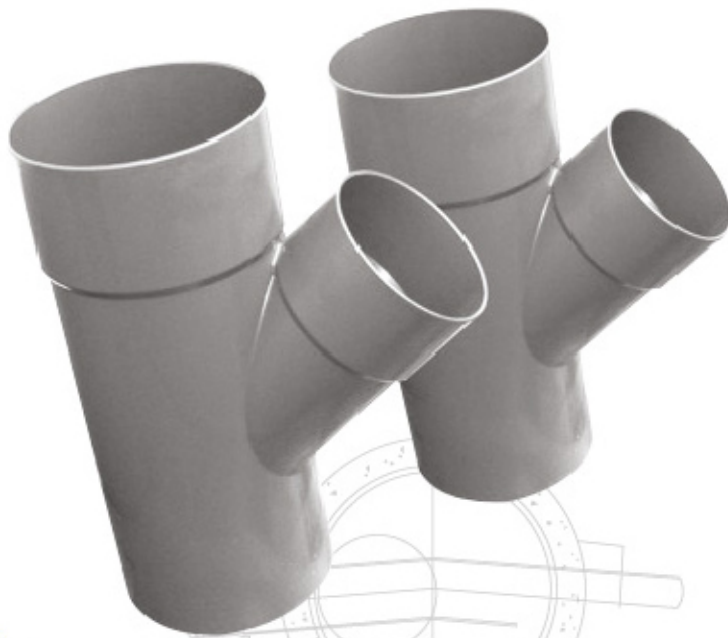


AZEETA[®]

AZEETA PIPE SYSTEM SDN BHD
(455260-W)

ABS SEWER SYSTEM



Listed By

SPAN
Suruhanjaya Perkhidmatan Air Negara



PIONEER IN MALAYSIA

AZEETA® ABS SEWER SYTEM is the first in Malaysia to apply ABS material to sewerage reticulation. ABS is a copolymer consists of Acrylonitrile, Butadiene and Styrene. It carries properties of toughness, high impact strength, good chemical resistance. It is also toxic free and has wide operational temperature range.

STRUCTURAL FEATURES

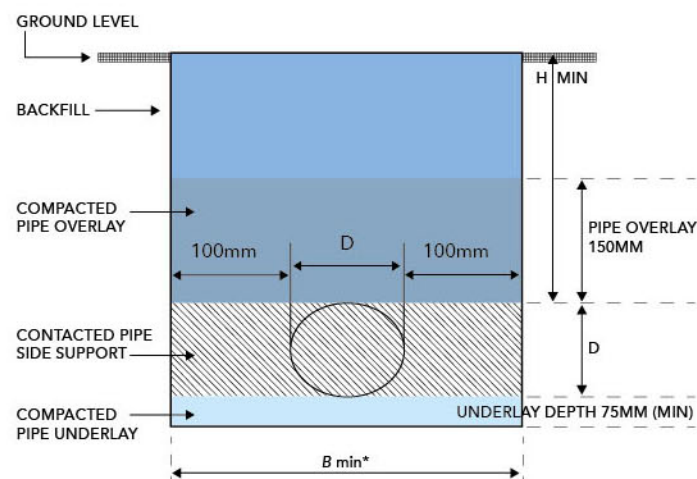
- Fully Integrated Range of pipes and Fitting Available from 15mm to 500mm.
- Designed to last 50 years.
- Significant savings in installation time and costs.
- No corrosion.
- No scaling.
- Minimal maintenance.
- Lightweight.
- Tough and durable.
- Ductile.
- Exceptional smooth bore.
- Fast and reliable jointing.
- Reduced insulation.

APPLICATION

AZEETA® ABS SEWER SYTEM is applicable to the following areas:

- Residential areas / Housing estates / Bungalows.
- High rise building – apartments, hotels, Condominium
- Commercial / Business Centres.
- Hospitals, Shopping complexes, education centres.
- Sewer Treatment Plants.

TYPICAL INSTALLATION IN A TRENCH (MS 1419: PART 4: 1998)



* Minimum Width Of Trench $B_{min} = D + 200\text{MM}$

MINIMUM COVER OVER PIPE (H)

Not subject to vehicular loading	300mm
Subject to vehicular loading	
Not in roadways	450mm
2" sealed roadways	600mm
Under unsealed roadways	750mm
Pipes in embankment conditions or subject to construction equip loading.	750mm

Notes:

1. Requirements of regulatory authorities may specify different depth pending on local conditions.
2. For calculation of external loading on buried pipe, reference should be made to AS 2566 and to the pipe manufacturer for data specific to ABS.

