Innovate to zero

ZERO WASTE is now possible. 80% of your workload comes from the 20% most vulnerable items. By replacing all damaged foundations with ZERO WASTE Foundations you can reduce waste (costs and risks) by 80% in as little as 2 to 3 years. You are building our future. **By 2050 your city will be fully sustainable, or not, it's up to you.**

WE CARE FOR YOU

WE CARE FOR THE ENVIRONMENT

WE ARE BUILDING A BETTER FUTURE

ZERO CIVIL

ADVANCED ZERO WASTE TECHNOLOGIES

DIRECTIONS

UNIT INCLUDES

- Ground Socket
- Self -locking Taper
- Self-drilling screws
- Cap

TOOLS

Installation Tool
(Taper is positioned on tool so that the tool does NOT lock in and can be repositioned to install 150, 350 or 650 mm units)

Removal Tool
Used to lever out damaged items from a standing position

Foot Removal Tool
Used to remove modified* items & flattened posts

WHAT'S THE CHAIN FOR?

If a post sheers off, the chain link is used to remove the post from the socket. The triangular head is place inside the post (and twisted until sharp edges grab onto internal walls of post) the chain is hooked over the pin on top of the tool and the tool is then used, as usual, to remove the item from the ground socket.

*** MODIFIED ITEMS**

Taper can be moved up post by 10-20 mm to make item removable by hand. Alternatively, a pin can be inserted near the base of an item (like café tables) to enable removal of items using the simple foot tool.

YOU WILL NEED

- Installation Tool
- Small amount of rubble
- Concrete 30MPa +
- Spirit Level
- Drill (or screwdriver)
- 10 mm screwdriver drill bit
- Ground Socket & cap
- Pigment to colour concrete

IMPORTANT

Concrete must be 30MPa or greater to be impact resistant. Ground sockets must be installed flush with ground level with 150 mm of quality 30MPa concrete on all sides to protect surrounding paving from damage when items are badly impacted. Rapid set is NOT impact-resistant /grout is too flexible and will not last 100 years. Colour concrete to suit surrounding paving or foundations.

IMPORTANT: TAPER MUST BE ATTACHED USING SCREWS

If Taper is not attached to item using screws provided **items will NOT be removable from ground socket** Taper must be attached at exact level (5mm alters locking capacity by around 200kgf). IE: Move Taper up post to 370mm and item is removable by hand (no tools required)

IMPORTANT: TAPER MUST BE FLUSH

With top of socket (ground level). This ensures taper is re-usable following impact and item is locked in sufficiently.

NO SIZE OR WEIGHT LIMITATIONS

Theres is no limit to the size or weight item you can install using the ZERO WASTE Foundations. Install bins, seating, tables, barriers, signage, shopfront bollards, large diameter bollards (using Impact Recovery System), and use our new impact absorbing foundations for large items such as traffic light columns and impact absorbing bollards designed to withstand high speed impact.

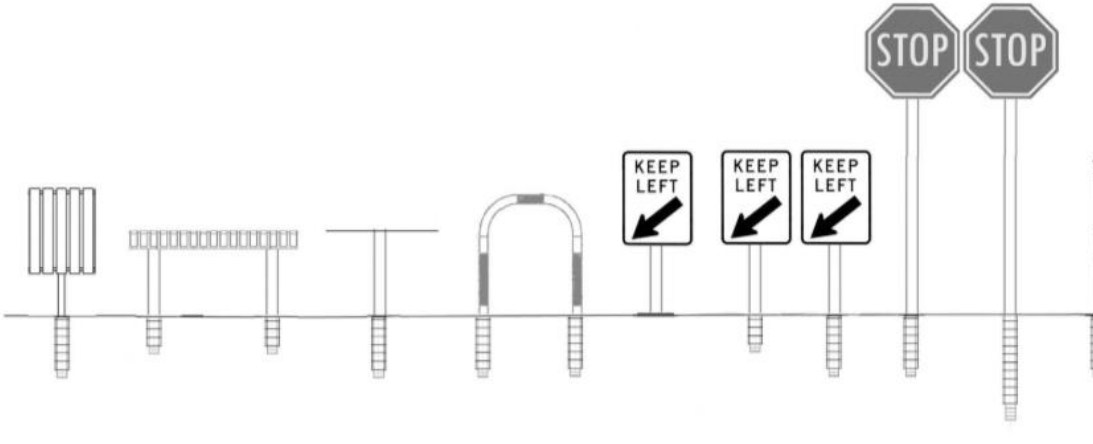
FOOTING MUST BE LARGE ENOUGH TO NOT BE DISLODGED

For the footing to be reusable you must ensure it is large enough that it is not dislodged when items are impacted. You may need a little more concrete to ensure it will last 100 years and will not need replacing during this time.

The size footing depends on soil conditions, strength of post, size of item, wind conditions and many other factors. Refer to local guidelines as soil conditions change from region to region.

