ROCLA

OUR DIFFERENCE IS CONCRETE

Sewerage system

Sewerage

The range of products that Rocla offers in terms of sewer reticulation is:

a) Reinforced concrete pipes (dolomitic aggregate)
b) Reinforced concrete pipes with a sacrificial layer
c) Reinforced concrete pipes with HDPE lining
d) Reinforced concrete pipes with Xypex BIO-SAN C500

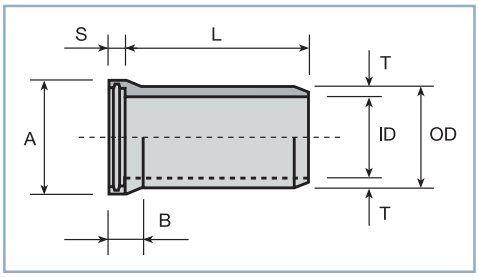
Reinforced concrete pipes (dolomitic aggregate)

Spigot & Socket (RJ) Pipes.

Notes:

1. Manufactured to SANS 677 (concrete non-presure pipes).
2. The joint uses the rolling rubber ring principal and no lubricant is required.
3. Pipe class greater than 1000 can be supplied. Contact Rocla for enquiries.
4. Pipe wall thickness may vary between factories.
5. For satisfactory performance the allowable joint deflection given below should not be exceeded:

Nominal diameters (mm)	300-375	450-600	675-900	1050-1200	1350-1800
Maximum deflection (°)	2	1.5	1	0.75	0.5



Pipe Class	Nominal diameter (ND) (mm)	Inside diameter (ID) (mm)	Outside diameter (OD) (mm)	Wall thickness (T) (mm)	Nominal length (L) (mm)	Socket Outside diameter (A) (mm)	Socket Outside length (B) (mm)	Socket slip (S) (mm)	Approximate pipe mass (kg)
50D	300	298	368	35	2440	464	225	114	258
	375	369	445	38	2440	540	235	127	340
	450	445	533	44	2440	641	260	127	476
	525	534	616	41	2440	730	265	121	527
	600	611	699	44	2440	825	300	139	658
	675	685	787	51	2440	920	315	139	849
	750	762	870	54	2440	1016	330	139	1007
	825	830	946	58	2440	1086	330	139	1159
	900	913	1041	64	2440	1194	360	139	1415
	1050	1034	1194	80	2440	1353	390	162	1998
	1200	1187	1365	89	2440	1543	425	168	2568
	1350	1328	1524	98	2440	1708	445	175	3151
	1500	1461	1689	114	2440	1886	490	190	4059
	1650	1640	1878	119	2440	2088	510	190	4758
	1800	1755	2019	132	2440	2250	525	190	5675
75D	300	298	368	35	2440	464	225	114	258
	375	369	445	38	2440	540	235	127	340
	450	445	533	44	2440	641	260	127	476
	525	514	616	51	2440	730	265	121	631
	600	585	699	57	2440	825	300	139	811
	675	659	787	64	2440	920	315	139	1022
	750	730	870	70	2440	1016	330	139	1243
	825	788	946	79	2440	1086	330	139	1495
	900	869	1041	86	2440	1194	360	139	1803
	1050	986	1194	104	2440	1353	390	162	2477
	1200	1157	1365	104	2440	1543	425	168	2916
	1350	1292	1524	116	2440	1708	445	175	3617
	1500	1419	1689	135	2440	1886	490	190	4657
	1650	1600	1878	139	2440	2088	510	190	5399
	1800	1707	2019	156	2440	2250	525	190	6496
100D	300	298	368	35	2440	464	225	114	258
	375	369	445	38	2440	540	235	127	340
	450	445	533	44	2440	641	260	127	476
	525	514	616	51	2440	730	265	121	631
	600	585	699	57	2440	825	300	139	811
	675	659	787	64	2440	920	315	139	1022
	750	730	870	70	2440	1016	330	139	1243
	825	788	946	79	2440	1086	330	139	1495
	900	869	1041	86	2440	1194	360	139	1803
	1050	986	1194	104	2440	1353	390	162	2477
	1200	1127	1365	119	2440	1543	425	168	3255
	1350	1262	1524	131	2440	1708	445	175	3996
	1500	1383	1689	153	2440	1886	490	190	5155
	1650	1548	1878	165	2440	2088	510	190	6208
	1800	1665	2019	177	2440	2250	525	190	7197

Please note: Mass is an approximation only. Rocla cannot guarantee the exact mass as listed on this table.

Reinforced concrete pipes with a sacrificial layer

Rocla offers the following sacrificial layer pipes:

Host pipe:

- Dolomitic aggregate and ordinary Portland cement
- Siliceous aggregate and ordinary Portland cement

Sacrificial layer:

- Dolomotic aggregate and ordinary Portland cement
- Dolomitic/Siliceous aggregate and calcium aluminate cement

It is recommended that the joints of sacrificial layer pipeline are sealed (refer to “Joint Sealing”).

Pipes with sacrificial layer

Joint sealing of sacrificial layer pipes

The exposed concrete in the joints of the pipeline needs to be protected against the corrosive gasses. The inside of the joint will not give the same resistance to sewer corrosion as the sacrificial layer is in the barrel of the pipe.

