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Land Drainage Systems

WavinCoil

Product and Installation Guide



FOR SURFACE AND SUB-SURFACE
WATER DRAINAGE

Intelligent Solutions for Below Ground Projects

OSMA

OSMA, from Wavin Plastics Limited, is the leading name in plastic systems for building, construction and utilities. The OSMA product range is unrivalled in scope and quality, covering:

- Above Ground systems
- Plumbing and Heating systems
- Below Ground Drainage systems
- Water Management systems
- Ducting systems
- Water and Gas Distribution systems

Quality assured products

OSMA systems are the benchmark for excellence and product innovation: precision-manufactured in the UK using the most advanced injection moulding and extrusion machines. All products comply with or exceed relevant British and European standards to ensure reliability and long-lasting service.

Intelligent connections

OSMA systems offer integrated solutions. This enables specifiers and installers to assemble complete drainage, plumbing and heating, and pressure pipe systems from a single source, with complete confidence in compatibility and performance.

All systems are backed by comprehensive technical support and a nationwide distribution network to ensure availability when and where required.

From Wavin

Wavin is a leading European manufacturer of industrial plastic products, and one of the largest producers of plastic pipe and fittings in the world.

Wavin is credited with inventing and pioneering the use of plastic pipe for water distribution in the mid 1950s. Constant research and development has enabled Wavin to maintain its position at the forefront of plastics technology.

Environmental responsibility

Wavin Plastics Limited has BS EN ISO 9001: 2000 BSI status and was the first plastic pipe manufacturer to be accredited to BS EN ISO 14001 Environmental Management Systems.

Wavin Plastics Limited is committed to environmental responsibility, and is a leading pioneer of systems to conserve and control water. In production, the Company recycles the majority of waste materials, and sets annual targets for energy efficiency audited by the certifying body.

Passion and resourcefulness

All Wavin personnel are committed to providing a comprehensive, responsive service – and are passionate about delivering total Customer satisfaction.

Wavin Plastics Limited maintains an industry-wide dialogue and rigorous assessment of all procedures to ensure that Wavin product development and product support accurately addresses the needs of all Customers – today and into the future.



LAND DRAINAGE SYSTEMS

WavinCoil Product and Installation Guide: Contents

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Further information

The following related publications are available for OSMA Land Drainage systems:

- Product and Installation Guide
- Trade Price List

To obtain copies, please contact:

Literature requests

Tel: 01249 766333

Fax: 01249 766332

literature@wavin.co.uk

Product Range

WavinCoil

WavinCoil is a single walled corrugated pipe which is supplied perforated for the collection and removal of surface water, or unperforated for carrier pipe applications. The current WavinCoil PVC-U Land Drainage system is the result of over 30 years of experience in manufacturing and supplying land drainage products.

WavinCoil provides an exceptionally cost effective drainage system which is quick and simple to install using either open-cut or trenchless methods.

The WavinCoil corrugated profile provides exceptional pipe stiffness and strength, resisting handling and installation damage and excessive deformation due to soil loading.



The Need for Land Drainage

Most farmed land has, at some time over the past 100 years, been drained. Early drainage systems simply depended on ditches to remove excess water. Most systems, however, were introduced with a different level of farming in mind from today and many are nearing the end of their useful life.

Benefits of Land Drainage

- Previously waterlogged land can be brought into a condition for growing crops, extending the availability of land.
- Land can be switched to more profitable enterprises, changing from grazing pasture to intensive grazing and crop production.
- The growing season can be extended, with earlier germination of crops and fewer problems with disease.
- Wet soils suffer more from soil compaction due to vehicle traffic, a drained soil therefore reduces this problem.
- Where a large proportion of land is drained, there may be indirect benefits from activities on other parts of the farm, or to the farm as a whole. For example, increased stocking rates on lowland pasture may release upland areas for arable production.
- Land Drainage is a capital improvement and adds to the long-term efficiency of farming and increases the land value.
- Farmers now require more flexibility and diversity, land drainage provides this flexibility in land use, offering safeguards in profitability when farming faces increasing challenges.

LAND DRAINAGE SYSTEMS

Quality Assurance • Product Application

Quality Assurance

WavinCoil pipe (60mm–200mm) meets the requirements of BS4962 and carries the BSI kitemark.

Wavin Plastics is BSI Registered (Certificate No. FM00217) and is accredited to BS EN ISO 14001 Environmental Management Systems.

The WavinCoil range of pipes and fittings are manufactured and tested under a fully integrated Quality Management system which is accredited to BS EN ISO 9001 : 2000. This covers all aspects of design and manufacture, from selection of raw material through to manufacture of the finished product.

