

TECHNICAL MANUAL

June 2020



SuperTite
Suspended Drainage System



THE AUSTRALIAN PIPE COMPANY



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1.0 INTRODUCTION

1.1 About SuperTite

High performance, extremely durable SuperTite Suspended Drainage System offers significant installation and performance benefits for above ground stormwater drainage applications for many civil, commercial and residential projects.

SuperTite pipes and fittings deliver superior fire resistance with up to a 4 hour fire rating. This makes the SuperTite Suspended Drainage System the ideal choice for under-slab applications such as basements and car-parks where fire resistance is a critical consideration.

The unique joint design capabilities of the SuperTite Suspended Drainage System provides a high integrity pipeline system which resists leakage, while still achieving up to 4 degrees of joint rotation. The unique SuperTite rubber 'V' rings are manufactured and tested in accordance with AS1646 'Elastomeric seals for waterworks purposes'. Made from nitrile rubber, the SuperTite 'V' rings are resistant to most chemicals and hydrocarbons and can withstand service temperatures up to 100°C.

An extensive range of fittings is available to maximise the versatility of stormwater drainage design, by allowing easy transitions between different pipe diameters, pipe materials, and changes in pipeline direction. Standard fittings available include bends, junctions, saddles, reducers and adaptors to other pipe materials such as PVC.

The SuperTite Suspended Drainage Systems offers you a truly Smart solution for your suspended drainage needs.

1.2 About RCPA

RCPA was formed in 2015 when RCPA Holdings acquired the Fibre Reinforced Concrete Pipes business from James Hardie Australia. As a part of the RCPA Group of companies, RCPA is a leader in the manufacture of fibre reinforced concrete pipes.

Formed in 2009, Reinforced Concrete Pipes Australia Pty Ltd was a merger between Reinforced Concrete Pipes (RCP) and Australasian Pipeline & Pre-cast (APP). This merger resulted in the only Australian owned and operated national supplier of reinforced concrete pipe.

With concrete pipe production plants and/or distribution centres located in Sydney, Brisbane, Perth and Melbourne, the RCPA Group of companies is well established as an industry leader in the Australian concrete pipe market.



2.0 SAFE WORKING PRACTICES

2.1 Health & Safety Information

WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA.

RCPA products contain sand, a source of respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks.

During installation or handling:

1. Work in outdoor areas with ample ventilation;
2. Minimise dust when cutting by only using suitable cutting equipment capable of adequately suppressing dust;
3. Warn others in the immediate area to avoid breathing dust;
4. Wear a properly fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet clean-up methods - never dry sweep. For further information such as Material Safety Data Sheets, please ask RCPA on 1800 88 7272.

For further information such as Safety Data Sheets please contact RCPA on 1800 88 7272

2.2 Cutting SuperTite Concrete Pipes

From time to time it will be necessary to cut pipes and install fittings. Only use suitable cutting equipment capable of adequately suppressing dust. All power cutting operations should be carried out in an open-air situation or in well ventilated spaces.

As there is no steel reinforcement to corrode, no corrosion protection is required to be applied to the cut end.

Use appropriate safety precautions when operating cutting equipment in accordance with manufacturers recommended practices.

Cutting guide:

1. Mark a cut line on the outside of the pipe.
2. Make sure pipe is stable before cutting.
3. Cut length of pipe to the cut line marked.
4. When cutting a length of pipe, it will be necessary to roll the pipe to get access to the entire circumference. After rolling make sure pipe is stable before resuming cutting. It is recommended pipe be chocked to prevent the pipe rolling during cutting.
5. Proper safety gear must be worn to protect operator in accordance with applicable safety standards and manufacturers recommendations.

Note: Refer to section 6 for further cutting recommendations.

3.0 PRODUCTION INFORMATION

3.1 SuperTite Jointing System

The unique design capabilities of the SuperTite joint provides a high integrity pipeline system which resists leakage, while still achieving up to 4 degrees of joint rotation.

All SuperTite joint surfaces for pipes and fittings are precision machined on lathes, achieving high precision joint tolerances. This allows for straightforward installation on site.

All SuperTite pipes are supplied as a standard 4m length.

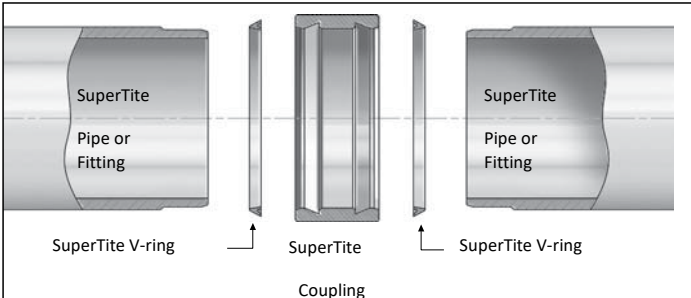


Figure 1 - SuperTite Jointing System



3.2 SuperTite Concrete Pipes

SuperTite Concrete Pipes are available in 225mm to 750mm diameters, with a standard length of 4m for all sizes. The high tolerance factory machined spigots allow quick installation and resist leakage.

TABLE 1							
Nominal Pipe Size (DN) mm	225	300	375	450	525	600	750
Strength Class	2	2	2	2	2	2	2
Pipe ID	233	302	377	455	531	608	719
Pipe OD	273	346	427	513	593	678	803
Wall Thickness (mm)	20	22	25	29	31	35	42
Pipe Length (m)	4	4	4	4	4	4	4
Spigot (mm)	257	336	415	504	584	664	783
Approx Mass (kg)	107	149	209	292	370	475	670

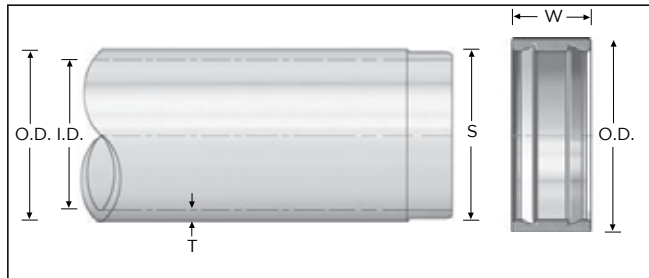


Figure 2 - SuperTite Concrete Pipe and Coupling

3.3 SuperTite Couplings

Manufactured from the same concrete material as SuperTite Pipes and designed to provide a high integrity seal, SuperTite Couplings are used to connect SuperTite pipes and fittings. Using the supplied VJoin lubricant, the SuperTite Couplings are simple to connect and can provide up to 4 degrees of deflection per joint to accommodate small pipe line misalignments

TABLE 2							
Nominal Pipe Size (DN) mm	225	300	375	450	525	600	750
Length (mm)	160	160	180	180	180	180	180
Approx Mass (kg)	5	7	12	15	18	21	29

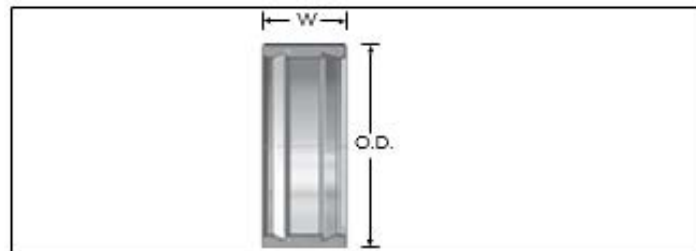


Figure 3 - SuperTite Concrete Pipe and Coupling

3.5 SuperTite Fittings

An extensive range of proprietary fittings are available to maximise design versatility allowing easy transitions between different pipe diameters, pipe materials, and changes in pipeline direction. Standard fittings available include bends, junctions, saddles, reducers and adaptors to other pipe materials such as PVC, however the ability to manufacture special items such as manifolds, long leg bends, and special junctions, further enhances the versatility of the SuperTite Suspended Drainage System.

Some fittings are only made upon request, items marked with an asterisk (*) in the following tables are non-stock items, please contact RCPA for availability.

3.6 SuperTite Bends

The standard range of SuperTite bends include 45 and 88 degree bends. If you require other angles such as 11, 22, 30 or 60 degrees, please Contact RCPA to discuss pricing and availability.

