SHIELD™

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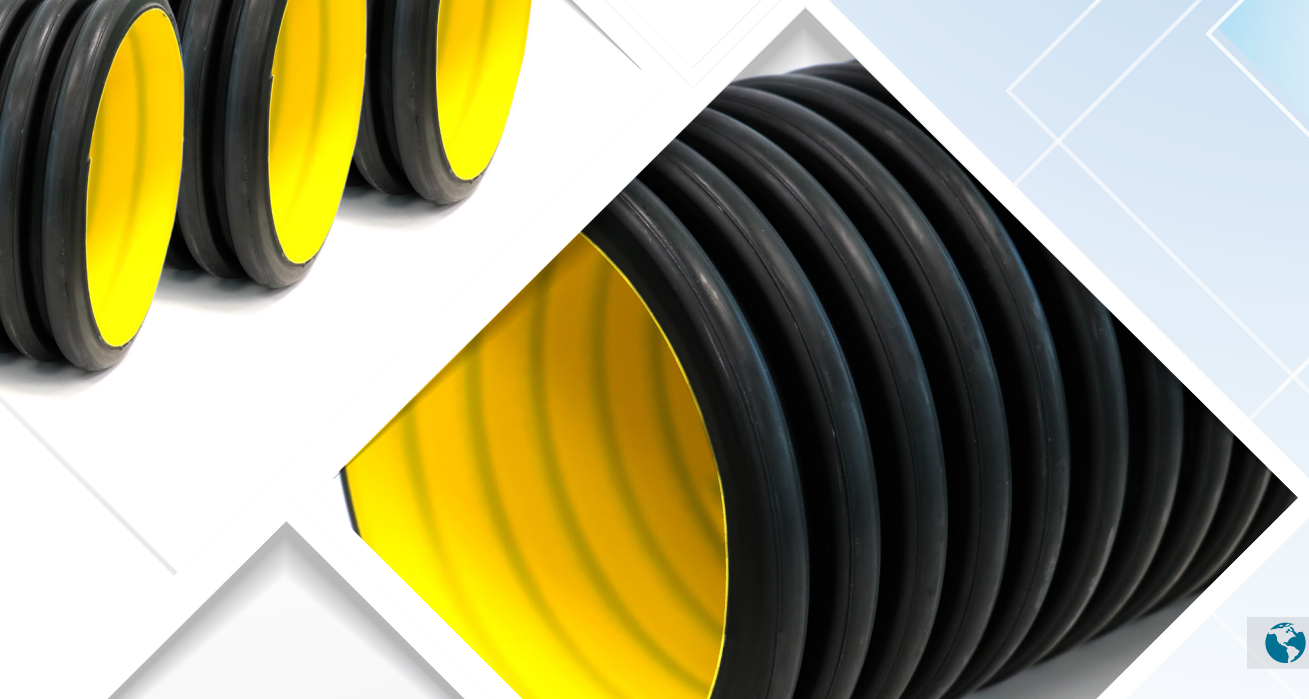
DOUBLE WALL CORRUGATED

PIPES

Sustainable Solutions for Your Valuable Projects



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INTRODUCTION

At SHIELD, we are dedicated to serving the needs of the fire protection and building services industries. We have a comprehensive range of quality products designed to the highest local and international standards.

Our commitment to continued research and development ensure that we remain at the forefront of innovative products to bring to the marketplace.

Our worldwide manufacturing facilities are some of the most advanced in the industry. Our experienced and professional staff provide the highest levels of service across engineering, quality, manufacturing, and after-sales support.

With our highly responsive and customer-focused network of distribution centres around the world, we excel at providing outstanding levels of service to our customers.

With offices and facilities in the UK and the Middle East, we can cater to the specific needs of your region and we are justifiably proud of our global client base.

At our manufacturing facility, in the UAE, we produce UL Listed, API, FM Approved, WRAS approved, and Bureau Veritas approved PE Pipes and fittings for use across a wide range of industries and applications in the region.

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Double Wall Corrugated Pipes

Introduction

Double Wall Corrugated Pipes is a double layer pipe with the outer layer having corrugation and with smooth surface inner layer. The outer corrugated layer substantially increases the stiffness of the pipe, which enables the pipe to take same burial load at a fraction of the weight of Solid wall pipes of the same size.

