Road Safety Products
Construction Products
Galvanizing

ARMCO SUPERLITE

OBO Bettermann Group

Index

Armco Superlite

HISTORY

Armco was founded as a subsidiary of the American Roller Mill Corporation in the early 1930's. It was sold to the Robson Group and then later to Murray & Roberts to form part of its light industry focus. In 1997 the business was sold to Steelwood Africa as part of a Black Empowerment Initiative by M & R. Armco Superlite is a wholly owned subsidiary of O-Line Support Systems (Pty) Ltd who have recently been acquired in 2012 by OBO Bettermann of Germany.

PRODUCTS AND OPERATIONS

Armco's products can be broadly categorized into three separate business units, Construction Products, Road Safety Products and Galvanizing. The Construction Products division specializes in the manufacture of corrugated steel culverts used mainly in the road, mining and rail sectors.

The Road Safety division was launched in 2005. This division supplies a variety of products to the road industry such as guardrail, wire rope systems, crash cushions and steel barriers to name a few.

The Galvanizing business involves the treatment of steel to prevent corrosion. The two businesses were originally interdependent with the bulk of the galvanizing work being performed for Construction Products.

QUALITY

Armco Superlite are certified in accordance to ISO 9001:2015 Quality Management System which ensures the quality of all products and services produced by Armco Superlite. Specific customer quality plans are drawn up where required for any of our operations.

Armco holds the SATAS mark for Hot Dipped Galvanizing and all products are galvanized in accordance to SANS 121/ISO 1461 specifications. Galvanizing certificates are supplied on request.

Armco also holds the SATAS mark for the manufacture of W-Beam guardrail and all guardrail is manufactured in accordance to SANS 1350.

EMPLOYMENT EQUITY AND AFFIRMATIVE ACTION

In line with current legislation and group policies Armco Superlite has an active Employment Equity Working Committee addressing all the issues of the Employment Equity Act including an Affirmative Action Plan and Measures, Skills and Development Plan, Training and Education Plan.

CORPORATE GOVERANCE

In line with international shareholding requirements, corporate governance identifies these risks in order to ensure compliance. This process is well entrenched in Armco Superlite and many risk areas have been identified and reduced or even removed. In addition an external auditing firm conducts annual Internal Audits.

OCCUPATIONAL HEALTH & SAFETY

Armco Superlite is fully committed to the OHS Act as the health and safety of our workers is vital to our company. We have a well established Health and Safety Committee with fully trained representatives through the works representing all employees and high standards of safety confirm this.

MEMBERSHIPS

Hot Dip Galvanizers Association of South Africa

Through active membership, knowledge and information sharing assists us to continuously improve the industry. Simultaneously the H.D.G.A.S.A. provides recourse to all galvanizing customers and consultants alike. Their strict codes of discipline and a professional approach promote our shared objectives.

Steel Engineering Industries Federation of South Africa (SEIFSA)

With legislation and industry changing continuously in South Africa SEIFSA guides its members and also handles negotiations in respect of Human Resources and Industrial Relations on their behalf. SEIFSA offers various other industry-related services supporting their members for example, indices, main agreements and training.

South African Institute of Steel Construction (SAISC)

The SAISC is South Africa's only technical and advisory organization supporting the use of steel in construction. The SAISC is commercially minded but professional, independent and respected.

OBO Bettermann Group

FM654728

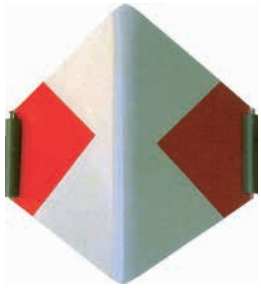
ROAD SAFETY PRODUCTS

ARMCO GUARDRAIL

FEATURES

Armco Guardrail has gained international acceptance because it:

- Marks the limit of safe travel and warns of danger
- Reduces centreline crowding by increasing driver confidence
- Restrains and guides out-of-control vehicles
- Is highly visible at night due to reflective delineators



Type D1 reflector

Guardrail

- Guardrail available in effective lengths of 3.81m and 4m.
- Special lengths available on request.
- Individual sections may be curved to fit any radius from 3 to 45m.
- Manufactured to SANS 1350.
- End protection available in standard bullnose endwings.
- Available either hot dip galvanized to SANS 121 / ISO 1461 or uncoated.
- Installation guidelines available on request.

Guardrail Posts

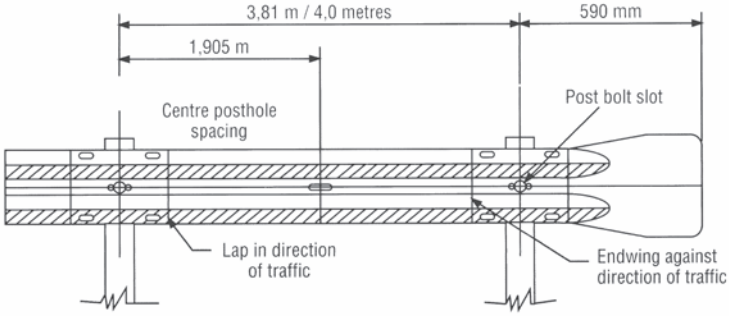
- Standard timber posts 1800 mm long x 150-175 mm diameter.
- Domed or beveled tops available.
- Pre-drilled for ease of installation.
- Creosoted to preserve timber.
- Timber posts conform to SANS 457.
- Steel posts are manufactured to customer specification on request.

Type V reflector

Reflectors (Delineators)

- Type D specified by Department of Transport.
- Type V reflectors also available.
- Manufactured from Chromadek to ensure long service life.
- Retro-reflective material complies with provisions of CKS 191.
- Colour coding to customer specification.
- Slotted base for ease of installation.
- Other basic materials available on request.

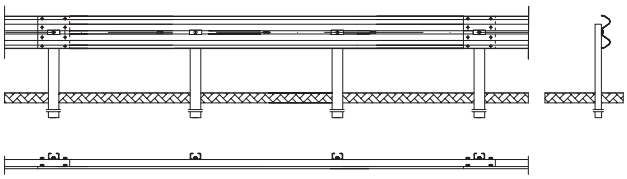
Guardrail on posts



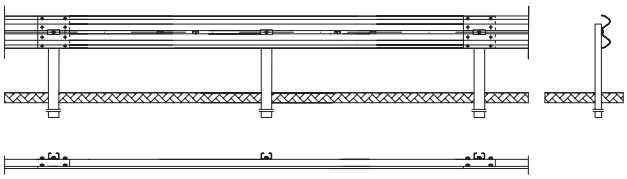
ARMCO EN1317 GUARDRAIL SYSTEM

FEATURES

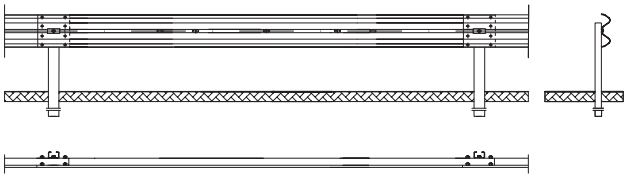
Passco N2/H1-A-W2/W3 (ES 1.33)		
Containment Level	**N2**	**H1**
Impact Severity Level	A	A
Working Width	W2 = 0,8 m	W3 = 0,9 m
Profill "A" Weight	21,7 kg/m	21,7 kg/m
Vehicle Intrusion	VI6	VI6



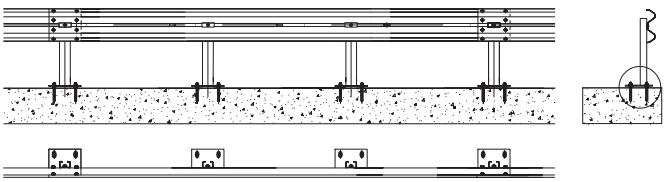
Passco N2/H1-A-W3/W4 (ES 2.0)		
Containment Level	**N2**	**H1**
Impact Severity Level	A	A
Working Width	W3 = 1,0 m	W4 = 1,3 m
Profill "A" Weight	17,8 kg/m	17,8 kg/m
Vehicle Intrusion	VI7	VI7

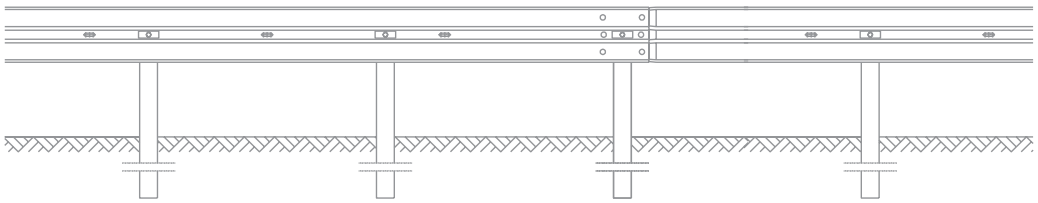


Passco N2-A-W4 (ES 4.0)	
Containment Level	**N2**
Impact Severity Level	A
Working Width	W4 = 1,2 m
Profill "A" Weight	13,9 kg/m



Passco H1-A-W4 (BW-ES 1.33)	
Containment Level	**H1**
Impact Severity Level	A
Working Width	W4 = 1,2 m
Profill "A" Weight	18,2 kg/m
Vehicle Intrusion	VI5





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ARMCO WIRE ROPE SAFETY FENCE

FEATURES

Safence is a product from Blue Systems which we have developed together with the Danish company Brdr. Markussens Metalvarefabrik (BMM). The wire rope fences are designed to meet the requirements for road safety barriers according to NCHRP 350-TL4 and the new European CEN standards.

High Safety Levels

Within the European standards organisation CEN, standards have been worked out as to how impact testing of safety barriers is to be carried out. These impact tests for road safety barriers are described in prEN 1317, Road Restraint Systems. The CEN standards place functional demands on road barriers from the viewpoint of road safety, and establish different containment levels for testing road safety barriers. The traffic environment where they are to be installed determines which containment level should be used and which working width can be allowed. Also included in the CEN standards is the demand that there should be minimal risk of personal injury in a collision with the barrier (Impact severity level).

We can provide different models and designs depending on the customer's requirements regarding containment level, working width and impact severity level.

Installation

All installations are done by Armco Road Safety Products accredited teams in accordance with Blue Systems specifications.

Easy Repair

The repair of a wire rope fence is quick and easy due to the slotted post holes whereby posts are easily removed and replaced. It is important that repair work on the fence can be done easily and quickly without any loss of quality. In order to ensure the quality, function, length of life and standards of service for our products, we offer training to the service personnel concerned on each stretch of highway where our fence has been installed.

Long Life

All fittings are supplied in grade 316 stainless steel. All other steel components are galvanized to SANS 121 / ISO 1461.

Specifications

Containment Level	Speed	Weight	Angle
N1	80 km/h	1500 kg	20
N2	100 km/h	900 kg	20
	110 km/h	1500 kg	20
H1	70 km/h	10000 kg	15
H2	70 km/h	13000 kg	20

Working Width	
W1	<=0,6 m
W2	<=0,8 m
W3	<=1,0 m
W4	<=1,3 m
W5	<=1,7 m
W6	<=2,1 m
W7	<=2,5 m
W8	<=3,5 m

EURO ET™ TERMINAL

FEATURES

The **Euro ET™** offers specifiers and installers the latest innovation of the world's leading guardrail end treatment. The European version of the **ET-Plus™** meets or exceeds EN 1317-4 P4 criteria. It is uniquely configured to meet European highway safety specifications.

Benefits

- All steel construction.
- Easy installation and fits directly onto traditional w-beam guardrail.
- **ET Plus™** head is frequently reusable after a design impact.
- EN 1317-4 P4 compliant.
- 12 meter pay length.

Specifications

Length	12 m
Width	0.381 m
Post Spacing	2 m

Before impact

After impact

TREND CEN END TERMINAL

FEATURES

The **Trend CEN End Terminal** is a steel post, energy absorbing terminal for use with w-beam safety barriers. The steel “breakaway” posts are designed using an innovative concept. The lower post, having a U-Section, is driven into the ground. The upper post, with its U-Section, slides into the lower post and is then secured using a steel tension bolt.

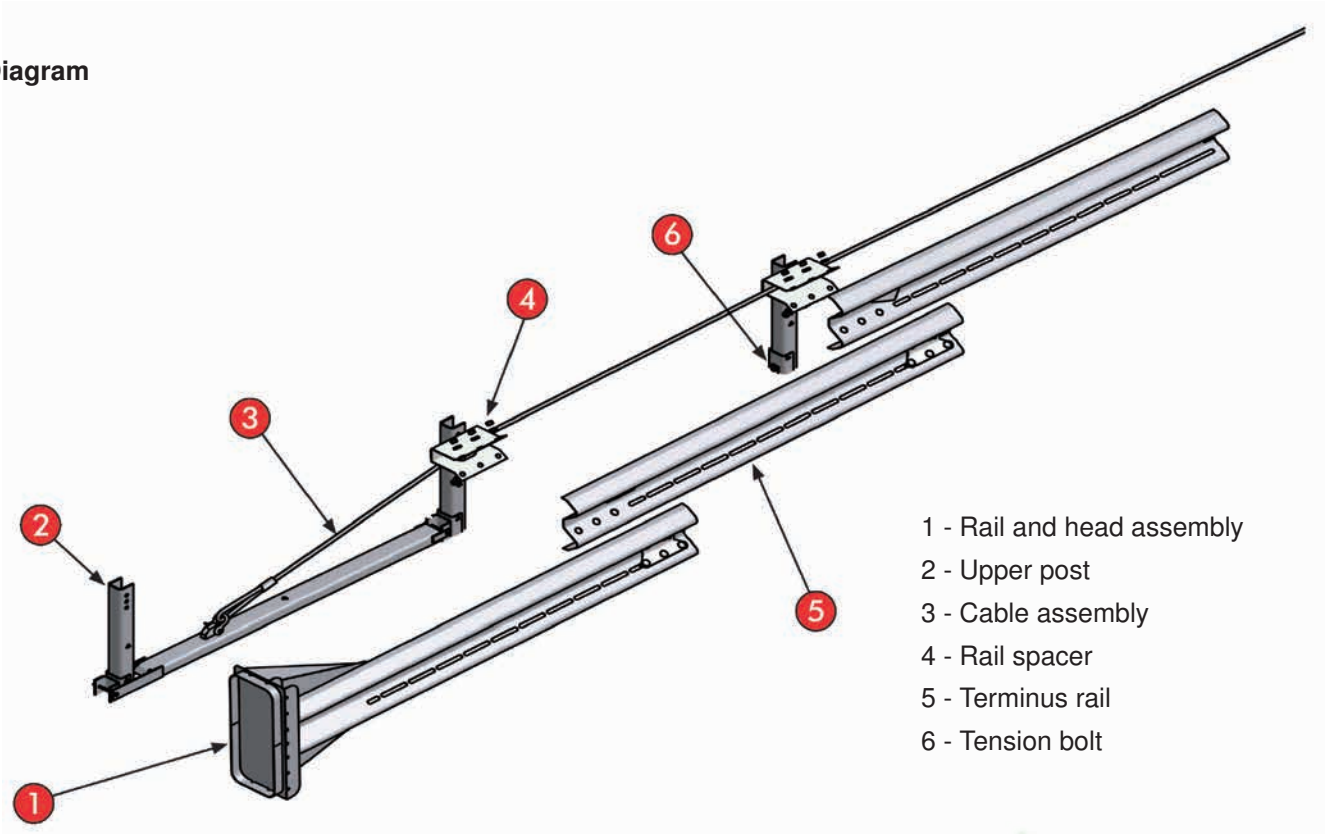
Benefits

- Fully tested as a P4 terminal for 110 km/h using ENV 1317-4 criteria.
- Breakaway steel post technology.
- Easy to transport – one complete unit, weighing approximately 400 kg, can fit onto a standard pallet for transportation on small work vehicles.
- Easy to install – the **Trend CEN End Terminal** can be installed in 2 hours by a three person crew using standard safety barrier installation equipment.
- Debris field is less than 1m.
- Multiple post anchoring options.
- Fits directly onto traditional w-beam guardrail.

Specifications

Length (110 km/h system)	12 m
Weight (approximate)	400 kg
Post Spacing	2 m

Diagram



QUADGUARD® SYSTEM

FEATURES

The new standard in crash cushions... NCHRP 350, TL-3! The new family of QuadGuard® crash cushions offers the latest technology for shielding hazards 610 to 1755 mm. Each QuadGuard® System consists of crushable, energy-absorbing cartridges surrounded by a framework of steel Quad-BeamTM panels. These new crash cushions redefine NCHRP 350, Test Level 3 performance for redirective, non-gating attenuators.

Benefits

- Compact, modular design (1 to 12 bays) accommodates speeds from 40 km/h to 120 km/h.
- Quad-Beam panels provide 30% higher beam strength than thrie beam.
- “Staged” cartridge design safely decelerates both light cars and heavier, high centre-of-gravity vehicles.
- Monorail base eliminates the need for anchoring chains and tension cable – easier installation!
- Self-supporting nose – no legs mean reduced installation and maintenance time.
- Simplified backups – choose from Tension Strut or Concrete.
- Quick and easy refurbishment – QuadGuard® System offer high efficiency 80% reusability, allow for quick refurbishment and keep repair costs low. After a head-on impact, typically only the cartridges and plastic nose are expended. The cartridges contain the debris, further reducing refurbishment time.

