

Ennor Farm

Confidential

Drainage Specification

For

The Council of the Isles of Scilly

Project Number: 13847

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Document Details

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R12

Below ground drainage systems

Clauses

2 To be read with preliminaries/ general conditions.

General

110 Below ground drainage system

1. Description: Surface and Foul Water
2. Surface water and rainwater drainage sources: One piece gullies and covers, Rainwater downpipes (nonsiphonic), as section R10
3. Foul drainage sources: Discharge stack and branch pipes, as section R11
4. Land drainage sources: Below ground pipelines from land drainage, as section R13
5. Pressure relief drainage sources: None
6. Pipes, bends and junctions: PVC-U - solid wall
 - 6.1. Accessories: Connectors - saddle, Rodding points
7. Manholes, inspection chambers, traps, and separators: Inspection chambers - plastics, Manholes and inspection chambers - concrete
 - 7.1. Accessories: Manhole channels and branches - conventional, Sealing for concrete manholes - bituminous strips, Vortex flow control units
8. Disposal: To sewers, To storage tanks
9. Accessories – general: Concrete, Geotextile - filter, Geotextile - impervious

122 Soakaway system – plastics units

1. Description: Private Soakaways to Plots 03 - 12
2. Rainwater drainage sources: Below ground rainwater pipelines
3. Foul drainage sources: None
4. Soakaway units: As section R17
 - 4.1. Accessories: Geotextile membranes - filter, Geotextile membranes - membrane
5. Pipes, bends and junctions: Submit proposals

124 Soakaway system – granular fill

1. Description: Filter Trench and Tickle Trench Outfall
2. Rainwater drainage sources: Below ground rainwater pipelines
3. Foul drainage sources: None
4. Soakaways
 - 4.1. Geotextile: As section R17
 - 4.2. Granular fill – rubble: As section R17
 - 4.3. Accessories: None
5. Pipes, bends and junctions: Submit proposals

135 Private packaged pumping stations and pressure pipeline system

1. Description: Foul Water
2. Foul drainage sources: Below ground pipelines.
3. Private packaged pumping stations: As section R18

- 3.1. Control panel type: Submit proposals
 - 3.1.1. Location: Submit proposals
 - 3.1.2. Distance from tank: Submit proposals
- 3.2. Accessories: Submit proposals
4. Pressure pipes, bends and junctions: Submit proposals
 - 4.1. Accessories: Submit proposals
5. Disposal: Sewers

145X Adoptable works and standards

1. Works which are to be adopted shall be carried out in accordance with the adopting authority's standard specifications and requirements. where inconsistencies occur between this specification and the adopting authority standard specifications and requirements, the adopting authority standard specifications and requirement shall take precedence on adoptable works.
2. The Contractor shall confirm with the adopting authority requirements with regard to inspection notices, approvals, procedures, submissions etc. in advance of any works.
3. The above requirements shall also apply to areas of work already under the control of the Local Authority.

150X Contractor

1. The Contractor's particular attention is drawn to the following items: Refer to 13847-CRH-XX-XX-DR-C-5301 for filter trench and trickle trench outfall details

System performance

211 Design – below ground drainage systems

1. Design: Complete the design of the below ground drainage system in accordance with BS EN 752, BS EN 1295-1 and BS EN 1610.
2. Ground conditions: Refer to geotechnical site investigation reports
3. Performance criteria: Building Regulations Part H, Sewerage Sector Guidance Appendix C
4. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

Products

312 Adaptors to plastics drainage

1. Description: Surface Water
2. Material and standard: Plastics to BS 4660 and Kitemark certified or to BS EN 1401-1 and Kitemark certified.
3. Type: DN 100 rainwater pipe to DN 100 plastics, DN 100 rainwater pipe to DN 150 plastics
4. Manufacturer: Submit proposals
 - 4.1. Product reference: Submit proposals

315 One piece gullies and covers

1. Description: Surface Water
2. Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
 - 2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
 - 2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
 - 2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
 - 2.4. Plastics: To BS 4660 and Kitemark certified, or Agrément certified.
 - 2.5. Polypropylene: To BS EN 1852-1.

3. Material: Concrete
4. Manufacturer: Submit proposals
 - 4.1. Product reference: Submit proposals
5. Sizes: 900 x 450 mm
6. Outlet sizes: DN 150
7. Covers: Double Triangular Gully Grating
 - 7.1. Product reference: Submit proposals
 - 7.2. Type: Loose grating
 - 7.3. Material: Ductile cast iron
 - 7.4. Sizes: 450 x 450 mm
 - 7.5. Loading grades to BS EN 124: D400
8. Silt buckets: As drawing 13847-CRH-XX-XX-DR-C-5301
 - 8.1. Product reference: Submit proposal