Double Wall Corrugated Pipes is a technically superior and cost effective solution for drainage and sewerage systems over conventional DI & RCC pipes with a steep reduction in installation time and equipment hiring cost. These pipes are available in sizes ranging from 100mm DN/ID to 800mm DN/ID having ring stiffness ranging from SN4 to SN16. Inner layer can be in different colours, with the outer layer in black colour.

Pipe Dimensions as per EN 13476 / ISO 16098 / ISO 21138				
Nominal Size	PE/PP			
ID (mm)	SN4	SN8	SN12	SN16
100	✓	✓		
150	✓	✓		
200		✓	✓	✓
250		✓	✓	✓
300		✓	✓	✓
400		✓	✓	✓
500		✓	✓	✓
600		✓	✓	✓
800		✓	✓	✓

Note:

- Pipe Length 6m and 12m.
- Coil Length 50m, 100m, 200m, 300m.
- Connecting / Jointing by rubber seal

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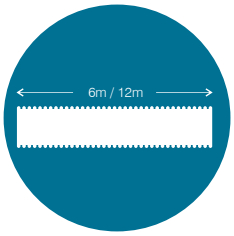
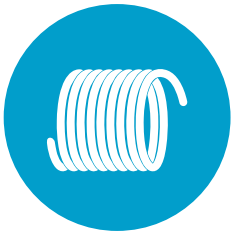
Double Wall Corrugated Pipes

Features and Advantages



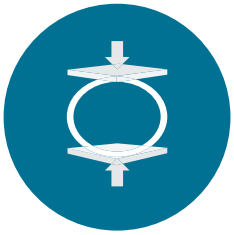
Longer Length



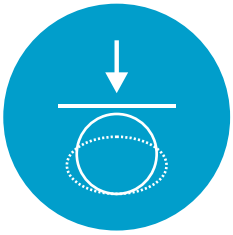
Formed into Coil

Lightweight

High Abrasion Resistance

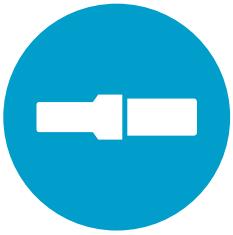


High Impact Strength



Deformation

Chemically Inert



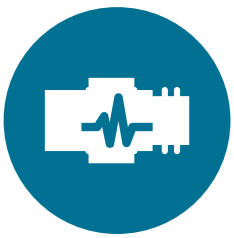
Ease in Jointing

Corrosion Resistant

No Lamination

Safe Installation
& Easy to Maintain

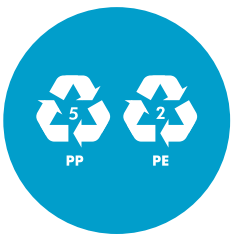
Smooth Inner Surface



Over 50 Years
Service Life

Life Cycle Cost

Low Installation Cost



Recyclable

Application

Sewer Line Application

Drainage System

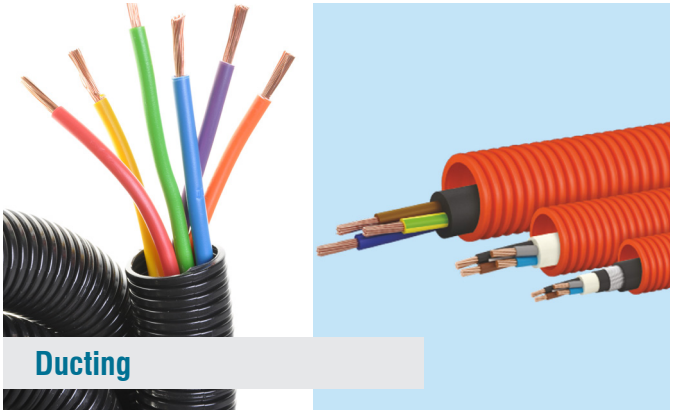
Rainwater Drainage

Highway Drainage Corridors

Storm Water Drainage

Effluent Discharge

Irrigation System



Ducting

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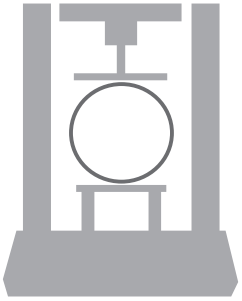
Technical Characteristics

