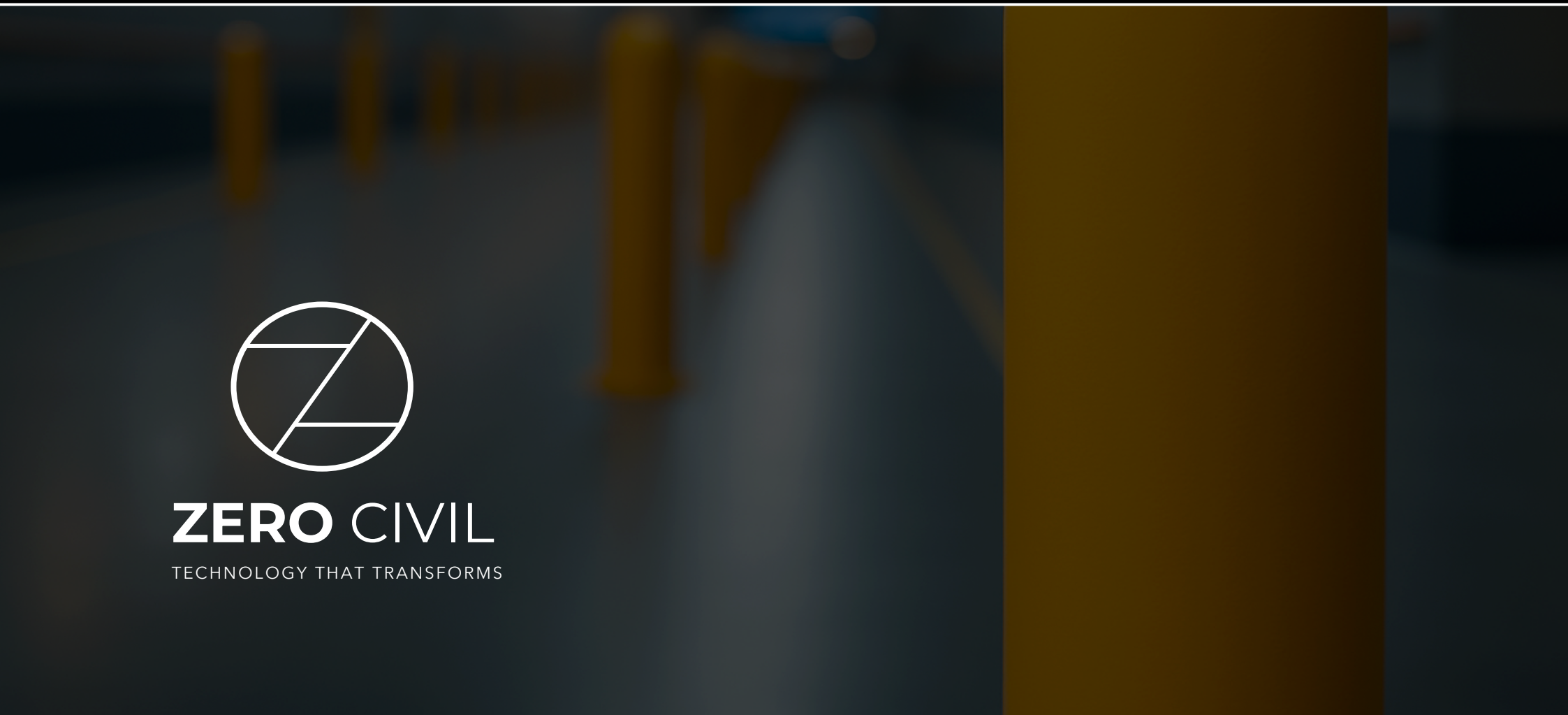
BOLLARD CATALOGUE- 2026

From repetition to resilience

02



ZERO CIVIL

TECHNOLOGY THAT TRANSFORMS

Protection Bollards

Unless you incorporate some form of shock absorbing mechanism the bollard and footing will need replacing almost every time a bollard is impacted by a vehicle

> It’s time to move from repetition **to resilience**

Join Australia's market leaders using ZERO WASTE Technologies to make both surface mount and inground bollards and the surrounding foundations re-usable even following severe impact

Saving thousands over the life of a development

Main Photo Dept Transport Advanced Polymer Impact Recovery Bollards

Photo Insert City of Perth Stainless steel Surface Mount Impact Recovery Bollards

60 mm Galv steel Bollard
In-ground

Quality Australian 60 OD CHS Galvanised steel Pipe 2.9 mm wall thickness

Primed and powder-coated to last.

MRWA Striping available 100W/300R/100W

Taper is removable and reusable

Re-usable ground socket protects surrounding foundations from damage impact after impact

Cap included

Bollards are removable (using removal tool from a standing position) to allow access, for wide loads, maintenance or upgrades.

Socket can be capped when bollard is removed.

100% AUSSIE MADE

Recommended for high speed zones (MRWA Recommends for use on Highways) Suitable for zones from carparks to Highways. Good for shopfront- substantially reducing maintenance- removable and socket can be capped to allow access. Tools required. (MRWA as tools).

RESILIENCE RATING – THREE +HALF

1. Bollard is removable for easy maintenance and to allow access
2. Bollard footings are resistant to impact
3. Footing re-usable following impact
4. Bollard casing is highly resilient to UV rays but not resistant to impact from vehicles
5. Bollard not re-usable following impact
6. MRWA Approved as safe at High impact

VIEW SPECS

140 mm Galv steel Bollard
In-ground

140 x 1650
In-ground Galv
Bollard

Cap included
(supplied
separately)

3 mm wall
thickness

3 mm wall

Ground Anchor
pin

Ground Anchor

RESILIENCE RATING – ZERO

2. Bollard casing is possibly resistance to light impact but will dent upon high impact. May rust and corrode.
3. Bollard footings not resistance to impact
4. Bollard not re-usable following impact
5. Footing not re-usable following impact

Refer to Impact Chart

165 mm Powder coated Bollard
Inground

100% AUSSIE MADE

Quality Primed & Powder coated for long lasting finish

Available in other colours- ask for colour chart. Min qty 6

Cap included (supplied separately)

Heavy 5 mm wall thickness

Heavy 5 mm

Red or white 100 mm Striping available

MRWA Striping available

Can manufacture with pin

Can manufacture

RESILIENCE RATING – HALF

1. Bollard casing is possibly resistance to light impact but will dent or chip upon high impact. May rust and corrode.
2. Bollard and footings not resistance to impact
3. Bollard not re-usable following bad impact
4. Footing not re-usable following impact

Refer to Impact Chart

RESULT IMPACT RIGID BOLLARD ›

165 mm Powder coated Bollard
Inground Impact Recovery

RESILIENCE RATING – THREE + HALF

1. Bollard casing is possibly resistance to light impact but will dent or chip upon high impact. May rust and corrode.
2. Bollard footings resistance to impact
3. Bollard re-usable
4. Footing re-usable

Refer to Impact Chart

MORE INFO

Extra Heavy-duty Resistance Core

165 mm Powder coated Bollard

XHD Inground Impact Recovery

RESILIENCE RATING - FOUR + HALF

1. Bollard casing is possibly resistance to light impact but will dent or chip upon high impact. May rust and corrode.
2. Bollard footings resistance to impact
3. Bollard re-usable
4. Footing re-usable
5. Reduced risk of resistance core bending

