

Product Manual



Release 10/18 (Australia)

ArmorZone Temporary Safety Barrier



1.0 Introduction

ArmorZone® is a TL-2 barrier made up of plastic units that when joined together using a steel pin and filled with water provides positive work zone barrier protection to temporary construction sites and other miscellaneous roadside activities.

The unique ArmorZone® polyethylene composition, profile design and steel pin allow the barrier to be installed straight or down to a minimum radius of 92' (28m) if required.

When correctly installed the ArmorZone™ system is capable of stopping, containing or redirecting an errant vehicle in a safe manner under these worldwide test standards.

If required the ArmorZone® TL-2 barrier connects directly to the ArmorZone® TL-2 end treatment which negates the need to shield or flare the ends of the barrier.

ArmorZone® barrier has been designed and tested to meet the evaluation criteria for end treatment to NCHRP 350 Test Level 2 (TL-2) for crash cushions.

ArmorZone™ barrier is designed and constructed to provide acceptable structural adequacy, minimal occupant risk and safe trajectory as set forth in these worldwide test standards for longitudinal barriers and end treatments.

During testing when impacted with vehicles ranging between 820kg to 2000kg at speeds up to 70kph and angles up to 25 degrees, the impacting vehicle is controlled in a safe manner.

2.0 Before Installation

Placement of ArmorZone® shall be in accordance with the design as provided for the temporary work zone.



Installation shall be in accordance with the installation instructions supplied for this product.

Depending on the circumstances at the site, installation including the filling of a unit (using a truck mounted water tanker) should take no more than 1 minute for each 6'-7" (2.0m) unit.

ArmorZone® is a highly engineered safety device made up of a relatively small number of parts. Before starting installation ensure that one is familiar with the make up of the system.

3.0 Limitations and Warnings

ArmorZone® TL-2 barrier and end treatment have been rigorously tested and evaluated per the evaluation criteria in the NCHRP 350 guidelines for crash cushions. The impact conditions recommended are intended to address typical in-service collisions.

When properly installed and maintained ArmorZone® TL-2 barrier and end treatment allows an impacting vehicle to be stopped, contained or re-directed in a safe and predictable manner under the NCHRP 350 impact conditions.

Vehicle impacts that vary from the NCHRP 350 impact conditions described for longitudinal barriers and crash cushions may result in significantly different results than those experienced in testing. Vehicle impact characteristics different than, or in excess of, those encountered in compliance testing (weight, speed and angle) may result in system performance that may not meet the evaluation criteria.

The ArmorZone® barrier can be installed with the ArmorZone® end treatment. If this treatment is not used the end of the barrier must be shielded or flared as per Road Controlling Authority requirements.



4.0 System Design and Design Considerations

4.1 Slopes

A maximum slope of 10:1 is preferable.

On slopes greater than this, follow the Road Controlling Authority's guidelines.

4.2 Curbs

ArmorZone® has been designed and tested so the centre of gravity of the impacting vehicle is a constant height in relation to the barrier. For this reason, it is preferred that curbs or channels are not in front or behind the barrier as they will result in altering the height of the vehicle at impact. If there is no option but to install ArmorZone® near a curb, consult Road Controlling Authority's guidelines.



4.3 Undulating ground conditions

Site specific grading may be necessary to ensure that there are no "humps" or "hollows" that may significantly alter the impacting vehicles stability or substantially alter the barrier height in relation to the ground.

4.4 Median and Roadside Applications

ArmorZone® can be used in both 'roadside' and 'median' applications where the 'gating' behaviour can be accommodated safely.

4.5 Length of Need

The Length of Need (LoN) of ArmorZone® is 46' (14m). Ensure that when installing the barrier that it is of sufficient length. For further details consult the Road Controlling Authority's guidelines. If an ArmorZone® end treatment is connected the LoN increase to 52' (16m).

4.6 End Treatment

ArmorZone® end treatment is a free standing 'special' end unit that can be fitted to the ArmorZone® barrier in a tangent position if an end treatment is required. If an end treatment is not used it may be required to flare or shield the barrier as per Road Controlling Authority's guidelines.

4.7 Soil Conditions

ArmorZone® is installed above ground so soil conditions on site are not applicable. However it is recommended ArmorZone® systems are installed on a compacted surface.

4.8 Freezing Conditions

The ArmorZone™ barrier is filled with water and for that reason it MUST NOT be used in conditions where the water can freeze.



4.9 Deflection

Test 2-11 (NCHRP 350 TL-2)

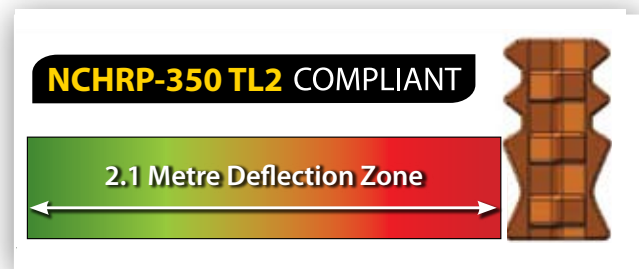
2000kg pickup, 25 degree angle at 70kph

Dynamic Deflection	Permanent Deflection
2.1m	2.1m

820kg car, 20 degree angle at 70kph

Dynamic Deflection	Permanent Deflection
3'-5.5" (1.05m)	3'-5.5" (1.05m)

Note: Results are from actual crash testing and the test article length was 164' (50m).

