ROADSIDE

SERVICES AND SOLUTIONS

ARMOUR SECURITY BOLLARD

PRODUCT MANUAL

"Creating a **safer environment**"™

Our shared vision

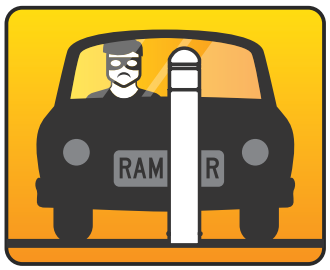
Wherever possible, Roadside Services and Solutions chooses suppliers who share our vision and embrace sustainability. This is why Roadside is proud to partner with global companies like 3M which is renowned for its commitment to the environment and is the sole supplier to Roadside of sign sheeting and pavement marking solutions.

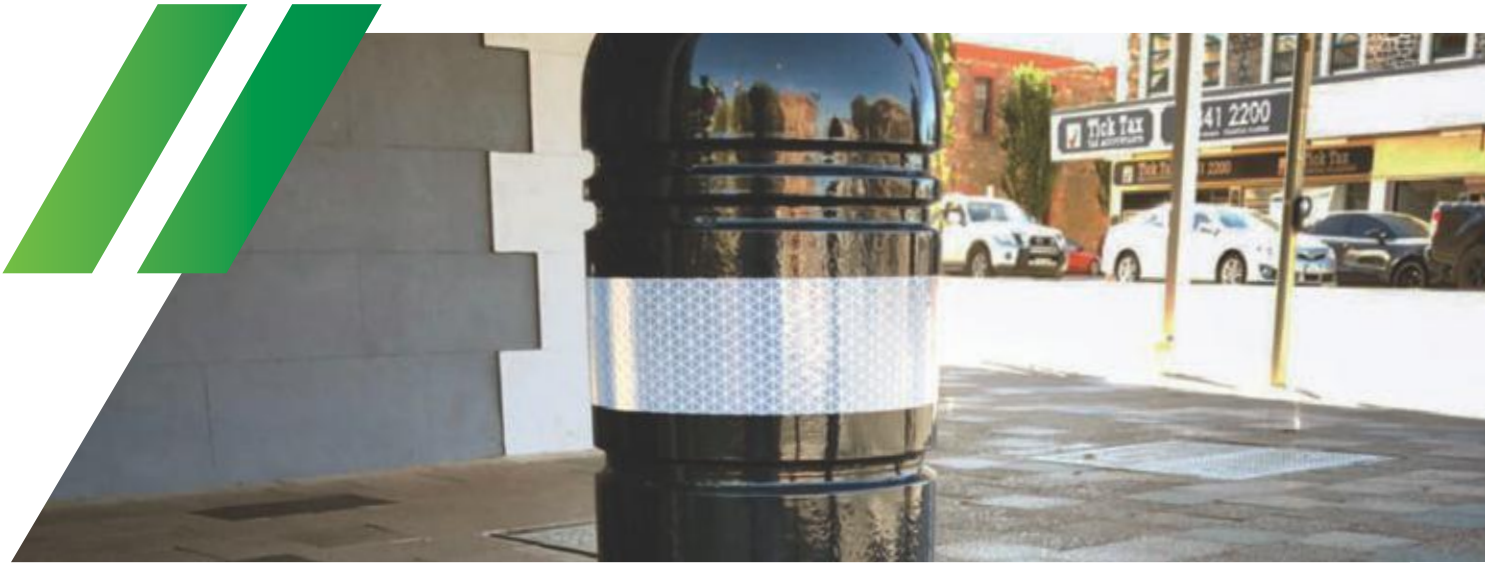
Armour Security Bollard - ASB product manual

Armour Security Bollards are designed to protect shop fronts and assets without impeding pedestrian access and flow.

The Armour Security Bollard can be utilised for numerous applications where the speed limit and risk is low but the need to protect is deemed high. It is a non-deforming bollard ideally suited to protect carparks, hospitals, shopfronts, auto tellers, work zones and many other areas where vehicle impacts are likely due to driver error or negligence. They can also assist in keeping infrastructure and facilities safe from deliberate actions by drivers.

This product is in a series of products being offered by Roadside Services and Solutions designed to be applied to improve national road safety. The product has been carefully researched, tested and its engineering design has been applied across a number of systems to ensure its crash testing capability. This product has been designed to protect the most vulnerable road user, namely a pedestrian, and assets such as buildings, poles, parks etc.





