What is the Wire Spacings and Regulations?

Firstly, 3.2mm wire is the industry standard size used in Australia. For 4mm wire please see our guide for 4.0mm Wire Balustrade.

Most commonly wire balustrading is installed horizontally for safety reasons on decks, pergolas and landings. The below guidelines apply when heights are between 1000mm and 4000mm from the ground at the highest point. For decks or balconies above 4m high and around swimming pools vertical wires are required (refer to the building code on spacings for vertical balustrading). If the level is below 1000mm at the highest point, at time of publication (March 2019), a balustrading is not required, however we recommend it still meets the building code to be a safe.

What is the tension and deflection required?

Tension of the wire can be checked by hanging a 2kg weight (i.e. 2ltr bottle) from the mid-point of your posts to measure the deflection. If deflection is more than the building code guidelines then further tension of the turnbuckle/bottlescrew is required. Don’t overtighten the bottlescrew as you will put excessive strain on your posts.

It is highly recommended not to bend wire around corners. This will damage the stainless wire, put excessive stress on your posts and make it difficult to tension. Below is snippets form the NCC 2016 V2 3.9.2.3.

<table>
<thead>
<tr>
<th>Wire dia. (mm)</th>
<th>Lay</th>
<th>Wire spacing (mm)</th>
<th>Minimum required tension in Newtons (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>7x7</td>
<td>600</td>
<td>15, 178, 270, 314, 350, 390, 431, 471, 511, 591</td>
</tr>
<tr>
<td>1x19</td>
<td></td>
<td>1000</td>
<td>80, 100, 1220, 1300, 1491</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wire dia. (mm)</th>
<th>Wire spacing (mm)</th>
<th>Maximum permissible deflection of each wire in mm when a 2 kg mass is suspended at mid span</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>8</td>
</tr>
</tbody>
</table>

Summary of Building Code:

Handrail must be minimum of 1000mm high and 40mm thick, thus the underside of your handrail should be 960mm.

Balustrade wires spaced horizontally 80mm apart with 12 spacings = 11 runs (11 Kits).

Distance between intermediate posts is no greater than 1200mm for 1x19 wire and 1500mm for 7x7.

<table>
<thead>
<tr>
<th>Height of UNDERSIDE of the Hand Rail = 960mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Spacings = 86mm</td>
</tr>
<tr>
<td>12 spacings @ 80mm = 960mm</td>
</tr>
<tr>
<td>Height therefore 11 runs of wire are required</td>
</tr>
</tbody>
</table>

Minimum top handrail Thickness is 40mm

Total Height of Hand Rail (min 1006mm)

DISCLAIMER:

All information given is based on our interpretation of the building code NCC 2016 Volume 2, and we strongly encourage clients to check with both their local council and the National Building Code of Australia (BCA, Volumes 1 and NCC Volume 2) for compliance before and after installation.

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Wire Balustrade parts calculator

The Fastener Factory has the world’s first wire balustrade calculator, simply select your kit and add your measurements of each section. We then advise what stainless steel wire, balustrade fittings and tools you need. Simply then press add to cart for the lowest priced wire balustrade on the market.

What System Should I Use?

The Fastener Factory stocks a wide variety of wire balustrade with two different methods of crimping. Wire Balustrade fittings are either crimped by a hand swaging tool or by a hydraulic swaging tool/press. Swageless systems are also available, however The Fastener Factory doesn’t stock these due to the extremely high price of the fittings and the issues caused by being a non fixed system.

Hand Swaging

Hand swaging is where the wire is wrapped around a thimble and a hand swaging tool is used to crimp the wire inside a nickel plated copper swage. As the wire needs to be flexible enough to loop around a thimble, you can only use the 7x7 wire. 7x7 wire has a course rope look rather than a smooth sleek look of the 1x19 wire configuration.

Pros’ and Con’s

✔ Use 7x7 Wire
✔ Lowest Price Systems
✘ Slow to Install
✘ Dated/Old Style System
✘ Messy/Difficult to Install
✘ Can’t use 1x19 Wire

Hydraulic Swaging

Hydraulic Swaging is where the wire is inserted straight into the end of the stainless wire fitting and a hydraulic crimping tool or press is used to crimp the wire.