We suggest

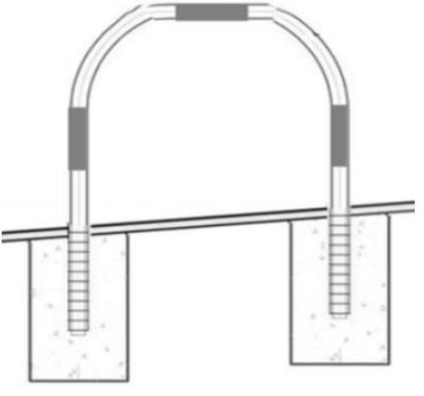
- 150 mm depth x 150 mm min diameter in solid concrete
- 350 mm depth x 300 mm in diameter in all other locations
- 650 mm depth x 300 mm in diameter for bollards subject to high impact or large items like football posts



DRAINAGE

If you want your sockets to drain of any water, simply pierce hole in base (weak spot provided) using screwdriver or drill, and place rubble beneath socket to allow drainage.

ITEMS WITH MULTIPLE LEGS



Socket is installed flush with surface and must be completely encased in concrete. If ground is uneven install both sockets flush with ground level.

Place item in sockets and mark on each leg where to attach Taper so it finishes flush with top of ground socket.

Remove item, attach Taper using self-drilling screws and drop item in socket. Tap item down firmly until taper finishes flush with ground level. Socket should NOT protrude from ground level.

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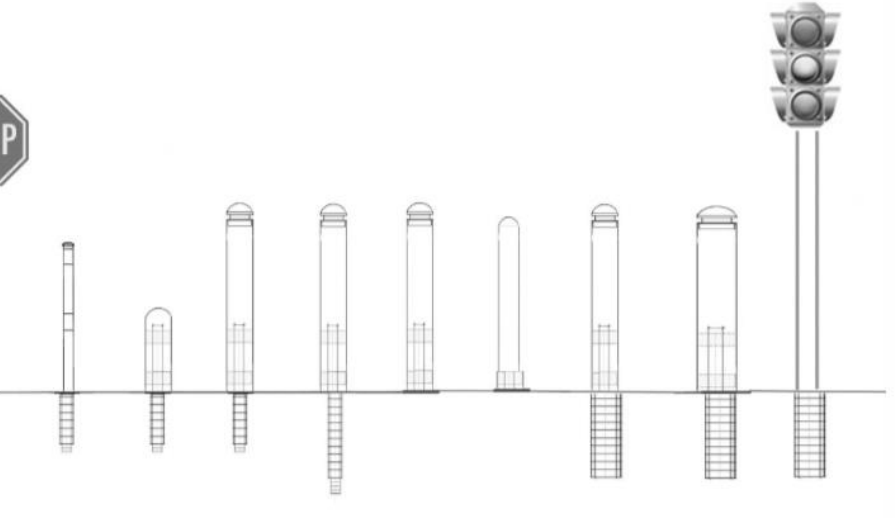


PAVED AREAS /ASPHALT

Ground Socket is installed flush with surface and for paved areas ground socket must be completely encased in a min of 150 mm of quality 30Mpa concrete on all sides to protect paving from damage (asphalt can be poured up to socket to create perfect finish)

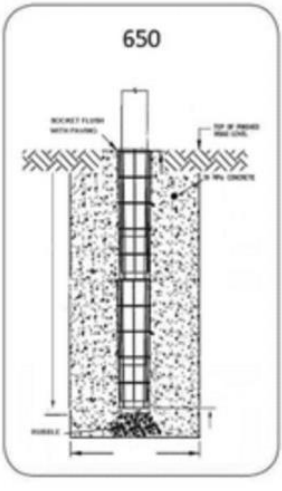
Remove pavers or core drill, ensuring ground socket finishes level with road or footpath with a **minimum of 150 mm solid 30 MPA concrete ion all sides** of ground socket (DO NOT USE flexible grout or rapid set) to protect surrounding paving from damage when items are impacted and fold flat.

NB: Make sure you install caps before spraying asphalt or any time before items are installed to avoid grit entering socket.

SOLID EXISTING FOUNDATION

Such as asphalt carpark/ solid concrete footpath or traffic island min 200 mm thick. Ground Socket is installed flush with surface and must be completely encased in a **minimum of 150 mm solid 30 MPA concrete ion all sides** to protect brick paving from damage when items are impacted.

Core drill hole large enough to fit socket and fill gap with quality concrete to secure ground socket to existing foundation. We recommend 150 mm - 350 mm ground sockets (650 mm is not necessary in solid concrete footpaths or foundations unless installing Extra Heavy-duty Impact Recovery System)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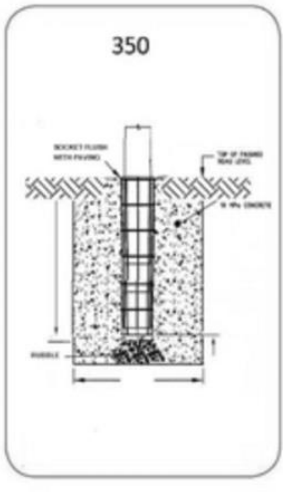
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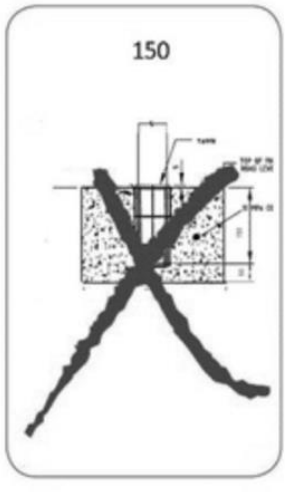
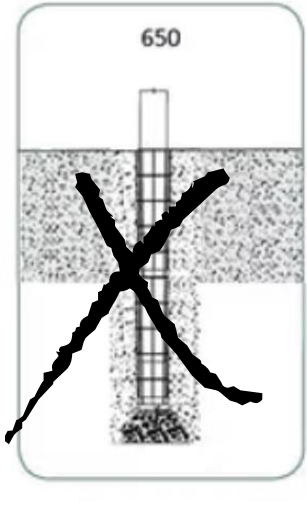

