STRUCTURAL SYSTEMS MANUAL

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Dimond Structural, a division of Fletcher Steel Ltd.

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Dimond Structural™

DIMOND STRUCTURAL PURLIN SYSTEMS

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For on-line technical information
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Contact the Dimond Technical Team:
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For Design Advice, Technical Assistance, System Specification Help

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SCOPE OF USE

Dimond Structural Purlin Systems are intended for use as structural support to roofing and wall cladding. The systems provide for bolted connections to primary structural framework and include Dimond Structural DHS Purlins, Fastbrace, Bolted Brace Channels and Top Notch Purlins. The systems are subject to limitations on the environment in which they are used, depending on the type of coating specified.

The information for Dimond Structural Purlin Systems herein is intended for use by suitably qualified structural engineers for their design and PS1 certification.

It is critical to product performance that the loads applied, member spans, member sizes and bracing points are designed within the appropriate Limit State Loads and limitations published in this manual.

Consideration of construction loads relevant to each project are to be accounted for in design to ensure construction can proceed in a safe manner, and contractors are aware of any constraints.

Before commencing a project using a Dimond Structural Purlin System, the designer must ensure relevant information is available to the end user. Failure to observe this information may result in a significant reduction in product performance. Dimond Structural accepts no liability whatsoever for products which are used otherwise than in accordance with these recommendations.

The information contained within this manual is only applicable to Dimond Structural Purlin and Bracing Systems – it cannot be assumed to apply to similar products from other manufacturers.

USE OUTSIDE THE STATED GUIDELINES

If the need arises to use a Dimond Structural Purlin System outside the limitations and procedures given in this manual or if there exists any doubt on product handling or use, written approval should be obtained from Dimond Structural for the specific project, before the project is commenced.

DURABILITY

SCOPE

The Dimond Structural Purlin Systems described in this manual are subject to limitations on the environment in which they are used, depending on the type of coating specified in this section.

COATING MATERIAL SPECIFICATIONS

Dimond Structural Purlin Systems are manufactured from galvanised coil in the following protective galvanised zinc coating weights.

Standard Grade Z275, i.e. 275g/m^2 total galvanised zinc coating weight.

Grade Z450, i.e. 450g/m^2 total galvanised zinc coating weight. Grade Z450 requires a three-month lead time from date of order to supply for all sizes of purlins and quantities.

Dimond Structural Bracing Systems are manufactured from Grade Z450 material.

ENVIRONMENTS

GENERAL

The durability of galvanised zinc coated products is dependent on:

- The environment it will be installed in.
- The grade or weight of the galvanised zinc coating used.
- The degree and extent of the maintenance that will be undertaken over the life of the product.

Performance of galvanised zinc coated products is affected by:

- The cumulative effects of the weather.
- The amount of dust (which can hold moisture) that settles on the product.
- Any other wind-blown deposits that may settle on the product, promoting corrosion.
- Proximity to the ground in subfloor areas with little or no ventilation.

Condensation or other deposits should be prevented from accumulating on Dimond Structural Purlin Systems by providing adequate ventilation and carrying out regular maintenance. A protective barrier must be provided if dampness is possible on the purlin system. Refer Durability Statement 2.1.5 and Maintenance 2.1.6.

LIMITATIONS ON USE

The use of galvanised steel purlin systems should be avoided:

- In areas where high concentrations of chemicals are combined with a high humidity, where the system remains wet for long periods of time, causing rapid consumption of the galvanised zinc coating and eventual red rusting of the base metal for example, swimming pool roofs.
- Where the galvanised surface is being exposed to continuous moisture, without a chance for the surface to dry out for example, water tank roofs.
- In or near marine environments, where the prevailing wind carries marine salts which deposit on the purlin system, causing rapid consumption of the galvanised zinc coating and eventual red rusting of the base metal.
- In areas surrounding chemical or industrial storage buildings where any chemical attack may lessen the life of the structure or wind-driven chemical fumes may attack the galvanised coating.
- When in contact with or laid directly on ground.
- When in contact with timber and especially treated timber such as CCA (copper chrome arsenic) without the use of an isolating material such as DPC between the timber and purlin system.

- When used as supporting members to which fall arrest anchor points are attached.
- Where used as ceiling support members, vertical studs or horizontal wall girts where plaster board is fixed directly to the DHS purlin and a level 4 finish or above is required (fixing to a secondary adjustable grid framing system connected to the DHS purlins prior to lining with plasterboard will ensure tighter alignment and fixing tolerance, to achieve the required finish).
- When used in sub-floor areas with less than 450mm ground clearance.
- When used in sub-floor areas where ventilation does not comply with NZS 3604 Clause 6.14.
- Where embedded in concrete or where used within 50mm of the concrete ground slab.

2.1.4

NZBC COMPLIANCE

Past history of use of Dimond Structural Purlin Systems indicate that provided the system design, product use and maintenance is in line with the guidelines of this manual, Dimond Structural Purlin Systems can reasonably be expected to meet the performance criteria in clause B1 Structure and B2 Durability of the New Zealand Building Code for a period of not less than 50 years, provided the steel components remain dry and free from contamination.

2.1.5

DURABILITY STATEMENT

The use of Dimond Structural Purlin Systems is limited to dry and non corrosive environments unless further protection of the surfaces is provided.

It is the responsibility of the design engineer to assess the durability requirements and specify accordingly.

Dimond Structural Purlin Systems can be used in the temperature range of +60°C to -30°C.

As a guide and subject to designers specification and approval,

- Standard Z275 zinc coating weight is used on buildings where components are kept dry in service and protected from exposure to moisture and corrosive environments.
- Z450 zinc coating weight could be considered for mild external environments, such as the underside of canopies (Note: Fastbrace, Bolted Brace Channel and bracing end cleats are supplied in Z450 zinc coating).
- Where the surface of the purlin system may be exposed to contaminants and/or moisture that will not regularly dry out, the use of Dimond Structural Purlin Systems is only recommended if suitable protection of the galvanised steel surface can be achieved with a proprietary coating system applied in-situ. Coating specifications and statements on suitability of use can be obtained from PPG Coatings or Akzo Nobel Coatings.

2.1.6

MAINTENANCE

Dimond Structural Purlin Systems require a minimum degree of maintenance to ensure expected performance is achieved. Careful maintenance can extend the useful life of the Dimond Structural Purlin System.

As a guide the following should be carried out as often as is needed (this could be as often as every three months).

a) Keep surfaces clean and free from continuous contact with moisture, dust and other debris. This includes areas such as the exposed underside of canopy structures. Where necessary, regular maintenance should include a wash-down programme to remove all the accumulated dirt or salt buildup on all the galvanised surfaces with a soft brush and plenty of clean water or by water blasting at 15 MPa (2000 psi).

b) Periodically inspect the Purlin, Girt, Fastbrace, Bolted Brace Channel, Sag Rod members and connections. At the first sign of any surface corrosion, the affected areas should be cleaned down, spot primed with a zinc rich primer and then repainted to an appropriate paint manufacturer's recommendations.

c) Periodically inspect and, where necessary, tighten any loose bolts or fasteners and replace any that have deteriorated to the extent that red rust has become obvious over most of their surface.

Any case of severe damage or corrosion must be reported to the design engineer.

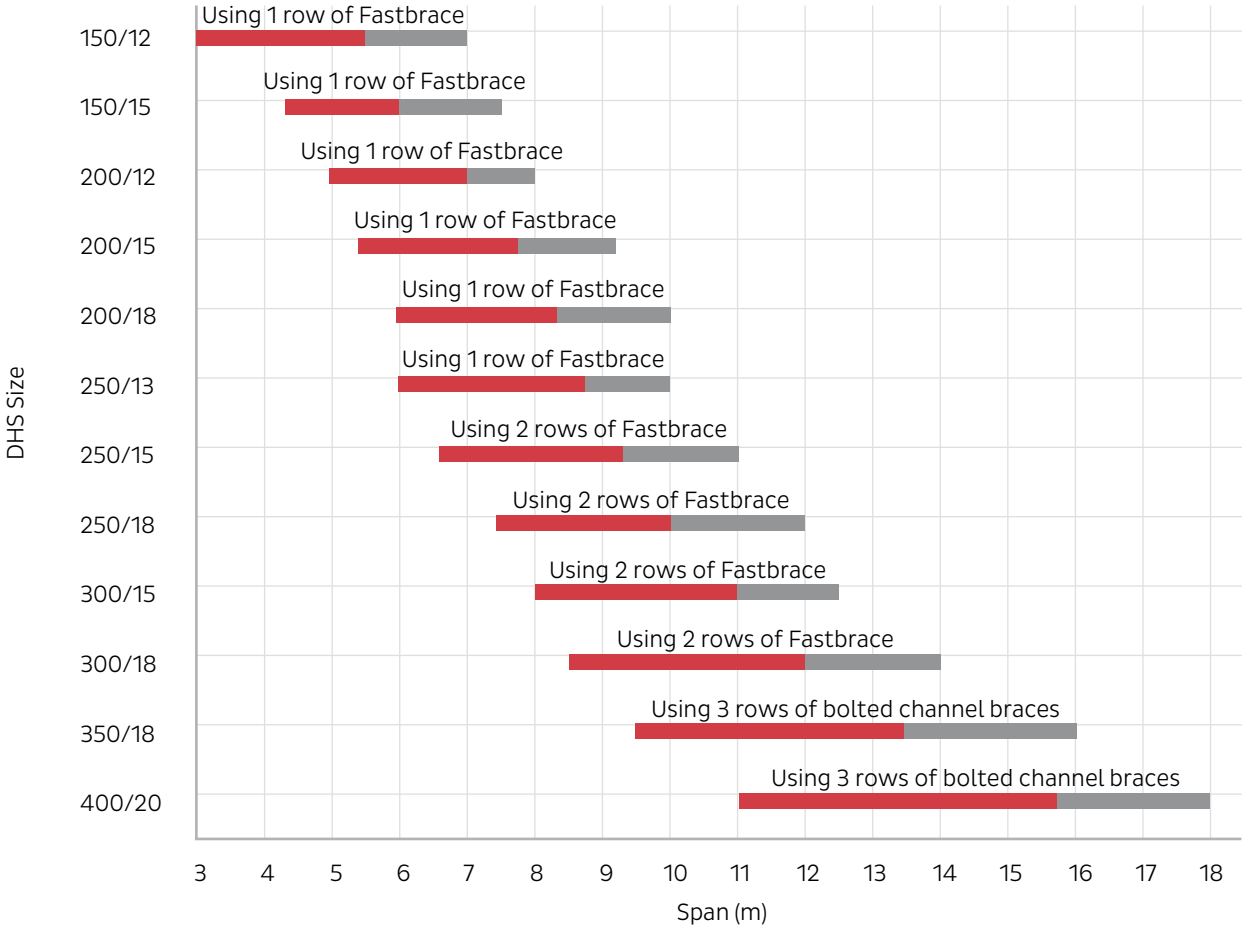
GENERAL DESIGN CONSIDERATIONS

OPTIMISATION

The charts and tables in this section are based on typical product use and are intended as a quick reference guide only. These must not be used for design purposes or as a substitute for specific design in sections 2.3 and 2.4 as there may be specific cases in this section where the spans indicated on these charts and tables will not be achievable.

DHS PURLIN SYSTEM QUICK REFERENCE GUIDE

1. This guide is intended to be used as an indicator of the purlin and bracing options suitable for particular spans.
2. Final purlin and bracing design must be based on detailed design specific to each building.



Key: Single Spans Lapped Spans

TOP NOTCH PURLIN SYSTEM QUICK REFERENCE GUIDE

The following quick reference guide is intended for use as a preliminary design for farm building and non-habitable sheds and is for guidance only. It is not a substitute for final design or building consent requirements.

1. The quick reference guide is based on AS/NZS 1170:2002 design actions with nominal internal (+0.3) pressures and an allowance for local peak pressures ($K_l C_{pe} + C_{pi} = 1.4$), with a maximum building height of 8 metres and a maximum building height/depth ratio of 0.6.

   Urban and rural purlins are designed for a 1 in 500 year Ultimate Limit State (ULS) wind event and wind serviceability deflections of span/150 (1 in 25 year wind event).

   Farm purlins are designed for a 1 in 100 year Ultimate Limit State (ULS) wind event and maximum wind serviceability deflections of span/90 (1 in 25 year wind event).

2. In **snow** regions specific design is required. **The tables are not appropriate above 200 metres elevation for Canterbury, Otago and Southland, nor above 450 metres for the West Coast, Marlborough and the Central/Lower North Island.**

3. Terrain Categories (TC) from AS/NZS 1170 are defined as follows:

   Urban areas are those built-up with numerous obstructions 3-5 metres high, such as areas of suburban housing (TC = 3).

   Sheltered Rural assumes rural with some sheltering from trees and adjacent buildings (TC = $2^1/_2$).

   Rural assumes open terrain or grassland with few, well-scattered obstructions such as isolated trees and buildings (TC = 2).

   Farm indicates buildings of low importance with a low degree of hazard to life and other property on open terrain (TC = 2).

4. **Fasteners** use the following number and fastener gauge, i.e. 2/12g requires 2 x 12g fasteners:

	Top Notch Purlin			
	60	100	120	150
At purlin ends	2/12g	2/12g	2/14g	2/14g
At internal (continuous) supports	4/12g	6/12g	6/14g	8/14g

5. **For Lapped Top Notch purlins,** laps shall be a minimum of 15% of maximum adjacent Top Notch span.

TOP NOTCH PURLIN SYSTEM QUICK REFERENCE GUIDE

All New Zealand (except Wellington and Marlborough Sounds)

Top Notch Spacing (mm)	Span (m)	Urban (TC=3)			Sheltered Rural (TC=2½)			Rural (TC=2)			Farm (TC=2)		
		Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped
1200	1.50	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1200	1.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1200	2.00	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1200	2.25	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75
1200	2.50	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	60 x 0.75	60 x 0.75
1200	2.75	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.95	100 x 0.75	60 x 0.95	100 x 0.75	60 x 0.95	60 x 0.95
1200	3.00	100 x 0.75	100 x 0.75	60 x 0.95	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95
1200	3.25	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1200	3.50	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1200	3.75	120 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75
1200	4.00	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	120 x 0.95	100 x 0.95	120 x 0.95	100 x 0.95	100 x 0.75
1200	4.25	150 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95	150 x 0.95	100 x 0.95	100 x 0.75
1200	4.50	150 x 0.95	100 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95	150 x 0.95	120 x 0.95	100 x 0.75
1200	4.75	150 x 0.95	120 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	120 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95
1200	5.00	150 x 1.15	120 x 0.95	120 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95		150 x 1.15	120 x 0.95	150 x 1.15	150 x 0.95	100 x 0.95
1200	5.25	150 x 1.15	150 x 0.95	120 x 0.95		150 x 0.95	150 x 0.95		150 x 1.15	150 x 0.95	150 x 1.15	150 x 0.95	100 x 0.95
1200	5.50		150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	100 x 0.95
1200	5.75		150 x 0.95	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	120 x 0.95
1200	6.00		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95			150 x 1.15		150 x 1.15	120 x 0.95
1200	6.25		150 x 1.15	150 x 0.95			150 x 0.95			150 x 1.15		150 x 1.15	150 x 0.95
1200	6.50		150 x 1.15	150 x 0.95			150 x 1.15			150 x 1.15			150 x 0.95
1200	6.75		150 x 1.15	150 x 1.15			150 x 1.15						150 x 0.95
1200	7.00			150 x 1.15									150 x 1.15
1200	7.25			150 x 1.15									150 x 1.15
1200	7.50												150 x 1.15

Note: TC = Terrain Category from AS/NZS 1170.

TOP NOTCH PURLIN SYSTEM QUICK REFERENCE GUIDE

All New Zealand (except Wellington and Marlborough Sounds)

Top Notch Spacing (mm)	Span (m)	Urban (TC=3)			Sheltered Rural (TC=2½)			Rural (TC=2)			Farm (TC=2)		
		Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped
1700	1.50	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1700	1.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1700	2.00	60 x 0.95	60 x 0.75	60 x 0.75	100 x 0.95	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75
1700	2.25	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	100 x 0.75	60 x 0.95	100 x 0.75	60 x 0.95	60 x 0.95
1700	2.50	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	100 x 0.75	60 x 0.95	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95
1700	2.75	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1700	3.00	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1700	3.25	120 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75
1700	3.50	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	150 x 1.15	120 x 0.95	100 x 0.95	150 x 0.95	100 x 0.95	100 x 0.75
1700	3.75	150 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	120 x 0.95	100 x 0.95		150 x 0.95	100 x 0.95	150 x 0.95	120 x 0.95	100 x 0.75
1700	4.00	150 x 0.95	120 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95		150 x 0.95	120 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95
1700	4.25	150 x 1.15	120 x 0.95	100 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95		150 x 1.15	120 x 0.95	150 x 1.15	150 x 0.95	100 x 0.95
1700	4.50	150 x 1.15	150 x 0.95	100 x 0.95		150 x 1.15	120 x 0.95		150 x 1.15	150 x 0.95		150 x 0.95	100 x 0.95
1700	4.75	150 x 1.15	150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	120 x 0.95
1700	5.00		150 x 1.15	120 x 0.95		150 x 1.15	150 x 0.95			150 x 1.15		150 x 1.15	120 x 0.95
1700	5.25		150 x 1.15	150 x 0.95			150 x 0.95			150 x 1.15		150 x 1.15	150 x 0.95
1700	5.50		150 x 1.15	150 x 0.95			150 x 1.15			150 x 1.15			150 x 0.95
1700	5.75			150 x 0.95			150 x 1.15			150 x 1.15			150 x 1.15
1700	6.00			150 x 1.15			150 x 1.15						150 x 1.15
1700	6.25			150 x 1.15									150 x 1.15
1700	6.50												150 x 1.15
1700	6.75												150 x 1.15
1700	7.00												
1700	7.25												
1700	7.50												

Note: TC = Terrain Category from AS/NZS 1170.

