The future of road safety, starts here...

Vehicle restraint systems in accordance with SANS 51317-2 : 9000 and EN 1317-2 : 1998
With over 90 years of experience and engineering ‘know how’, Rocla is the clear leader in Precast Concrete Products in South Africa.

From custom made concrete products and accessories through to our full product range, we pride ourselves in absolute quality and above average service. Our technical team is always on the look-out for the latest technologies and innovations from all over the world.

Making us your preferred partner for all things precast, ensures that you always benefit from the Rocla difference, which is indeed, concrete.

With the local drive to ensure that South African roads meet international safety standards, we decided to investigate how and where, we could add value to this industry.

After exhaustive research into the precast concrete road barrier industry, we recognized that the development of a state-of-the-art system such as REBLOC is very complicated, expensive and time consuming. We therefore decided that the best option would be to try and partner with the current market leader and there-by benefit from their expertise.

We are excited to announce our new partnership with REBLOC systems of Austria. We have been appointed the exclusive license holders for the REBLOC system of Road Barriers to Southern Africa.

REBLOC combines almost 100 years of experience in the manufacture of concrete elements with the latest innovations and concepts in modern vehicle restraint systems.

REBLOC technology, patents pending, enables the most stringent safety specifications to be met while raising the bar concerning rapid installation and cost effectiveness.

As an autonomous company within the Oberndorfer Group, REBLOC develops, manufactures and markets state-of-the-art concrete vehicle restraint systems to enhance traffic safety. The comprehensive system offers the right solution for all main fields of application.
One of the objectives of the development engineers at REBLOC was to develop a system that works without additional fastening components. This is because quick installation and straightforward logistics minimize the time taken to finish the work on-site. Plus, the lower the disruption to traffic flow, the higher the level of road safety. No loose parts, ensures that the system is installed correctly and remains that way.

“Concrete does not travel economically”. This is a fact that REBLOC takes very seriously and encouraged the development of lighter and longer elements. The narrow elements represent a significant saving in material and weight compared to conventional systems. Installation and logistics are accelerated as a result and transport can be organized more efficiently.

The REBLOC system offers products for permanent separation of traffic flow in the central reservation and along the verge of the road as well as temporary safety systems for managing roadwork sites. A range of special elements rounds off the system to offer technically superior solutions even for the most difficult installation situations.

REBLOC systems feature very low maintenance and servicing requirements, further enhancing the level of road safety and cost saving.
Usually, the road administrators of a country prescribe a procedure for the procurement of barriers to ensure the use of safe products on national roads. This would include the containment levels required for different road types. Manufacturers must make reference to this in order to ensure that all barriers are tested and certified to the required standards.

Safety barriers, irrespective of material used, must be crash tested with real vehicles in order to demonstrate their ability to safely redirect moving vehicles. These test procedures are fully documented in the European Code EN 1317 which has been included in SANS 51317-2 : 2009

Accordingly, several levels of performance are given for the three main criteria relating to the restraint of a road vehicle:

• The containment Level, (T1, T2, T3, N1, N2, H1, H2, H3, H4a and H4b), refers to the category of containment achieved by the barrier. This is determined by different crash test conditions. (see page 17)
• The impact severity level (ASI). This refers to the level of safety to the occupants of the vehicle. Sans allows for A or B, where A is safer than B with regards the safety of the passengers of light vehicles. This also includes THIV and PHD measurements. (see page 17)
• The deformation of the barrier system, as expressed by the working width (W1 - W8). This defines how far the barrier can be expected to move after the specified collision. (see page 17)
A barrier has failed if, (amongst other reasons):

- Break-through or break-up of the system occurs.
- ASI value exceeds those stipulated in the code.
- The exit angle of the vehicle is not within limits.
- Vehicle overturns.

