Guide to detailing and installation of

Stramit® Purlins, Girts & Bridging

and their accessories.

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INTRODUCTION

This Detailing and Installation Guide is complementary to the Stramit® Purlins, Girts & Bridging – Product Technical Manual (incorporating design capacity tables). The Guide contains details on all Stramit® Purlins, Girts, Bridging and relevant accessories. Information is provided to enable detailed purlin design including a wide range of practical component assemblies to cover almost all applications.

Stramit offers a wide range of standard C and Z purlins from 100 to 350 deep in several thicknesses. Downturn lips are also available for both C and Z sections from 150 to 350, including lappable Zs. Special sizes from 100 to 400 are also possible.

Now available are Stramit Exacta® purlins and girts for increased structural efficiency. These use the same bridging and accessories that are shown in this guide. For technical information see the Stramit Exacta® C&Z Purlins & Girts Design Capacity Tables and Member Moment Capacities.

Stramit® Boltless Bridging combines the best features of many obsolete proprietary systems, and has itself been improved to become the superior bridging system.

Customer Support

Stramit has specialist staff in each region to assist with all issues related to purlin detailing and installation. This enables Stramit to provide advice that reflects local conditions and practices.
SELECTION & SPECIFICATION

Materials
Stramit® Purlins and Girts are manufactured from hi-tensile (G450, G500 or G550) galvanised steel, with a minimum Z350 galvanised coating (350g/m²). Stramit® Bridging and Purlin accessories are manufactured from steel with a minimum yield of 300 MPa and galvanised coating of Z275 or zinc aluminium alloy AZ150 coating. Other coatings, grades and materials may be available, subject to inquiry.

Specification
Maintaining the correct specification of purlins, girts and bridging is very important. Even a small change in specification can lead to substantial reduction in performance. Beware of so-called ‘equivalent’ products that are smaller in size, (and hence capacity) have a lesser coating and even a lower strength grade of steel.

This specification can be found on the Stramit web site and can be easily downloaded on to your documentation.

“All purlins and girts shall be Stramit sections or approved equivalent, supported by submission of section properties, purlin capacity calculations, bridging capacity calculations and a performance warranty, produced and detailed for this project. All sections shall be produced from galvanised steel to AS1397 with a coating mass of at least 350g/m² and designed in accordance with AS4600. All sections should be installed in accordance with the manufacturer’s instructions with particular regard to bolt locations and lap sizes”.

“Where required for structural or installation purposes, Stramit® Bridging shall be installed using pre-made components to manufacturer’s instructions. All other accessories shall be supplied by Stramit”.

“All structural work shall be completed in a workmanlike manner prior to installation of the cladding material”.

Structural Adequacy
It is important that the structural adequacy of each purlin and girt application be established by a practising structural engineer. Limit-state design capacities can be found in the Stramit® Purlins, Girts & Bridging – Product Technical Manual.

Adverse Conditions
Stramit® Purlins and Girts will give excellent durability in most applications. In exposed conditions unwashed areas subject to salt-laden air or other corrosive matter may need additional protection. Stramit® Purlins and Girts are not recommended for use within 450mm of moist soil.

Compatibility
Contact between galvanised steel and copper (eg. pipework) must be avoided as premature corrosion will occur.

Stramit Exacta® Purlins
For increased structural efficiency Stramit Exacta® Purlins & Girts can be specified. Selection is enhanced by the use of Stramit EX-facta™ Design Software for Exacta Purlins. This state-of-the-art design tool allows the designer to optimise purlin sizes, thicknesses, bridging, bridging positions, lap lengths etc to find the great purlins solutions.

Stramit Exacta® Purlins
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DESIGN DATA
Stramit® Purlins & Girts

Sizes
The table below lists the sizes and thicknesses readily available for purlins and girts.

Shapes other than standard C Section and standard Z Section may be subject to minimum order requirement.

For sections outside this range please contact your local Stramit office.