329 Pipes, bends and junctions – supply

1. Pipes and fittings: From same manufacturer for each pipeline.

344 Pipes, bends and junctions - plastics - structured wall

1. Description: Surface and Foul Water
2. Standard: Type B, to BS EN 13476-1 and -3, Kitemark or Agrément certified
 - 2.1. Supplementary requirements: Puncture resistance, jetting resistance and longitudinal bending to requirements of WIS 4-35-01, issue 2.
3. Material: PVC-U
4. Manufacturer: Submit proposals
 - 4.1. Product reference: Submit proposals
5. Recycled content: Submit proposals
6. Sizes: DN 110, DN 150, DN 255
7. Jointing type: Spigot and socket

346 Pipes, bends and junctions – pvc-u – solid wall

1. Description: Foul Water
2. Standard: BS EN 1401-1 with flexible joints.
 - 2.1. Class: SN8
3. Manufacturer: Submit proposals
 - 3.1. Product reference: Submit proposals
4. Recycled content: Submit proposals
5. Sizes: DN 100, DN 160
6. Application area code: UD.

357 Connectors – saddle

1. Description: Surface and Foul Water
2. Standards
 - 2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
 - 2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
 - 2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
 - 2.4. Plastics: To BS 4660 and Kitemark certified, or Agrément certified.

3. Material: Plastics
4. Manufacturer: Submit Proposals
 - 4.1. Product reference: Submit Proposals
5. Sizes: DN 100, DN 150, DN 225

359 Flexible couplings

1. Description: Surface and Foul Water
2. Standard: To BS EN 295-4 or WIS 4-41-01 and Kitemark certified, or Agrément certified.
3. Manufacturer: Submit proposals
 - 3.1. Product reference: Submit proposals

371 Rodding points

1. Description: Surface Water
2. Standards
 - 2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
 - 2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
 - 2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
 - 2.4. Plastics: To BS 4660 and Kitemark certified, to BS EN 13598-1 or Agrément certified.
3. Material: Plastics
4. Manufacturer: Submit proposals
 - 4.1. Product reference: Submit proposals
5. Sizes: DN 100, DN 150

401 Inspection chambers – plastics

1. Description: Surface and Foul Water
2. Standard: To BS EN 13598-1, BS EN 13598-2 or Agrément certified.
3. Diameter: 450 mm
4. Manufacturer: Submit proposals
5. Bases
 - 5.1. Product reference: Submit proposals
6. Shaft units
 - 6.1. Product reference: Submit proposals
7. Access covers and frames
 - 7.1. Product reference: Submit proposals
 - 7.2. Loading grades to BS EN 124: B125

407 Manholes and inspection chambers – concrete

1. Description: Surface and Foul Water
2. Standards
 - 2.1. To BS 5911-3 and BS EN 1917 and Kitemark certified; or
 - 2.2. To BS 5911-4 and BS EN 1917.
3. Manufacturer: Submit proposals
4. Shape: Circular
5. Sizes: DN 1200
6. Cement type and content: To BS 5911-1 and BS EN 1916

7. Chamber sections
 - 7.1. Product reference: Submit proposals
 - 7.2. Jointing type: Bituminous strips
8. Cover slabs
 - 8.1. Product reference: Submit proposals
 - 8.2. Thickness: To be designed by Manufacturer, suitable for B125 or D400 loading
 - 8.3. Loading grades to BS EN 124: B125, D400
 - 8.4. Openings: To suit access covers.
9. Steps: Not required
10. Vortex flow control unit: As drawings 13847-CRH-XX-XX-DR-C-5050 and 13847-CRH-XX-XX-DR-C-5302, to CL437

414X Flow control chamber

1. Precast concrete manhole: As clause 407 but modified as detailed on manufacturers installation drawings.
2. Flow Control Chamber design parameters: Discharge: l/s
3. Design head: m
 - 3.1. Surface water: Yes
 - 3.1.1. Pre initialised: Yes/No

433 Manhole channels and branches – conventional

1. Description: Surface and Foul Water
2. Material: Plastics
3. Manufacturer: Submit proposals
 - 3.1. Product reference: Submit proposals

435 Manhole channels and branches – preformed plastics

1. Description: Surface and Foul Water
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

437 Vortex flow control units

1. Description: Surface Water
2. Manufacturer: Hydro-International
 - 2.1. Product reference: As drawing 13847-CRH-XX-XX-DR-C-5302
3. Material: Stainless steel
4. Drain down secondary outlet pipe: Integral
 - 4.1. Control type: Submit proposals
 - 4.2. Operation: From surface.

