Vinidex by aliaxis

StormPRO® & SewerPRO®

Twin-Walled Corrugated Polypropylene Pipe and Fittings System for Non-Pressure Applications

LIGHT WEIGHT

EASY TO HANDLE - COST EFFECTIVE TO INSTALL

SIMPLE & EFFECTIVE JOINTS

ADAPTS TO SOIL MOVEMENT

DOMESTIC OR INDUSTRIAL APPLICATIONS

USED IN AGGRESSIVE OR SALINE SOILS

Certified System™
Quality
ISO 9001
Lic 570
SAI GLOBAL

STORMPRO® AND SEWERPRO®

INTRODUCTION

Vinidex StormPRO® and SewerPRO® provide the sewer and stormwater markets with a modern pipe and fittings system for non-pressure applications.

StormPRO® and SewerPRO® pipes are twin-wall, corrugated polypropylene pipes for non-pressure applications, manufactured in accordance with AS/NZS 5065.

Utilising modern co-extrusion techniques, StormPRO® and SewerPRO® are manufactured with a smooth bore for optimum hydraulic performance and a corrugated outside wall for high stiffness to weight ratio.

SewerPRO® and StormPRO® pipes combine the strength and toughness of advanced polypropylene materials with a structured wall design.

SewerPRO® provides a cost effective pipe for sewer applications with a full range of fittings to suit different designs and installations. SewerPRO® pipe is a comprehensive solution for sewer needs.

StormPRO® has its own fittings specially designed for stormwater needs, providing a cost-effective system for drainage applications.

Vinidex StormPRO® and SewerPRO® can be installed in trafficable areas including under road pavements and non-trafficable areas. SewerPRO® and StormPRO® are sensitive to the environment, with their material efficient design reducing raw material usage, long life and recyclability at the end of life contributing to reduced environmental needs.

SewerPRO® and StormPRO® are less likely to crack than rigid pipe, resulting in less leakage and consequential environmental issues.

WHY CHOOSE VINIDEX STORMPRO® & SEWERPRO® CORRUGATED POLYPROPYLENE PIPE SYSTEM?

A full system solution in sizes from DN150 to DN900.

✓ **Lower total installed cost**
- Light weight product, easy to handle
- Less heavy lifting equipment required
- Pipes easy to cut
- Ease of jointing

✓ **Introducing the improved PRO2® joint**
- Reduced jointing forces
- Enhanced joint performance under adverse soil movement and deflection conditions
- New rubber ring design
- The new PRO2 joint is not compatible with the old joint or rubber rings. Make sure you only use Vinidex fittings labelled PRO2 with Vinidex PRO2 pipes to ensure dimensional compatibility and system performance. Note that systems may not be leak-tight if PRO2 fittings are not used.
- PRO2 sockets should only be joined using PRO2 rubber rings

✓ **Optimum hydraulic performance**
- Smooth inner skin for hydraulic flow
- Surface is resistant to build up
- Pipes easy to cut
- Ease of jointing

✓ **Can be used in aggressive or saline soils, sensitive to the environment**

✓ **Light internal colour to facilitate video inspection**

✓ **Optimum hydraulic performance**
- Polypropylene (PP), Polyethylene (PE) and Polyvinyl Chloride (PVC) materials are used in PRO fittings
- All fittings are SN8 minimum
- Vinidex offers a range of adaptors to connect to non PRO systems
- Special fittings can also be provided, contact Vinidex for more information

Note: Fittings DN450 and larger are generally not stocked. Contact Vinidex for price and availability.

STORMPRO® FITTINGS, ACCESSORIES & TOOLS

Vinidex also offers fittings, accessories and tools specifically designed for StormPRO applications.

The PROgrommet is a quick and easy system to install 100m and 150mm connections to StormPRO pipe.

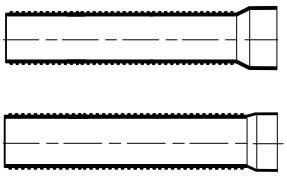
The PROsaw has been specifically designed to accommodate the PRO rib height and for simple installation of the PROgrommet.

PRODUCT RANGE

Pipe

Vinidex SewerPRO® pipes are designed for sewerage applications and StormPRO® used for stormwater applications. SewerPRO® has a dark grey coloured corrugated outside surface and a smooth light grey interior. StormPRO® has a black coloured corrugated outside surface and a smooth light grey interior.

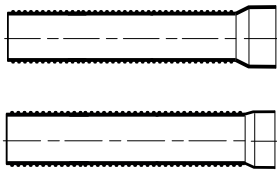
Each length of SewerPRO® and StormPRO® pipe is supplied with the rubber rings required for jointing. SewerPRO® and StormPRO® pipe is available in standard rubber ring jointed spigot/socket configuration (Sp/So). SewerPRO® comes in 3m nominal lengths and StormPRO® comes in 6m nominal lengths. Please see below tables for Product Data.



StormPRO® Polypropylene Pipe – Nominal 6m Length

Vinidex Code	Nominal Diameter (mm)	Product Description	Comments
29479	150	150 StormPRO2 SN8 PP 6.02m	
29456	225	225 StormPRO2 SN8 PP 5.99m	
29458	300	300 StormPRO2 SN8 PP 5.94m	
29460	375	375 StormPRO2 SN8 PP 5.93m	
29471	450	450 StormPRO2 SN8 PP 5.95m	
29473	525	525 StormPRO2 SN8 PP 5.89m	
29475	600	600 StormPRO2 SN8 PP 5.85m	
29418	750	750 StormPRO2 SN8 PP 5.92m	Reduced Spigot
29419	900	900 StormPRO2 SN8 PP 5.94m	Reduced Spigot

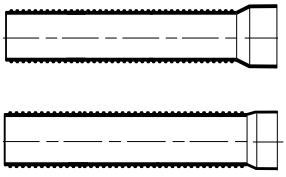
Available in other lengths for projects.
Sufficient Lubricant is supplied with pipe. Additional Lubricant may be ordered if required.



StormPRO® Polypropylene Pipe – Nominal 3m Length

Vinidex Code	Nominal Diameter (mm)	Product Description	Comments
29485	225	225 StormPRO2 SN8 PP 2.92m	
29406	300	300 StormPRO2 SN8 PP 2.88m	
29407	375	375 StormPRO2 SN8 PP 2.87m	
29482	450	450 StormPRO2 SN8 PP 2.86m	
29453	525	525 StormPRO2 SN8 PP 2.80m	
29484	600	600 StormPRO2 SN8 PP 2.76m	
29454	750	750 StormPRO2 SN8 PP 2.82m	
29405	900	900 StormPRO2 SN8 PP 2.81m	

Available in other lengths for projects.
Sufficient Lubricant is supplied with pipe. Additional Lubricant may be ordered if required.

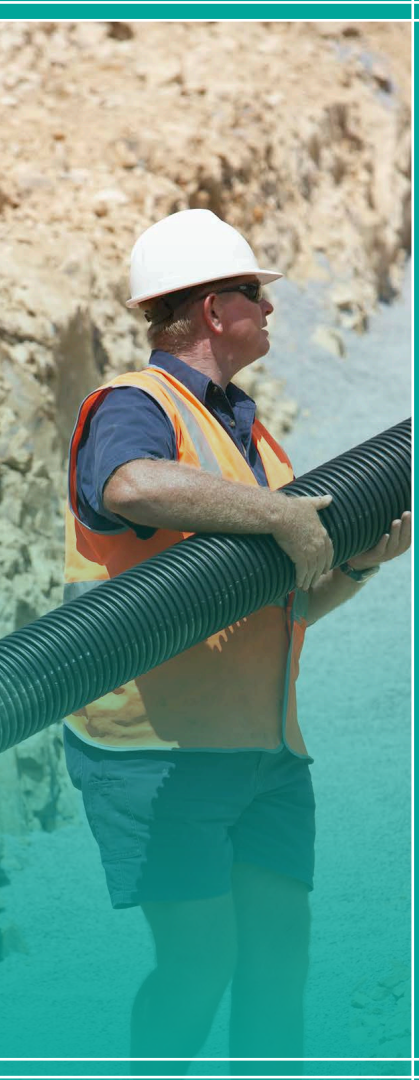


SewerPRO® Polypropylene Pipe – Nominal 3m Length

Vinidex Code	Nominal Diameter (mm)	Product Description	Comments
29480	150	150 SewerPRO2 SN10 PP 2.95m	
29457	225	225 SewerPRO2 SN10 PP 2.92m	
29459	300	300 SewerPRO2 SN10 PP 2.87m	
29461	375	375 SewerPRO2 SN10 PP 2.86m	
29472	450	450 SewerPRO2 SN10 PP 2.86m	
29474	525	525 SewerPRO2 SN10 PP 2.80m	
29476	600	600 SewerPRO2 SN10 PP 2.76m	
29427	750	750 SewerPRO2 SN10 PP 2.82m	Reduced Spigot
29428	900	900 SewerPRO2 SN10 PP 2.81m	Reduced Spigot

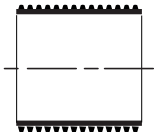
Available in other lengths for projects.

Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.



Fittings

PRO Shorts


PP

Vinidex Code	Size (mm)	Product Description	Availability
30344	150	150 PRO MHole SP SN10 600mm PP	✓
30346	225	225 PRO MHole SP SN10 600mm PP	✓
30563	300	300 PRO MHole SP SN10 600mm PP	✓
30565	375	375 PRO MHole SP SN10 600mm PP	✓
30348	450	450 PRO MHole SP SN10 600mm PP	✓
30350	525	525 PRO MHole SP SN10 600mm PP	✓
30352	600	600 PRO MHole SP SN10 600mm PP	✓
30354	750	750 PRO MHole SP SN10 600mm PP	✓

Rubber Rings

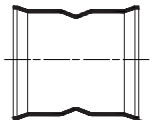
Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.

Vinidex Code	Size DN (mm)	Product Description	Availability
83449	150	150 PRO2 PP Ring EPDM	✓
83401	225	225 PRO2 PP Ring EPDM	✓
83444	300	300 PRO2 PP Ring EPDM	✓
83445	375	375 PRO2 PP Ring EPDM	✓
83446	450	450 PRO2 PP Ring EPDM	✓
83447	525	525 PRO2 PP Ring EPDM	✓
83448	600	600 PRO2 PP Ring EPDM	✓
83426	750	750 PRO2 PP Ring EPDM	✓
83391	900	900 PRO2 PP Ring EPDM	✓

Rubber Rings for use with Slip Couplings

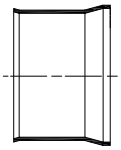
Vinidex Code	Size DN (mm)	Product Description	Availability
83416	750	750 PRO2 PP SlipCoup Ring EPDM	✓
83417	900	900 PRO2 PP SlipCoup Ring EPDM	✓

PRO Couplings


PVC and PE

Vinidex Code	Size (mm)	Product Description	Availability
30568	150	150 PRO Coupling SN8 PVC	✓
30320	225	225 PRO Coupling SN8 PVC	✓
30321	300	300 PRO Coupling SN8 PVC	✓
30322	375	375 PRO Coupling SN8 PVC	✓
30323	450	450 PRO Coupling RMPE	Contact Vinidex
30324	525	525 PRO Coupling RMPE	Contact Vinidex
30325	600	600 PRO Coupling RMPE	Contact Vinidex

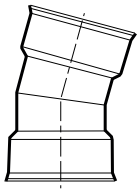
PRO Slip Couplings


PE

Vinidex Code	Size (mm)	Product Description	Availability
30450	150	150 PRO Slip Coupling SN8 PVC	✓
30451	225	225 PRO Slip Coupling SN8 PVC	✓
30452	300	300 PRO Slip Coupling SN8 PVC	✓
30453	375	375 PRO Slip Coupling SN8 PVC	✓
30454	450	450 PRO Slip Coupling RMPE	Contact Vinidex
30455	525	525 PRO Slip Coupling RMPE	Contact Vinidex
30456	600	600 PRO Slip Coupling RMPE	Contact Vinidex
30457	750	750 PRO Slip Coupling PE	Contact Vinidex
30458	900	900 PRO Slip Coupling PE	Contact Vinidex

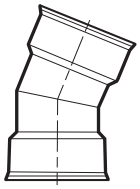
Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.

