

irandiPROTM

EDGE RESTRAINT SYSTEM



Driveways - Footways - Landscaping

www.irandiPRO.com

EDGE RESTRAINT SYSTEM

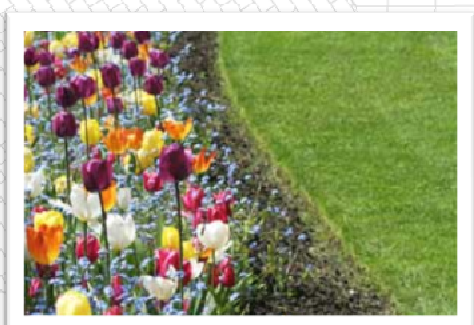
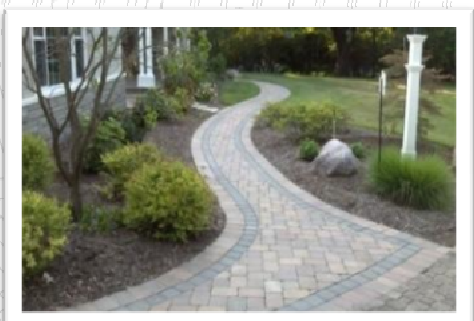
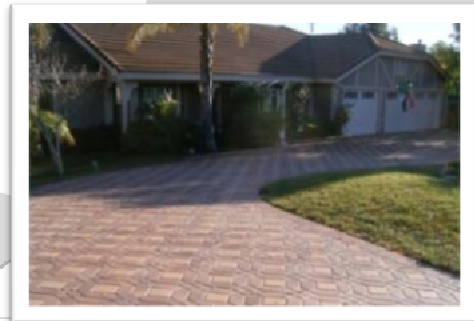
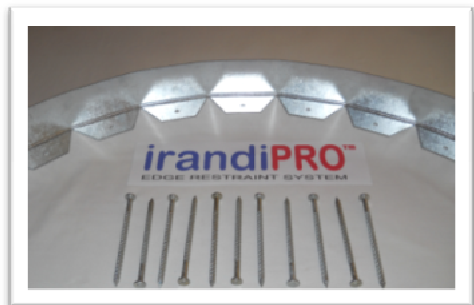
Whether its decorative block paving or precast flags, alternate edge restraint systems are taking the world of paving by storm and IrandiPRO is South Africa's first such system. Proudly designed and manufactured in the heart of the Eastern Cape the IrandiPRO Edge Restraint System rivals and in our opinion, exceeds such systems available in Europe and the America's.

The IrandiPRO edge restraint system is an L-shaped flexible galvanised steel edging 60mm deep with an effective installation length of 1.2m per unit run. As the units are manufactured from galvanised steel they do not require intermediate support struts and are reversible as a result. The units are designed to restrain all standard light duty precast paving units, as well as, loose fill such as topsoil, gravel and mulch.

Installation is quick and simple. The IrandiPRO system is set out on the prepared base and simply nailed into place using standard spiral steel or wire spikes. The sand bed is then laid on the base and the precast paving units installed in the normal fashion.

There is no faster way to install an edging course, particularly when the project calls for smooth flowing curves. The IrandiPRO system mitigates the time consuming, skilled and labourousome task of installing a mortar or concrete reinforced edge supporting the integrity of the paved surface and unlike the traditional mortar or concrete kerb reinforced edge is that no curing time is required and the surface can be trafficked immediately following final compaction of the surface.

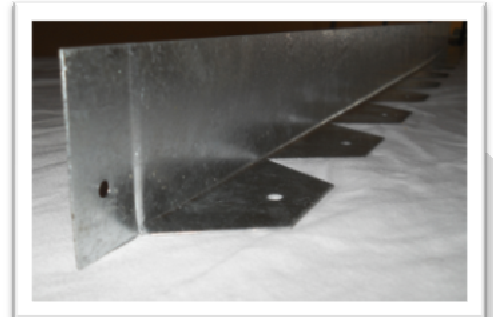
Whether you're a Contractor looking to boost your bottom line, a Developer looking to cut construction costs or a Landscape Architect wanting your vision of curves to run wild, IrandiPRO is the product to aid you in achieving these aspirations.