TOP NOTCH PURLIN SYSTEM QUICK REFERENCE GUIDE

Wellington and Marlborough Sounds

Top Notch Spacing (mm)	Span (m)	Urban (TC=3)			Sheltered Rural (TC=2½)			Rural (TC=2)			Farm (TC=2)		
		Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped
1200	1.50	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1200	1.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1200	2.00	60 x 0.95	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75
1200	2.25	100 x 0.75	60 x 0.75	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	60 x 0.95	60 x 0.95
1200	2.50	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95
1200	2.75	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1200	3.00	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1200	3.25	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75
1200	3.50	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	120 x 0.95	100 x 0.95	150 x 0.95	100 x 0.95	100 x 0.75
1200	3.75	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95	150 x 0.95	120 x 0.95	100 x 0.75
1200	4.00	150 x 0.95	100 x 0.95	100 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95
1200	4.25	150 x 1.15	120 x 0.95	120 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95		150 x 0.95	120 x 0.95	150 x 1.15	150 x 0.95	100 x 0.95
1200	4.50	150 x 1.15	120 x 0.95	120 x 0.95	150 x 1.15	150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 0.95	100 x 0.95
1200	4.75	150 x 1.15	150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	120 x 0.95
1200	5.00		150 x 0.95	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	120 x 0.95
1200	5.25		150 x 1.15	150 x 0.95		150 x 1.15	150 x 0.95			150 x 1.15		150 x 1.15	150 x 0.95
1200	5.50		150 x 1.15	150 x 0.95			150 x 1.15			150 x 1.15			150 x 0.95
1200	5.75		150 x 1.15	150 x 1.15			150 x 1.15						150 x 1.15
1200	6.00			150 x 1.15									150 x 1.15
1200	6.25			150 x 1.15									150 x 1.15
1200	6.50												150 x 1.15
1200	6.75												150 x 1.15
1200	7.00												
1200	7.25												
1200	7.50												

Note: TC = Terrain Category from AS/NZS 1170.

TOP NOTCH PURLIN SYSTEM QUICK REFERENCE GUIDE

Wellington and Marlborough Sounds

Top Notch Spacing (mm)	Span (m)	Urban (TC=3)			Sheltered Rural (TC=2½)			Rural (TC=2)			Farm (TC=2)		
		Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped	Single	Double	Lapped
1700	1.50	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.75	60 x 0.75
1700	1.75	60 x 0.95	60 x 0.75	60 x 0.75	60 x 0.95	60 x 0.75	60 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95	60 x 0.95	60 x 0.75	60 x 0.75
1700	2.00	100 x 0.75	60 x 0.95	60 x 0.75	100 x 0.75	60 x 0.95	60 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95	60 x 0.75
1700	2.25	100 x 0.75	100 x 0.75	60 x 0.95	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.75	60 x 0.95
1700	2.50	100 x 0.95	100 x 0.75	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	100 x 0.95	100 x 0.75	100 x 0.75
1700	2.75	100 x 0.95	100 x 0.75	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75
1700	3.00	120 x 0.95	100 x 0.95	100 x 0.75	150 x 0.95	100 x 0.95	100 x 0.75	150 x 1.15	120 x 0.95	100 x 0.75	120 x 0.95	100 x 0.95	100 x 0.75
1700	3.25	150 x 0.95	100 x 0.95	100 x 0.75	150 x 1.15	120 x 0.95	100 x 0.95		150 x 0.95	100 x 0.95	150 x 0.95	100 x 0.95	100 x 0.75
1700	3.50	150 x 1.15	120 x 0.95	100 x 0.95		150 x 0.95	100 x 0.95		150 x 1.15	120 x 0.95	150 x 1.15	120 x 0.95	100 x 0.95
1700	3.75	150 x 1.15	150 x 0.95	100 x 0.95		150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 0.95	100 x 0.95
1700	4.00		150 x 0.95	120 x 0.95		150 x 1.15	150 x 0.95		150 x 1.15	150 x 1.15		150 x 0.95	100 x 0.95
1700	4.25		150 x 1.15	120 x 0.95		150 x 1.15	150 x 1.15			150 x 1.15		150 x 1.15	120 x 0.95
1700	4.50		150 x 1.15	150 x 0.95		150 x 1.15	150 x 1.15			150 x 1.15		150 x 1.15	150 x 0.95
1700	4.75		150 x 1.15	150 x 0.95			150 x 1.15					150 x 1.15	150 x 0.95
1700	5.00			150 x 1.15			150 x 1.15						150 x 1.15
1700	5.25			150 x 1.15			150 x 1.15						150 x 1.15
1700	5.50			150 x 1.15									150 x 1.15
1700	5.75												150 x 1.15
1700	6.00												
1700	6.25												
1700	6.50												
1700	6.75												
1700	7.00												
1700	7.25												
1700	7.50												

Note: TC = Terrain Category from AS/NZS 1170.

SPECIFIC DESIGN – DHS PURLIN SYSTEM

DESIGN BASIS

Dimond Structural DHS Purlin Systems have been designed to comply with AS/NZS 4600:1996, based on physical testing and analysis carried out by the University of Sydney, who are recognised for their expertise in the area of cold form design. The structural analysis consisted of several modules including cross-sectional analysis, an AS/NZS 4600:1996 design module, in-plane structural analysis, and finite element lateral buckling analysis.

Methods in AS/NZS 4600:1996 for determining pure shear, combined bending/shear, lateral buckling and distortional buckling have, in some cases, resulted in lower purlin capacities than previously published. These are included in the design tables in this manual.

Appropriate design load combinations for each Limit State should be determined in accordance with AS/NZS 1170. It is recommended these be expressed as uniformly distributed bending loads (kN/m) assumed to be acting in-plane applied about the major axis of symmetry (X-X) and uniform axial compression loads (kN) applied about the rotational axis (Z-Z) for direct comparison with the tabulated data in this manual.

Self weight of the DHS Purlin Systems is not included in any load tables and must be calculated as part of the total dead load of the building elements supported by the purlin.

DHS PURLIN SYSTEM DESIGN CONSIDERATIONS

Data presented in this manual is intended for use by structural engineers. Load situations other than uniformly distributed and axial loads will require specific design.

Design capacity of the DHS Purlin System is largely dependent on the amount of restraint provided to the purlin section. Data presented in DHS Purlin System Load Span Tables 2.3.4 assumes that bracing prevents both lateral movement and rotation of the section at that point.

Design Capacities in the Limit State format have been derived by the application of a capacity factor, ϕ:

Bending $\phi_b = 0.90$

Compression $\phi_c = 0.85$

A design yield strength of 500 MPa has been used for DHS purlins and girts. This is in line with the minimum specified yield for G500 material and is less than the consistent minimum yield stress in the G450 material used in manufacture.

Tables in this manual are intended for use where roofing or cladding is attached to one DHS purlin or girt flange, where it is assumed that the screw-fastened cladding significantly prevents lateral movement of the flange to which it is attached. Where this assumption does not hold, it is recommended that the number of braces required is specified such that the purlin load capacity, $\phi_b W_{bx}$ is not less than the capacity for the Fully Restrained (FR) case.

Gravity type loads can be assumed to act perpendicular to the roof plane for roof pitches up to 10 degrees provided the DHS purlins are placed with their flanges facing up the slope. For roof pitches greater than 10 degrees, load components about the minor axis of symmetry (Y-Y) should also be considered.

Span Guide

As a guide, single spans are used most frequently, particularly where purlins/girts are set down between the rafters/columns. Deflections may govern on larger spans.

End and internal continuous configurations may be used where lower deflections are required.

Lapped end and lapped internal configurations are more economical on large purlin spans where better strength and lower deflections are required.

Deflection Guidelines

As a guide to acceptable deflection limits for serviceability of the DHS Purlin System used as purlins or girts, the following limits are recommended for wind load and dead load actions,

- **Where there is no ceiling:**
  - Deflection for W_S ≯ Span/150
  - Deflection for G ≯ Span/300
- **Where there is a ceiling:**
  - Deflection for W_S ≯ Span/200
  - Deflection for G ≯ Span/360.

For further guidance on deflection limits, refer to AS/NZS 1170.

Bracing Guidelines

For roofs, the out of plane component of the dead load of the roofing and purlins is assumed to be carried in tension by Fastbrace or Bolted Brace Channels tied across the ridge or into the ridge beam for monoslope roofs. In order to minimise lateral deflections to purlin members, we recommend a maximum spacing between bracing lines and/or support framing of 3.5 metres.

For walls, the following table gives the maximum allowable wall heights for Dimond Structural bracing systems, where the dead load of cladding and girts is assumed to be carried in tension to an eaves beam by Fastbrace or Bolted Brace Channels. In order to minimise deflections in the girt member, we recommend a maximum spacing between bracing lines and/or support framing of 3.5 metres.

Specific design of the bracing system and connections is required for wall heights greater than the limits shown or where the bracing is designed to carry compression loads.

Purlin Thickness BMT (mm)	Maximum Wall Height	
	Fastbrace	Bolted Channel Bracing
1.15, 1.25	5.0m	15.0m
1.45	6.5m	15.0m
1.75	8.0m	15.0m
1.95	-	15.0m

Basis to table: 1) Maximum spacing of bracing lines/portal frames 3.5m and 2) Maximum cladding weight 6.7kg/m^2.

Specific Design

Specific design to AS/NZS 4600 is required where DHS purlins -

- have suspended loads present (such as ducting and piping). Suspended loads are connected to the DHS purlin web or, if this is not possible, to the DHS purlin bottom flange within 25mm of the web. Under no circumstances should loads be hung off the purlin lips.
- are used as cantilever members.
- are used as truss or portal members.
- have holes larger than standard bolt holes present.
- are subject to out of plane loading about the minor Y-Y axis.

Distortional Buckling Stresses and Design Capacities in Compression, Bending and Shear

The following table lists design capacities and distortional buckling stresses that were used in determining the load span tables.

DHS size	Compression	Bending			Shear	
	$\phi_c N_s$ (kN)	$\phi_b M_{sx}$ (kNm)	f_{odx}(TW) (MPa)	$\phi_b M_{bdx}$ (kNm)	k_v	$\phi_v V_{vy}$ (kN)
DHS 150/12	94.7	6.93	413	5.82	7.80	14.03
DHS 150/15	133.4	9.60	526	7.93	7.53	27.27
DHS 200/12	101.2	9.85	321	8.62	7.62	10.06
DHS 200/15	142.8	14.15	409	11.82	7.45	19.78
DHS 200/18	188.9	18.96	498	15.21	7.33	34.31
DHS 250/13	123.3	15.00	290	13.36	8.03	10.75
DHS 250/15	153.6	18.82	339	16.40	7.89	16.53
DHS 250/18	203.3	25.29	412	21.18	7.73	28.54
DHS 300/15	161.9	23.85	271	21.39	8.00	13.83
DHS 300/18	214.6	31.89	330	27.74	7.83	23.85
DHS 350/18	222.4	38.37	301	33.48	7.70	19.97
DHS 400/20	270.1	53.28	300	45.29	7.51	23.50

- $\phi_c N_s$: Design section capacity in pure compression, determined in accordance with AS/NZS 4600:1996 Clause 3.4.1 with $\phi_c = 0.85$.
- $\phi_b M_{sx}$: Design section capacity in pure bending about the major (X-X) axis, determined in accordance with AS/NZS 4600:1996 Clause 3.3.2 with $\phi_b = 0.95$ and the web modelled as a single stiffened flat element.
- $\phi_b M_{bdx}$: Design member capacity in pure bending about the major (X-X) axis based on failure by distortional buckling, determined in accordance with AS/NZS 4600:1996 Clause 3.3.3.3 with $\phi_b = 0.90$. The corresponding distortional buckling stress (f_{odx}(TW)) is determined using a rational elastic buckling analysis of the whole cross-section.
- k_v: Shear buckling coefficient for the web following the procedures outlined in Section R6.2 of the ECCS document entitled *European Recommendations for Steel Construction: The Design of Profiled Sheeting* (ECCS, 1983). The ECCS procedures provide a sound basis for determining k_v where a stiffening swage is present in the web.
- $\phi_v V_{vy}$: Design shear capacity for a shear force in the direction of the Y-Y axis, determined in accordance with AS/NZS 4600:1996 Clause 3.3.5 with $\phi_v = 0.90$.

Combined Bending and Compression Design

When purlins are designed to act under combined bending and axial loads, for example purlins transmitting end wall loads to braced bays, interaction of combined bending and axial loads may be shown in the following equations:

1. If $N^*/\phi_c N_c \le 0.15$, the following interaction equation may be used:

$$\frac{N^*}{\phi_c N_c} + \frac{W_x^*}{\phi_b W_{bx}} \le 1.0$$

This is usually the case when purlins are used primarily as bending members near capacity and are also required to take a nominal level of axial compression.

If $N^*/\phi_c N_c > 0.15$ then the following equations must be used:

2. $$\frac{N^*}{\phi_c N_c} + \frac{C_{mx} W_x^*}{\phi_b W_{bx} \alpha_{nx}} \le 1.0$$

3. $$\frac{N^*}{\phi_c N_s} + \frac{W_x^*}{\phi_b W_{bx}} \le 1.0$$

where

N^* = Design axial compressive load (kN).

$\phi_c N_c$ = Axial compression member capacity (kN) in the absence of other actions.

$\phi_c N_s$ = Axial compression section capacity (kN).

W_x^* = Design bending load (kN/m) about the X-X axis.

$\phi_b W_{bx}$ = Uniformly loaded bending capacity (kN/m) about the X-X axis.

C_{mx} = Restraint coefficient about the X-X axis.

It is reasonable to assume C_{mx} is 1.0 for unrestrained supports (i.e. simply supported) and 0.85 for restrained supports (end or internal spans).

α_{nx} = $1 - [N^*/\phi_c N_{ex}]$.

$\phi_c N_{ex}$ = Elastic buckling capacity (kN) about the major axis of symmetry (X-X).

Flexure about the minor axis of symmetry (Y-Y) is assumed to be zero. If biaxial flexure is expected, specific design to AS/NZS 4600 is required.

Solution of the interaction equation involves solving for the design axial compressive load (N*), yielding the remaining axial capacity or directly substituting the known variables. These methods are illustrated in DHS Purlin System Design Examples 2.3.5.

Where DHS purlins are designed to take solely axial load, the design of the bolted connections must be considered. For example a DHS purlin designed as a load-bearing post will likely be limited by the capacity of bolts used at supports.

Bracing System Design

Fastbrace and Bolted Brace Channels are used with the DHS Purlin System and run in continuous lines between all purlins/girts. Fastbrace is the preferred bracing type for use with the DHS Purlin System and is suitable for use with DHS 150/12 up to DHS 300/18 (Bolted Brace Channels must be used with DHS 350/18 and DHS 400/20). Bolted Brace Channels are suitable for use on all DHS Purlin sizes.

Individual bracing units are available in lengths greater than 250mm.

To minimise lateral movement of the DHS Purlin System and for the bracing system to be effective with the Load Capacities in Section 2.3.4 it is assumed -

- Bracing lines are continuous from ridge to eaves.
- A minimum of one bracing line per bay is used for all purlin/girt configurations, assumed bolted to cleats at all supports.
- Bracing lines are located as set out for the span type and number of bracing lines considered. Refer CAD Details on-line (**www.dimondstructural.co.nz/products/dhs-purlins**).
- Bracing lines are not more than 3.5m apart and each length of brace channel does not exceed 3.20m
- No other structure is connected to or hung from the bracing system. DHS Bracing Systems are not suitable for hanging suspended loads.
- Brace channels and alternating sag rods are not used. This significantly lowers the rotational restraint of the bracing system on the DHS Purlin System.

Bracing System Design Method

Specific design of the bracing system is required where bracing is used to support additional loads (other than providing rotational and lateral restraint to the purlins), for example sprinkler pipes or ducting.

The bending moment on each brace channel is determined by:

$M^* = 0.75\ \phi_b W_{bx} l_b m$ if roofing or cladding attachment provides sufficient restraint to the outside flange

or $M^* = 1.5\ \phi_b W_{bx} l_b m$ if there is no additional restraint to the outside flange.

Where $\phi_b W_{bx}$ = Uniformly loaded bending capacities from DHS load span tables

$l_b = l \times h$ where l = purlin span, h = contributing length factor from below

m = distance from shear centre to mid plane of DHS purlin web from below.

Contributing Length Factor (h)

Span Type	No. of Brace Lines		
	1	2	3
Single	0.50	0.31	0.25
End	0.50	0.31	0.25
Internal	0.50	0.31	0.25
End Lapped	0.475	0.295	0.24
Internal Lapped	0.45	0.28	0.23

Dimension (m)

DHS Member	150/12	150/15	200/12	200/15	200/18	250/13	250/15	250/18	300/15	300/18	350/18	400/20
m (mm)	33.2	32.9	36.3	35.9	35.6	38.3	38.1	37.8	42.8	42.6	41.6	40.1

M^* must not exceed the brace member capacity M_b given below.

Bracing Member Moment Capacity (M_b)

Maximum Brace Length (m)	≤ 3.2	3.4	3.6	3.8	4.0
M_b (kNm)	0.50	0.48	0.45	0.41	0.38

Notes:
1. For brace lengths less than 3.2m, the brace capacity is limited by cleat connection rather than the brace channel.
2. The moment capacities given above do not apply where additional loads are connected eccentrically to the web of the brace channel. We do not recommend connecting additional loads to the flanges or lips of the brace channel.

Connection Design

The following table sets out the bolt shear capacities for Grade 4.6 and Grade 8.8 bolts and the connection capacity for different steel thicknesses of the DHS Purlin System when checked for end tearing and bearing. These can be compared with connection design loads determined by the design engineer. Refer Example: Bolt Sizing in Section 2.3.5.