<table>
<thead>
<tr>
<th>Section</th>
<th>Web D (mm)</th>
<th>Flange B (mm)</th>
<th>Flange E (mm)</th>
<th>Flange F (mm)</th>
<th>Lip L (mm)</th>
<th>Thickness t (mm)</th>
<th>Mass (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/Z100-10</td>
<td>102</td>
<td>51</td>
<td>49</td>
<td>53</td>
<td>12.5</td>
<td>1.0</td>
<td>1.77</td>
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<tr>
<td>C/Z100-12</td>
<td>102</td>
<td>51</td>
<td>49</td>
<td>53</td>
<td>13.0</td>
<td>1.2</td>
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<td>C/Z100-15</td>
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<td>53</td>
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<td>49</td>
<td>53</td>
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<td>1.9</td>
<td>3.29</td>
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<tr>
<td>C/Z150-10</td>
<td>152</td>
<td>64</td>
<td>61</td>
<td>65</td>
<td>14.5</td>
<td>1.0</td>
<td>2.43</td>
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<td>152</td>
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<td>61</td>
<td>65</td>
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<td>1.2</td>
<td>2.90</td>
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<td>61</td>
<td>65</td>
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<td>1.5</td>
<td>3.59</td>
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<tr>
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<td>152</td>
<td>64</td>
<td>61</td>
<td>65</td>
<td>17.0</td>
<td>1.9</td>
<td>4.51</td>
</tr>
<tr>
<td>C/Z150-24</td>
<td>152</td>
<td>64</td>
<td>61</td>
<td>66</td>
<td>18.5</td>
<td>2.4</td>
<td>5.67</td>
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<tr>
<td>C/Z200-15</td>
<td>203</td>
<td>76</td>
<td>74</td>
<td>79</td>
<td>16.0</td>
<td>1.5</td>
<td>4.50</td>
</tr>
<tr>
<td>C/Z200-19</td>
<td>203</td>
<td>76</td>
<td>74</td>
<td>79</td>
<td>19.5</td>
<td>1.9</td>
<td>5.74</td>
</tr>
<tr>
<td>C/Z200-24</td>
<td>203</td>
<td>76</td>
<td>74</td>
<td>79</td>
<td>21.0</td>
<td>2.4</td>
<td>7.21</td>
</tr>
<tr>
<td>C/Z250-19</td>
<td>254</td>
<td>76</td>
<td>74</td>
<td>79</td>
<td>19.0</td>
<td>1.9</td>
<td>6.5</td>
</tr>
<tr>
<td>C/Z250-24</td>
<td>254</td>
<td>76</td>
<td>74</td>
<td>79</td>
<td>20.5</td>
<td>2.4</td>
<td>8.17</td>
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<tr>
<td>C/Z300-24</td>
<td>300</td>
<td>96</td>
<td>93</td>
<td>100</td>
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<td>2.4</td>
<td>10.18</td>
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<td>12.69</td>
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<td>121</td>
<td>129</td>
<td>30.0</td>
<td>3.0</td>
<td>15.19</td>
</tr>
</tbody>
</table>
Hole Punching

Stramit® Purlins and Girts are usually delivered with holes punched to details supplied. This allows purlins to be used on arrival at site.

The computer controlled production line allows holes at almost any position or frequency on the web and the flanges. Holes are positioned from hole detail sheets supplied prior to manufacture.

The preferred method of dimensioning is hole centre to hole centre rather than referenced from one end. An overall purlin length is also desirable to provide a data entry dimension check.

Stramit normally supply purlins and girts punched to conventional AISC hole centres. Ensure hole detail sheets show correct hole centres and spacing required and location and type of bridging holes.

<table>
<thead>
<tr>
<th>PURLIN SIZE</th>
<th>AISC CENTRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>D (mm)</td>
<td>A (mm)</td>
</tr>
<tr>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>150</td>
<td>60*</td>
</tr>
<tr>
<td>200</td>
<td>110</td>
</tr>
<tr>
<td>250</td>
<td>160</td>
</tr>
<tr>
<td>300</td>
<td>210</td>
</tr>
<tr>
<td>350</td>
<td>260</td>
</tr>
</tbody>
</table>

*Standard centres in Victoria - 70mm. All accessories supplied in Victoria conform to the 70mm spacing for 150 sections.

Alternative hole sizes, shapes and centres are possible, subject to enquiry.
**Bridging Hole Location**

Stramit recommends that bridging be installed such that the maximum unbraced length is \(20 \times D\) (where \(D\) is the purlin web height), or 4000mm whichever is the least. In addition to enhancing purlin performance this requirement assists with the erection of roof sheeting. Location of bridging must be as shown below (to the nearest 50mm), or as determined by the design engineer by computation.

**Single or Internal Spans**

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.3L</th>
<th>0.5L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Row Bridging</td>
<td>Bridging Holes</td>
<td>Cleat Holes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.35L</th>
<th>0.3L</th>
<th>0.35L</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Rows Bridging</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.3L</th>
<th>0.2L</th>
<th>0.3L</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Rows Bridging</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Double or End Spans**

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.38L</th>
<th>0.42L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Row Bridging</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.44L</th>
<th>0.26L</th>
<th>0.30L</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Rows Bridging</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span (L)</th>
<th>0.35L</th>
<th>0.2L</th>
<th>0.2L</th>
<th>0.25L</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Rows Bridging</td>
<td>Internal Supports</td>
<td>End Supports</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Laps**

All lapped Z section configurations generally require a total lap length (bolt centre to bolt centre) of 15% of the span (to the nearest 50mm).

