Bailey's Production Facility, Mallusk.
Tegral Twin-Skin Roofing and Cladding

The Helix, Dublin.
Tegral Roof Decking

Independent News & Media plc.
Tegral Composite Floor Decking

Central Park, Leopardstown, Dublin.
Tegral Composite Floor Decking



# Purlins & Rails

## Cold Rolled Steel Profiles

# A world of experience

### Our Company
Tegral Metal Forming is part of the Tegral Group and a subsidiary of the Etex Group, a world-renowned international building products company. For over 25 years, Tegral Metal Forming has been to the forefront of development with regard to roofing, cladding and flooring systems.

Based in Athy, Co. Kildare, the Tegral Group consists of Tegral Building Products and Tegral Metal Forming. Tegral Building Products is Ireland's largest manufacturer and distributor of roofing products and Tegral Metal Forming Ltd. is a leading manufacturer and supplier of metal roofing, cladding and flooring systems for the construction industry.

The comprehensive product range is designed to suit most applications in modern commercial, industrial and agricultural construction. Over the years, Tegral Metal Forming has developed an expertise in every aspect of metal systems application.

Project: Colaiste de hIdé, Dublin
Architects: Campbell Conroy Hickey
Product: Tegral Fineline 19, Corus Colorcoat® HPS200

### Our Partners
Through a long-standing partnership with Corus, a world-renowned manufacturer of steel and aluminium, Tegral customers and specifiers are assured of the highest standards and quality in all Tegral products.

### Our Standards
All manufacturing in Athy meets with the stringent requirements of Quality Assurance systems to ISO EN 9001:2000.

### Our People
People really do matter at Tegral Metal Forming. Recently the company proudly embraced and succeeded in achieving the "Excellence Through People" award, Ireland's national standard for human resource development.

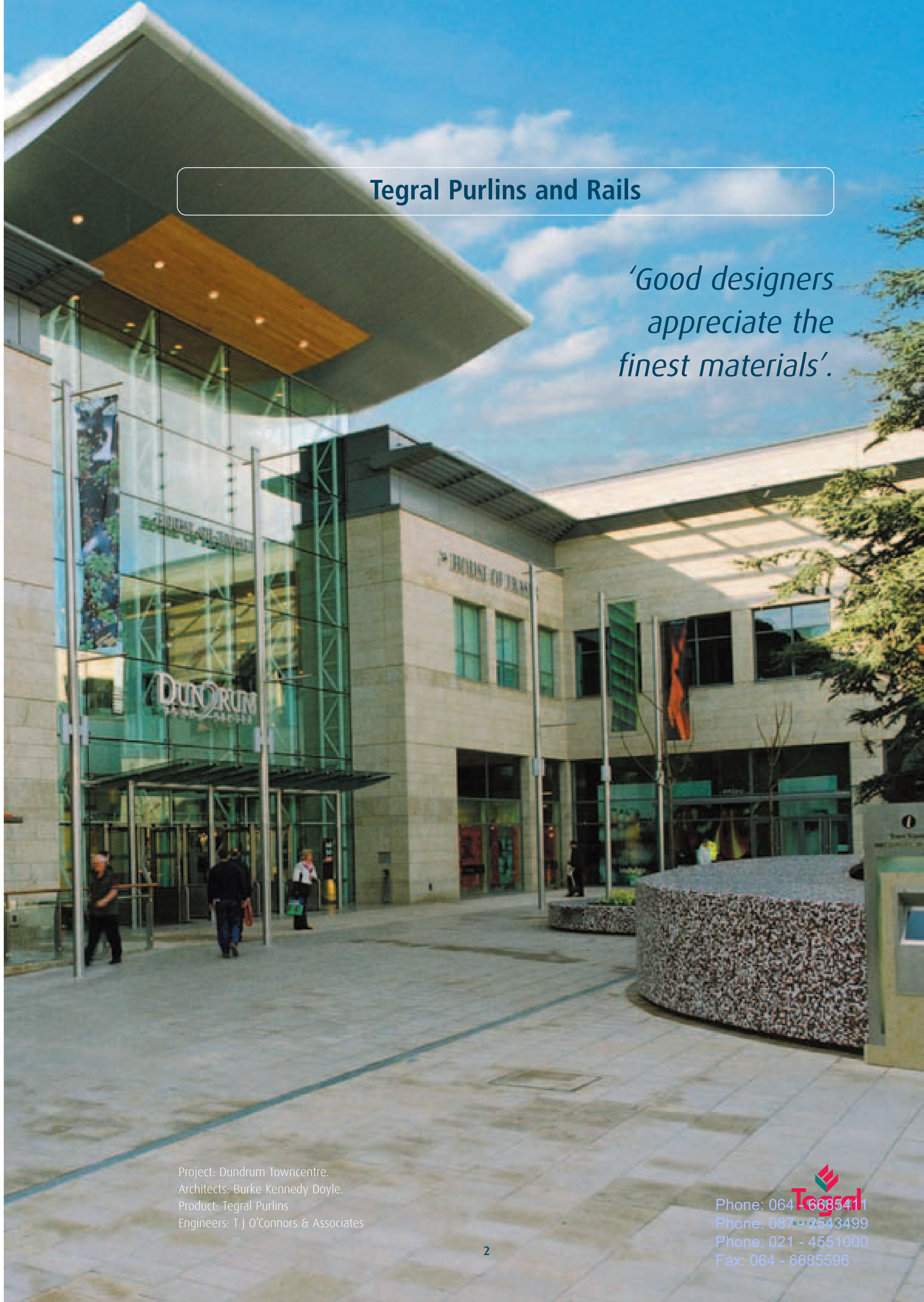
### Our Industry Associates
Tegral Metal Forming takes an active role in the promotion of the metal industry and is involved in the Roof Manufacturers and Suppliers Association (RMSA) in Ireland, the Metal Cladding and Roofing Manufacturers Association (MCRMA) in the UK and also the Irish Farm Buildings Association.

*Cover Photo*
Project: Gregor Shore Apartments, Leith, Edinburgh
Product: External Rainscreen Framing Tegframe 140 Section and Internal Partitioning Tegframe 90 Section





# Tegral Purlins and Rails



*'Good designers appreciate the finest materials'.*

Project: Dundrum Towncentre.
Architects: Burke Kennedy Doyle.
Product: Tegral Purlins
Engineers: T J O'Connors & Associates

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# Purlins Rails

When it comes to purlins and rails, the Tegral Zeta range is clearly a brand leader in Ireland today. For over 20 years Tegral has supplied the island of Ireland from its central location in Co Kildare. The production of cold-rolled steel profiles requires specialist skills, superior manufacturing capabilities and top quality materials. Due to the complex nature of working with purlins, professional technical support service are important.

Tegral has taken the production of roll-forming metal to new heights. Over the years Tegral has developed and improved the product range to such an extent that Tegral Purlins and Rails have now set the industry standard for the quality of steel used. Using "S390" means greater working capacities for Tegral purlins, rails and complementary sections.

The Tegral Technical Services Department has dedicated purlins and rails professionals who are available to assist and support on all projects.

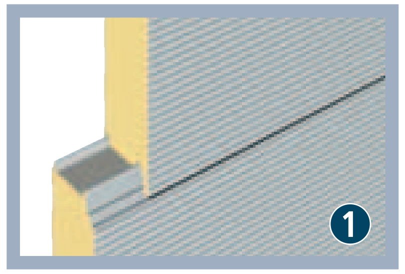
## Computer Aided Design

A selection of software is available upon request from the Tegral's Technical Services team to facilitate the design and detailing ofTegral Zeta purlin and rail systems.

## Ordering Purlins and Rails

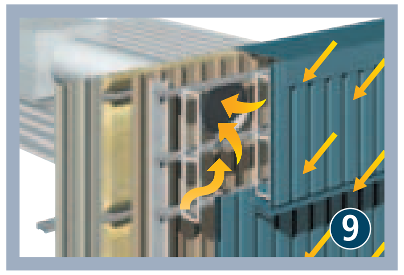
Ordering purlins and rails from Tegral Metal Forming is now easier than every before thanks to a new free step by step guide called ' How to Order Purlins using Strucad© Software'. Contact Technical Services for further details.

# Tegral product range



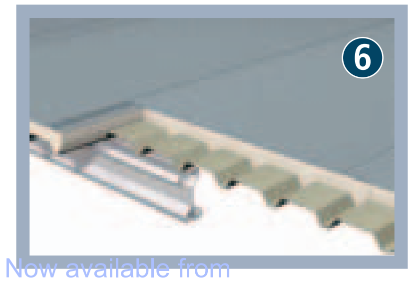

LPCB & FM approved Insulated Panel Range


Built-Up Roofing and Wall Cladding Systems




SolarWall™


Aluseam® and Seam-Loc Standing Seam Roofing



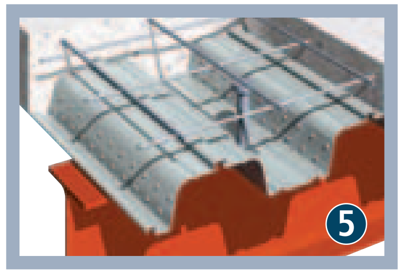

Superdeck Membrane-faced Insulated Roof Panel



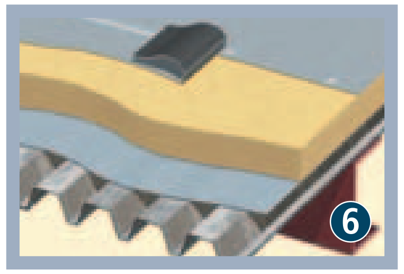
DESIGNER'S ROOF DECKING GUIDE ROOF DECKING

Tegral product range

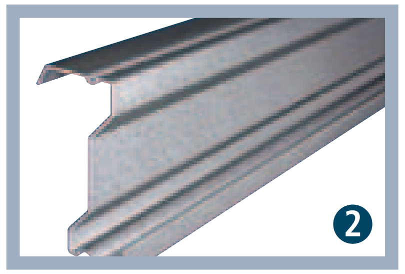

Complete Tegral Systems Range including the World's first CarbonNeutral building envelope through Confidex Sustain™ from Corus with Colorcoat® assessed systems.




ComFlor® Flooring Range




Flat Roof Deck Range




Zeta Purlin Range


Tegframe® Light Gauge Steel Framing


Flashings

# Purlins Rails - Product Range

The following information is provided as a general guide to the purlin and cladding rail systems available from Tegral Metal Forming. It is intended to offer indicative guidance to the range of sections, systems and ancillary members produced, and their proposed applications.

## Zeta

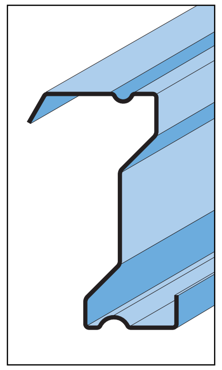
Fully effective section offering maximum efficiency. No sag bars for majority of roofing applications.

**Ideal purlin section for spans up to 7.60m.**

*Depths available:*

125mm
150mm
175mm
200mm

**Section**



**Systems**

SLEEVED
DOUBLE SPAN
HEAVY END BAY (HEB)
DOUBLE SPAN HEB
BUTTED

## Zeta 2

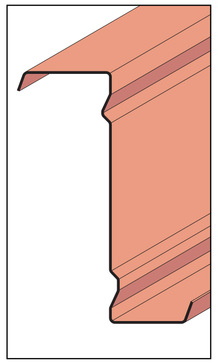
'Zed' section with web stiffeners offering maximum structural efficiency for weight of material used.

**Ideal purlin and rail for spans over 7.50m and heavier loadings.**

*Depths available:*

225mm
245mm
265mm
285mm

**Section**



**Systems**

SLEEVED
HEAVY END BAY (HEB)
BUTTED

## Zed

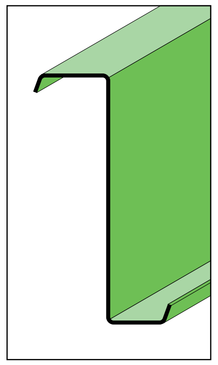
Plain Zed offering simple construction details. Fully compatible range of CW sections for framing around openings.

**Ideal small span rail.**

*Depths available:*

125mm
140mm
155mm
170mm
185mm
200mm

**Section**



**Systems**

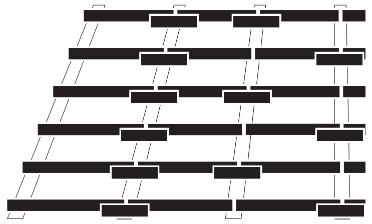
SLEEVED
HEAVY END BAY (HEB)
BUTTED







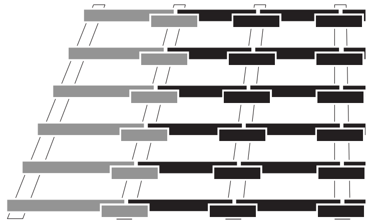
## Systems



### Sleeved

Single spanning sections with sleeves at alternate supports. Sleeves act as 'mechanical hinges' to provide maximum structural efficiency for the number of components employed. Single span purlins provide manageable lengths on site.

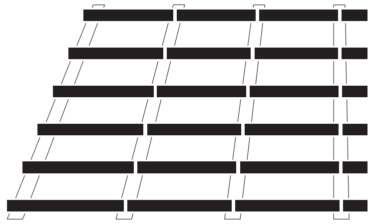
**Suitable for most building applications.**



### Heavy End Bay

Single spanning sections with sleeves at all supports providing a fully continuous system. End bay sections and sleeves increased in gauge to compensate for the lack of continuity at the gable. High load carrying capacity for larger spans and/or heavier loadings.

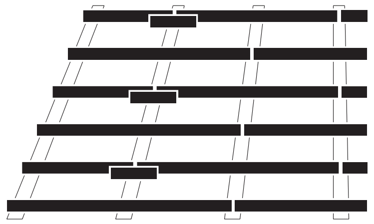
**Suitable as a purlin system for buildings with a large number of bays (say 10 No.).**



### Butted

Single spanning sections without sleeves. Non continuous system.

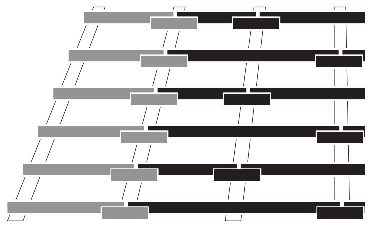
**Suitable where depth constraints exist and sections are fixed between supports.**



### Double Span

Double spanning sections with only a minimum number of sleeves to alternate purlins across the penultimate support. Does not give quite the same strength capacity as the Sleeved system, but uses fewer components and is therefore faster to erect.

**Alternative to the Sleeved system for spans up to 7.50m.**

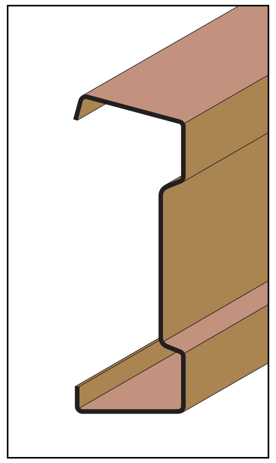


### Double Span Heavy End Bay

Similar to Heavy End Bay system, but using double spanning interior purlin lengths and fewer sleeves. Does not give quite the same strength capacity as the Heavy End Bay system, but uses fewer components and is therefore faster to erect.

**Alternative to the Heavy End Bay system for spans up to 7.50m.**

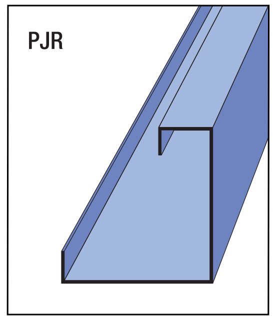
## Complimentary sections

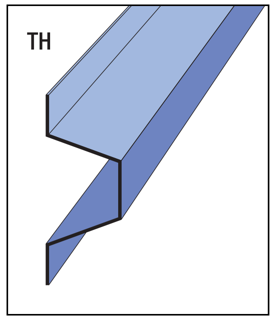


### Eaves Beam

Specially designed to combine the function of purlin, cladding rail and gutter support at the eaves position.

Depths available:
160 and 240mm

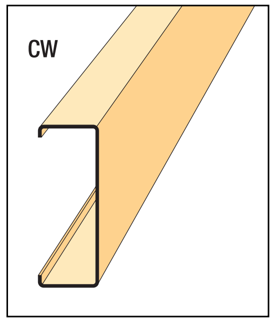


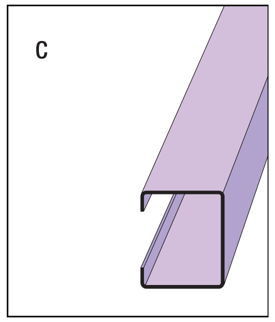




### Panel Joint Rail and Top Hat Sections

Developed for the support of horizontal cladding panels. Intended to span vertically between conventional horizontal rails (Panel Joint Rails only).

Depths available:
PJR: 140 - 200mm
TH: 80 and 100mm




### 'C' & 'CW' Sections

A variety of sections available for use as:
Cladding rails, Masonry wall restraints, Door/window restraints, Parapet capping rails.

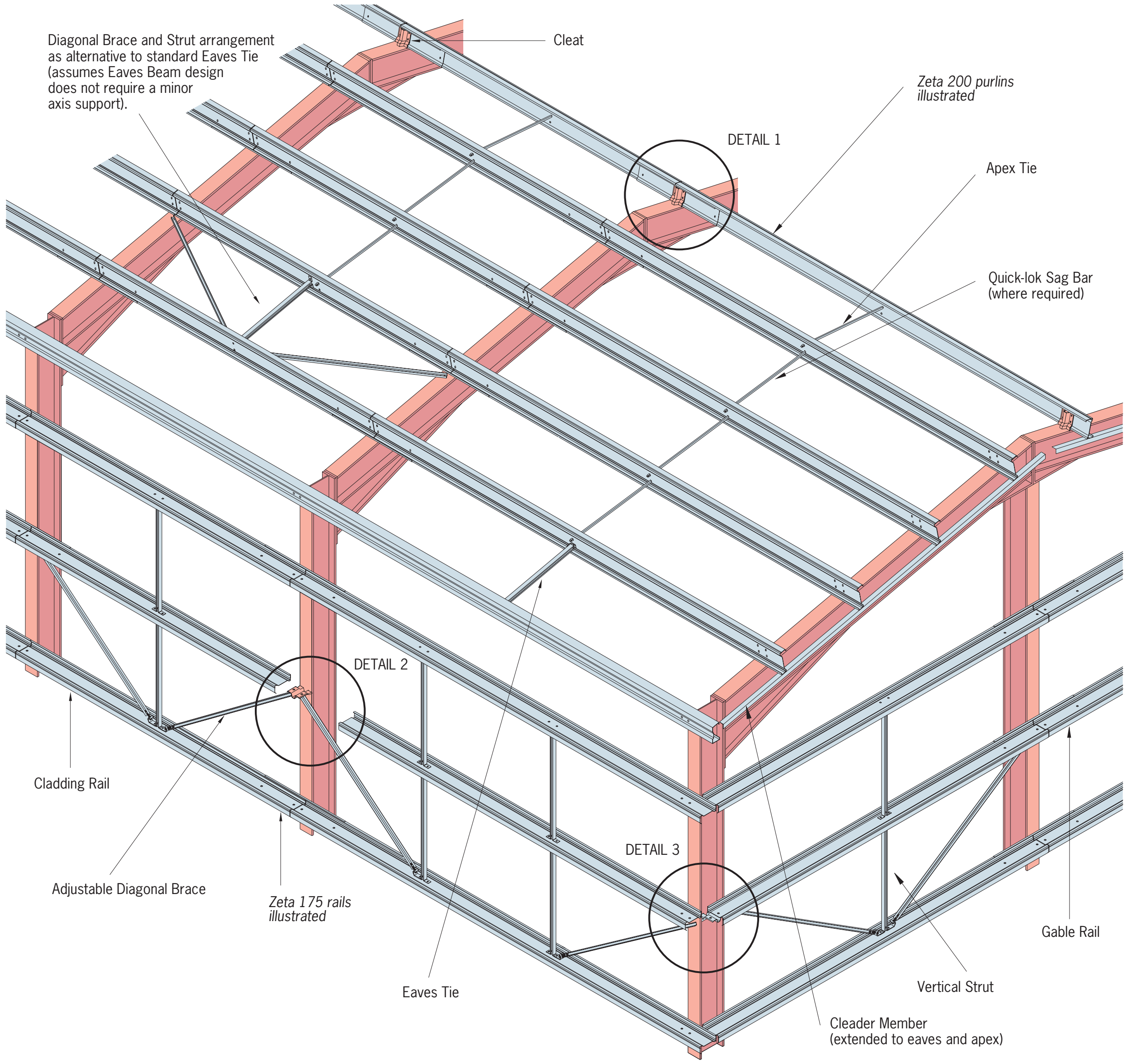
Depths available:
C: 90 – 160mm,
CW: 127 – 240mm

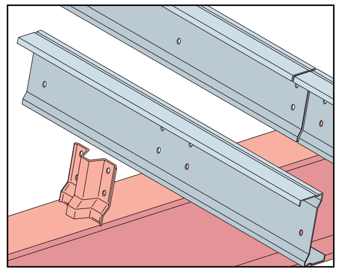




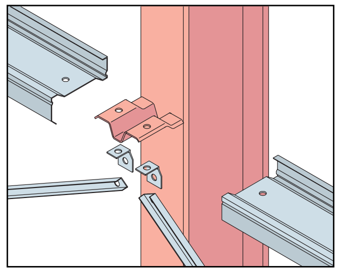


# Typical Arrangements

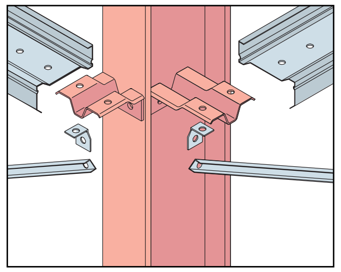


**DETAIL 1**
Sleeve detail.

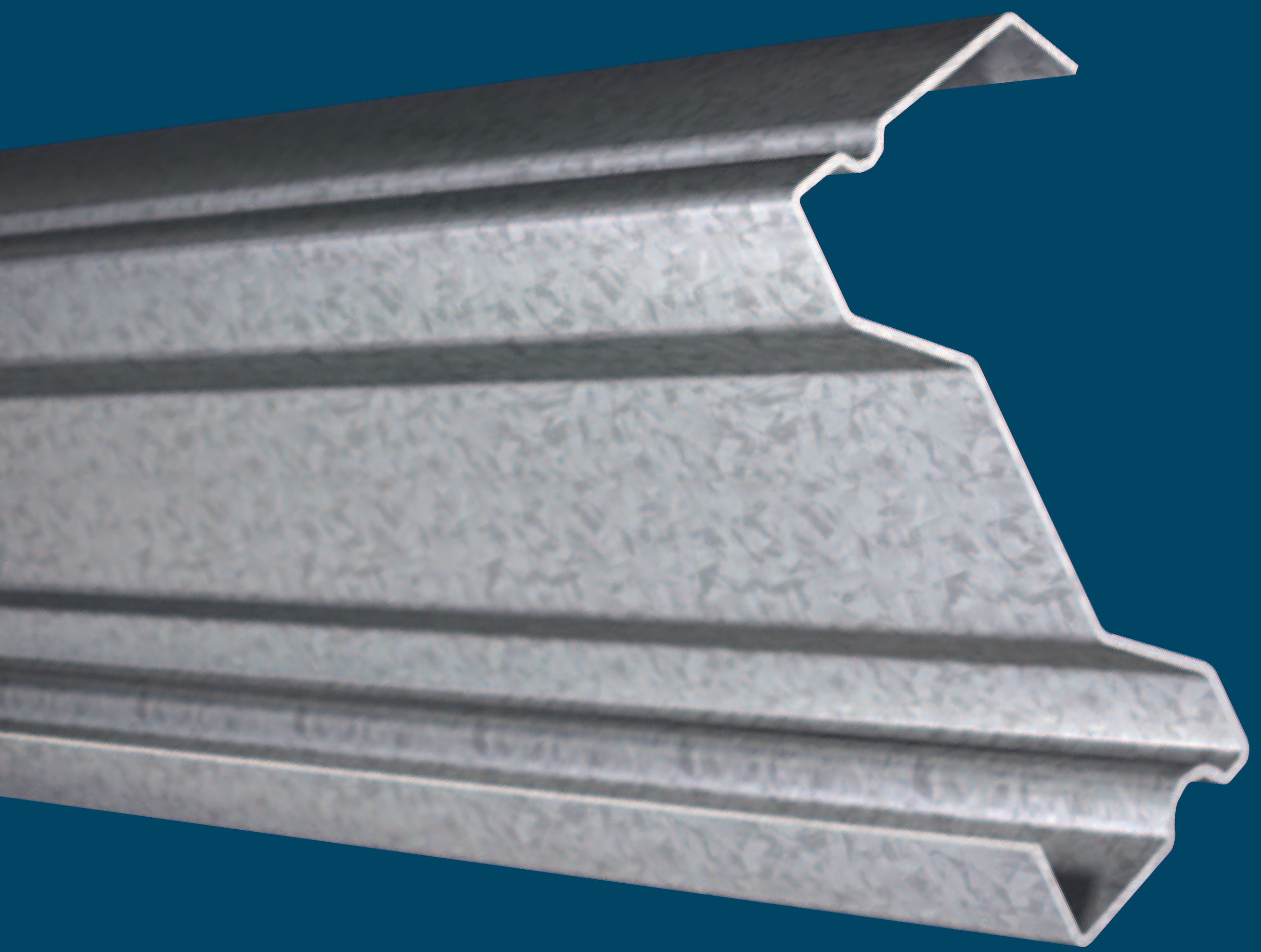


**DETAIL 2**
Rail and cleat assembly at diagonal brace position.



**DETAIL 3**
Corner column cleat detail using extended cleat.

# Zeta Purlins & Rails



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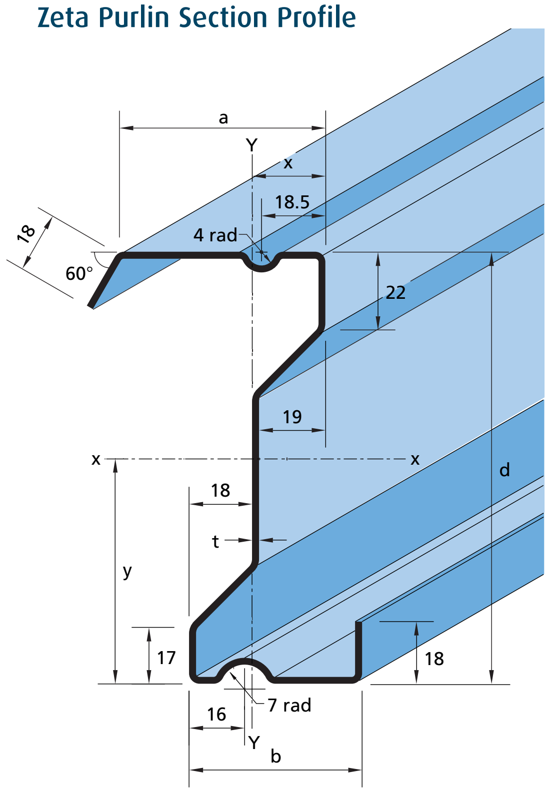
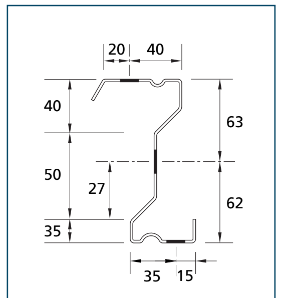
# Zeta Purlins

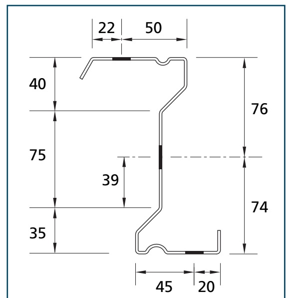
## Zeta Purlin Section Profile



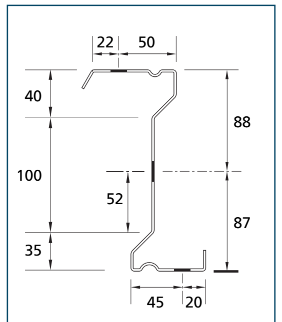

*By Special order



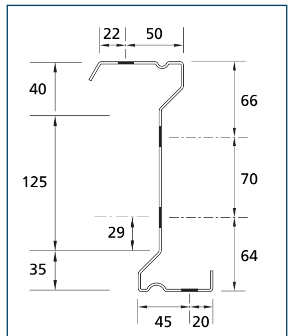
*125 RANGE



150 RANGE



175 RANGE



200 RANGE

## Zeta Section Properties

### Standard holing lines for all sections

18 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines.

| Section No | Depth d mm | Thickness t mm | Top Flange a mm | Btm Flange b mm | Weight kg/m | Area $mm^2$ | Ixx $cm^4$ | Zxx $cm^3$ | Iyy $cm^4$ | ryy mm | x mm | y mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 1/12513 | 125 | 1.3 | 60 | 50 | 2.73 | 348 | 83.6 | 12.84 | 11.85 | 18.81 | 21.39 | 65.10 |
| * 1/12514 | 125 | 1.4 | 60 | 50 | 2.95 | 375 | 90.0 | 13.82 | 12.78 | 18.79 | 21.45 | 65.11 |
| * 1/12515 | 125 | 1.5 | 60 | 50 | 3.16 | 402 | 96.4 | 14.81 | 13.71 | 18.78 | 21.51 | 65.12 |
| * 1/12517 | 125 | 1.7 | 60 | 50 | 3.58 | 456 | 109.2 | 16.76 | 15.55 | 18.75 | 21.62 | 65.15 |
| * 1/12520 | 125 | 2.0 | 60 | 50 | 4.21 | 536 | 128.0 | 19.64 | 18.29 | 18.71 | 21.80 | 65.18 |
| 1/15013 | 150 | 1.3 | 72 | 65 | 3.28 | 417 | 147.4 | 19.04 | 22.27 | 23.56 | 21.39 | 77.42 |
| 1/15014 | 150 | 1.4 | 72 | 65 | 3.53 | 449 | 158.8 | 20.51 | 24.02 | 23.54 | 21.45 | 77.43 |
| 1/15015 | 150 | 1.5 | 72 | 65 | 3.78 | 482 | 170.2 | 21.98 | 25.77 | 23.53 | 21.51 | 77.44 |
| 1/15017 | 150 | 1.7 | 72 | 65 | 4.28 | 546 | 192.9 | 24.90 | 29.25 | 23.50 | 21.63 | 77.47 |
| 1/15020 | 150 | 2.0 | 72 | 65 | 5.04 | 642 | 226.5 | 29.22 | 34.43 | 23.45 | 21.81 | 77.50 |
| 1/17513 | 175 | 1.3 | 72 | 65 | 3.53 | 450 | 211.2 | 23.43 | 22.28 | 22.70 | 21.28 | 90.14 |
| 1/17514 | 175 | 1.4 | 72 | 65 | 3.80 | 484 | 227.7 | 25.25 | 24.03 | 22.68 | 21.34 | 90.15 |
| 1/17515 | 175 | 1.5 | 72 | 65 | 4.07 | 519 | 244.0 | 27.07 | 25.78 | 22.67 | 21.39 | 90.16 |
| 1/17517 | 175 | 1.7 | 72 | 65 | 4.62 | 588 | 276.6 | 30.67 | 29.26 | 22.64 | 21.51 | 90.19 |
| 1/17520 | 175 | 2.0 | 72 | 65 | 5.43 | 692 | 325.0 | 36.02 | 34.45 | 22.60 | 21.69 | 90.23 |
| 1/20013 | 200 | 1.3 | 72 | 65 | 3.79 | 482 | 288.9 | 28.10 | 22.29 | 21.92 | 21.18 | 102.83 |
| 1/20014 | 200 | 1.4 | 72 | 65 | 4.08 | 519 | 311.5 | 30.29 | 24.04 | 21.91 | 21.24 | 102.84 |
| 1/20015 | 200 | 1.5 | 72 | 65 | 4.37 | 557 | 334.0 | 32.47 | 25.78 | 21.89 | 21.30 | 102.86 |
| 1/20016 | 200 | 1.6 | 72 | 65 | 4.66 | 594 | 356.4 | 34.64 | 27.53 | 21.88 | 21.36 | 102.87 |
| 1/20018 | 200 | 1.8 | 72 | 65 | 5.24 | 668 | 400.9 | 38.96 | 31.00 | 21.85 | 21.47 | 102.90 |
| 1/20020 | 200 | 2.0 | 72 | 65 | 5.82 | 742 | 445.2 | 43.25 | 34.46 | 21.82 | 21.59 | 102.93 |
| 1/20025 | 200 | 2.5 | 72 | 65 | 7.22 | 920 | 554.4 | 53.83 | 43.01 | 21.84 | 21.88 | 102.99 |



Phone: 064 - 6685411
Phone: 087 - 2543499
Phone: 021 - 4551000
Fax: 064 - 6685596

## Zeta Double Span Purlins

This system has been developed to utilise a minimum number of components leading to maximum speed of erection on site. The purlins are continuous over two bays with simple connections at each support. Joints are staggered with a minimum number of sleeves being required across the penultimate support of alternate purlin lines to maintain continuity (see page 5 for alternative joint arrangement diagram).

The double span system does not quite achieve the same strength capacity as the equivalent sleeved system, but requires fewer components.

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **1/12513** | **2.73** | 7.790 | 8.032 | 6.390 | 6.659 | 5.373 | 5.669 | 4.325 | 4.646 | | | | | | |
| **1/12514** | **2.95** | 8.530 | 8.790 | 6.880 | 7.169 | 5.785 | 6.103 | 4.656 | 5.002 | | | | | | |
| **1/12515** | **3.16** | 9.260 | 9.539 | 7.369 | 7.678 | 6.196 | 6.537 | 4.987 | 5.358 | | | | | | |
| **1/15013** | **3.28** | 10.578 | 10.868 | 9.490 | 9.812 | 8.597 | 8.951 | 7.849 | 8.236 | 6.674 | 7.092 | | | | |
| **1/15014** | **3.53** | 11.765 | 12.076 | 10.556 | 10.902 | 9.563 | 9.944 | 8.733 | 9.148 | 7.190 | 7.640 | | | | |
| **1/15015** | **3.78** | 12.909 | 13.243 | 11.583 | 11.954 | 10.495 | 10.902 | 9.443 | 9.887 | 7.707 | 8.189 | | | | |
| **1/17513** | **3.53** | 12.461 | 12.773 | 11.182 | 11.529 | 10.133 | 10.514 | 9.255 | 9.671 | 8.510 | 8.960 | 7.869 | 8.354 | 6.907 | 7.427 |
| **1/17514** | **3.80** | 13.901 | 14.237 | 12.476 | 12.849 | 11.306 | 11.716 | 10.328 | 10.776 | 9.498 | 9.983 | 8.696 | 9.218 | 7.447 | 8.007 |
| **1/17515** | **4.07** | 15.289 | 15.649 | 13.722 | 14.122 | 12.437 | 12.876 | 11.362 | 11.842 | 10.450 | 10.969 | 9.319 | 9.878 | 7.980 | 8.580 |
| **1/20013** | **3.79** | 14.207 | 14.542 | 12.751 | 13.123 | 11.557 | 11.965 | 10.558 | 11.004 | 9.710 | 10.193 | 8.981 | 9.501 | 8.346 | 8.903 |
| **1/20014** | **4.08** | 15.911 | 16.271 | 14.282 | 14.682 | 12.945 | 13.385 | 11.828 | 12.308 | 10.880 | 11.400 | 10.064 | 10.624 | 9.355 | 9.955 |
| **1/20015** | **4.37** | 17.556 | 17.942 | 15.760 | 16.188 | 14.286 | 14.757 | 13.054 | 13.569 | 12.009 | 12.566 | 11.110 | 11.710 | 10.328 | 10.971 |
| **1/20016** | **4.66** | 19.179 | 19.590 | 17.217 | 17.674 | 15.608 | 16.111 | 14.264 | 14.812 | 13.123 | 13.717 | 12.141 | 12.781 | 11.288 | 11.973 |
| **1/20018** | **5.24** | 22.369 | 22.832 | 20.083 | 20.598 | 18.209 | 18.774 | 16.642 | 17.259 | 15.312 | 15.981 | 14.169 | 14.889 | 13.175 | 13.946 |

### General notes to all Zeta purlin systems

Working load capacities for **gravity loading** are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.6.
Working load capacities for **wind uplift** are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.4.

The effect of purlin self weight is included in the tabulated loads above. The tabulated values will give deflections not exceeding span/180.
The load capacities may be achieved without the use of sag bars for most conditions where a steel sheeting system is screw fixed to the purlins (see page 14 for further information and limitations). For applications where any other type of sheeting system is employed, i.e. other than screw fixed steel sheeting, please consult our Technical Services Department.







## Zeta Sleeved Purlins

This system utilises single bay purlin lengths joined with connecting sleeves at alternate supports. All purlins must be sleeved across the penultimate support (see page 4 for alternative joint arrangement diagram). This system is considered to be the most efficient on the majority of buildings for bay centres up to 7.5m approx. The use of single span purlin lengths ensures easier on site handling and compliance with Health & Safety Authority requirements.

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **1/12513** | **2.73** | 7.684 | 7.926 | 5.870 | 6.138 | 5.071 | 5.366 | 3.917 | 4.239 | | | | | | | | | | |
| **1/12514** | **2.95** | 8.272 | 8.532 | 6.319 | 6.608 | 5.459 | 5.777 | 4.217 | 4.563 | | | | | | | | | | |
| **1/12515** | **3.16** | 8.861 | 9.139 | 6.769 | 7.078 | 5.847 | 6.187 | 4.517 | 4.888 | | | | | | | | | | |
| **1/15013** | **3.28** | 11.553 | 11.522 | 10.367 | 10.400 | 9.394 | 9.486 | 7.921 | 8.307 | 6.206 | 6.624 | | | | | | | | |
| **1/15014** | **3.53** | 12.488 | 12.799 | 11.206 | 11.552 | 10.154 | 10.535 | 8.534 | 8.949 | 6.687 | 7.136 | | | | | | | | |
| **1/15015** | **3.78** | 13.702 | 14.036 | 12.296 | 12.667 | 10.946 | 11.354 | 9.146 | 9.591 | 7.167 | 7.649 | | | | | | | | |
| **1/17513** | **3.53** | 13.608 | 13.212 | 12.215 | 11.924 | 11.071 | 10.873 | 10.115 | 10.000 | 8.599 | 9.049 | 7.292 | 7.777 | 6.163 | 6.683 | 5.172 | 5.727 | | |
| **1/17514** | **3.80** | 14.754 | 14.323 | 13.243 | 12.926 | 12.004 | 11.786 | 10.942 | 10.840 | 9.271 | 9.756 | 7.862 | 8.384 | 6.645 | 7.204 | 5.577 | 6.174 | | |
| **1/17515** | **4.07** | 16.227 | 16.587 | 14.567 | 14.966 | 13.204 | 13.644 | 11.725 | 12.204 | 9.935 | 10.455 | 8.425 | 8.984 | 7.120 | 7.720 | 5.976 | 6.616 | | |
| **1/20013** | **3.79** | 15.514 | 15.042 | 13.927 | 13.573 | 12.626 | 12.375 | 11.538 | 11.379 | 10.615 | 10.539 | 9.821 | 9.822 | 9.130 | 9.203 | 8.340 | 8.664 | 6.804 | 7.436 |
| **1/20014** | **4.08** | 16.887 | 16.369 | 15.160 | 14.770 | 13.744 | 13.466 | 12.560 | 12.382 | 11.556 | 11.468 | 10.692 | 10.687 | 9.940 | 10.013 | 8.993 | 9.426 | 7.337 | 8.017 |
| **1/20015** | **4.37** | 18.632 | 19.018 | 16.728 | 17.157 | 15.167 | 15.638 | 13.862 | 14.376 | 12.754 | 13.311 | 11.802 | 12.402 | 10.974 | 11.616 | 9.642 | 10.328 | 7.867 | 8.596 |
| **1/20016** | **4.66** | 20.354 | 20.765 | 18.275 | 18.732 | 16.570 | 17.073 | 15.145 | 15.694 | 13.936 | 14.531 | 12.897 | 13.537 | 11.780 | 12.466 | 10.289 | 11.021 | 8.395 | 9.172 |
| **1/20018** | **5.24** | 23.740 | 24.203 | 21.317 | 21.831 | 19.330 | 19.896 | 17.670 | 18.287 | 16.261 | 16.930 | 15.050 | 15.770 | 13.251 | 14.022 | 11.574 | 12.397 | 9.443 | 10.318 |

### General notes to all Zeta purlin systems

Working load capacities for **gravity loading** are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.6.
Working load capacities for **wind uplift** are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.4.

The effect of purlin self weight is included in the tabulated loads above. The tabulated values will give deflections not exceeding span/180.
The load capacities may be achieved without the use of sag bars for most conditions where a steel sheeting system is screw fixed to the purlins (see page 14 for further information and limitations). For applications where any other type of sheeting system is employed, i.e. other than screw fixed steel sheeting, please consult our Technical Services Department.

## Zeta Heavy End Bay Purlins

This is a fully continuous system with sleeves provided at all supports. The end bay purlins and sleeves to the penultimate support are increased in gauge to compensate for the lack of continuity across the gable, hence the name (see page 5 for alternative joint arrangement diagram).

This system is usually more advantageous for longer spans and/or heavier loadings where there are a minimum of six bays. Providing sleeves at all supports increases the capacity by over 25% compared to the equivalent sleeved system, with sleeves at alternate joints.

### Working Load Capacities in kN

| Interior Section No. | End Bay Section | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| 1/15013 | .17 | 14.300 | 14.194 | 12.840 | 12.805 | 11.642 | 11.672 | 10.366 | 10.730 | 8.122 | 8.669 | | | | | | | | |
| 1/15014 | .20 | 15.903 | 16.214 | 14.279 | 14.626 | 12.948 | 13.329 | 11.836 | 12.251 | 9.537 | 10.179 | | | | | | | | |
| 1/15015 | .20 | 17.448 | 17.781 | 15.668 | 16.038 | 14.208 | 14.616 | 12.171 | 12.765 | 9.537 | 10.179 | | | | | | | | |
| 1/17513 | .17 | 16.841 | 16.278 | 15.124 | 14.683 | 13.716 | 13.382 | 12.540 | 12.300 | 11.262 | 11.387 | 9.551 | 10.185 | | | | | | |
| 1/17514 | .20 | 18.784 | 18.145 | 16.870 | 16.366 | 15.301 | 14.914 | 13.990 | 13.707 | 12.878 | 12.688 | 11.221 | 11.818 | | | | | | |
| 1/17515 | .20 | 20.659 | 21.018 | 18.555 | 18.954 | 16.830 | 17.270 | 15.389 | 15.869 | 13.233 | 13.925 | 11.221 | 11.967 | | | | | | |
| 1/20013 | .18 | 19.197 | 18.535 | 17.242 | 16.717 | 15.639 | 15.232 | 14.300 | 13.999 | 13.164 | 12.958 | 12.188 | 12.068 | 11.340 | 11.299 | 10.595 | 10.629 | | |
| 1/20014 | .18 | 21.496 | 20.741 | 19.309 | 18.705 | 17.515 | 17.043 | 16.017 | 15.661 | 14.747 | 14.495 | 13.655 | 13.498 | 12.706 | 12.637 | 11.873 | 11.886 | | |
| 1/20014 | .20 | 21.496 | 20.741 | 19.309 | 18.705 | 17.515 | 17.043 | 16.017 | 15.661 | 14.747 | 14.495 | 13.655 | 13.498 | 12.706 | 12.637 | 11.873 | 11.886 | | |
| 1/20015 | .20 | 23.716 | 24.102 | 21.304 | 21.733 | 19.326 | 19.798 | 17.675 | 18.189 | 16.274 | 16.831 | 15.070 | 15.670 | 14.024 | 14.667 | 12.853 | 13.767 | 10.487 | 11.458 |
| 1/20016 | .25 | 25.168 | 25.580 | 22.608 | 23.065 | 20.509 | 21.012 | 18.756 | 19.305 | 17.270 | 17.864 | 15.992 | 16.632 | 14.882 | 15.567 | 13.907 | 14.639 | 13.045 | 13.822 |
| 1/20018 | .25 | 30.160 | 30.623 | 27.095 | 27.610 | 24.583 | 25.149 | 22.485 | 23.102 | 20.706 | 21.375 | 19.178 | 19.898 | 17.849 | 18.621 | 16.007 | 17.141 | 13.061 | 14.266 |

### General notes to all Zeta purlin systems

Working load capacities for **gravity loading** are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.6.

Working load capacities for **wind uplift** are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.4.

The effect of purlin self weight is included in the tabulated loads above. The tabulated values will give deflections not exceeding span/180.

The load capacities may be achieved without the use of sag bars for most conditions where a steel sheeting system is screw fixed to the purlins (see page 14 for further information and limitations). For applications where any other type of sheeting system is employed, i.e. other than screw fixed steel sheeting, please consult our Technical Services Department.





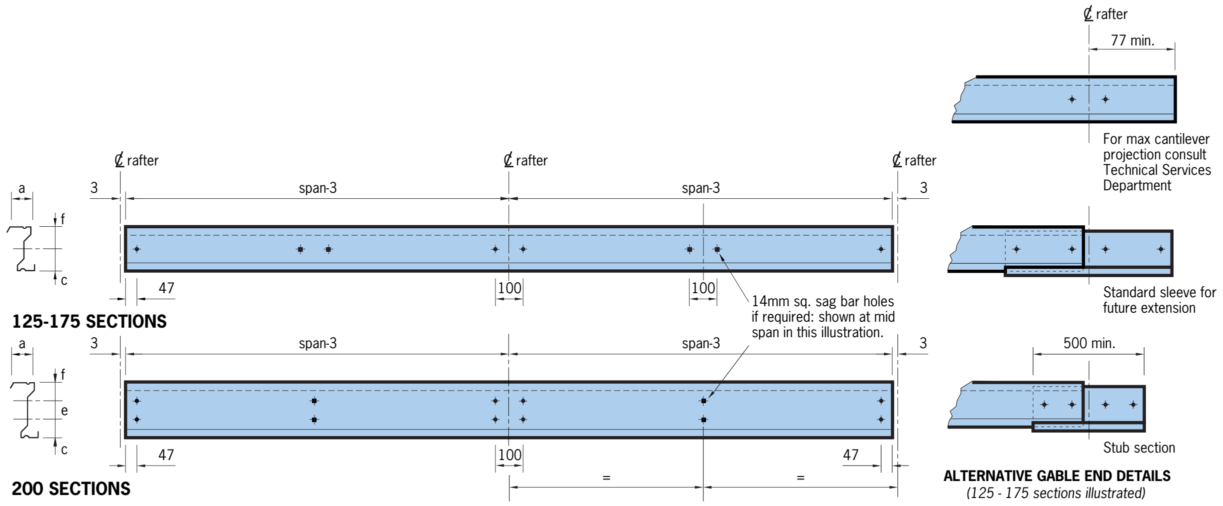


# Zeta Purlin Detailing

## Double Span System

The Double Span System comprises a two bay spanning purlin with simple connections at supports.

*Note: End bays that require a single bay purlin will need a sleeve connection at the penultimate rafter.*



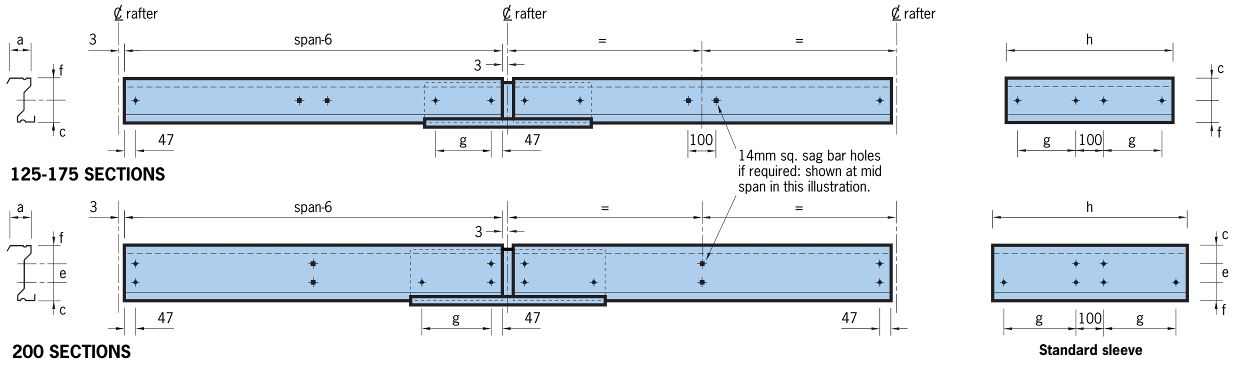

## Sleeved and Heavy End Bay Systems

The Sleeved System comprises a single bay purlin with a sleeve connection at alternate supports.

*Note: Sleeves on every joint at penultimate rafter.*

The Heavy End Bay System comprises a single bay purlin with a sleeve connection at every support.

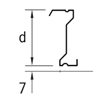
*Note: End bays require the appropriate heavier gauge section and sleeve at the penultimate rafter.*




### General Detailing Notes

All purlins must be fixed with the top flange facing the apex. See page 14 for minimum sag bar requirements.

All fixing holes are 18 dia. for M16 grade 4.6 bolts. Sag Bar/Bracing Strut holes are 14 sq. punched in pairs.



Sheeting line depth using standard Zeta cleats equals section depth +7mm.

| STANDARD DIMENSIONS FOR ZETA SECTIONS | | | | | |
|---|---|---|---|---|---|
| Purlin depth | d | **125** | **150** | **175** | **200** |
| Flange widths | a | 60 | 72 | 72 | 72 |
| | b | 50 | 65 | 65 | 65 |
| Hole centres | c | 62 | 74 | 87 | 64 |
| | e | 0 | 0 | 0 | 70 |
| | f | 63 | 76 | 88 | 66 |
| Sleeve Dimensions | g | 250 | 315 | 390 | 405 |
| | h | 695 | 825 | 975 | 1000 |

# Zeta Purlin Accessories

## Sag Bar Requirements

Where adequate lateral restraints is afforded by steel sheeting screw fixed to the purlin flange, sag bars are not required to develop the load capacities given on pages 10-12.