150


300 MM
300 MM
PLAN


300 MM
300 MM
PLAN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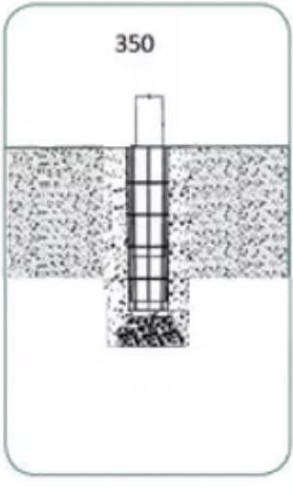
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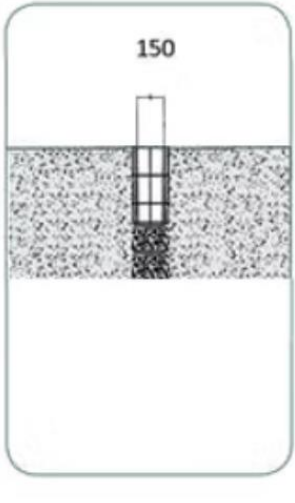
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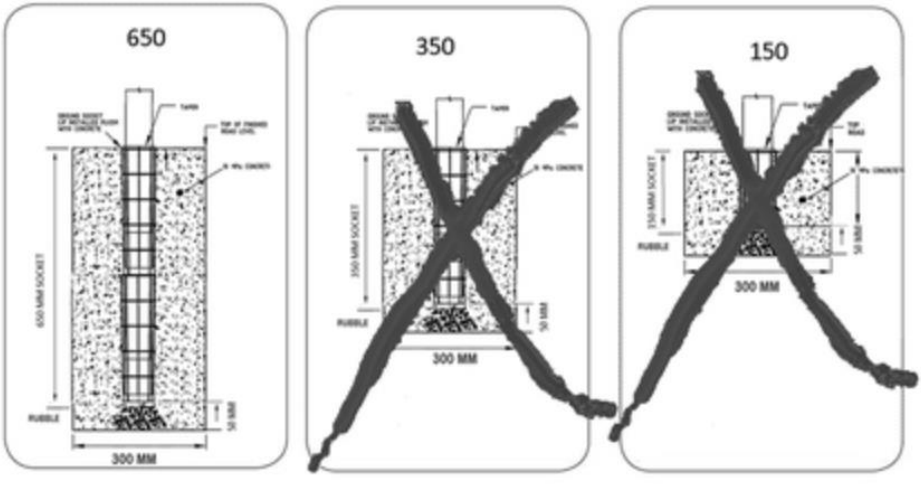
FREE-STANDING ITEMS - SOIL

Socket is installed flush with surface and must be completely encased in concrete. When installing items directly in soil you need a large footing, so it is more imperative than ever that you make the concrete reusable.

NB: Socket does not alter the size concrete footing required- it is simply a protective shield to make the concrete footing re-usable.

We recommend you install a 700 mm deep (minimum 50 mm beneath socket) We suggest increasing depth to 650 mm for bollards likely to be impacted by trucks or heavy vehicles x 400 mm square foundation to provide stability and ensure against dislodgement when bollard is impacted. In sandy soil you may need to reinforce the footing using a cage.

Remember these footings will last 100 years if installed correctly, so a little more concrete is money well spent.


650
650 MM SOCKET
RUBBLE
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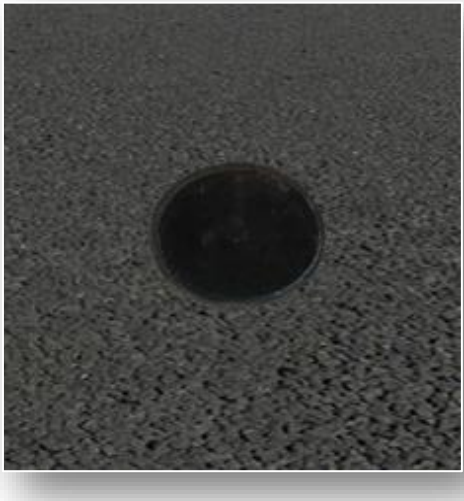
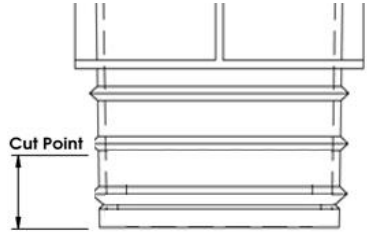


INSTALLATION TOOL – ALTER TO FIT SOCKET

Tools are set to 350 mm depth (with Taper 370 mm from base of tool) for 650 mm sockets move Taper to 670 mm from base of tool and for 150 mm sockets, move Taper to 170 mm from base of tool so that installation tool does not lock in.