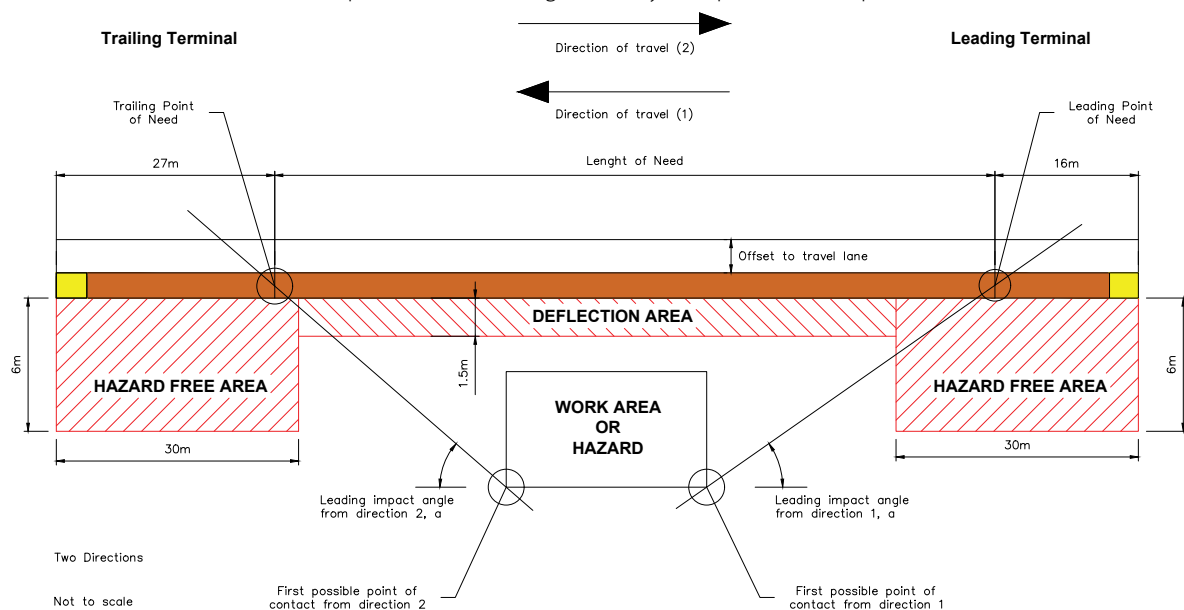


4.10 Point of Need

The Point of Need (PoN) of ArmorZone™ is shown in the diagram below. Ensure that when installing the barrier that it is of sufficient length. For further details consult the Road Controlling Authority's guidelines.

ArmorZone Installation Layout

As per road controlling authority acceptance at 50kph



4.11 Design Speed

ArmorZone™ barrier is restricted to locations where the design speed is limited to 50kph. In some states and territories ArmorZone can be used in speeds up to 70kmh after a site specific risk is conducted.

4.12 Barrier Unit Type Configuration

ArmorZone™ barrier unit types located between the PoN and the end of the system are always the same configuration. This is one ArmorZone™ End Treatment unit at the 'exposed end' connected to as many ArmorZone™ Standard units as required to reach the PoN which contain 520L of water each.



NOTE: ArmorZone™ End Treatment units **MUST NOT** be used in any location other than the barrier end, including the re-directive longitudinal barrier section between the PoN's.

4.13 ArmorZone™ Lifting Techniques

It is recommended that ArmorZone™ units are transported on a flatbed truck in securely strapped bundles of 13. Each bundle requires 3 straps for safe transportation and unloading, and the required configuration is shown below. (Bundles must be removed from the truck one at a time by the lifting points using a fork hoist or crane with appropriate lifting equipment).

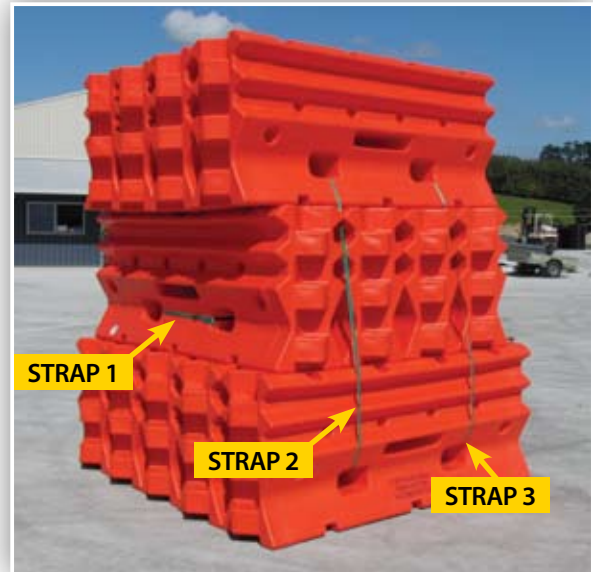
Once a bundle is on the ground the levels can be lowered one row at a time. The recommended technique is to have the fork hoist forks supporting the top level before straps 2 and 3 are removed. The middle level can then be lowered and strap 1 removed.

Note: Each ArmorZone™ unit has 'through holes' designed not only to provide strength to the barrier but also so that they can be used as 'lifting points'.

Once the ArmorZone™ barrier bundles rows have been lowered to ground the units can be manoeuvred into position by one personnel. If for whatever reason a barrier unit is required to be lifted this must be done by 2 personnel.

At the end of each ArmorZone™ unit are 'lugs' which can be used as manual lifting points. Personnel must wear the correct safety gear.

An empty ArmorZone™ unit weighs 50kg and this detail is 'stamped' on the top of each unit so all personnel will be aware of this fact. Personnel must be 'fit for task' and educated in safe lifting techniques including Risk Assessment.

