



# The Grange

## **Below Ground Drainage Specification**

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# Quality Assurance

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## Q10

### Kerbs/ edgings/ channels/ paving accessories **ADDED**

To be read with preliminaries/ general conditions.

#### 30 Linear slot drainage channel system **ADDED**

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1. Manufacturer: ACO
  - 1.1. Product reference: MultiDrain MD150 x 210mm deep
2. Bedding: Fresh concrete races
3. Accessories: Gratings Brickslot Twinslot offset galvanised steel  
Sump units as noted on drawings

#### 35 Drainage channel systems with gratings **ADDED**

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1. Manufacturer: ACO
  - 1.1. Product reference: MultiDrain MD150 x 210mm deep
2. Accessories: Sump units as noted on drawings
3. Bedding: Fresh concrete races
4. Cover gratings: Gratings TBC

#### 44 Drainage channel systems **ADDED**

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1. Installation: To an even gradient, without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washing and detritus: Safely disposed without discharging into sewers or watercourses.

Ω End of Section

# R12

## Below ground drainage systems **REVISED**

### General

#### 110 Below ground drainage system **ADDED**

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1. Surface water and rainwater drainage sources: One piece gullies and covers Rainwater downpipes
2. Foul drainage sources: One piece gullies and covers Discharge stack and branch pipes
3. Pipes, bends and junctions: PVC-U - solid wall
4. Manholes, inspection chambers, traps, and separators: Inspection chambers - plastics Manholes and inspection chambers - concrete
5. Disposal: To sewers

### System performance

#### 211 Design – below ground drainage systems

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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: Loamy Clay
3. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

### Products

#### 315 Vitrified clay one-piece gullies Type A

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1. Description: - UNIVERSAL
2. Material: Clay
3. Manufacturer: [Wavin Ltd](#)
  - 3.1. Contact details
    - 3.1.1. Address: Wavin Registered Office  
Edlington Lane  
Edlington  
Doncaster  
South Yorkshire  
DN12 1BY
    - 3.1.2. Telephone: +44 1709 856300
    - 3.1.3. Web: [www.wavin.co.uk](http://www.wavin.co.uk)
    - 3.1.4. Email: [info@wavin.co.uk](mailto:info@wavin.co.uk)
  - 3.2. Product reference: [Hepworth Clay Gullies \(RGP2 yard gully, DN 150\)](#)
4. Outlet sizes: DN 150

#### 329 Pipes, bends and junctions – supply

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

#### 344 Unplasticized polyvinyl chloride (PVC-U) solid wall below-ground drainage pipes and fittings Type A **ADDED**

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1. Description: For 225mm dia.
2. Standard: To BS EN 13476-1 and -2 or -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:
  - 4.1. Contact details
    - 4.1.1. Address: Wavin Registered Office  
Edlington Lane  
Edlington  
Doncaster  
South Yorkshire  
DN12 1BY
    - 4.1.2. Telephone: +44 1709 856300
    - 4.1.3. Web: [www.wavin.co.uk](http://www.wavin.co.uk)
  - 4.2. Product reference: Wavin TwinWall
5. Sizes: DN 225

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

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1. Description: Foul and Surface Water Drainage
2. Standard: BS EN 1401-1 with flexible joints.
  - 2.1. Class: SN4
3. Manufacturer: Wavin
  - 3.1. Product reference: OsmaDrain
4. Sizes: 100, 150,
5. Application area code: UD.

### 359 Flexible couplings

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1. Description: For rocker pipe joints
2. Standard: To BS EN 295-4 or WIS 4-41-01 and Kitemark certified, or Agrément certified.
3. Manufacturer: Contractor's choice
  - 3.1. Product reference: Submit proposals

### 401 Plastics access chambers Type A

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1. Standard: To BS EN 13598-2.
2. Material: Polypropylene (PP).
3. Description: Base and Shaft units
4. Diameter: 500mm, 600mm
5. Manufacturer: [Wavin Ltd](http://Wavin Ltd)
6. Contact details
  - 6.1. Address: Wavin Registered Office  
Edlington Lane  
Edlington  
Doncaster  
South Yorkshire  
DN12 1BY
  - 6.2. Telephone: +44 1709 856300
  - 6.3. Web: [www.wavin.co.uk](http://www.wavin.co.uk)
  - 6.4. Email: [info@wavin.co.uk](mailto:info@wavin.co.uk)

- 7.1. Product reference: Osma
- 8. Shaft units
- 9. Access covers and frames

#### **407 Manholes and inspection chambers – concrete Hydro-brake manhole**

ADDED

- 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 1500
- 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: Hydro-brake spec TBC

#### **437 Vortex flow control units**

- 1. Manufacturer: Hydro-Brake
  - 1.1. Product reference: CCU-0312-8540-0800-8540
- 2. Material: Stainless Steel
- 3. Drain down secondary outlet pipe: Integral
  - 3.1. Control type: Penstock valve
  - 3.2. Operation: From surface.