15 Degree PRO Bends


PVC

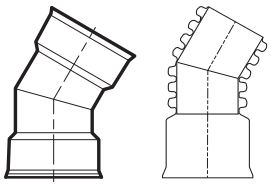
Vinidex Code	Size (mm)	Product Description	Comments
30245	150	150 PRO Bend 15D SN8 FF PVC	Contact Vinidex
30238	225	225 PRO Bend 15D SN8 FF PVC	Contact Vinidex
30247	300	300 PRO Bend 15D SN8 FF PVC	Contact Vinidex
30248	375	375 PRO Bend 15D SN8 FF PVC	Contact Vinidex

22.5 Degree PRO Bends


PVC

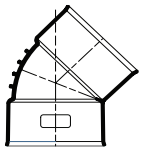
Vinidex Code	Size (mm)	Product Description	Comments
30249	150	150 PRO Bend 22.5D SN8 FF PVC	Contact Vinidex
30250	225	225 PRO Bend 22.5D SN8 FF PVC	Contact Vinidex
30251	300	300 PRO Bend 22.5D SN8 FF PVC	Contact Vinidex
30252	375	375 PRO Bend 22.5D SN8 FF PVC	Contact Vinidex

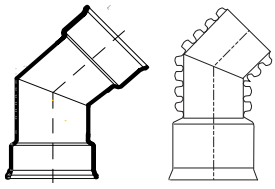
30 Degree PRO Bends


PVC M&F PP

Vinidex Code	Size (mm)	Product Description	Availability
30253	150	150 PRO Bend 30D SN8 FF PVC	Contact Vinidex
30254	225	225 PRO Bend 30D SN8 FF PVC	Contact Vinidex
30255	300	300 PRO Bend 30D SN8 FF PVC	Contact Vinidex
30256	375	375 PRO Bend 30D SN8 FF PVC	Contact Vinidex
30477	450	450 PRO Bend 30D SN10 MF PP	Contact Vinidex
30319	600	600 PRO Bend 30D SN10 MF PP	Contact Vinidex

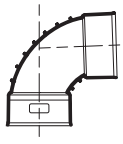
45 Degree PRO Bends

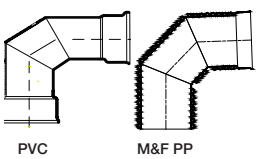

F&F PP


PVC M&F PP

Vinidex Code	Size (mm)	Product Description	Availability
30548	150	150 PRO Bend 45D SN10 FF PP	✓
32571	225	225 PRO Bend 45D SN8 FF PVC	✓
32580	300	300 PRO Bend 45D SN8 FF PVC	✓
32592	375	375 PRO Bend 45D SN8 FF PVC	✓
32416	450	450 PRO Bend 45D SN10 MF PP	Contact Vinidex
32418	525	525 PRO Bend 45D SN10 MF PP	Contact Vinidex
32420	600	600 PRO Bend 45D SN10 MF PP	Contact Vinidex
30555	750	750 PRO Bend 45D SN10 MF PP	Contact Vinidex
30556	900	900 PRO Bend 45D SN10 MF PP	Contact Vinidex

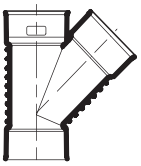
88 Degree PRO Bends


PP

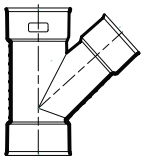

PVC M&F PP

Vinidex Code	Size (mm)	Product Description	Availability
30539	150	150 PRO Bend 88D SN10 FF PP	✓
32572	225	225 PRO Bend 88D SN8 FF PVC	✓
32581	300	300 PRO Bend 88D SN8 FF PVC	✓
32593	375	375 PRO Bend 88D SN8 FF PVC	✓
32417	450	450 PRO Bend 88D SN10 MF PP	Contact Vinidex
32419	525	525 PRO Bend 88D SN10 MF PP	Contact Vinidex
32421	600	600 PRO Bend 88D SN10 MF PP	Contact Vinidex
30546	750	750 PRO Bend 88D SN10 MF PP	Contact Vinidex
30547	900	900 PRO Bend 88D SN10 MF PP	Contact Vinidex

Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.



PP



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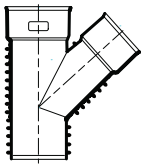
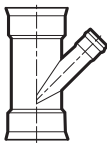


M&F PP



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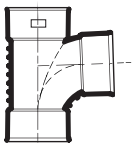

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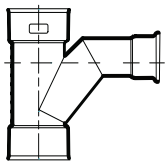

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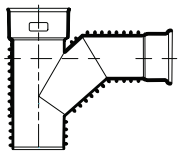


M&F PP

45 Degree PRO Junctions

Vinidex Code	Size (mm)	Product Description	Availability
30490	150	150 PRO Jun 45D SN10 FF PP	✓
32574	225 x 150	225x150 PRO Jun 45D SN8 FF PVC	✓
32575	225	225 PRO Jun 45D SN8 FF PVC	✓
32583	300 x 150	300x150 PRO Jun 45D SN8 FF PVC	✓
32584	300 x 225	300x225 PRO Jun 45D SN8 FF PVC	Contact Vinidex
32585	300	300 PRO Jun 45D SN8 FF PVC	✓
32595	375 x 150	375x150 PRO Jun 45D SN8 FF PVC	✓
32596	375 x 225	375x225 PRO Jun 45D SN8 FF PVC	✓
32597	375 x 300	375x300 PRO Jun 45D SN8 FF PVC	✓
32598	375	375 PRO Jun 45D SN8 FF PVC	✓
32387	450	450 PRO Jun 45D SN10 MF PP	Contact Vinidex
32391	450x375	450x375 PRO Jun 45D SN10 MF PP	Contact Vinidex
32392	525	525 PRO Jun 45D SN10 MF PP	Contact Vinidex
32393	600	600 PRO Jun 45D SN10 MF PP	Contact Vinidex
30512	750	750 PRO Jun 45D SN10 MF PP	Contact Vinidex
30513	900	900 PRO Jun 45D SN10 MF PP	Contact Vinidex

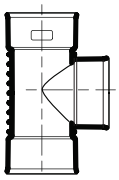
45 Degree PRO Junction Adaptor to PVC DWV

Vinidex Code	Size (mm)	Product Description	Availability
32607	225 x 100	225x100 PROJun45D SN8 FF PVC SWJ	✓
30364	225 x 100	225x100 PROJun45D SN8 FF PVC RRJ	✓

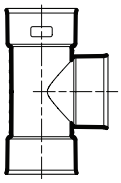
88 Degree PRO Junctions

Vinidex Code	Size (mm)	Product Description	Availability
30461	150	150 PRO Jun 88D SN10 FF PP	✓
32576	225 x 150	225x150 PRO Jun 88D SN8 FF PVC	✓
32577	225	225 PRO Jun 88D SN8 FF PVC	✓
32586	300 x 150	300x150 PRO Jun 88D SN8 FF PVC	✓
32587	300 x 225	300x225 PRO Jun 88D SN8 FF PVC	✓
32588	300	300 PRO Jun 88D SN8 FF PVC	✓
32599	375 x 150	375x150 PRO Jun 88D SN8 FF PVC	✓
32600	375 x 225	375x225 PRO Jun 88D SN8 FF PVC	✓
32601	375 x 300	375x300 PRO Jun 88D SN8 FF PVC	✓
32602	375	375 PRO Jun 88D SN8 FF PVC	✓
32406	450x375	450x375 PRO Jun 88D SN10 MF PP	Contact Vinidex
32403	450	450 PRO Jun 88D SN10 MF PP	Contact Vinidex
32408	525	525 PRO Jun 88D SN10 MF PP	Contact Vinidex
32409	600	600 PRO Jun 88D SN10 MF PP	Contact Vinidex
30486	750	750 PRO Jun 88D SN10 MF PP	Contact Vinidex
30487	900	900 PRO Jun 88D SN10 MF PP	Contact Vinidex

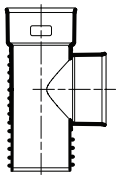
Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.



PP



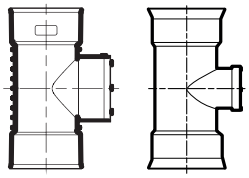
PVC



M&F PP

PRO Tees

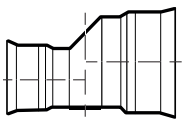
Vinidex Code	Size (mm)	Product Description	Comments
30519	150	150 PRO Tee SN10 FF PP	✓
32578	225 x 150	225x150 PRO Tee SN8 FF PVC	✓
32579	225	225 PRO Tee SN8 FF PVC	✓
32589	300 x 150	300x150 PRO Tee SN8 FF PVC	✓
32590	300 x 225	300x225 PRO Tee SN8 FF PVC	✓
32591	300	300 PRO Tee SN8 FF PVC	Contact Vinidex
32603	375 x 150	375x150 PRO Tee SN8 FF PVC	Contact Vinidex
32604	375 x 225	375x225 PRO Tee SN8 FF PVC	✓
32605	375 x 300	375x300 PRO Tee SN8 FF PVC	✓
32606	375	375 PRO Tee SN8 FF PVC	✓
32436	450 x 150	450x150 PRO Tee SN10 MF PP	Contact Vinidex
32437	450 x 225	450x225 PRO Tee SN10 MF PP	Contact Vinidex
32438	450 x 300	450x300 PRO Tee SN10 MF PP	Contact Vinidex
32439	450 x 375	450x375 PRO Tee SN10 MF PP	Contact Vinidex
32435	450	450 PRO Tee SN10 MF PP	Contact Vinidex
32441	525	525 PRO Tee SN10 MF PP	Contact Vinidex
32442	600	600 PRO Tee SN10 MF PP	Contact Vinidex
30533	750	750 PRO Tee SN10 MF PP	Contact Vinidex
30534	900	900 PRO Tee SN10 MF PP	Contact Vinidex



PP PVC

45 Degree PRO Junction Adaptor to PVC DWV

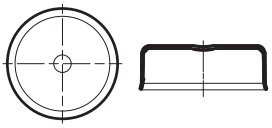
Vinidex Code	Size (mm)	Product Description	Availability
30514	150x150	150 PRO InspTee SN10 FF PP	✓
30515	225x150	225x150 PRO InspTee SN8 FF PVC	✓
30516	300x150	300x150 PRO InspTee SN8 FF PVC	✓
30517	375x150	375x150 PRO InspTee SN8 FF PVC	✓



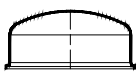
PVC

PRO Level Invert Tapers

Vinidex Code	Size (mm)	Product Description	Availability
30342	225 x 150	225x150 PRO LITaper SN8 FF PVC	✓
32608	300 x 150	300x150 PRO LITaper SN8 FF PVC	✓
30152	300 x 225	300x225 PRO LITaper SN8 FF PVC	✓
32611	375 x 225	375x225 PRO LITaper SN8 FF PVC	✓
30153	375 x 300	375x300 PRO LITaper SN8 FF PVC	✓



PP and PE

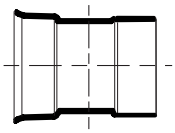


PVC

PRO Push On Caps

Vinidex Code	Size (mm)	Product Description	Availability
30557	150	150 PRO Push on Cap PP	✓
30558	225	225 PRO Push on Cap PP	✓
30593	300	300 PRO Push on Cap PVC	✓
30594	375	375 PRO Push on Cap PVC	✓
30592	450	450 PRO Push on Cap RMPE	Contact Vinidex
30337	525	525 PRO Push on Cap RMPE	Contact Vinidex
30338	600	600 PRO Push on Cap RMPE	Contact Vinidex

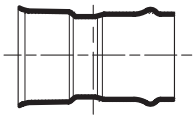
Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.