Table 1 on page 17, (from EN and SANS standards), refers:

**Containment Levels that different barriers will be rated against**

- T1, T2 and T3 are generally intended for use as temporary safety barriers
- N1 and N2 are medium containment levels
- H1, H2 and H3 offer higher containment levels
- H4a and H4b offer the maximum available containment levels.
- The column showing kinetic energy of impact reflects these increasing levels

**Acceptance Tests that define barrier rating**

TB tests define the containment level with each rating referring to a different set of test requirements including:

- Size and mass of vehicles from a small passenger car to a 38ton truck,
- Impact angles from 8 degrees up to 20 degrees,
- Speeds of impact from 65 km/h up to 110 km/h
- Kinetic energy of impact ranging from 6.2 KJ up to 724.6 KJ

A typical specification would call for something like an H2-W5 barrier. This refers to a barrier that has successfully passed the H2 tests, which include TB51 and TB11 and has not deformed by a working width of more than 1.7m.
The innovative coupling system integrated into the elements, joins the individual sections to form a very high strength continuous chain that safely absorbs energy and force applied to the restraint system in the event of impact from a vehicle.

A major benefit is that NO additional fastenings or rubber spacers are required, making the REBLOC system much easier and safer to install, ensuring that all required parts are installed and secured. The symmetrical configuration of the couplings enables elements to be installed from either side. If repairs, maintenance or modifications are required, individual elements can simply be lifted out of the continuous chain and then slotted back in again.

The full length of steel tension bar inside the concrete elements, together with the ingeniously designed reinforcement, efficiently absorbs impact, safely preventing even heavy vehicles from breaking through the restraint system. This, whilst minimizing damage to the element itself.

The extended length of the elements creates a cost effective system, which, in combination with the integrated coupling and full length steel tension bar, reliably controls the deflection of vehicles. The dimensions of the elements also facilitate a quick and efficient installation.

More than simple steel and concrete...
The next leap in technology, is already integrated:
REBLOC products have been subjected to real impact tests in accordance with European Standard EN 1317 and have been proven to meet all the specifications of a modern vehicle restraint system. Meeting specifications regarding high containment levels ensures that the risk of vehicle breakthrough is eliminated as best as possible.

This versatile and flexible system enhances the safety of drivers and passengers inside lighter-weight vehicles in the event of an accident. The values reached for impact severity (ASI, THIV, PHD) are well below the limits in the specification. The ASI figures (acceleration severity index) are within level A or B and demonstrate the extent to which REBLOC fulfils safety specifications. The safety of motorcyclists is also increased to a great extent thanks to the uninterrupted smooth surface of the REBLOC system.

The low working widths of the system are a major safety advantage, allowing the restraint elements to be used even on very narrow stretches of road.
Concrete road barriers, compared by classification, are generally more cost effective than other types of barriers and have the advantage of being less dependent on constantly fluctuating prices of other materials.

Compared to other types of guard rails, concrete barriers have considerably reduced maintenance requirements and a high level of safety for motorists and motorcyclists alike.

**Advantages of PRECAST concrete barriers**

- Quick and easy to install,
- Quick and easy to repair or replace,
- Installation irrespective of weather conditions,
- Can be opened or moved at any time and placed in case of emergency or for road / construction works,
- Flexible and adaptable to local circumstances,
- Relatively little damage to concrete barriers in the case of an impact with medium speed relative to the classification of the barrier,
- Quality assured if manufactured off-site at a facility with SABS and ISO accreditation,
- Generally superior finish to the product,
- Can be used for temporary and permanent barrier applications.
REBLOC elements in South Africa use the F-Shape profile, which is well established all over the world and conforms to SANRAL’s standard profile requirements.