Product Application

- Agricultural Land Drainage
- Sports Field Drainage
- Golf Courses
- Highways
 - Embankment drainage
 - Verge and central reservation drainage
- Construction
 - Retaining wall drainage
 - Cut-off drains
- Domestic
 - Garden drainage
 - Septic tank
 - Soakaway drainage



Product Details - Pipe

Diameter (mm)	Coil Length (m)	Coil Weight (kg)	Full Vehicle Load Quantity	Removed Area – Perforations (mm ² /m)
60	25	4.85	94	2707
	50	9.70		
	150	29.10		
	500	97.00		
80	25	7.70	70	4560
	50	15.40		
	100	30.80		
	450	138.60		
100	25	10.75	52	4560
	50	21.50		
	100	43.00		
125	75	37.50	52	3648
160	25	20.00	41	3648
	50	40.00		
200	45	44.55	24	1955

Pipe Dimensions and Properties

Diameter (mm)	ID (mm)	Weight (kg/m)	% Area removed stiffness (mm ² /m)	Pipe Stiffness STES* (N/m ²)	Ring Stiffness (kN/m ²)
60	53	0.194	1.44	3.42	8.90
80	71	0.308	1.82	4.10	9.70
100	90.5	0.430	1.44	2.52	5.70
125	114.5	0.500	0.93	1.45	3.50
160	145.9	0.800	0.73	1.30	3.30
200	183.5	0.990	0.30	1.08	2.70

* the minimum STES requirement is 1.0 kN/m²

Perforation Details

Perforation size	60mm 80 – 200mm	5 x 1.5mm 6 x 1.9mm

PRODUCT DETAILS

Fittings

Product Details - Fittings

Product		Size (mm)
Pipe Coupler		60 80 100 125 160 200
Reducer		100 x 80 160 x 100
67.5° Multi Junction		100 160
67.5° Equal Junction		60 80 100
67.5° Unequal Junction		80 x 60 100 x 60 100 x 80 125 x 60 125 x 80 125 x 100
End Cap		60 80 100 125 160

Open Cut Installation

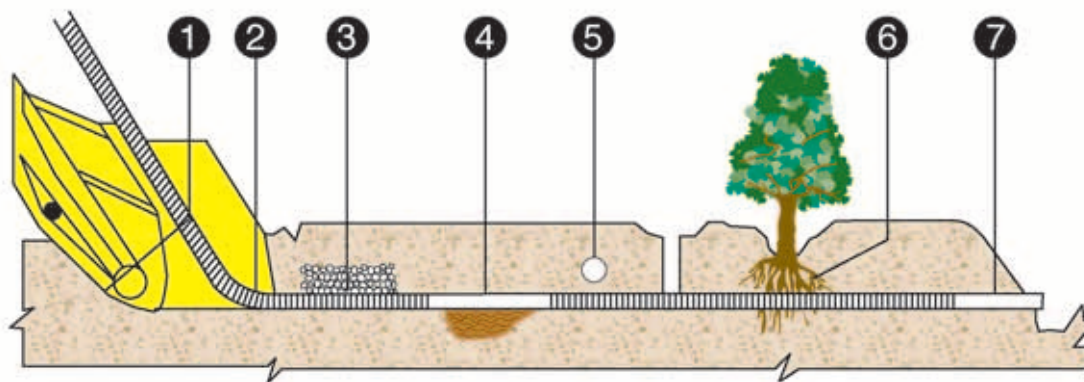
Traditional methods of installing land drainage pipes have involved excavating a trench to line and level, laying the pipe and backfilling with permeable fill. Trenches are now cut by either a back-hoe bucket excavator or chain trencher. Narrow chain trenchers are particularly effective for sports field and golf course drainage, causing minimal ground disturbance with a quick return to the use of the land.

Construction Details

- The trench bed should be firm and free from large stones and rocks. Chain trenchers typically provide a profiled bed for the pipe to sit in.
- The trench width should be sufficient to allow placement and compaction of the granular fill around the pipe.

