

INSTALLATION

DRILLING LUBRICATION

Trenchless applications using Restrain® Sewer Pipe require "in hole" lubrication within the host hole with either water or an appropriate water/bentonite suspension lubricant mixture at all times.

OVERCUT

The amount of overcut of the host hole is dependent on many factors, including, the type of soil, lubrication, pipe size and line length. The host hole is normally at least 20mm larger than the maximum socket outside diameter and may be 30mm-50mm larger in rock or swelling clays.

JOINT ASSEMBLY AND ORIENTATION

Prior to lubrication and assembly check the pipe socket and spigot for any damage or scratches, especially on the threads and ensure both the Restrain® pipe thread and seal ring are clean and free of dirt and grit.

For best results, ensure that the joint assembly is spigot-into - socket, (not socket-over-spigot) and that the spigot is in the direction of the pipeline insertion.



Figure 1.1 Restrain[®] Sewer Pipe typical joint assembly and orientation

JOINTING INSTRUCTIONS

Trenchless applications using Restrain® Sewer Pipe require "in hole" lubrication within the host hole with either water or an appropriate water/bentonite suspension lubricant mixture at all times. Regardless whether Restrain® Sewer Pipe is installed via HDD, micro tunnelling, auger boring, static pipe bursting, pipe reaming or slip lining the method of pipe jointing will be the same.

The pipe jointing procedure is shown and described as follows;



STEP 1 Figure 1.2 Clean ends of pipe Ensure that the thread is clean and free from damage. Place the rubber ring in the groove (the furthest groove from the end of the pipe). The crown of the seal should be facing outwards.



STEP 2 Figure 1.3 Lubricate surfaces Lubricate the spigot thread, the seal ring, the socket thread and the lead in to the socket with an approved spray lubricant.

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RESTRAIN® PVC-U SEWER PIPE



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STEP 3 Figure 1.4 Align pipe ends

Align the spigot with the socket in a straight line. Ensure there is a smooth initial engagement. Do not crossthread. Use temporary alignment support blocks if required.



STEP 6 Figure 1.5 Tighten joint

For DN100 to DN225 apply the strap wrenches to both the spigot and socket and screw up pipe until the seal ring completely disappears up into the socket mouth and the joint firmly resists further tightening.



STEP 4 Figure 1.6 Engage thread

Initially turn the spigot by hand in a clock-wise direction. The initial thread engagement and first few turns should be smooth and free of "binding".



STEP 7 Figure 1.7 Witness mark The end machining mark on the spigot threaded section is the approximate "witness mark"



STEP 5 Figure 1.8 Start thread Continue to hand screw the spigot into the socket as far as it will easily go, or up to near the seal ring.



STEP 8 Figure 1.9 C Wrench A "C Wrench" assembly tool is required for the DN300 Restrain® Sewer Pipe due to the high torsional forces required.

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APPROVED PIPE JOINTING LUBRICANT

Use only "Gensil 601", "CRC 808" or "Rocol" brand aerosol silicon lubricant or an Iplex approved equivalent for lubrication of joint prior to assembly. **Do not use conventional pipe jointing lubricant.**

The silcone spray is used to lubricate the thread and ring prior to jointing of the pipes. The lubricant also provides an ability to undo the thread should the pipes need to be removed.

PIPE STRAPS

Use strap wrenches with woven nylon webbing straps for pipe turning during assembly. "RIDGID", "Hit" or Super Ego" brand or an Iplex approved equivalent is recommended.

It is recommended that a strap wrench with an extended handle is used, at least 1200mm long for DN225 and DN300 Restrain[™] Sewer Pipe. RIDGID product codes are shown below.

TABLE 1.0 RIDGID STRAP WRENCHES

DN	RIDGID CODE			
100	Model 2 Cat 31345			
150	Model 2 Cat 31345			
225	Model 5 Cat 31365			
300	Model 5 Cat 31365			



Figure 1.10 "C wrench" assembly tool used on DN300 Restrain™ Sewer Pipe

A "C wrench" assembly tool is recommended for DN300 Restrain™ Sewer Pipe.

If it is necessary to leave the installed pipe ends exposed, protect the threaded spigot or socket ends with temporary caps. Dress threads with a file if lightly impacted or marked.