PVC

PRO Adaptor Couplings - PRO to PVC DWJ SWJ

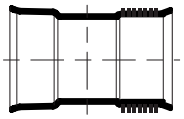
Vinidex Code	Size (mm)	Product Description	Availability
30583	150	150 PRO Coupling SN8 PVC SWJ	✓
30584	225	225 PRO Coupling SN8 PVC SWJ	✓
30585	300	300 PRO Coupling SN8 PVC SWJ	✓
30586	375	375 PRO Coupling SN8 PVC SWJ	✓



PVC

PRO Adaptor Couplings - PRO to PVC DWJ RRJ

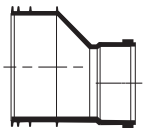
Vinidex Code	Size (mm)	Product Description	Availability
30446	150	150 PRO Coupling SN8 PVC RRJ	✓
30447	225	225 PRO Coupling SN8 PVC RRJ	✓
30448	300	300 PRO Coupling SN8 PVC RRJ	✓
30449	375	375 PRO Coupling SN8 PVC RRJ	✓



PVC

PRO Adaptor Couplings - PRO to Ultra Rib

Vinidex Code	Size (mm)	Product Description	Availability
30579	150	150 PRO Coupling URib SN8 PVC	✓
30580	225	225 PRO Coupling URib SN8 PVC	✓
30581	300	300 PRO Coupling URib SN8 PVC	✓
30582	375	375 PRO Coupling URib SN8 PVC	✓



PVC

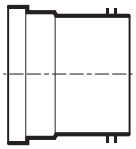
PRO Adaptor Couplings - PRO Spigot to PVC DWJ SWJ Socket

(DWV socket has thread for access cap)

Vinidex Code	Size (mm)	Product Description	Availability
65090	150 x 100	150x100 PRO LIT M-DWV F no cap	✓

PRO Adaptor Couplings - PRO Spigot to PVC DWJ SWJ Socket

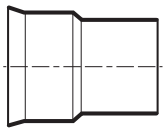
Vinidex Code	Size (mm)	Product Description	Availability
65112	150	150 PRO Access Coup DWV F +cap	✓



PVC

PRO Adaptor Couplings - PRO to PVC DWV Spigot

Vinidex Code	Size (mm)	Product Description	Availability
30333	150	150 PVC SP-PRO SOC SN8 AdapPVC	✓
30334	225	225 PVC SP-PRO SOC SN8 AdapPVC	✓
30335	300	300 PVC SP-PRO SOC SN8 AdapPVC	Contact Vinidex
30336	375	375 PVC SP-PRO SOC SN8 AdapPVC	✓

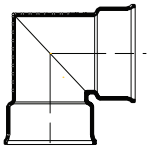


PVC

Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.

Stormwater Applications Only

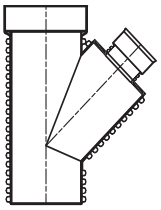
PRO Tees



PVC

Vinidex Code	Size (mm)	Product Description	Comments
32573	225	225 PRO Elbow 90D SN8 FF PVC	✓
32582	300	300 PRO Elbow 90D SN8 FF PVC	✓
32594	375	375 PRO Elbow 90D SN8 FF PVC	✓

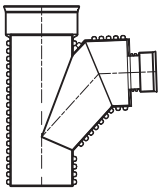
45 Degree PRO Junction Adaptor to PVC DWV



PE

Vinidex Code	Size (mm)	Product Description	Availability
32388	450x150	450x150 PRO Jun 45D SN10 MF PP	Contact Vinidex
32389	450x225	450x225 PRO Jun 45D SN10 MF PP	Contact Vinidex
32390	450x300	450x300 PRO Jun 45D SN10 MF PP	Contact Vinidex

PRO Level Invert Tapers



PE

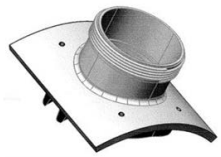
Vinidex Code	Size (mm)	Product Description	Availability
32407	450x150	450x150 PRO Jun 88D SN10 MF PP	Contact Vinidex
32404	450x225	450x225 PRO Jun 88D SN10 MF PP	Contact Vinidex
32405	450x300	450x300 PRO Jun 88D SN10 MF PP	Contact Vinidex

PROgrommet

(For use with StormPRO® Only)

Vinidex Code	Size (mm)	Product Description	Availability
30185	225/300	225/300 100 PROgrommet	✓
30188	300/375	300/375 150 PROgrommet	✓
30186	375/450/525	375/450/525 100 PROgrommet	✓
30177	375/450/525	375/450/525 150 PROgrommet	✓
30178	600/750/900	600/750/900 150 PROgrommet	✓

PROsaddle



Vinidex Code	Size (mm)	Product Description	Availability
30155	225 x 100	225 100 90D PRO Saddle SN8	✓
30156	300 x 100	300 100 90D PRO Saddle SN8	✓
30157	375 x 100	375 100 90D PRO Saddle SN8	✓
30158	450 x 100	450 100 90D PRO Saddle SN8	✓
30164	225 x 150	225 150 90D PRO Saddle SN8	✓
30166	375 x 150	375 150 90D PRO Saddle SN8	✓
30356	450 x 150	450 150 45D PRO Saddle SN8	✓

PRO Saws

PROsaw 100-127mm

PROsaw 150-177mm

Holesaw Arbor

Drillbit

Vinidex Code	Size (mm)	Product Description	Availability
30231	100	100 Diameter - 127 PROsaw	✓
30293*	150-177	150 Diameter - 177 PROsaw	✓
30294*	132-210	Holesaw Arbor	✓
30214*	8	Drillbit	✓

150mm PROsaw for PRO pipe sizes 225mm to 450mm only.
*Please note all three of these items are required to make the complete Holesaw.

Note: Rubber Rings are normally supplied with all pipes and fittings. Additional rubber rings may be ordered if required.

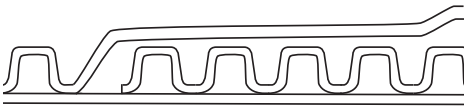
PRODUCT DATA

Pipe Dimensions

A schematic of the wall profile is shown in Figure A and significant dimensions are given in Table 1.

Figure A: Wall Profile

DN150 to 600



DN750 to 900

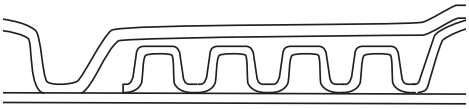


Table 1: StormPRO® & SewerPRO® pipe dimensions

Nom. Dia. (mm)	Mean Pipe Outside Dia. (mm)	Mean Pipe Internal Dia. (mm)	Profile Pitch (mm)	Min. Profile Thickness (mm)	Inner Wall Thickness (e)	Approx. Pipe Mass StormPRO (kg/length)	Approx. Pipe Mass SewerPRO (kg/length)	Number of Pipes per crate
150	169	148	17.5	1.1	1.2	9	5	30
225	259	226	26.2	1.5	1.6	19	10	12
300	343	300	34.9	1.85	2.0	31	16	6
375	428	374	44.9	2.3	2.4	48	25	2 or 3
450	514	448	52.8	2.8	3.1	72	38	2
525	600	523	66.0	3.2	3.5	94	49	2
600	682	596	75.4	3.7	3.9	121	62	3
750	835	731	88.0	4.6	5.0	190	98	2
900	999	873	105.6	5.2	5.7	260	134	2

Dimensions & Effective Lengths

StormPRO® and SewerPRO® are available in spigot/socket configuration (Sp/So) in 6m and 3m nominal lengths respectively.

The effective length of pipes is the overall length minus the insertion depth into the socket. The effective lengths of StormPRO® and SewerPRO® are given on the next page in Table 2.

Note: Nominal overall lengths are longer than effective length due to socket length.

Table 2: StormPRO® & SewerPRO® effective length

Nominal Diameter	StormPRO® Length (Sp/So) Effective Length (m)	SewerPRO®Length (Sp/So) Effective Length (m)
150	6.02	2.95
225	5.99	2.92
300	5.94	2.87
375	5.93	2.86
450	5.95	2.86
525	5.89	2.80
600	5.85	2.76
750	5.92	2.82
900	5.91	2.81

Joint Details

StormPRO® and SewerPRO® pipes have a simple and effective rubber ring joint system which is easy to assemble, leak-tight and protects against tree root intrusion.

Vinidex PRO2 is a new jointing system designed for easier installation and leak-tight joint performance. The PRO2 joint design uses a new redesigned rubber ring to match new socket geometry. Ensure that only PRO2 rubber rings are used with PRO2 sockets. PRO2 sockets can be identified by a label on the socket and PRO2 rubber rings can be identified by PRO2 marking on the ring.

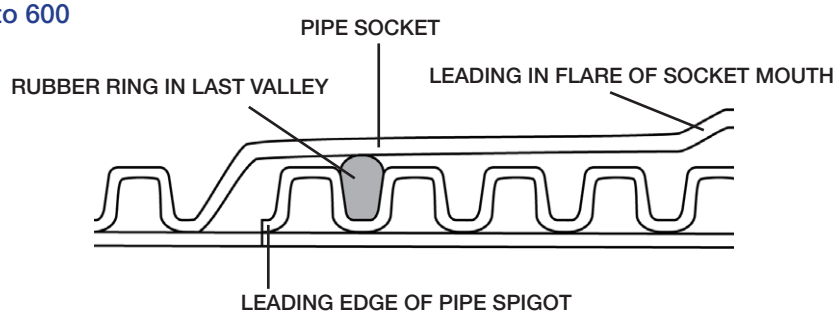
For DN150 to DN600 pipes, the rubber ring is located on the spigot in the last valley between the corrugations.

For DN750 and DN900 pipes, two rings are used and are located in the first two valleys. The ring in the first valley is the sealing ring whereas the second ring is a mechanical support ring which has the dual benefit of providing redundant sealing capacity.

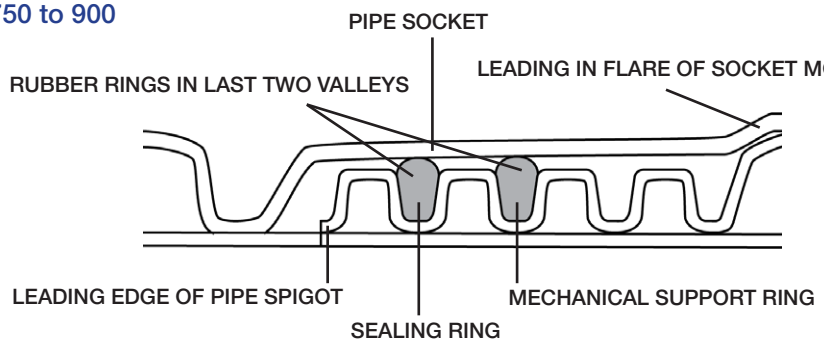
The Figure below shows the joint details in cross section.

Figure B: Joint cross section

DN150 to 600



DN750 to 900



Chemical Resistance

StormPRO® and SewerPRO® polypropylene pipes are resistant to corrosion by aggressive soils and substances typically found in sewage effluent, including most industrial discharges. Therefore, the question of chemical resistance is likely to arise only if the pipes are used in unusual circumstances.

Chemical resistance is affected by concentration, temperature, period of contact and stress. Polypropylene is resistant to weak inorganic acids, organic acids, alcohols, ammonia and oxidising salts and has limited resistance to aliphatic hydrocarbons, esters, ketones and ethers.

Vinidex PRO fittings are manufactured from PVC, PP or PE, depending on size and configuration. These plastics materials have been proven in sewer applications for over 50 years and have excellent resistance to any substances found in normal sewage effluent.

Pollution control measures mean that these plastics materials can be safely used in any sewerage network, including areas accepting industrial discharges. Users should check local authority requirements.

Polypropylene is generally not recommended for aromatic and halogenated hydrocarbons. For more details or to check resistance to specific chemicals, refer to the Vinidex Chemical Resistance Guide (VIN067) on our website.

Temperature

StormPRO® and SewerPRO® pipes have high temperature resistance. Continuous service temperatures of up to 60°C and short term applications of up to 90°C will not adversely affect the performance.

