

NEPEAN
Building &
Infrastructure

TM

Weldlok® Aluminium Grating & Handrail



NEPEAN™ Building & Infrastructure

NEPEAN Building & Infrastructure is a division of NEPEAN, Australia's largest privately owned engineering, mining services and industrial manufacturing organisation.

Through our renowned Weldlok® brand, we manufacture and supply grating, handrails and drainage products, as well as perforated and expanded metals in a variety of materials, including galvanised mild steel, stainless steel and aluminium.

This brochure is designed to assist the architect, draughtsperson, engineer, fabricator and specifier in the correct selection of our range of aluminium grating and handrail products.

Ask our sales team for a copy of these and other Weldlok® product brochures.



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Aluminium Handrail

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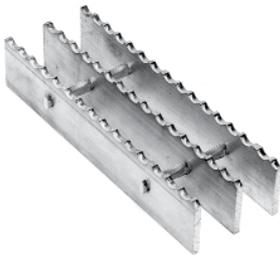


WELDLOK® ALUMINIUM PRODUCTS

Aluminium has a unique combination of properties that makes it one of the most versatile engineering and construction materials. Its many advantages include:

- Excellent corrosion resistance
- High strength-to-weight ratio
- Can be customised on site
- Non-toxic
- Naturally attractive
- Easily recycled
- Our most abundant metallic element

RECTANGULAR BAR GRATING



It is an ideal material for bar grating because of its low mass (about a third the weight of copper or steel), unmatched strength to weight ratio and excellent corrosion resistance under most service conditions.

Aluminium construction products provide years of service without showing wear or decay. Because aluminium is non toxic, it can easily be cleaned and does not absorb bacteria-sustaining particles. This makes it an excellent choice for food processing facilities. Aluminium is also resilient; it can deflect under loads and then spring back.

These attributes make aluminium grating an ideal solution for many special applications such as sewage and wastewater treatment plants, off-shore drilling rigs, some types of chemical processing plants and marine superstructure applications. Its aesthetic appeal also makes aluminium a natural choice for architectural and commercial applications such as sunscreens, ceiling tiles, vents, fencing, building facades, fountains, walkways and entranceways.



Weldlok® aluminium grating at Abbot Point Coal Terminal, QLD



Weldlok® aluminium handrails and FRP walkway at Palm Beach Jetty, Rockingham, WA



Weldlok® aluminium grating balustrades and FRP walkway at Red Bluff Shared Pathway, Lake Macquarie, NSW

WELDLOK® ALUMINIUM RECTANGULAR BAR GRATING

Grating is pressure-locked, with crossbars permanently attached to load bars through a swaging process. Grating is available with a range of load bar sizes and spacing. Crossbar spacing can also be at 50mm or 100mm centres. Also available with serrated surface for slip resistance.

Rectangular Bar Grating is the most widely used aluminium pressure-locked grating. The square crossbars are inserted through punched holes in the rectangular load bars, then permanently locked into place by swaging.

Recessed crossbars provide clean, crisp lines, while the advanced swaging process eliminates the need for welding to form the panels, allowing for variety of spacing. Its aesthetic appeal and ability to meet tight tolerances make this grating ideal for architectural applications.



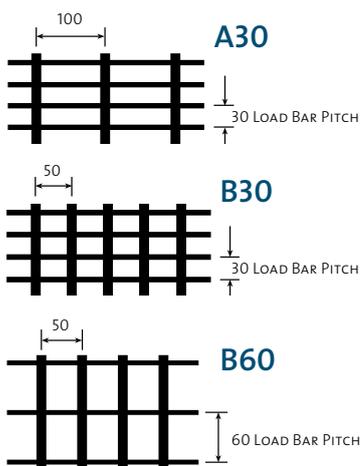
Series 30 Standard Mat Sizes

LOAD BAR THICKNESS	SPAN X WIDTH	NO. OF LOAD BARS
3mm	6000 x 993mm	34
5mm	6000 x 995mm	34

Series 60 Standard Mat Sizes

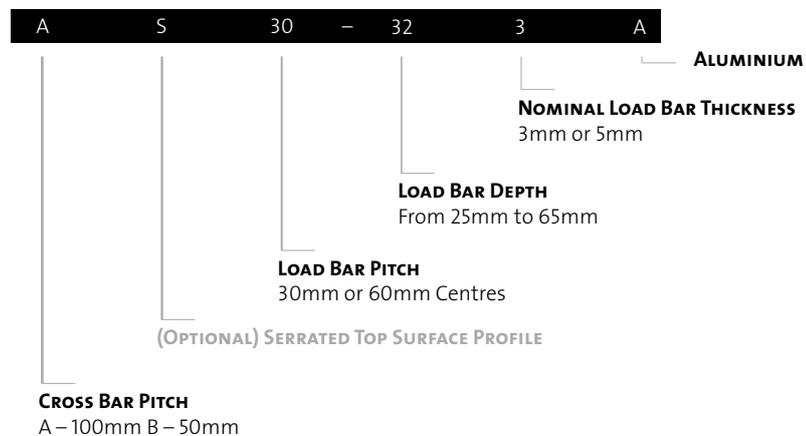
LOAD BAR THICKNESS	SPAN X WIDTH	NO. OF LOAD BARS
3mm	6000 x 1023mm	18
5mm	6000 x 1025mm	18

Grating Profiles



Product Code Example

AS 30 – 32 3 A = Series 30 Aluminium Rectangular Grating, Serrated Load Bars 32 x 3 at 30mm centres, crossbars at 100mm spacing.

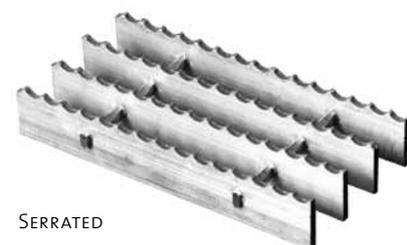


Finishes

Aluminium Grating is available in three finishes:
 M = Mill Finish
 PV = Passivated
 A = Anodised



PLAIN



SERRATED

WELDLOK® ALUMINIUM STAIR TREADS

Weldlok® aluminium stair treads are fabricated from rectangular swaged bar grating. The bar grating is available with a plain or serrated surface.

Aluminium stair treads are available with two types of nosing - floor plate or non-slip yellow abrasive. The treads can be welded into place or supplied with pre-drilled holes for bolting.

Overall tread length can be made to any dimension. However, it is preferable where possible to select tread dimensions from the tables of recommended widths and maximum lengths below.

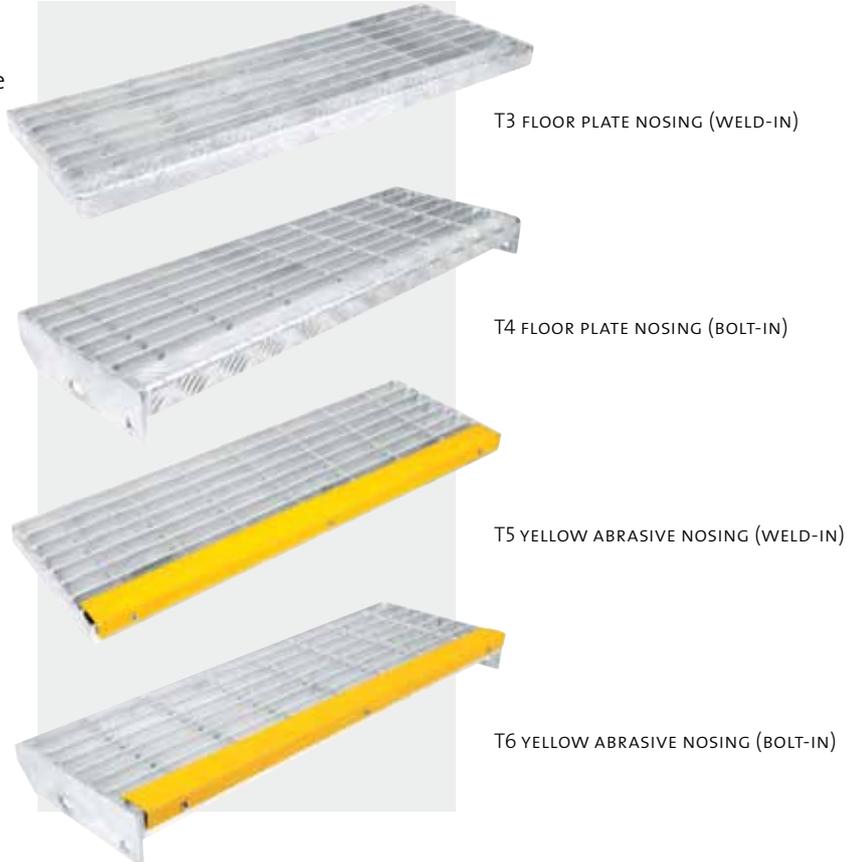
Stair Tread Types

T3 Floor plate nosing (weld-in)

