Subbase thickness to catchments F, G & H	MK
02/01/2021	MJP	Subbase depths and baffle updated	MK
22/12/2020	MJP	Minor amendments to subbase depths	MK
11/09/2020	MJP	Diffusers moved 5m from buildings	MK
03/09/2020	MJP	Updated to WSSC comments. Highway drain added	MK
28/06/20	PJR	Voided subbase formation levels added. Cover and inverts added. Drainage revised	SRM
17/06/19	MJP	Gullies removed from roads	SRM
16/06/19	AJD	Site layout updated	SRM
06/06/19	MJP	Plots 28 and 27 updated	SRM
DATE	INT	DESCRIPTION	CHK



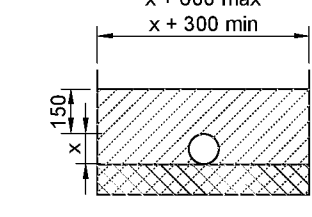
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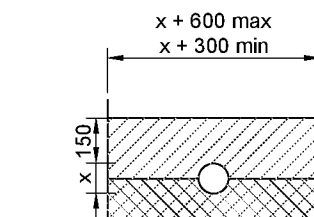
DRAWING M Pacifico	DATE May 2019	PROJECT NO. 23018
ENGINEER S Magowan	CHECKED SRM	DWG. No. REV. 1210 K
SCALE 1:500 @ A1 / 1:1000 @ A3		



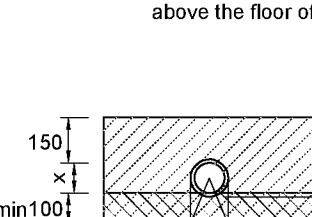
CLASS D PIPE BEDDING



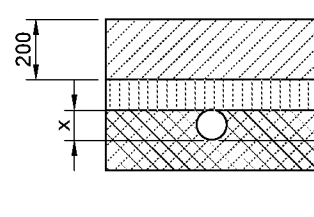
CLASS N PIPE BEDDING



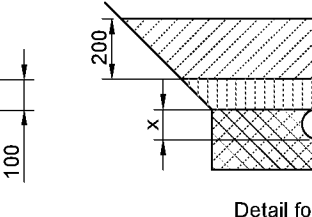
CLASS B PIPE BEDDING



CLASS F PIPE BEDDING



PIPE BEDDING FOR FLEXIBLE PIPES



PIPE BEDDING FOR RIGID APPLIES (NON ADOPTIVE DRAINS)

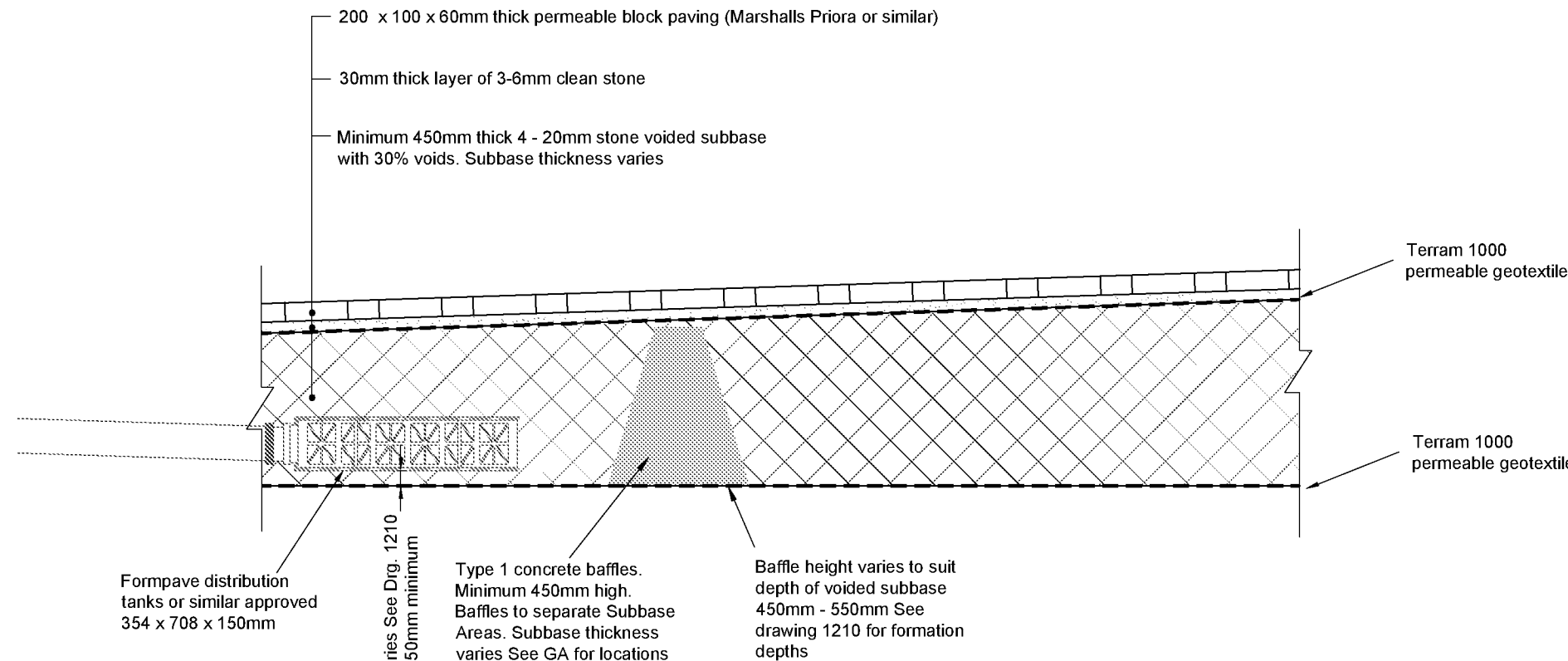
PIPE BEDDING DETAILS
(NON ADOPTABLE DRAINS)
(Not To Scale)