As the wire doesn’t need to be flexible enough to loop around a thimble either 7x7 or 1x19 wire can be used. However 1x19 is most commonly used as it is more rigid and aestically pleasing.

Pros’ and Con’s

✔ Use 1x19 Wire (preferable)
✔ Cost effective
✔ Quick to Install
✔ Neat/Sleek Style System
✔ 7x7 wire can be used
Hand Swaging Kits for Timber Posts

Our Hand Swaging Kits are Kits #1, #2, #5, #9 & #10. In all of these Kits, wire is looped around a thimble and crimped off with a nickel plated copper swage using a hand swaging tool (a hydraulic swaging tool can also be used). What length of runs are these suitable for? These kits are suitable for a single straight run up of to 10m long. For runs between 10 - 15m - see ur kits #11, #12, #15, #19 & #20 which have a turnbuckle at each end.

Kit #1 Eye/Eye Turnbuckle. Swages. Thimbles. Saddles. Screws


Kit #9 Hook/Eye Turnbuckle. Thimbles. Swages. Lag - Eye Screws

Kit #10 Hook/Eye Turnbuckle. Swages. Thimbles. Saddles. Screws

Images Not to Scale
Hydraulic Swaging Kits for Timber Posts with Stairs

Our Hydraulic Swaging Kits #3, #4 and #4S are ideal for use on landings and stairs with timber posts. In these Kits, wire is inserted into the tubular end of the fitting and crimped off with a hydraulic swaging tool or press. These kits are suitable for a single straight run up to 10m long. For runs between 10 - 15m - see ur kits #13 and #14, which have bottlescrews at each end. Our Kit #4M and #4MS are for short runs less than 2metres. These kits can be used on stairs because they can all pivot on the fork of the jaw/swage bottlescrew and fork terminal.

Kit #3 Jaw/Swage Bottlescrew. Fork Terminal. Saddles. Screws

Kit #4 Jaw/Swage Bottlescrew. Fork Terminal. Lag Eye Screws

Kit #4S Jaw/Swage Bottlescrew. Fork Terminal. Short Lag Eye Screws

Kit #4M MINI Jaw/Swage Bottlescrew. MINI Fork Terminal. Lag Eye Screws

Kit #4MS MINI Jaw/Swage Bottlescrew. MINI Fork Terminal. Short Lag Eyes

IMAGES NOT TO SCALE
Hydraulic Swaging Kits for Timber Posts (no stairs)

Our Hydraulic Swaging Kits #6, #7 and #8 are ideal for use on landings with timber posts and without stairs. The fittings in these kits come out perpendicular to the posts and no angle can be easily created for stairs. In these Kits, wire is inserted into the tubular end of the fitting and crimped off with a hydraulic swaging tool or press. These kits are suitable for a single straight run up of to 10m long. Our Kit #16 is suitable for runs between 10 - 15m as it has a bottlescrews at each end.

Kit #6 Lag Screw/Swage Bottlescrew. Lag Screw Terminal

Kit #7 Stud Terminals. Timber Inserts

Kit #8 Lag - Screw Terminals. Left and Right

IMAGES NOT TO SCALE

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Hand Swaging Kits for Metal Posts

Our Hand Swaging Kits are Kits #21, #22, & #30. In all of these Kits, wire is looped around a thimble and crimped off with a nickel plated copper swage using a hand swaging tool (a hydraulic swaging tool can also be used). What length of runs are these suitable for? These kits are suitable for a single straight run up of to 10m long.

Kit #21 Eye/Eye Turnbuckle. Swages. Thimbles. Saddles. Rivets


Kit #30 Hook/Eye Turnbuckle. Swages. Thimbles. Saddles. Rivets
Hydraulic Swaging Kits for Timber Posts with Stairs

Our Hydraulic Swaging Kits #23, #24 & #24N are ideal for use on landings and stairs with timber posts. In these Kits, wire is inserted into the tubular end of the fitting and crimped off with a hydraulic swaging tool or press. These kits are suitable for a single straight run up to 10m long. Our Kit #24M is for short runs less than 2 metres. These kits can be used on stairs because they can all pivot on the fork of the jaw/swage bottlescrew and fork terminal.