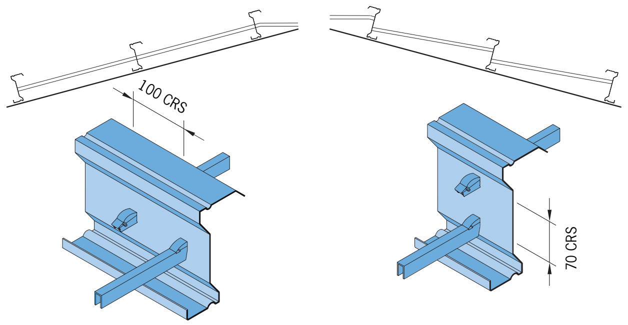
To maintain the correct alignment and to help prevent distortion of the purlin during sheeting, sag bars should be fitted in accordance with our minimum recommendations shown in the table below.

| PURLIN SPAN IN METRES | | | |
|---|---|---|---|
| Roof pitch θ | S ≤ 4.5 | 4.5 < S ≤ 7.6 | S >7.6 |
| 0º < θ ≤ 3º | Consult Technical Services Dept. | | |
| 3º < θ ≤12º | 0 | 0˚ | 2˚ |
| 12º < θ ≤ 20º | 0 | 1˚ | 2˚ |
| θ > 20º | Consult Technical Services Dept. | | |

For purlin in excess of 2m, Heavy Duty Sag Bars should be used as required.
˚See section headed "Eaves Tie and Fixing Bracket" for guidance on restraint to first purlins at eaves.

ARRANGEMENT OF SAG BARS FOR 125,150 AND 175 PURLINS

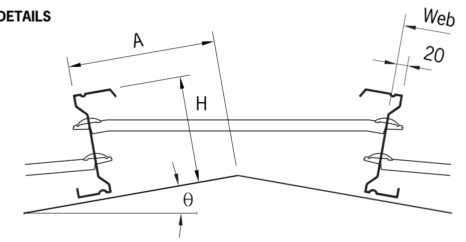
ARRANGEMENT OF SAG BARS FOR 200 PURLINS




For roof slope lengths in excess of 20m, it may become necessary to introduce additional support along the roof slope in the form of diagonal brace section tied back to the rafters. Details of the diagonal braces are shown on page 21. Please consult the Technical Services Department for further advice.

Special consideration must be given to purlins clad with any material other than screw fixed profiled steel sheeting. These include fibre cement sheeting, standing seam clip fix profiles and tiled roof constructions.

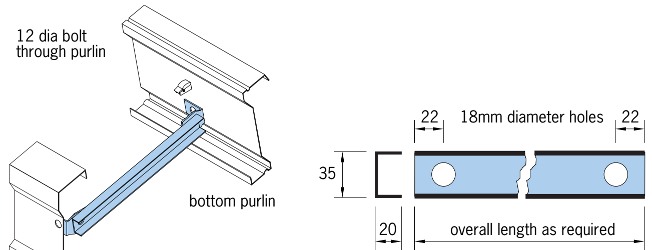
APEX TIE DETAILS



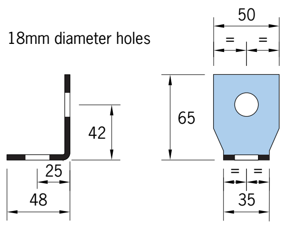

Details required from customer:
Dimension A (Note: measured to heel of flange)
Dimension H
Angle θ

## Eaves tie and fixing bracket

To ensure the first purlin at eaves is kept straight, particularly during the early stages of sheeting, it is necessary to give consideration to additional restraint to this purlin, especially on spans of 5m or more.
This may be done by providing an eaves tie of the type shown, or in agreement with the sheeting contractor, a temporary prop may be used.



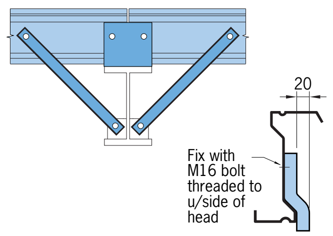

Eaves Tie




FB Fixing Bracket

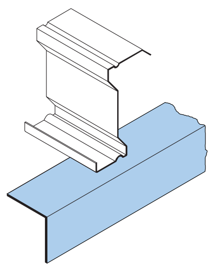
## Rafter Stays

The same section used to form the eaves tie is also available as a rafter stay member, where these are specified by the frame designer. A special cranked version with a 20mm offset is used for Zeta purlins.

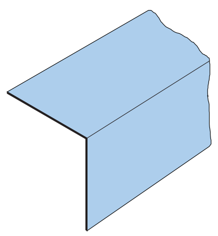



## Cleader Members

50 x 50 x 1.5mm thick galvanised steel Cleader Angle, avaliable in 4m unpunched lengths.



100 x 100 x 1.5mm thick galvanised steel verge trim angle for fixing to the top flange, available in 4m unpunched lenghts.



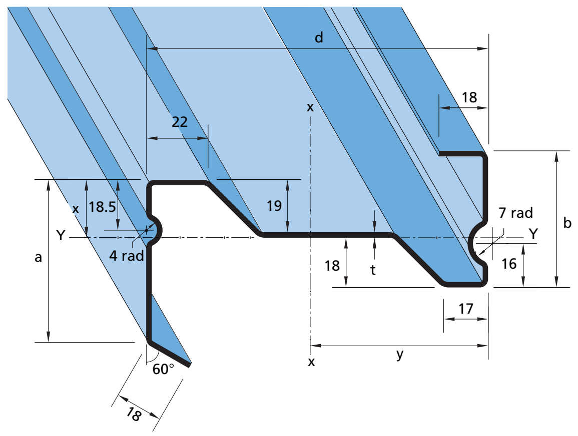




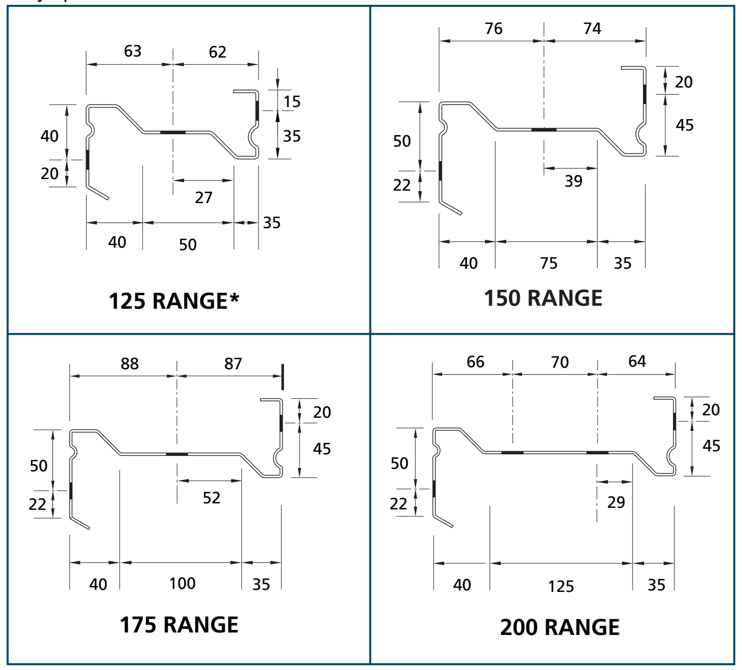


# Zeta Rails

## Zeta Rail Section Profile




*By Special order




## Zeta Section Properties

**Standard holing lines for all sections**
18 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines.

| Section No | Depth d | Thickness t | Top Flange a | Btm Flange b | Weight | Area | Ixx | Zxx | Iyy | ryy | x | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | mm | kg/m | $mm^2$ | $cm^4$ | $cm^3$ | $cm^4$ | mm | mm | mm |
| *1/12513 | 125 | 1.3 | 60 | 50 | 2.73 | 348 | 83.6 | 12.84 | 11.85 | 18.81 | 21.39 | 65.10 |
| *1/12514 | 125 | 1.4 | 60 | 50 | 2.95 | 375 | 90.0 | 13.82 | 12.78 | 18.79 | 21.45 | 65.11 |
| *1/12515 | 125 | 1.5 | 60 | 50 | 3.16 | 402 | 96.4 | 14.81 | 13.71 | 18.78 | 21.51 | 65.12 |
| *1/12517 | 125 | 1.7 | 60 | 50 | 3.58 | 456 | 109.2 | 16.76 | 15.55 | 18.75 | 21.62 | 65.15 |
| *1/12520 | 125 | 2.0 | 60 | 50 | 4.21 | 536 | 128.0 | 19.64 | 18.29 | 18.71 | 21.80 | 65.18 |
| 1/15013 | 150 | 1.3 | 72 | 65 | 3.28 | 417 | 147.4 | 19.04 | 22.27 | 23.56 | 21.39 | 77.42 |
| 1/15014 | 150 | 1.4 | 72 | 65 | 3.53 | 449 | 158.8 | 20.51 | 24.02 | 23.54 | 21.45 | 77.43 |
| 1/15015 | 150 | 1.5 | 72 | 65 | 3.78 | 482 | 170.2 | 21.98 | 25.77 | 23.53 | 21.51 | 77.44 |
| 1/15017 | 150 | 1.7 | 72 | 65 | 4.28 | 546 | 192.9 | 24.90 | 29.25 | 23.50 | 21.63 | 77.47 |
| 1/15020 | 150 | 2.0 | 72 | 65 | 5.04 | 642 | 226.5 | 29.22 | 34.43 | 23.45 | 21.81 | 77.50 |
| 1/17513 | 175 | 1.3 | 72 | 65 | 3.53 | 450 | 211.2 | 23.43 | 22.28 | 22.70 | 21.28 | 90.14 |
| 1/17514 | 175 | 1.4 | 72 | 65 | 3.80 | 484 | 227.7 | 25.25 | 24.03 | 22.68 | 21.34 | 90.15 |
| 1/17515 | 175 | 1.5 | 72 | 65 | 4.07 | 519 | 244.0 | 27.07 | 25.78 | 22.67 | 21.39 | 90.16 |
| 1/17517 | 175 | 1.7 | 72 | 65 | 4.62 | 588 | 276.6 | 30.67 | 29.26 | 22.64 | 21.51 | 90.19 |
| 1/17520 | 175 | 2.0 | 72 | 65 | 5.43 | 692 | 325.0 | 36.02 | 34.45 | 22.60 | 21.69 | 90.23 |
| 1/20013 | 200 | 1.3 | 72 | 65 | 3.79 | 482 | 288.9 | 28.10 | 22.29 | 21.92 | 21.18 | 102.83 |
| 1/20014 | 200 | 1.4 | 72 | 65 | 4.08 | 519 | 311.5 | 30.29 | 24.04 | 21.91 | 21.24 | 102.84 |
| 1/20015 | 200 | 1.5 | 72 | 65 | 4.37 | 557 | 334.0 | 32.47 | 25.78 | 21.89 | 21.30 | 102.86 |
| 1/20016 | 200 | 1.6 | 72 | 65 | 4.66 | 594 | 356.4 | 34.64 | 27.53 | 21.88 | 21.36 | 102.87 |
| 1/20018 | 200 | 1.8 | 72 | 65 | 5.24 | 668 | 400.9 | 38.96 | 31.00 | 21.85 | 21.47 | 102.90 |
| 1/20020 | 200 | 2.0 | 72 | 65 | 5.82 | 742 | 445.2 | 43.25 | 34.46 | 21.82 | 21.59 | 102.93 |
| 1/20025 | 200 | 2.5 | 72 | 65 | 7.22 | 920 | 554.4 | 53.83 | 43.01 | 21.84 | 21.88 | 102.99 |

## Zeta Double Span Rails

This system utilises a minimum number of components leading to maximum speed of erection on site. The rails are continuous over two bays with simple connections at the each support.

Joints are staggered with a minimum number of sleeves being required across the penultimate support of alternate rail lines to maintain continuity (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| 1/12513 | 2.73 | 9.041 | 7.911 | 7.830 | 7.120 | 6.625 | 6.473 | 5.383 | 5.383 | 4.649 | 4.649 | | | | |
| 1/12514 | 2.95 | 9.897 | 8.660 | 8.429 | 7.794 | 7.132 | 7.085 | 5.795 | 5.795 | 5.005 | 5.005 | | | | |
| 1/12515 | 3.16 | 10.742 | 9.400 | 9.028 | 8.460 | 7.640 | 7.640 | 6.207 | 6.207 | 5.361 | 5.361 | | | | |
| 1/15013 | 3.28 | 12.255 | 10.723 | 11.030 | 9.651 | 10.027 | 8.774 | 9.191 | 8.042 | 8.260 | 7.424 | 6.785 | 6.785 | 6.428 | 6.428 |
| 1/15014 | 3.53 | 13.624 | 11.921 | 12.261 | 10.729 | 11.147 | 9.753 | 10.218 | 8.941 | 8.898 | 8.253 | 7.310 | 7.310 | 6.926 | 6.926 |
| 1/15015 | 3.78 | 14.944 | 13.076 | 13.449 | 11.768 | 12.227 | 10.698 | 11.208 | 9.807 | 9.537 | 9.053 | 7.835 | 7.835 | 7.423 | 7.423 |
| 1/17513 | 3.53 | 14.420 | 12.617 | 12.978 | 11.355 | 11.798 | 10.323 | 10.815 | 9.463 | 9.983 | 8.735 | 9.270 | 8.111 | 8.600 | 7.570 |
| 1/17514 | 3.80 | 16.079 | 14.069 | 14.471 | 12.662 | 13.155 | 11.511 | 12.059 | 10.552 | 11.131 | 9.740 | 10.336 | 9.044 | 9.272 | 8.441 |
| 1/17515 | 4.07 | 17.679 | 15.469 | 15.911 | 13.922 | 14.465 | 12.657 | 13.259 | 11.602 | 12.239 | 10.709 | 11.365 | 9.945 | 9.936 | 9.282 |
| 1/20013 | 3.79 | 16.428 | 14.374 | 14.785 | 12.937 | 13.441 | 11.761 | 12.321 | 10.781 | 11.373 | 9.952 | 10.561 | 9.241 | 9.857 | 8.625 |
| 1/20014 | 4.08 | 18.390 | 16.091 | 16.551 | 14.482 | 15.046 | 13.165 | 13.792 | 12.068 | 12.731 | 11.140 | 11.822 | 10.344 | 11.034 | 9.655 |
| 1/20015 | 4.37 | 20.284 | 17.749 | 18.256 | 15.974 | 16.596 | 14.522 | 15.213 | 13.312 | 14.043 | 12.288 | 13.040 | 11.410 | 12.171 | 10.649 |
| 1/20016 | 4.66 | 22.153 | 19.384 | 19.938 | 17.446 | 18.126 | 15.860 | 16.615 | 14.538 | 15.337 | 13.420 | 14.242 | 12.461 | 13.292 | 11.631 |
| 1/20018 | 5.24 | 25.829 | 22.601 | 23.246 | 20.341 | 21.133 | 18.491 | 19.372 | 16.950 | 17.882 | 15.647 | 16.605 | 14.529 | 15.498 | 13.560 |

**General notes to all Zeta cladding rail systems**

Working load capacities for wind pressure (wide, sheeted flange in compression at mid span) are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.4.
Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background.

These values are derived from the Ultimate Load Capacities given on pages 74-75 divided by 1.4.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 14 for information on bracing requirements and limitations.
For applications where any other type of cladding system is employed, please consult Tegral Technical Services Department.







## Zeta Sleeved Rails

This system utilises single bay rail lengths joined with connecting sleeves at alternate supports.

All rails must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| 1/12513 | 2.73 | 9.366 | 8.393 | 7.205 | 7.205 | 6.262 | 6.262 | 4.894 | 4.894 | 4.294 | 4.294 | | | | | | | | |
| 1/12514 | 2.95 | 10.083 | 9.185 | 7.756 | 7.756 | 6.741 | 6.741 | 5.268 | 5.268 | 4.623 | 4.623 | | | | | | | | |
| 1/12515 | 3.16 | 10.800 | 9.969 | 8.308 | 8.308 | 7.221 | 7.221 | 5.643 | 5.643 | 4.952 | 4.952 | | | | | | | | |
| 1/15013 | 3.28 | 13.369 | 11.377 | 12.032 | 10.240 | 10.939 | 9.309 | 9.737 | 8.533 | 7.698 | 7.698 | 5.965 | 5.965 | | | | | | |
| 1/15014 | 3.53 | 14.450 | 12.644 | 13.005 | 11.379 | 11.823 | 10.345 | 10.490 | 9.483 | 8.294 | 8.294 | 6.426 | 6.426 | | | | | | |
| 1/15015 | 3.78 | 15.850 | 13.869 | 14.265 | 12.482 | 12.968 | 11.347 | 11.243 | 10.402 | 8.889 | 8.889 | 6.888 | 6.888 | | | | | | |
| 1/17513 | 3.53 | 15.731 | 13.056 | 14.158 | 11.751 | 12.870 | 10.682 | 11.798 | 9.792 | 10.589 | 9.039 | 9.042 | 8.393 | 7.707 | 7.707 | 6.540 | 6.540 | | |
| 1/17514 | 3.80 | 17.054 | 14.155 | 15.348 | 12.739 | 13.953 | 11.581 | 12.790 | 10.616 | 11.416 | 9.799 | 9.748 | 9.099 | 8.309 | 8.309 | 7.050 | 7.050 | | |
| 1/17515 | 4.07 | 18.751 | 16.407 | 16.876 | 14.767 | 15.342 | 13.424 | 14.063 | 12.305 | 12.234 | 11.359 | 10.446 | 10.446 | 8.904 | 8.904 | 7.555 | 7.555 | | |
| 1/20013 | 3.79 | 17.921 | 14.875 | 16.129 | 13.387 | 14.663 | 12.170 | 13.441 | 11.156 | 12.407 | 10.298 | 11.521 | 9.562 | 10.753 | 8.925 | 10.081 | 8.367 | 8.544 | 7.875 |
| 1/20014 | 4.08 | 19.505 | 16.189 | 17.554 | 14.570 | 15.959 | 13.246 | 14.629 | 12.142 | 13.503 | 11.208 | 12.539 | 10.407 | 11.703 | 9.713 | 10.972 | 9.106 | 9.213 | 8.571 |
| 1/20015 | 4.37 | 21.514 | 18.825 | 19.363 | 16.942 | 17.603 | 15.402 | 16.136 | 14.119 | 14.894 | 13.033 | 13.831 | 12.102 | 12.909 | 11.295 | 11.982 | 10.589 | 9.878 | 9.878 |
| 1/20016 | 4.66 | 23.497 | 20.560 | 21.147 | 18.504 | 19.225 | 16.822 | 17.623 | 15.420 | 16.267 | 14.234 | 15.105 | 13.217 | 14.098 | 12.336 | 12.786 | 11.565 | 10.540 | 10.540 |
| 1/20018 | 5.24 | 27.396 | 23.971 | 24.656 | 21.574 | 22.415 | 19.613 | 20.547 | 17.978 | 18.966 | 16.595 | 17.611 | 15.410 | 16.364 | 14.383 | 14.382 | 13.484 | 11.857 | 11.857 |

**General notes to all Zeta cladding rail systems**

Working load capacities for wind pressure (wide, sheeted flange in compression at mid span) are printed on a blue background. These values are derived from the Ultimate Load Capacities given on page 80 divided by 1.4.
Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background.

These values are derived from the Ultimate Load Capacities given on page 80 divided by 1.4.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 14 for information on bracing requirements and limitations.
For applications where any other type of cladding system is employed, please consult Tegral Technical Services Department.

## Zeta Butted Rails

This system is employed where continuity across the supports either cannot be provided, i.e. rails are within the depth of the column, or is not required to achieve the necessary load carrying capacity (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.0 metre span | | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| 1/15013 | 3.28 | 10.027 | 8.222 | 8.356 | 7.309 | 6.769 | 6.578 | 5.594 | 5.594 | 4.700 | 4.700 | 4.005 | 4.005 | | | | |
| 1/15014 | 3.53 | 11.147 | 9.140 | 9.003 | 8.125 | 7.292 | 7.292 | 6.027 | 6.027 | 5.064 | 5.064 | 4.315 | 4.315 | | | | |
| 1/15015 | 3.78 | 12.212 | 10.026 | 9.649 | 8.912 | 7.816 | 7.816 | 6.459 | 6.459 | 5.427 | 5.427 | 4.625 | 4.625 | | | | |
| 1/17513 | 3.53 | 11.798 | 9.674 | 10.487 | 8.599 | 8.867 | 7.739 | 7.328 | 7.036 | 6.158 | 6.158 | 5.247 | 5.247 | 4.524 | 4.524 | | |
| 1/17514 | 3.80 | 13.155 | 10.787 | 11.694 | 9.589 | 9.560 | 8.630 | 7.901 | 7.845 | 6.639 | 6.639 | 5.657 | 5.657 | 4.877 | 4.877 | | |
| 1/17515 | 4.07 | 14.465 | 11.861 | 12.647 | 10.543 | 10.244 | 9.489 | 8.466 | 8.466 | 7.114 | 7.114 | 6.062 | 6.062 | 5.227 | 5.227 | | |
| 1/17517 | 4.62 | 17.027 | 13.962 | 14.337 | 12.411 | 11.613 | 11.170 | 9.597 | 9.597 | 8.064 | 8.064 | 6.871 | 6.871 | 5.925 | 5.925 | | |
| 1/20013 | 3.79 | 13.441 | 11.022 | 11.948 | 9.797 | 10.753 | 8.817 | 9.775 | 8.016 | 8.423 | 7.348 | 7.177 | 6.783 | 6.188 | 6.188 | 5.391 | 5.391 |
| 1/20014 | 4.08 | 15.046 | 12.338 | 13.374 | 10.967 | 12.037 | 9.870 | 10.808 | 8.973 | 9.082 | 8.225 | 7.738 | 7.593 | 6.672 | 6.672 | 5.812 | 5.812 |
| 1/20015 | 4.37 | 16.596 | 13.609 | 14.752 | 12.097 | 13.277 | 10.887 | 11.589 | 9.897 | 9.738 | 9.073 | 8.297 | 8.297 | 7.154 | 7.154 | 6.232 | 6.232 |
| 1/20016 | 4.66 | 18.126 | 14.863 | 16.112 | 13.212 | 14.500 | 11.890 | 12.366 | 10.809 | 10.391 | 9.909 | 8.854 | 8.854 | 7.634 | 7.634 | 6.650 | 6.650 |
| 1/20018 | 5.24 | 21.133 | 17.329 | 18.785 | 15.404 | 16.831 | 13.863 | 13.910 | 12.603 | 11.688 | 11.553 | 9.959 | 9.959 | 8.587 | 8.587 | 7.481 | 7.481 |

**General notes to all Zeta cladding rail systems**
Working load capacities for wind pressure (wide, sheeted flange in compression at mid span) are printed on a blue background. These values are derived from the Ultimate Load Capacities given on page 80 divided by 1.4.
Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background. These values are derived from the Ultimate Load Capacities given on page 80 divided by 1.4.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 14 for information on bracing requirements and limitations.
For applications where any other type of cladding system is employed, please consult Tegral Technical Services Department.





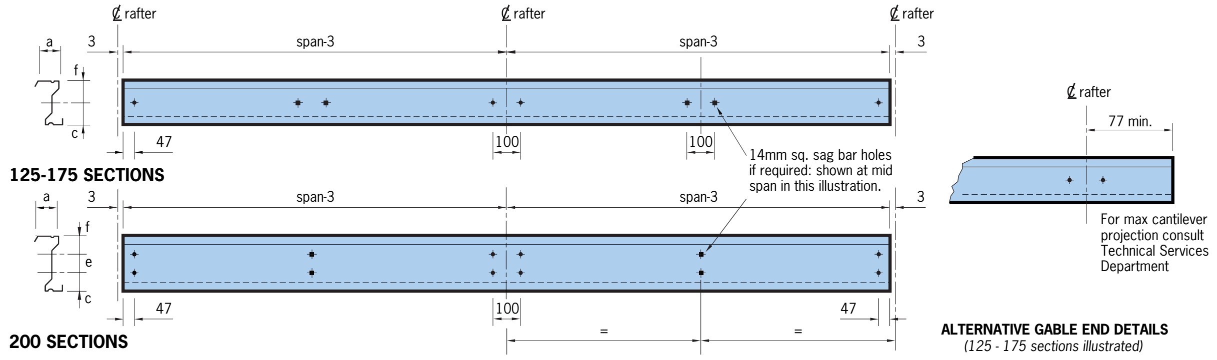


# Zeta Rail Detailing

## Double Span System

The Double Span System comprises a two bay spanning purlin with simple connections at supports.

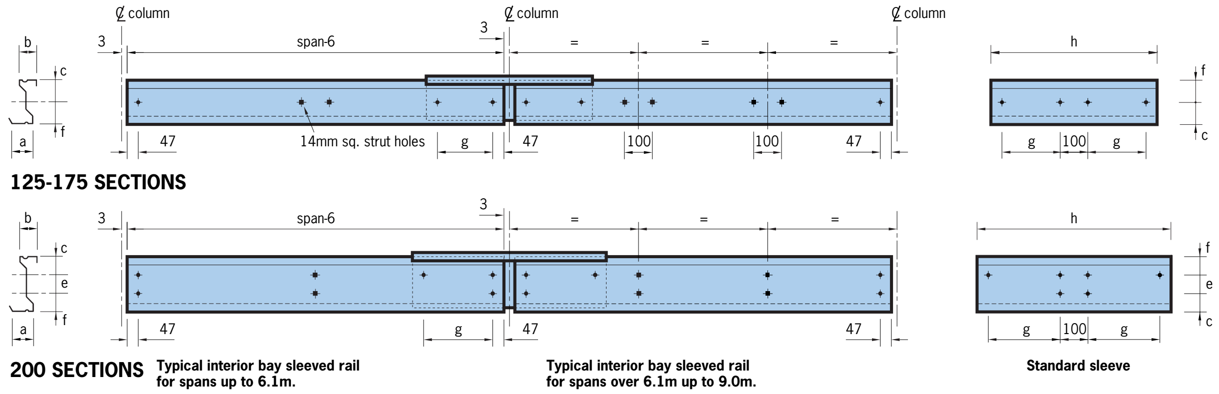
*Note: End bays that require a single bay purlin will need a sleeve connection at the penultimate rafter.*




## Sleeved and Heavy End Bay System

The Sleeved System comprises a single bay rail with a sleeve connection at alternate supports.

*Note: Sleeves on every joint at penultimate column.*



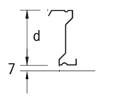

### General Detailing Notes

Rails may be fixed with the sheeting (wide) flange pointing up or down to suit the detail. When cladding fixed with hook bolts is employed, the sheeting (narrow) flange points up.

See page 21 for minimum strut requirements.

All fixing holes are 18 dia for M16 grade 4.6 bolts.

Bracing Strut holes are 14 sq, punched in pairs.



Sheeting line depth using standard Zeta cleats equals section depth +7mm.

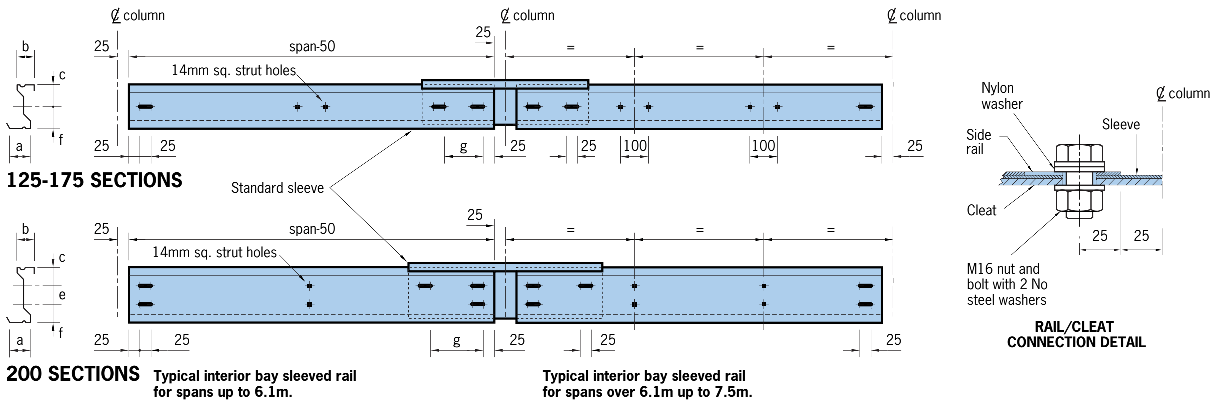
**STANDARD DIMENSIONS FOR ZETA SECTIONS**

| | | | | | |
|---|---|---|---|---|---|
| Rail depth | d | **125** | **150** | **175** | **200** |
| Flange widths | a | 60 | 72 | 72 | 72 |
| | b | 50 | 65 | 65 | 65 |
| Hole centres | c | 62 | 74 | 87 | 64 |
| | e | 0 | 0 | 0 | 70 |
| | f | 63 | 76 | 88 | 66 |
| Sleeve Dimensions | g | 250 | 315 | 390 | 405 |
| | h | 695 | 825 | 975 | 1000 |

## Firescreen Rails

All cladding and eaves rails must be allowed to expand during a fire. Slotted holes with both steel and nylon washers under the bolt heads are required.

The minimum allowance for expansion should be 7mm/metre length of rail. For rails up to 7.5m span the gap between rails is rounded to 50mm.
The maximum span and spacing should be 7.5m and 2.0m respectively.
Rails should generally be single span, but may be sleeved to achieve continuity.




| STANDARD DIMENSIONS FOR ZETA SECTIONS | | | | | |
|---|---|---|---|---|---|
| Rail depth | d | **125** | **150** | **175** | **200** |
| Flange widths | a | 60 | 72 | 72 | 72 |
| | b | 50 | 65 | 65 | 65 |
| Hole centres | c | 62 | 74 | 87 | 64 |
| | e | 0 | 0 | 0 | 70 |
| | f | 63 | 76 | 88 | 66 |
| Sleeve | g | 250 | 315 | 390 | 405 |
| Dimensions | h | 695 | 825 | 975 | 1000 |

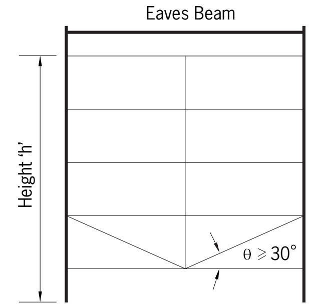




# Zeta Rail Accessories

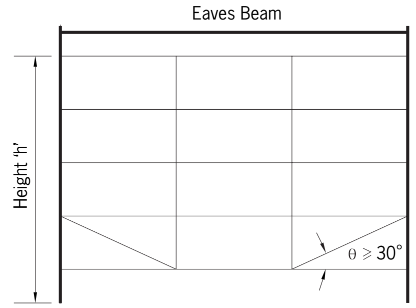
### Arrangement of Diagonal Braces and Vertical Struts

All rails should be braced in accordance with the recommendations shown below, to maintain alignment of the sections.
Diagonal braces and vertical struts are not necessarily required to develop the load carrying capacities given on pages 16-17-18, where screw fixed steel cladding is employed.
They should, however, be provided to maintain alignment during erection and cladding.
Special consideration must be given to alternative cladding constructions such as clip fixed panels and glazing.
Please consult the Technical Services Department for further information.




**Metal Sheeting:** Spans up to and including 6.1m.

**Fibre Cement Sheeting:** Spans up to and including 4.5m.



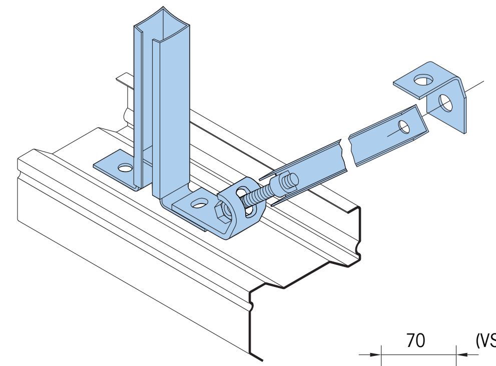

**Metal Sheeting:** Spans over 6.1m and up to 9.0m.

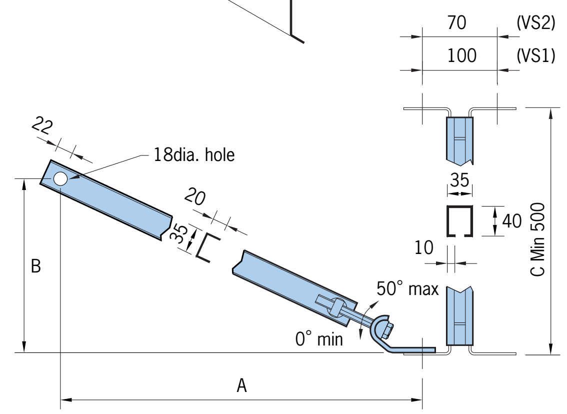
**Fibre Cement Sheeting:** Spans over 4.5m and up to 7.6m.

Maximum height 'h' for insulated Metal Sheeting (S. Wt. 13.25 kg/m2) = 12m.* Maximum height 'h' for insulated F.C. Sheeting (S. Wt. 26.75 kg/m2) = 8.5m.*
For heights greater than 'h' further sets of diagonal braces are required.*

In addition, maximum number of rails per bay per set of diagonals should not exceed 8 No. for spans 9.0m (rail weight 7.94 kg/m).
For other cases, please consult our Technical Services Department.

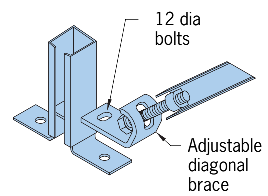
### Diagonal Brace, fixing bracket & vertical strut fixing.



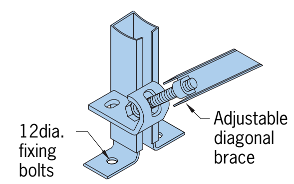



Details of diagonal brace
(specify dim. 'A' and 'B' when ordering)

**VS1 FOR ZETA 125, 150, 175**

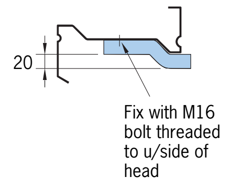


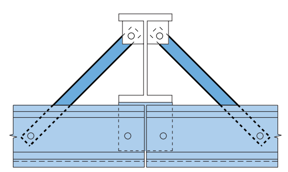

**VS2 FOR ZETA 200**




### Column Stays

The same section used for the diagonal brace channel is also available as a column stay member, where these are required by the frame designer. A special cranked version with a 20mm offset is used for Zeta cladding rails.



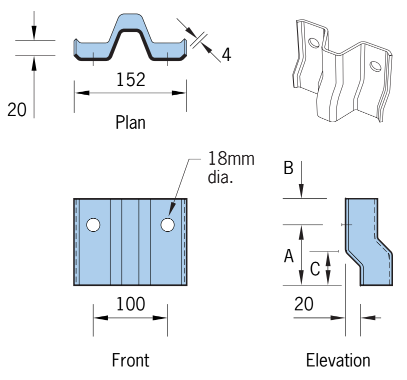



# Zeta Cleats Purlin & Rail

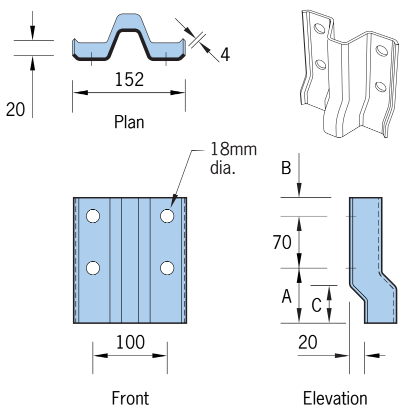
Tegral cleats for Zeta purlins and cladding rails are available as either a weld-on type or as a bolt-on type, with the facility to offer an extended leg to suit alternative sheeting lines.

The appropriate dimention for standard section punching and sheeting lines, as well as limiting dimensions for extended leg cleats are given in the table below.

## Weld-on cleats




To suit 125, 150, and 175mm purlin or rail depth




To suit 200mm purlin or rail depth

## Design

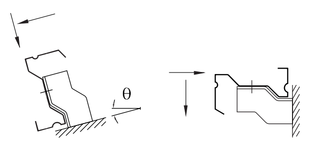
The cleat capacities have been verified by testing at the University of Salford. For Zeta purlins and rails subject to the following constraints:

1. A screw fixed steel cladding system is employed.
2. The standard sheeting line is used.
3. The roof slope for purlins is not greater than 40 degrees, and cleats supporting cladding rails are horizontal, then the cleat capacity should be satisfactory.

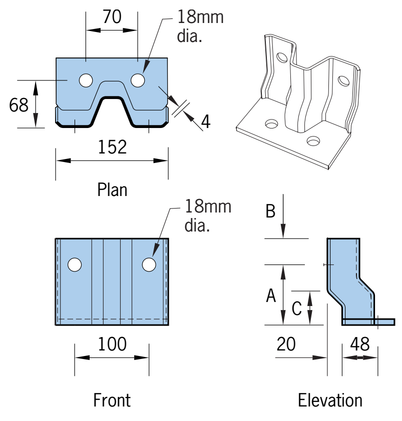
For variations on any of the above criteria please contact Tegral Technical Services Department.

## Capacity of weld-on and bolt-on type cleats

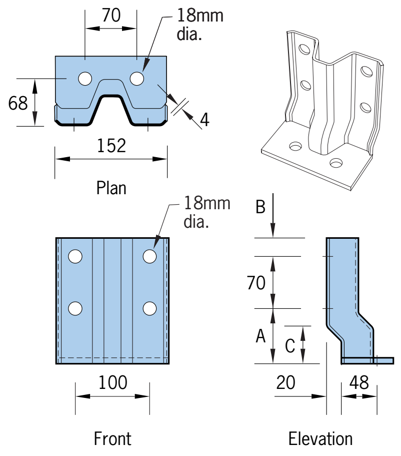
For spine in tension (direction for forces as shown for purlin) $M_{ult}$ M = 2.50kNm
For reverse condition (spine in compression as shown for rail) $M_{ult}$ M = 1.20 kNm




## Bolt-on cleats




To suit 125, 150, and 175mm purlin or rail depth




To suit 200mm purlin or rail depth

For ordering purposes, the Zeta cleat reference is followed by the required sheeting line, eg: for a bolt-on Zeta cleat to suit a 125mm purlin depth and a 132mm sheeting line the reference is 1/B125/132.

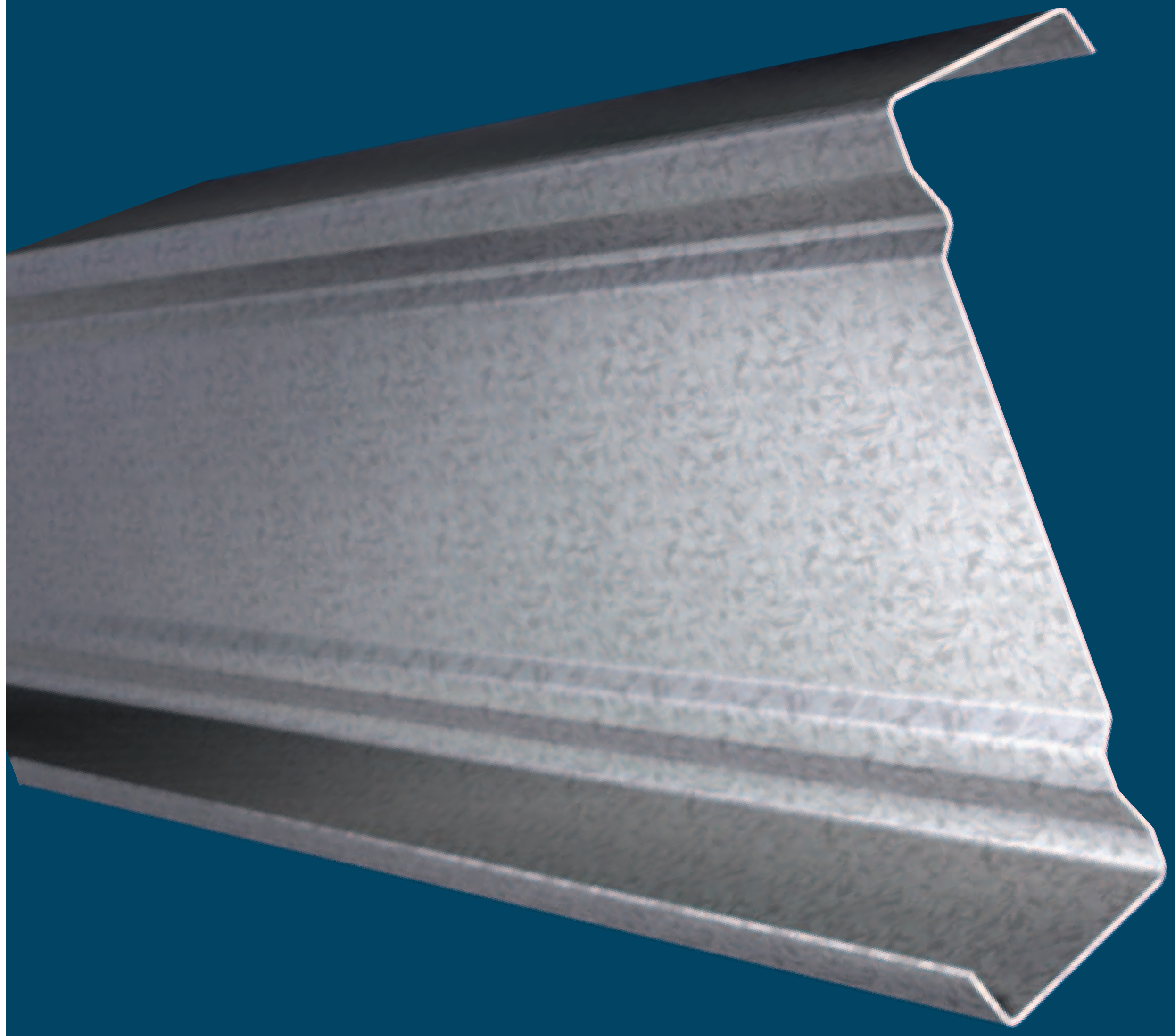
| Section | Weld-on | Bolt-on | Sheeting line Standard | Sheeting line Max | A Standard | A Max | B | C Standard | C Max |
|---|---|---|---|---|---|---|---|---|---|
| 1/125 | 1/C125/_ | 1/B125/_ | 132 | 287 | 69 | 224 | 25 | 45 | 200 |
| 1/150 | 1/C150/_ | 1/B150/_ | 157 | 312 | 81 | 236 | 35 | 45 | 200 |
| 1/175 | 1/C175/_ | 1/B175/_ | 182 | 332 | 94 | 244 | 45 | 50 | 200 |
| 1/200 | 1/C200/_ | 1/B200/_ | 207 | 360 | 71 | 224 | 25 | 47 | 197 |





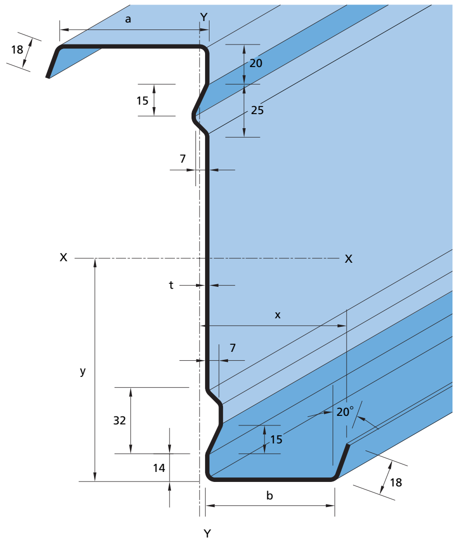


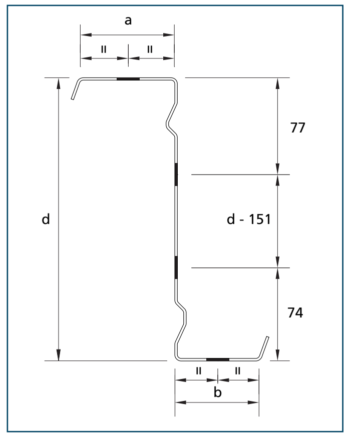
# Zeta 2 Purlins & Rails



# Zeta 2 Purlins

## Zeta 2 Purlin Section Profile




### Standard holing lines for all sections

18 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines.

## Zeta 2 Section Properties

| Section No | Depth d | Thickness t | Top Flange a | Btm Flange b | Weight | Area | Ixx | Zxx | Iyy | ryy | x | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | mm | kg/m | $mm^2$ | $cm^4$ | $cm^3$ | $cm^4$ | mm | mm | mm |
| **2/22514** | 225 | 1.4 | 78 | 68 | 4.47 | 570 | 417.8 | 36.38 | 59.72 | 32.98 | 75.10 | 114.85 |
| **2/22515** | 225 | 1.5 | 78 | 68 | 4.79 | 610 | 448.2 | 39.02 | 64.11 | 32.98 | 75.15 | 114.85 |
| **2/22516** | 225 | 1.6 | 78 | 68 | 5.10 | 650 | 478.4 | 41.66 | 68.49 | 32.98 | 75.20 | 114.85 |
| **2/22518** | 225 | 1.8 | 78 | 68 | 5.73 | 731 | 538.7 | 46.90 | 77.23 | 32.98 | 75.30 | 114.85 |
| **2/22520** | 225 | 2.0 | 78 | 68 | 6.37 | 811 | 598.6 | 52.12 | 85.95 | 32.97 | 75.40 | 114.85 |
| **2/22525** | 225 | 2.5 | 78 | 68 | 7.94 | 1011 | 746.9 | 65.03 | 107.65 | 32.96 | 75.65 | 114.85 |
| **2/24514** | 245 | 1.4 | 78 | 68 | 4.69 | 598 | 510.7 | 40.88 | 59.73 | 32.20 | 75.02 | 124.94 |
| **2/24515** | 245 | 1.5 | 78 | 68 | 5.02 | 640 | 547.9 | 43.85 | 64.12 | 32.20 | 75.07 | 124.94 |
| **2/24516** | 245 | 1.6 | 78 | 68 | 5.35 | 682 | 584.9 | 46.81 | 68.50 | 32.20 | 75.12 | 124.94 |
| **2/24518** | 245 | 1.8 | 78 | 68 | 6.02 | 767 | 658.6 | 52.72 | 77.24 | 32.19 | 75.22 | 124.94 |
| **2/24520** | 245 | 2.0 | 78 | 68 | 6.68 | 851 | 732.0 | 58.59 | 85.96 | 32.19 | 75.32 | 124.94 |
| **2/24525** | 245 | 2.5 | 78 | 68 | 8.31 | 1058 | 913.7 | 73.13 | 107.66 | 32.22 | 75.57 | 124.94 |
| **2/26515** | 265 | 1.5 | 78 | 68 | 5.26 | 670 | 659.9 | 48.88 | 64.13 | 31.47 | 74.99 | 135.01 |
| **2/26516** | 265 | 1.6 | 78 | 68 | 5.61 | 714 | 704.5 | 52.18 | 68.50 | 31.47 | 75.04 | 135.01 |
| **2/26518** | 265 | 1.8 | 78 | 68 | 6.30 | 803 | 793.5 | 58.77 | 77.25 | 31.47 | 75.14 | 135.01 |
| **2/26520** | 265 | 2.0 | 78 | 68 | 6.99 | 891 | 882.0 | 65.33 | 85.97 | 31.46 | 75.24 | 135.01 |
| **2/26525** | 265 | 2.5 | 78 | 68 | 8.72 | 1111 | 1101.4 | 81.58 | 107.68 | 31.45 | 75.49 | 135.01 |
| **2/26530** | 265 | 3.0 | 78 | 68 | 10.44 | 1330 | 1318.0 | 97.62 | 129.25 | 31.44 | 75.74 | 135.02 |
| **2/28515** | 285 | 1.5 | 78 | 68 | 5.49 | 700 | 784.9 | 54.10 | 64.13 | 30.79 | 74.92 | 145.08 |
| **2/28516** | 285 | 1.6 | 78 | 68 | 5.86 | 746 | 838.1 | 57.77 | 68.51 | 30.79 | 74.97 | 145.08 |
| **2/28518** | 285 | 1.8 | 78 | 68 | 6.58 | 839 | 944.0 | 65.06 | 77.26 | 30.78 | 75.07 | 145.09 |
| **2/28520** | 285 | 2.0 | 78 | 68 | 7.31 | 931 | 1049.4 | 72.33 | 85.98 | 30.78 | 75.17 | 145.09 |
| **2/28525** | 285 | 2.5 | 78 | 68 | 9.11 | 1161 | 1310.9 | 90.35 | 107.69 | 30.77 | 75.42 | 145.09 |
| **2/28530** | 285 | 3.0 | 78 | 68 | 10.91 | 1390 | 1569.2 | 108.15 | 129.27 | 30.75 | 75.67 | 145.09 |







## Zeta 2 Sleeved Purlins

This system utilises single bay purlin lengths joined with connecting sleeves at alternate supports. All purlins must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram). The use of single span purlin lengths ensures easier on site handling and compliance with Health & Safety Authority requirements.

