

Mann Williams

Cyfarthfa Castle

P1

Below Ground Drainage
For Approval

15-05-2025

Drainage Infrastructure Improvements

Contents

R12 Below ground drainage systems **REVISED**1

R12

Below ground drainage systems **REVISED**

General - Not Used

System performance - Not Used

Products

313 One piece gullies

1. Description: - BACK INLET
2. Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
 - 2.1. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
3. Material: Clay
4. Manufacturer: Hepworth
 - 4.1. Product reference: Hepworth Clay SuperSleeve Access Gully SG3/1
5. Sizes: 420 x 160 mm
6. Outlet sizes: DN 100

315 One piece gullies covers

1. Covers: Cast Iron Grid for Hepworth Clay SuperSleeve Access Gully SG3/1
 - 1.1. Product reference: IG1C
 - 1.2. Material: Cast Iron
 - 1.3. Sizes: 100 mm

329 Pipes, bends and junctions – supply

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

336 Pipes, bends and junctions – clay – flexible joints

1. Description: Surface Water Drainage
2. Material and standard: Vitrified clay to BS EN 295-1, Kitemark certified.
3. Manufacturer: Wavin Hepworth SuperSleeve
 - 3.1. Product reference: Flexible Joints
4. Sizes: DN 100 DN 150 DN 225 DN 300

359 Flexible couplings

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

373 Root barriers **ADDED**

1. Description: Flat root barriers designed for the protection of shallow service ducts, utilities & pipework
2. Requirement: As indicated on Drawings
3. Thickness: 1mm, 2mm.

4. Height: 300mm, 600mm, 1000mm select as appropriate
5. Installation: install root barrier to the full depth of the excavation.
6. Manufacturer: GreenBlue Urban, Or Equal & Approved
 - 6.1. Product reference: ReRoot, Or Equal & Approved

401 Inspection chambers – Polypropylene

1. Description: Base and shaft units
2. Standard: To BS EN 13598-1, BS EN 13598-2 or Agrément certified.
3. Diameter: 600 mm
4. Manufacturer: Wavin Hepworth
5. Bases
 - 5.1. Product reference: Range 600
6. Shaft units
 - 6.1. Product reference: Range 600
7. Access covers and frames
 - 7.1. Product reference: Contractor's choice - Stainless Steel
 - 7.2. Loading grades to BS EN 124: D400

407 Manholes and inspection chambers – concrete Hydrobrake Manhole

1. Description: Flow Control Manhole
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: Contractor's choice
4. Shape: Circular
5. Sizes: DN 1800
6. Chamber sections
 - 6.1. Product reference: Marshalls or similar approved precast chamber with sump, bypass and hydrobrake flat face.
7. Cover slabs
 - 7.1. Thickness: 200 mm
 - 7.2. Loading grades to BS EN 124: D400
 - 7.3. Openings: To suit access covers.
8. Steps: Required in chambers over 900 mm deep
9. Vortex flow control unit: Hydrobrake, Spec TBC

437 Vortex flow control units

1. Description: Hydro-brake Flow Control Chamber
2. Manufacturer: Hydro International
 - 2.1. Product reference: CHE-0172-2000-2000-2000
3. Material: Stainless steel

439 Manhole steps

1. Description: Hydro-brake chamber
2. Standard: To BS EN 13101.

3. Type: Contractors choice
4. Manufacturer: Contractors choice
 - 4.1. Product reference: Contractors choice
5. Material: Galvanized steel

464 Modular stormwater attenuation units

1. Description: To Attenuation Tank
2. Manufacturer: Wavin
 - 2.1. Product reference: AquaCell Core-R
3. Unit size: 1m x 0.5m x 0.4m deep

471 Access covers and frames

1. Description: - SURFACE WATER MANHOLES
2. Standard: To BS EN 124.
3. Manufacturer: Saint Gobain/Submit Proposals
4. Material: Galvanized steel or Ductile Iron
5. Sizes: 600 mm clear opening
6. Loading grades to BS EN 124: D400

494 Geotextile membranes – impervious

1. Description: Attenuation Tank Lining
2. Manufacturer: Geoworks
 - 2.1. Product reference: GT Membrane 500

497 Granular material – manufactured

1. Description: To Attenuation Tank and pipe bedding surround
2. Standards: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
3. Manufacturer: Contractor's choice
4. Size: Dependent on location – see Execution clauses in this section, and in sections R16, R17 and R18, if used.

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.

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.

667 Class S surround **REVISED**

1. Description: All pipe bedding
2. Trench width up to 300 mm above crown of pipe (maximum)
 - 2.1. DN 100 nominal pipe size: 600 mm.
 - 2.2. DN 150 nominal pipe size: 700 mm.
 - 2.3. DN 225 nominal pipe size: 800 mm.
 - 2.4. DN 300 nominal pipe size: 900 mm.
3. Granular material: Contractor's choice
 - 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. Where trench bottom is uneven, increase depth by 100 mm.
5. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
6. Initial testing before placing surround: Not required
7. Surround
 - 7.1. Material: Granular.
 - 7.2. Depth: To 150 mm above crown of pipe.
 - 7.3. Compaction: By hand in 100 mm layers.
8. Backfilling
 - 8.1. Material: Site excavated material.
 - 8.2. Compaction: By hand in 300 mm layers.

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.

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.

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.

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.

713 Installing root barriers

1. Root barrier installation: Full depth of excavation. Fit closely to trench wall nearest the tree.

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.

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.

728 Laying warning marker tapes

1. Installation: During backfilling, lay continuously over pipelines.
2. Depth: 300-400 mm.
 - 2.1. Pipelines deeper than 2 m: Lay an additional tape 600 mm above the top of the pipeline.

734 Installing access points and gullies

1. Bedding
 - 1.1. Material: Granular - manufactured, size 4/10 to BS EN 13242
 - 1.2. Thickness (minimum): 100 mm
2. Backfilling
 - 2.1. Material: Granular - manufactured, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill
 - 2.2. Compaction: By hand in 100 mm layers.
3. Setting out relative to adjacent construction features: Square and tightly jointed.
4. Permissible deviation in level of external covers and gratings: +0 to -6 mm.
5. Raising pieces (clay and concrete units): Joint with 1:3 cement:sand mortar.
6. Exposed openings: Fit purpose made temporary caps. Protect from traffic.

741 Installing inspection chambers – plastics

1. Bedding
 - 1.1. Material: Granular - manufactured, size 4/10 to BS EN 13242
 - 1.2. Thickness (minimum): 150 mm
2. Backfilling: Granular material - manufactured, size 4/10 to BS EN 13242, to 100 mm above crown of pipes, then selected fill
 - 2.1. Compaction: By hand in 100 mm layers.
3. Concrete collar
 - 3.1. Material: Concrete

- 3.2. Thickness (minimum): 300 mm
- 3.3. Width (minimum): 200 mm
- 4. Seating: Class B Engineering Brick

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): 100 mm
 - 2.3. Height: Full height
- 3. Backfilling
 - 3.1. Material: Granular - manufactured, 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.

753 Fixing manhole steps

- 1. Fixing: Secure to chamber wall
- 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: As manufacturers details
- 2. Inner joint surface: Trim surplus jointing material extruded into chamber and point neatly.

773 Installing access covers and frames

- 1. Seating: Class B Engineering Brick
- 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.

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.

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.

971 CCTV inspection of private pipelines

1. **General:** Carry out and record internal inspection using CCTV equipment.
 - 1.1. **Locations to be inspected:** All new surface 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.

978 Lifting keys

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

Ω End of Section



Specification created using NBS Chorus