TRENCH AND BACKFILL RECOMMENDATIONS

1. Trench as per Diagram
2. Bedding Material – Suitable sand (Free Of Rock) or Crushed Rock / Gravel (Max Size = 14mm)
3. Pipe Size Support – Clayey sand or fine sand
4. Pipe Overlay – Sand or Gravel
5. Backfill – Excavated material from site (Mixed Soil)

COMPARISON BETWEEN *ABEETA*[®] ABS SEWER SYSTEM & OTHER MATERIALS

PROPERTIES	ABS	Vitrified Clay Pipe	HDPE Double Walled Corrugated Sewer Pipe	Ductile Iron
JOINT	Homogeneous - cold weld (Leak proof)	Rubber ring (non-leak proof)	Non-homogeneous mechanical socket joint (non-leak proof)	Hot welding (leak proof)
LENGTH	2 m - 6 m available in custom lengths as per order	1.5 m - 2.0 m	6 m	6 m
INSTALLATION	Easy	Moderately difficult due to weight and alignment	Moderately difficult due to additional fittings	Difficult due to hot welding works and weight
CORROSION / ABRASION RESISTANCE	Very good	Moderate	Very good	Poor
WEIGHT	Very light	Heavy	Light	Very heavy
STRENGTH CHARACTERISTIC	Strong and tough	Strong but brittle	Moderate	Very strong
HANDLING	Easy	Difficult	Easy	Difficult

PIPE CLASS SELECTION ACCORDING TO DEPTH

OD (mm)	Buried Depth (m)					
	0.3 - 3.0	3.1 - 3.3	3.4 - 4.5	4.6 - 6.0	6.1 - 8.5	8.6 - 14.0
160	PN / Class 6.3		PN / Class 8	PN / Class 10	PN / Class 12.5	PN / Class 16
225	PN / Class 4.5	PN / Class 6	PN / Class 8	PN / Class 10	PN / Class 12	PN / Class 15
315						
355						
400						
450						
500						

*Note: For applications with vehicular loading, minimum cover over pipe shall be 1m.

MANNING'S COEFFICIENT FOR ABS

Material	Manning's coefficient		Factor Comparison		Percentage Diff	
ABS	New 0.009	Old 0.011	New 1.000	Old 1.000	New 0%	Old 0%

* Note :

1. ABS manning's coefficient is calculated based on the following formula with the roughness factor (ks) in mm given as 0.06 for new and 0.6 for old (sourced from MSIG III, 2008)
2. Relationship between manning's n and surface roughness ks is given as

$$n = \frac{D^{1/6}}{22.3 \log \left(3.7 \frac{D}{k} \right)}$$

Where n = manning's coefficient

D = diameter of pipe

k = surface roughness

(Sourced from N.B. Webber, 1971)

3. Manning's coefficient for other material is sourced from pg.22 table 2.3 MSIG III, 2008.
4. There is no reference for Manning's coefficient for corrugated HDPE in the MSIG.

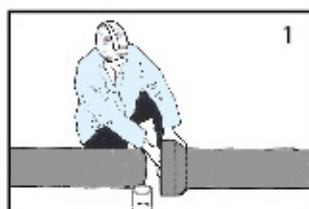
MSIG: Malaysian Sewer Industry Guideline – Published by SPAN