MATERIAL AND RESTRAINT DESIGN

GALVANISED STEEL:

- Independently tested by Manufacturer to meet relevant SABS requirements.
- Z275 Galvanised coating for maximum durability.
- Galvanise ductility and adherence bend tested to ensure long term anti corrosion performance.
- Infinitely recyclable.



L-SHAPED DESIGN:

- Intermediate struts not required so differing finishes can be installed either side of the units.
- Utilises the downward pressure of the load and weight of the pavers to tie the edging to the pavers.
- Allows installation tight up to obstructions.
- Bedding sand will not migrate from under the edging.



BASE PLATE TRIANGULAR CUT OUTS:

- Set out at 100mm pitch.
- Allows flexibility to the vertical face to easily install curves 0.5m and greater.
- Can accommodate 60° bends at internal cut out nodes.



PRE-DRILLED SPIKE HOLES:

- Set out at 100mm pitch.
- Accommodates standard 150mm wire or 120mm spiral nails which are easily available.
- Driveway loading the unit is spiked every 100mm and this is increased to 200mm for pedestrian only areas.

JOGGLE END CONNECTOR:

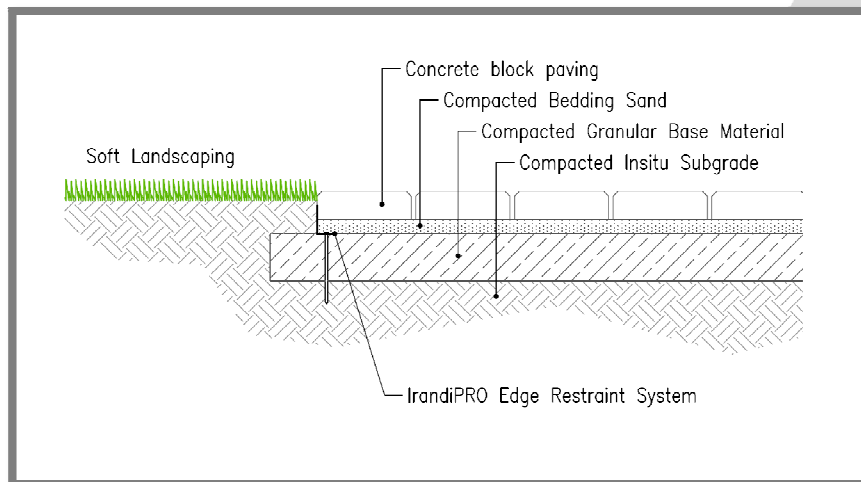
- Joggle ensures flat restraint laying face.
- Adjacent units easily riveted together.
- Enables 90° bend internal/external unit installation.



PAVEMENT COMPONENTS

The purpose of the edge restraint system is to ensure that movement of the edge course is limited whilst dynamic loads resulting from use of the paved surface are imparted to the pavement structure. This ensures the integrity of the paved surface is maintained and kept looking as good as the day it was installed.

TYPICAL LIGHT DUTY PAVEMENT STRUCTURE:



- Subgrade – Insitu pavement formation
- Base – Imported material with thickness dependant on the strength of the sub-grade and anticipated loading imparted to the pavement.
- Bedding Sand – Sand Layer installed above base to aid in providing a smooth laying surface.
- Block Pavers – Precast concrete or clay.
- Edge restraint – IrandiPRO System nailed to granular base.

COMMON CAUSES OF FLEXIBLE PAVER SYSTEM FAILURE:

- Insufficient base depth for imposed loading.
- Poor compaction of the pavement layers.
- Insufficient base extension beyond the edge of the paved surface.
- Bedding sand layer uneven or too thick.
- Edge restraint failure.



ADVANTAGES OVER TRADITIONAL INSTALLATION

The IrandiPRO system offers many benefits when compared to traditional mortar or precast concrete edgings and the below list highlights some of these benefits.