Weathering Resistance

StormPRO® and SewerPRO® pipes are manufactured from compounds containing additives which ensure their resistance to ultraviolet light and weathering during handling and storage.

Manufacture

StormPRO® and SewerPRO® pipes incorporate the latest manufacturing technology using continuous polypropylene dual extrusion combined with a vacuum controlled corrugating process. The twinwall structure consists of simultaneously extruded smooth inner wall and corrugated outer wall. At the valley of each corrugation, where the inner and outer walls meet, the two surfaces are fused together for the full circumference of the pipe.

Standards

StormPRO® and SewerPRO® pipes are manufactured in accordance with AS/NZS 5065: “Polyethylene and Polypropylene pipes and fittings for drainage and sewerage applications”, complying with the dimensional requirements of Type B pipes - ID series.

AS/NZS 5065 classifies pipes according to their minimum ring-bending stiffness in short term laboratory tests.

This is a measure of the ability of a pipe to resist deformation due to an external load. Stiffness classes are identified by an SN number where a higher number indicates greater resistance to deflection.

SewerPRO® pipes are classified as SN10 with a minimum stiffness of 10,000 N/m.m.

StormPRO® pipes are classified as SN8 with a minimum stiffness of 8000 N/m.m.

Material Properties

Table 3: Typical materials of properties of StormPRO® & SewerPRO®

Property		Value	Standard
Polypropylene (PP) pipe compound		block copolymer	
Density		900kg/m³	ISO 1183
Flexural modulus		1700MPa	ISO 178
Creep ratio (2 years)		3	ISO 9967
Pipe ring bending stiffness StormPRO®		8,000N/m.m	AS/NZS 1462.22
Pipe ring bending stiffness SewerPRO®		10,000N/m.m	AS/NZS 1462.22
Coefficient of thermal expansion		15 x 10^{-5}/°C	ISO 11359-2
Tensile stress at yield (50mm/min)		31 MPa	ISO 527-2
Tensile strain at yield (50mm/min)		8%	ISO 527-2
Poisson's ratio		0.45	ISO 527-2
Charpy impact strength - notched	(+23)	50kJ/m²	ISO 179-1
	(-20)	5 kJ/m²	ISO 179-1
Shore D hardness		60	ISO 868
Melt flow rate		0.3g/10min	ISO 1133
Melting point		130-170°C	

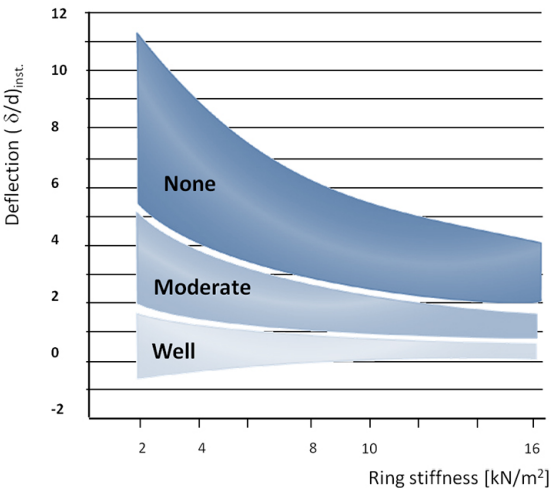
DESIGN

Structural Design

Under general gravity drainage and sewer pipe laying conditions, detailed calculations predicting pipe performance are not necessary. Following an extensive study of installed pipe performance, The European Plastic Pipe and Fitting Association (TEPPFA) concluded that final deflection of pipes was controlled by the settlement of the soil after installation. Where installation was controlled, or self-compacting granular material were used, pipe deflections were consistently low regardless of installation depth and traffic or other loads.

In the graph below:

- "Well" compacted refers to bedding material placed and compacted around the pipe to a minimum 94% dry density ratio, in layers of maximum 300 mm thickness, to a minimum depth over the pipe of 150mm; and
- "Moderate compaction refers to bedding material placed and compacted around the pipe to 87% to 94% dry density ratio, in layers of maximum 500mm thickness, to a minimum depth over the pipe of 150mm



The graph shows deflection immediately after installation. Final pipe deflection after soil settlement are expected to be 1% higher for well compacted granular soil, 2% for moderately compacted granular soil and 3-4% where no compaction has taken place.

Where SewerPRO® or StormPRO® pipes are to be installed in normal conditions at depths up to 6m such that the depth to diameter ratio is at least 2, design calculations are not required. Simply following the recommended installation procedures will ensure that deflections are controlled. This is particularly true for installations under roadways, where the level of compaction required to prevent subsidence of the pavement also provides a highly supportive structural environment for the pipe.

For unusual conditions, or depths greater than 6 metres, design calculations may be performed in accordance with AS/NZS 2566.1. The structural design aspects of buried flexible pipes to be considered are vertical deflection, ring bending strain and buckling.

The following typical values in Table 4 may be used in pipe design.

Table 4: Typical structural design properties of StormPRO® & SewerPRO®

Property	Symbol	Value
Short Term Stiffness - StormPRO®	S_{DI}	8000 N/m/m
Short Term Stiffness - SewerPRO®	S_{DI}	10000 N/m/m
Allowable Long Term Deflection	$\frac{\Delta_{yall}}{D}$	7.5%
Allowable Long Term Ring Bending Strain	εball	4%
Long Term Stiffness - StormPRO®	S_{DL2}	3900 N/m/m
Long Term Stiffness - SewerPRO®	S_{DL2}	4900 N/m/m

Contact Vinidex to discuss your design criteria.

Hydraulic Design

StormPRO® and SewerPRO® pipes are normally sized to accommodate maximum design discharge when flowing full. The discharge rates in Tables 5 through 9 on Pages 19 to 23 for StormPRO® and SewerPRO® pipes flowing full are based on the Colebrook-White formula which is recognised by engineers throughout the world as the most accurate basis for hydraulic design over a wide range of flow conditions.

In addition to friction losses in the pipeline, a pressure drop will occur due to energy loss at any change in the direction of flow or pipeline cross section. In long pipelines, these "form losses" are usually small in comparison to friction losses. However, they may be considerable in pipelines with many fittings or in short pipes such as in culvert applications, where entry and exit losses may dominate. For more information on form losses, consult the Vinidex Flow Charts (VIN015 and VIN039).

The Colebrook-White formula expresses velocity as:

$$V=\sqrt{2g\,D_i\frac{H}{L}}\bullet\log_{10}\left[\frac{D_i}{\frac{k}{3.7}+\frac{2.51\nu}{\sqrt{2g\,D_i\frac{H}{L}}}}\right]^2$$

Where:

V	= Velocity (m/s)
H/L	= Pipe Gradient, i.e. friction head loss / pipe length (m/m)
D_i	= Internal Diameter (m)
k	= Colebrook-White roughness coefficient (m)
v	= kinematic viscosity of water (m^2/s) 1 x 10^{-6} m^2/s for water at 20°C
g	= acceleration due to gravity ($9.8m/s^2$)

And

Q	= VA
Where:	Q = flow rate (m^3/s)
	A = Internal area (m^2)

Choice of Roughness Coefficients

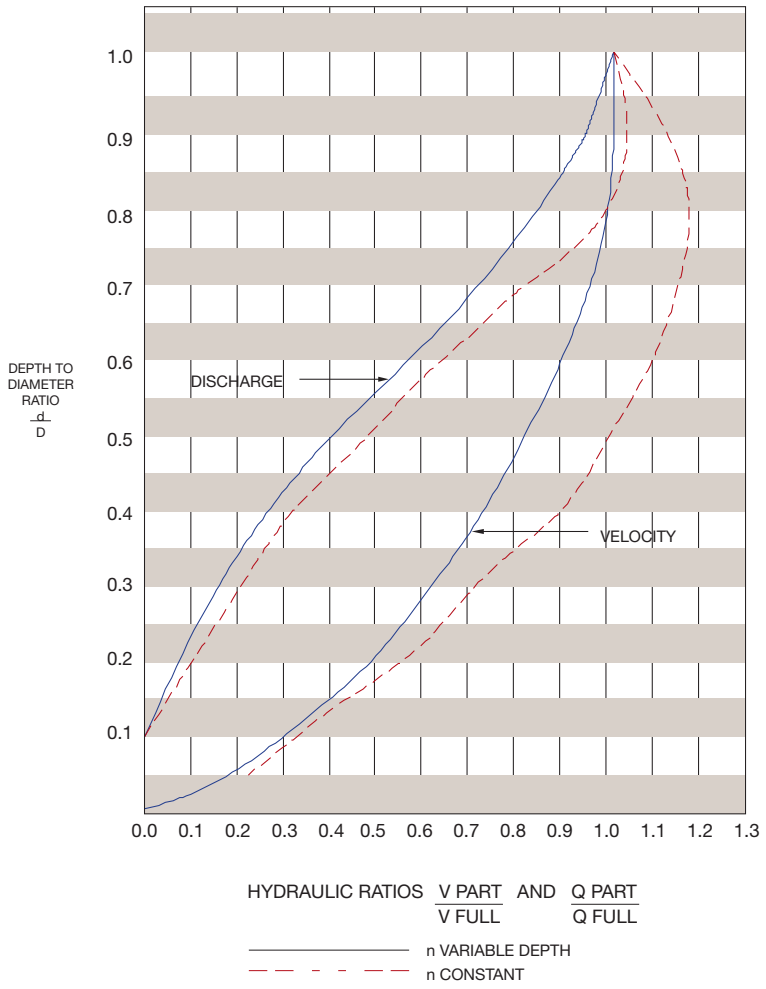
AS2200 - Design charts for water supply and sewerage - recommends k values in the range 0.003 to 0.015mm for clean, concentrically jointed thermoplastics pipes and AS3500.3 - National plumbing and drainage, Part 3 Stormwater drainage - specifies 0.015mm for design of plastics stormwater pipe drains for normal conditions.

However, it is important to note that factors such as slime growth and accumulation of debris can affect the selection of roughness coefficient in some circumstances.

In addition, local utilities may have preferred values for design of their systems. For flow under alternative conditions contact Vinidex or use the Vinidex Friction Loss in Uniform Fluid Flow (FLUFF) software.

For partial flow, consult Figure C for adjustment factors.