T4 Floor plate nosing (bolt-in)

T5 Yellow abrasive nosing (weld-in)

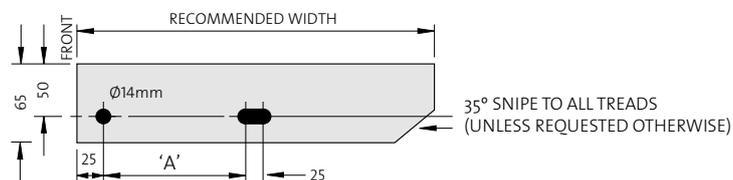
T6 Yellow abrasive nosing (bolt-in)



RECOMMENDED WIDTHS (mm)								
TYPE T3/T4	SERIES 30	125	155	185	215	245	275	305
	SERIES 60		155		215		275	
TYPE T5/T6	SERIES 30	125	155	185	215	245	275	305
	SERIES 60			185		245		305
BOLTED CONNECTIONS								
END PLATE HOLE CENTRES "A"	45	75	75	100	100	100	100	

RECOMMENDED MAX. LENGTHS (mm)			
LOAD BAR SIZE	25 x 5	32 x 5	40 x 5
SERIES 30	550	900	1275
SERIES 60		450	700

Standard End Plates for Bolted Treads



Note: Special End Plate Hole Centres available on request.

WELDLOK® ALUMINIUM GRATING SPECIFICATIONS



These specifications are intended as a guide for architects and engineers, and should be modified to fit the specific conditions of the application.

General

The contractor shall provide all labour, materials, equipment and incidentals as specified to install grating and stair treads.

Site measurements should be taken prior to preparation of shop drawings and fabrication, where required, to ensure proper fitting of the work.

Submittals

The contractor shall submit for approval shop drawings for the fabrication and erection of all work, including plans, elevations and details of sections and connections. Type and location of all fasteners should be shown.

The contractor shall submit the manufacturer's specifications, load tables, anchor details and standard installation details.

Products

Specify complete product details. For example:

Grating: Weldlok® Aluminium Rectangular Bar, or approved equivalent.

Load Bars: Rectangular bars at maximum 60mm centres.

Crossbars: Locked at right angles to load bars at maximum 100mm centres (50mm cross-bar centres may be specified at the discretion of the architect/engineer).

Loading: Grating to carry a pedestrian loading equal to a uniform load of 2.5kN per square metre over the required clear span, with deflection not to exceed 5mm. (Alternate loading requirement may be specified at the discretion of the architect/engineer in accordance with AS1657.)

Surface: Plain. (Serrated surface may be specified for maximum slip resistance.)

Finish: Mill finish, passivated, anodised.

Stair Treads: Specify same type and spacing as grating.

Tread Nosing: Specify whether nosing is floor plate or abrasive yellow nosing. (Carrier End Plate angles should be specified in conjunction with close mesh grating treads.)

Installation

Prior to grating installation, the contractor shall inspect supports for correct size, layout and alignment. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the architect or owner's agent prior to grating placement.

Grating shall be installed in accordance with shop drawings and standard installation clearances.

Fitting & Placement

Before installation, all cutting and fitting required for installation should be completed. Grating shall be placed so that cross-bars align.

Wherever grating is pierced by pipes, ducts and structural members, openings must be cut neatly and accurately to size and a rectangular band bar of the same height and material as the load bars welded to the opening, unless a kick plate is required by AS1657.

Cut-outs for circular obstructions are to be at least 50mm larger in diameter than the obstruction. Cut-outs for all piping 100mm or less shall be made on site.

All rectangular cut-outs are to be made to the next load bar beyond the penetration, with a clearance not to exceed load bar spacing.

Standard panel widths shall be used wherever possible.

Protection of Aluminium

Where aluminium surfaces come into contact with dissimilar materials such as dissimilar metals, concrete, masonry or lime mortar, exposed aluminium surfaces shall be painted with one coat of bituminous paint or other approved insulating material.

Where stainless steel fasteners are used these should be isolated from the aluminium by Weldlok® nylon separation washers.

Grating Attachment

Appropriate fixing devices (such as clips, clamps and anchor blocks) and fasteners must be used to secure grating to supporting members or prepared openings. Grating fixing should be installed with a minimum of four per panel or four per square metre, whichever is greater.

WELDLOK® ALUMINIUM GRATING FASTENING METHODS

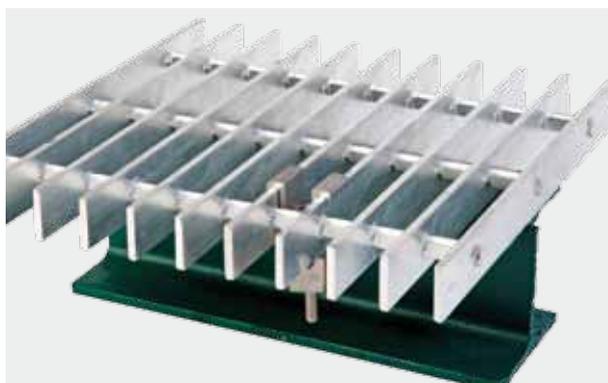
Weldlok® fixing clips are recommended to secure grating to supporting members. A minimum of 4 clips should be used per panel or 4 per square metre, whichever is greater.

30 Series Aluminium Saddle Clip

Suitable for 30 Series grating. Comprises extruded aluminium top clip, 8mm diameter hex head screw and threaded bent bottom clip.

Material: 6063 Aluminium Alloy (Top Clip)

Stainless Steel 316 (Bottom Clip/Screw)



30 Series SS316 Clip Set

Suitable for Series 30 Grating. Comprises top clip, 8mm diameter hex head screw, nyloc nut and folded bottom clamping bracket.

Material: Stainless Steel 316



60 Series SS316 Clip Set

Suitable for Series 30 & 60 Grating. Comprises double saddle clip, 8mm diameter hex head screw, nyloc nut and folded bottom clamping bracket.