**Laps for Unequal Spans**

As with equal spans, the total lap length must be 15%. However, for unequal spans this means 15% of the average span and the lap is not equally spaced about the support. In practice 7.5% of the longer span must be applied to the shorter purlin (as this material ends up in the longer span). Conversely, 7.5% of the shorter span can be applied to the longer span. This is demonstrated in the example below.

A satisfactory alternative is simply to apply the 15% lap based on the longer of the spans. In the example above this would require a total lap length of 1800mm.
**Expansion Joints**

The length of roof sheeting is limited by issues associated with thermal expansion and also practical handling limitations. The table below gives recommended maximum sheet lengths for flat roofs.

<table>
<thead>
<tr>
<th>STRAMIT® PURLINS &amp; GIRTS – MAXIMUM FLAT SHEET LENGTH (m)</th>
<th>Through Fixed</th>
<th>Concealed Fastened</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>25</td>
<td>42</td>
</tr>
<tr>
<td>Dark</td>
<td>17</td>
<td>30</td>
</tr>
</tbody>
</table>

The illustration shows a typical expansion joint detail.

Where *Stramit Speed Deck Ultra*® concealed fixed decking is used for the roof a low profile expansion joint with only one purlin run can be constructed using *Stramit Farlap® Roof Lap Joint System*. For further details refer to the *Stramit Farlap® Product Technical Supplement*.

**Detailing of Purlins**

All purlins are custom cut-to-length and custom punched. It is imperative that precise details are provided to enable the correct product to be supplied. As there are regional variations in the detailing of purlins, each Stramit purlin manufacturing location has developed pro-forma detailing sheets. Contact your nearest Stramit location to obtain a pad of purlin, bridging and accessory detailing sheets.

Key information:
- section size (100, 150, 200, 250, 300, 350)
- section shape (normally C or Z)
- hole centres or gauge (AISC centres for Stramit bridging)
- hole spacings (no closer than 35mm from ends) centre to centre
- hole positions (web, flange or both - for bridging, cleats, laps and fly bracing)
- overall length
- flange orientation / hand (Z flanges must alternate)
- quantity required
- marking number
- delivery address
- delivery date (check with Stramit office)
- bolts, bridging and accessories

**Electronic Detailing**

In some Stramit locations, interfaces have been, or are being developed to receive electronic purlin details. This may take form of output from proprietary design packages or from Stramit developed specific purlin detailing software. Talk to your regional Stramit Technical Services Manager about availability and options.
Cleats

Single cleats are used in most situations including for lapped Z purlins. Double cleats are generally only used where successive purlins (usually unlated) are butted together. Double cleats could also be used in applications with a high reaction load to reduce bolt stresses. In this situation, additional care would be needed in hole detailing.

The table below shows industry standard recommended cleat sizes including purlin clearances.

Cleat Nominal Dimensions (mm)

<table>
<thead>
<tr>
<th>Section</th>
<th>X</th>
<th>B</th>
<th>Y</th>
<th>t</th>
<th>Gap</th>
<th>D</th>
<th>W</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>40</td>
<td>40</td>
<td>105</td>
<td>8</td>
<td>10</td>
<td>18</td>
<td>50</td>
<td>130</td>
</tr>
<tr>
<td>150</td>
<td>60</td>
<td>55</td>
<td>145</td>
<td>8</td>
<td>10</td>
<td>18</td>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>200</td>
<td>110</td>
<td>55</td>
<td>195</td>
<td>8</td>
<td>10</td>
<td>18</td>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>250</td>
<td>160</td>
<td>55</td>
<td>245</td>
<td>8</td>
<td>10</td>
<td>18</td>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>300</td>
<td>210</td>
<td>65</td>
<td>305</td>
<td>12</td>
<td>20</td>
<td>22</td>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>350</td>
<td>260</td>
<td>65</td>
<td>355</td>
<td>12</td>
<td>20</td>
<td>22</td>
<td>60</td>
<td>140</td>
</tr>
</tbody>
</table>

* 70mm in Victoria
** 50mm in Victoria
† When using downturn lip purlins or girts the lip length must be added to dimension B and Y.

Fascia Purlins

There are significant variations in the sections used for Fascia Purlins throughout Australia and for different applications. This variation is reflected in the products offered by Stramit regionally.

The most commonly offered Fascia Purlins are shown below. Contact your nearest Stramit office for availability or refer to the Stramit Price and Service Guide for the area.

Fascia Purlins not available at all locations.

It is also common practice to use C section purlins in fascia applications. In some locations these can be supplied with the top flange angled to suit the roof slope.

Fascia Purlin

Nominal heights: 100, 150, 200 and 250.
For dimensions see C section purlins.
Stramit® Purlin Accessories

Stramit® Purlin Accessories are designed for full compatibility with Stramit® Purlins and Girts.

