

**BRIXHAM ROAD**

**PAIGNTON**

**SPECIFICATION**

**FOR**

**DRAINAGE**

**SPECIFICATION NO: P9464 – H120(D)**

**CONSTRUCTION ISSUE**

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## SPECIFICATION CONTROL SHEET

**Client:** CAVANNA HOMES & PARKBAY DEVELOPMENTS

**Project:** BRIXHAM ROAD, PAIGNTON

**Job No:** P9464

**Title:** SPECIFICATION FOR S38/S278 SURFACING

**Specification No:** H119

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<b>Version</b>	<b>Date</b>	<b>Detail</b>	<b>Prepared</b>	<b>Reviewed</b>	<b>Approved</b>
A	30/9/11	Preliminary	TA	CJW	CJW
B	22/11/11	Tender Issue	TA	CJW	CJW
C	18/07/12	Construction Issue	TA	CJW	CJW
D	24/08/12	Clarifications & Testing Requirements added	TS	TA	

**ALL EXTERNAL DRAINAGE WORKS TO BE IN ACCORDANCE WITH CLAUSES 501 TO 508 OF THE HIGHWAYS AGENCY SPECIFICATION HIGHWAY WORKS (SHW), BUILDING DRAINAGE BS EN 752 AND SEWERS FOR ADOPTION 6<sup>TH</sup> EDITION.**

### **GENERALLY:**

**Before starting work check invert levels and positions of existing drains, sewers, inspection chambers and manholes against information shown on drawings. Any discrepancies are to be immediately reported to the Engineer.**

### **DRAINAGE PIPES GENERALLY:**

Adoptable - To be super strength/extra strength vitrified clay or Class M spun concrete; to BS EN 295-1 and BS5911 respectively, with Class S bedding,

To be Class M spun concrete to BS EN 1916 and 5911: Part 1 with flexible joints for pipes over 300mm dia.

All clay/concrete pipes Class S bedding generally and warning marker tape.

Plastics: Non-trafficked areas and private drainage only. Plain wall plastic pipelines to BS EN 1401-1, class SN4, with flexible joints, Class P bedding generally and warning marker tape required.

Plastics: Twin wall, Concentric Rib to WIS 4-35-01 or equivalent approved with flexible joints Class P bedding generally and warning marker tape required. Private drainage only.

All pipe joints to be sealed fully watertight in accordance with SHW clause 504.3 unless indicated otherwise in this specification or on the associated construction drawings.

### **S104 SEWERS:**

Pipes to be protected by **150mm concrete surround** (designated mix GEN 3) where cover less than 1.2m below main access or 0.9m elsewhere. Slab to span pipe trench and extend a minimum of 150mm both sides. There shall be a min 150mm of granular surround between crown of pipe and underside of slab.

### **PRIVATE DRAINS:**

Pipes to be protected by **150mm concrete surround** (designated mix GEN 3) where cover less than 1.2m below main access or 0.9m elsewhere.

BACKFILLING TO PIPELINES GENERALLY:

Backfill, from top of specified surround, with suitable approved material compacted in layers not exceeding 300mm thick. Do not use heavy compactors before there is 600mm of material over crown of pipeline.

BACKFILLING TO PIPELINES UNDER CARRIAGEWAY:

Backfill, from top of specified surround, with granular sub-base material Type 1 to SHW Clause 803 and compacted in 150mm layers.

INSTALLATION GENERALLY:

Obtain pipes and fittings for each pipeline from the same manufacturer unless otherwise specified.

Lay pipes to true line and regular gradient on an even bed for the full length of the barrel with sockets (if any) facing up the gradient.

Joint using recommended lubricants, leaving recommended gaps at ends of spigots to allow for movement.

Adequately protect pipelines from damage and ingress of debris. Seal all exposed ends during construction.

PIPE BEDDING:**CLASS P FULL DEPTH GRANULAR SUPPORT**

Granular material: To BS 882.

Pipe Size (DN)	Nominal Single Graded Size Size	(mm)
150	10	Not permitted
225 & 375	10 or 20	20 to 5

Lay and compact to a thickness not less than 100mm over full width of trench. Scoop out locally at couplings/sockets and lay pipes digging lightly into bed and resting uniformly on their barrels. Adjust to line and gradient.

After initial testing, lay and compact by hand more granular material to slightly above crown of pipe.

Backfill with a protective cushion of selected fill, free from vegetable matter, rubbish, frozen soil and material retained on a 40mm sieve. Compact by hand in 100mm layers to 300mm above crown of pipe. (100mm of granular material may be used in lieu).

### **CLASS S GRANULAR SURROUND**

Granular material: To BS882:

Pipe size (DN)	Nominal single size (mm)	Graded size (mm)
100 & 150	10	Not permitted
225 & 300	10 or 20	14 to 5
375 to 450	10, 14 or 20	14 to 5 or 20 to 5
Over 500	10,14,20 or 40	20 to 5 or 40 to 5

Lay and compact to a thickness not less than 50mm for sleeve jointed pipes, 100mm (130mm for 600 dia pipes) for socket jointed pipes, over full width of trench. Where trench bottom is uneven due to hard spots or other reason, increase depth by 100mm. Scoop out locally at couplings/sockets and lay pipes digging slightly into bed and resting uniformly on their barrels. Adjust to line and gradient.

After initial testing, lay and compact more granular material in 100mm layers to 300mm (for adoptable sewers) above crown of pipe.

### **CLASS Z CONCRETE SURROUND**

Class Z concrete surround required where cover to soffit less than 1.2m below carriageway or less than 1 m below verges.

Concrete surround to be designated mix **GEN 3**.