Physical Characteristics				
	PP Value	PE Value	MU	Test Method
Density at 23°C	910	960	kg/m³	ISO 1183
Flow Index	0.3 (230°C, 2.16kg)	0.3 (190°C, 5kg)		ISO 1183
Resistance to Traction	> 30	> 22	MPa	ISO 527
Coefficient elasticity to bending	1700 - 2000	800 - 1200	MPa	ISO 178
Charpy Impact Resistance 23°C - jagged)	50	25	kJm²	ISO 179 / 1eA
Oxidation induction time at 200°C	> 80	> 20	minutes	ISO 728
Vicat Softening Temperature	155	125	°C	ISO 306
Oven Test (150°C, 30-60min.)	Without Cracks	Without Cracks	-	ISO 12091

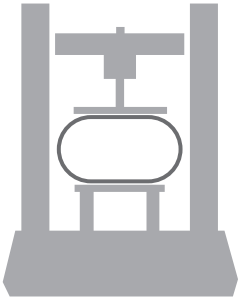
Mechanical Characteristics				
	PP Value	PE Value	MU	Test Method
Angular Stiffness SN	8 : 12	4 : 8	kN/m²	ISO 9969
Impact Resistance at °C	TIR ≤ 10	TIR ≤ 10	%	EN 744
Angular Flexibility (Strain 30%)	Without Cracks	Without Cracks		EN 1446

Functional Characteristics				
	PP Value	PE Value	MU	Test Method
Tightness of the system at pressure after 30min	Without Loss	Without Loss		EN 1277
Tightness of the system at pressure after 15min	Variation ≤ 10	Variation ≤ 10		EN 1277
Resistance to abrasion after 100.000 cycles (loss through abrasion)	< 0.1	< 0.1	mm	EN 295

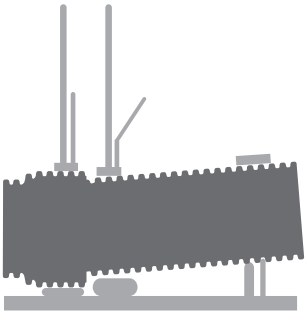
Technical Characteristics



Testing the stiffening clamp



Flexibility of deformation clamp



Deformation testing and hydraulic properties of the system

Flow									
ID (mm)	OD (mm)	Slope 2%		Slope 5%		Slope 1%		Slope 5%	
		Q (l/s)	V (m/s)	Q (l/s)	V (m/s)	Q (l/s)	V (m/s)	Q (l/s)	V (m/s)
100	115	5.75	0.41	9.09	0.65	12.85	0.92	28.74	2.05
200	230	11.66	0.49	18.43	0.77	26.06	1.09	58.28	2.44
250	290	20.13	0.56	58.27	1.03	82.4	1.46	184.26	3.26
300	350	36.85	0.65	58.27	1.03	82.4	1.46	184.26	3.26
400	465	69.07	0.76	109.22	1.2	154.46	1.7	345.37	3.81
500	580	123.88	0.88	195.87	1.39	277.01	1.97	619.41	4.41
600	700	226.02	1.02	357.37	1.62	505.392	2.29	1130.09	5.12
800	930	425.09	1.2	672.12	1.9	950.53	2.68	2125.44	6

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Jointing Method

SHIELD incorporates Integrated Coupling System with elastomeric Seal Ring for leak tight joining.
The jointing procedure of SHIELD pipes illustrated below:

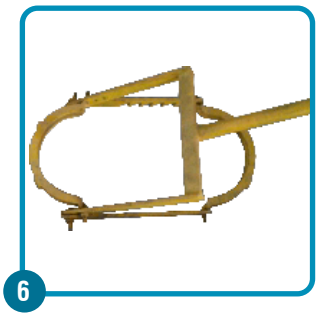
Corrugated Pipes

Sealing Rings

Put ring first in corrugation valley

Fixing of Ring

Ensure ring is well fitted on the pipe



Arrangement for joining

Bring pipe closer with joining device as shown in the picture

Pipes are now successfully jointed and 100% leak-proof

Elastomeric Sealing

- Elastomeric sealing ring made of EPDM with resistance to UV exposure, ozone, ageing, weathering, and many chemicals - great for outdoor application.
- Low Electrical Conductivity
- Resistance to steam and water
- Surface of the ring is smooth, free from pitting cracks, blisters, air marks, and any other imperfection that may affect its behavior in service.
- Elastomeric sealing rings are made in accordance with one of the type (Type 1 to Type 6) of IS 5382 standard.