Basic Components
See also Stramit® Bridging components.

FASTENERS
M12/M16 Integral Flange Bolt & Nut

GENERAL PURPOSE BRACKET

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<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>h</th>
<th>100</th>
<th>60</th>
<th>110</th>
<th>70</th>
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<td>125</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>60</td>
<td>135</td>
<td>160</td>
<td>110</td>
<td>75</td>
<td>30x17</td>
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<td>250</td>
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<td></td>
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</tr>
</tbody>
</table>

ADAPTOR BRACKET

| a | b | c | d | e | f | g | m | k | n | 150-100 | 68 | 40 | 100 | 125 | 64 | 114 | 12 | 8 | 30x16.5 | 45 |
|---|---|---|---|---|---|---|---|---|---|------|----|----|-----|----|----|----|----|---|------|
| 200-100 | 68 | 40 | 110 | 135 | 110 | 163 | 14 | 9 | 30x16.5 | 55 |
| 200-150 | 106 | 64 | 110 | 135 | 110 | 158 | 9 | 9 | 30x16.5 | 55 |
| 250-100 | 68 | 40 | 110 | 135 | 160 | 214 | 15 | 9 | 30x16.5 | 55 |
| 250-150 | 106 | 64 | 110 | 135 | 160 | 208 | 9 | 9 | 30x16.5 | 55 |
| 250-200 | 158 | 110 | 110 | 135 | 160 | 208 | 9 | 9 | 30x16.5 | 55 |
| 300-100 | 68 | 40 | 135 | 160 | 210 | 260 | 30 | 20 | ø16.5 | 84 |

Available left or right handed.
Not available all regions

ANGLE CONNECTOR

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>h</th>
<th>k</th>
<th>100</th>
<th>90</th>
<th>-</th>
<th>-</th>
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<tbody>
<tr>
<td>150</td>
<td>140</td>
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<td>74</td>
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</tr>
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RAKING GIRT BRACKET

100 only

CLAMP PLATE

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>h</th>
<th>100</th>
<th>25</th>
<th>90</th>
<th>40</th>
<th>22x17</th>
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</thead>
<tbody>
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<td>150</td>
<td>40</td>
<td>140</td>
<td>60</td>
<td>37</td>
<td>30x17</td>
<td></td>
<td></td>
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Note: Clamp Plates are generally only used in nominal (non-structural) connections.

Bolts

Design Capacities for Stramit® Purlins and Girts are based on the use of commercially available bolts. Normally M12 bolts are required for purlins between 100 and 250, whilst M16 bolts are needed for 300 and 350 purlins. Each bolt requires integral washers. The bolt strength grade (4.6 or 8.8) should be specified by the design engineer to conform with the Stramit® Purlins, Girts & Bridging – Product Technical Manual.

Hangers/Services

Loads to be suspended from roof purlins must be accounted for in design. No allowance is included in the capacity tables. Any such loadings must be connected to the purlin web by using hangers or other means. Never attach loads to the purlin lips. Attachments to the purlin flange must be within 25mm of the web. Connection design should follow the rules within AS/NZS4600, including a check on bearing of the purlin. Loads should not be suspended from wall girts.

Safety Mesh

In most roof applications safety regulations and good practice will dictate the use of safety mesh on roofs prior to the installation of sheeting or decking.

Guidance on the fixing and laying of safety mesh can be found in Standard Australia Handbook HB39.
**Typical Purlin Accessory Assemblies**

**Typical structural door frame using hot rolled channel (by others)**

- Bolted Locator (1 bolt)
- Weld or bolt to flange welded to trimmer
- Girt Foot Assembly (4 bolts)
- Hot rolled channel
- Welded special cleats for girt connection (2 bolts)

**Typical low-duty door frame using C section purlins**

- Intermediate Bridging
- Clamp Plate, Angle Connector, Slotted Channel & Locator (3 bolts)
- Clamp Plate and Angle Connector for trimmer to door head connection (4 bolts)
- Clamp Plate and Angle Connector for foot connection (2 bolts + 2 floor bolts)

**Typical penetration using trimmer of different size to purlin or girt**

- Adaptor Bracket (4 bolts)

**Typical raking girt/ fascia purlin connection**

- Clamp Plate (2 bolts)
- Raking Girt Bracket and Clamp Plate (4 bolts)
**Stramit® Bridging**

There are three members of the Stramit® Bridging family – Stramit® Boltless Bridging, Stramit® Bolted Bridging and Stramit® Large Series Bridging. All members of the Stramit® Bridging family are suitable for use with AISC industry standard hole size and centres.

**Applications**

Stramit® Boltless Bridging and Stramit® Bolted Bridging systems are intended for installation with pre-installed purlin or girts. These systems can only be used with pre-assembled sections to be lifted into place if provision has been made to accommodate the additional forces that may be encountered.