Refer to Impact Chart

MORE INFO

150 mm Advanced Polymer
Inground

Cap moulded

Quality UV stabilised impact resistant material
Highly durable

Flexes upon impact reducing risk of damage to footings

Lightweight- easy to use

Heavy 7 mm wall thickness

Heavy 7 mm

Can concrete fill to ground level for added resistance and retain flexibility

Available in other colours- ask for colour chart.
Min qty 10

RESILIENCE RATING – TWO + HALF

1. Bollard casing is resistant to impact will not dent, chip or rust (UV stabilised)
2. Bollard footings made resistant to light impact (as bollard flexes) but not resistance to high impact
3. Bollard re-usable following light impact but not re-usable following bad impact
4. Footing re-usable following light impact but not re-usable following bad impact

Refer to Impact Chart

150 mm Advanced Polymer
Impact Recovery Inground

Quality UV stabilised impact resistant material Highly durable

Secured using the Impact Recovery System

Making bollards self-recover from light impact and reusable following severe impact.

100% AUSSIE MADE

Cap moulded

Lightweight- easy to use

Heavy 7 mm wall thickness

Removable and socket can be capped.

Secured on ZERO WASTE Foundations 350 or 650 mm Depth

Footing remain reusable following severe impact.

RESILIENCE RATING – FOUR

1. Bollard casing is resistant to impact will not dent, chip or rust (UV stabilised)
2. Bollard footings resistant to impact
3. Bollards recover from low impact, removable and re-usable following severe impact
4. Footing re-usable following impact

Refer to Impact Chart

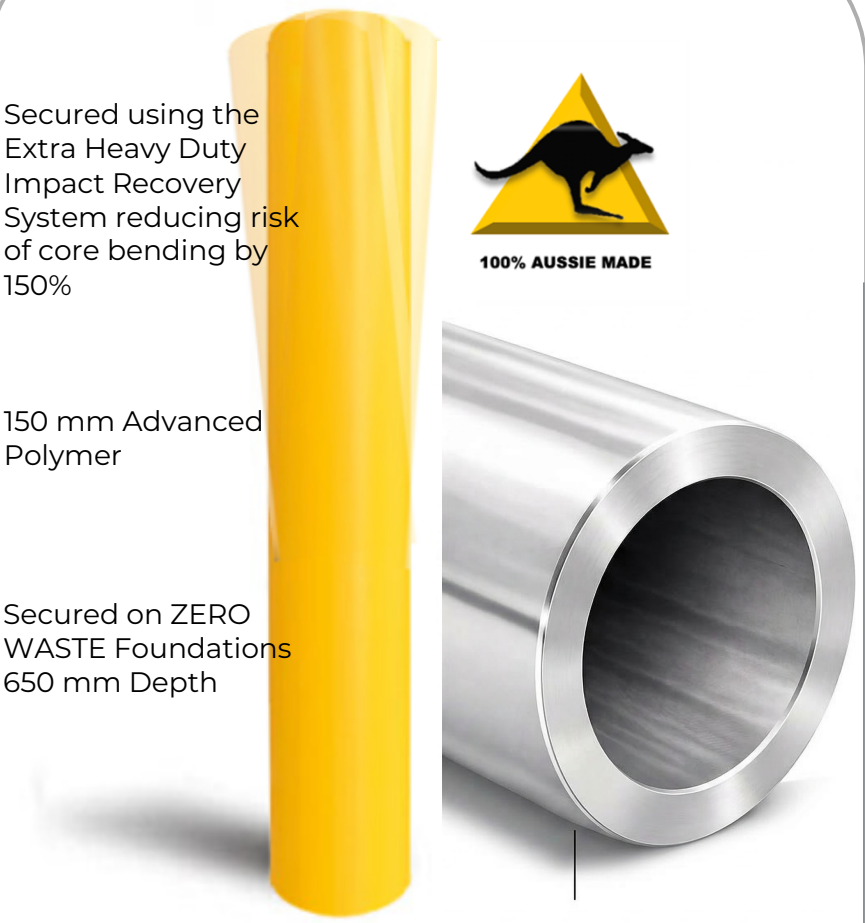
MORE INFO

150 mm Advanced Polymer
XHD Impact Recovery Inground

Secured using the Extra Heavy Duty Impact Recovery System reducing risk of core bending by 150%

150 mm Advanced Polymer

Secured on ZERO WASTE Foundations 650 mm Depth



Extra Heavy-duty Resistance Core

RESILIENCE RATING – SIX

1. Bollard casing is resistant to impact
2. Bollard footings resistant to impact
3. Bollards recover from low impact
4. Bollards re-usable following impact
5. Footing re-usable following impact
6. XHD Resistance core provides reduced risk of resistance core bending

Refer to Impact Chart

MORE INFO ›

These bollards in Maylands were installed around 8 years ago and have been clipped by trucks regularly (you can see the scuffing on the concrete base)

One bollard was bowled over by a large truck and the resistance core remained seated in the footing – with no damage to footings and no expensive repairs required.

Photo taken following impact and reinstatement of same bollard in same footing using the same Impact Recovery Rings and a new core.

140 mm Galv steel Bollard
Surface Mount

140 x 1200
Surface Mount
Galv Bollard

Cap included
(supplied
separately)

3 mm wall
thickness

3 mm wall

8 mm Base plate
250 mm diameter
x 4 holes

RESILIENCE RATING – ZERO STARS

1. Bollard casing is possibly resistance to light impact but will dent upon high impact. May rust and corrode.
2. Bollard footings not resistance to impact
3. Bollard not re-usable following impact
4. Footing not re-usable following impact

Refer to Impact Chart

140 mm Powder coated Bollard
Surface Mount

140 x 1200H
Surface Mount
Galv Bollard

Cap included
(supplied
separately)