EXTENDING DEPTH OF SOCKET

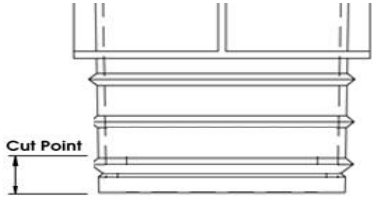
You can increase the depth by 300 mm increments by truncating a ground socket just below the second horizontal rib and inserting it firmly into the top of a complete ground socket



REDUCING DEPTH OF SOCKET

Truncate the ground socket at exactly 150 mm from top lip, (just below the second horizontal ring from the top) remove base of socket just above bottom rib (as shown right), flip base over and insert into the open end of the truncated ground socket.

This provides a tight fit but can be sealed with industrial glue or weld as an extra precaution. NB: You will need to reduce Taper to 140 mm accordingly.



INSTALLING SAFETY BARRIERS

You can install barriers for regular events making them easily removable, re configurable and relocatable. ZERO WASTE Foundations ensure your barriers remain secure, safe and perfectly aligned. This makes installing, maintaining and removing barriers very fast and efficient and greatly improves the strength and safety of your barriers.

INSTALLING BOLLARDS

150 mm Diameter Steel bollards, 168 mm Diameter Stainless steel Bollards or 150 mm Diameter Advanced Polymer Bollards can be installed on the same ZERO WASTE foundations using the Impact Recovery System.

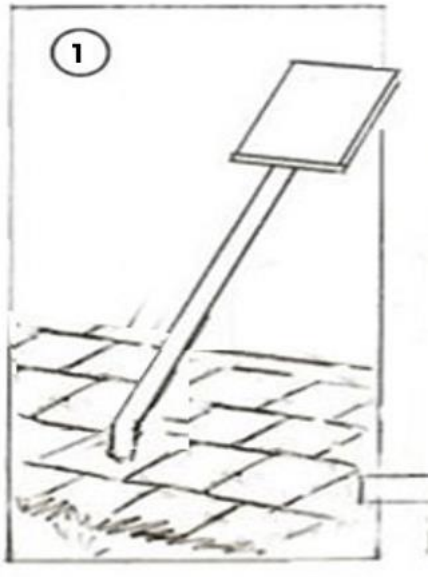
IMPACT RESISTANT

This makes bollards impact resistant and ensures both the bollard and the surrounding foundations re-usable impact after impact, saving thousands over the life of a development.

BOLLARDS & FOOTINGS BECOME RE-USABLE

Bollards remain safe, secure and upright and if badly impacted are replaced in less than 5 minutes. This also means bollards can be installed and removed whenever required and easily relocated.

No more expensive maintenance and no need to throw away a bollard and expensive footings again! (Surface Mount option available)

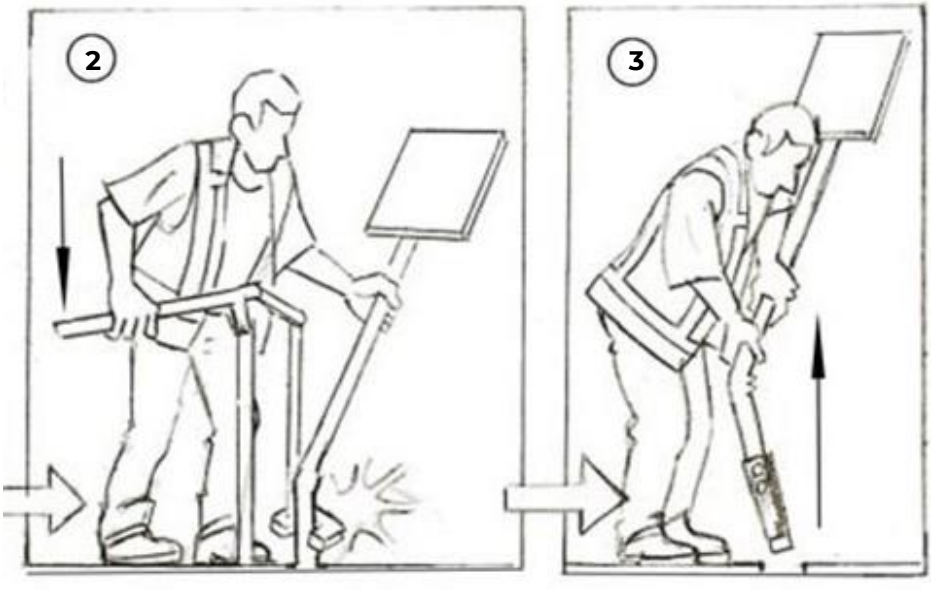


REMOVING ITEMS

1. Place head of removal tool around base of post.

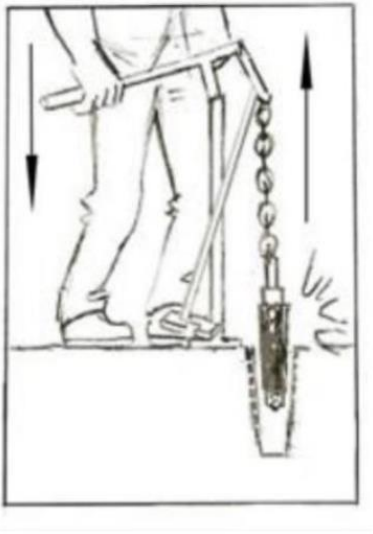
2. Place square base of tool very close to post and apply quick jerking pressure to the extended arm to remove item from ground socket.