Trench Terminology

Trench Preparation

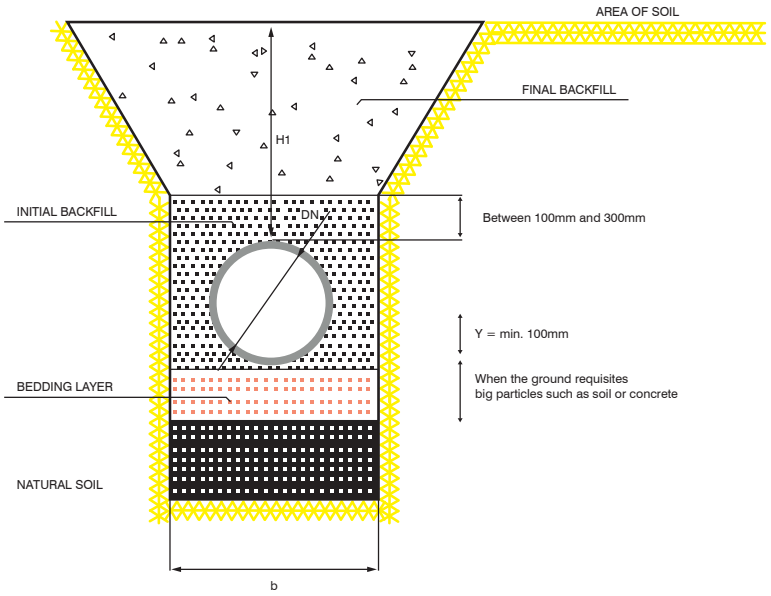
The width of a sewer trench depends on the soil condition, type of side protection and the working space required at the bottom of trench for smooth installations. Increase in width over required minimum would unduly increase the load on pipe and cost of road restoration. Excavation of sewer trenches should be in straight lines as much as possible and to the correct depths and gradients as per the requirement of design of the system. These pipes can also be laid at very wide and smooth curvatures without transitional manholes because of the inherent flexible property.

Dewatering

Sewer installation trenches shall be adequately dewatered for the placement of pipe at proper gradient till the pipe is integrated through socket and spigot joint/coupler assembly with the already laid segment. Precautions are to be taken to arrest floating of installed sewer segments against buoyant forces in case of sudden accumulation of water in the trench.

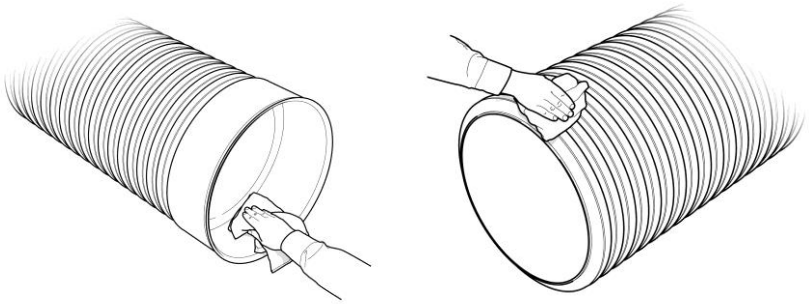
Bedding

Normally, even for the maximum combined loading (wheel load + backfill), any form of cement concrete structural bedding would not be necessary. For maintenance of sewer slopes the initial backfill envelop with sand or gravel (as computed through structural design of buried flexible conduit) over a single Brick Flat Soling would be sufficient. In the event that the anchorage becomes imperative the transverse concrete anchorage blocks spaced at suitable interval shall also act as chairs for defining and maintaining the sewer slopes.