Details of single bolt connection capacities for DHS Purlins and Girts

Bolt Diameter (mm)	Failure Mode	Steel capacity (kN) for varying steel thicknesses (mm)					Bolt shear ϕV_{fn} (kN)	
		1.15	1.25	1.45	1.75	1.95	Grade 4.6	Grade 8.8
12	Tearing ϕV_f	13.6	14.8	17.2	19.2	21.3	15.1	31.4
	Bearing ϕV_b	12.9	14.0	16.3	18.1	20.2		
16	Tearing ϕV_f	13.6	14.8	17.2	19.2	21.3	28.6	59.3
	Bearing ϕV_b	17.2	18.7	21.7	24.2	27.0		
20	Tearing ϕV_f	13.6	14.8	17.2	19.2	21.3	44.6	92.6
	Bearing ϕV_b	21.5	23.4	27.1	30.2	33.7		

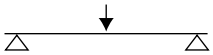
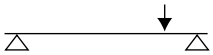
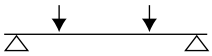
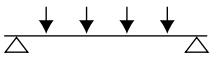
Notes:
1. All capacities are in accordance with AS/NZS 4600:1996 (Grade 4.6 bolts - 400MPa minimum tensile strength and Grade 8.8 bolts - 830MPa minimum tensile strength).
2. Bolts are assumed to comply to AS1111 (Grade 4.6) or AS1252 (Grade 8.8) and be produced to a quality assurance programme.
3. All connections are assumed to have one washer under each of the bolt head and the nut (or the portal cleat acting as one of the washers).
4. Calculation of tearing capacity assumes a 38mm edge distance.
5. The maximum structural ductility factor used for seismic loads must be less than 1.25.

Point Load Conversion Guide

The following formula may be used as a guide in converting point loads to equivalent uniformly distributed bending loads specific to the DHS Purlin System.

Formula $W = F \times \frac{P}{L}$

Where W = Uniform bending load
F = Factor "F" from table below
P = Point load ↓
L = Length of span

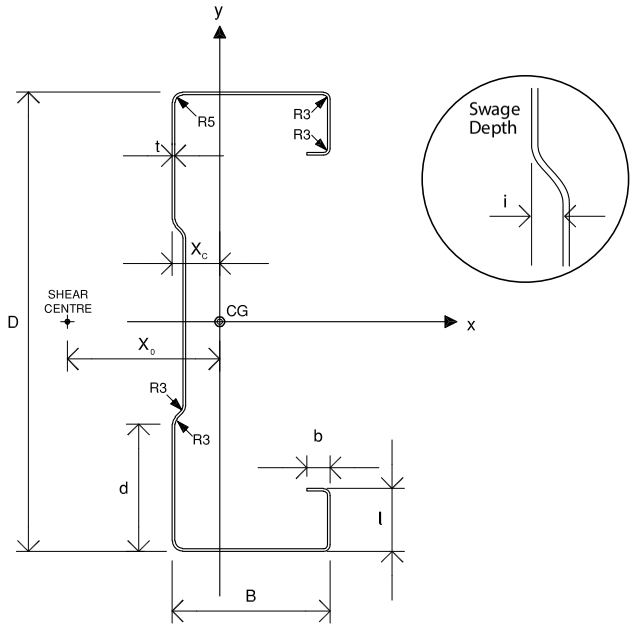
Type	Symbol	Factor "F"			
		Simple	End or Internal	Lapped End	Lapped Internal
One equidistant point load		2	1.75	1.75	1.5
One eccentric point load		1.5	1.5	1.5	1
Two equidistant point loads		2.67	2.5	2.5	1.75
Three equidistant point loads		4	3	3	2.5
Four equidistant point loads		4.8	4	4	3
Five equidistant point loads		6	5	5	4

Notes:
1. This conversion guide and factors (F) is only applicable to the DHS Purlin System.
2. The conversion factors (F) are an approximation to the pure derivation and are to be used as a guide only.
3. The conversion formula assumes all point loads are equal in magnitude.

DHS PURLIN SYSTEM SECTION PROPERTIES

DHS Section	Depth D (mm)	Depth B (mm)	Thickness t (mm)	Mass (kg/m)	Weight (kN/m)	d (mm)	Swage Depth i (mm)	b (mm)	l (mm)	X_c (mm)	X_o (mm)
DHS 150/12	150	65	1.15	2.99	0.030	54	4	10	23	24.0	56.6
DHS 150/15	150	65	1.45	3.74	0.037	54	4	10	23	23.9	56.1
DHS 200/12	200	75	1.15	3.71	0.037	62	4	10	28	26.3	62.0
DHS 200/15	200	75	1.45	4.65	0.046	62	4	10	28	26.2	61.4
DHS 200/18	200	75	1.75	5.59	0.055	62	4	10	28	26.1	60.8
DHS 250/13	250	85	1.25	4.87	0.048	67	6	12	33	29.4	67.1
DHS 250/15	250	85	1.45	5.63	0.056	67	6	12	33	29.3	66.7
DHS 250/18	250	85	1.75	6.76	0.067	67	6	12	33	29.3	66.2
DHS 300/15	300	100	1.45	6.66	0.066	67	7	12	38	34.0	76.1
DHS 300/18	300	100	1.75	8.01	0.079	67	7	12	38	33.9	75.6
DHS 350/18	350	100	1.75	8.83	0.087	77	7	12	43	32.7	73.4
DHS 400/20	400	100	1.95	10.74	0.106	79	7	12	48	31.8	70.9

Note: Mass assumes a total coated weight for the standard zinc coating of 275g/m^2.



DHS Section	Full (Gross) Section Properties											Effective Section Properties						
	A_g (mm^2)	I_x (10^6mm^4)	I_y (10^6mm^4)	Z_x (10^3mm^3)	$Z_y^{(+ve)}$ (10^3mm^3)	$Z_y^{(-ve)}$ (10^3mm^3)	r_x (mm)	r_y (mm)	β_y (mm)	J (mm^4)	I_w (10^9mm^6)	$A_{e(fy)}$ (mm^2)	I_{ex} (10^6mm^4)	$I_{ey}^{(+ve)}$ (10^6mm^4)	$I_{ey}^{(-ve)}$ (10^6mm^4)	Z_{ex} (10^3mm^3)	$Z_{ey}^{(+ve)}$ (10^3mm^3)	$Z_{ey}^{(-ve)}$ (10^3mm^3)
DHS 150/12	381	1.33	0.24	17.8	5.9	10.2	59.2	25.3	166	168	1.44	223	1.18	0.24	0.16	14.6	5.9	4.9
DHS 150/15	477	1.66	0.30	22.2	7.3	12.6	59.1	25.1	165	334	1.76	314	1.57	0.30	0.22	20.2	7.3	6.6
DHS 200/12	473	2.90	0.40	29.0	8.2	15.2	78.4	29.1	207	208	4.04	238	2.37	0.40	0.25	20.7	8.2	6.2
DHS 200/15	593	3.63	0.49	36.3	10.1	18.9	78.2	28.9	206	415	4.96	336	3.22	0.49	0.33	29.8	10.1	8.6
DHS 200/18	712	4.34	0.59	43.4	12.0	22.4	78.1	28.7	206	726	5.82	445	4.12	0.59	0.42	39.9	12.0	10.8
DHS 250/13	620	5.86	0.66	46.8	11.8	22.4	97.2	32.6	246	323	10.47	290	4.62	0.66	0.39	31.6	11.8	8.6
DHS 250/15	717	6.76	0.76	54.1	13.6	25.8	97.1	32.5	245	502	11.97	361	5.62	0.76	0.47	39.6	13.6	10.5
DHS 250/18	861	8.10	0.90	64.8	16.1	30.7	97.0	32.3	245	879	14.13	478	7.20	0.90	0.60	53.2	16.1	13.8
DHS 300/15	849	11.55	1.22	77.0	18.4	35.8	116.7	37.9	292	595	27.41	381	8.93	1.22	0.73	50.2	18.4	13.5
DHS 300/18	1020	13.86	1.45	92.4	22.0	42.7	116.5	37.7	292	1042	32.47	505	11.46	1.45	0.92	67.1	22.0	17.6
DHS 350/18	1125	20.22	1.60	115.6	23.7	48.8	134.1	37.7	333	1149	48.48	523	16.36	1.60	0.96	80.8	23.7	18.0
DHS 400/20	1368	31.31	1.91	156.5	28.0	60.0	151.3	37.4	380	1734	75.70	635	25.75	1.91	1.14	112.2	28.0	21.4

Note: Notation used is consistent with Table 1.4 in AS/NZS 4600, (+ve) = DHS Purlin Lip in compression (-ve) = DHS Purlin Web in compression.

DHS PURLIN SYSTEM LOAD SPAN TABLES

Uniformly loaded bending capacities (kN/m) and axial compression capacities (kN) are given for DHS purlins and girts for spans between 3.0m and 18.0m in the following confirgurations -

1B, 2B, 3B Ultimate - 1, 2 or 3 Braces

FR Ultimate - Fully Restrained (Used when the compression flange is fully restrained against lateral movement)

Ws Serviceability - Load at which midspan deflection equates to span/150.

$\phi_c N_{ex}$ Elastic buckling capacity about the X-X axis.

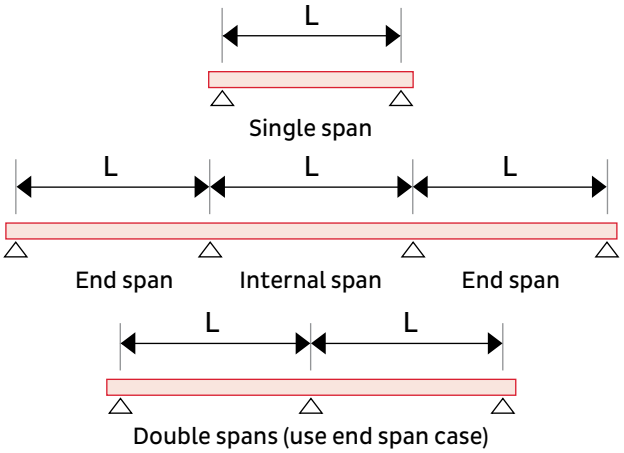
As deflection is proportional to loading, Ws loads may be factored by the deflection ratio for any deflection within the limit of the linear load capacities.

The following notes apply to the load span tables in this section -

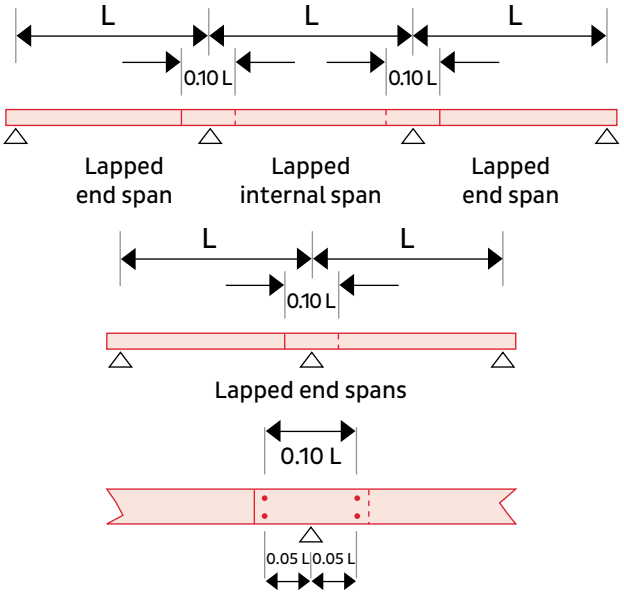
1. No bolt slip or member rotation has been allowed for at fixed ends.
2. End and internal spans can be either Continuous or Lapped span type, however only tables of the corresponding span type may be used in conjunction.
3. Use of end span tables with corresponding internal span tables assumes that the end span is within plus 5% or minus 10% of the internal spans, provided that for a 3 span configuration both end spans are reduced by the same amount. Otherwise specific design to AS/NZS 4600 is required.
4. Linear interpolation is permitted for Loads between intermediate DHS purlin spans.

Typical DHS Purlin System Span Configurations

L = Span length



All lap lengths are to be a minimum of 0.1 of the maximum span, measured from bolt centre to bolt centre at each end of the lap, positioned equally each side of the portal rafter.
Refer CAD Details on-line (**www.dimondstructural.co.nz/products/dhs-purlins**).



Dimond Structural

DHS PURLIN SYSTEM LOAD SPAN TABLES - SINGLE SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0	5.17	5.17	5.17	5.17	4.73																									
3.5	3.80	3.80	3.80	3.80	3.02	5.18	5.18	5.18	5.18	3.92	5.63	5.63	5.63	5.63	5.86															
4.0	2.91	2.91	2.91	2.91	2.05	3.96	3.96	3.96	3.96	2.65	4.31	4.31	4.31	4.31	4.03	5.91	5.91	5.91	5.91	5.51	7.60	7.60	7.60	7.60	6.80	5.37	5.37	5.37	5.37	7.48
4.5	2.30	2.30	2.30	2.30	1.45	3.09	3.13	3.13	3.13	1.86	3.40	3.40	3.40	3.40	2.90	4.67	4.67	4.67	4.67	3.91	6.00	6.00	6.00	6.00	4.82	4.77	4.77	4.77	4.77	5.37
5.0	1.73	1.86	1.86	1.86	1.06	2.29	2.53	2.53	2.53	1.36	2.69	2.75	2.75	2.75	2.16	3.78	3.78	3.78	3.78	2.87	4.86	4.86	4.86	4.86	3.54	4.27	4.27	4.27	4.27	3.99
5.5	1.26	1.54	1.54	1.54	0.80	1.67	2.09	2.09	2.09	1.02	2.09	2.28	2.28	2.28	1.65	3.02	3.12	3.12	3.12	2.17	3.85	4.02	4.02	4.02	2.66	3.43	3.53	3.53	3.53	3.05
6.0	0.94	1.29	1.29	1.29	0.62	1.24	1.76	1.76	1.76	0.78	1.63	1.91	1.91	1.91	1.29	2.35	2.62	2.62	2.62	1.68	2.94	3.38	3.38	3.38	2.05	2.73	2.96	2.96	2.96	2.39
6.5	0.71	1.10	1.10	1.10	0.49	0.94	1.50	1.50	1.50	0.62	1.27	1.63	1.63	1.63	1.02	1.79	2.23	2.23	2.23	1.33	2.24	2.88	2.88	2.88	1.61	2.20	2.53	2.53	2.53	1.91
7.0	0.55	0.94	0.95	0.95	0.39	0.72	1.26	1.29	1.29	0.49	1.00	1.40	1.40	1.40	0.82	1.39	1.93	1.93	1.93	1.07	1.73	2.48	2.48	2.48	1.29	1.75	2.18	2.18	2.18	1.55
7.5	0.43	0.78	0.82	0.82	0.32	0.56	1.03	1.12	1.12	0.40	0.81	1.21	1.22	1.22	0.67	1.09	1.68	1.68	1.68	0.87	1.36	2.16	2.16	2.16	1.05	1.41	1.90	1.90	1.90	1.28
8.0						0.44	0.84	0.99	0.99	0.33	0.65	1.02	1.07	1.07	0.56	0.87	1.47	1.47	1.47	0.72	1.07	1.90	1.90	1.90	0.86	1.15	1.66	1.67	1.67	1.07
8.5											0.53	0.86	0.95	0.95	0.47	0.70	1.25	1.30	1.30	0.60	0.85	1.60	1.68	1.68	0.72	0.94	1.43	1.48	1.48	0.90
9.0											0.43	0.74	0.85	0.85	0.39	0.57	1.07	1.16	1.16	0.50	0.69	1.34	1.50	1.50	0.60	0.79	1.23	1.32	1.32	0.77
9.5											0.35	0.62	0.76	0.76	0.34	0.47	0.89	1.04	1.04	0.43	0.56	1.11	1.34	1.34	0.51	0.66	1.06	1.18	1.18	0.66
10.0											0.29	0.53	0.67	0.69	0.29	0.38	0.75	0.94	0.94	0.37	0.46	0.93	1.21	1.21	0.44	0.56	0.92	1.06	1.06	0.57
10.5																0.32	0.63	0.85	0.85	0.32	0.38	0.79	1.10	1.10	0.38	0.48	0.79	0.97	0.97	0.49
11.0																					0.32	0.67	0.97	1.00	0.33	0.40	0.68	0.86	0.88	0.43
11.5																					0.27	0.57	0.85	0.92	0.29	0.34	0.59	0.77	0.80	0.38
12.0																										0.29	0.52	0.68	0.74	0.33
12.5																										0.25	0.45	0.61	0.68	0.29
13.0																														
13.5																														
14.0																														
14.5																														
15.0																														
15.5																														
16.0																														
16.5																														
17.0																														
17.5																														
18.0																														