Powder Coated

Powder Coated

3 mm wall
thickness

3 mm wall

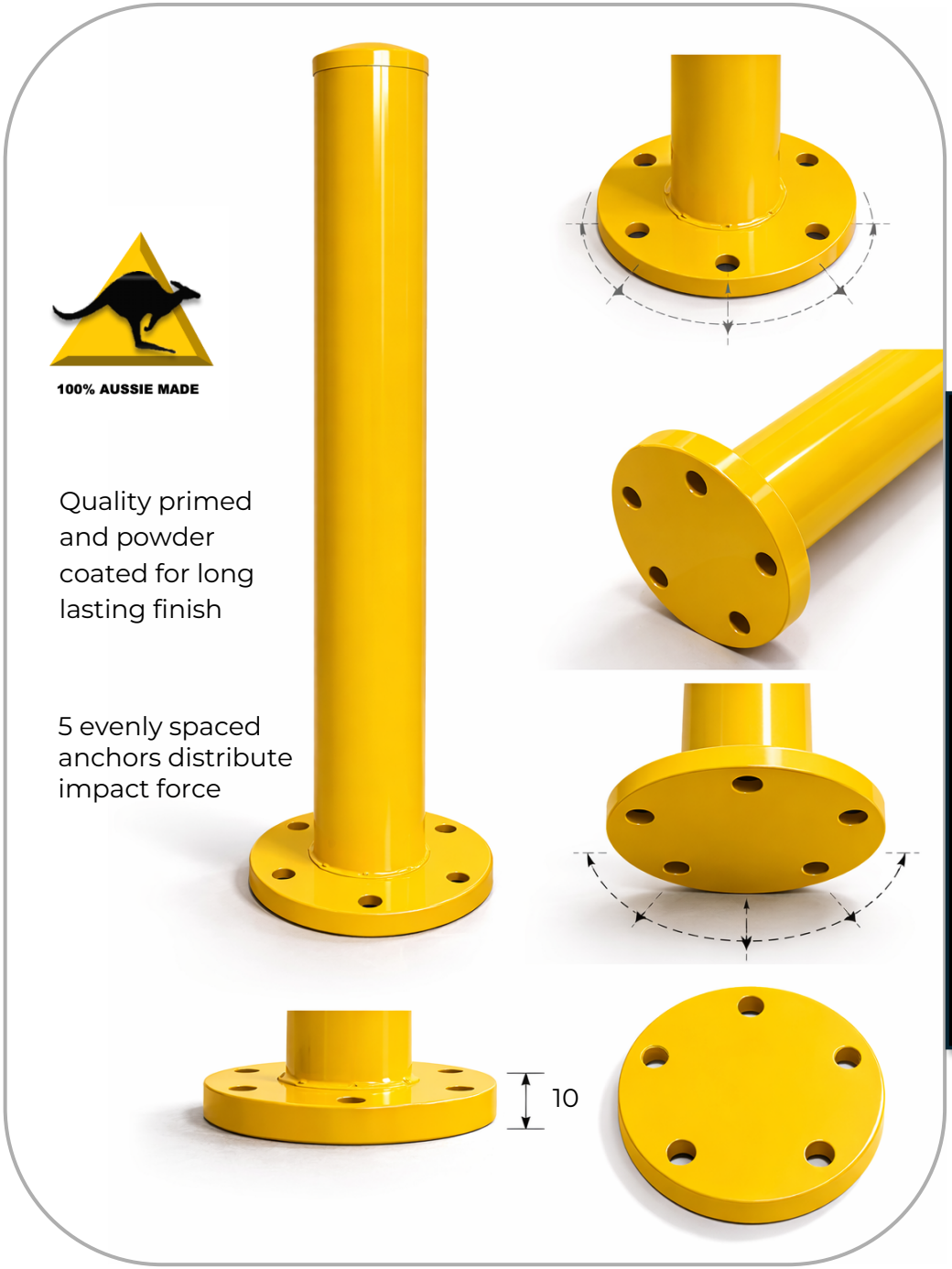
8 mm x 200
Base Plate 4
Holes

RESILIENCE RATING – ZERO

1. Bollard casing will dent or chip upon impact. May rust and corrode over time.
2. Bollard footings not resistance to impact
3. Bollard not re-usable following impact
4. Footing not re-usable following impact

Refer to Impact Chart

165 mm Powder coated Bollard
Surface Mount



RESILIENCE RATING – ONE

1. Bollard casing is resistance to light impact but will dent or chip upon high impact. May rust and corrode.
2. Heavy Duty Bollard Base Plates are resistant to light impact, but bolts will be sheared or ripped from footings upon high impact
3. Bollard not re-usable following bad impact
4. Footing not re-usable following bad impact

Refer to Impact Chart

165 mm Powder coated
Impact Recovery Surface Mount

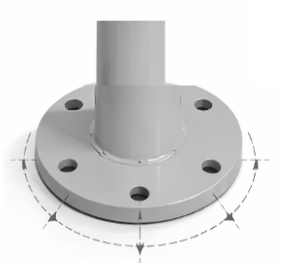
100% AUSSIE MADE

Quality Primed & Powder coated for long lasting finish

Cap included

Heavy 5 mm wall thickness

Secured on Re-usable Heavy Duty 10 mm thick x 300 mm diameter Base Plate with 5 evenly spaced anchors to distribute energy



Secured using the Impact Recovery System

Making bollards self-recover from light impact and reusable following severe impact.

Footings remain reusable following severe impact.

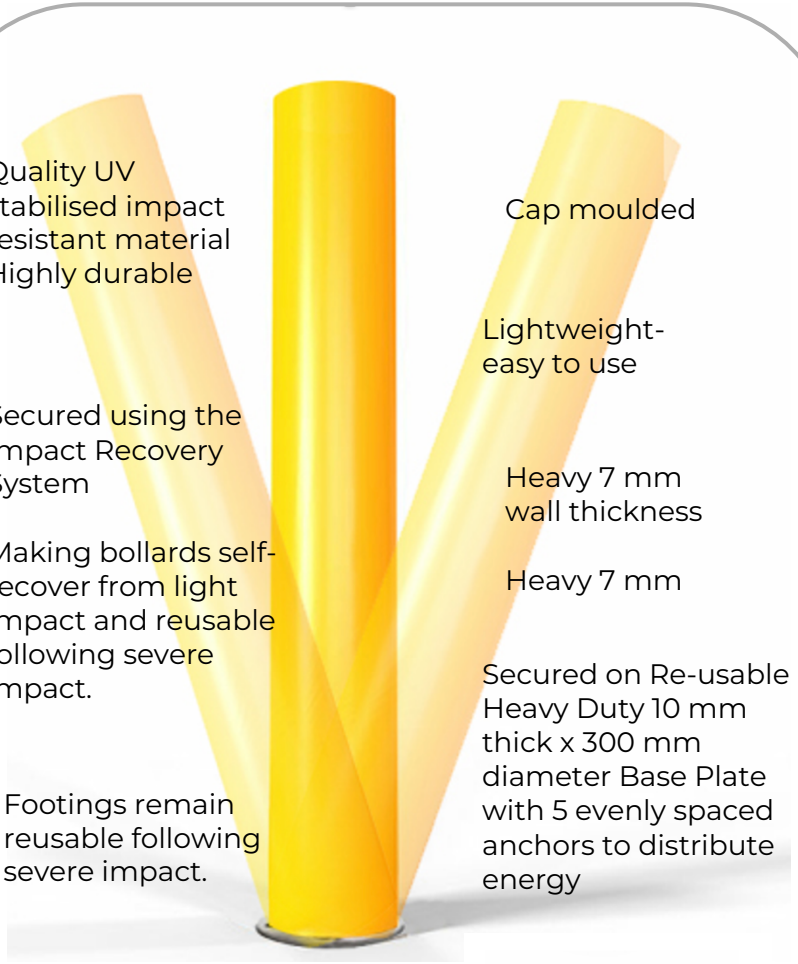
RESILIENCE RATING – THREE + HALF

1. Bollard casing is possibly resistance to light impact but will dent or chip upon high impact. May rust and corrode.
2. Bollard footings resistance to impact
3. Bollard re-usable
4. Footing re-usable

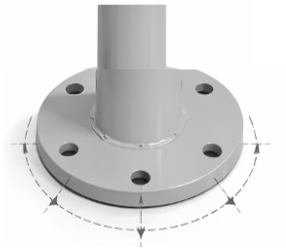
Refer to Impact Chart

MORE INFO

150 mm Advanced Polymer
Impact Recovery Surface Mount



100% AUSSIE MADE



RESILIENCE RATING – FOUR

1. Bollard casing is resistant to impact will not dent, chip or rust (UV stabilised)
2. Bollard footings resistant to impact
3. Bollards recover from low impact, removable and re-usable following severe impact
4. Footing re-usable following impact

Refer to Impact Chart

MORE INFO

168 mm Stainless Steel
Impact Recovery Surface Mount

Quality Bollards easy to install and maintain

Flat (slightly domed) welded cap

Polished Satin finish (most durable finish)

Secured using the Impact Recovery System

Heavy 3.6 mm wall thickness

Making bollards self-recover from light impact and reusable following severe impact.