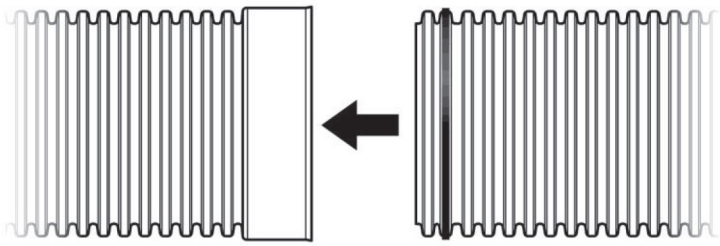
Pipe Joint Assembly

- Before pipe is laid into the trench, it should be reinspected for any damage and any debris that may have accumulated on the inside of the pipe, the gaskets, or sealing surfaces should be cleaned. The pipe should also be checked to ensure that it is the correct type and size.



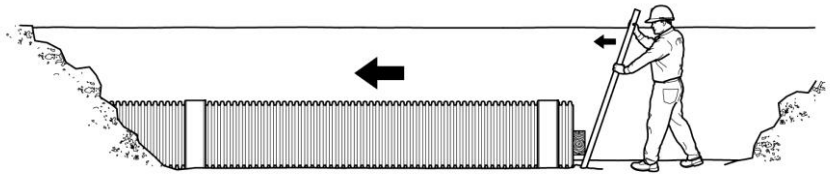
Cleaning Seal Surface of Pipe

- The pipe should be lowered into the trench using slings placed in a manner that evenly supports the pipe. It is good practice to use a tag line (i.e., a line attached to the end of the pipe that prevents uncontrolled pipe movement) when positioning the pipe. Pipe equipped with integral bell and spigots must be installed by inserting the spigot into the bell.



Integral Bell and Spigot Connection

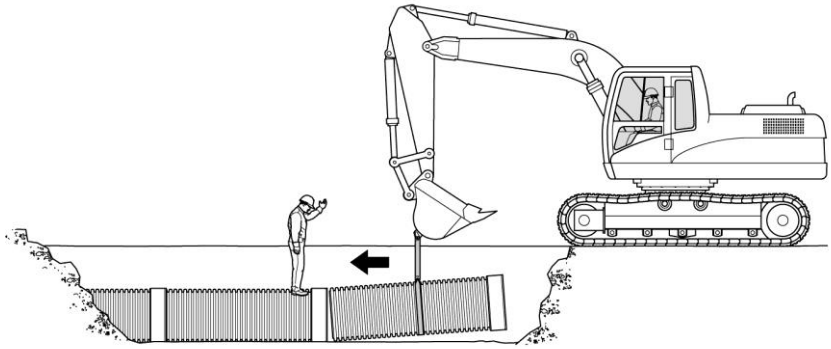
- Smaller diameter pipe may be pushed together by hand or leveraged together using a spanner block and a lever



Installing Small Diameter Pipe

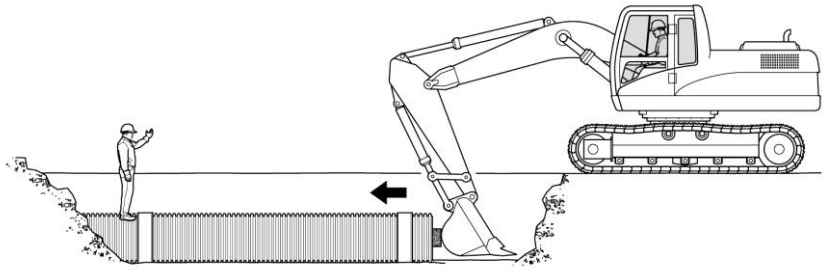
Pipe Joint Assembly

- Larger diameter pipe typically requires more force to assemble and typically necessitates the use of machinery, such as a backhoe. One method of using a backhoe for assembly is to use the slinging strap to position the spigot into the bell of a previously-installed pipe. A pipe is properly joined when it is pushed together in a straight alignment.



Installing Large Diameter Pipe with Sling

- Another method involves pushing the pipe joints together. For this method, a sacrificial spigot or portion of pipe of the same size is placed inside the bell of the pipe to be installed, and then the assembly is pushed into the bell of a previously-installed pipe.

