



Polysewer
Gravity Sewer System

SPECIFICATION

Example Specification

July 2014

SCOPE OF WORKS

To meet the specific performance criteria detailed within this specification and accompanying drawings.

The completed drainage systems shall meet the performance requirements stated in:

- BS EN 752: 2008; *Drain and sewer systems outside buildings*
- The requirements of the adopting organisation (i.e. Local Authority).
- Sewers for Adoption, 7th Edition.
- the Civil Engineering Specification for the water Industry (CESWI)

The Installer will provide for the supply and installation of all pipework, fittings and ancillary equipment and is to include for all necessary, jointing, bedding, manhole construction, temporary and enabling works etc, to allow the whole of the works to satisfy the tests and performance requirements detailed in this specification.

The Installer will be required to identify, protect and maintain any existing live drainage works adjacent to the site during the construction of all new works.

Notwithstanding the normal testing and inspection procedures it will be noted that there is a requirement under this specification to CCTV survey, video and report on the completed installation immediately prior to practical completion for this package.

The Installer will verify, prior to the commencement of the works detailed in this package, that the location, size and invert level of all points of connection to existing outfalls are as shown on the drawings.

Reference should be made to the sewer and utility record drawings, for all adjacent existing and new infrastructure systems. Provision shall be made that at the commencement of work on site, a sufficient survey shall be undertaken to locate pipes and all other underground works. Where the results of this survey indicate that the proposed works would be affected, the supervising engineer shall be immediately notified.

PIPEWORK

Plastic Pipework

Polysewer PVCu structured pipes and fittings will convey the flow of foul and stormwater under gravity conditions in domestic, public and private sewers drainage systems. All system pipes are extruded as plain ended or with an integral socket; all system fittings are either injection moulded or fabricated from extruded pipe.

Manufacturer and reference:

Polypipe Civils

Size(s):

150, 225 & 300mm Ø

Polysewer Structural Wall

BS EN 13476 [Cert KM 582885]

WIS 4-35-01:2008 [Cert KM 582885]

WIS 4-35-01:2000 [BBA Cert 02/3923]

Colour: Terracotta
Stiffness Class: Polysewer 8 kN/m² (SN 8)

Plastic pipework and fittings jointing shall be made on site using EPDM ring seals.

Store elastomeric jointing ring seals in their delivery bags or protective containers. Do not expose to direct sunlight.

Store lubricant in a cool place out of direct sunlight and away from any heat source.

Stack pipes on a level surface. Provide side supports; do not expose to direct sunlight.

Keep fittings under cover, do not remove from packaging until required.

Inspect all pipes and fittings carefully before installing, ensure products are clean and free from contamination. Reject any which are defective.

Chemical Resistance

Polypipe PVCu pipework is resistant to most common acids. It will be necessary to check on the type of chemical(s) being discharged prior to installation.

For further information refer to Polypipe Civils Technical Department or to BS CP 312, Part 1; *Code of Practice for Plastic Pipework*.

INSTALLATION

Design and install pipework, fittings and accessories to collect, convey and discharge all foul, storm and surface water from within the confines of the site, operating under gravity principles, to either:

- infiltration drainage structure(s), situated as close to the point of collection as practically possible, or
- the infrastructure system provided adjacent to and around the perimeter of the site.

Pipe Routes

To be the shortest practical, with as few bends as possible, access via inspection manholes and elliptical rodding points.

Bends and Branches

All bends and branches shall be swept in direction of flow at all connections.

Ensure factory moulded and/or pre fabricated fittings are used.

Pipe Laying

Immediately following excavation of the trench, pipes shall be laid and jointed on the pipe bed.

Pipes shall be laid and bedded with their inverts to the lines and levels shown on the drawings and schedules, within the tolerances specified by the design. Any adjustments to level shall be made by raising or lowering the bedding, ensuring pipes are continuously supported along their whole length.