Design Table (Avg G deceleration values)

Number of Bays	Effective Length	Design Velocity km/h	40	50	60	70	80	90	100	105	110	115	120
7*	7.21 m	105	–	–	–	–	–	5.2	6.4	7.1	7.8	8.5	9.2
6	6.30 m	100	–	–	–	–	4.7	5.9	7.3 TL3	8.1	8.9	9.7	–
5*	5.38 m	90	–	–	–	4.2	5.5	7.0	8.6	9.5	10.4	–	–
4*	4.47 m	80	–	–	3.7	5.1	6.6	8.4	10.4	–	–	–	–
3	3.56 m	70	–	3.2	4.7	6.4 TL2	8.3	10.5	–	–	–	–	–

* System capacity estimated through calculation
Above G's are based upon average values calculated for vehicles 820 to 2000 kg that stop in a distance equal to 85% of the system's length.
Warning: Shaded area denotes excessive decelerations based upon occupant risk recommendations outlined in NCHRP 350 for 2000 kg vehicles. Armco Road safety products does not recommend choosing systems from this area of the chart.

ALPHA 70K TMA™

FEATURES

The **Alpha 70K** Truck Mounted Attenuator meets NCHRP 350, Test Level 2 criteria and offers a wide range of protection for workers, motorists and equipment.

Benefits

- Provides 70 km/h impact protection.
- Absorbs collision energy during rear-end impacts.
- Prevents impacting vehicles from underriding the truck.
- Reduces expensive equipment damage.
- Resilient Durashell® Nose resists nuisance hit damage.
- Tapered nose shape minimises corner damage.
- Aluminium construction withstands harsh weather and corrosive elements.
- Lightweight cartridge provides easy handling.

Specifications

Length*	254 cm
Height*	57 cm
Width*	236 cm
Weight - Complete System°	450 to 550 kg
Road Clearance	28 to 33 cm

* Cartridge only
° Depends on options

EURONEAT™ SYSTEM

FEATURES

The **EuroNEAT™ System** is an end treatment for permanent and temporary installations. This Non-Redirective, Energy-Absorbing Terminal provides impact protection for speeds up to 80 km/h. It meets the EN 1317-3 criteria for non-redirective crash cushions. The **EuroNEAT™** system's cartridge is lightweight, weighing only 147 kg. It is also compact, measuring less than 3 metres in length. The system can be installed in less than 15 minutes, without the use of special tools or heavy equipment.

The **EuroNEAT™ System** consists of a unique configuration of aluminum cells encased in an aluminum shell that withstands harsh weather and environmental conditions. The basic components of the system are:

- A one-piece, aluminum cartridge
- Steel backup and attachment hardware
- Steel transition panels

The system's unique design allows for easy attachment to the end of concrete barrier utilizing the barrier's existing pin and loop connection. The nose of the system can be equipped with a chevron sign and is reversible for unidirectional or bi-directional traffic. The cartridge features integrated caster wheels to aid repositioning and resetting.

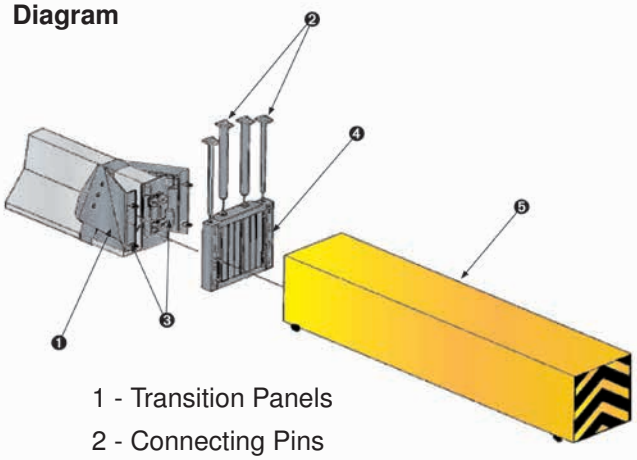
Benefits

- Easy installation due to very few components - takes less than 15 minutes.
- Lightweight design means superior portability - weighs less than 150 kg.
- No special tools or heavy equipment required for installation.
- Integrated caster wheels aid in positioning and resetting.
- Meets EN 1317-3 criteria for non-redirective crash cushions at 80/1 level.
- Self-contained cartridge eliminates post-impact debris for easy clean-up and refurbishment.
- Anchors to portable barrier - ground anchorage not required.

Specifications

Length	2965 mm
Width	570 mm
Height	813 mm
Weight	147 kg

Diagram



1 - Transition Panels
2 - Connecting Pins
3 - Attachment Hardware
4 - Backup
5 - Cartridge

WATERFILLED SAFETY BARRIERS

FEATURES

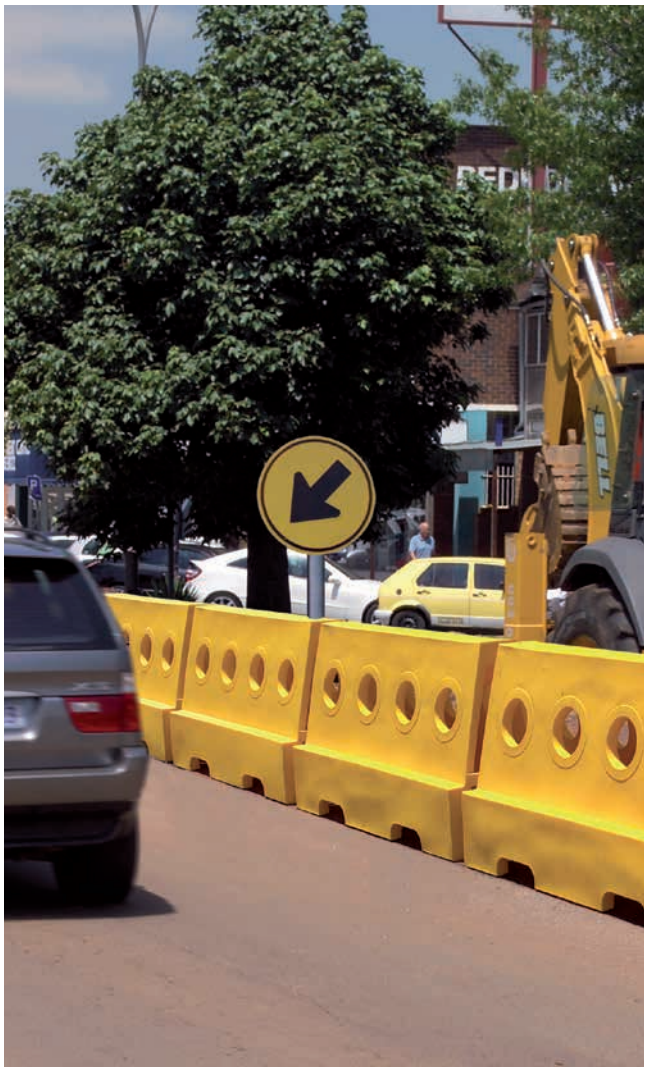
Armco introduces a new range of waterfilled safety barriers.
Manufactured from High Impact UV stabalised Polyethylene.

Benefits

- Stackable (saving on transport costs) on 28 kg only.
- Interlockable.
- Flush mounted.
- Yellow for visibility.

Specifications

	28 kg	17 kg	6 kg
Length - Effective	1.910 m	1.910 m	1.235 m
Length - Overall	2.030 m	2.030 m	1.350 m
Height	1.015 m	1.015 m	600 mm
Base	520 mm	530 mm	570 mm
Weight - Empty	28 kg	17 kg	6 kg
Weight - Full	80 kg	80 kg	60 kg



28 kg waterfilled barrier

17 kg waterfilled barrier

6 kg waterfilled barrier

1,8 m ROAD CONE

FEATURES

This road cone is 1,8 m tall, is highly visible and was designed especially for sites operating large, heavy machinery and vehicles.

Benefits

- **1,8 m Road Cone** is available in a wide range of colours and can be used in conjunction with a reflective sleeve.
- The road cone can also be fixed to the ground through specially moulded holes to secure the cone from moving around.

Specifications

Height	1.8 m
Base Width	1 m
Weight	6.5 kg

Moulded holes to secure the cone from moving around.

MONSTER MAN BARRIER

FEATURES

Armco introduces a new Monster Man safety barrier.
Manufactured from High Impact UV stabalised Polyethylene.

Benefits

- Flush mounted.
- Yellow or Black.

Specifications

Length	3 m
Height	2.06 m
Base	2 m
Empty	120 kg
Fill with water	2000 Lt

BASES

FEATURES

These products are manufactured from regrind PVC. Due to the weight advantage, it offers free standing options. These products are extremely durable and cost effective.

Specifications

Medium Delineator Base	
Length	440 mm
Width	300 mm
Height	75 mm
Weight	4.5 kg
Hole ø	None

Light Delineator Base	
Length	490 mm
Width	310 mm
Height	70 mm
Weight	2.5 kg
Hole ø	None

PP Base	
Length	500 mm
Width	335 mm
Height	80 mm
Weight	0.5 kg
Hole ø	None

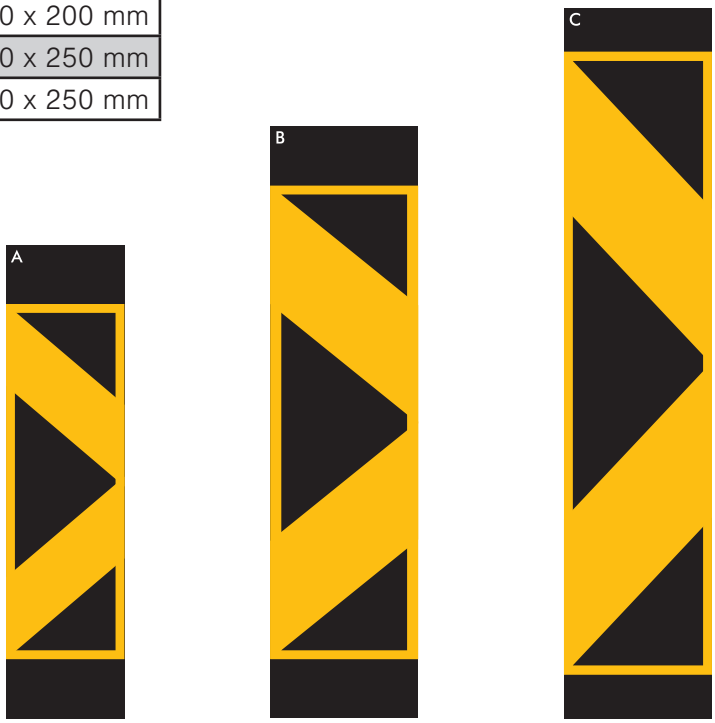
Actual products supplied may differ slightly in appearance to images shown and subject to stock availability.

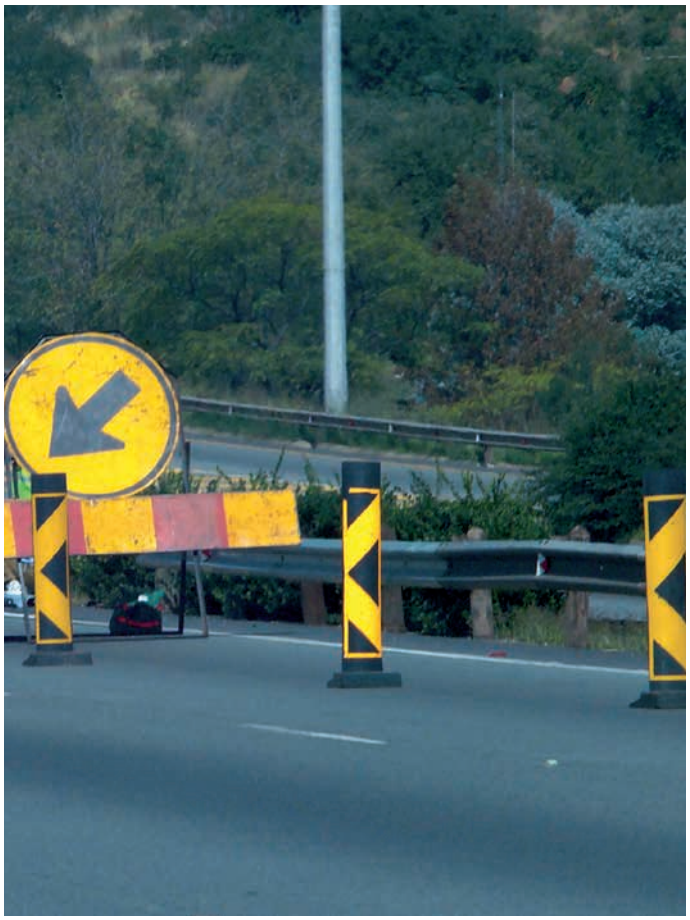
DELINEATORS

FEATURES

Sizes

	Reflector Size	Blade Size
A	600 x 200 mm	800 x 200 mm
B	800 x 250 mm	1000 x 250 mm
C	1000 x 250 mm	1200 x 250 mm





SPEED RAMPS

FEATURES

Manufactured from tough recycled PVC.

Ramps are supplied in pairs (one black and one yellow).

Ramp end caps are available and supplied in black (standard) or yellow.

Specifications

Height	Footprint	Excalibur Bolts	Cat Eye	End Piece	Excalibur Bolts
50 mm	500 mm long x 420 mm wide Weight 8 kg	4 x 100 mm	White	320 mm long x 420 mm wide Weight 2.5 kg	2 x 100 mm

Actual products supplied may differ slightly in appearance to images shown and subject to stock availability.

CONES

FEATURES

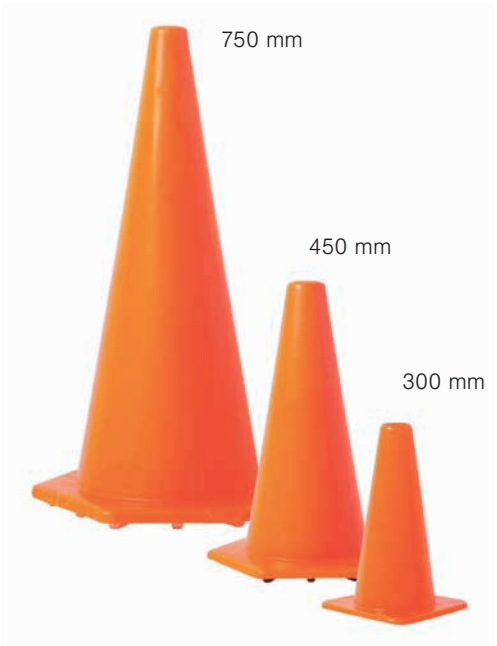
Benefits

- The heavy-based cones are stable and remain upright in windy weather conditions.
- These cones are strong and ideal for the harsh conditions of South African roads.
- UV resistant ink is used to colour the PVC cones.
- Armco cones are economical and offer value for money.

Specifications

Heavy Base Cone		
Height	**Weight**	**Width**
750 mm	5.5 kg	410 mm

Cone		
Height	**Weight**	**Width**
450 mm	1.3 kg	275 mm



Flow Mould Soft Cone		
Height	**Weight**	**Width**
300 mm	0.5 kg	180 mm
450 mm	1.1 kg	280 mm
750 mm	1.7 kg	385 mm

DURA-POST® DELINEATOR

FEATURES

The **Dura-Post® Delineator** is designed to take abuse.

The highly visible **Dura-Post®** is safer because it is more likely to be there when you need it. The **Dura-Post® Delineator** can withstand multiple impacts at any angle and return to an upright position. The **Dura-Post® Delineator** has been tested to withstand over 200 impacts at 97 km/h (60 mph). Installation is easy using quick-set epoxy to hold the base to the road.

Benefits

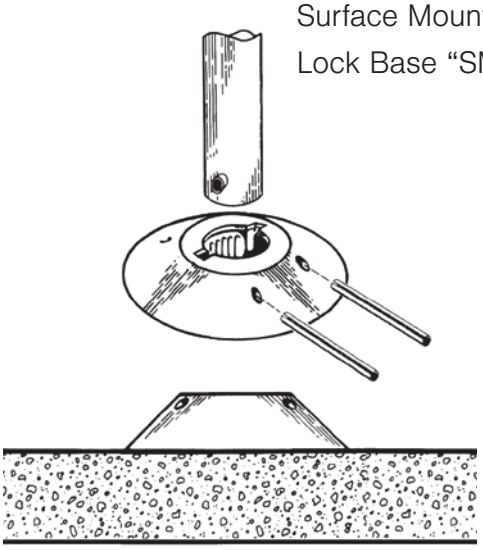
- Available in yellow.
- Extremely impact resistant.
- 360° full visibility.
- Ultraviolet resistant.
- Patented tapered wall design.
- Meets MUTCD.
- No protruding metal parts.
- One piece post construction.
- Withstands extreme temperatures -20° - 60° C (0° - 140° F).
- Easy installation.

Specifications

Height (overall)	914.4 mm
Post Diameter	76.2 mm
Base Diameter	200.5 mm
Weight (overall)	1.35 kg

Base Options

Surface Mount Pin Lock Base “SMA”



CONSTRUCTION PRODUCTS

Corrugated Steel Structures

DEVELOPMENT

The advantages of corrugated steel culverts have been recognised by consulting engineers for use in Europe and Africa for decades. The ten inherent economies of corrugated metal structures are the following:

- Economy of transport because of the stacking nature of the product.
- Installation by unskilled labour with minimum supervision.
- No mechanical plant required for installation.
- Backfilling can take place immediately after installation.
- No breakages.
- Excavation quantities reduced.
- Saving on design and engineering time.
- Structures can be extended, or salvaged and reassembled as changes in conditions occur.
- Shop fabrication of complicated specials.
- Long service life.

PRODUCT CHARACTERISTICS STRENGTH

Corrugated steel pipe structures have the ability to withstand both the massive dead loads of high embankments or the live load forces from highway, railway and airport traffic, under shallow covers.