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | | 9.0 metre span | | 9.5 metre span | | 10.0 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **2/22514** | **4.47** | 12.174 | 11.634 | 11.195 | 10.781 | 10.353 | 10.053 | 9.621 | 9.425 | 8.977 | 8.879 | | | | | | | | |
| **2/22515** | **4.79** | 13.723 | 13.086 | 12.622 | 12.125 | 11.675 | 11.304 | 10.851 | 10.596 | 10.128 | 9.979 | 9.486 | 9.438 | | | | | | |
| **2/22516** | **5.10** | 15.313 | 14.575 | 14.087 | 13.502 | 13.033 | 12.586 | 12.115 | 11.795 | 11.310 | 11.106 | 10.596 | 10.502 | 9.438 | 9.967 | | | | |
| **2/22518** | **5.73** | 18.574 | 17.628 | 17.091 | 16.326 | 15.816 | 15.214 | 14.708 | 14.254 | 13.641 | 13.418 | 12.004 | 12.683 | 10.628 | 11.639 | | | | |
| **2/24514** | **4.69** | 13.283 | 12.673 | 12.217 | 11.742 | 11.300 | 10.948 | 10.502 | 10.262 | 9.801 | 9.666 | 9.180 | 9.142 | 8.625 | 8.678 | | | | |
| **2/24515** | **5.02** | 15.010 | 14.289 | 13.808 | 13.238 | 12.775 | 12.340 | 11.875 | 11.564 | 11.085 | 10.889 | 10.386 | 10.297 | 9.761 | 9.772 | | | | |
| **2/24516** | **5.35** | 16.780 | 15.945 | 15.439 | 14.769 | 14.286 | 13.765 | 13.283 | 12.898 | 12.402 | 12.142 | 11.621 | 11.479 | 10.925 | 10.892 | | | | |
| **2/24518** | **6.02** | 20.403 | 19.333 | 18.777 | 17.902 | 17.379 | 16.681 | 16.163 | 15.626 | 15.096 | 14.706 | 14.150 | 13.898 | 13.307 | 13.184 | | | | |
| **2/26515** | **5.26** | 16.260 | 15.459 | 14.959 | 14.319 | 13.841 | 13.346 | 12.868 | 12.506 | 12.014 | 11.775 | 11.257 | 11.132 | 10.582 | 10.564 | 9.975 | 10.058 | 9.426 | 9.605 |
| **2/26516** | **5.61** | 18.216 | 17.287 | 16.762 | 16.010 | 15.511 | 14.919 | 14.424 | 13.978 | 13.469 | 13.158 | 12.624 | 12.437 | 11.869 | 11.800 | 11.190 | 11.232 | 10.577 | 10.724 |
| **2/26518** | **6.30** | 22.214 | 21.020 | 20.446 | 19.462 | 18.926 | 18.132 | 17.604 | 16.983 | 16.444 | 15.981 | 15.417 | 15.101 | 14.500 | 14.322 | 13.677 | 13.629 | 12.933 | 13.007 |
| **2/28515** | **5.49** | 16.281 | 16.569 | 16.052 | 15.346 | 14.853 | 14.302 | 13.811 | 13.401 | 12.896 | 12.615 | 12.085 | 11.925 | 11.361 | 11.315 | 10.711 | 10.772 | 10.123 | 10.286 |
| **2/28516** | **5.86** | 19.593 | 18.573 | 18.030 | 17.200 | 16.687 | 16.027 | 15.519 | 15.014 | 14.493 | 14.131 | 13.585 | 13.356 | 12.774 | 12.670 | 12.046 | 12.059 | 11.388 | 11.512 |
| **2/28518** | **6.58** | 23.976 | 22.662 | 22.069 | 20.981 | 20.431 | 19.545 | 19.006 | 18.304 | 17.756 | 17.222 | 16.649 | 16.272 | 15.661 | 15.431 | 14.774 | 14.682 | 13.972 | 14.010 |

### General notes to all Zeta 2 Purlin Systems

Working load capacities for gravity loading are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 76-77 divided by 1.6.

Working load capacities for wind uplift are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 75-76 divided by 1.4.

The effect of purlin self weight is included in the tabulated loads above.

The tabulated values will give deflections not exceeding span/150.

The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 29 for information on bracing requirements and limitations.

For applications where any other type of sheeting system is employed, i.e. other than screw fixed sheeting, please consult Tegral Technical Services Department.

## Zeta 2 Butted Purlins

This system is employed where continuity across the supports either can not be provided, i.e. purlins are within the depth of the rafter, or is not required to achieve the necessary load carrying capacity. (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | | 9.0 metre span | | 9.5 metre span | | 10.0 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **2/22514** | **4.47** | 8.235 | 8.033 | 7.560 | 7.457 | 6.978 | 6.967 | | | | | | | | | | | | |
| **2/22515** | **4.79** | 9.288 | 9.032 | 8.528 | 8.382 | 7.671 | 7.829 | | | | | | | | | | | | |
| **2/22516** | **5.10** | 10.369 | 10.055 | 9.523 | 9.330 | 8.190 | 8.711 | | | | | | | | | | | | |
| **2/22518** | **5.73** | 12.586 | 12.153 | 10.786 | 11.272 | 9.222 | 10.009 | | | | | | | | | | | | |
| **2/24514** | **4.69** | 8.989 | 8.747 | 8.253 | 8.119 | 7.620 | 7.583 | 7.067 | 7.122 | | | | | | | | | | |
| **2/24515** | **5.02** | 10.164 | 9.858 | 9.334 | 9.147 | 8.620 | 8.541 | 7.998 | 8.019 | | | | | | | | | | |
| **2/24516** | **5.35** | 11.367 | 10.996 | 10.442 | 10.200 | 9.646 | 9.522 | 8.701 | 8.938 | | | | | | | | | | |
| **2/24518** | **6.02** | 13.830 | 13.323 | 12.710 | 12.355 | 11.343 | 11.529 | 9.799 | 10.684 | 8.529 | 9.474 | | | | | | | | |
| **2/26515** | **5.26** | 11.004 | 10.654 | 10.108 | 9.884 | 9.336 | 9.228 | 8.664 | 8.662 | 8.073 | 8.171 | | | | | | | | |
| **2/26516** | **5.61** | 12.333 | 11.908 | 11.332 | 11.045 | 10.469 | 10.309 | 9.718 | 9.675 | 9.057 | 9.124 | 8.061 | 8.641 | | | | | | |
| **2/26518** | **6.30** | 15.051 | 14.470 | 13.833 | 13.417 | 12.786 | 12.518 | 11.874 | 11.743 | 10.350 | 11.069 | 9.081 | 10.132 | 8.012 | 9.125 | | | | |
| **2/28515** | **5.49** | 11.806 | 11.412 | 10.846 | 10.586 | 10.019 | 9.882 | 9.299 | 9.275 | 8.666 | 8.748 | 8.104 | 8.286 | 7.601 | 7.878 | | | | |
| **2/28516** | **5.86** | 13.264 | 12.788 | 12.189 | 11.859 | 11.263 | 11.068 | 10.456 | 10.385 | 9.747 | 9.792 | 9.118 | 9.272 | 8.532 | 8.813 | 7.576 | 8.405 | | |
| **2/28518** | **6.58** | 16.243 | 15.592 | 14.931 | 14.455 | 13.802 | 13.484 | 12.820 | 12.648 | 11.956 | 11.920 | 10.879 | 11.281 | 9.613 | 10.717 | 8.536 | 9.762 | 7.611 | 8.902 |

### General notes to all Zeta 2 Purlin Systems

Working load capacities for gravity loading are printed on a blue background. These values are derived from the Ultimate Load Capacities given on page 78 divided by 1.6.
Working load capacities for wind uplift are printed on a grey background.
These values are derived from the Ultimate Load Capacities given on page 78 divided by 1.4.

The effect of purlin self weight is included in the tabulated loads above.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 29 for information on bracing requirements and limitations.
For applications where any other type of sheeting system is employed, i.e. other than screw fixed sheeting, please consult Tegral Technical Services Department.







## Zeta 2 Heavy End Bay Purlins

### Zeta 2 Heavy End Bay Purlins

This is a fully continuous system with sleeves provided at all supports. The end bay purlins and sleeves to the penultimate support are increased in gauge to compensate for the lack of continuity across the gable, hence the name (see page 5 for alternative joint arrangement diagram). This system is usually more advantageous for longer spans and/or heavier loadings where there are a minimum of six bays. Providing sleeves at all supports increases the capacity by over 25% compared to the equivalent sleeved system, with sleeves at alternate joints.

### Working Load Capacities in kN

| Interior Section No. | End Bay Section | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | | 9.0 metre span | | 9.5 metre span | | 10.0 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **2/22514** | **.18** | 16.415 | 15.512 | 15.110 | 14.361 | 13.989 | 13.377 | 13.014 | 12.528 | 12.158 | 11.787 | 11.400 | 11.137 | 10.724 | 10.561 | | | | |
| **2/22515** | **.18** | 18.499 | 17.453 | 17.031 | 16.156 | 15.769 | 15.047 | 14.672 | 14.089 | 13.710 | 13.254 | 12.004 | 12.520 | 10.628 | 11.639 | | | | |
| **2/22516** | **.20** | 20.638 | 19.444 | 19.002 | 17.996 | 17.597 | 16.759 | 16.375 | 15.690 | 15.158 | 14.758 | 13.339 | 13.938 | 11.809 | 12.934 | | | | |
| **2/24514** | **.18** | 17.907 | 16.901 | 16.485 | 15.645 | 15.263 | 14.572 | 14.201 | 13.645 | 13.269 | 12.836 | 12.444 | 12.126 | 11.708 | 11.497 | | | | |
| **2/24515** | **.18** | 20.231 | 19.062 | 18.627 | 17.643 | 17.249 | 16.430 | 16.051 | 15.383 | 15.001 | 14.469 | 14.070 | 13.666 | 13.241 | 12.954 | | | | |
| **2/24516** | **.20** | 22.611 | 21.276 | 20.821 | 19.690 | 19.283 | 18.334 | 17.947 | 17.162 | 16.774 | 16.140 | 15.737 | 15.242 | 14.812 | 14.446 | | | | |
| **2/26515** | **.18** | 21.894 | 20.610 | 20.160 | 19.074 | 18.670 | 17.761 | 17.376 | 16.627 | 16.240 | 15.638 | 15.234 | 14.768 | 14.338 | 13.998 | 13.533 | 13.311 | 12.806 | 12.696 |
| **2/26516** | **.20** | 24.522 | 23.052 | 22.583 | 21.332 | 20.917 | 19.861 | 19.469 | 18.590 | 18.199 | 17.482 | 17.075 | 16.507 | 16.073 | 15.643 | 15.173 | 14.874 | 14.361 | 14.184 |
| **2/26518** | **.25** | 29.894 | 28.041 | 27.535 | 25.944 | 25.508 | 24.150 | 23.748 | 22.600 | 22.204 | 21.247 | 20.838 | 20.057 | 19.620 | 19.003 | 18.527 | 18.063 | 17.541 | 17.220 |
| **2/28515** | **.18** | 23.480 | 22.086 | 21.622 | 20.439 | 20.026 | 19.031 | 18.638 | 17.814 | 17.421 | 16.753 | 16.344 | 15.820 | 15.384 | 14.993 | 14.522 | 14.257 | 13.743 | 13.596 |
| **2/28516** | **.20** | 26.363 | 24.764 | 24.280 | 22.914 | 22.490 | 21.333 | 20.935 | 19.966 | 19.571 | 18.774 | 18.364 | 17.725 | 17.288 | 16.797 | 16.322 | 15.969 | 15.450 | 15.226 |
| **2/28518** | **.25** | 32.249 | 30.226 | 29.706 | 27.963 | 27.522 | 26.028 | 25.625 | 24.355 | 23.961 | 22.896 | 22.489 | 21.612 | 21.177 | 20.474 | 19.999 | 19.459 | 18.936 | 18.549 |

### General notes to all Zeta 2 Purlin Systems

Working load capacities for gravity loading are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 77 divided by 1.6.
Working load capacities for wind uplift are printed on a grey background.
These values are derived from the Ultimate Load Capacities given on pages 77 divided by 1.4.

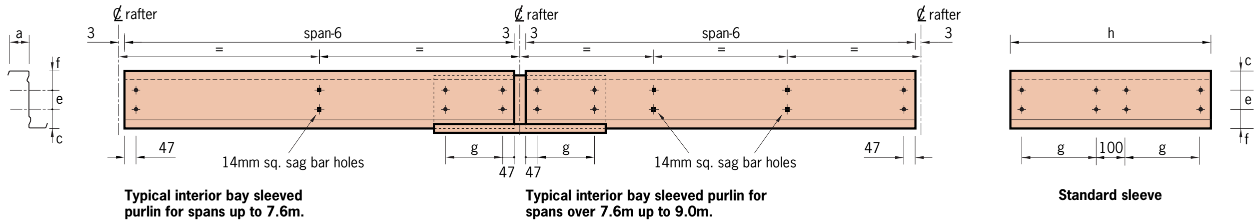
The effect of purlin self weight is included in the tabulated loads above.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 29 for information on bracing requirements and limitations.
For applications where any other type of sheeting system is employed, i.e. other than screw fixed sheeting, please consult Tegral Technical Services Department.

# Zeta 2 Purlin Detailing

## Sleeved System

The sleeved System comprises a single bay purlin with a sleeve connected at alternate supports.

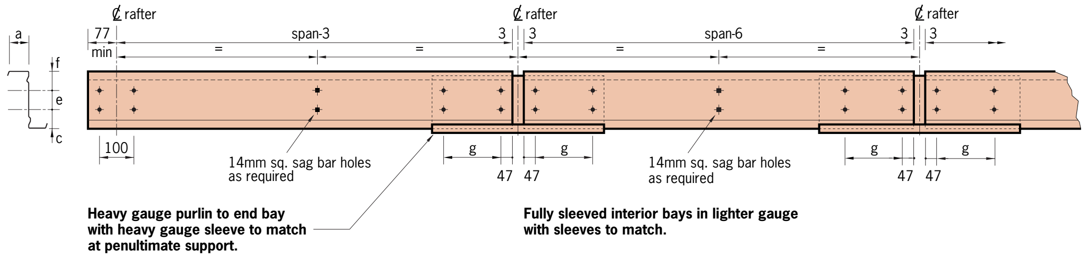
*Note: Sleeves on every joint at penultimate rafter.*

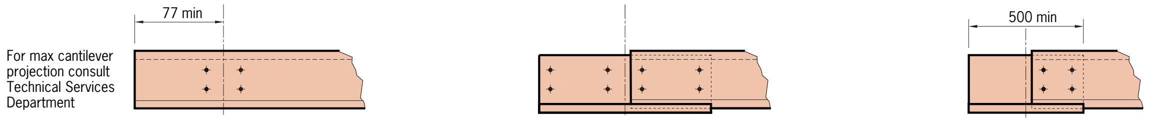



## Heavy End Bay System

The Heavy End Bay System comprises a single bay purlin with a sleeve connection at every support.

*Note: End Bays require the appropriate heavier guage section and sleeve at the penultimate rafter.*




ALTERNATIVE GABLE END DETAILS

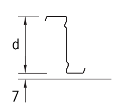
Standard sleeve for future extension

Stub section

### General detailing notes

All purlins must be fixed with the top flange facing the apex. See page 29 for maximum sag bar requirements.

All fixing holes are 18 dia. for M16 grade 4.6 bolts. Sag Bar/Bracing Strut holes are 14 sq. punched in pairs.




Sheeting line depth using standard Zeta II cleats equals section depth +7mm.

**STANDARD DIMENSIONS FOR ZETA 2 SECTIONS**

| | | | | | |
|---|---|---|---|---|---|
| Purlin depth | d | **225** | **245** | **265** | **285** |
| Flange widths | a | 78 | 78 | 78 | 78 |
| | b | 68 | 68 | 68 | 68 |
| Hole centres | c | 74 | 74 | 74 | 74 |
| | e | 74 | 94 | 114 | 134 |
| | f | 77 | 77 | 77 | 77 |
| Sleeve | g | 350 | 375 | 400 | 425 |
| Dimensions | h | 850 | 900 | 950 | 1000 |







# Zeta 2 Purlin Accessories

## Sag Bar Requirements

Where adequate lateral restraints is afforded by steel sheeting screw fixed to the purlin flange, sag bars are required to develop the load capacities given on page 25, 26 & 27.

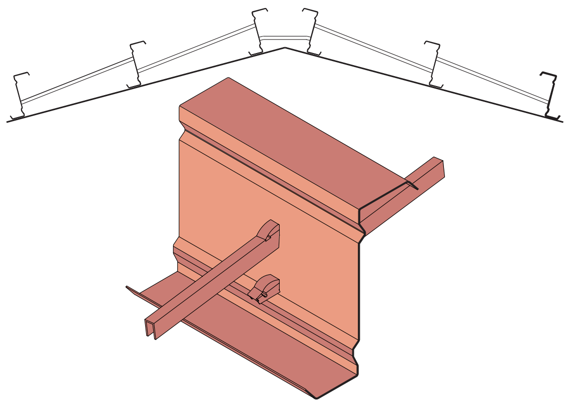
To maintain the correct alignment and to help prevent distortion of the purlin during sheeting, sag bars should be fitted in accordance with our minimum recommendations shown in the table below.

**PURLIN SPAN IN METRES**

| Roof pitch θ | S ≤ 4.5 | 4.5< S ≤ 7.6 | 7.6 < S≤ 90 |
|---|---|---|---|
| 0º < θ ≤ 3º | Consult Technical Services Dept. | | |
| 3º < θ ≤ 30º | 0 | 1* | 2* |
| θ > 30º | Consult Technical Services Dept. | | |

For all Zeta 2 sections Heavy Duty Sag Bars should be used as required.
*See section heading "Eaves Tie and Fixing Bracket" for guidance on restraint to first purlins at eaves.

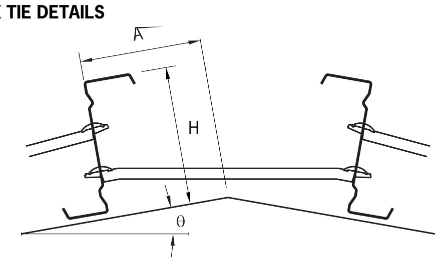
ARRANGEMENT OF SAG BARS



For roof slope lengths in excess of 20m, it may become necessary to introduce additional support along the roof slope in the form of diagonal brace section tied back to the rafters. Details of the diagonal braces are shown on page 33. Please consult the Technical Services Department for further advice.

Special consideration must be given to purlins clad with any material other than screw fixed profiled steel sheeting. These include fibre cement sheeting, standing seam clip fix profiles and tiled roof constructions.

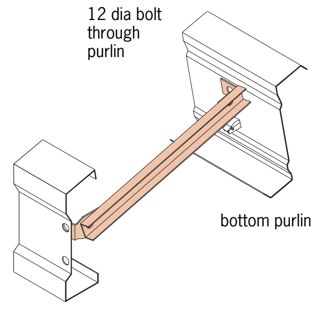
APEX TIE DETAILS

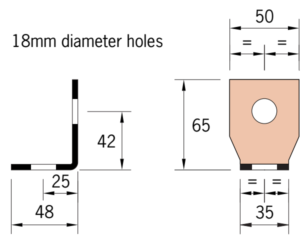



*Details required from customer:*
Dimension A
Dimension H
Angle θ

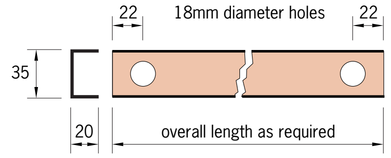
## Eaves tie and fixing bracket

To ensure the first purlin at eaves is kept straight, particularly during the early stages of sheeting, it is necessary to give consideration to additional restraint to this purlin, especially on spans of 5m or more.
This may be done by providing an eaves tie of the type shown, or in agreement with the sheeting contractor, a temporary prop may be used.



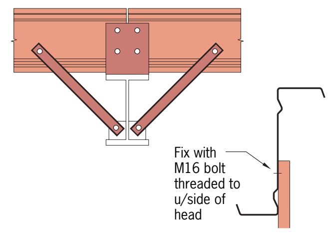

FB Fixing Bracket




Eaves Tie

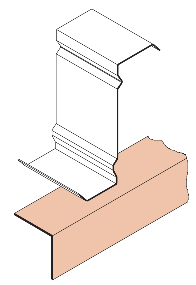
## Rafter Stays

The same section used to form the eaves tie is also available as a rafter stay member, where these are specified by the frame designer.

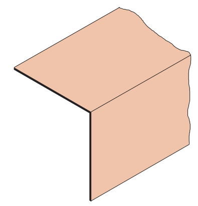



## Cleader Members

50 x 50 x 1.5mm thick galvanised steel Cleader Angle, avaliable in 4m unpunched length.

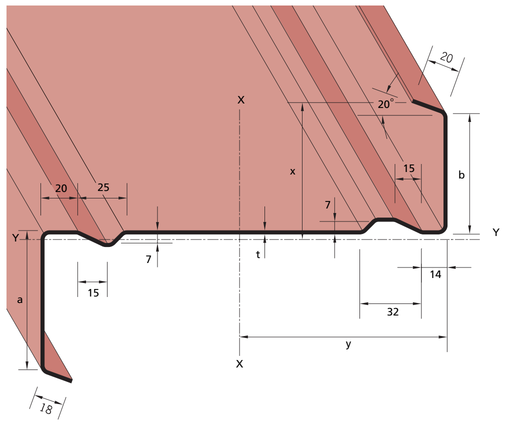


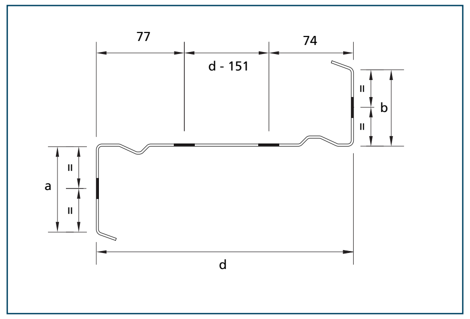
100 x 100 x 1.5mm thick galvanised steel verge trim angle for fixing to the top flange, available in 4m unpunched lenghts.



# Zeta 2 Rails

## Zeta 2 Rail Section Profile




**Standard holing lines for all sections**
18 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines.

## Zeta 2 Rail Section Properties

| Section No | Depth d | Thickness t | Top Flange a | Btm Flange b | Weight | Area | Ixx | Zxx | Iyy | ryy | x | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | mm | kg/m | $mm^2$ | $cm^4$ | $cm^3$ | $cm^4$ | mm | mm | mm |
| **2/22514** | 225 | 1.4 | 78 | 68 | 4.47 | 570 | 417.8 | 36.38 | 59.72 | 32.98 | 75.10 | 114.85 |
| **2/22515** | 225 | 1.5 | 78 | 68 | 4.79 | 610 | 448.2 | 39.02 | 64.11 | 32.98 | 75.15 | 114.85 |
| **2/22516** | 225 | 1.6 | 78 | 68 | 5.10 | 650 | 478.4 | 41.66 | 68.49 | 32.98 | 75.20 | 114.85 |
| **2/22518** | 225 | 1.8 | 78 | 68 | 5.73 | 731 | 538.7 | 46.90 | 77.23 | 32.98 | 75.30 | 114.85 |
| **2/22520** | 225 | 2.0 | 78 | 68 | 6.37 | 811 | 598.6 | 52.12 | 85.95 | 32.97 | 75.40 | 114.85 |
| **2/22525** | 225 | 2.5 | 78 | 68 | 7.94 | 1011 | 746.9 | 65.03 | 107.65 | 32.96 | 75.65 | 114.85 |
| **2/24514** | 245 | 1.4 | 78 | 68 | 4.69 | 598 | 510.7 | 40.88 | 59.73 | 32.20 | 75.02 | 124.94 |
| **2/24515** | 245 | 1.5 | 78 | 68 | 5.02 | 640 | 547.9 | 43.85 | 64.12 | 32.20 | 75.07 | 124.94 |
| **2/24516** | 245 | 1.6 | 78 | 68 | 5.35 | 682 | 584.9 | 46.81 | 68.50 | 32.20 | 75.12 | 124.94 |
| **2/24518** | 245 | 1.8 | 78 | 68 | 6.02 | 767 | 658.6 | 52.72 | 77.24 | 32.19 | 75.22 | 124.94 |
| **2/24520** | 245 | 2.0 | 78 | 68 | 6.68 | 851 | 732.0 | 58.59 | 85.96 | 32.19 | 75.32 | 124.94 |
| **2/24525** | 245 | 2.5 | 78 | 68 | 8.31 | 1058 | 913.7 | 73.13 | 107.66 | 32.22 | 75.57 | 124.94 |
| **2/26515** | 265 | 1.5 | 78 | 68 | 5.26 | 670 | 659.9 | 48.88 | 64.13 | 31.47 | 74.99 | 135.01 |
| **2/26516** | 265 | 1.6 | 78 | 68 | 5.61 | 714 | 704.5 | 52.18 | 68.50 | 31.47 | 75.04 | 135.01 |
| **2/26518** | 265 | 1.8 | 78 | 68 | 6.30 | 803 | 793.5 | 58.77 | 77.25 | 31.47 | 75.14 | 135.01 |
| **2/26520** | 265 | 2.0 | 78 | 68 | 6.99 | 891 | 882.0 | 65.33 | 85.97 | 31.46 | 75.24 | 135.01 |
| **2/26525** | 265 | 2.5 | 78 | 68 | 8.72 | 1111 | 1101.4 | 81.58 | 107.68 | 31.45 | 75.49 | 135.01 |
| **2/26530** | 265 | 3.0 | 78 | 68 | 10.44 | 1330 | 1318.0 | 97.62 | 129.25 | 31.44 | 75.74 | 135.02 |
| **2/28515** | 285 | 1.5 | 78 | 68 | 5.49 | 700 | 784.9 | 54.10 | 64.13 | 30.79 | 74.92 | 145.08 |
| **2/28516** | 285 | 1.6 | 78 | 68 | 5.86 | 746 | 838.1 | 57.77 | 68.51 | 30.79 | 74.97 | 145.08 |
| **2/28518** | 285 | 1.8 | 78 | 68 | 6.58 | 839 | 944.0 | 65.06 | 77.26 | 30.78 | 75.07 | 145.09 |
| **2/28520** | 285 | 2.0 | 78 | 68 | 7.31 | 931 | 1049.4 | 72.33 | 85.98 | 30.78 | 75.17 | 145.09 |
| **2/28525** | 285 | 2.5 | 78 | 68 | 9.11 | 1161 | 1310.9 | 90.35 | 107.69 | 30.77 | 75.42 | 145.09 |
| **2/28530** | 285 | 3.0 | 78 | 68 | 10.91 | 1390 | 1569.2 | 108.15 | 129.27 | 30.75 | 75.67 | 145.09 |







## Zeta 2 Sleeved Rails

This system utilises single bay rail lengths joined with connecting sleeves at alternate supports. All rails must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram). The use of single span purlin lengths ensures easier on site handling and compliance with Health & Safety Authority requirements.

### Zeta 2 Sleeved Rails - Working Load Capacities in kN

| Section No. | Self wt kg/m | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | | 9.0 metre span | | 9.5 metre span | | 10.0 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **2/22514** | **4.47** | 12.174 | 11.634 | 11.195 | 10.781 | 10.353 | 10.053 | 9.621 | 9.425 | 8.977 | 8.879 | | | | | | | | |
| **2/22515** | **4.79** | 13.723 | 13.086 | 12.622 | 12.125 | 11.675 | 11.304 | 10.851 | 10.596 | 10.128 | 9.979 | 9.486 | 9.438 | | | | | | |
| **2/22516** | **5.10** | 15.313 | 14.575 | 14.087 | 13.502 | 13.033 | 12.586 | 12.115 | 11.795 | 11.310 | 11.106 | 10.596 | 10.502 | 9.438 | 9.967 | | | | |
| **2/22518** | **5.73** | 18.574 | 17.628 | 17.091 | 16.326 | 15.816 | 15.214 | 14.708 | 14.254 | 13.641 | 13.418 | 12.004 | 12.683 | 10.628 | 11.639 | | | | |
| **2/24514** | **4.69** | 13.283 | 12.673 | 12.217 | 11.742 | 11.300 | 10.948 | 10.502 | 10.262 | 9.801 | 9.666 | 9.180 | 9.142 | 8.625 | 8.678 | | | | |
| **2/24515** | **5.02** | 15.010 | 14.289 | 13.808 | 13.238 | 12.775 | 12.340 | 11.875 | 11.564 | 11.085 | 10.889 | 10.386 | 10.297 | 9.761 | 9.772 | | | | |
| **2/24516** | **5.35** | 16.780 | 15.945 | 15.439 | 14.769 | 14.286 | 13.765 | 13.283 | 12.898 | 12.402 | 12.142 | 11.621 | 11.479 | 10.925 | 10.892 | | | | |
| **2/24518** | **6.02** | 20.403 | 19.333 | 18.777 | 17.902 | 17.379 | 16.681 | 16.163 | 15.626 | 15.096 | 14.706 | 14.150 | 13.898 | 13.307 | 13.184 | | | | |
| **2/26515** | **5.26** | 16.260 | 15.459 | 14.959 | 14.319 | 13.841 | 13.346 | 12.868 | 12.506 | 12.014 | 11.775 | 11.257 | 11.132 | 10.582 | 10.564 | 9.975 | 10.058 | 9.426 | 9.605 |
| **2/26516** | **5.61** | 18.216 | 17.287 | 16.762 | 16.010 | 15.511 | 14.919 | 14.424 | 13.978 | 13.469 | 13.158 | 12.624 | 12.437 | 11.869 | 11.800 | 11.190 | 11.232 | 10.577 | 10.724 |
| **2/26518** | **6.30** | 22.214 | 21.020 | 20.446 | 19.462 | 18.926 | 18.132 | 17.604 | 16.983 | 16.444 | 15.981 | 15.417 | 15.101 | 14.500 | 14.322 | 13.677 | 13.629 | 12.933 | 13.007 |
| **2/28515** | **5.49** | 16.281 | 16.569 | 16.052 | 15.346 | 14.853 | 14.302 | 13.811 | 13.401 | 12.896 | 12.615 | 12.085 | 11.925 | 11.361 | 11.315 | 10.711 | 10.772 | 10.123 | 10.286 |
| **2/28516** | **5.86** | 19.593 | 18.573 | 18.030 | 17.200 | 16.687 | 16.027 | 15.519 | 15.014 | 14.493 | 14.131 | 13.585 | 13.356 | 12.774 | 12.670 | 12.046 | 12.059 | 11.388 | 11.512 |
| **2/28518** | **6.58** | 23.976 | 22.662 | 22.069 | 20.981 | 20.431 | 19.545 | 19.006 | 18.304 | 17.756 | 17.222 | 16.649 | 16.272 | 15.661 | 15.431 | 14.774 | 14.682 | 13.972 | 14.010 |

### Zeta 2 Butted Rails - Working Load Capacities in kN

| Section No. | Self wt kg/m | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | | 8.0 metre span | | 8.5 metre span | | 9.0 metre span | | 9.5 metre span | | 10.0 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| **2/22514** | **4.47** | 8.235 | 8.033 | 7.560 | 7.457 | 6.978 | 6.967 | | | | | | | | | | | | |
| **2/22515** | **4.79** | 9.288 | 9.032 | 8.528 | 8.382 | 7.671 | 7.829 | | | | | | | | | | | | |
| **2/22516** | **5.10** | 10.369 | 10.055 | 9.523 | 9.330 | 8.190 | 8.711 | | | | | | | | | | | | |
| **2/22518** | **5.73** | 12.586 | 12.153 | 10.786 | 11.272 | 9.222 | 10.009 | | | | | | | | | | | | |
| **2/24514** | **4.69** | 8.989 | 8.747 | 8.253 | 8.119 | 7.620 | 7.583 | 7.067 | 7.122 | | | | | | | | | | |
| **2/24515** | **5.02** | 10.164 | 9.858 | 9.334 | 9.147 | 8.620 | 8.541 | 7.998 | 8.019 | | | | | | | | | | |
| **2/24516** | **5.35** | 11.367 | 10.996 | 10.442 | 10.200 | 9.646 | 9.522 | 8.701 | 8.938 | | | | | | | | | | |
| **2/24518** | **6.02** | 13.830 | 13.323 | 12.710 | 12.355 | 11.343 | 11.529 | 9.799 | 10.684 | 8.529 | 9.474 | | | | | | | | |
| **2/26515** | **5.26** | 11.004 | 10.654 | 10.108 | 9.884 | 9.336 | 9.228 | 8.664 | 8.662 | 8.073 | 8.171 | | | | | | | | |
| **2/26516** | **5.61** | 12.333 | 11.908 | 11.332 | 11.045 | 10.469 | 10.309 | 9.718 | 9.675 | 9.057 | 9.124 | 8.061 | 8.641 | | | | | | |
| **2/26518** | **6.30** | 15.051 | 14.470 | 13.833 | 13.417 | 12.786 | 12.518 | 11.874 | 11.743 | 10.350 | 11.069 | 9.081 | 10.132 | 8.012 | 9.125 | | | | |
| **2/28515** | **5.49** | 11.806 | 11.412 | 10.846 | 10.586 | 10.019 | 9.882 | 9.299 | 9.275 | 8.666 | 8.748 | 8.104 | 8.286 | 7.601 | 7.878 | | | | |
| **2/28516** | **5.86** | 13.264 | 12.788 | 12.189 | 11.859 | 11.263 | 11.068 | 10.456 | 10.385 | 9.747 | 9.792 | 9.118 | 9.272 | 8.532 | 8.813 | 7.576 | 8.405 | | |
| **2/28518** | **6.58** | 16.243 | 15.592 | 14.931 | 14.455 | 13.802 | 13.484 | 12.820 | 12.648 | 11.956 | 11.920 | 10.879 | 11.281 | 9.613 | 10.717 | 8.536 | 9.762 | 7.611 | 8.902 |

### General notes to all Zeta cladding rail systems

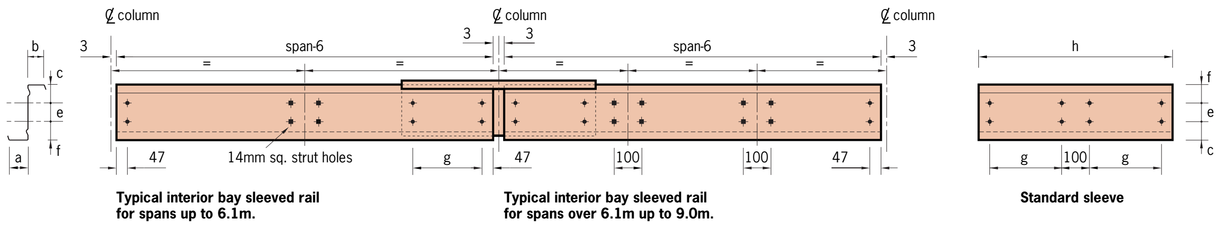
Working load capacities for wind pressure (wide, sheeted flange in compression at mid span) are printed on a blue background. These values are derived from the Ultimate Load Capacities given on pages 76-78 divided by 1.4.
Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background.

These values are derived from the Ultimate Load Capacities given on pages 76-78 divided by 1.4.
The tabulated values will give deflections not exceeding span/150.
The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 33 for information on bracing requirements and limitations.
For applications where any other type of cladding system is employed, please consult Tegral Technical Services Department.

## Sleeved System

The Sleeved System comprises of a single bay rail with a sleeve connection at alternate supports.

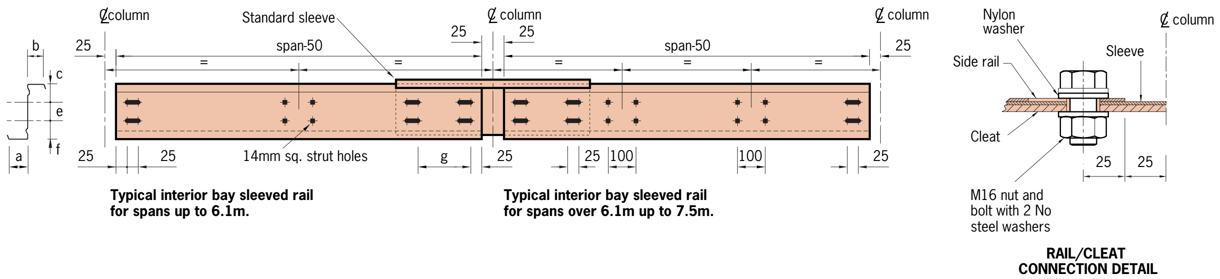
*Note: Sleeves on every joint at penultimate column.*




## Firescreen Rails

All cladding and eaves rails must be allowed to expand during a fire. Slotted holes with both steel and nylon washers under the bolt heads are required.

The minimum allowance for expansion should be 7mm/metre length of rail. For rails up to 7.5m span the gap between rails is rounded to 50mm. The maximum span and spacing should be 7.5m and 2.0m respectively. Rails should generally be single span, but may be sleeved to achieve continuity.

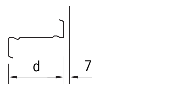



### General Detailing Notes

Rails may be fixed with the sheeting (wide) flange pointing up or down to suit the detail.

When cladding fixed with hook bolts is employed, the sheeting (narrow) flange points up.

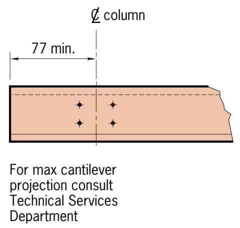
See page 33 for minimum strut requirements.
All fixing holes are 18 dia for M16 grade 4.6 bolts.
Bracing Strut holes are 14 sq, punched in pairs.



Sheeting line depth using standard Zeta II cleats equals section depth +7mm.

**STANDARD DIMENSIONS FOR ZETA 2 SECTIONS**

| | | | | | |
|---|---|---|---|---|---|
| Rail depth | d | **225** | **245** | **265** | **285** |
| Flange widths | a | 78 | 78 | 78 | 78 |
| | b | 68 | 68 | 68 | 68 |
| Hole centres | c | 74 | 74 | 74 | 74 |
| | e | 74 | 94 | 114 | 134 |
| | f | 77 | 77 | 77 | 77 |
| Sleeve Dimensions | g | 350 | 375 | 400 | 425 |
| | h | 850 | 900 | 950 | 1000 |




GABLE END DETAIL



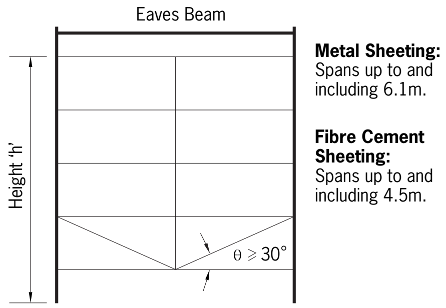


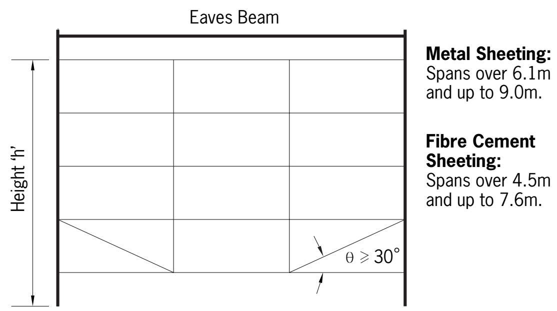


# Zeta 2 Rail Accessories

### Arrangement of Diagonal Braces and Vertical Struts

All rails should be braced in accordance with the recommendations shown below, to maintain alignment of the sections.
Diagonal braces and vertical struts are required to develop the load capacities given on page 31.
Special consideration must be given to alternative cladding constructions such as clip fixed panels and glazing. Please consult the Technical Services Department for further information.



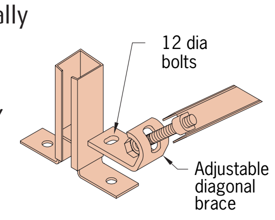

Maximum height 'h' for insulated Metal Sheeting (S. Wt. 13.25 kg/m²) = 12m.*
Maximum height 'h' for insulated F.C. Sheeting (S. Wt. 26.75 kg/m²) = 8.5m.*
For heights greater than 'h' further sets of diagonal braces are required.*

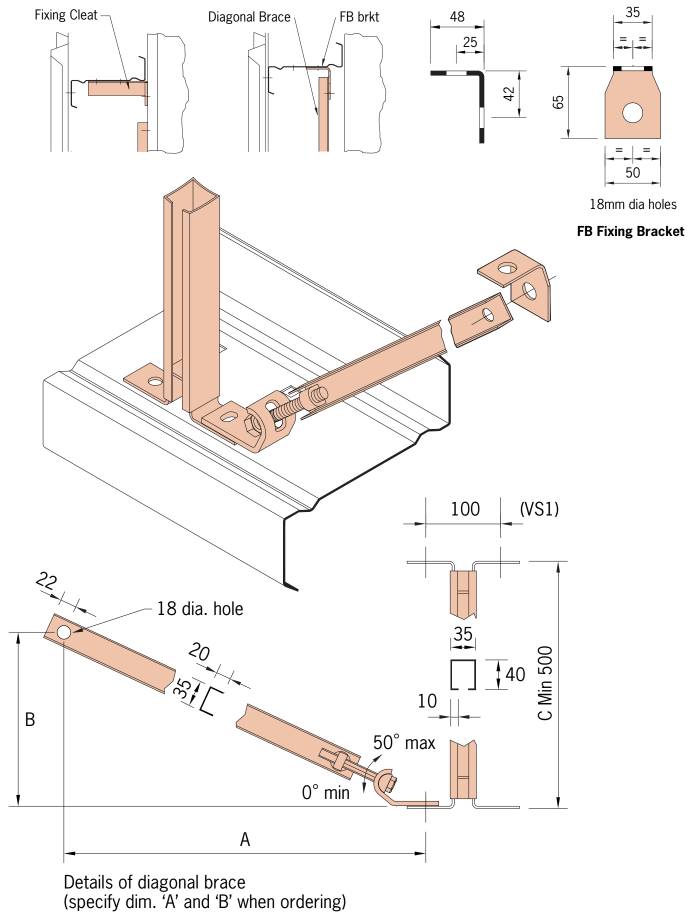
In addition, maximum number of rails per bay per set of diagonals should not exceed 8 No. for spans < 9.0m (rail weight < 7.94 kg/m).
For other cases, please consult our Technical Services Department.

### Diagonal Brace, fixing bracket & vertical strut fixing

The top of the diagonal brace must be fixed back to a "rigid" point, generally the stanchion flange. Where the diagonal brace is tied back to the stanchion via the cladding rail cleat, i.e. using an FB bracket as illustrated, the structural adequacy of the cleat must be confirmed.

**VS1 FOR ALL SECTIONS**

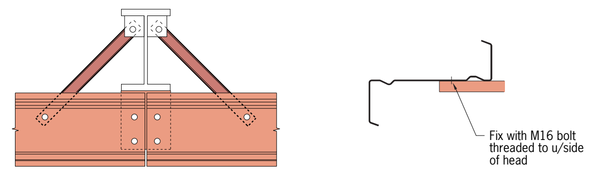



Details of diagonal brace
(specify dim. 'A' and 'B' when ordering)

### Column Stays

The same section used for the diagonal brace channel is also available as a column stay member, where these are required by the frame designer.

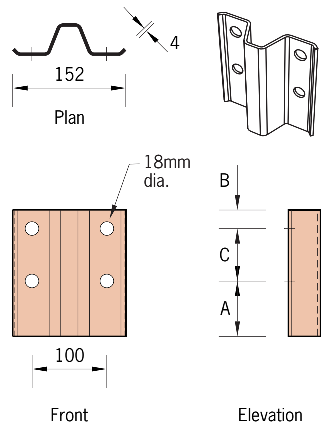


# Zeta 2 Purlin & Rail Cleats

Tegral cleats for Zeta 2 purlins and cladding rails are available as either a weld-on type or as a bolt-on type, with the facility to offer an extended leg to suit alternative sheeting lines.

The appropriate dimension for standard section punching and sheeting lines, as well as limiting dimensions for extended leg cleats are given in the table below.

## Weld-on cleats



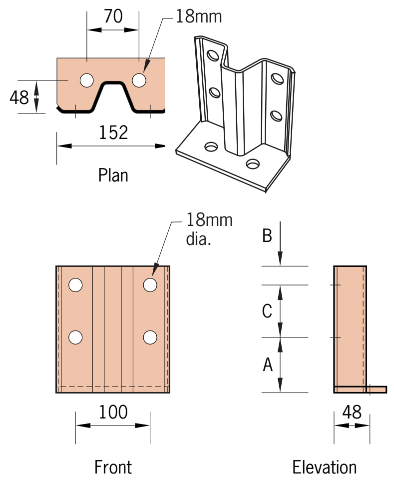

## Design

The cleat capacities have been verified by testing at the University of Salford. For Zeta 2 purlins and rails subject to the following constraints:

1. A screw fixed steel cladding system is employed.
2. The standard sheeting line is used.
3. The roof slope for purlins is not greater than 30 degrees, and cleats supporting cladding rails are horizontal.
4. Purlin/rail span not greater than 9.0m then the cleat capacity should be satisfactory.

For variations on any of the above criteria please contact Tegral Technical Services Department.

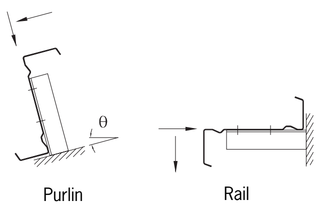
## Bold-on cleats




## Capacity of weld-on and bolt-on type cleats

For spine in tension (direction for forces as shown for purlin)

$M_{ult}$ M = 2.50kNm For reverse condition (spine in compression as shown for rail) $M_{ult}$ M = 1.20 kNm




For ordering purposes, the Zeta 2 cleat reference is followed by the required sheeting line, eg: for a bolt-on Zeta cleat to suit a 225mm purlin depth and a 232mm sheeting line the reference is 2/B225/232.