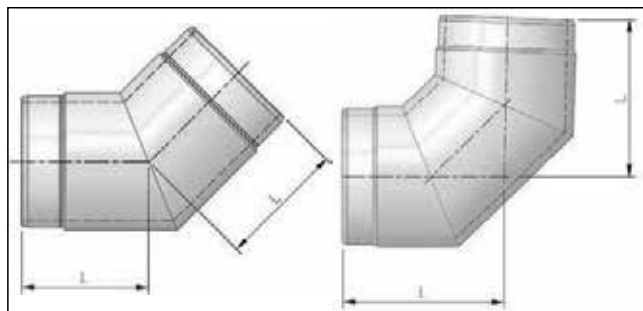


Figure 5 - SuperTite Bends

TABLE 4				
Pipe Diam (mm)	45 Degree		88 Degree	
	L (mm)	Approx Mass (kg)	L (mm)	Approx Mass (kg)
225	248	10	330	12
300	248	16	395	23
375	298	28	445	38
450*	298	38	500	58
525*	348	57	560	82
600*	348	73	625	117
750*	398	113	685	172

3.7 SuperTite Bends

The standard range of SuperTite bends include 45 and 88 degree bends. If you require other angles such as 11, 22, 30 or 60 degrees, please Contact RCPA to discuss pricing and availability.

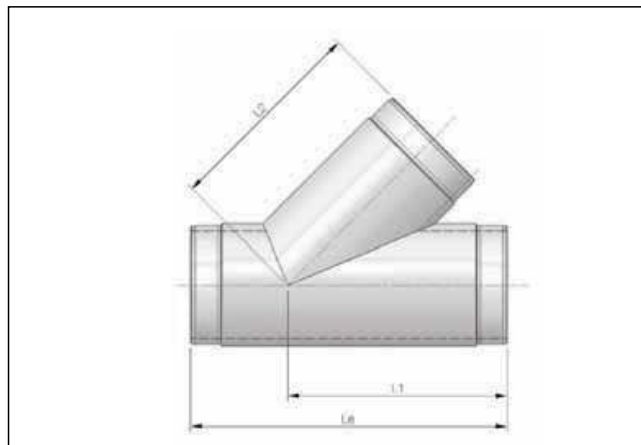


Figure 5 - SuperTite Junction

TABLE 5					
Pipe Diam (mm)	Branch Size (mm)	Dimensions (mm)			Approx Mass (kg)
		Le	L1	L2	
225	225	700	485	500	21
300	300	900	625	585	40
375	375	1000	715	685	64
450*	450	1100	810	785	94
525*	525	1300	950	885	140
600*	600	1400	1045	1035	200
750*	750	1500	1150	1185	289

3.8 SuperTite Saddle JUNCTIONS

These can be used as an alternative to a SuperTite Slope Junction where smaller diameter branch lines are used. SuperTite Saddle Junctions also give the flexibility of installation after the main drainage line has been completed.

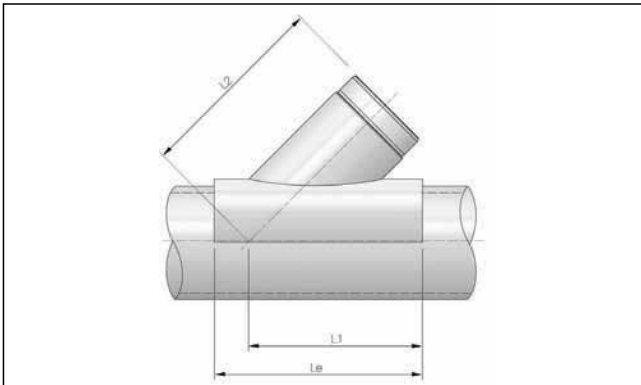


Figure 7 - SuperTite Saddle Junction

TABLE 6				
Saddle Slope Pipe X Branch	Dimensions (mm)			Approx Mass (kg)
	Le	L1	L2	
300/225	600	490	585	22
375/225	600	530	640	18
375/300	700	580	700	34
450/225	600	575	695	21
450/300	700	625	755	29

3.9 SuperTite Saddle Tees

Commonly used for bridge drainage scuppers, SuperTite Saddle Tees allow a vertical inlet pipe directly into the main drainage line. Available to suit a range of inlet pipe materials, the 150mm diameter socket inlet has a rubber V-ring for a high integrity seal.

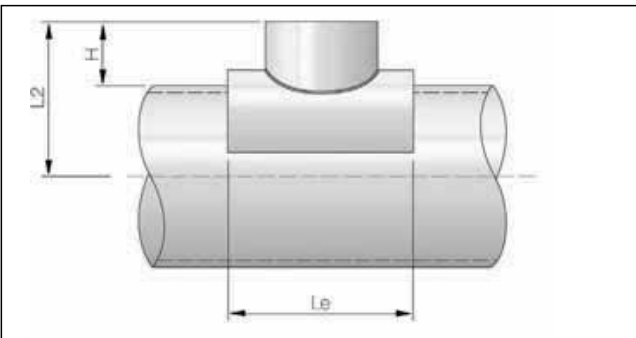


Figure 8 - SuperTite Saddle Tee

TABLE 7				
Adaptor Size Pipe X Branch	Dimensions (mm)			Approx Mass (kg)
	Le	H	L2	
225/150	350	75	225	6
300/150	350	75	280	8
375/150	350	75	320	9

3.10 SuperTite Adaptors and Reducers

To allow connection between different sizes of SuperTite pipes, or to allow a different material line to be incorporated, there are a range of SuperTite Adaptors and Reducers available as standard. All of the adaptors and reducers feature a rubber ring seal to prevent leakage.



Figure 9 - SuperTite Reducer

TABLE 8				
Reducer Size Pipe X Branch (mm)	Dimensions (mm)			
	Le	H	L2	L3
225/150 PVC	265	162	120	257
300/225 PVC	346	252	120	336
300/225	350	260	120	336
375/300	431	340	120	415
450/375	519	418	120	504
525/450	603	507	120	584
600/525	689	587	120	664

3.11 SuperTite Expansion Joints

SuperTite expansion joints are manufactured by RCPA for use where a cyclic expansion may occur, such as bridge decks or connections between adjacent building structures.

For more information see Section 4.7

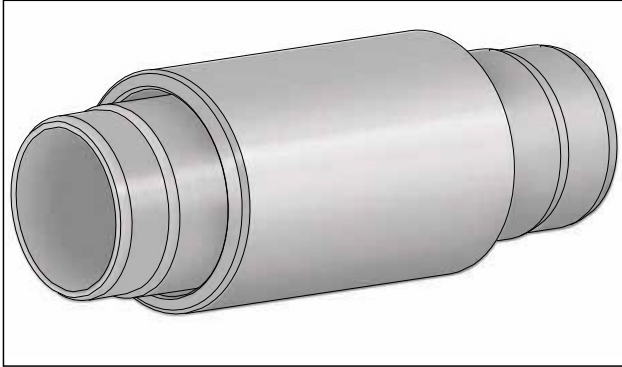


Figure 10 - SuperTite Expansion Unit

3.12 SuperTite Cleanout Point

To allow maintenance access for inspection or rodding of drainage lines, SuperTite cleanout points can be installed along a suspended pipe where required. Featuring a bitumen coated cast iron access point with a rubber ring seal and secured with 316 stainless steel straps, the SuperTite cleanout point provides a 100mm access opening that can be oriented at any location around the pipe circumference. SuperTite cleanout points can be retro-fitted to any drainage pipe line.

Using a 100mm BSP 316 stainless steel threaded plug to seal the opening, the SuperTite cleanout point provides a simple solution for maintenance access.

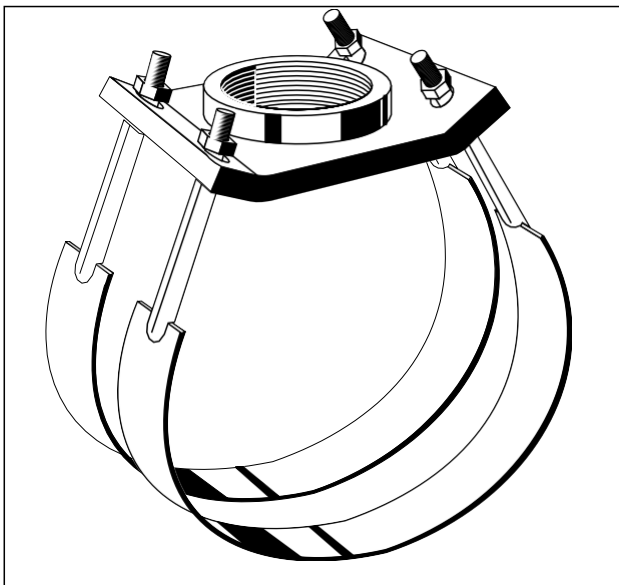


Figure 11 - Cleanout saddle to 100 BSP

3.13 Custom Applications

RCPA can custom design a drainage solution for unique applications that present particular challenges to designers. Some examples of these custom solutions can be found in bridge and tunnel drainage where the stormwater system must be adapted to work with structural components that cannot be altered.