Secured on Re-usable Heavy Duty 10 mm thick x 300 mm diameter Base Plate with 5 evenly spaced anchors to distribute energy

Footings remain reusable following severe impact.

100% AUSSIE MADE

RESILIENCE RATING- FOUR

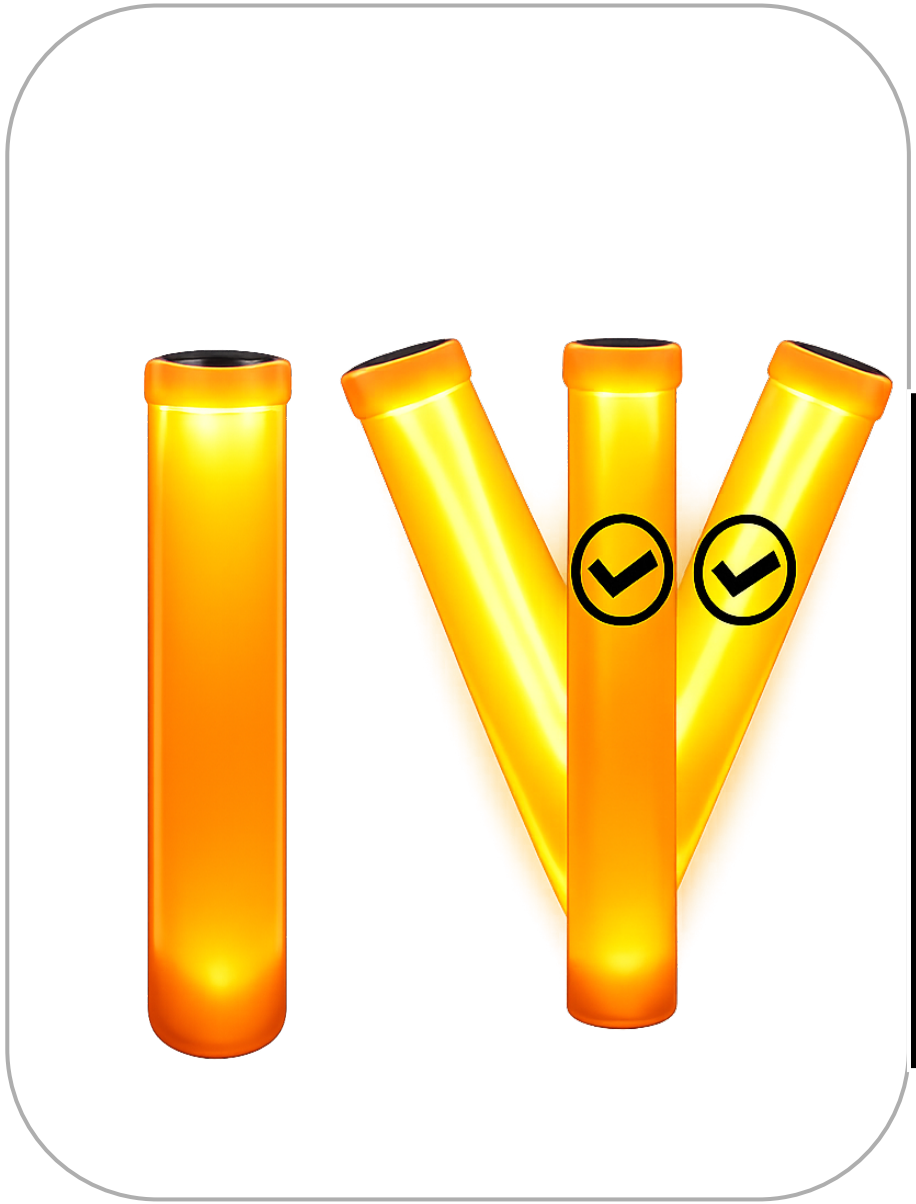
1. Bollard casing is resistant to impact will not chip or rust (has most durable finish)
2. Bollard footings resistant to impact
3. Bollards recover from low impact, removable and re-usable following severe impact
4. Footing re-usable following impact

Refer to Impact Chart

MORE INFO

City of Perth has had these surface Mount Bollards installed for over five years and they remain in good condition today.

City of Perth has installed inground bollards throughout Northbridge (that are removable, and sockets can be capped off) to protect sapling trees- that are now fully grown and is now installing more surface mount bollards in the city.



Solar “Glow Bollards”

RESILIENCE RATING – FOUR (SIX IRS)

1. Bollard casing is resistant to impact
2. Solar light has up to 12 hours glow at night (depending upon sunshine during day)
3. No electrical supply required batteries have around 5 + years lifespan
4. Several colours- (white, yellow, orange, blue, red) Standard units yellow
5. Recycled units available
6. Can be secured using Impact Recovery System
7. Caps can be retro-fitted

COMING SOON- IN R&D

190 mm Advanced Polymer
Bollard Covers

RESILIENCE RATING – SIX

1. Bollard Cover is resistant to impact
2. UV Stabilised
3. Heavy walled (7mm walls)
4. Fits 165 Steel Bollards
5. 150 mm Bollard diameter bollards
6. Large range of colours (Min 6 Covers)
7. Easy to attach
8. Easy to clean

Smart Impact detection
Sensor relay system

We are now developing a low cost sensor system to detect impact and send a message to operations enabling fast replacement of damaged bollards.

Unlike other detection options- our system provides instant response, does not require large financial investment and can be rolled out as required (can be retro-fitted) economical for small and large operations).