   NB: You can place foot on base to stabilise and provide added friction. If tool is not gripping it may need sharpening



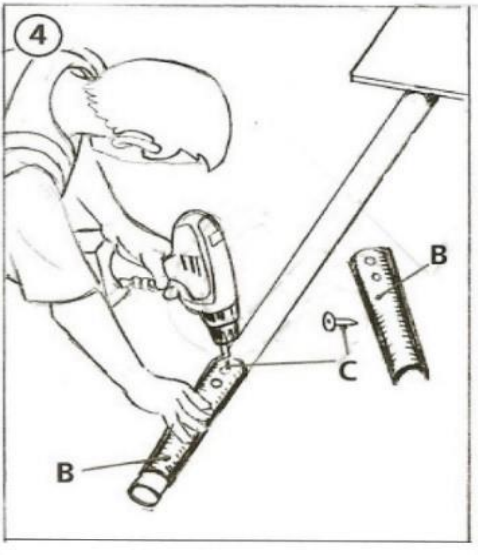
REMOVING FLATTENED POSTS

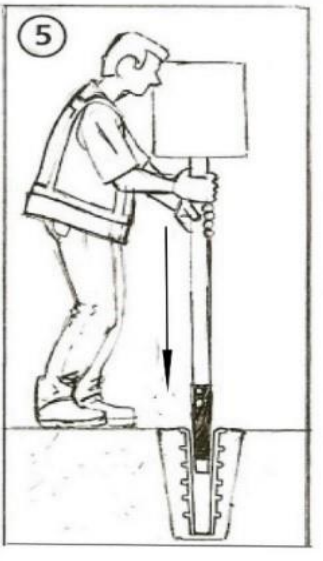
If post is flattened, slip base of removal tool under the flattened post (or foot removal tool) and apply quick jerking action to release taper (only needs to move approx. 1mm to break seal) alternatively use foot tool – or crowbar



REMOVING SHEARED OFF POSTS

Lower triangular head of sheared post removal tool into the socket until it grabs the internal sides of the post. Hook chain link around pin on top of removal tool and use tool as usual to remove the post. (Head must be sharpened if tool is used regularly)





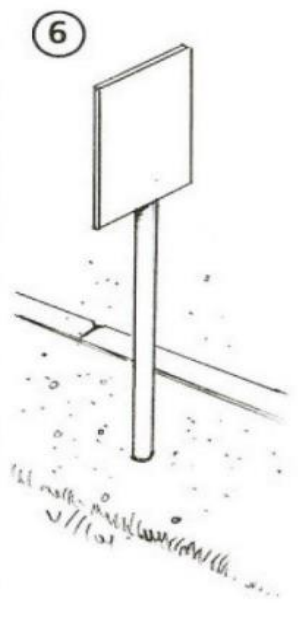
INSTALLING ITEM

1. Attach Taper to post using Phillips drive and self-drilling screws supplied. Best to pre-drill posts 2.9 + wall thickness

- 140 mm from base for 150 mm socket
- 340 mm from base for 350 mm socket
- 640 mm from base for 650 mm socket

2. Item is simply dropped firmly into ground socket

3. Tap down firmly until taper finishes flush with ground level



INSTALLING BOLLARDS

We have a range of bollards designed to withstand impact.

Heavy duty Australian made Steel Bollards galvanised, primed and quality powder coated; Australian made Stainless Steel Bollards made from heavy duty pipe (to withstand impact) and polished to nice Satin finish; and Advanced Polymer (non-conductive) Bollards (Western Power Approved/ Dept of Transport Approved) designed to withstand Australian conditions (UV Stabilised) and highly resilient (also impact resistant)

STEEL BOLLARD

Australian made 150 NB / 165 mm ⌀ galvanised steel x 1250H quality powder coated safety yellow. MRWA option.

STAINLESS BOLLARD

Australian made 168 mm ⌀ stainless-steel heavy-duty pipe x 1200H with satin finish extremely durable.

We manufacture a range of Advanced Polymer Bollards & Bollard Covers designed to withstand impact.

Bollard covers also available to fit 165 steel bollards (or smaller). Powder coated and Advanced Polymer bollards can be manufactured in almost any colour**- ask for colour chart.**

Reflective striping available. Bollard Covers are heavy duty and extremely durable (Aussie Made) secured using either screws or double-sided padded tape - Directions provided.

POLY BOLLARD

Advanced Polymer bollard 150 mm ⌀ x 1200 (IR) /1800 H (inground) in Safety Yellow smooth finish

POLY BOLLARD COVER

Advanced Polymer bollard cover 190 mm ⌀ x 1250H in Safety Yellow smooth finish.

SURFACE MOUNT IMPACT RECOVERY

Surface Mount footing is sufficient for installation into solid concrete pavements. Footing needs to be sufficient to prevent dislodgement when bollard is impacted.

