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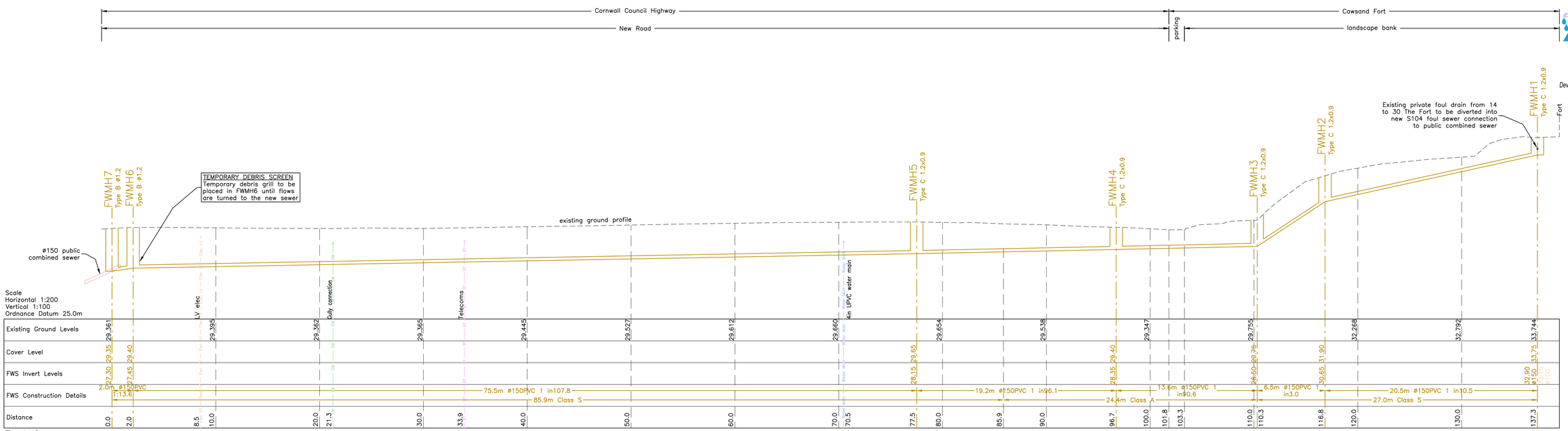
Development Infrastructure Engineering



Foul Sewer

Sewer Adoption Construction Notes
Design and Construction Guidance
Sewerage Sector Guidance Appendix C V2.0

1. General

1.1. All dimensions are given in millimetres unless otherwise stated.

1.2. All levels are referred to Ordnance Datum.

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1.4. Statutory Undertakers apparatus details where shown are for illustrative purposes only as such their locations and depths cannot be guaranteed. Reference should be made to the relevant statutory body for appropriate location detection measures prior to commencing excavation.

1.5. The planning, design and construction of sewers shall be in accordance with Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code") Approved Version 2.0 10 March 2020, the Civil Engineering Specification for the Water Industry 7th Edition and South West Water amendments to Civil Engineering Specification for the Water Industry 7th Edition dated May 2011.

1.6. Figure references below refer to Figures in SSG Design and Construction Guidance V2.0.

1.7. The Contractor is to comply in all respects with current Building Legislation and British Standards. This drawing must be read with and checked by the Contractor against any structural, geotechnical or other specialist documentation available.

1.8. Where work is required to be carried out within or adjacent to any sewer, there shall be regard of the relevant provisions of 'The Classification and Management of Confined Space Entries' published by Water UK.

1.9. This drawing is to be read in conjunction with all other relevant Sewer and Highway Adoption drawings, documents and specifications.

1.10. Existing critical levels marked (*) are to be verified by trial excavation prior to commencement of construction.

1.11. Existing levels marked (?) are to be confirmed.

1.12. This drawing is not intended to show details of foundations, ground conditions or contaminants. Any suspected contamination found by the Contractor is to be reported to the Consultant and further investigated by a suitable expert appointed by the Contractor.

1.13. Setting out to be based on information shown on the Developer's drawings and not by scaling. Discrepancies are to be reported to the Consultant.

1.14. Preliminary and tender stage drawings shall not be used for construction.

2. Materials

2.1. Vitrified clay pipes and fittings for sewers shall have flexible mechanical joints. Pipes for foul sewers and surface water sewers shall comply with the relevant requirements of BS EN 295–1 and BS 65 (surface water pipes only) for pipe crushing strengths of 40kN/m up to and including 150mm dia, 45kN/m for 225mm dia and 72kN/m for 300mm dia.