Advantages of REBLOC precast concrete barriers

- All materials are placed as delivered - no secure storage areas required,
- Coupling is fully integrated and no loose parts are required,
- 100% Guaranteed effective - no need to check if coupling has been placed and/or positioned correctly,
- Vandalism proof as coupling cannot be stolen,
- Quick and safe installation, from any side - symmetrical units,
- Quick and easy to change single elements at any place in the chain,
- REBLOC is the only precast concrete barrier with an element length of 8m - this allows for cost savings due to less couplings, and faster installation. Shorter elements (2m & 4m) are available to form narrow curves,
- REBLOC has been designed to eliminate the need for loose rubber inserts between blocks as these tend to fall out and scatter on the road surface,
- A full set of standard, terminal, transition and bifurcation elements are available - allowing the system to adapt to almost all local circumstances and attach to all existing systems,
  (see pages 10-12 for description and drawings)
- Best technical results (containment levels, ASI, working widths) combined with lowest cost offer the customer the best option available today,
- Only terminal elements at each end of a barrier chain are anchored to the road surface / foundation block in order to cope with impact at that point.
Not just made for the road...

Precast concrete barriers can also be used for:

- Permanent or temporary road barriers either in the central reserve or on the verge, to the sides of bridges or during periods of road works.
- Securing railways and airports,
- First line of defence against terror attacks on high security areas,
- First line of defence to prevent vehicles penetrating warehouses with the intention of theft of goods there-in,
- Large function and concert venues as parking rails, guardrails or to direct traffic through congested or restricted areas,
- At the base of mountains and hills to control debris from land and mudslides,
- Preventing illegal dumping,
- Blocking entrances to building sites and other areas with health and safety access requirements,
- Prevent explosive items (like butane or other fuel tanks) from being struck by vehicles, either by accident or on purpose
- Deterring unwanted traffic from entering driveways or access points to facilities with access control.
- A cost effective way to segregate bulk materials - to keep different grades of coal, salt, or different types of landscape materials separate,
- Permanent or temporary barrier for child safety,
- Securing vacant land or buildings - ideal perimeter security walling creating an effective barrier to vehicles.
Meet the family RB60...
Meet the family RF80...

ROCLA

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Meet the family RF100...
Installation, one, two, three...

So simple, it’s beautiful:

Basically, REBLOC systems are free standing, such that individual elements are not connected with the subsoil. The restraint function is achieved by the strong connection of the single elements to a continuous tension chain.

Only terminal elements are anchored into either the road pavement (asphalt/concrete) or a local concrete foundation.

Elements are delivered to site and taken from the truck with suitable lifting apparatus (tongs, belts or lifting holes and pins) and an appropriate crane. Elements are removed and placed directly into position along a predefined mark on the surface.

The coupling of the unit must be positioned over the coupling of the already positioned unit such that both couplings lap in the view from above. A handler places a hand on the top edge of the new unit to slightly tip this edge downward, ensuring that no collision occurs between the bottom of this unit and the top of the previous unit.

The integrated guidance channel simplifies the positioning of the two elements such that both couplings fit into each other as the new unit is lowered onto the road surface.
Maintenance! What maintenance?
So independent, you'll forget about it:

The REBLOC road restraint system is very maintenance-friendly. The connecting facilities are integrated into the specially profiled concrete ensuring that there are no loose parts or accessories that would require maintenance. This provides maximum safety and peace-of-mind against vandalism and theft.

Maintenance may be required only in the event of a collision with the road barrier. This will be determined by the severity of impact with the barrier:

- If there are visible scratches or abrasion marks, but no cracks, and the system has not displaced, no maintenance or repairs are required.
- If no damage or cracking is visible, but the system has displaced, it will be sufficient to just move these elements back to their original positions.
- If cracks larger than 0.2mm are visible, or parts of the reinforcement are exposed due to spalling of concrete, the integrity of the barrier system could still be intact. Nevertheless, to ensure durability and peace-of-mind, the affected units should be replaced instead of repositioned.
- If severe cracks or spalling have occurred with or without damage or deformation to the coupling, the restraint system will be considered to be compromised. Affected elements must be replaced immediately.

These conditions also apply to terminal elements and their anchorages, including the foundation, anchorage bolts and plates.
Road safety, on location...