UNDER DEVELOPMENT

Impact Recovery
Bollards

02

Bollard Options

- Steel 165
- Stainless steel 168
- Advanced Polymer 150

Footing Options

- 350 Inground Heavy Duty
- 650 In-ground Heavy Duty
- 650 In-ground Extra Heavy Duty
- Surface Mount Heavy Duty

ZERO CIVIL’s second zero waste innovation

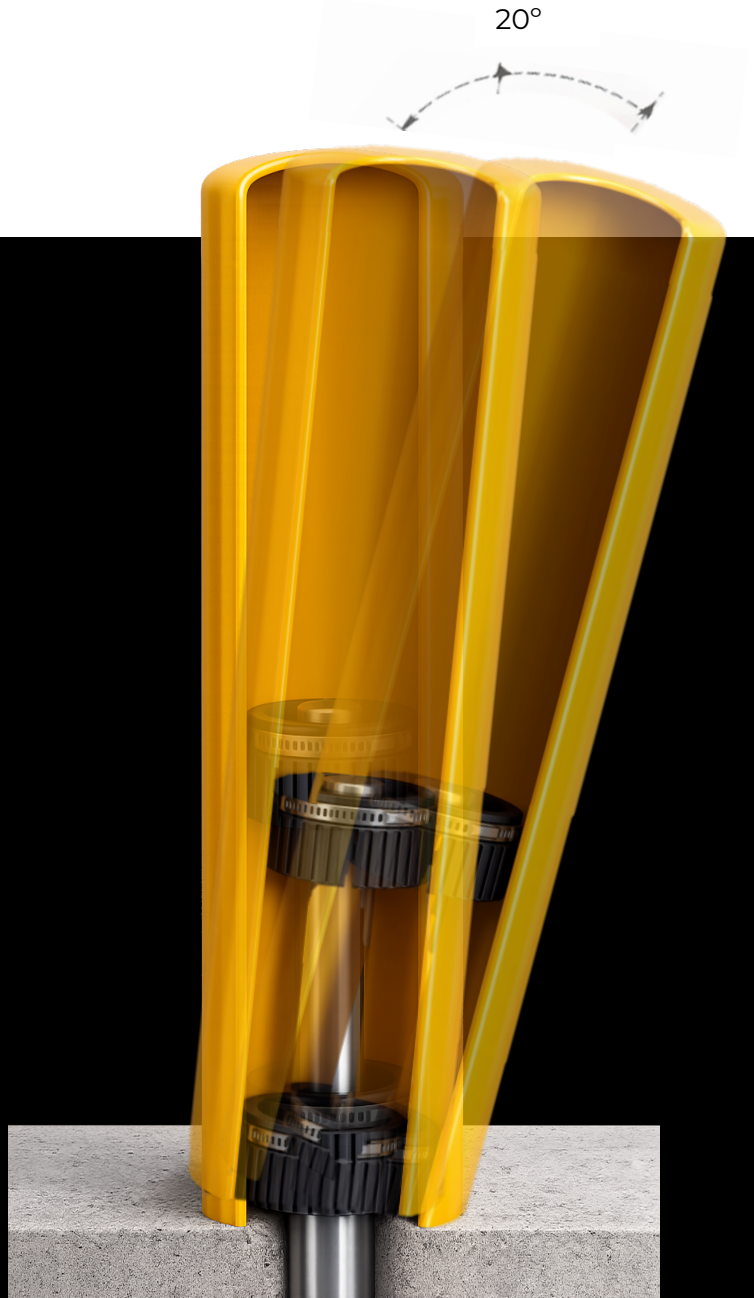
Inground **Impact Recovery System**

In-ground Bollards are suitable for almost any application (concrete/ asphalt/ paved areas)

We recommend

- 350 for most applications
- 650 Depth for bollards subject to impact from utility vehicles and possible high impact Core is used to
- Extra Heavy Duty to reduce maintenance in more high impact regions

Bollards remain rigid but when impacted by a vehicle the rings absorb the impact force allowing the bollard to deflect up to 20 degrees and slowly self-recover.

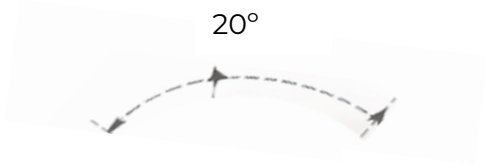


Ground socket protects surrounding foundations from damage impact after impact

Cap included

Impact Recovery Rings are made from advanced urethane and rubber compound, withstanding hundreds of impacts

Surface mount **Impact Recovery System**

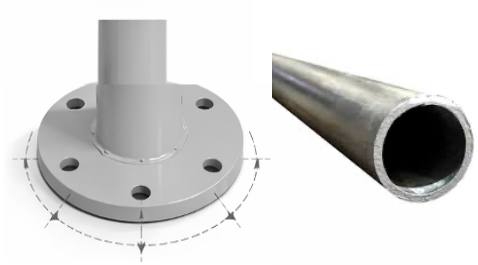


Surface Mount Bollards are suitable for installation into solid concrete pavements, driveways or concrete slabs.

Bollards remain rigid but when impacted by a vehicle the rings absorb the impact force allowing the bollard to deflect up to 20 degrees and slowly self-recover.

If badly impacted the resistance core may bend and need replacing.

Heavy duty base plate with solid upright spigot resists bending and 5 evenly spaced anchors distribute impact force.



Heavy Duty Resistance core resistant forward movement of vehicles beyond 20 degrees.

Impact Recovery Rings are made from advanced urethane and rubber compound, repeated recovering following impact
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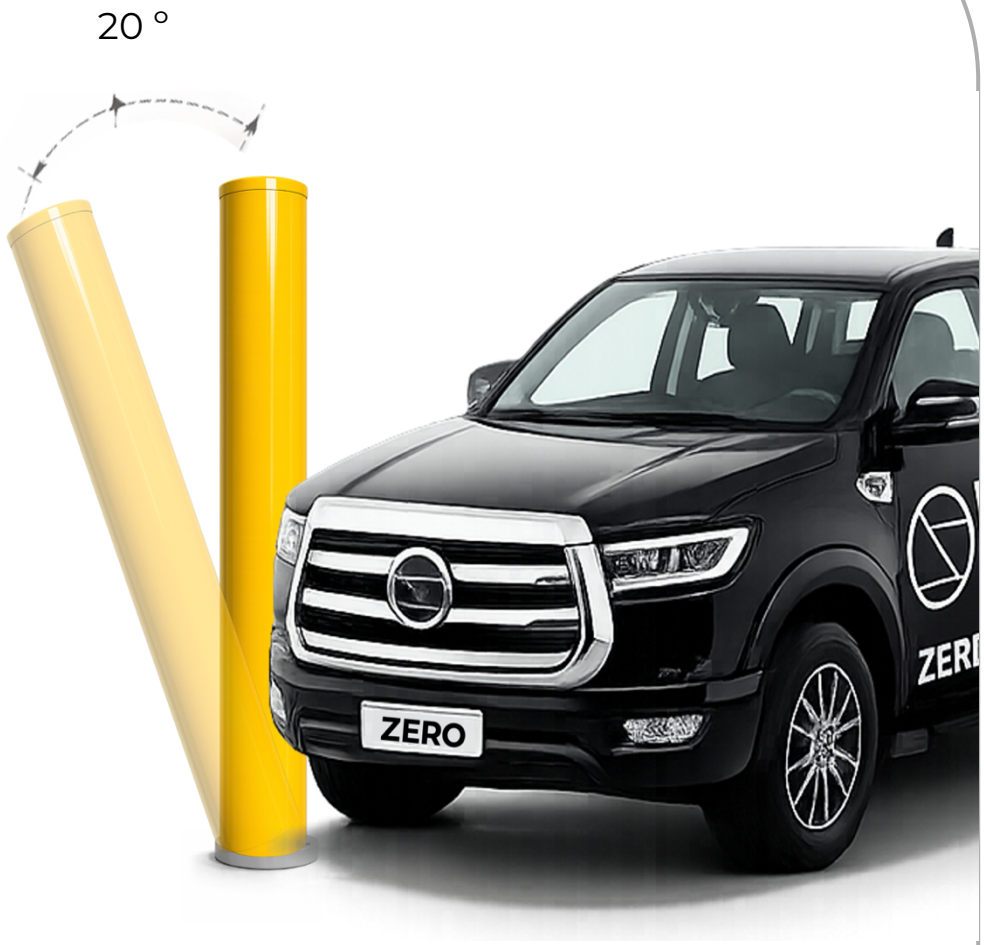


Advanced engineering

Bollards are often subject to vehicle impact and when impacted the impact force must go somewhere.

