



**CIVILS**

# **CorriPipe™**

Technical Specification





# 1. Introduction

CorriPipe™ is a twin wall polyethylene drainage pipe manufactured from a black high density polyethylene by a twin extrusion process.

CorriPipes main application is filter and carrier pipe for surface and storm water drainage in civil engineering, construction, sports amenity, agricultural and other sub-soil applications.

CorriPipes excellent structural strength is achieved by the corrugate outer profile while the smooth inner wall ensures increased flow capacity.

CorriPipe™ is available in ring stiffness classes from SN2 to SN8 depending on the pipe size as per table 1 below.

NOMINAL ID (MM)	PIPE STIFFNESS (ISO 9969)
94	SN8
100	SN8
150	SN8
225	SN6 / SN8
300	SN6 / SN8
375	SN6
450	SN6
600	SN6
750	SN2 / SN4 / SN6
900	SN2 / SN4 / SN6
1050	SN2 / SN4 / SN6

**Note – Contact JFC for other specifications**  
**TABLE 1. – PIPE STIFFNESS**

CorriPipe™ is manufactured to different standards depending on the pipe size and application in question. Pipe sizes from 150mm - 600mm are certified by the British Board of Agreement (BBA) under certificate number 02/H069.

CorriPipe™ is also manufactured to EN 61386-24 for use as cable protection duct, this product is known as CorriDuct.

## 2. Sizes

CorriPipe™ comes in a complete range of sizes between 94mm and 1050mm and is available in either carrier or filter pipe.

CorriPipe™ also has a complete range of fittings and junctions as detailed below.

TABLE 2. - CORRIPIPE™ DIMENSIONS

NOMINAL SIZE (MM)	NOM. ID (MM)	NOM. OD (MM)	PIPE LENGTH (M)
94	94.5	111.5	6
100	100	119	6
150	150	178	6
225	225	265	6
300	300	354	6
375	372	426	6
450	445	512	6
600	592	680	6
750	750	848	6
900	900	1024	6
1050	1050	1200	6

TABLE 3. - PERFORATED PIPE DETAIL

NOMINAL SIZE (MM)	NO. OF SLOTS PER DWELL*	NOM. SLOT WIDTH (MM)	PEF. AREA (MM <sup>2</sup> /M)
94	4	2.0-2.5	7920
100	n/a	n/a	n/a
150	4	2.0-2.5	6120
225	4	2.0-2.5	4680
300	4	2.0-2.5	5120
375	3*	2.7-3.3	4263
450	3*	2.8-3.5	4024
600	3*	2.9-3.5	4942
750	3	3.0-4.0	13716
900	4	3.0-4.0	14688
1050	4	3.0-4.0	10944

\* Slots on alternate dwells

## Fittings

TABLE 4. - CORRIPIPE™ FITTINGS

NOMINAL SIZE (MM)	CODE	FITTING TYPE
150	150TB15	15° Bend
150	150TB30	30° Bend
150	150TB45	45° Bend
150	150TB90	90° Bend
150	150TT90	Equal Tee
150	150TY45	Equal Wye
150	150SWSTT90	Single Wall Tee
225	225TB15	15° Bend
225	225TB30	30° Bend
225	225TB45	45° Bend
225	225TB90	90° Bend
225	225TT90	Equal Tee
225	225TY45	Equal Wye
225	225/150TT90	Unequal Tee 150
225	225/150TY45	Unequal Wye 150
225	225SWSTT90	Single Wall Tee
300	300TB15	15° Bend
300	300TB30	30° Bend
300	300TB45	45° Bend
300	300TB90	90° Bend
300	300TT90	Equal Tee
300	300TY45	Equal Wye
300	300/150TT90	Unequal Tee 150
300	300/150TY45	Unequal Wye 150
300	300/225TT90	Unequal Tee 225
300	300/225TY45	Unequal Wye 225
300	300SWSTT90	Single Wall Tee
375	375/150TT90	Unequal Tee 150
375	375/150TY45	Unequal Wye 150
375	375/SWS6"TT90	Single Wall Tee
450	450/150TY45	Unequal Tee 150

**Note:** Larger fitting sizes fabricated on request

**Note:** CorriPipe™ also available in various perforation specifications. e.g. half, full, extra, etc.

## 3. Hydraulic Capacity

There are two main formulas used in hydraulic calculations of gravity flow pipelines – Manning’s and Colebrook-White:

### Manning’s

Manning’s is the most popular equation for stormwater design because it is simple to apply and it generally provides an acceptable level of accuracy.

$$Q = \frac{1}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$$

Q = Water Discharge [m<sup>3</sup>/s]  
 n = Manning’s roughness factor  
 A = Cross-sectional area [m<sup>2</sup>]  
 R = Hydraulic radius [m]  
 S = Surface Water Slope [m/m]