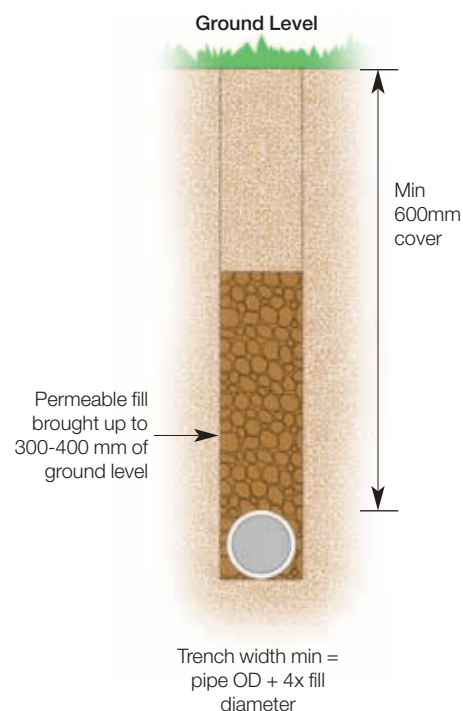
Typically the trench should be a minimum of pipe OD and 4 times the diameter of the fill material.

- The minimum cover should be 600mm, this will ensure the pipe is not damaged by cultivation or excessive traffic loading from farm machinery.
- WavinCoil should not be surrounded by concrete as this eliminates all pipe flexibility and drainage capabilities.



Key Design Points

- 1 Heavy clay soils should have a permeable fill to the base of the plough layer. Clay soils should not be worked in wet conditions. Finely minced clay used as a backfill becomes compacted and impermeable.
- 2 Pipes should be laid to an even gradient 1 : 400. Modern installation involves the use of self levelling laser grading systems.
- 3 5 - 40mm permeable fill material should be washed, screened and carefully placed to the required fill depth.
- 4 Crossings over existing drains should be bridged with a length of solid wall pipe to avoid pipe displacement. This also applies when crossing old ditch lines or soft ground.
- 5 All active old drains should be connected into the new system with junctions or with permeable fill.
- 6 WavinCoil with sealed joints should be used where drains are laid close to trees or hedges, preventing the risk of root penetration.
- 7 Drain outfalls should be constructed of solid wall pipe, minimum 1.5m in length.



INSTALLATION

Trenchless • Key Design Points

Trenchless Installation

Trenchless pipe laying techniques have been used extensively for many years and are ideally suited for use with flexible continuous lengths of WavinCoil pipe.

Pipelaying is quicker and easier and therefore more economical, with laying rates of up to 5 metres per minute, dependent on soil type.

Modern trenchless machines incorporate laser levelling which ensures drains are laid

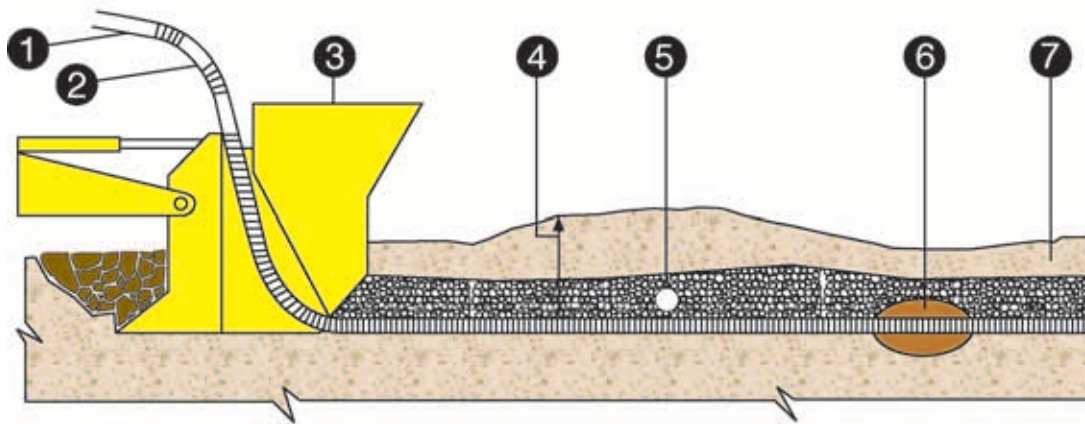
to level and appropriate gradients. They also usually use soil moling devices on the plough blade to give maximum soil fissuring, creating permeable pathways for the water to reach the pipe.

Permeable fill, 5 - 40mm, should be placed around the pipe as it is installed, greatly improving the effectiveness of the system. The use of a permeable fill can

increase the spacing of laterals and is particularly effective on heavier soils and clay.

Maintenance

Regular moling or subsoiling below the plough depth will enhance the surface drainage by allowing the water to get through to the permeable fill. See diagram below.