**Performance**

Stramit® Boltless Bridging and Stramit® Bolted Bridging each have a strength limit-state design capacity of 4.0kN in both tension and compression, for bridging lengths up to 2.5m in both roofs and walls. Maximum wall heights for both systems in girt applications are provided in the Stramit® Purlins, Girts & Bridging – Product Technical Manual (Capacity Tables).

**Basic Components**

- **CHANNEL**
  - cut to length
  - with a hole at each end
  - 30 nominal
  - 70 nominal

- **SLOTTED CHANNEL**
  - 2 hole 130
  - 3 hole 190
  - 5 hole 310

- **FASCIA BRACKET**

- **FASTENERS**
  - M12 x 30mm Integral Flange
  - Grade 4.6 Bolt & Nut
  - M12 x 30mm Fascia Bolt
  - Grade 4.6 with Integral Nut
  - No. 12 x 20mm
  - Self Drilling & Threading Screws
**Stramit® Boltless Bridging**

*Stramit® Boltless Bridging* is a state-of-the-art proprietary system developed for fast installation and optimum compatibility with *Stramit® Purlins and Girts*. Available for purlin sizes between 100 and 250. *Stramit® Boltless Bridging* has been fully tested and engineered for balanced performance in both compressive and tensile applications. It is interchangeable with *Stramit® Bolted Bridging* by specifying intermediate members with one end Bolted and the other Boltless. The adequacy of the Boltless Bridging for the 250 purlin size needs to be checked, as large series bridging may be required for some applications.

(Note – the terminology ‘Boltless’ refers to the basic lock to locator connection. There are assemblies within the *Stramit® Boltless Bridging* system that require bolts.)

**Basic Components**

**LOCK END**

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*90 in Victoria

**LOCATOR END**

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*85 in Victoria

**STARTER CLIP**

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<td>200</td>
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<td>250</td>
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</table>

*93 in Victoria

**Stramit® Boltless Bridging Assemblies**

The illustrations on pages 12-17 show typical *Stramit® Boltless Bridging* assemblies and their normal application. Commonly used alternative arrangements are shown.

The suggested arrangement, that assumes installation direction up the roof or wall, is shown. Installation down the roof is also possible, but requires lock and locator component ends to be reversed.

*Stramit® Boltless Bridging* ends are generally provided with a rigid connection using a set of 4 non-penetrating proprietary (TOX®) connections.

**Stramit® Boltless Bridging – typical rigid connection**

**Lock and Locator Ends as well as the plain channel are provided with bolt holes for alternative swivel or out-of-alignment assemblies. It is recommended that such connections be completed by the use of self-drilling screws once the alignment/adjustment is finished.**

**Stramit® Boltless Bridging – typical swivel connection**
**Fascia Bridging**
Fascia Bridging is used to provide support to the first internal purlin and for straightening and securing the fascia purlin. Whilst other component combinations are possible, fascia bridging generally comprises of a fascia bracket, slotted channel, plain channel and a locator end.

![Fascia Bridging Diagram]

3 bolts, 2 fascia bolts, 4 screws

**Intermediate Bridging**
Intermediate Bridging is the basic connecting member between purlins and generally comprises of a lock and a locator end rigidly connected to a cut-to-length plain channel.

![Intermediate Bridging Diagram]
Expansion joint Bridging
typical component combinations are shown below.

**Alternative 1**

![Diagram of Alternative 1]

2 bolts, 4 screws

(Available as a rigid [TOX®] connection in Victoria)

**Alternative 2**

![Diagram of Alternative 2]

3 bolts, 6 screws

**Alternative 3**

![Diagram of Alternative 3]

190 minimum
300 typical

2 bolts, 2 screws

Adjustable Tie Rod Bridging
For light duty applications, Adjustable Tie Rod Bridging may be used to provide alignment and adjustment. This can be used adjacent to Fascia Bridging, Expansion Joint Bridging or Ridge Bridging that comprises of plain channel with a Bolted End. That connection may be a swivel connection secured by screws or a rigid (TOX®) connection. Adjustable Tie Rod Bridging is not suitable for sustaining compressive loads.
Ridge Bridging
Ridge Bridging is used at the roof apex and is usually adjustable. Several alternatives are available.

Alternative 1
- 2 bolts

Alternative 2
- 2 bolts, 4 screws

Alternative 3
- 3 bolts, 2 screws

Alternative 4
- 2 bolts, 4 screws
  (Available as a rigid [TOX®] connection in Victoria)

Alternative 5
- 4 bolts
- Intermediate Bridging Bolted End/Boltless Lock End
- Intermediate Bridging Bolted End/Boltless Lock End
- Cranked Tie Rod

Alternative 6
- 6 bolts, 4 screws
  (Available as a rigid [TOX®] connection in Victoria)
**Girt Foot**
Girt Foot assemblies are used to transfer downward forces in girt bridging to the floor. They also provide some adjustment for alignment of the lowest girt.