Contact RCPA to discuss how the SuperTite Drainage System can be adapted or customised to suit your specific project.



4.0 DESIGN INFORMATION

4.1 Working Pressure

The maximum instantaneous pressure for the SuperTite Drainage System is 250kPa (25m head). Sustained working pressures should be limited to below 90kPa, if a requirement exists for a higher working pressure please Contact RCPA to discuss your application.

4.2 Connection of non-SuperTite

Other pipe materials can be connected to SuperTite pipes using SuperTite Slope Junctions, SuperTite Saddle Tee's or in-line SuperTite Adaptors. Commonly connected pipes are PVC or stainless steel in nominal diameters of 150 or 225mm. Contact RCPA for more information on available adaptors.

4.2 Suspending Pipes

SuperTite Suspended Drainage System may be hung from the structure or coupled directly to it. A range of different bracket types can be used to support pipes and fittings however these should be certified by their manufacturer for suitability (see Figure 12). The following table indicates the approximate weight of one 4 metre length of SuperTite pipe with couplings full of water.

TABLE 9 Weight of pipe full of water			
Nom. Pipe Diameter (mm)	Weight of pipe and coupling (kg)	Weight of water (kg) SG=1	Total Suspended Weight per 4m length (kg)
225	93	166	259
300	147	288	435
375	215	447	662
450	281	656	937
525	362	896	1258
600	467	1169	1636
750	657	1629	2286

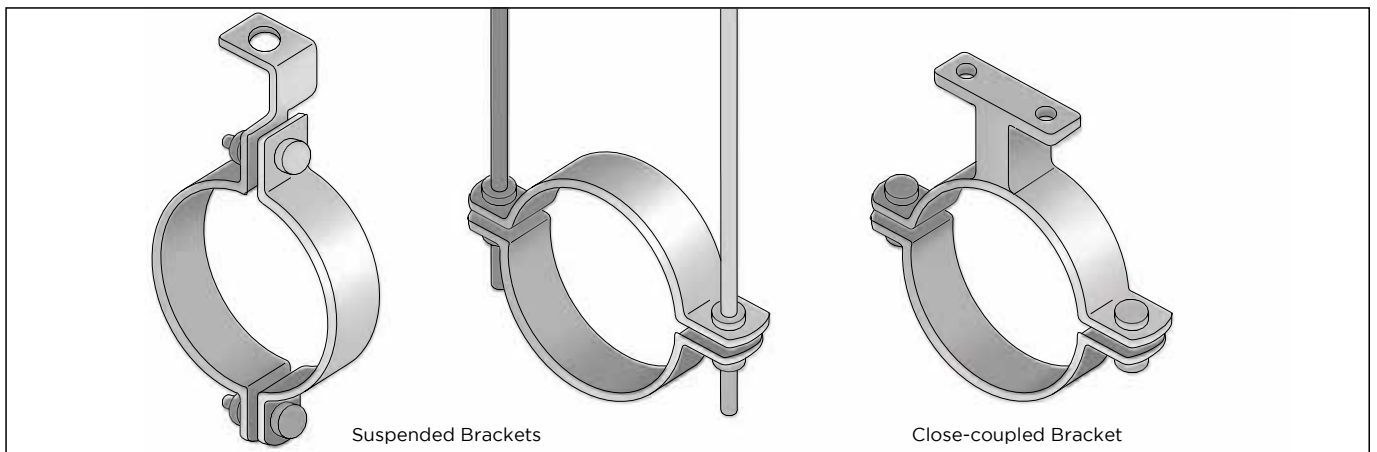


Figure 12 - Typical Pipe Brackets

4.4 Horizontal Pipes

Three support brackets per length of SuperTite pipe are required. It is usual to support the pipe adjacent to the couplings at either end and in the centre. Bracketing should directly support all fittings. Bends should have at least one bracket, and junctions at least two.

Do not clamp around the coupling or allow the coupling to carry the weight of the pipe, this may affect the seal integrity of the joint.

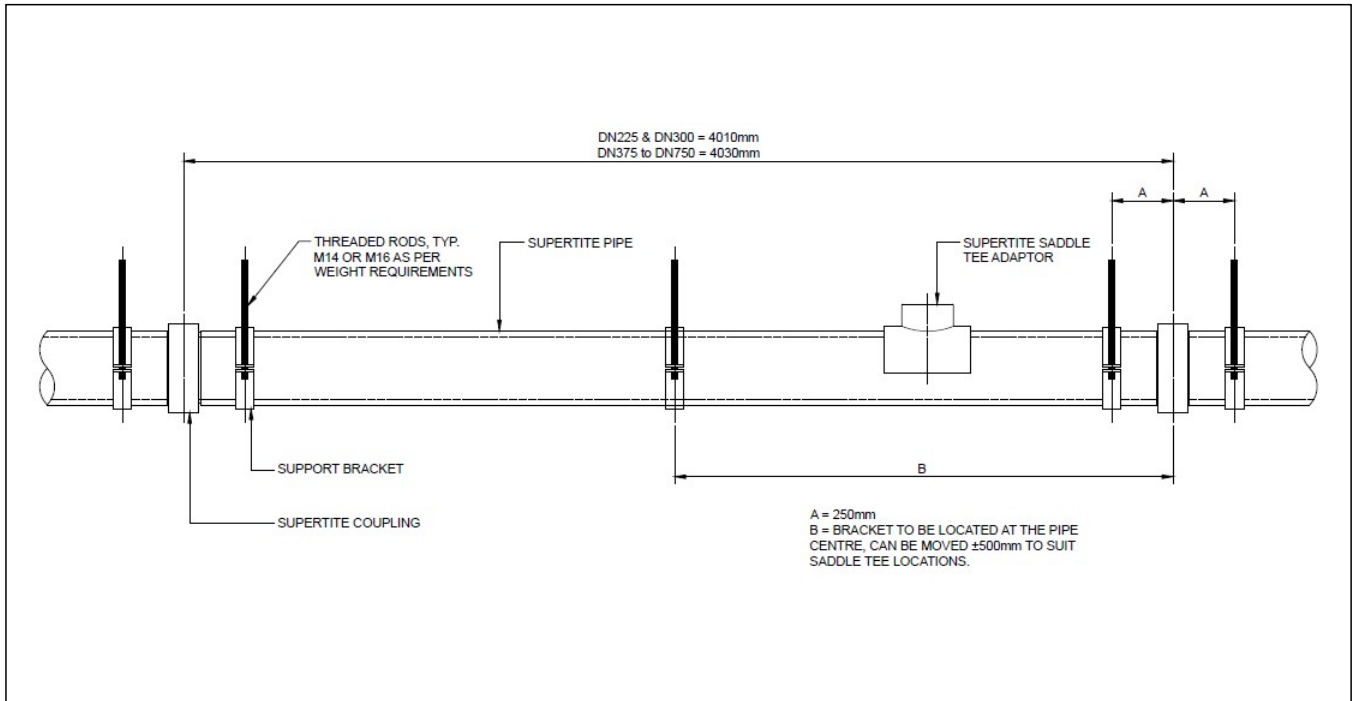


Figure 13 - Horizontal Pipe Support

4.5 Vertical Pipes

For nominal diameters 225mm to 750mm, two support brackets per length are required. All fittings should be supported. No special support requirements are needed for saddle junctions in the vertical plane.

Notes: For vertical pipes install SuperTite Concrete Pipes close-coupled directly to the structure whenever possible. If SuperTite Concrete Pipes are to be suspended from light weight roof structures consisting of "Z" purlins or similar, the structure should be checked for load bearing capacity and deflections by a structural engineer.

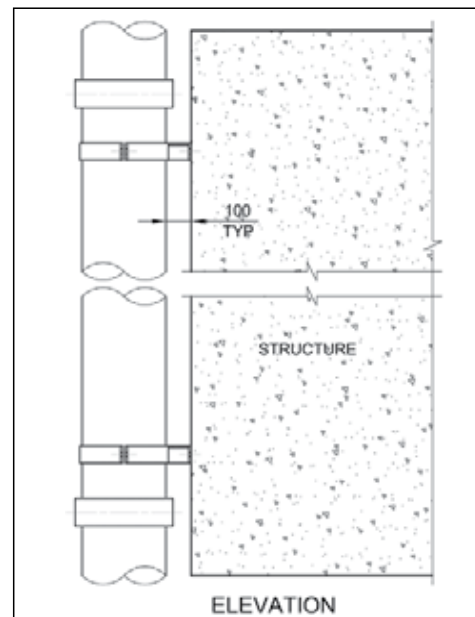


Figure 14 - Vertical Pipe Support

4.6 Resisting Thrust (Bracing)

Normal engineering requirements apply to the SuperTite Suspended Drainage System for the restraint of out-of-balance forces generated by internal pressure at changes in pipeline direction.

