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## PROTECTION BOLLARDS- 02 Stainless steel

From repetition to resilience

# 02

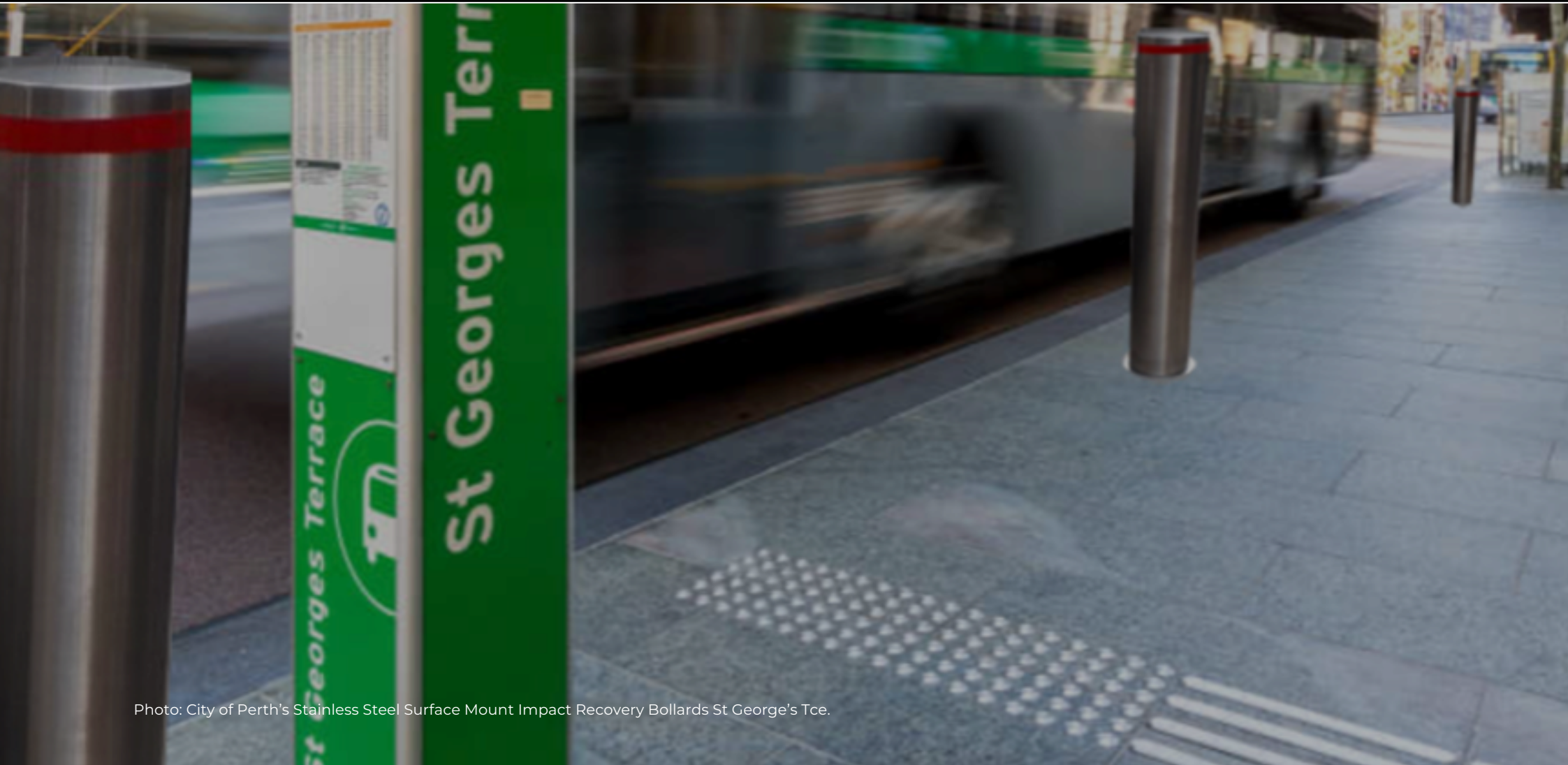


Photo: City of Perth's Stainless Steel Surface Mount Impact Recovery Bollards St George's Tce.



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## Protection Bollards

### 02 Stainless steel

Unless you incorporate some form of shock absorbing mechanism the bollard and footing will need replacing every time

It's time to move from repetition **to resilience**

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## Our approach

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Bollards can be secured using the In-ground or Surface Mount Impact Recovery System making footings and bollard re-usable following impact

### deflect

Two extremely durable shock absorbing Impact Recovery Rings absorb vehicle impact enabling bollard to deflect up to 20 degrees and self-recover.