444 Sealing for concrete manholes – bituminous strips

1. Description: Surface and Foul Water
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

446 Sealing for concrete manholes – mortar

1. Description: Surface and Foul Water
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

448 Sealing for concrete manholes – sealant

1. Description: Surface and Foul Water
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

464 Modular stormwater attenuation units

1. Description: Surface Water, beneath car park
2. Manufacturer: Polypipe or similar approved
 - 2.1. Product reference: PSM1A or similar approved
3. Unit size: Manufacturer's standard
4. Tank capacity/ size (minimum): As drawing 13847-CRH-XX-XX-DR-C-5305

468 Precast concrete cover slabs

1. Standard: To BS 5911-3 and BS EN 1917 and Kitemark certified.
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals
3. Size: 1200 mm diameter
4. Openings: 600 mm diameter (minimum)

471 Access covers and frames

1. Description: Surface and Foul Water
2. Standard: To BS EN 124.
3. Types: Single seal
4. Manufacturer: Submit proposals
 - 4.1. Product reference: Submit proposals
5. Material: Ductile cast iron
6. Finishes: Self finish
7. Sizes: 450 x 450 mm, 600 x 600 mm
8. Loading grades to BS EN 124: B125 for chambers in pedestrian areas, D400 for chambers in carriageway
9. Edging trims: Not required
10. Accessories: None

485 Concrete (structural)

1. Standard: To BS 8500-2.
2. Concrete: GEN3

487 Concrete (adoptable manhole benchings and surrounds)

1. Standard:
 - 1.1. England and Wales, Northern Ireland: To WRc 'Sewers for Adoption'.
 - 1.2. Scotland: To WRc 'Sewers for Scotland'.

2. Concrete: In situ.

489 Concrete (adoptable manhole benching topping)

1. Standard:
 - 1.1. England and Wales, Northern Ireland: To WRc 'Sewers for Adoption'.
 - 1.2. Scotland: To WRc 'Sewers for Scotland'.
2. Concrete: High strength.

492 Geotextile membranes – filter

1. Description: Soakaways and trenches
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

494 Geotextile membranes – impervious

1. Description: Permeable Paving and Geocellular Attenuation Tank
2. Manufacturer: Submit proposals
 - 2.1. Product reference: Submit proposals

496 Granular material – natural

1. Description: Surface and Foul Water
2. Standards: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
3. Supplier : Submit proposals
4. Recycled content: Submit proposals
5. Size: Dependent on location – see Execution clauses in this section, and in sections R16, R17 and R18, if used.

497 Granular material – manufactured

1. Description: Surface and Foul Water
2. Standards: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
3. Manufacturer: Submit proposals
 - 3.1. Product reference: Submit proposals
4. Material: Manufacturer's standard
5. Size: Dependent on location – see Execution clauses in this section, and in sections R16, R17 and R18, if used.

498 Granular sub-base material

1. Description: Roads and Footways
2. Standard: To Highways Agency Volume 1, 'Specification for Highway Works', Type 1 Unbound mixtures for sub-base.
3. Recycled content: Submit proposals

Fabrication - Not Used

Execution

611 Existing drains

1. Setting out: Before starting work, check invert levels and positions of existing drains, sewers, inspection chambers and manholes against drawings. Report discrepancies.

2. **Protection:** Protect existing drains to be retained and maintain normal operation if in use.

613 Excavated material

1. **Turf, topsoil, hardcore, etc:** Set aside for use in reinstatement.

616 Selected fill for backfilling

1. **Selected fill:** As-dug material, free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve.
 - 1.1. **Compaction:** By hand in 100 mm layers.

623 Lower part of trench – general

1. **Trench up to 300 mm above crown of pipe:** Vertical sides, width as small as practicable.
 - 1.1. **Width (minimum):** External diameter of pipe plus 300 mm.

625 Lower part of trench – transition depth

1. **Trench widths up to 300 mm above crown of pipe (maximum)**
 - 1.1. DN 100 pipelines more than 6.0 m deep: 600 mm.
 - 1.2. DN 150 pipelines more than 5.4 m deep: 700 mm.
 - 1.3. DN 225 pipelines more than 4.0 m deep: 800 mm.
 - 1.4. DN 300 pipelines more than 2.9 m deep: 900 mm.

631 Type of subsoil

1. **General:** Where type of subsoil at level of crown of pipe differs from that stated for the type of bedding, surround or support, give notice.

635 Formation for beddings

1. **Timing:** Excavate to formation immediately before laying beddings or pipes.
2. **Mud, rock projections, boulders and hard spots:** Remove. Replace with consolidated bedding material.
3. **Local soft spots:** Harden by tamping in bedding material.
4. **Inspection of excavated formations:** Give notice.

641 Pipes at different levels in common trench

1. **Subtrench:** Permissible provided soil of step is stable and unlikely to break away.
 - 1.1. **Subtrench not permissible:** Trench depth as required for lower pipe. Increase thickness of bedding to upper pipe as necessary.
2. **Lower pipe:** Backfill with compacted granular material to at least half way up higher pipe.
3. **Clear horizontal distance between pipes (minimum)**
 - 3.1. Pipes up to DN 700: 350 mm.
 - 3.2. Pipes exceeding DN 700: 500 mm.