**Girt Hanger**
Girt Hangers are primarily used to assist in alignment and stabilisation of the fascia purlin. The Girt Hanger is usually attached to the slotted channel in the Fascia Bridging assembly. Girt Hangers should not be used to suspend the wall girts other than for a small number of 100 girts.

**Alternative 1**
2 bolts, 4 screws

**Alternative 2**
2 bolts

**Alternative 3**
2 bolts
**Plain Start**
A Plain Start may be required to accommodate a building opening or proximity to an obstruction such as a wall or box gutter. Alternative 3 using a starter clip gives a near flush facing but for heavier duty applications, Alternative 1 using a bolted end may be preferred.

**Alternative 1**

**Alternative 2**

**Alternative 3** (When flush start required)

**Plain Finish**
A Plain Finish may be required to accommodate a building opening or proximity to an obstruction such as a wall or box gutter. Alternative 3 using a starter clip gives a near flush facing but for heavier duty applications, Alternative 1 using a bolted end may be preferred.

**Alternative 1**

**Alternative 2**

**Alternative 3** (When flush finished required)

**Alternative 4**
Stramit® Bolted Bridging

Stramit® Bolted Bridging is a conventional bolted system requiring two bolts at each purlin or girt. It is also available for purlin sizes between 100 and 250†. The Stramit® Bolted Bridging end bracket and connection has however been carefully designed to give substantially greater performance than simple angle brackets. It is interchangeable with Stramit® Boltless Bridging by specifying intermediate members with one end Bolted and the other Boltless.

Assemblies of Stramit® Bolted Bridging are similar to those shown for Stramit® Boltless Bridging.† Heavier duty bridging may be required for some 250 purlin applications. This is included in Stramit® Large Series Bridging.

Basic Components

<table>
<thead>
<tr>
<th>CHANNEL</th>
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<td>Cut to length with a hole at each end</td>
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<table>
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<th>BOLTED END</th>
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<tr>
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*110 in Victoria
**70 in Victoria

<table>
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<th>FASTENERS</th>
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</thead>
<tbody>
<tr>
<td>M12 x 30mm Integral Flange</td>
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<tr>
<td>Grade 4.6 Bolt &amp; Nut</td>
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</tbody>
</table>

Bolted Ends as well as the plain channel are provided with bolt holes for alternative swivel or out-of-alignment assemblies. It is recommended that such connections be completed by the use of self-drilling screws once the alignment/adjustment is finished.

Stramit® Bolted Bridging – typical rigid connection

Stramit® Bolted Bridging – typical swivel connection
Curved Roofs

*Stramit® Boltless Bridging* is eminently suitable for curved roofs (that is roofs with parallel purlins supporting sprung curved sheeting). The lock and locator ends of rigid *Stramit® Boltless Bridging* (with TOX® clinched ends - as normally supplied) can accommodate a small amount of angular difference between adjacent purlins. This is reflected in the table below, which shows the minimum radii (the same value as the radii of sprung curved sheeting) that are suitable for this configuration.

<table>
<thead>
<tr>
<th>Purlin Size</th>
<th>Purlin Spacing (mm)</th>
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<td>Size 900</td>
<td>1200 1500 1800 2100</td>
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<td>100s</td>
<td>18 24 30 36 42</td>
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<tr>
<td>150s</td>
<td>43 57 72 86 100</td>
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<tr>
<td>200s</td>
<td>63 84 105 126 147</td>
</tr>
<tr>
<td>250s</td>
<td>88 117 147 176 205</td>
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</table>

For radii less than the values in the table above *Stramit® Boltless Bridging* must be ordered in its swivel configuration. In this configuration a bolt connects the lock and locator ends to the bridging channel (note that this configuration can also be used to accommodate purlin out-of-alignment for expansion joints). In this swivel configuration *Stramit® Boltless Bridging* can be used for any practical sheeting radius. (Available as a rigid (TOX®) connection in Victoria.)

![Diagram](image)

Design advice on spring curving radii for *Stramit® Roof Sheeting and Decking* can be found in the *Stramit Design Guide - Spring Curving.*
**Stramit® Large Series Bridging**

Large purlins require large bridging systems due to the larger spans and heavier loads encountered. These bridging components are conventional in nature but on a much larger scale.

Generally the bridging channel is a C150 section firmly bolted to end plates to suit the particular purlin concerned.