2.2. Un–reinforced and reinforced concrete pipes and fittings shall comply with the relevant provisions of BS EN 1916 and BS 5911:Port 1 and shall be Class 120 to conform with EN1916/BS5911. All pipes and fittings shall have gasket type joints of spigot and socket or rebate form.

2.3. PVC Ultrarib (150mm, 225mm and 300mm diameters) solid wall pipes, joints and fittings for gravity sewers and drains shall comply with the relevant provisions of BS 4660, BS 5481 or BS EN 1401–1 respectively. PVC Ultrarib solid wall pipes shall be laid in lengths no greater than 3.0m.

2.4. Ductile iron pipes, fittings and joints shall comply with BS EN 598 for sewerage applications. Site applied external protection of ductile iron pipes shall comprise the covering of the pipes with lay flat polythene sheeting securely held in place with adhesive tape at pipe joints and intermediate positions. Factory applied external protection formed of plastic sleeving or plastic tape shall have the protection of joints and repairs to any damage carried out in accordance with the manufacturer's instructions.

2.5. Polyethylene pressure pipes for rising mains shall comply with the relevant provisions of BS EN 13244–2. The colour shall be BLACK. Polyethylene fittings, including fusion joints and electrofusion fittings shall comply with the relevant provisions of BS EN 13244–3. HDPE pipework shall conform to BS EN1295–1 for pipe strengths detailed on the scheme drawings.

2.6. Polyethylene (Ridgistorm XL) structured wall pipes, joints and fittings for gravity sewers and drains 750–3000mm diameters manufactured in accordance with BS EN 13476–1 & 3 [BS EN13476 is classed as a guidance document for pipe Ø > 1200mm] to stiffness classification 8 (PP–SNB) shall carry the BSI Kitemark, be BBA approved & adoptable by water companies and fully comply with the relevant provisions of BS EN 13476–1 & WIS 4–35–01 v2, and will meet WRc Code of Practice for high pressure water jetting tolerance.

2.7. Polypropylene (Twinwall) structured wall pipes, joints and fittings for gravity sewers and drains 225–600mm diameters manufactured to stiffness classification 8 (PP–SNB) shall carry the BSI Kitemark, be BBA approved & adoptable by water companies and fully comply with the relevant provisions of BS EN 13476–1 & WIS 4–35–01 v2, and will meet WRc Code of Practice for high pressure water jetting tolerance.

2.8. Thermoplastics pipes, joints and fittings for gravity sewers shall comply with the relevant provisions of BS EN 1401–1, BS EN 1852 and BS EN 12666–1.

2.9. Short length pipes built into manholes together with rocker pipes shall be of the material consistent with the sewer pipe length.

2.10. Vitrified clay channels to be used in constructed manholes for pipework up to 300mm diameter. Channel material to be agreed for pipework above 300mm diameter.

2.11. Sewers should be laid in straight lines in both the vertical alignment (profile) and horizontal alignment (plan) except that bends up to 45 degrees may be laid immediately outside inspection chambers (see Figure B.13).

2.12. Manhole and inspection chamber cover loading shall be in accordance with manhole schedule for specific chamber locations. "In–fill" type covers should not be used. Where a cover is located in an area of block paving, the bottom of the frame should be 150 mm deep.

2.13. Manhole and inspection chamber covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highways Agency Guidance Document HA 104/09 shall have a minimum square opening of 600 x 600mm. Covers shall be double triangle for 675mm square openings and be provided with loose bolted connections. They shall be of a non–rocking design which does not rely on the use of cushion inserts. Inspection chamber covers on foul–only sewers shall be of low leakage types in order to prevent excessive surface water ingress. As a minimum, Class D 400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles. Class B 125 shall be used in footways, pedestrian areas and communal locations. All inspection chamber covers shall be the non–ventilating type and shall have closed keyways.

2.14. All ironwork to be kite marked by BSI or certified by equal inspection authority.

2.15. The use of ladders or steps in manholes, wet wells and valve chambers shall comply with the following: Steel plastic encapsulated MH single steps shall not be used in MHs of a greater depth than 1.0m. Steel plastic encapsulated double steps may be provided in MHs up to 3.0m in depth. Ladders shall be provided in accordance with BS 4211 in MHs between 3.0 & 6.0m deep. MHs greater than 6.0m deep shall be specially designed and have intermediate landings. Access holes in intermediate landings shall be provided with galvanised mild steel gratings to prevent persons falling through. The design of deep MHs shall permit the use of a winch or lifting gear mounted at ground level in case of emergencies.