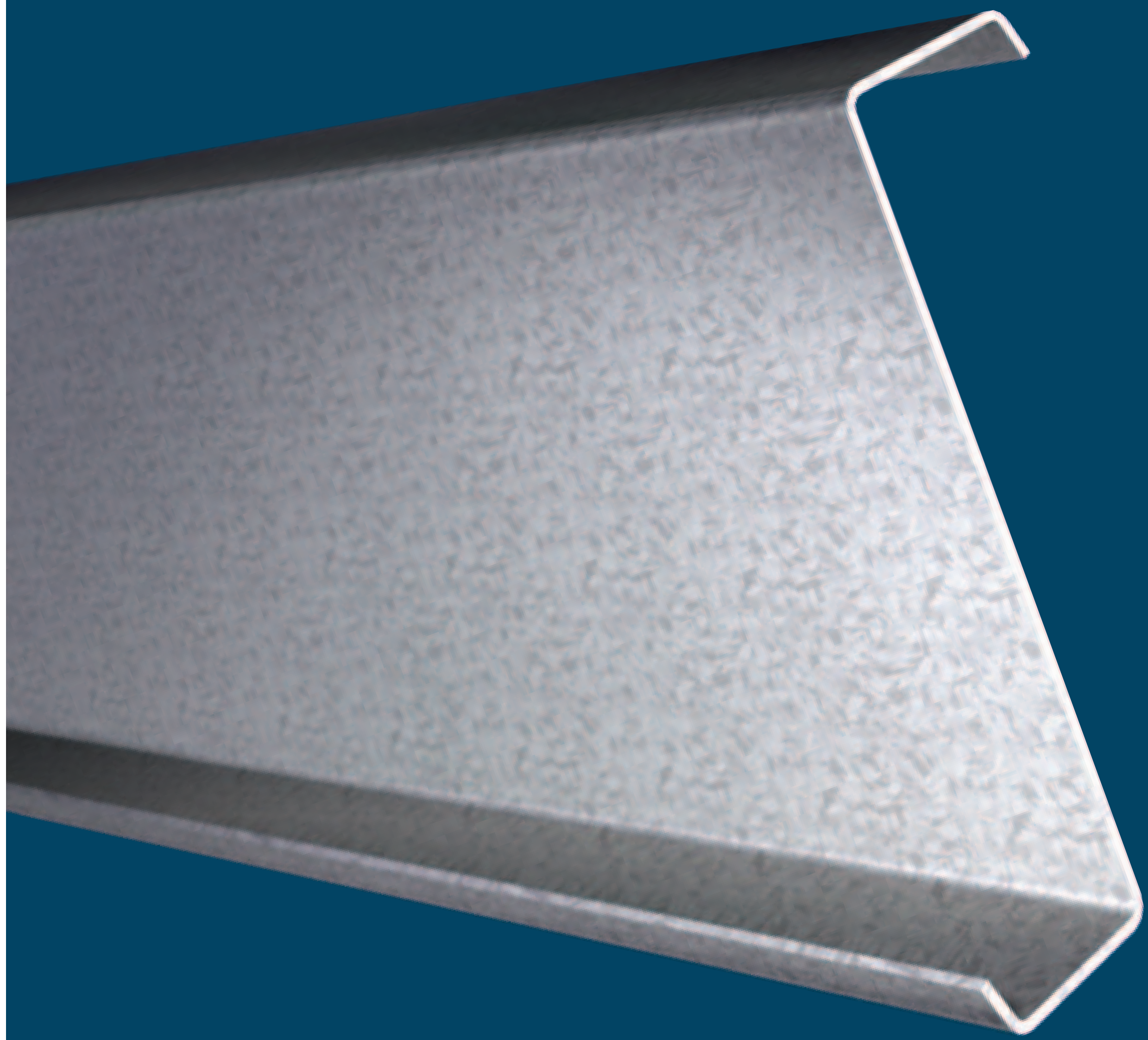
| Section | Weld-on | Bolt-on | Sheeting line Standard | Sheeting line Max | A Standard | A Max | B | C |
|---|---|---|---|---|---|---|---|---|
| 2/225 | 2/C225/_ | 2/B225/_ | 232 | 402 | 81 | 251 | 25 | 74 |
| 2/245 | 2/C245/_ | 2/B245/_ | 252 | 402 | 81 | 231 | 25 | 94 |
| 2/265 | 2/C265/_ | 2/B265/_ | 272 | 402 | 81 | 211 | 25 | 114 |
| 2/285 | 2/C285/_ | 2/B285/_ | 292 | 402 | 81 | 191 | 25 | 134 |





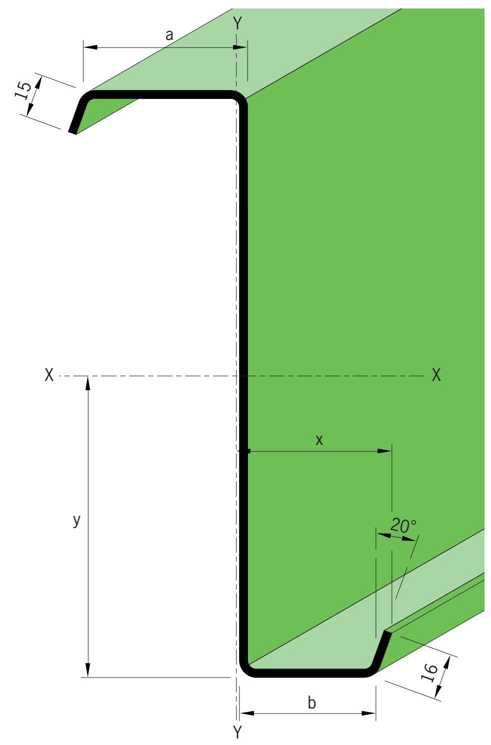


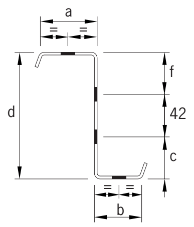
# Zed Purlins



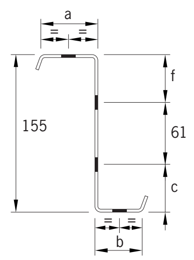
# Zed Purlins

## Zed Section Profile

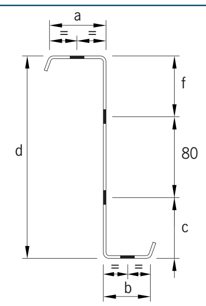



125-140 RANGE




155 RANGE




170-200 RANGE

**Standard holing lines for all sections**

14 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines. Also available 8, 12, 18 and 22mm dia. 14 x 25mm and 18 x 25mm slots. Please refer to page 4 for section properties.

| STANDARD DIMENSIONS FOR ZED SECTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Purlin depth | d | **125** | **140** | **155** | **170** | **185** | **200** |
| Flange widths | a | 55 | 58 | 58 | 58 | 58 | 58 |
| | b | 45 | 45 | 45 | 45 | 45 | 45 |
| Hole centres | c | 40 | 47 | 45 | 43 | 51 | 58 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 63 |
| Sleeve | g | 208 | 208 | 208 | 208 | 278 | 278 |
| Dimensions | h | 566 | 566 | 566 | 566 | 706 | 706 |





DESIGNER'S PURLIN & RAIL GUIDE Zed Purlins

## Zed Section Properties

| Section No | Depth d mm | Thickness t mm | Top Flange a mm | Btm Flange b mm | Weight kg/m | Area $mm^2$ | Ixx $cm^4$ | Zxx $cm^3$ | Iyy $cm^4$ | ryy mm | x mm | y mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Z/12513** | 125 | 1.3 | 55 | 45 | 2.51 | 321 | 78.1 | 12.07 | 19.77 | 24.83 | 52.03 | 64.65 |
| **Z/12514** | 125 | 1.4 | 55 | 45 | 2.70 | 345 | 84.1 | 13.01 | 21.33 | 24.86 | 52.08 | 64.65 |
| **Z/12515** | 125 | 1.5 | 55 | 45 | 2.89 | 369 | 90.1 | 13.94 | 22.88 | 24.89 | 52.13 | 64.65 |
| **Z/12517** | 125 | 1.7 | 55 | 45 | 3.27 | 418 | 102.1 | 15.79 | 25.99 | 24.94 | 52.23 | 64.65 |
| **Z/12520** | 125 | 2.0 | 55 | 45 | 3.83 | 490 | 119.8 | 18.53 | 30.63 | 24.99 | 52.38 | 64.65 |
| **Z/14013** | 140 | 1.3 | 58 | 49 | 2.74 | 350 | 106.0 | 14.68 | 23.62 | 25.99 | 51.91 | 72.21 |
| **Z/14014** | 140 | 1.4 | 58 | 49 | 2.95 | 376 | 114.2 | 15.82 | 25.48 | 26.02 | 51.96 | 72.21 |
| **Z/14015** | 140 | 1.5 | 58 | 49 | 3.15 | 403 | 122.4 | 16.95 | 27.34 | 26.05 | 52.01 | 72.21 |
| **Z/14017** | 140 | 1.7 | 58 | 49 | 3.56 | 456 | 138.7 | 19.21 | 31.05 | 26.10 | 52.11 | 72.21 |
| **Z/14020** | 140 | 2.0 | 58 | 49 | 4.16 | 535 | 162.9 | 22.57 | 36.60 | 26.15 | 52.26 | 72.20 |
| **Z/15513** | 155 | 1.3 | 58 | 49 | 2.89 | 369 | 134.3 | 16.83 | 23.62 | 25.29 | 51.79 | 79.81 |
| **Z/15514** | 155 | 1.4 | 58 | 49 | 3.11 | 397 | 144.7 | 18.14 | 25.49 | 25.33 | 51.84 | 79.81 |
| **Z/15515** | 155 | 1.5 | 58 | 49 | 3.33 | 425 | 155.1 | 19.44 | 27.34 | 25.35 | 51.89 | 79.81 |
| **Z/15517** | 155 | 1.7 | 58 | 49 | 3.76 | 481 | 175.8 | 22.03 | 31.06 | 25.40 | 51.99 | 79.81 |
| **Z/15520** | 155 | 2.0 | 58 | 49 | 4.40 | 565 | 206.6 | 25.89 | 36.61 | 25.45 | 52.14 | 79.81 |
| **Z/17013** | 170 | 1.3 | 58 | 49 | 3.04 | 389 | 166.7 | 19.07 | 23.63 | 24.66 | 51.69 | 87.41 |
| **Z/17014** | 170 | 1.4 | 58 | 49 | 3.28 | 418 | 179.7 | 20.55 | 25.49 | 24.69 | 51.74 | 87.41 |
| **Z/17015** | 170 | 1.5 | 58 | 49 | 3.50 | 448 | 192.6 | 22.03 | 27.35 | 24.71 | 51.79 | 87.41 |
| **Z/17017** | 170 | 1.7 | 58 | 49 | 3.96 | 507 | 218.3 | 24.98 | 31.07 | 24.76 | 51.89 | 87.41 |
| **Z/17020** | 170 | 2.0 | 58 | 49 | 4.63 | 595 | 256.6 | 29.36 | 36.62 | 24.81 | 52.04 | 87.41 |
| **Z/18513** | 185 | 1.3 | 58 | 49 | 3.20 | 408 | 203.4 | 21.41 | 23.64 | 24.07 | 51.60 | 95.00 |
| **Z/18514** | 185 | 1.4 | 58 | 49 | 3.44 | 439 | 219.2 | 23.07 | 25.50 | 24.09 | 51.65 | 95.00 |
| **Z/18515** | 185 | 1.5 | 58 | 49 | 3.68 | 470 | 235.0 | 24.74 | 27.36 | 24.12 | 51.70 | 95.00 |
| **Z/18517** | 185 | 1.7 | 58 | 49 | 4.16 | 532 | 266.5 | 28.05 | 31.08 | 24.16 | 51.80 | 94.99 |
| **Z/18520** | 185 | 2.0 | 58 | 49 | 4.87 | 625 | 313.3 | 32.98 | 36.63 | 24.21 | 51.95 | 94.99 |
| **Z/20013** | 200 | 1.3 | 58 | 49 | 3.35 | 428 | 244.6 | 23.84 | 23.64 | 23.51 | 51.52 | 102.58 |
| **Z/20014** | 200 | 1.4 | 58 | 49 | 3.60 | 460 | 263.6 | 25.70 | 25.51 | 23.54 | 51.57 | 102.57 |
| **Z/20015** | 200 | 1.5 | 58 | 49 | 3.86 | 493 | 282.7 | 27.56 | 27.37 | 23.57 | 51.62 | 102.57 |
| **Z/20017** | 200 | 1.7 | 58 | 49 | 4.36 | 558 | 320.5 | 31.25 | 31.08 | 23.60 | 51.72 | 102.57 |
| **Z/20020** | 200 | 2.0 | 58 | 49 | 5.10 | 655 | 377.0 | 36.75 | 36.64 | 23.65 | 51.87 | 102.57 |
| **Z/20025** | 200 | 2.5 | 58 | 49 | 6.33 | 816 | 470.1 | 45.83 | 45.87 | 23.70 | 52.12 | 102.57 |

## Zed Sleeved Purlins

This system utilises single bay purlin lengths joined with connecting sleeves at alternate supports. All purlins must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram). The use of single span purlin lengths ensures easier on site handling and compliance with Health & Safety Authority requirements.

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4. 5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| Z/12513 | 2.51 | 6.657 | 6.348 | 5.359 | 5.605 | 4.395 | 4.666 | 3.659 | 3.955 | | | | | | |
| Z/12514 | 2.70 | 7.172 | 7.126 | 5.773 | 6.038 | 4.735 | 5.026 | 3.942 | 4.260 | | | | | | |
| Z/12515 | 2.89 | 7.685 | 7.905 | 6.186 | 6.470 | 5.074 | 5.386 | 4.224 | 4.564 | | | | | | |
| Z/12517 | 3.27 | 8.704 | 8.993 | 7.007 | 7.328 | 5.747 | 6.100 | 4.785 | 5.170 | | | | | | |
| Z/14013 | 2.74 | 7.734 | 7.303 | 6.935 | 6.598 | 6.006 | 6.024 | 5.010 | 5.332 | 4.231 | 4.581 | | | | |
| Z/14014 | 2.95 | 8.719 | 8.221 | 7.820 | 7.426 | 6.471 | 6.779 | 5.398 | 5.745 | 4.559 | 4.935 | | | | |
| Z/14015 | 3.15 | 9.724 | 9.157 | 8.443 | 8.270 | 6.936 | 7.276 | 5.785 | 6.156 | 4.887 | 5.288 | | | | |
| Z/14017 | 3.56 | 11.722 | 11.018 | 9.567 | 9.916 | 7.859 | 8.243 | 6.556 | 6.975 | 5.537 | 5.991 | | | | |
| Z/15513 | 2.89 | 8.653 | 8.155 | 7.760 | 7.367 | 7.028 | 6.724 | 6.380 | 6.191 | 5.397 | 5.742 | 4.614 | 5.011 | | |
| Z/15514 | 3.11 | 9.765 | 9.191 | 8.760 | 8.301 | 7.934 | 7.575 | 6.876 | 6.973 | 5.817 | 6.213 | 4.973 | 5.400 | | |
| Z/15515 | 3.33 | 10.898 | 10.245 | 9.777 | 9.251 | 8.824 | 8.442 | 7.370 | 7.762 | 6.234 | 6.659 | 5.330 | 5.787 | | |
| Z/15517 | 3.76 | 13.152 | 12.342 | 11.802 | 11.143 | 10.002 | 10.165 | 8.354 | 8.796 | 7.067 | 7.546 | 6.042 | 6.558 | | |
| Z/17013 | 3.04 | 9.558 | 8.995 | 8.574 | 8.124 | 7.766 | 7.414 | 7.090 | 6.825 | 6.516 | 6.328 | 5.764 | 5.905 | 4.979 | 5.427 |
| Z/17014 | 3.28 | 10.800 | 10.152 | 9.690 | 9.167 | 8.778 | 8.365 | 8.016 | 7.698 | 7.257 | 7.137 | 6.212 | 6.658 | 5.366 | 5.849 |
| Z/17015 | 3.50 | 12.066 | 11.327 | 10.827 | 10.227 | 9.810 | 9.330 | 8.959 | 8.586 | 7.780 | 7.958 | 6.660 | 7.141 | 5.754 | 6.269 |
| Z/17017 | 3.96 | 14.583 | 13.668 | 13.088 | 12.338 | 11.861 | 11.254 | 10.414 | 10.353 | 8.820 | 9.325 | 7.551 | 8.095 | 6.523 | 7.106 |
| Z/18513 | 3.20 | 10.441 | 9.817 | 9.367 | 8.865 | 8.486 | 8.089 | 7.749 | 7.445 | 7.122 | 6.903 | 6.583 | 6.440 | 6.113 | 6.041 |
| Z/18514 | 3.44 | 11.819 | 11.097 | 10.605 | 10.019 | 9.609 | 9.141 | 8.776 | 8.411 | 8.068 | 7.797 | 7.460 | 7.272 | 6.589 | 6.820 |
| Z/18515 | 3.68 | 13.219 | 12.397 | 11.863 | 11.192 | 10.750 | 10.209 | 9.820 | 9.393 | 9.030 | 8.705 | 8.168 | 8.118 | 7.065 | 7.606 |
| Z/18517 | 4.16 | 16.007 | 14.986 | 14.367 | 13.527 | 13.022 | 12.336 | 11.898 | 11.347 | 10.808 | 10.513 | 9.262 | 9.802 | 8.011 | 8.623 |
| Z/20013 | 3.35 | 11.299 | 10.613 | 10.138 | 9.583 | 9.185 | 8.743 | 8.388 | 8.046 | 7.711 | 7.459 | 7.128 | 6.958 | 6.621 | 6.526 |
| Z/20014 | 3.60 | 12.813 | 12.019 | 11.498 | 10.851 | 10.419 | 9.898 | 9.517 | 9.107 | 8.751 | 8.440 | 8.092 | 7.872 | 7.518 | 7.381 |
| Z/20015 | 3.86 | 14.352 | 13.448 | 12.880 | 12.139 | 11.673 | 11.071 | 10.664 | 10.185 | 9.808 | 9.438 | 9.070 | 8.800 | 8.429 | 8.250 |
| Z/20017 | 4.36 | 17.419 | 16.295 | 15.637 | 14.706 | 14.174 | 13.410 | 12.952 | 12.333 | 11.915 | 11.426 | 11.022 | 10.651 | 9.684 | 9.982 |

### General notes to all Zed Purlin systems

Working load capacities for gravity loading are printed on a green background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.6.
Working load capacities for wind uplift are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.4.
The effect of purlin self weight is included in the tabulated loads above.
The tabulated values will give deflections not exceeding span/180.

The load capacities shown assume that the purlins support a screw fixed steel sheeting system. Reference must be made to page 41 for information on bracing requirements and limitations.
For applications where any other type of sheeting system is employed, i.e. other than screw fixed steel sheeting, please consult Tegral Technical Services Department.







## Zed Heavy End Bay Purlins

This is a fully continuous system with sleeves provided at all supports. The end bay purlins and sleeves to the penultimate support are increased in gauge to compensate for the lack of continuity across the gable, hence the name (see page 5 for alternative joint arrangement diagram.

This system is usually more advantageous for longer spans and/or heavier loadings where there are a minimum of six bays. Providing sleeves at all supports increases the capacity by over 25% compared to the equivalent sleeved system, with sleeves at alternate joints.

### Working Load Capacities in kN

| Interior Section No. | End Bay Section | 4. 5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift | Gravity | Uplift |
| Z/14013 | .17 | 10.447 | 9.783 | 9.377 | 8.830 | 7.859 | 8.053 | 6.556 | 6.975 | 5.537 | 5.991 | 4.726 | 5.215 | | |
| Z/14014 | .20 | 11.775 | 11.015 | 10.570 | 9.941 | 9.232 | 9.065 | 7.701 | 8.191 | 6.505 | 7.036 | 5.552 | 6.123 | | |
| Z/14015 | .20 | 13.130 | 12.271 | 11.238 | 11.073 | 9.232 | 9.681 | 7.701 | 8.191 | 6.505 | 7.036 | 5.552 | 6.123 | | |
| Z/15513 | .17 | 11.685 | 10.927 | 10.489 | 9.862 | 9.509 | 8.992 | 8.354 | 8.270 | 7.067 | 7.546 | 6.042 | 6.558 | 5.211 | 5.765 |
| Z/15514 | .20 | 13.185 | 12.317 | 11.837 | 11.115 | 10.732 | 10.133 | 9.808 | 9.318 | 8.305 | 8.631 | 7.101 | 7.705 | 6.125 | 6.773 |
| Z/15515 | .20 | 14.712 | 13.732 | 13.209 | 12.390 | 11.754 | 11.295 | 9.817 | 10.335 | 8.305 | 8.866 | 7.101 | 7.705 | 6.125 | 6.773 |
| Z/17013 | .17 | 12.905 | 12.055 | 11.586 | 10.878 | 10.504 | 9.918 | 9.600 | 9.120 | 8.833 | 8.447 | 7.551 | 7.872 | 6.523 | 7.106 |
| Z/17014 | .20 | 14.580 | 13.607 | 13.091 | 12.277 | 11.871 | 11.192 | 10.851 | 10.290 | 9.985 | 9.529 | 8.877 | 8.880 | 7.669 | 8.351 |
| Z/17015 | .20 | 16.286 | 15.186 | 14.625 | 13.700 | 13.262 | 12.487 | 12.124 | 11.479 | 10.369 | 10.629 | 8.877 | 9.513 | 7.669 | 8.351 |
| Z/18513 | .17 | 14.096 | 13.158 | 12.657 | 11.872 | 11.476 | 10.823 | 10.490 | 9.951 | 9.653 | 9.216 | 8.933 | 8.588 | 8.011 | 8.046 |
| Z/18514 | .20 | 15.953 | 14.877 | 14.326 | 13.421 | 12.991 | 12.233 | 11.876 | 11.246 | 10.930 | 10.413 | 10.117 | 9.702 | 9.410 | 9.088 |
| Z/18515 | .20 | 17.840 | 16.622 | 16.022 | 14.994 | 14.531 | 13.666 | 13.285 | 12.561 | 12.229 | 11.630 | 10.892 | 10.834 | 9.421 | 10.138 |
| Z/20013 | .17 | 15.252 | 14.227 | 13.695 | 12.836 | 12.419 | 11.700 | 11.352 | 10.757 | 10.448 | 9.961 | 9.670 | 9.281 | 8.993 | 8.694 |
| Z/20014 | .20 | 17.293 | 16.115 | 15.530 | 14.537 | 14.084 | 13.249 | 12.877 | 12.179 | 11.852 | 11.276 | 10.972 | 10.504 | 10.206 | 9.838 |
| Z/20015 | .20 | 19.366 | 18.033 | 17.394 | 16.265 | 15.776 | 14.823 | 14.425 | 13.624 | 13.279 | 12.612 | 12.294 | 11.748 | 11.438 | 11.001 |

### General notes to all Zeta Purlin systems

Working load capacities for gravity loading are printed on a green background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.6.
Working load capacities for wind uplift are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.4.
The effect of purlin self weight is included in the tabulated loads above.
The tabulated values will give deflections not exceeding span/180.

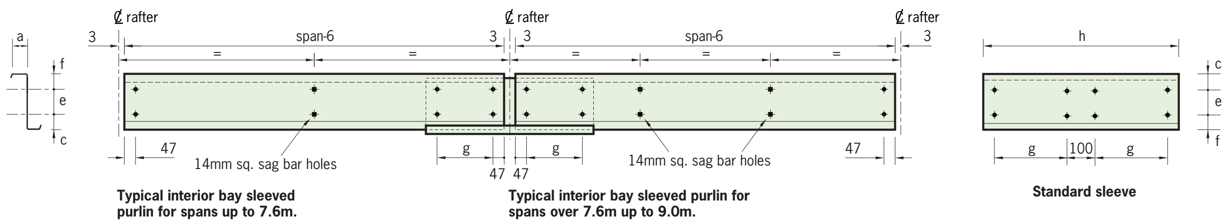
The load capacities shown assume that the purlins support a screw fixed steel sheeting system. Reference must be made to page 41 for information on bracing requirements and limitations.
For applications where any other type of sheeting system is employed, i.e. other than screw fixed steel sheeting, please consult Tegral Technical Services Department.

# Zed Purlins Detailing

## Sleeved System

The sleeved System comprises a single bay purlin with a sleeve connected at alternate supports.

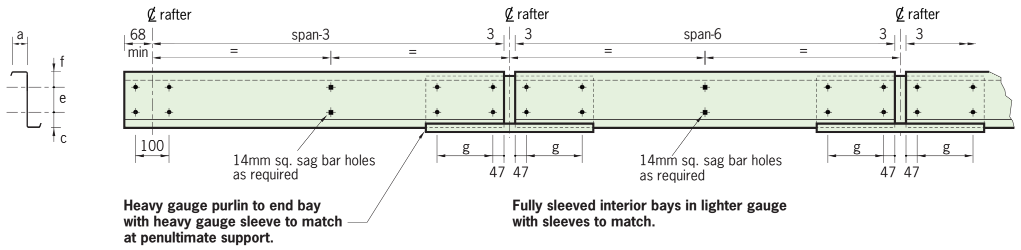
*Note: Sleeves on every joint at penultimate rafter.*

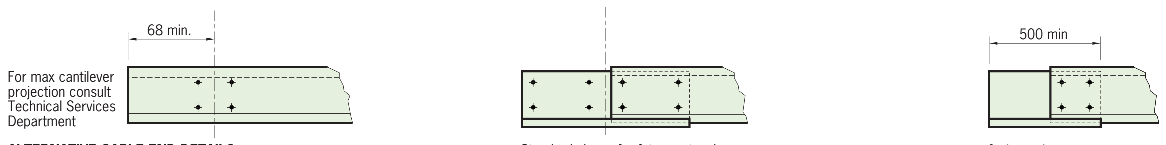



## Heavy End Bay System

The Heavy End Bay System comprises a single bay purlin with a sleeve connection at every support. *Note: End Bays require the appropriate heavier guage section and sleeve at the penultimate rafter.*

*Note: End Bays require the appropriate heavier guage section and sleeve at the penultimate rafter.*



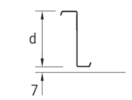




ALTERNATIVE GABLE END DETAILS

Standard sleeve for future extension

Stub section

**General detailing notes**
All purlins must be fixed with the top flange facing the apex. See page 41 for maximum sag bar requirements.
All fixing holes are 14 dia. for M12 grade 8.8 bolts. Sag Bar/Bracing Strut holes are 14 sq. punched in pairs.




Sheeting line depth using standard Zed cleats equals section depth +7mm.

| STANDARD DIMENSIONS FOR ZED SECTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Purlin depth | d | 125 | 140 | 155 | 170 | 185 | 200 |
| Flange widths | a | 55 | 58 | 58 | 58 | 58 | 58 |
| | b | 49 | 49 | 49 | 49 | 49 | 49 |
| Hole centres | c | 40 | 47 | 45 | 43 | 51 | 58 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 63 |
| Sleeve Dimensions | g | 208 | 208 | 208 | 208 | 278 | 278 |
| | h | 566 | 566 | 566 | 566 | 706 | 706 |







# Zed Purlin Accessories

### Sag Bar Requirements

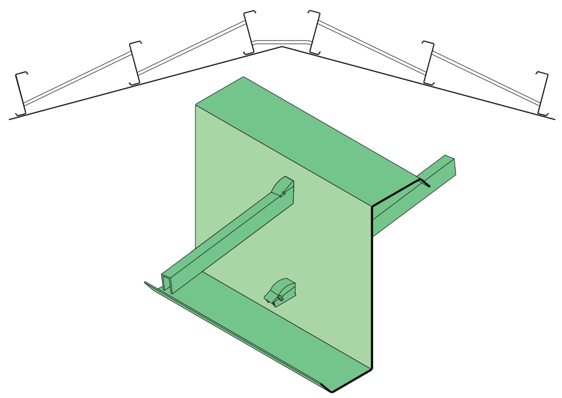
Where adequate lateral restraints is afforded by steel sheeting screw fixed to the purlin flange, sag bars are required to develop the load capacities given on page 38 & 39.

To maintain the correct alignment and to help prevent distortion of the purlin during sheeting, sag bars should be fitted in accordance with our minimum recommendations shown in the table below.

| PURLIN SPAN IN METRES | | | |
|---|---|---|---|
| Roof pitch θ | S ≤ 4.5 | 4.5< S ≤ 7.6 | 7.6 < S≤ 90 |
| 0° < θ ≤ 3° | Consult Technical Services Dept. | | |
| 3° < θ ≤ 30° | 0 | 1* | 2* |
| θ ≤ 30° | Consult Technical Services Dept. | | |

For purlin spacings in excess of 2m, Heavy Duty Sag Bars should be used as required.
*See section heading "Eaves Tie and Fixing Bracket" for guidance on restraint to first purlins at eaves.

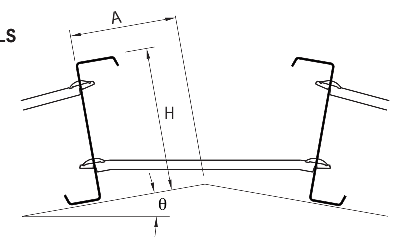
ARRANGEMENT OF SAG BARS



For roof slope lengths in excess of 20m, it may become necessary to introduce additional support along the roof slope in the form of diagonal brace section tied back to the rafters. Details of the diagonal braces are shown on page 47. Please consult the Technical Services Department for further advice.

Special consideration must be given to purlins clad with any material other than screw fixed profiled steel sheeting. These include fibre cement sheeting, standing seam clip fix profiles and tiled roof constructions.

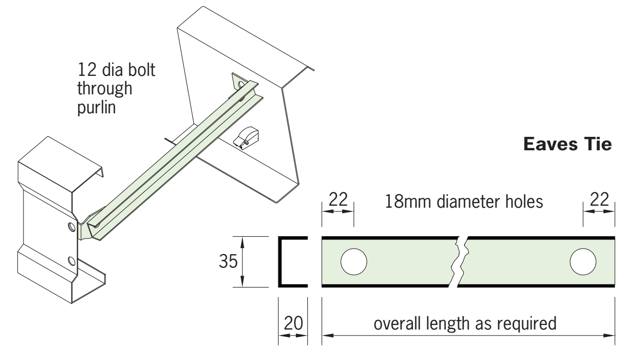
APEX TIE DETAILS

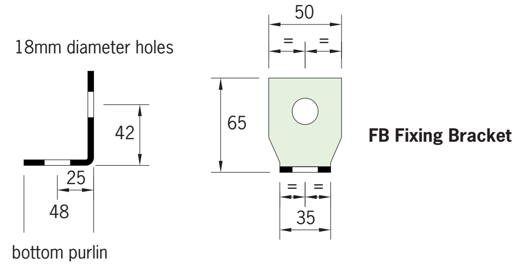



*Details required from customer:*
Dimension A
Dimension H
Angle θ

### Eaves tie and fixing bracket

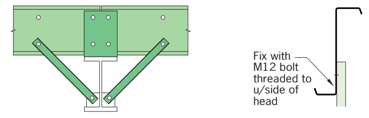
To ensure the first purlin at eaves is kept straight, particularly during the early stages of sheeting, it is necessary to give consideration to additional restraint to this purlin, especially on spans of 5m or more.
This may be done by providing an eaves tie of the type shown, or in agreement with the sheeting contractor, a temporary prop may be used.



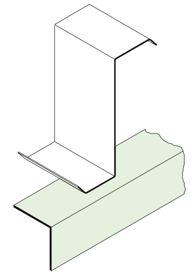

### Rafter Stays

The same section used to form the eaves tie is also available as a rafter stay member, where these are specified by the frame designer.

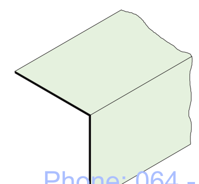



### Cleader Members

50 x 50 x 1.5mm thick galvanised steel Cleader Angle, avaliable in 4m unpunched length.

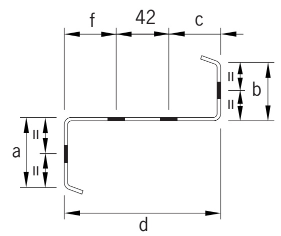


100 x 100 x 1.5mm thick galvanised steel verge trim angle for fixing to the top flange, available in 4m unpunched lenghts.

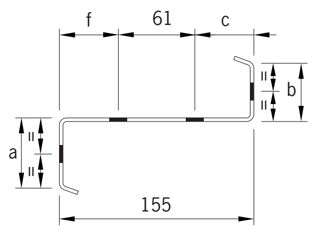


# Zed Rails

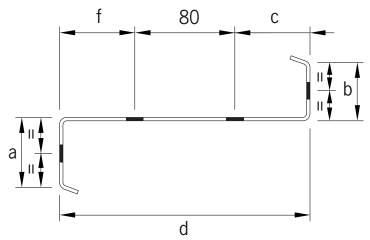
## Zed Section Profile




125-140 RANGE




155 RANGE




170-200 RANGE

### Standard holing lines for all sections

14 dia. or 14 sq. web holes, and 14 dia. flange holes may be punched in any pattern on these standard lines.

Also available 8, 12, 18 and 22mm dia.

14 x 25mm and 18 x 25mm slots.

Please refer to page 43 for section properties.

| STANDARD DIMENSIONS FOR ZED SECTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Purlin depth | d | **125** | **140** | **155** | **170** | **185** | **200** |
| Flange widths | a | 55 | 58 | 58 | 58 | 58 | 58 |
| | b | 49 | 49 | 49 | 49 | 49 | 49 |
| Hole centres | c | 40 | 47 | 45 | 43 | 51 | 58 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 63 |
| Sleeve Dimensions | g | 208 | 208 | 208 | 208 | 278 | 278 |
| | h | 566 | 566 | 566 | 566 | 706 | 706 |







### Zed Section Properties

| Section No | Depth d mm | Thickness t mm | Top Flange a mm | Btm Flange b mm | Weight kg/m | Area $mm^2$ | Ixx $cm^4$ | Zxx $cm^3$ | Iyy $cm^4$ | ryy mm | x mm | y mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Z/12513** | 125 | 1.3 | 55 | 45 | 2.51 | 321 | 78.1 | 12.07 | 19.77 | 24.83 | 52.03 | 64.65 |
| **Z/12514** | 125 | 1.4 | 55 | 45 | 2.70 | 345 | 84.1 | 13.01 | 21.33 | 24.86 | 52.08 | 64.65 |
| **Z/12515** | 125 | 1.5 | 55 | 45 | 2.89 | 369 | 90.1 | 13.94 | 22.88 | 24.89 | 52.13 | 64.65 |
| **Z/12517** | 125 | 1.7 | 55 | 45 | 3.27 | 418 | 102.1 | 15.79 | 25.99 | 24.94 | 52.23 | 64.65 |
| **Z/12520** | 125 | 2.0 | 55 | 45 | 3.83 | 490 | 119.8 | 18.53 | 30.63 | 24.99 | 52.38 | 64.65 |
| **Z/14013** | 140 | 1.3 | 58 | 49 | 2.74 | 350 | 106.0 | 14.68 | 23.62 | 25.99 | 51.91 | 72.21 |
| **Z/14014** | 140 | 1.4 | 58 | 49 | 2.95 | 376 | 114.2 | 15.82 | 25.48 | 26.02 | 51.96 | 72.21 |
| **Z/14015** | 140 | 1.5 | 58 | 49 | 3.15 | 403 | 122.4 | 16.95 | 27.34 | 26.05 | 52.01 | 72.21 |
| **Z/14017** | 140 | 1.7 | 58 | 49 | 3.56 | 456 | 138.7 | 19.21 | 31.05 | 26.10 | 52.11 | 72.21 |
| **Z/14020** | 140 | 2.0 | 58 | 49 | 4.16 | 535 | 162.9 | 22.57 | 36.60 | 26.15 | 52.26 | 72.20 |
| **Z/15513** | 155 | 1.3 | 58 | 49 | 2.89 | 369 | 134.3 | 16.83 | 23.62 | 25.29 | 51.79 | 79.81 |
| **Z/15514** | 155 | 1.4 | 58 | 49 | 3.11 | 397 | 144.7 | 18.14 | 25.49 | 25.33 | 51.84 | 79.81 |
| **Z/15515** | 155 | 1.5 | 58 | 49 | 3.33 | 425 | 155.1 | 19.44 | 27.34 | 25.35 | 51.89 | 79.81 |
| **Z/15517** | 155 | 1.7 | 58 | 49 | 3.76 | 481 | 175.8 | 22.03 | 31.06 | 25.40 | 51.99 | 79.81 |
| **Z/15520** | 155 | 2.0 | 58 | 49 | 4.40 | 565 | 206.6 | 25.89 | 36.61 | 25.45 | 52.14 | 79.81 |
| **Z/17013** | 170 | 1.3 | 58 | 49 | 3.04 | 389 | 166.7 | 19.07 | 23.63 | 24.66 | 51.69 | 87.41 |
| **Z/17014** | 170 | 1.4 | 58 | 49 | 3.28 | 418 | 179.7 | 20.55 | 25.49 | 24.69 | 51.74 | 87.41 |
| **Z/17015** | 170 | 1.5 | 58 | 49 | 3.50 | 448 | 192.6 | 22.03 | 27.35 | 24.71 | 51.79 | 87.41 |
| **Z/17017** | 170 | 1.7 | 58 | 49 | 3.96 | 507 | 218.3 | 24.98 | 31.07 | 24.76 | 51.89 | 87.41 |
| **Z/17020** | 170 | 2.0 | 58 | 49 | 4.63 | 595 | 256.6 | 29.36 | 36.62 | 24.81 | 52.04 | 87.41 |
| **Z/18513** | 185 | 1.3 | 58 | 49 | 3.20 | 408 | 203.4 | 21.41 | 23.64 | 24.07 | 51.60 | 95.00 |
| **Z/18514** | 185 | 1.4 | 58 | 49 | 3.44 | 439 | 219.2 | 23.07 | 25.50 | 24.09 | 51.65 | 95.00 |
| **Z/18515** | 185 | 1.5 | 58 | 49 | 3.68 | 470 | 235.0 | 24.74 | 27.36 | 24.12 | 51.70 | 95.00 |
| **Z/18517** | 185 | 1.7 | 58 | 49 | 4.16 | 532 | 266.5 | 28.05 | 31.08 | 24.16 | 51.80 | 94.99 |
| **Z/18520** | 185 | 2.0 | 58 | 49 | 4.87 | 625 | 313.3 | 32.98 | 36.63 | 24.21 | 51.95 | 94.99 |
| **Z/20013** | 200 | 1.3 | 58 | 49 | 3.35 | 428 | 244.6 | 23.84 | 23.64 | 23.51 | 51.52 | 102.58 |
| **Z/20014** | 200 | 1.4 | 58 | 49 | 3.60 | 460 | 263.6 | 25.70 | 25.51 | 23.54 | 51.57 | 102.57 |
| **Z/20015** | 200 | 1.5 | 58 | 49 | 3.86 | 493 | 282.7 | 27.56 | 27.37 | 23.57 | 51.62 | 102.57 |
| **Z/20017** | 200 | 1.7 | 58 | 49 | 4.36 | 558 | 320.5 | 31.25 | 31.08 | 23.60 | 51.72 | 102.57 |
| **Z/20020** | 200 | 2.0 | 58 | 49 | 5.10 | 655 | 377.0 | 36.75 | 36.64 | 23.65 | 51.87 | 102.57 |
| **Z/20025** | 200 | 2.5 | 58 | 49 | 6.33 | 816 | 470.1 | 45.83 | 45.87 | 23.70 | 52.12 | 102.57 |

## Zed Rails

This system utilises single bay rail lengths joined with connecting sleeves at alternate supports.

All rails must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4. 5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| Z/12513 | 2.51 | 7.796 | 6.237 | 6.579 | 5.613 | 5.437 | 5.103 | 4.569 | 4.569 | | | | | | |
| Z/12514 | 2.70 | 8.749 | 7.006 | 7.087 | 6.306 | 5.857 | 5.733 | 4.921 | 4.921 | | | | | | |
| Z/12515 | 2.89 | 9.375 | 7.777 | 7.593 | 6.999 | 6.276 | 6.276 | 5.273 | 5.273 | | | | | | |
| Z/12517 | 3.27 | 10.618 | 9.538 | 8.601 | 8.584 | 7.108 | 7.108 | 5.973 | 5.973 | | | | | | |
| Z/14013 | 2.74 | 8.978 | 7.182 | 8.080 | 6.464 | 7.345 | 5.876 | 6.205 | 5.387 | 5.287 | 4.972 | | | | |
| Z/14014 | 2.95 | 10.113 | 8.091 | 9.102 | 7.282 | 7.956 | 6.620 | 6.685 | 6.068 | 5.696 | 5.601 | | | | |
| Z/14015 | 3.15 | 11.272 | 9.018 | 10.145 | 8.116 | 8.527 | 7.378 | 7.165 | 6.763 | 6.105 | 6.105 | | | | |
| Z/15513 | 2.89 | 10.034 | 8.028 | 9.031 | 7.225 | 8.210 | 6.568 | 7.526 | 6.021 | 6.698 | 5.558 | 5.775 | 5.161 | | |
| Z/15514 | 3.11 | 11.317 | 9.054 | 10.185 | 8.148 | 9.259 | 7.408 | 8.471 | 6.790 | 7.218 | 6.268 | 6.224 | 5.820 | | |
| Z/15515 | 3.33 | 12.622 | 10.098 | 11.360 | 9.088 | 10.327 | 8.262 | 9.079 | 7.573 | 7.736 | 6.991 | 6.670 | 6.491 | | |
| Z/15517 | 3.76 | 15.220 | 12.176 | 13.698 | 10.959 | 12.246 | 9.962 | 10.290 | 9.132 | 8.768 | 8.430 | 7.560 | 7.560 | | |
| Z/17013 | 3.04 | 11.076 | 8.861 | 9.969 | 7.975 | 9.062 | 7.250 | 8.307 | 6.646 | 7.668 | 6.135 | 7.121 | 5.696 | 6.244 | 5.317 |
| Z/17014 | 3.28 | 12.509 | 10.007 | 11.258 | 9.006 | 10.234 | 8.188 | 9.382 | 7.505 | 8.660 | 6.928 | 7.725 | 6.433 | 6.729 | 6.004 |
| Z/17015 | 3.50 | 13.966 | 11.173 | 12.569 | 10.056 | 11.427 | 9.141 | 10.475 | 8.380 | 9.604 | 7.735 | 8.281 | 7.183 | 7.213 | 6.704 |
| Z/17017 | 3.96 | 16.866 | 13.493 | 15.180 | 12.144 | 13.800 | 11.040 | 12.650 | 10.120 | 10.887 | 9.341 | 9.387 | 8.674 | 8.177 | 8.096 |
| Z/18513 | 3.20 | 12.095 | 9.676 | 10.885 | 8.708 | 9.896 | 7.916 | 9.071 | 7.257 | 8.373 | 6.699 | 7.775 | 6.220 | 7.257 | 5.805 |
| Z/18514 | 3.44 | 13.681 | 10.945 | 12.313 | 9.851 | 11.194 | 8.955 | 10.261 | 8.209 | 9.472 | 7.577 | 8.795 | 7.036 | 8.209 | 6.567 |
| Z/18515 | 3.68 | 15.293 | 12.235 | 13.764 | 11.011 | 12.513 | 10.010 | 11.470 | 9.176 | 10.588 | 8.470 | 9.831 | 7.865 | 8.802 | 7.341 |
| Z/18517 | 4.16 | 18.503 | 14.803 | 16.653 | 13.322 | 15.139 | 12.111 | 13.878 | 11.102 | 12.810 | 10.248 | 11.457 | 9.516 | 9.981 | 8.882 |
| Z/20013 | 3.35 | 13.082 | 10.465 | 11.774 | 9.419 | 10.703 | 8.563 | 9.811 | 7.849 | 9.057 | 7.245 | 8.410 | 6.728 | 7.849 | 6.279 |
| Z/20014 | 3.60 | 14.825 | 11.860 | 13.343 | 10.674 | 12.130 | 9.704 | 11.119 | 8.895 | 10.264 | 8.211 | 9.530 | 7.624 | 8.895 | 7.116 |
| Z/20015 | 3.86 | 16.596 | 13.277 | 14.937 | 11.949 | 13.579 | 10.863 | 12.447 | 9.958 | 11.490 | 9.192 | 10.669 | 8.535 | 9.958 | 7.966 |
| Z/20017 | 4.36 | 20.128 | 16.102 | 18.115 | 14.492 | 16.468 | 13.174 | 15.096 | 12.077 | 13.935 | 11.148 | 12.939 | 10.351 | 12.006 | 9.661 |

### General notes to all Zed Rail systems

Working load capacities for wind pressure (wide sheeted flange in compression at mid span) are printed on a green background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.6.

Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.4.

The tabulated values will give deflections not exceeding span/150.

The load capacities shown assume that the rail support a screw fixed steel cladding system. Reference must be made to page 47 for information on bracing requirements and limitations.

For applications where any other type of sheeting system is employed, please consult Tegral Technical Services Department.





DESIGNER'S PURLIN & RAIL GUIDE Zed Rails

## Zed Rails

This system is employed where continuity across the supports either cannot be provided, i.e. rails are within the depth of the column, or is not required to achieve the necessary load carrying capacity (see page 5 for alternative joint arrangement diagram).

### Working Load Capacities in kN

| Section No. | Self wt kg/m | 4.5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| Z/14013 | 2.74 | 5.495 | 4.923 | 4.451 | 4.431 | 3.679 | 3.679 | 3.091 | 3.091 | | | | | | |
| Z/14014 | 2.95 | 5.921 | 5.546 | 4.796 | 4.796 | 3.963 | 3.963 | 3.330 | 3.330 | | | | | | |
| Z/14015 | 3.15 | 6.345 | 6.182 | 5.140 | 5.140 | 4.248 | 4.248 | 3.569 | 3.569 | | | | | | |
| Z/15513 | 2.89 | 6.879 | 5.503 | 5.639 | 4.953 | 4.660 | 4.503 | 3.916 | 3.916 | 3.337 | 3.337 | | | | |
| Z/15514 | 3.11 | 7.502 | 6.206 | 6.077 | 5.586 | 5.022 | 5.022 | 4.220 | 4.220 | 3.596 | 3.596 | | | | |
| Z/15515 | 3.33 | 8.041 | 6.922 | 6.513 | 6.230 | 5.383 | 5.383 | 4.523 | 4.523 | 3.854 | 3.854 | | | | |
| Z/15517 | 3.76 | 9.113 | 8.347 | 7.382 | 7.382 | 6.101 | 6.101 | 5.126 | 5.126 | 4.368 | 4.368 | | | | |
| Z/17013 | 3.04 | 7.593 | 6.074 | 6.834 | 5.467 | 5.784 | 4.970 | 4.860 | 4.556 | 4.141 | 4.141 | 3.571 | 3.571 | | |
| Z/17014 | 3.28 | 8.575 | 6.860 | 7.542 | 6.174 | 6.233 | 5.613 | 5.238 | 5.145 | 4.463 | 4.463 | 3.848 | 3.848 | | |
| Z/17015 | 3.50 | 9.574 | 7.659 | 8.085 | 6.893 | 6.682 | 6.267 | 5.615 | 5.615 | 4.784 | 4.784 | 4.125 | 4.125 | | |
| Z/17017 | 3.96 | 11.315 | 9.250 | 9.166 | 8.325 | 7.575 | 7.568 | 6.365 | 6.365 | 5.423 | 5.423 | 4.676 | 4.676 | | |
| Z/18513 | 3.20 | 8.291 | 6.633 | 7.462 | 5.970 | 6.784 | 5.427 | 5.929 | 4.975 | 5.052 | 4.592 | 4.356 | 4.264 | 3.795 | 3.795 |
| Z/18514 | 3.44 | 9.379 | 7.503 | 8.441 | 6.753 | 7.606 | 6.139 | 6.391 | 5.627 | 5.446 | 5.194 | 4.696 | 4.696 | 4.090 | 4.090 |
| Z/18515 | 3.68 | 10.484 | 8.387 | 9.435 | 7.548 | 8.154 | 6.862 | 6.852 | 6.290 | 5.838 | 5.806 | 5.034 | 5.034 | 4.385 | 4.385 |
| Z/18517 | 4.16 | 12.684 | 10.148 | 11.187 | 9.133 | 9.246 | 8.303 | 7.769 | 7.611 | 6.620 | 6.620 | 5.708 | 5.708 | 4.972 | 4.972 |
| Z/20013 | 3.35 | | | 8.071 | 6.457 | 7.337 | 5.870 | 6.726 | 5.381 | 6.076 | 4.967 | 5.239 | 4.612 | 4.563 | 4.305 |
| Z/20014 | 3.60 | | | 9.147 | 7.317 | 8.315 | 6.652 | 7.622 | 6.098 | 6.549 | 5.629 | 5.647 | 5.227 | 4.919 | 4.878 |
| Z/20015 | 3.86 | | | 10.239 | 8.192 | 9.309 | 7.447 | 8.241 | 6.826 | 7.022 | 6.301 | 6.054 | 5.851 | 5.274 | 5.274 |
| Z/20017 | 4.36 | | | 12.418 | 9.934 | 11.122 | 9.031 | 9.345 | 8.279 | 7.963 | 7.642 | 6.866 | 6.866 | 5.981 | 5.981 |

### General notes to all Zed Rail systems

Working load capacities for wind pressure (wide sheeted flange in compression at mid span) are printed on a green background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.6.

Working load capacities for wind suction (narrow, unsheeted flange in compression at mid span) are printed on a grey background. These values are derived from the Ultimate Load Capacities given on pages 79-80 divided by 1.4.

The tabulated values will give deflections not exceeding span/150.

The load capacities shown assume that the rail support a screw fixed steel cladding system. Reference must be made to page 47 for information on bracing requirements and limitations.

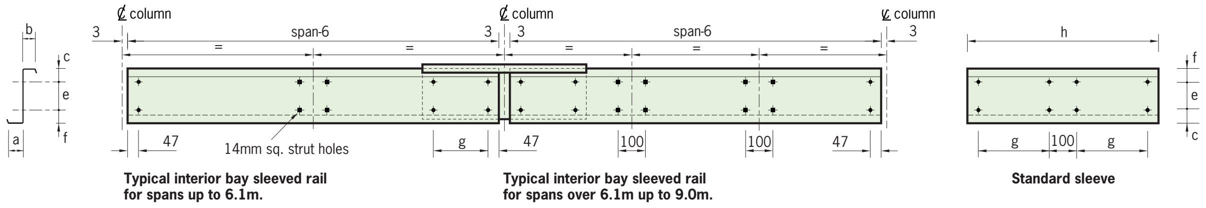
For applications where any other type of sheeting system is employed, please consult Tegral Technical Services Department.

# Zed Rail Detailing

## Sleeved System

The sleeved System comprises a single bay rail with a sleeve connection at alternate supports.

*Note: Sleeves on every joint at penultimate column*



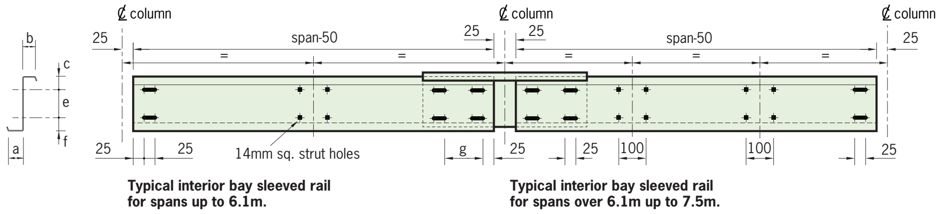

## Firescreen Rails

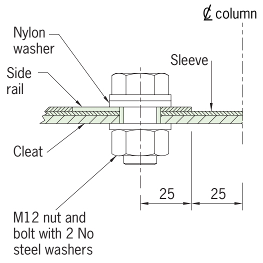
All cladding and eaves rails must be allowed to expand during a fire. Slotted holes with both steel and nylon washers under the bolt heads are required.

The minimum allowance for expansion should be 7mm/metre length of rail. For rails up to 7.5m span the gap between rails is rounded to 50mm.

The maximum span and spacing should be 7.5m and 2.0m respectively.

Rails should generally be single span, but may be sleeved to achieve continuity.



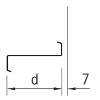




RAIL/CLEAT CONNECTION DETAIL

### General Detailing Notes

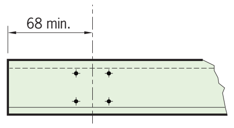
Rails may be fixed with the sheeting (wide) flange pointing up or down to suit the detail. When cladding fixed with hook bolts is employed, the sheeting (narrow) flange points up.

See page 47 for minimum strut requirements.
All fixing holes are 14 dia for M12 grade 8.8 bolts.
Bracing Strut holes are 14 sq. punched in pairs.



Sheeting line depth using standard Zed cleats equals section depth +7mm.

| STANDARD DIMENSIONS FOR ZED SECTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rail depth | d | 125 | 140 | 155 | 170 | 185 | 200 |
| Flange widths | a | 55 | 58 | 58 | 58 | 58 | 58 |
| | b | 49 | 49 | 49 | 49 | 49 | 49 |
| Hole centres | c | 40 | 47 | 45 | 43 | 51 | 58 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 63 |
| Sleeve | g | 208 | 208 | 208 | 208 | 278 | 278 |
| Dimensions | h | 566 | 566 | 566 | 566 | 706 | 706 |




For max cantilever projection consult Technical Services Department

GABLE END DETAIL





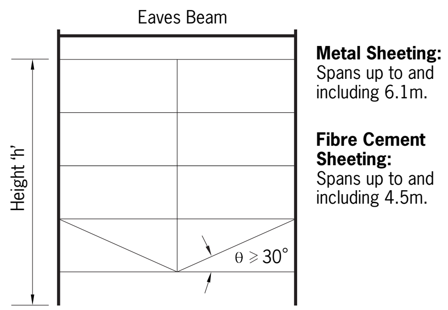
# Zed Rail Accessories

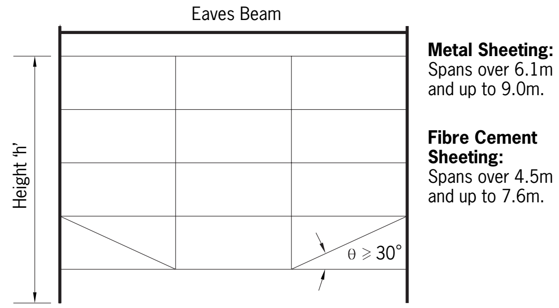
### Arrangement of Diagonal Braces and Vertical Struts

All rails should be braced in accordance with the recommendations shown below, to maintain alignment of the sections.

Diagonal braces and vertical struts are required to develop the load capacities given on pages 44 & 45.

Special consideration must be given to alternative cladding constructions such as clip fixed panels and glazing. Please consult the Technical Services Department for further information.




Maximum height 'h' for insulated Metal Sheeting (S. Wt. 13.25 kg/m²) = 12m.*

Maximum height 'h' for insulated F.C. Sheeting (S. Wt. 26.75 kg/m²) = 8.5m.*

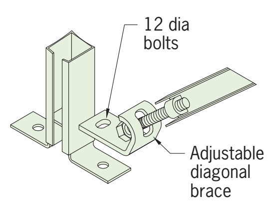
For heights greater than 'h' further sets of diagonal braces are required.

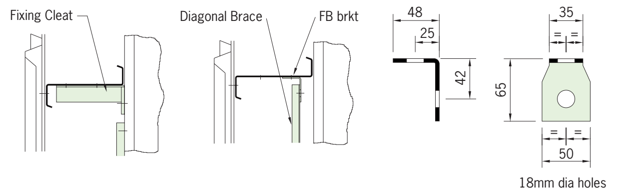
* In addition, maximum number of rails per bay per set of diagonals should not exceed 8 No. for spans ≤ 9.0m. For other cases, please consult our Technical Services Department.