653 Class B support

1. **Description:** Where directed by Engineer
2. **Type of subsoil:** Gravel, sand - compact
3. **Granular material:** Submit proposals
 - 3.1. **Sizes:** To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
4. **Bedding**

- 4.1. Material: Granular, compacted over full width of trench.
- 4.2. Thickness (minimum): 50 mm for sleeve jointed pipes, 100 mm for socket jointed pipes. If trench bottom is uneven, increase thickness by 100 mm.
5. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
6. Initial testing before placing support: Not required
7. Support
 - 7.1. Material: Granular.
 - 7.2. Depth: Halfway up each side of pipe.
 - 7.3. Compaction: By hand.
8. Backfilling
 - 8.1. Material: Protective cushion of selected fill.
 - 8.2. Depth: To 150 mm (250 mm for adoptable sewers) above crown of pipe.
 - 8.3. Compaction: By hand in 100 mm layers.

667 Class S surround

1. Description: Surface and Foul Water
2. Type of subsoil: Gravel, sand - compact
3. Trench width up to 300 mm above crown of pipe (maximum)
 - 3.1. DN 100 nominal pipe size: 600 mm.
 - 3.2. DN 150 nominal pipe size: 700 mm.
 - 3.3. DN 225 nominal pipe size: 800 mm.
 - 3.4. DN 300 nominal pipe size: 900 mm.
4. Granular material: Submit proposals
 - 4.1. Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
5. Bedding
 - 5.1. Material: Granular, compacted over full width of trench.
 - 5.2. Thickness (minimum): 50 mm for sleeve jointed pipes, 100 mm for socket jointed pipes. Where trench bottom is uneven, increase depth by 100 mm.
6. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
7. Initial testing before placing surround: Required
8. Surround
 - 8.1. Material: Granular.
 - 8.2. Depth: To 50 mm above crown of pipe.
 - 8.3. Compaction: By hand in 100 mm layers.
9. Backfilling
 - 9.1. Material: Protective cushion of selected fill.
 - 9.2. Depth: 150 mm (250 mm for adoptable sewers) above crown of pipe.
 - 9.3. Compaction: By hand in 100 mm layers.

678 Class Z surround

1. Description: Surface and Foul Water
2. Type of subsoil: Submit proposals
3. Blinding
 - 3.1. Material: Concrete (general).
 - 3.2. Material: Concrete.

- 3.3. Thickness (minimum): 25 mm.
- 3.4. Width: Full width of trench.
- 3.5. Allow to set before proceeding.
4. Pipes
 - 4.1. Temporary support: Folding wedges of compressible board. Prevent flotation.
 - 4.2. Clearance under pipes (minimum): 100 mm.
 - 4.3. Adjust pipes to line and gradient.
5. Initial testing before placing surround: Required
6. Surround
 - 6.1. Material: Concrete.
 - 6.2. Depth: To 150 mm above crown of pipe.
 - 6.3. Width: Full width of trench.
7. Vertical construction joints
 - 7.1. Location: At face of flexible pipe joints.
 - 7.2. Material: 18 mm thick compressible board precut to profile of pipe.
 - 7.3. Socketed pipes: Fill gaps between spigots and sockets with resilient material to prevent entry of concrete.

680 Concrete surround for pipe runs near foundations

1. Class Z surround: Provide in locations where bottom of trench is lower than bottom of foundation and as follows (horizontal clear distance between nearest edges of foundations and pipe trenches):
 - 1.1. Trenches less than 1 m from foundations: Top of concrete surround not lower than bottom of foundation.
 - 1.2. Trenches more than 1 m from foundations: Top of concrete surround not lower than D mm below bottom of foundation, where D mm is horizontal distance of trench from foundation, less 150 mm.

683 Laying pipelines

1. Laying pipes: To true line and regular gradient on even bed for full length of barrel with sockets (if any) facing up the gradient.
2. Ingress of debris: Seal exposed ends during construction.
3. Timing: Minimize time between laying and testing.

684X Tolerances in pipelines

1. The position of the internal face of any pipeline shall not deviate from the line and level described in the agreement by more than ± 20 mm, provided that no pipe shall have a reverse gradient.
2. Where rising mains are laid to curves, the deflection at any pipe joint as laid shall not exceed three quarters of the maximum deflection recommended by the manufacturer.

685 Jointing pipelines

1. Connections: Durable, effective and free from leakage.
2. Junctions, including to differing pipework systems: With adaptors intended for the purpose.
3. Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
4. Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
5. Allowance for movement: Provide and maintain appropriate clearance at ends of spigots as fixing and jointing proceeds.

6. **Jointing material:** Do not allow to project into bore of pipes and fittings.

687 Concrete surround for crossovers

1. **Class Z surround:** Provide where two pipelines (other than plastics pipes) cross with less than 300 mm separation.
 - 1.1. **Extent, on both pipes:** 1 m centred on the crossing point, and beyond as necessary to come within 150 mm of nearest flexible joints.