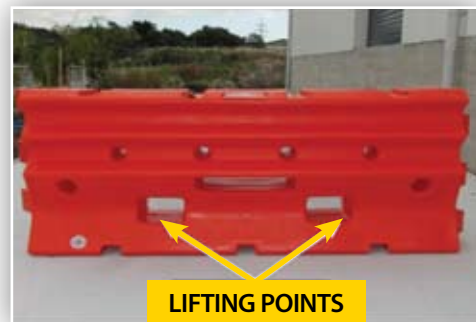


2 personnel can lift an empty ArmorZone™ unit.

No attempt shall be made to lift an ArmorZone™ unit that contains water



Manual Lifting Points



Machine Lifting Points

5.0 Parts Identification



Standard Unit
(HDPE)



End Treatment Unit
(HDPE)

6.0 Bill of Materials

For every 6'-7" (2.0m) (linear) of temporary barrier the following components are required:

- 6'-7" (2.0m) ArmorZone® Standard Unit 1 required
- Steel Pin 1 required
- Water 520 Litres
- 6'-7" (2.0m) ArmorZone® End Treatment Unit & Pin Water is not required)

Note: ArmorZone™ End Treatment units must be used to protect the end of the barrier as shown in the temporary work zone design drawings. Connector pins must **not** be installed in the ArmorZone End Treatment end which is exposed to traffic.



Connector
(Hot Dipped Galvanised)

7.0 Installation Preparation

7.1 Getting Started

It is essential that ArmorZone® barrier and ArmorZone® end treatment are installed correctly. Please carefully read and understand the following instructions before installing system.

Note: These instructions relate only to the installation of ArmorZone® and are for standard installations only.

ArmorZone® is designed so that it has exactly the same components and barrier setup whether in a 'roadside' or 'median' application. For all installations, commence placement of the units at one end and connect the units together until the correct barrier length and position is achieved. Please ensure that the checklists for both barrier and end treatment are completed for every installation.



Before handling any ArmorZone™ units all personnel involved need to be familiar with the instructions contained in the Lifting Techniques section in the manual

7.2 Preparation

Before installing ArmorZone®, ensure that all components required for the system are on site and have been identified. ArmorZone® is a highly engineered safety device made up of a relatively small number of parts. Before starting installation ensure that one is familiar with the make up of the system. Refer to the Parts Identification and Bill of Materials section in this manual for more information.

Ensure that the area where ArmorZone® is to be installed is flat enough (max slope 10:1) and compacted, so that the ground conditions will not significantly alter the height of the vehicle in relation to the height of the barrier.

Minor site grading may be required.

7.3 Tools Required

There are no tools required to install the components of ArmorZone®. The units can be manually lifted and positioned by 2 personnel and the steel pin used to connect the units is simply dropped into position.

Each unit requires approx 520 litres of water and it is recommended that a large truck mounted tanker with large fill hose is sourced for fast barrier construction. The diameter of the 'fill hole' is 125mm.



8.0 Installation Instructions

8.1 Step 1 – Site Preparation

It is preferred that ArmorZone® barrier is installed on compacted flat, level ground.

Ensure that sufficient width and traffic control is available before installing ArmorZone®. Due to the bulky nature of the units, deployment will be from a flat deck truck or similar. Each unit requires 520 litres of water and it is recommended that a large truck mounted tanker is used.

ArmorZone® barrier should be installed in a tangent position to the direction of travel and in accordance with the temporary work zone design.

ArmorZone® units are dispatched in bundles of up to 13 (shown in Figure 1). To ensure safe unloading of the units, use a fork hoist or similar to lower each row to ground level.



Figure 1: ArmorZone® units are dispatched in bundles of up to 13.



Use a fork hoist or similar to lower each row to ground level.

Safety Statements

General Safety

- All required traffic safety precautions should be complied with. All workers should wear required safety clothing (high visibility vests, steel capped footwear, gloves and hard hats). Gloves should be worn at all times.



Gloves



Hard Hat



Steel-Capped Footwear



Hi-Visibility Vest

- Only authorised trained personnel should operate any machinery. Where overhead machinery is used, care must be taken to avoid any overhead hazards.

ArmorZone® Safety Statements

- All installers must be well clear of the water tanker when the units are being filled.
- ArmorZone® is a stand alone barrier and does not require at any stage during installation that the surrounding soil is dug or drilled in anyway.
- The empty units weigh 50kg and can be pushed at ground level by 1 personnel. If lifting of a unit is required this must be done by 2 personnel. Do not attempt to lift a unit which contains water.
- Final positioning of the empty units and placement of the steel pin connectors should be done by 1 personnel so as to remove the risk of hands and fingers being caught between the components.

8.2 Step 2 – Placement of the Barrier Units

Unload the units and set out in a row along the intended barrier position. Make sure the configuration of the ends will fit together (shown in Figure 2).

Lifting the units is a 2 person job; they weigh 50kg each when empty.

Slide the units into position (shown in Figure 3).

The units must fit flush together so that the vertical holes on each unit line up (shown in Figure 4 & 5).

Note: If the drainage bung is on the workzone side of the barrier when assembled, it will allow for safe access when decommissioning the barrier.

Note: None of the units are fixed to the ground in any way.



Drainage Bung



Bung Spanner



Figure 2: When setting out, ensure the configuration of the ends will fit together.



Figure 3: Sliding the units into position.



Figure 4: Units are pushed together to align the vertical holes



Figure 5: The units must fit flush together so that the vertical holes on each unit line up.