NDB NON-DEFORMING BOLLARD

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1. Introductory notes

It is important to know the Armour Security Bollards cannot be installed within 5 metres from a roadside curb as is clearly outlined in "Guide to Road Design Part 6: Roadside Design, Safety and Barriers". An energy absorbing bollard is required for these installations. See Roadside Services and Solutions EAB (Energy Absorbing Bollards).

The Armour Security bollard will stop a 1100kg vehicle travelling at 60km/h. It is designed to be a non-gating safety barrier with a total penetration distance of 300mm from the bollard's original installation point of reference.

The Armour Security bollard is designed to be installed in rows with a gap of 1.4 metres measured between the centre of each bollard.

2. System overview

The Armour Security Bollard (ASB) is a rigid non-deforming bollard. It is a non-gating vehicle security barrier that has been tested to withstand the impact of vehicles weighing 1100kg travelling at speeds of up to 60km/h.

3. Function

The ASB can be used to protect outdoor dining areas, buildings, road assets and as a perimeter barrier system to a specific protected zone. This non-gating barrier system will fully arrest an errant vehicle's kinetic energy and bring it to a complete stop.

The ASB can be installed in a row with 1400mm distance between each bollard centre or it can be installed as a single unit protecting a specific zone or asset. Risk assessment is mandatory to ascertain the functionality of the ASB for the area and zones it will protect. Furthermore ascertaining the average operating speeds of vehicles in the area is also imperative.

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4. Preparation

Before any attempt is made to begin the installation of an ASB, it is important to read and fully understand the installation instructions. This will ensure correct installation and minimise possible errors which can compromise the performance of the ASB. Before soil excavation begins, it is critical to locate all underground services.

A plan / plans of the underground services can be obtained from Dial Before You Dig. Using the plans and an experienced locator, all underground services (gas pipes, phone cables and water pipes) must be clearly marked on the surface of the road / footpath where the work will be undertaken. Water jets and vacuum trucks are the preferred method for excavation. An auger could cause extensive damage to the underground services if not detected before works start.

DIAL BEFORE YOU DIG
www.1100.com.au
The Essential First Step.

While underground infrastructure plans supplied from Dial Before you Dig provide the best available public information, the risk of unidentified services not marked on the plans is a reality.

Therefore, extra care must be taken when excavating for the installation of ASB.

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5. Tools required and mandatory PPE

The following tools are typically required, although in some locations this may change, depending on the circumstances.

- High water pressure jet / vacuum truck
- Auger or digging tools
- Spirit level
- String line
- Road marking paint
- 1/2 Besser block or high density foam block
- 32MPa concrete
- Crowbar
- Shovel
- Broom

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6. Installation instructions

ITEM	ACTIVITY	ACCEPTANCE CRITERIA	PICTURE
1	Preparation	Before soil excavation begins, locate all underground services. The underground services plans can be obtained from Dial Before You Dig. An experienced locator will identify all underground services (gas pipes, phone cables, water pipes, etc) from the plan and clearly mark these on the surface of the road or footpath. Water jets and vacuum trucks are preferred for excavation, rather than an auger which could cause extensive damage to obscured underground services. Correct PPE must be worn at all times during the installation. Refer to SWMS.	DIAL BEFORE YOU DIG www.1100.com.au The Essential First Step.
2	Site preparation	Mark out where the hole centres are to be dug or excavated. Follow the site design. NOTE: It is recommended spacing be 600mm from the curbing, this may vary slightly depending on the job requirements.	
3	Site preparation	If installing a line of bollards, use a string line to check the bollards are in a straight line. NOTE: Ensure the ITP has been checked for the correct locator to avoid hitting any services.	
4	Dig holes Use water jet vacuum truck or auger	Excavate a 600mm deep x 450mm diameter wide hole. NOTE: If using machinery refer to the SWMS for the safe operating procedure. NOTE: Water jet and vacuum truck are the preferred method for excavation, rather than an auger which could cause extensive damage to the obscured underground services.	
5	Position reo cage	Insert the reo cage into ground. Place the EAB20 bollard in to the centre of the cage. Use a spirit level to ensure the bollard is level. Pour concrete into the space surrounding the reo and bollard. NOTE: Concrete should be 32Mpa strength concrete at a 70mm slump mix.	
6	Position bollard	Use a spirit level to ensure the bollard is correctly positioned.	