Unless the pipeline system is close-coupled to the structure, it is good practice to have a lateral brace at approximately 8m intervals (every second joint). If the hanging distance is large, lateral bracing may be required at 4m intervals.

At changes in direction, the forces tabulated in Table 10 must to be transferred to the structure. The methods of bracing vary widely depending on pipeline location, working or test pressure of the pipeline and the type of structure. Solid bracing, or tubular bracing should be used if compression loads need to be transferred to the structure. Threaded rod may be used where tensile loads need to be transferred to the structure. However, it should not be used to transfer compression loads due to the possibility of deflection.

Where several fittings are located near each other (particularly bends), extreme care should be exercised that all forces are transferred to the structure. If doubt exists as to the adequacy of a particular bracing requirement or if more detailed information is required, refer to a reputable bracing manufacturer.

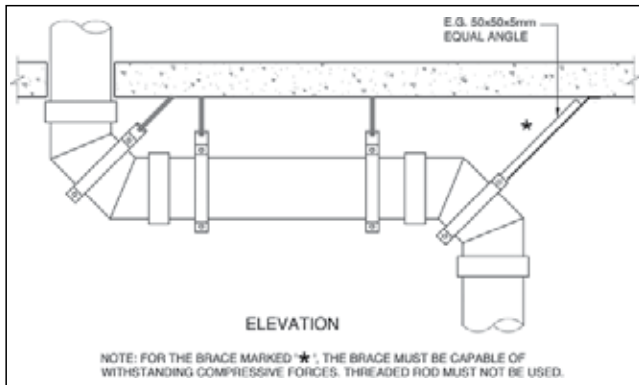


Figure 15 - Typical Bracing Details

TABLE 10
Thrust force at bends

	Nominal Pipe Dia (mm)	45 degree bend	88 degree bend	Tee or closed end
APPROX. THRUST ON BENDS (Thrust kN per 5m of head)	225	3	4	3
	300	4	7	5
	375	6	10.5	7
	450	8	15	10
	525	11	21	14
	600	14	26	18
	675	17	32	23
	750	21	37	26

Note: Thrusts are for 5m head at the fitting, loads for other head values can be proportioned linearly. The above thrusts have been calculated ignoring any velocity head and have generally been rounded to the nearest whole number. All dimensions are nominal and may change without notice.

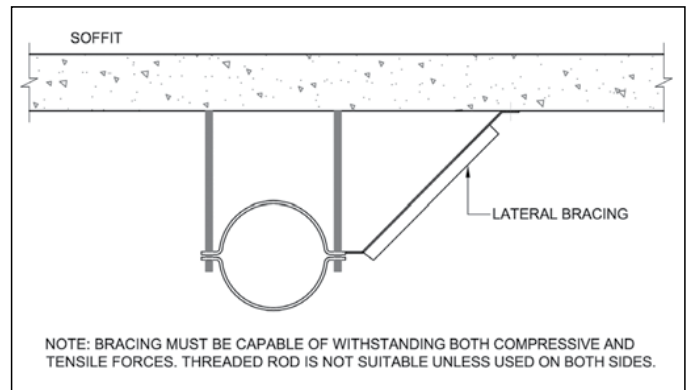


Figure 16 - Lateral Bracing

4.7 Expansion Joints

SuperTite Expansion Joints are manufactured by RCPA for use where a cyclic expansion may occur, such as bridge decks or connections between adjacent building structures. The standard SuperTite Expansion Joint is manufactured to allow a movement range of 90mm, although this can be varied to suit specific applications. The SuperTite Expansion Joint functions by using an internal rolling O-ring held between an inner and outer sleeve.

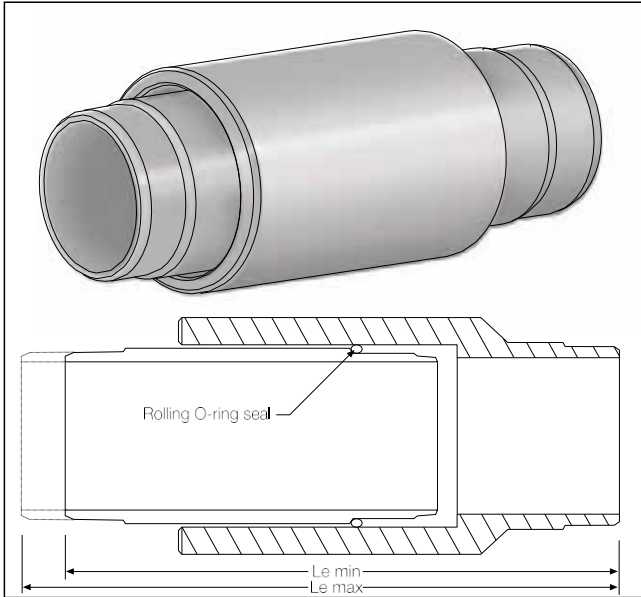


Figure 17 - Expansion Joint Dimensions

TABLE 11
Expansion Joint Dimensions

Nom. Pipe Diameter (mm)	Dimensions (mm)		Approx Mass (kg)
	Le min (mm)	Le max (mm)	
225	860	950	44
300	945	1035	72
375	1040	1130	112

When considering a SuperTite Expansion Joint, the design of brackets for thrust bracing must be done with careful consideration of the forces required to expand/contract the SuperTite Expansion Joint. The SuperTite Expansion Joint must be robustly secured to the adjacent sides of the structure to ensure that the SuperTite drainage line expands and contracts at the required point (i.e. at the SuperTite Expansion Joint).

If this is not done correctly, there is the potential for the pipeline to become disconnected at another location, causing water leakage and potentially hazardous conditions. Brackets to securely connect SuperTite Couplings located in close proximity to the SuperTite Expansion Joint may also be required.

More detail on the installation of the SuperTite Expansion Joint can be found in Section 6 - Installation.

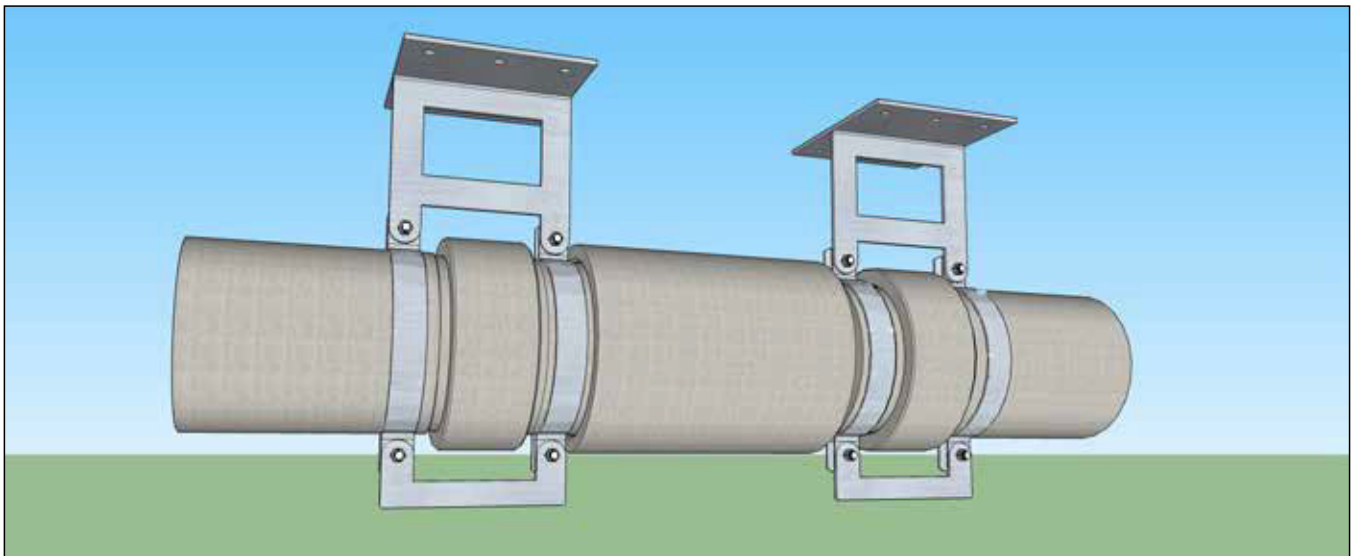


Figure 18 - SuperTite Expansion Joint

4.8 Joint Deflection

The table below shows the maximum recommended rotation at a SuperTite coupling joint for each pipe size, together with the resulting minimum achievable radius curvature and corresponding deflection for each 4 metre length of SuperTite pipe.