PIPE BORE	BEDDING CLASS	Fields and gardens				Light traffic roads		Heavy traffic roads	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
100mm	D or N	0.4	4.2	0.7	4.1	0.7	3.7		
	F	0.3	5.8	0.5	5.8	0.5	5.5		
	B	0.3	7.4	0.4	7.4	0.4	7.2		
150mm	D or N	0.6	2.7	1.1	2.5	--	--		
	F	0.6	3.9	0.7	3.8	0.7	3.3		
	B	0.6	5.0	0.6	5.0	0.6	4.6		
225mm	D or N	--	--	--	--	--	--		
	F	0.6	2.5	1.2	2.1	--	--		
	B	0.6	3.3	0.8	3.2	0.9	2.4		

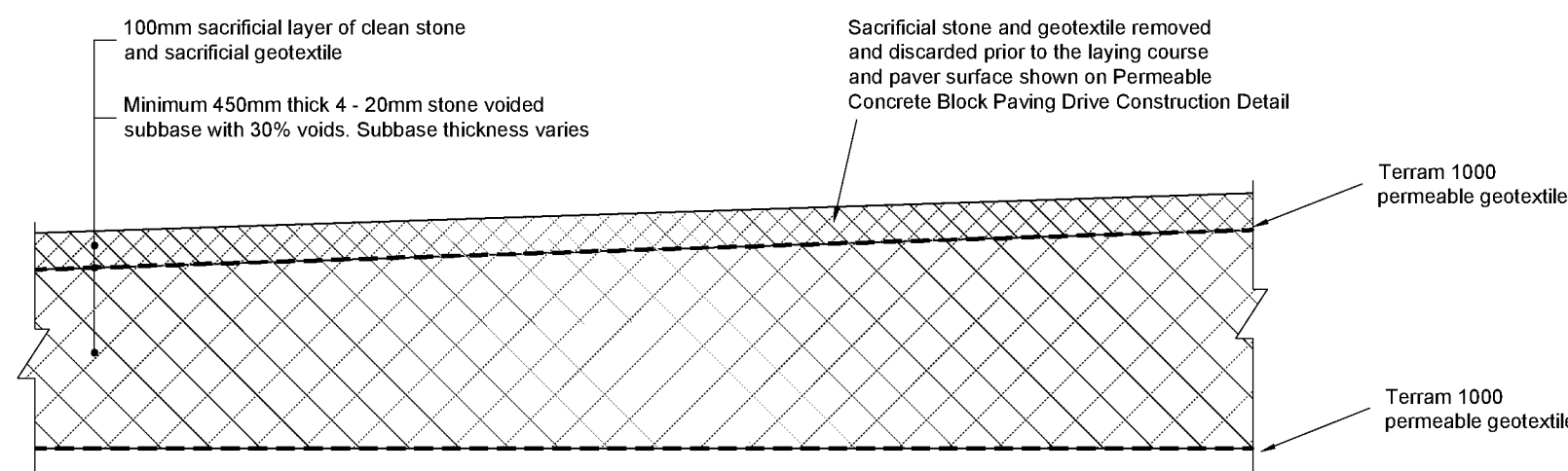
PIPE BEDDING FOR RIGID APPLIES (NON ADOPTIVE DRAINS)