A buried corrugated steel pipe acts as a flexible conduit which relies only partly on its inherent strength to resist external loads. In deflecting under load, the horizontal diameter tends to increase, bringing into play the passive resistance of the side fill, which in turn acts to restrain further deflection and helps to support the vertically applied load. Pressures are distributed around the pipe and utilise the compressive strength of the steel ring to transmit the loads.

Rigid pipes do not act in this way and rely on their inherent strength to resist external loading.

Due to this mechanism, tests carried out by the road work committee of the American Rail Way Engineering Association (AREA) at Verina Illinois show that flexible pipes attract less load than the mass of the earth over them whilst rigid pipes in fact attract a far greater load than this. Patently flexible pipes are more suitable than rigid pipes for installations in poorer ground since they will readily accommodate the forces from embankment settlement which tend to crack or distort rigid structures. The wide range of steel thicknesses available enables the engineer to design a structure economically to meet his particular loading requirements. Load tables for the various structures are available upon request.

LONG SERVICE LIFE

Thousands of galvanized corrugated steel structures have been examined over the past 60 years with reassuring evidence of both structural and material durability.

In Southern Africa, regular inspection of the condition and performance of corrugated steel structures dating back to the 1920's confirms international experience and approval of this material. All corrugated steel structures manufactured by Armco Superlite are hot-dipped galvanized to SANS 121/ ISO 1461 specifications. For severely corrosive conditions special coatings are available. If severe invert wear is anticipated the invert may be paved. Details of these coatings are available upon request.

VERSATILITY

Corrugated steel conduits are supplied in a vast range of shapes, sizes and thicknesses. Applications include culverts, stream enclosures, underpasses, service ducts, bridges, relining of failing structures, storage bins and silos, explosive magazines and other types of shelters, water tanks, reservoirs and pipe shells.

Further benefits are obvious where structures have to be built in locations where access is difficult. In addition, pre assembly of material can be undertaken where foundations are of concern, where water cannot be diverted or in weather conditions that would hamper other forms of construction.

Bevels, elbows, stubs, branches and other shapes increase the versatility of Armco Superlite's products.

END PROTECTION

Corrugated steel pipes have the advantage of being shaped to many different forms. This is particularly true of the ends of structures where bevel ends are cut to conform to the side slope of embankments, resulting in substantial savings in the design and construction of inlet and outlet end protection. This however does not mean that end protection may be omitted. Corrugated metal pipes require the same protection as any other drainage structure and care should be taken at the inlet and outlet ends.

Several methods of embankment slope protection can be recommended to prevent backfill material from eroding or washing away. Armco Superlite will be pleased to assist you in deciding the most suitable method for your application.

DIMENSIONS

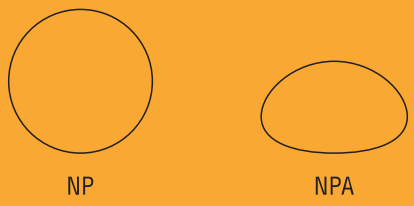
All dimensions quoted are to the Neutral Axis. All areas are to the inside of the corrugation without manufacturing and assembly tolerances.

QUALITY

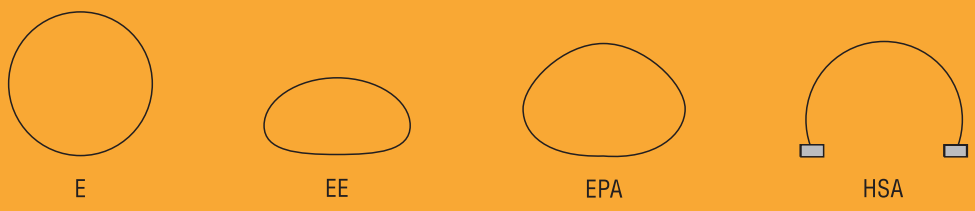
Armco Superlite are certified in accordance to ISO 9001:2015 Quality Management System. This internationally accepted listing ensures the quality of all products that leave our premises. Specific customer quality plans can be catered for in our manufacturing process.

Corrugations and Standard Profiles

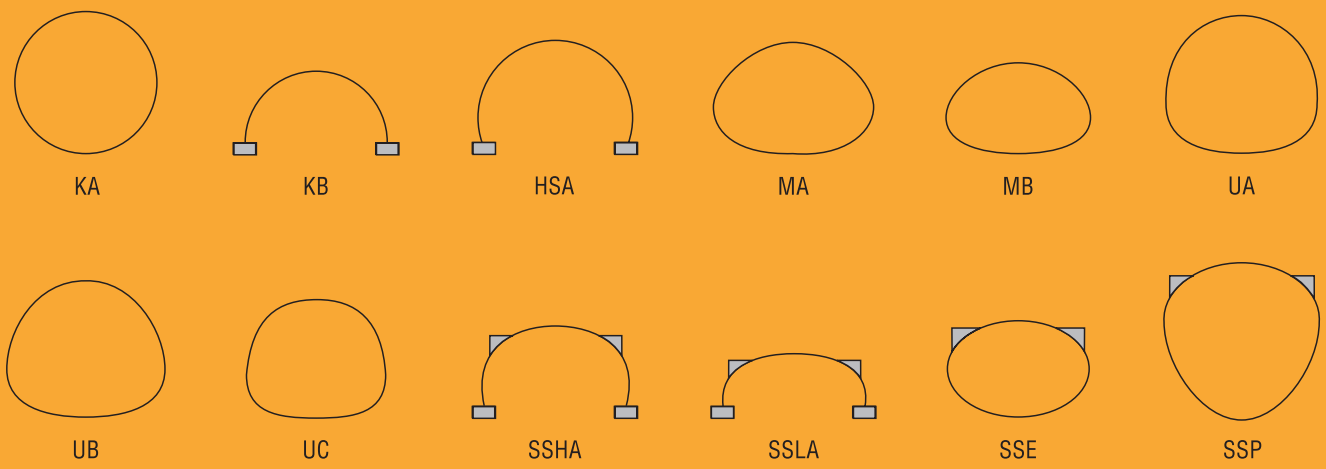
MP68



MP100



MP200



MP68 | Notch Nestable Pipe

MP68 is used when the sophistication of a fully bolted pipe is not required and is used extensively in Botswana.

The **MP68** pipes are assembled by clipping two half sections together to form the required shape.

The sections are fixed using either stitches for sizes less than 825 mm or hook and eye bolts for sizes greater than 825 mm.

The joints are staggered as indicated in figure 3 by using split sections.

The plates are corrugated as indicated in figure 1 and have the properties as indicated in table 1.

The pipes are manufactured from either 1,6; 2,0; 2,8; 3,5 mm thick steel.

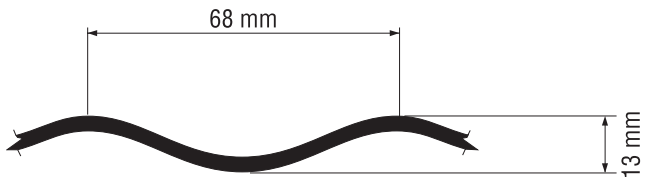


Fig. 1 - Typical corrugation **(MP68)**

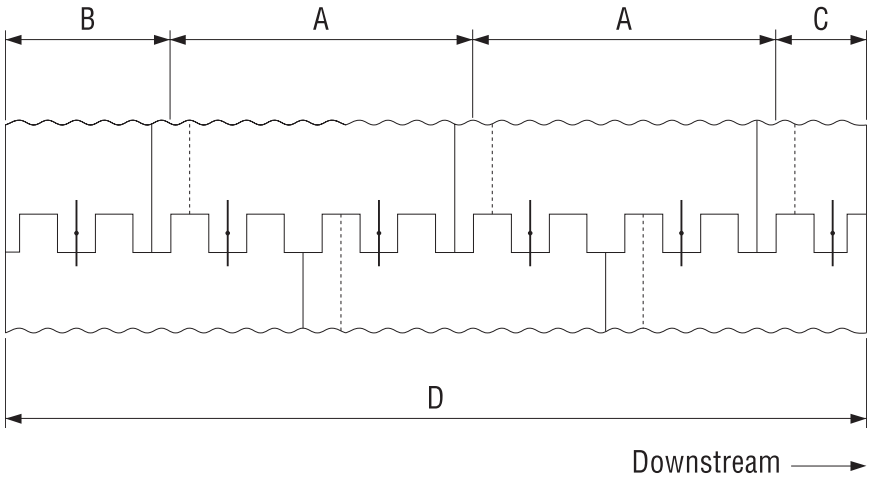


Fig. 3 - Typical assembly arrangements

A = 9 Corrugation section
B = 4 Corrugation section
C = 5 Corrugation section
D = Length in multiples of 610 mm

Thickness (mm)	Area of Section (mm^2/mm)	Moment of Inertia (mm^4/mm)	Section Modulus (mm^3/mm)	Radius of Gyration (mm)
1,6	1,73	32,72	4,58	4,35
2,0	2,16	41,38	5,63	4,38
2,8	3,02	59,40	7,66	4,43
3,5	3,78	76,29	9,42	4,49

Table 1 - Sectional properties

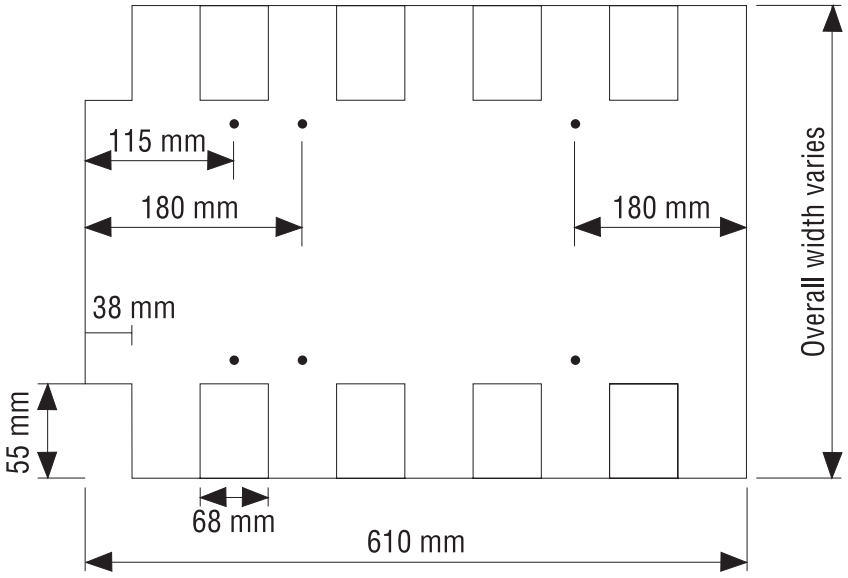


Fig. 2 - Typical plate

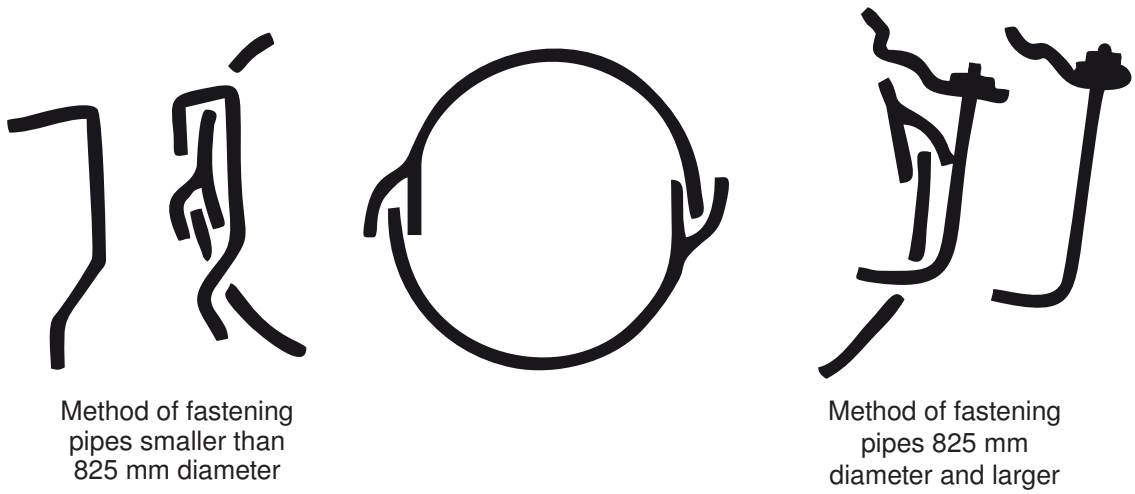


Fig. 4 - Fastening method

Profile No.	Span (mm)	Rise (mm)	End Area (mm^2)
NPA 1	450	330	0,15
NPA 2	600	400	0,22
NPA 3	750	500	0,35
NPA 4	900	570	0,48
NPA 5	1050	660	0,65
NPA 6	1200	750	0,86
NPA 7	1350	840	1,06
NPA 8	1500	930	1,31
NPA 9	1650	1020	1,60
NPA 10	1800	1120	1,88

Table 2 - Dimensions for **MP68 Pipe Arch**

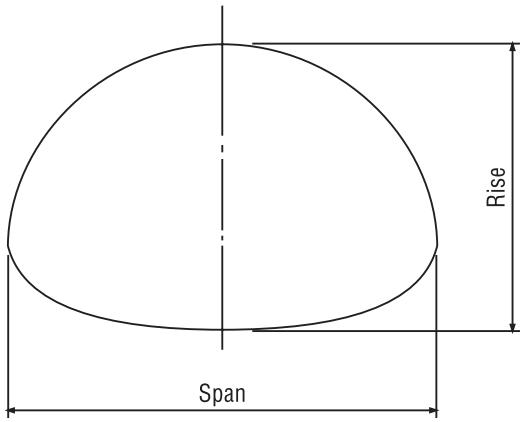


Fig. 5 - NPA Pipe Arch

Profile No.	Diameter (mm)	End Area (mm^2)
NP 1	300	0,07
NP 2	375	0,11
NP 3	450	0,16
NP 4	525	0,22
NP 5	600	0,28
NP 6	675	0,36
NP 7	750	0,44
NP 8	825	0,53
NP 9	900	0,64
NP 10	1050	0,87
NP 11	1200	1,13
NP 12	1350	1,43
NP 13	1500	1,77
NP 14	1650	2,14
NP 15	1800	2,55

Table 3 - Dimensions for **MP68 Round Pipe**

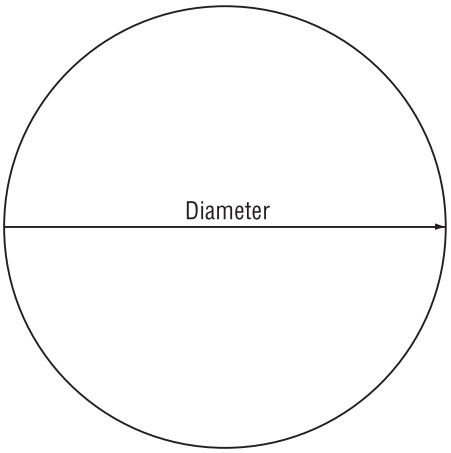


Fig. 6 - NP Round Pipe

MP100 | Bolted Nestable Pipe

MP100 pipes are assembled by bolting two half sections together to form the required shape.

The moment of inertia of the 100 mm x 20 mm corrugation is double that of the 68 mm x 13 mm corrugation used for the **MP68** notch nestable pipe, and the bolted feature gives the **MP100** higher seam strength characteristics than the **MP68** while still maintaining the transport advantage inherent in notch nestable pipes.

The plates are corrugated as indicated in figure 1 and have the properties indicated in table 1.

The pipes are manufactured from either 1,6; 2,0; 2,5; 3,0 or 3,5 mm thick steel.