8.3 Connecting the Barrier Units

Once the units are 'flush fit' aligned, the steel pin can be positioned down the 2 vertical alignment holes (shown in Figure 6 & 7).

Care must be taken not to pinch a hand or finger when inserting the pin. Gloves must be worn.

The steel pin sits in the vertical holes under its own weight only and is not connected to the barrier units in any other way.

Note: If slight curvature of the barrier is required, position as required at this point.



Figure 6: Once the units are aligned, the steel pin can be dropped into the alignment holes. Take care not to pinch hands or fingers between the top of the pin and the top of the barrier.

8.4 Step 4 – Filling the Barrier Units

Lifting the flap on the top of the unit will allow access to the 125mm diameter water 'fill hole' (shown in Figure 8).

Using a truck mounted tanker fill each unit to the top with water (shown in Figure 9).

Check that there are no leaks before filling the next unit. If there is a leak the unit must be replaced. It may be possible to fix at a later stage depending on the damage.



Figure 7: Check the steel pin has gone through the alignment holes.



Figure 8: Lift the flap on the top of the unit to allow access to the water 'fill hole'.



Figure 9: Using a truck mounted tanker fill each unit to the top with water.



NOTE:

The ArmorZone® end treatment unit is never filled with water. Through design it is not possible to hold water through error or weather conditions.

8.5 Step 5 – Connecting the End Treatment Unit (Optional)

If protection is required for the end of the barrier, the ArmorZone® end treatment unit can be connected to the barrier in a tangent position.

Position the end treatment unit so that the lugs line up with the end barrier unit. Slide the unit into position so that the vertical holes line up (shown in Figure 11 & 12).

Once the units are 'flush fit' aligned, the 'twin pin' connector can be positioned down the 2 vertical alignment holes (shown in Figure 13 & 14).

Note: The end treatment unit is not and can not be filled with water.

The connector sits in the vertical holes under its own weight only and is not connected to the barrier units in any other way.

Note: The end treatment unit is NOT fixed to the ground in any way and must NOT have the 'twin pin' connector inserted at the exposed end of the unit.

8.6 Step 6 – Delineation (Optional)

Depending on location, delineation may be required as per the Road Controlling Authority Guidelines or as outlined in the temporary work zone design.

For further details contact your ArmorZone® distributor.

Delineation must be glued to the top of the standard unit. Delineation can be glued, screwed, riveted or bolted to the front of the end treatment unit.

Note: Substrate used for the delineation should have a maximum thickness of 1.2mm so to not interfere with the performance of the system. The recommended glue is a fast curing polyurethane constructive adhesive such as Sika SuperGrip® 30 minute. For this product and any alternative brands used, make sure one is familiar with the hazards associated with the adhesive which are outlined on the product itself.



Figure 10: Position the end treatment unit so that the lugs line up with the end barrier unit.



Figure 11: Slide the unit into position so that the vertical holes line up.



Figure 12: Once the units are aligned, the steel pin can be dropped into the alignment holes.



Figure 13: Ensure the steel pin has gone through the alignment holes.

9.0 Installation Examples

Note: A minimum 92' (28m) radius curvature can be achieved when the 'flush fit' connection is made between ArmorZone® units. It is recommended that this positioning should be completed before the units are filled with water.



Straight Installation



Curved Installation



Installed End Treatment



Installed End Treatment

10.0 Decommission

Before the barrier units can be uplifted ALL water must be removed. This is achieved by either pumping the water out the top using a flexible hose to a truck mounted tank, or by releasing the bung at the bottom to express the contents. Guidance on which method to use should be sort from the Site Project Manager.

Remove the pins from the units so they can be separated from the barrier, and then replace the pin.

Using a fork hoist or similar stack the rows in to the recommended bundle of 13 units. Strap together with 3 separate cables to secure the bundle for lifting and transportation (shown in Figure 14).

Further details on this can be found in the Lifting Technique section in this product manual.

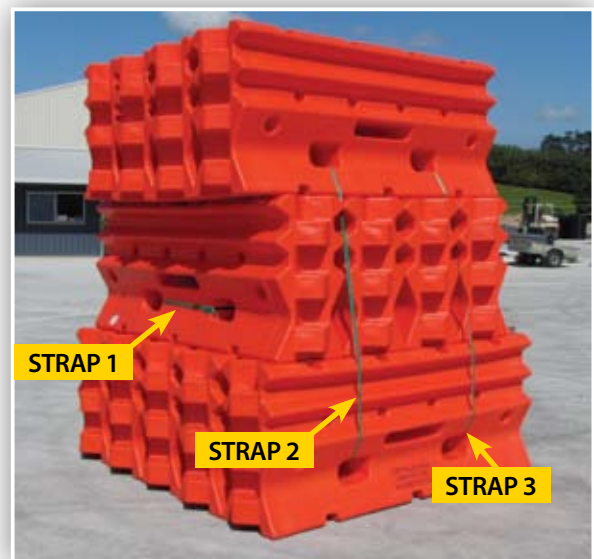


Figure 14: Strapping for transport

11.0 ArmorZone® Temporary Safety Barrier & End Treatment Installation Checklist

Location:

Installed By:

Date:

Signed:

Inspected By:

Date:

Signed:

Barrier		
The units are positioned on level ground	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The set-out of the barrier is as per the design instructions	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The lugs of each unit have a 'flush fit' with each other and the steel pin is positioned through both vertical holes in the lugs of each unit	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The lid and bung are attached to each unit correctly so as to ensure the units will remain full of water as intended	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Each unit is filled to the top with water (approx 520L) and check for leaks	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The barrier is not fixed to the ground or any other device in any way	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Attach delineation as required by the Road Controlling Authority Guidelines	<input type="checkbox"/> Yes	<input type="checkbox"/> No
End Treatment		
The end treatment unit is positioned on level ground	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The set-out of the system is as per the design instructions	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The ArmorZone® end treatment unit is connected to the ArmorZone® barrier using the twin pin steel connector through both vertical holes in the lugs of each unit	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The lugs of each unit have a 'flush fit' with each other	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The end treatment unit is not and can not be filled with water	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do not install a twin pin connector at the upstream end of the end treatment unit	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The end treatment unit is not fixed to the ground or any other device in any way	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Attach delineation as required by the Road Controlling Authority Guidelines	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Disclaimer:

Important Note: The conformity of the installation is the responsibility of the installation contractor, and Ingal Civil Products accepts no liability for or in connection with any installation that is outside of the specifications of this manual or the Road Controlling Authority. For more information, please refer to our Standard Terms and Conditions of Sale available on our website: www.ingalcivil.com.au.

12.0 Maintenance

ArmorZone™ is a maintenance free system but it is recommended that inspections are carried out periodically to ensure that the system is installed as required.

Over a long period of time in extreme conditions it may be possible for evaporation to take place and it is imperative that all the barrier units remain filled to the correct level. ArmorZone™ barrier units are fitted with fill level indicators which allow for 'drive by' inspection which makes it easy to ascertain that each barrier contains the required amount of water or not.

It is also important that the ArmorZone™ end treatment unit is inspected periodically as to confirm that it is in the correct position, undamaged and not filled with significant debris.

13.0 ArmorZone™ System – Repair

Recommended tools:

- Flat deck truck and suitable lifting equipment
- A truck mounted water tanker
- A crow bar or similar (with curved pincher grip)

Replacement parts required for a severe impact:

- ArmorZone™ Standard and / or End Treatment Units
- ArmorZone™ Steel Pins
- Water for each standard unit

Typical vehicle impacts causing damage to an ArmorZone™ system will either be head on the end treatment unit or from a side on impact into multiple barrier units.

When an ArmorZone™ system is damaged it is extremely important that it is reinstated as required in a timely manner and the following examples show how to assess damaged components that must be replaced.

Any ArmorZone™ units that clearly show damage like large holes or significant deformation must be replaced accordingly.

It is also important that less obviously damaged units that are no longer fit for use are replaced and they can be determined using the following 2 methods.

13.1 Water-tight check

Fill all barrier units with water that do not have the required water level and check for leaks. Any barrier that is found to have even the smallest leak must be replaced.

However, small leaks and holes in the centre section of the ArmorZone can be repaired as per the 'Repair Guide' and the 'Plastic Weld Guide' of this manual.

Note: It is assumed that all barriers that do still have the correct water level will not have a leak and the fill level indicator is activated fully.



End On Impact



Side On Impact

13.2 HDPE integrity check

All impacted barrier units (and the unit upstream and downstream of the impact area) that are intended to be re-used (and show they do not leak) must be inspected in the following manner for fatigue.

Access is needed to each barrier end so that the 3 'end lugs' can be closely viewed. As shown in the photo below the HDPE before complete failure shows a 'white stress mark' if the integrity has been significantly affected. Regardless of the size of this condition, all barrier units found to show it must be replaced.

Label all damaged units clearly so that future use does not take place by mistake.

Note: These testing techniques are not relevant to the ArmorZone™ End Treatment unit. If there is any sign of deformation however, the unit must be replaced.

The above techniques accurately determined which ArmorZone™ units can be re-used or need replacing. The following steps along with the Installation Instructions contained in this manual, explain how the ArmorZone™ barrier can be reinstated as required.

13.3 Recycling

The ArmorZone™ Barrier and End Treatment are manufactured from HDPE and therefore the material in any units damaged beyond repair can be recycled. The connector pins are manufactured from steel and can also be recycled.