Rocla & REBLOC - always close to your projects:

A network of production facilities and sales teams enable us to supply products cost effectively throughout Southern Africa. With 11 production facilities at key locations in South Africa, one in Namibia and another in Botswana, Rocla is best positioned to respond timeously and cost effectively to all your requirements.
Raising the bar with research and development
Applying technology to protect and save lives:

All REBLOC systems are based on the principle of ongoing innovative development. A principle that is taken very seriously, which explains constant investment into new ideas and industry leading development. In addition to meeting technical specifications, REBLOC engineers take into consideration the ease of use and durability of their systems.

State-of-the-art simulation and calculation methods, complex testing facilities and instrumentation as well as a strong team of development engineers and material experts help keep up the pace in creating new technologies. Short decision channels and many years of expertise make it possible to respond quickly to new requirements and offer suitable solutions within a very short time-frame.
### Table 1

<table>
<thead>
<tr>
<th>Containment Levels</th>
<th>Acceptance Test</th>
<th>Vehicle Mass (kg)</th>
<th>Impact Speed (km/h)</th>
<th>Impact Angle (°)</th>
<th>Kinetic Energy (kJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>TB21</td>
<td>1 300</td>
<td>80</td>
<td>8</td>
<td>6,2</td>
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<td></td>
<td>TB21</td>
<td>1 300</td>
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<td>-</td>
</tr>
<tr>
<td></td>
<td>TB41</td>
<td>10 000</td>
<td>70</td>
<td>8</td>
<td>36,6</td>
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<tr>
<td>T2</td>
<td>TB31</td>
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<td>80</td>
<td>20</td>
<td>43,3</td>
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<td></td>
<td>TB11</td>
<td>900</td>
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<td>20</td>
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</tr>
<tr>
<td>T3</td>
<td>TB32</td>
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<td>110</td>
<td>20</td>
<td>81,9</td>
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<td></td>
<td>TB11</td>
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<tr>
<td>N1</td>
<td>TB42</td>
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<td>15</td>
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<td></td>
<td>TB11</td>
<td>900</td>
<td>100</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>N2</td>
<td>TB51</td>
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<td>20</td>
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<td>H3</td>
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#### Classes of Working Width

<table>
<thead>
<tr>
<th>Classes of Working Width</th>
<th>Working Width Levels (m)</th>
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<tbody>
<tr>
<td>W2</td>
<td>W &lt;= 0.8</td>
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<tr>
<td>W3</td>
<td>W &lt;= 1.0</td>
</tr>
<tr>
<td>W4</td>
<td>W &lt;= 1.3</td>
</tr>
<tr>
<td>W5</td>
<td>W &lt;= 1.7</td>
</tr>
<tr>
<td>W6</td>
<td>W &lt;= 2.1</td>
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<tr>
<td>W7</td>
<td>W &lt;= 2.5</td>
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<td>W8</td>
<td>W &lt;= 3.5</td>
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#### Impact Severity Assessment Indices

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<thead>
<tr>
<th>ASI Values</th>
<th>A</th>
<th>ASI &lt;= 1.0</th>
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<tr>
<td></td>
<td>B</td>
<td>ASI &lt;= 1.4</td>
</tr>
<tr>
<td>THIV</td>
<td>&lt;= 33 km/h</td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>&lt;= 20g</td>
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## Technical