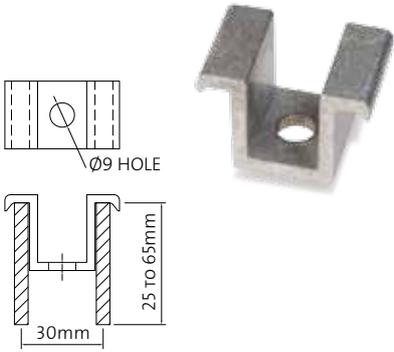
Material: Stainless Steel 316



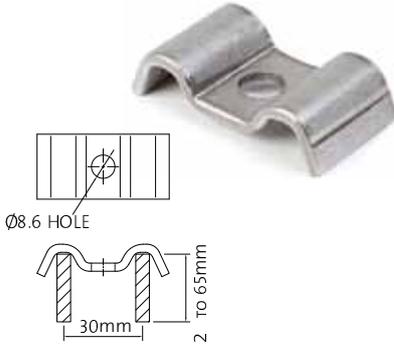
WELDLOK® ALUMINIUM GRATING FIXING CLIPS



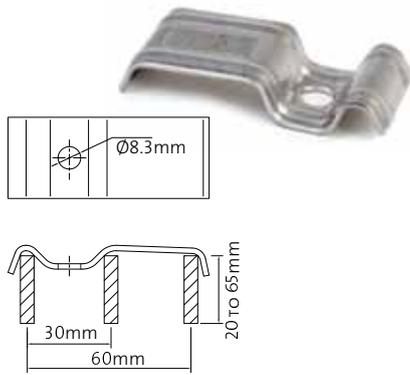
Top Clips



30 Series Aluminium Saddle Top Clip

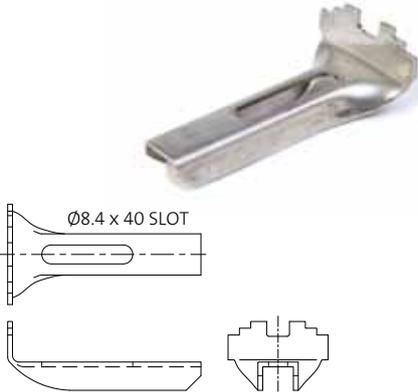


30 Series SS316 Clip Top



60 Series SS316 Clip Top

Bottom Clips



Folded SS316 Bottom Clip



Threaded SS316 Bent Bottom Clip



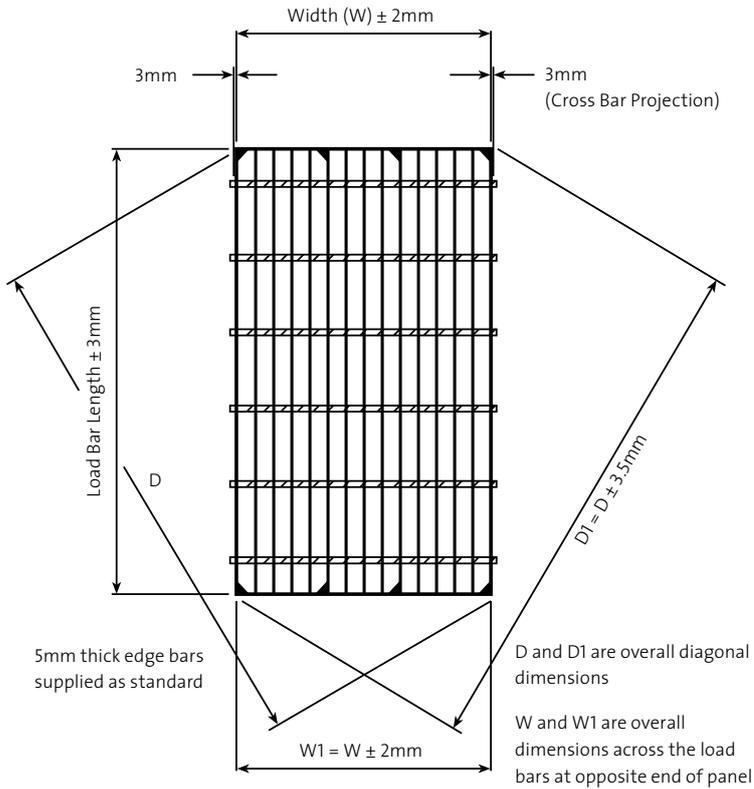
SS316 M8 Screw with Nyloc Nut
(length 65mm & 100mm)



WELDLOK® ALUMINIUM GRATING MANUFACTURING TOLERANCES

Overall Dimensions and Squareness

All dimensions are maximum permissible tolerances



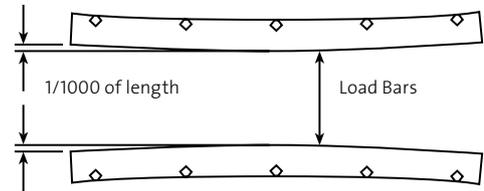
Standard Fabrication Welding

Edge bars and attachments are welded with a minimum 3mm fillet weld to one side of:
Every 4th load bar on Series 30 Grating
Every 3rd load bar on Series 60 Grating

Optional Welding

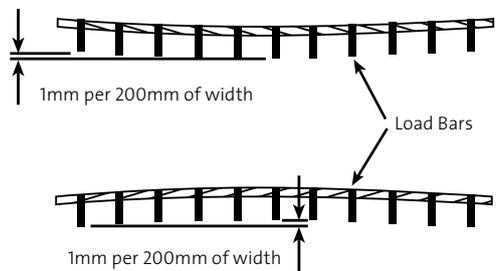
Full Weld:
Weld one side of every load bar.
Seal Weld:
Weld both sides of every load bar.

Longitudinal Bow

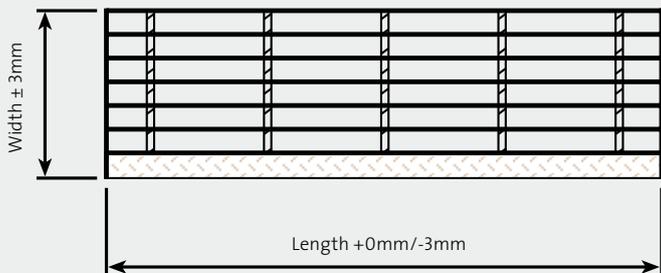


Transverse Bow

(Before fastening to supports)



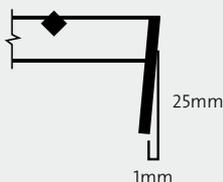
Stair Tread Tolerances



Note: Length of tread is distance between outer faces of end flats

Stair Tread End Flat Lean

Fabrication: Edge bars and end plates welded on side of every load bar with minimum 3mm fillet weld