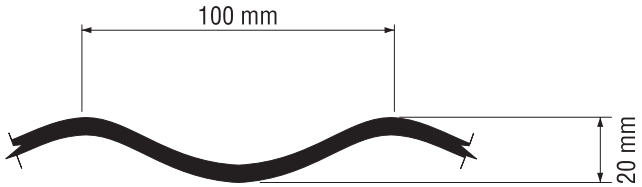


Fig. 1 - Typical corrugation **(MP100)**

Thickness (mm)	Area of Section (mm^2/mm)	Moment of Inertia (mm^4/mm)	Section Modulus (mm^3/mm)	Radius of Gyration (mm)
1,6	1,73	79,02	7,32	6,76
2,0	2,19	96,85	8,81	6,65
2,5	2,74	118,38	10,52	6,58
3,0	3,28	145,60	12,66	6,66
3,5	3,83	158,46	13,49	6,43

Table 1 - Sectional properties

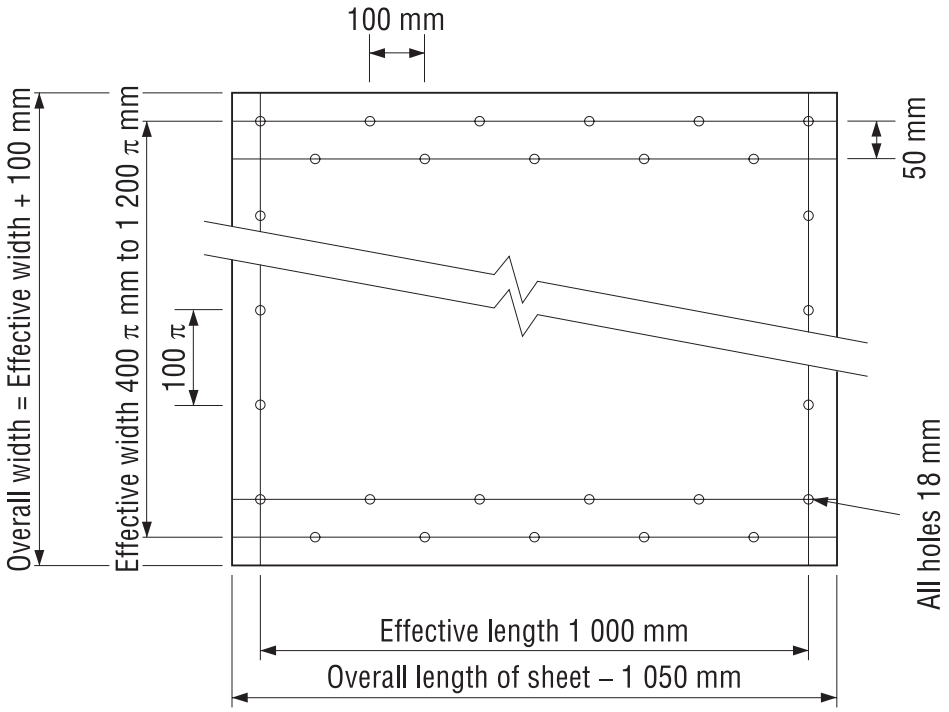


Fig. 2 - Typical plate

Profile No.	Diameter (m)	Periphery (m)	End Area (m^2)
E 1	0,6	1,88	0.,28
E 2	0,7	2,20	0,38
E 3	0,8	2,51	0,50
E 4	0,9	2,83	0,64
E 5	1,0	3,14	0,79
E 6	1,1	3,46	0,95
E 7	1,2	3,77	1,13
E 8	1,3	4,08	1,33
E 9	1,4	4,40	1,54
E 10	1,5	4,71	1,77
E 11	1,6	5,03	2,01
E 12	1,7	5,34	2,27
E 13	1,8	5,65	2,54
E 14	1,9	5,97	2,84
E 15	2,0	6,28	3,14
E 16	2,1	6,60	3,46
E 17	2,2	6,91	3,80
E 18	2,3	7,23	4,15
E 19	2,4	7,54	4,52

Table 2 - Dimensions for **MP100 Round Pipe**

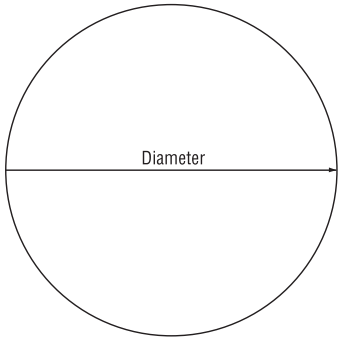


Fig. 3 - Round Pipe

Profile No.	Span (m)	Rise (m)	Periphery (m)	End Area (m^2)	R_T (mm)	R_S (mm)
EE 1	1,20	0,80	3,14	0,75	800	300
EE 2	1,36	1,00	3,77	1,09	937	441
EE 3	1,59	1,18	4,39	1,49	1022	493
EE 4	1,83	1,35	5,02	1,94	1125	540
EE 5	2,06	1,52	5,66	2,45	1235	583
EE 6	2,30	1,70	6,28	3,03	1350	623
EE 7	2,50	1,86	6,91	3,66	1523	735

Table 3 - Dimensions for **MP100 Ellipse**

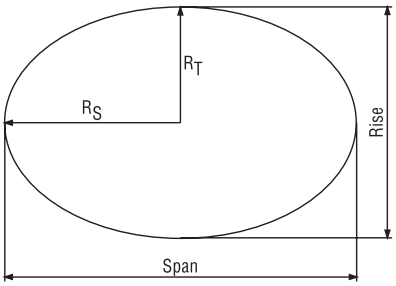


Fig. 4 - Ellipse

Profile No.	Span (m)	Rise (m)	Periphery (m)	End Area (m^2)	R_T (mm)	R_B (mm)	R_C (mm)
EPA 1	1,34	1,00	3,77	1,13	673	6599	371
EPA 2	1,70	1,20	4,71	1,66	852	9967	388
EPA 3	1,98	1,30	5,34	2,05	999	9780	378
EPA 4	2,25	1,40	5,97	2,48	1136	9425	375

Table 4 - Dimensions for **MP100 Pipe Arch**

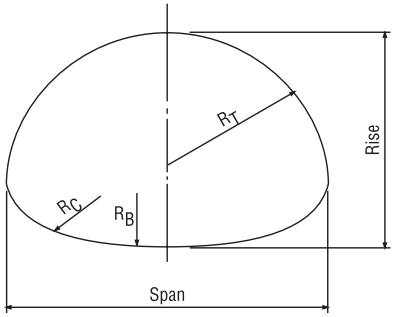


Fig. 5 - Pipe Arch

Profile No.	Max Span (m)	Bottom Span (m)	Total Rise (m)	R1	Diameter	Total Angle	End Area (m^2)	Periphery (m)
SP 01	0.75	0.65	0.563	0.375	0.75	240	0.446	1.571
SP 02	0.9	0.78	0.675	0.45	0.9	240	0.634	1.885
SP 03	1.05	0.91	0.788	0.525	1.05	240	0.834	2.199
SP 04	1.2	1.04	0.900	0.6	1.2	240	1.074	2.513
SP 05	1.35	1.17	1.013	0.675	1.35	240	1.343	2.827
SP 06	1.5	1.3	1.125	0.75	1.5	240	1.643	3.142
SP 07	1.65	1.43	1.238	0.825	1.65	240	1.968	3.456
SP 08	1.8	1.56	1.350	0.9	1.8	240	2.323	3.770
SP 09	1.95	1.69	1.463	0.975	1.95	240	2.705	4.084
SP 10	2.1	1.82	1.575	1.05	2.1	240	3.116	4.398
SP 11	2.25	1.95	1.688	1.125	2.25	240	3.596	4.712
SP 12	2.4	2.08	1.800	1.2	2.4	240	4.067	5.027
SP 13	2.55	2.21	1.913	1.275	2.55	240	4.567	5.341
SP 14	2.7	2.34	2.025	1.35	2.7	240	5.095	5.655
SP 15	2.85	2.47	2.138	1.425	2.85	240	5.651	5.969
SP 16	3	2.6	2.250	1.5	3	240	6.236	6.283
SP 17	3.15	2.73	2.363	1.575	3.15	240	6.849	6.597
SP 18	3.3	2.86	2.475	1.65	3.3	240	7.491	6.912

Table 5 - Dimensions for **MP100 Horse Shoe Arch**

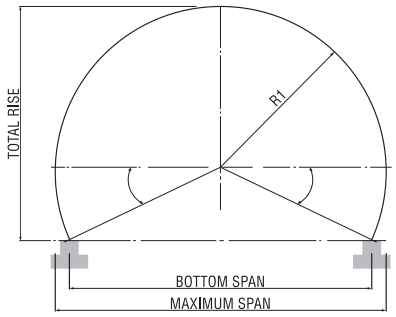


Fig. 6 - Horse Shoe Arch

VERSATILITY

The properties of the **MP100** corrugations naturally indicate that in addition to corrugated steel pipe, sheets formed and curved in this manner could be used extensively for other purposes.

Such uses include heavy duty roof sheeting, conveyor belt covers, walkway covers, silos, watertanks etc.

All pipe junction types can be catered for.

MP200 | Multiplate Pipe

MP200 structures are assembled using multiple plates of various widths (see table 1) to make up the structure.

The circumferential joints of the structure are staggered longitudinally.

The plates are corrugated as indicated in figure 2 and have the properties indicated in table 2.

The structures are manufactured in 2,5; 3,0; 4,0; 5,0; 6,0 or 7,0 mm thick steel.

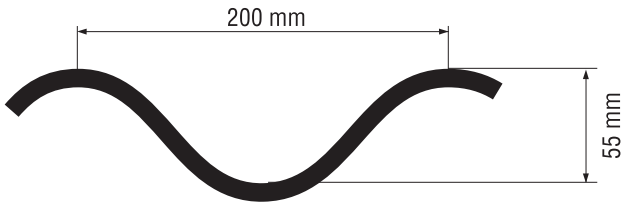


Fig. 1 - Typical corrugation **(MP200)**

No. of Circumferential Bolt Holes	No. of Spaces	Effective Width (mm)	Overall Width (mm)
5	4	940	1060
7	6	1410	1530
8	7	1645	1765

Table 1 - Details of uncurved corrugated multiplate sections

Thickness (mm)	Area of Section (mm^2/mm)	Moment of Inertia (mm^4/mm)	Section Modulus (mm^3/mm)	Radius of Gyration (mm)
3,0	3,56	1287	44,40	19,01
4,0	4,75	1811	61,40	19,53
5,0	5,94	2270	75,70	19,55
6,0	7,12	2734	89,60	19,60
7,0	8,31	3208	103,50	19,65

Table 2 - Sectional properties

Fig. 1 - Typical plate

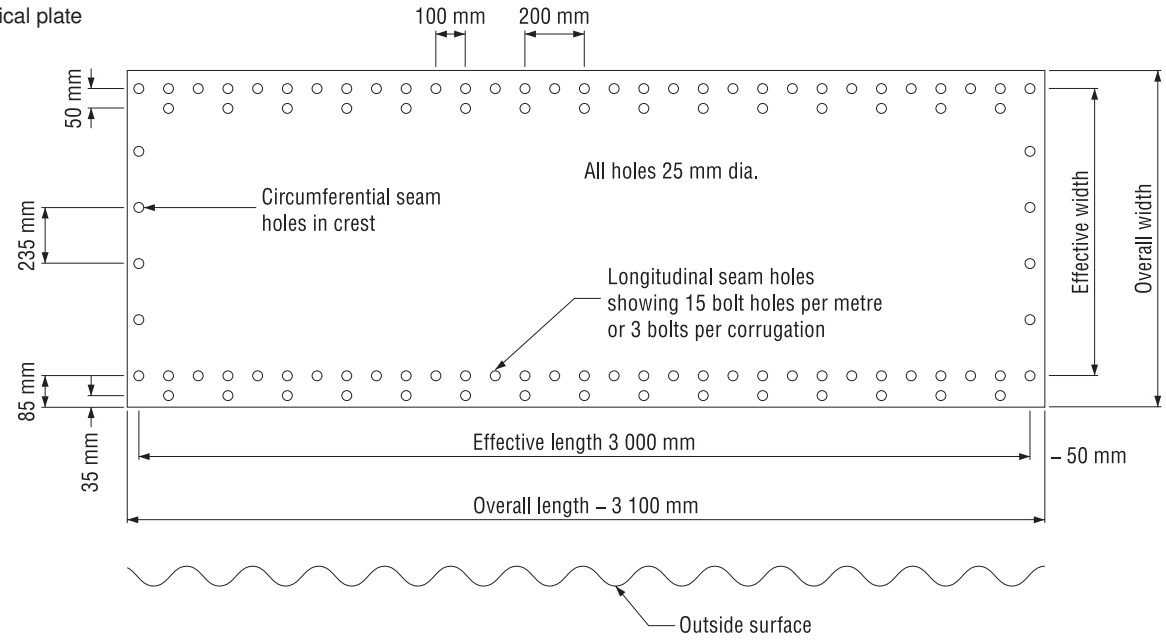


PLATE MARKINGS

Hard punched identification numerals are placed on each plate, indicating the job number by the first four digits, the material thickness by the fifth, and the radius of curvature of the plate in centimetres by the last three digits.

Each plate which is cut or welded to form part of a structure is marked in such a way that it can be identified on an accompanying drawing, designating the correct position in the structure.

MP200 | Ring Beams

Ring beams may be used around the ends of **MP200** structures. All structures larger than 4,0 m diameter or span must be provided with a **ring beam**.

The diagram below must be used to decide if a **ring beam** is required for structures less than 4,0 m in diameter.

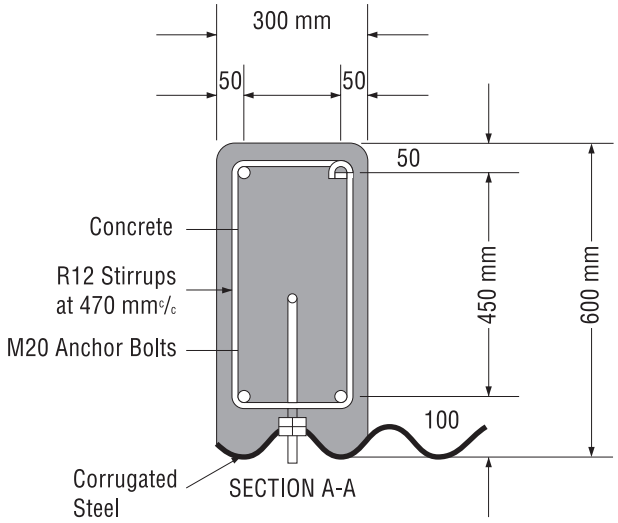


Fig. 3 - Typical ring beam detail

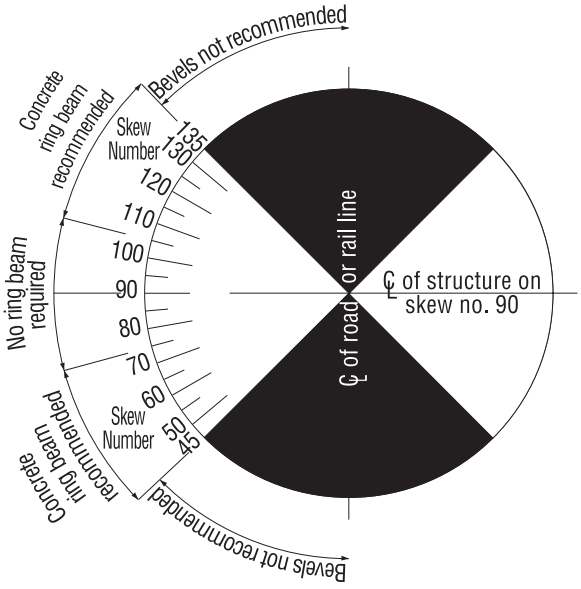


Fig. 4

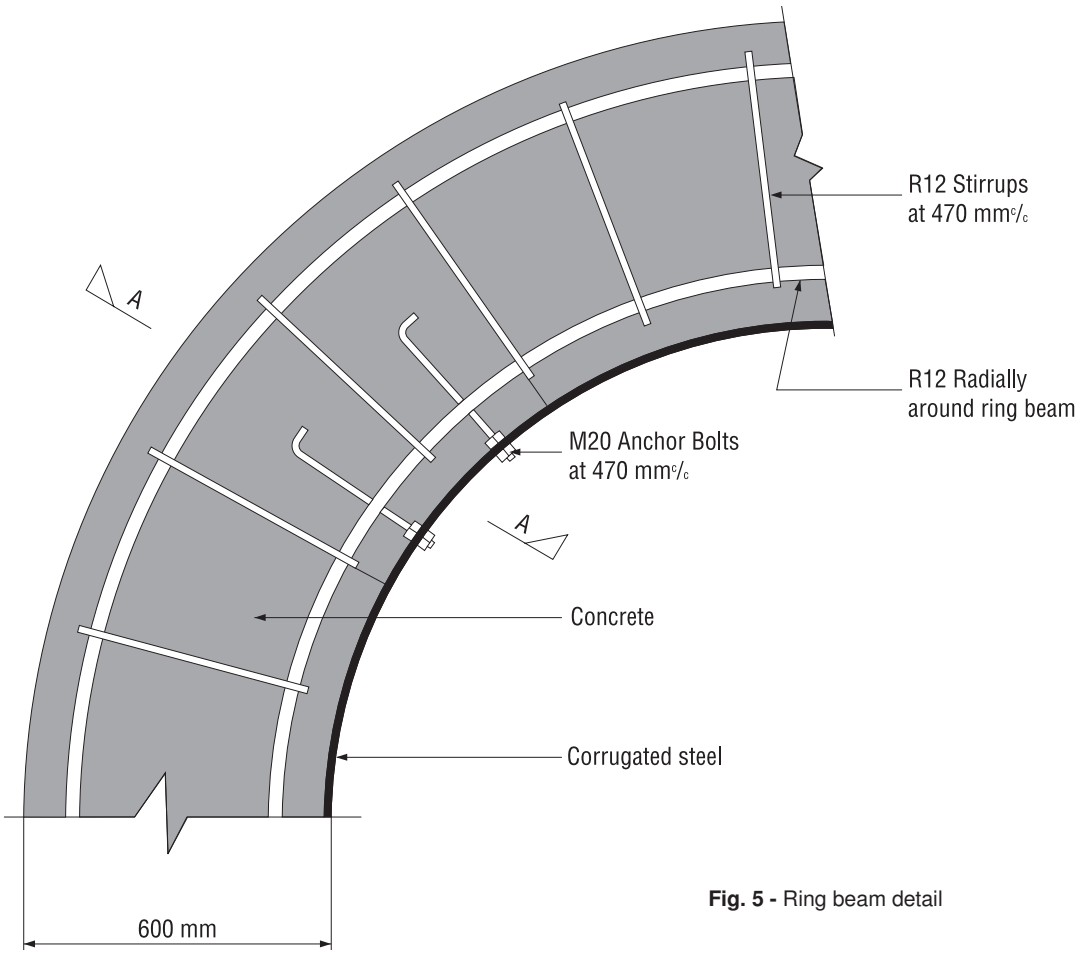


Fig. 5 - Ring beam detail

MP200 | Cast in Angles

Unbalanced channels are supplied to facilitate the proper connection of **MP200** plates to the concrete footings or foundations in arches.

The channel is designed to be cast into the concrete footings and allows for the bolting of plates in their correct positions.

Care should be taken in positioning the **unbalanced channel** as far as line and grade is concerned.