TABLE 12 SuperTite Joint Deflection			
Nom. Pipe Diameter (mm)	Max. Rotation (degrees)	Min. radius of curvature (m)	Pipe end deflection at 4m (4mm)
225	4.0	57	280
300	4.0	57	280
375	2.5	92	175
450	2.0	115	140
525	1.5	153	105
600	1.0	230	70
750	1.0	230	70

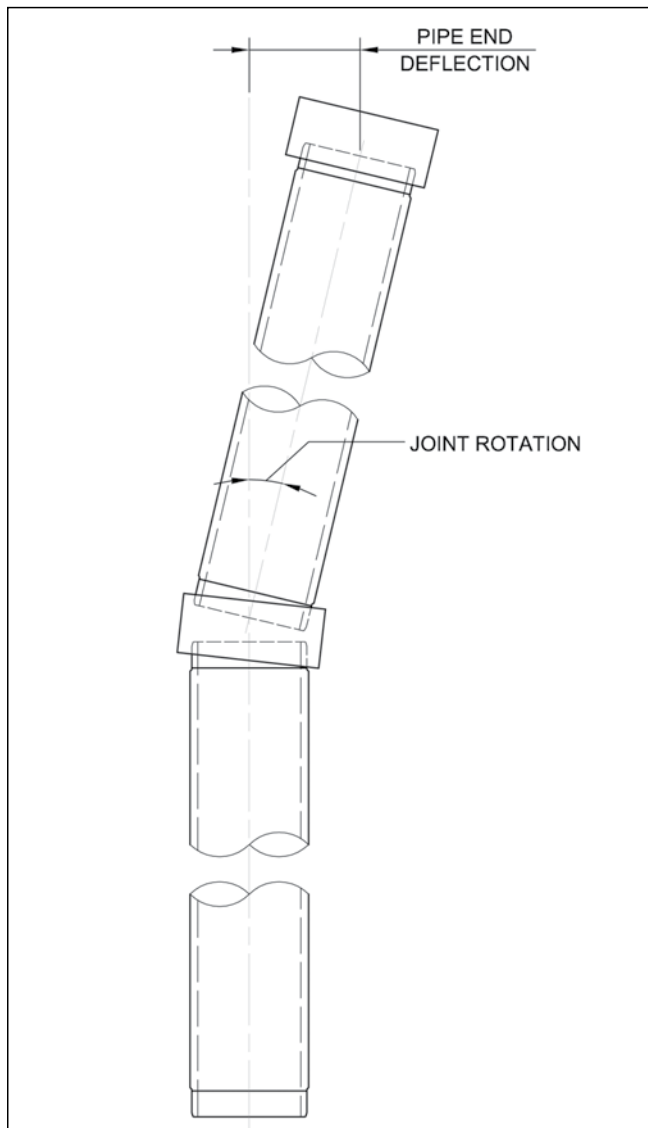


Figure 19 - SuperTite Joint Deflection

4.9 Hydraulic Performance

The consistent, smooth bore of SuperTite Concrete Pipes provides excellent hydraulic characteristics. To determine hydraulic characteristics the two most common formulae are Mannings and Colebrook-White.

Mannings

The use of the Mannings equation may give reasonable flow estimates for less than full pipe flow, if an allowance is made for the variation of the roughness coefficient with pipe size and flow velocity.

$$V = \frac{1}{n} \cdot R^{\frac{2}{3}} S^{\frac{1}{2}}$$

Colebrook-White

Colebrook-White is a more accurate method for calculations involving SuperTite pipes that are flowing full. The following Colebrook-White formula and design chart for SuperTite pipes should allow quick and easy estimates without involved calculations. The formula is derived from the Colebrook equation, Darcy friction factor equations and Reynolds number definition for flow in a pipe to allow solution for V.

$$V = -2 \sqrt{2gDS} \log_{10} \left(\frac{k}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right)$$

Where:

- V = cross-sectional average velocity (m/s)
- n = Manning roughness coefficient
- S = hydraulic gradient (m/m)
- R_h = hydraulic radius = A/P (m)
- A = cross sectional area of flow (m²)
- P = wetted perimeter (m)
- D = pipe internal diameter (m)
- k = hydraulic roughness (m)
- g = gravitational acceleration (m/s²)
- ν = kinematic viscosity of water (m²/s)

Note: This flow chart has been prepared using the Colebrook-White equation where the friction coefficient (f) is determined from the formulae:

$$f = \frac{0.25}{\left\{ \log_{10} \left(\frac{k}{3.7D} + \frac{5.74}{Re^{0.9}} \right) \right\}^2}$$

Where:

- Re = Reynolds number
- Manning's 'n' may be taken as 0.011 and the 'Australian Rainfall and Runoff' publication recommends that the Colebrook-White roughness co-efficient 'k' lies in the range 0.015 to 0.060mm.

The chart has been prepared using a (k) value of 0.060mm. Once the average velocity has been established, the discharge formula Q = A.V can be used to estimate the volumetric flow rate (discharge). For the purposes of the following chart, the nominal internal diameters of SuperTite concrete pipes have been used.



5.0 MATERIAL PROPERTIES

5.1 Durability

With a history of pipe manufacturing going back to 1926, RCPA is at the forefront of fibre reinforced concrete composite technology. The Portland cement based concrete constituents of the pipe matrix have a demonstrated performance record of over 80 years.

SuperTite concrete pipes are manufactured with a matrix of high pressure, steam cured (autoclaved) cement and silica. The high pressure steam curing converts the raw materials of the matrix to a calcium silicate hydrate material which has been proven to be highly durable in service. Further to this attribute, as SuperTite pipes and fittings do not contain any steel, the risk of steel corrosion is not present. SuperTite pipes and fittings are intended to achieve a 100 year design life when correctly installed.

5.2 Thermal Expansion

SuperTite concrete pipes have a low linear thermal expansion similar to concrete. This reduces the need for any allowance for differential expansion rates between the SuperTite pipe and the structure to which it is attached.

TABLE 12 Indicative Thermal Expansion Values	
Indicative linear thermal expansion (10-6 m/m/C°)	
Concrete	12
SuperTite pipes	10
Plastic (PVC, HDPE, PE)	50-150

Note: Values are indicative only and should not be relied upon for calculation purposes. Please contact RCPA Pipes for more information. SuperTite expansion joints are available where needed, for example when a SuperTite pipeline passes underneath a bridge deck expansion joint. Consideration must be made for the associated SuperTite pipe movement.

5.3 Fire Resistance

SuperTite Concrete Pipes are manufactured using fibre-reinforced cement material. Fibre-reinforced cement sheets are defined as a non-combustible material in the National Construction Code of Australia.

For more information regarding fire resistance of SuperTite Concrete Pipes, please contact RCPA on 1800 88 7272.

5.4 Acoustic Properties

Because of the excellent acoustic properties of SuperTite Concrete Pipes, the use of this product in suspended applications significantly reduces hydraulic noise caused by pipeline flow when compared to some other pipe materials. Testing carried out at the Queensland University of Technology showed that the pseudo STC rating for SuperTite Concrete Pipes is 12dB (A) quieter than for PVC pipes. The pseudo STC rating was calculated using measured differences in A-weighted 1/3 - Octave Band Levels at frequencies of 180 Hz and above for radial transmission of sound through each pipe.

A difference of 10dB (A) is equivalent to sound appearing half as loud. Therefore, assuming a constant internal noise source, SuperTite Concrete Pipes are half as loud as PVC pipes.



6.0 INSTALLATION

6.1 Unloading and Handling

Before attempting to unload SuperTite Concrete Pipes, personnel should be aware of the weight to be lifted. Refer to pipe mass information provided in Section 3.

As careless handling can damage pipes they must not be dropped or thrown to the ground, and severe impact with other pipes or objects must also be avoided. For ease of handling, SuperTite pipes are supplied in strapped stacks. Unloading can be done by either lifting full stacks, or by separating the stacks into individual crates by cutting the strapping and removing a single crate at a time as shown in figures 20 and 21. Couplings and fittings may be supplied either strapped onto the top of a pipe crate, or in a separate pallet box.