LEGEND:

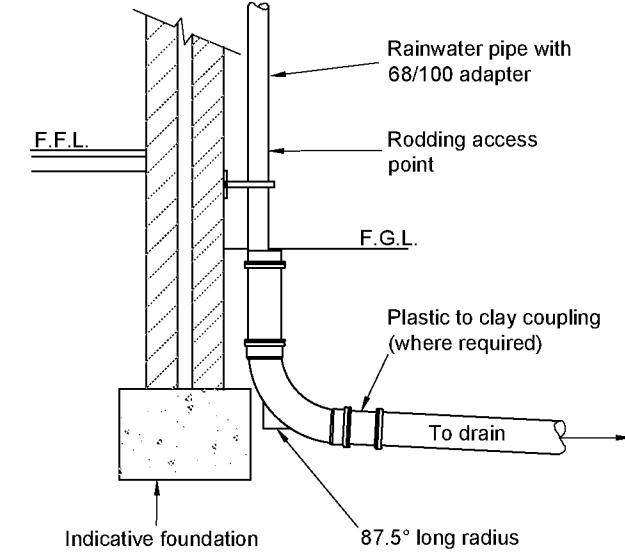
- Selected fill free from stones larger than 40mm, lumps of clay over 100mm, timber frozen material and vegetable matter
- Granular material should conform to BS 882:1983 table 4 or BS8301:1985 Appendix D. Compaction fraction > 0.3 for class N > 0.2 for class F and B.
- Selected fill or granular fill free from stones larger than 40mm
- 'X' - Denotes external pipe diameter.



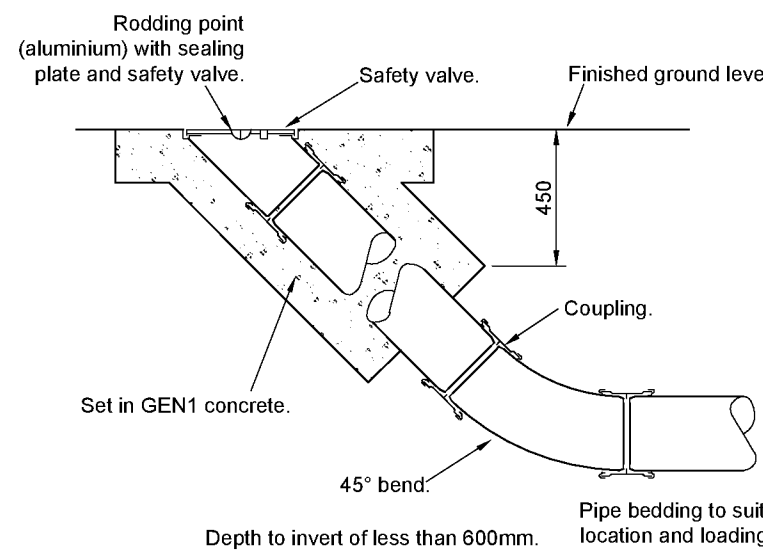
PERMEABLE CONCRETE BLOCK PAVING
CARRIAGEWAY & DRIVE CONSTRUCTION DETAIL
Scale 1:20