Small deviations from the required position could result in unacceptable distortions of the structure.

It is important to ensure that the channels on either side of a structure are parallel to one another.

Unbalanced channels are manufactured in 5,0 mm thick steel and hot-dip galvanized to the same standard as the **MP200**.

Channels are available in lengths of 3,0 m and the holes to receive the **MP200** bolts are all slotted, 25 mm x 44 mm.

The mass of the channel is 10,9 kg per metre length.

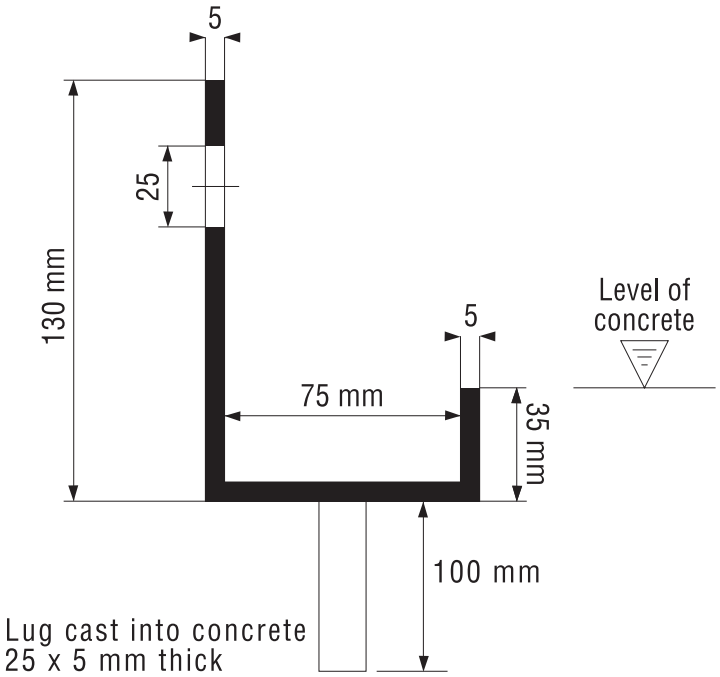


Fig. 6 - Unbalanced channel for MP200 Arches

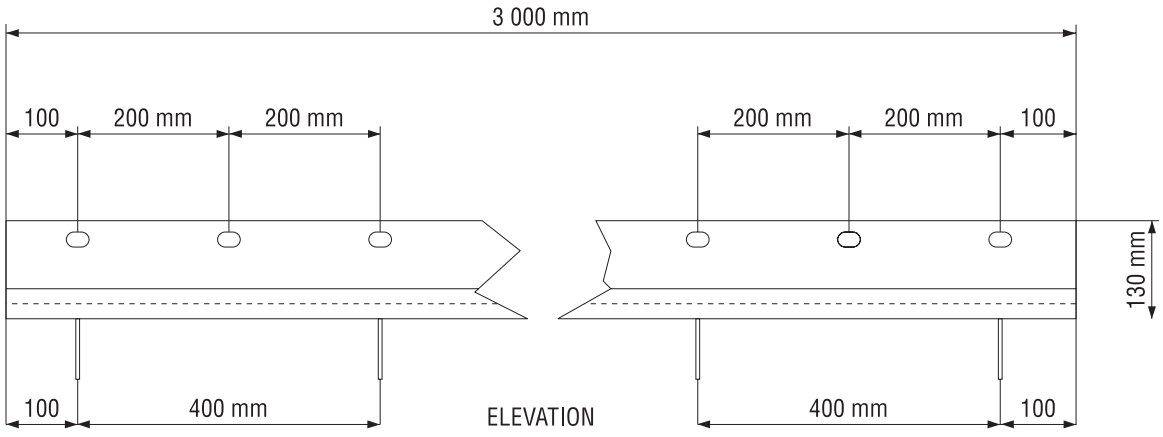


Fig. 7 - Unbalanced channel

MP200 | Super-Span Thrust Beams

Thrust beams form an integral part of **Super-Span** design and construction.

These beams are not required on any other type of structure.

The overall **thrust beam** dimensions vary with the size of **Super-Span** used. The basic reinforcing detail remains unchanged.

Dimensions of **thrust beams** are available on request.

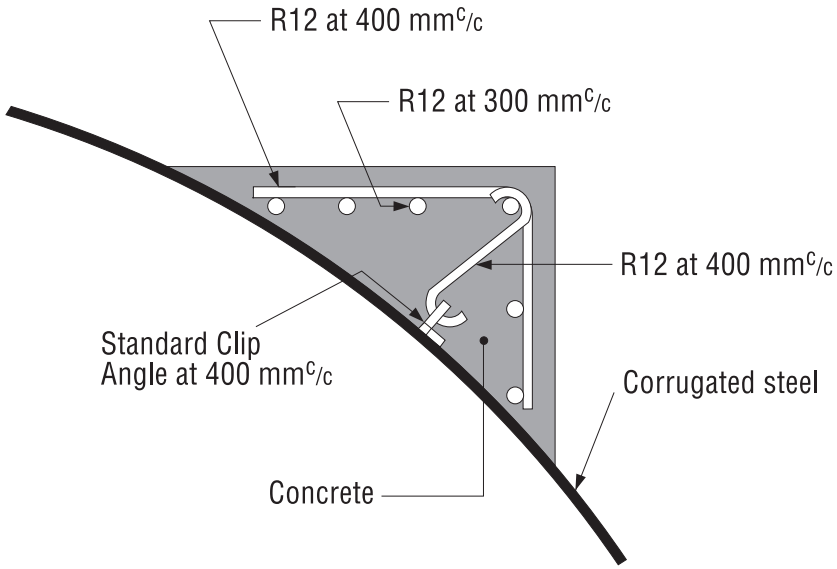
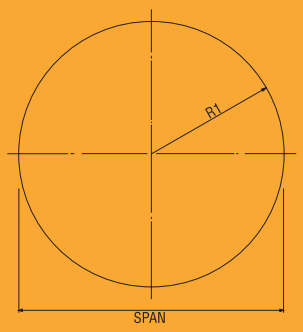


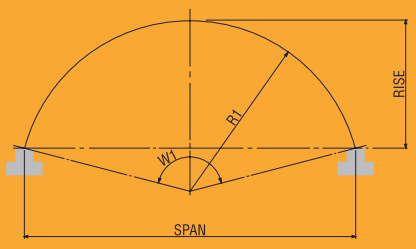
Fig. 8 - Typical thrust beam detail

MP200 | Standard Profile Diagrams

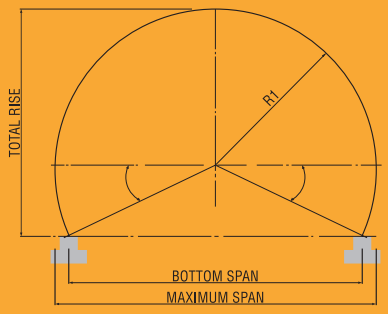
Round Pipe KA



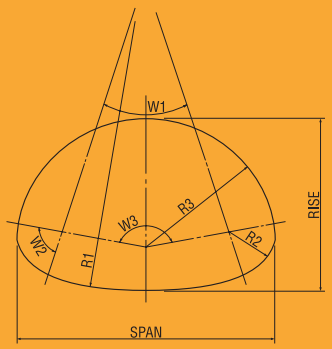
Arch Section KB



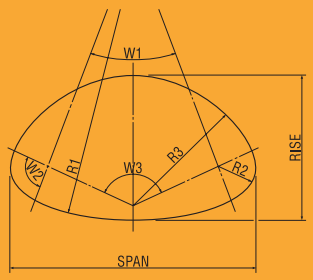
Horse Shoe Arch HSA



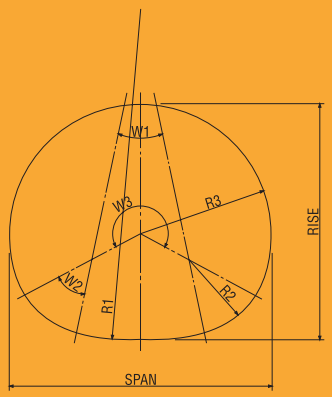
High Profile Pipe Arch MA



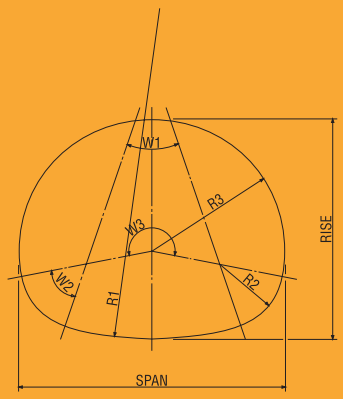
Low Profile Pipe Arch MB



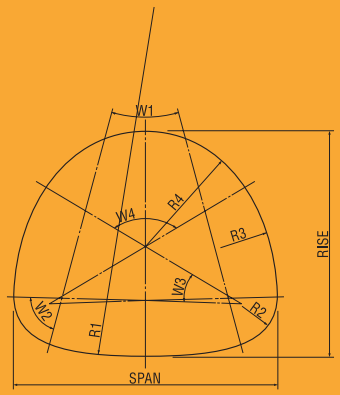
High Profile Underpass UA



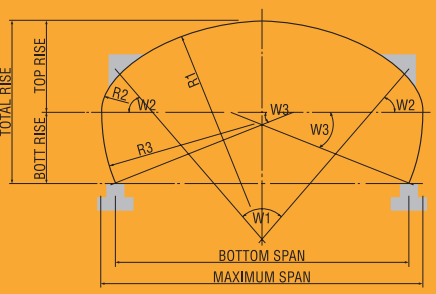
Low Profile Underpass UB



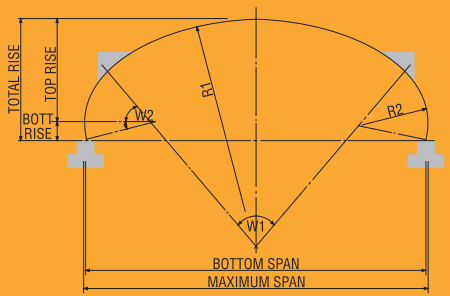
Standard Underpass UC



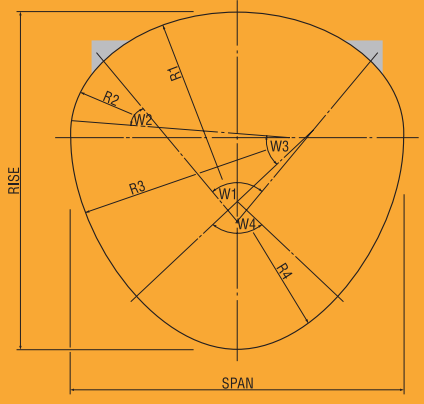
Super-Span High Profile Arch SSHA



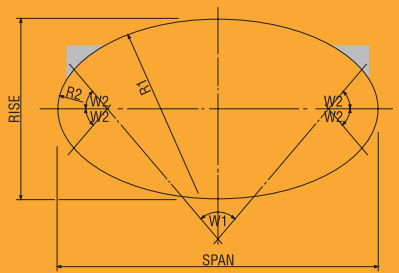
Super-Span Low Profile Arch SSLA



Super-Span Pear SSP



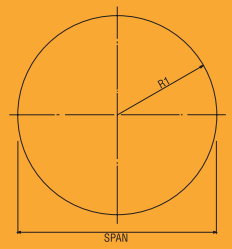
Super-Span Ellipse SSE



MP200 | Round Pipe KA

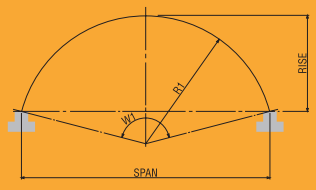
Profile No.	Diameter (m)	End Area (m^2)	Periphery (m)	R1 (m)
KA 01	1,57	1,79	4,93	0,78
KA 02	1,64	1,97	5,17	0,82
KA 03	1,72	2,16	5,40	0,86
KA 04	1,79	2,36	5,64	0,90
KA 05	1,87	2,57	5,88	0,93
KA 06	1,94	2,79	6,11	0,97
KA 07	2,02	3,01	6,34	1,01
KA 08	2,09	3,25	6,58	1,05
KA 09	2,17	3,49	6,81	1,08
KA 10	2,24	3,75	7,05	1,12
KA 11	2,32	4,00	7,28	1,16
KA 12	2,39	4,27	7,52	1,20
KA 13	2,47	4,55	7,75	1,23
KA 14	2,54	4,84	7,99	1,27
KA 15	2,62	5,14	8,22	1,31
KA 16	2,69	5,44	8,46	1,35
KA 17	2,77	5,75	8,69	1,38
KA 18	2,84	6,08	8,93	1,42
KA 19	2,92	6,41	9,16	1,46
KA 20	2,99	6,75	9,40	1,50
KA 21	3,07	7,10	9,63	1,53
KA 22	3,14	7,45	9,87	1,57
KA 23	3,22	7,82	10,10	1,61
KA 24	3,29	8,19	10,34	1,64
KA 25	3,37	8,58	10,57	1,68
KA 26	3,44	8,97	10,81	1,72
KA 27	3,51	9,37	11,04	1,76
KA 28	3,59	9,79	11,28	1,79
KA 29	3,66	10,20	11,51	1,83
KA 30	3,74	10,64	11,75	1,87
KA 31	3,81	11,07	11,98	1,91
KA 32	3,89	11,51	12,22	1,94
KA 33	3,96	11,97	12,45	1,98
KA 34	4,04	12,43	12,69	2,02
KA 35	4,11	12,91	12,92	2,06
KA 36	4,19	13,38	13,16	2,09
KA 37	4,26	13,87	13,39	2,13
KA 38	4,34	14,37	13,63	2,17

Profile No.	Diameter (m)	End Area (m^2)	Periphery (m)	R1 (m)
KA 39	4,41	14,88	13,86	2,21
KA 40	4,49	15,40	14,10	2,24
KA 41	4,56	15,92	14,33	2,28
KA 42	4,64	16,45	14,57	2,32
KA 43	4,71	17,00	14,80	2,36
KA 44	4,79	17,54	15,04	2,39
KA 45	4,86	18,11	15,27	2,43
KA 46	4,94	18,67	15,51	2,47
KA 47	5,01	19,24	15,74	2,50
KA 48	5,09	19,84	15,98	2,54
KA 49	5,16	20,43	16,21	2,58
KA 50	5,24	21,04	16,45	2,62
KA 51	5,31	21,65	16,68	2,65
KA 52	5,38	22,26	16,92	2,69
KA 53	5,46	22,90	17,15	2,73
KA 54	5,53	23,53	17,39	2,77
KA 55	5,61	24,19	17,63	2,80
KA 56	5,68	24,84	17,86	2,84
KA 57	5,76	25,50	18,09	2,88
KA 58	5,83	26,18	18,33	2,92
KA 59	5,91	26,86	18,56	2,95
KA 60	5,98	27,56	18,80	2,99
KA 61	6,06	28,26	19,03	3,03
KA 62	6,13	28,96	19,27	3,07
KA 63	6,21	29,69	19,50	3,10
KA 64	6,28	30,41	19,74	3,14
KA 65	6,36	31,15	19,97	3,18
KA 66	6,43	31,89	20,21	3,22
KA 67	6,51	32,63	20,44	3,25
KA 68	6,58	33,41	20,68	3,29
KA 69	6,66	34,17	20,91	3,33
KA 70	6,73	34,96	21,15	3,37
KA 71	6,81	35,74	21,38	3,40
KA 72	6,88	36,53	21,62	3,44
KA 73	6,96	37,35	21,85	3,48
KA 74	7,03	38,16	22,09	3,51
KA 75	7,11	38,99	22,32	3,55



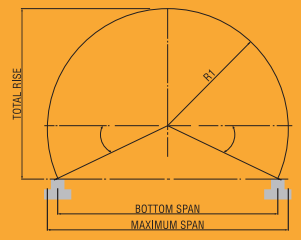
MP200 | Arch Section KB

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions	Angle in Degrees
					R1	W1
KB 01	1,75	0,85	1,10	2,58	0,88	177,07
KB 02	2,00	0,89	1,30	2,82	1,01	167,44
KB 03	2,50	1,10	2,01	3,52	1,26	165,79
KB 04	3,00	1,31	2,88	4,23	1,51	164,68
KB 05	3,00	1,43	3,23	4,46	1,50	174,97
KB 06	3,25	1,35	3,18	4,46	1,65	158,94
KB 07	3,25	1,48	3,56	4,70	1,63	169,20
KB 08	3,50	1,39	3,49	4,70	1,80	153,66
KB 09	3,50	1,64	4,31	5,17	1,75	172,86
KB 10	3,75	1,56	4,25	5,17	1,91	158,93
KB 11	3,75	1,81	5,13	5,64	1,88	175,90
KB 12	4,00	1,59	4,61	5,40	2,05	154,32
KB 13	4,00	1,97	6,02	6,11	2,00	178,47
KB 14	4,25	1,76	5,48	5,87	2,16	158,91
KB 15	4,25	2,02	6,48	6,34	2,13	174,09
KB 16	4,50	1,80	5,88	6,11	2,30	154,84
KB 17	4,50	2,18	7,48	6,81	2,25	176,52
KB 18	4,75	1,84	6,30	6,34	2,45	151,00
KB 19	4,75	2,35	8,54	7,28	2,38	178,63
KB 20	5,00	2,01	7,32	6,81	2,56	155,24
KB 21	5,00	2,51	9,68	7,76	2,50	180,49
KB 22	5,25	2,05	7,78	7,05	2,71	151,78
KB 23	5,25	2,56	10,26	7,99	2,63	177,02
KB 24	5,50	2,22	8,91	7,52	2,81	155,58
KB 25	5,50	2,72	11,50	8,46	2,75	178,76
KB 26	5,75	2,25	9,42	7,75	2,96	152,42
KB 27	5,75	2,76	12,14	8,69	2,88	175,55
KB 28	6,00	2,43	10,66	8,22	3,07	155,90
KB 29	6,00	2,93	13,48	9,16	3,00	177,29
KB 30	6,25	2,46	11,21	8,46	3,21	152,95
KB 31	6,25	3,09	14,90	9,63	3,13	178,85
KB 32	6,50	2,50	11,77	8,69	3,36	150,17
KB 33	6,50	3,14	15,63	9,87	3,25	176,06
KB 34	6,75	2,67	13,16	9,16	3,47	153,40
KB 35	6,75	3,30	17,15	10,34	3,38	177,54
KB 36	7,00	2,70	13,76	9,40	3,62	150,82
KB 37	7,00	3,47	18,74	10,81	3,50	178,92
KB 38	7,25	2,88	15,27	9,87	3,72	153,79
KB 39	7,25	3,51	19,55	11,04	3,63	176,39
KB 40	7,50	2,91	15,93	10,10	3,87	151,38
KB 41	7,50	3,67	21,25	11,51	3,75	177,74
KB 42	7,75	3,08	17,53	10,58	3,98	154,12
KB 43	7,75	3,84	23,02	11,98	3,88	178,98
KB 44	8,00	3,12	18,23	10,81	4,12	151,87
KB 45	8,00	3,88	23,91	12,22	4,00	176,69
KB 46	8,25	3,29	19,94	11,28	4,23	154,41
KB 47	8,25	4,05	25,78	12,69	4,13	177,90
KB 48	8,50	3,33	20,69	11,51	4,38	152,29
KB 49	8,50	4,21	27,74	13,16	4,25	179,03