UNIT INCLUDES

- 2 x Impact Recovery Rings
- 2 x Metal Clamps
- 1 x Steel Resistance Core
- 1 x Securing Stud
- Re-usable Base Plate
- 5 x Flush mounted Concrete Anchors

TOOLS REQUIRED

- Electric Drill
- Screwdriver
- Allen key

You will require hammer drill with masonry drill bits or concrete diamond point screws for drilling into concrete.

INSTALL CORE

Securing stud is installed using Allen key to secure resistance core to base plate

INSTALL BASE PLATE

Install base plate using concrete anchors provided. If installing in new concrete- we suggest using 30 MPa (or greater) and waiting until concrete cures, before installing bollards.

NB: To avoid contracting Silicosis when drilling into concrete, be sure to wear the appropriate personal protection equipment

INSTALL RINGS

Rings are attached to the Internal Resistance Core using clamps provided. Clamps face centre with flat side of ring facing out

INSTALL BOLLARD

Drill hole in bollard to accept 10 mm stud. Bollard is slipped over rings and secured by inserting securing stud beneath bottom ring.

IN-GROUND IMPACT RECOVERY

UNIT INCLUDES

- 2 x Impact Recovery Rings
- 2 x Metal Clamps
- 1 x Steel Resistance Core
- 1 x Securing stud

FOOTINGS

- Ground socket 350 Depth
- Cap

Additional sockets are used to extend depth by 300 mm increments.

TOOLS REQUIRED

- Installation Tool
- Removal Tool
- Allen Key or drill with bit
- Screwdriver or drill with bit

ATTACH RINGS

First ring is attached approx. 20 mm from base- allowing room for securing stud to sit beneath bottom ring

EXTRA HEAVY DUTY

Extra Heavy Duty Resistance Core available for 650 mm footings increasing resistance to bending by another 150%

NB: Protective cuff available to prevent pavement from scuffing.

INSTALL SOCKET

When installing bollards into existing concrete or asphalt foundations you can install sockets 350 mm deep. For free standing bollards or bollards subject to high impact, we suggest 650 mm deep. Refer to ZERO WASTE FOUNDATIONS for details

DROPPED INTO SOCKET

Resistance core is simply dropped into ground socket automatically locking in

INSTALL BOLLARD

Drill hole in bollard to accept 10 mm stud. Bollard is slipped over rings and secured by inserting securing stud beneath bottom ring.

REPLACEMENT CORE

The ONLY replaceable component

1. A Heavy-Duty Resistance core is available for Surface Mount units, with hole drilled and tapped and securing stud installed.
2. A Heavy-Duty Resistance core is available for 350 Depth units with Taper attached.
3. A Heavy-Duty Resistance core is available for 650 Depth units with Taper attached.
4. **An Extra Heavy-Duty Resistance core** is available for 650 Depth units with Taper attached.

REMOVE STUD

Remove securing stud from bollard using Allen key (or security Allen key)

REMOVE BOLLARD

Slip bollard off

REMOVAL TOOL

Place base up against post and apply quick jerking action to leverage arm, to release the lock and allow you to lift the resistance core from the ground socket.

If a post sheers off, the chain link is used to remove the core from the socket. The triangular head is place inside the post (and twisted until sharp edges grab onto internal walls of post) the chain is hooked over the pin on top of the tool and the tool is then used, as usual, to remove the item from the ground socket.