### Diagonal Brace, fixing bracket & vertical strut fixing.

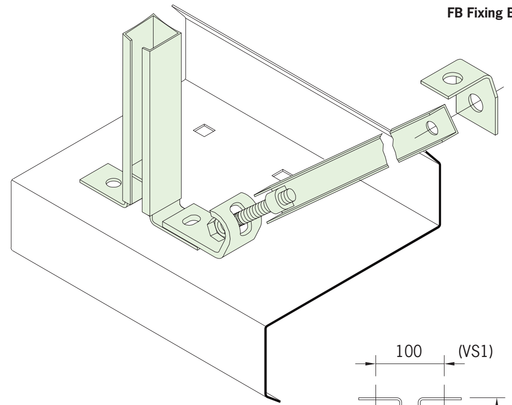
The top of the diagonal brace must be fixed back to a "rigid" point, generally the stanchion flange. Where the diagional brace is tied back to the stanchion via the cladding rail cleat, i.e. using an FB bracket as illustrated, the structural adequacy of the cleat must be confirmed.

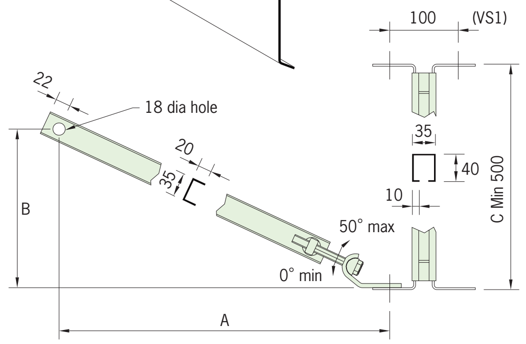
VS1 FOR ALL SECTIONS




FB Fixing Bracket

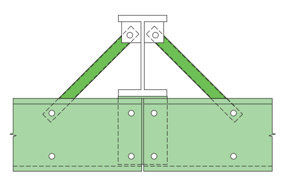


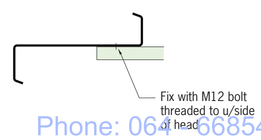



Details of diagonal brace (specify dim. 'A' and 'B' when ordering)

### Column Stays

The same section used for the diagonal brace channel is also available as a column stay member, where these are required by the frame designer.



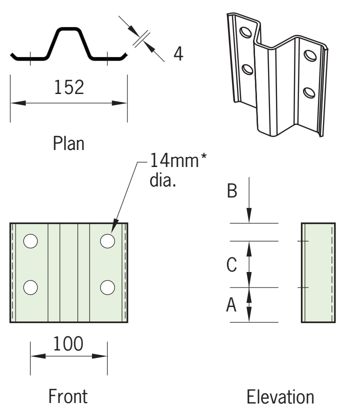


# Zed Purlins & Rails Cleats

Tegral cleats for Zed purlins and cladding rails are available as either a weld-on type or as a bolt-on type, with the facility to offer an extended leg to suit alternative sheeting lines.

The appropriate dimension for standard section punching and sheeting lines, as well as limiting dimensions for extended leg cleats are given in the table below.

## Weld-on cleats




## Design

The cleat capacities have been verified by testing at the University of Salford.
For Zed purlins and rails subject to the following constraints:

1. A screw fixed steel cladding system is employed.
2. The standard sheeting line is used.
3. The roof slope for purlins is not greater than 30 degrees, and cleats supporting cladding rails are horizontal.
4. Purlin/rail span not greater than 9.0m then the cleat capacity should be satisfactory.

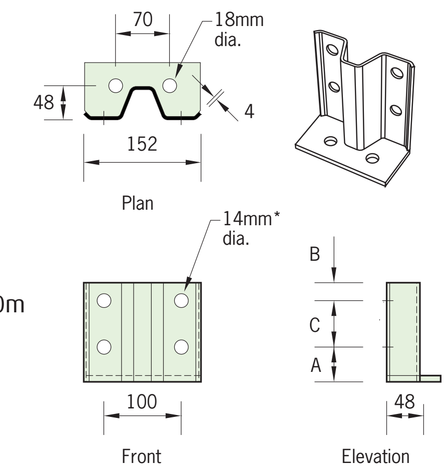
For variations on any of the above criteria please contact Tegral Technical Services Department.

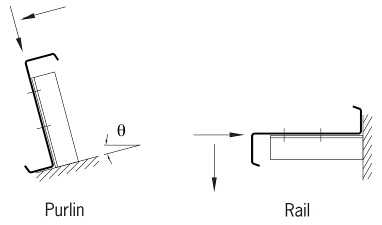
## Capacity of weld-on and bolt-on type cleats

For spine in tension
(direction for forces as shown for purlin)
$M_{ult}$ M = 2.50kNm

For reverse condition
(spine in compression as shown for rail)
$M_{ult}$ M = 1.20 kNm

## Bolt-on cleats




For ordering purposes, the Zed cleat reference is followed by the required sheeting line, eg: for a bolt-on Zed cleat to suit a 140mm purlin depth and a 147mm sheeting line the reference is Z/B140/147

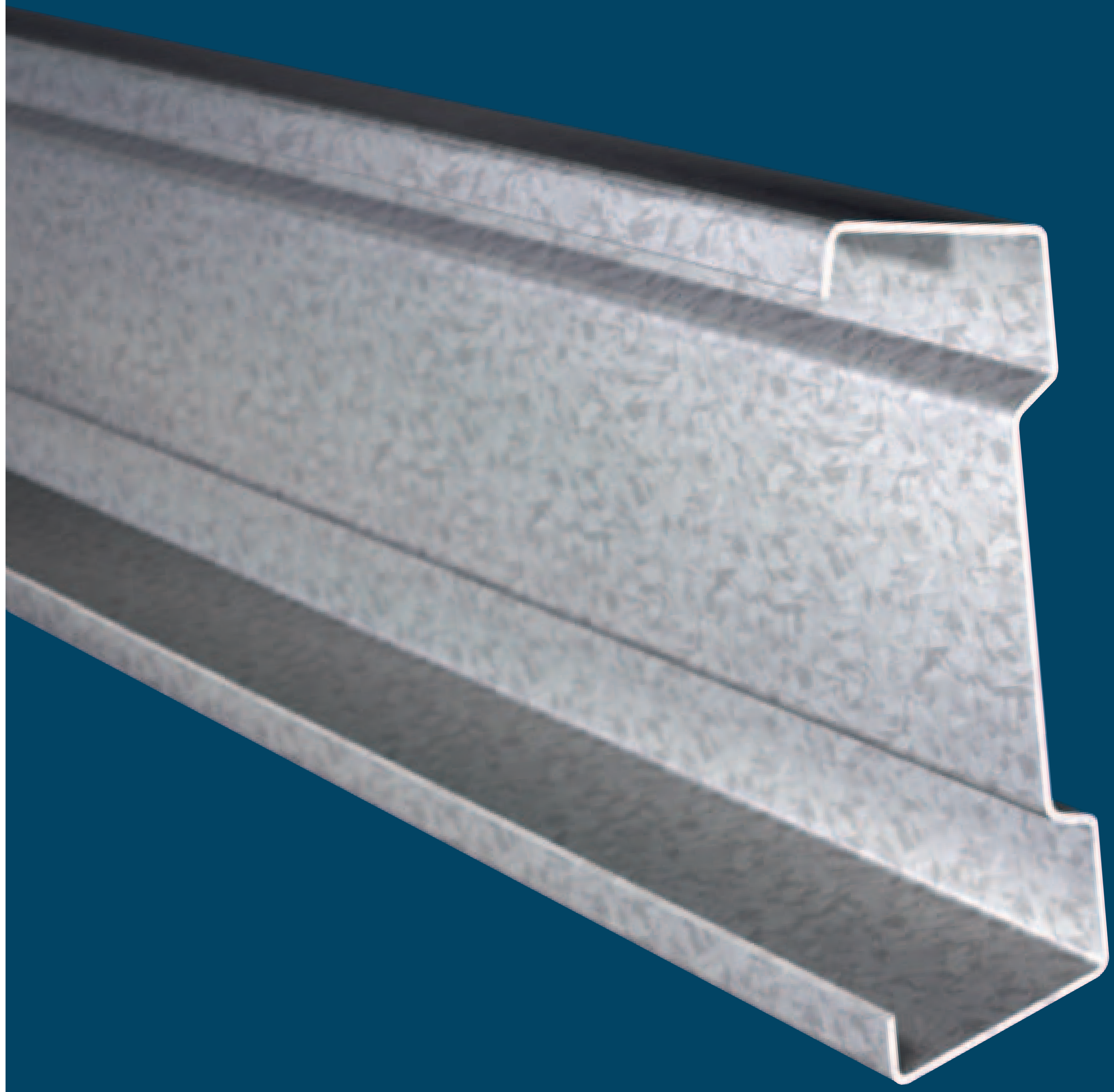
| Section | Weld-on | Bolt-on | Sheeting line Standard | Sheeting line Max | A Standard | A Max | B | C |
|---|---|---|---|---|---|---|---|---|
| Z/125 | Z/C125/_ | Z/B125/_ | 132 | 368 | 47 | 283 | 25 | 42 |
| Z/140 | Z/C140/_ | Z/B140/_ | 147 | 376 | 54 | 283 | 25 | 42 |
| Z/155 | Z/C155/_ | Z/B155/_ | 162 | 374 | 52 | 264 | 25 | 61 |
| Z/170 | Z/C170/_ | Z/B170/_ | 177 | 372 | 50 | 245 | 25 | 80 |
| Z/185 | Z/C185/_ | Z/B185/_ | 192 | 379 | 58 | 245 | 25 | 80 |
| Z/200 | Z/C200/_ | Z/B200/_ | 207 | 387 | 65 | 245 | 25 | 80 |







# Eaves Beam

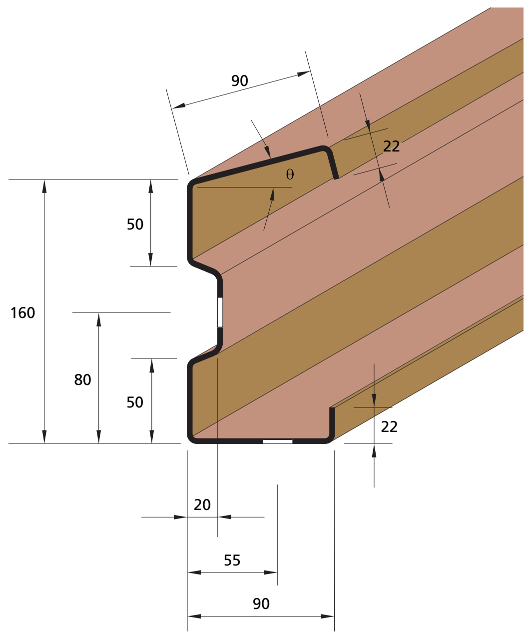


# Eaves Beam

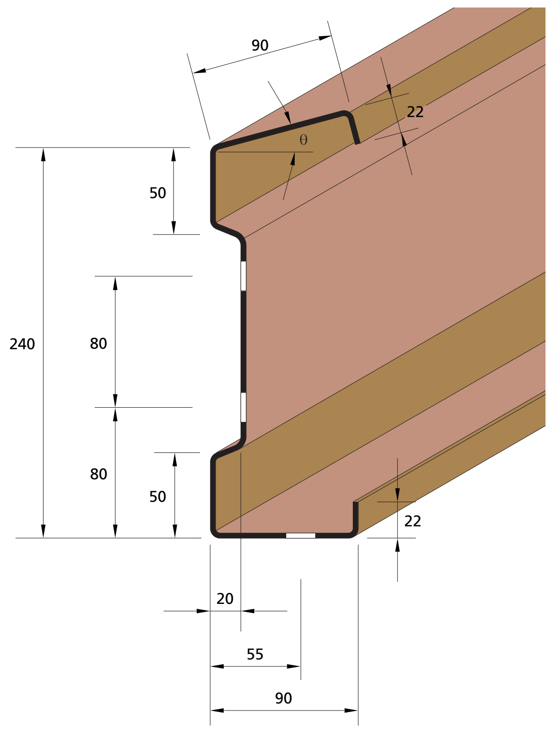
Tegral's range of Eaves Beam sections are designed to combine the function of purlin, cladding rail and gutter support at the eaves position.

The sections are 160mm and 240mm deep and are available in three gauges, 2.0mm, 2.5mm and 3.2mm thick (by special order). They are supported by a complete range of accessory components and brackets to complement fully our existing comprehensive range of Zeta, Zeta 2 and Zed purlin and cladding rail systems.

## 160 Eaves Beam Section Profile




## 240 Eaves Beam Section Profile




## Section Properties

| Section | Depth mm | t mm | Weight kg/m | Area $mm^2$ | Ixx $cm^4$ | Zxx $cm^3$ | rxx mm | Iyy $cm^4$ | Zyy $cm^3$ | ryy mm | Mcx kNm | Mcy kNm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EB16020 | 160 | 2.0 | 6.04 | 752 | 305.18 | 38.16 | 63.71 | 72.04 | 12.55 | 30.95 | 12.88 | 4.89 |
| EB16025 | 160 | 2.5 | 7.50 | 944 | 378.32 | 47.30 | 63.32 | 88.21 | 15.40 | 30.58 | 17.81 | 6.01 |
| *EB16032 | 160 | 3.2 | 9.50 | 1198 | 476.61 | 59.59 | 63.08 | 110.19 | 19.21 | 30.33 | 23.29 | 7.49 |
| EB24020 | 240 | 2.0 | 7.29 | 908 | 787.10 | 65.60 | 93.11 | 73.98 | 12.43 | 28.55 | 21.21 | 4.85 |
| EB24025 | 240 | 2.5 | 9.07 | 1140 | 979.91 | 81.68 | 92.73 | 90.01 | 15.23 | 28.10 | 29.60 | 5.94 |
| *EB24032 | 240 | 3.2 | 11.51 | 1450 | 1238.37 | 103.22 | 92.42 | 112.75 | 19.02 | 27.89 | 40.03 | 7.42 |

*Special order

### Note

Section properties are calculated based on a 'flat top' Eaves Beam (θ=0°), and are therefore conservative for θ values greater than zero.

***Note** EB 16032 and EB 24032 by Special order

### Holing lines for all sections

18mm dia holes may be punched in any pattern along the lines indicated above.







### Load Capacities

The following design charts show allowable load capacities based on single spanning members with an eaves tie at mid span for spans up to 6.0m, and eaves ties at third points for spans of 6.0m and over. Load capacities vary for other eaves tie configurations.

For vertical loading in the absence of horizontal loading, a load factor of 1.6 has been used. For combined horizontal and vertical loading, a load factor of 1.2 has been used. For horizontal loading in the absence of vertical loading, a load factor of 1.4 has been used. Deflections are limited to span/200 for vertical loads. The following design information assumes adequate restraint in both axis. For a given span condition, load cases below the relevant span line pass, load cases above the relevant span line fail.

### Design Equations

The following design equations allow a more detailed analysis of Eaves Beam performance using limit state design methods.

### Stress

For Eaves Beams with no eaves ties $\quad \frac{VL}{8Mcx} + \frac{HL}{8Mcy} = 1.0$

For Eaves Beams with eaves ties at mid-span $\quad \frac{VL}{8Mcx} + \frac{HL1.0}{32Mcy} = 1.0$

For Eaves Beams with eaves ties at third points $\quad \frac{VL}{8Mcx} + \frac{HL1.0}{90Mcy} = 1.0$

### Vertical Deflection

Deflection limited capacity (kN) $\quad \frac{157.44\ Ixx}{d\ L^2}$

**Variables**

V = Factored vertical load (kN)

H = Factored horizontal load (kN)L = Span (m)

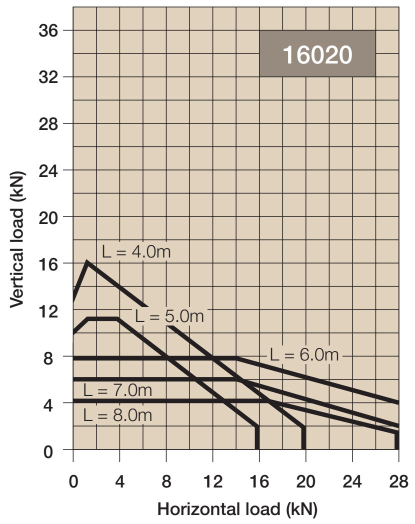
Mcx = Major axis ultimate moment capacity (kNm)

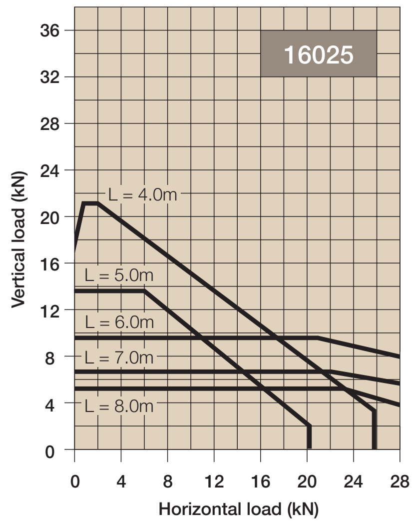
Mcy = Minor axis ultimate moment capacity (kNm)

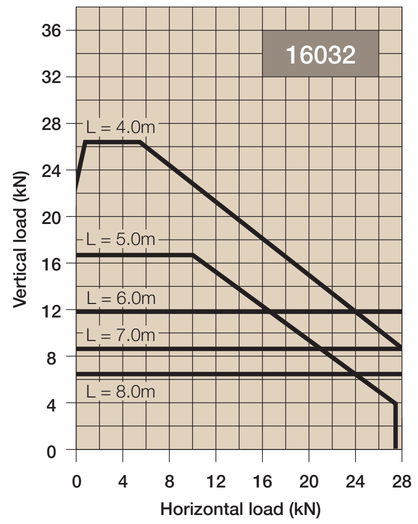
Ixx = Major axis second moment of area ($cm^4$)

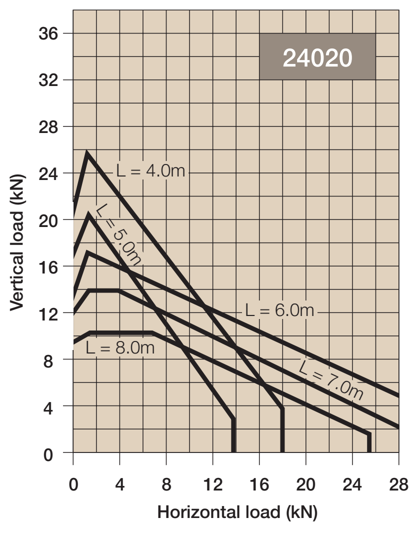
d = Deflection ratio (i.e. for an L/200 deflection limit, d = 200)

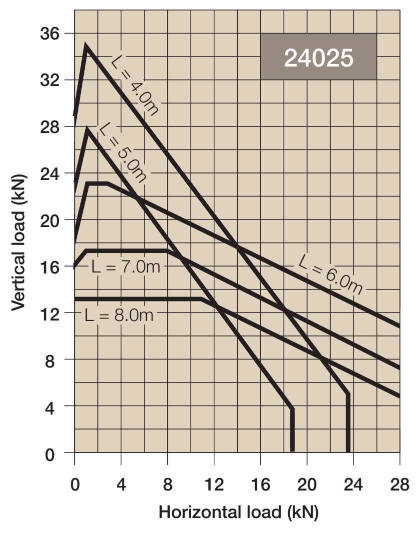
Youngs modulus, in deflection equation above, is taken as 205 $kN/mm^2$.

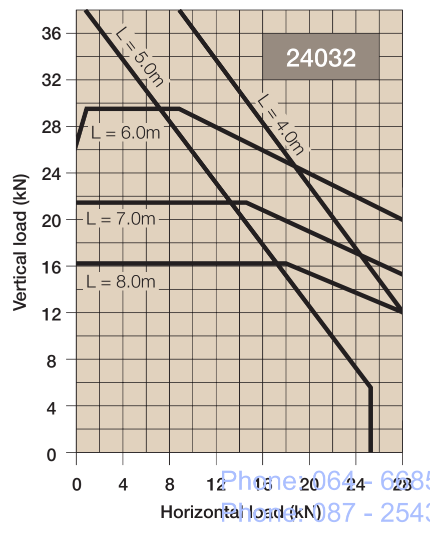


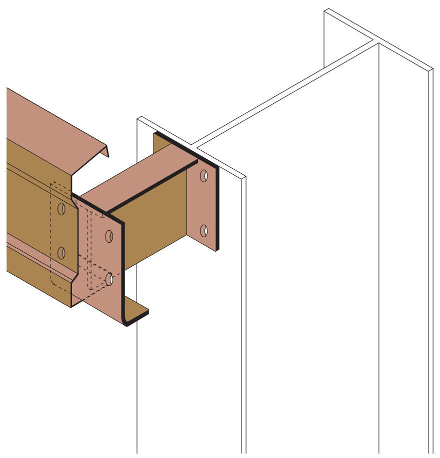



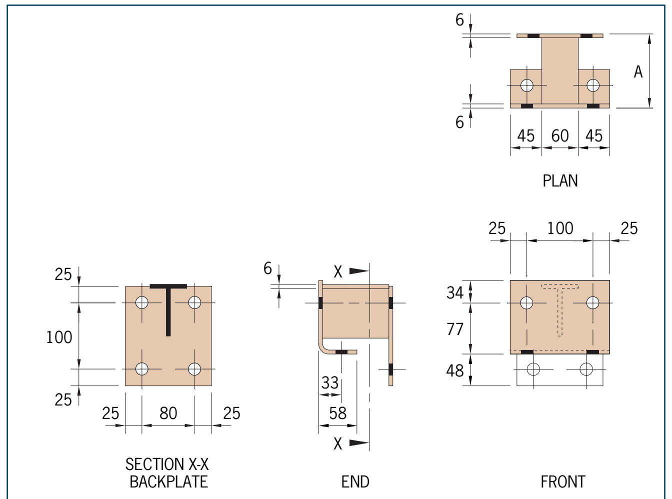



# Stand off Detailing

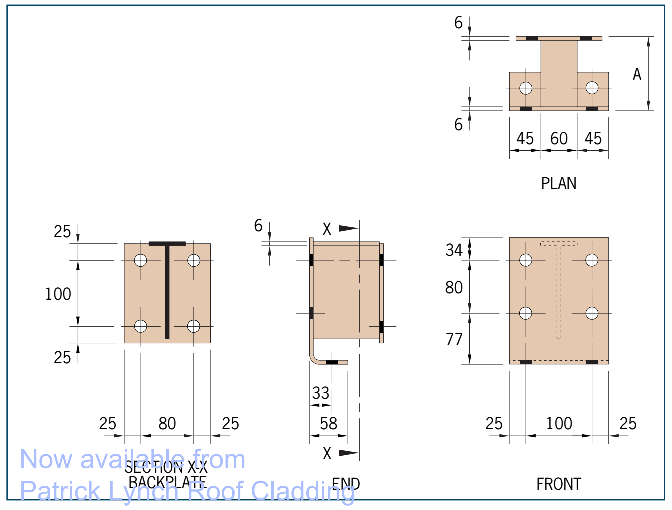
## Stand off fixing arrangement



## Fixing Cleats (by special order) Type S16




## Fixing Cleats (by special order) Type S24



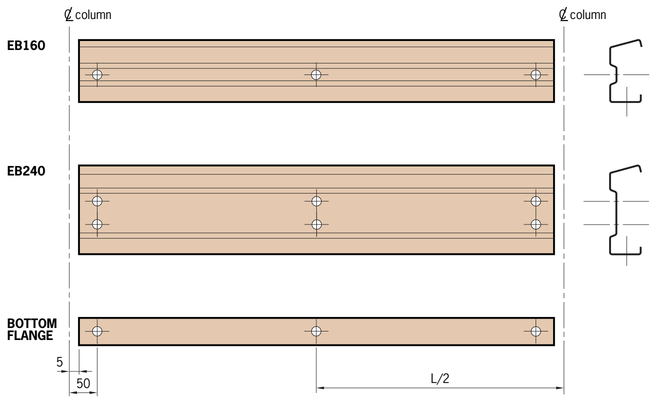

## Stand off detail

The detail shown is for the stand off arrangement using one eaves tie at mid span.

Note: additional eaves ties may be required.

The top flange slope must be specified on all manufacturing details.

All hole sizes are 18 diameter to suit M16 bolts.

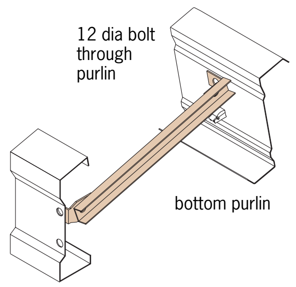



| BRACKET TYPE: S16 & S24 | | | | |
|---|---|---|---|---|
| Rail size | 160 Ref | 240 Ref | Dim A | Standard Sheeting Roof |
| **125** | S16/125 | S24/125 | 110 | 132 |
| **140** | S16/140 | S24/140 | 125 | 147 |
| **150** | S16/150 | S24/150 | 135 | 157 |
| **155** | S16/155 | S24/155 | 140 | 162 |
| **170** | S16/170 | S24/170 | 155 | 177 |
| **175** | S16/175 | S24/175 | 160 | 182 |
| **185** | S16/185 | S24/185 | 170 | 192 |
| **200** | S16/200 | S24/200 | 185 | 207 |
| **225** | S16/225 | S24/225 | 210 | 232 |
| **245** | S16/245 | S24/245 | 230 | 252 |
| **265** | S16/265 | S24/265 | 250 | 272 |
| **285** | S16/285 | S24/285 | 270 | 292 |

## Eaves tie and fixing bracket

Note: The eaves tie assembly illustrated is not deemed to act as a lateral restraint to an unrestrained eaves beam section (see page 69).

See pages 14, 29 or 41 as appropriate for eaves tie and bracket details.

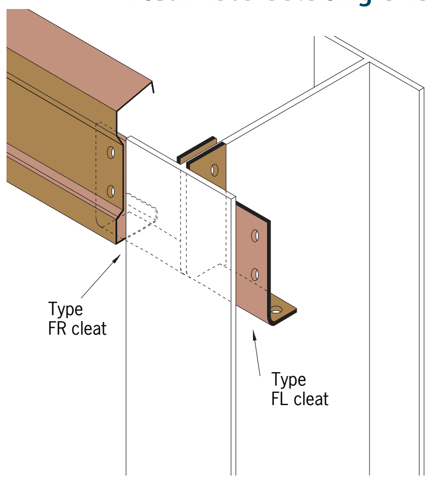




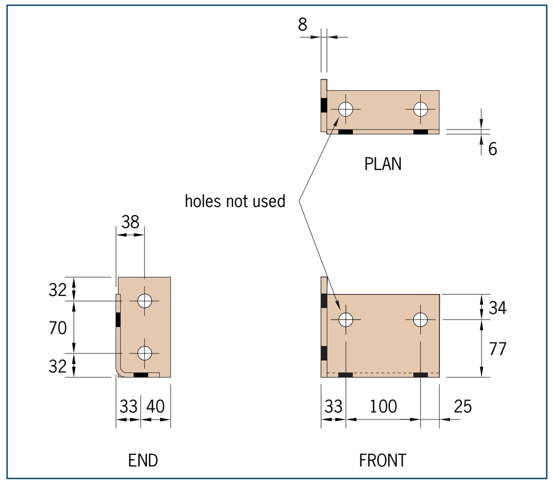



# Flush Face Detailing

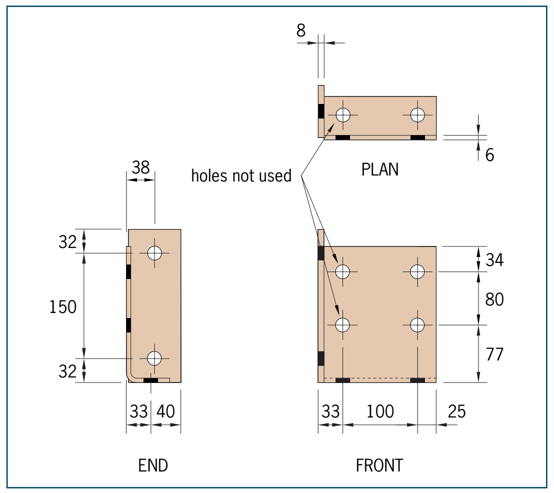
## Flush face detailing arrangement




## Fixing Cleats (by special order) (FR16 opposite hand)




## Fixing Cleats Type FL24 (by special order) (FR24 opposite hand)



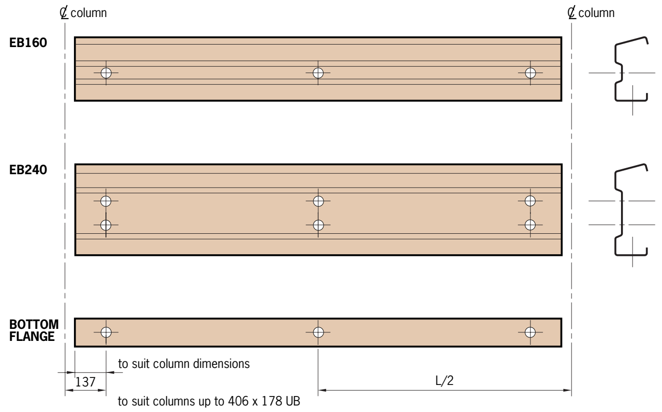

## Flush face detail

The detail shown is for the flush face arrangement using one eaves tie at mid span.

Note: additional eaves ties may be required.

The top flange slope must be specified on all manufacturing details.

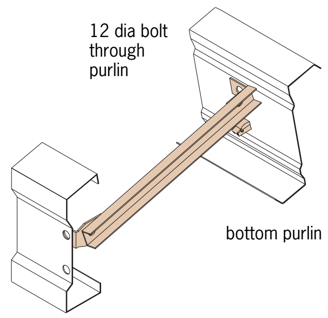
All hole sizes are 18 diameter to suit M16 bolts.



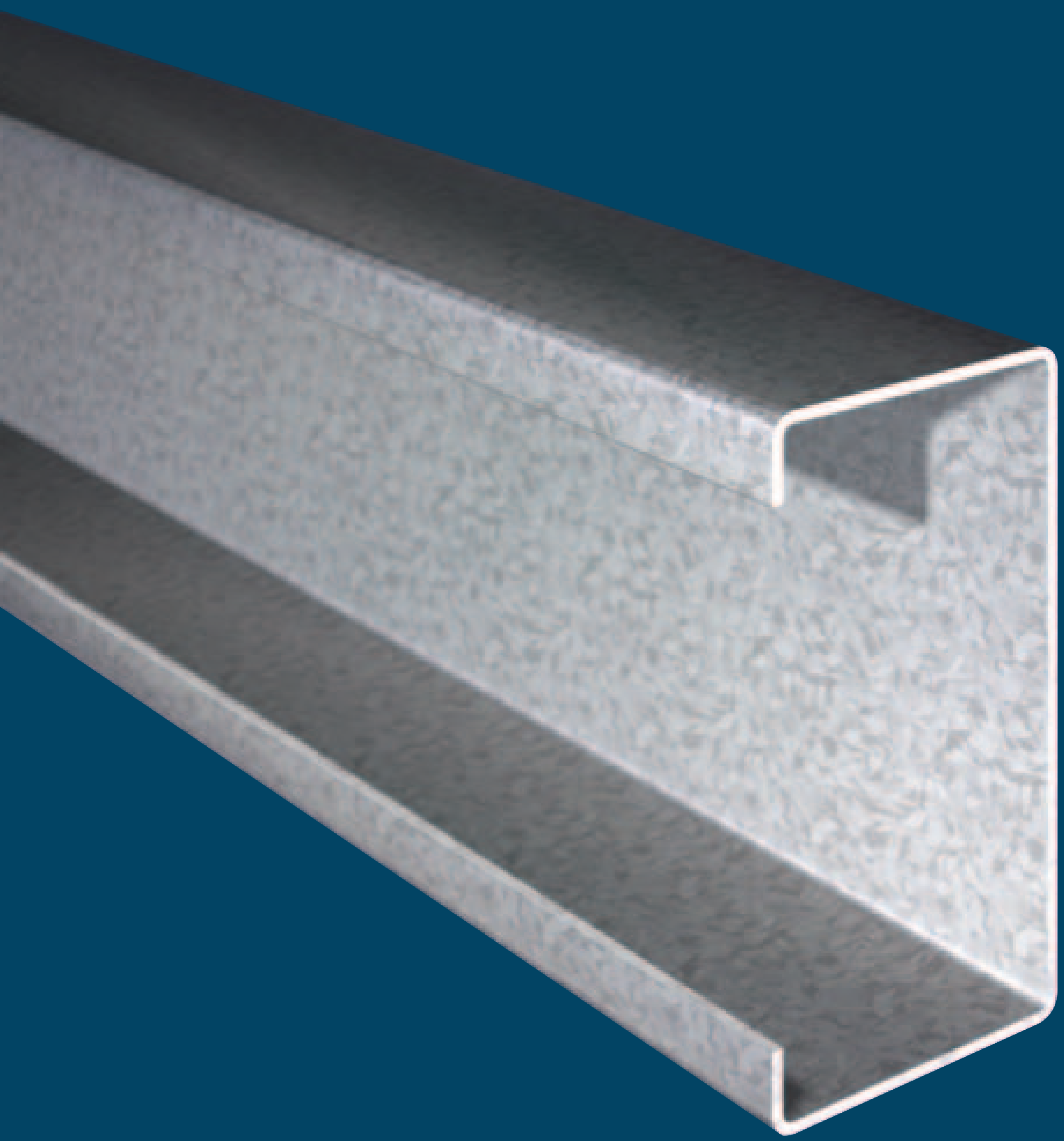

## Eaves tie and fixing bracket

Note: The eaves tie assembly illustrated is not deemed to act as a lateral restraint to an unrestrained eaves beam section (see page 69).

See pages 14, 29 or 41 as appropriate for eaves tie and bracket details.



# 'C' & 'CW' Sections







DESIGNER'S STRUCTURAL PRODUCTS GUIDE 'C' & 'CW' Sections

# 'C' Sections

Tegral 'C' Sections, have been introduced to offer the customer a wider choice and greater versatility.

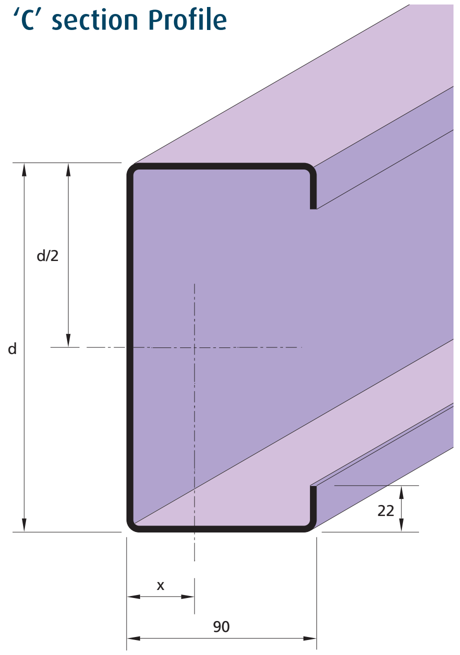
The sections are available from 90mm to 160mm in depth and are supplied in two gauges, 2.5mm and 3.2mm thick.

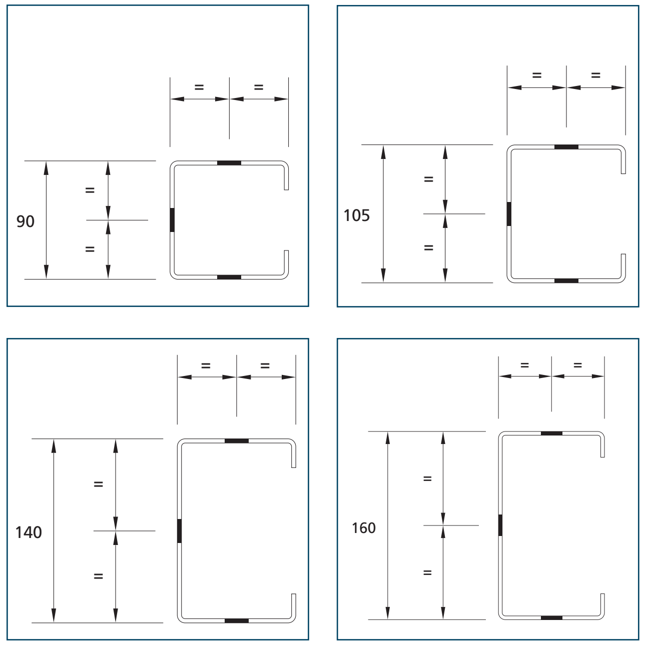
The new range can be employed in applications such as door sections, floor members and strutting sections to suit individual customer requirements.

**Specification**

- **Section** Grade S390GD+Z275, refer to page 80 for full technical specification
- **Bolts** M16 x 45 Grade 4.6 minimum to BS EN 24018, nuts to BS EN 24034 (should be protected against corrosion)
- **Design** BS5950:Part 5:1998

## 'C' section Profile




**Holing lines for all sections**
18mm dia web and flange holes may be punched in any pattern along these lines.
Note: alternative lines and sizes are available.

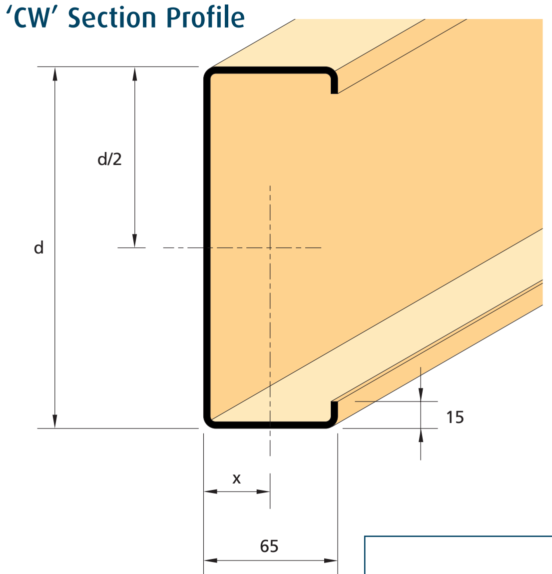
## Section Properties

| Section | Depth | t | Weight | Area | Ixx | Zxx | rxx | Iyy | Zyy | ryy | x | Aeff | Mcx | Mcy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | kg/m | $mm^2$ | $cm^4$ | $cm^3$ | mm | $cm^4$ | $cm^3$ | mm | mm | $mm^2$ | kNm | kNm |
| C9025 | 90 | 2.5 | 5.72 | 729 | 101.46 | 22.45 | 37.68 | 78.44 | 15.11 | 33.13 | 39.32 | 697 | 8.40 | 5.89 |
| *C9032 | 90 | 3.2 | 7.24 | 922 | 126.84 | 28.19 | 37.37 | 97.70 | 18.81 | 32.80 | 39.65 | 905 | 10.99 | 7.33 |
| C10525 | 105 | 2.5 | 6.02 | 766 | 143.80 | 27.37 | 43.74 | 83.20 | 15.49 | 33.27 | 37.52 | 709 | 10.23 | 6.04 |
| *C10532 | 105 | 3.2 | 7.62 | 970 | 180.23 | 34.33 | 43.43 | 103.69 | 19.30 | 32.94 | 37.84 | 942 | 13.39 | 7.52 |
| C14025 | 140 | 2.5 | 6.71 | 854 | 276.17 | 39.42 | 57.43 | 92.67 | 16.17 | 33.27 | 33.93 | 713 | 14.80 | 6.30 |
| *C14032 | 140 | 3.2 | 8.50 | 1083 | 347.54 | 49.65 | 57.11 | 115.59 | 20.17 | 32.93 | 34.25 | 983 | 19.38 | 7.86 |
| C16025 | 160 | 2.5 | 7.10 | 904 | 374.49 | 46.63 | 65.01 | 97.25 | 16.47 | 33.13 | 32.19 | 713 | 17.34 | 6.42 |
| *C16032 | 160 | 3.2 | 9.00 | 1147 | 472.02 | 59.00 | 64.67 | 121.35 | 20.55 | 32.79 | 32.52 | 987 | 23.04 | 8.01 |

*Special order

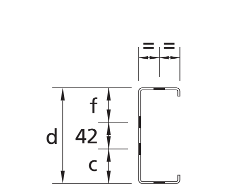
# 'CW' Sections

## 'CW' Section Profile

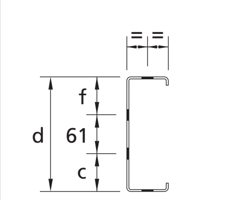


**Specification**

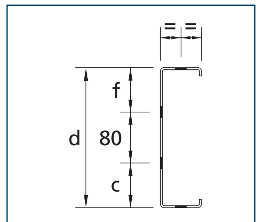
| | | |
|---|---|---|
| ✓ | **Engineering design** | complies with BS 5950, Part 5 1998 |
| ✓ | **Applications** | cladding Rails, doors and window sections, floor joists and brickwork restraints |
| ✓ | **Sleeved system** | maximum efficiency, flexable erection |
| ✓ | **system compatibility** | depths corresponding to Zed sections have the same punching patterns giving greater flexabilty |
| ✓ | **Guaranteed material** | Grade S390GD+Z275 Refer to Page 80 for full technical specification |



127-140 RANGE



155 RANGE



170-240 RANGE

### Standard holing lines for all sections

14 dia. web holes, and 14 dia. flange holes may be punched in any pattern on these lines. Dimensions f and c are shown on page 57.

## 'CW' Section Properties

| Section No | Depth d | Thickness t | Weight | Area | Ixx | Zxx | Iyy | ryy | x | Mcx |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | kg/m | $mm^2$ | $cm^4$ | $cm^3$ | $cm^4$ | mm | mm | kNm |
| CW12715 | 127 | 1.50 | 3.17 | 404 | 105.5 | 16.62 | 22.70 | 23.88 | 21.25 | 5.68 |
| CW12716 | 127 | 1.60 | 3.38 | 430 | 112.4 | 17.70 | 24.13 | 23.83 | 21.25 | 6.26 |
| CW12718 | 127 | 1.80 | 3.80 | 484 | 125.9 | 19.84 | 26.92 | 23.74 | 21.24 | 7.37 |
| CW12720 | 127 | 2.00 | 4.22 | 538 | 139.3 | 21.94 | 29.65 | 23.64 | 21.24 | 8.40 |
| CW14015 | 140 | 1.50 | 3.32 | 423 | 131.9 | 18.84 | 23.46 | 23.72 | 20.32 | 6.34 |
| CW14016 | 140 | 1.60 | 3.54 | 451 | 140.5 | 20.07 | 24.93 | 23.67 | 20.32 | 6.99 |
| CW14018 | 140 | 1.80 | 3.98 | 508 | 157.5 | 22.51 | 27.83 | 23.58 | 20.32 | 8.24 |
| CW15515 | 155 | 1.50 | 3.50 | 446 | 166.7 | 21.51 | 24.26 | 23.52 | 19.35 | 7.09 |
| CW15518 | 155 | 1.80 | 4.20 | 535 | 199.2 | 25.71 | 28.77 | 23.37 | 19.35 | 9.24 |
| CW17015 | 170 | 1.50 | 3.67 | 468 | 206.4 | 24.29 | 24.95 | 23.29 | 18.47 | 7.84 |
| CW17018 | 170 | 1.80 | 4.41 | 562 | 246.8 | 29.04 | 29.62 | 23.14 | 18.47 | 10.24 |
| CW18515 | 185 | 1.50 | 3.85 | 491 | 251.4 | 27.18 | 25.63 | 23.06 | 17.67 | 8.58 |
| CW18518 | 185 | 1.80 | 4.62 | 589 | 300.6 | 32.51 | 30.40 | 22.91 | 17.68 | 11.24 |
| CW20015 | 200 | 1.50 | 4.03 | 513 | 301.7 | 30.18 | 26.23 | 22.81 | 16.94 | 9.31 |
| CW20016 | 200 | 1.60 | 4.30 | 547 | 321.6 | 32.17 | 27.88 | 22.76 | 16.94 | 10.30 |
| CW20018 | 200 | 1.80 | 4.83 | 616 | 361.0 | 36.11 | 31.11 | 22.66 | 16.95 | 12.24 |
| CW20020 | 200 | 2.00 | 5.37 | 684 | 399.9 | 40.00 | 34.26 | 22.56 | 16.95 | 14.07 |
| CW22015 | 220 | 1.50 | 4.26 | 543 | 377.7 | 34.34 | 26.95 | 22.49 | 16.06 | 10.35 |
| CW22016 | 220 | 1.60 | 4.55 | 579 | 402.6 | 36.61 | 28.64 | 22.44 | 16.06 | 11.36 |
| CW22018 | 220 | 1.80 | 5.12 | 652 | 452.1 | 41.11 | 31.96 | 22.34 | 16.07 | 13.55 |
| CW22020 | 220 | 2.00 | 5.68 | 724 | 501.0 | 45.56 | 35.21 | 22.24 | 16.08 | 15.63 |
| CW24020 | 240 | 2.00 | 6.00 | 764 | 616.3 | 51.37 | 36.05 | 21.91 | 15.29 | 17.17 |





## 'CW' Sleeve Rails

This system utilises single bay rail lengths joined with connecting sleeves at alternate supports.

All rails must be sleeved across the penultimate support (see page 5 for alternative joint arrangement diagram).

### 'CW' Sleeved Rail - Working Load Capacities in kN

| Section No. | Self wt kg/m | 4. 5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| CW12715 | 3.17 | 10.679 | 7.661 | 8.650 | 6.895 | 7.149 | 6.268 | 6.007 | 5.746 | | | | | | |
| CW12716 | 3.38 | 11.375 | 8.257 | 9.214 | 7.431 | 7.614 | 6.756 | 6.398 | 6.193 | | | | | | |
| CW12718 | 3.80 | 12.747 | 9.392 | 10.325 | 8.453 | 8.533 | 7.685 | 7.170 | 7.044 | | | | | | |
| CW12720 | 4.22 | 14.033 | 10.446 | 11.420 | 9.402 | 9.438 | 8.547 | 7.931 | 7.835 | | | | | | |
| CW14015 | 3.32 | 11.522 | 8.490 | 10.370 | 7.641 | 8.936 | 6.947 | 7.509 | 6.368 | 6.398 | 5.878 | | | | |
| CW14016 | 3.54 | 12.557 | 9.158 | 11.301 | 8.242 | 9.519 | 7.493 | 7.999 | 6.869 | 6.816 | 6.340 | | | | |
| CW14018 | 3.98 | 14.075 | 10.436 | 12.668 | 9.392 | 10.672 | 8.538 | 8.968 | 7.827 | 7.641 | 7.225 | | | | |
| CW15515 | 3.50 | 12.524 | 9.843 | 11.271 | 8.859 | 10.247 | 8.054 | 9.393 | 7.382 | 8.087 | 6.815 | 6.973 | 6.328 | | |
| CW15518 | 4.20 | 16.140 | 12.042 | 14.526 | 10.838 | 13.206 | 9.853 | 11.342 | 9.031 | 9.664 | 8.337 | 8.333 | 7.741 | | |
| CW17015 | 3.67 | 13.544 | 11.256 | 12.190 | 10.130 | 11.082 | 9.209 | 10.158 | 8.442 | 9.377 | 7.792 | 8.636 | 7.236 | 7.523 | 6.753 |
| CW17018 | 4.41 | 17.575 | 13.716 | 15.818 | 12.344 | 14.380 | 11.222 | 13.181 | 10.287 | 11.974 | 9.496 | 10.325 | 8.817 | 8.994 | 8.230 |
| CW18515 | 3.85 | 15.634 | 12.297 | 14.070 | 11.067 | 12.791 | 10.061 | 11.725 | 9.223 | 10.823 | 8.513 | 10.050 | 7.905 | 9.160 | 7.387 |
| CW18518 | 4.62 | 19.864 | 15.025 | 17.878 | 13.523 | 16.253 | 12.294 | 14.898 | 11.269 | 13.752 | 10.402 | 12.577 | 9.659 | 10.956 | 9.015 |
| CW20015 | 4.03 | | | 14.866 | 12.041 | 13.514 | 10.946 | 12.388 | 10.034 | 11.435 | 9.262 | 10.618 | 8.600 | 9.910 | 8.027 |
| CW20016 | 4.30 | | | 16.373 | 12.957 | 14.884 | 11.779 | 13.644 | 10.797 | 12.594 | 9.967 | 11.695 | 9.255 | 10.915 | 8.638 |
| CW20018 | 4.83 | | | 19.369 | 14.745 | 17.608 | 13.405 | 16.141 | 12.288 | 14.899 | 11.343 | 13.835 | 10.532 | 12.913 | 9.830 |
| CW20020 | 5.37 | | | 21.378 | 16.436 | 19.434 | 14.942 | 17.815 | 13.697 | 16.444 | 12.643 | 15.270 | 11.740 | 14.252 | 10.957 |

## 'CW' Butted Rails

This system is employed where continuity across the supports either can not be provided, i.e. rails are within the depth of the column, or is not required to achieve the necessary load carrying capacity (see page 5 for alternative joint arrangement diagram).