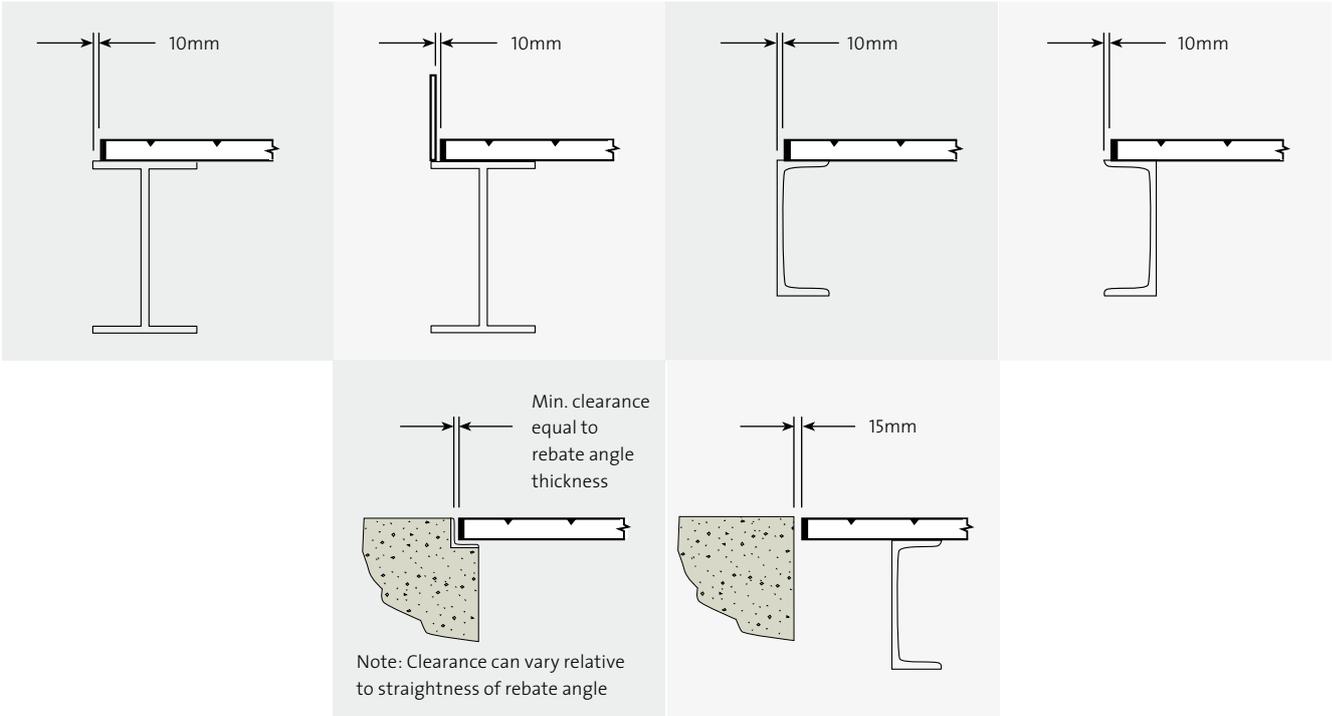
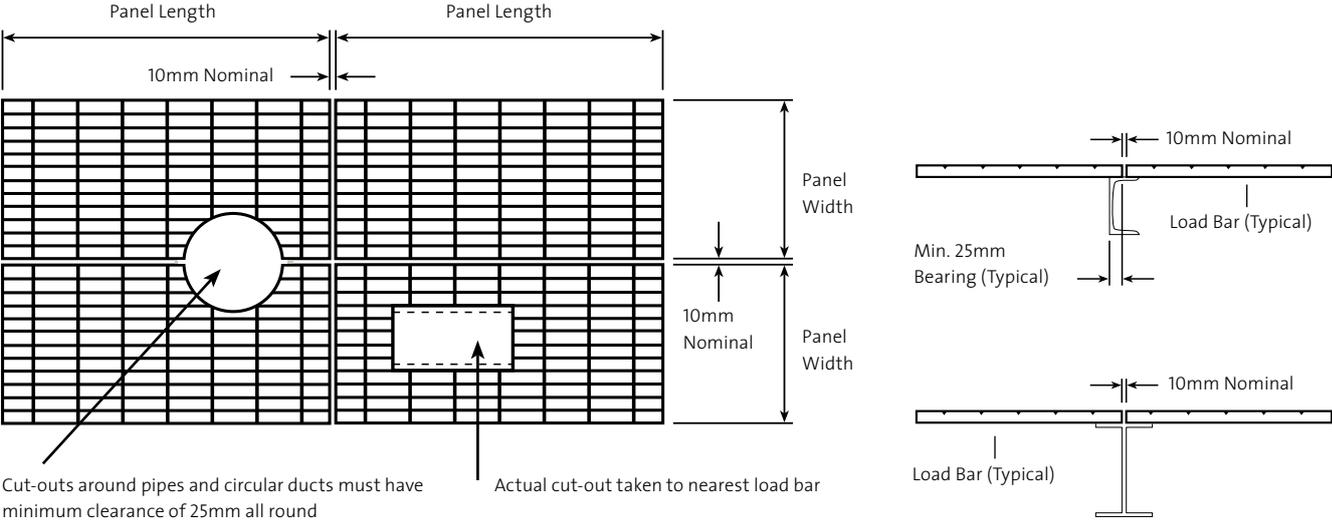


WELDLOK® ALUMINIUM GRATING INSTALLATION TOLERANCES



Overall Installation Dimensions

All dimensions are maximum permissible tolerances

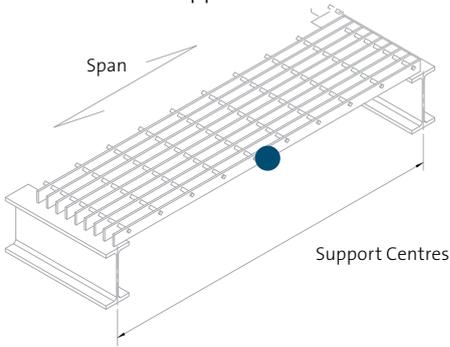


WELDLOK® ALUMINIUM GRATING

GRATING TERMINOLOGY

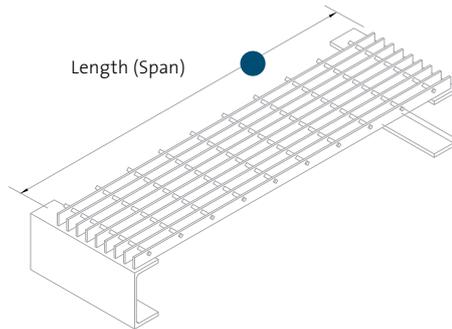
Load Bearing Bar

A load-carrying member spanning between supports.



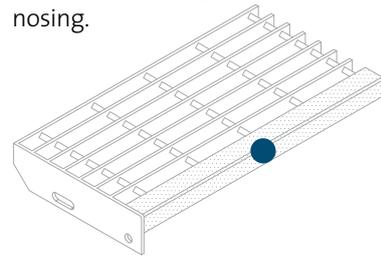
Length (Direction of Span)

The overall dimension of a panel parallel to the load-bearing bars.



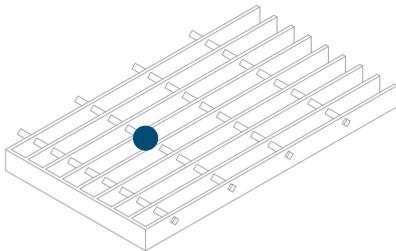
Nosing Bar

A member attached to the front edge of a stair tread or top stair landing panel such as yellow replaceable nosing or plate nosing.



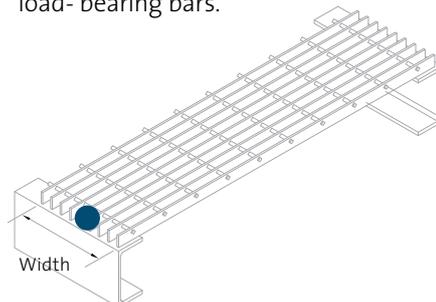
Cross Bar

A member fixed at right angles to the load bearing bars to provide lateral restraint.



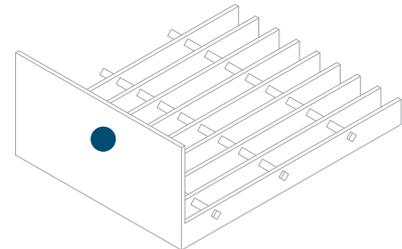
Width

The overall dimension of a panel at right angles to the load-bearing bars.



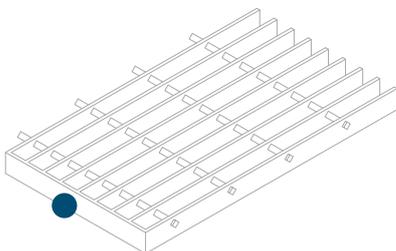
Kick Plate

A large, flat bar welded to the side of a panel or ends and around cut-outs, where specified. Nominally 100mm above walking surface.



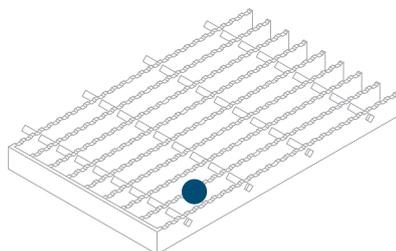
Edge Bar

Non-load-bearing bars, running at right angles to the load-bearing members.



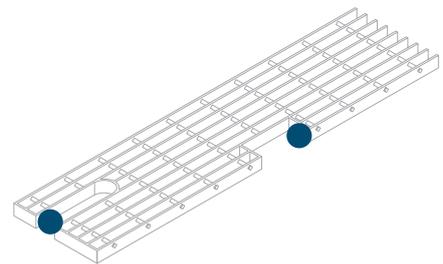
Serrations

Notches formed in the top of load-bearing bars to improve slip resistance.