Figure C: Adjustment factors



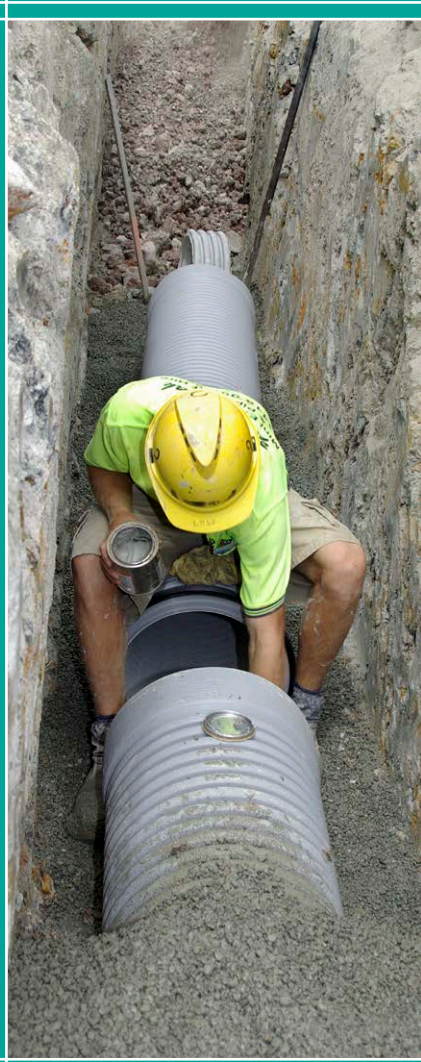


Table 5: Full discharges and velocities DN150 - DN225

Gradient H/L	Velocity/ Discharge k (mm)	DN 150				DN 225			
		Di 0.003	0.148 0.006	0.015	0.03	Di 0.003	0.226 0.006	0.015	0.03
1/10	m/s	4.8	4.7	4.6	4.4	6.2	6.2	5.9	5.7
	L/s	82.2	81.0	78.4	75.3	250.7	246.9	238.3	228.6
1/20	m/s	3.3	3.2	3.2	3.0	4.3	4.2	4.1	4.0
	L/s	56.4	55.8	54.3	52.5	172.4	170.4	165.5	159.6
1/30	m/s	2.6	2.6	2.5	2.5	3.5	3.4	3.3	3.2
	L/s	45.2	44.8	43.7	42.4	138.4	137.0	133.5	129.2
1/40	m/s	2.2	2.2	2.2	2.1	3.0	2.9	2.9	2.8
	L/s	38.6	38.3	37.5	36.4	118.4	117.3	114.6	111.1
1/50	m/s	2.0	2.0	1.9	1.9	2.6	2.6	2.5	2.5
	L/s	34.2	33.9	33.2	32.4	104.8	104.0	101.7	98.8
1/60	m/s	1.8	1.8	1.8	1.7	2.4	2.3	2.3	2.2
	L/s	30.9	30.7	30.1	29.4	94.9	94.2	92.3	89.7
1/70	m/s	1.7	1.6	1.6	1.6	2.2	2.2	2.1	2.1
	L/s	28.4	28.2	27.7	27.0	87.2	86.6	84.9	82.7
1/80	m/s	1.5	1.5	1.5	1.5	2.0	2.0	2.0	1.9
	L/s	26.4	26.2	25.8	25.2	81.1	80.5	79.1	77.1
1/90	m/s	1.4	1.4	1.4	1.4	1.9	1.9	1.8	1.8
	L/s	24.7	24.6	24.2	23.6	76.0	75.5	74.2	72.4
1/100	m/s	1.4	1.3	1.3	1.3	1.8	1.8	1.7	1.7
	L/s	23.3	23.2	22.8	22.3	71.8	71.3	70.1	68.4
1/120	m/s	1.2	1.2	1.2	1.2	1.6	1.6	1.6	1.5
	L/s	21.1	21.0	20.7	20.3	64.9	64.6	63.5	62.1
1/140	m/s	1.1	1.1	1.1	1.1	1.5	1.5	1.5	1.4
	L/s	19.4	19.3	19.0	18.6	59.7	59.3	58.5	57.2
1/160	m/s	1.0	1.0	1.0	1.0	1.4	1.4	1.4	1.3
	L/s	18.0	17.9	17.7	17.3	55.5	55.2	54.4	53.3
1/180	m/s	1.0	1.0	1.0	0.9	1.3	1.3	1.3	1.2
	L/s	16.9	16.8	16.6	16.3	52.0	51.7	51.0	50.0
1/200	m/s	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.2
	L/s	15.9	15.8	15.6	15.4	49.1	48.8	48.2	47.3
1/250	m/s	0.8	0.8	0.8	0.8	1.1	1.1	1.1	1.0
	L/s	14.0	14.0	13.8	13.6	43.4	43.2	42.7	41.9
1/300	m/s	0.7	0.7	0.7	0.7	1.0	1.0	1.0	0.9
	L/s	12.7	12.6	12.5	12.3	39.2	39.1	38.6	38.0
1/400	m/s	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8
	L/s	10.8	10.8	10.7	10.5	33.5	33.3	33.0	32.5
1/500	m/s	0.6	0.6	0.5	0.5	0.7	0.7	0.7	0.7
	L/s	9.5	9.5	9.4	9.3	29.6	29.5	29.2	28.8

Table 6: Full discharges and velocities DN300 - DN375

Gradient H/L	Velocity/ Discharge k (mm)	DN 300 Di 0.003	0.3 0.006	0.015	0.03	DN 375 Di 0.003	0.374 0.006	0.015	0.03
1/10	m/s	7.5	7.3	7.1	6.8	8.6	8.4	8.1	7.8
	L/s	527.7	519.1	500.1	479.4	940.8	924.8	889.8	852.4
1/20	m/s	5.1	5.1	4.9	4.7	5.9	5.8	5.6	5.4
	L/s	363.6	359.0	348.0	335.2	649.0	640.3	619.9	596.7
1/30	m/s	4.1	4.1	4.0	3.8	4.7	4.7	4.6	4.4
	L/s	292.1	288.9	281.1	271.6	521.8	515.7	501.1	483.8
1/40	m/s	3.5	3.5	3.4	3.3	4.1	4.0	3.9	3.8
	L/s	250.0	247.5	241.4	233.8	446.8	442.1	430.6	416.6
1/50	m/s	3.1	3.1	3.0	2.9	3.6	3.6	3.5	3.4
	L/s	221.5	219.5	214.4	208.0	396.0	392.2	382.7	370.8
1/60	m/s	2.8	2.8	2.8	2.7	3.3	3.2	3.2	3.1
	L/s	200.6	198.9	194.6	189.0	358.8	355.6	347.4	337.1
1/70	m/s	2.6	2.6	2.5	2.5	3.0	3.0	2.9	2.8
	L/s	184.5	183.0	179.2	174.3	330.0	327.2	320.1	311.0
1/80	m/s	2.4	2.4	2.4	2.3	2.8	2.8	2.7	2.6
	L/s	171.5	170.2	166.9	162.5	307.0	304.5	298.1	289.9
1/90	m/s	2.3	2.3	2.2	2.2	2.6	2.6	2.5	2.5
	L/s	160.9	159.7	156.7	152.7	287.9	285.7	280.0	272.5
1/100	m/s	2.1	2.1	2.1	2.0	2.5	2.5	2.4	2.3
	L/s	151.9	150.8	148.1	144.4	271.9	269.9	264.7	257.8
1/120	m/s	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.1
	L/s	137.5	136.6	134.3	131.1	246.2	244.6	240.1	234.2
1/140	m/s	1.8	1.8	1.7	1.7	2.1	2.0	2.0	2.0
	L/s	126.4	125.6	123.6	120.8	226.4	225.0	221.1	215.9
1/160	m/s	1.7	1.7	1.6	1.6	1.9	1.9	1.9	1.8
	L/s	117.5	116.8	115.0	112.5	210.5	209.2	205.8	201.1
1/180	m/s	1.6	1.6	1.5	1.5	1.8	1.8	1.8	1.7
	L/s	110.2	109.6	107.9	105.7	197.4	196.3	193.2	189.0
1/200	m/s	1.5	1.5	1.4	1.4	1.7	1.7	1.7	1.6
	L/s	104.0	103.4	102.0	99.9	186.4	185.3	182.5	178.7
1/250	m/s	1.3	1.3	1.3	1.3	1.5	1.5	1.5	1.4
	L/s	92.0	91.6	90.4	88.7	165.0	164.1	161.9	158.7
1/300	m/s	1.2	1.2	1.2	1.1	1.4	1.4	1.3	1.3
	L/s	83.2	82.9	81.9	80.4	149.3	148.6	146.7	143.9
1/400	m/s	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1
	L/s	71.1	70.8	70.0	68.9	127.5	127.0	125.5	123.4
1/500	m/s	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0
	L/s	62.8	62.6	62.0	61.1	112.8	112.4	111.2	109.5

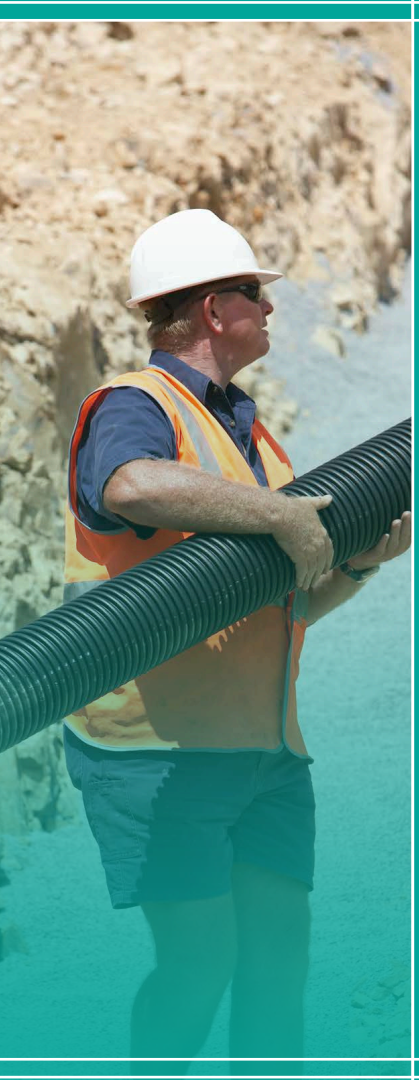


Table 7: Full discharges and velocities DN450 - DN525

Gradient H/L	Velocity/ Discharge k (mm)	DN 450				DN 525			
		Di 0.003	0.448 0.006	0.015	0.03	Di 0.003	0.523 0.006	0.015	0.03
1/10	m/s	9.6	9.4	9.0	8.7	10.5	10.3	9.9	9.5
	L/s	1509.7	1482.8	1425.3	1364.8	2263.4	2221.7	2133.7	2042.5
1/20	m/s	6.6	6.5	6.3	6.1	7.3	7.2	6.9	6.7
	L/s	1042.4	1027.7	994.0	956.2	1564.2	1541.1	1489.3	1431.9
1/30	m/s	5.3	5.3	5.1	4.9	5.9	5.8	5.6	5.4
	L/s	838.6	828.3	804.0	775.6	1258.8	1242.7	1205.2	1162.0
1/40	m/s	4.6	4.5	4.4	4.2	5.0	5.0	4.8	4.7
	L/s	718.3	710.4	691.2	668.2	1078.6	1066.2	1036.5	1001.4
1/50	m/s	4.0	4.0	3.9	3.8	4.5	4.4	4.3	4.2
	L/s	636.8	630.4	614.5	595.0	956.6	946.4	921.7	891.9
1/60	m/s	3.7	3.6	3.5	3.4	4.0	4.0	3.9	3.8
	L/s	577.1	571.7	558.0	541.1	867.1	858.5	837.3	811.3
1/70	m/s	3.4	3.3	3.3	3.2	3.7	3.7	3.6	3.5
	L/s	531.0	526.2	514.3	499.2	797.9	790.4	771.8	748.7
1/80	m/s	3.1	3.1	3.0	3.0	3.5	3.4	3.3	3.3
	L/s	494.0	489.8	479.1	465.5	742.4	735.8	719.2	698.3
1/90	m/s	2.9	2.9	2.9	2.8	3.2	3.2	3.1	3.1
	L/s	463.4	459.7	450.1	437.7	696.6	690.7	675.7	656.6
1/100	m/s	2.8	2.8	2.7	2.6	3.1	3.0	3.0	2.9
	L/s	437.7	434.3	425.5	414.1	658.0	652.6	638.9	621.4
1/120	m/s	2.5	2.5	2.4	2.4	2.8	2.8	2.7	2.6
	L/s	396.5	393.6	386.1	376.3	596.1	591.6	579.9	564.8
1/140	m/s	2.3	2.3	2.3	2.2	2.6	2.5	2.5	2.4
	L/s	364.6	362.1	355.6	347.0	548.3	544.4	534.2	520.8
1/160	m/s	2.2	2.1	2.1	2.1	2.4	2.4	2.3	2.3
	L/s	339.1	336.9	331.1	323.3	510.0	506.6	497.5	485.5
1/180	m/s	2.0	2.0	2.0	1.9	2.2	2.2	2.2	2.1
	L/s	318.0	316.1	310.9	303.8	478.4	475.3	467.2	456.3
1/200	m/s	1.9	1.9	1.9	1.8	2.1	2.1	2.1	2.0
	L/s	300.3	298.5	293.8	287.3	451.8	449.0	441.6	431.6
1/250	m/s	1.7	1.7	1.7	1.6	1.9	1.9	1.8	1.8
	L/s	265.9	264.5	260.6	255.3	400.1	397.9	391.8	383.5
1/300	m/s	1.5	1.5	1.5	1.5	1.7	1.7	1.7	1.6
	L/s	240.7	239.5	236.3	231.7	362.3	360.4	355.3	348.2
1/400	m/s	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4
	L/s	205.7	204.8	202.3	198.7	309.7	308.3	304.3	298.8
1/500	m/s	1.2	1.2	1.1	1.1	1.3	1.3	1.3	1.2
	L/s	182.0	181.3	179.3	176.3	274.2	273.0	269.8	265.2

