



**sentaur**  
OOO PRODUCTS

Handrail &  
Balustrade  
Solutions



edition 1.0

Protecting

People

& Property

Sentaur Products is an Australian company supplying handrail and balustrade solutions for architectural, commercial and industrial applications.

Our modular systems eliminate the disadvantages of traditional installations through well-tested innovation, providing Architects, Designers and Engineers a superior and cost effective solution when specifying Handrails or Balustrade into Projects.

## modular / no-weld hand railing systems

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Pre-Engineered



Tough & Durable



Cost Efficient



No On-Site Welding



Tamper Proof





# conecta-bal™

**conecta-bal™** is our commercial balustrade system which combines strength, durability and versatility, enabling it to be used in a wide variety of applications.

Constructed from steel and fully galvanised after fabrication, the unique modular design provides maximum strength, cost efficiency, and longevity.

Stainless steel, anti-vibration locking screws which embed into the pipe give the ultimate confidence in a modular system that is Safe, Fast and Easy!

#### Why use **conecta-bal™**?

- Eliminate design and fabrication time
  - Unlimited configurations
    - No site welding
    - Ease of installation
  - Designed to comply with Australian Standards
  - Pre-engineered designs ensure structural integrity
- Can be supplied in a range of paint finishes to suit your application



Installation - Type C1



Installation - Type C1



Installation - Type C1

## conecta-bal™

### UNLIMITED USES

- Retaining walls
- Footbridges
- Public Housing projects
- Viewing Platforms
- Back of house applications
- Access ramps 1 metre or higher above ground level



Installation - Type C1





Installation - Type C1

## **conecta-bal™** revolve™ (left)

**conecta-bal™** can be supplied as curved or radius panels to suit any custom application.

From circular platforms to gently curving retaining walls, all we require is the radius to produce panels which match perfectly to your project.

## **conecta-bal™** bikesafe™ (right)

**bikesafe™** meets the Austroads Safety requirements for cycleways and paths.

### AUSTROADS GTEP Part 14 Bicycles

7.6.2 As a key objective of fences constructed in close proximity to bicycle lane or path facilities, cyclists (and their bicycles) should be able to brush against fences at speed and not be injured or 'caught' as a result.



Installation - Type C7



Installation - Type C1



Installation - Type C5

## conecta-bal™ assist™ AS 1428.1-2009 compliant

As pictured the **conecta-bal™** system can be configured in a number of ways to ensure compliance with the standard for access and mobility AS 1428.1-2009 and also the BCA requirements for Primary Schools.

See next page for configuration options that satisfy the requirements of the relevant standards.

### AS 1428.1-2009

6.1(i) Handrails shall be constructed and fixed so that there is no obstruction to the passage of a hand along the rail.

### BCA - Building Code of Australia

- D2.17 Handrails
- (a)(iv) In a Class 9b building used as a primary school
    - (a) have one handrail fixed at a height of not less than 865mm; and
    - (b) have a second handrail fixed at a height between 665mm and 750mm



Installation - Type C5





Installation - Type C3

## conecta-bal™ configurations

Sentaur has made selection of your balustrade as easy as possible.

**Type C1** - Standard Balustrade  
*(Designed to comply with AS 1170)*

**Type C2** - Standard Balustrade with kick plate  
*(Designed to comply with AS 1657 at 2m + drop height)*

**Type C3** - Balustrade with a smooth inline handrail  
*(Designed to comply with AS 1428)*

**Type C4** - Balustrade with a smooth offset handrail  
*(Designed to comply with AS 1428)*

**Type C5** - Balustrade with 2 smooth offset handrails  
*(Designed to comply with AS 1428 and  
BCA requirements for Primary Schools)*

**Type C6** - Balustrade with 2 smooth handrails - 1 inline & 1 offset  
*(Designed to comply with AS 1428 and BCA requirements for Primary Schools)*

**Type C7** - Balustrade with a smooth turned-in handrail  
*(Designed to comply with Austroads Bike Path  
Safety requirements)*

If you can't find the configuration you require please call us on 1300 664 804 to discuss the options.

Type C1



Type C2



Type C3



Type C4



Type C5



Type C6



Type C7







# assistaur™

The **assistaur™** AS 1428.1-2009 compliant range has been developed to provide a solution to the ever increasing emphasis placed on ease of access for persons with disability.