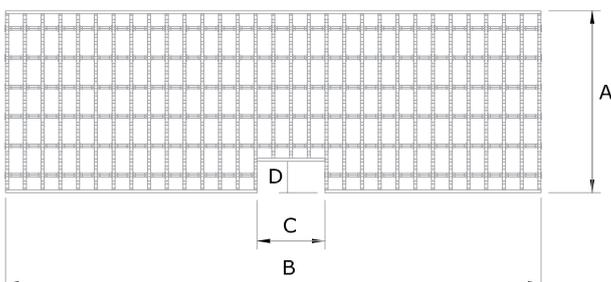
Cut-Outs

Area of flooring removed to clear around columns, pipes, machinery, etc.



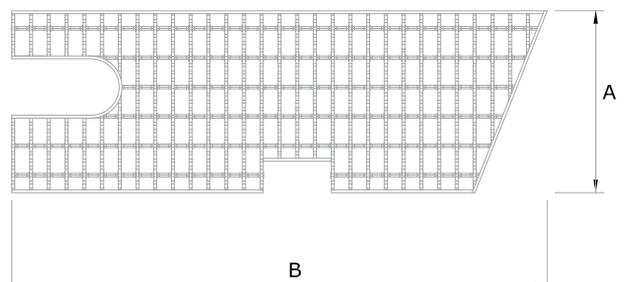
Nett Area

The area of flooring remaining after deducting cut-outs $([A \times B] - [C \times D])$.



Gross Area

Total area of flooring, including cut-outs $(A \times B)$.



ALUMINIUM HANDRAIL SPECIFICATION & INSTALLATION

Stanchions

Stanchions are manufactured from aluminium tubing 50mm OD x 4.0mm wall thickness. Ball size is 76mm OD x 2.0mm wall thickness.

Stanchion Pitching

Australian Standard AS1657:1992 recommends a maximum spacing for stanchions of 1800mm centres. All warranties become void if the system is not erected in compliance with this standard.

Stanchion Handing

Handing of stanchions is from point of view on stairway or platform, facing the inside of the stanchion. Those on the right-hand side are suffixed 'R', those on the left-hand side are suffixed 'L'.

Rails

Standard drilled openings on stanchions allow for a top rail (handrail) of 46mm OD and a mid-rail (knee-rail) of 38.1mm OD. Rails are supplied in standard lengths of 6.0m.

Handrail (HR): 46mm OD x 39mm ID.
Mass = 1.34 kg/m (6.0m = 8.04kg).

Knee-rail (KR): 38.1mm OD x 34.1 ID.
Mass = 0.97 kg/m (6.0m = 5.82kg)

Kick Plate Mounting Brackets

Kick plate mounting brackets (KPMB) are manufactured from 40mm x 40mm x 6mm angle x 93mm long, with a mass of 0.11kg each. Holes are 14 x 22mm slots at 51mm centres to suit 100mm high kick plate.

Kick Plates

Standard kick plates (KP) are 100mm x 6mm flat in 4.0m lengths, with a mass of 1.62 kg/m (4.0m = 6.48kg). Splice plates (KPSP) are 100mm x 80mm x 6mm with a mass of 0.13kg each. All kick plates have two slotted holes at each end, 14mm diameter x 27mm long.

Base Plates

Base plates are manufactured in standard, angle-mounted and corner versions. For details see page 20.

Materials

NEPEAN Building & Infrastructure can supply detailed material specifications on request.

Finish

Standard finish is passivated natural aluminium. Optional finishes include anodising and powder coating, which can be done off-site.

Separation Washers

It is recommended that nylon separation washers be used between dissimilar metals. These can be supplied with the handrail.

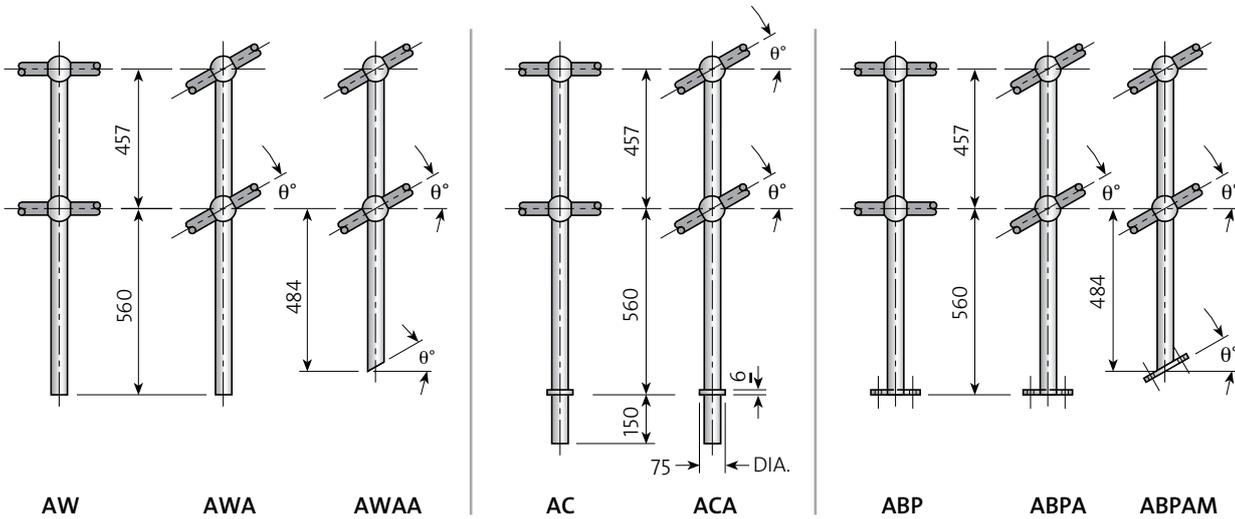
General Installation Instructions

1. Loosely bolt stanchions to structure.
2. Feed top rails and mid-rail through ball joints.
3. Where top or mid-rails join, use slip joint.
4. Tighten nuts and bolts on stanchions.
5. Run approximately 25mm (1 inch) of weld on side or top where ball units join top and mid-rails.
6. Bends and corners to be fully welded then ground smooth.



WELDLOK® ALUMINIUM HANDRAIL STANDARD STANCHIONS

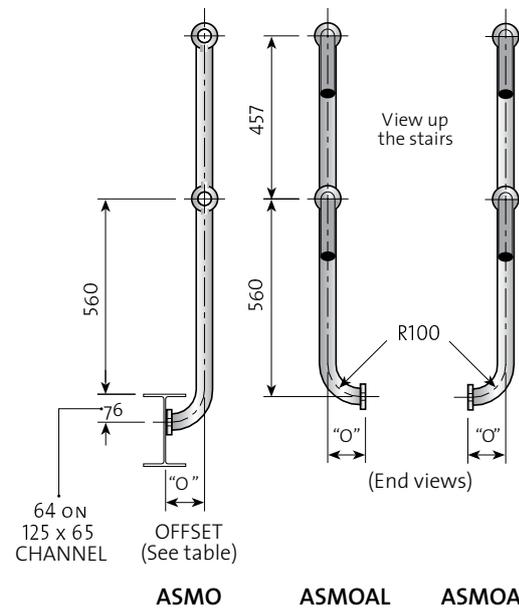
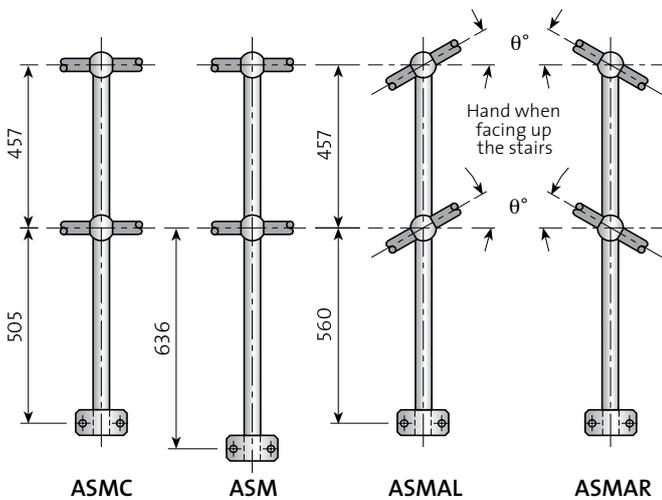
Standard Stanchions