Table 8: Full discharges and velocities DN600 - DN750

Gradient H/L	Velocity/ Discharge k (mm)	DN 600				DN 750			
		Di 0.003	0.596 0.006	0.015	0.03	Di 0.003	0.731 0.006	0.015	0.03
1/10	m/s	11.4	11.2	10.7	10.3	12.9	12.7	12.2	11.6
	L/s	3184.8	3124.5	2998.6	2869.6	5427.6	5320.2	5100.5	4879.5
1/20	m/s	7.9	7.8	7.5	7.2	9.0	8.8	8.5	8.2
	L/s	2202.4	2168.9	2094.3	2012.8	3757.2	3697.2	3565.8	3425.1
1/30	m/s	6.4	6.3	6.1	5.9	7.2	7.1	6.9	6.6
	L/s	1773.2	1749.7	1695.5	1634.0	3026.8	2984.5	2888.6	2781.9
1/40	m/s	5.4	5.4	5.2	5.0	6.2	6.1	5.9	5.7
	L/s	1519.7	1501.6	1458.6	1408.5	2595.3	2562.5	2486.2	2399.0
1/50	m/s	4.8	4.8	4.7	4.5	5.5	5.4	5.3	5.1
	L/s	1348.1	1333.2	1297.5	1254.9	2302.9	2276.0	2212.4	2138.0
1/60	m/s	4.4	4.3	4.2	4.1	5.0	4.9	4.8	4.6
	L/s	1222.1	1209.6	1178.8	1141.6	2088.3	2065.5	2010.7	1945.6
1/70	m/s	4.0	4.0	3.9	3.8	4.6	4.5	4.4	4.3
	L/s	1124.8	1113.8	1086.9	1053.7	1922.3	1902.5	1854.3	1796.2
1/80	m/s	3.8	3.7	3.6	3.5	4.3	4.2	4.1	4.0
	L/s	1046.6	1037.0	1012.9	982.9	1789.2	1771.6	1728.5	1676.0
1/90	m/s	3.5	3.5	3.4	3.3	4.0	4.0	3.9	3.8
	L/s	982.2	973.5	951.7	924.4	1679.3	1663.5	1624.5	1576.4
1/100	m/s	3.3	3.3	3.2	3.1	3.8	3.7	3.7	3.6
	L/s	927.9	920.0	900.1	874.9	1586.6	1572.4	1536.7	1492.3
1/120	m/s	3.0	3.0	2.9	2.9	3.4	3.4	3.3	3.2
	L/s	840.8	834.2	817.2	795.3	1438.1	1426.1	1395.6	1357.0
1/140	m/s	2.8	2.8	2.7	2.6	3.2	3.1	3.1	3.0
	L/s	773.5	767.8	752.9	733.6	1323.3	1312.9	1286.2	1252.0
1/160	m/s	2.6	2.6	2.5	2.5	2.9	2.9	2.9	2.8
	L/s	719.5	714.5	701.3	683.9	1231.2	1222.0	1198.3	1167.5
1/180	m/s	2.4	2.4	2.4	2.3	2.8	2.7	2.7	2.6
	L/s	675.0	670.5	658.6	642.8	1155.3	1147.0	1125.6	1097.6
1/200	m/s	2.3	2.3	2.2	2.2	2.6	2.6	2.5	2.5
	L/s	637.5	633.4	622.6	608.1	1091.3	1083.8	1064.3	1038.5
1/250	m/s	2.0	2.0	2.0	1.9	2.3	2.3	2.3	2.2
	L/s	564.8	561.5	552.6	540.6	967.1	961.0	945.0	923.5
1/300	m/s	1.8	1.8	1.8	1.8	2.1	2.1	2.0	2.0
	L/s	511.5	508.7	501.2	490.8	876.0	870.9	857.4	838.9
1/400	m/s	1.6	1.6	1.5	1.5	1.8	1.8	1.8	1.7
	L/s	437.3	435.2	429.5	421.3	749.4	745.5	735.0	720.5
1/500	m/s	1.4	1.4	1.4	1.3	1.6	1.6	1.6	1.5
	L/s	387.2	385.5	380.8	374.1	663.7	660.6	652.1	640.1

Table 9: Full discharges and velocities DN450 - DN900

Gradient H/L	Velocity/ Discharge k (mm)	DN 900 Di 0.003	0.873 0.006	0.015	0.03
1/10	m/s	14.4	14.1	13.5	12.9
	L/s	8623.3	8446.3	8090.5	7738.1
1/20	m/s	10.0	9.8	9.5	9.1
	L/s	5974.7	5875.1	5660.8	5434.9
1/30	m/s	8.0	7.9	7.7	7.4
	L/s	4815.6	4745.3	4588.1	4416.1
1/40	m/s	6.9	6.8	6.6	6.4
	L/s	4130.6	4075.9	3950.5	3809.5
1/50	m/s	6.1	6.0	5.9	5.7
	L/s	3666.2	3621.3	3516.5	3396.0
1/60	m/s	5.6	5.5	5.3	5.2
	L/s	3325.3	3287.2	3196.8	3091.1
1/70	m/s	5.1	5.1	4.9	4.8
	L/s	3061.7	3028.5	2948.8	2854.3
1/80	m/s	4.8	4.7	4.6	4.5
	L/s	2850.0	2820.6	2749.3	2663.7
1/90	m/s	4.5	4.4	4.3	4.2
	L/s	2675.4	2649.0	2584.3	2505.9
1/100	m/s	4.2	4.2	4.1	4.0
	L/s	2528.1	2504.1	2445.0	2372.5
1/120	m/s	3.8	3.8	3.7	3.6
	L/s	2292.0	2271.7	2221.0	2157.9
1/140	m/s	3.5	3.5	3.4	3.3
	L/s	2109.4	2091.8	2047.4	1991.4
1/160	m/s	3.3	3.3	3.2	3.1
	L/s	1962.9	1947.4	1907.9	1857.4
1/180	m/s	3.1	3.1	3.0	2.9
	L/s	1842.1	1828.2	1792.5	1746.5
1/200	m/s	2.9	2.9	2.8	2.8
	L/s	1740.3	1727.7	1695.1	1652.8
1/250	m/s	2.6	2.6	2.5	2.5
	L/s	1542.6	1532.4	1505.7	1470.3
1/300	m/s	2.3	2.3	2.3	2.2
	L/s	1397.7	1389.1	1366.4	1335.9
1/400	m/s	2.0	2.0	2.0	1.9
	L/s	1196.0	1189.5	1172.0	1147.9
1/500	m/s	1.8	1.8	1.7	1.7
	L/s	1059.7	1054.4	1040.1	1020.2

INSTALLATION

Vinidex StormPRO® and SewerPRO® pipes are twin-wall, corrugated polypropylene pipes for non-pressure applications, and can be installed in non-trafficable and trafficable areas, including under road pavements.

This guide is intended to provide general information for the safe installation of Vinidex StormPRO®and SewerPRO® pipes. For more detailed information refer to AS/NZS 2566.2 'Buried flexible pipelines: Part 2, Installation'. When designed and installed correctly, Vinidex StormPRO® and SewerPRO® systems will provide continuous service in excess of 100 years.

Flexible Pipes

Vinidex StormPRO®and SewerPRO® are flexible pipes. This means that as vertical loads are applied, the pipe will deflect and take advantage of horizontal soil pressure to provide additional support to the system. The interaction of the pipe and the embedment material means that both play an important role in the structural performance of the pipeline.

Flexible pipes have shown excellent performance in buried applications and have been thoroughly researched in both field installations and laboratory studies.

Well-installed pipes, in which the specified embedment material is placed and compacted to the required level, have characteristically low deflections because the pipe deflection follows the soil settlement.

After initial compaction and settlement, applied vertical loads have very little effect on deflection. The use of flexible pipes in all buried applications including under road pavements is well established in Australia and throughout the world.

Where StormPRO®and SewerPRO® pipes are installed at depths between 0.8m and 6m in normal soils and recommended installation practices are followed there is generally no need for structural design calculations. In these typical installations, deflection can be reliably predicted from a design chart based on the compaction level of the embedment.

For installation conditions at greater depths or in poor soils, a design methodology for flexible pipes is clearly set out in AS/NZS 2566.1 "Buried flexible pipelines. Part 1: Design". This Standard uses the pipe characteristics and material properties, installation conditions and external loads to predict pipe deflection, strain in the pipe wall and resistance to buckling which are compared against conservative allowable limits.

Handling & Storage

StormPRO®and SewerPRO® pipes are relatively light weight and smaller sizes can be lifted manually. Note that correct PPE and safe lifting practices should always be used. Care should also be taken when pipes are loaded, unloaded, stacked or distributed on sites to avoid damage to the pipe.

When pipes are lifted mechanically, approved and certified web or rope slings should be used. Transport should not have sharp projections which could cause damage to pipes. Pipes should not be dragged along the ground as this can damage the pipe, causing difficulty with jointing and testing.

StormPRO® and SewerPRO® pipes should be stacked on flat firm ground, which has been cleared of debris and hazardous combustible vegetation. Pipes should be laid flat on transverse bearers at least 75mm wide at maximum 1.5m centres.

Pipe sockets should be supported so that the ends are free from loading, with sockets in each layer opposite to the previous layer. Different sizes are best stacked separately. If this is not practical, then stack with the largest pipes at the base. Framed crates must be stored timber on timber (sizes 150, 225 and 300 only). The height of the pipe stacks should be limited to prevent distortion and excessive ovalisation.

If pipes are to be nested (smaller diameter pipes stored inside larger diameter pipes) for long periods, stacks should not exceed 2m in height.

Trench Excavation

All trenches are potentially dangerous and proper care should be taken to ensure the stability of the trench wall and the safety of all workers. The trench should not be excavated too far in advance of pipe laying and should be backfilled as soon as possible.

Minimum Trench Width

The trench width should be as narrow as is practicable, but wide enough to allow adequate compaction of the haunch zone and the making and inspection of joints. AS/NZS 2566.2 sets out the minimum trench dimensions for StormPRO® and SewerPRO® as shown in Table 10.

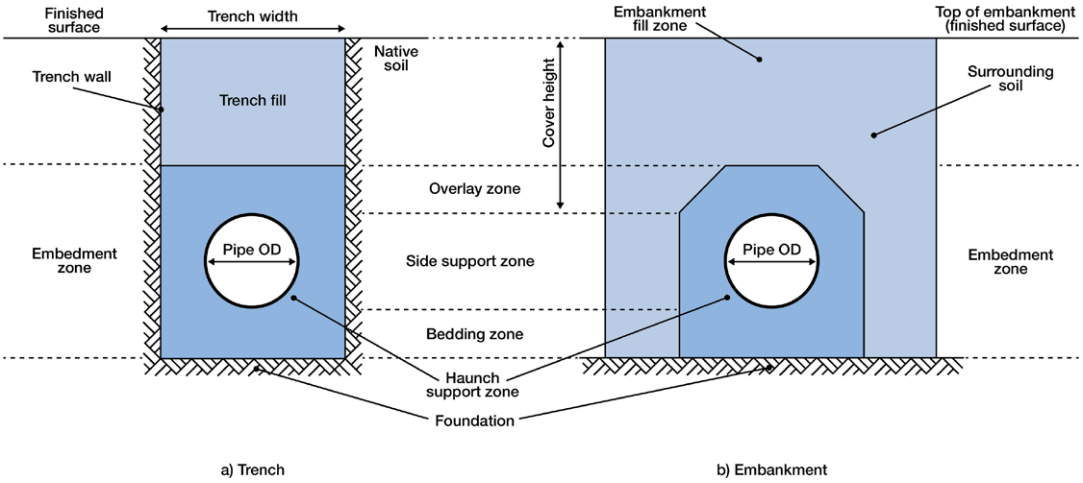


Table 10: Minimum trench dimensions

Nominal Diameter (mm)	150	225	300	375	450	525	600	750	900
Minimum Trench Width (mm)	470	560	745	830	1115	1200	1280	1435	1700
Minimum Depth of Bedding Zone (mm)	100	100	100	100	150	150	150	150	150
Minimum Depth of Overlay Zone (mm)	150	150	150	150	150	150	150	150	200

Pipes in Parallel

Where pipes are laid in parallel, the minimum spacings between pipelines are given below.