Leaking Barrier Treatment



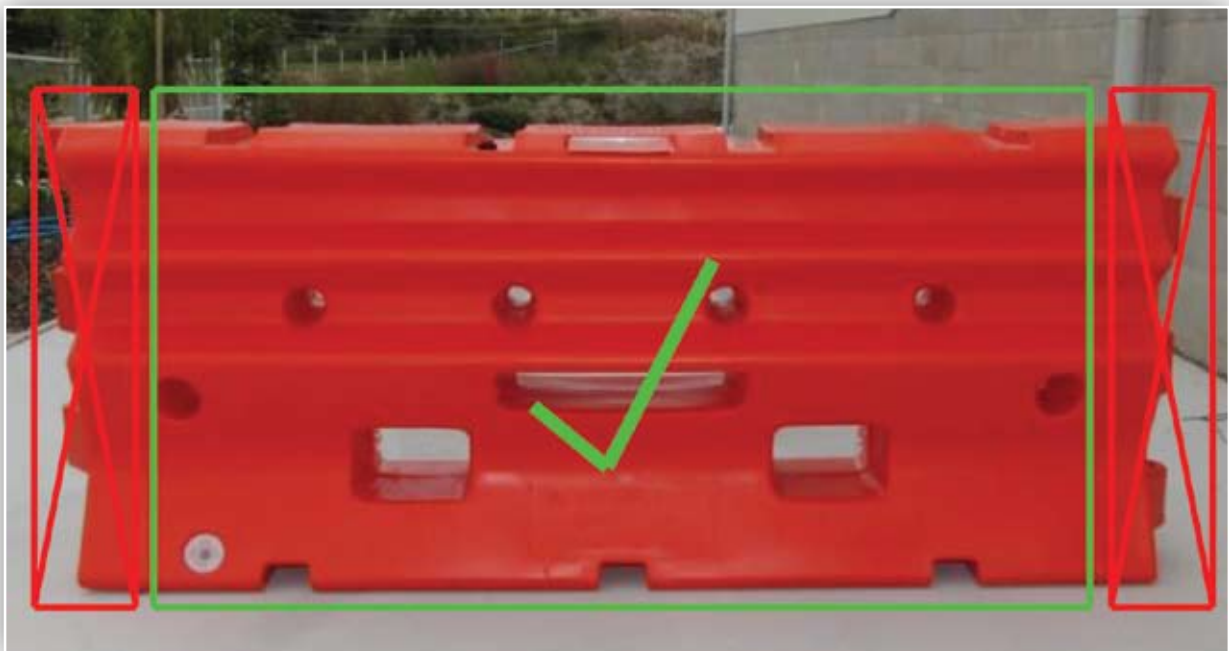
White Stress Mark

13.4 Repair Guide

ArmorZone™ barriers can only be repaired if the damage sustained is in accordance with these guidelines. Not only is the size of repair important, but also the location.

Repair is only to make the barrier water-tight again. Any barriers which have structural damage must be discarded (recycled), as they cannot be used a vehicle barrier.

- Maximum permissible size of a repair is 50mm x 12mm.
- Damage must be located between the green area indicated on diagram (shown below).
- Repair must be carried out by suitably trained personnel.
- Only HDPE plastic wire supplied by Ingal Civil Products to be used.



Damage must be located between the green area indicated above



Welder & HDPE Plastic Wire

13.5 Plastic Welding

In some circumstances it is acceptable to repair an ArmorZone™ plastic barrier unit.

If repair is allowed, carefully follow the instructions below.

Preparation:

- Ensure that the area is clean of all dirt, oil and grease
- Drill a small hole at each end of the crack
- 'V' out the crack to allow weld penetration



Initial Crack



Holes & "V"

Equipment Required:

- A hot air welder with a 5mm nozzle (i.e. Leister or Techspan)
- ArmorZone™ welding rod (same material as the barrier itself)



Hot Air Welder



Welding Rod

Welding

- Clean the 'V' and welding rod with solvent
- Adjust heat setting on welder and then place the welding rod at the end of the 'V'. Heat both at the same time
- When molten, force the welding rod into the 'V' and move along the crack

Note: If the plastic turns brown the welder is too hot. If the welding rod is not melting into the plastic, either slow down or turn the welder temperature up.



Molten Plastic



Finished Weld

Finishing:

- Use a die-grinder to make the raised weld flush
- Flame repaired area to wet to remove small scratches



Sand Weld Flush



Flame to Finish

Note: Repair must be carried out by suitably trained personnel and ONLY ArmorZone™ welding rod can be used.

13.6 Key Steps to Disassemble Barrier:

- Separate the impacted units (and the unit upstream and downstream of the impact area) by removing the steel pins. (Photos below show how to deal with difficult to remove pins)
- Assess which units are damaged using the techniques described in this section.
- Set aside all damaged units and completely empty of water for safe collection.
- Set aside all damaged pins. (Both ArmorZone™ units and pins are 100% recyclable)

13.7 Key Steps for Barrier Reinstatement

- Align barrier units (re-usable and replacement) as required to reconstruct the system.
- Install the ArmorZone™ steel pins (re-usable and replacement) between each unit.
- Fill all units with water to the required level. (Water fill level indicator must be activated)
- Connect ArmorZone™ end treatment unit and delineation as required.



14.0 Frequently Asked Questions

1. What type of equipment is required to install ArmorZone™?

Each unit weighs 50kg (empty) so can be unloaded, moved by hand by 2 personnel.

Units are connected together by fitting the steel pin by hand. To fill the units it is recommended that a truck mounted water tanker is used due to the large volume of water. For details on all safe handling consult the Lifting Technique section in this product manual.

2. Does your company provide spare parts? What is the lead-time for supply?

It is important to fix a damaged barrier as soon as possible because it most probably won't perform as required when damaged.

Replacement components are available from Ingal Civil Products.

3. On average, how long does it take to install an ArmorZone™ Barrier?

Depending on the application and circumstances at the site, installation and assembly of the system should take a 2 person crew approximately 1 hour to install a 120m section.

4. What about vandalism, can ArmorZone™ be easily damaged?

The units are constructed using strong polyethylene and would not easily be damaged. The construction is similar to 'other' water filled barriers and this is not considered an issue.

5. How easily can ArmorZone™ be restored after impact?

The system is made up of very few components and is modular so easily repaired. A flat deck truck, crow bar and water tanker will be required to reinstate.

(For further details on repairing an ArmorZone™ barrier consult the Repair section of this manual)

6. What maintenance is required? What is the expected performance life?

ArmorZone™ is a maintenance free system but periodic inspection is recommended.

For further details on maintenance consult the System Design section of this manual.

See separate Assessment of Materials report for details on performance life.

7. What is the Deflection of ArmorZone™ Barrier?

ArmorZone™ has been tested to a range of different standards. (For further details on all performance consult the System Design section of this manual)

8. What Terminal End can be used with the ArmorZone™ Barrier?

A NCHRP 350 TL-2 ArmorZone™ end treatment must be connected to the barrier. Contact your ArmorZone™ distributor for further information on this product.