Rocla, as suppliers of concrete pipes, cannot be prescriptive as to the sealing material that should be used. That remains the prerogative and responsibility of the consultant. The following recommendations can however be made:

Sealing of man-entry pipes:
The sealing of man-entry pipes normally consists of a Polyurethane Sealant plus a Backing

- Compriband allows larger movement in joints
- Nitoseal PU (a multi-component joint sealant based on polyurethane technology) and Epidermix 326 as a primer may be specified.
- Modified bitumen and rubber with a primer only accommodates small movements
- Bitujoint putty with a Bituprime only accommodates small movements. The sealant may drop out of large diameter pipe joints unless great care is taken

Sealing of non man-entry pipes:
The sealing of non man-entry pipes is done during the jointing of the pipes. The recommended materials to be used are Bitujoint Putty and a Bituprime as supplied by ABE Industrial Products (Pty) Ltd. Before the pipes are jointed, the end face of the spigot is to be covered with a layer of Bitujoint Putty. The putty will then extrude out of the joint when the pipes are forced home. Excess putty is to be trimmed to the pipes internal bore.

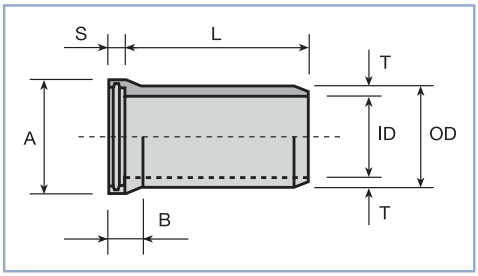
Table 2: Spigot and Socket (RJ) Pipes with sacrificial layer.

Spigot & Socket (RJ) sacrificial layer pipes

Notes:

1. Manufactured to SANS 677 (concrete non-presure pipes).
2. The joint uses the rolling rubber ring principal and no lubricant is required.
3. Pipe class greater than 1000 can be supplied. Contact Rocla for enquiries.
4. Pipe wall thickness may vary between factories.
5. For satisfactory performance the allowable joint deflection given below should not be exceeded:

Nominal diameters (mm)	300-375	450-600	675-900	1050-1200	1350-1800
Maximum deflection (°)	2	1.5	1	0.75	0.5



6. Standard sacrificial layer thickness is as follows:

Nominal diameters (mm)	300-1050	1200-1800
Sacrificial layer thickness (mm)	13	19

7. Pipes with different sacrificial layer thicknesses can be supplied. Contact Rocla for enquiries.

Pipe Class	Nominal diameter (ND)	Inside diameter (ID)	Outside diameter (OD)	Wall thickness (T)	Nominal length (L)	Socket Outside diameter (A)	Socket Outside length (B)	Socket slip (S)	Approximate pipe Mass
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
50D	300	272	368	48	2440	464	225	114	331
	375	343	445	51	2440	540	235	127	431
	450	419	533	57	2440	641	260	127	587
	525	508	616	54	2440	730	265	121	661
	600	585	699	57	2440	825	300	139	811
	675	659	787	64	2440	920	315	139	1022
	750	736	870	67	2440	1016	330	139	1200
	825	804	946	71	2440	1086	330	139	1369
	900	887	1041	77	2440	1194	360	139	1647
	1050	1008	1194	93	2440	1353	390	162	2260
	1200	1149	1365	108	2440	1543	425	168	3007
	1350	1290	1524	117	2440	1708	445	175	3643
	1500	1423	1689	133	2440	1886	490	190	4601
	1650	1602	1878	138	2440	2088	510	190	5367
	1800	1717	2019	151	2440	2250	525	190	6327
75D	300	272	368	48	2440	464	225	114	331
	375	343	445	51	2440	540	235	127	431
	450	419	533	57	2440	641	260	127	587
	525	488	616	64	2440	730	265	121	760
	600	559	699	70	2440	825	300	139	958
	675	633	787	77	2440	920	315	139	1188
	750	704	870	83	2440	1016	330	139	1428
	825	762	946	92	2440	1086	330	139	1694
	900	843	1041	99	2440	1194	360	139	2023
	1050	960	1194	117	2440	1353	390	162	2727
	1200	1119	1365	123	2440	1543	425	168	3344
	1350	1254	1524	135	2440	1708	445	175	4095
	1500	1381	1689	154	2440	1886	490	190	5183
	1650	1562	1878	158	2440	2088	510	190	5993
	1800	1669	2019	175	2440	2250	525	190	7131
100D	300	272	368	48	2440	464	225	114	331
	375	343	445	51	2440	540	235	127	431
	450	419	533	57	2440	641	260	127	587
	525	488	616	64	2440	730	265	121	760
	600	559	699	70	2440	825	300	139	958
	675	633	787	77	2440	920	315	139	1188
	750	704	870	83	2440	1016	330	139	1428
	825	762	946	92	2440	1086	330	139	1694
	900	843	1041	99	2440	1194	360	139	2023
	1050	960	1194	117	2440	1353	390	162	2727
	1200	1089	1365	138	2440	1543	425	168	3671
	1350	1224	1524	150	2440	1708	445	175	4463
	1500	1345	1689	172	2440	1886	490	190	5668
	1650	1510	1878	184	2440	2088	510	190	6783
	1800	1627	2019	196	2440	2250	525	190	7815

Reinforced concrete pipes with a HDPE lining

A HDPE lined concrete pipe offers the advantages of a conventional concrete pipe as well as a plastic pipe i.e. it maintains its shape under load and is inert to acid attack. It is an ideal product for large diameter gravity pipelines in almost any condition. Standard HDPE lining is light green and 3mm thick. Different colours and thicknesses can be supplied.

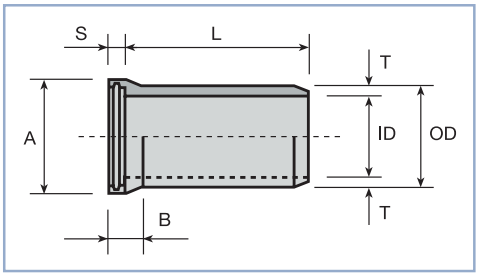
Table 1: Spigot and Socket (RJ) Pipes with HDPE Lining.