### Colebrook-White

A more accurate method for calculations is to utilize the Colebrook-White formula.

$$V = -2\sqrt{2gDS} \log \left( \frac{k}{3.7D} + \frac{2.51\nu}{d\sqrt{2gDS}} \right)$$

V = Velocity (m/s)  
 S = Hydraulic gradient (m/m)  
 k = Hydraulic roughness (m)  
 R = Hydraulic radius = D/4 (m)  
 D = Pipe internal diameter (m)  
 g = Gravitational acceleration (m/s<sup>2</sup>)  
 ν = Kinematic viscosity of water (m<sup>2</sup>/s)

## 4. Cover Depths

### Minimum Cover Depths

JFC Manufacturing Limited recommends the following minimum cover depths.

- 0.6m for non-trafficked areas
- 0.9m to finished surface for trafficked areas not subject to Highways Agency or National Roads Authority requirements
- 1.2m to finished surface for trafficked areas subject to Highways Agency or National Roads Authority requirements.

For further information contact

IRL: Tel: + 353 93 24066 or email: info@jfccivils.com

UK: Tel: +44 1928 583 391 or email: infouk@jfccivils.com

In certain circumstances lower minimum cover levels may be allowed. e.g. installation with rigid pavement, concrete surround etc. Please contact JFC for more information.

### Maximum Cover Depths

The maximum cover depths for CorriPipe™ are typically between 6-10 meters when installed in accordance with series 500 of the MCDHW Volume 1 as detailed in the CorriPipe™ BBA certificate.

The actual maximum allowable cover level is dependent on the following installation parameters and is often well in excess of 6-10 meters:

- The native soil stiffness
- The pipe bed and surround stiffness
- The size of the trench
- The density of the overburden
- Hydrostatic loading
- Factor of Safety
- Maximum allowable deflection limit

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For specific site conditions JFC can calculate the maximum pipe deflection based on BS EN 1295-1. Contact JFC for more details.



## 5. Installation

JFC CorriPipe™ is to be installed in accordance with the following national guidelines. In countries outside that specified contact JFC for more details.

### Ireland

The Specification of Road Works, series 500 as published by Transport Infrastructure Ireland.

### United Kingdom

The Manual of Contract Documents for Highway Works, Volume 1 series 500 as published by the Highways Agency.

### Trench Preparation

The trench width is generally between OD+300mm and OD+600mm but larger trenches are permissible. The trench (D) should provide for a minimum of 150mm pipe bed and local soft spots must be removed and replaced with hardcore. The pipe must sit evenly on the bed (C) and must be free of voids under the pipe. The trench should not be excavated too far in advance of pipe installation. All trenches are to be excavated in accordance with national health and safety regulations and local building regulations.

CorriPipe™ is to be backfilled in accordance with the relevant national guideline documents. Sidefill material is to be a well compacted single size coarse aggregate in accordance with BS EN 13242; Clause 4.3.2. Recommended grading to be 4/10mm (Ø94-Ø1050), 6/14mm (Ø450-Ø1050) and 10/20mm (Ø750-1050). The pipe surround material is to be installed at 150-300 layers to 95% compaction unless otherwise specified. Required compaction can be achieved using the correct combination of material type, layer thickness and compaction plant. Compaction equipment must not come in contact with the pipe. The sidefill material should extend to a minimum of 100mm over the crown of the pipe.

Backfill is to continue to a minimum of 300mm above the crown of the pipe with suitable material as per specification. The material should be free of any stone particles greater than 50mm. Compaction should not be carried out until a minimum cover of 300mm is achieved. Compaction equipment should be sized so as not to exert any undue stress in the pipe. Further backfill to the required level should be carried out in layers no greater than 300mm.

### Sidefill (B)

### Backfill (A)

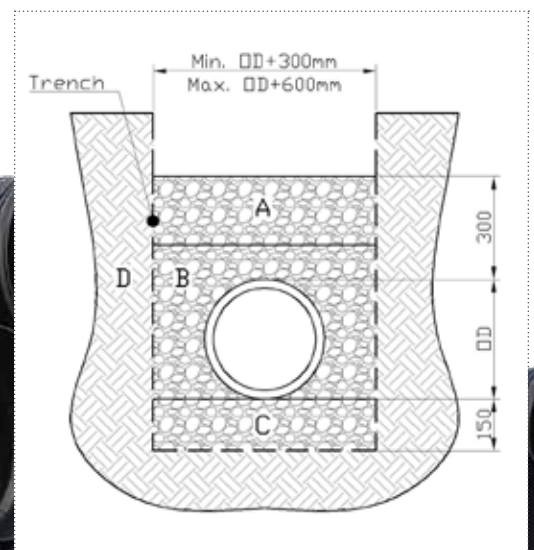


FIGURE 1. - TYPICAL INSTALLATION DETAILS

## 6. Jointing Plain Ended Pipe

All CorriPipe™ sizes are available as plain ended pipe.