### 'CW' Butted Rail - Working Load Capacities in kN

| Section No. | Self wt kg/m | 4. 5 metre span | | 5.0 metre span | | 5.5 metre span | | 6.0 metre span | | 6.5 metre span | | 7.0 metre span | | 7.5 metre span | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction | Pressure | Suction |
| CW12715 | 3.17 | 5.468 | 5.468 | 4.429 | 4.429 | | | | | | | | | | |
| CW12716 | 3.38 | 5.824 | 5.824 | 4.717 | 4.717 | | | | | | | | | | |
| CW12718 | 3.80 | 6.527 | 6.527 | 5.287 | 5.287 | 4.369 | 4.369 | | | | | | | | |
| CW12720 | 4.22 | 7.219 | 7.219 | 5.847 | 5.847 | 4.832 | 4.832 | | | | | | | | |
| CW14015 | 3.32 | 6.835 | 6.439 | 5.536 | 5.536 | 4.575 | 4.575 | 3.844 | 3.844 | | | | | | |
| CW14016 | 3.54 | 7.281 | 7.101 | 5.897 | 5.897 | 4.874 | 4.874 | 4.095 | 4.095 | | | | | | |
| CW14018 | 3.98 | 8.163 | 8.163 | 6.612 | 6.612 | 5.464 | 5.464 | 4.591 | 4.591 | | | | | | |
| CW15515 | 3.50 | 8.639 | 7.206 | 6.998 | 6.486 | 5.783 | 5.783 | 4.860 | 4.860 | 4.141 | 4.141 | | | | |
| CW15518 | 4.20 | 10.323 | 9.384 | 8.362 | 8.362 | 6.911 | 6.911 | 5.807 | 5.807 | 4.948 | 4.948 | | | | |
| CW17015 | 3.67 | 9.958 | 7.966 | 8.666 | 7.170 | 7.162 | 6.518 | 6.018 | 5.975 | 5.128 | 5.128 | 4.422 | 4.422 | | |
| CW17018 | 4.41 | 12.792 | 10.404 | 10.361 | 9.363 | 8.563 | 8.512 | 7.195 | 7.195 | 6.131 | 6.131 | 5.286 | 5.286 | | |
| CW18515 | 3.85 | 10.896 | 8.717 | 9.806 | 7.845 | 8.721 | 7.132 | 7.328 | 6.538 | 6.244 | 6.035 | 5.384 | 5.384 | 4.690 | 4.690 |
| CW18518 | 4.62 | 14.275 | 11.420 | 12.621 | 10.278 | 10.431 | 9.344 | 8.765 | 8.565 | 7.468 | 7.468 | 6.439 | 6.439 | 5.609 | 5.609 |
| CW20015 | 4.03 | 11.817 | 9.454 | 10.635 | 8.508 | 9.668 | 7.735 | 8.796 | 7.090 | 7.495 | 6.545 | 6.463 | 6.077 | 5.630 | 5.630 |
| CW20016 | 4.30 | 13.077 | 10.462 | 11.770 | 9.416 | 10.700 | 8.560 | 9.376 | 7.846 | 7.989 | 7.243 | 6.888 | 6.726 | 6.001 | 6.001 |
| CW20018 | 4.83 | 15.539 | 12.431 | 13.985 | 11.188 | 12.525 | 10.171 | 10.525 | 9.323 | 8.968 | 8.606 | 7.732 | 7.732 | 6.736 | 6.736 |
| CW20020 | 5.37 | 17.865 | 14.292 | 16.078 | 12.863 | 13.876 | 11.693 | 11.660 | 10.719 | 9.935 | 9.894 | 8.566 | 8.566 | 7.462 | 7.462 |

### General notes to all 'CW' rail systems

Working load capacities for **wind pressure** are printed on a dark yellow background. These values are derived from Ultimate Load Capacities divided by 1.4.

Working load capacities for **wind suction** are printed on a light grey background. These values are derived from Ultimate Load Capacities divided by 1.4.

The tabulated values will give deflections not exceeding span/150. The load capacities assume that the rails support a screw fixed, steel cladding system. Reference must be made to page 46 for information on bracing requirements and limitations.

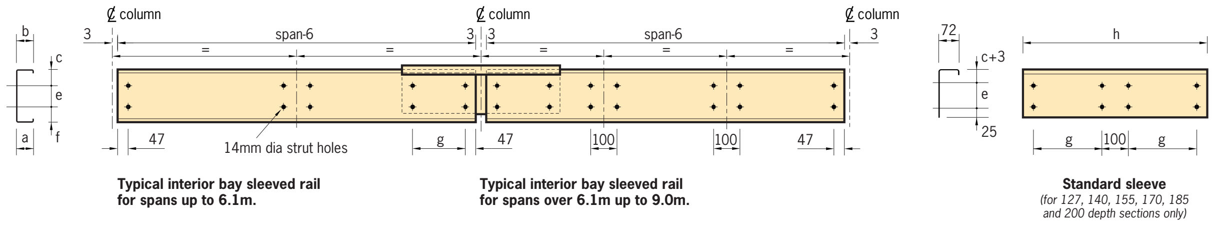
For applications where any other type of cladding system is employed, please consult Tegral Technical Services Department.

# 'CW' Section Detailing

## Sleeved System

The sleeved System comprises a single bay rail with a sleeve connection at alternate supports.

*Note: Sleeves on every joint at penultimate column.*



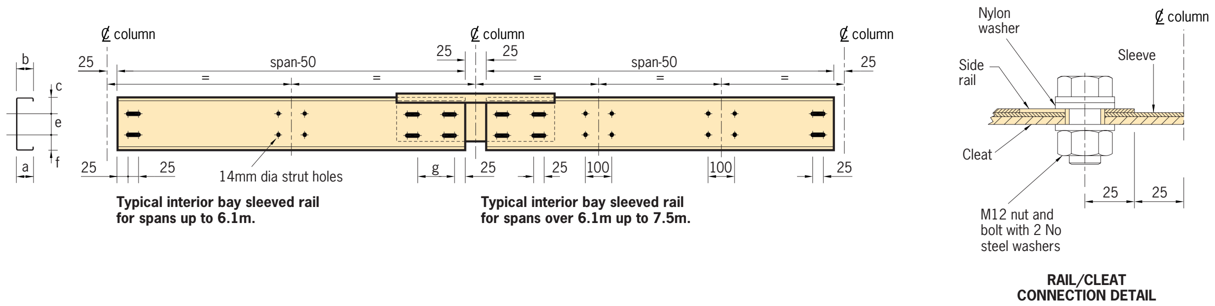

## Firescreen Rails

All cladding and eaves rails must be allowed to expand during a fire. Slotted holes with both steel and nylon washers under the bolt heads are required.

The minimum allowance for expansion should be 7mm/metre length of rail. For rails up to 7.5m span the gap between rails is rounded to 50mm.

The maximum span and spacing should be 7.5m and 2.0m respectively.

Rails should generally be single span, but may be sleeved to achieve continuity.




### General Detailing Notes

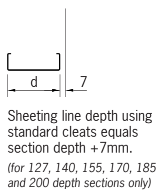
Rails may be fixed with the sheeting flange pointing up or down to suit the detail.

All sleeves are 2.5mm thick.

See page 46 for bracing requirements/details and page 48 for cleat details.

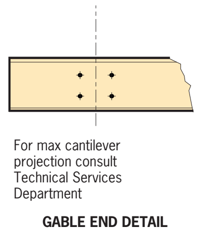
All fixing holes are 14 dia for M12 grade 8.8 bolts.

Bracing Strut holes are 14 sq. punched in pairs.




**STANDARD DIMENSIONS FOR 'CW' SECTIONS**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rail depth | d | 127 | 140 | 155 | 170 | 185 | 200 | 220 | 240 |
| Flange widths | a | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| | b | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| Hole centres | c | 42 | 47 | 45 | 43 | 51 | 58 | 70 | 80 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 62 | 70 | 80 |
| Sleeve Dimensions | g | 208 | 208 | 208 | 208 | 278 | 278 | - | - |
| | h | 566 | 566 | 566 | 566 | 706 | 706 | - | - |







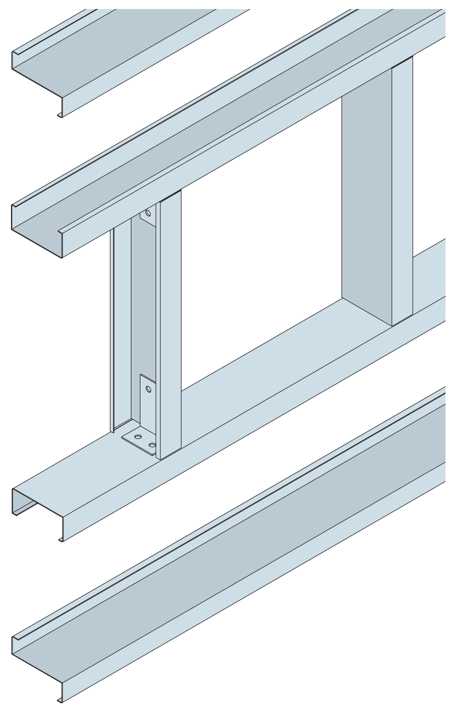



# 'CW' Section Applications

### Window and Door Trimmers

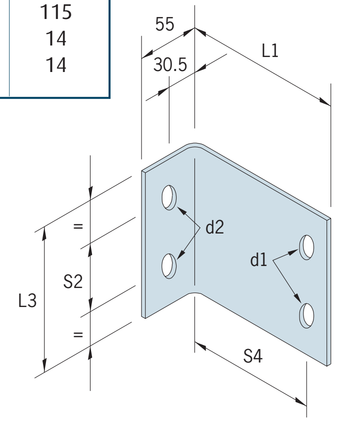
'CW' sections can be incorporated within the cladding rail system to act as window trimmers, and also access door frameworks.

The formulae given under the "Brickwork Supports" heading may be used to calculate an appropriate window trimmer section.



**INSET CLEAT (By special order)**

| SECTION RANGE | 127-140 | 155 | 170-200 |
|---|---|---|---|
| Cleat Code | I1 | I8 | I9 |
| L1 (mm) | 130 | 130 | 140 |
| L3 (mm) | 90 | 110 | 130 |
| S2 (mm) | 42 | 61 | 80 |
| S4 (mm) | 105 | 115 | 115 |
| d1 (mm) | 14 | 14 | 14 |
| d2 (mm) | 13 | 14 | 14 |




All 3mm thick

### Brickwork Supports

'CW' sections are increasingly being used as restraint members at the head of masonry walls. These members are often single spanning, and generally deflection critical as a result of tighter permissible limits required when supporting masonry.

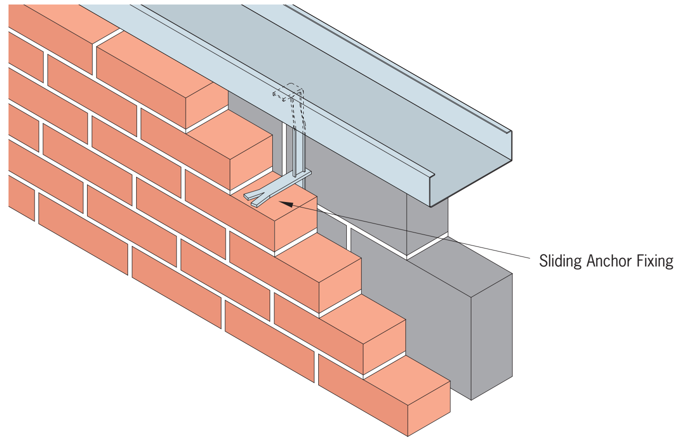
The following formulae may be used to determine a suitable section size for a single span, non-continuous rail. It is assumed that the applied load is uniformly distributed, i.e. for a vertical spanning masonry panel:

Deflection: Ixx req $= \dfrac{dWL^2}{157.44}$

Strength: Mc req $= \dfrac{WL}{5.714}$

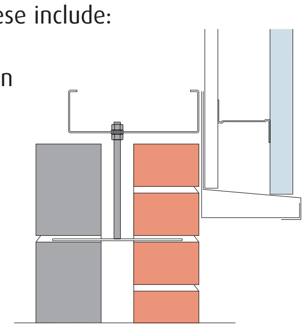
where:
- W = Total unfactored applied wind load (kN)
- L = Span (m)
- d = Deflection ratio (i.e. for an L/360 deflection limit, d = 360)
- Ixx req = value of Ixx required (cm4)
- Mc req = value of moment capacity required (kNm)

Youngs modulus in deflection equation taken as 205 $kN/mm^2$

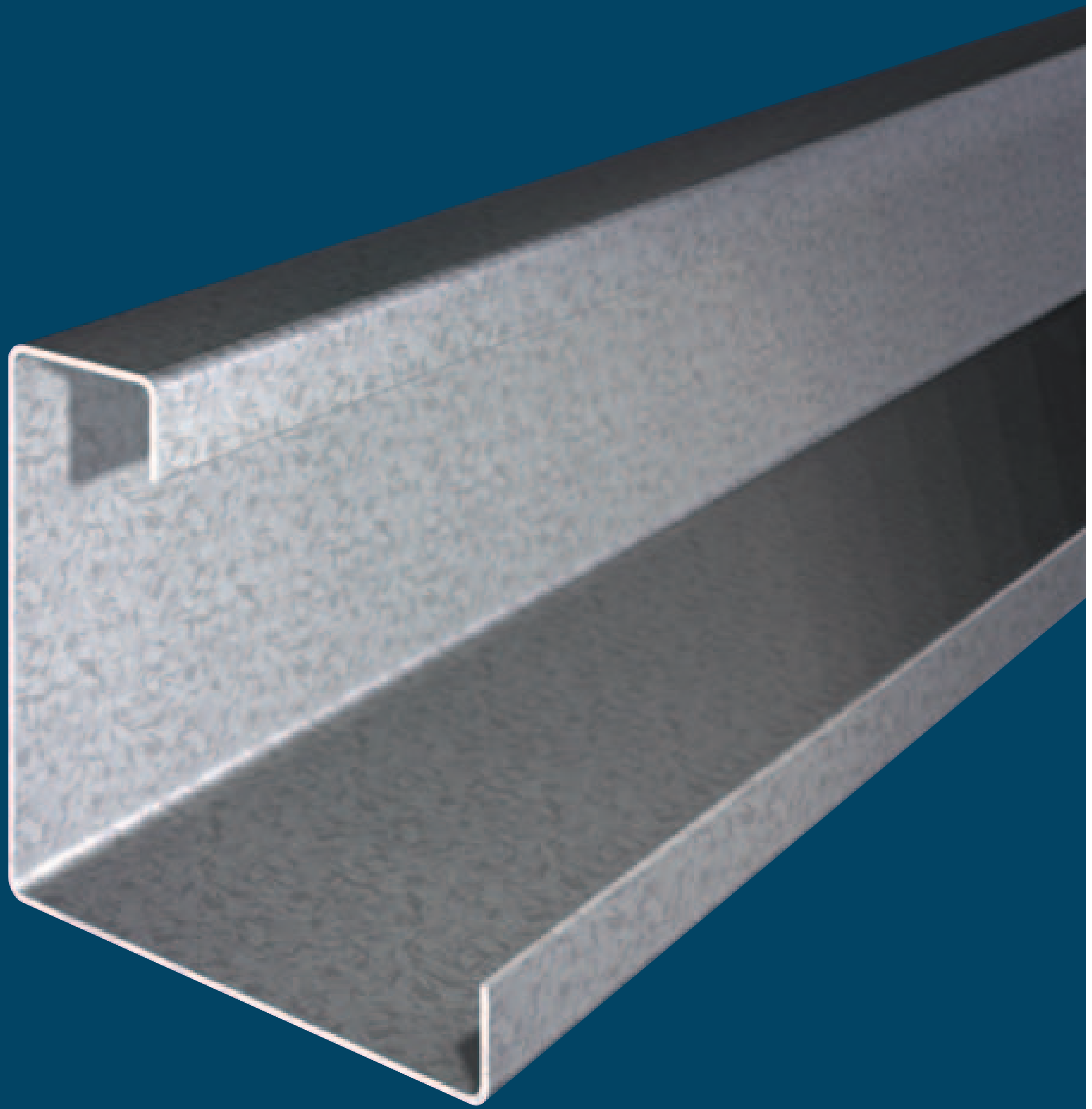



There are a number of suitable methods available for tying the masonry to the 'CW' section, these include:

1. proprietary sliding anchor ties bolted to the 'CW' section
2. threaded rod with standard ties welded to the underside and secured to the 'CW' section with a nut top and bottom
3. flat sheet strips fixed to the 'CW' section using self drilling, self tapping screws, bent down into the perpend joints of the masonry during construction.



# Panel Joint Rail Sections



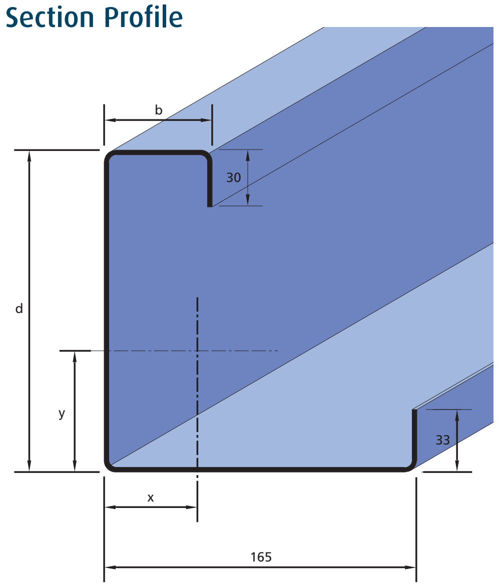






# Panel Joint Rail Sections (PJR)

## 'C' Section Profile




### Specification

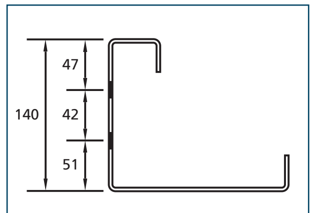
| | |
|---|---|
| Section | Grade S390GD+Z275, zinc coated steel with a minimum yield strength of 390 N/mm$^2$. Refer to page 80 for full technical specification |
| Design | BS5950: Part 5: 1998 |

| STANDARD DIMENSIONS FOR ZED SECTIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Purlin depth | d | **125** | **140** | **155** | **170** | **185** | **200** |
| Flange widths | a | 55 | 58 | 58 | 58 | 58 | 58 |
| | b | 49 | 49 | 49 | 49 | 49 | 49 |
| Hole centres | c | 40 | 47 | 45 | 43 | 51 | 58 |
| | e | 42 | 42 | 61 | 80 | 80 | 80 |
| | f | 43 | 51 | 49 | 47 | 54 | 63 |
| Sleeve Dimensions | g | 208 | 208 | 208 | 208 | 278 | 278 |
| | h | 566 | 566 | 566 | 566 | 706 | 706 |

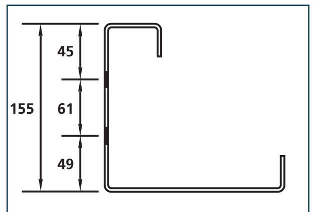
Tegral Panel Joint Rails (PJRs) have been introduced to offer a single, wide flanged member to support horizontal cladding panels at joint positions, where minimum bearing width stipulations would otherwise require the use of a compound solution.

The sections are available from 140mm to 200mm in depth, and are all a minimum 1.8mm thick to ensure that the flange is sufficiently stiff to allow the sheeters to fix the cladding panels.

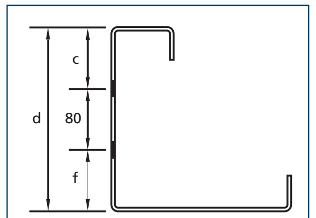
The sections are designed to interconnect with the similar depth Zed and CW sections using the Inset cleats shown on page 59, and provide a flush external and internal line.




PJR 140




PJR 155




PJR 170-200

**Standard holing lines for all sections**

14 dia. web holes may be punched in any pattern on these lines (Dimensions f and c match those shown on page 39 for the Zed range).

## Section Properties

| Section | Depth | b | t | Weight | Area | Ixx | Zxx | rxx | Iyy | Zyy | ryy | x | y | Mca | Mcb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | kg/m | mm$^2$ | cm$^4$ | cm$^3$ | mm | cm$^4$ | cm$^3$ | mm | mm | mm | kNm | kNm |
| PJR140 | 140 | 1.8 | 47 | 5.67 | 702 | 208.14 | 22.97 | 54.51 | 225.70 | 20.00 | 56.76 | 52.09 | 49.32 | 8.78 | 8.09 |
| PJR155 | 155 | 1.8 | 52 | 5.95 | 737 | 272.56 | 27.70 | 60.87 | 232.26 | 20.30 | 56.19 | 50.55 | 56.55 | 10.04 | 9.52 |
| PJR170 | 170 | 1.8 | 57 | 6.23 | 772 | 347.80 | 32.82 | 67.19 | 238.74 | 20.63 | 55.66 | 49.20 | 63.98 | 11.31 | 10.98 |
| PJR185 | 185 | 1.8 | 62 | 6.51 | 807 | 434.47 | 38.32 | 73.44 | 245.29 | 20.98 | 55.18 | 48.02 | 71.58 | 12.60 | 12.43 |
| PJR200 | 200 | 1.8 | 47 | 6.51 | 807 | 480.78 | 38.21 | 77.26 | 249.66 | 20.89 | 55.67 | 45.42 | 74.12 | 13.36 | 12.12 |

'$M_{ca}$' refers to the Ultimate Restrained Capacity of the section with the wide (sheeted) flange in compression. '$M_{cb}$' refers to the Ultimate Restrained Capacity of the section with the narrow (unsheeted) flange in compression. For suction loading, it is suggested that the stress ratio is restricted to 0.80, i.e. $M_x/M_{cb}$<0.80..

# Top Hat Sections

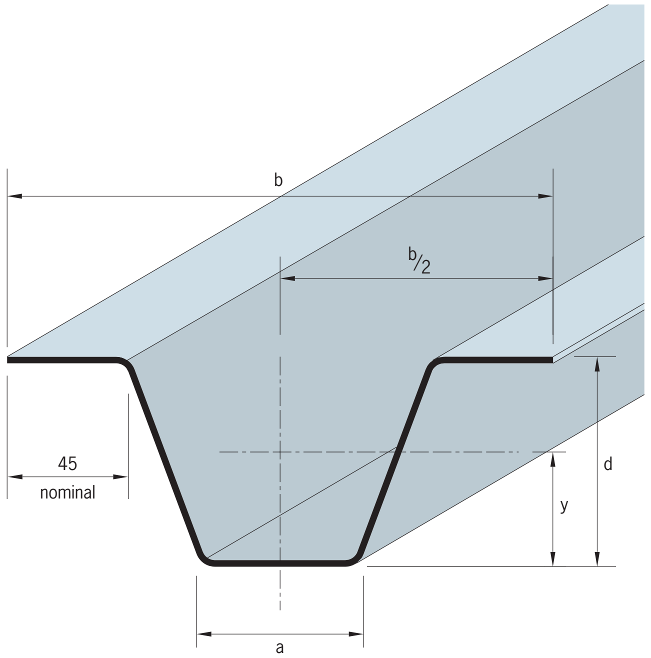
## Top Hat Sections

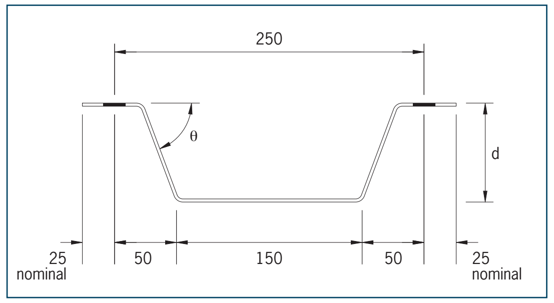
Tegral offers 80mm and 100mm deep Top Hat sections for fixing directly to the flanges of the horizontal rails.

**Specification Section** Grade S390GD+Z275, zinc coated steel with a minimum yield strength of 390 N/mm². Refer to page 78 for full technical specification

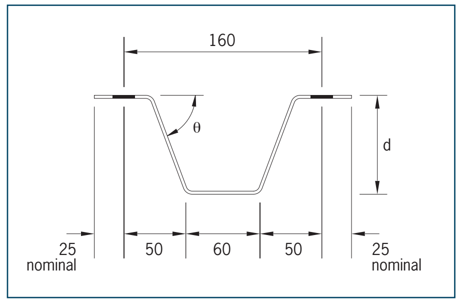
**Design** BS5950:Part5:1998

**Maximum length** 10m




Top Hat at Panel Joints 'THPJ' Ref




Top Hat "TH" Ref

### Section Properties

| Section | Depth | t | θ | Weight | Area | Ixx | Zxx | rxx | Iyy | Zyy | ryy | y | Mca | Mcb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | deg | kg/m | mm² | cm⁴ | cm³ | mm | cm⁴ | cm³ | mm | mm | kNm | kNm |
| **TH80** | 80 | 1.7 | 70 | 4.15 | 508 | 50.73 | 11.61 | 31.26 | 159.74 | 15.36 | 55.46 | 43.76 | 4.28 | 3.60 |
| **THPJ80** | 80 | 1.8 | 70 | 5.65 | 702 | 77.48 | 17.09 | 32.93 | 551.99 | 36.56 | 87.88 | 34.66 | 4.80 | 4.43 |
| **TH100** | 100 | 1.7 | 73 | 4.61 | 571 | 83.96 | 15.58 | 38.13 | 172.9 | 16.63 | 54.71 | 53.96 | 5.74 | 4.96 |
| **THPJ100** | 100 | 1.8 | 73 | 6.25 | 772 | 127.25 | 22.67 | 40.39 | 612.38 | 40.29 | 88.61 | 43.86 | 6.52 | 6.06 |

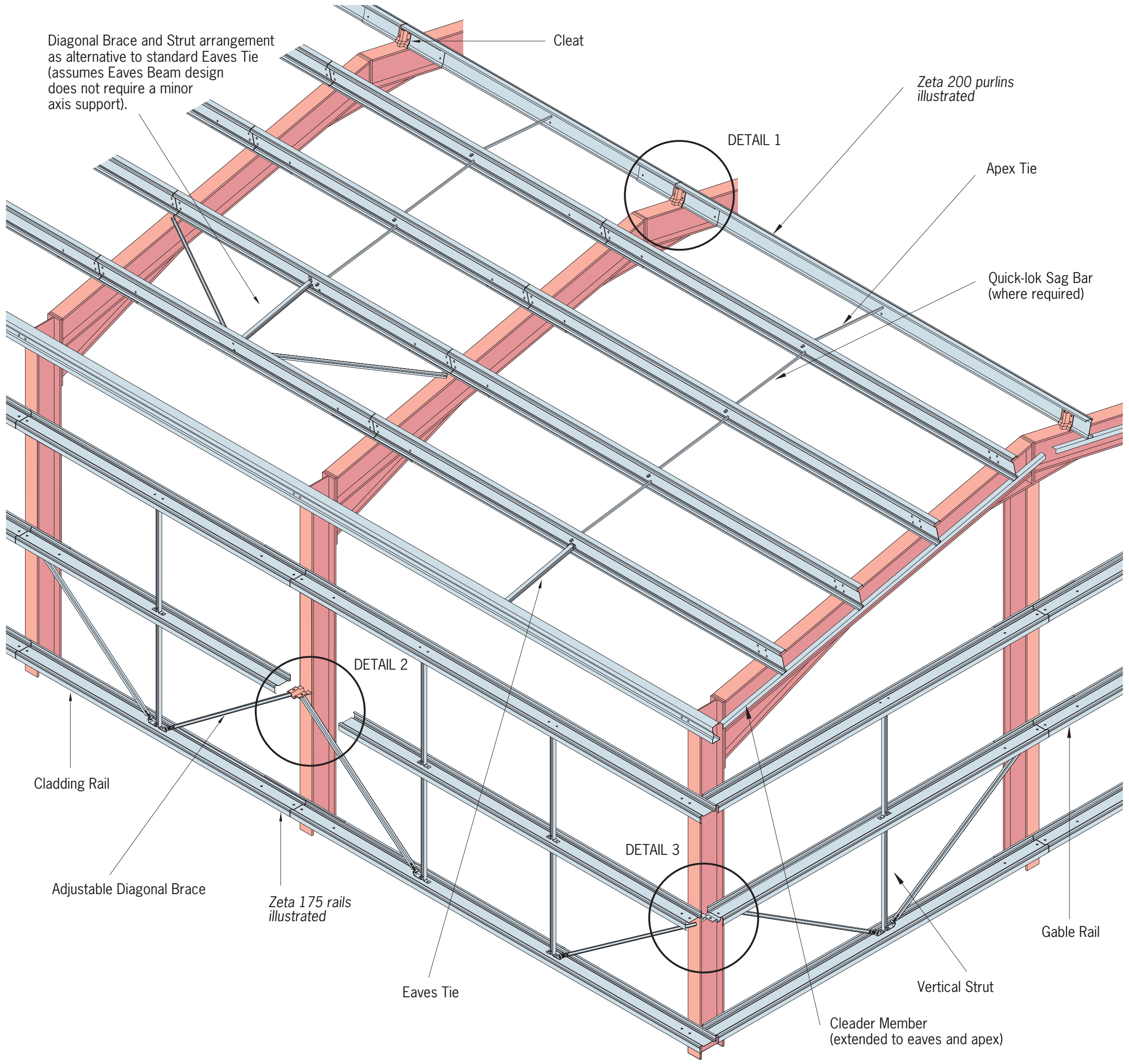
'$M_{ca}$' refers to the Ultimate Restrained Capacity of the section with the stiffened (sheeted) flange in compression. '$M_{cb}$' refers to the Ultimate Restrained Capacity of the section with the two non-stiffened flange in compression.

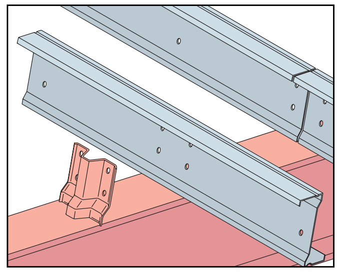




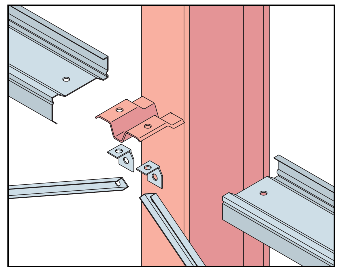


# Purlins - Construction Details

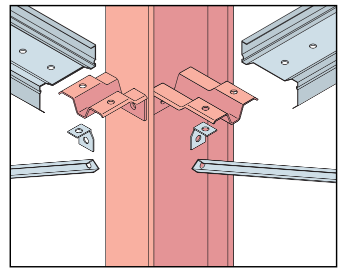


**DETAIL 1**
Sleeve detail.



**DETAIL 2**
Rail and cleat assembly at diagonal brace position.



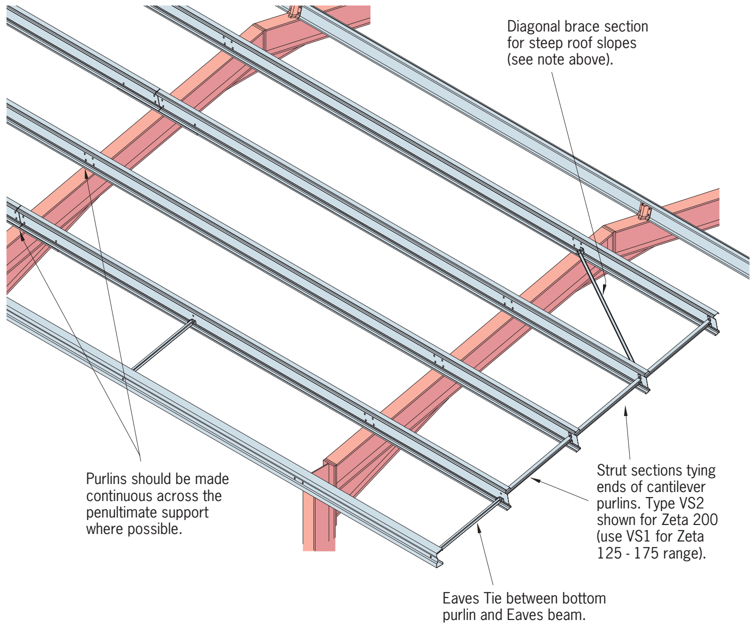
**DETAIL 3**
Corner column cleat detail using extended cleat.

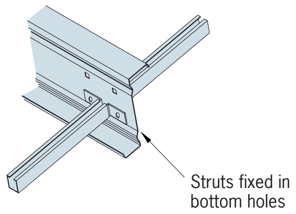
# Purlins - Construction Details

## Cantilever Purlins

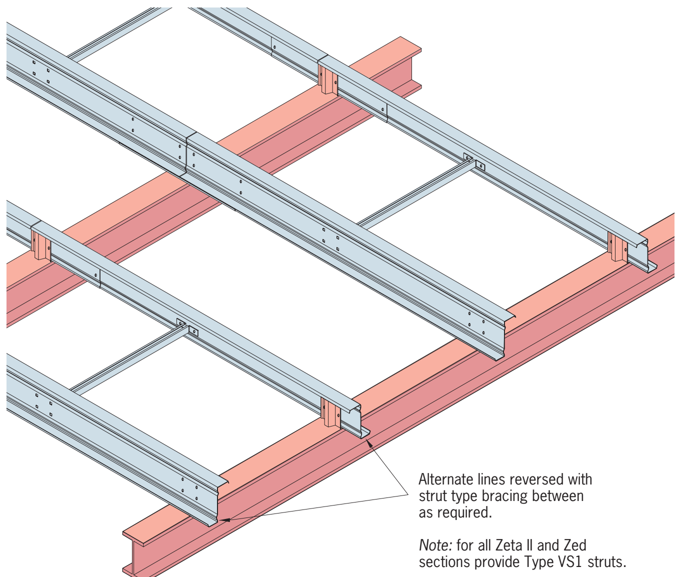
It is sometimes necessary to extend purlins and cladding rails beyond the gable frame creating a cantilever condition. In this situation, the following points should be considered:

1. The sections forming the cantilever must be continuous across the gable frame. The stiffness of the cantilever is improved if continuity is also provided across the penultimate support (eg by providing a sleeve).
2. The cantilever ends of the sections must be braced to prevent lateral displacement. The Ayrshire strut section indicated on pages 21, 33 or 47 can be provided as a tie member. Alternatively, where the cantilevered sections are to be clad, the inclusion of cleader members to support the fascia cladding should be sufficient.
3. For steep slopes i.e. $\theta > 20°$ for Zeta, $\theta > 30°$ for Zeta II and Zed, diagonal members should be located at the top of the slope (or at the base for cladding rails) to prevent displacement.
4. Cantilevers are generally deflection rather than strength critical. We suggest that deflection of the cantilever is checked for the worst relevent load combination before confirming its strength capacity. For further advice and confirmation of suitable sizes for given condition, please consult our Technical Services Department.




**Strut location for all Zeta 2 and Zed sections (strut type VS1)**




## Shallow Pitched Roofs ($\theta < 3°$)

In this situation it is necessary to avoid a potential build-up of lateral force in any one direction due to the inclination of the principle axes of the purlins. This can be achieved by reversing alternate lines of section to face each other. When sag bars are required in accordance with the tables on pages 14, 29 or 41 we recommend that pairs of sections are braced together at the appropriate positions (i.e. mid-span or third points) using a standard Tegral strut section, VS1 or VS2.







# Purlins - Construction Details

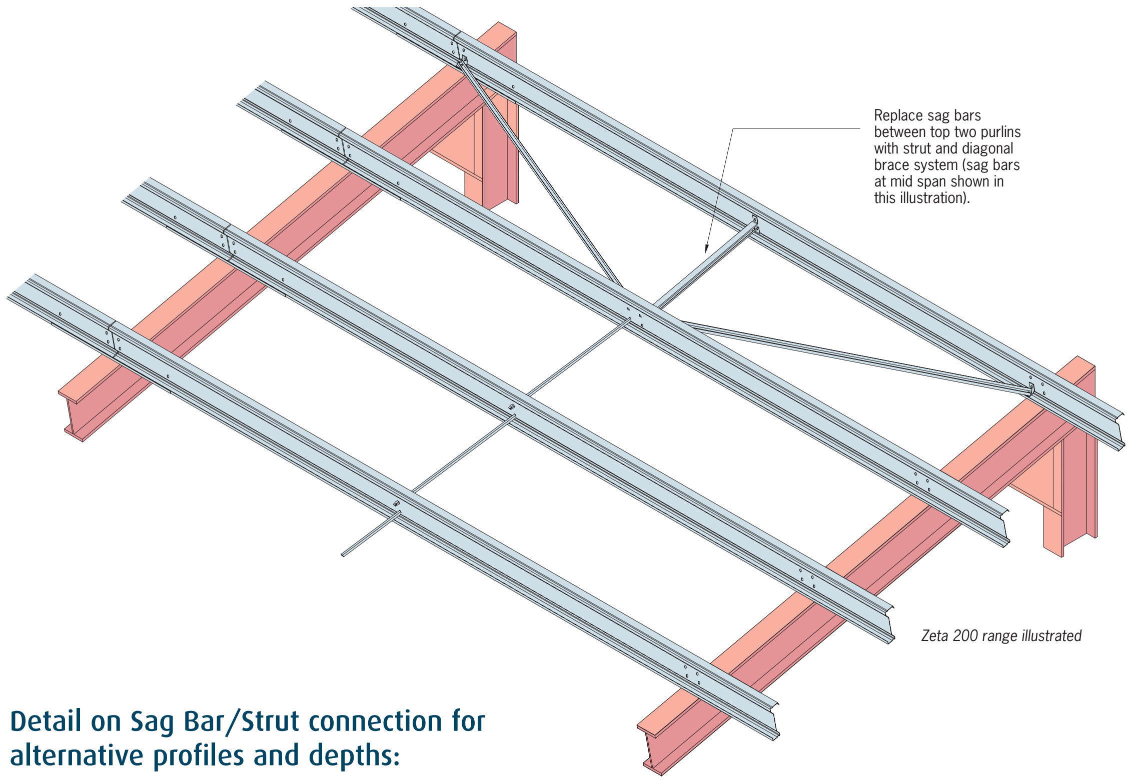
## Monopitched Roofs

Where sag bars are required for a conventional duo-pitched roof, in accordance with the tables on pages 14, 29 or 41 they will also be required for a monopitched roof.

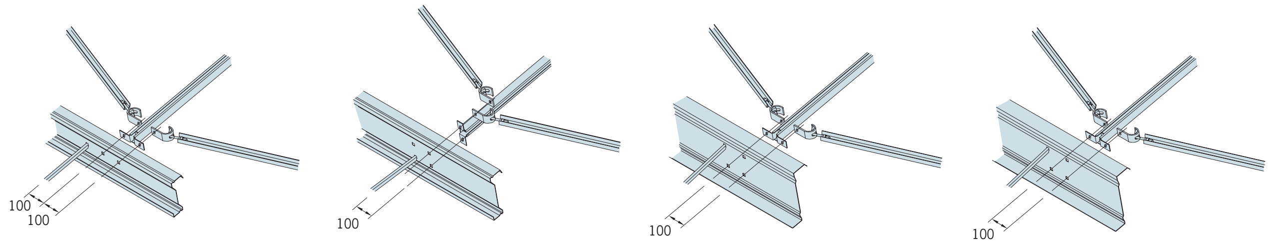
It is suggested that strut and diagonal bracing sections are provided between the top two purlins at the higher eaves. This acts as a substitute for the apex tie member in a conventional duo-pitched roof and ties the purlin system back to the steelwork. Sag bars can be provided in the required manner below these top two purlins.

An alternative solution is to provide an "eaves tie" member at the high eaves position, fixed back to a suitable structural member capable of carrying the downslope forces from the purlins.

It should be noted that where sag bars are not required in accordance with the tables on pages 14, 29 or 41 (i.e. Zeta purlins in the majority of applications), no sag bars are required to the equivalent monopitched roof.




**Detail on Sag Bar/Strut connection for alternative profiles and depths:**




ZETA 125 -175 RANGE | ZETA 200 RANGE | ZETA 2 AND ZED RANGE

# Purlins - Construction Details

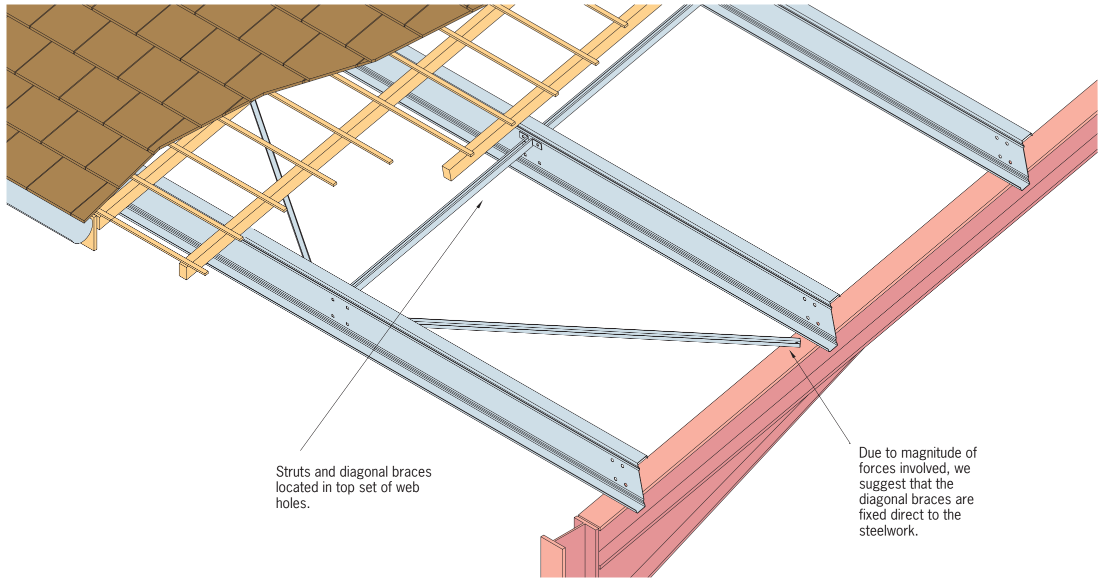
## Tiled Roofs

The use of cold rolled steel purlin systems to support traditional tiled roof constructions has become increasingly popular over recent years. The following offers design and installation advice with regard to the purlins in this situation.

Unlike a conventional screw fixed steel cladding system, a built up tiled roof construction is not deemed to act as a diaphragm panel. Consequently, the purlin sections must be designed for a bi-axial bending condition, taking into account the downslope forces. The timber rafters fixed to the top flange of the purlins are still considered to provide full lateral restraint to that flange in compression.

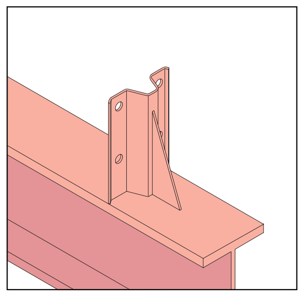
Struts are provided to act as supports to the downslope forces as appropriate, with diagonal braces to transfer these forces back to the supporting steelwork. It should be noted that ties across the apex are not required in this situation, assuming the timber rafters are connected at the ridge point.

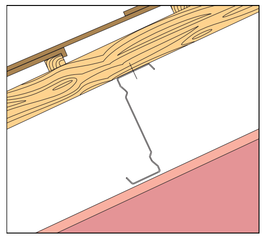
The number of struts and diagonal bracings required is a function of the geometry and loading conditions in each individual case, and advice should be sought from Tegral Technical Services Department. Alternatively, the Tegral Purlin and Cladding Rail Design Software providing an accurate and economic design, is available upon request.



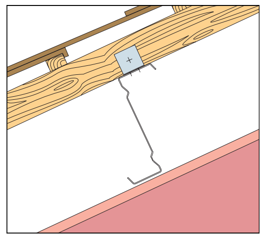

## Tiled Roof Cleats

Due to the increase in Dead loads for a tiled roof construction, coupled with a steeper roof slope, a check on the suitability of Tegrals standard cleats (shown on pages 22, 34 or 48) must be made, and a stiffener plate provided where appropriate. Particular care must be taken where the diagonal braces are secured back to the steelwork. Due to the magnitude of force involved, it is suggested that these are fixed directly to the steelwork flange.





Timber rafter fixed direct to putin using appropriate screw fixing.



Angle cleat fixed with appropriate screw fixing (by others).



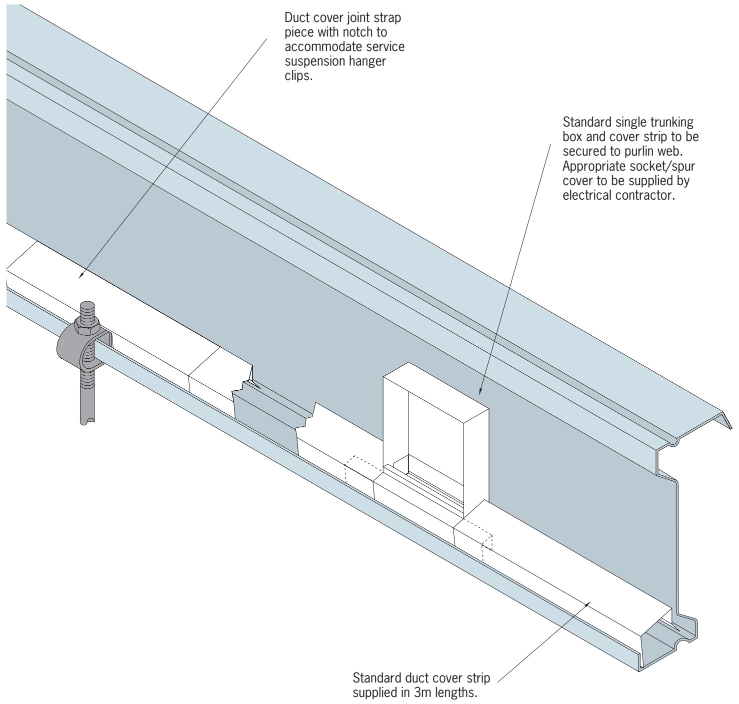


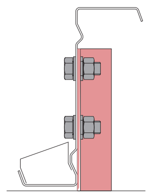
# Purlins - Construction Details

## Ductcover System

Tegral has developed a Ductcover system to complement our purlin ranges. The system is manufactured from lightweight white polyester coated galvanised steel as a standard finish.

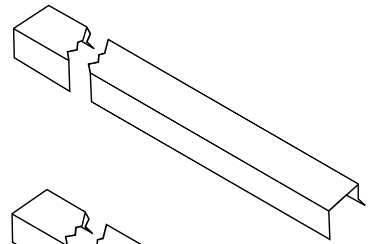
The range of components available are designed to offer a comprehensive system compatible with standard electrical accessories and service suspension clips and hangers.



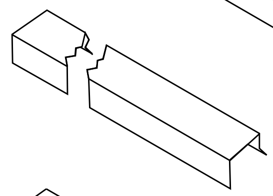



## System Components

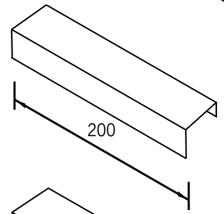
Standard Ductcover strip, 3m length



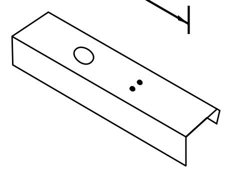
Optional 1m length Ductcover strip



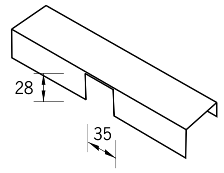
Standard Ductcover Joint Strap



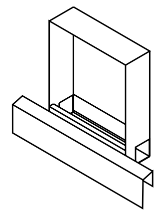

Gland Inlet/Outlet Joint Strap supplied with a 20mm dia hole and a 15A 3 No. Terminal Strip (supplied with or without gland)



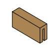
Notched Ductcover Joint Strap for use at service suspension hanger positions




Standard single PVC trunking box (25mm depth) with front cover strip to suit MK Crabtree or Tenby socket/spur cover



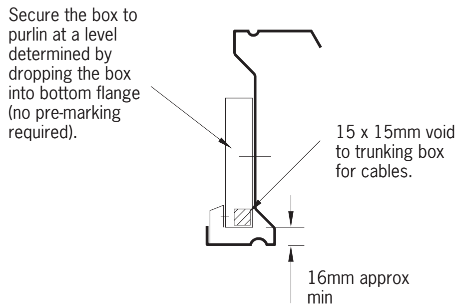
Earth Continuity Strip



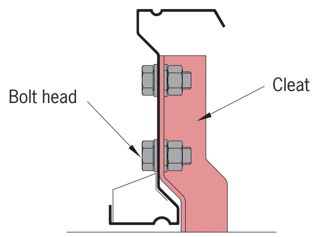
# Purlins - Construction Details

## Duct cover Installation

1. Drop the Trunking Box into the bottom flange of the purlin at the required position. Secure the box to the web of the purlin at this level using self drilling, self tapping screws or bolts as appropriate.




2. Snap the Standard Ductcover Strips into place and slide along to abut the Trunking Box. They are designed to lap over the outstand of the Trunking Box cover strip. Optional 1m lengths of the Standard Ductcover Strip are also available. For Zeta 125 and 200 deep sections, together with all the Zeta 2, their use is suggested at cleat positions where the strips must be snapped into place clear of the bolt positions and slid along under the bolt heads as appropriate.

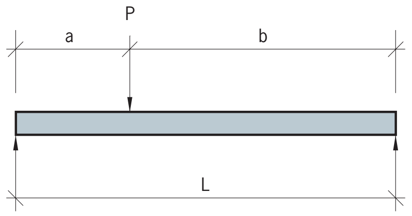



3. Snap over the Standard Joint Straps between strips. A nominal clearance between abutting strips of 50mm is suggested.
4. Notched Joint Straps are located over services suspension clips and hangers where appropriate.
5. Gland Inlet/Outlet Pieces are treated in a similar manner, although we suggest that the gap between the Ductcover strips should be 100mm minimum to allow for the gland and terminal strip.
6. Earth Continuity Strips are available for all non continuous joints in the purlin system, i.e. unsleeved joints. These can be located over the lip to the bottom flange of the purlin.

   A Notched Joint Strap can be placed over the Earth Continuity Strip as appropriate.

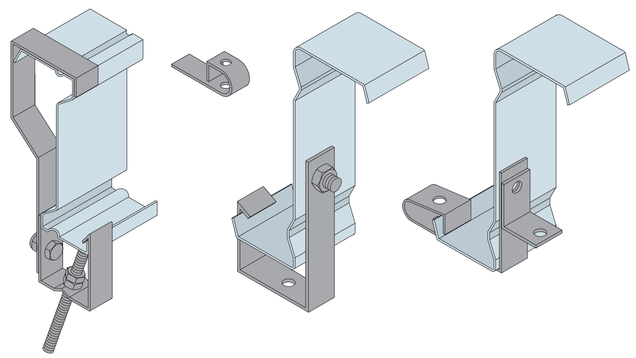
## Service Suspension Clips and Hangers

A proprietary range of clips and hangers for supporting services are available in the market to suit all Tegral's purlin sections (see below).
The effect of an applied point load on the purlin must be checked. We suggest that these loads should be recalculated as an equivalent udl applied to a simply supported beam using the formula below:




moment due to point load, M $= \frac{Pab}{L}$ P in kN a, b, L in metres

the equivalent udl $= \frac{8M}{L}$ (in kN)

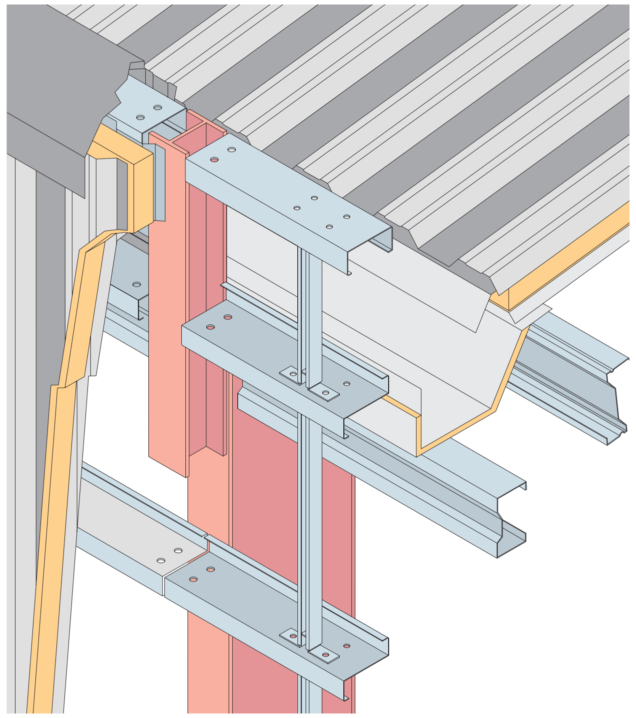


The capacities of the various clips and hangers themselves are available from the manufacturers.
It should be noted, however, that for clips supported off the bottom flange of the purlin only, the maximum applied loading should not exceed 15kg (working load) to ensure that lateral displacement of the purlin does not occur. This is irrespective of any higher capacities quoted by the clip manufacturers. Where the loading exceeds 15kg, this load must be transferred back to the web, or whole, of the section using the appropriate part wrap-around or total wrap-around bracket.