- Strong, durable and easy to install.
- Unit is reversible allowing installation close to obstructions.
- The same unit is utilised to form straight and free flowing curves.
- Curved sections are easier to set out and install.
- Full depth backfill of the lawn aids to further increase the pavement strength.
- Aesthetically pleasing as pavers finish flush with adjacent soft/hard landscaping finish.
- The edge rail unit is hidden once installed.
- Ease of transportation of the units result in reduced transportation costs.
- Less storage space required on site.
- The spiral or wire nails used to fix the system to the prepared base are widely available.
- The unit is easier to install when compared to traditional mortar utilising less skilled labour.
- Quicker installation times versus traditional concrete kerb or mortar haunching.
- No curing time is required.
- Pavement can be trafficked immediately after final compaction of the paved surface.
- No risk of cold joints along the edge course as units are riveted together.
- Units can be used to retain loose fills such as topsoil, gravel and mulch.
- System easily removed to extend existing paved system with no damage to blocks forming the existing edge course.
- Edge rail used as a screed guide when placing sand bedding course.
- Edge rail used as a guide for setting the edge course cut line, particularly useful on curved sections.
- Units are infinitely recyclable.



TYPICAL PAVEMENT DESIGN

TYPICAL LIGHT DUTY PAVEMENT CONSTRUCTION:

The below schedules illustrate typical light duty construction thicknesses against varying California Bearing Ratio (CBR) ranges for light duty residential uses.

TYPICAL PEDESTRIAN ONLY						
Surface Options		Block Pavers		Concrete Flags		
Layers	Surfacing	$\geq 50\text{mm}$		400x400x65mm		
	Bedding Sand	25mm Compacted		25mm Compacted		
	Granular Sub-base	200	150	125	100	Nil
	Subgrade CBR (%)	≤ 2	3	4	5	≥ 6

TYPICAL LIGHT VEHICLE						
Surface Options		Block Pavers		Concrete Flags		
Layers	Surfacing	$\geq 50\text{mm}$		400x400x65mm		
	Bedding Sand	25mm Compacted		25mm Compacted		
	Granular Sub-base	275	230	200	175	150
	Subgrade CBR (%)	≤ 2	3	4	5	≥ 6

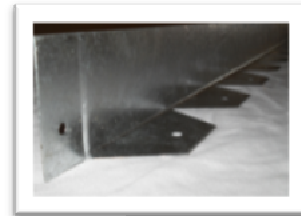
- Above pavement thicknesses to be treated as a guide only, exact requirements pending insitu ground conditions and detailed design by Project Engineer.
- Above pavement thicknesses based on *CMA Book 2 – Design Aspects* & BS 7533, Part II – *Guide for the Structural Design of Lightly Trafficked Pavements Constructed of Clay Pavers or Precast Concrete Paving Blocks* guidance.
- For CBR ranges $\leq 5\%$ the sub-base and subgrade should be separated by means of a suitable geotextile.
- The granular sub-base should extend beyond the edge of the paved surface at a length equal to the depth of the sub-base.
- Topsoil should never form part of the pavement structure.
- Subgrade compaction – Typically 90% MOD AASHTO
- Granular base compaction – Typically 93% MOD AASHTO

THE IRANDIPRO SYSTEM

THE IRANDIPRO SYSTEM – PARTS:

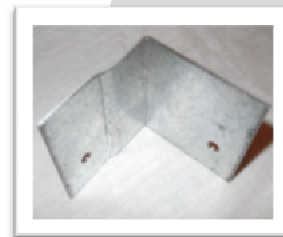
The IrandiPRO Edge Rail

- Main system component.
- Manufactured from high quality galvanised steel.
- Part Number: IPR130309



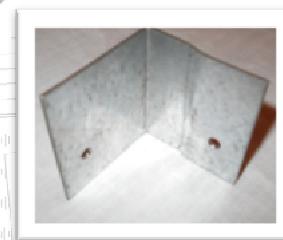
The IrandiPRO 90° External

- Secondary component enabling 90° bend when bend formed around paved surface.
- Manufactured from high quality galvanised steel.
- Part Number: IPR170986



The IrandiPRO 90° Internal

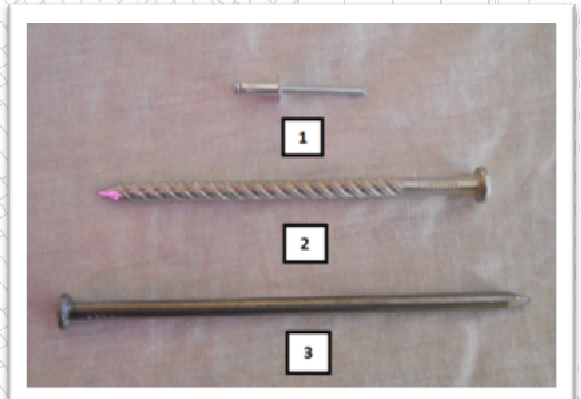
- Secondary component enabling 90° bend when bend formed within paved surface.
- Manufactured from high quality galvanised steel.
- Part Number: IPR170987



THE IRANDIPRO SYSTEM – FIXING UNITS:

The IrandiPRO Edge rail is fixed to the prepared base utilising either regular wire or spiral nails, pending the base conditions. Corresponding units and internal/external bends are fixed together using standard aluminium rivets.