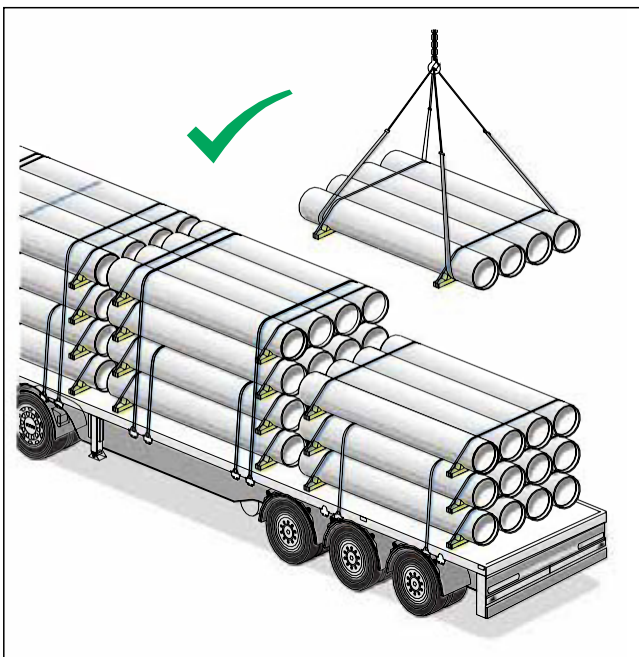


Figure 20 - Unloading of pipes

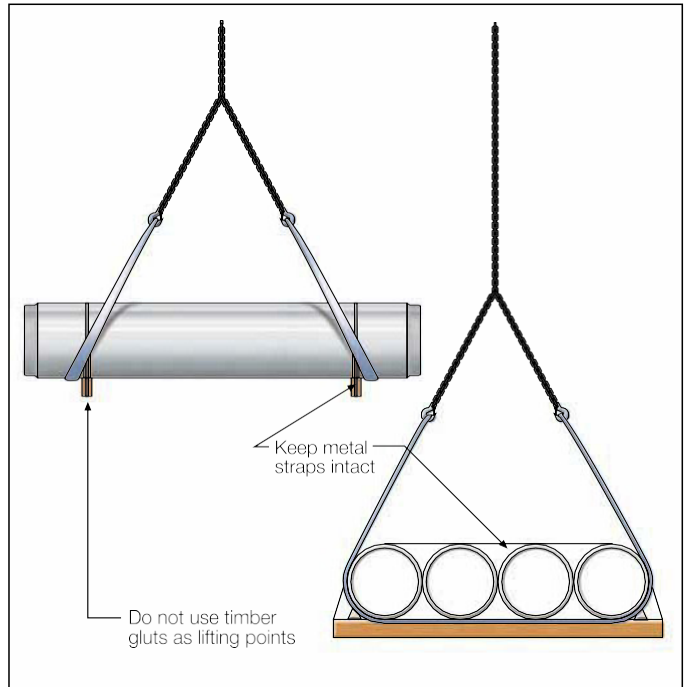


Figure 21 - Supporting pipes while unloading

Forklifts can also be used to unload crates as long as the lifting load is spread evenly onto the underside of all the pipes in the crate. Fork extensions may be required.

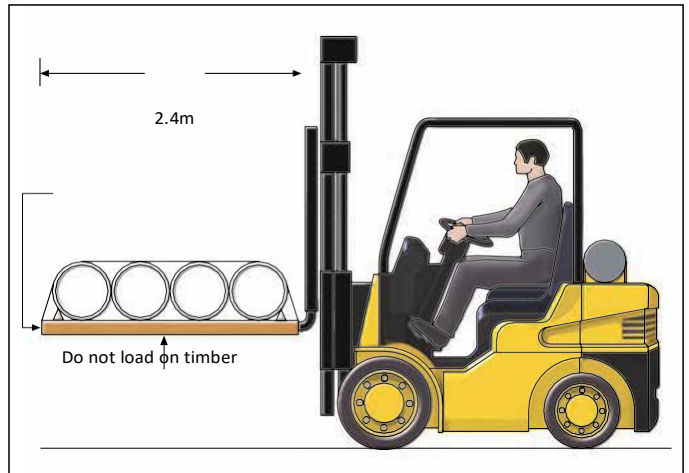


Figure 22 - Unloading by Forklift

Lifting of SuperTite pipes should be done by appropriately qualified operators using suitably rated lifting equipment. Refer to Section 3 for pipe masses to be lifted. Care should be taken to ensure that the pipe ends are not damaged and worker safety is maintained while moving SuperTite pipes and fittings around site.

Good handling practice is based on sound judgement and common sense, keeping in mind regard for safety, health and the environment.

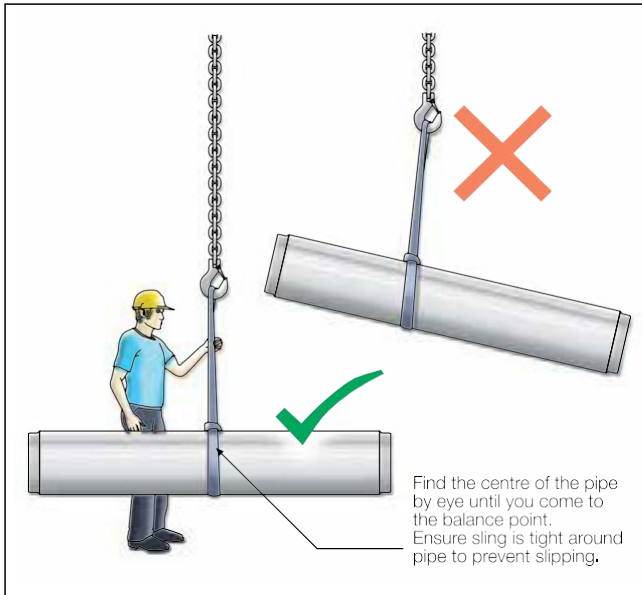


Figure 23 - Proper Lifting

Notes

1. SuperTite concrete pipes are heavy and need to be handled with extreme caution to prevent injury or property damage.
2. When the contractor is unloading it is their responsibility to do so in a safe manner. All necessary risk assessments, hazard identifications, and safe work methods must be implemented.
3. It is not recommended to cut the steel bands bundling the pipe together until safely stored on site. However, if it is necessary to cut the bands while on the truck, please take safety precautions to stabilise the pipe on the pallet and the remaining pipe on the truck.
4. Do not use the timber gluts or beams as lifting points at any time.
5. Contact your local sales representative or ask RCPA on 1800 88 7272 if you are not sure about offloading procedures.

6.2 Storing On-Site

SuperTite pipes, couplings and fittings should be stored properly on site to prevent unnecessary damage. Be sure to keep stored rubber rings out of direct contact with sunlight to prevent the rubber from experiencing UV damage. The storage area must be a level area with a stable base. SuperTite pipes and fittings should not be stored on sloping ground as shown in Figure 24.

- Pipe stacks can be up to 2.4m high provided:
- Pipes must be aligned in the same direction
- Stacks must be aligned in the same direction
- Stacks must be aligned vertically ensuring the timber gluts are in line
- No cantilevered pipes or crates are allowed

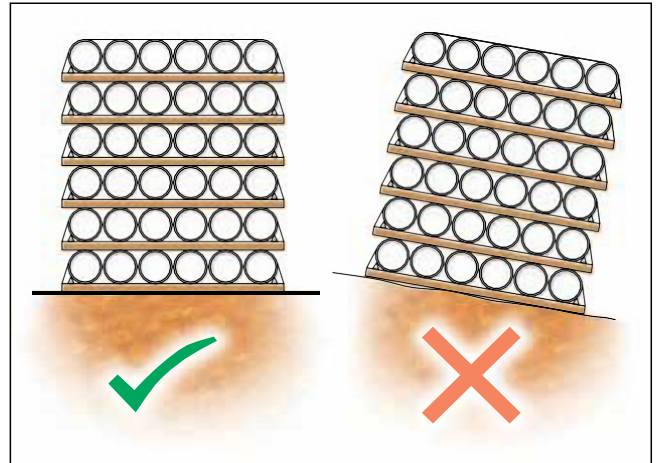


Figure 24 - Storage on level ground

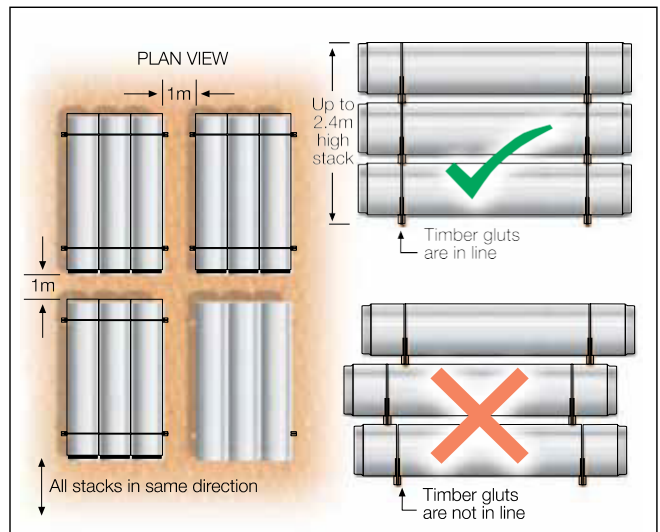


Figure 25 - Storage on levelground

Note: The above recommendations must be considered in addition to normal industry practice and any specific site OH&S requirements applicable to the safe handling and storage of SuperTite pipes and fittings.