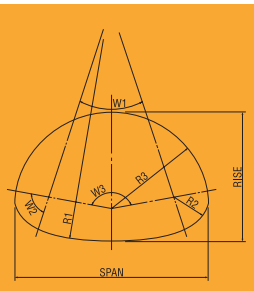
MP200 | Horse Shoe Arch HSA

Profile No.	Max Span (m)	Bottom Span (m)	Total Rise (m)	R1	Diameter	Total Angle	End Area (m^2)	Periphery (m)
HA 14	1.57	1.295	1.23	0.755	1.515	248.76	1.246	3.289
HA 18	2.02	1.685	1.565	0.98	1.965	246.82	2.079	4.232
HA 22	2.47	2.075	1.905	1.205	2.415	245.58	3.125	5.176
HA 26	2.92	2.465	2.24	1.43	2.865	244.72	4.382	6.118
HA 32	3.59	3.05	2.745	1.765	3.535	243.84	6.648	7.522
HA 38	4.265	3.63	3.25	2.1	4.21	243.22	9.405	8.936
HA 42	4.715	4.02	3.585	2.325	4.66	242.92	11.509	9.879
HA 46	5.16	4.41	3.925	2.55	5.105	242.66	13.797	10.810
HA 51	5.72	4.895	4.345	2.83	5.665	242.4	16.971	11.983
HA 57	6.395	5.48	4.85	3.17	6.34	242.16	21.236	13.398
HA 63	7.07	6.06	5.355	3.505	7.015	241.94	25.975	14.811
HA 68	7.63	6.545	5.775	3.785	7.575	241.8	30.270	15.984
HA 74	8.305	7.13	6.28	4.12	8.25	241.66	35.884	17.398
HA 81	9.09	7.81	6.87	4.515	9.035	241.52	43.013	19.043
HA 88	9.875	8.49	7.455	4.91	9.82	241.4	50.786	20.687



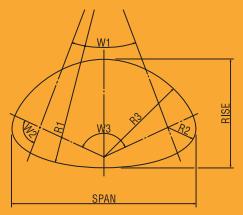
MP200 | High Profile Pipe Arch MA

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions			Angle in Degrees		
					R1	R2	R3	W1	W2	W3
MA 01	1,85	1,55	2,12	5,40	1,72	0,63	0,93	31,29	84,95	158,81
MA 02	1,94	1,60	2,31	5,64	2,26	0,63	0,97	23,87	84,95	166,23
MA 03	2,28	1,73	2,91	6,34	1,77	0,63	1,18	53,34	84,95	136,76
MA 04	2,54	1,88	3,57	7,05	2,90	0,63	1,28	32,43	84,95	157,67
MA 05	2,88	2,07	4,54	7,99	4,73	0,63	1,45	22,77	84,95	167,33
MA 06	3,28	2,20	5,33	8,69	3,15	0,63	1,69	46,93	84,95	143,17
MA 07	3,43	2,30	5,91	9,16	4,19	0,63	1,74	35,38	84,95	154,73
MA 08	3,70	2,44	6,81	9,87	5,04	0,63	1,87	32,02	84,95	158,08
MA 09	3,77	2,49	7,13	10,10	6,01	0,63	1,90	26,90	84,95	163,20
MA 10	4,10	2,57	7,75	10,57	3,82	0,63	2,16	52,83	84,95	137,27
MA 11	4,18	2,62	8,09	10,81	4,25	0,63	2,17	47,56	84,95	142,54
MA 12	4,39	2,77	9,15	11,51	6,16	0,63	2,22	32,78	84,95	157,32
MA 13	4,46	3,67	12,62	12,92	3,94	1,31	2,23	41,01	72,00	174,99
MA 14	4,54	3,72	13,07	13,16	4,26	1,31	2,27	37,92	72,00	178,08
MA 15	4,89	3,87	14,46	13,86	3,92	1,31	2,45	51,46	72,80	164,53
MA 16	4,97	3,92	14,94	14,10	4,17	1,31	2,49	48,37	72,00	167,63
MA 17	5,19	4,09	16,43	14,80	5,11	1,31	2,59	39,54	72,00	176,46
MA 18	5,26	4,14	16,95	15,04	5,50	1,31	2,63	36,73	72,00	179,26
MA 19	5,48	4,18	17,44	15,27	4,41	1,31	2,76	54,97	72,00	161,03
MA 20	5,63	4,29	18,50	15,74	4,93	1,31	2,82	49,17	72,00	166,82
MA 21	5,84	4,45	20,16	16,45	5,92	1,31	2,92	40,93	72,00	175,07
MA 22	6,11	4,61	21,86	17,15	6,45	1,31	3,05	39,65	72,00	176,34
MA 23	6,30	4,72	23,04	17,63	6,58	1,31	3,15	40,90	72,00	175,09
MA 24	6,49	4,75	23,61	17,86	5,81	1,31	3,26	50,96	72,00	165,04
MA 25	6,76	4,98	26,10	18,80	7,24	1,31	3,38	40,91	72,00	175,09
MA 26	6,83	5,03	26,73	19,03	7,69	1,31	3,41	38,54	72,00	177,46
MA 27	7,02	5,14	28,02	19,50	7,79	1,31	3,51	39,74	72,00	176,25
MA 28	7,16	5,12	27,99	19,50	6,54	1,31	3,60	51,48	72,00	164,51
MA 29	7,29	5,23	29,33	19,97	7,21	1,31	3,66	46,65	72,00	169,34
MA 30	7,48	5,40	31,38	20,68	8,46	1,31	3,74	39,78	72,00	176,22
MA 31	7,68	5,50	32,77	21,15	8,56	1,31	3,84	40,88	72,00	175,12
MA 32	7,94	5,66	34,92	21,85	9,13	1,31	3,97	39,81	72,00	176,18
MA 33	8,14	5,76	36,39	22,32	9,23	1,31	4,07	40,86	72,00	175,13
MA 34	8,40	5,92	38,64	23,03	9,80	1,31	4,20	39,84	72,00	176,15
MA 35	8,60	6,03	40,19	23,50	9,89	1,31	4,30	40,85	72,00	175,14



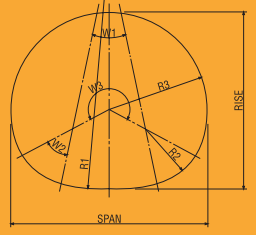
MP200 | Low Profile Pipe Arch MB

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions			Angle in Degrees		
					R1	R2	R3	W1	W2	W3
MB 01	2,27	1,58	2,62	6,11	2,01	0,56	1,22	46,85	96,00	121,14
MB 02	2,36	1,62	2,82	6,34	2,44	0,56	1,25	38,64	96,00	129,35
MB 03	2,49	1,66	3,02	6,58	2,23	0,56	1,35	48,30	96,00	119,69
MB 04	3,13	1,91	4,35	7,99	2,84	0,56	1,74	52,07	96,00	115,92
MB 05	3,51	2,08	5,36	8,93	4,09	0,56	1,88	39,49	96,00	128,51
MB 06	3,72	2,66	7,44	10,10	3,23	0,98	1,98	45,82	95,98	122,22
MB 07	3,81	2,70	7,78	10,34	3,63	0,98	2,01	40,85	95,98	127,19
MB 08	4,02	2,78	8,45	10,81	3,86	0,98	2,13	41,86	95,98	126,18
MB 09	4,19	2,87	9,15	11,28	4,95	0,98	2,19	32,63	95,98	135,41
MB 10	4,65	3,03	10,62	12,22	4,52	0,98	2,51	44,68	95,98	123,36
MB 11	5,29	3,28	13,02	13,63	5,15	0,98	2,89	47,05	95,98	120,99
MB 12	5,46	3,37	13,87	14,10	6,24	0,98	2,92	38,82	95,98	129,22
MB 13	5,67	3,45	14,74	14,57	6,44	0,98	3,04	39,72	95,98	128,32
MB 14	5,89	3,53	15,64	15,04	6,64	0,98	3,17	40,53	95,98	127,51
MB 15	6,04	3,62	16,56	15,51	8,18	0,98	3,19	32,93	95,98	135,11
MB 16	6,23	3,65	17,01	15,74	6,44	0,98	3,42	46,00	95,98	122,04
MB 17	6,39	3,74	17,98	16,21	7,70	0,98	3,43	38,47	95,98	129,58
MB 18	6,60	3,82	18,96	16,68	7,88	0,98	3,55	39,27	95,98	128,77
MB 19	6,68	3,87	19,47	16,92	8,69	0,98	3,56	35,63	95,98	132,41
MB 20	6,95	3,95	20,47	17,39	7,58	0,98	3,81	44,40	95,98	123,64
MB 21	7,23	4,24	23,09	18,33	8,39	1,12	3,90	40,14	96,00	127,86
MB 22	7,44	4,32	24,20	18,80	8,57	1,12	4,02	40,83	96,00	127,16
MB 23	7,65	4,40	25,34	19,27	8,76	1,12	4,15	41,51	96,00	126,49
MB 24	7,94	4,53	27,08	19,97	9,64	1,12	4,28	39,10	96,00	128,90
MB 25	8,16	4,61	28,28	20,44	9,82	1,12	4,41	39,76	96,00	128,23
MB 26	8,37	4,70	29,51	20,91	10,00	1,12	4,54	40,38	96,00	127,62
MB 27	8,59	4,78	30,75	21,38	10,17	1,12	4,67	41,02	96,00	126,97



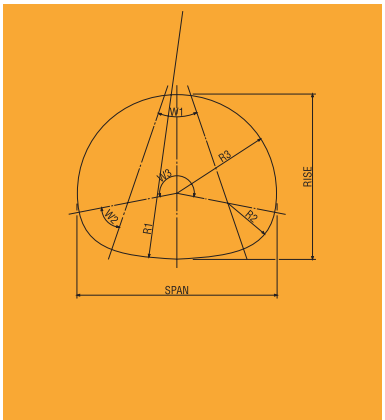
MP200 | High Profile Underpass UA

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions			Angle in Degrees		
					R1	R2	R3	W1	W2	W3
UA 01	2,88	2,73	6,05	8,93	3,18	1,08	1,44	16,95	50,01	243,03
UA 02	3,30	3,03	7,76	10,10	3,00	1,08	1,65	31,37	50,01	228,62
UA 03	3,37	3,10	8,13	10,34	3,31	1,08	1,69	28,49	50,01	231,49
UA 04	3,45	3,16	8,51	10,57	3,67	1,08	1,72	25,68	50,01	234,30
UA 05	3,61	3,28	9,27	11,04	3,70	1,08	1,81	29,09	50,01	230,90
UA 06	3,76	3,41	10,09	11,51	4,51	1,08	1,88	23,86	50,01	236,12
UA 07	3,91	3,54	10,93	11,98	5,66	1,08	1,96	19,02	50,01	240,97
UA 08	4,27	3,77	12,70	12,92	4,50	1,08	2,13	32,92	50,01	227,07
UA 09	4,34	3,84	13,16	13,16	4,85	1,08	2,17	30,54	50,01	229,45
UA 10	4,49	3,97	14,13	13,63	5,71	1,08	2,24	25,94	50,01	234,04
UA 11	4,58	4,02	14,61	13,86	5,23	1,08	2,29	30,91	50,01	229,07
UA 12	4,80	4,22	16,13	14,57	6,61	1,08	2,40	24,45	50,01	235,54
UA 13	5,09	4,80	19,17	15,74	4,92	1,88	2,54	21,89	50,00	238,11
UA 14	5,24	4,93	20,33	16,21	5,81	1,88	2,62	18,54	50,00	241,45
UA 15	5,50	5,11	22,13	16,92	4,91	1,88	2,75	30,16	50,00	229,84
UA 16	5,73	5,30	24,01	17,63	5,88	1,88	2,87	25,18	50,00	234,82
UA 17	5,97	5,48	25,96	18,33	6,30	1,88	2,99	25,62	50,00	234,38
UA 18	6,27	5,74	28,69	19,27	8,24	1,88	3,14	19,60	50,00	240,39
UA 19	6,47	5,85	30,07	19,74	6,45	1,88	3,24	31,29	50,00	228,71
UA 20	6,55	5,91	30,80	19,97	6,79	1,88	3,27	29,75	50,00	230,25
UA 21	6,77	6,11	33,00	20,68	7,96	1,88	3,39	25,38	50,00	234,62
UA 22	7,07	6,37	36,05	21,62	10,13	1,88	3,53	19,93	50,00	240,07
UA 23	7,20	6,41	36,81	21,85	7,58	1,88	3,60	31,97	50,00	228,03
UA 24	7,45	6,59	39,19	22,56	7,95	1,88	3,72	32,19	50,00	227,81
UA 25	7,57	6,73	40,84	23,03	9,61	1,88	3,78	25,21	50,00	234,79
UA 26	7,69	6,77	41,65	23,26	8,31	1,88	3,84	32,39	50,00	227,61
UA 27	7,81	6,92	43,37	23,73	10,01	1,88	3,90	25,55	50,00	234,44
UA 28	8,12	7,17	46,83	24,67	10,91	1,88	4,06	24,69	50,00	235,31
UA 29	8,32	7,28	48,59	25,14	9,80	1,88	4,16	30,21	50,00	229,79
UA 30	8,49	7,40	50,41	25,61	9,78	1,88	4,24	31,66	50,00	228,34



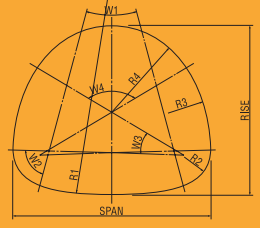
MP200 | Low Profile Underpass UB

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions			Angle in Degrees		
					R1	R2	R3	W1	W2	W3
UB 01	2,89	2,55	5,68	8,69	2,66	0,90	1,45	35,37	59,98	204,68
UB 02	3,22	2,78	6,96	9,63	3,48	0,90	1,61	30,97	59,98	209,07
UB 03	3,29	2,84	7,31	9,87	3,93	0,90	1,65	27,43	59,98	212,62
UB 04	3,69	3,06	8,74	10,81	3,45	0,90	1,84	42,86	59,98	197,19
UB 05	3,83	3,18	9,52	11,28	4,11	0,90	1,91	36,02	59,98	204,03
UB 06	4,08	3,35	10,72	11,98	4,56	0,90	2,04	35,39	59,98	204,66
UB 07	4,22	3,48	11,58	12,45	5,51	0,90	2,11	29,31	59,98	210,74
UB 08	4,63	3,69	13,35	13,39	4,78	0,90	2,31	42,23	59,98	197,82
UB 09	4,83	3,88	14,79	14,10	5,99	0,90	2,41	33,72	59,98	206,33
UB 10	4,96	4,00	15,79	14,57	7,10	0,90	2,48	28,44	59,98	211,61
UB 11	5,32	4,15	17,30	15,27	5,69	0,90	2,66	42,57	59,98	197,48
UB 12	5,57	4,32	18,91	15,98	6,12	0,90	2,78	41,82	59,98	198,23
UB 13	5,82	4,50	20,59	16,68	6,55	0,90	2,91	41,10	59,98	198,95
UB 14	6,01	4,68	22,37	17,39	7,93	0,90	3,00	33,97	59,98	206,07
UB 15	6,22	5,21	25,56	18,33	5,91	1,57	3,11	41,00	59,99	199,01
UB 16	6,44	5,39	27,54	19,03	6,91	1,57	3,22	35,05	59,99	204,96
UB 17	6,69	5,57	29,58	19,74	7,38	1,57	3,34	34,68	59,99	205,33
UB 18	6,94	5,74	31,70	20,44	7,84	1,57	3,47	34,34	59,99	205,67
U B19	7,22	5,99	34,64	21,38	9,84	1,57	3,61	27,37	59,99	212,64
UB 20	7,37	6,03	35,37	21,62	8,36	1,57	3,68	35,42	59,99	204,59
UB 21	7,62	6,20	37,67	22,32	8,83	1,57	3,81	35,08	59,99	204,93
UB 22	7,89	6,45	40,87	23,26	10,85	1,57	3,95	28,53	59,99	211,48
UB 23	8,12	6,55	42,48	23,72	9,77	1,57	4,06	34,44	59,99	205,57
UB 24	8,30	6,66	44,13	24,20	9,79	1,57	4,15	35,74	59,99	204,27
UB 25	8,55	6,84	46,69	24,91	10,27	1,57	4,28	35,41	59,99	204,60