Welded

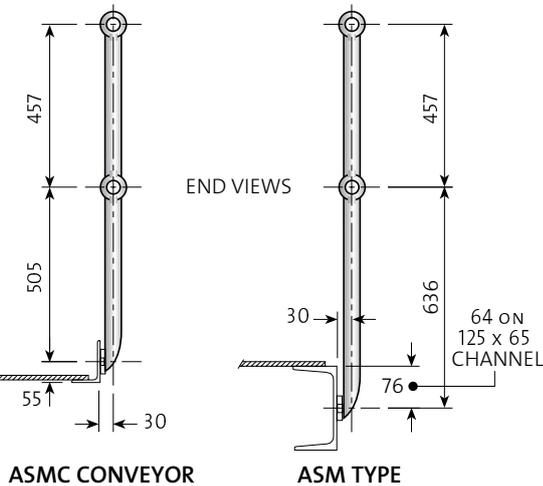
Collar

Base Plate



Offset "O" (mm)

Channel	"O" offset	Universal Beam	"O" offset
125 x 65	115	200	115
150 x 75	115	250	135
180 x 75	115	310	135
200 x 75	115	360	135
230 x 75	115	410	135
250 x 90	120	460	150
300 x 90	120		
380 x 100	135		

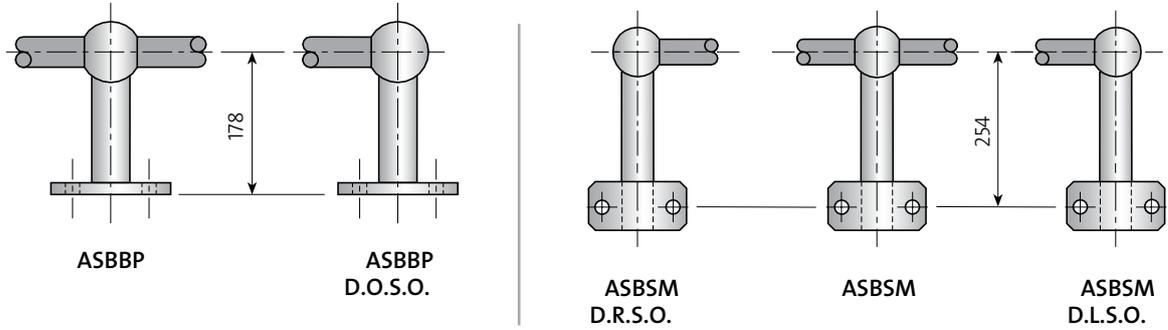


Side Mounted

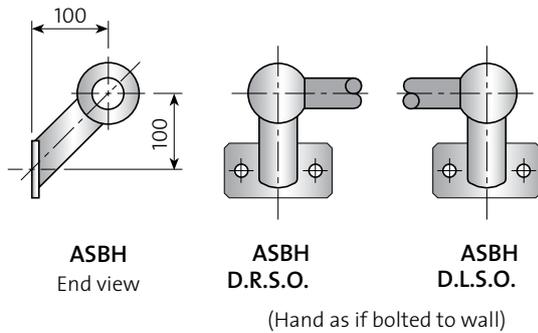
Side Mounted Offset

WELDLOK® ALUMINIUM HANDRAIL SINGLE & MULTI-BALL STANCHIONS

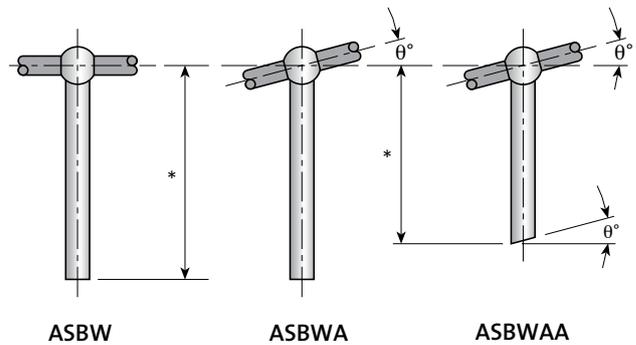
Standard Single Ball Stanchions



Single Ball Base Plate



Single Ball Side Mounted

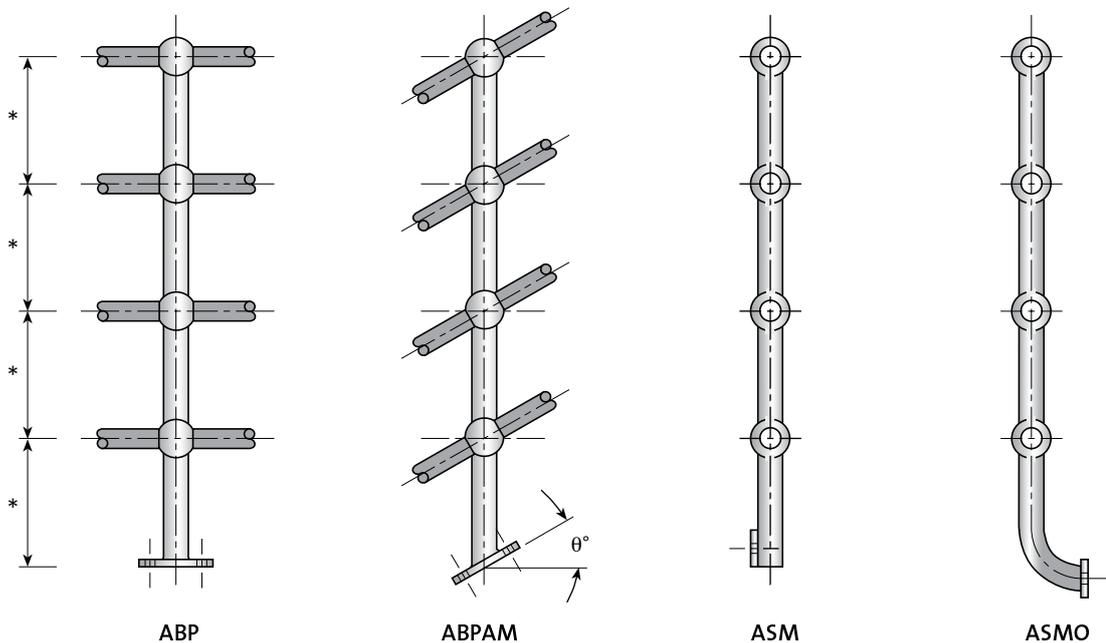


*Nominate dimensions
Available in all base plate types

Single Ball Offset Handrail

Single Ball Welded

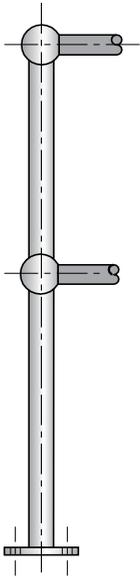
Multi Ball Stanchions



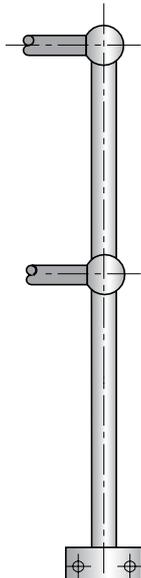
*Specify number of balls, pitching & height required of stanchion (150mm minimum centres)
Multi ball stanchions are available in any of the range of configurations