Table 11: Minimum spacings between parallel pipelines

Nominal Diameter (mm)	150	225	300	375	450	525	600	750	900
Minimum Spacing (mm)	150	150	200	200	300	300	300	300	350

The trench should be excavated deep enough to allow for the specified grade, the required depth of underlay and the minimum cover.

Selection of Embedment Material

Embedment material for StormPRO® and SewerPRO® pipes should preferably be granular, free-flowing material. This type of embedment material requires less compactive effort to provide support for the pipe and minimises soil settlement.

The table below provides typical gradings for single-size aggregates suitable for use as embedment material for StormPRO® and SewerPRO®.

Table 12: Typical aggregate grading

SIEVE SIZE (mm)	% PASSING BY MASS Nominal size of single-size aggregate		
	10mm	7mm	5mm
26.5	-	-	-
19	-	-	-
13.2	100	-	-
9.5	85-100	100	
6.7	-	85-100	100
4.75	0-20	-	85-100
2.36	0-5	0-20	0-40
0.075	0-2	0-2	0-2

Where sand is more readily available, a typical sand grading is shown below.

Table 13: Typical sand grading

SIEVE SIZE (mm)	% PASSING BY MASS
4.75	100
2.36	90-100
1.18	85-100
0.6	70-100
0.3	50-100
0.15	0-40
0.075	0-5

In cases of reduced cover, it may be preferable to use a cement stabilised sand/gravel as the embedment material (including bedding, side support and overlay zones). According to Table L2 of AS/NZS 2566.2, the cement stabilised material should have a cement content of 6-10%, a moisture content of 10%, and have an unconfined compression strength of 1.7MPa, as determined from cylinder specimen at 7 days.

In cases where it is difficult to achieve mechanical compaction of the bedding material, controlled low strength material (CLSM) may be used as an alternative material. CLSM, also known as slurry fill, flowable fill, flowable mortar, soil-cement slurry, unshrinkable fill or controlled density fill, should achieve a compressive strength in the range of 0.6 MPa to 3.0 MPa, depending on cement content.

When placing CLSM, care should be taken to prevent flotation of the pipe by selecting a lift thickness appropriate to the diameter of the pipe, or ballasting the pipe with sandbags. Further details are available in Appendix K of AS/NZS 2566.2.

Placing and Compacting of Embedment Material

The embedment material should be placed and graded to invert level, and compacted to a minimum 95% Modified Maximum Dry Density or 70% Density Index, depending on the selected material. In conditions where the trench bottom is wet, soft or irregular, it may be necessary to first stabilise, fill and level, and compact the base. Place and compact material in the pipe bedding zone to minimum depth of 75mm beneath the pipe.

Side support and overlay material should be placed in a manner to ensure:

a. uniform distribution and compaction of embedment material, especially under the haunches of the pipe;
b. the material relative compaction is consistent with design;
c. pipe distortion is minimized;
d. the pipe is not damaged; and
e. the specified pipe alignment, level and grade is maintained

In order to ensure uniform support along the pipe barrel, a small indentation should be excavated in the pipe bedding zone to accommodate the pipe sockets.

The pipe side support material should be placed evenly on both sides of the pipeline and compacted such that relative compaction is consistent with design. Side support material should be worked under the sides of the pipe to minimise voids and provide maximum pipe haunching, taking care to minimise distortion of the pipe and maintain alignment and grade.

The pipe overlay material should be levelled and compacted in layers, to a minimum height of 150mm above the crown of the pipe, or as specified.

Cutting of Pipes

DN150 to DN600 StormPRO® and SewerPRO® pipes may be cut anywhere along their length as required, always ensuring that safe work practices are followed. The cut should be made in the valley between the corrugations at right angles to the axis of the pipe. No end treatment or chamfer is required.

StormPRO® and SewerPRO® pipes can be safely cut using any saw suitable for cutting timber. This can be a manual or powered saw.

Due to the reduced spigot diameter, cutting of DN750 and DN900 StormPRO® and SewerPRO® pipe is not recommended unless absolutely necessary. Special slip couplings and rubber rings are required to connect cut DN750 and DN900 StormPRO® and SewerPRO® pipe.

Jointing Instructions

The following procedure is recommended when jointing StormPRO® and SewerPRO® rubber ring jointed pipes:

1. Clean the pipe socket and spigot end, making sure both are free of any dirt and grit. Any foreign matter trapped in the joint will compromise joint performance and leak-tightness of the system.

2. For DN150 – DN600 - Install the rubber ring by stretching it over the spigot so that it seats between the first and second corrugations from pipe spigot end.

   For DN750 and DN900 pipes – Install two rubber rings, one in the valley between the first and second corrugations and one in the adjacent valley between the second and third corrugations from the spigot end.

3. Ensure rubber rings are evenly fitted by running fingers around the full circumference of the pipe.

4. Apply a generous quantity of Vinidex jointing lubricant to the inside of the receiving socket. Do not lubricate the rubber ring or the valley under the rubber ring. Avoid getting lubricant under the rubber ring. This will ensure that the ring does not pick up dirt and introduce contaminants to the joint or become displaced during jointing.

HINT: To further minimize the risk of introducing grit from the embedment material into the joint, a small piece of rubber mat, poly tarp or equivalent can be temporarily placed under the socket/spigot during joint assembly.

5. Insert the leading edge of the spigot into the receiving socket. It is essential that pipes are in a straight line before attempting to make the joint. Double check that the ring and spigot is free from any grit or embedment material so as not to compromise the joint.

6. Do not apply jointing force directly to the socket. Insert a short stub of pipe in the opposite socket. The short stub can be an off-cut, 50mm longer than the socket, and can be re-used.

7. Apply even jointing force. Subject to pipe diameter and local conditions, use a crowbar (see Note) to push on a timber block on the end of the short pipe.

8. Push home the pipe until the spigot end comes into contact with the inner wall of the socket.

NOTE: The jointing force required increases with the nominal diameter of the pipe. A leverage tool such as a crowbar is generally sufficient for StormPRO® and SewerPRO® pipes up to 375mm nominal diameter. For larger sizes, mechanical assistance is required. Where applying a jointing force is not practical, consideration should be given to the use of come-along or winch and rope devices.

Angular Deflection
The pipe may be deflected at the joint after jointing has been completed. Any deflection should be limited to a maximum of 1°.

Witness Mark
The rubber ring is held in position by the corrugations as shown in the diagrams below. When the joint is assembled, the inner walls of the pipe butt together so it is not necessary to joint to a witness mark in the same way as it is for pipe joints designed with a laying gap.

Depending on manufacturing tolerances, a witness mark on the crest of the 5th rib for sizes DN150 to DN300 and on the crest of the 4th rib for sizes DN375 to DN900 will be either wholly within the socket, or just visible at the mouth at the completion of jointing.

Internal Lining
When the StormPRO® and SewerPRO® pipes are pushed fully home during assembly, the spigot end and the internal lining at the back of the socket are generally in contact. However, due to manufacturing tolerances or where there is angular deflection at the joint a small gap may sometimes be observed. This has no effect on the sealing capability of the joint. To reduce this gap when cutting pipe, ensure the cut is clean and even throughout.

Backfilling
Where the finished surface is not to be paved, and surface settlement is not considered critical, ordinary fill material is suitable up to the finished surface. Under pavements where settlement of the fill material is to be controlled, a fill material that can be compacted to the required density should be used.

Trench fill should be placed on the pipe overlay and compacted as specified but generally not in layers in excess of 300mm. Complete the backfilling operation to finished surface level.

Allowable Cover
Minimum cover in Table F reflects industry standards for various design load cases.

Table 14: Minimum depth of cover over pipe

Loading Condition	Minimum Cover (m)
Not subject to vehicular loading	0.30
Land zoned for agricultural use	0.60
Subject to vehicular loading: (a) no carriageway (b) sealed carriageways (c) unsealed carriageways	 0.45 0.60 0.75
Pipelines in embankments or subject to construction equipment loads	0.75

Construction Loads

During construction, consideration of loading during placement and compaction of fill around the pipe and any other construction loading is critical. Care must be taken to ensure that any construction loading from trench compaction and road construction equipment does not overload the pipe.

The following minimum depths of compacted fill over the pipe apply for the placement and compaction of fill around of StormPRO® and SewerPRO®.

Table 15: Minimum depths of compacted fill over StormPRO® and SewerPRO® for construction loads

Construction Load	Minimum compacted fill over StormPRO® and SewerPRO®
Pedestrian vibrating plate	200mm
Vibratory rammer (up to 75kg)	250mm
Vibratory trench roller (up to 2t)	250mm
Vibratory smooth drum roller (7t)	500mm
Truck and dog trailer	500mm
25 tonne excavator and 580 mm compaction wheel acting separately	1,000mm

Flotation

The possibility of pipe flotation exists when StormPRO® and SewerPRO® are installed in areas which will be inundated, such as creek crossings, flood plains and high groundwater areas. To prevent flotation, a minimum cover equivalent to 75% of the nominal diameter is required.

Concrete Encasement

Where concrete encasement is required, StormPRO® and SewerPRO® pipes should be laid to the correct alignment and grade, supported on hessian bags filled with stabilised sand or on concrete blocks or cradles. The concrete surround should be placed so as to provide uniform and continuous support around the entire circumference of the pipe.

StormPRO® and SewerPRO® joints for concrete encasement should be made with an additional rubber ring. For pipe sizes up to and including DN300, a gap should be left and the extra ring placed in the valley between the third and fourth corrugations from the spigot end. For sizes DN375 and greater, the second ring should be placed adjacent to the first ring in the valley between the second and third corrugations. DN750 and DN900 have rings in the first two valleys as usual. Table 16 outlines placement of additional rings.

The completed joint should also be sealed with tape to prevent concrete entering the socket during encasement.

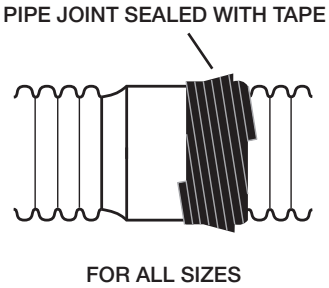


Table 16: Placement of additional rubber ring for concrete encasement

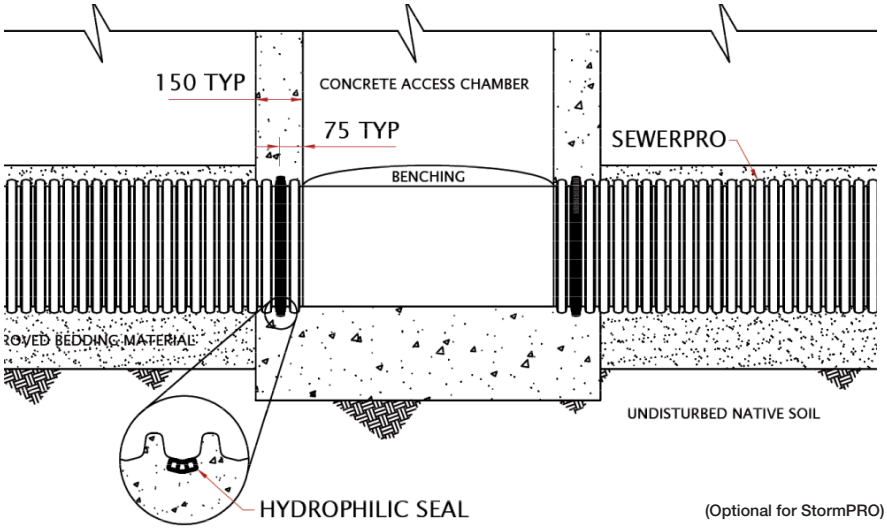
DN150 to DN300	DN375 to DN600	DN750 to DN900
		

The pipe shall be restrained and care taken to prevent movement, misalignment, distortion and / or flotation during the encasement process.