Spigot & Socket (RJ) Pipes with HDPE lined pipes.

Notes:

1. The joint uses the rolling rubber ring principal and no lubricant is required.
2. Pipe class greater than 100D can be supplied. Contact Rocla for enquiries.
3. For satisfactory performance the allowable joint deflections given below should not be exceeded:

Nominal diameters (mm)	675-900	1050-1200	1350-1800
Maximum deflection (°)	1	0.75	0.5

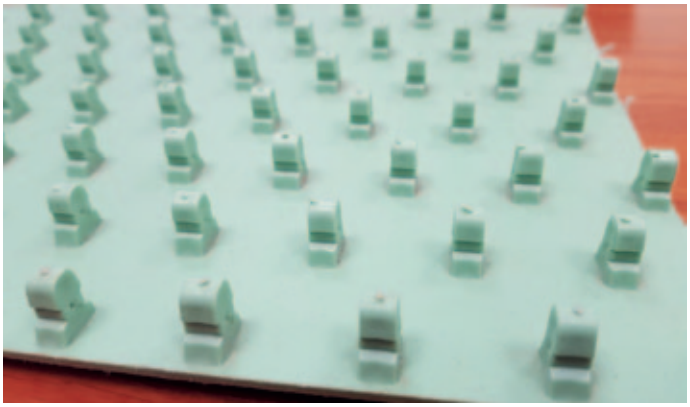


Pipe Class	Nominal Diameter (ND) (mm)	Inside Diameter (ID) (mm)	Outside Diameter (OD) (mm)	Wall Thickness (T) (mm)	Nominal Length (L) (mm)	Socket Outside Diameter (A) (mm)	Socket Outside Length (B) (mm)	Socket Slip (S) (mm)	Approximate Pipe Mass (kg)
50D/75D 100D	750	750	890	70	2500	1016	330	139	1293
	900	900	1041	70.5	2500	1194	360	139	1565
	1000	1000	1170	85	2500	1325	390	162	2095
	1200	1200	1390	95	2500	1543	425	168	2800
	1400	1400	1620	110	2500	1808	460	175	3804
	1500	1500	1740	120	2500	1947	490	190	4493
	1650	1640	1878	119	2500	2088	510	190	4860
	1800	1755	2019	132	2500	2250	525	190	5796

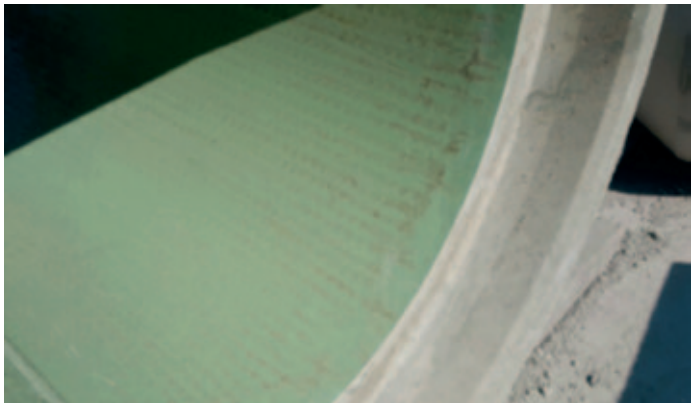
Joint sealing of HDPE lined pipes

The exposed concrete in the joints of the pipeline needs to be protected against the corrosive gasses. A HDPE capping strip is welded over the joint of the pipe after installation. The capping strip is as specified by the consultant and is generally 200mm wide and the same thickness as the lining used in the pipe. The supply and installation of the capping strip is not carried out by ROCLA but by an independent contractor proficient in the process.

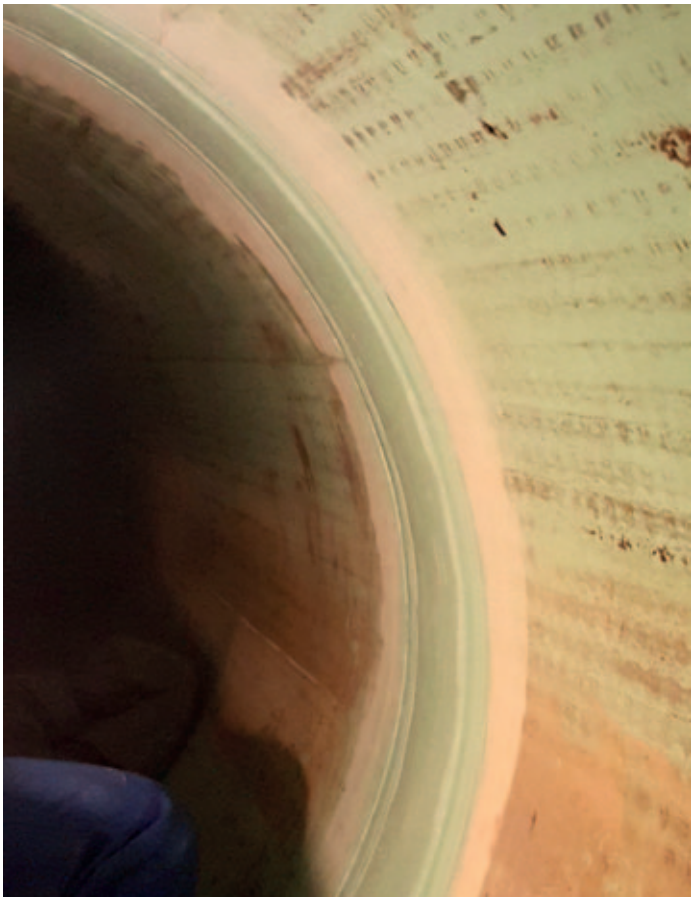
One 100mm long section of lining at the invert or at 60° either side of the pipe invert should not be welded so that any ground water that may gradually accumulate over time in the space behind the lining is relieved.