<table>
<thead>
<tr>
<th>Product</th>
<th>RB60_12</th>
<th>RF80_2</th>
<th>RF80_4</th>
<th>RF80_8</th>
<th>RF100_2</th>
<th>RF100_4</th>
<th>RF100_8</th>
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<tbody>
<tr>
<td>Unit Length</td>
<td>12 m</td>
<td>2 m</td>
<td>4 m</td>
<td>8 m</td>
<td>2 m</td>
<td>4 m</td>
<td>8 m</td>
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<tr>
<td>Unit Height</td>
<td>600 mm</td>
<td>800 mm</td>
<td>800 mm</td>
<td>800 mm</td>
<td>1000 mm</td>
<td>1000 mm</td>
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<tr>
<td>Unit Width</td>
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<td>560 mm</td>
<td>560 mm</td>
<td>640 mm</td>
<td>640 mm</td>
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<tr>
<td>Unit Mass</td>
<td>2.20 t</td>
<td>1.20 t</td>
<td>2.40 t</td>
<td>4.80 t</td>
<td>1.70 t</td>
<td>3.40 t</td>
<td>6.80 t</td>
</tr>
<tr>
<td>Minimum Installation Length</td>
<td>120 m</td>
<td>-</td>
<td>-</td>
<td>112 m</td>
<td>64 m</td>
<td>-</td>
<td>104 m</td>
</tr>
<tr>
<td>Curve Radius ( r &gt;= )</td>
<td>-</td>
<td>( r &gt;= 27 ) m</td>
<td>( r &gt;= 54 ) m</td>
<td>( r &gt;= 108 ) m</td>
<td>( r &gt;= 27 ) m</td>
<td>( r &gt;= 54 ) m</td>
<td>( r &gt;= 108 ) m</td>
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<tr>
<td>Anchorage</td>
<td>Not Anchored</td>
<td>Only Terminal Elements</td>
<td>Only Terminal Elements</td>
<td></td>
<td></td>
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<tr>
<td>Installation</td>
<td>All system can be utilised as a single (central reserve, verge) or double (central reserve) row installation</td>
<td></td>
<td></td>
<td></td>
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## Product Family

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<tr>
<th>Containment Levels</th>
<th>RB60_12 T3/W2</th>
<th>RF80_8 N2/W3</th>
<th>RF80_8 H1/W4</th>
<th>RF100_2 H2/W5</th>
<th>RF100_8 H2/W5</th>
<th>RF100_8 H4b/W6</th>
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<tr>
<td>Certified Working Width</td>
<td>( W &lt;= 0.8 ) m</td>
<td>( W &lt;= 1.0 ) m</td>
<td>( W &lt;= 1.3 ) m</td>
<td>( W &lt;= 1.7 ) m</td>
<td>( W &lt;= 1.7 ) m</td>
<td>( W &lt;= 2.1 ) m</td>
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<tr>
<td>Tested Working Width</td>
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<td>W2</td>
<td>W2</td>
<td>W3</td>
<td>W2</td>
<td>W5</td>
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<tr>
<td>Acceptance Test</td>
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<td>TB41</td>
<td>TB11</td>
<td>TB32</td>
<td>TB11</td>
<td>TB51</td>
</tr>
<tr>
<td>Vehicle Mass (Kg)</td>
<td>1,300</td>
<td>10,000</td>
<td>900</td>
<td>1,500</td>
<td>900</td>
<td>13,000</td>
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<tr>
<td>Impact Speed (km/h)</td>
<td>80</td>
<td>70</td>
<td>100</td>
<td>110</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>Impact Angle (º)</td>
<td>8</td>
<td>8</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Kinetic Energy (kJ)</td>
<td>-</td>
<td>36.6</td>
<td>-</td>
<td>81.9</td>
<td>-</td>
<td>126.6</td>
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<tr>
<td>ASI Classification</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>THIV</td>
<td>Theoretical Head Impact velocity is tested only for passenger vehicle tests - Rebloc is within required limits ( \leq 33 ) km/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>Post-Impact Head Deceleration is tested only for passenger vehicle tests - Rebloc is within required limits ( \leq 20 ) g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rocla nationwide

Positioned to serve your needs, Rocla’s 14 factories and depots are strategically located throughout South Africa’s nine provinces and in Namibia and Botswana.

South Africa and offshore markets are cost effectively supplied by road, rail and sea.

Made by modern processes, supervised in accordance with SABS Quality Management System, Rocla’s factories make products that proudly carry the SABS Mark of Approval.

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