689 Pipelines passing through structures

1. **Pipelines that must be cast in or fixed to structures (including manholes, catchpits and inspection chambers):** Provide 600 mm long rocker pipes adjacent to the external face of the structure (or both faces where appropriate, e.g. walls to footings), with flexible joints at both ends.
 - 1.1. **Distance to rocker pipe from structure (maximum):** 150 mm.
2. **Provision for movement for pipelines that need not be cast in or fixed to structures (e.g. walls to footings)**
 - 2.1. **Rocker pipes as specified above; or**
 - 2.2. **Openings in the structures to give 50 mm minimum clearance around the pipeline. Closely fit a rigid sheet to each side of opening to prevent ingress of fill or vermin.**

695 Backdrop pipes outside manhole walls

1. **Excavation beneath backdrop pipe:** Backfill.
 - 1.1. **Material:** Concrete.
2. **Pipe encasement:**
 - 2.1. **Material:** Concrete.
 - 2.2. **Thickness (minimum):** 150 mm.

697 Installing flexible couplings

1. **Ends of pipes to be joined:** Cut cleanly and square.
2. **Outer surfaces of pipes to be joined:** Clean and smooth. Where necessary, e.g. on concrete or iron pipes, smooth out mould lines and/ or apply a cement grout over the sealing area.
3. **Clamping bands:** Tighten carefully to make gastight and watertight seals.

699 Connections to sewers

1. **General:** Connect new pipework to existing adopted sewers to the requirements of the adopting authority or its agent.

702X Future connection(s)

1. **Connections for future addition to the sewer to be plugged with proprietary end caps at locations shown on contract drawings and suitably marked to CA approval. Stubs are to be pegged out on site using wooden stakes, coloured to make them visible.**

705 Initial testing of pipelines

1. **Before testing**
 - 1.1. **Cement mortar jointing:** Leave 24 h.
 - 1.2. **Solvent welded pipelines:** Leave 1 h.
2. **Method:** Block open ends of pipelines to be tested and pressurise. Air test short lengths to BS EN 1610.

711 Trench supports

1. Removal of trench supports and other obstacles: Sufficient to permit compacted filling of all spaces.

715 Backfilling to pipelines

1. Backfilling above top of surround or protective cushion: Material excavated from trench, compacted in layers 300 mm (maximum) thick.
2. Heavy compactors: Do not use before there is 600 mm (total) of material over pipes.

718 Backfilling over concrete

1. Minimum times from placing concrete
 - 1.1. Backfilling generally: 24 h.
 - 1.2. Heavy compactors and traffic loads: 72 h.

720 Backfilling under roads and pavings

1. Backfilling from top of surround or protective cushion up to formation level: Granular sub-base material, laid and compacted in 150 mm layers.

722 Public roads and pavings – Eng, Wales, Scot

1. Excavating and backfilling of trenches: To Department for Transport 'Specification for the reinstatement of openings in highways'.

734 Installing access points and gullies

1. Bedding
 - 1.1. Material: Granular - natural, size 4/10 to BS EN 13242
 - 1.2. Thickness (minimum): 150 mm
2. Surround
 - 2.1. Material: Concrete
 - 2.2. Thickness (minimum): 150 mm
 - 2.3. Height: Full height
3. Backfilling
 - 3.1. Material: Not required
 - 3.2. Compaction: By hand in 100 mm layers.
4. Setting out relative to adjacent construction features: Square and tightly jointed.
5. Permissible deviation in level of external covers and gratings: +0 to -6 mm.
6. Raising pieces (clay and concrete units): Joint with 1:3 cement:sand mortar.
7. Exposed openings: Fit purpose made temporary caps. Protect from traffic.

736 Installing rodding points

1. Bedding and surround
 - 1.1. Material: Concrete.
 - 1.2. Thickness (minimum): 150 mm.
2. Permissible deviation in level of external covers and gratings: +0 to -6 mm.

741 Installing inspection chambers – plastics

1. Bedding
 - 1.1. Material: Granular - natural, size 4/10 to BS EN 13242

- 1.2. Thickness (minimum): 150 mm
2. Surround
 - 2.1. Material: Granular
 - 2.2. Thickness (minimum): 150 mm
3. Backfilling: Granular material - natural, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill
 - 3.1. Compaction: By hand in 100 mm layers.
4. Concrete collar
 - 4.1. Material: Concrete
 - 4.2. Thickness (minimum): 150 mm
 - 4.3. Width (minimum): 150 mm
5. Seating: As drawing 13847-CRH-XX-XX-DR-C-5300

743 Installing concrete manholes

1. Bases
 - 1.1. Material: Concrete
 - 1.2. Thickness (minimum): 225 mm
2. Surround
 - 2.1. Material: Concrete
 - 2.2. Thickness (minimum): 150 mm
 - 2.3. Height: Full height
3. Backfilling
 - 3.1. Material: Granular - natural, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill
 - 3.2. Compaction: By hand in 100 mm layers.