Under no circumstances should any pipes be laid without the correct bedding and surround material.

Pipes with flexible joints will be laid only in straight lines. Pipes will be laid in the opposite direction to the flow so that the spigot end of the pipe is drawn into the socket.

Pipes shall be protected at all times from the ingress of debris with pipe ends being sealed during construction.

Properly fitted temporary stoppers will be provided and constantly used to close the ends of all incomplete pipelines. The stoppers are only to be removed when pipes are being laid and jointed.

For further information refer to Polypipe Civils Technical Department or BS EN 1610:1998; *Construction and testing of drains and sewers*

Bedding, Laying and Surrounding of Pipes

A firm, stable, uniform trench base shall be formed, free of all debris or large soil particles that might cause damage to or point loading on the pipeline. The invert of the trench base shall be to a level that is able to accommodate the minimum depth of bedding material specified on the construction drawing(s).

Pipe bed and surround material shall consist of natural and/or recycled coarse aggregate complying with BS EN 13242 and the requirements in the table below:

BS EN 13242, Coarse aggregate (Clause 4.3.2)		
Category for general grading requirements	G _c 80-20	
Category for tolerances at mid-size sieves	GT _{NR} (no requirements)	
Category for maximum values of fines content	Gravel – f _{1.5} Crushed rock, recycled aggregate – f ₄	
	Graded	Single sized
Aggregate size [mm]	2/14, 4/20 or 4/40	4/10, 6/14, 10/20 or 20/40
Note 1. Coarse aggregate materials shall be in accordance with the relevant provisions of BS EN 13242, as detailed within: <ul style="list-style-type: none"> • SW Drainage MCHW, Vol 1, Clause 503 i) • Sewer WIS 4-08-02 (amendment Nov 2008), Tables A4 & A5 2. Alternative pipe bed & surround material specifications shall not be used without prior written approval from the overseeing engineer.		

The granular bedding shall be placed, uniformly spread and carefully compacted by means of a vibrating plate or other approved apparatus over the full width of the pipe trench. Bedding shall be cut away and removed at each pipe socket so that the socket does not bare on the bed and pipes are supported along the whole length of their barrel.

Placement of sidefill and the main backfill shall only commence once the pipe joints and bedding are in a condition to permit loading. Haunching of the pipes with granular material shall proceed in layers not exceeding 150mm, ensuring proper placement and compaction of

material occurs equally along both sides of the pipe. Care shall be exercised to avoid disturbance of the bedding beneath the pipe, with any disturbance being made good.

Placement of side and backfill material shall be carried out on both sides of the pipe, in such a manner, to prevent lateral or vertical displacement of the pipeline.

Where trench supports are used, these shall be progressively removed during placement of the embedment. Where removal of sheeting, prior to completion of backfilling is not practicable, it shall be immediately brought to the attention of the overseeing engineer.

Mechanical compaction plant shall not be allowed to pass above the pipe crown until a minimum 300mm depth of cover has been achieved. The minimum depth of cover above the pipe crown, before mechanical compaction is commenced, is dependant on the type of compaction device

Cleaning of works

Prior to CCTV survey, all pipelines and associated structures (i.e. benching, traps etc) shall be flushed with water and left free from obstructions, with all extraneous materials removed. Where water jetting is used it shall be by low pressure high volume in accordance with the WRc Sewer Jetting Code of Practice, 2nd Edition.

All interceptors, flow control and pump chambers shall be pumped out and extraneous materials removed.

All arisings from the cleaning and pump outs must be removed from site by bowser and not discharged to public sewer or water courses.

Record drawings

The Installer will supply record drawings in accordance with the preliminaries of this contract.