HDPE lining showing anchor knobs

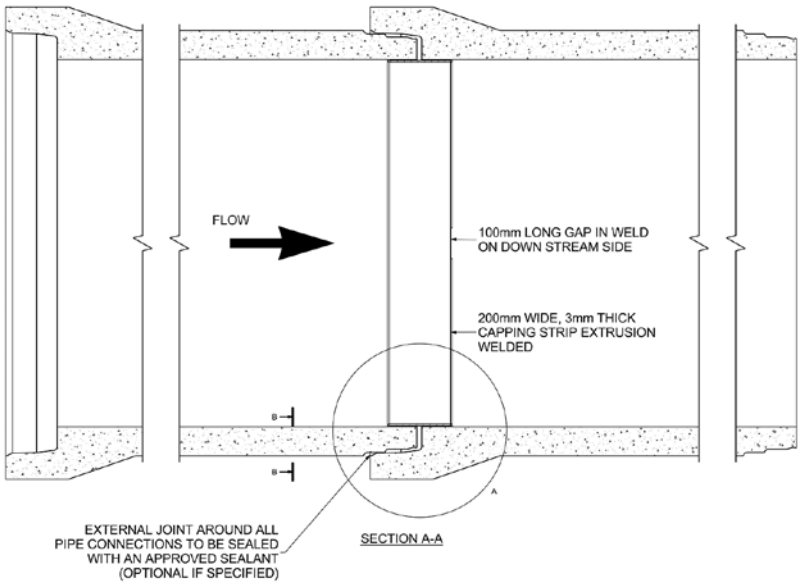


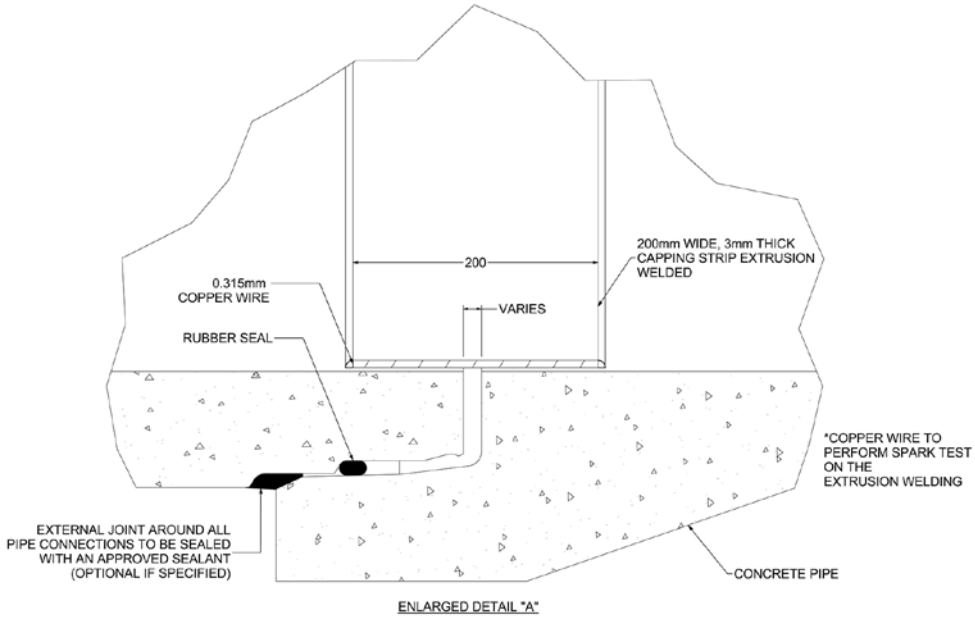
HDPE lined pipe

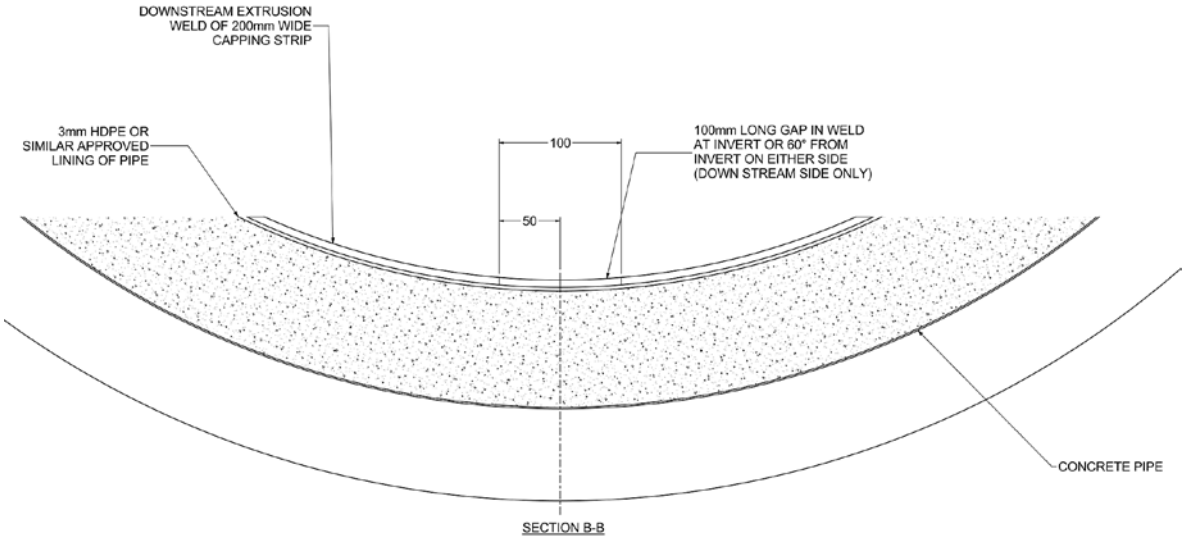


HDPE lining with installed capping strip

Details of joint sealing of HDPE lined pipes

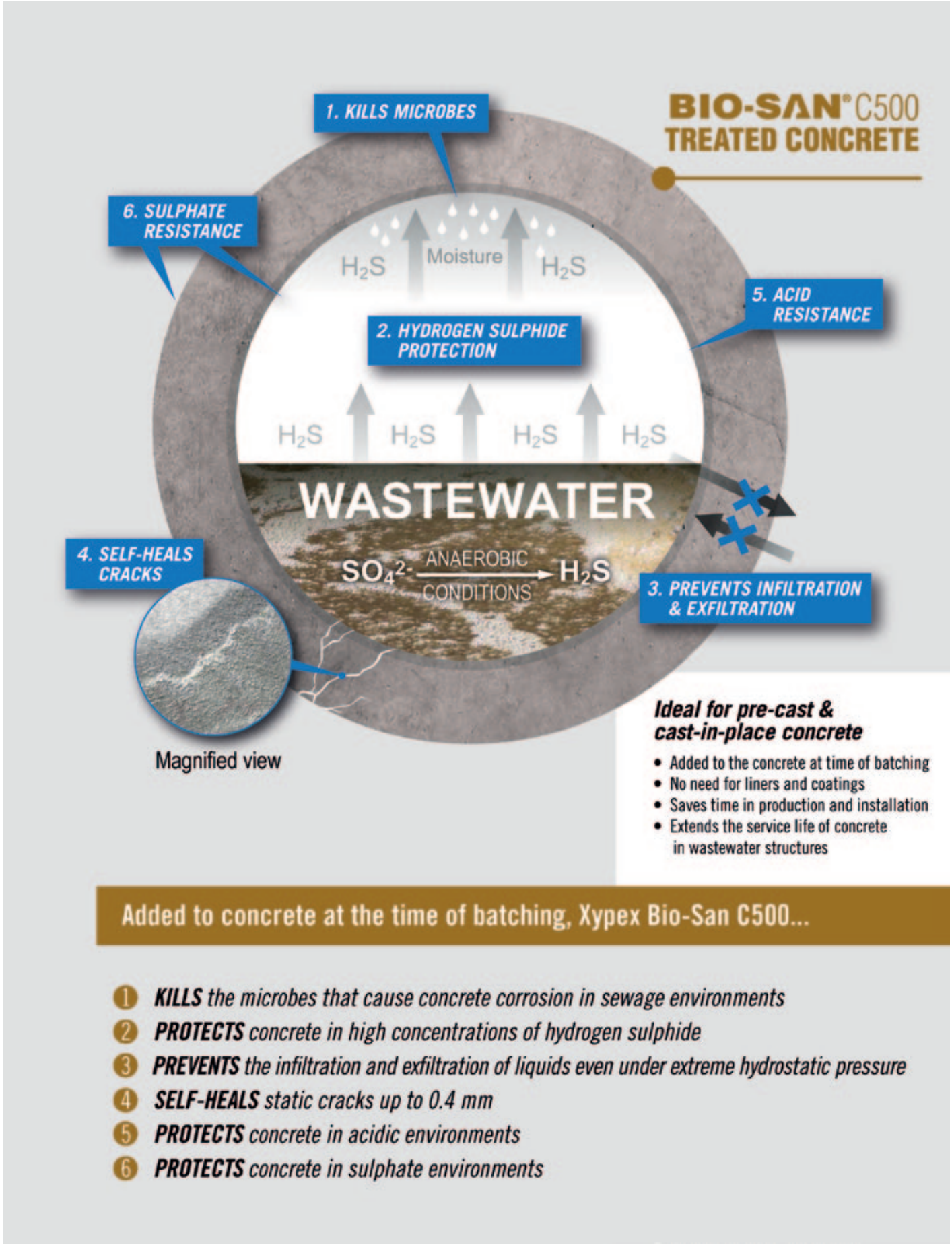






Reinforced concrete pipes with Xypex BIO-SAN C500