750 Installing vortex flow control units

1. Benching
 - 1.1. Material: Concrete.
 - 1.2. Profile: Rise from manhole base to a level not lower than soffit of outlet pipe, then slope upwards at 10% towards soffit of inlet pipe.
 - 1.3. Topping
 - 1.3.1. Material: Concrete
 - 1.4. Application: Before benching concrete has set, and with dense smooth uniform finish.
2. Vortex flow control mounting block (cast in situ)
 - 2.1. Material: Concrete
 - 2.2. Profile: Rise from manhole base vertically to provide plane surface for attachment of unit.
3. Outlet pipe: Build in.
4. Drain down secondary outlet pipe: Build in

753 Fixing manhole steps

1. Fixing: Bed in joints
2. Positioning: 300 mm vertical centres staggered 300 mm horizontally, with lowest step 300 mm (maximum) above benching and top step 450 mm (maximum) below top of cover.

755 Jointing concrete manhole chamber sections

1. Jointing and sealing: Bituminous
2. Inner joint surface: Trim surplus jointing material extruded into chamber and point neatly.

757 Laying conventional channels, branches and benching

1. Main channel: Bed solid in 1:3 cement:sand mortar.
 - 1.1. Branches: Connect to channel, preferably at or slightly above invert level, but not higher than half pipe level, so that discharge flows smoothly in direction of main flow.
 - 1.2. Branches greater than nominal size 150 mm: Connect the branch soffit level with the main drain soffit.
 - 1.3. Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.
2. Benching
 - 2.1. Material: Concrete.
 - 2.2. Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
 - 2.3. Topping
 - 2.3.1. Material: 1:3 Cement:sand mortar
 - 2.4. Application: Before benching concrete has set, and with dense smooth uniform finish.

759 Laying preformed plastics channels, branches and benching

1. Main channel: Bed solid in 1:3 cement:sand mortar.
 - 1.1. Branches: Connect to channel, preferably at half pipe level, so that discharge flows smoothly in direction of main flow.
 - 1.2. Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.
2. Bedding: 1:3 cement:sand mortar. Use clips or ensure adequate mechanical key.
3. Benching
 - 3.1. Material: Concrete.
 - 3.2. Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
 - 3.3. Topping
 - 3.3.1. Material: 1:3 Cement:sand mortar
 - 3.3.2. Application: Before benching concrete has set, and with dense smooth uniform finish.

761 Laying sealed access fittings, branches and benching

1. Unused branches: Fit caps.
2. Bedding: 1:3 cement:sand mortar.
3. Benching
 - 3.1. Material: Concrete.
 - 3.1.1. Profile: 10% fall from manhole walls to component rim.
 - 3.2. Topping
 - 3.2.1. Material: 1:3 Cement:sand mortar
 - 3.2.2. Application: Before benching concrete has set, and with dense smooth uniform finish.

773 Installing access covers and frames

1. Seating: Precast concrete

2. Bedding and haunching of frames: Continuously.
 - 2.1. Material: 1:3 cement:sand mortar
 - 2.2. Top of haunching: 30 mm below surrounding surfaces.
3. Horizontal positioning of frames
 - 3.1. Centred over openings.
 - 3.2. Square with joints in surrounding paving.
4. Vertical positioning of frames
 - 4.1. Level; or
 - 4.2. Marry in with levels of surrounding paving.
5. Permissible deviation in level of external covers and frames: +0 to -6 mm.

776 Exposed openings in inspection chambers, access points, fittings and equipment

1. General: Fit purpose made temporary caps. Protect from site traffic.

Completion

901 Removal of debris and cleaning

1. Preparation: Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.
 - 1.1. Timing: Before cleaning, final testing, CCTV inspection if specified, and immediately before handover.
2. Cleaning: Thoroughly flush pipelines with water to remove silt and check for blockages. Rod pipelines between access points if there is any indication that they may be obstructed.
3. Washings and detritus: Do not discharge into sewers or watercourses.
4. Covers: Securely replace after cleaning and testing.

903 Temporary measures

1. Water used to stabilize tanks and the like during installation: Drain.

911 Testing and inspection

1. Dates for testing and inspection: Give notice.
 - 1.1. Period of notice: 48 Hour minimum

921 Final testing of private gravity drains and sewers up to dn 300

1. Before testing
 - 1.1. Cement mortar jointing: Leave 24 h.
 - 1.2. Solvent welded pipelines: Leave 1 h.
2. Standard: To Building Regulations.
3. Method: Contractor's choice

931 Final testing of adoptable and large private sewers

1. Standard (sewers up to and including size DN 750)
 - 1.1. England, Wales and Northern Ireland: To WRc 'Sewers for adoption'.
 - 1.2. Scotland: To WRc 'Sewers for Scotland'.
2. Method: As per adopting authority's requirements

941 Water testing of manholes and inspection chambers

1. **Timing:** Before backfilling.
2. **Standard**
 - 2.1. **Exfiltration:** To BS EN 1610.
 - 2.2. **Method:** Testing with water (method W).
 - 2.3. **Infiltration:** No identifiable flow of water penetrating the chamber.