1. 4.8 x 12mm Aluminium Rivet
2. 120mm Spiral Steel Nail
3. 150mm Round Wire Nail



Note:

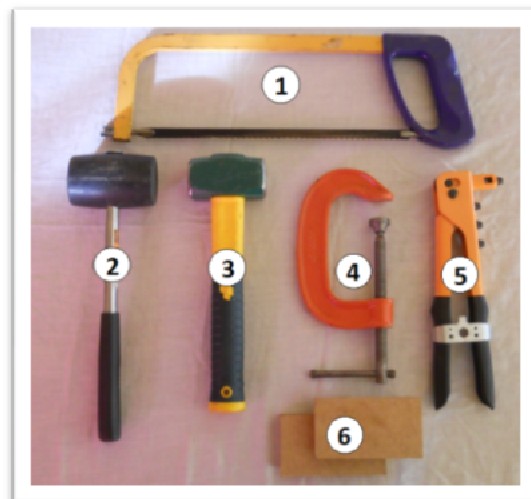
As these fixing units are industry standard and widely available, they are not generally supplied as part of the IrandiPRO system, however, we'll gladly supply these should it be requested as an over extra item.

QUICK INSTALLATION GUIDE

HAND TOOLS REQUIRED:

Read the instructions carefully before starting the installation. The instructions are written in English. If you need them in another language, please contact us.

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- +! Read the instructions carefully before starting the installation.
- A! *! Read the instructions carefully before starting the installation.
- G! 4! Read the instructions carefully before starting the installation.
- 3! Read the instructions carefully before starting the installation.
- (!) Read the instructions carefully before starting the installation.



POWER TOOLS REQUIRED:

Read the instructions carefully before starting the installation. The instructions are written in English. If you need them in another language, please contact us.

- *! #! Read the instructions carefully before starting the installation.
- +! Read the instructions carefully before starting the installation.

SAFETY EQUIPMENT:

Read the instructions carefully before starting the installation. The instructions are written in English. If you need them in another language, please contact us.

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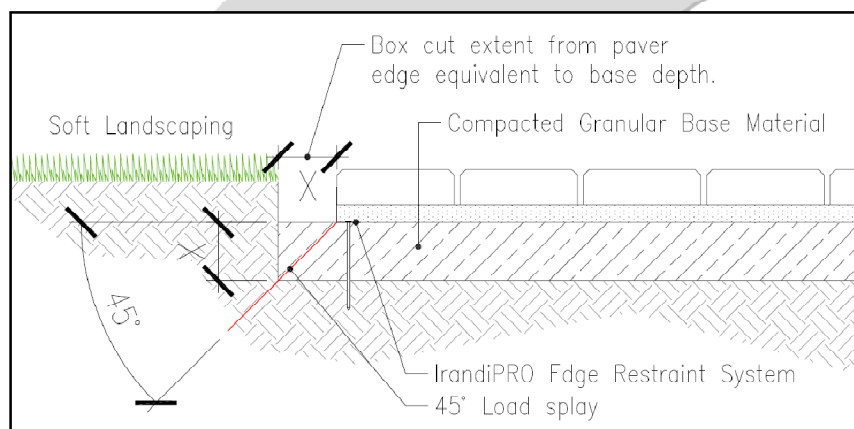
QUICK INSTALLATION GUIDE

SUBGRADE PREPARATION:

The depth of the box cut and associated formation level will be subject to the strength of the subgrade. The sub-grade strength is measured by means of the California Bearing Ratio or CBR as its more commonly referred to.

Once the CBR of the formation is known, a suitable depth of base material can be determined and a box cut carried out to suit the required depth of the base. Any soft spots found in the subgrade should be removed and the area filled with suitable capping material.

Particular care must be taken to ensure that the width of the box cut is sufficiently far from the edge of the pavers to enable an equivalent length of base material depth can be installed. This approach ensures that any load on the edge of the pavers is transmitted to the subgrade via base material.