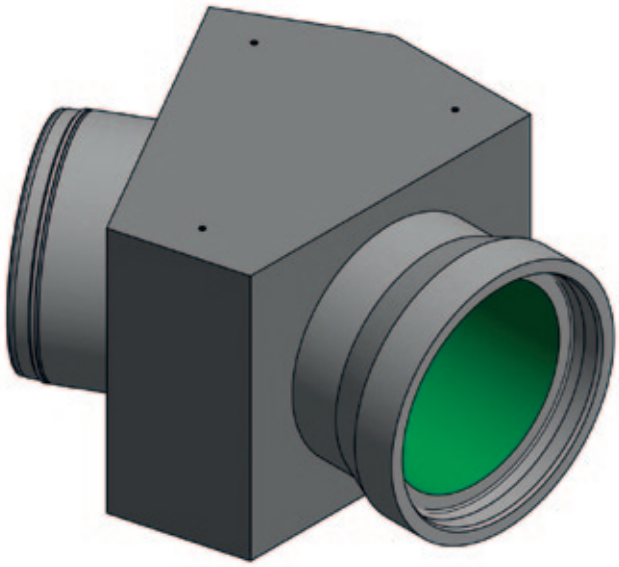
Xypex Bio-San C500 is a uniquely designed admixture for integral, long-term protection of concrete in harsh sewage conditions with high levels of H2S that cause microbial induced corrosion in pipelines. All pipes listed in Table 1 can be manufactured with Xypex BIO-SAN C500. For more details visit www.msasa.co.za