2.16. Fully bar carbon steel or stainless steel ladders for vertical fixing to MHs will be acceptable.

2.17. Proposed adoptable sewers are only permitted to have other sewer/gully connections and other services laid at an angle of between 45 degrees and 90 degrees across the line with a vertical clearance in excess of 300mm.

2.18. Red coloured plastic marker tape at least 150mm wide is to be laid at a minimum of 200mm above the soffit of the pipe. The tape shall be printed with a description of the service in bold capital letters throughout its length, in intervals not exceeding 700mm and shall incorporate a corrosion resistant tracing system for non–metallic pipes.

2.19. The minimum depth of cover to the crown of gravity pipes without protection should be as follows:

3.1.1. domestic gardens and pathways without any possibility of vehicular access, 0.35m;

3.1.2. domestic driveways, parking areas and yards with height restrictions to prevent entry by vehicles with a gross vehicle weight in excess of 7.5tonnes, 0.5m;

3.1.3. domestic driveways, parking areas and narrow streets without footways (e.g., mews developments) with limited access for vehicles with a gross vehicle weight in excess of 7.5tonnes, 0.9m;

3.1.4. agricultural land and public open space, 0.9m;

3.1.5. other highways and parking areas with unrestricted access to vehicles with a gross vehicle weight in excess of 7.5tonnes, 1.2m.

3.2. If the depth of cover to the crown of the pipe is less than the values above one of the following protection measures should be provided:

3.2.1. a concrete slab in accordance with Figure B.18; or

3.2.2. a concrete surround with flexible joints in accordance with Figure B.19; or

3.2.3. a ductile iron pipe of an adequate strength should be used. Where connections are made to adoptable sewer pipelines laid in ductile iron, a ductile iron junction pipe shall be used.

3.3. Protection of pipes laid at shallow depths, joints for concrete encased pipes and protection of pipes penetrating single leaf boundary walls shall be provided in accordance with SSG Design and Construction Guidance V2.0. Figures B.27, B28 and B29 respectively.

3.4. Minimum backdrop height shall be 1m.

3.5. The Contractor is responsible for all pipe fittings and resistance to thrusts.

3.6. When the proposed site drainage connects to the public sewerage system either by new junction, new manhole or at an existing manhole, it will require the submission of an application for sewer connection form to SWW Ltd prior to works commencing.

3.7. Private drainage and utility services to be laid 300mm vertically clear of and no more acute than 45° horizontally to that of the adoptable sewers.

3.8. 150mm wide concrete surround to ground level to be provided to frames in unmade ground.

3.9. All constructed manholes using pre–cast sections shall have joints sealed using 'Iokstrip' and lifting eyes are to be pointed with resin modified mortar.

3.10. Manholes with outgoing pipework greater than 375mm dia shall be fitted with guide bars, safety chains or other safety devices.

3.11. No private drainage surface water run–off is permitted to discharge onto adoptable highway.

3.12. No tree, shrub or bush shall be planted close to a sewer or lateral drain than the canopy width at mature height without special precautions in accordance with Clause B5.5. No tree shall be planted directly over sewers or where excavation onto the sewer would require removal of the tree. The following shallow rooting shrubs are generally suitable for planting close to sewers and lateral drains:

3.12.1. Berberis candidula; (Paleleaf barberry)
3.12.2. Berberis julianae; (Wintergreen barberry)
3.12.3. Ceanothus burkwoodii; (Californian lilac 'Burkwoodii')
3.12.4. Cotoneaster dammeri; (Bearberry cotoneaster)
3.12.5. Cotoneaster skogholm; (Cotoneaster x suecicus, 'Skogholm')
3.12.6. Cytisus varieties or Sarothamnus; ((Common or Scotch) Broom)
3.12.7. Euonymus japonica; (Japanese spindle)
3.12.8. Euonymus radicans; Variety of Euonymus (Fortune's spindle or wintercreeper)
3.12.9. Mahonia varieties; can be included in the genus Berberis, most common name is M. aquifolium (Oregon grape)
3.12.10. Potentilla varieties; most varieties are types of cinquefoil. Also includes Common tormentil, silverweed and barren strawberry
3.12.11. Skimmia japonica; (Skimmia)
3.12.12. Spiraea japonica; (Japanese spirea or Japanese meadowsweet)
3.12.13. Veronica varieties; (Speedwell)
3.12.14. Viburnum davidii; (David viburnum)
3.12.15. Viburnum tinus; (Lauristinus)