**Basic Components**

- **CHANNEL**

  C150 purlins used as bridging channel

- **LARGE SERIES END PLATE**

<table>
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<td>250</td>
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<tr>
<td>350</td>
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</table>

- **FASTENERS**

  M12 Integral Flange Bolt & Nut®

* M12 Integral Flange Bolt & Nuts are generally sufficient for connections between Stramit® Large Series Bridging and Stramit® Purlins, provided the bridging is installed after the purlins are connected to the in-place building frame.

If the bridging is to be used in pre-assembled sections to be lifted into place, both the bridging component and the bolt capacities should be separately checked for adequacy.
Procurement

Prices
Prices of Stramit® Purlins and Girts, Stramit® Bridging and their accessories can be obtained from your nearest Stramit location or distributor of Stramit products.

Lengths
Stramit® Purlins and Girts are supplied cut-to-length. If you are designing or transporting long products ensure that the length is within the limit of the local Transport Authority regulations. All sections are custom-cut to length from 0.6m to 12.6m. For longer lengths, contact your Stramit representative to determine special transport arrangements.

Lengths less than 1.5m may be supplied “sausage” style in a continuous run approximately 5m long with only a small uncut tag connecting the purlin. Simply break off individual purlins on site. Although supplied in a string, each purlin has individual marking labels.

Accessories
Stramit® Bridging for sizes 100 to 250 has a variety of components that are adaptable to all practical applications. Any combination of channel, locator end, lock end and bolted end can be supplied in a pre-assembled form. These are also available in a bolted form for use on curved roofs and at expansion joints.

Stramit® Boltless Bridging is easy to install starting with the locator end and completing with the lock end. A detailed installation leaflet is available upon request.

Stramit® Larger Series Bridging for sizes 300 and 350 (also available for 250) is a heavy duty bolted system which uses a C150 purlin in place of the channel.

Orders
Stramit® Purlins, Girts, Bridging and accessories can be ordered directly from your nearest Stramit location. Exact details of lengths, hole positions and section sizes are required. Ask at your nearest Stramit location for order pad/detailing sheets.

Lead Times
Manufacture of purlins cannot commence without receipt of an order and detail sheets. Please talk to your nearest Stramit branch for current lead times on purlin manufacture and delivery.

Related Products

Roof and Wall sheeting
in a comprehensive range to cover all applications.

Rainwater goods
in a comprehensive range to cover all applications.

Insulating blanket
in a variety of thicknesses and with or without foil backing.

Roofing mesh
for roof safety and blanket support.

Delivery / Unloading
Delivery is subject to delivery location, quantity and material availability, or can be at a pre-arranged date and time. Please ensure that suitable arrangements have been made for truck unloading, as this is the responsibility of the receiver. Pack mass may be up to one tonne.
**Installation**

**Good Practice**
Stramit recommends that good trade practice be followed when using these products. Examples can be found in AS3828, ASI/Australian Standards HB39 and state regulations and guidelines, and work practices.

**Inspection**
Inspection of purlins and girts should be carried out prior to installation. The ease of inspection, and cost and time lost if remedial action is required, will be substantially less favourable once the purlins have been installed.

Inspection should comprise of checks that labelling is in line with specifications and detailing, and that the section dimensions, hole positions and thickness are exactly to the manufacturer’s stated values.

Even small deviations to these values may lead to significant variations in performance from that used in design. It is imperative that this be resolved immediately and prior to installation.

Purlins and Girts supplied by Stramit will be made from high tensile galvanised steel.

Final inspection of the installed purlin, girt and bridging system should check for correct bolting of laps and that bridging is correctly in place. If practical, a check of bolt tightness is highly desirable, both on the purlins and on bolted bridging connections.

**Walking**
Stramit® Purlins, Girts and Bridging are not designed for walking on and will be flexible and twist until both bridging and roofing are fully fixed. Residual oil may be present on these components from manufacturing. The use of appropriate cradles or cherry pickers is recommended. As a minimum, follow these rules:

- Never walk on purlins without safety mesh in place.
- Always use a safety harness if walking on girts.
- Never walk or place body weight on to bridging.

**Bridging**
Stramit® Boltless Bridging can be installed either up or down the roof slope. However, as the starting and finishing components will be different, the direction of fixing must be established at the design/procurement phase.

For walls, where more than one row is to be installed, always complete the bridging for each girt before commencing on the next (i.e. Do not complete one row of bridging before starting the next).
**Additional Information**

**Design Service**
With the wide variations possible in building design, the publication of specific capacity data becomes increasingly challenging. As a service to its customers, Stramit may be able to assist with more specific purlin capacities to suit particular applications. This includes calculations for:
- special purlin sizes
- downturn lips
- cantilever purlins
- combined different thickness purlins
- different span dimensions
- different lap lengths
- shorter or longer spans than those shown in the tables
- multiple span continuous systems
- design member capacities
- variable UDL within spans
- concentrated loads
- alternative bridging positions
- mixed bridging numbers
- any combination of the above
For more information please contact your regional Stramit Technical Services Manager.