951 Testing of ancillary components

1. **Components:** Surface water storage tanks
2. **Standard:** To BS EN 1610.
 - 2.1. **Tests:** Manufacturer's recommendation
 - 2.1.1. **Method:** Manufacturer's recommendation

971 CCTV inspection of private pipelines

1. **General:** Carry out and record internal inspection using CCTV equipment.
 - 1.1. **Locations to be inspected:** Surface and foul water drains
2. **Illumination:** Of adequate intensity.
3. **Recording:** Provide continuous position recording, still photographs and stopping of the camera at any point.
 - 3.1. **Copy of videotape recording:** Submit.

976 CCTV inspection of adoptable pipelines

1. **General:** Permit the Adopting Authority or its agent to carry out and record internal CCTV inspection of pipelines and associated manholes after completion.
 - 1.1. **Locations to be inspected:** Surface and foul water drains
2. **Pipelines under highways:** Complete construction, except for laying of wearing course, before inspection.

978 Lifting keys

1. **Lifting keys:** Supply suitable keys for each type of access cover.
 - 1.1. **Timing:** At completion.

980 Instructions

1. **Manufacturer's user instructions:** Refer to manufacturer's user instructions for non-standard items
- Ω End of Section

R13 Land drainage

Generally - Not Used

Drains

205 Filter drains with geotextile trench lining

1. Trench
 - 1.1. Depth: 1000 mm
 - 1.2. Width: 500 mm
2. Geotextile trench lining
 - 2.1. Manufacturer: Terram
 - 2.1.1. Product reference: T1000
3. Backfill
 - 3.1. Material: As drawing 13847-CRH-XX-XX-DR-C-5301
 - 3.2. Recycled content of granular material: Submit proposals
 - 3.3. Level: To finished ground level.
 - 3.4. Filling to finished ground level: Backfill material

205 Filter drains with geotextile trench lining Gravel Land Drain

1. Trench
 - 1.1. Depth: 400 mm
 - 1.2. Width: 300 mm
2. Geotextile trench lining
 - 2.1. Manufacturer: Terram
 - 2.1.1. Product reference: T1000
3. Backfill
 - 3.1. Material: As drawing 13847-CRH-XX-XX-DR-C-5301
 - 3.2. Recycled content of granular material: Submit proposals
 - 3.3. Level: To finished ground level.
 - 3.4. Filling to finished ground level: Backfill material

220 Filter drains with pipe and geotextile trench lining - Trickle Trench Outfall

1. Trench size
 - 1.1. Depth: 400 mm
 - 1.2. Width: 500 mm
2. Geotextile trench lining
 - 2.1. Manufacturer: Terram or similar approved
 - 2.1.1. Product reference: T1000 or similar approved
3. Pipe bedding: Trimmed trench bottom
 - 3.1. Recycled content of granular material: Submit proposals
4. Pipes: Plastics to BS 4962, Kitemark-certified, perforated
 - 4.1. Manufacturer: Submit proposals
 - 4.1.1. Product reference: Submit proposals

- 4.2. Sizes: DN 150
- 4.3. Recycled content of plastics pipes: Submit proposals
- 4.4. Perforations: Up
- 5. Pipe surround and backfill
 - 5.1. Material: As drawing 13847-CRH-XX-XX-DR-C-5301
 - 5.2. Recycled content of granular material: Submit proposals
 - 5.3. Level: To finished ground level
 - 5.4. Filling to finished ground level: Backfill material

350 Laying pipes

- 1. Weather conditions: Lay pipes in good weather using methods suitable for the site conditions
 - 1.1. Plastics pipes: Do not lay or backfill at temperatures lower than 5°C
 - 1.2. Trafficking: Do not compact, smear, cause top ponding, rutting or damage to the soil structure
- 2. General: Scoop out locally at couplings and sockets. Lay pipes digging slightly into bed and resting uniformly on their barrels. Lay to line and gradient without backfalls
- 3. Proximity to plants: Use unperforated pipes with positively sealed joints and as-dug backfill in areas closer than 6 m to trees and hedges
- 4. Junctions between branches and mains: Purpose made components
- 5. Upper ends of drain runs: Plug to prevent ingress of soil or animals
- 6. Backfilling: Do not damage, distort or displace pipes