9. What is ArmorZone™ Barrier connected to?

ArmorZone™ barrier is a free standing system and is not anchored in anyway.

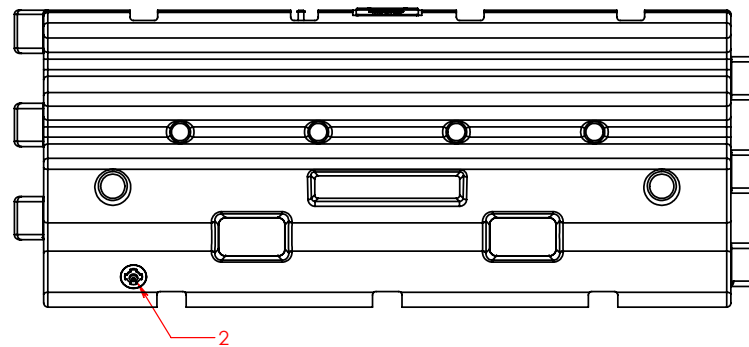
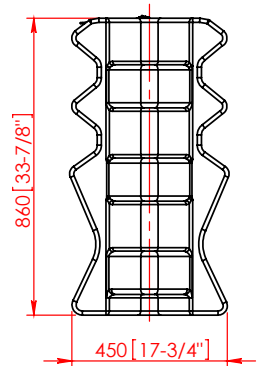
10. Can ArmorZone™ units be moved when full?

No, no attempt shall be made to lift an ArmorZone™ unit that contains water.

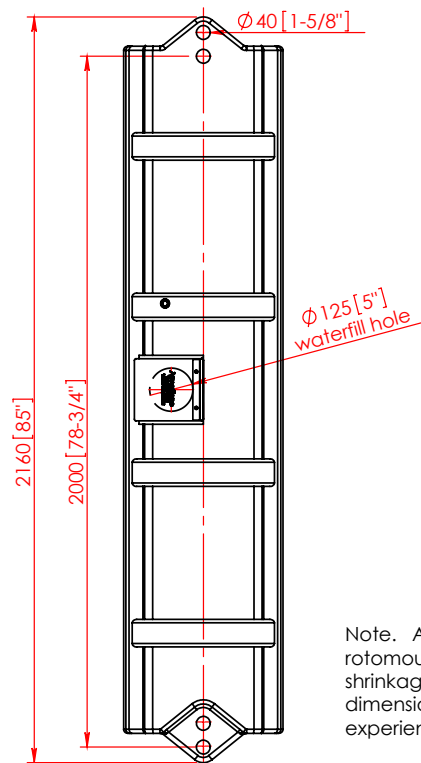
11. Can ArmorZone™ units be damaged by fire?

ArmorZone™ is made of HDPE and joined together using steel pins. It is possible that under extreme conditions, like large fires, that the components of the system can be damaged.

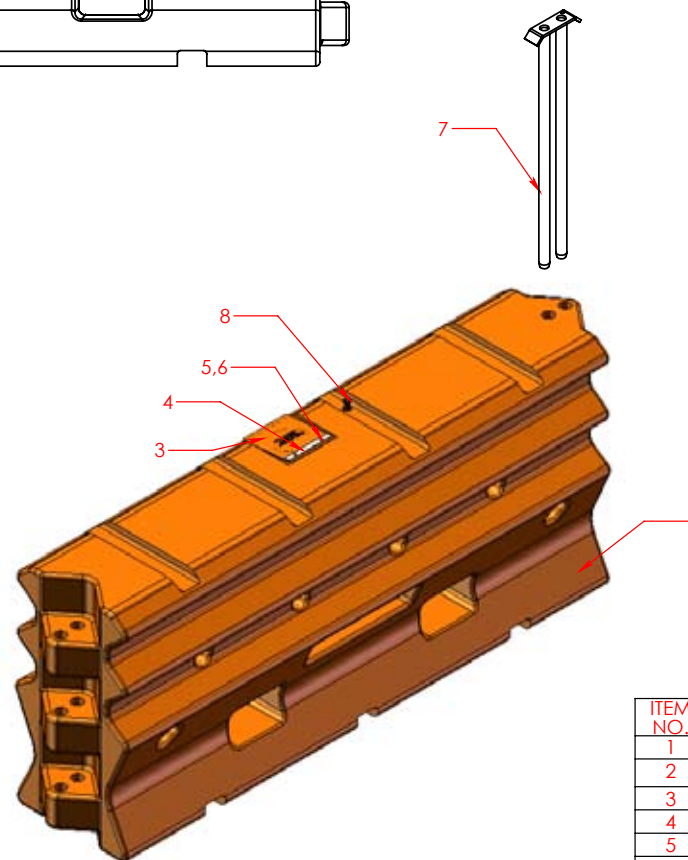
For further information on damaged ArmorZone™ barriers consult the Repair section and the Installation Instructions contained in this manual.



Note:
No Steel Connector inside
Empty weight 50kg
Water volume 520 l
Full weight 570kg



Note. All dimensions are nominal only. This is a rotomoulded product and is therefore subject to shrinkage after manufacture, some variation in dimensions is likely. Further variances may be experienced, depending on climatic conditions.