REMOVE CORE

Lever damaged resistance core from socket using tool provided

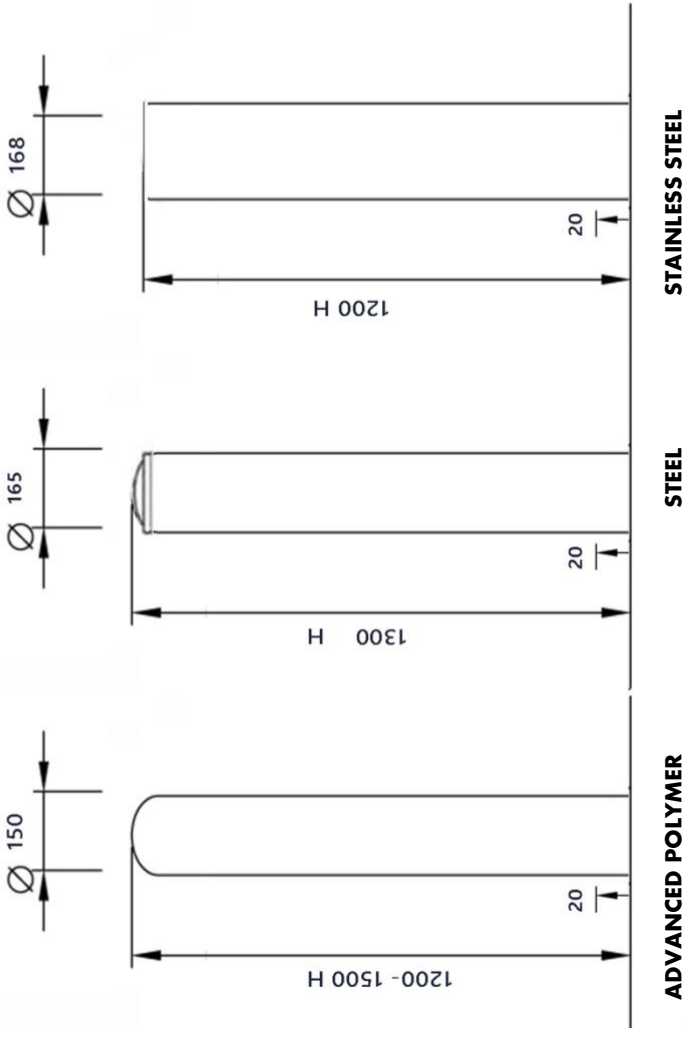
INSTALL BOLLARD

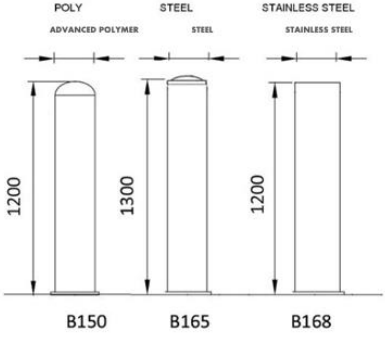
Attach rings to the new core and install the resistance core and then the bollard.

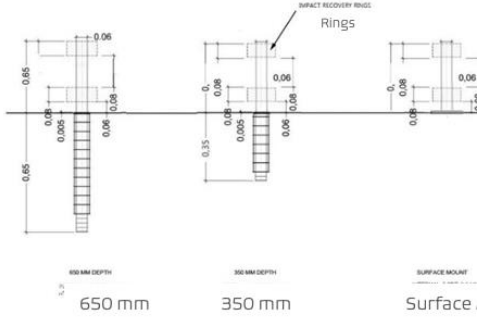
SECURING STUD

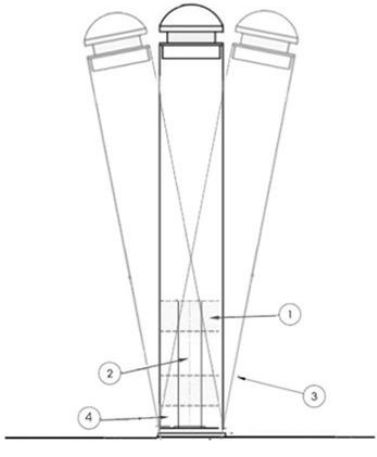
* Hole must be drilled (and tapped) approx. 20 mm from base of bollard to accept 10 mm stud. Advanced Polymer do not need tapping - suggest using 8.5 mm drill bit.

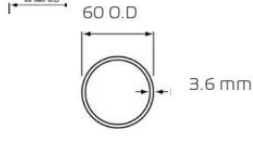
Stud must sit “below” bottom ring- **should not bite into ring.**









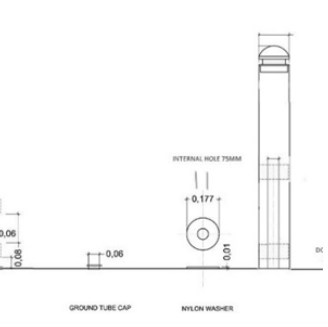


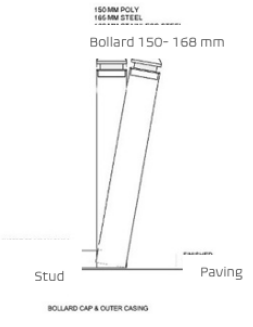
COMPONENTS

1. Impact Recovery Rings
2. Resistance Core*
3. Bollard
4. 10 mm Securing stud

* Internal Resistance Core must be 3.6 mm wall thickness (can increase to 5mm when using 650 mm depth foundations).

NB: Poly protective cuff available to sit below bollard and protect paving from scuffing due to frequent impacts.