6.3 Preparation

As it is essential to be completely familiar with design drawings and specifications, work through the following list before commencing pipe installation:

1. Check that the correct pipes and fittings are stored at the correct locations.
2. Combine and match couplings and rubber rings by diameter and match with the location of the stored pipes.
3. Ensure that SuperTite Cutter Pipes are available for pipe lengths less than full 4 metre lengths.
4. Do not cut SuperTite Concrete Pipes, use SuperTite Cutter Pipe for all lengths less than 4m. Refer to Section 6.5
5. Confirm the locations and types of all thrust resisting bracing.
6. Confirm all testing requirements and whether testing will be done in sections or for the completed system.
7. Draw up a realistic but firm construction schedule.

6.4 Pipeline Assmby

The SuperTite Suspended Drainage System is simple to install, requiring no welding, brazing or other specialised techniques. It is good practice to draft the location of the pipeline route so that the pipe support brackets are accurately located and installed before the pipe and fittings are lifted into place.

This allows the weight of the pipe or fitting to be supported by the bracket during the jointing operation.

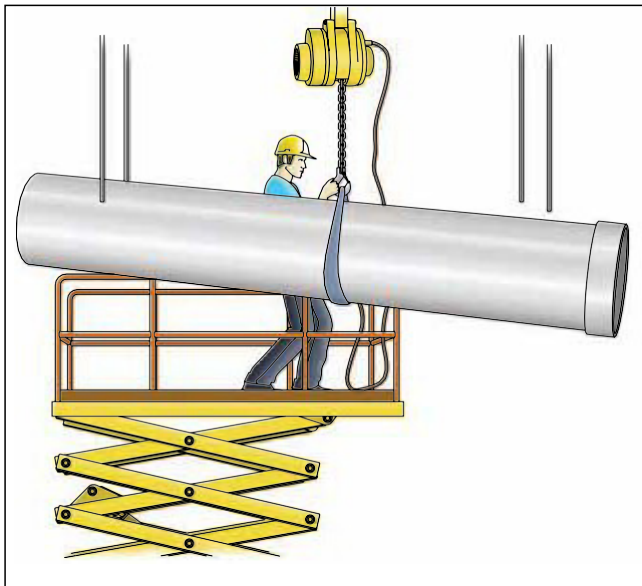


Figure 26 - Lifting SuperTite Pipes

VJoin Lubricant

VJoin lubricant is a special compound of soft soap solution that is supplied to facilitate jointing SuperTite Concrete Pipes with fittings. It is essential that the VJoin lubricant is used and not oil or grease, as these will cause deterioration of the rubber rings. In an emergency, a solution of soap powder and water can be used as a jointing compound. The following table gives the metres of pipe that can be jointed per litre of VJoin lubricant.

TABLE 12
Pipes jointed per litre of VJoin Lubricant

Pipe Size (mm)	Joints Per Litre	Metres Per Litre
225	19	80
300	14	60
375	11	48
450	9	40
525	8	36
600	7	32
675	5	24
750	4	20

SuperTite Coupling Installation

For ease of installation, SuperTite couplings may be fitted to one end of the SuperTite pipe prior to lifting into position, as this leaves only one operation per joint for the installation crew to complete. SuperTite pipes should be left plain



Figure 27 - SuperTite Coupling Installation

The following procedures should be followed to fit SuperTite couplings to SuperTite pipes:

1. Check that the SuperTite coupling is free from dirt and place the rubber ring into the SuperTite Coupling, ensuring that the V-ring is correctly fitted to the groove in the SuperTite Coupling.
2. Apply Joint lubricant to the pipe spigot back to the witness groove.
3. Push on the SuperTite Coupling back to the witness groove.
4. Use of a pipe jointing tool such as an over-centre puller or winch block may be required to provide the required insertion force. For larger diameter pipes, two jointing tools may be required to keep the pipes centerline in position.

6.5 Cutting Pipes

It may be necessary to cut pipes and install fittings at intervals along a pipe length depending on the drainage design. As the ends of SuperTite Concrete Pipes are machined to the SuperTite spigot, a standard pipe cannot be cut and jointed with a SuperTite Coupling. To overcome this SuperTite Cutter Pipes are available which is machined to the SuperTite spigot dimension along the full length. This allows the pipe to be cut anywhere along its length and then be jointed with a standard SuperTite Coupling.

Alternatively, custom lengths of SuperTite pipe can be created using the SuperTite to Unturned Adaptor Coupling. For more information on this please contact RCPA on 1800 88 7272.

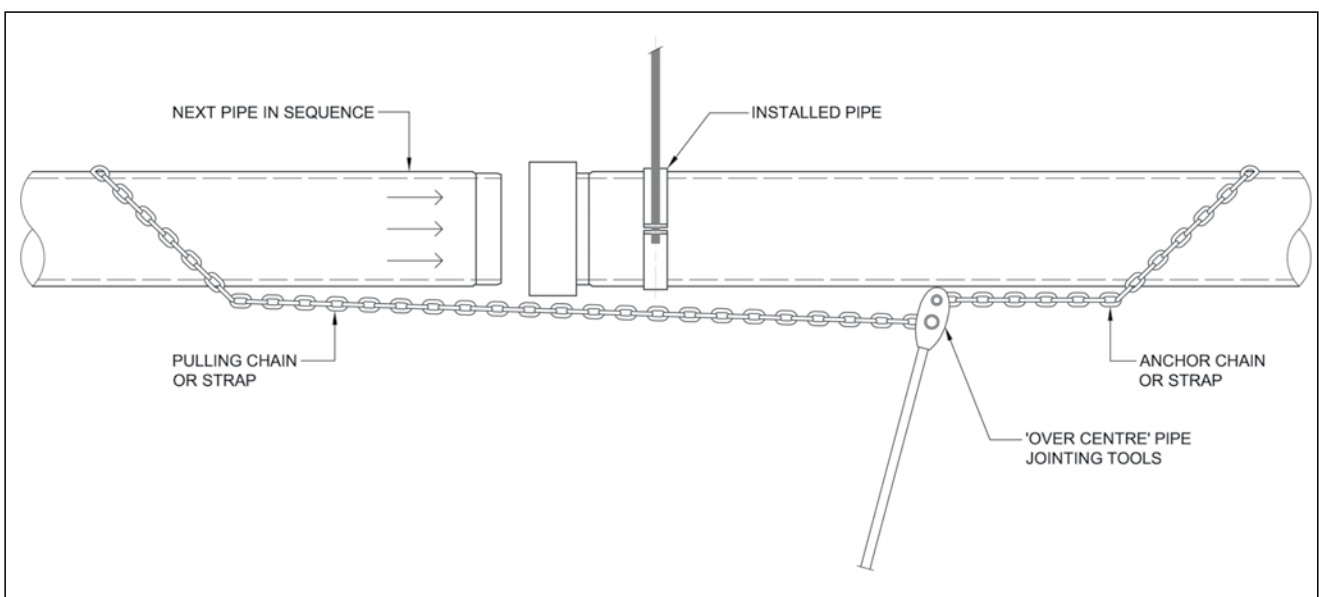


Figure 28 - SuperTite Pipe Jointing Method

6.6 Installing Fittings

On suspended systems, SuperTite bends and junctions should be installed in a similar method to the equivalent sized pipes. Saddle junctions can be used in suspended SuperTite pipelines in lieu of standard junctions. They are joined into a line by use of an epoxy adhesive. Saddle junctions may be further secured with stainless steel strapping if required. The hole for the saddle is to be formed using clean cuts by using a circular drill, or a suitable wet saw with straight cuts as shown in Figure 29.