Purlins - Construction Details

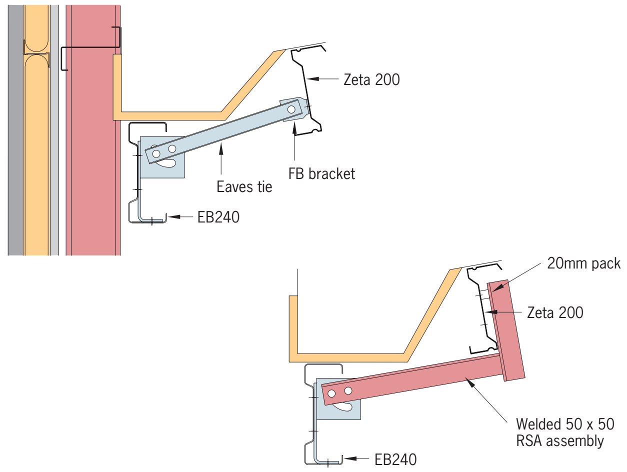


## Parapet Details

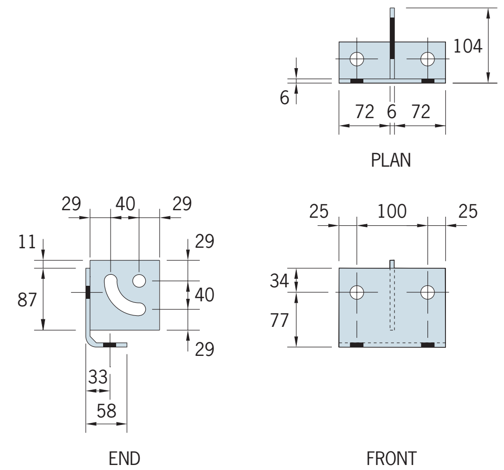
Tegral's comprehensive range of sections can be integrated to form a parapet detail as required.

The rails above eaves level are often single spanning between the hot rolled cantilevered posts at each frame position. A 'C' or Eaves Beam section may be incorporated as the top, capping member to suit the detail.

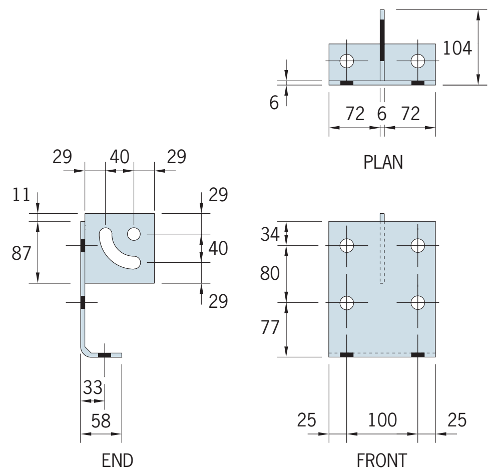
The standard strut and diagonal bracing system should be continued up to and including this top rail.




If an Eaves Beam section is employed as a gutter bearer behind the parapet, consideration must be given to its restraint condition against lateral buckling. We would suggest that where the eaves beam is used purely as a gutter bearer, the section is deemed to be laterally unrestrained, particularly if subject to a nett wind uplift and horizontal suction force.
The eaves tie detail indicated on pages 14, 29 or 41 is not deemed to provide a lateral restraint position in this situation, and we would recommend the use of one of the alternative details shown above.

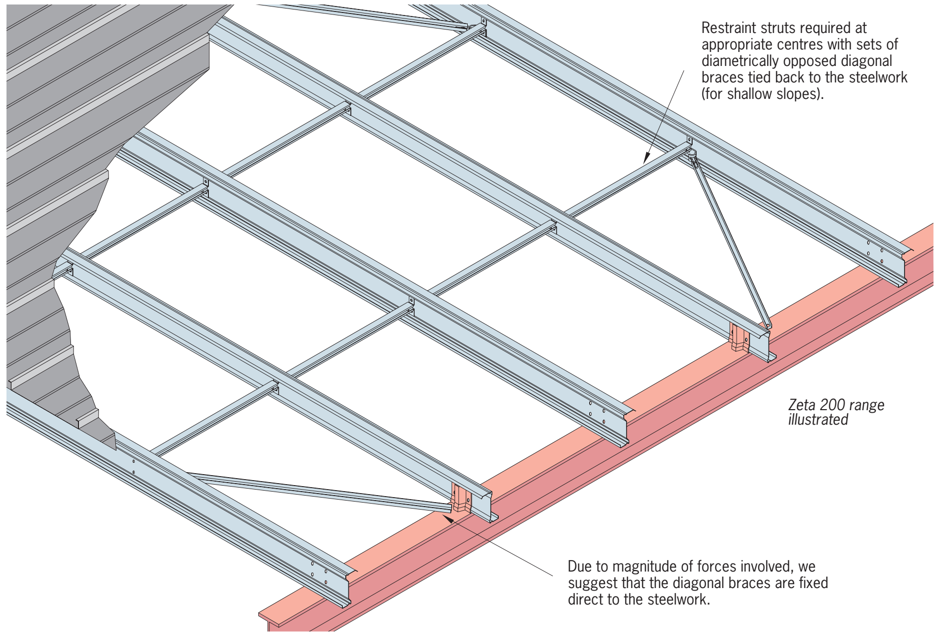



**EB160 RESTRAINT BRACKET**
**(By Special Order)**




**EB240 RESTRAINT BRACKET**
**(By Special Order)**

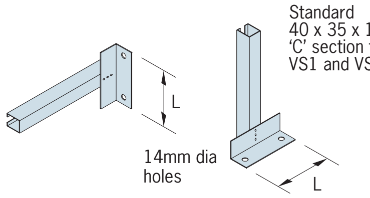
# Purlins - Construction Details



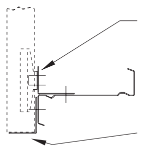

## Restraint Struts

Where cladding is deemed not to provide lateral restraint, special restraining sections, termed "Restraint Struts", are available to act as minor axis supports against lateral buckling as appropriate.

For shallow pitched roof applications (θ < 3°), two sets of diametrically opposed diagonal bracings should be provided, as a minimum, to transfer the restraint forces back to the supporting structure. For steeper slopes, one set at eaves level should be provided as a minimum. The total number of diagonal bracings required, in one or both directions, is a function of the roof slope length.



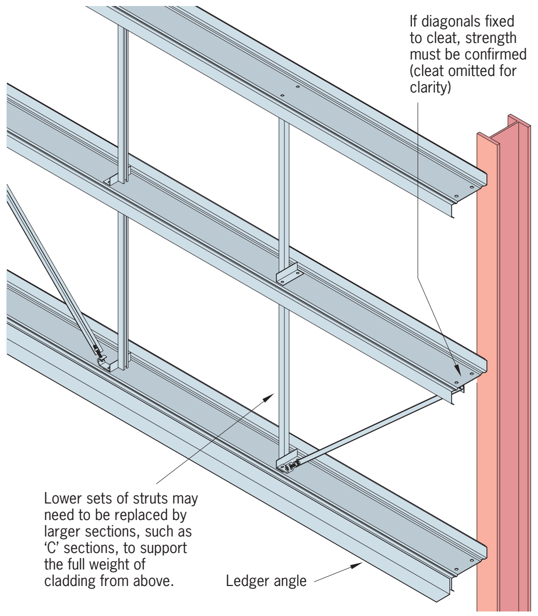

50 x 50 angle, length L to suit standard holing line centres for each Zeta II and Zed section plus 50mm. (Clamp plate length amended to suit).
For Zeta 125-175 range, use standard VS1 strut.
For Zeta 200 range use standard VS2 strut, (see page 20).




## Non-Restraining Cladding

Certain types of sheeting are not deemed to provide lateral restraint to the purlin and cladding rail sections. These include clip fixed standing seam profiles fixed directly to the sections, without the presence of a steel lining panel, and certain secret fix wall cladding panels. Another common application where this situation arises would be for purlins supporting a proprietary suspended ceiling system.

The load tables published in this manual are not applicable in these situations, and advice should be sought from Tegral Technical Services Department. Alternatively, the Tegral Purlin and Cladding Rail Design Software provides an accurate and economic design, and is available upon request.

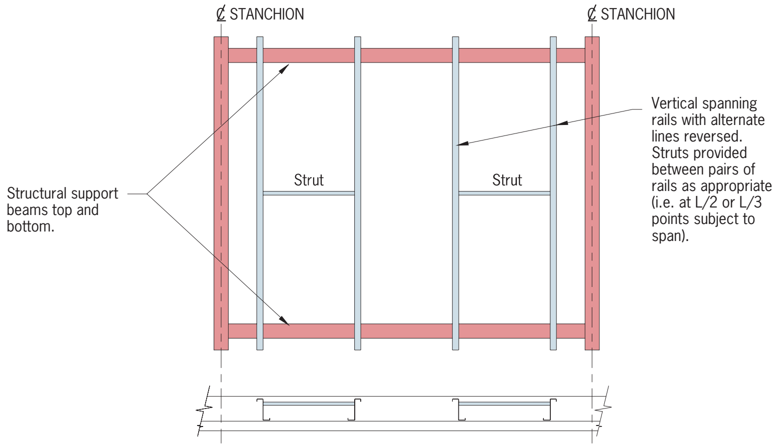




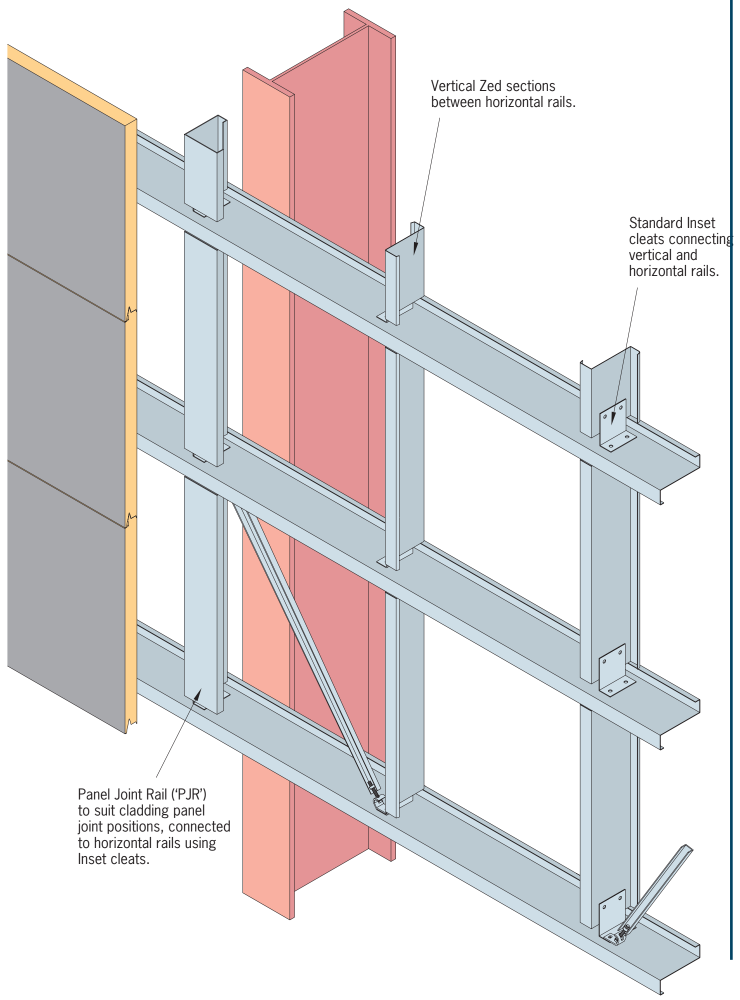





# Rails - Construction Details




VERTICAL AND HORIZONTAL GRILLAGE




## Horizontal Cladding

Where horizontal cladding is required to be fixed to the cladding rail system, there are a number of alternative solutions available to the designer. The following pages highlight four possible methods.

1. **Vertical spanning rails**
   Vertical spanning rails between a structural top and bottom member, and across any intermediate members as appropriate. In this solution, "ties" between pairs of sections should be provided to prevent lateral displacement under loading.

2. **Mini-zed spacers in the cavity of a built-up cladding system**
   If a built-up cladding system is employed, the liner panel can be fixed vertically in the conventional manner between horizontal rails, with mini-zed spacer bars spanning vertically between rails. The horizontal outer sheet can then be fixed to these spacer bars. This solution assumes that the vertical liner is aesthetically acceptable, and the mini-zed spacer bar is structurally capable of spanning between the horizontal rails. It should also be noted that, in this situation, the horizontal rails are restrained laterally and the published load tables in this manual are applicable.

# Rails - Construction Details

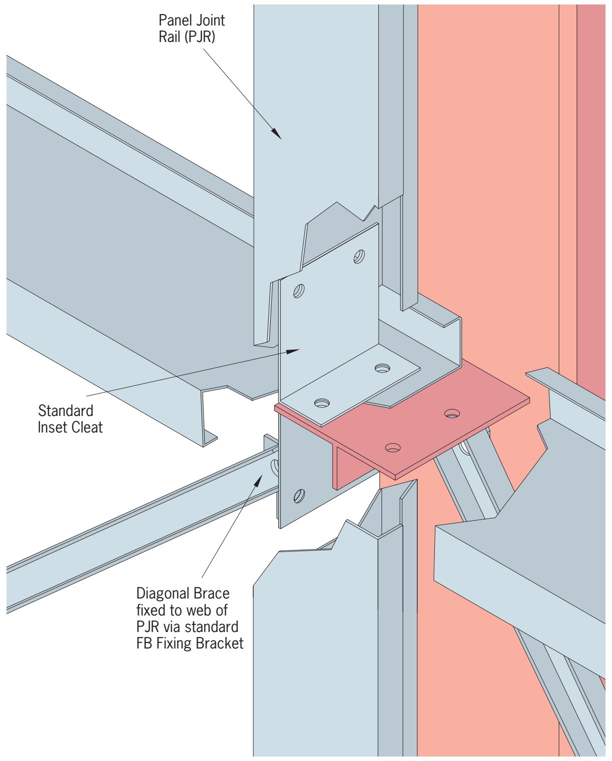
**3. Vertical and horizontal cold rolled grillage**

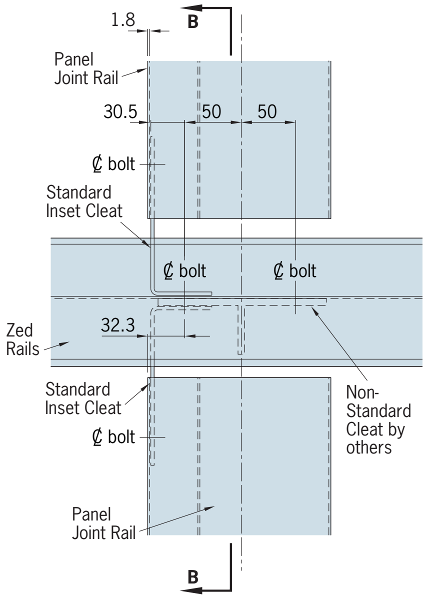
The most frequently employed detail involves the use of vertical spanning rails fixed between the conventional horizontal spanning cladding rail system as illustrated opposite.

Zed sections can be used for the vertical rails, with "Panel Joint Rails" (PJRs) at cladding joint positions where a double bearing width is required. Tegral's PJR range is fully compatible with the Zed sections and can be interconnected using the appropriate Inset cleat. Refer to page 61 for PJR properties, and page 59 for Inset cleat details.

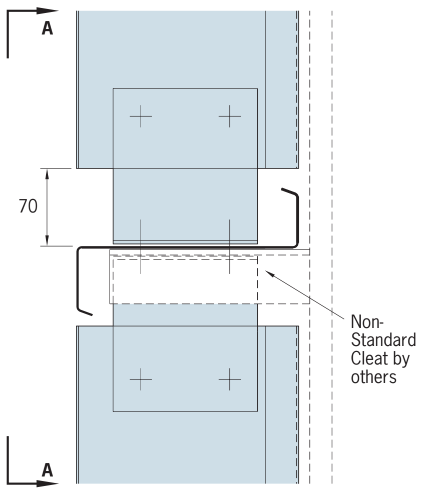
The PJR section has been specifically developed such that the centre line of the flange coincides with the gridline when standard Inset cleats are used. The vertical rails act as "struts" in the conventional strut and diagonal brace system required for the horizontal rails.

It should be noted that the horizontal rails in this situation are laterally restrained at cleat and vertical rail positions only, and should be checked for lateral buckling between these points accordingly. Please consult Tegral Technical Services Department for advice. Alternatively, the "Tegral" Purlin and Cladding Rail Design Software can be used to design laterally unrestrained sections. This software is available upon request.




FRONT VIEW (A-A)




SECTION THROUGH (B-B)





# Rails - Construction Details

**4. Structural Top Hat solution**

A similar solution to the vertical rail/PJR arrangement shown on the previous pages, but using fewer components and fixings.

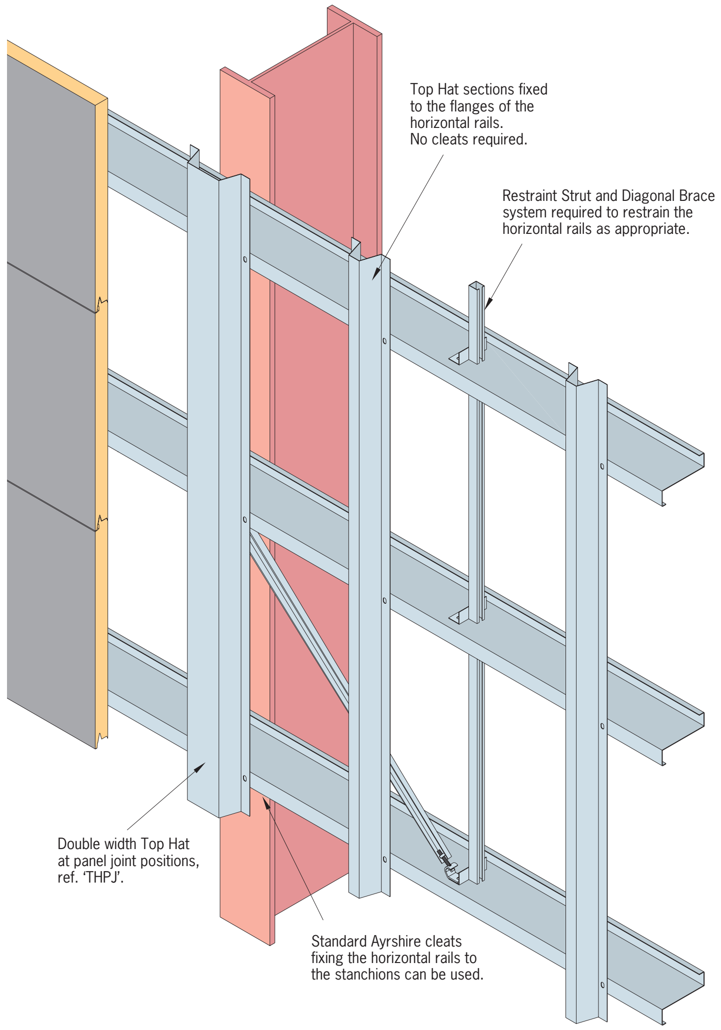
The use of a Top Hat section spanning between the conventional horizontal rails, and fixed to the outer flange removes the need for Inset cleats and reduces the number of bolt fixings required by up to 20%.

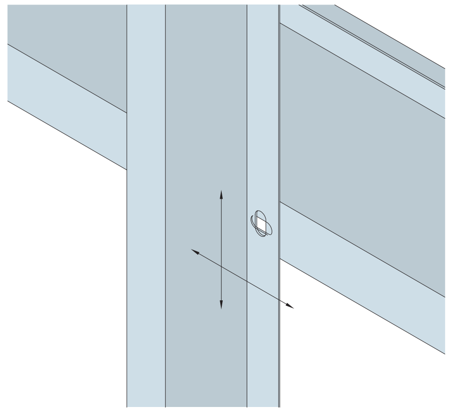
A separate bracing support system (Restraint Struts and Diagonal Bracing) is required for the horizontal rails to afford restraint and maintain alignment during construction.

A "Panel Joint Top Hat" is also available for cladding joint positions - see details below.

The Top Hat profile can be connected to the full range of Tegral sections, primarily Zeta, Zeta 2, Zed and CW ranges.

It should be noted that the horizontal rails in this situation are not restrained by the cladding system, and a separate restraining system in the form of Restraint Struts is required. Please consult Tegral Technical Services Department for advice. Alternatively, the "Tegral" Purlin and Cladding Rail Design Software can be used to design laterally unrestrained sections. This Software is available upon request.



Slotted holes are available in the vertical Top Hat sections, and horizontally in the flange of the rails. This provides vertical and horizontal adjustment on site during construction to aid alignment.

# Zeta Ultimate Load Capacities

## Zeta Double Span (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 1/12513 | 1/12514 | 1/12515 | 1/12517 | 1/12520 | 1/15013 | 1/15014 | 1/15015 | 1/15017 | 1/15020 | 1/17513 | 1/17514 | 1/17515 | 1/17517 | 1/17520 | 1/20013 | 1/20014 | 1/20015 | 1/20016 | 1/20018 | 1/20020 | 1/20025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 2.73 | 2.95 | 3.16 | 3.58 | 4.21 | 3.28 | 3.53 | 3.78 | 4.28 | 5.04 | 3.53 | 3.80 | 4.07 | 4.62 | 5.43 | 3.79 | 4.08 | 4.37 | 4.66 | 5.24 | 5.82 | 7.22 |
| 4.50 | Gravity Load | 12.658 | 13.856 | 15.039 | 17.380 | 20.187 | 17.157 | 19.073 | 20.921 | 24. 523 | 29.175 | 20.188 | 22.510 | 24.751 | 29.135 | 34.862 | 22.999 | 25.746 | 28.398 | 31.015 | 36.161 | 40.468 | 52.612 |
| | δ = Span/180 | 8.252 | 8.883 | 9.515 | 10.778 | 12.634 | 14.881 | 16.031 | 17.182 | 19.474 | 22.866 | 20.193 | 21.770 | 23.329 | 26.446 | 31.073 | 28.678 | 30.921 | 33.155 | 35.378 | 39.796 | 44.193 | 55.033 |
| | Wind Uplift | 11.075 | 12.124 | 13.159 | 15.207 | 17.663 | 15.013 | 16.689 | 18.306 | 21.457 | 25.528 | 17.664 | 19.697 | 21.657 | 25.493 | 30.504 | 20.124 | 22.528 | 24.848 | 27.138 | 31.641 | 35.409 | 46.036 |
| 5.00 | Gravity Load | 11.392 | 12.470 | 13.535 | 15.642 | 18.168 | 15.442 | 17.166 | 18.829 | 22.070 | 26.258 | 18.169 | 20.259 | 22.276 | 26.222 | 31.375 | 20.699 | 23.171 | 25.558 | 27.913 | 32.545 | 36.421 | 47.351 |
| | δ = Span/180 | 6.525 | 7.024 | 7.524 | 8.523 | 9.990 | 12.053 | 12.985 | 13.918 | 15.774 | 18.521 | 16.356 | 17.634 | 18.896 | 21.421 | 25.169 | 23.229 | 25.046 | 26.855 | 28.657 | 32.235 | 35.797 | 44.577 |
| | Wind Uplift | 9.968 | 10.912 | 11.843 | 13.687 | 15.897 | 13.511 | 15.020 | 16.476 | 19.312 | 22.975 | 15.898 | 17.727 | 19.491 | 22.944 | 27.454 | 18.112 | 20.275 | 22.363 | 24.424 | 28.477 | 31.868 | 41.432 |
| 5.50 | Gravity Load | 10.356 | 11.337 | 12.305 | 14.220 | 16.516 | 14.038 | 15.605 | 17.118 | 20.064 | 23.871 | 16.517 | 18.418 | 20.251 | 23.838 | 28.523 | 18.817 | 21.065 | 23.235 | 25.376 | 29.586 | 33.110 | 43.046 |
| | δ = Span/180 | 5.521 | 5.944 | 6.366 | 7.212 | 8.453 | 9.961 | 10.732 | 11.502 | 13.036 | 15.307 | 13.518 | 14.574 | 15.617 | 17.703 | 20.801 | 19.198 | 20.699 | 22.195 | 23.683 | 26.640 | 29.584 | 36.840 |
| | Wind Uplift | 9.062 | 9.920 | 10.767 | 12.442 | 14.452 | 12.283 | 13.655 | 14.978 | 17.556 | 20.887 | 14.452 | 16.115 | 17.719 | 20.858 | 24.958 | 16.465 | 18.432 | 20.330 | 22.204 | 25.888 | 28.971 | 37.666 |
| 6.00 | Gravity Load | 9.493 | 10.392 | 11.279 | 13.035 | 15.140 | 12.868 | 14.305 | 15.691 | 18.392 | 21.881 | 15.141 | 16.883 | 18.563 | 21.851 | 26.146 | 17.249 | 19.309 | 21.298 | 23.261 | 27.121 | 30.351 | 39.459 |
| | δ = Span/180 | 4.486 | 4.829 | 5.172 | 5.859 | 6.868 | 8.370 | 9.018 | 9.665 | 10.954 | 12.862 | 11.359 | 12.246 | 13.123 | 14.876 | 17.479 | 16.131 | 17.393 | 18.650 | 19.900 | 22.385 | 24.859 | 30.956 |
| | Wind Uplift | 8.307 | 9.093 | 9.869 | 11.405 | 13.247 | 11.259 | 12.517 | 13.730 | 16.093 | 19.146 | 13.248 | 14.772 | 16.243 | 19.120 | 22.878 | 15.093 | 16.896 | 18.636 | 20.353 | 23.731 | 26.557 | 34.527 |
| 6.50 | Gravity Load | 8.763 | 9.593 | 10.412 | 12.032 | 13.975 | 11.878 | 13.205 | 14.484 | 16.977 | 20.198 | 13.976 | 15.584 | 17.135 | 20.171 | 24.135 | 15.922 | 17.824 | 19.660 | 21.472 | 25.035 | 28.016 | 36.424 |
| | δ = Span/180 | 3.874 | 4.171 | 4.467 | 5.060 | 5.932 | 6.883 | 7.415 | 7.948 | 9.008 | 10.577 | 9.678 | 10.434 | 11.181 | 12.675 | 14.893 | 13.745 | 14.820 | 15.891 | 16.957 | 19.074 | 21.181 | 26.377 |
| | Wind Uplift | 7.668 | 8.393 | 9.110 | 10.528 | 12.228 | 10.393 | 11.554 | 12.674 | 14.855 | 17.673 | 12.229 | 13.636 | 14.993 | 17.649 | 21.118 | 13.932 | 15.596 | 17.203 | 18.788 | 21.905 | 24.514 | 31.871 |
| 7.00 | Gravity Load | | | | | | 11.030 | 12.261 | 13.449 | 15.765 | 18.755 | 12.978 | 14.471 | 15.911 | 18.730 | 22.411 | 14.785 | 16.551 | 18.256 | 19.938 | 23.246 | 26.015 | 33.822 |
| | δ = Span/180 | | | | | | 5.655 | 6.092 | 6.529 | 7.400 | 8.689 | 8.308 | 8.957 | 9.599 | 10.881 | 12.785 | 11.852 | 12.779 | 13.702 | 14.621 | 16.446 | 18.264 | 22.743 |
| | Wind Uplift | | | | | | 9.651 | 10.729 | 11.768 | 13.794 | 16.411 | 11.355 | 12.662 | 13.922 | 16.389 | 19.610 | 12.937 | 14.482 | 15.974 | 17.446 | 20.341 | 22.763 | 29.594 |
| 7.50 | Gravity Load | | | | | | | | | 14.714 | 17.505 | 12.113 | 13.506 | 14.850 | 17.481 | 20.917 | 13.799 | 15.447 | 17.039 | 18.609 | 21.697 | 24.281 | 31.567 |
| | δ = Span/180 | | | | | | | | | 7.011 | 8.232 | 7.167 | 7.727 | 8.280 | 9.386 | 11.028 | 10.324 | 11.132 | 11.936 | 12.736 | 14.326 | 15.910 | 19.812 |
| | Wind Uplift | | | | | | | | | 12.874 | 15.317 | 10.598 | 11.818 | 12.994 | 15.296 | 18.302 | 12.075 | 13.517 | 14.909 | 16.283 | 18.985 | 21.245 | 27.621 |

## Zeta Heavy End Bay (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 1/15013 .17 | 1/15014 .20 | 1/15015 .20 | 1/17513 .17 | 1/17514 .20 | 1/17515 .20 | 1/20013 .18 | 1/20014 .18 | 1/20014 .20 | 1/20015 .20 | 1/20016 .25 | 1/20018 .25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Swt. (End Bay) | 4.28 | 5.04 | 5.04 | 4.62 | 5.43 | 5.43 | 5.24 | 5.24 | 5.82 | 5.82 | 7.22 | 7.22 |
| 4.50 | Gravity Load | 23.112 | 25.693 | 28.183 | 27.194 | 30.324 | 33.342 | 30.982 | 34.682 | 34.682 | 38.255 | 40.598 | 48.627 |
| | δ = Span/180 | 18.877 | 22.165 | 22.165 | 24.112 | 28.332 | 28.332 | 37.879 | 37.879 | 42.065 | 42.065 | 52.383 | 52.383 |
| | Wind Uplift | 19.669 | 22.482 | 24.660 | 22.571 | 25.169 | 29.174 | 25.715 | 28.786 | 28.786 | 33.473 | 35.524 | 42.548 |
| 5.00 | Gravity Load | 20.801 | 23.124 | 25.365 | 24.475 | 27.291 | 30.007 | 27.884 | 31.214 | 31.214 | 34.429 | 36.539 | 43.764 |
| | δ = Span/180 | 15.291 | 17.954 | 17.954 | 19.531 | 22.949 | 22.949 | 30.682 | 30.682 | 34.073 | 34.073 | 42.430 | 42.430 |
| | Wind Uplift | 17.702 | 20.234 | 22.194 | 20.314 | 22.652 | 26.257 | 23.143 | 25.907 | 25.907 | 30.126 | 31.971 | 38.294 |
| 5.50 | Gravity Load | 18.910 | 21.022 | 23.059 | 22.250 | 24.810 | 27.279 | 25.349 | 28.376 | 28.376 | 31.299 | 33.217 | 39.786 |
| | δ = Span/180 | 12.637 | 14.838 | 14.838 | 16.141 | 18.966 | 18.966 | 25.357 | 25.357 | 28.159 | 28.159 | 35.066 | 35.066 |
| | Wind Uplift | 16.093 | 18.394 | 20.177 | 18.468 | 20.592 | 23.870 | 21.039 | 23.552 | 23.552 | 27.387 | 29.065 | 34.812 |
| 6.00 | Gravity Load | 17.334 | 19.270 | 21.137 | 20.396 | 22.743 | 25.006 | 23.236 | 26.011 | 26.011 | 28.691 | 30.449 | 36.470 |
| | δ = Span/180 | 10.618 | 12.468 | 12.468 | 13.563 | 15.937 | 15.937 | 21.307 | 21.307 | 23.662 | 23.662 | 29.465 | 29.465 |
| | Wind Uplift | 14.751 | 16.861 | 18.495 | 16.929 | 18.876 | 21.880 | 19.286 | 21.589 | 21.589 | 25.105 | 26.643 | 31.911 |
| 6.50 | Gravity Load | 16.001 | 17.788 | 19.511 | 18.827 | 20.993 | 23.083 | 21.449 | 24.011 | 24.011 | 26.484 | 28.107 | 33.665 |
| | δ = Span/180 | 8.396 | 9.858 | 9.858 | 11.557 | 13.579 | 13.579 | 18.155 | 18.155 | 20.161 | 20.161 | 25.107 | 25.107 |
| | Wind Uplift | 13.617 | 15.564 | 17.072 | 15.626 | 17.424 | 20.197 | 17.803 | 19.929 | 19.929 | 23.173 | 24.593 | 29.457 |
| 7.00 | Gravity Load | 14.858 | 16.517 | 18.118 | 17.482 | 19.494 | 21.434 | 19.917 | 22.296 | 22.296 | 24.592 | 26.099 | 31.260 |
| | δ = Span/180 | 6.505 | 7.638 | 7.638 | 9.868 | 11.594 | 11.594 | 15.654 | 15.654 | 17.384 | 17.384 | 21.648 | 21.648 |
| | Wind Uplift | 12.644 | 14.453 | 15.853 | 14.510 | 16.180 | 18.755 | 16.531 | 18.505 | 18.505 | 21.518 | 22.837 | 27.353 |
| 7.50 | Gravity Load | | | | 16.317 | 18.194 | 20.005 | 18.589 | 20.809 | 20.809 | 22.953 | 24.359 | 29.176 |
| | δ = Span/180 | | | | 8.412 | 9.884 | 9.884 | 13.637 | 13.637 | 15.143 | 15.143 | 18.858 | 18.858 |
| | Wind Uplift | | | | 13.543 | 15.101 | 17.504 | 15.429 | 17.272 | 17.272 | 20.084 | 21.314 | 25.529 |
| 8.00 | Gravity Load | | | | 15.297 | 17.057 | 18.755 | 17.427 | 19.509 | 19.509 | 21.518 | 22.837 | 27.353 |
| | δ = Span/180 | | | | 7.137 | 8.386 | 8.386 | 11.985 | 11.985 | 13.310 | 13.310 | 16.574 | 16.574 |
| | Wind Uplift | | | | 12.696 | 14.157 | 16.410 | 14.465 | 16.192 | 16.192 | 18.828 | 19.982 | 23.933 |
| 8.50 | Gravity Load | | | | | | | 16.402 | 18.361 | 18.361 | 20.252 | 21.493 | 25.744 |
| | δ = Span/180 | | | | | | | 9.880 | 9.880 | 10.972 | 10.972 | 13.664 | 13.664 |
| | Wind Uplift | | | | | | | 13.614 | 15.240 | 15.240 | 17.721 | 18.807 | 22.526 |







# Zeta - Ultimate Load Capacities

## Zeta Butted (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 1/12513 | 1/12514 | 1/12515 | 1/12517 | 1/12520 | 1/15013 | 1/15014 | 1/15015 | 1/15017 | 1/15020 | 1/17513 | 1/17514 | 1/17515 | 1/17517 | 1/17520 | 1/20013 | 1/20014 | 1/20015 | 1/20016 | 1/20018 | 1/20020 | 1/20025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 2.73 | 2.95 | 3.16 | 3.58 | 4.21 | 3.28 | 3.53 | 3.78 | 4.28 | 5.04 | 3.53 | 3.80 | 4.07 | 4.62 | 5.43 | 3.79 | 4.08 | 4.37 | 4.66 | 5.24 | 5.82 | 7.22 |
| 4.00 | Gravity Load | 11.651 | 12.754 | 13.843 | 15.997 | 18.925 | 14.038 | 15.605 | 17.118 | 20.064 | 24.313 | 16.517 | 18.418 | 20.251 | 23.838 | 29.051 | 18.817 | 21.065 | 23.235 | 25.376 | 29.586 | 33.723 | 43.843 |
| | δ = Span/180 | 5.534 | 5.958 | 6.381 | 7.229 | 8.473 | 8.813 | 9.495 | 10.177 | 11.534 | 13.543 | 11.546 | 12.448 | 13.339 | 15.121 | 17.767 | 15.793 | 17.029 | 18.259 | 19.483 | 21.916 | 24.338 | 30.307 |
| | Wind Uplift | 9.554 | 10.458 | 11.351 | 13.118 | 15.518 | 11.511 | 12.796 | 14.036 | 16.453 | 19.936 | 13.544 | 15.102 | 16.606 | 19.547 | 23.822 | 15.430 | 17.273 | 19.052 | 20.808 | 24.261 | 27.653 | 35.952 |
| 4.50 | Gravity Load | 10.356 | 11.337 | 12.305 | 14.220 | 16.822 | 12.478 | 13.871 | 15.216 | 17.835 | 21.611 | 14.682 | 16.371 | 18.001 | 21.189 | 25.823 | 16.727 | 18.724 | 20.653 | 22.556 | 26.299 | 29.976 | 38.972 |
| | δ = Span/180 | 4.373 | 4.707 | 5.042 | 5.712 | 6.695 | 6.964 | 7.502 | 8.041 | 9.113 | 10.700 | 9.122 | 9.835 | 10.539 | 11.947 | 14.038 | 12.479 | 13.455 | 14.427 | 15.394 | 17.316 | 19.230 | 23.946 |
| | Wind Uplift | 8.492 | 9.296 | 10.090 | 11.660 | 13.794 | 10.232 | 11.375 | 12.477 | 14.624 | 17.721 | 12.039 | 13.424 | 14.760 | 17.375 | 21.175 | 13.716 | 15.354 | 16.936 | 18.496 | 21.565 | 24.580 | 31.957 |
| 5.00 | Gravity Load | 9.321 | 10.203 | 11.074 | 12.798 | 15.140 | 11.230 | 12.484 | 13.694 | 16.051 | 19.450 | 13.214 | 14.734 | 16.201 | 19.070 | 23.241 | 15.054 | 16.852 | 18.588 | 20.301 | 23.669 | 26.978 | 35.075 |
| | δ = Span/180 | 3.542 | 3.813 | 4.084 | 4.626 | 5.423 | 5.641 | 6.077 | 6.513 | 7.382 | 8.667 | 7.389 | 7.966 | 8.537 | 9.677 | 11.371 | 10.108 | 10.898 | 11.686 | 12.469 | 14.026 | 15.576 | 19.397 |
| | Wind Uplift | 7.643 | 8.366 | 9.081 | 10.494 | 12.415 | 9.209 | 10.237 | 11.229 | 13.162 | 15.949 | 10.835 | 12.082 | 13.284 | 15.638 | 19.058 | 12.344 | 13.818 | 15.242 | 16.647 | 19.409 | 22.122 | 28.761 |
| 5.50 | Gravity Load | 8.473 | 9.275 | 10.068 | 11.634 | 13.764 | 10.209 | 11.349 | 12.449 | 14.592 | 17.682 | 12.012 | 13.395 | 14.728 | 17.337 | 21.128 | 13.685 | 15.320 | 16.898 | 18.455 | 21.517 | 24.526 | 31.886 |
| | δ = Span/180 | 2.927 | 3.151 | 3.375 | 3.824 | 4.482 | 4.662 | 5.022 | 5.383 | 6.101 | 7.163 | 6.107 | 6.584 | 7.055 | 7.998 | 9.397 | 8.353 | 9.007 | 9.657 | 10.305 | 11.592 | 12.873 | 16.030 |
| | Wind Uplift | 6.948 | 7.606 | 8.255 | 9.540 | 11.286 | 8.372 | 9.306 | 10.208 | 11.965 | 14.499 | 9.850 | 10.984 | 12.077 | 14.216 | 17.325 | 11.222 | 12.562 | 13.856 | 15.133 | 17.644 | 20.111 | 26.147 |
| 6.00 | Gravity Load | 7.767 | 8.503 | 9.229 | 10.665 | 12.617 | 9.358 | 10.404 | 11.412 | 13.376 | 16.208 | 11.011 | 12.278 | 13.500 | 15.892 | 19.368 | 12.545 | 14.043 | 15.490 | 16.917 | 19.724 | 22.482 | 29.229 |
| | δ = Span/180 | 2.460 | 2.648 | 2.836 | 3.213 | 3.766 | 3.917 | 4.220 | 4.523 | 5.126 | 6.019 | 5.131 | 5.532 | 5.928 | 6.720 | 7.896 | 7.019 | 7.568 | 8.115 | 8.659 | 9.740 | 10.817 | 13.470 |
| | Wind Uplift | 6.369 | 6.972 | 7.567 | 8.745 | 10.346 | 7.674 | 8.531 | 9.358 | 10.968 | 13.291 | 9.029 | 10.068 | 11.070 | 13.031 | 15.881 | 10.287 | 11.515 | 12.702 | 13.872 | 16.174 | 18.435 | 23.968 |
| 6.50 | Gravity Load | | | | | | 8.639 | 9.603 | 10.534 | 12.347 | 14.962 | 10.164 | 11.334 | 12.462 | 14.669 | 17.878 | 11.580 | 12.963 | 14.298 | 15.616 | 18.207 | 20.753 | 26.981 |
| | = Span/180 | | | | | | 3.338 | 3.596 | 3.854 | 4.368 | 5.129 | 4.372 | 4.714 | 5.051 | 5.726 | 6.728 | 5.981 | 6.449 | 6.915 | 7.378 | 8.299 | 9.217 | 11.477 |
| | Wind Uplift | | | | | | 7.084 | 7.875 | 8.638 | 10.125 | 12.269 | 8.335 | 9.294 | 10.219 | 12.029 | 14.660 | 9.496 | 10.630 | 11.725 | 12.805 | 14.930 | 17.017 | 22.124 |
| 7.00 | Gravity Load | | | | | | | | | | | 9.438 | 10.524 | 11.572 | 13.622 | 16.601 | 10.753 | 12.037 | 13.277 | 14.500 | 16.906 | 19.270 | 25.053 |
| | δ = Span/180 | | | | | | | | | | | 3.770 | 4.065 | 4.355 | 4.937 | 5.801 | 5.157 | 5.560 | 5.962 | 6.362 | 7.156 | 7.947 | 9.896 |
| | Wind Uplift | | | | | | | | | | | 7.739 | 8.630 | 9.489 | 11.170 | 13.613 | 8.817 | 9.870 | 10.887 | 11.890 | 13.863 | 15.802 | 20.544 |
| 7.50 | Gravity Load | | | | | | | | | | | 8.809 | 9.823 | 10.800 | 12.714 | 15.494 | 10.036 | 11.235 | 12.392 | 13.534 | 15.779 | 17.986 | 23.383 |
| | δ = Span/180 | | | | | | | | | | | 3.284 | 3.541 | 3.794 | 4.301 | 5.054 | 4.492 | 4.844 | 5.194 | 5.542 | 6.234 | 6.923 | 8.621 |
| | Wind Uplift | | | | | | | | | | | 7.223 | 8.055 | 8.856 | 10.425 | 12.705 | 8.229 | 9.212 | 10.161 | 11.098 | 12.939 | 14.748 | 19.174 |

## Zeta Heavy End Bay (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 1/15013 .17 | 1/15014 .20 | 1/15015 .20 | 1/17513 .17 | 1/17514 .20 | 1/17515 .20 | 1/20013 .18 | 1/20014 .18 | 1/20014 .20 | 1/20015 .20 | 1/20016 .25 | 1/20018 .25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Swt. (End Bay) | 4.28 | 5.04 | 5.04 | 4.62 | 5.43 | 5.43 | 5.24 | 5.24 | 5.82 | 5.82 | 7.22 | 7.22 |
| 4.50 | Gravity Load | 22.149 | 24.959 | 27.377 | 26.061 | 29.457 | 32.389 | 29.691 | 33.691 | 33.691 | 37.161 | 39.438 | 47.237 |
| | δ = Span/180 | 18.877 | 22.165 | 22.165 | 24.112 | 28.332 | 28.332 | 37.879 | 37.879 | 42.065 | 42.065 | 52.383 | 52.383 |
| | Wind Uplift | 18.849 | 21.839 | 23.955 | 21.631 | 24.449 | 28.340 | 24.643 | 27.963 | 27.963 | 32.516 | 34.508 | 41.332 |
| 5.00 | Gravity Load | 19.934 | 22.463 | 24.640 | 23.455 | 26.511 | 29.150 | 26.722 | 30.321 | 30.321 | 33.445 | 35.494 | 42.513 |
| | δ = Span/180 | 15.291 | 17.954 | 17.954 | 19.531 | 22.949 | 22.949 | 30.682 | 30.682 | 34.073 | 34.073 | 42.430 | 42.430 |
| | Wind Uplift | 16.964 | 19.655 | 21.560 | 19.468 | 22.004 | 25.506 | 22.179 | 25.167 | 25.167 | 29.264 | 31.057 | 37.199 |
| 5.50 | Gravity Load | 18.122 | 20.421 | 22.400 | 21.323 | 24.101 | 26.500 | 24.293 | 27.565 | 27.565 | 30.405 | 32.267 | 38.648 |
| | δ = Span/180 | 12.637 | 14.838 | 14.838 | 16.141 | 18.966 | 18.966 | 25.357 | 25.357 | 28.159 | 28.159 | 35.066 | 35.066 |
| | Wind Uplift | 15.422 | 17.868 | 19.600 | 17.698 | 20.004 | 23.187 | 20.163 | 22.879 | 22.879 | 26.604 | 28.234 | 33.817 |
| 6.00 | Gravity Load | 16.612 | 18.719 | 20.533 | 19.546 | 22.093 | 24.291 | 22.268 | 25.268 | 25.268 | 27.871 | 29.578 | 35.428 |
| | δ = Span/180 | 10.618 | 12.468 | 12.468 | 13.563 | 15.937 | 15.937 | 21.307 | 21.307 | 23.662 | 23.662 | 29.465 | 29.465 |
| | Wind Uplift | 14.137 | 16.379 | 17.966 | 16.223 | 18.337 | 21.255 | 18.483 | 20.972 | 20.972 | 24.387 | 25.881 | 30.999 |
| 6.50 | Gravity Load | 15.334 | 17.279 | 18.954 | 18.042 | 20.393 | 22.423 | 20.555 | 23.324 | 23.324 | 25.727 | 27.303 | 32.702 |
| | δ = Span/180 | 8.396 | 9.858 | 9.858 | 11.557 | 13.579 | 13.579 | 18.155 | 18.155 | 20.161 | 20.161 | 25.107 | 25.107 |
| | Wind Uplift | 13.049 | 15.119 | 16.584 | 14.975 | 16.926 | 19.620 | 17.061 | 19.359 | 19.359 | 22.511 | 23.890 | 28.615 |
| 7.00 | Gravity Load | 14.239 | 16.045 | 17.600 | 16.754 | 18.936 | 20.821 | 19.087 | 21.658 | 21.658 | 23.889 | 25.353 | 30.367 |
| | δ = Span/180 | 6.505 | 7.638 | 7.638 | 9.868 | 11.594 | 11.594 | 15.654 | 15.654 | 17.384 | 17.384 | 21.648 | 21.648 |
| | Wind Uplift | 12.117 | 14.039 | 15.400 | 13.906 | 15.717 | 18.219 | 15.842 | 17.976 | 17.976 | 20.903 | 22.184 | 26.571 |
| 7.50 | Gravity Load | | | | 15.637 | 17.674 | 19.433 | 17.815 | 20.214 | 20.214 | 22.297 | 23.663 | 28.342 |
| | δ = Span/180 | | | | 8.412 | 9.884 | 9.884 | 13.637 | 13.637 | 15.143 | 15.143 | 18.858 | 18.858 |
| | Wind Uplift | | | | 12.979 | 14.669 | 17.004 | 14.786 | 16.778 | 16.778 | 19.510 | 20.705 | 24.799 |