When a rigid bollard is impacted, the force is directed to the base plate, or footing, which is dislodged.

Advanced engineering overcomes these problems. By incorporating a shock absorbing mechanism and secured our bollards on a safe secure footing that remains intact when a bollard is severely impacted

Refer to Impact Chart

OPTIONS

- Surface Mount
- In-ground 350 mm
- Inground 650 mm
- XHD Inground 650 mm

VISIT WEBSITE FOR SPECS & VIDEOS

4 levels of
extreme protection

1. PROTECTIVE BOLLARD CASING

You can secure heavy-duty galvanised steel or impact resistant stainless-steel pipe bollards to provide an impact resistant surface, but we highly recommend using our impact resistant advanced polymer bollards to further reduce maintenance. UV stabilised and heavy walled made from advanced polymers they are rust proof, scratch and dent proof, designed to last and further improve energy absorption

2. ZERO WASTE FOUNDATIONS:

ZERO WASTE Foundations are made from Advanced Polymers that absorb impact energy protecting the surrounding foundations when a bollard is impacted and continue working keeping items secure following multiple high and low speed impacts.

3. HEAVY DUTY RESISTANCE CORE

Unlike spring loaded bollards that over-flex, a Heavy-duty resistance core works to prevent deflection of the bollard beyond 20 degrees when impacted by a passenger vehicle. The resistance core can be increased from Heavy Duty to Extra Heavy Duty

4. SHOCK ABSORBING IMPACT RECOVERY RINGS

Unlike springs that quickly wear out, creating dangerous litigation risks, our re-usable energy absorbing Impact Recovery Rings create a permanent shock absorbing cushion that absorb the impact force and self-recover, with no reduction in capacity following hundreds of impacts, greatly improving energy absorption, safety and resilience

resistance
core

With 650 mm Depth Foundations you can choose an Extra Heavy-duty core that increases resistance to bending by 150%

This reduces maintenance in zones subject to impact from utility vehicles and trucks.

NB: You must weigh up the extra damage to vehicles against the benefit of reduced maintenance.

Heavy Duty Resistance Core

Extra Heavy-duty Resistance Core

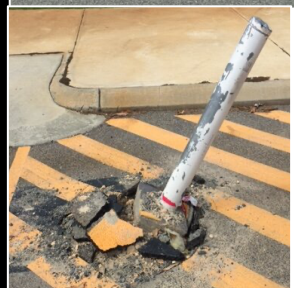
impact resistance

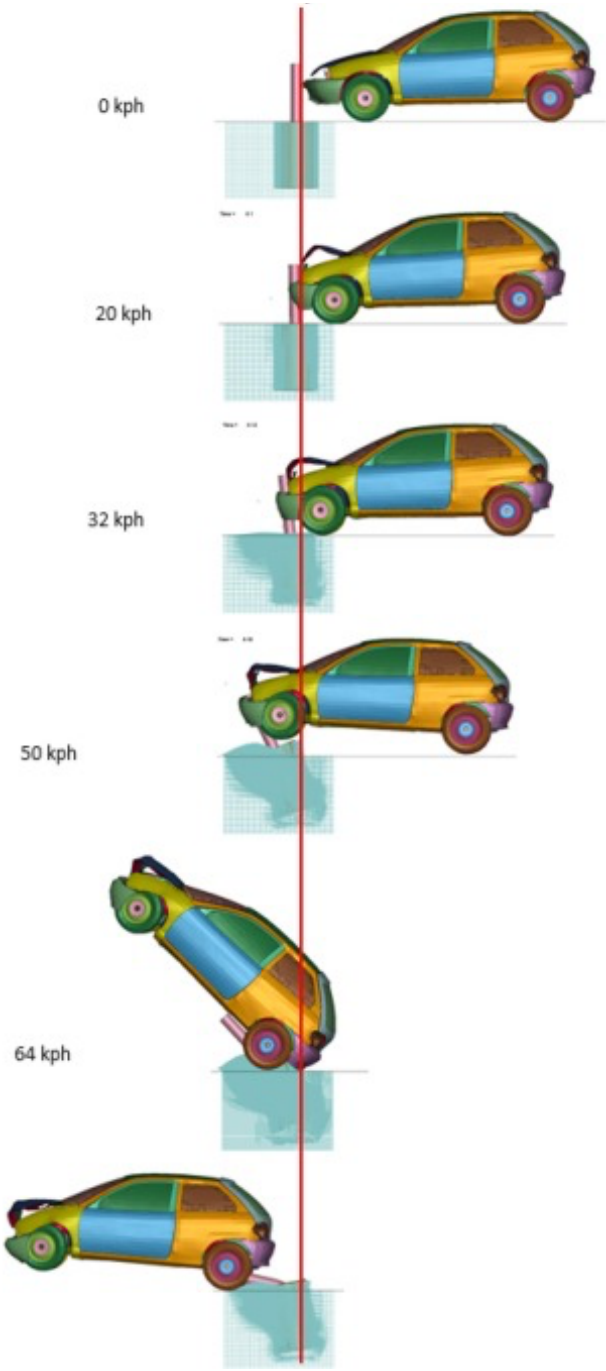
Solid inground bollards have been the mainstay of the industry for decades, but in recent times with more pedestrians and vehicles on our roads there is a growing concern for the safety factor when designing bollards.

When a car hits something that **doesn't give**, the impact energy has only a few places to go:

1. **The car deforms hard** (front end crush), *then*
2. The vehicle can **ride up the bollard** as the front suspension collapses and the contact point climbs, *then*
3. The car can **pivot and launch** (you see the nose lift → car rotates → wheels leave ground). That's the "projectile" effect that is not suitable for urban environments.

For a bollard to resistant impact, it requires some form of shock absorbing mechanism.





In-ground **Bollards**

RATING – ONE POINT FOR EACH BENEFIT

7. Bollard casing is resistant to impact
8. Bollard footings resistant to impact
9. Bollards recover from low impact
10. Bollards re-usable following impact
11. Footing re-usable following impact
12. XHD Resistance core provides reduced risk of resistance core bending

Meets requirement

Partially meets requirement

IMPACT RESISTANT

Resistant to impact from a passenger vehicle (some bollard will flex and self-recover)

IMPACT RECOVERY

Resistant to impact from a vehicle (self-recover from light impact). Bollard and footings recoverable (re-usable) following even severe impact.