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6. Installation instructions

ITEM	ACTIVITY	ACCEPTANCE CRITERIA	PICTURE
7	**Pour concrete**	Fill the remainder of the hole with a minimum 32MPa strength concrete. NOTE: If the cartridge is to be covered with concrete or asphalt, the covering depth must not exceed a depth of 30mm. The cartridge may be covered with non bonded pavers to a depth of 50mm.	
8	**Replace pavement**	Finish by screeding the concrete surface and if applicable replace pavers around the installed bollard.	
9	**Finish**	Clean and sweep up any excess dirt or debris from the site.	
10	**Ensure**	Installers complete the Roadside EAB Registration Form and email it to: roadside@rss.net.au	

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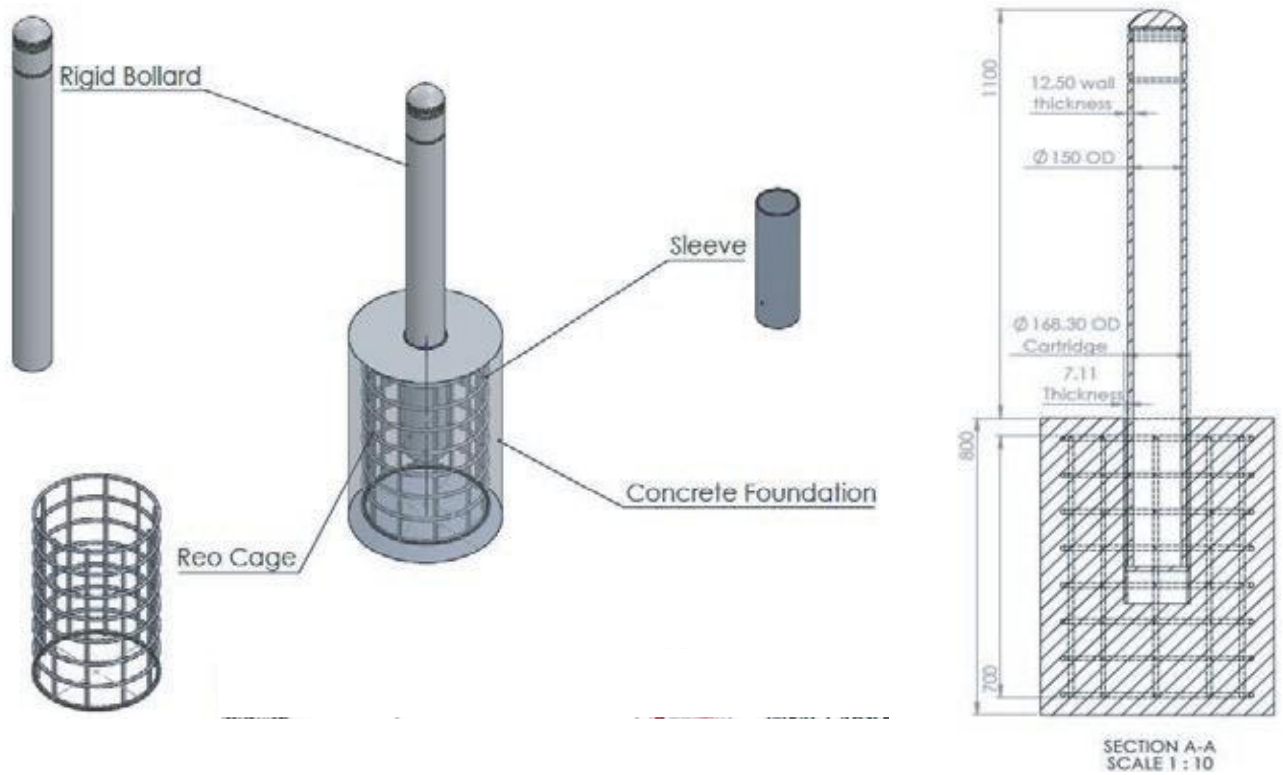
7. Main components and dimensions



ASB weights and dimensions

	Bollard shaft	Sleeve	Reo cage	
Diameter	152mm	168.3mm	500mm	
Length	1450mm	500mm	700mm	
Weight	67.5kg	10kg	30kg	

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8. Repair and maintenance

In the event an out-of-control vehicle hits the Armour Security Bollard (ASB), it is important to visually examine damage at the earliest opportunity. Damaged paintwork is usually a sign the ASB has been hit.

8.1

Next step is to examine damage to the foundation and below the surface around the sleeve of the ASB. A bend will mean there has been significant damage to the bollard.

8.2

The bollard needs to be removed from the sleeve and the foundation needs to be removed and repaired.

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9. Notes

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