Accessories

Pipes with access hole

Bends

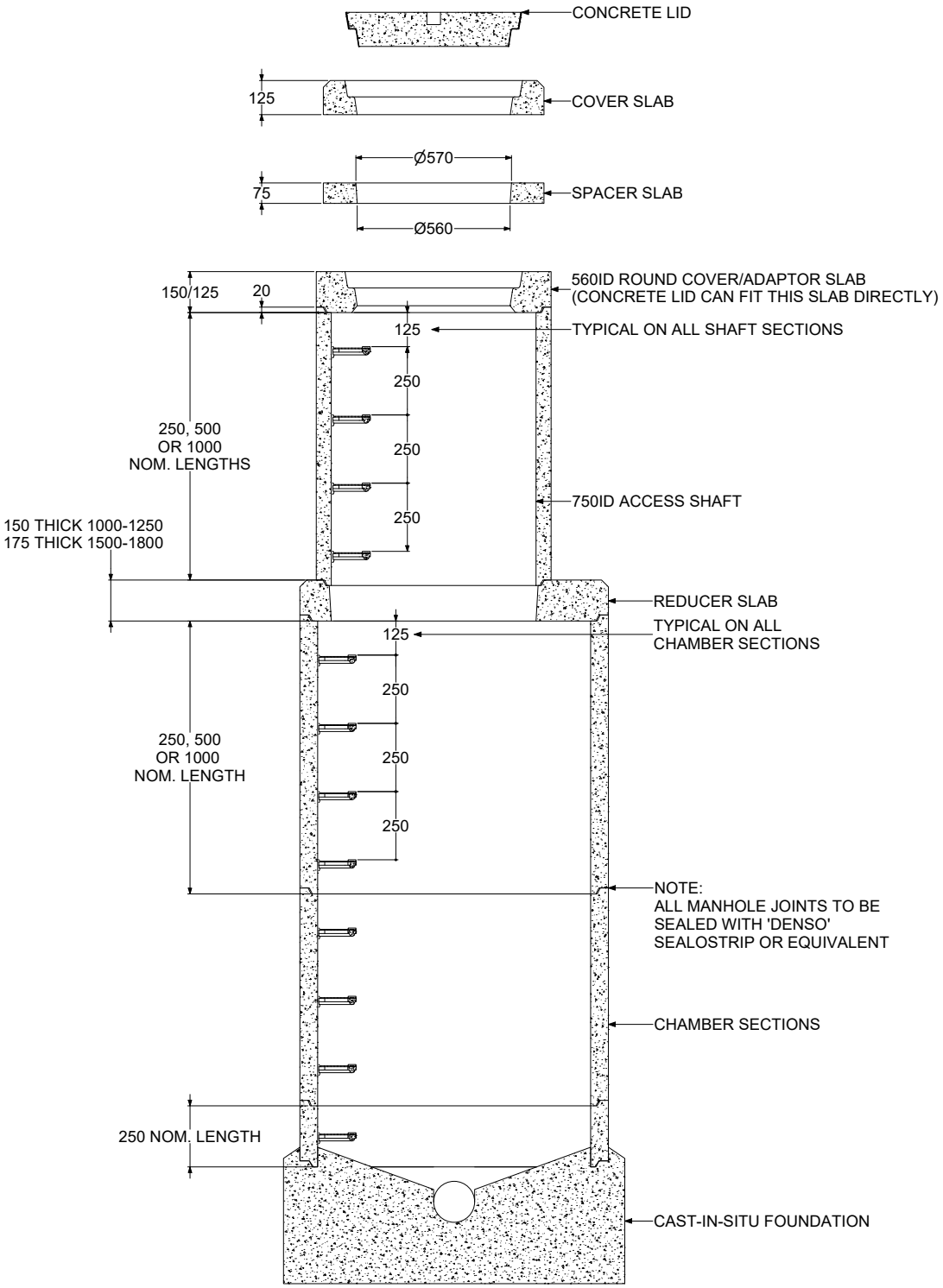


Rocla can supply custom made bends up to 30°

Manholes

Manholes form an integral part of sewer reticulation systems through providing access for inspection and maintenance purposes. Manholes are also used to facilitate changes in the direction of effluent flow as required.

Rocla manufactures various manhole components to accommodate a wide range of project specifications:
a) Standard manhole components for sewers are manufactured with OPC cement and dolomitic aggregates.
b) HDPE lined manhole components are also manufactured. This gives total protection against corrosive gases that are formed in the sewer system. All joints between the manhole components are protected by a capping strip that is welded over the joints after installation. The supply and installation of the capping strip is not carried out by ROCLA but by an independent contractor proficient in the process.
c) Manhole components with Xypex BIO-SAN C500. Refer to page 7 for details on BIO-SCAN C500.