	DEPTH	IMPACT RESISTANT	IMPACT RECOVERY	SPEED AT FAILURE
IN-GROUND BOLLARDS				
140 mm Galv steel Bollard	400 mm	NO	NO	7 kmph
165 mm Powder coated Bollard	400 mm	NO	NO	8 kmph
	650 mm	NO	NO	10 kmph
165 mm Powder coated Bollard IR	350 mm	YES	YES	16 kmph
	650 mm	YES	YES	19 kmph
	XHD 650mm	YES	YES	21 kmph
150 mm Advanced Polymer	600 mm	YES	NO	10 kmph
150 mm Advanced Polymer IR	350 mm	YES	YES	16 kmph
	650 mm	YES	YES	19 kmph
	XHD 650mm	YES	YES	21 kmph

** Indicative only, as outcome is affected by vehicle mass, impact angle, braking, height of contact and conditions.*
In High speed zones MRWA recommends our 60 mm Traffic Bollards that are frangible when impacted at high speed without risking injury to vehicle occupants.

	DEPTH	IMPACT OUTCOME	APPLICATION
IN-GROUND BOLLARDS			
140 PC Steel	400 mm	Light vehicle contact can bend the bollard or damage the footing. Typically suited to visual separation rather than impact-prone areas.	Visual boundary marking where vehicle contact is unlikely.
165 PC Steel	400 mm	With 5mm wall thickness they are slightly stronger than 140 mm steel but still a rigid bollard. Impact loads transfer into the footing and repairs are often required after a strike.	Low-risk urban applications where bollards are primarily for delineation.
165 PC Steel	650 mm	Greater embedment improves resistance to minor contact, though footing damage may still occur under vehicle impact.	Industrial locations requiring static protection or delineation. Not recommended for high speed zones due to risk of injury to occupants upon impact. (Refer to Impact Chart for rigid bollards. P30)
165 mm PC	350 mm	Designed to deflect and self-recover under lower-speed impacts while reducing damage to the surrounding footing.	Carparks and roadside parking areas with solid concrete foundations like traffic islands, concrete footpaths, asphalt.
	650 mm	Greater embedment improves impact resistance and stability while retaining recovery performance.	Roadsides, carparks and council assets exposed to more frequent vehicle contact. Any free-standing bollard with no existing concrete footing
	XHD 650mm	XHD configuration provides the highest resistance in this range for severe low-speed impacts and repeated strikes.	High-risk roadside zones, truck routes, utilities and heavy-duty transport environments.
150 mm AP IG	600 mm	Corrosion-resistant and will flex upon minor impacts, but as a non-recovery bollard it may still require replacement after a heavier strike.	Coastal areas, corrosive environments and locations prioritising durability with lower maintenance. Electrical asset protection
150 mm AP IR	350 mm	Combines corrosion resistance with impact recovery, allowing the bollard to deflect and reduce footing damage under impact.	"as above" Plus Urban streets, car parks, shopfront, transport nodes and sustainability-focused council projects.
	650 mm	Greater embedment increases low-speed impact resistance and improves performance in higher-risk locations.	Higher-risk urban roadsides, intersections and areas with repeated vehicle contact.
	XHD 650mm	Highest-performance polymer option, designed for severe low-speed impacts while preserving the footing and simplifying replacement.	Heavy-duty roadside applications, high density carparks, utilities, industrial areas and transport corridors.

	DEPTH	ON-GOING REPAIRS	RE-USE FOOTING	RE-USE BOLLARD	RATING
INGROUND BOLLARDS					
140 PC Steel	400 mm				
165 PC Steel	400 mm				
165 PC Steel	650 mm				
165 mm PC	350 mm	**ZERO**	**YES**	**YES**	
	650 mm	**ZERO**	**YES**	**YES**	
	XHD 650mm	**ZERO**	**YES**	**YES**	
150 mm AP IG	600 mm	**WITH BAD IMPACT**	**WITH LIGHT IMPACT**	**WITH LIGHT IMPACT**	
150 mm AP IR	350 mm	**ZERO**	**YES**	**YES**	
	650 mm	**ZERO**	**YES**	**YES**	
	XHD 650mm	**ZERO**	**YES**	**YES**	

Surface mount **Bollards**

RATING – ONE STAR FOR EACH BENEFIT

1. Bollard casing is resistant to impact
2. Bollard footings resistant to impact
3. Bollards recover from low impact
4. Bollards re-usable following impact
5. Footing re-usable following impact
6. XHD Resistance core provides reduced risk of resistance core bending

Meets requirement

Partially meets requirement

IMPACT RESISTANT

Resistant to impact from a passenger vehicle (some bollard will flex and self-recover)

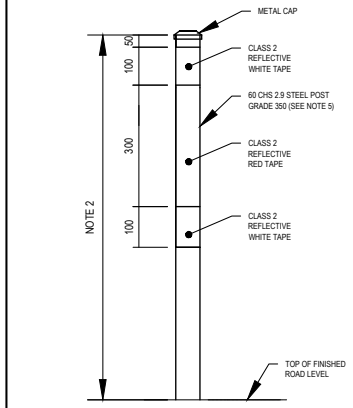
IMPACT RECOVERY

Resistant to impact from a vehicle (self-recover from light impact). Bollard and footings recoverable (re-usable) following even severe impact.

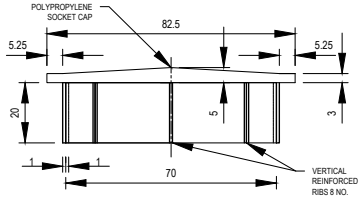
	DEPTH	IMPACT RESISTANT	IMPACT RECOVERY	SPEED AT FAILURE
SURFACE MOUNT BOLLARDS				
140 Steel Bollard	Surface Mount	NO	NO	4 kmph
140 Steel Bollard PC	Surface Mount	NO	NO	4 kmph
165 Steel Bollard PC	Surface Mount	NO	NO	4 kmph
165 Steel PC IR	Surface Mount	YES	YES	13 kmph
150 mm Advanced Polymer IR	Surface Mount	YES	YES	13 kmph
168 mm Stainless Steel Heavy Walled Pipe IR	Surface Mount	YES	YES	13 kmph

	DEPTH	IMPACT OUTCOME	APPLICATION
SURFACE MOUNT BOLLARDS			
140 Steel Bollard	Surface Mount	Surface-mounted rigid bollard. Under impact, anchor bolts may loosen, bend or pull out and slab damage is likely.	Visual separation where vehicle strikes are unlikely. Not suitable for carparks or shopfront protection.
140 Steel Bollard PC	Surface Mount	Similar performance to the standard 140 steel bollard, with powder coating providing finish protection only, not impact recovery.	Low-risk visual delineation in pedestrian environments. Not suitable for carparks or shopfront protection.
165 Steel Bollard PC	Surface Mount	Larger round base redirects impact energy reducing damage but a surface mount bollard without any shock absorbing mechanism ultimately relies on the strength of the concrete anchors.	Used in low-risk areas where installing a foundation is difficult. Not a protection bollard. Not recommended for use on roads with speed limits over 10kmph
165 Steel PC IR	Surface Mount	Designed to absorb and recover from lower-speed impact while reducing damage to the slab and surrounding footing zone.	Car parks, service areas, loading zones and urban spaces exposed to low-speed vehicle contact. Bollard can still chip, scratch rust and corrode (Maximum lifespan if not impacted 20 years)
150 mm AP IR	Surface Mount	Corrosion-resistant impact recovery bollard suited to repeated low-speed strikes and reduced maintenance.	Coastal sites, public realm projects, car parks and sustainability-focused infrastructure. Protecting assets- including electrical. Provide soft surface and low impact for Bike Paths and Disabled parking bays. (Lifespan Bollard 25-50 years/ Foundation 100 years)
168 mm Stainless Steel IR	Surface Mount	Durable impact recovery bollard with corrosion resistance and good low-speed recovery performance.	Premium public realm projects, coastal areas and sites needing appearance, durability and impact recovery. (Lifespan Bollard 25-50 years/ Foundation 100 years)