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - SINGLE SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5																														
4.0																														
4.5																														
5.0	5.24	5.24	5.24	5.24	4.90	6.77	6.77	6.77	6.77	6.35	5.53	5.53	5.53	5.53	7.44															
5.5	4.31	4.33	4.33	4.33	3.75	5.60	5.60	5.60	5.60	4.81	5.03	5.03	5.03	5.03	5.69															
6.0	3.44	3.64	3.64	3.64	2.94	4.63	4.70	4.70	4.70	3.73	4.61	4.61	4.61	4.61	4.46															
6.5	2.77	3.10	3.10	3.10	2.35	3.74	4.01	4.01	4.01	2.95	3.86	4.05	4.05	4.05	3.56	5.17	5.25	5.25	5.25	4.63										
7.0	2.21	2.67	2.67	2.67	1.91	2.98	3.45	3.45	3.45	2.37	3.18	3.49	3.49	3.49	2.89	4.26	4.52	4.52	4.52	3.77	5.15	5.46	5.46	5.46	5.17					
7.5	1.78	2.33	2.33	2.33	1.57	2.36	3.01	3.01	3.01	1.94	2.64	3.04	3.04	3.04	2.39	3.54	3.94	3.94	3.94	3.11	4.27	4.76	4.76	4.76	4.26	5.95	6.26	6.26	6.26	6.54
8.0	1.45	2.04	2.04	2.04	1.30	1.88	2.64	2.64	2.64	1.60	2.17	2.67	2.67	2.67	1.99	2.91	3.46	3.46	3.46	2.60	3.52	4.18	4.18	4.18	3.56	4.91	5.66	5.66	5.66	5.46
8.5	1.20	1.79	1.81	1.81	1.09	1.52	2.34	2.34	2.34	1.34	1.79	2.36	2.36	2.36	1.68	2.41	3.07	3.07	3.07	2.20	2.91	3.70	3.70	3.70	3.00	4.06	5.01	5.01	5.01	4.60
9.0	0.99	1.54	1.61	1.61	0.92	1.24	2.08	2.09	2.09	1.13	1.49	2.11	2.11	2.11	1.43	2.02	2.74	2.74	2.74	1.86	2.43	3.30	3.30	3.30	2.56	3.39	4.47	4.47	4.47	3.92
9.5	0.82	1.34	1.45	1.45	0.78	1.02	1.80	1.87	1.87	0.96	1.26	1.85	1.89	1.89	1.23	1.70	2.45	2.45	2.45	1.59	2.05	2.96	2.96	2.96	2.20	2.85	4.01	4.01	4.01	3.37
10.0	0.68	1.16	1.31	1.31	0.67	0.85	1.57	1.69	1.69	0.82	1.07	1.62	1.71	1.71	1.07	1.45	2.17	2.21	2.21	1.37	1.74	2.63	2.67	2.67	1.91	2.42	3.62	3.62	3.62	2.92
10.5	0.57	1.00	1.19	1.19	0.58	0.71	1.35	1.53	1.53	0.71	0.91	1.43	1.55	1.55	0.93	1.23	1.91	2.01	2.01	1.18	1.49	2.31	2.42	2.42	1.66	2.07	3.22	3.28	3.28	2.54
11.0	0.48	0.86	1.08	1.08	0.51	0.59	1.16	1.40	1.40	0.62	0.79	1.26	1.41	1.41	0.82	1.04	1.69	1.83	1.83	1.03	1.28	2.04	2.21	2.21	1.46	1.79	2.85	2.99	2.99	2.23
11.5	0.41	0.75	0.96	0.99	0.45	0.50	0.99	1.28	1.28	0.54	0.68	1.12	1.29	1.29	0.72	0.89	1.50	1.67	1.67	0.91	1.11	1.81	2.02	2.02	1.29	1.55	2.52	2.73	2.73	1.97
12.0	0.35	0.66	0.86	0.91	0.39	0.42	0.86	1.16	1.17	0.47	0.59	0.98	1.18	1.18	0.64	0.76	1.32	1.54	1.54	0.80	0.97	1.60	1.86	1.86	1.15	1.35	2.23	2.51	2.51	1.75
12.5	0.30	0.58	0.77	0.83	0.35	0.36	0.74	1.04	1.08	0.42	0.52	0.86	1.07	1.09	0.57	0.66	1.16	1.42	1.42	0.71	0.84	1.40	1.71	1.71	1.02	1.17	1.96	2.31	2.31	1.56
13.0	0.26	0.51	0.69	0.77	0.31	0.31	0.65	0.94	1.00	0.37	0.45	0.76	0.97	1.01	0.51	0.57	1.03	1.30	1.31	0.63	0.73	1.24	1.57	1.58	0.92	1.01	1.73	2.14	2.14	1.40
13.5						0.27	0.57	0.84	0.93	0.33	0.40	0.67	0.88	0.93	0.46	0.50	0.91	1.18	1.21	0.57	0.63	1.10	1.42	1.46	0.82	0.87	1.54	1.98	1.98	1.26
14.0						0.23	0.50	0.75	0.86	0.30	0.35	0.60	0.80	0.87	0.41	0.43	0.81	1.07	1.13	0.51	0.55	0.98	1.29	1.36	0.74	0.76	1.37	1.80	1.84	1.14
14.5											0.30	0.54	0.72	0.81	0.37	0.38	0.73	0.97	1.05	0.46	0.48	0.88	1.18	1.27	0.66	0.66	1.22	1.64	1.72	1.03
15.0											0.27	0.48	0.66	0.76	0.33	0.33	0.66	0.89	0.98	0.41	0.42	0.79	1.07	1.19	0.60	0.58	1.10	1.49	1.61	0.94
15.5											0.24	0.43	0.60	0.71	0.30	0.29	0.59	0.81	0.92	0.38	0.37	0.71	0.98	1.11	0.55	0.51	0.99	1.36	1.50	0.85
16.0																0.26	0.53	0.73	0.86	0.34	0.33	0.64	0.89	1.04	0.50	0.45	0.89	1.24	1.41	0.77
16.5																0.23	0.47	0.66	0.81	0.31	0.29	0.58	0.80	0.98	0.45	0.40	0.81	1.12	1.33	0.71
17.0																					0.26	0.53	0.73	0.92	0.41	0.36	0.73	1.02	1.25	0.65
17.5																					0.23	0.48	0.67	0.87	0.38	0.32	0.67	0.93	1.18	0.59
18.0																					0.21	0.44	0.61	0.82	0.35	0.29	0.61	0.85	1.11	0.54

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - END SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0	4.75	4.75	4.75	4.75	10.78	7.05	7.05	7.05	7.05	14.30	4.57	4.57	4.57	4.57	21.64															
3.5	3.69	3.69	3.69	3.69	6.78	5.18	5.18	5.18	5.18	9.01	3.74	3.74	3.74	3.74	13.63	6.46	6.46	6.46	6.46	18.50	9.71	9.71	9.71	9.71	23.62	4.39	4.39	4.39	4.39	26.55
4.0	2.91	2.91	2.91	2.91	4.54	3.96	3.96	3.96	3.96	6.03	3.11	3.11	3.11	3.11	9.13	5.27	5.27	5.27	5.27	12.39	7.60	7.60	7.60	7.60	15.83	3.73	3.73	3.73	3.73	17.78
4.5	2.30	2.30	2.30	2.30	3.19	3.13	3.13	3.13	3.13	4.24	2.63	2.63	2.63	2.63	6.41	4.37	4.37	4.37	4.37	8.70	6.00	6.00	6.00	6.00	11.11	3.21	3.21	3.21	3.21	12.49
5.0	1.86	1.86	1.86	1.86	2.33	2.53	2.53	2.53	2.53	3.10	2.25	2.25	2.25	2.25	4.67	3.68	3.68	3.68	3.68	6.34	4.86	4.86	4.86	4.86	8.10	2.79	2.79	2.79	2.79	9.10
5.5	1.54	1.54	1.54	1.54	1.78	2.09	2.09	2.09	2.09	2.35	1.94	1.94	1.94	1.94	3.51	3.12	3.12	3.12	3.12	4.76	4.02	4.02	4.02	4.02	6.08	2.45	2.45	2.45	2.45	6.84
6.0	1.29	1.29	1.29	1.29	1.39	1.76	1.76	1.76	1.76	1.82	1.69	1.69	1.69	1.69	2.70	2.62	2.62	2.62	2.62	3.67	3.38	3.38	3.38	3.38	4.69	2.17	2.17	2.17	2.17	5.27
6.5	1.10	1.10	1.10	1.10	1.11	1.50	1.50	1.50	1.50	1.44	1.49	1.49	1.49	1.49	2.12	2.23	2.23	2.23	2.23	2.88	2.88	2.88	2.88	2.88	3.69	1.93	1.93	1.93	1.93	4.14
7.0	0.95	0.95	0.95	0.95	0.89	1.29	1.29	1.29	1.29	1.16	1.31	1.31	1.31	1.31	1.70	1.93	1.93	1.93	1.93	2.33	2.48	2.48	2.48	2.48	2.97	1.73	1.73	1.73	1.73	3.31
7.5	0.82	0.82	0.82	0.82	0.73	1.11	1.12	1.12	1.12	0.95	1.17	1.17	1.17	1.17	1.40	1.68	1.68	1.68	1.68	1.92	2.16	2.16	2.16	2.16	2.43	1.56	1.56	1.56	1.56	2.69
8.0	0.70	0.72	0.72	0.72	0.60	0.93	0.99	0.99	0.99	0.78	1.05	1.05	1.05	1.05	1.16	1.47	1.47	1.47	1.47	1.61	1.90	1.90	1.90	1.90	2.01	1.41	1.41	1.41	1.41	2.22
8.5	0.59	0.64	0.64	0.64	0.50	0.78	0.86	0.87	0.87	0.66	0.91	0.94	0.94	0.94	0.98	1.30	1.30	1.30	1.30	1.36	1.68	1.68	1.68	1.68	1.68	1.28	1.28	1.28	1.28	1.85
9.0	0.49	0.55	0.57	0.57	0.43	0.65	0.74	0.78	0.78	0.55	0.79	0.85	0.85	0.85	0.84	1.14	1.16	1.16	1.16	1.15	1.46	1.50	1.50	1.50	1.43	1.17	1.17	1.17	1.17	1.56
9.5	0.41	0.47	0.51	0.51	0.36	0.54	0.63	0.70	0.70	0.47	0.68	0.74	0.76	0.76	0.72	0.98	1.04	1.04	1.04	0.98	1.25	1.34	1.34	1.34	1.22	1.07	1.07	1.07	1.07	1.34
10.0	0.34	0.40	0.46	0.46	0.31	0.45	0.53	0.63	0.63	0.40	0.59	0.64	0.69	0.69	0.62	0.85	0.93	0.94	0.94	0.85	1.06	1.20	1.21	1.21	1.05	0.98	0.98	0.98	0.98	1.16
10.5						0.39	0.45	0.57	0.57	0.35	0.50	0.56	0.62	0.62	0.54	0.72	0.82	0.85	0.85	0.73	0.90	1.04	1.10	1.10	0.91	0.86	0.90	0.90	0.90	1.01
11.0						0.33	0.39	0.52	0.52	0.30	0.44	0.50	0.57	0.57	0.47	0.61	0.72	0.78	0.78	0.64	0.77	0.91	1.00	1.00	0.79	0.75	0.82	0.83	0.83	0.88
11.5											0.38	0.43	0.52	0.52	0.42	0.53	0.62	0.71	0.71	0.56	0.66	0.78	0.92	0.92	0.69	0.66	0.73	0.77	0.77	0.78
12.0											0.33	0.38	0.47	0.47	0.37	0.46	0.54	0.65	0.65	0.50	0.57	0.68	0.84	0.84	0.61	0.57	0.65	0.72	0.72	0.69
12.5											0.29	0.33	0.44	0.44	0.33	0.40	0.47	0.60	0.60	0.44	0.50	0.59	0.77	0.77	0.54	0.50	0.58	0.67	0.67	0.62
13.0											0.26	0.29	0.40	0.40	0.30	0.35	0.41	0.56	0.56	0.39	0.43	0.51	0.72	0.72	0.48	0.45	0.51	0.62	0.62	0.55
13.5																0.30	0.36	0.51	0.51	0.35	0.38	0.45	0.66	0.66	0.43	0.40	0.45	0.58	0.58	0.49
14.0																0.27	0.32	0.47	0.48	0.31	0.33	0.40	0.61	0.62	0.38	0.35	0.40	0.54	0.54	0.45
14.5																					0.29	0.35	0.55	0.57	0.35	0.31	0.36	0.49	0.50	0.40
15.0																					0.25	0.31	0.50	0.54	0.31	0.28	0.32	0.45	0.47	0.37
15.5																										0.25	0.29	0.41	0.44	0.33
16.0																										0.23	0.26	0.38	0.41	0.31
16.5																														
17.0																														
17.5																														
18.0																														

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - END SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5																														
4.0	5.41	5.41	5.41	5.41	21.61	8.47	8.47	8.47	8.47	27.70	5.01	5.01	5.01	5.01	34.35															
4.5	4.61	4.61	4.61	4.61	15.17	7.12	7.12	7.12	7.12	19.45	4.36	4.36	4.36	4.36	24.13															
5.0	3.97	3.97	3.97	3.97	11.06	6.05	6.05	6.05	6.05	14.18	3.82	3.82	3.82	3.82	17.59	6.11	6.11	6.11	6.11	22.56	5.67	5.67	5.67	5.67	32.21					
5.5	3.45	3.45	3.45	3.45	8.31	5.20	5.20	5.20	5.20	10.65	3.39	3.39	3.39	3.39	13.21	5.35	5.35	5.35	5.35	16.95	5.04	5.04	5.04	5.04	24.20					
6.0	3.03	3.03	3.03	3.03	6.40	4.52	4.52	4.52	4.52	8.20	3.02	3.02	3.02	3.02	10.18	4.73	4.73	4.73	4.73	13.05	4.51	4.51	4.51	4.51	18.64	5.53	5.53	5.53	5.53	29.35
6.5	2.68	2.68	2.68	2.68	5.03	3.95	3.95	3.95	3.95	6.45	2.71	2.71	2.71	2.71	8.00	4.21	4.21	4.21	4.21	10.27	4.07	4.07	4.07	4.07	14.66	5.01	5.01	5.01	5.01	23.08
7.0	2.38	2.38	2.38	2.38	4.03	3.45	3.45	3.45	3.45	5.16	2.45	2.45	2.45	2.45	6.41	3.76	3.76	3.76	3.76	8.22	3.69	3.69	3.69	3.69	11.74	4.57	4.57	4.57	4.57	18.48
7.5	2.13	2.13	2.13	2.13	3.27	3.01	3.01	3.01	3.01	4.20	2.22	2.22	2.22	2.22	5.21	3.38	3.38	3.38	3.38	6.68	3.35	3.35	3.35	3.35	9.54	4.18	4.18	4.18	4.18	15.02
8.0	1.91	1.91	1.91	1.91	2.70	2.64	2.64	2.64	2.64	3.46	2.02	2.02	2.02	2.02	4.29	3.05	3.05	3.05	3.05	5.50	3.07	3.07	3.07	3.07	7.86	3.84	3.84	3.84	3.84	12.38
8.5	1.73	1.73	1.73	1.73	2.25	2.34	2.34	2.34	2.34	2.90	1.85	1.85	1.85	1.85	3.58	2.77	2.77	2.77	2.77	4.59	2.81	2.81	2.81	2.81	6.55	3.53	3.53	3.53	3.53	10.32
9.0	1.57	1.57	1.57	1.57	1.90	2.09	2.09	2.09	2.09	2.47	1.70	1.70	1.70	1.70	3.01	2.52	2.52	2.52	2.52	3.86	2.59	2.59	2.59	2.59	5.52	3.27	3.27	3.27	3.27	8.69
9.5	1.40	1.43	1.43	1.43	1.64	1.87	1.87	1.87	1.87	2.12	1.56	1.56	1.56	1.56	2.56	2.31	2.31	2.31	2.31	3.28	2.39	2.39	2.39	2.39	4.69	3.03	3.03	3.03	3.03	7.39
10.0	1.23	1.30	1.30	1.30	1.42	1.66	1.69	1.69	1.69	1.84	1.44	1.44	1.44	1.44	2.19	2.12	2.12	2.12	2.12	2.82	2.21	2.21	2.21	2.21	4.02	2.82	2.82	2.82	2.82	6.34
10.5	1.08	1.17	1.19	1.19	1.23	1.45	1.53	1.53	1.53	1.60	1.33	1.33	1.33	1.33	1.89	1.95	1.95	1.95	1.95	2.43	2.05	2.05	2.05	2.05	3.47	2.62	2.62	2.62	2.62	5.47
11.0	0.95	1.04	1.08	1.08	1.08	1.28	1.40	1.40	1.40	1.41	1.24	1.24	1.24	1.24	1.65	1.77	1.80	1.80	1.80	2.13	1.91	1.91	1.91	1.91	3.02	2.45	2.45	2.45	2.45	4.76
11.5	0.83	0.92	0.99	0.99	0.96	1.12	1.24	1.28	1.28	1.24	1.15	1.15	1.15	1.15	1.45	1.58	1.66	1.66	1.66	1.88	1.78	1.78	1.78	1.78	2.64	2.29	2.29	2.29	2.29	4.16
12.0	0.72	0.82	0.91	0.91	0.85	0.97	1.11	1.17	1.17	1.10	1.05	1.07	1.07	1.07	1.29	1.41	1.53	1.54	1.54	1.67	1.66	1.66	1.66	1.66	2.33	2.15	2.15	2.15	2.15	3.66
12.5	0.64	0.73	0.83	0.83	0.76	0.85	0.99	1.08	1.08	0.98	0.94	1.00	1.00	1.00	1.15	1.26	1.38	1.42	1.42	1.49	1.52	1.55	1.55	1.55	2.06	2.02	2.02	2.02	2.02	3.24
13.0	0.56	0.65	0.77	0.77	0.68	0.74	0.88	1.00	1.00	0.87	0.83	0.93	0.94	0.94	1.03	1.12	1.24	1.31	1.31	1.34	1.35	1.46	1.46	1.46	1.84	1.88	1.90	1.90	1.90	2.88
13.5	0.50	0.58	0.72	0.72	0.61	0.65	0.78	0.93	0.93	0.78	0.74	0.84	0.88	0.88	0.93	1.00	1.12	1.21	1.21	1.20	1.20	1.36	1.37	1.37	1.66	1.67	1.79	1.79	1.79	2.57
14.0	0.45	0.51	0.66	0.66	0.55	0.57	0.68	0.86	0.86	0.70	0.66	0.76	0.82	0.82	0.84	0.89	1.02	1.13	1.13	1.09	1.08	1.23	1.29	1.29	1.50	1.49	1.69	1.69	1.69	2.31
14.5	0.40	0.46	0.62	0.62	0.50	0.51	0.61	0.80	0.80	0.63	0.59	0.68	0.78	0.78	0.76	0.80	0.92	1.05	1.05	0.98	0.96	1.11	1.21	1.21	1.36	1.34	1.55	1.59	1.59	2.09
15.0	0.36	0.41	0.57	0.58	0.45	0.45	0.54	0.75	0.75	0.57	0.53	0.62	0.73	0.73	0.69	0.72	0.83	0.98	0.98	0.89	0.87	1.00	1.14	1.14	1.23	1.20	1.40	1.51	1.51	1.90
15.5	0.32	0.37	0.52	0.54	0.41	0.40	0.48	0.70	0.70	0.52	0.48	0.55	0.69	0.69	0.63	0.65	0.75	0.92	0.92	0.82	0.78	0.90	1.08	1.08	1.12	1.09	1.26	1.43	1.43	1.73
16.0	0.29	0.34	0.48	0.51	0.38	0.36	0.43	0.65	0.66	0.47	0.43	0.50	0.65	0.65	0.57	0.59	0.68	0.86	0.86	0.75	0.71	0.82	1.02	1.02	1.03	0.98	1.14	1.35	1.35	1.58
16.5	0.26	0.31	0.44	0.48	0.35	0.32	0.39	0.59	0.62	0.43	0.39	0.45	0.61	0.62	0.53	0.54	0.62	0.81	0.81	0.68	0.64	0.74	0.97	0.97	0.94	0.89	1.04	1.29	1.29	1.45
17.0	0.23	0.28	0.41	0.45	0.32	0.29	0.35	0.55	0.58	0.39	0.36	0.41	0.57	0.58	0.48	0.49	0.56	0.76	0.76	0.63	0.58	0.68	0.92	0.92	0.87	0.81	0.94	1.22	1.22	1.33
17.5						0.26	0.31	0.51	0.55	0.36	0.33	0.38	0.52	0.55	0.45	0.44	0.51	0.70	0.72	0.58	0.53	0.62	0.85	0.87	0.80	0.74	0.86	1.16	1.16	1.23
18.0						0.23	0.28	0.46	0.52	0.33	0.30	0.34	0.49	0.52	0.41	0.40	0.47	0.65	0.68	0.54	0.49	0.56	0.79	0.82	0.74	0.68	0.79	1.10	1.11	1.13