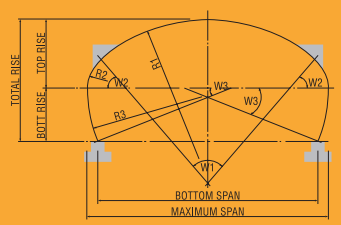
MP200 | Standard Underpass UC

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions				Angle in Degrees			
					R1	R2	R3	R4	W1	W2	W3	W4
UC 01	1,97	2,01	2,97	6,34	1,79	0,70	1,68	0,84	30,00	76,94	32,00	112,12
UC 02	2,66	2,31	4,71	7,99	3,14	0,70	1,89	1,24	30,00	76,94	28,49	119,14
UC 03	2,90	2,54	5,56	8,69	3,59	0,70	1,99	1,16	30,00	76,94	47,40	81,32
UC 04	3,44	3,23	8,49	10,57	3,14	1,22	2,10	1,46	30,00	77,00	51,19	73,61
UC 05	3,59	3,12	8,56	10,81	4,94	0,70	2,83	1,48	30,00	76,94	38,09	99,94
UC 06	3,82	3,28	9,72	11,51	5,38	0,70	3,32	1,69	30,00	76,94	28,35	119,41
UC 07	4,37	3,86	13,08	13,16	4,94	1,22	2,92	1,98	30,00	77,00	36,94	102,12
UC 08	4,60	4,09	14,48	13,86	5,38	1,22	3,06	1,87	30,00	77,00	48,40	79,19



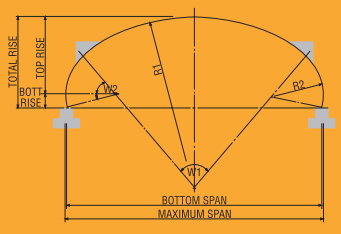
MP200 | Super-Span High Profile Arch SSHA

Profile No.	Max Span (m)	Bottom Span (m)	Total Rise (m)	Top Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions			Angle in Degrees		
							R1	R2	R3	W1	W2	W3
SSHA 01	5,95	5,59	2,70	1,77	13,48	9,40	4,03	1,08	2,47	80	50	22
SSHA 02	6,53	5,90	4,01	2,39	22,31	12,22	4,03	1,89	4,33	80	50	22
SSHA 03	7,03	6,40	3,59	1,97	21,44	11,99	4,87	1,08	4,33	80	50	22
SSHA 04	7,25	6,62	3,63	2,01	22,32	12,22	5,04	1,08	4,33	80	50	22
SSHA 05	7,25	6,83	3,67	2,04	23,22	12,46	5,20	1,08	4,33	80	50	22
SSHA 06	7,80	7,08	4,65	2,79	30,91	18,10	4,87	2,16	4,95	80	50	22
SSHA 07	7,83	7,11	4,48	2,63	29,85	14,10	5,04	1,89	4,95	80	50	22
SSHA 08	8,11	7,39	4,02	2,16	27,70	13,63	5,71	1,08	4,95	80	50	22
SSHA 09	8,23	7,51	4,73	2,87	33,10	18,57	5,20	2,16	4,95	80	50	22
SSHA 10	8,33	7,61	4,06	2,20	28,69	13,87	5,88	1,08	4,95	80	50	22
SSHA 11	8,45	7,73	4,77	2,91	34,24	15,04	5,37	2,16	4,95	80	50	22
SSHA 12	8,88	8,16	4,84	2,99	36,72	15,51	5,71	2,16	4,95	80	50	22
SSHA 13	8,97	8,25	4,17	2,32	31,62	14,57	6,38	1,08	4,95	80	50	22
SSHA 14	9,10	8,38	4,88	3,03	37,64	15,75	5,88	2,16	4,95	80	50	22
SSHA 15	9,19	8,47	4,21	2,36	32,66	14,81	6,55	1,08	4,95	80	50	22
SSHA 16	9,75	9,02	5,00	3,15	41,17	15,04	6,38	2,16	4,95	80	50	22
SSHA 17	9,96	8,97	5,73	3,19	48,68	18,10	6,55	2,16	6,80	80	50	22
SSHA 18	9,98	9,26	4,87	3,02	41,00	16,45	6,71	1,89	4,95	80	50	22
SSHA 19	10,17	9,18	5,77	3,22	50,06	18,33	6,71	2,16	6,80	80	50	22
SSHA 20	10,41	9,69	4,95	3,10	43,41	16,92	7,05	1,89	4,95	80	50	22
SSHA 21	10,61	9,62	5,85	3,30	52,87	18,80	7,05	2,16	6,80	80	50	22
SSHA 22	10,61	9,18	6,39	3,30	57,66	20,21	7,05	2,16	7,05	80	50	26
SSHA 23	10,63	9,64	5,68	3,14	51,38	18,57	7,22	1,89	6,80	80	50	22
SSHA 24	10,83	9,36	6,51	3,34	59,94	20,45	7,22	2,16	7,22	80	50	26
SSHA 25	10,91	9,92	5,22	2,67	48,32	19,51	7,89	1,08	6,80	80	50	22
SSHA 26	11,06	10,07	5,76	3,21	54,17	19,04	7,55	1,89	6,80	80	50	22
SSHA 27	11,25	9,83	6,61	3,42	63,29	20,92	7,55	2,16	7,55	80	50	25
SSHA 28	11,49	10,50	5,84	3,29	57,01	19,51	7,89	1,89	6,80	80	50	22
SSHA 29	11,69	10,32	6,71	3,50	66,81	21,39	7,89	2,16	7,89	80	50	24
SSHA 30	11,69	10,21	6,84	3,50	68,05	21,86	7,89	2,16	7,89	80	50	23
SSHA 31	12,46	10,98	7,41	4,33	78,22	23,74	7,89	3,24	7,89	80	50	25
SSHA 32	12,46	10,98	7,66	4,33	81,15	23,74	7,89	3,24	7,89	80	50	24



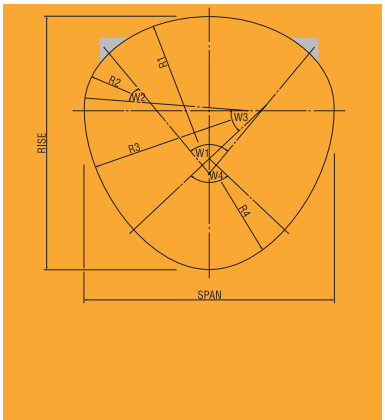
MP200 | Super-Span Low Profile Arch SSLA

Profile No.	Max Span (m)	Bottom Span (m)	Total Rise (m)	Top Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions		Angle in Degrees	
							R1	R2	W1	W2
SSLA 01	3,25	3,21	1,37	1,18	3,60	4,82	2,02	0,92	80	62
SSLA 02	3,90	3,86	1,49	1,29	4,68	5,52	2,52	0,92	80	62
SSLA 03	4,55	4,51	1,60	1,41	5,81	6,23	3,03	0,92	80	62
SSLA 04	4,77	4,73	1,64	1,45	6,22	6,46	3,20	0,92	80	62
SSLA 05	5,45	5,38	2,32	1,99	10,28	8,11	3,37	1,57	80	62
SSLA 06	5,66	5,59	2,35	2,03	10,76	8,34	3,53	1,57	80	62
SSLA 07	5,88	5,81	2,39	2,07	11,35	8,58	3,70	1,57	80	62
SSLA 08	6,03	5,99	1,83	1,65	8,62	7,76	4,21	0,87	80	62
SSLA 09	6,28	6,21	2,43	2,11	12,28	9,05	4,04	1,52	80	62
SSLA 10	7,36	7,29	2,62	2,31	15,36	10,11	4,88	1,52	80	62
SSLA 11	7,58	7,51	2,66	2,35	16,03	10,34	5,05	1,52	80	62
SSLA 12	7,80	7,73	2,70	2,39	16,71	10,58	5,22	1,52	80	62
SSLA 13	8,02	7,95	2,74	2,43	17,41	9,87	5,39	1,52	80	62
SSLA 14	8,66	8,59	2,86	2,54	19,58	11,52	5,89	1,52	80	62
SSLA 15	8,82	8,74	3,07	2,71	21,53	11,99	5,89	1,74	80	62
SSLA 16	9,47	9,39	3,19	2,83	23,93	12,69	6,40	1,74	80	62
SSLA 17	9,68	9,60	3,23	2,87	24,71	12,93	6,56	1,74	80	62
SSLA 18	9,90	9,82	3,27	2,91	25,55	13,16	6,73	1,74	80	62
SSLA 19	10,36	10,26	3,90	3,41	32,39	14,57	6,73	2,39	80	62
SSLA 20	10,33	10,25	3,35	2,99	27,26	13,63	7,07	1,74	80	62
SSLA 21	10,77	10,69	3,43	3,07	29,01	14,10	7,41	1,74	80	62
SSLA 22	10,80	10,70	3,98	3,48	34,45	15,04	7,07	2,39	80	62
SSLA 23	11,23	11,13	4,06	3,56	36,49	15,51	7,41	2,39	80	62
SSLA 24	11,39	11,28	4,28	3,73	39,15	15,98	7,41	2,61	80	62
SSLA 25	11,41	11,33	3,55	3,18	31,78	14,81	7,91	1,74	80	62
SSLA 26	11,63	11,55	3,59	3,22	32,7	15,04	8,08	1,74	80	62
SSLA 27	12,65	12,50	5,23	4,51	53,53	18,57	7,91	3,47	80	62
SSLA 28	12,87	12,72	5,27	4,55	54,83	18,08	8,08	3,47	80	62



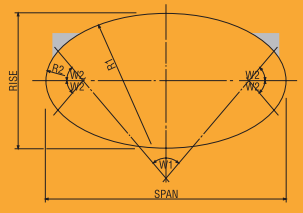
MP200 | Super-Span Pear SSP

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions				Angle in Degrees			
					R1	R2	R3	R4	W1	W2	W3	W4
SSP 01	7,21	7,82	44,50	23,74	4,61	1,91	5,10	4,61	76	42	66	76
SSP 02	7,32	7,87	45,90	22,80	4,99	2,13	5,34	2,09	62	44	58	90
SSP 03	7,77	7,90	48,20	28,44	4,96	2,13	5,51	3,44	76	44	50	90
SSP 04	7,57	8,43	48,56	25,85	4,83	2,07	6,14	2,75	76	39	57	88
SSP 05	8,36	8,23	54,50	26,56	6,14	1,37	6,99	2,91	68	59	52	74
SSP 06	8,10	8,61	54,90	26,56	6,30	1,76	5,94	2,38	62	46	68	68
SSP 07	8,56	8,48	57,75	27,50	6,28	2,15	5,96	3,95	60	50	52	92
SSP 08	8,71	9,32	63,90	28,91	5,72	2,09	7,48	3,43	80	45	45	98
SSP 01	9,14	9,04	65,30	27,73	6,94	1,99	7,69	2,86	66	54	42	94
SSP 10	9,14	9,50	68,60	29,61	5,89	2,09	7,48	3,71	80	45	45	98



MP200 | Super-Span Ellipse SSE

Profile No.	Span (m)	Rise (m)	End Area (m^2)	Periphery (m)	Layout Dimensions		Angle in Degrees	
					R1	R1	W1	W1
SSE 01	3,27	2,39	6,09	8,93	2,02	0,94	80	50
SSE 02	3,92	2,62	7,94	10,34	2,52	0,94	80	50
SSE 03	4,66	3,07	11,12	12,22	3,03	1,08	80	50
SSE 04	4,88	3,15	11,91	12,69	3,20	1,08	80	50
SSE 05	5,10	3,22	12,72	13,16	3,37	1,08	80	50
SSE 06	5,60	3,92	17,08	15,04	3,53	1,48	80	50
SSE 07	6,25	4,16	20,16	16,45	4,04	1,48	80	50
SSE 08	6,61	3,78	19,02	16,45	4,54	1,08	80	50
SSE 09	6,69	4,32	22,33	27,26	4,38	1,48	80	50
SSE 10	7,05	3,94	21,06	17,39	4,88	1,08	80	50
SSE 11	7,07	5,14	28,42	19,27	4,38	2,02	80	50
SSE 12	7,26	4,02	22,14	17,86	5,05	1,08	80	50
SSE 13	7,72	5,38	32,31	20,68	4,88	2,02	80	50
SSE 14	7,77	4,71	28,09	19,74	5,22	1,48	80	50
SSE 15	7,94	5,46	33,68	21,15	5,05	2,02	80	50
SSE 16	7,99	4,79	29,32	20,21	5,39	1,48	80	50
SSE 17	8,25	5,74	36,83	22,09	5,22	2,15	80	50
SSE 18	8,37	5,62	36,51	22,09	5,39	2,02	80	50
SSE 19	8,41	4,94	31,79	21,15	5,72	1,48	80	50
SSE 20	8,47	5,82	38,29	22,56	5,39	2,15	80	50
SSE 21	8,73	5,24	35,93	22,09	5,89	1,69	80	50
SSE 22	9,08	6,38	45,18	24,44	5,72	2,42	80	50
SSE 23	9,17	5,40	37,84	23,03	6,23	1,62	80	50
SSE 24	9,30	6,46	46,80	24,91	5,89	2,42	80	50
SSE 25	9,58	5,89	43,38	24,44	6,40	1,89	80	50
SSE 26	9,78	5,97	44,87	24,91	6,56	1,89	80	50
SSE 27	9,96	6,70	51,79	26,32	6,40	2,42	80	50
SSE 28	10,00	6,04	46,40	25,38	6,73	1,89	80	50
SSE 29	10,16	6,78	53,44	26,79	6,56	2,42	80	50
SSE 30	10,26	6,99	55,77	27,26	6,56	2,56	80	50
SSE 31	10,53	6,40	51,79	26,79	7,07	2,02	80	50
SSE 32	10,66	6,28	51,21	30,55	7,24	1,89	80	50
SSE 33	10,67	7,48	62,24	28,67	6,73	2,83	80	50
SSE 34	10,75	6,48	53,47	27,26	7,24	2,02	80	50
SSE 35	11,11	7,64	66,06	29,61	7,07	2,83	80	50
SSE 36	11,27	6,84	59,15	28,67	7,57	2,15	80	50
SSE 37	11,70	7,00	62,79	29,61	7,91	2,15	80	50
SSE 38	11,90	7,41	67,89	30,55	7,91	2,42	80	50
SSE 39	11,95	8,29	77,09	31,96	7,57	3,10	80	50
SSE 40	12,04	8,49	79,67	32,43	7,57	3,23	80	50
SSE 41	12,36	7,23	68,33	31,02	8,42	2,15	80	50
SSE 42	12,48	8,65	83,99	33,37	7,91	3,23	80	50
SSE 43	12,77	9,28	92,53	34,78	7,91	3,64	80	50
SSE 44	13,27	9,97	103,58	36,66	8,08	4,04	80	50

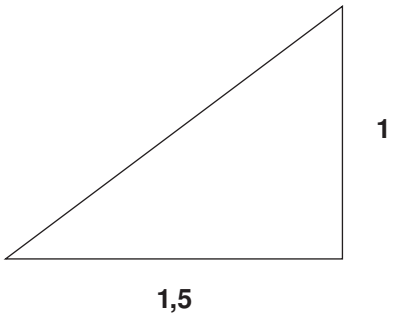


Corrugated Steel Pipe Bevel Specifications

BEVEL DETAILS AND STRUCTURE MEASUREMENT PARAMETERS

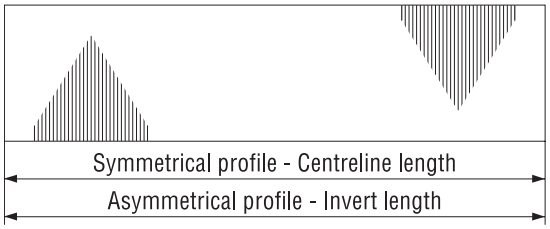
Armco Superlite has four different standard end details. These are shown below together with the method of measurement used for each type. The length applicable to each type should be used when specifying that structure. Note that reference is made to symmetrical and asymmetrical structures. Symmetrical structures include round pipes and ellipses, while asymmetrical structures include pipe-arches, underpasses and arches.

Bevelled ends are usually cut to conform to the slope of the embankment. The slope must be clearly indicated when ordering bevelled ends. For convenience the slope is defined as slope = (vertical) : (horizontal) eg. slope = 1:1,5.

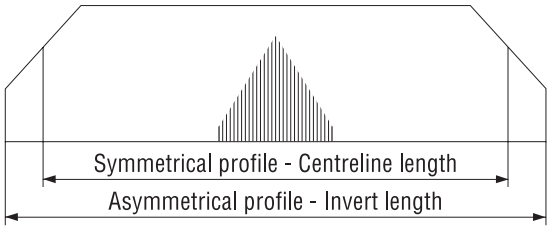


The invert slope of the culvert may influence the angle to which a bevelled end is cut. We recommend that this slope be indicated where the slope exceeds 2%.