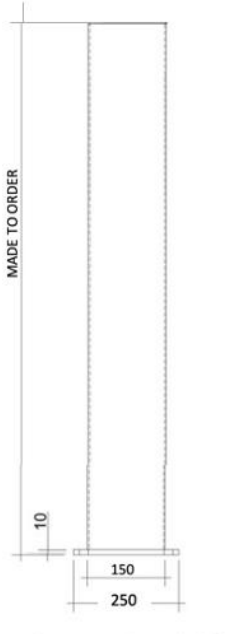


e Mount Cap Protective cuff

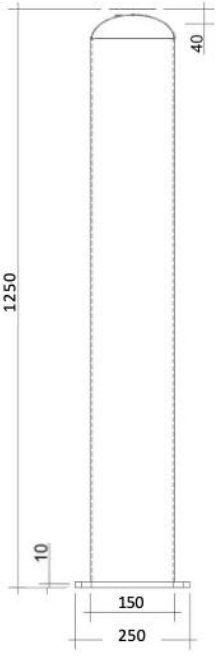
ZERO CIVIL

IMPACT RECOVERY BOLLARDS

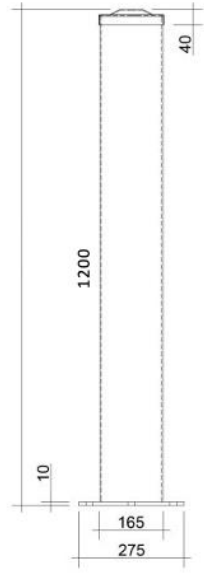
SURFACE MOUNT IMPACT RECOVERY BOLLARDS



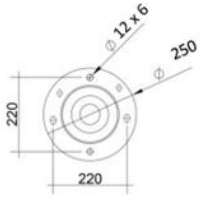
Surface Mount Stainless steel 168 ∅

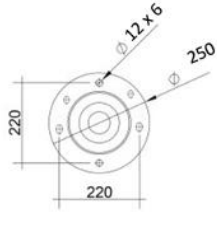


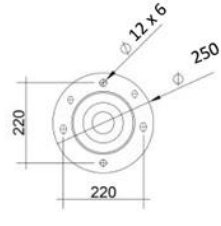
Surface Mount APB 150mm ∅

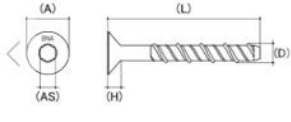


Surface Mount Steel Bollard 15mm ∅



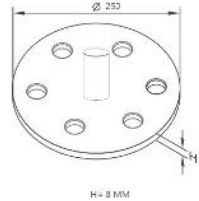


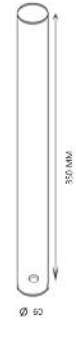




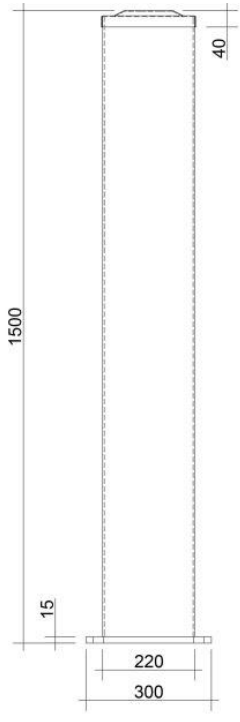
6 x Countersunk Screw Anchors

A: 27.65mm
L: 150 mm
D: M12: 12 mm
H: 10.20 - 10.40mm
AS: 10 mm

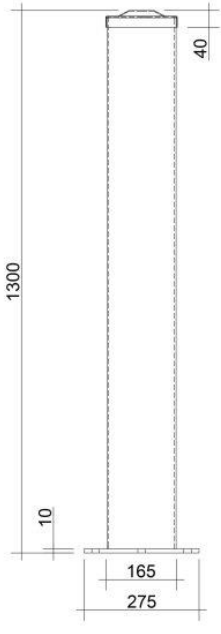




BOLLARD COVERS - STEEL 150/165 O.D. BOLLARDS



Bollard Covers 190 mm ∅



Galv Steel Bollard 165 mm ∅

ZERO CIVIL

ZERO WASTE SOLUTIONS

TASK	HAZARDS	
Installing Sockets	- Bending of the back - Twisting of the back - Working in traffic	
Installing Items	- Bending of the back - Twisting of the back - Working in traffic - Item not secure	
Using Removal Tool	- Bending of the back - Twisting of the back - Working in traffic - Trapping of fingers	

SAFE WORKING PROCEDURES

- Dial before you dig
- Install appropriate traffic management
- Dig hole to insert ground socket
- Insert Installation tool inside ground socket
- Lower Installation tool & socket into hole and fill with concrete.
- Operate installation tool from standing position with straight back

- Install appropriate traffic management/ cones
- Attach Taper to item using self-drilling screws provided
  (This can be done prior to going onsite to reduce time on location)
- For 2.9 – 5.5 mm wall thickness posts or large number of items, we suggest pre-drilling
- Using two hands, drop item firmly into ground socket
- Check item is sufficiently installed to protect from unauthorized removal

- Position a minimum of two safety cones or safety barriers at extremity of working space
- Face on-coming traffic when operating tool
- Make sure the base of the tool as close as possible to the base of the item before applying jerking action
- Apply downward quick jerking action to arm of tool
- Lift item from ground socket using two arms (for items over 25 kg, 2 people must lift item from ground socket)
- Bend knees to insert cap in ground socket
- Carrying Tool: Hold upright stand and arm together in one hand to avoid trapping fingers

SPECIFICATIONS ZWF

View specifications for the ZERO WASTE Foundations including videos, directions, and much more

SPECIFICATIONS IRS

View specifications for the Bollard Impact Recovery System including videos, directions, and much more

BOLLARD RANGE

View our range of fixed and removable bollards including in-ground, surface mount, EAB, Steel, stainless steel and Advanced Polymer Non-conductive Bollards.

VIDEOS

Videos available online to show you how the products work and explain in detail how to install ZERO WASTE Foundations

ZERO WASTE FOUNDATIONS -ZWF60

150-650 mm depth ZWF can be used to secure any 60OD post, signposts, barriers, bollards, bins, street furniture, bike racks, safety barriers, crowd barriers., seating, fencing. Items become interchangeable. Now also available in 114 mm

IMPACT RECOVERY SYSTEM -IRS

Make steel, stainless steel and Advanced Polymer bollards impact resistant and surrounding foundations re-usable impact after impact, saving thousands over the life of a development. (Surface mount option available)

ADVANCED POLYMER BOLLARDS & COVERS

We have developed some impact resistant, scratch resistant, UV resistant, dent resistant bollards that are non-conductive, highly durable and low cost. Can be secured in ground or secured using the Impact Recovery System (IRS)