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - INTERNAL SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5	5.18	5.18	5.18	5.18	14.11	7.77	7.77	7.77	7.77	18.74	4.93	4.93	4.93	4.93	28.35															
4.0	4.17	4.17	4.17	4.17	9.45	5.95	5.95	5.95	5.95	12.55	4.15	4.15	4.15	4.15	18.99															
4.5	3.43	3.43	3.43	3.43	6.64	4.70	4.70	4.70	4.70	8.81	3.54	3.54	3.54	3.54	13.34	6.06	6.06	6.06	6.06	18.10	9.01	9.01	9.01	9.01	23.12	4.20	4.20	4.20	4.20	25.98
5.0	2.79	2.79	2.79	2.79	4.84	3.80	3.80	3.80	3.80	6.42	3.06	3.06	3.06	3.06	9.72	5.15	5.15	5.15	5.15	13.19	7.30	7.30	7.30	7.30	16.85	3.69	3.69	3.69	3.69	18.94
5.5	2.31	2.31	2.31	2.31	3.63	3.14	3.14	3.14	3.14	4.83	2.67	2.67	2.67	2.67	7.30	4.42	4.42	4.42	4.42	9.91	6.03	6.03	6.03	6.03	12.66	3.26	3.26	3.26	3.26	14.23
6.0	1.94	1.94	1.94	1.94	2.80	2.64	2.64	2.64	2.64	3.72	2.34	2.34	2.34	2.34	5.62	3.83	3.83	3.83	3.83	7.63	5.07	5.07	5.07	5.07	9.75	2.91	2.91	2.91	2.91	10.96
6.5	1.65	1.65	1.65	1.65	2.20	2.25	2.25	2.25	2.25	2.92	2.07	2.07	2.07	2.07	4.42	3.35	3.35	3.35	3.35	6.00	4.32	4.32	4.32	4.32	7.67	2.61	2.61	2.61	2.61	8.62
7.0	1.42	1.42	1.42	1.42	1.76	1.94	1.94	1.94	1.94	2.35	1.84	1.84	1.84	1.84	3.54	2.89	2.89	2.89	2.89	4.81	3.72	3.72	3.72	3.72	6.14	2.35	2.35	2.35	2.35	6.90
7.5	1.24	1.24	1.24	1.24	1.45	1.69	1.69	1.69	1.69	1.92	1.65	1.65	1.65	1.65	2.88	2.52	2.52	2.52	2.52	3.91	3.24	3.24	3.24	3.24	4.99	2.13	2.13	2.13	2.13	5.61
8.0	1.09	1.09	1.09	1.09	1.21	1.48	1.48	1.48	1.48	1.59	1.48	1.48	1.48	1.48	2.37	2.21	2.21	2.21	2.21	3.22	2.85	2.85	2.85	2.85	4.11	1.94	1.94	1.94	1.94	4.62
8.5	0.96	0.96	0.96	0.96	1.02	1.31	1.31	1.31	1.31	1.33	1.34	1.34	1.34	1.34	1.97	1.96	1.96	1.96	1.96	2.68	2.52	2.52	2.52	2.52	3.43	1.77	1.77	1.77	1.77	3.85
9.0	0.86	0.86	0.86	0.86	0.87	1.17	1.17	1.17	1.17	1.13	1.22	1.22	1.22	1.22	1.66	1.75	1.75	1.75	1.75	2.26	2.25	2.25	2.25	2.25	2.89	1.62	1.62	1.62	1.62	3.24
9.5	0.77	0.77	0.77	0.77	0.74	1.05	1.05	1.05	1.05	0.96	1.11	1.11	1.11	1.11	1.41	1.57	1.57	1.57	1.57	1.93	2.02	2.02	2.02	2.02	2.47	1.49	1.49	1.49	1.49	2.76
10.0	0.69	0.69	0.69	0.69	0.64	0.95	0.95	0.95	0.95	0.83	1.01	1.01	1.01	1.01	1.22	1.41	1.41	1.41	1.41	1.67	1.82	1.82	1.82	1.82	2.12	1.38	1.38	1.38	1.38	2.36
10.5	0.63	0.63	0.63	0.63	0.55	0.86	0.86	0.86	0.86	0.72	0.93	0.93	0.93	0.93	1.06	1.28	1.28	1.28	1.28	1.46	1.65	1.65	1.65	1.65	1.84	1.27	1.27	1.27	1.27	2.04
11.0	0.57	0.57	0.57	0.57	0.48	0.78	0.78	0.78	0.78	0.63	0.85	0.85	0.85	0.85	0.93	1.17	1.17	1.17	1.17	1.28	1.50	1.50	1.50	1.50	1.61	1.18	1.18	1.18	1.18	1.77
11.5	0.52	0.52	0.52	0.52	0.42	0.72	0.72	0.72	0.72	0.55	0.78	0.78	0.78	0.78	0.82	1.07	1.07	1.07	1.07	1.13	1.38	1.38	1.38	1.38	1.41	1.10	1.10	1.10	1.10	1.55
12.0	0.48	0.48	0.48	0.48	0.37	0.66	0.66	0.66	0.66	0.48	0.71	0.71	0.71	0.71	0.73	0.98	0.98	0.98	0.98	1.00	1.26	1.26	1.26	1.26	1.25	1.02	1.02	1.02	1.02	1.37
12.5	0.44	0.44	0.44	0.44	0.33	0.60	0.60	0.60	0.60	0.43	0.66	0.66	0.66	0.66	0.65	0.90	0.90	0.90	0.90	0.89	1.16	1.16	1.16	1.16	1.11	0.95	0.95	0.95	0.95	1.21
13.0	0.41	0.41	0.41	0.41	0.29	0.56	0.56	0.56	0.56	0.38	0.61	0.61	0.61	0.61	0.58	0.84	0.84	0.84	0.84	0.80	1.08	1.08	1.08	1.08	0.99	0.89	0.89	0.89	0.89	1.08
13.5						0.51	0.50	0.52	0.52	0.34	0.56	0.56	0.56	0.56	0.52	0.77	0.77	0.77	0.77	0.71	1.00	1.00	1.00	1.00	0.88	0.83	0.83	0.83	0.83	0.97
14.0						0.46	0.46	0.48	0.48	0.31	0.52	0.52	0.52	0.52	0.47	0.72	0.72	0.72	0.72	0.64	0.93	0.93	0.93	0.93	0.79	0.78	0.78	0.78	0.78	0.88
14.5											0.48	0.48	0.49	0.49	0.43	0.67	0.67	0.67	0.67	0.58	0.86	0.86	0.86	0.86	0.71	0.74	0.74	0.74	0.74	0.79
15.0											0.44	0.44	0.46	0.46	0.39	0.63	0.63	0.63	0.63	0.52	0.81	0.81	0.81	0.81	0.65	0.69	0.69	0.69	0.69	0.72
15.5											0.41	0.40	0.42	0.43	0.35	0.59	0.58	0.59	0.59	0.48	0.76	0.75	0.76	0.76	0.59	0.65	0.65	0.65	0.65	0.66
16.0											0.37	0.37	0.39	0.40	0.32	0.54	0.53	0.55	0.55	0.43	0.69	0.69	0.71	0.71	0.53	0.61	0.61	0.62	0.62	0.60
16.5											0.35	0.34	0.36	0.38	0.30	0.50	0.49	0.52	0.52	0.40	0.64	0.63	0.67	0.67	0.49	0.56	0.56	0.58	0.58	0.55
17.0																0.46	0.45	0.48	0.49	0.36	0.58	0.58	0.62	0.63	0.45	0.52	0.52	0.54	0.55	0.51
17.5																0.43	0.42	0.45	0.46	0.33	0.54	0.52	0.57	0.59	0.41	0.48	0.48	0.51	0.52	0.47
18.0																0.39	0.38	0.41	0.43	0.31	0.49	0.48	0.53	0.56	0.38	0.45	0.44	0.47	0.49	0.43

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - INTERNAL SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	W_S	1B	2B	3B	FR	W_S	1B	2B	3B	FR	W_S	1B	2B	3B	FR	W_S	1B	2B	3B	FR	W_S	1B	2B	3B	FR	W_S
3.0																														
3.5																														
4.0																														
4.5	6.13	6.13	6.13	6.13	31.56	9.68	9.68	9.68	9.68	40.46	5.63	5.63	5.63	5.63	50.18															
5.0	5.33	5.33	5.33	5.33	23.01	8.31	8.31	8.31	8.31	29.49	4.98	4.98	4.98	4.98	36.58															
5.5	4.68	4.68	4.68	4.68	17.29	7.21	7.21	7.21	7.21	22.16	4.44	4.44	4.44	4.44	27.48															
6.0	4.14	4.14	4.14	4.14	13.31	6.31	6.31	6.31	6.31	17.07	3.98	3.98	3.98	3.98	21.17	6.36	6.36	6.36	6.36	27.15	5.90	5.90	5.90	5.90	38.77					
6.5	3.68	3.68	3.68	3.68	10.47	5.56	5.56	5.56	5.56	13.42	3.60	3.60	3.60	3.60	16.65	5.70	5.70	5.70	5.70	21.35	5.35	5.35	5.35	5.35	30.50					
7.0	3.29	3.29	3.29	3.29	8.38	4.93	4.93	4.93	4.93	10.75	3.27	3.27	3.27	3.27	13.33	5.13	5.13	5.13	5.13	17.10	4.87	4.87	4.87	4.87	24.42	5.97	5.97	5.97	5.97	38.44
7.5	2.96	2.96	2.96	2.96	6.81	4.40	4.40	4.40	4.40	8.74	2.98	2.98	2.98	2.98	10.84	4.64	4.64	4.64	4.64	13.90	4.46	4.46	4.46	4.46	19.85	5.48	5.48	5.48	5.48	31.25
8.0	2.68	2.68	2.68	2.68	5.61	3.94	3.94	3.94	3.94	7.20	2.73	2.73	2.73	2.73	8.93	4.22	4.22	4.22	4.22	11.45	4.10	4.10	4.10	4.10	16.36	5.06	5.06	5.06	5.06	25.75
8.5	2.43	2.43	2.43	2.43	4.68	3.51	3.51	3.51	3.51	6.00	2.51	2.51	2.51	2.51	7.44	3.85	3.85	3.85	3.85	9.55	3.78	3.78	3.78	3.78	13.63	4.68	4.68	4.68	4.68	21.47
9.0	2.22	2.22	2.22	2.22	3.94	3.13	3.13	3.13	3.13	5.05	2.31	2.31	2.31	2.31	6.27	3.52	3.52	3.52	3.52	8.04	3.49	3.49	3.49	3.49	11.49	4.35	4.35	4.35	4.35	18.08
9.5	2.03	2.03	2.03	2.03	3.35	2.81	2.81	2.81	2.81	4.30	2.14	2.14	2.14	2.14	5.33	3.24	3.24	3.24	3.24	6.84	3.24	3.24	3.24	3.24	9.76	4.05	4.05	4.05	4.05	15.37
10.0	1.86	1.86	1.86	1.86	2.87	2.54	2.54	2.54	2.54	3.68	1.98	1.98	1.98	1.98	4.57	2.98	2.98	2.98	2.98	5.86	3.01	3.01	3.01	3.01	8.37	3.78	3.78	3.78	3.78	13.18
10.5	1.71	1.71	1.71	1.71	2.48	2.30	2.30	2.30	2.30	3.18	1.84	1.84	1.84	1.84	3.95	2.75	2.75	2.75	2.75	5.06	2.81	2.81	2.81	2.81	7.23	3.54	3.54	3.54	3.54	11.39
11.0	1.58	1.58	1.58	1.58	2.16	2.10	2.10	2.10	2.10	2.77	1.72	1.72	1.72	1.72	3.43	2.55	2.55	2.55	2.55	4.40	2.62	2.62	2.62	2.62	6.29	3.32	3.32	3.32	3.32	9.90
11.5	1.46	1.46	1.46	1.46	1.89	1.92	1.92	1.92	1.92	2.42	1.60	1.60	1.60	1.60	3.00	2.37	2.37	2.37	2.37	3.85	2.45	2.45	2.45	2.45	5.50	3.12	3.12	3.12	3.12	8.66
12.0	1.36	1.36	1.36	1.36	1.66	1.76	1.76	1.76	1.76	2.15	1.50	1.50	1.50	1.50	2.64	2.20	2.20	2.20	2.20	3.39	2.30	2.30	2.30	2.30	4.84	2.93	2.93	2.93	2.93	7.63
12.5	1.25	1.25	1.25	1.25	1.48	1.62	1.62	1.62	1.62	1.91	1.41	1.41	1.41	1.41	2.34	2.06	2.06	2.06	2.06	3.00	2.16	2.16	2.16	2.16	4.28	2.76	2.76	2.76	2.76	6.75
13.0	1.16	1.16	1.16	1.16	1.32	1.50	1.50	1.50	1.50	1.72	1.32	1.32	1.32	1.32	2.08	1.92	1.92	1.92	1.92	2.67	2.03	2.03	2.03	2.03	3.81	2.61	2.61	2.61	2.61	6.00
13.5	1.08	1.08	1.08	1.08	1.19	1.39	1.39	1.39	1.39	1.54	1.24	1.24	1.24	1.24	1.85	1.80	1.80	1.80	1.80	2.38	1.92	1.92	1.92	1.92	3.40	2.47	2.47	2.47	2.47	5.35
14.0	1.00	1.00	1.00	1.00	1.07	1.29	1.29	1.29	1.29	1.39	1.17	1.17	1.17	1.17	1.66	1.69	1.69	1.69	1.69	2.13	1.81	1.81	1.81	1.81	3.05	2.34	2.34	2.34	2.34	4.80
14.5	0.93	0.93	0.93	0.93	0.97	1.20	1.20	1.20	1.20	1.26	1.10	1.10	1.10	1.10	1.50	1.58	1.58	1.58	1.58	1.92	1.71	1.71	1.71	1.71	2.74	2.21	2.21	2.21	2.21	4.32
15.0	0.87	0.87	0.87	0.87	0.88	1.13	1.13	1.13	1.13	1.15	1.04	1.04	1.04	1.04	1.35	1.47	1.47	1.47	1.47	1.74	1.62	1.62	1.62	1.62	2.48	2.10	2.10	2.10	2.10	3.90
15.5	0.81	0.81	0.81	0.81	0.81	1.05	1.05	1.05	1.05	1.05	0.99	0.99	0.99	0.99	1.23	1.38	1.38	1.38	1.38	1.59	1.53	1.53	1.53	1.53	2.24	2.00	2.00	2.00	2.00	3.54
16.0	0.76	0.76	0.76	0.76	0.74	0.99	0.99	0.99	0.99	0.96	0.93	0.93	0.93	0.93	1.12	1.30	1.30	1.30	1.30	1.45	1.45	1.45	1.45	1.45	2.04	1.90	1.90	1.90	1.90	3.21
16.5	0.70	0.70	0.72	0.72	0.68	0.93	0.93	0.93	0.93	0.88	0.89	0.89	0.89	0.89	1.03	1.22	1.22	1.22	1.22	1.33	1.38	1.38	1.38	1.38	1.86	1.81	1.81	1.81	1.81	2.93
17.0	0.65	0.65	0.68	0.68	0.62	0.87	0.87	0.87	0.87	0.81	0.84	0.84	0.84	0.84	0.95	1.15	1.15	1.15	1.15	1.23	1.31	1.31	1.31	1.31	1.70	1.72	1.72	1.72	1.72	2.68
17.5	0.61	0.60	0.64	0.64	0.57	0.81	0.81	0.83	0.83	0.74	0.80	0.80	0.80	0.80	0.87	1.08	1.08	1.08	1.08	1.13	1.25	1.25	1.25	1.25	1.56	1.64	1.64	1.64	1.64	2.46
18.0	0.56	0.56	0.59	0.60	0.53	0.76	0.76	0.78	0.78	0.68	0.76	0.76	0.76	0.76	0.81	1.02	1.02	1.02	1.02	1.05	1.19	1.19	1.19	1.19	1.44	1.57	1.57	1.57	1.57	2.26