### protect

A Heavy Duty steel resistance core is used to prevent bollard from deflecting beyond twenty degrees.

If a truck or utility vehicle pushes it beyond twenty degrees, the resistance core can bend and need replacing.

### recover

The damaged resistance core is removed using ergonomic tools and replaced. The same bollard is reinstated on the same footing impact after impact. Bollard, ground socket, taper, footing and Rings are reusable.

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## deflect

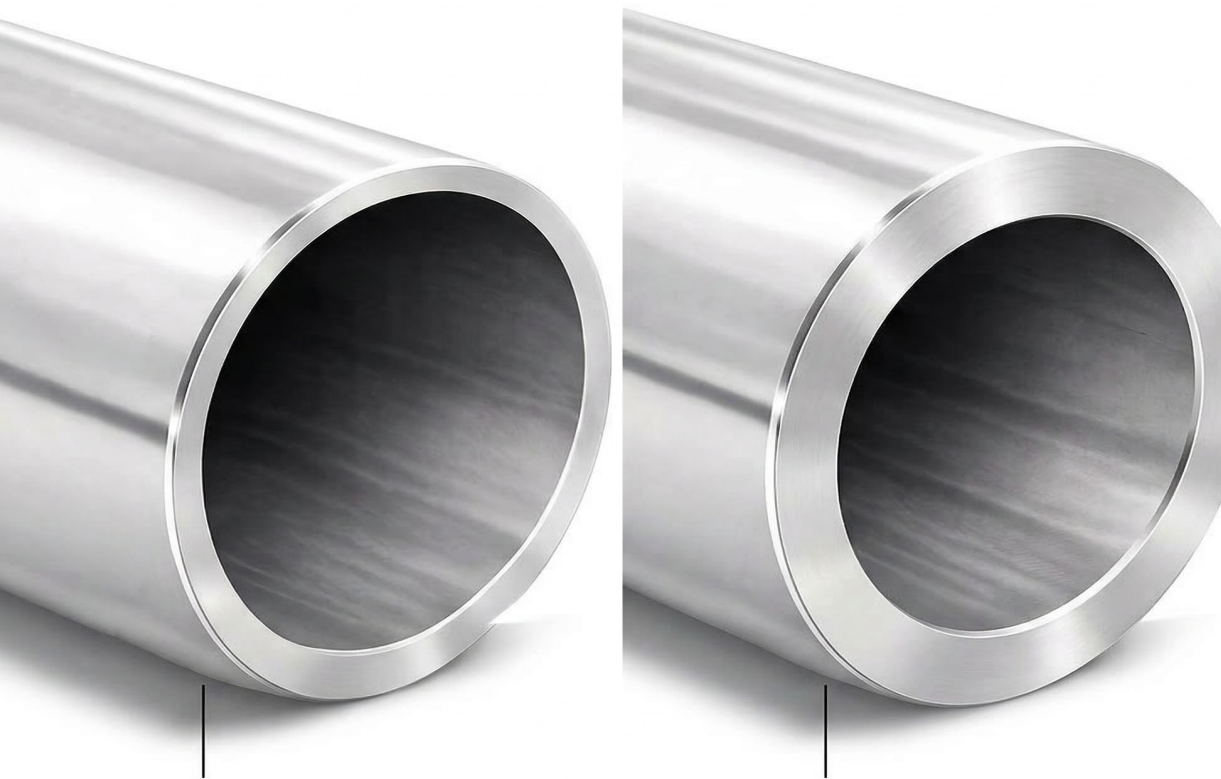
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Two extremely durable shock absorbing Impact Recovery Rings absorb vehicle impact enabling the bollard to deflect up to 20 degrees and self-recover following multiple impacts.

Unlike springs- The Impact Recovery Rings are made from an advanced urethane and rubber compound that is designed to self-recover hundreds of times with no diminished capacity following multiple impacts

The material slowly decompresses- allowing bollards to slowly return to upright (not spring back as this creates dangerous litigation risks)





Heavy Duty Resistance Core

Extra Heavy-duty Resistance Core

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## protect

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A Heavy Duty steel resistance core is used to prevent bollard from deflecting beyond twenty degrees.