Culverts - Not Used

Excavating/ beddings/ surrounds/ backfill

520 Formation for beds or pipes

- 1. Timing: Excavate to formation immediately before laying beds or pipes
- 2. Hard spots: Remove rock projections, boulders, etc. Replace with consolidated bedding material
- 3. Soft spots: Tamp in bedding material
- 4. Inspection:
 - 4.1. Requirement: Give notice of completed excavated formation for each section of the work
 - 4.2. Period of notice (minimum): Two working days

525 Granular beds

- 1. Compacted thickness (minimum): 50 mm
- 2. Laying pipes: Scoop out locally at couplings and sockets and lay pipes digging slightly into bed and resting uniformly on their barrels. Lay to line and gradient without backfalls

555 Granular backfilling to drains with pipes

- 1. General: Not applicable to narrow trenches where a backfill is placed continuously by machine
- 2. Placing: In maximum 300 mm thick layers, with mechanical compaction from 300 mm above crown of pipe, up to finished ground level
 - 2.1. Surround and backfill material: Do not heap in the trench before spreading
 - 2.2. Packing: Carefully pack material around the sides of the pipe. Prevent damage or disruption to pipelines and compact thoroughly

560 Granular backfilling to drains without pipes

1. **General:** Not applicable to narrow trenches where a backfill is placed continuously by machine
2. **Placing:** Backfill in maximum 300 mm thick layers, with mechanical compaction, up to finished ground level

570 Installing geotextile trench lining

1. **Preparation:** Trim trench, remove sharp stones and other projections
2. **Placing**
 - 2.1. **Dressing geotextile:** Uniformly to trench profile without stretching, perforation or rupture
Protect geotextile trench lining from damage during subsequent construction
 - 2.2. **Top level:** 100 mm below ground level
 - 2.3. **Top of aggregate:** Wrap free lengths of geotextile over top surface and overlap by 300 mm.
Tuck top layer down trench side by 100 mm

Ancillary constructions and work

800 Cleaning

1. **General:** Thoroughly flush out the whole of the installation with clean water to remove silt and debris immediately before handover
2. **Preparation:** Lift covers to any access points which form part of the system. Remove mortar droppings, debris and loose wrappings
3. **Timing:** Before cleaning, final testing, CCTV inspection (if specified), and immediately before handover
4. **Cleaning:** Thoroughly flush any pipes with water to remove silt and check for blockages. Where appropriate, rod pipes between access points if there is any indication that they may be obstructed
5. **Washings and detritus:** Dispose of safely. Do not discharge into sewers or watercourses
6. **Covers:** Securely replace after cleaning and testing

Ω End of Section

R17

Soakaway, septic tank and sewage treatment units

Clauses

2 To be read with preliminaries/ general conditions

Products

305 Below ground drainage systems – products

1. Products generally: As section R12.

307X Contractor's attention

1. The Contractor's particular attention is drawn to the following items: Individual plot soakaways to be constructed as per drawings 13847-CRH-XX-XX-DR-C-5050, 13847-CRH-XX-XX-DR-C-5303 and 13847-CRH-XX-XX-DR-C-5304
2. Upon commencement of the site works, the Contractor is to undertake location specific infiltration tests in strict accordance with BRE Digest 365 at the proposed formation level and position of each infiltration device to verify the design infiltration rates.
3. The results of these tests are to be provided CampbellReith for review a minimum of 5 working days prior to the installation of the infiltration device

315 Modular plastics soakaway units

1. Manufacturer: Polypipe
 - 1.1. Product reference: PSM1A
2. Unit size: Manufacturer's standard
3. Soakaway capacity (minimum): As drawings 13847-CRH-XX-XX-DR-C-5303 and 13847-CRH-XX-XX-DR-C-5304

355 Granular material – rubble

1. Material: Submit proposals

Execution

605 Below ground drainage systems – execution

1. Execution generally: As section R12.

625 Soakaways – granular fill

1. Geotextile membrane: Line bottom and sides of pit.
 - 1.1. Jointing: Overlap 300 mm.
2. Inspection and distributor pipes: Insert as required.
3. Fill: Granular material - rubble.
 - 3.1. Height: Up to invert level of inlet pipe.
4. Top of fill: Cover with geotextile membrane.
5. Backfill: As-dug material.
6. Access covers: Bed and haunch continuously in 1:3 cement:sand mortar.

650 Backfilling with as-dug material

1. Material: As excavated from the trench.

2. **Placing and compaction:** Maximum 300 mm thick layers, up to finished ground level. Compact each layer before placing the next.
3. **Heavy compactors:** Do not use before there is 600 mm of material over pipes.

Completion - Not Used

Ω End of Section

R18

Pumping stations and pressure pipelines

Clauses

2 To be read with preliminaries/ general conditions.

1. Pump station to be to adoptable standards. Construction to be to pumping station specialist's specification.:

Products - Not Used

Execution - Not Used

Completion - Not Used

Ω End of Section