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_S:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED END SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0	5.66	5.66	5.66	5.66	12.02	8.98	8.98	8.98	8.98	15.96	5.18	5.18	5.18	5.18	24.15															
3.5	4.45	4.45	4.45	4.45	7.57	6.62	6.62	6.62	6.62	10.05	4.28	4.28	4.28	4.28	15.21															
4.0	3.58	3.58	3.58	3.58	5.07	5.06	5.06	5.06	5.06	6.73	3.60	3.60	3.60	3.60	10.19	6.24	6.24	6.24	6.24	13.83	9.41	9.41	9.41	9.41	17.66	4.21	4.21	4.21	4.21	19.84
4.5	2.94	2.94	2.94	2.94	3.56	4.00	4.00	4.00	4.00	4.73	3.06	3.06	3.06	3.06	7.15	5.22	5.22	5.22	5.22	9.71	7.67	7.67	7.67	7.67	12.40	3.65	3.65	3.65	3.65	13.94
5.0	2.38	2.38	2.38	2.38	2.59	3.24	3.24	3.24	3.24	3.44	2.64	2.64	2.64	2.64	5.21	4.43	4.43	4.43	4.43	7.08	6.22	6.22	6.22	6.22	9.04	3.20	3.20	3.20	3.20	10.16
5.5	1.96	1.96	1.96	1.96	1.95	2.68	2.68	2.68	2.68	2.59	2.30	2.30	2.30	2.30	3.92	3.80	3.80	3.80	3.80	5.32	5.14	5.14	5.14	5.14	6.79	2.83	2.83	2.83	2.83	7.63
6.0	1.65	1.65	1.65	1.65	1.50	2.25	2.25	2.25	2.25	2.00	2.02	2.02	2.02	2.02	3.02	3.29	3.29	3.29	3.29	4.09	4.31	4.31	4.31	4.31	5.23	2.52	2.52	2.52	2.52	5.88
6.5	1.40	1.40	1.40	1.40	1.20	1.92	1.92	1.92	1.92	1.58	1.78	1.78	1.78	1.78	2.37	2.86	2.86	2.86	2.86	3.22	3.68	3.68	3.68	3.68	4.11	2.25	2.25	2.25	2.25	4.62
7.0	1.21	1.21	1.21	1.21	0.97	1.61	1.65	1.65	1.65	1.27	1.59	1.59	1.59	1.59	1.90	2.46	2.46	2.46	2.46	2.58	3.17	3.17	3.17	3.17	3.29	2.03	2.03	2.03	2.03	3.70
7.5	1.00	1.05	1.05	1.05	0.80	1.33	1.44	1.44	1.44	1.04	1.42	1.42	1.42	1.42	1.54	2.14	2.14	2.14	2.14	2.09	2.76	2.76	2.76	2.76	2.68	1.84	1.84	1.84	1.84	3.01
8.0	0.83	0.91	0.93	0.93	0.66	1.10	1.22	1.26	1.26	0.86	1.27	1.27	1.27	1.27	1.27	1.88	1.88	1.88	1.88	1.72	2.42	2.43	2.43	2.43	2.21	1.67	1.67	1.67	1.67	2.48
8.5	0.68	0.78	0.82	0.82	0.55	0.90	1.03	1.12	1.12	0.72	1.11	1.15	1.15	1.15	1.06	1.60	1.67	1.67	1.67	1.45	2.04	2.15	2.15	2.15	1.85	1.53	1.53	1.53	1.53	2.06
9.0	0.56	0.65	0.73	0.73	0.47	0.74	0.86	1.00	1.00	0.61	0.95	1.03	1.04	1.04	0.90	1.37	1.49	1.49	1.49	1.24	1.72	1.92	1.92	1.92	1.57	1.40	1.40	1.40	1.40	1.74
9.5	0.47	0.54	0.66	0.66	0.40	0.62	0.72	0.89	0.89	0.52	0.80	0.89	0.95	0.95	0.77	1.15	1.29	1.33	1.33	1.06	1.44	1.65	1.72	1.72	1.34	1.28	1.28	1.28	1.28	1.48
10.0	0.39	0.46	0.59	0.59	0.34	0.52	0.61	0.81	0.81	0.45	0.69	0.78	0.87	0.87	0.67	0.97	1.13	1.20	1.20	0.92	1.21	1.42	1.55	1.55	1.15	1.18	1.18	1.18	1.18	1.27
10.5	0.33	0.38	0.54	0.54	0.30	0.44	0.51	0.73	0.73	0.39	0.59	0.67	0.80	0.80	0.58	0.82	0.97	1.09	1.09	0.80	1.03	1.21	1.41	1.41	1.00	1.02	1.09	1.09	1.09	1.09
11.0						0.37	0.44	0.65	0.67	0.34	0.51	0.58	0.72	0.72	0.51	0.70	0.82	0.99	0.99	0.70	0.87	1.03	1.28	1.28	0.87	0.88	0.99	1.01	1.01	0.95
11.5						0.31	0.37	0.58	0.61	0.30	0.44	0.50	0.66	0.66	0.45	0.60	0.71	0.91	0.91	0.62	0.75	0.89	1.17	1.17	0.76	0.77	0.88	0.94	0.94	0.84
12.0											0.39	0.44	0.60	0.61	0.40	0.52	0.61	0.83	0.83	0.54	0.64	0.77	1.08	1.08	0.67	0.67	0.77	0.88	0.88	0.74
12.5											0.34	0.39	0.54	0.56	0.36	0.45	0.53	0.77	0.77	0.48	0.55	0.66	0.99	0.99	0.60	0.59	0.67	0.82	0.82	0.66
13.0											0.30	0.34	0.48	0.52	0.32	0.39	0.46	0.70	0.71	0.43	0.48	0.58	0.90	0.92	0.53	0.52	0.59	0.76	0.76	0.59
13.5											0.26	0.30	0.44	0.48	0.29	0.34	0.40	0.63	0.66	0.38	0.42	0.50	0.81	0.85	0.48	0.46	0.53	0.72	0.72	0.53
14.0																0.30	0.36	0.57	0.61	0.35	0.37	0.44	0.72	0.79	0.43	0.41	0.47	0.65	0.67	0.48
14.5																0.27	0.31	0.51	0.57	0.31	0.32	0.39	0.64	0.74	0.39	0.37	0.42	0.60	0.63	0.43
15.0																					0.28	0.34	0.57	0.69	0.35	0.33	0.38	0.54	0.59	0.39
15.5																					0.25	0.30	0.51	0.64	0.32	0.30	0.34	0.50	0.56	0.36
16.0																					0.22	0.27	0.46	0.60	0.29	0.27	0.31	0.45	0.53	0.33
16.5																										0.24	0.28	0.41	0.50	0.30
17.0																														
17.5																														
18.0																														

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED END SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5																														
4.0	6.18	6.18	6.18	6.18	24.11	9.86	9.86	9.86	9.86	30.91	5.61	5.61	5.61	5.61	38.33															
4.5	5.31	5.31	5.31	5.31	16.93	8.36	8.36	8.36	8.36	21.71	4.89	4.89	4.89	4.89	26.92															
5.0	4.61	4.61	4.61	4.61	12.34	7.17	7.17	7.17	7.17	15.82	4.32	4.32	4.32	4.32	19.62															
5.5	4.04	4.04	4.04	4.04	9.27	6.21	6.21	6.21	6.21	11.89	3.85	3.85	3.85	3.85	14.74	6.19	6.19	6.19	6.19	18.91	5.69	5.69	5.69	5.69	27.01					
6.0	3.57	3.57	3.57	3.57	7.14	5.43	5.43	5.43	5.43	9.16	3.45	3.45	3.45	3.45	11.36	5.50	5.50	5.50	5.50	14.57	5.12	5.12	5.12	5.12	20.80					
6.5	3.17	3.17	3.17	3.17	5.62	4.78	4.78	4.78	4.78	7.20	3.12	3.12	3.12	3.12	8.93	4.92	4.92	4.92	4.92	11.46	4.64	4.64	4.64	4.64	16.36	5.66	5.66	5.66	5.66	25.76
7.0	2.84	2.84	2.84	2.84	4.50	4.23	4.23	4.23	4.23	5.76	2.83	2.83	2.83	2.83	7.15	4.43	4.43	4.43	4.43	9.17	4.22	4.22	4.22	4.22	13.10	5.18	5.18	5.18	5.18	20.62
7.5	2.55	2.55	2.55	2.55	3.65	3.77	3.77	3.77	3.77	4.69	2.58	2.58	2.58	2.58	5.81	4.00	4.00	4.00	4.00	7.46	3.86	3.86	3.86	3.86	10.65	4.76	4.76	4.76	4.76	16.76
8.0	2.30	2.30	2.30	2.30	3.01	3.38	3.38	3.38	3.38	3.86	2.36	2.36	2.36	2.36	4.79	3.64	3.64	3.64	3.64	6.14	3.55	3.55	3.55	3.55	8.77	4.39	4.39	4.39	4.39	13.81
8.5	2.09	2.09	2.09	2.09	2.51	2.99	2.99	2.99	2.99	3.22	2.17	2.17	2.17	2.17	3.99	3.31	3.31	3.31	3.31	5.12	3.27	3.27	3.27	3.27	7.31	4.06	4.06	4.06	4.06	11.51
9.0	1.90	1.90	1.90	1.90	2.11	2.65	2.67	2.67	2.67	2.71	2.00	2.00	2.00	2.00	3.36	3.03	3.03	3.03	3.03	4.31	3.02	3.02	3.02	3.02	6.16	3.77	3.77	3.77	3.77	9.70
9.5	1.71	1.74	1.74	1.74	1.80	2.30	2.39	2.39	2.39	2.30	1.85	1.85	1.85	1.85	2.86	2.78	2.78	2.78	2.78	3.67	2.80	2.80	2.80	2.80	5.24	3.51	3.51	3.51	3.51	8.25
10.0	1.48	1.60	1.60	1.60	1.54	2.00	2.16	2.16	2.16	1.97	1.71	1.71	1.71	1.71	2.45	2.56	2.56	2.56	2.56	3.14	2.60	2.60	2.60	2.60	4.49	3.27	3.27	3.27	3.27	7.07
10.5	1.28	1.42	1.47	1.47	1.33	1.73	1.92	1.96	1.96	1.72	1.59	1.59	1.59	1.59	2.12	2.37	2.37	2.37	2.37	2.71	2.42	2.42	2.42	2.42	3.88	3.06	3.06	3.06	3.06	6.11
11.0	1.11	1.25	1.36	1.36	1.16	1.49	1.69	1.79	1.79	1.51	1.48	1.48	1.48	1.48	1.84	2.15	2.19	2.19	2.19	2.36	2.26	2.26	2.26	2.26	3.37	2.87	2.87	2.87	2.87	5.31
11.5	0.97	1.10	1.25	1.25	1.03	1.28	1.49	1.63	1.63	1.33	1.38	1.38	1.38	1.38	1.61	1.91	2.03	2.03	2.03	2.06	2.12	2.12	2.12	2.12	2.95	2.69	2.69	2.69	2.69	4.65
12.0	0.85	0.97	1.16	1.16	0.91	1.11	1.31	1.50	1.50	1.18	1.25	1.29	1.29	1.29	1.42	1.68	1.86	1.89	1.89	1.82	1.98	1.98	1.98	1.98	2.60	2.53	2.53	2.53	2.53	4.09
12.5	0.75	0.85	1.07	1.07	0.81	0.96	1.14	1.38	1.38	1.06	1.10	1.21	1.21	1.21	1.25	1.48	1.67	1.76	1.76	1.61	1.78	1.86	1.86	1.86	2.30	2.38	2.38	2.38	2.38	3.62
13.0	0.66	0.75	0.99	0.99	0.73	0.84	1.00	1.28	1.28	0.95	0.97	1.12	1.13	1.13	1.11	1.31	1.50	1.65	1.65	1.43	1.58	1.75	1.75	1.75	2.04	2.19	2.25	2.25	2.25	3.22
13.5	0.59	0.67	0.90	0.92	0.65	0.74	0.88	1.18	1.18	0.85	0.87	1.00	1.07	1.07	1.00	1.17	1.34	1.54	1.54	1.29	1.41	1.62	1.65	1.65	1.82	1.95	2.13	2.13	2.13	2.87
14.0	0.52	0.60	0.82	0.85	0.59	0.65	0.77	1.10	1.10	0.77	0.77	0.89	1.00	1.00	0.90	1.04	1.20	1.44	1.44	1.16	1.25	1.45	1.56	1.56	1.63	1.74	2.01	2.01	2.01	2.57
14.5	0.46	0.53	0.75	0.79	0.53	0.57	0.68	1.01	1.03	0.69	0.69	0.80	0.95	0.95	0.81	0.94	1.07	1.34	1.34	1.06	1.12	1.30	1.47	1.47	1.47	1.56	1.81	1.91	1.91	2.32
15.0	0.41	0.48	0.68	0.74	0.49	0.51	0.61	0.93	0.96	0.63	0.62	0.71	0.89	0.89	0.74	0.84	0.97	1.26	1.26	0.96	1.01	1.17	1.39	1.39	1.33	1.40	1.62	1.81	1.81	2.09
15.5	0.36	0.43	0.63	0.69	0.44	0.45	0.54	0.85	0.90	0.57	0.56	0.64	0.85	0.85	0.67	0.76	0.87	1.17	1.18	0.87	0.91	1.05	1.32	1.32	1.21	1.26	1.46	1.72	1.72	1.90
16.0	0.32	0.38	0.57	0.65	0.40	0.40	0.48	0.77	0.84	0.52	0.51	0.58	0.80	0.80	0.62	0.69	0.79	1.08	1.10	0.80	0.82	0.95	1.25	1.25	1.11	1.14	1.32	1.63	1.63	1.72
16.5	0.29	0.34	0.52	0.61	0.37	0.36	0.43	0.71	0.79	0.47	0.46	0.53	0.74	0.76	0.57	0.62	0.72	0.99	1.04	0.73	0.75	0.86	1.19	1.19	1.01	1.04	1.20	1.55	1.55	1.57
17.0	0.26	0.31	0.47	0.58	0.34	0.32	0.39	0.64	0.74	0.43	0.42	0.48	0.68	0.72	0.52	0.55	0.65	0.92	0.98	0.68	0.68	0.78	1.11	1.13	0.93	0.94	1.09	1.48	1.48	1.44
17.5	0.23	0.28	0.43	0.54	0.31	0.29	0.35	0.58	0.70	0.40	0.38	0.44	0.63	0.68	0.48	0.50	0.60	0.85	0.92	0.62	0.62	0.71	1.03	1.07	0.86	0.86	0.99	1.41	1.41	1.32
18.0	0.21	0.25	0.40	0.51	0.29	0.26	0.31	0.53	0.66	0.37	0.35	0.40	0.59	0.65	0.44	0.45	0.54	0.79	0.87	0.57	0.57	0.65	0.95	1.02	0.79	0.79	0.91	1.33	1.35	1.22