Kit #24N Jaw/Swage Bottlescrew. Fork Terminal. Eye Bolts. (Tapped Thread)
Hydraulic Swaging Kits for Steel Posts (no stairs)

Our Hydraulic Swaging Kits #26, #27 & #28 are ideal for use on landings with steel posts and without stairs. The fittings in these kits come out perpendicular to the posts and no angle can be easily created for stairs. In these Kits, wire is inserted into the tubular end of the fitting and crimped off with a hydraulic swaging tool or press. These kits are suitable for a single straight run up of to 10m long.

Kit #26 Swage/Stud Bottlescrew. Swage Stud. Rivet Nuts

Kit #27 Stud Terminals. Rivet Nuts. Left & Right

Kit #28 Stud Terminals. Left and Right (tapped threads)
Wire Types

There are three main types of stainless steel wire configurations on the market. 7x7 and 1x19 are commonly used in balustrading and the third type is 7x19 is more used in other applications.

The 7x7 wire is flexible enough to loop around a thimble it has a course rope look rather than a smooth sleek look of the 1x19 wire configuration.

1x19 is most commonly used as it is more rigid and aestically pleasing. It has a smooth, sleek appearance and can be used in hydraulically swaged systems. It is too stiff to loop around a thimble.

The Fastener Factory conveniently has a variety of lengths of 3.2mm stainless steel wire including 25m, 50m, 100m, 200m, 305m.
Tools required

The Fastener Factory stocks all the tools required to install your wire balustrade from hand swaging and hydraulic swaging tools to crimp your fittings, to wire cutters for cutting the stainless steel wire. We also have tools for installing rivet nuts, left and right, as well as hand riveters for installing pop rivets.

- **Hand Swaging tool for crimping nickle pated swages (ferrules)**
- **Hydraulic crimping tools**
  - STonne for small jobs and 8T for large jobs. The 8T tool is easier to use and has larger leverage reducing RSI.
- **Spare Dies for Hydraulic crimping tools**
- **Hydraulic press for factory swaging**
- **Wire Cutters for cutting stainless steel wire.**
- **Lag eye driver**
- **Rigging Screw Spanner**
- **Drill Bits specialised sizes for balustrading**
- **Standard rivet nut tool for RHT ONLY**
- **Rivet nut tool for LEFT and Right Rivet Nuts**
- **Hand Riveters for pop rivets**
Intermediate Posts

The Fastener Factory currently two pre-fabricated intermediate posts for timber handrail.

Flat Bar Satin Polished
960mm w/11 pre-drilled holes

Rectangle Tube 50mm x 10mm
Polished 960mm w/11 holes

Code: SSPFB40x960S

Code: SSPST50x960S
Price, Quality & Guarantee

Warranty and Guarantee

Further to the ACCC’s consumer guarantee, The Fastener Factory provide a manufacturers warranty of replacement of the goods if there is a product defect or manufacturing fault. We can guarantee that our product is high quality and meets the chemical composition of 316 grade stainless steel.

Maintence and Care

In normal conditions stainless steel products will last between 30-50 years with proper maintenance and care. We send our wire balustrade products all over this continent’s harsh environment, and fully back the quality of our stainless products. However without maintenance stainless still will tea stain and/or corrode.

Tea Staining

All stainless steel stains. No one can give you a time frame on staining, it requires maintenance/cleaning, hence the name stain-less not stain-proof. Don’t know what tea staining is, please have a read on tea staining on the Australian authority for stainless steel products, the Australian Stainless Steel Development Association.

Price

We are a trade store with thousands of transactions per month, Whilst our pricing may be very low, we back that the quality of our product is extremely high. If we sold any inferior products our tradies would throw them back at us, literally.

Testing of Material Composition

The Fastener Factory routinely tests its stainless steel wire balustrade products for chemical composition to make sure it meets the requirements of 316 grade.