CCTV Inspection of Pipelines

Carry out and record internal inspection of surface water systems, interceptors and pump chambers with CCTV equipment. Provide all necessary equipment, including suitable covered accommodation for viewing monitor screen, together with personnel experienced in the operation of equipment and interpretation of the results. Ensure that adequate intensity illumination within pipe(s) is maintained. Provide for continual positioning recording, still photographs and stopping movement of the camera at any point requested by the Engineer. Provide 2 No. colour copies of videotape recording and full report to the Engineer within one week of survey. Obtain instruction from the CA on remedying any defects which may be revealed.

Health and Safety

The Installer will comply fully with all Health and Safety requirements as detailed in the preliminaries.

Existing Services

The install shall not solely rely on any record of installed services made available and will obtain up to date record drawings from the Utilities Companies. All routes of services shall be traced and surfaces marked prior to the commencement of works.

Operating and Maintenance manuals

The Installer will supply Operating and Maintenance Manuals in accordance with the preliminaries of this contract.

TESTING

The installer shall:

- (a) Inform the Main Contractor sufficiently in advance to give him a reasonable opportunity to observe tests.
- (b) Check that all sections of installation are securely fixed and free from obstruction and debris.

Keep a record of all tests and provide a copy of each to the Main contractor and project Engineer.

The Installer is to allow for intermediate testing where work is to be concealed by other installations, final finishes and to suit phased handover of areas.

Tests shall be carried out on the drainage installation as specified, and shall be carried out under the inspection of and to the approval of the Project Engineer (PE).

Observation of Tests

The Contractor shall inform the PE at the earliest opportunity to give reasonable notice to observe the carrying out of tests.

The Installer will be responsible for arranging all necessary tests, surveys and inspections to ensure that materials and components in this specification are properly installed in accordance with the Contract Programme and that they will fulfil the function and performance requirements specified.

Records

A pro-forma test sheet will be issued to the Installer as part of the overall project commissioning program and the sheets will be completed, witnessed by the and or, visiting engineers and handed to the PE on satisfactory completion of the test required.

Preliminary Tests

Obstruction and water or air tests to be carried out as soon as practicable after laying and jointing but before backfilling or laying concrete surround or concrete slab.

Final Tests

Obstruction and water or air tests to be carried out immediately prior to handover or practical completion when all permanent manhole covers, gratings etc have been installed and temporary and airtight caps have been fitted to all discharge pipes and rainwater pipes.

Air Test (Non-Pressure Pipeline)

Temporarily seal the ends of drains and all connections to the pipe section being tested.

Connect glass 'U' tube gauge to drain plug in length of drain under test.

Pump air into test section by suitable means to 100mm water gauge for pipelines or where trapped gullies and/or ground floor appliances are connected, 50mm water gauge.

Allow five minutes for stabilization of air temperature.

Adjust air pressure to 100mm or 50mm water gauge as necessary.

In a period of five minutes, without further pumping, the head of water should not fall by more than 25mm for a 100mm water gauge test pressure and 13mm for a 50mm water gauge test pressure.

Pre-Handover

Following the satisfactory completion of all final tests the completed system including the drainage elements installed will be pressure jet cleaned and all debris removed by tanker and not drained to either public sewer or water courses. Carry out a CCTV survey as detailed within this specification and a full level check. When carrying out the aforementioned exercise compare findings with the record drawings required to ensure the latter are accurate.

Remedial Works

Remedial works found necessary as a result of test failures will be carried out by the Installer in agreement with the PE.

Test Certificate

A test certificate shall be submitted following successful testing of the pipework

SPECIFICATION CLAUSE

PVCu structural wall pipework and fittings shall be Polysewer as manufactured and supplied by **Polypipe Civils** conforming to BS EN 13476, Cert No KM 582885 for gravity sewer systems.

PVCu structural wall pipework and fittings shall be Polysewer as manufactured and supplied by **Polypipe Civils** conforming to WIS 4-35-01, BS Cert No KM 582885 for gravity sewer systems

150, 225 and 300mm diameter extruded plain ended/single socket, SN4 & SN8, structural wall pipework and injection moulded fittings with EPDM rubber seals.

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