MANHOLE WITH CAST-IN-SITU BASE

Sewer Manholes

Normal Diameter	Inside Diameter	Outside Diameter	Wall Thickness	Nominal Length	Approx Mass	Proof Load
ND	ID	OD	T	L		
mm	mm	mm	mm	mm	kg/unit	kN/m
750	750	860	55	250	90	15
	750	860	55	500	179	15
	750	860	55	1000	359	15
1000	1000	1130	65	250	140	15
	1000	1130	65	500	281	15
	1000	1130	65	1000	561	15
1250	1250	1400	75	250	201	15
	1250	1400	75	500	403	15
	1250	1400	75	1000	805	15
1500	1523	1689	83	250	270	15
	1523	1689	83	500	540	15
	1523	1689	83	1000	1080	15
1800	1829	2019	95	250	370	15
	1829	2019	95	500	741	15
	1829	2019	95	1000	1481	15
1950	1944	2184	120	1000	2008	15

Reducer Slabs

Nominal Diameter	Reduce to	Thickness	Approx Mass
mm	mm	mm	kg
1000	750	150	217
1250	750	150	425
1500	750	175	812
1800	750	175	1246
1950	750	195	1662

Cover Slabs

Nominal Diameter	Reduce to	Thickness	Approx Mass
mm	mm	mm	kg
750	560	150	115
1000	560	150	279
1250	560	150	486
1500	560	175	884
1800	560	175	1318
1950	560	195	1742

Concrete Lids

Nominal Diameter	Rating	Mass
mm		kg
560	MD	91
560	HD	91
560	XHD	91

Adaptor/Cover Slab

Nominal Diameter	Opening	Thickness	Mass
mm	mm	mm	kg
750	560	150	115

Spacer Slabs

Nominal Diameter	Opening	Thickness	Mass
mm	mm	mm	kg
750	560	75	58

Note:
Manufactured to SANS 1294 (Precast concrete manhole sections and components).
Concrete manholes components shown above can be manufactured with Xypex BIO-SAN C500.
Refer to page 7 for details of BIO-SAN C500.

HDPE Lined manhole components

Manhole Chambers with HDPE Lining

Normal Diameter ND mm	Inside Diameter ID mm	Outside Diameter OD mm	Wall Thickness T mm	Nominal Length L mm	Approx Mass kg/unit	Proof Load kN/m
1250	1250	1400	75	250	201	15
	1250	1400	75	1000	805	15
1500	1500	1690	95	500	614	15
	1500	1690	95	1000	1228	15
1800	1800	2020	110	500	851	15
	1800	2020	110	1000	1703	15

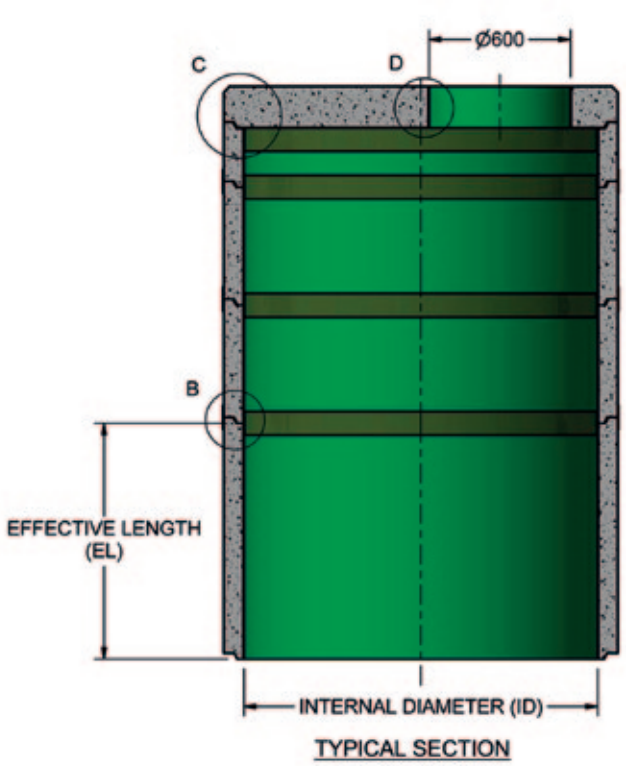
Reducer Slabs

Reducer Slab	Reduce To	Thickness mm	Approx Mass kg
1250	750	150	425
1500	750	175	812
1800	750	175	1246

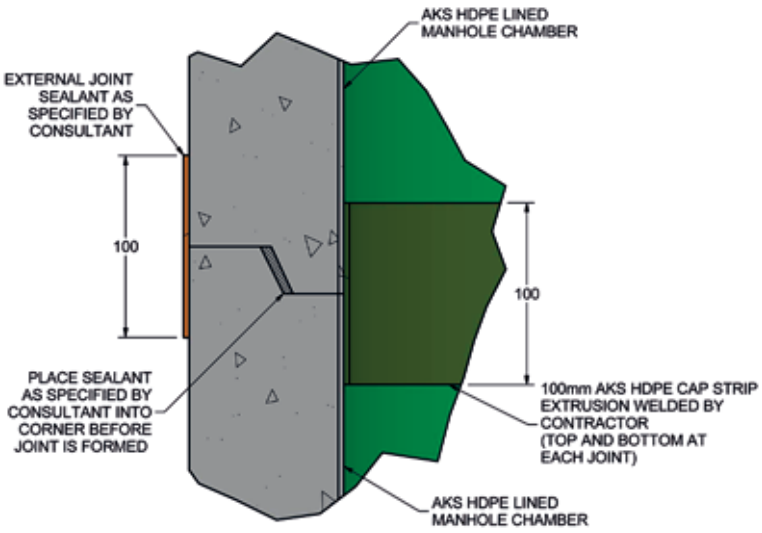
Cover Slabs

Cover Slab	Reduce To	Thickness mm	Approx Mass kg
1250	560	150	486
1500	560	175	884
1800	560	175	1318