Whether your application is a new project or an upgrade to an existing building to meet Australian Standards, the **assistaur™** range makes compliance with the Standards easy and cost effective.

#### Why use **assistaur™** ?

- Smooth Handrails
- Suits ramps, stairs or other applications
  - No site welding
  - Unlimited configurations
- Can be supplied in a range of paint finishes to suit your application

#### AS 1428.1-2009

10.3 (i) Ramps and intermediate landings shall have kerb rails on both sides that comply with the following:

- (i) The minimum height above the finished floor shall be 65mm.
- (ii) The height of the top of the kerb or kerb rail shall not be within the range 75mm to 150mm above the finished floor.
- (iii) There shall be no longitudinal gap or slot greater than 20mm in the kerb or kerb rail within the range 75mm to 150mm above the finished floor.

12 (i) Handrails shall have no obstruction to the passage of a hand along the rail.



Installation - Type A4



Installation - Type A16



Installation - Type A7

**assistaur™**

**UNLIMITED USES**

- Access ramps and stairs
- Schools and Universities
- Aged Care Facilities
- Shopping Centres
- Hospitals and Medical facilities
- Public places of interest



Installation - Type A7 & Type A8



Type A1



Type A2



Type A3



Type A4



Type A5



Type A6



Type A7



Type A8



Type A9



## assistaur™ configurations

Sentaun has made your  
selection of disability  
rails as easy as possible.

Pictured are most of  
the commonly required  
configurations that can be  
achieved.

See next page for  
more options.





Installation - Type A4

Type A10



Type A11



**assistaur™**  
configurations

**FOR EXAMPLE**

For single inline rail you would use Type A1.

For a handrail with two offset rails mounted to a kerb for a Primary School project you could use Type A11.

If you can't find the configuration you require please call us on 1300 664 804 to discuss the options.

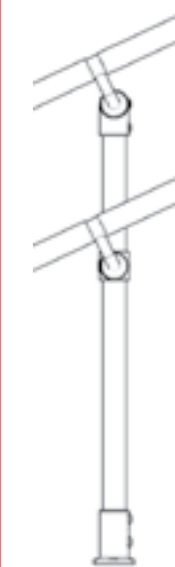
Type A12



Type A13



Type A14



Type A15



Type A16





# safestop™

The **safestop™** commercial hand railing systems are extremely versatile, heavy duty and suitable for use in a wide variety of commercial, industrial and civil applications.

**safestop™** - the culmination of extensive innovation, engineering and testing, is a durable and user friendly system offering many safety and cost saving benefits at the point of installation.

#### Why use **safestop™**?

- Independently load tested to AS 1657
  - No on site welding / hot works
  - Significant cost savings over conventional systems
- Reduced safety risk for installer / public
- Reduced risk of corrosion, as the galvanised surface is not burnt off by welding
  - Unlimited uses and configurations
  - Can be supplied in a range of paint finishes to suit your application



Installation - Type S2



Installation - Type S2 (custom painted)



Installation - Type S2

## safestop™ duo

### UNLIMITED USES

- Pedestrian footpaths
- Warehouses, mezzanine floors, loading docks
  - Carparks
- Bridge Abutments
  - Retaining walls
- Service platforms and stairs
  - Airports
- Shopping centres



Installation - Type S2



Installation - Type S1



Installation - Type S1

## **safestop™ mono**

### **UNLIMITED USES**

- Parapet walls
- Guard rail extensions.  
For example "Armco"  
type barriers
- Sports field perimeter rails
- Bump rails

## **safestop™ trio**

### **UNLIMITED USES**

- To meet BCA clause 2.16h (i)(b) requirements for service platforms and accessways
- Barrier Rails
- Retaining walls where added protection is required



Installation - Type S4



Installation - Type S3



Installation - Type S2 Stairs & S3 Platform

## safestop™ duo industrial applications

While **safestop™** is an aesthetic and versatile system for use in public areas, huge benefits can also be achieved in the areas of a building not readily seen.