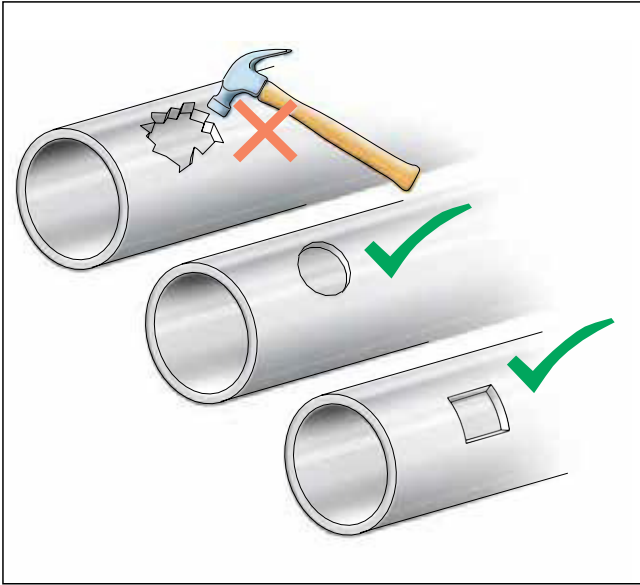


Figure 29 - Hole Forming

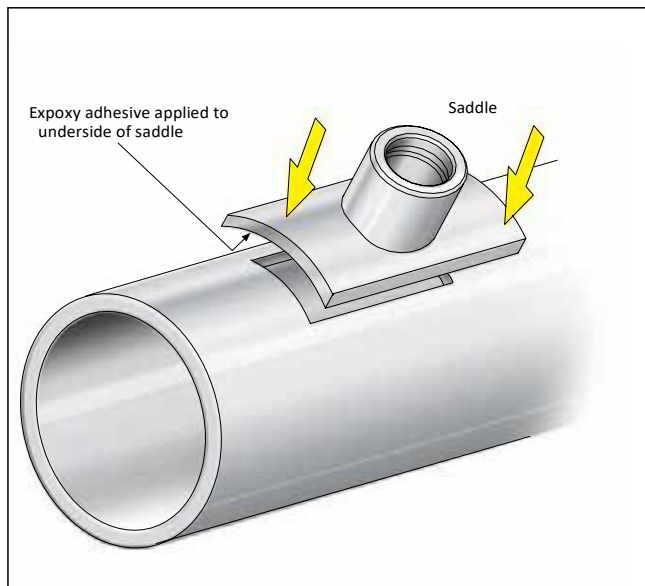


Figure 30 - Saddle Installation

6.7 SuperTite Adaptors and Reducers

To allow a change in pipe diameter or to introduce an alternative pipe material without loss of the high integrity SuperTite seal, a range of SuperTite Adaptors and Reducers are available.

To assemble a SuperTite Reducer, simply

1. Join the SuperTite Reducer to the smaller diameter SuperTite pipe in accordance with the instructions in the previous sections.
2. A SuperTite Coupling of the next size pipe is then joined to the SuperTite Reducer.
3. The larger diameter SuperTite pipe is joined into the SuperTite Coupling and pipe installation continues.

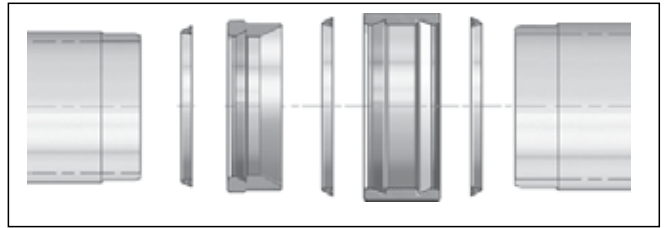


Figure 31 - SuperTite Reducer Assembly



Figure 32 - Example of SuperTite Reducers used to change pipe diameter

6.8 SuperTite Expansion Joints

To ensure correct operation of the SuperTite expansion joint, the connection between the SuperTite pipe and expansion joint is different from others along the pipe line.

Both sides of the SuperTite expansion joint must be rigidly connected to the bridge structure on the correct side of the bridge expansion joint. A suggested design is shown in Figure 33, where the pipe brackets are connected on both sides of the SuperTite couplings and a solid bracket is used to connect to the bridge structure. Use of a cementitious epoxy to fasten the brackets to the pipe is also recommended.

SuperTite expansion joints are supplied in a fully closed position, and should be adjusted to the required start position prior to installation depending upon the project requirements.

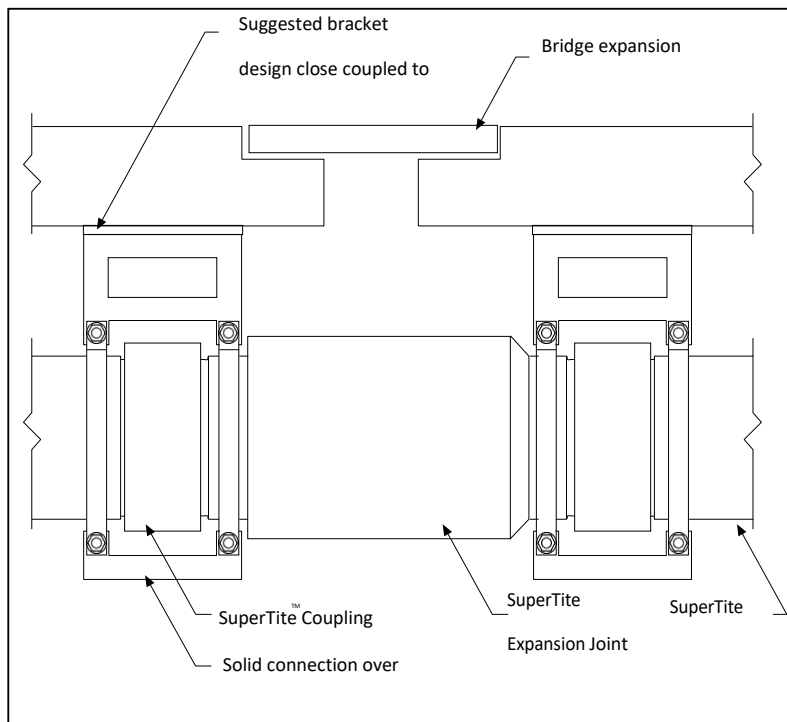


Figure 33 - SuperTite Expansion Joint Installation

7.0 TESTING

7.1 Purpose of Testing

The purpose of testing a SuperTite pipe system is to ensure that the joints and fittings are watertight and that the bracing is capable of resisting the thrust for which it was designed. It is recommended that all testing should be done hydrostatically, as air testing will not give a true test result as there may be some degree of permeation through the pipe wall and joint material. If hydrostatic testing is conducted over a long period of time (in excess of 1 hour), allowance for water absorption into the SuperTite pipe wall should be made.

Note the restrictions on working pressure in Section 4.1. The manner of testing should be carefully considered as a test requirement in excess of likely working pressures could significantly increase the cost of installation. In most cases, the limiting pressure will be that able to be withstood by the test plug.

7.2 Test Plugs

Test plugs are commonly manufactured to isolate pipelines for access and maintenance. These test plugs are suitable for use for hydrostatic testing provided that:

- The test plug should be capable of resisting the thrust generated by the test pressure.
- Testing fluid (usually water) must be able to be introduced through the test plug while air is bled from the highest point in the pipeline being tested.
- The test plug must have the facility to safely release the test fluid before the plug itself is re-opened.



Figure 35 - Typical hydrostatic test plugs

7.3 Volume of water required to fill line

For a guide to the amount of water required to fill the test section of a suspended pipeline refer to the following table. The amount of water in practice may vary due to pressure and temperature.

Approx. volume of water	Pipe Size (mm)	Litres per meter
	225	43
	300	73
	375	113
	450	165
	525	224
	600	293
	675	359
	750	409

7.4 Test Procedure

The duration and test pressure will depend on the requirements of the authority or consultant concerned. The test pressure should not exceed the maximum working pressure.

Note: *Testing of pipelines can introduce a risk to health, personal safety and the environment if not carefully planned and considered. These recommendations are intended for guidance only, and individual site conditions should be assessed for potential risks and appropriate control measures put in place prior to any testing.*

NOTES



THE AUSTRALIAN PIPE COMPANY

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rcpa.com.au