ITEM NO.	DESCRIPTION	QTY.
1	Plastic Shell	1
2	Bung	1
3	Lid	1
4	Lid Plate	1
5	Lid Rivet	2
6	Lid Washer	2
7	Standard Pin	1
8	Full Indicator	1

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SCALE: 1:20

Standard Tolerance

	DATE	INIT.
DRAWN BY	11/11/2010	LW
APPR'D BY	11/11/2010	BM



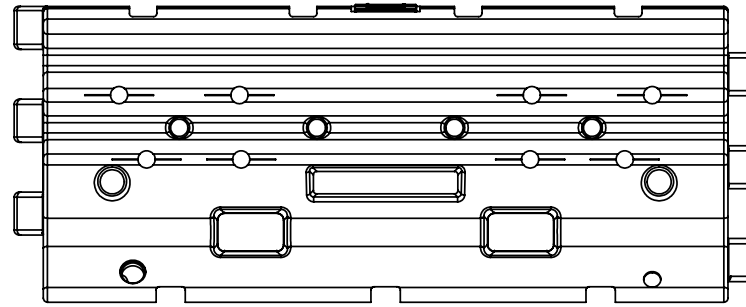
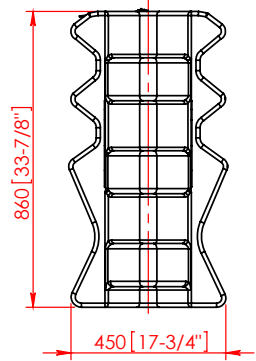
57-65 Airds Road,
Minto NSW 2566
1800 251 420
info@ingalcivil.com.au

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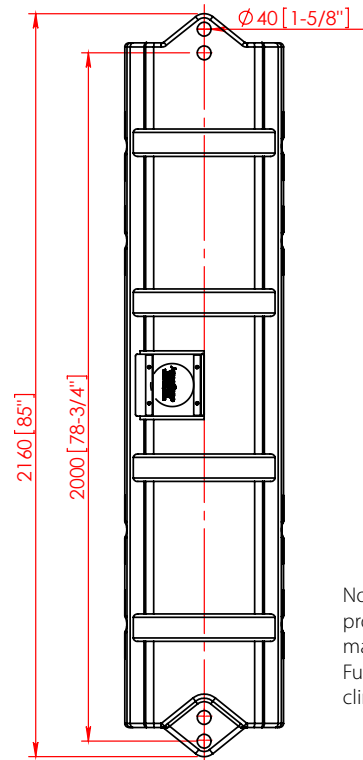
REV.	CHANGES	DATE
A	INITIAL ISSUE	11/11/2010

ArmorZone™

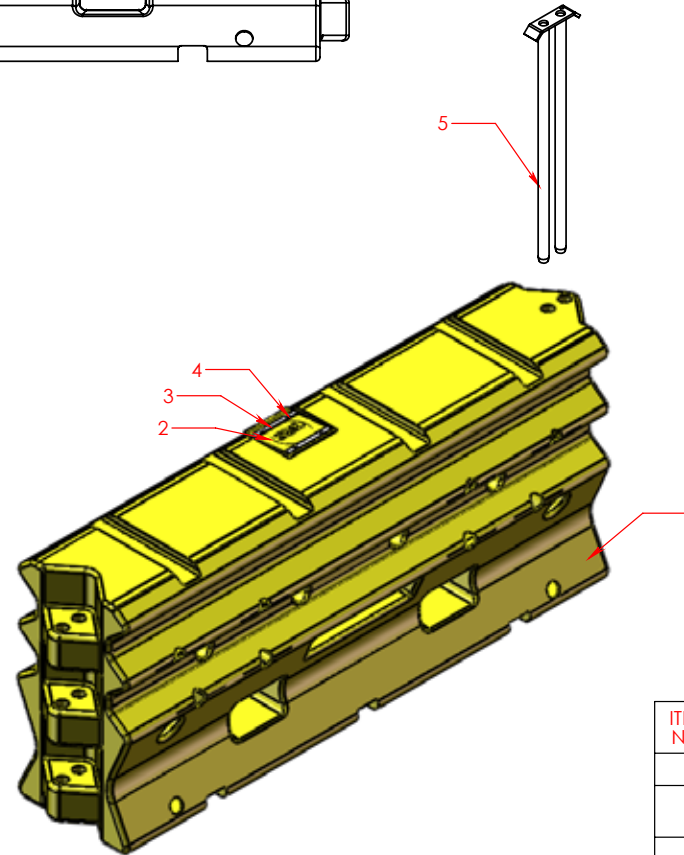
SHEET	DRAWING NUMBER	REV.
1 OF 1	AI0273	A



Note:
No Steel Connector inside
Weight 50kg



Note: All dimensions are nominal only. This is a rotomolded product and is therefore subject to shrinkage after manufacture so some variation in dimensions will occur. Further variances may be experienced depending on climatic conditions.



ITEM NO.	DESCRIPTION	QTY.
1	Plastic Shell	1
2	Lid	1
3	Lid Plate	2
4	Lid Screw	4
5	Standard Pin	1

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REV.	CHANGES	DATE
A	INITIAL ISSUE	11/11/2010

SCALE: 1:20	DATE	INIT.
DRAWN BY	11/11/2010	LW
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Standard Tolerance

ArmorZone™ End Treatment



57-65 Airds Road,
Minto NSW 2566
1800 251 420
info@ingalcivil.com.au

SHEET	DRAWING NUMBER	REV.
1 OF 1	AI0274	A



For more information

contact us on the web

www.ingalcivil.com.au

Head Office: Sydney

57-65 Airs Road, Minto, NSW 2566

Ph: +61 2 9827 3333

Fax: +61 2 9827 3300

Free call (within Australia):

1800 803 795

Email: sales@ingalcivil.com.au

Our Locations:

- Adelaide • Brisbane
- Melbourne • Newcastle
- Perth • Sydney • Wagga
- Auckland • Christchurch