**Further Information**
As well as our standard range of Technical manuals, Installation Leaflets, Case Studies and other promotional literature Stramit has a series of Guides to aid design. These include:
- Concealed-Fastened Decking
- Roof Slope Guide
- Foot Traffic Guide
- Bullnosing, Curving and Crimping
- Acoustic Panels
- Cyclonic Areas
- Spring Curving Guide
Please contact your nearest Stramit location for any of these guides, or other literature.

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**Laps**
Purlin laps must be bolted in the top web hole and the lower flange holes at both ends of the lap as shown below. Bolting only in the web of lapped purlins does not provide full structural continuity and excessive loads could be placed on to roofing screws that penetrate both purlins within a lapped region.

**Bolts / Fastening**
Always use the correct size and grade of bolts as nominated by the design engineer. Ensure that all bolts are tightened.

It is essential that all bolts are fully tightened prior to roofing installation and before any loads are applied to the purlins, girts or bridging. Swivel assemblies require additional screw fastening prior to roofing and the application of loads.

**Fly Bracing**
If the lower web hole in a lap is used for attaching fly bracing ensure that an additional bolt is used.

**Welding**
Stramit does not recommend the welding of purlins, girts or bridging. The heat produced in welding will affect the material properties of the high-tensile cold-formed steel used by Stramit in all its purlins. In many instances considerable stress concentrations are likely to arise, even with good quality welding. In addition welding will locally remove the galvanized coating leading to a potential reduction in durability.

**Roofing Mesh**
If using insulation blanket, do not overtighten roofing mesh as this may impede the installation of roof sheeting.
Other Products
Stramit offers a wide range of building products, including:
• Formwork decking
• Roof and wall sheeting
• Lightweight structural sections
• Truss components
• Gutters and downpipes
• Fascias
• Custom flashings
• Insulation products
• Fasteners

References
In preparing this document reference has been made to:
• Standards Australia Handbook - HB39
• BlueScope Steel - Technical Bulletin TB-17
  (Selection guide for galvanised steel purlin products)
The Stramit web page can be found at:  
www.stramit.com.au  
Details of many Stramit® products can also be seen on the AIA site ‘Product Selector’ at:  
www.selector.com.au

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<td>33-83 Quarry Road, Erskine Park NSW 2759</td>
<td><strong>phone</strong> (02) 9834 0909</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>fax</strong> (02) 9834 0988</td>
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<td><strong>general</strong> (02) 9834 0900</td>
<td><strong>technical</strong> (02) 9834 0988</td>
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<tr>
<td>Canberra</td>
<td>4 Bass Street, Queanbeyan NSW 2620</td>
<td><strong>phone</strong> (02) 6297 3533</td>
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<td>Coffs Harbour</td>
<td>6 Mansbridge Drive, Coffs Harbour NSW 2450</td>
<td><strong>phone</strong> (02) 6652 6333</td>
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<td>17 Nelson Road, Cardiff NSW 2285</td>
<td><strong>phone</strong> (02) 4954 5033</td>
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<td><strong>phone</strong> (03) 9237 6300</td>
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<td><strong>phone</strong> (02) 6041 7600</td>
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<td><strong>fax</strong> (02) 6041 7666</td>
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<td>Ramsay Court, Kangaroo Flat VIC 3555</td>
<td><strong>phone</strong> (03) 5448 6400</td>
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<td><strong>fax</strong> (03) 5447 9677</td>
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<td>57 Crooked Billiet Drive, Brighton TAS 7030</td>
<td><strong>phone</strong> (03) 6263 5536</td>
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<td>289 Hobart Road, Kings Meadows TAS 7249</td>
<td><strong>phone</strong> (03) 6343 7390</td>
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<td><strong>phone</strong> (07) 3803 9999</td>
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<td><strong>phone</strong> (07) 4779 0844</td>
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<td><strong>fax</strong> (07) 4775 7155</td>
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<td>Cairns</td>
<td>Vickers Street, Edmonton QLD 4869</td>
<td><strong>phone</strong> (07) 4045 3069</td>
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<td></td>
<td></td>
<td><strong>fax</strong> (07) 4045 4762</td>
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<td><strong>phone</strong> (07) 4942 3488</td>
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<td><strong>fax</strong> (07) 4942 2343</td>
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<tr>
<td>Maryborough</td>
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<td><strong>fax</strong> (02) 6672 6798</td>
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<td><strong>fax</strong> (08) 8947 1577</td>
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<td>Perth</td>
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<td><strong>fax</strong> (08) 9493 8899</td>
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</tbody>
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