# Zeta 2 Ultimate Load Capacities

## Zeta 2 Sleeved (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 2/22514 | 2/22515 | 2/22516 | 2/22518 | 2/22520 | 2/22525 | 2/24514 | 2/24515 | 2/24516 | 2/24518 | 2/24520 | 2/24525 | 2/26515 | 2/26516 | 2/26518 | 2/26520 | 2/26525 | 2/26530 | 2/28515 | 2/28516 | 2/28518 | 2/28520 | 2/28525 | 2/28530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 4.47 | 4.79 | 5.10 | 5.73 | 6.37 | 7.94 | 4.69 | 5.02 | 5.35 | 6.02 | 6.68 | 8.31 | 5.26 | 5.61 | 6.30 | 6.99 | 8.72 | 10.44 | 5.49 | 5.86 | 6.58 | 7.31 | 9.11 | 10.91 |
| 6.00 | Gravity Load | **19.899** | **22.407** | **24.981** | **30.258** | **35.719** | **48.839** | **21.694** | **24.489** | **27.353** | **33.212** | **39.263** | **53.853** | **26.511** | **29.674** | **36.136** | **42.794** | **58.910** | **73.991** | **26.567** | **31.900** | **38.981** | **46.260** | **63.949** | **80.583** |
| | δ = Span/180 | 19.430 | 20.842 | 22.248 | 25.050 | 27.836 | 34.733 | 24.396 | 26.171 | 27.939 | 31.463 | 34.968 | 43.649 | 32.359 | 34.547 | 38.910 | 43.251 | 54.006 | 64.630 | 39.233 | 41.890 | 47.185 | 52.456 | 65.522 | 78.433 |
| | Wind Uplift | 15.919 | 17.926 | 19.985 | 24.207 | 28.575 | 39.071 | 17.355 | 19.591 | 21.882 | 26.570 | 31.410 | 43.082 | 21.209 | 23.739 | 28.909 | 34.235 | 47.128 | 59.193 | 22.744 | 25.520 | 31.185 | 37.008 | 51.159 | 64.466 |
| 6.50 | Gravity Load | **18.368** | **20.684** | **23.060** | **27.931** | **32.972** | **45.082** | **20.025** | **22.606** | **25.249** | **30.657** | **36.242** | **49.710** | **24.471** | **27.391** | **33.356** | **39.502** | **54.378** | **68.299** | **26.243** | **29.446** | **35.982** | **42.701** | **59.030** | **74.384** |
| | δ = Span/180 | 16.555 | 17.758 | 18.957 | 21.345 | 23.718 | 29.595 | 20.787 | 22.299 | 23.806 | 26.809 | 29.795 | 37.192 | 27.572 | 29.437 | 33.154 | 36.853 | 46.017 | 55.070 | 33.429 | 35.693 | 40.205 | 44.696 | 55.830 | 66.831 |
| | Wind Uplift | 14.695 | 16.547 | 18.448 | 22.345 | 26.377 | 36.065 | 16.020 | 18.084 | 20.199 | 24.526 | 28.994 | 39.768 | 19.577 | 21.913 | 26.685 | 31.602 | 43.503 | 54.639 | 20.995 | 23.557 | 28.786 | 34.161 | 47.224 | 59.507 |
| 7.00 | Gravity Load | **17.056** | **19.206** | **21.412** | **25.936** | **30.617** | **41.862** | **18.595** | **20.991** | **23.445** | **28.468** | **33.654** | **46.160** | **22.724** | **25.435** | **30.974** | **36.680** | **50.494** | **63.421** | **24.369** | **27.343** | **33.412** | **39.651** | **54.813** | **69.071** |
| | δ = Span/180 | 14.275 | 15.312 | 16.346 | 18.404 | 20.451 | 25.518 | 17.924 | 19.228 | 20.527 | 23.116 | 25.691 | 32.069 | 23.774 | 25.382 | 28.587 | 31.776 | 39.678 | 47.483 | 28.824 | 30.776 | 34.667 | 38.539 | 48.139 | 57.624 |
| | Wind Uplift | 13.645 | 15.365 | 17.130 | 20.748 | 24.493 | 33.489 | 14.876 | 16.793 | 18.756 | 22.774 | 26.923 | 36.928 | 18.179 | 20.348 | 24.779 | 29.344 | 40.395 | 50.737 | 19.495 | 21.874 | 26.730 | 31.721 | 43.851 | 55.257 |
| 7.50 | Gravity Load | **15.919** | **17.926** | **19.985** | **24.207** | **28.575** | **39.071** | **17.355** | **19.591** | **21.882** | **26.570** | **31.410** | **43.082** | **21.209** | **23.739** | **28.909** | **34.235** | **47.128** | **59.193** | **22.744** | **25.520** | **31.185** | **37.008** | **51.159** | **64.466** |
| | δ = Span/180 | 12.435 | 13.339 | 14.239 | 16.032 | 17.815 | 22.229 | 15.614 | 16.749 | 17.881 | 20.136 | 22.380 | 27.936 | 20.709 | 22.110 | 24.902 | 27.681 | 34.564 | 41.363 | 25.109 | 26.809 | 30.199 | 33.572 | 41.934 | 50.197 |
| | Wind Uplift | 12.735 | 14.341 | 15.988 | 19.365 | 22.860 | 31.257 | 13.884 | 15.673 | 17.506 | 21.256 | 25.128 | 34.466 | 16.967 | 18.991 | 23.127 | 27.388 | 37.702 | 47.354 | 18.195 | 20.416 | 24.948 | 29.606 | 40.927 | 51.573 |
| 8.00 | Gravity Load | **14.924** | **16.805** | **18.736** | **22.694** | **26.790** | **36.629** | **16.271** | **18.367** | **20.514** | **24.909** | **29.447** | **40.390** | **19.883** | **22.255** | **27.102** | **32.095** | **44.182** | **55.493** | **21.323** | **23.925** | **29.236** | **34.695** | **47.962** | **60.437** |
| | δ = Span/180 | 10.929 | 11.723 | 12.515 | 14.091 | 15.658 | 19.537 | 13.723 | 14.721 | 15.716 | 17.698 | 19.670 | 24.553 | 18.202 | 19.433 | 21.887 | 24.329 | 30.378 | 36.355 | 22.068 | 23.563 | 26.542 | 29.506 | 36.856 | 44.119 |
| | Wind Uplift | 11.939 | 13.444 | 14.989 | 18.155 | 21.432 | 29.303 | 13.016 | 14.694 | 16.412 | 19.927 | 23.558 | 32.312 | 15.906 | 17.804 | 21.681 | 25.676 | 35.346 | 44.394 | 17.058 | 19.140 | 23.389 | 27.756 | 38.369 | 48.350 |
| 8.50 | Gravity Load | | **15.817** | **17.634** | **21.359** | **25.214** | **34.474** | **15.313** | **17.287** | **19.308** | **23.444** | **27.715** | **38.014** | **18.713** | **20.946** | **25.508** | **30.207** | **41.584** | **52.229** | **20.068** | **22.518** | **27.516** | **32.654** | **45.140** | **56.882** |
| | δ = Span/180 | | 10.385 | 11.086 | 12.482 | 13.870 | 17.306 | 12.156 | 13.040 | 13.921 | 15.677 | 17.424 | 21.749 | 16.123 | 17.214 | 19.388 | 21.551 | 26.910 | 32.203 | 19.549 | 20.872 | 23.511 | 26.137 | 32.648 | 39.081 |
| | Wind Uplift | | 12.654 | 14.107 | 17.087 | 20.171 | 27.579 | 12.251 | 13.829 | 15.446 | 18.755 | 22.172 | 30.411 | 14.971 | 16.757 | 20.406 | 24.166 | 33.267 | 41.783 | 16.055 | 18.014 | 22.013 | 26.123 | 36.112 | 45.506 |
| 9.00 | Gravity Load | | | | **20.172** | **23.813** | **32.559** | **14.463** | **16.326** | **18.235** | **22.141** | **26.175** | **35.902** | **17.674** | **19.782** | **24.091** | **28.529** | **39.273** | **49.327** | **18.953** | **21.267** | **25.987** | **30.840** | **42.633** | **53.722** |
| | δ = Span/180 | | | | 11.133 | 12.372 | 15.437 | 10.843 | 11.631 | 12.417 | 13.983 | 15.541 | 19.400 | 14.382 | 15.354 | 17.293 | 19.223 | 24.003 | 28.725 | 17.437 | 18.618 | 20.971 | 23.314 | 29.121 | 34.859 |
| | Wind Uplift | | | | 16.138 | 19.050 | 26.047 | 11.570 | 13.061 | 14.588 | 17.713 | 20.940 | 28.722 | 14.139 | 15.826 | 19.272 | 22.823 | 31.419 | 39.462 | 15.163 | 17.013 | 20.790 | 24.672 | 34.106 | 42.978 |
| 9.50 | Gravity Load | | | | | | | | | | **20.976** | **24.797** | **34.012** | **16.744** | **18.741** | **22.823** | **27.028** | **37.206** | **46.731** | **17.956** | **20.147** | **24.619** | **29.217** | **40.389** | **50.894** |
| | δ = Span/180 | | | | | | | | | | 12.550 | 13.949 | 17.411 | 12.908 | 13.781 | 15.521 | 17.253 | 21.543 | 25.780 | 15.650 | 16.709 | 18.822 | 20.924 | 26.136 | 31.286 |
| | Wind Uplift | | | | | | | | | | 16.781 | 19.838 | 27.210 | 13.395 | 14.993 | 18.258 | 21.622 | 29.765 | 37.385 | 14.365 | 16.118 | 19.696 | 23.373 | 32.311 | 40.716 |
| 10.00 | Gravity Load | | | | | | | | | | **19.927** | **23.558** | **32.312** | **15.906** | **17.804** | **21.681** | **25.676** | **35.346** | **44.394** | **17.058** | **19.140** | **23.389** | **27.756** | **38.369** | **48.350** |
| | δ = Span/180 | | | | | | | | | | 11.327 | 12.589 | 15.714 | 11.649 | 12.437 | 14.008 | 15.570 | 19.442 | 23.267 | 14.124 | 15.080 | 16.987 | 18.884 | 23.588 | 28.236 |
| | Wind Uplift | | | | | | | | | | 15.942 | 18.846 | 25.849 | 12.725 | 14.243 | 17.345 | 20.541 | 28.277 | 35.516 | 13.646 | 15.312 | 18.711 | 22.205 | 30.696 | 38.680 |

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# Zeta 2 Ultimate Load Capacities

## Zeta 2 Heavy End Bay (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 2/22514 .18 | 2/22515 .18 | 2/22516 .20 | 2/22518 .25 | 2/24514 .18 | 2/24515 .18 | 2/24516 .20 | 2/24518 .25 | 2/26515 .18 | 2/26516 .20 | 2/26518 .25 | 2/26520 .25 | 2/28515 .18 | 2/28516 .20 | 2/28518 .25 | 2/28520 .25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Swt. (End Bay) | 5.73 | 5.73 | 6.37 | 7.94 | 6.02 | 6.02 | 6.68 | 8.31 | 6.30 | 6.99 | 8.72 | 8.72 | 6.58 | 7.31 | 9.11 | 9.11 |
| 6.00 | Gravity Load | **26.685** | **30.049** | **33.501** | **40.578** | **29.093** | **32.842** | **36.681** | **44.539** | **35.525** | **39.764** | **48.423** | **57.345** | **38.085** | **42.733** | **52.218** | **61.969** |
| | δ = Span/180 | 25.050 | 25.050 | 27.836 | 34.733 | 31.463 | 31.463 | 34.968 | 43.649 | 38.910 | 43.251 | 54.006 | 54.006 | 47.185 | 52.456 | 65.522 | 65.522 |
| | Wind Uplift | 21.348 | 24.040 | 26.801 | 32.462 | 23.274 | 26.273 | 29.345 | 35.632 | 28.420 | 31.811 | 38.739 | 45.876 | 30.468 | 34.186 | 41.775 | 49.575 |
| 6.50 | Gravity Load | **24.633** | **27.738** | **30.924** | **37.457** | **26.855** | **30.315** | **33.860** | **41.113** | **32.793** | **36.705** | **44.698** | **52.934** | **35.155** | **39.446** | **48.202** | **57.202** |
| | δ = Span/180 | 21.345 | 21.345 | 23.718 | 29.595 | 26.809 | 26.809 | 29.795 | 37.192 | 33.154 | 36.853 | 46.017 | 46.017 | 40.205 | 44.696 | 55.830 | 55.830 |
| | Wind Uplift | 19.706 | 22.190 | 24.739 | 29.965 | 21.484 | 24.252 | 27.088 | 32.891 | 26.234 | 29.364 | 35.759 | 42.347 | 28.124 | 31.557 | 38.561 | 45.762 |
| 7.00 | Gravity Load | **22.873** | **25.757** | **28.715** | **34.781** | **24.937** | **28.150** | **31.441** | **38.177** | **30.450** | **34.083** | **41.506** | **49.153** | **32.644** | **36.628** | **44.759** | **53.116** |
| | δ = Span/180 | 18.404 | 18.404 | 20.451 | 25.518 | 23.116 | 23.116 | 25.691 | 32.069 | 28.587 | 31.776 | 39.678 | 39.678 | 34.667 | 38.539 | 48.139 | 48.139 |
| | Wind Uplift | 18.299 | 20.605 | 22.972 | 27.825 | 19.949 | 22.520 | 25.153 | 30.541 | 24.360 | 27.267 | 33.205 | 39.322 | 26.115 | 29.303 | 35.807 | 42.493 |
| 7.50 | Gravity Load | **21.348** | **24.040** | **26.801** | **32.462** | **23.274** | **26.273** | **29.345** | **35.632** | **28.420** | **31.811** | **38.739** | **45.876** | **30.468** | **34.186** | **41.775** | **49.575** |
| | δ = Span/180 | 16.032 | 16.032 | 17.815 | 22.229 | 20.136 | 20.136 | 22.380 | 27.936 | 24.902 | 27.681 | 34.564 | 34.564 | 30.199 | 33.572 | 41.934 | 41.934 |
| | Wind Uplift | 17.079 | 19.232 | 21.441 | 25.970 | 18.619 | 21.019 | 23.476 | 28.505 | 22.736 | 25.449 | 30.991 | 36.701 | 24.374 | 27.349 | 33.420 | 39.660 |
| 8.00 | Gravity Load | **20.014** | **22.537** | **25.126** | **30.433** | **21.820** | **24.631** | **27.511** | **33.405** | **26.644** | **29.823** | **36.317** | **43.009** | **28.564** | **32.050** | **39.164** | **46.477** |
| | δ = Span/180 | 14.091 | 14.091 | 15.658 | 19.537 | 17.698 | 17.698 | 19.670 | 24.553 | 21.887 | 24.329 | 30.378 | 30.378 | 26.542 | 29.506 | 36.856 | 36.856 |
| | Wind Uplift | 16.011 | 18.030 | 20.101 | 24.347 | 17.456 | 19.705 | 22.009 | 26.724 | 21.315 | 23.858 | 29.054 | 34.407 | 22.851 | 25.640 | 31.331 | 37.181 |
| 8.50 | Gravity Load | **18.837** | **21.211** | **23.648** | **28.643** | **20.536** | **23.182** | **25.893** | **31.440** | **25.077** | **28.069** | **34.181** | **40.479** | **26.883** | **30.164** | **36.860** | **43.743** |
| | δ = Span/180 | 12.482 | 12.482 | 13.870 | 17.306 | 15.677 | 15.677 | 17.424 | 21.749 | 19.388 | 21.551 | 26.910 | 26.910 | 23.511 | 26.137 | 32.648 | 32.648 |
| | Wind Uplift | 15.069 | 16.969 | 18.918 | 22.915 | 16.429 | 18.546 | 20.714 | 25.152 | 20.061 | 22.455 | 27.345 | 32.383 | 21.507 | 24.132 | 29.488 | 34.994 |
| 9.00 | Gravity Load | **17.790** | **20.033** | **22.334** | **27.052** | **19.395** | **21.894** | **24.454** | **29.693** | **23.684** | **26.509** | **32.282** | **38.230** | **25.390** | **28.489** | **34.812** | **41.313** |
| | δ = Span/180 | 11.133 | 11.133 | 12.372 | 15.437 | 13.983 | 13.983 | 15.541 | 19.400 | 17.293 | 19.223 | 24.003 | 24.003 | 20.971 | 23.314 | 29.121 | 29.121 |
| | Wind Uplift | 14.232 | 16.026 | 17.867 | 21.642 | 15.516 | 17.516 | 19.563 | 23.754 | 18.947 | 21.207 | 25.826 | 30.584 | 20.312 | 22.791 | 27.850 | 33.050 |
| 9.50 | Gravity Load | | | | | **18.374** | **20.742** | **23.167** | **28.130** | **22.437** | **25.114** | **30.583** | **36.218** | **24.054** | **26.989** | **32.980** | **39.138** |
| | δ = Span/180 | | | | | 12.550 | 12.550 | 13.949 | 17.411 | 15.521 | 17.253 | 21.543 | 21.543 | 18.822 | 20.924 | 26.136 | 26.136 |
| | Wind Uplift | | | | | 14.700 | 16.594 | 18.534 | 22.504 | 17.950 | 20.091 | 24.466 | 28.974 | 19.243 | 21.591 | 26.384 | 31.311 |
| 10.00 | Gravity Load | | | | | | | | | **21.315** | **23.858** | **29.054** | **34.407** | **22.851** | **25.640** | **31.331** | **37.181** |
| | δ = Span/180 | | | | | | | | | 14.008 | 15.570 | 19.442 | 19.442 | 16.987 | 18.884 | 23.588 | 23.588 |
| | Wind Uplift | | | | | | | | | 17.052 | 19.087 | 23.243 | 27.526 | 18.281 | 20.512 | 25.065 | 29.745 |
| 10.50 | Gravity Load | | | | | | | | | **20.300** | **22.722** | **27.670** | **32.769** | **21.763** | **24.419** | **29.839** | **35.411** |
| | δ = Span/180 | | | | | | | | | 12.705 | 14.123 | 17.635 | 17.635 | 15.407 | 17.128 | 21.395 | 21.395 |
| | Wind Uplift | | | | | | | | | 16.240 | 18.178 | 22.136 | 26.215 | 17.410 | 19.535 | 23.871 | 28.329 |
| 11.00 | Gravity Load | | | | | | | | | **19.377** | **21.689** | **26.413** | **31.279** | **20.774** | **23.309** | **28.483** | **33.801** |
| | δ = Span/180 | | | | | | | | | 11.577 | 12.868 | 16.068 | 16.068 | 14.039 | 15.607 | 19.494 | 19.494 |
| | Wind Uplift | | | | | | | | | 15.502 | 17.351 | 21.130 | 25.023 | 16.619 | 18.647 | 22.786 | 27.041 |



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# Zeta 2 Ultimate Load Capacities

## Zeta 2 Butted (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | 2/22514 | 2/22515 | 2/22516 | 2/22518 | 2/22520 | 2/22525 | 2/24514 | 2/24515 | 2/24516 | 2/24518 | 2/24520 | 2/24525 | 2/26515 | 2/26516 | 2/26518 | 2/26520 | 2/26525 | 2/26530 | 2/28515 | 2/28516 | 2/28518 | 2/28520 | 2/28525 | 2/28530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 4.47 | 4.79 | 5.10 | 5.73 | 6.37 | 7.94 | 4.69 | 5.02 | 5.35 | 6.02 | 6.68 | 8.31 | 5.26 | 5.61 | 6.30 | 6.99 | 8.72 | 10.44 | 5.49 | 5.86 | 6.58 | 7.31 | 9.11 | 10.91 |
| 6.00 | Gravity Load | 13.598 | 15.312 | 17.071 | 20.677 | 24.408 | 33.373 | 14.824 | 16.735 | 18.691 | 22.695 | 26.830 | 36.800 | 18.102 | 20.262 | 24.674 | 29.220 | 40.225 | 50.522 | 19.406 | 21.775 | 26.608 | 31.576 | 43.651 | 55.005 |
| | δ = Span/180 | 10.151 | 10.889 | 11.624 | 13.087 | 14.543 | 18.146 | 12.408 | 13.311 | 14.210 | 16.002 | 17.785 | 22.200 | 16.033 | 17.118 | 19.279 | 21.430 | 26.759 | 32.023 | 19.070 | 20.362 | 22.936 | 25.498 | 31.849 | 38.125 |
| | Wind Uplift | 10.878 | 12.249 | 13.657 | 16.541 | 19.527 | 26.699 | 11.860 | 13.388 | 14.953 | 18.156 | 21.464 | 29.440 | 14.482 | 16.209 | 19.739 | 23.376 | 32.180 | 40.418 | 15.525 | 17.420 | 21.286 | 25.261 | 34.921 | 44.004 |
| 6.50 | Gravity Load | 12.552 | 14.134 | 15.758 | 19.086 | 22.531 | 30.806 | 13.684 | 15.447 | 17.253 | 20.949 | 24.766 | 33.969 | 16.710 | 18.703 | 22.776 | 26.973 | 37.131 | 46.636 | 17.913 | 20.100 | 24.561 | 29.148 | 40.293 | 50.774 |
| | δ = Span/180 | 8.649 | 9.278 | 9.904 | 11.151 | 12.392 | 15.462 | 10.573 | 11.342 | 12.108 | 13.635 | 15.154 | 18.916 | 13.661 | 14.586 | 16.427 | 18.260 | 22.801 | 27.286 | 16.249 | 17.349 | 19.543 | 21.726 | 27.137 | 32.485 |
| | Wind Uplift | 10.041 | 11.307 | 12.606 | 15.269 | 18.025 | 24.645 | 10.947 | 12.358 | 13.803 | 16.760 | 19.813 | 27.175 | 13.368 | 14.963 | 18.221 | 21.578 | 29.705 | 37.309 | 14.331 | 16.080 | 19.649 | 23.318 | 32.235 | 40.619 |
| 7.00 | Gravity Load | 11.655 | 13.124 | 14.632 | 17.723 | 20.922 | 28.606 | 12.707 | 14.344 | 16.021 | 19.453 | 22.997 | 31.543 | 15.516 | 17.367 | 21.149 | 25.046 | 34.479 | 43.305 | 16.634 | 18.664 | 22.807 | 27.066 | 37.415 | 47.147 |
| | δ = Span/180 | 7.458 | 8.000 | 8.540 | 9.615 | 10.685 | 13.332 | 9.116 | 9.779 | 10.440 | 11.757 | 13.067 | 16.311 | 11.779 | 12.576 | 14.164 | 15.745 | 19.660 | 23.527 | 14.011 | 14.959 | 16.851 | 18.733 | 23.399 | 28.010 |
| | Wind Uplift | 9.324 | 10.500 | 11.706 | 14.178 | 16.737 | 22.885 | 10.165 | 11.475 | 12.817 | 15.562 | 18.397 | 25.234 | 12.413 | 13.894 | 16.919 | 20.037 | 27.583 | 34.644 | 13.307 | 14.931 | 18.246 | 21.652 | 29.932 | 37.718 |
| 7.50 | Gravity Load | 10.878 | 12.249 | 13.657 | 16.541 | 19.527 | 26.699 | 11.860 | 13.388 | 14.953 | 18.156 | 21.464 | 29.440 | 14.482 | 16.209 | 19.739 | 23.376 | 32.180 | 40.418 | 15.525 | 17.420 | 21.286 | 25.261 | 34.921 | 44.004 |
| | δ = Span/180 | 6.497 | 6.969 | 7.439 | 8.376 | 9.308 | 11.614 | 7.941 | 8.519 | 9.095 | 10.241 | 11.382 | 14.208 | 10.261 | 10.955 | 12.339 | 13.715 | 17.126 | 20.495 | 12.205 | 13.031 | 14.679 | 16.318 | 20.383 | 24.400 |
| | Wind Uplift | 8.703 | 9.800 | 10.925 | 13.233 | 15.621 | 21.359 | 9.488 | 10.710 | 11.962 | 14.525 | 17.171 | 23.552 | 11.585 | 12.968 | 15.792 | 18.701 | 25.744 | 32.334 | 12.420 | 13.936 | 17.029 | 20.209 | 27.937 | 35.203 |
| 8.00 | Gravity Load | 10.198 | 11.484 | 12.803 | 15.507 | 18.306 | 25.030 | 11.118 | 12.551 | 14.018 | 17.021 | 20.122 | 27.600 | 13.577 | 15.196 | 18.506 | 21.915 | 30.169 | 37.892 | 14.555 | 16.331 | 19.956 | 23.682 | 32.738 | 41.254 |
| | δ = Span/180 | 5.710 | 6.125 | 6.538 | 7.362 | 8.180 | 10.207 | 6.980 | 7.487 | 7.993 | 9.001 | 10.004 | 12.488 | 9.019 | 9.629 | 10.845 | 12.055 | 15.052 | 18.013 | 10.727 | 11.453 | 12.901 | 14.342 | 17.915 | 21.445 |
| | Wind Uplift | 8.159 | 9.187 | 10.242 | 12.406 | 14.645 | 20.024 | 8.895 | 10.041 | 11.215 | 13.617 | 16.098 | 22.080 | 10.861 | 12.157 | 14.805 | 17.532 | 24.135 | 30.313 | 11.644 | 13.065 | 15.965 | 18.946 | 26.191 | 33.003 |
| 8.50 | Gravity Load | | | 12.050 | 14.595 | 17.230 | 23.558 | 10.464 | 11.813 | 13.194 | 16.020 | 18.939 | 25.976 | 12.778 | 14.302 | 17.417 | 20.626 | 28.394 | 35.663 | 13.699 | 15.370 | 18.782 | 22.289 | 30.813 | 38.827 |
| | δ = Span/180 | | | 5.792 | 6.521 | 7.246 | 9.042 | 6.183 | 6.632 | 7.081 | 7.973 | 8.862 | 11.062 | 7.989 | 8.529 | 9.606 | 10.678 | 13.333 | 15.956 | 9.502 | 10.146 | 11.428 | 12.705 | 15.869 | 18.996 |
| | Wind Uplift | | | 9.640 | 11.676 | 13.784 | 18.846 | 8.371 | 9.450 | 10.555 | 12.816 | 15.151 | 20.781 | 10.222 | 11.442 | 13.934 | 16.501 | 22.715 | 28.530 | 10.959 | 12.296 | 15.026 | 17.831 | 24.650 | 31.062 |
| 9.00 | Gravity Load | | | | | 16.272 | 22.249 | 9.883 | 11.156 | 12.461 | 15.130 | 17.886 | 24.533 | 12.068 | 13.508 | 16.450 | 19.480 | 26.817 | 33.682 | 12.938 | 14.516 | 17.739 | 21.051 | 29.101 | 36.670 |
| | δ = Span/180 | | | | | 6.464 | 8.065 | 5.515 | 5.916 | 6.316 | 7.112 | 7.905 | 9.867 | 7.126 | 7.608 | 8.569 | 9.525 | 11.893 | 14.233 | 8.476 | 9.050 | 10.194 | 11.332 | 14.155 | 16.944 |
| | Wind Uplift | | | | | 13.018 | 17.799 | 7.906 | 8.925 | 9.969 | 12.104 | 14.309 | 19.627 | 9.654 | 10.806 | 13.160 | 15.584 | 21.453 | 26.945 | 10.350 | 11.613 | 14.191 | 16.841 | 23.281 | 29.336 |
| 9.50 | Gravity Load | | | | | | | | | | | 16.945 | 23.242 | 11.433 | 12.797 | 15.584 | 18.455 | 25.405 | 31.909 | 12.257 | 13.752 | 16.805 | 19.943 | 27.569 | 34.740 |
| | δ = Span/180 | | | | | | | | | | | 7.094 | 8.856 | 6.395 | 6.828 | 7.690 | 8.548 | 10.674 | 12.774 | 7.607 | 8.122 | 9.149 | 10.171 | 12.704 | 15.208 |
| | Wind Uplift | | | | | | | | | | | 13.556 | 18.594 | 9.146 | 10.238 | 12.467 | 14.764 | 20.324 | 25.527 | 9.805 | 11.002 | 13.444 | 15.954 | 22.055 | 27.792 |
| 10.00 | Gravity Load | | | | | | | | | | | | 22.080 | 10.861 | 12.157 | 14.805 | 17.532 | 24.135 | 30.313 | 11.644 | 13.065 | 15.965 | 18.946 | 26.191 | 33.003 |
| | δ = Span/180 | | | | | | | | | | | | 7.992 | 5.772 | 6.162 | 6.941 | 7.715 | 9.633 | 11.528 | 6.865 | 7.330 | 8.257 | 9.179 | 11.466 | 13.725 |
| | Wind Uplift | | | | | | | | | | | | 17.664 | 8.689 | 9.726 | 11.844 | 14.026 | 19.308 | 24.251 | 9.315 | 10.452 | 12.772 | 15.157 | 20.953 | 26.403 |







# Zed - Ultimate Load Capacities

## Zed Sleeved Purlins - Ultimate Load Capacities in kN

| Span (m) | Section No. | Z/12513 | Z/12514 | Z/12515 | Z/12517 | Z/12520 | Z/14013 | Z/14014 | Z/14015 | Z/14017 | Z/14020 | Z/15513 | Z/15514 | Z/15515 | Z/15517 | Z/15520 | Z/17013 | Z/17014 | Z/17015 | Z/17017 | Z/17020 | Z/18513 | Z/18514 | Z/18515 | Z/18517 | Z/18520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 2.51 | 2.70 | 2.89 | 3.27 | 3.83 | 2.74 | 2.95 | 3.15 | 3.56 | 4.16 | 2.89 | 3.11 | 3.33 | 3.76 | 4.40 | 3.04 | 3.28 | 3.50 | 3.96 | 4.63 | 3.20 | 3.44 | 3.68 | 4.16 | 4.87 |
| 4.50 | Gravity Load | 10.914 | 12.261 | 13.610 | 16.691 | 19.839 | 12.569 | 14.159 | 15.781 | 19.006 | 23.499 | 14.048 | 15.844 | 17.671 | 21.308 | 26.421 | 15.507 | 17.512 | 19.553 | 23.613 | 29.365 | 16.932 | 19.154 | 21.411 | 25.905 | 32.317 |
| | δ = Span/180 | 6.768 | 7.291 | 7.812 | 8.848 | 10.387 | 9.193 | 9.904 | 10.614 | 12.027 | 14.126 | 11.645 | 12.550 | 13.451 | 15.245 | 17.913 | 14.453 | 15.577 | 16.698 | 18.929 | 22.250 | 17.633 | 19.007 | 20.376 | 23.104 | 27.166 |
| | Wind Uplift | 8.732 | 9.809 | 10.888 | 13.353 | 15.871 | 10.055 | 11.327 | 12.625 | 15.205 | 18.799 | 11.239 | 12.675 | 14.137 | 17.047 | 21.137 | 12.406 | 14.010 | 15.642 | 18.890 | 23.492 | 13.546 | 15.323 | 17.129 | 20.724 | 25.854 |
| 5.00 | Gravity Load | 9.823 | 11.035 | 12.249 | 15.022 | 17.855 | 11.312 | 12.743 | 14.203 | 17.106 | 21.149 | 12.643 | 14.260 | 15.904 | 19.178 | 23.779 | 13.956 | 15.761 | 17.597 | 21.252 | 26.428 | 15.239 | 17.239 | 19.270 | 23.314 | 29.086 |
| | δ = Span/180 | 5.482 | 5.906 | 6.328 | 7.167 | 8.414 | 7.446 | 8.023 | 8.598 | 9.742 | 11.442 | 9.433 | 10.165 | 10.895 | 12.348 | 14.510 | 11.707 | 12.617 | 13.525 | 15.332 | 18.023 | 14.283 | 15.395 | 16.504 | 18.714 | 22.004 |
| | Wind Uplift | 7.858 | 8.828 | 9.799 | 12.018 | 14.284 | 9.049 | 10.194 | 11.362 | 13.684 | 16.919 | 10.115 | 11.408 | 12.723 | 15.342 | 19.023 | 11.165 | 12.609 | 14.078 | 17.001 | 21.143 | 12.191 | 13.791 | 15.416 | 18.651 | 23.269 |
| 5.50 | Gravity Load | 8.930 | 10.032 | 11.135 | 13.657 | 16.232 | 10.283 | 11.584 | 12.911 | 15.550 | 19.227 | 11.494 | 12.963 | 14.458 | 17.434 | 21.617 | 12.687 | 14.328 | 15.998 | 19.320 | 24.026 | 13.854 | 15.671 | 17.518 | 21.195 | 26.442 |
| | δ = Span/180 | 4.531 | 4.881 | 5.230 | 5.923 | 6.953 | 6.154 | 6.630 | 7.106 | 8.051 | 9.456 | 7.796 | 8.401 | 9.004 | 10.205 | 11.992 | 9.675 | 10.427 | 11.178 | 12.671 | 14.895 | 11.804 | 12.724 | 13.640 | 15.466 | 18.185 |
| | Wind Uplift | 7.144 | 8.026 | 8.908 | 10.925 | 12.986 | 8.227 | 9.268 | 10.329 | 12.440 | 15.381 | 9.195 | 10.371 | 11.567 | 13.947 | 17.294 | 10.150 | 11.463 | 12.798 | 15.456 | 19.221 | 11.083 | 12.537 | 14.014 | 16.956 | 21.153 |
| 6.00 | Gravity Load | 8.186 | 9.196 | 10.208 | 12.519 | 14.879 | 9.426 | 10.619 | 11.836 | 14.255 | 17.624 | 10.536 | 11.883 | 13.253 | 15.981 | 19.816 | 11.630 | 13.134 | 14.664 | 17.710 | 22.024 | 12.699 | 14.365 | 16.058 | 19.429 | 24.238 |
| | δ = Span/180 | 3.807 | 4.101 | 4.394 | 4.977 | 5.843 | 5.171 | 5.571 | 5.971 | 6.765 | 7.946 | 6.551 | 7.059 | 7.566 | 8.575 | 10.076 | 8.130 | 8.762 | 9.392 | 10.647 | 12.516 | 9.919 | 10.691 | 11.461 | 12.996 | 15.281 |
| | Wind Uplift | 6.549 | 7.357 | 8.166 | 10.015 | 11.904 | 7.541 | 8.495 | 9.468 | 11.404 | 14.100 | 8.429 | 9.506 | 10.603 | 12.785 | 15.853 | 9.304 | 10.507 | 11.732 | 14.168 | 17.619 | 10.159 | 11.492 | 12.846 | 15.543 | 19.390 |
| 6.50 | Gravity Load | 7.556 | 8.489 | 9.422 | 11.556 | 13.735 | 8.701 | 9.802 | 10.925 | 13.158 | 16.269 | 9.726 | 10.969 | 12.234 | 14.752 | 18.292 | 10.736 | 12.124 | 13.536 | 16.347 | 20.329 | 11.722 | 13.260 | 14.823 | 17.934 | 22.374 |
| | δ = Span/180 | 3.244 | 3.495 | 3.744 | 4.241 | 4.979 | 4.406 | 4.747 | 5.087 | 5.764 | 6.770 | 5.582 | 6.015 | 6.447 | 7.307 | 8.586 | 6.927 | 7.466 | 8.003 | 9.072 | 10.664 | 8.451 | 9.110 | 9.766 | 11.073 | 13.020 |
| | Wind Uplift | 6.045 | 6.791 | 7.538 | 9.244 | 10.988 | 6.961 | 7.842 | 8.740 | 10.526 | 13.015 | 7.781 | 8.775 | 9.787 | 11.802 | 14.633 | 8.588 | 9.699 | 10.829 | 13.078 | 16.264 | 9.378 | 10.608 | 11.858 | 14.347 | 17.899 |
| 7.00 | Gravity Load | | | | | | 8.080 | 9.102 | 10.145 | 12.218 | 15.107 | 9.031 | 10.185 | 11.360 | 13.698 | 16.985 | 9.969 | 11.258 | 12.569 | 15.180 | 18.877 | 10.885 | 12.313 | 13.764 | 16.653 | 20.775 |
| | δ = Span/180 | | | | | | 3.799 | 4.093 | 4.387 | 4.970 | 5.838 | 4.813 | 5.186 | 5.559 | 6.300 | 7.403 | 5.973 | 6.437 | 6.901 | 7.823 | 9.195 | 7.287 | 7.855 | 8.421 | 9.548 | 11.227 |
| | Wind Uplift | | | | | | 6.464 | 7.282 | 8.116 | 9.775 | 12.085 | 7.225 | 8.148 | 9.088 | 10.959 | 13.588 | 7.975 | 9.006 | 10.056 | 12.144 | 15.102 | 8.708 | 9.851 | 11.011 | 13.322 | 16.620 |
| 7.50 | Gravity Load | | | | | | | | | | | | | | | | 9.304 | 10.507 | 11.732 | 14.168 | 17.619 | 10.159 | 11.492 | 12.846 | 15.543 | 19.390 |
| | δ = Span/180 | | | | | | | | | | | | | | | | 5.203 | 5.608 | 6.011 | 6.814 | 8.010 | 6.348 | 6.842 | 7.335 | 8.317 | 9.780 |
| | Wind Uplift | | | | | | | | | | | | | | | | 7.443 | 8.406 | 9.385 | 11.334 | 14.095 | 8.128 | 9.194 | 10.277 | 12.434 | 15.512 |

## Zed Heavy End Bay Purlins - Ultimate Load Capacities in kN

| Span (m) | Section No. | Z/14013 .17 | Z/14014 .20 | Z/14015 .20 | Z/15513 .17 | Z/15514 .20 | Z/15515 .20 | Z/17013 .17 | Z/17014 .20 | Z/17015 .20 | Z/18513 .17 | Z/18514 .20 | Z/18515 .20 | Z/20013 .17 | Z/20014 .20 | Z/20015 .20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Swt. (End Bay) | 3.56 | 4.16 | 4.16 | 3.76 | 4.40 | 4.40 | 3.96 | 4.63 | 4.63 | 4.16 | 4.87 | 4.87 | 4.36 | 5.10 | 5.10 |
| 4.50 | Gravity Load | 16.909 | 19.048 | 21.230 | 18.900 | 21.315 | 23.774 | 20.862 | 23.560 | 26.305 | 22.780 | 25.768 | 28.804 | 24.639 | 27.923 | 31.259 |
| | δ = Span/180 | 12.027 | 14.126 | 14.126 | 15.245 | 17.913 | 17.913 | 18.929 | 22.250 | 22.250 | 23.104 | 27.166 | 27.166 | 27.792 | 32.687 | 32.687 |
| | Wind Uplift | 13.527 | 15.239 | 16.984 | 15.120 | 17.052 | 19.019 | 16.690 | 18.848 | 21.044 | 18.224 | 20.615 | 23.044 | 19.711 | 22.338 | 25.007 |
| 5.00 | Gravity Load | 15.218 | 17.143 | 19.107 | 17.010 | 19.184 | 21.396 | 18.776 | 21.204 | 23.674 | 20.502 | 23.192 | 25.924 | 22.175 | 25.130 | 28.133 |
| | d = Span/180 | 9.742 | 11.442 | 11.442 | 12.348 | 14.510 | 14.510 | 15.332 | 18.023 | 18.023 | 18.714 | 22.004 | 22.004 | 22.511 | 26.477 | 26.477 |
| | Wind Uplift | 12.174 | 13.715 | 15.286 | 13.608 | 15.347 | 17.117 | 15.021 | 16.963 | 18.939 | 16.401 | 18.553 | 20.739 | 17.740 | 20.104 | 22.506 |
| 5.50 | Gravity Load | 13.835 | 15.585 | 17.370 | 15.463 | 17.440 | 19.451 | 17.069 | 19.276 | 21.522 | 18.638 | 21.083 | 23.567 | 20.159 | 22.846 | 25.575 |
| | δ = Span/180 | 8.051 | 9.456 | 9.456 | 10.205 | 11.992 | 11.992 | 12.671 | 14.895 | 14.895 | 15.466 | 18.185 | 18.185 | 18.604 | 21.881 | 21.881 |
| | Wind Uplift | 11.068 | 12.468 | 13.896 | 12.371 | 13.952 | 15.561 | 13.655 | 15.421 | 17.218 | 14.910 | 16.867 | 18.854 | 16.127 | 18.277 | 20.460 |
| 6.00 | Gravity Load | 12.682 | 14.286 | 15.923 | 14.175 | 15.986 | 17.830 | 15.646 | 17.670 | 19.728 | 17.085 | 19.326 | 21.603 | 18.479 | 20.942 | 23.444 |
| | δ = Span/180 | 6.765 | 7.946 | 7.946 | 8.575 | 10.076 | 10.076 | 10.647 | 12.516 | 12.516 | 12.996 | 15.281 | 15.281 | 15.633 | 18.387 | 18.387 |
| | Wind Uplift | 10.145 | 11.429 | 12.738 | 11.340 | 12.789 | 14.264 | 12.517 | 14.136 | 15.783 | 13.668 | 15.461 | 17.283 | 14.783 | 16.754 | 18.755 |
| 6.50 | Gravity Load | 11.706 | 13.187 | 14.698 | 13.084 | 14.757 | 16.459 | 14.443 | 16.311 | 18.211 | 15.770 | 17.840 | 19.941 | 17.058 | 19.331 | 21.641 |
| | δ = Span/180 | 5.764 | 6.770 | 6.770 | 7.307 | 8.586 | 8.586 | 9.072 | 10.664 | 10.664 | 11.073 | 13.020 | 13.020 | 13.320 | 15.667 | 15.667 |
| | Wind Uplift | 9.365 | 10.550 | 11.758 | 10.467 | 11.805 | 13.167 | 11.554 | 13.048 | 14.569 | 12.616 | 14.272 | 15.953 | 13.646 | 15.465 | 17.313 |
| 7.00 | Gravity Load | 10.870 | 12.245 | 13.648 | 12.150 | 13.703 | 15.283 | 13.411 | 15.146 | 16.910 | 14.644 | 16.565 | 18.517 | 15.839 | 17.950 | 20.095 |
| | δ = Span/180 | 4.970 | 5.838 | 5.838 | 6.300 | 7.403 | 7.403 | 7.823 | 9.195 | 9.195 | 9.548 | 11.227 | 11.227 | 11.485 | 13.508 | 13.508 |
| | Wind Uplift | 8.696 | 9.796 | 10.918 | 9.720 | 10.962 | 12.226 | 10.729 | 12.116 | 13.528 | 11.715 | 13.252 | 14.814 | 12.672 | 14.360 | 16.076 |
| 7.50 | Gravity Load | | | | 11.340 | 12.789 | 14.264 | 12.517 | 14.136 | 15.783 | 13.668 | 15.461 | 17.283 | 14.783 | 16.754 | 18.755 |
| | δ = Span/180 | | | | 5.488 | 6.449 | 6.449 | 6.814 | 8.010 | 8.010 | 8.317 | 9.780 | 9.780 | 10.005 | 11.767 | 11.767 |
| | Wind Uplift | | | | 9.072 | 10.231 | 11.411 | 10.014 | 11.309 | 12.626 | 10.934 | 12.369 | 13.826 | 11.827 | 13.403 | 15.004 |
| 8.00 | Gravity Load | | | | | | | 11.735 | 13.252 | 14.796 | 12.814 | 14.495 | 16.202 | 13.860 | 15.706 | 17.583 |
| | δ = Span/180 | | | | | | | 5.989 | 7.040 | 7.040 | 7.310 | 8.595 | 8.595 | 8.793 | 10.342 | 10.342 |
| | Wind Uplift | | | | | | | 9.388 | 10.602 | 11.837 | 10.251 | 11.596 | 12.962 | 11.088 | 12.565 | 14.066 |
| 8.50 | Gravity Load | | | | | | | | | | 12.060 | 13.642 | 15.249 | 13.044 | 14.783 | 16.549 |
| | δ = Span/180 | | | | | | | | | | 6.475 | 7.614 | 7.614 | 7.789 | 9.161 | 9.161 |
| | Wind Uplift | | | | | | | | | | 9.648 | 10.914 | 12.200 | 10.435 | 11.826 | 13.239 |

# Zed - Ultimate Load Capacities

## Zeta Butted (Purlin & Rail) - Ultimate Load Capacities in kN

| Span (m) | Section No. | Z/12513 | Z/12514 | Z/12515 | Z/12517 | Z/12520 | Z/14013 | Z/14014 | Z/14015 | Z/14017 | Z/14020 | Z/15513 | Z/15514 | Z/15515 | Z/15517 | Z/15520 | Z/17013 | Z/17014 | Z/17015 | Z/17017 | Z/17020 | Z/18513 | Z/18514 | Z/18515 | Z/18517 | Z/18520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Weight | 2.51 | 2.70 | 2.89 | 3.27 | 3.83 | 2.74 | 2.95 | 3.15 | 3.56 | 4.16 | 2.89 | 3.11 | 3.33 | 3.76 | 4.40 | 3.04 | 3.28 | 3.50 | 3.96 | 4.63 | 3.20 | 3.44 | 3.68 | 4.16 | 4.87 |
| **4.50** | Gravity Load | **7.482** | **8.405** | **9.330** | **11.442** | **13.600** | **8.616** | **9.706** | **10.818** | **13.029** | **16.109** | **9.630** | **10.861** | **12.114** | **14.607** | **18.112** | **10.630** | **12.005** | **13.404** | **16.187** | **20.130** | **11.607** | **13.130** | **14.677** | **17.758** | **22.154** |
| | δ = Span/180 | 3.372 | 3.632 | 3.892 | 4.408 | 5.175 | 4.579 | 4.934 | 5.288 | 5.991 | 7.037 | 5.801 | 6.252 | 6.701 | 7.594 | 8.924 | 7.200 | 7.760 | 8.318 | 9.430 | 11.084 | 8.784 | 9.468 | 10.150 | 11.509 | 13.533 |
| | Wind Uplift | 5.986 | 6.724 | 7.464 | 9.154 | 10.880 | 6.893 | 7.765 | 8.654 | 10.423 | 12.887 | 7.704 | 8.689 | 9.691 | 11.686 | 14.490 | 8.504 | 9.604 | 10.723 | 12.950 | 16.104 | 9.286 | 10.504 | 11.742 | 14.207 | 17.723 |
| **5.00** | Gravity Load | **6.734** | **7.565** | **8.397** | **10.298** | **12.240** | **7.754** | **8.735** | **9.736** | **11.726** | **14.498** | **8.667** | **9.775** | **10.903** | **13.147** | **16.301** | **9.567** | **10.804** | **12.063** | **14.568** | **18.117** | **10.447** | **11.817** | **13.210** | **15.982** | **19.939** |
| | δ = Span/180 | 2.731 | 2.942 | 3.152 | 3.570 | 4.191 | 3.709 | 3.997 | 4.283 | 4.853 | 5.700 | 4.699 | 5.064 | 5.427 | 6.151 | 7.228 | 5.832 | 6.285 | 6.738 | 7.638 | 8.978 | 7.115 | 7.669 | 8.222 | 9.323 | 10.962 |
| | Wind Uplift | 5.387 | 6.052 | 6.718 | 8.238 | 9.792 | 6.204 | 6.988 | 7.789 | 9.381 | 11.599 | 6.934 | 7.820 | 8.722 | 10.517 | 13.041 | 7.654 | 8.644 | 9.651 | 11.655 | 14.494 | 8.357 | 9.454 | 10.568 | 12.786 | 15.951 |
| **5.50** | Gravity Load | | | | | | **7.049** | **7.941** | **8.851** | **10.660** | **13.180** | **7.879** | **8.887** | **9.911** | **11.951** | **14.819** | **8.698** | **9.822** | **10.967** | **13.244** | **16.470** | **9.497** | **10.743** | **12.009** | **14.529** | **18.126** |
| | δ = Span/180 | | | | | | 3.066 | 3.303 | 3.540 | 4.011 | 4.711 | 3.884 | 4.185 | 4.486 | 5.084 | 5.974 | 4.820 | 5.195 | 5.568 | 6.312 | 7.420 | 5.880 | 6.338 | 6.795 | 7.705 | 9.059 |
| | Wind Uplift | | | | | | 5.640 | 6.353 | 7.081 | 8.528 | 10.544 | 6.304 | 7.109 | 7.929 | 9.561 | 11.855 | 6.958 | 7.858 | 8.773 | 10.595 | 13.176 | 7.598 | 8.594 | 9.607 | 11.624 | 14.501 |
| **6.00** | Gravity Load | | | | | | **6.462** | **7.280** | **8.113** | **9.772** | **12.082** | **7.223** | **8.146** | **9.085** | **10.955** | **13.584** | **7.973** | **9.004** | **10.053** | **12.140** | **15.098** | **8.706** | **9.848** | **11.008** | **13.319** | **16.616** |
| | δ = Span/180 | | | | | | 2.576 | 2.775 | 2.974 | 3.370 | 3.958 | 3.263 | 3.517 | 3.769 | 4.272 | 5.020 | 4.050 | 4.365 | 4.679 | 5.304 | 6.235 | 4.941 | 5.326 | 5.710 | 6.474 | 7.612 |
| | Wind Uplift | | | | | | 5.170 | 5.824 | 6.491 | 7.817 | 9.665 | 5.778 | 6.517 | 7.268 | 8.764 | 10.867 | 6.378 | 7.203 | 8.042 | 9.712 | 12.078 | 6.964 | 7.878 | 8.806 | 10.655 | 13.293 |
| **6.50** | Gravity Load | | | | | | | | | | | **6.667** | **7.519** | **8.387** | **10.113** | **12.539** | **7.359** | **8.311** | **9.279** | **11.206** | **13.936** | **8.036** | **9.090** | **10.161** | **12.294** | **15.338** |
| | δ = Span/180 | | | | | | | | | | | 2.781 | 2.996 | 3.212 | 3.640 | 4.277 | 3.451 | 3.719 | 3.987 | 4.519 | 5.313 | 4.210 | 4.538 | 4.865 | 5.516 | 6.486 |
| | Wind Uplift | | | | | | | | | | | 5.334 | 6.015 | 6.709 | 8.090 | 10.031 | 5.888 | 6.649 | 7.424 | 8.965 | 11.149 | 6.429 | 7.272 | 8.129 | 9.835 | 12.270 |
| **7.00** | Gravity Load | | | | | | | | | | | | | | | | **6.834** | **7.717** | **8.617** | **10.406** | **12.941** | **7.462** | **8.441** | **9.435** | **11.416** | **14.242** |
| | δ = Span/180 | | | | | | | | | | | | | | | | 2.975 | 3.207 | 3.438 | 3.897 | 4.581 | 3.630 | 3.913 | 4.195 | 4.756 | 5.593 |
| | Wind Uplift | | | | | | | | | | | | | | | | 5.467 | 6.174 | 6.893 | 8.325 | 10.353 | 5.970 | 6.753 | 7.548 | 9.133 | 11.394 |
| **7.50** | Gravity Load | | | | | | | | | | | | | | | | | | | | | **6.964** | **7.878** | **8.806** | **10.655** | **13.293** |
| | δ = Span/180 | | | | | | | | | | | | | | | | | | | | | 3.162 | 3.409 | 3.654 | 4.143 | 4.872 |
| | Wind Uplift | | | | | | | | | | | | | | | | | | | | | 5.572 | 6.303 | 7.045 | 8.524 | 10.634 |







# Material Specifications

### 'S390' Material

The majority of the sections illustrated in this manual are manufactured from 'S390' material.

BS EN 10147 is the standard code of practice for the specification of hot dipped zinc coated steel strip for cold formed sections.

Whilst this code does not explicitly carry a standard specification for 'S390' material, an appropriate technical description can be calculated that complies with the principles given in Table 1 of this code.

These structural parameters can be defined as follows:

Yield strength: ReH = 390 N/mm² guaranteed minimum value

Tensile strength: Rm = 468 N/mm² minimum value (i.e. 1.2 x Yield strength in accordance with the design code BS5950:Part5:1998) Elongation: A80 = 14%

All other technical delivery conditions for the coating, surface finish, quality and treatment as defined in BS EN 10147 are satisfied. Hence, the material reference is 'S390GD+Z275' zinc coated steel, with a minimum guaranteed yield strength of 390 N/mm².

The calculation of structural properties for the sections in this manual are in accordance with BS5950:Part5:1998 using the yield and tensile strengths as defined above. Test data has also been analysed to confirm full compliance with the principles adopted.

**Cleats**

Cleats manufactured from Grade HR4 material to BS 1449, Section 1.2. Baseplate for bolt-on cleats Grade S275 material.

**Eaves Beam Brackets**

Manufactured from Grade S275 material, and galvanised to BS 729:1971.

**Nothing in this manual represents a performance warranty with regard to material durability.**

**The Building Designer is responsible for assessing the suitability of the products for their intended application, taking into account local environmental conditions.**

**Since our policy is one of continuing product development, Tegral Metal Forming Ltd reserve the right to revise the information shown without notification.**

### Quality Assurance

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