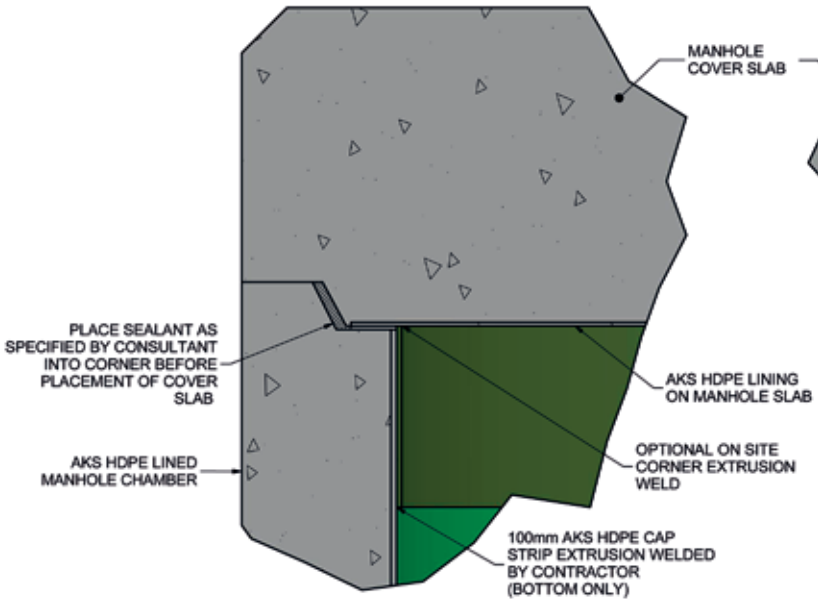
HDPE Lined Manhole Assembly



TYPICAL SECTION



ENLARGED DETAIL "B"



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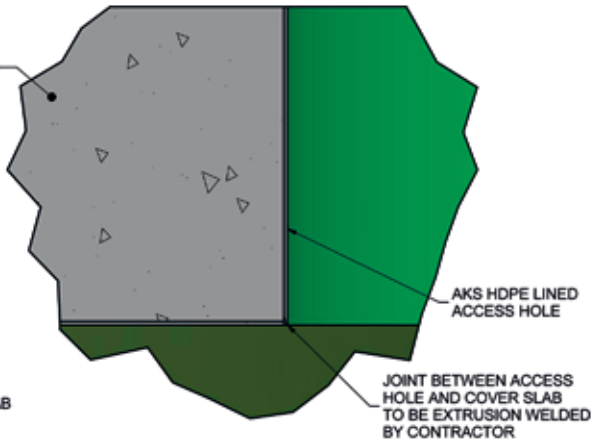

ENLARGED DETAIL "D"

General: Spigot and socket pipes

Specification

1) Sewer pipes fall into the SI category as defined by SANS 677 and should be specified as such.
2) Specification of sewer pipes must be done in accordance with SANS 677 and should include:
   a. Nominal diameter
   b. Application class
   c. Strength class
   d. Joint Type
   e. Additional corrosion protection

   (e.g. 600mm diameter type SI pipe 75D RJ with 3mm HDPE lining, or 450mm diameter type SI pipe 100D RJ with 13mm CAC sacrificial layer)

Product specific definitions

- SC - Stormwater Culvert Pipes
- SI - Sewer & Irrigation Pipes
- RJ - Spigot and socket pipe with a Rolling rubber ring Joint
- ND - Nominal Diameter
- L - Effective Length
- ID - Inside Diameter
- OD - Outside Diameter
- CAC - Calcium Aluminate Cement
- OPC - Ordinary Portland Cement
- Host Pipe - The standard precast pipe that provides structural strength to a pipe in which a sacrificial layer is cast
- Sacrificial Layer- Additional concrete layer on the inside of a host pipe, which provides protection against corrosion
- HDPE Liner - High Density Polyethylene lining. The product takes on the form of AKS (as defined below)
- AKS - Anchor Knob Sheet (HDPE)
- CMACS - Concrete Manufacturers Association Certification Services

Design and construction guidelines

SANS 677 – Concrete non pressure pipes	SABS
SANS 10102 (Parts I and II) – The selection of pipes for buried pipelines	SABS
Concrete Pipe & Portal Culvert Handbook	CMA
Design Manual for Concrete Pipe Outfall Sewers	CMA
Concrete Pipe & Portal Culvert Installation Manual	CMA
Fill Heights Over Concrete Pipes	CMA
Rigid vs. Flexible Pipes	CPA
SANS 2001 – Concrete works	SABS

- CMA - Concrete Manufacturers Association
- CPA - Concrete Pipe Association

Notes

ROCLA NATIONWIDE

Positioned to serve your needs, Rocla's 11 factories are strategically located throughout South Africa's nine provinces and in Namibia and Botswana.

South Africa and offshore markets are cost effectively supplied by road, rail and sea.

Made by modern processes, supervised in accordance with the ISO 9001 Quality Management System, Rocla's factories make products that proudly carry the CMACS Mark of Approval.

- **Head Office, Roodepoort:** Tel: (011) 670-7600, Fax: (086) 677-1510
- **Blackheath:** Tel: (021) 905-1270, Fax: (021) 905-2913
- **Newcastle:** Tel: (034) 375-7848/9, Fax: (034) 375-6941
- **Nelspruit:** Tel: (087) 354-9202, Fax: (086) 681-1052
- **Polokwane:** Tel: (015) 293-1857/8, Fax: (015) 293-2821
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- **Windhoek, Rocla Pipes:** Tel: (002646) 126-3128, Fax: (002646) 121-5149
- **Gaborone, Kwena Rocla:** Tel: (00267) 390-4032, Fax: (00267) 390-7160

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