<i>ABEETA</i> [®] FABRICATED BEND 45° & 90°	<i>ABEETA</i> [®] FABRICATED Y PIECE	<i>ABEETA</i> [®] FABRICATED TEE
OUTSIDE DIAMETER (MM)	OUTSIDE DIAMETER (MM)	OUTSIDE DIAMETER (MM)
160 OD	160 OD X 160 OD	160 OD X 160 OD
225 OD	225 OD X 225 OD	225 OD X 225 OD
315 OD	225 OD X 160 OD*	225 OD X 160 OD
355 OD	315 OD X 315 OD	315 OD X 315 OD
400 OD	315 OD X 225 OD	315 OD X 225 OD
450 OD	315 OD X 160 OD	315 OD X 160 OD
500 OD	355 OD X 160 OD	355 OD X 160 OD
	355 OD X 225 OD	355 OD X 225 OD
	355 OD X 315 OD	355 OD X 315 OD
	355 OD X 355 OD	355 OD X 355 OD
	400 OD X 160 OD	400 OD X 160 OD
	400 OD X 225 OD	400 OD X 225 OD
	400 OD X 315 OD	400 OD X 315 OD
	400 OD X 355 OD	400 OD X 355 OD
	400 OD X 400 OD	400 OD X 400 OD
	450 OD X 160 OD	450 OD X 160 OD
	450 OD X 225 OD	450 OD X 225 OD
	450 OD X 315 OD	450 OD X 315 OD
	450 OD X 355 OD	450 OD X 355 OD
	450 OD X 400 OD	450 OD X 400 OD
	450 OD X 450 OD	450 OD X 450 OD
	500 OD X 160 OD	500 OD X 160 OD
	500 OD X 225 OD	500 OD X 225 OD
	500 OD X 315 OD	500 OD X 315 OD
	500 OD X 355 OD	500 OD X 355 OD
	500 OD X 400 OD	500 OD X 400 OD
	500 OD X 450 OD	500 OD X 450 OD
	500 OD X 500 OD	500 OD X 500 OD

* moulded

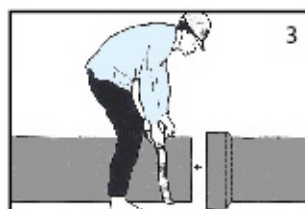
JOINING METHOD



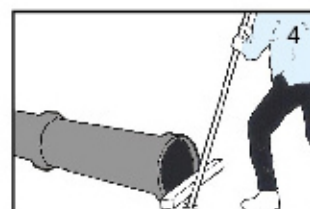
1
Clean socket and pipe with ABS primer.



2
Apply ABS solvent cement to the socket and the pipe.



3
Align the pipe to the socket.



4
Using suitable leverage, push the pipe into the socket.

SIZES AND DIMENSIONS

ABS SEWERAGE PIPES

Pipe Sizes	Pipe Class Bars	Pipe OD (mm)	Pipe ID (mm)	Wall Thickness (mm)	Length of Pipe (m)	
					Plain End	Socket End
OD 160	6.3	OD160	150.2	4.9	2 or 5.8	2 or 6
	8.0	OD160	147.6	6.2		
	10.0	OD160	144.6	7.7		
	12.5	OD160	141.0	9.5		
	16.0	OD160	136.4	11.8		
OD225	4.5	OD225	214.2	5.4	2 or 5.8	2 or 6
	6.0	OD225	211.2	6.9		
	8.0	OD225	206.6	9.2		
	10.0	OD225	202.2	11.4		
	12.0	OD225	198.0	13.5		
OD315	15.0	OD225	191.8	16.6	2 or 5.8	2 or 6
	4.5	OD315	300.2	7.4		
	6.0	OD315	295.4	9.8		
	8.0	OD315	289.4	12.8		
	10.0	OD315	283.2	15.9		
OD355	12.0	OD315	277.4	18.8	2 or 5.8	2 or 6
	15.0	OD315	268.6	23.2		
	4.5	OD355	338.4	8.3		
	6.0	OD355	333.0	11.0		
	8.0	OD355	326.0	14.5		
OD400	10.0	OD355	319.2	17.9	2 or 5.8	2 or 6
	12.0	OD355	312.6	21.2		
	15.0	OD355	302.8	26.1		
	4.5	OD400	381.2	9.4		
	6.0	OD400	375.0	12.5		
OD450	8.0	OD400	367.4	16.3	2 or 5.8	2 or 6
	10.0	OD400	359.6	20.2		
	12.0	OD400	352.2	23.9		
	15.0	OD400	341.2	29.4		
	4.5	OD450	429.0	10.5		
OD500	6.0	OD450	422.2	13.9	2 or 5.8	2 or 6
	8.0	OD450	413.4	18.3		
	10.0	OD450	404.8	22.6		
	12.0	OD450	396.2	26.9		
	15.0	OD450	383.8	33.1		
OD500	4.5	OD500	476.6	11.7	2 or 5.8	2 or 6
	6.0	OD500	469.2	15.4		
	8.0	OD500	459.4	20.3		
	10.0	OD500	449.8	25.1		
	12.0	OD500	440.4	29.8		
	15.0	OD500	426.4	36.8		

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