Lay concrete blinding, 25mm thick over full width of trench and allow to set.

Lay pipes on blinding on folding wedges of compressible board to give a minimum 150mm clearance under the pipe. Anchor the pipeline or fill with water, if necessary, to prevent flotation.

Form vertical construction joints in surround at face of flexible pipe joints using 18mm thick compressible board pre-cut to profile of pipe. Fill any gap between spigot and socket with resilient material to prevent entry of concrete.

After initial testing, place and compact more concrete for full width of trench to encase pipe to 150mm above crown or to other height as specified or shown on drawings.

**CROSSOVERS:**

Clearance between pipes to be minimum 150mm, where clearance is less than 300mm construction to be agreed with Highway Inspector.

**ROAD GULLIES:**

Road Gully to be  
PCC or VC to BS5911 Part 2 and BS 65 respectively  
**450mm dia x 900mm**  
150mm dia trapped outlet with stopper and chain  
Grating and frame to be BS EN 124 Class D 400

**GULLY CONNECTIONS:**

To be 150mm dia with 150mm (designated mix **GEN 3**) concrete surround.

**MANHOLES/INSPECTION CHAMBERS:**

All manholes to comply with Sewers for Adoption 6<sup>th</sup> Edition.  
675mm x 675mm minimum clear access.  
Cover and Frames to be ductile iron to BS EN 124 Class 400 and  
150mm deep cover

**CONVENTIONAL CHANNEL(S), BRANCHES AND BENCHING:**

Bed main channel solid in 1:3 cement: sand mortar. Connect branches to channel, preferably at half pipe level, so that discharge flows smoothly in the direction of main flow. Connect branches greater than nominal size 150mm with the soffit level with that of the main drain. Where the connecting angle is more than 45° to direction of flow use three-quarter section channel bends. Use clips or ensure adequate mechanical key when bedding plastics channels on to mortar.

Form benching in concrete, designated mix **GEN 3**, to rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls. Within 3 hours float with coat of 1:2 cement: sand mortar (high strength topping) and finish smooth with steel trowel.

**TESTING AND CLEANING:**

All drainage to be tested and cleaned in accordance with SHW, Clause 509 and BS EN 752 – See *Appendix A*

**CCTV INSPECTION OF PRIVATE PIPELINES:**

Carry out and record internal inspection of each Foul Water Drain (FWD) and Surface Water Drain (SWD) with CCTV equipment.

Provide all necessary equipment, including suitable covered accommodation for viewing monitor screen, together with personnel experienced in operation of the equipment and interpretation of the results.

Ensure that adequate intensity of illumination within pipe(s) is maintained.

Provide for continual position recording, still photographs and stopping movement of the camera at any point requested by Engineer.

Provide copy of videotape recording to Engineer.

Obtain instruction from Engineer on remedying any defects which may be revealed.

**AS BUILT SURVEY**

Carry out survey and record 'as constructed' cover & invert levels and locations of all SWD and FWD manholes.

Provide a copy of 'as constructed' survey to the Engineer in printed and electronic formats (dwg or dxf unless agreed otherwise.)



## APPENDIX A

## TESTING AND CLEANING: SHW Appendix 5/1 Requirements:

The following testing shall be carried out and test certificates provided to the Engineer.

SHW Clause	Material	Test Requirement	Frequency of testing	Comment
501	Pipes for drainage and Service Ducts			Product Certification Scheme documentation to be provided
	Vitrified clay			
	Concrete-PC/SRC, not exceeding 1050mm diameter			
	Concrete Pre-stressed, not exceeding 1050mm diameter			
	Other materials			BBA certification (or equivalent) documentation to be provided
503	Pipe Bedding	Grading and fines content	1 per source	
		Water soluble sulphate content	3 per source	
		Oxidisable sulphides content and total potential sulphate content	3 per source	
		Resistance to fragmentation	1 per source	
505	Filter Medium Backfill	Plastic Index	1 per source	
		Resistance to fragmentation	1 per source	
		Water-soluble sulphate content	3 per source	
		Oxidisable sulphides Content and total potential sulphate content	3 per source	
		Grading and fines content	1 per source	
		Permeability	1 per source	



SHW Clause	Material	Test Requirement	Frequency of testing	Comment
506	Sealing existing drains			Permanent sealing not required
507	Chambers	Precast Concrete		Product Certification scheme documentation to be provided
	Manhole steps			
	Steel fitments			Hydrobrake documentation
	Covers, grates and frames			Product Certification scheme documentation to be provided
	Cover Bolts			
508	Gullies and pipe junctions			Product Certification scheme documentation to be provided
	Pre-cast concrete			
	Clay			
	Cast Iron and Steel			
509	Watertightness of joints	Air Test	All pipelines with watertight joints	See SHW clause 504. All joints are to be watertight unless otherwise shown on drawings or elsewhere in this specification
513	Precast hollow concrete blocks	(Manufacturer's tests)		Required
515	Narrow filter drains			
	Geotextile, pipes and fittings		Required	BBA certification (or equivalent) applies
	Granular fill	Plastic index	1 per source	
		Resistance to fragmentation		
		Water-soluble sulphate content	5 per source	
		Oxidisable sulphides (OS) Content and total potential sulphate Content	5 per source	
		Grading and fines content	1 per week (minimum of 3)	
		Permeability	1 per source	

<b>SHW Clause</b>	<b>Material</b>	<b>Test Requirement</b>	<b>Frequency of testing</b>	<b>Comment</b>
<b>518</b>	<b>Thermoplastics structured wall pipes and fittings</b>	<b>(Manufacturer's tests)</b>	<b>Required</b>	<b>BBA certification (or equivalent applies)</b>