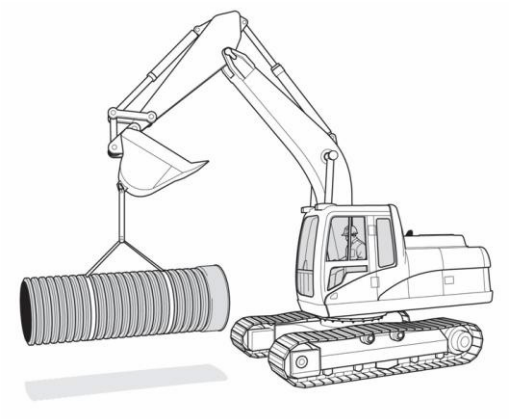


Installing Large Diameter Pipe with Stub

Handling & Transportation

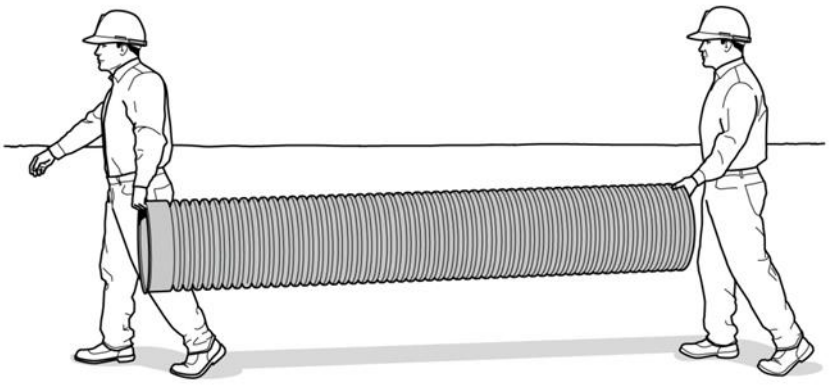
Handling

- Pipes shall be smoothly lowered to the ground.
- Pipes should not be dragged against the ground to avoid the damages to the coupler/pipes.
- 900mm and larger diameter pipes are carried with slings at two points spaced approximately at 3m apart.



Lifting Larger Diameter Pipe

- For smaller diameters (450 mm - 900 mm both exclusive) one lift point shall be sufficient. For diameters smaller than or equal to 450 mm manual labour can be used.



Lifting Small Diameter Pipe

- Do not use a loading Boom or Fork Lift directly on or inside pipe.

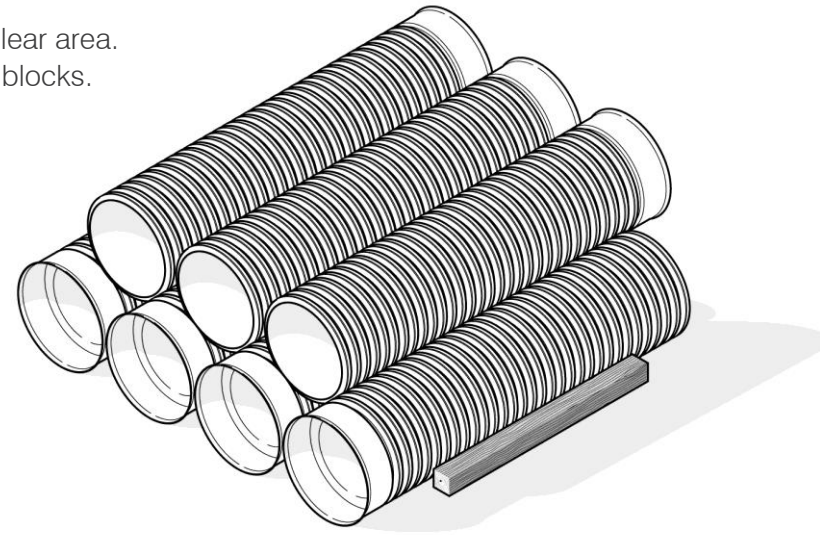
Handling & Transportation

Transport

The arrangement of loading the pipes is advised, i.e. smaller diameters inserted into the next higher sizes of pipes up to the height of 2.5m in a truck. While loading the pipes into the truck, care should be taken the spigot/coupler end should be arranged alternatively in the corresponding layer to avoid the damage to the coupling/socket-end.

Storage

- Stockpiling should be done temporarily on a flat clear area.
- Avoiding collapse of stacks use wooden posts or blocks.
- Stacking should not be higher than 2.5m.
- While stacking, alternate the socket/coupler ends at each row of stacked pipes.



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For further information on any aspect of the Shield range of Double Wall Corrugated Pipes please contact your nearest office.

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