Key Design Points

- 1 New land drains must be sealed at their leading ends to prevent siltation.
- 2 Pipe connectors must be securely fixed to prevent pipe separation during installation.
- 3 A free flowing granular fill must be specified. 5 - 40mm fill will ensure the material flows from the hopper and around the pipe.
- 4 Unlike open-cut installations which are easily visually checked, it is essential to check regularly on drain depth and gradient to ensure they are correctly maintained. Ideally a laser grading system should be used, especially on level or very undulating sites.
- 5 Existing drainage systems should be clearly located so that connections into the new drains can be made.
- 6 Pipes should not be laid in slurried soil conditions.

- 7 With trenchless laying methods, ground heave is created. This can be mechanically levelled or allowed to settle, levelling is required before moling or subsoiling operations.

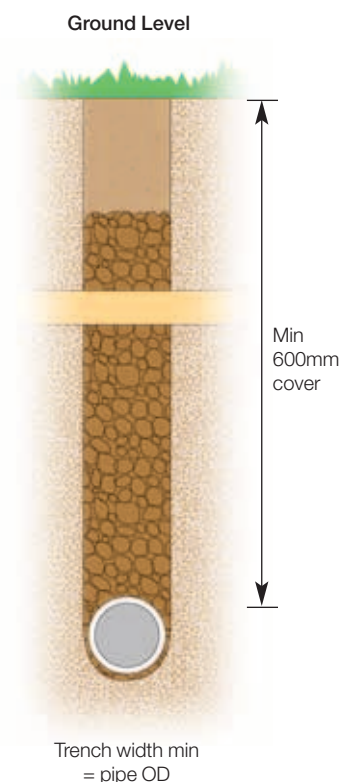
Specific Soil Conditions

Heavy Soil and Clay

Regular moling or subsoiling through the soil will greatly enhance the surface drainage. Moling allows the water to get through to the permeable fill above the WavinCoil drainage system.

Fissured Soil

Some soils are sufficiently fissured, allowing good pathways for water to drain through the WavinCoil. These soils may not need a permeable fill above the pipe, again regular moling of the soil will aid fissuring and create good soil structure.



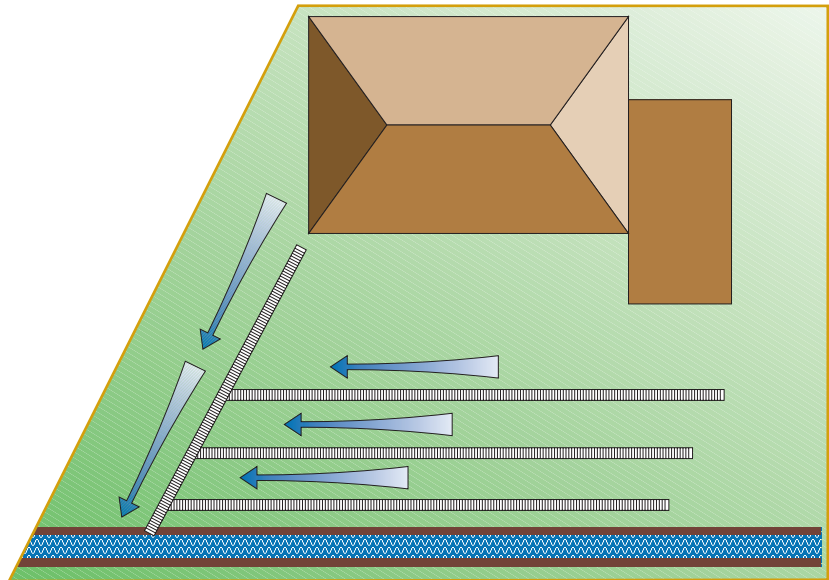
Application Notes

Filter Wrapped WavinCoil

In very fine silty soils, drainage systems can in time become blocked and be ineffective. A solution to this problem is to use a 'Geotextile' filter wrap membrane around the pipe. The Geotextile wrap acts as an external filter, extending the service life of the system. Please contact our Customer Services Department for more information.

Domestic Garden Drainage

WavinCoil can be successfully used for Garden Drainage problems; for example, to drain permanently waterlogged areas or areas prone to flooding during heavy rain. WavinCoil can also act as a cut-off drain behind retaining walls and buildings below ground level.



Handling and Storage



WavinCoil is manufactured from PVC-U (Unplasticised Polyvinyl Chloride), resulting in a strong, tough product which is also lightweight and therefore easy to handle.

Coils should be handled by fork truck with a boom attachment or with a webbing sling. When offloading from a wagon, coils should not be dropped onto hard surfaces or objects. WavinCoil can be stored either vertically in rows or stacked flat, upto 4 coils high when on level ground.

Further detailed advice on the design, installation and application of all Wavin products is available from our Technical Services Helpdesk.