- Roof service areas
- Catwalks
- Service platforms and stairs
- Warehouses
- Mezzanine Floors
- Loading docks

### AS 1657-1992

3.2.1.1 Continuous guardrailling complying with clause 3.4 shall be provided on the sides and ends of all platforms and walkways, except at points of access from a stairway or ladder, or where there is a permanent structure not more than 100mm distance from the edge of the platform or walkway which will give protection equal to or greater than that prescribed in clause 3.4.



Installation - Type S2





Installation - Type S2 Stairs & S3 Platform

## safestop™ configurations

Sentaur has made selection of  
your safety railing easy.

### FOR EXAMPLE

To extend the height of an existing wall or  
protect the perimeter of a sports field, you  
would use Type S1 (available in any height).

For standard AS 1657 compliant handrails  
you would use Type S2.

For handrailing where extra protection is  
desirable you could use Type S5.

If you can't find the configuration you  
require please call us on 1300 664 804  
to discuss the options.

### AS 1657-1992

3.2.1.2 A toe-board complying with Clause 3.4.3 shall  
be provided at the edge of a platform, walkway, or  
landing, which is greater than 10mm distant from a  
permanent structure and where an object could fall  
more than 2000mm.

3.4.3 The toe-board shall be firmly attached to the floor  
or posts, and any gap between the toe-board and the  
floor shall not exceed 10mm. The top of the toe-board  
shall be not less than 100mm above the top of the floor.

Type S1



Type S2



Type S3



Type S4



Type S5





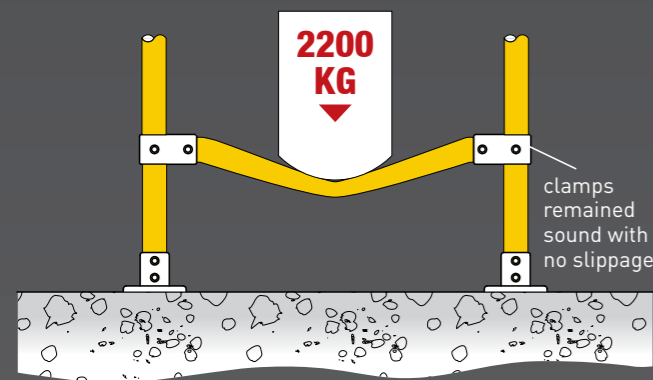
# our commitment to testing

Structural integrity is paramount in safety railing. With this in mind, Sentaaur Products has commissioned a stringent series of tests of the system by approved testing agencies in Australia and the United Kingdom, which highlight how the system exceeds the high standards demanded by engineers.

## LOAD TEST #1 Integrity within a structure

Under an extreme load test of 2.2 tonnes, the Sentaaur fittings remained strong and sound, while a section of standard 48mm diameter pipe rail within the assembly collapsed.

The test assembly consisted of two vertical sections of 48mm diameter pipe separated by a 600mm length of 48mm diameter pipe rail. The test was conducted utilising 101-D48 clamps. All locking screws were tightened to the recommended torque of 40Nm.



The assembly was positioned on the loading platen of a 50 tonne Universal Testing Machine to enable a central load to be applied to the 48mm diameter pipe rail via a 20mm wide loading nose. Loading was applied at 5mm per minute to monitor any slippage. A load of 2.2 tonnes was recorded without evidence of any slippage.

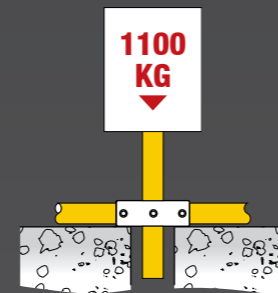
## LOAD TEST #2 Push-through integrity

Under vertical load testing, the Interclamp fitting was tested to 1.1 tonnes before any slippage was detected.

The test assembly consisted of a 600mm vertical section of 48mm diameter pipe connected to a

119-D48 clamp. The locking screw was tightened to the recommended torque of 40Nm.

The assembly was positioned on the loading platen of a 50 tonne Universal Testing Machine to enable a central load to be applied to the end of the 48mm diameter pipe. Loading was applied at 5mm per minute to monitor any slippage. A load of 1.1 tonnes was recorded without evidence of any slippage.



## VIBRATION TEST Vibration of assemblies

Stringent vibration endurance tests were performed utilising sample clamps by an independent testing authority, to evaluate the vibration resistance of the stainless steel locking setscrews.