The bollard is secured using a heavy Duty Resistance Core. It is the Impact Recovery Rings that take the initial impact and if the vehicle continues to propel forward the force is transferred to the internal Resistance Core which can bend and need replacing (sacrificial

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

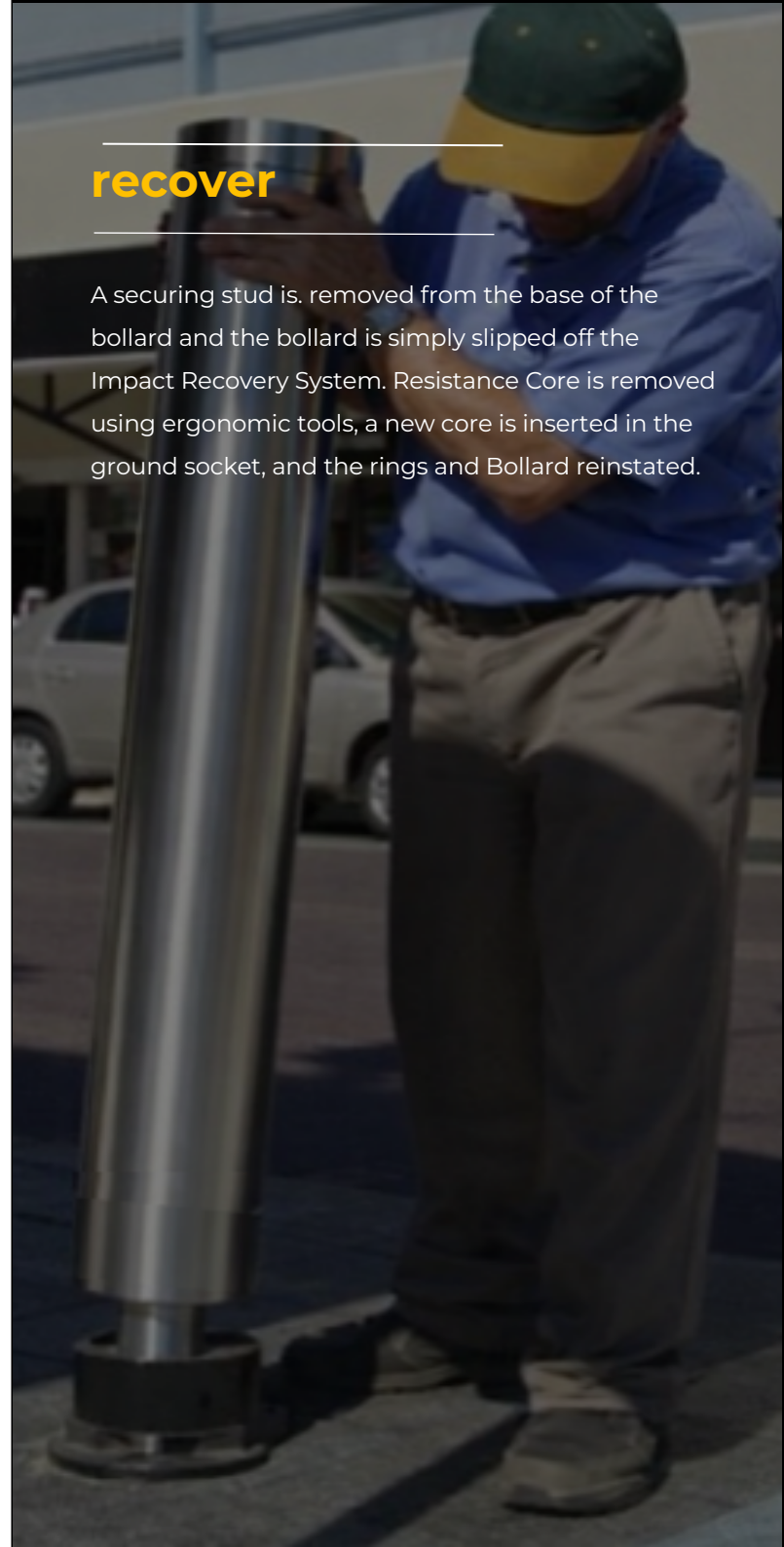
This reduces maintenance in zones subject to impact from utility vehicles and trucks. NB: You must weigh up the extra damage to vehicles against the benefit of reduced maintenance.



Bollard simply slips off the Impact Recovery System

## recover

A securing stud is removed from the base of the bollard and the bollard is simply slipped off the Impact Recovery System. Resistance Core is removed using ergonomic tools, a new core is inserted in the ground socket, and the rings and Bollard reinstated.