Technical Advice and Assistance

OSMA WavinCoil Land Drainage System is backed by Wavin's comprehensive technical advisory service. This is available to provide expert assistance at every stage of a project, from planning and product selection to installation and maintenance.

Services include:

- Full technical literature, including:
 - System Product Guides
 - Design and Installation Guides
 - Trade Price Lists

Contact Wavin Technical Design Department for prompt assistance:

TECHNICAL DESIGN

Tel: 01249 766655

Fax: 01249 766653

Email: technical.design@wavin.co.uk

To request a copy of any item(s) of current literature, please contact:

LITERATURE REQUESTS

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Email: literature@wavin.co.uk

Further Information

WAVINCOIL LAND DRAINAGE SYSTEM

The following related publications are available for Land Drainage systems:

■ Trade Price List

ASSOCIATED OSMA SYSTEMS

OSMA systems are fully integrated to provide a total solution for above and below ground drainage, plumbing and heating. Contact Wavin Technical Design Department for further details regarding:

- OSMA Rainwater systems
- OSMA Soil & Waste systems
- OSMA Flexible Plumbing systems
- OSMA Underfloor Heating systems
- OSMA Below Ground Drainage systems
- OSMA Water Management systems
- OSMA Ducting systems
- OSMA Pressure Pipes for Water
- OSMA Pressure Pipes for Gas



WAVIN ONLINE

The complete OSMA product catalogue, together with design and installation guidance, is also available online at: www.wavin.co.uk

All literature can be downloaded via the searchable PDF library at: www.wavinpdfs.co.uk

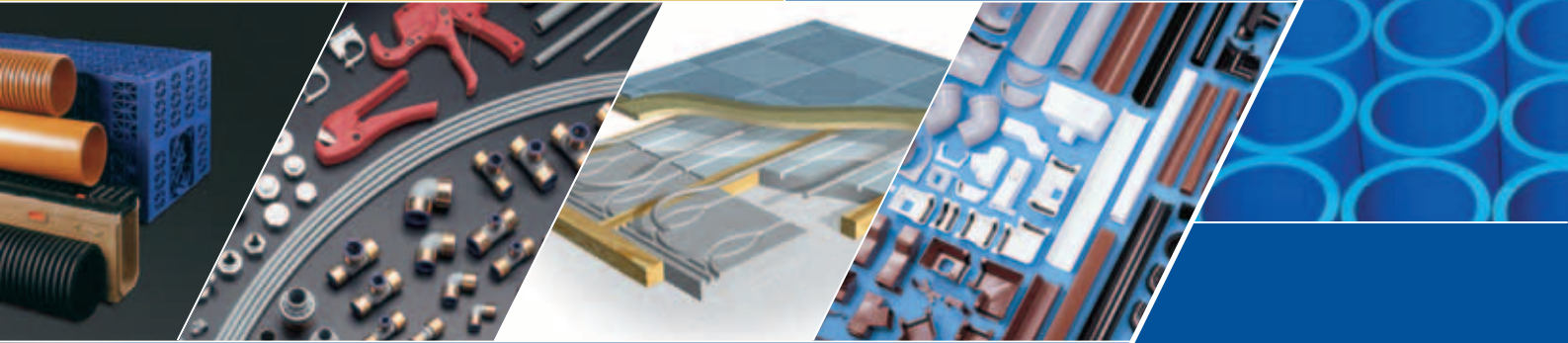
Wavin images can be downloaded at different resolutions from: www.wavinimages.co.uk



Land Drainage Systems

WavinCoil

Product and Installation Guide



Meeting your needs

The WavinCoil system developed by Wavin Plastics Limited, forms part of a comprehensive range of systems that provide intelligent solutions for all building, construction and utilities projects.

These include:

Above Ground Projects

- OSMA Rainwater systems
- OSMA Soil & Waste systems

Plumbing & Heating Projects

- OSMA Flexible Plumbing systems
- OSMA Underfloor Heating systems

Below Ground Projects

- OSMA Below Ground Drainage systems
- OSMA Water Management systems
- OSMA Ducting systems

Pressure Pipe Projects

- OSMA Pressure Pipes for Water
- OSMA Pressure Pipes for Gas

All OSMA systems are backed by full technical literature and project support.



ISO 9001:2000

Wavin Plastics Limited operates a programme of continuous product development, and therefore reserves the right to modify or amend the specification of their products without notice. All information in this publication is given in good faith, and believed to be correct at the time of going to press. However, no responsibility can be accepted for any errors, omissions or incorrect assumptions. Users should satisfy themselves that products are suitable for the purpose and application intended.



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