The tests were conducted on V860 and V875 Shaker Systems coupled with compatible amplifiers and vibration controllers.

A 'Tee' section test assembly was produced using three 300mm lengths of galvanised 48mm diameter pipe held together by a short tee fitting (code 104-D48). The vertical leg of the test assembly was supported in a standard railing base flange (code 132-D48). All fittings were tightened to the recommended torque of 40Nm, with each fitting then marked to establish if any loosening of the setscrews occurred during the test procedures.

The completed 'Tee' section was then rigidly attached to the vibration table of the V860 unit to carry out tests on the X and Y axes of the assembly, and on the V875 unit to carry out test on its Z (vertical) axis.

A monitoring accelerometer was fitted to the extreme end of one the horizontal pipe rails in all tests to measure any resonances throughout the testing procedures.

In all tests, the assembly was subjected to a Resonance Search followed by 6 hour Resonance Dwells as shown below:

Axis	Frequency (Hz)	Level (g)
X	73.33*	12.42
X	194.09	8.62
Y	96.10*	25.00
Y	114.04*	13.90
Y	122.42	1.68
Z	292.00*	32.50
Z	202.00*	5.28

\*These frequencies were dwelled at for duration of 6 hours at an acceleration of 4g.

In addition to the two vibration endurance tests in the Z axis, the assembly was also subjected to a 6 hour swept endurance test at 1 Oct/min between the frequencies of 74Hz and 87Hz.

After the completion of each Resonance Dwell, the fittings were checked to observe if there had been any movement, by checking markings placed on the fittings prior to the test procedures. No signs of loosening of any of the stainless steel setscrews occurred.

**Materials Compatibility**  
Malleable iron, hot dip galvanised fitting and stainless steel locking screw

Sentaaur fittings consist of hot-dip galvanised 'ductile' cast iron connector fittings and 410 S21 stainless steel locking screws, which are utilised to securely clamp hot-dip galvanised pipe. A qualified metallurgist report confirms that stainless steel locking screws are suitable for use with zinc-coated steel and iron components.

When stainless steel is in contact with zinc-coated steel, the zinc acts as a sacrificial anode towards both types of steel. The protective galvanic effect of zinc is considerably stronger than the corrosive galvanic effect of stainless steel and as a consequence, the galvanic effect of the small stainless locking screws on large zinc-coated areas is negligible.

## SALT WATER CORROSION TEST

Independent testing has been carried out to confirm the suitability of the Sentaaur system in maritime conditions.

Two standard clamp fittings were mounted on the ends of a length of D48 pipe, and all 'as factory supplied' locking screws were tightened to the recommended torque of 40Nm.

The assembly was then immersed at a slant in water containing 3.5wt% sodium chloride, a test solution that has the same chloride content as seawater. The immersion resulted in one locking screw being completely immersed, one locking screw being partly below the water line, and the third locking screw being completely above the waterline. The assembly was left in the tank of solution in the same location for 12 days. The assembly was then removed and disassembled and cut in sections to allow inspection of the various surfaces.

The parts above the water line displayed deposits of salt, however, none of the locking screw holes showed any orange-brown staining characteristic of corrosion.

The fully immersed and partially immersed locking screws were removed and also revealed no indication of corrosion.

The non-immersed locking screw was sectioned in situ to reveal how the screw ends bear against the galvanised pipe. Once again, the non-immersed threaded hole did not exhibit corrosion.

The system has been tested by a NATA accredited laboratory to **Australian Standards AS 1657-1992**

**Product Safety Type Approval by TÜV Rheinland**  
(Leading independent testing house in Europe)

## HEALTH BENEFITS OF THE SENTAUR SYSTEM

As welding is not necessary in assembly, the Sentaaur system avoids the dangers of Metal Fume Fever.

Inhalation of zinc oxide fumes can occur when welding or cutting on galvanised metals. Exposure to these fumes is known to cause Metal Fume Fever, the symptoms of which are very similar to those of common influenza including fever, chills, nausea, dryness of the throat, cough, fatigue, and general weakness and aching of the head and body.



# specifications

## Typical draft specification for Sentaur **CONECTA-BAL**<sup>™</sup>

Balustrades will be Sentaur Products Type ....., comprising fully galvanised panels and/or rails and clamps with stainless steel locking screws.