VOIDED SUBBASE PROTECTION DURING CONSTRUCTION
Scale 1:20

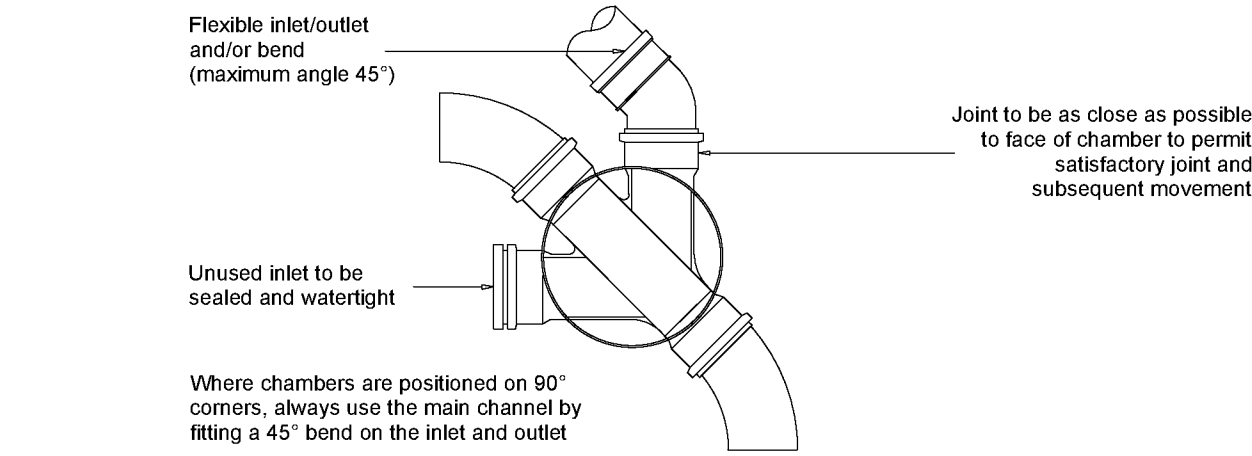
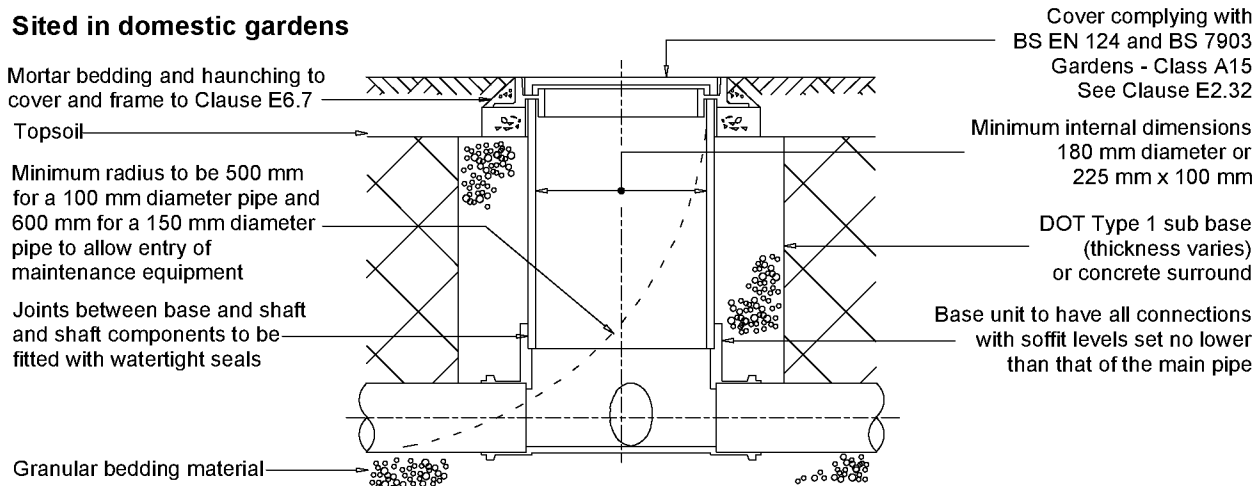
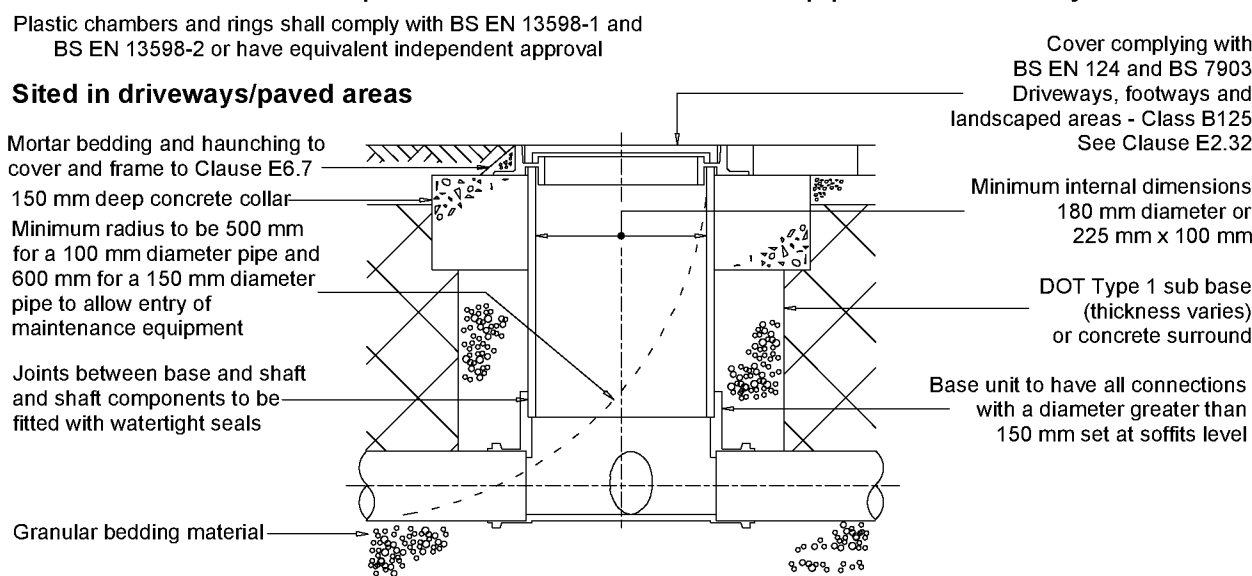