4. Reinstatement

4.1. The reinstatement and backfill of trench excavations in existing roads or constructed prospectively adoptable highways will be to New Roads and Street Works Act 1991 Specification for the Reinstatement of Openings in Highways Third Edition Code of Practice for England Approved by the Secretary of State under Section 71 of the New Roads and Street Works Act 1991 published by Highway Authorities and Utilities Committee (HAUC).

Pipe Trench Beddings

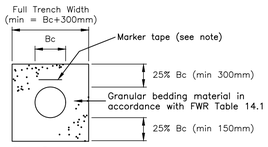
Foundation for Water Research Table 14.1
Granular bedding and sidefill materials for flexible pipes.

Nominal size of pipes (mm)	Maximum particle size (mm)	Granular materials	Maximum compaction fraction value for granular materials
100	10	10mm nominal single size	0.15
Over 100 to 150	15	10 or 14mm nominal single size or 14mm to 5mm graded	0.15
Over 150 to 300	20	10, 14 or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded	0.15
Over 300 to 600	20	14 or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded	0.15
Over 600	40	14, 20 or 40mm single size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded	0.15

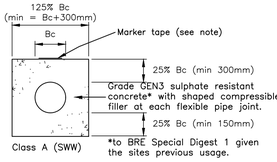
NOTES (a) Imported granular materials to include aggregates to BS 882, air cooled blast furnace slag to BS 1047 and sintered pulverised fuel ash to BS 3797.
(b) Material excavated from trenches dug through land contaminated with domestic, building or industrial waste should not be used as bedding or side fill material.
(c) Air cooled blast furnace slag and sintered pulverised fuel ash are not recommended for use with ductile iron or steel pipelines because of the risk of corrosion.

M.H. Ref	Plan	Cover Level (m)	Invert Level (m)	Depth (m)	Type	Dimensions	Pipe Diameter (mm) Main inlet	Branch Inlet(s)	Outlet	Cover Grade	Remarks
FWMH1	X-150 PVC, A-100	107.150	105.550	1.600	Type C	1.2x0.9	150		150	D400 1220x685	
FWMH2	X-150 PVC, A-150 PVC	106.400	104.800	1.600	Type C	1.2x0.9	150		150	D400 1220x685	
FWMH3	X-150 PVC, A-150 PVC	105.100	103.500	1.600	Type C	1.2x0.9	150		150	D400 1220x685	
FWMH4	X-150 PVC, A-150 PVC	103.850	102.150	1.700	Type C	1.2x0.9	150		150	D400 1220x685	
FWMH5	X-150 PVC, A-150 PVC	99.500	97.550	1.950	Type C	1.2x0.9	150		150	D400 1220x685	
FWMH6	X-150 PVC, A-150 PVC	95.150	92.950	2.200	Type B	Ø1.2	150		150	D400 600x600	
FWMH7	X-150 PVC, B-150 PVC, A-150	90.800	88.350	2.450	Type B	Ø1.2	150	150	150	D400 600x600	

Pipe orientation shown is diagrammatic only.



Class S



Class A (SWW)

*to BRE Special Digest 1 given the sites previous usage.

MARKER TAPE
Red coloured PVC or heavy gauge polyethylene sheeting marker tape at least 150mm wide shall be laid at a minimum of 200mm above the soffit of the pipe. The tape shall be printed with the words "GRAVITY SEWER" or "PUMPED SEWER" in bold capital letters throughout its length and at intervals not exceeding 700mm and shall incorporate a corrosion resistant tracing system for non–metallic pipes.

Rev.	Date	By	Eng.	Details
A	28 Oct 22	ATCL	cp	Approved
.	23/08/21	ATCL	cp	First issue

REVISIONS

Drawing Status
APPROVED

Client
Cawsand Fort Management Company Ltd

Scheme Title.
Cawsand
The Fort, New Road

Drawing Title.
S104 Foul Sewer Adoption Long Section and Manhole Schedule

North	Drawn	Checked	Date
	Atcl	.	28 Oct 22

Scale @ A1	Scheme	Drg. No.	Rev.
1:200	AT2445	03	A