When impacted  
**something's got to give!**



## 4 levels of protection

4 levels of protection to protect people and assets,  
protect bollards and surrounding foundations

### 1. Heavy Duty **resistance core**

Unlike spring-loaded bollards that can over-flex, the heavy-duty resistance core restricts bollard deflection to approximately 20 degrees under low-speed passenger vehicle impact. For higher-risk zones and areas subject to utility vehicle impact, the 650 mm depth IRS can be upgraded to an Extra Heavy Duty resistance core to further reduce the risk of bending

## 2. 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 multiple impacts, greatly improving energy absorption, safety and resilience



## 3. Durable **Bollard casing**

A Heavy-duty impact resistant stainless-steel pipe bollard casing provides an impact resistant surface, designed to last and continue looking good. Under mild inland conditions, stainless bollards may last for decades. In coastal or high-salt environments, **316 stainless steel** is generally recommended for improved corrosion resistance and longer aesthetic life.



## 4. Zero Waste **foundations:**

ZERO WASTE Inground Foundations are made from Advanced Polymers that protect the surrounding foundations when a bollard is impacted and continue working following multiple low and high speed impacts. Surface Mount are made from heavy duty base plate that is highly resilient to impact and with the sacrificial resistance core taking the brunt of the impact- the base plate becomes reusable following even severe impact.



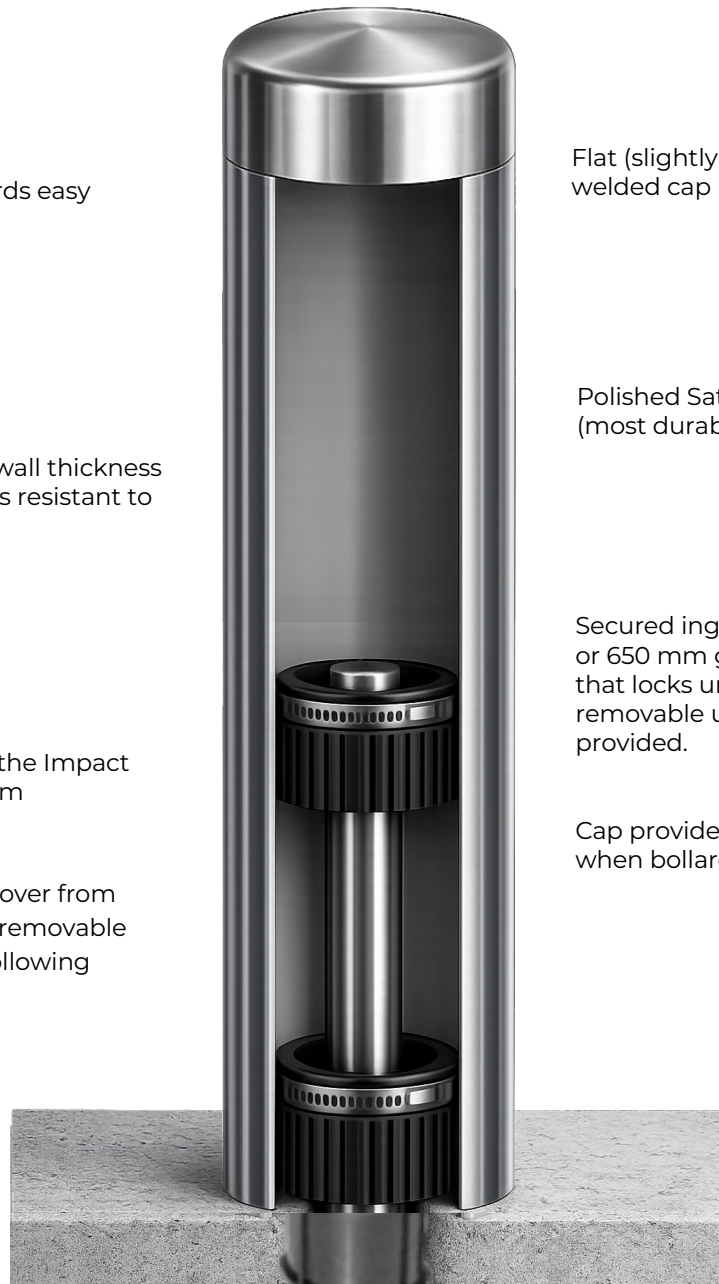
# In-ground Impact Recovery Bollard

Quality Bollards easy to install and maintain

Heavy 3.6 mm wall thickness Bollard casing is resistant to impact

Secured using the Impact Recovery System

Bollards self-recover from low impact, are removable and re-usable following severe impact



Flat (slightly domed) welded cap

Polished Satin finish (most durable finish)

Secured inground using 350 or 650 mm ground socket that locks units in- only removable using tools provided.