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED INTERNAL SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5																														
4.0	5.43	5.43	5.43	5.43	11.72	8.46	8.46	8.46	8.46	15.56	5.04	5.04	5.04	5.04	23.54															
4.5	4.51	4.51	4.51	4.51	8.23	6.68	6.68	6.68	6.68	10.93	4.35	4.35	4.35	4.35	16.53															
5.0	3.80	3.80	3.80	3.80	6.00	5.41	5.41	5.41	5.41	7.96	3.79	3.79	3.79	3.79	12.05	6.60	6.60	6.60	6.60	16.35	9.98	9.98	9.98	9.98	20.89	4.43	4.43	4.43	4.43	23.47
5.5	3.24	3.24	3.24	3.24	4.51	4.47	4.47	4.47	4.47	5.98	3.34	3.34	3.34	3.34	9.05	5.72	5.72	5.72	5.72	12.29	8.55	8.55	8.55	8.55	15.69	3.95	3.95	3.95	3.95	17.63
6.0	2.76	2.76	2.76	2.76	3.47	3.76	3.76	3.76	3.76	4.61	2.96	2.96	2.96	2.96	6.97	5.01	5.01	5.01	5.01	9.46	7.21	7.21	7.21	7.21	12.09	3.55	3.55	3.55	3.55	13.58
6.5	2.35	2.35	2.35	2.35	2.73	3.20	3.20	3.20	3.20	3.62	2.64	2.64	2.64	2.64	5.48	4.41	4.41	4.41	4.41	7.44	6.14	6.14	6.14	6.14	9.51	3.20	3.20	3.20	3.20	10.68
7.0	2.02	2.02	2.02	2.02	2.18	2.76	2.76	2.76	2.76	2.90	2.37	2.37	2.37	2.37	4.39	3.91	3.91	3.91	3.91	5.96	5.29	5.29	5.29	5.29	7.61	2.91	2.91	2.91	2.91	8.55
7.5	1.76	1.76	1.76	1.76	1.77	2.40	2.40	2.40	2.40	2.36	2.14	2.14	2.14	2.14	3.57	3.49	3.49	3.49	3.49	4.84	4.61	4.61	4.61	4.61	6.19	2.65	2.65	2.65	2.65	6.95
8.0	1.55	1.55	1.55	1.55	1.46	2.11	2.11	2.11	2.11	1.94	1.93	1.93	1.93	1.93	2.94	3.13	3.13	3.13	3.13	3.99	4.05	4.05	4.05	4.05	5.10	2.43	2.43	2.43	2.43	5.73
8.5	1.37	1.37	1.37	1.37	1.22	1.87	1.87	1.87	1.87	1.62	1.76	1.76	1.76	1.76	2.45	2.79	2.79	2.79	2.79	3.33	3.59	3.59	3.59	3.59	4.25	2.24	2.24	2.24	2.24	4.77
9.0	1.22	1.22	1.22	1.22	1.02	1.63	1.67	1.67	1.67	1.37	1.61	1.61	1.61	1.61	2.06	2.49	2.49	2.49	2.49	2.80	3.20	3.20	3.20	3.20	3.58	2.06	2.06	2.06	2.06	4.02
9.5	1.06	1.10	1.10	1.10	0.88	1.40	1.50	1.50	1.50	1.17	1.47	1.47	1.47	1.47	1.75	2.23	2.23	2.23	2.23	2.38	2.87	2.87	2.87	2.87	3.04	1.91	1.91	1.91	1.91	3.42
10.0	0.92	0.99	0.99	0.99	0.76	1.22	1.35	1.35	1.35	1.00	1.35	1.35	1.35	1.35	1.50	2.01	2.01	2.01	2.01	2.04	2.59	2.59	2.59	2.59	2.61	1.77	1.77	1.77	1.77	2.93
10.5	0.80	0.90	0.90	0.90	0.66	1.05	1.22	1.22	1.22	0.87	1.25	1.25	1.25	1.25	1.30	1.79	1.83	1.83	1.83	1.76	2.29	2.35	2.35	2.35	2.25	1.64	1.64	1.64	1.64	2.53
11.0	0.69	0.82	0.82	0.82	0.58	0.90	1.11	1.11	1.11	0.76	1.10	1.15	1.15	1.15	1.13	1.59	1.66	1.66	1.66	1.53	2.01	2.14	2.14	2.14	1.96	1.53	1.53	1.53	1.53	2.20
11.5	0.59	0.75	0.75	0.75	0.51	0.78	1.02	1.02	1.02	0.67	0.98	1.07	1.07	1.07	0.99	1.41	1.52	1.52	1.52	1.34	1.76	1.96	1.96	1.96	1.71	1.43	1.43	1.43	1.43	1.93
12.0	0.51	0.69	0.69	0.69	0.45	0.68	0.93	0.94	0.94	0.59	0.86	0.99	0.99	0.99	0.87	1.24	1.40	1.40	1.40	1.18	1.53	1.80	1.80	1.80	1.51	1.34	1.34	1.34	1.34	1.69
12.5	0.45	0.63	0.63	0.63	0.40	0.59	0.84	0.86	0.86	0.52	0.76	0.92	0.92	0.92	0.77	1.08	1.29	1.29	1.29	1.05	1.34	1.66	1.66	1.66	1.34	1.25	1.25	1.25	1.25	1.50
13.0	0.39	0.56	0.58	0.58	0.36	0.52	0.75	0.80	0.80	0.46	0.68	0.86	0.86	0.86	0.68	0.95	1.19	1.19	1.19	0.94	1.18	1.53	1.53	1.53	1.20	1.15	1.18	1.18	1.18	1.33
13.5	0.35	0.51	0.54	0.54	0.32	0.46	0.67	0.74	0.74	0.42	0.61	0.78	0.80	0.80	0.61	0.84	1.10	1.10	1.10	0.85	1.04	1.42	1.42	1.42	1.07	1.03	1.11	1.11	1.11	1.19
14.0	0.31	0.46	0.50	0.50	0.29	0.41	0.60	0.69	0.69	0.37	0.54	0.71	0.75	0.75	0.55	0.74	1.03	1.03	1.03	0.76	0.93	1.32	1.32	1.32	0.96	0.92	1.04	1.04	1.04	1.06
14.5						0.36	0.54	0.63	0.64	0.34	0.49	0.65	0.70	0.70	0.50	0.66	0.94	0.96	0.96	0.69	0.82	1.20	1.23	1.23	0.87	0.83	0.98	0.98	0.98	0.96
15.0						0.32	0.48	0.58	0.60	0.30	0.44	0.59	0.65	0.65	0.46	0.59	0.86	0.89	0.89	0.63	0.73	1.09	1.15	1.15	0.79	0.74	0.93	0.93	0.93	0.87
15.5											0.40	0.54	0.61	0.61	0.42	0.53	0.78	0.84	0.84	0.57	0.65	0.99	1.08	1.08	0.71	0.67	0.88	0.88	0.88	0.78
16.0											0.36	0.50	0.56	0.57	0.38	0.48	0.72	0.78	0.78	0.53	0.59	0.90	1.01	1.01	0.65	0.61	0.82	0.83	0.83	0.71
16.5											0.32	0.45	0.52	0.54	0.35	0.43	0.65	0.74	0.74	0.48	0.52	0.81	0.95	0.95	0.59	0.55	0.76	0.79	0.79	0.65
17.0											0.29	0.41	0.48	0.50	0.32	0.39	0.59	0.69	0.69	0.44	0.47	0.73	0.89	0.89	0.54	0.51	0.70	0.75	0.75	0.60
17.5											0.27	0.38	0.44	0.48	0.29	0.35	0.53	0.64	0.65	0.40	0.43	0.67	0.82	0.84	0.50	0.46	0.64	0.71	0.71	0.55
18.0																0.32	0.48	0.59	0.62	0.37	0.38	0.61	0.76	0.80	0.46	0.42	0.59	0.67	0.68	0.51

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED INTERNAL SPANS

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s	1B	2B	3B	FR	W_s
3.0																														
3.5																														
4.0																														
4.5																														
5.0																														
5.5	5.76	5.76	5.76	5.76	21.43	9.12	9.12	9.12	9.12	27.47	5.28	5.28	5.28	5.28	34.07															
6.0	5.14	5.14	5.14	5.14	16.50	8.05	8.05	8.05	8.05	21.16	4.77	4.77	4.77	4.77	26.24															
6.5	4.61	4.61	4.61	4.61	12.98	7.16	7.16	7.16	7.16	16.64	4.34	4.34	4.34	4.34	20.64															
7.0	4.16	4.16	4.16	4.16	10.39	6.40	6.40	6.40	6.40	13.32	3.96	3.96	3.96	3.96	16.52	6.37	6.37	6.37	6.37	21.19	5.86	5.86	5.86	5.86	30.26					
7.5	3.77	3.77	3.77	3.77	8.45	5.75	5.75	5.75	5.75	10.83	3.64	3.64	3.64	3.64	13.43	5.81	5.81	5.81	5.81	17.23	5.39	5.39	5.39	5.39	24.61					
8.0	3.43	3.43	3.43	3.43	6.96	5.19	5.19	5.19	5.19	8.92	3.35	3.35	3.35	3.35	11.07	5.31	5.31	5.31	5.31	14.20	4.98	4.98	4.98	4.98	20.27	6.07	6.07	6.07	6.07	31.92
8.5	3.14	3.14	3.14	3.14	5.80	4.71	4.71	4.71	4.71	7.44	3.10	3.10	3.10	3.10	9.23	4.88	4.88	4.88	4.88	11.83	4.62	4.62	4.62	4.62	16.90	5.64	5.64	5.64	5.64	26.61
9.0	2.88	2.88	2.88	2.88	4.89	4.29	4.29	4.29	4.29	6.27	2.87	2.87	2.87	2.87	7.77	4.49	4.49	4.49	4.49	9.97	4.29	4.29	4.29	4.29	14.24	5.27	5.27	5.27	5.27	22.41
9.5	2.65	2.65	2.65	2.65	4.15	3.92	3.92	3.92	3.92	5.33	2.67	2.67	2.67	2.67	6.61	4.15	4.15	4.15	4.15	8.48	4.00	4.00	4.00	4.00	12.10	4.93	4.93	4.93	4.93	19.06
10.0	2.44	2.44	2.44	2.44	3.56	3.60	3.60	3.60	3.60	4.57	2.49	2.49	2.49	2.49	5.66	3.85	3.85	3.85	3.85	7.27	3.74	3.74	3.74	3.74	10.38	4.62	4.62	4.62	4.62	16.34
10.5	2.26	2.26	2.26	2.26	3.08	3.27	3.27	3.27	3.27	3.94	2.33	2.33	2.33	2.33	4.89	3.57	3.57	3.57	3.57	6.28	3.50	3.50	3.50	3.50	8.96	4.34	4.34	4.34	4.34	14.11
11.0	2.10	2.10	2.10	2.10	2.67	2.98	2.98	2.98	2.98	3.43	2.18	2.18	2.18	2.18	4.25	3.33	3.33	3.33	3.33	5.46	3.29	3.29	3.29	3.29	7.80	4.09	4.09	4.09	4.09	12.27
11.5	1.95	1.95	1.95	1.95	2.34	2.69	2.73	2.73	2.73	3.00	2.05	2.05	2.05	2.05	3.72	3.10	3.10	3.10	3.10	4.78	3.09	3.09	3.09	3.09	6.82	3.86	3.86	3.86	3.86	10.74
12.0	1.79	1.82	1.82	1.82	2.06	2.41	2.51	2.51	2.51	2.64	1.92	1.92	1.92	1.92	3.28	2.90	2.90	2.90	2.90	4.20	2.91	2.91	2.91	2.91	6.00	3.65	3.65	3.65	3.65	9.45
12.5	1.61	1.70	1.70	1.70	1.82	2.16	2.31	2.31	2.31	2.34	1.81	1.81	1.81	1.81	2.90	2.72	2.72	2.72	2.72	3.72	2.75	2.75	2.75	2.75	5.31	3.45	3.45	3.45	3.45	8.36
13.0	1.44	1.59	1.59	1.59	1.62	1.93	2.13	2.13	2.13	2.08	1.71	1.71	1.71	1.71	2.58	2.55	2.55	2.55	2.55	3.30	2.60	2.60	2.60	2.60	4.72	3.27	3.27	3.27	3.27	7.43
13.5	1.29	1.49	1.49	1.49	1.44	1.73	1.98	1.98	1.98	1.85	1.61	1.61	1.61	1.61	2.30	2.40	2.40	2.40	2.40	2.95	2.46	2.46	2.46	2.46	4.22	3.11	3.11	3.11	3.11	6.64
14.0	1.15	1.40	1.40	1.40	1.29	1.54	1.84	1.84	1.84	1.66	1.52	1.52	1.52	1.52	2.06	2.20	2.26	2.26	2.26	2.65	2.33	2.33	2.33	2.33	3.78	2.95	2.95	2.95	2.95	5.95
14.5	1.04	1.31	1.31	1.31	1.17	1.37	1.71	1.71	1.71	1.49	1.44	1.44	1.44	1.44	1.85	2.00	2.13	2.13	2.13	2.38	2.21	2.21	2.21	2.21	3.40	2.81	2.81	2.81	2.81	5.36
15.0	0.94	1.22	1.24	1.24	1.05	1.22	1.60	1.60	1.60	1.35	1.36	1.37	1.37	1.37	1.68	1.81	2.01	2.01	2.01	2.15	2.10	2.10	2.10	2.10	3.07	2.68	2.68	2.68	2.68	4.84
15.5	0.85	1.12	1.16	1.16	0.95	1.10	1.50	1.50	1.50	1.23	1.23	1.30	1.30	1.30	1.52	1.64	1.90	1.90	1.90	1.95	1.98	2.00	2.00	2.00	2.78	2.55	2.55	2.55	2.55	4.38
16.0	0.77	1.03	1.09	1.09	0.87	0.99	1.39	1.41	1.41	1.12	1.12	1.23	1.23	1.23	1.38	1.49	1.80	1.80	1.80	1.77	1.79	1.90	1.90	1.90	2.53	2.44	2.44	2.44	2.44	3.99
16.5	0.70	0.95	1.02	1.02	0.80	0.89	1.28	1.32	1.32	1.03	1.02	1.17	1.17	1.17	1.26	1.36	1.71	1.71	1.71	1.61	1.63	1.81	1.81	1.81	2.31	2.26	2.33	2.33	2.33	3.63
17.0	0.64	0.88	0.96	0.96	0.73	0.81	1.18	1.25	1.25	0.95	0.93	1.12	1.12	1.12	1.15	1.24	1.62	1.62	1.62	1.48	1.49	1.73	1.73	1.73	2.11	2.06	2.23	2.23	2.23	3.32
17.5	0.59	0.81	0.91	0.91	0.67	0.73	1.09	1.18	1.18	0.87	0.85	1.07	1.07	1.07	1.05	1.14	1.50	1.54	1.54	1.35	1.37	1.65	1.65	1.65	1.93	1.88	2.13	2.13	2.13	3.04
18.0	0.53	0.75	0.85	0.86	0.62	0.66	1.01	1.11	1.11	0.81	0.78	1.02	1.02	1.02	0.97	1.05	1.40	1.46	1.46	1.24	1.25	1.58	1.58	1.58	1.78	1.73	2.04	2.04	2.04	2.80

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. W_s:** Load at a deflection of span/150.

DHS PURLIN SYSTEM LOAD SPAN TABLES - SINGLE SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0	65.4	76.4	77.0	77.1	247.9																									
3.5	57.3	70.8	71.5	71.6	182.1	80.2	99.4	100.5	100.6	227.3	73.2	85.4	86.2	86.2	397.2															
4.0	49.2	64.7	65.6	65.7	139.4	67.9	90.8	92.2	92.3	174.0	66.4	81.1	82.1	82.1	304.1	93.6	114.5	115.9	116.0	380.6	123.3	151.2	153.2	153.3	455.1	91.2	106.4	107.5	107.6	614.5
4.5	41.5	58.5	59.6	59.6	110.1	55.9	82.0	83.4	83.6	137.5	59.5	76.5	77.7	77.7	240.2	83.8	108.0	109.7	109.8	300.7	110.0	142.6	144.9	145.0	359.5	84.2	102.3	103.7	103.8	485.5
5.0	35.2	52.3	53.4	53.5	89.2	46.8	72.7	74.5	74.7	111.4	52.6	71.7	73.0	73.1	194.6	74.1	101.2	103.1	103.2	243.6	95.4	133.4	136.1	136.2	291.2	77.0	98.0	99.6	99.7	393.2
5.5	29.9	46.1	47.3	47.4	73.7	39.9	62.8	64.7	64.9	92.0	45.9	66.7	68.2	68.3	160.8	64.6	94.1	96.3	96.4	201.3	81.7	124.0	126.9	127.1	240.7	69.9	93.4	95.3	95.4	325.0
6.0	25.8	40.3	41.5	41.5	61.9	34.6	53.9	55.6	55.7	77.3	40.4	61.7	63.3	63.4	135.1	55.9	87.0	89.4	89.5	169.1	70.6	114.4	117.6	117.8	202.2	62.8	88.7	90.8	90.9	273.1
6.5	22.5	35.4	36.6	36.7	52.8	30.4	46.9	48.3	48.4	65.9	35.9	56.6	58.4	58.5	115.1	48.8	79.8	82.3	82.5	144.1	61.9	103.8	107.7	107.9	172.3	55.8	83.8	86.1	86.2	232.7
7.0	19.9	31.1	32.1	32.2	45.5	26.9	41.2	42.4	42.6	56.8	32.1	51.6	53.5	53.6	99.3	43.1	72.7	75.3	75.5	124.2	54.8	93.2	97.2	97.4	148.6	50.0	78.8	81.4	81.5	200.6
7.5	17.8	27.6	28.4	28.5	39.6	24.1	36.6	37.6	37.7	49.5	28.7	46.7	48.6	48.8	86.5	38.4	65.6	68.4	68.5	108.2	49.0	82.9	86.9	87.1	129.4	45.0	73.8	76.6	76.7	174.7
8.0						21.8	32.7	33.6	33.7	43.5	25.7	42.4	44.2	44.3	76.0	34.5	59.0	61.8	62.0	95.1	44.2	74.2	77.6	77.8	113.7	40.9	68.8	71.7	71.8	153.6
8.5											23.2	38.7	40.3	40.4	67.3	31.3	53.1	55.6	55.7	84.2	40.2	66.9	69.9	70.1	100.7	37.3	63.9	66.9	67.0	136.0
9.0											21.1	35.5	37.0	37.0	60.0	28.5	48.1	50.3	50.4	75.1	36.7	60.7	63.3	63.5	89.8	34.1	59.0	62.2	62.3	121.3
9.5											19.3	32.7	34.0	34.1	53.9	26.1	43.8	45.8	45.9	67.4	33.8	55.3	57.7	57.8	80.6	31.0	54.4	57.4	57.6	108.9
10.0											17.7	30.1	31.5	31.5	48.6	24.1	40.1	41.9	42.0	60.9	31.2	50.7	52.8	53.0	72.8	28.3	50.4	53.2	53.3	98.3
10.5																22.3	36.9	38.5	38.6	55.2	28.8	46.7	48.6	48.7	66.0	26.0	46.9	49.4	49.6	89.1
11.0																					26.5	43.2	44.8	45.0	60.1	24.0	43.7	46.1	46.2	81.2
11.5																					24.6	40.0	41.6	41.7	55.0	22.3	40.9	43.1	43.2	74.3
12.0																										20.7	38.4	40.4	40.5	68.2
12.5																										19.3	36.1	38.0	38.1	62.9
13.0																														
13.5																														
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1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - SINGLE SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0																														
4.5																														
5.0	95.9	122.2	124.3	124.4	453.6	126.3	161.7	164.5	164.6	543.6	114.7	137.8	139.9	139.9	775.1															
5.5	86.9	116.5	118.9	119.0	374.9	114.2	154.2	157.4	157.5	449.2	106.8	133.3	135.6	135.7	640.6															
6.0	78.0	110.6	113.3	113.4	315.0	102.2	146.3	149.9	150.1	377.5	98.7	128.5	131.2	131.3	538.3															
6.5	69.3	104.5	107.5	107.6	268.4	89.7	138.2	142.2	142.4	321.6	90.6	123.5	126.5	126.6	458.6	119.8	163.9	168.0	168.1	550.4										
7.0	61.9	98.3	101.5	101.7	231.4	78.8	130.0	134.3	134.5	277.3	82.7	118.3	121.6	121.8	395.4	109.2	157.0	161.5	161.7	474.5	112.4	162.9	179.0	179.2	692.3					
7.5	55.7	92.1	95.5	95.7	201.6	69.9	121.6	126.3	126.4	241.6	74.8	113.0	116.6	116.8	344.5	98.6	150.0	154.9	155.1	413.4	101.5	155.6	173.4	173.5	603.1	120.9	187.5	217.8	222.0	933.9
8.0	50.0	85.9	89.5	89.6	177.2	62.6	113.3	118.2	118.4	212.3	68.0	107.6	111.5	111.7	302.7	89.5	142.8	148.1	148.3	363.3	92.1	148.1	167.6	167.7	530.0	108.9	178.3	211.5	216.1	820.8
8.5	45.0	79.7	83.5	83.6	156.9	56.4	105.1	110.1	110.3	188.1	62.2	102.1	106.3	106.5	268.2	81.7	135.6	141.2	141.4	321.8	84.0	140.6	161.6	161.8	469.5	98.0	169.0	204.9	210.0	727.0
9.0	40.7	73.5	77.5	77.7	140.0	51.1	96.8	102.1	102.3	167.7	57.1	96.7	101.1	101.2	239.2	74.5	128.3	134.3	134.5	287.0	76.5	133.0	155.5	155.7	418.8	88.8	159.7	198.2	203.8	648.5
9.5	37.1	67.8	71.6	71.7	125.6	46.6	88.2	93.8	94.0	150.5	52.7	91.2	95.8	96.0	214.7	67.8	121.0	127.3	127.5	257.6	69.7	125.5	149.3	149.5	375.9	80.9	150.4	191.3	197.3	582.0
10.0	33.9	62.8	66.2	66.4	113.4	42.7	80.7	85.7	86.0	135.9	48.7	85.8	90.6	90.8	193.7	62.0	113.8	120.3	120.5	232.5	63.8	117.9	143.0	143.2	339.2	74.1	141.1	184.3	190.7	525.3
10.5	31.2	58.3	61.5	61.7	102.8	39.3	74.2	78.8	79.0	123.2	45.3	80.4	85.4	85.6	175.7	57.0	106.6	113.3	113.6	210.9	58.6	110.5	136.7	136.9	307.7	68.2	131.9	177.3	184.1	476.4
11.0	28.8	54.4	57.3	57.4	93.7	36.3	68.5	72.7	72.8	112.3	41.9	75.1	80.2	80.4	160.1	52.6	99.5	106.4	106.6	192.1	54.1	103.0	130.4	130.6	280.3	63.1	122.9	170.1	177.3	434.1
11.5	26.7	50.3	53.4	53.6	85.7	33.6	63.5	67.3	67.4	102.7	38.8	70.4	75.1	75.3	146.5	48.8	93.2	99.6	99.8	175.8	50.2	96.4	124.1	124.3	256.5	58.5	114.8	163.0	170.5	397.2
12.0	24.8	46.8	49.6	49.7	78.7	31.3	59.1	62.5	62.7	94.3	36.0	66.1	70.6	70.7	134.5	45.3	87.5	93.4	93.7	161.4	46.7	90.4	117.8	118.1	235.5	54.4	106.6	155.8	163.7	364.8
12.5	23.2	43.6	46.2	46.3	72.5	29.2	55.2	58.3	58.4	86.9	33.6	62.2	66.4	66.6	124.0	42.3	82.3	87.9	88.1	148.8	43.5	85.0	111.6	111.9	217.1	50.8	99.3	148.7	156.9	336.2
13.0	21.7	40.8	43.1	43.3	67.1	27.3	51.6	54.5	54.6	80.4	31.4	58.7	62.7	62.8	114.6	39.5	77.5	82.8	83.0	137.6	40.7	80.0	105.3	105.6	200.7	47.6	92.8	141.6	150.0	310.8
13.5						25.6	48.5	51.1	51.2	74.5	29.4	55.6	59.3	59.4	106.3	37.1	72.7	78.2	78.4	127.5	38.2	74.9	99.5	99.7	186.1	44.7	87.0	134.5	143.2	288.2
14.0						24.1	45.6	48.0	48.1	69.3	27.6	52.6	56.1	56.3	98.8	34.9	68.3	73.5	73.6	118.6	35.9	70.4	94.2	94.4	173.0	42.1	81.7	127.4	136.5	268.0
14.5											26.0	50.0	53.3	53.4	92.1	32.9	64.3	69.1	69.3	110.6	33.9	66.2	89.3	89.6	161.3	39.7	76.9	120.7	129.7	249.8
15.0											24.6	47.5	50.6	50.7	86.1	31.0	60.7	65.2	65.3	103.3	32.0	62.4	84.9	85.1	150.7	37.5	72.6	114.6	123.1	233.4
15.5											23.2	45.2	48.2	48.3	80.6	29.3	57.4	61.6	61.7	96.7	30.3	59.0	80.7	80.9	141.2	35.5	68.7	108.3	117.1	218.6
16.0																27.8	54.3	58.3	58.4	90.8	28.7	55.9	76.5	76.7	132.5	33.7	65.1	102.5	111.1	205.2
16.5																26.4	51.5	55.3	55.4	85.4	27.3	53.0	72.5	72.7	124.6	32.0	61.8	97.1	105.4	192.9
17.0																					25.9	50.4	68.8	69.0	117.3	30.5	58.7	92.3	100.0	181.7
17.5																					24.7	47.9	65.5	65.6	110.7	29.1	55.9	87.8	95.2	171.5
18.0																					23.6	45.7	62.4	62.5	104.7	27.7	53.3	83.6	90.6	162.1