WELDLOK® ALUMINIUM HANDRAIL SPECIAL DRILLING & BASE PLATES

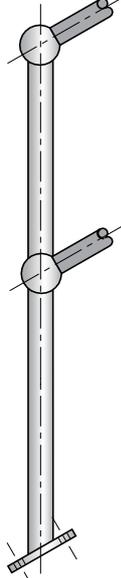
Special Drilling for Rails



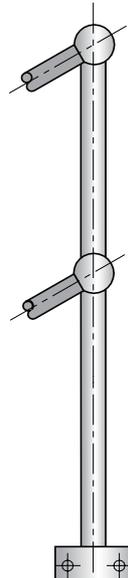
**DRILLED
RIGHT HAND
SIDE ONLY**



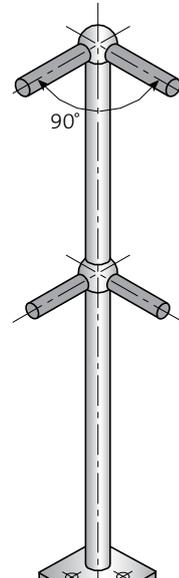
**DRILLED
LEFT HAND
SIDE ONLY**



**DRILLED
TOP
SIDE ONLY**



**DRILLED
BOTTOM
SIDE ONLY**

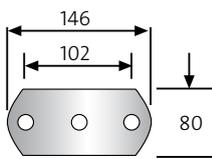


**CORNER
POST**

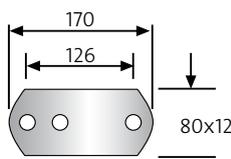
DRILLED ONE SIDE ONLY (D.O.S.O.)

These combinations of drilling are available on full range of standard stanchions

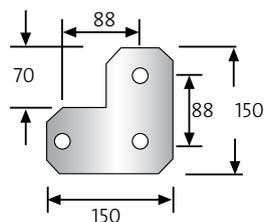
Standard Base Plates



STANDARD BASE PLATE



ANGLE MOUNTED ONLY



CORNER BASE PLATE ONLY

TYPICAL HOLE SIZE REF NOTE 5

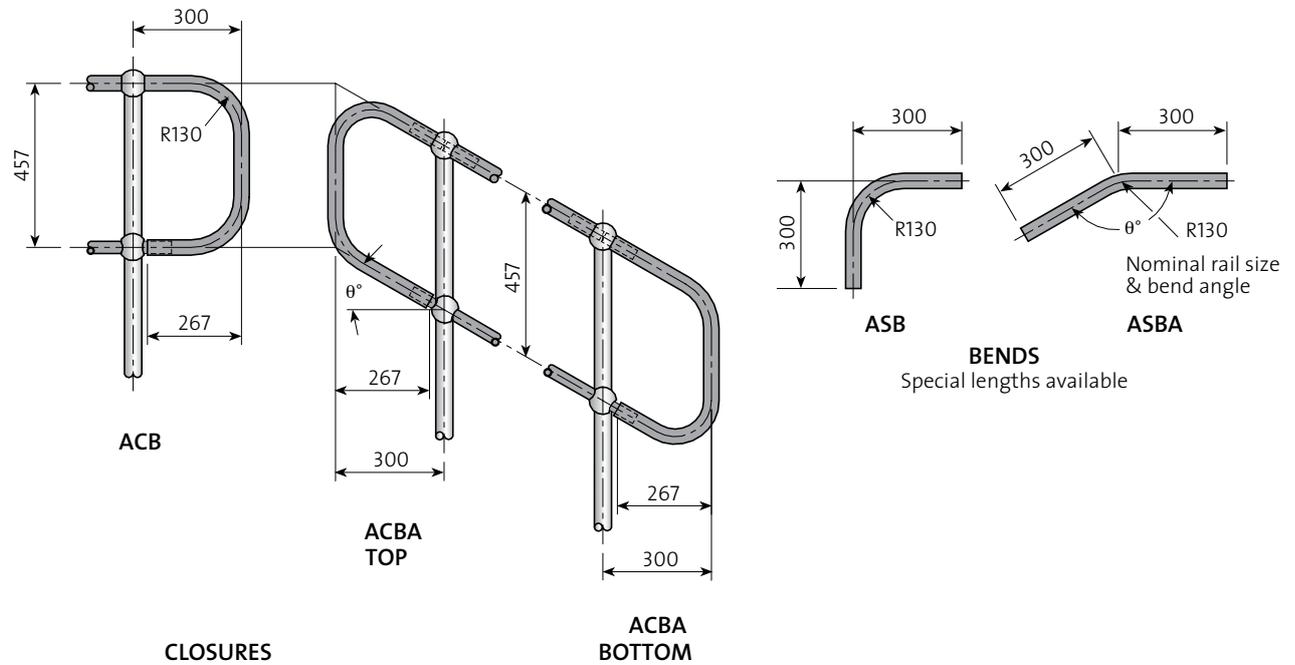


Notes

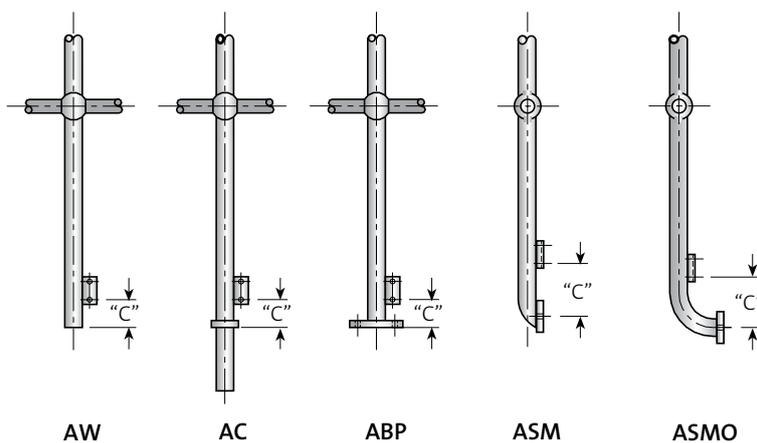
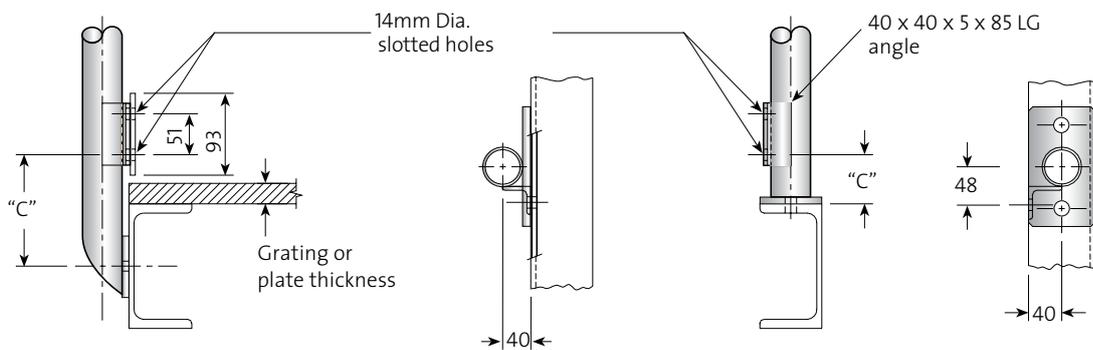
1. All stanchions can be supplied drilled one side only (DOSO). Please specify side, i.e. DLSO (drilled left side only). All handrail components are viewed from the walkway, platform or stairs.
2. Kick plate mounting brackets are available on all horizontal stanchions on request.
3. All dimensions can be modified to suit individual requirements.
4. Typical hole size in base plates is 19mm for a 16mm bolt (easier to match drill with a masonry bit).