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PIPE AXIAL CAPABILITY

The Restrain[™] Sewer Pipe is capable of being pulled or pushed through a bore hole. The threaded spigot and socket provide axial capability. The pipe must not be over strained during the pulling or pushing process.

The maximum tensile and compressive capabilities are shown in the following table.

TABLE 6.2 MAXIMUM TENSILE AND COMPRESSIVE LOADS

PIPE DN	SN	MAX TENSILE LOAD (kN)	MAX COMPRESSIVE LOAD (kN)		
100	16	17.6	17.6		
150	16	34.3	29.4		
225	16	93.2	93.2		
300	16	117.7	117.7		

PULLING HEAD

There are two types of pulling heads commonly used with Restrain[™] Sewer Pipe, internal type and external type. The pulling head generally has a tapered front cone that allows drilling mud to be pushed into the annulus between the pipe and bore hole.

The pulling head is generally attached to the Restrain[™] Sewer Pipe by a swivel assembly so that the pipe is not rotated during pipe reaming and/or pull back operations.





Figure 1.11 Typical external type pulling head attached to the Figure 1.12 Swivel arrangements attached to Restrain™ Sewer Restrain[™] Sewer Pipe

Pipe prior to the attachment of a pulling or reaming head

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INTERNAL PLUG

In some cases it is advisable to insert a plug into the lead Restrain[™] Sewer Pipe in order to stop groundwater and/or drilling mud from entering the pipeline during pull back. This will ensure that the pipe joint is clean at the point of entry into the bore hole.

EXPANSION AND CONTRACTION

Distortion can occur when laying pipes in direct sunlight. When one side of the pipe is hotter than the other it might develop a slight bow. This process is reversible and the bow can be eliminated by exposing the other side to the sunlight or otherwise allowing the temperature to stabilise before installation.

Plastic pipes will expand when heated and contract when they cool. A 2.75m length of PVC pipe will expand/contract approximately 2mm for each 10°C rise or fall in temperature.

PIPE CURVATURE

Restrain[™] Sewer Pipe must be axially aligned with the host hole at the point of entry. Some curvature back from the host hole is permitted, such as in HDD applications. Do not attempt to bend Restrain[™] Sewer Pipe at the point of host entry.



The minimum radii of curvature is based on 300 x pipe OD and is shown below.

TABLE 1.1 MINIMUM RADII OF CURVATURE

PIPE DN	MEAN PIPE OD (mm)	MIN RADIUS (m)	
100	110	33	
150	160	48	
225	250	75	
300	315	95	

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SERVICE LATERAL CONNECTIONS

As Restrain[™] Sewer Pipes are compatible with PVC-U pipe and fittings made in accordance with AS/NZS 1260 "PVC-U pipe and fittings for drain, waste and vent applications" connection to property or lateral connections is easily accomplished with conventional PVC sewer fittings. A full list of the range can be found in the Iplex 'DWV Pipe and Fittings System' technical guide available on the Iplex website: www.iplex.com.au.

SOLVENT WELD SADDLES

Once the Restrain[™] Sewer Pipe has been installed a solvent saddle can be applied to the Restrain[™] Sewer Pipe at the point of the property or service connection.

Solvent weld saddles require straps to hold the saddle in place whilst the solvent weld joint cures.

1.2 TYPICAL SOLVENT WELD SADDLE DETAILS

			DIMENSIONS IN (mm)		
PRODUCT CODE	NOM SIZE	ANGLE 'a'	Ά'	'B'	'C'
D050151045	150x100	45°	250	226	55
D050221045	225x100	45°	305	250	55
D050301045	300x100	45°	305	250	55
D050301545	300x150	45°	305	330	80



OBLIQUE JUNCTIONS

After the Restrain[™] Sewer Pipe has been installed a section of the Restrain[™] Sewer Pipe is cut out and an oblique reducing junction is installed with the use of DWV slip couplings.

STAINLESS STEEL COUPLINGS

Alternatively stainless steel clamps with DWV sockets can be clamped directly to the Restrain™ Sewer Pipe.

Figure 1.13 Typical solvent weld saddle details



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