Connection to Structures

StormPRO® and SewerPRO® pipes may generally be connected to rigid structures such as pits, headwalls and endwalls, both pre-cast and cast in situ. StormPRO® and SewerPRO® pipes have sufficient flexibility and strain tolerance to accommodate differential settlement at the interface. The figure below shows a typical entry or exit to a concrete structure.

Note that the hydrophilic seal is required only where a waterproof seal is critical. When required, use Hydrotite DSS0220 or equivalent.



Above-Ground Installation

For above-ground applications, StormPRO® must be adequately supported in order to prevent sagging and excessive distortion.

Clamp, saddle, angle, spring or other standard types of supports and hangers may be used where necessary. Pipe hangers should not be overtightened.

StormPRO® should be supported at regular intervals as detailed in the table below, always with one support located directly behind the socket. These support spacings are based on StormPRO® carrying water at 20°C.

Note that where temperatures in excess of 20°C are likely, the support spacing should be reduced.

The supports should provide a bearing surface of 120° under the base of the pipes and should be at least two corrugations wide. The pipes should be protected from damage at the supports with the provision of a membrane of PE, PVC or rubber. Table J refers to the maximum support spacings for above-ground installations.

Table 17: Maxiumum support spacings

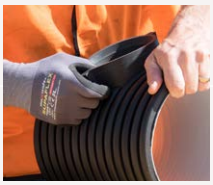
Nominal Diameter (mm)	150	225	300	375	450	525	600	750	900
Minimum Horizontal Support Spacing (m)	1.25	1.60	1.90	2.15	2.50	2.75	3.00	3.00	3.00

Stormwater Connections

The Vinidex PROgrommet range of stormwater service connections provide 100mm and 150mm diameter connections to StormPRO® pipe up to 900mm nominal diameter. The following procedure is recommended when installing the PROgrommet:

1. Drill hole in StormPRO® pipe using the PROsaw. Hole centre must be located in the valley between corrugations.
2. Inspect marking on PROgrommet to ensure the correct size for selected StormPRO® pipe.

3. Present PROgrommet to hole with PROgrommet flange to the inside and locating wings to the outside of the StormPRO® pipe.
4. Squash the PROgrommet by hand whereby the two locating wings align in the centre.



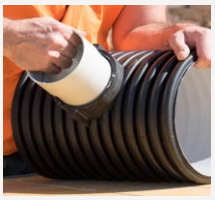
5. With the flattened PROgrommet, form a “C” shape and offer it to the prepared hole.
6. Position locating wings in the valley of the StormPRO® pipe profile.

7. Apply Vinidex Lubricant to the inside diameter of the PRO stopper. Insert PRO stopper into PROgrommet

8. Cut lead-in chamfer on pipe which is to be offered to PRO stopper.
9. Mark a line on pipe showing the required insertion depth.

10. Dry, degrease and prime the branch pipe spigot and the PRO stopper socket with a lint-free cloth dampened with Vinidex priming fluid.

11. Apply a thin even coat of Vinidex Type N solvent cement to the internal surface of the PRO stopper socket first, then apply a heavier, even coat of Vinidex Type N solvent cement up to the witness mark on the branch pipe spigot.



12. Insert the branch pipe spigot home to the full depth of the PRO stopper socket
13. Hold the joint against movement and rejection of the spigot for a minimum of 30 seconds, then wipe off excess solvent cement from the outside of the joint.

The following procedure is recommended when installing PROsaddles:

1. Drill a hole in the StormPRO® pipe at the required location as per PROsaw user instructions – pilot drill must be positioned in the valley between corrugations.

2. Remove the access cap. Inspect the label on the PROsaddle to ensure the correct size for the selected StormPRO® pipe.

3. Apply a thin bead of Butyl Mastic along the raised sealing faces of the gasket and in the holes (top and bottom).

4. Place the gasket and saddle in position.

5. Secure with the four fasteners provided – do not overtighten.

6. Before joining the branch pipe to the saddle, check that the branch pipe has been cut square and all the burrs are removed from the inside and outside edge. Remove all dirt, swarf, and moisture from the branch pipe and the PROsaddle socket.

7. Mark the spigot of the branch pipe with a witness mark at a distance equal to the internal depth of the PROsaddle socket.

8. Dry, degrease and prime the branch pipe spigot and the PROsaddle socket with a lint-free cloth dampened with Vinidex priming fluid.

9. Apply a thin even coat of Vinidex Type N solvent cement to the internal surface of the PROsaddle socket first, then apply a heavier, even coat of Vinidex Type N solvent cement up to the witness mark on the branch pipe spigot.

10. Insert the branch pipe spigot home to the full depth of the PRO saddle socket

11. Hold the joint against movement and rejection of the spigot for a minimum of 30 seconds, then wipe off excess solvent cement from the outside of the joint.

Embedment material should be placed around the branch pipe and saddle, and compacted to a minimum 90% Modified Maximum Dry Density or 60% Density Index, depending on the selected material. The branch pipe support material should be placed evenly around the pipe and compacted such that relative compaction is consistent with design.

Field Testing

Leakage testing is carried out to identify installation faults and sources of infiltration and exfiltration in pipelines which are required to be water-tight such as sewerage systems. Leakage testing is generally not required for stormwater drains.

It is advisable to begin testing early in the pipeline installation to confirm adequacy of laying procedures and, where appropriate, to increase the length tested progressively as experience is gained.

AS/NZS 2566.2 specifies detailed procedures for leakage testing using hydrostatic testing, air or vacuum testing or infiltration testing of non-pressure pipelines. These methods are summarised below. Notwithstanding this, leakage testing should be carried out in accordance with local authority requirements.

Method 1: Hydrostatic Test

Fill the pipeline with water and pressurise to not less than 20kPa at the highest point of the section being tested, but not greater than 60kPa at the lowest point of the test section. Maintain the test pressure for at least 2 hours by adding measured volumes of water if required. Each joint should be carefully examined visually for leaks, and any defects should be repaired. The pipeline section is deemed satisfactory if the make-up volume is less that 0.5L per hour per metre length per metre diameter. After any repairs, the pipeline should be re-tested.

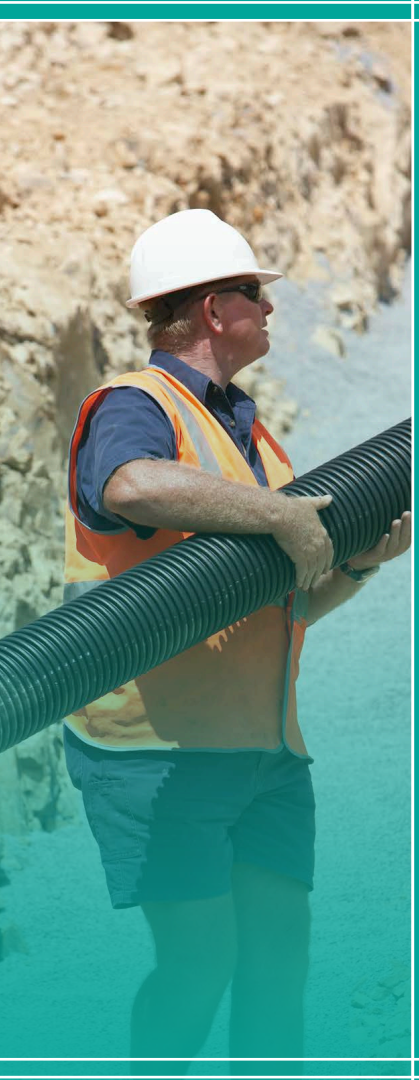
Method 2: Air Test

Introduce air slowly by suitable means until a pressure of 25kPa is obtained. Maintain for a period of at least 3 minutes. If no leaks are observed after 3 minutes, shut off the air supply. If the pressure of air contained in the pipes under test does not fall below 18kPa within the time period specified in the table below, the pipeline shall be considered satisfactory.

If, however, the pressure is not maintained within the specified limits, reintroduce the air and examine the pipeline for leaks by pouring a concentrated solution of soft soap and water over the joints and fittings. Identify and repair any leaks. After any repairs, the pipeline should be re-tested.

Method 3: Vacuum Test

Apply a vacuum until a negative pressure of 25 kPa is obtained. Maintain for a period of at least 3 minutes. If no leaks are observed after 3 minutes, isolate the test section from the vacuum pump. Monitor the pressure for the time specified in the table below. If the vacuum does not drop below 18 kPa within the specified time period, the pipeline shall be considered satisfactory. Where the pipeline section fails the test, re-apply the vacuum and examine the pipeline for leaks. Identify and repair any leaks. After any repairs, the pipeline should be re-tested.



Method 4: Infiltration Test

Where there is a free standing water table at a height of at least 1.5m above the test section, an infiltration test can be carried out. Observe the pipe for 24 hours. Where infiltration is detected, the leak should be identified and repaired.

Table 18: Minimum time intervals for 7kPa pressure change in air and vacuum test

DN	Minimum Test Duration (min)				
	Test Length (m) -50	Test Length (m) -100	Test Length (m) -150	Test Length (m) -200	Test Length (m) -250
150	3	3	3	5	6
225	4	5	8	10	13
300	6	9	14	18	23
375	7	14	22	29	36
450	10	21	31	41	52
525	14	28	42	56	70
600	18	37	55	73	92
750	29	57	86	115	143
900	41	83	124	165	207

Water Jet Cleaning

High-pressure water jet cleaning of internal pipeline surfaces is common, but if not properly managed, water emitted under high-pressure through a jet nozzle has the potential to damage any pipe surface, including those manufactured from plastics, metallic, ceramic and concrete materials.

PIPA Industry Guidelines POP205 provides information based on experience and research, as to the maximum pressures that may be used to avoid damage to StormPRO® and SewerPRO® pipes. The guidelines can be downloaded at http://www.pipa.com.au/documents/water-jet-cleaning-plastics-pipes.

CUT-INS & REPAIRS

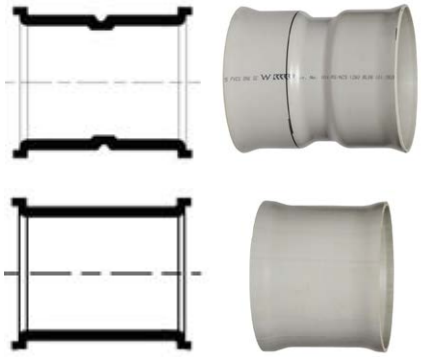
Cut-Ins

To cut into an existing buried StormPRO® or SewerPRO® pipeline and install a socketed junction or other socketed fitting, the following procedure should be adopted:

1. Expose the existing pipe and cut out a length equal to the effective length of the fitting, plus approximately 600mm.
2. Connect 300mm long short pipes to the junction sockets and fit rubber rings to the spigot ends of the short pipes.
3. Fit slip couplings to the cut ends of the existing pipe and install junction.

Standard and Slip Couplings

Standard socket/socket couplings and slip couplings are available in all sizes. Refer product catalogue for further information.



Repairs

If StormPRO® or SewerPRO® is damaged, the repair method will depend on the nature and severity of the damage. Table K below provides guidance on the most suitable method relative to the extent of damage.

Table 19: Suitable methods of pipe repair

	EXTENT OF DAMAGE	REPAIR METHOD
INTERNAL	Minor damage to inner wall (no penetration)	No repair required
	Penetration of the inner wall	Internal repair sleeve required
EXTERNAL	Minor damage to outer wall (no penetration of the outer corrugated wall)	No repair required
	Minor damage to outer wall (penetration of the outer corrugated wall)	External repair sleeve required
	Penetration of both inner and outer walls	Cut, remove and replace affected section of pipe

Contact Vinidex for a range of repair clamps and fittings for StormPRO® and SewerPRO® pipes.

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