WELDLOK® ALUMINIUM HANDRAIL CLOSURES & KICK PLATES

Standard Closures, Joiners and Bends



Kick Plate Mounting Brackets



Dimension "C" (mm)

Type	"C" = Grating or Plate Thickness Plus
W	33
C	33
BP	33
SM	109*
SMO	109*

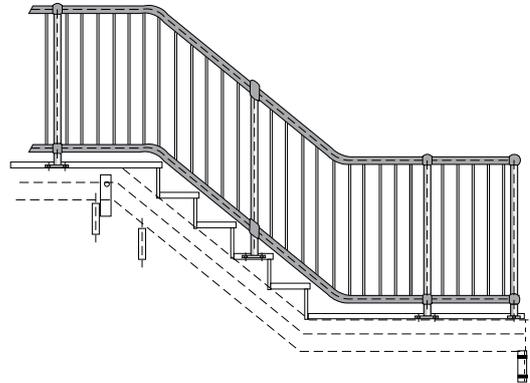
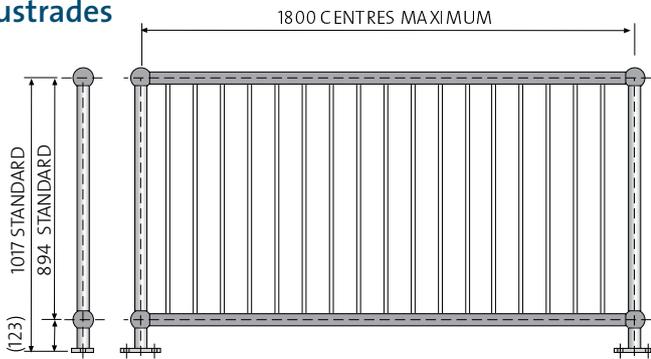
*94 when used on 125 x 65 channel

Example:
If grating is 25mm deep then
"C" Dimension = 58mm
for types W, C, & BP.

Note: Kick plate mounting brackets are an optional extra

WELDLOK® ALUMINIUM HANDRAIL ACCESSORIES

Balustrades

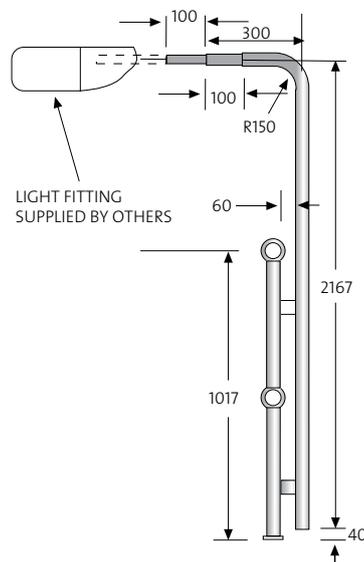


Light Poles

Note: Light pole welded to Stanchion at time of manufacture. Stanchion type to be specified at time of ordering.

Light Pole material is 46 OD x 3.5mm wall thickness.

Stanchion diameter 50mm, Handrail diameter 46mm.

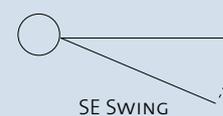
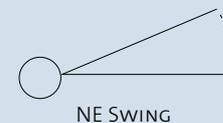


Raked Panels

Available with ASM, AW, AC and BP (illustrated). Supplied passivated mill finish as standard. Can be supplied powder-coated or anodized.

Important

When ordering self-closing gates, it is essential to nominate the swing direction and type of stanchion.



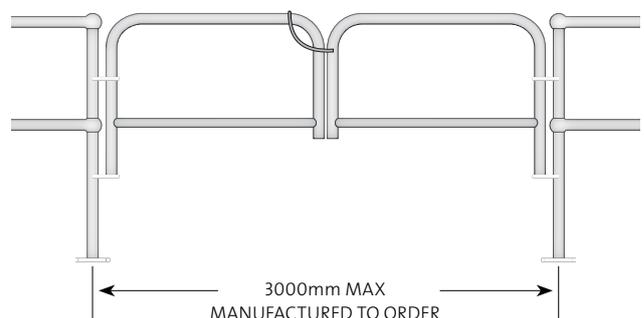
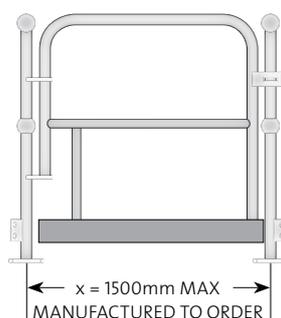
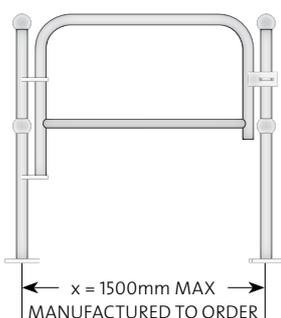
Self-Closing Gates

All gates are manufactured with 316 SS spring closures and nylon bearings to guarantee years of fault-free service.

Kick plates are only required on platforms that are 2m or higher.

Notes:

1. All gate stanchions can be ordered to suit individual requirements
2. Comprehension fabrication service available for handrail assembly.
3. Stanchions and Light Poles can be custom made to individual needs.
4. Quotation forms available.



WELDLOK® ALUMINIUM HANDRAIL WEIGHTS & ORDERING

Standard Stanchions

CODE	COMPONENT	MASS (KG)
ABP	Platform Mount	1.95
AC	Cored Mount	1.87
AW	Welded Mount	1.62
ASM	Side Mount	2.14
ASMC	Side Conveyor Mount	1.93
ASMO	Side Offset Mount	2.18
AMB	Multi-Ball	O/A
ABPAM	Angle Mount	1.91
AWA	Angle Mount Weld	1.95
ASMOAL	Side Offset Angle Left	2.08
ASMOAR	Side Offset Angle Right	2.08
ABPA	Platform Mount Angle	1.95
ACA	Core Mount Angle	1.87
AWAA	Welded Mount Angle	1.62
ASMAL	Side Mount Angle Left	2.08
ASMAR	Side Mount Angle Right	2.08
ABPCNR	Corner Platform Mount	2.22

Single Ball Stanchions Kick Plate Brackets

CODE	COMPONENT	MASS (KG)
ASBBP	Single Ball Base Plate Mount	0.9
ASBSM	Single Ball Side Mount	1.1
ASBH	Single Ball Wall Mount	0.9
ASBW	Single Ball Weld Mount	2.2
ASBWA	Single Ball Angle Weld Mount	2.2
AKPMB	Kick Plate Mounting Bracket	0.1
ABASEPL	Base Plate	0.4
ACNRBASEPL	Corner Base Plate	0.8

Note: All Stanchions can be supplied Drilled One Side Only (DOSO)



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Closures & Bends

CODE	COMPONENT	MASS (KG)
ACB46OD	Horizontal Closure Bend	1.4
ACBA46OD	Angle Closure Bend	1.5
ASB46OD	Standard Bend, Top Rail	0.8
ASB38OD	Standard Bend, Bottom Rail	0.4

Rails & Kick Plates

CODE	COMPONENT	MASS (KG)
AHR46	46mm OD Handrail x 6m	8.0
AKR38	38mm OD Knee-Rail x 6m	3.9
A1006KP6	100 x 6 Kick Plate x 6m	9.7
A1006KP4	100 x 6 Kick Plate x 4m	6.5

Ordering Information

Important When Ordering

1. Nominate type of stanchion (see codes).
2. State top rail and mid-rail sizes required in nominal bore pipe sizes.
3. If kickplate mounting bracket is required, nominate handing and dimension "C" (refer to page 21).
Note: Right-hand location of kickplate is standard and will be supplied on RH unless otherwise nominated.
4. If stanchions are offset type, state "O" dimension from selection table on page 18.
5. If stanchions are angled type, specify angle of elevation.
6. If stanchions are to be drilled one side only, nominate handing.
7. Any variations to normal stanchions should be noted and drawing supplied.
8. Supply list of all joiners, rails, kickplates, etc.

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