This pipe type requires independent couplers for joining pipes together.

CorriPipe™ provides a fully watertight seal when installed in accordance with JFC guidelines in this document.

JFC recommends the following procedure for joining plain ended CorriPipe™ and associated fittings / couplers.

1. Cut the pipe to the require length with

a conventional handsaw. Ensure the pipe is cut square.

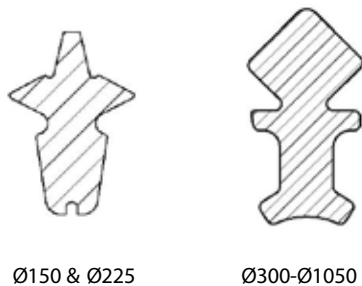
2. Clean the end of the pipe and accompanying coupler or fitting. Ensure no moisture or debris is present on either part.
3. Install a ring seal in the first dwell of the pipe. Ring seals are bi directional for plain ended pipe but need to be installed with the narrow end facing out from the pipe.
4. Lubricate the ring seal and accompanying coupler / fitting with pipe lubrication gel.
5. Measure the coupler / fitting and mark its depth on the pipe to show the home position.

with a piece of timber ensuring not to damage the pipe / coupler / fitting. Larger pipes may require mechanical assistance.

7. When using mechanical assistance there are two possible methods;
  - a. Push with a short pipe stub of equal diameter until home. See figure 4 below.
  - b. Use a sling wrapped between the corrugations to push the pipe home. See figure 5 below.
8. For joining pipes to the opposite side of the fitting /coupler follow the same steps as outlined above.

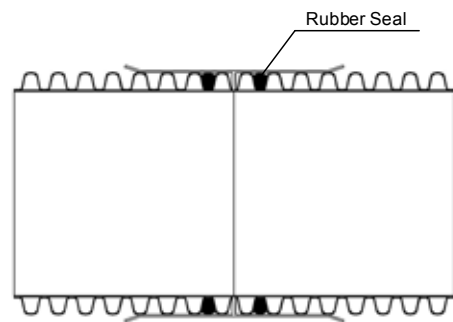
6. Lever the fitting / coupler onto the pipe

FIGURE 2.



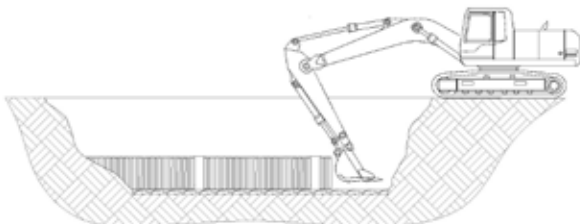
RUBBER SEAL TYPES FOR PLAIN ENDED PIPE

FIGURE 3.



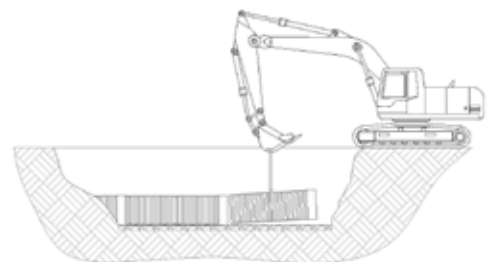
JOINT DETAILS ON PLAIN ENDED PIPE

FIGURE 4.



MECHANICAL ASSISTANCE WITH STUB

FIGURE 5.



MECHANICAL ASSISTANCE WITH SLING

## 7. Jointing Bell and Spigot Pipe

CorriPipe™ sizes of Ø750, Ø900 and Ø1050 are available as bell and spigot i.e. integrated sockets. This pipe type does not require independent couplers for joining pipes together.

There are two pipe types available denoted by colour marks on the Bell and Spigot of each pipe.

Green Line – Suitable for use with ring seals

Yellow Line – Not suitable for use with ring seals

CorriPipe™ Green Line provides a fully watertight seal when installed in accordance with JFC guidelines in this document.

JFC recommends the following procedure for joining Bell and Spigot Pipe.

1. Clean both Bell and Spigot ends of the pipe. Ensure no moisture or debris is present on either part.
  2. Install a ring seal in the first narrow dwell of the pipe as per figure 7. Ring seals are uni directional and must only be fitted as per Detail A in figure 7.
  3. Generously lubricate the ring seal and accompanying Bell end with pipe lubrication gel.
  4. Measure the spigot and mark its depth on the pipe to show the home position.
  5. Rotate the pipe until the green or yellow lines on the Bell and Spigot are aligned as per figure 8. Do not insert unless marks are aligned.
  6. Push the two pipes together using a small amount of mechanical assistance.
  7. There are two methods in which the pipe can be installed with mechanical assistance
    - a. Push with a short pipe stub of equal diameter until home. See figure 9 below.
    - b. Use a sling wrapped between the corrugations to push the pipe home. See figure 10 below.
- Care is required as excessive force can damage the pipe.