Cap provided to cover socket when bollard is removed.

# Surface Mount Impact Recovery Bollard

Quality Bollards easy to install and maintain

Heavy 3.6 mm wall thickness Bollard casing is resistant to impact

Secured using the Impact Recovery System

Bollards self-recover from low impact, are removable and re-usable following severe impact

Flat (slightly domed) welded cap

Polished Satin finish (most durable finish)

Secured on Re-usable Heavy Duty 10 mm thick x 300 mm diameter Stainless steel Base Plate

5 evenly spaced recessed High quality concrete anchors to evenly distribute energy reducing risk of damage



# Advanced engineering overcomes these problems



## **Bollards self-recover**

Upon low-speed impact bollards absorb the impact force and slowly self-recover and are removable and reusable following severe impact



## **No damage to footings**

ZERO WASTE Foundations remain in good working condition following both low and high speed impact. Base plates are reusable following impact



## **Bollards Impact Resistant**

ZERO Bollards are made from Australian heavy-duty materials designed to withstand impact, remaining in good condition



## **Superior protection**

Unlike flexible bollards that can over-flex, the strong resistance core provides superior protection against errant vehicles, greatly improving safety



## **Bollard re-usable**

Both surface mount and Inground bollards are removable and reusable following severe impact, saving thousands over the life of a development



## **Footings reusable**

ZERO WASTE foundations remain in pristine condition and surface mount base plates are reusable following severe impact, saving thousands



## **Simple replacements**

Bollards are low cost to maintain. If damaged, they are removed and replaced in less than 5 minutes without the need for digging or heavy labour.



## **Impact resistant base plate**

With square base plates the impact force is concentrated on one anchor- with heavy duty round base plates the impact force is evenly distributed, reducing the risk of damage



Option	Resilience	Likely Impact Response	Key Benefits
<b>Tube – Surface Mount</b>	<b>Low around 1-3 km/h</b>	Tube is 1.3 mm thick and will easily bend or deform upon vehicle impact.	Not suitable for bollard subject to impact. Decorative or indoor only.
<b>Tube – In-Ground</b>	<b>Low around 1-3 km/h</b>	Tube may bend or fold under impact. (Refer to image on back page)	Not suitable for bollard subject to impact. Decorative only.
<b>Pipe – Surface Mount</b>	<b>Med around 5-8 km/h</b>	Depending upon weight of base plate (we use Heavy duty to increase resistance)	Easier retrofit than in-ground, strong visual presence, easier replacement than direct-set
<b>Pipe – In-Ground</b>	<b>Med around 8-12 km/h</b>	Bollard better withstands impact, but force is transferred into footing and surrounding pavement	Strongest rigid asset protection and can be concrete filled- although costly to maintain
<b>Pipe – SM IRS</b>	<b>High 10-16km/h</b>	Impact Rings absorb initial impact energy then resistance core which bends with continued force	Reusable mounting system, easier install and replacement
<b>Pipe – IG IRS 350</b>	<b>Very High 12-18 km/h</b>	Impact Rings absorb initial impact energy then resistance core which bends with continued force	Strong balance of resilience, maintainability and easier reinstatement; suitable for asphalt and standard concrete footing areas
<b>Pipe – IG IRS 650</b>	<b>Very High 15-22 km/h</b>	Better suited to repeated or heavier accidental impacts; reduced risk of bollard and footing damage	Greater embedment for more demanding locations, easier replacement, reduced maintenance
<b>Pipe – IG IRS 650 XHD</b>	<b>Extreme 18-28 km/h</b>	Most resilient option in the range; impact recovery system minimises damage to bollard and footing in severe service conditions	Highest level of resilience and durability, best for repeated strikes and tougher environments

\*Speeds are indicative only. Assumes typical 45° impact from 1800kg passenger vehicle. Failure defined as permanent bollard bend or footing disruption or IRS Resistance Core yield (assuming footings are installed according to Directions provided).

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**ZERO CIVIL**  
ADVANCED ZERO WASTE TECHNOLOGIES

**ZEROCIVIL**