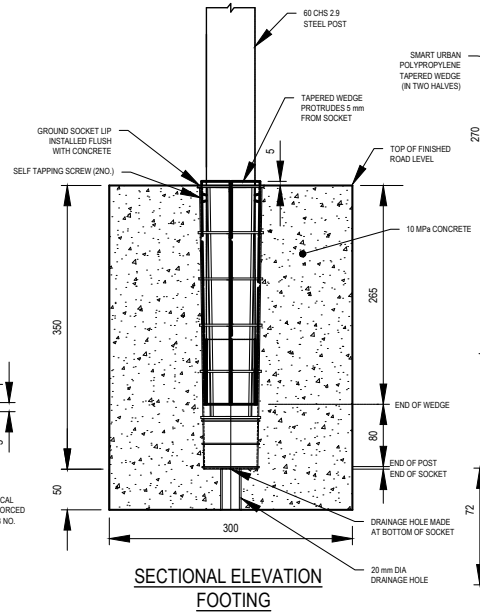
	DEPTH	MAINTENANCE	REUSE FOOTING	REUSE BOLLARD	RATING
SURFACE MOUNT BOLLARDS					
140 Steel Bollard	Surface Mount				
140 Steel Bollard PC	Surface Mount				
165 Steel Bollard PC	Surface Mount				
165 Steel PC IR	Surface Mount	NO	YES	YES	
150 mm AP IR	Surface Mount	NO	YES	YES	
168 mm Stainless Steel IR	Surface Mount	NO	YES	YES	



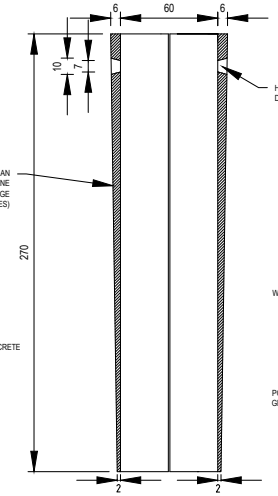
BOLLARD



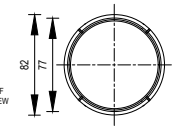
ELEVATION
SOCKET CAP



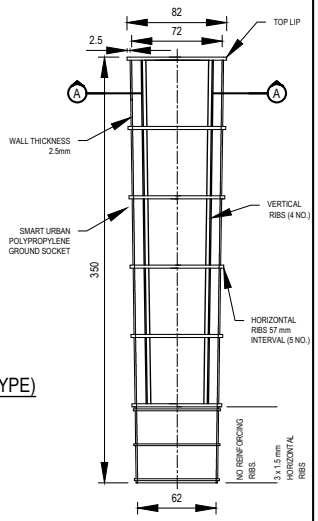
SECTIONAL ELEVATION
FOOTING



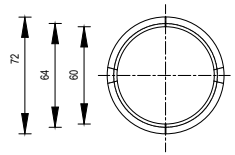
SECTIONAL ELEVATION
WEDGE (SMART URBAN TYPE)



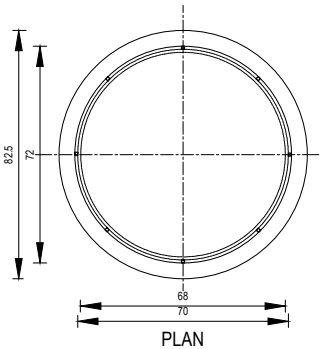
SECTION A-A



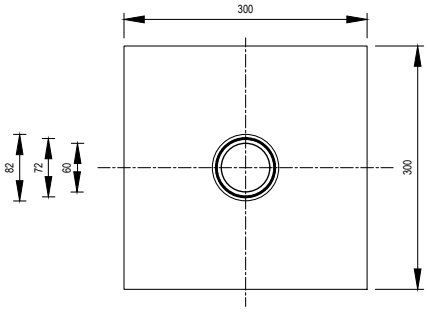
ELEVATION
SOCKET (SMART URBAN TYPE)



PLAN



PLAN



PLAN
(SEE NOTE 8)

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE
2.	20mm DIA DRAINAGE HOLE ADDED. CHANGE AUSPOSTS TO SMART URBAN AMENDED.	T. FREEMAN 06/05/14
3.	TITLE BLOCK AND FONT UPDATED. MOVED NOTES TO TITLEBLOCK.	C. Mariano 3/11/23

NOTES

1. SMART URBAN REMOVABLE BOLLARDS TO BE INSTALLED TO MANUFACTURER'S SPECIFICATIONS AND THIS DRAWING.
2. HEIGHT OF BOLLARD TO BE 900 mm ABOVE FINISHED ROAD LEVEL UNLESS OTHERWISE SPECIFIED IN THE DESIGN DRAWINGS.
3. THE SPACING OF BOLLARDS SHOULD BE IN ACCORDANCE WITH THE DESIGN DRAWINGS
4. THE SOCKETS SHOULD BE CAPPED WHEN NOT USED.
5. BOLLARDS AND METAL CAPS SHALL BE COVERED WITH EXTERIOR GRADE LEAD FREE POLYESTER POWDER COAT.
6. THE FINISHED COLOUR AND SPECULAR GLOSS VALUE SHALL BE EQUIVALENT TO GOLDEN YELLOW Y14 AS SPECIFIED IN AS2700.
7. ALL DIMENSIONS IN MILLIMETERS.
8. AS AN ALTERNATIVE TO THE 300X300X400 mm DEEP CONCRETE FOOTING, THE FOOTING MAY BE BORED USING A 350 mm DIA. AUGER TO GIVE CYLINDRICAL 400 mm DEEP FOOTING

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mainroads
WESTERN AUSTRALIA

PLANNING AND TECHNICAL SERVICES DIRECTORATE
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DRAWN	SOORI K. KASIRI	29/04/14
DESIGNED	SOORI K. KASIRI	29/04/14
VERIFIED	D. LANDMARK	26/06/08
APPROVED	R. GROVE	26/06/08
FILE NO.	13/4330	

SCALES N.T.S
A3

STANDARD DRAWING
REMOVABLE BOLLARDS
FOR USE ON ROADS UP TO 110 km/h

MRWA DRAWING NUMBER AMENDMENT
200831-0014-3