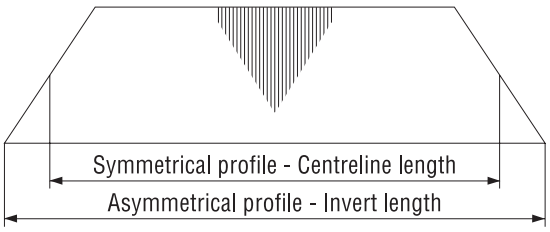
1. Square-ended structures



3. Cutoff bevel structures



2. Full bevel structures



4. Step bevel structures

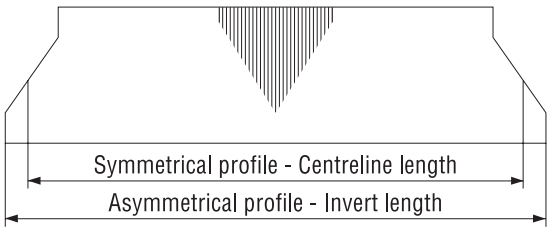


Fig. 3 - Typical bevels

SKEW BEVEL REQUIREMENTS

In order to ensure uniformity in the ordering of structures on which skew bevels have to be cut, we recommend that figure 4 be used and that all angles of skew be stated in terms of skew numbers. The skew number must be read off at the inlet end of the structure eg. in figure 4.

Structure 1 is skew 60

Structure 2 is skew 90

Structure 3 is skew 120

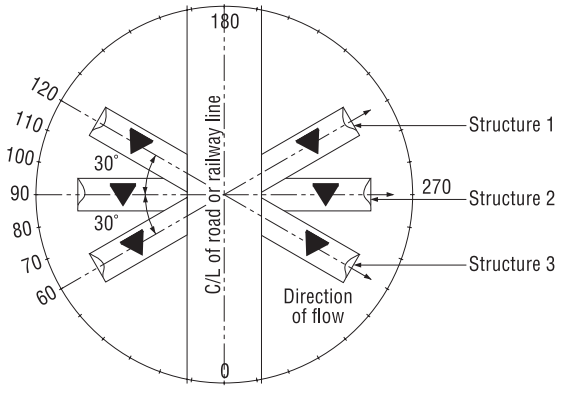


Fig. 4 - Skew Numbers

CHARCOAL KILNS
SUPERLITE PRODUCTS

Charcoal Kilns

ADVANTAGES OF CORRUGATED STEEL KILNS

The use of Armco Corrugated Steel Charcoal Kilns in today's market will provide charcoal manufacturers with the following essentials:

- Strength;
- Long service life;
- Ease of handling and installation;
- Economy;
- Versatility.

1. Strength

The use of Armco Corrugated Steel has shed a new light on the strength of charcoal kilns during charcoal manufacture. It will no longer be necessary to halt production for repairs to kilns whilst they are being loaded before firing. Gone are the days where chipping, melting, cracking and crumbling played a part in the delay of charcoal manufacturing.

2. Longer Service Life

Temperatures in excess of 600° C (112° F) have very little effect on the service life of Armco Corrugated Steel Charcoal Kilns. Currently kilns have been in operation for periods of ±36 months with no visible defects excluding the bottom 450 mm of these kilns.

This is due to the fact that there is acetic acid gas given off which condensates on the sides of the kiln and then runs down to the bottom. There it begins its slow corroding process. This can be retarded by neutralising the acetic acid with chalk or lime. Should these bottom plates corrode completely, they alone can be replaced. It is also advisable to put extra plates around the bottom of the kiln on the inside. These extra plates will then corrode first, thus saving the actual plates on the kiln.

3. Ease Of Handling & Installation

Assembly of Armco Corrugated Steel Charcoal Kilns is both time and cost saving. There is no need for skilled labour in the installation of structures of this kind.

Installation is a matter of bolting a number of marked plates together with Armco high tensile bolts and nuts. All kilns are supplied with accurate assembly drawings.

4. Versatility

Armco Corrugated Steel Charcoal Kilns can either be used as totally portable or permanent structures. Should the kiln need to be moved, the bolts can be removed, the plates dismantled and the site relocated.

5. Economy

There are large cost savings in comparison with conventional methods:

- Initial supply cost;
- Saving on installation time;
- Saving on installation cost;
- Cooling cycle is quicker, therefore more burns possible;
- No breakages;
- Less mass to handle and economy of transport;
- Savings on supervision;
- Life of kilns in excess of 36 months.

6. Acceptance In Many Markets

Corrugated steel structures are found on farms, under highways, country roads, city streets, railways, down mines, in deserts and antarctic wastes. They serve as charcoal kilns, culverts, bridges, conduits, storm drains, underpasses, air ducts, protective shelters, sub drains and water storage.

VOID FORMERS AND PILE CASINGS

DEVELOPMENT

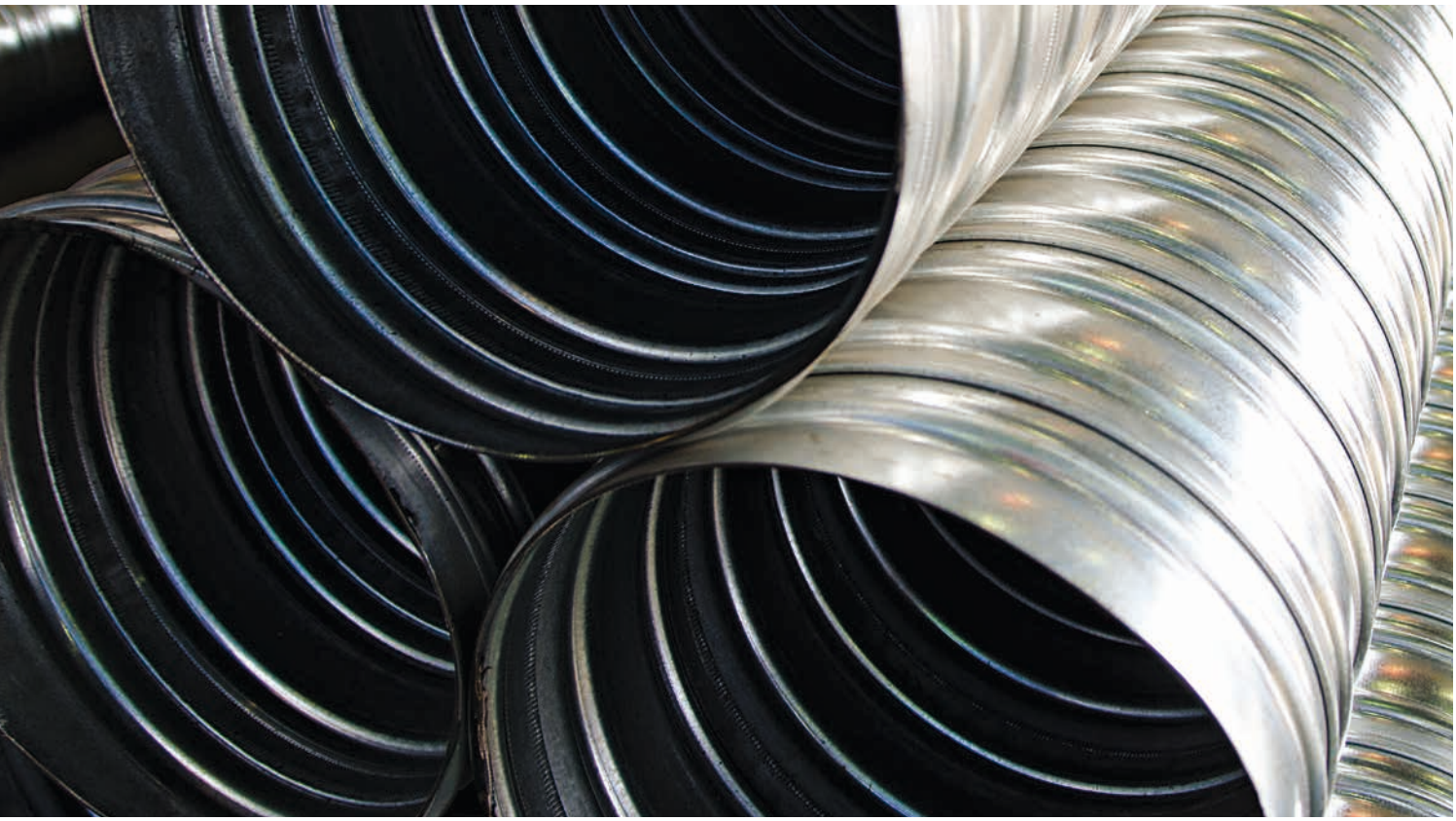
The Superlite Void Former has been developed to provide the South African construction industry with a low cost, lightweight and robust cell former. They are designed to meet the stringent performance requirements imposed by local design and on-site conditions. They are spirally locked, seamed and swaged for maximum strength and resist the full hydrostatic pressure of concrete and all loads associated with the compaction or vibration of concrete during placing.

PRODUCT CHARACTERISTICS

Superlite cell formers are available in uncoated or galvanized mild steel. Standard material thicknesses are 0,6; 0,8; 1,0 and 1,2 mm but other thicknesses can be catered for if the need arises. The standard maximum length of the cell former is 6 m, but special longer lengths are available on request. Where extra long lengths are required, the cell formers may be supplied in split lengths and fitted with a system of spigot and socket joining collars to enable the contractor to achieve any length that may be required. Stop ends can be provided if required to prevent the ingress of concrete, if the cell is to be used as a void former. Timber braces can be provided to minimise the risk of distortion during transport action especially where long distances are involved.

Diameter Internal	0,60 Mass	0,80 Mass	1,00 Mass	1,20 Mass
220	4.17	5.55	6.95	8.34
245	4.64	6.19	7.74	9.29
270	5.12	6.82	8.52	10.23
300	5.69	7.57	9.47	11.37
313	5.93	7.91	9.88	11.86
325	6.16	8.20	10.26	12.32
330	6.25	8.34	10.42	12.50
355	6.73	8.97	11.21	13.45
378	7.16	9.54	11.93	14.33
406	7.69	10.25	12.82	15.38
420	7.96	10.60	13.26	15.92
450	8.52	11.37	14.21	17.05
480	9.09	12.12	15.16	18.19
500	9.48	12.62	15.79	18.95
508	9.62	12.83	16.04	19.25
550	10.42	13.89	17.37	20.84
560	10.59	14.12	17.65	21.18
600	11.37	15.16	18.94	22.73
610	11.56	15.41	19.26	23.11
635	12.03	16.04	20.05	24.06
660	12.50	16.67	20.84	25.01
685	12.98	17.30	21.63	25.95
711	13.47	17.96	22.45	26.94
750	14.21	18.94	23.68	28.42
812		20.51	25.64	30.76
864		21.82	27.28	32.74
915		23.11	28.89	34.67
965		24.37	30.47	36.56
1000		25.26	31.57	37.89
1016		25.66	32.08	38.49
1066		26.93	33.66	40.39

Table 1 Standard Diameters and Masses
Note: All void cells below the **orange line** in the various material thicknesses must have timber cross braces.



TENDON SHEATHING

DEVELOPMENT

Armco Superlite tendon sheathing has been designed and developed to satisfy the requirements of the South African construction industry for low cost, lightweight tendon sheathing. It is a spirally lock-seamed and machine swaged product.

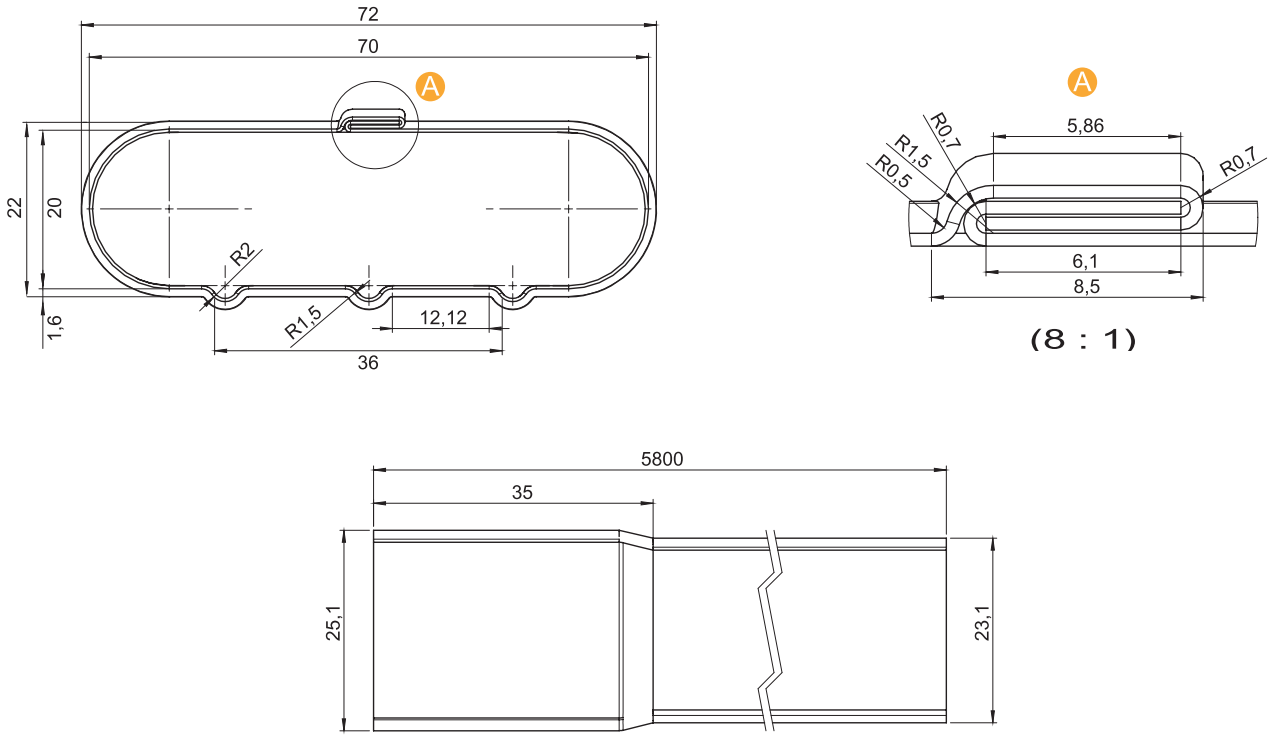
PRODUCT CHARACTERISTICS

Tendon sheathing is manufactured in uncoated mild steel from 0,4 mm material. All diameters quoted are internal diameters and range from 40 mm to 120 mm.
The product is strong, inherently rigid, uniform in size and shape, airtight and will accept a radius of 2,44 mm up to 60 mm diameter and 2,7 mm for larger diameters, while maintaining its seal and structural strength. Spiral corrugations provide a superior grout-duct-concrete bond. The standard length of the Armco Superlite tendon sheath is 10 m but shorter lengths can be manufactured. A rigid screw type coupling is available facilitating the assembly of sections on site to any design length. Sheathing can be packaged with polythene wrap if required.

Profile Code	Size Diameter
SH 1	40
SH 2	45
SH 3	50
SH 4	55
SH 5	60
SH 6	65
SH 7	70
SH 8	75
SH 9	80
SH 10	85
SH 11	90
SH 12	95
SH 13	100
SH 14	105
SH 15	110
SH 16	115
SH 17	120
SH 18	125
SH 19	130
SH 20	135
SH 21	140
SH 22	145
SH 23	150

Table 2 Standard Diameters and Masses

FLAT DUCT DETAILS



DISCLAIMER

While every care has been taken in preparing the information contained in this document, the details herein are provided solely as a guide and it remains the responsibility of the user to satisfy himself / herself that the information is of sufficient accuracy and applicable to safely use for their specific design requirements. ARMCO Superlite (Pty) Ltd cannot be held responsible for any errors or omissions contained herein and indemnifies itself from any and all claims which may arise from the use of this document.

GALVANIZING

Armco Galvanizers

Armco Superlite is listed in accordance with the BSI ISO 9001:2015 quality scheme which ensures the quality of all products and services produced by Armco Superlite. Specific customer quality plans are drawn up where required for any of our operations.

Armco holds the SATAS mark for Hot Dipped Galvanizing and all Galvanizing done at our premises is in accordance to the SANS 121 / ISO 1461 specifications. Galvanizing certificates are supplied on request.

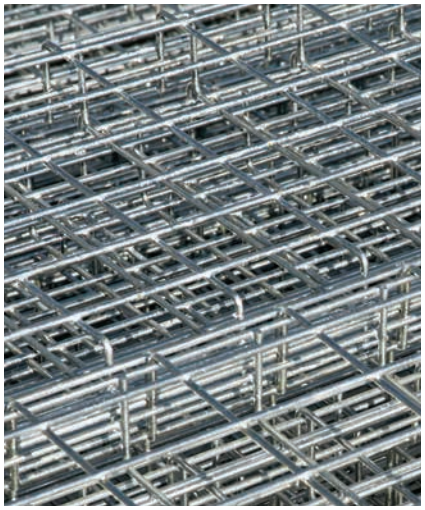
ISANDO

Armco Galvanizers Isando has been operating since 1989.
Geared up to accommodate heavy structural steel of up to 13m in length. Isando has an average output of approximately 2000 tons per month.

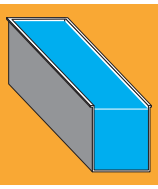


RANDFONTEIN

Armco Galvanizers Randfontein is our second facility based in the Randfontein area.
Randfontein has an average output of approximately 800 tons per month and is geared up to handle light to medium structural steel of up to 6m in length.



GALVANIZING BATH SIZES



ISANDO

13m x 1.45m x 2m
(length x width x depth)

RANDFONTEIN

6m x 1.45m x 1.8m
(length x width x depth)

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