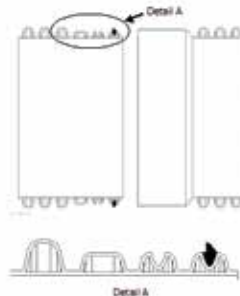
FIGURE 6.



Ø750 / Ø900 / Ø1050

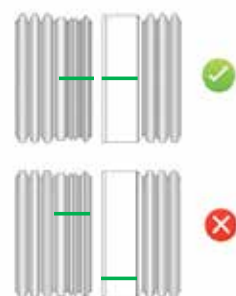
BELL AND SPIGOT SEAL

FIGURE 7.



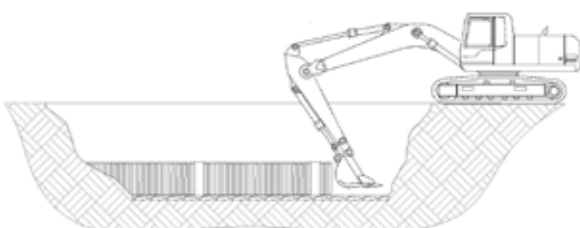
BELL AND SPIGOT SEAL INSTALLATION

FIGURE 8.



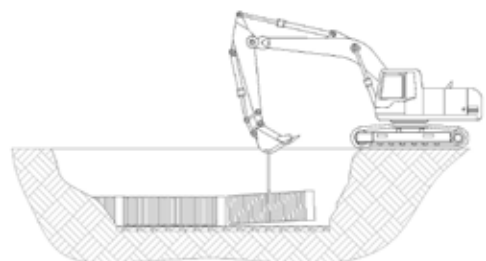
PIPE ALIGNMENT BEFORE INSERTION

FIGURE 9.



MECHANICAL ASSISTANCE WITH STUB

FIGURE 10.



MECHANICAL ASSISTANCE WITH SLING

## 8. Pressure Testing

There are two methods of pressure testing, the air test method and the water test method.

The most common method is the air test method and the test procedure is outlined below.

- Block the ends of the pipe / fitting with a suitable expanding stopper, ensuring both plug and pipe are thoroughly cleaned prior to fitting.
- Fill a U-Tube manometer with water to the correct level, ensuring there are no trapped air bubbles in the water.
- Connect the u-tube to the fitting on the expandable stopper
- Increase the pressure in the pipe until a head of water of 100mm is reached

- Allow the pressure to stabilise for a number of minutes, increasing the pressure if it drops.
- Record the pressure drop over a five minute period.
- To pass the test the pressure should not drop below a 75mm head of water.

**Note:** Temperature has a critical effect on the test, a 1°C change in air temperature inside pipe is sufficient for the test to fail.

## 9. Transportation, Handling and Storage

### General

Handling should be done carefully and in accordance with national health and safety guidelines. Dragging of pipes and fittings must be avoided. HDPE pipes and fittings become slippery in wet or in cold weather and extra precautions may be necessary.

Pipes up to 450mm in size are palletised with wooden frames and steel straps. 600mm pipes are generally steel banded in two's but can also be supplied loose. 750mm, 900mm and 1050mm are supplied as per order requirements.

TABLE 5. - CORRIPIPE™ PALLET QUANTITIES

NOMINAL SIZE (MM)	PIPES PER PACK	PACKS PER LOAD	PIPES PER LOAD
94	100	12	1200
100	90	12	1080
150	33	12	396
225	14	12	168
300	8	12	96
375	5	12	60
450	4	12	48
600	2	14	28
750	n/a	n/a	18
900	n/a	n/a	18
1050	n/a	n/a	8

### Storage

All materials should be carefully inspected at the time of delivery and any defects should be notified and reported immediately. All pipe stacks should be made on firm, flat ground to support the weight of the pipes and lifting equipment. For safety and Pipes and fittings should be transported and stored in their packaging.

Delivery vehicles should be provided with a clean, flat bed, free from sharp objects. Care must be taken to prevent slippage or excessive bowing of the pipes. Tie the load well to prevent rubbing. Use nylon straps, not chains or ropes.

The stacking height for pipes should be limited to not more than 3 meters. Pipes should be not be stored in open areas subject to high winds.

It is recommended that CorriPipe™ is not stored in direct sunlight for more than 3 months.







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### **For further information**

visit our website  
[www.jfccivils.com](http://www.jfccivils.com)  
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