#### **439 Manhole steps**

- 1. Standard: To BS EN 13101.
- 2. Manufacturer: Contractor's choice
- 3. Material: Galvanized steel

#### **464 Modular stormwater attenuation units** REVISED

- 1. Description: Attenuation Tank - Polypropylene (PP) Tanks
- 2. Manufacturer: Wavin
  - 2.1. Product reference: AquaCell Core-R
- 3. Unit size: 1m x 0.5m x 0.4m deep
- 4. Tank dimensions: 10m x 5m x 0.8m (200 crates)

#### **471 Access covers and frames 500mm dia.**

- 1. Standard: To BS EN 124.
- 2. Types: Single seal

3. Manufacturer: Contractor's choice
4. Material: Ductile cast iron
5. Sizes: 500 x 500 mm
6. Loading grades to BS EN 124: B125

#### **471 Access covers and frames 600mm dia.**

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1. Standard: To BS EN 124.
2. Types: Single seal
3. Manufacturer: Contractor's choice
4. Material: Ductile cast iron
5. Sizes: 600 x 600 mm
6. Loading grades to BS EN 124: B125

#### **483 Concrete**

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1. Standard: To BS 8500-2 To WRc Sewers for Adoption
2. Concrete: Designated, GEN1

#### **494 Geotextile membranes – impervious** REVISED

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1. Manufacturer: Terram
  - 1.1. Product reference: T1000

#### **496 Granular material – natural**

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

### **Fabrication**

#### **510 Vermin gratings for outfalls and outlet headwalls**

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1. Construction: Mild steel frame extending 75 mm beyond pipe opening all around, with 25 mm maximum opening steel mesh grille. Top hinged on built-in fish-tail straps and with bottom pin lock.
2. Finish: Galvanized to BS EN ISO 1461 after fabrication.
3. Submit: Shop drawings.
  - 3.1. Timing: Before manufacture.

### **Execution**

#### **610 Stripping out**

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1. Extent of stripping out: Shown on drawings
2. Exposed ends of existing drainage to be abandoned: Seal with concrete.

#### **611 Existing drains**

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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**

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

### **616 Selected fill for backfilling**

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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**

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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**

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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**

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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**

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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.

### **661 Class O support**

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1. Description: Pipe bedding
2. Granular material: Natural
  - 2.1. Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
3. Bedding
  - 3.1. Material: Granular, compacted over full width of trench.
  - 3.2. Thickness (minimum): 100 mm.
4. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
5. Backfilling
  - 5.1. Material and depth
    - 5.1.1. Protective cushion of selected fill to 300 mm above crown of pipe; or
    - 5.1.2. Additional granular material, to 100 mm above crown of pipe.
  - 5.2. Compaction: By hand in 100 mm layers.

### **683 Laying pipelines**

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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**

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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**

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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**

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

### **699 Connections to sewers**

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

### **705 Initial testing of pipelines**

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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**

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

### **715 Backfilling to pipelines**

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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.

### **734 Installing access points and gullies**

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1. Bedding
  - 1.1. Material: Concrete
  - 1.2. Thickness (minimum): 150 mm
2. Surround
  - 2.1. Material: Concrete
  - 2.2. Thickness (minimum): 100 mm
  - 2.3. Height: Full height
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.

### **736 Installing rodding points**

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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**

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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
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): 200 mm
  - 4.3. Width (minimum): 200 mm
5. Seating: Brickwork

### **743 Installing concrete manholes**

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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: To depths in drawings
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.

### **753 Fixing manhole steps**

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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**

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

### **771 Installing outfalls**

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1. Pipe outflow invert (minimum): Seasonal peak level or 150 mm above normal water level, whichever is the higher.
2. Pipe surround and backfill to the last 2 m run of drain: Excavated subsoil, rammed home.

### **773 Installing access covers and frames**

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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**

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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**

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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**

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1. General: Carry out and record internal inspection using CCTV equipment.
  - 1.1. Locations to be inspected: Foul and 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.

### **976 CCTV inspection of adoptable pipelines**

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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: Adoptable foul and surface water sewers
2. Pipelines under highways: Complete construction, except for laying of wearing course, before inspection.

### **978 Lifting keys**

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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