TYPICAL RAINWATER PIPE DETAIL
(Scale 1:25)



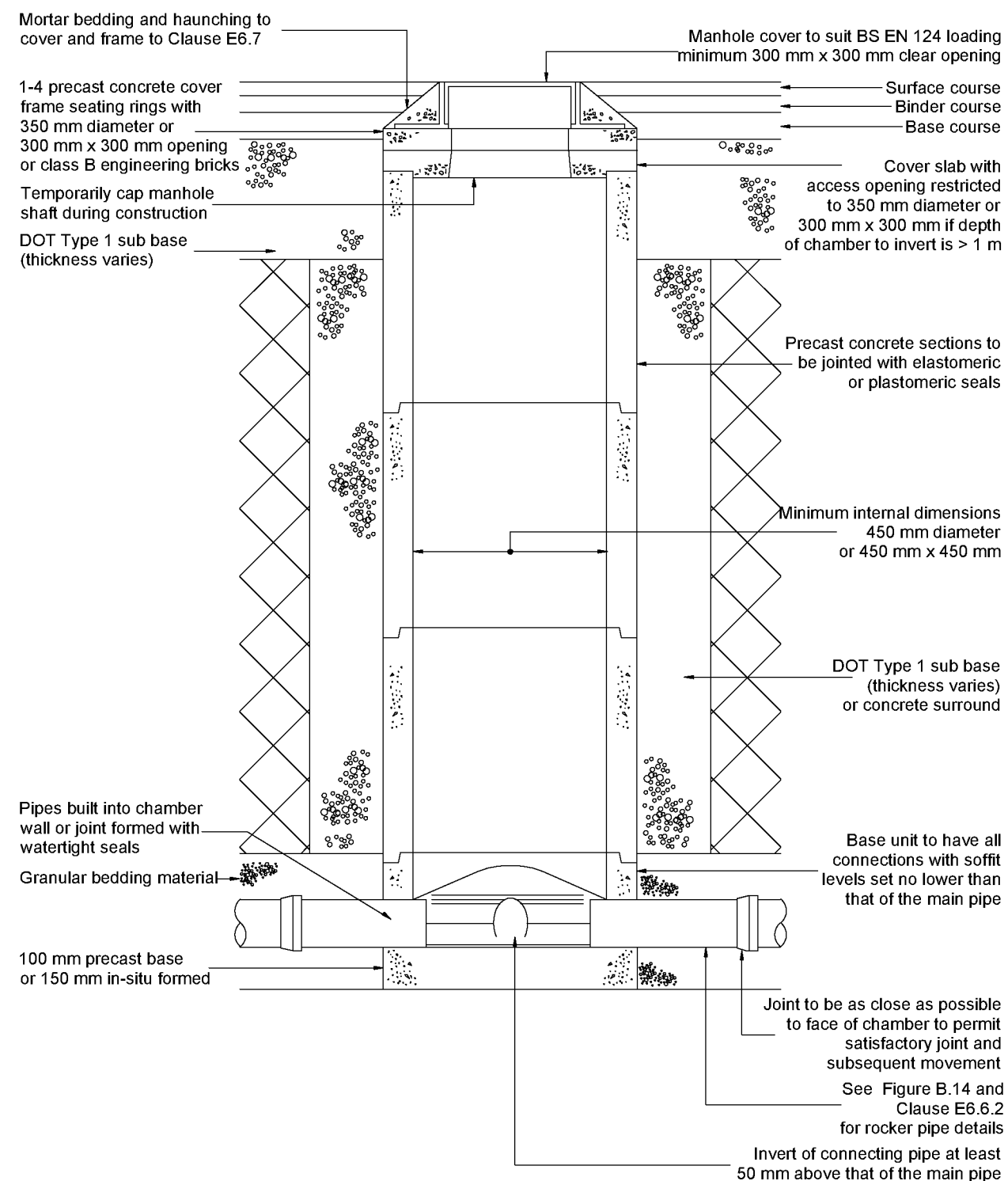
DETAIL OF RODDING EYE
(Scale 1:25)

FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry



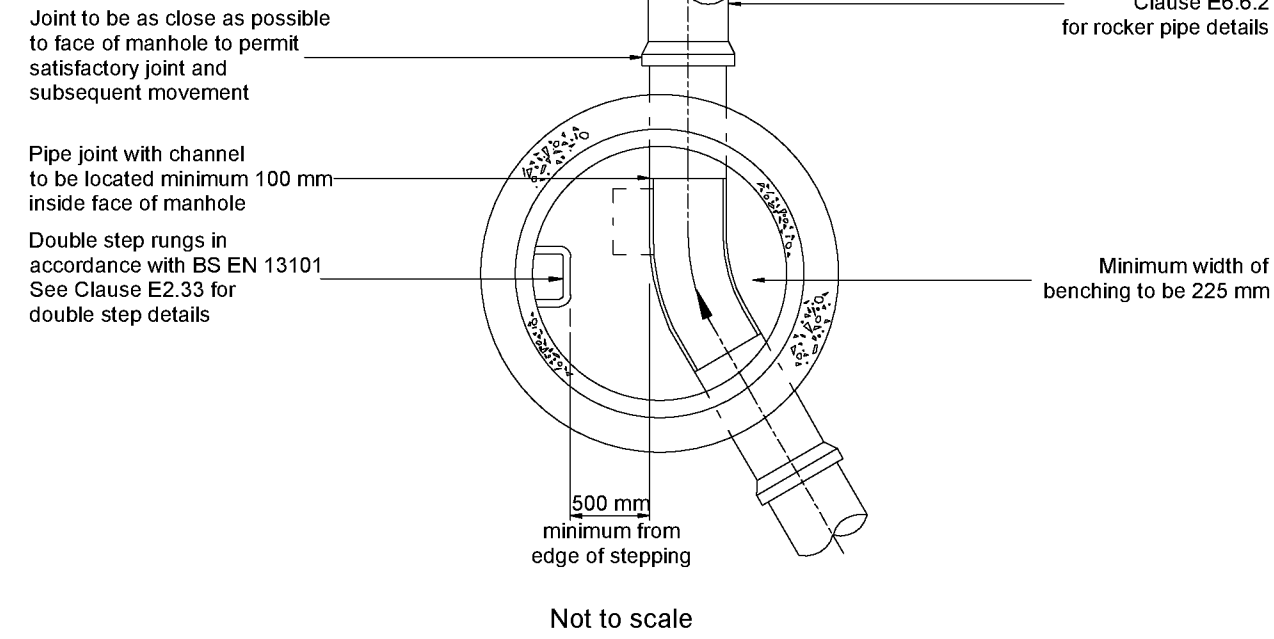
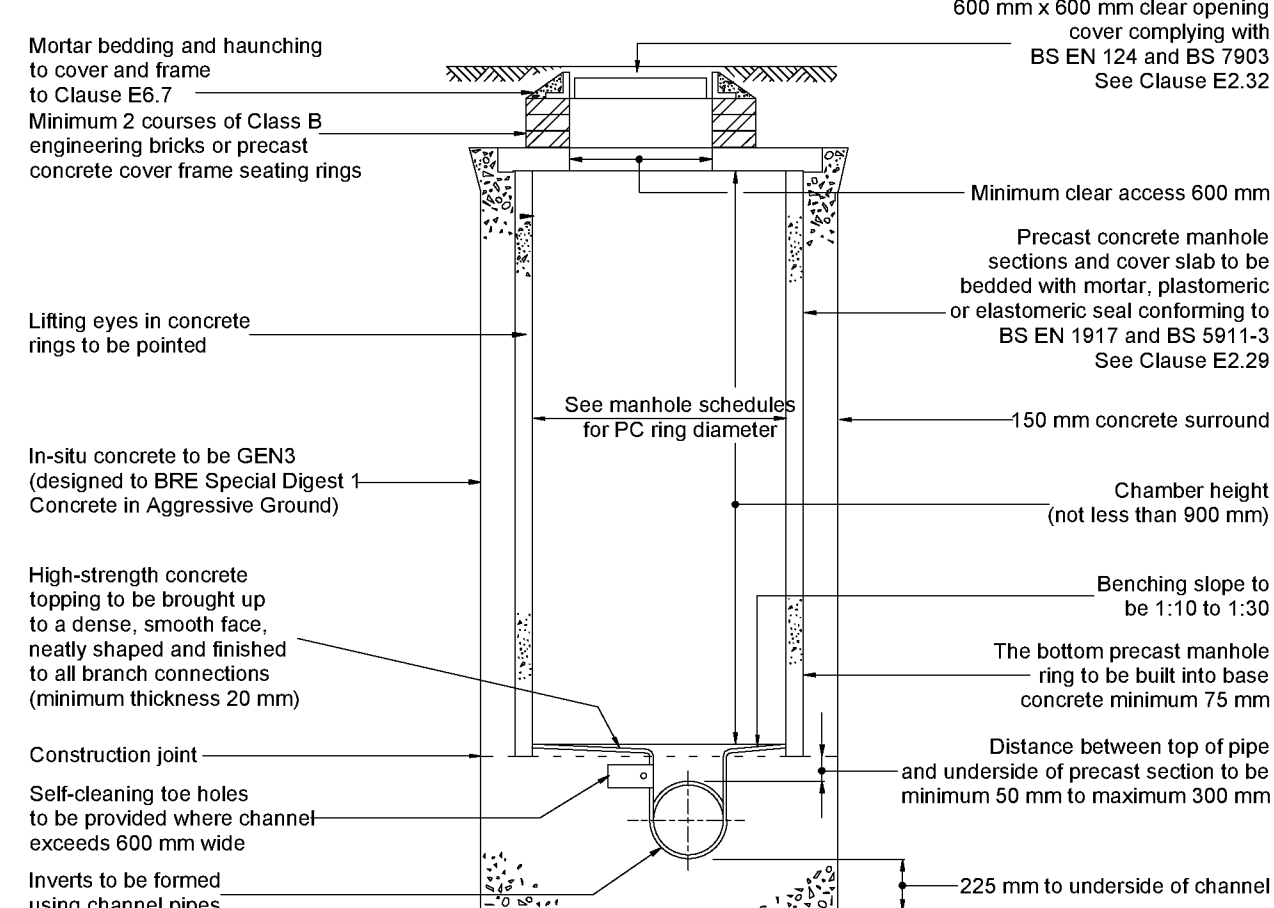
Note: Where the access chamber is in the highway the Highway Authority can have specific requirements
Not to scale

FIGURE B.18
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Rigid material detail)
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



Note: Where the access chamber is in the highway the Highway Authority can have specific requirements
Not to scale

FIGURE B.12
TYPICAL MANHOLE DETAIL - TYPE 2
Maximum depth from cover level to soffit of pipe 3.0 m



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DRAINAGE NOTES:

- All adoptable pipes, bends and junctions shall be verified clay in accordance with the current version of BS EN 295-1, with flexible joints and kitemark certified.
- All Adoptable sewers shall be in strict accordance with the 7th edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class 2 bedding.
- All private building drainage shall be constructed in strict accordance with the current version of BS EN 752:2017. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.
- Where a pipe is within 1m of a foundation the trench shall be filled with class GEN 3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN 3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN 3 concrete.
- Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
- In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 38mm for pipes over 450mm nominal diameter.
- All syps shall have rodding access plates fitted at their bases (ground floor level).
- Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.
- Any discrepancy between the drawing and site should be reported immediately to the Engineer.
- All manhole and chamber sizes are given as a minimum to meet the 7th edition of Sewers For Adoption.

D	17.02.2021	MJP	50mm bedding shown to diffuser tanks	M
C	02.02.2021	MJP	Subbase protection detail added	M
B	05.01.2021	MJP	Baffle and subbase details updated	M
A	26.06.2020	PJR	Details updated.	M
REV	DATE	INT	DESCRIPTION	CHK

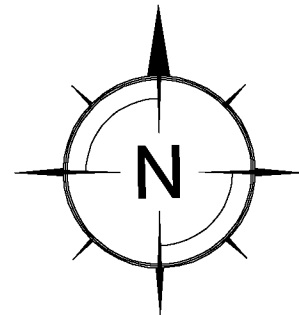
Issue Status FOR APPROVAL

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CLIENT Seaward Properties Limited
PROJECT Bonhams Field, Main Road, Yapton

TITLE Construction Details

DRAWN M Pacifico	DATE May 2019	PROJECT NO. 23018
ENGINEER S Magowan	CHECKED SRM	DWG NO. 1501
SCALE	As Shown @ A1	REV. D



GENERAL NOTES:

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DRAINAGE NOTES:

1. All adoptable pipes, bends and junctions shall be vitrified clay in accordance with the current version of BS EN 295-1, with flexible joints and kitemark certified.
2. All Adoptable sewers shall be in strict accordance with the 7th edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.
3. All private building drainage shall be constructed in strict accordance with the current version of BS EN 752:2017. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.
4. Where a pipe is within 1m of a foundation the trench shall be filled with class GEN 3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN 3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN 3 concrete.
5. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
6. In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass or polystyrene) shall be provided at a maximum of 3m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
7. All sumps shall have rodding access plates fitted at their bases (ground floor level).
8. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.
9. Any discrepancy between the drawing and site should be reported immediately to the Engineer.
10. All manhole and chamber sizes are given as a minimum to meet the 7th edition of Sewers For Adoption.

Storm Drainage Maintenance Legend:

To be maintained by the homeowner

- Private Type 4 Storm Water Inspection Chamber
- Private Storm Water Rodding Eye

To be maintained by estates management Company

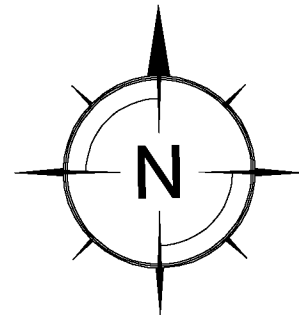
- Type 4 Storm Water Inspection Chamber
- Property boundary
- Distribution Tanks to Subbase
- Permeable Drives under private ownership. Subject to legal covenant
- Permeable Roads and Drives under private ownership

07.05.2001	MJP	Typo corrected - permeable roads	MK	
17.02.2021	MJP	Subbase thickness to Area F & H	MK	
02.02.2021	MJP	Subbase thickness to catchments F, G & H	MK	
05.01.2021	MJP	Subbase depths and baffles updated	MK	
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CLIENT	Seaward Properties Limited				
PROJECT	Bonhams Field, Main Road, Yapton				
TITLE	Site Layout Proposed Drainage Ownership Plan				
DRAWN	P Reynolds	DATE	May 2020		
ENGINEER	S Magowan	CHECKED	SRM		
SCALE	1:500 @ A1 / :1000 @ A3		PROJECT NO.	23018	
			DWG No.	2001	REV. E



GENERAL NOTES:

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5. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
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S Magowan	SRM	2001	E
SCALE			
1:500 @ A1 / :1000 @ A3			