SUB-BASE PREPARATION:

Preparation of the base is an incredibly important aspect of the overall pavement installation and taking the time and effort to ensure it's installed to the correct line, level and degree of compaction will improve the overall performance of the paved surface.

Compaction of light duty sub-bases are usually carried out with plate compactors and depending on the thickness of the sub-base it should be laid in two or more layers with a lift of between 50 to 75mm.

Note:

For detailed block paving installation and specification guidance refer to the Cement Manufacturers Association website - www.cma.org.za/Publications/Paving

QUICK INSTALLATION GUIDE

INSTALLING THE IRANDIPRO EDGE RAIL:

Once the sub-base has been prepared, the IrandiPRO edge rail is set out and nailed to the base using either 150mm wire or 120mm spiral steel nails. The lower leg of the 'L-Shaped' rail is to be located beneath the bedding sand and edge course of the paved surface.

The selection of which fixing to utilise is dependent on the type of material the nail is to be driven into. The spiral nail offers a greater bending resistance and is suitable for all applications. In certain instances where the insitu subgrade offers sufficient strength to omit the need for a sub-base, the use of the 150mm round wire nail could be utilised, assuming suitability of the subgrade material.



FIXING SPACING:

The spacing of the edge plate fixing pitch is dependent on the use of the paved surface.

- Loose fills (Flowerbeds) – 300mm pitch
- Pedestrian only areas (Residential Patio) – 200mm pitch
- Light duty (Residential Driveway) – 100mm pitch

ADDITIONAL LOCATION OF FIXINGS:

In addition to the standard fixing pitch described above, additional fixings to the sub-base should be located in the following instances:

- The first two anchor points at the start of the rail, usually propped up to a wall or other fixed feature. (Always start with the flat end of the edge rail butting up to the fixed feature)
- The anchor points immediately adjacent to either side of a joint or bend in the edge rail.



QUICK INSTALLATION GUIDE

FIXING ADJACENT EDGE RAILS:

An infinite number of lengths can be joined together to serve any length of edge restraint required by simply utilising a 4.8x12mm aluminium rivet. The end joggle is to wrap around the rear of the unit following on and the rivet head is to be located on the paver side of the edge rail. Nails driven into the sub-base either side of the joint complete the jointing of the two adjacent units.



INSTALLATION OF BENDS:

Bends of up to 60° can easily be formed along the edge of the rail at the triangular nodes by clamping the edge rail with 60mm deep wooden blocks along the line of the joint. The rail is then tapped with a rubber mallet until the required deviation is achieved. Should the bend not fall on a node, then the lower leg could be cut to suit the location of the required bend using either a steel saw or angle grinder.



For 90° bends the internal or external fitting should be utilised and is fixed to the preceding and following unit by means of aluminium rivets. For ease of installation the internal or external unit should be fixed to the edge rail and the portion of the edge rail installed butting up to the dwelling or fixed point cut using to size to ensure the correct width of the footway/patio is achieved.



QUICK INSTALLATION GUIDE

INSTALLING CURVED SECTIONS:

The following procedure should be followed when installing curved sections:

- Set out the line of the curved section on the surface of the sub base and then rivet together sufficient lengths of edge rail to suit the curve to be installed.
- Fix the starting end butting up to the dwelling or fixed point and tack the edge rail at intermediate joints whilst tracking the curve line.
- Once the edge rail is tacked into place the intermediate fixing units in line with the required pitch can be installed to complete the edge rail installation.



BEDDING SAND INSTALLATION:

The bedding sand is then installed in the usual manner, but the added benefit of having the edge rail in place means that the screeding rail could be notched and the edge rail used as a guide to ensure the required depth of bedding sand is achieved.

Cover bedding sand when not in use as it is important to work with dry sand and do not attempt to level out any surface irregularities with bedding sand as this will result in an uneven surface.



QUICK INSTALLATION GUIDE

BLOCKWORK INSTALLATION:

Starting from a permanent edge such as a dwelling or installed IrandiPRO edge rail lay pavers in the normal fashion.

Once all blockwork has been installed and the jointing sand compacted into place, all that remains is to fill the outer edge of the box cut to finish flush with the edge course surface.

The pavement structure is now suitable for trafficking as no curing time is required.