### FINISH

Balustrade finish will be ..... (eg. Galvanised, powdercoat, paint system)  
Colour ..... (eg. Yellow, blue, green etc.)

### MOUNT TYPE

Base of uprights will be Mount Type ..... (eg. T, F, etc)

## Typical draft specification for Sentaur **ASSISTAUR**<sup>™</sup>

Handrails will be Sentaur Products Type ....., comprising fully galvanised rails and clamps with stainless steel locking screws, to comply with AS1428 - 2001

### FINISH

Handrail finish will be ..... (eg. Galvanised, powdercoat, paint system)  
Colour ..... (eg. Yellow, blue, green etc.)

### MOUNT TYPE

Base of uprights will be Mount Type ..... (eg. T, F, etc)

## Typical draft specification for Sentaur **SAFESTOP**<sup>™</sup>

Handrails will be Sentaur Products Type....., comprising fully galvanised rails and clamps with stainless steel locking screws.

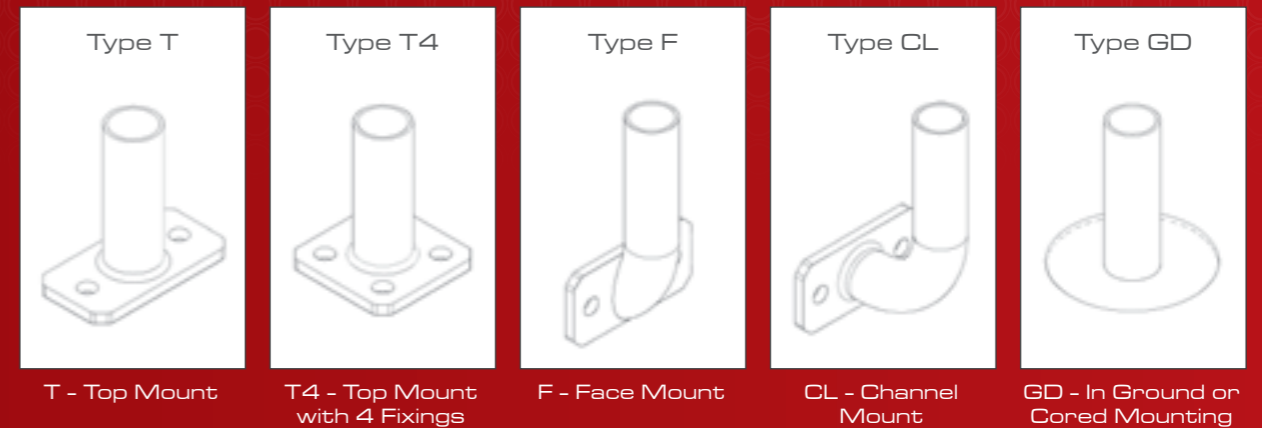
### FINISH

Handrail finish will be ..... (eg. Galvanised, powdercoat, paint system)  
Colour ..... (eg. Yellow, blue, green etc.)

### MOUNT TYPE

Base of uprights will be Mount Type ..... (eg. T, F, etc)

## MOUNT OPTIONS



## ANTI TAMPER SYSTEMS

Whilst evidence of tampering with previous installations is virtually non-existent, Sentaur offers 2 different options for extra peace of mind.

### vandalSMART<sup>™</sup>

patented anti-tamper system.



The clamps can be fitted with a simple, anti-vandal plug that when inserted into the set screws after assembly prohibits tampering.

### tampersafe<sup>™</sup>

unique locking mechanism.



tampersafe<sup>™</sup> incorporates a unique drive shape into the set screw preventing it from being easily loosened without the correct tool.

The anti-vandal package includes brass anti-tamper plugs and the necessary tools to apply and remove them.

### disclaimer

All specifications and standards are intended as a guide only and are subject to change without notice.

It is the responsibility of the persons installing any Sentaur system to ensure that both the product and the finished installation meets the specifications and requirements of the relevant Australian Standards or Building Codes.

Sentaur products cannot be held responsible for any errors or omissions, nor any resultant loss or damage from use of any Sentaur system.





[www.sentaur.com.au](http://www.sentaur.com.au)