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - END SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0	64.5	78.3	85.3	85.6	506.0	90.4	110.1	120.1	120.6	631.5	78.8	89.6	95.1	95.5	1103.3															
3.5	56.2	73.2	82.2	82.6	371.7	78.7	102.8	115.7	116.2	464.0	72.1	85.7	93.0	93.5	810.6	101.7	121.0	131.3	132.1	1014.6	134.0	159.8	173.6	174.7	1213.1	96.2	109.7	116.3	117.1	1638.0
4.0	48.0	67.7	78.7	79.2	284.6	66.0	94.9	110.7	111.5	355.2	65.1	81.5	90.7	91.3	620.6	91.8	115.1	128.0	129.0	776.8	120.8	151.9	169.2	170.6	928.8	89.2	105.8	114.3	115.3	1254.0
4.5	40.4	62.0	74.9	75.5	224.8	54.2	86.8	105.4	106.2	280.6	58.0	77.1	88.1	88.9	490.3	81.7	108.7	124.4	125.5	613.8	106.8	143.4	164.4	166.0	733.8	81.9	101.6	112.0	113.3	990.8
5.0	34.1	56.2	70.9	71.6	182.1	45.4	78.5	99.7	100.7	227.3	51.0	72.3	85.3	86.3	397.2	71.8	102.0	120.4	121.8	497.1	92.1	134.5	159.1	161.1	594.4	74.5	97.1	109.5	111.1	802.6
5.5	29.0	50.4	66.8	67.6	150.5	38.8	69.7	93.8	94.9	187.9	44.4	67.5	82.3	83.4	328.2	62.3	95.2	116.2	117.8	410.8	78.6	125.3	153.5	155.8	491.2	67.1	92.4	106.8	108.7	663.3
6.0	25.0	44.7	62.5	63.4	126.5	33.6	60.7	87.7	88.9	157.8	39.0	62.6	79.2	80.4	275.8	53.7	88.2	111.8	113.6	345.2	68.0	116.0	147.6	150.1	412.8	59.7	87.5	104.0	106.1	557.3
6.5	21.9	39.6	58.2	59.1	107.7	29.6	53.0	81.4	82.8	134.5	34.7	57.6	75.9	77.3	235.0	47.0	81.2	107.2	109.2	294.1	59.6	106.0	141.4	144.2	351.7	53.0	82.5	101.0	103.4	474.9
7.0	19.3	35.2	53.8	54.8	92.9	26.2	46.8	75.2	76.6	116.0	31.0	52.7	72.6	74.1	202.6	41.5	74.2	102.4	104.6	253.6	52.9	95.6	135.1	138.1	303.2	47.4	77.4	97.8	100.6	409.5
7.5	17.3	31.3	49.5	50.5	80.9	23.5	41.7	68.2	69.9	101.0	27.6	47.9	69.1	70.8	176.5	37.0	67.3	97.5	99.9	220.9	47.3	85.6	128.5	131.8	264.1	42.7	72.3	94.5	97.6	356.7
8.0	15.6	28.0	45.1	46.3	71.1	21.3	37.5	61.3	63.1	88.8	24.7	43.5	65.6	67.4	155.1	33.3	60.9	92.6	95.1	194.2	42.7	76.8	121.9	125.4	232.2	38.7	67.2	91.2	94.6	313.5
8.5	14.1	25.3	41.1	42.2	63.0	19.4	33.9	55.1	56.7	78.6	22.3	39.8	62.1	64.0	137.4	30.2	54.9	87.6	90.3	172.0	38.8	69.4	115.2	118.8	205.6	35.3	62.2	87.7	91.4	277.7
9.0	12.9	22.9	37.7	38.6	56.2	17.7	30.9	49.9	51.3	70.1	20.3	36.5	58.6	60.5	122.5	27.5	49.9	82.6	85.4	153.4	35.3	63.2	108.1	112.3	183.4	32.0	57.2	84.2	88.2	247.7
9.5	11.8	21.0	34.3	35.3	50.4	16.3	28.3	45.4	46.6	62.9	18.6	33.7	55.1	57.1	110.0	25.2	45.5	77.6	80.5	137.7	32.2	57.8	100.5	104.9	164.6	29.2	52.8	80.6	84.9	222.3
10.0	10.9	19.2	31.4	32.2	45.5	15.1	26.1	41.5	42.6	56.8	17.1	31.2	51.6	53.7	99.3	23.3	41.8	72.6	75.6	124.2	29.4	53.2	93.2	97.6	148.6	26.7	48.9	77.0	81.5	200.6
10.5						14.0	24.1	38.1	39.2	51.5	15.8	28.8	48.1	50.3	90.0	21.6	38.5	67.6	70.8	112.7	27.1	49.2	85.9	90.4	134.7	24.5	45.4	73.5	78.2	182.0
11.0						13.0	22.4	35.2	36.1	46.9	14.6	26.6	44.9	47.0	82.0	19.9	35.7	63.0	65.9	102.7	25.0	45.6	79.4	83.4	122.8	22.6	42.3	69.9	74.8	165.8
11.5											13.6	24.6	42.0	43.9	75.0	18.5	33.2	58.4	61.4	93.9	23.1	42.5	73.6	77.2	112.3	20.9	39.6	66.3	71.5	151.7
12.0											12.7	22.9	39.4	41.2	68.9	17.1	30.9	54.3	57.0	86.3	21.5	39.7	68.4	71.7	103.2	19.5	37.1	62.8	68.1	139.3
12.5											11.9	21.4	37.1	38.7	63.5	16.0	28.9	50.6	53.1	79.5	20.0	37.3	63.9	66.8	95.1	18.1	34.9	59.2	64.8	128.4
13.0											11.2	20.1	35.0	36.5	58.7	14.9	27.2	47.3	49.6	73.5	18.7	35.0	59.8	62.4	87.9	17.0	32.6	55.8	61.5	118.7
13.5																14.0	25.6	44.3	46.4	68.2	17.5	33.0	56.1	58.5	81.5	15.9	30.5	52.8	58.1	110.0
14.0																13.1	24.1	41.7	43.6	63.4	16.3	31.2	52.8	54.9	75.8	14.9	28.6	50.0	55.0	102.3
14.5																					15.2	29.6	49.7	51.7	70.6	14.1	26.9	47.4	52.2	95.4
15.0																					14.2	28.0	47.0	48.8	66.0	13.3	25.4	45.0	49.6	89.1
15.5																										12.6	24.0	42.9	47.3	83.5
16.0																										11.9	22.7	40.9	45.1	78.3
16.5																														
17.0																														
17.5																														
18.0																														

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - END SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0	111.1	131.8	142.4	143.7	1446.7	146.7	174.3	188.4	190.3	1733.4	127.7	144.8	153.1	154.6	2471.8															
4.5	102.0	126.6	139.5	141.2	1143.0	134.5	167.4	184.6	187.0	1369.6	120.0	140.5	150.9	152.8	1953.0															
5.0	92.7	121.0	136.4	138.5	925.8	122.0	159.9	180.5	183.4	1109.4	111.9	136.0	148.4	150.7	1581.9	148.2	180.2	196.8	199.9	1898.3	153.0	186.4	203.7	210.7	2769.4					
5.5	83.4	115.2	133.1	135.5	765.1	109.5	152.1	176.0	179.4	916.8	103.6	131.1	145.8	148.5	1307.4	137.2	173.8	193.2	196.9	1568.8	141.5	179.7	200.0	208.3	2288.8					
6.0	74.1	109.1	129.6	132.4	642.9	97.0	143.9	171.3	175.2	770.4	95.2	126.0	142.9	146.1	1098.5	126.0	167.0	189.4	193.8	1318.2	129.9	172.6	196.1	205.7	1923.2	155.8	208.5	237.5	254.0	2978.0
6.5	65.7	102.8	125.8	129.0	547.8	84.4	135.5	166.3	170.8	656.4	86.9	120.6	139.9	143.5	936.0	114.9	159.9	185.4	190.4	1123.2	118.3	165.2	191.8	203.0	1638.7	141.6	199.3	232.3	251.3	2537.5
7.0	58.7	96.4	121.9	125.5	472.3	74.2	127.0	161.1	166.1	566.0	78.6	115.1	136.7	140.8	807.1	103.7	152.6	181.1	186.8	968.5	106.8	157.5	187.4	200.0	1412.9	127.4	189.9	226.8	248.4	2187.9
7.5	52.6	90.0	117.8	121.8	411.5	65.8	118.4	155.6	161.2	493.0	71.0	109.5	133.3	137.9	703.0	93.6	145.1	176.7	183.0	843.7	96.3	149.7	182.7	196.9	1230.8	114.6	180.3	221.0	245.4	1905.9
8.0	47.0	83.6	113.6	118.0	361.6	58.9	109.8	150.0	156.2	433.3	64.6	103.8	129.8	134.9	617.9	84.9	137.5	172.0	179.0	741.5	87.3	141.8	177.9	193.7	1081.8	102.5	170.5	215.0	242.2	1675.1
8.5	42.3	77.3	109.3	114.0	320.3	53.1	101.3	144.2	150.9	383.8	59.0	98.1	126.2	131.8	547.3	77.4	129.8	167.2	174.9	656.8	79.5	133.8	172.8	190.3	958.2	92.3	160.7	208.8	238.8	1483.8
9.0	38.3	71.0	104.9	110.0	285.7	48.1	92.3	138.3	145.6	342.4	54.2	92.4	122.4	128.6	488.2	70.1	122.1	162.2	170.7	585.9	72.0	125.9	167.6	186.7	854.7	83.6	150.9	202.4	235.3	1323.5
9.5	34.9	65.5	100.4	105.9	256.4	43.9	84.0	132.3	140.1	307.3	49.9	86.7	118.6	125.2	438.2	63.8	114.5	157.2	166.3	525.8	65.6	117.9	162.3	183.1	767.1	76.2	141.1	195.8	231.6	1187.9
10.0	31.9	60.6	95.9	101.8	231.4	40.2	76.8	126.3	134.6	277.3	46.2	81.0	114.7	121.8	395.4	58.4	107.0	152.0	161.8	474.5	60.0	110.1	156.9	179.3	692.3	69.8	131.4	189.2	227.8	1072.1
10.5	29.4	56.2	91.4	97.6	209.9	37.0	70.6	120.3	129.0	251.5	42.8	75.4	110.8	118.4	358.7	53.7	99.4	146.7	157.2	430.4	55.2	102.3	151.4	175.4	627.9	64.3	122.0	182.4	223.9	972.4
11.0	27.1	52.1	86.9	93.4	191.2	34.2	65.2	114.2	123.4	229.2	39.4	70.4	106.8	114.8	326.8	49.5	92.8	141.4	152.5	392.2	51.0	95.4	145.9	171.3	572.2	59.4	113.4	175.6	219.8	886.0
11.5	25.1	48.2	82.4	89.2	175.0	31.7	60.3	108.2	117.7	209.7	36.5	65.9	102.7	111.2	299.0	45.9	86.8	136.0	147.7	358.8	47.3	89.2	140.3	167.3	523.5	55.1	105.0	168.7	215.7	810.6
12.0	23.4	44.7	78.0	84.9	160.7	29.5	56.1	102.2	112.1	192.6	33.9	61.9	98.7	107.6	274.6	42.7	81.4	130.6	142.9	329.5	44.0	83.6	134.7	163.1	480.8	51.3	97.5	161.7	211.4	744.5
12.5	21.8	41.7	73.5	80.8	148.1	27.5	52.3	96.1	106.5	177.5	31.6	58.2	94.7	104.0	253.1	39.8	76.2	125.2	138.1	303.7	41.0	78.4	129.1	158.9	443.1	47.9	90.9	154.8	207.1	686.1
13.0	20.4	38.9	69.3	76.6	136.9	25.7	48.9	89.7	100.9	164.1	29.5	54.9	90.6	100.3	234.0	37.3	71.2	119.8	133.2	280.8	38.4	73.2	123.5	154.6	409.6	44.9	85.0	147.9	202.6	634.3
13.5	19.1	36.5	65.4	72.4	127.0	24.1	45.8	84.0	95.1	152.1	27.7	51.9	86.6	96.6	217.0	34.9	66.7	114.5	128.3	260.4	36.0	68.6	117.9	150.3	379.8	42.1	79.7	141.1	198.1	588.2
14.0	18.0	34.3	61.9	68.6	118.0	22.7	43.1	78.8	89.2	141.5	26.0	49.1	82.7	93.0	201.7	32.8	62.6	109.2	123.4	242.1	33.9	64.4	112.4	145.9	353.2	39.7	74.8	134.3	193.5	546.9
14.5	16.9	32.3	58.7	65.0	110.0	21.4	40.6	74.2	83.9	131.9	24.5	46.6	78.6	89.3	188.1	31.0	58.9	103.7	118.6	225.7	31.9	60.6	106.8	141.5	329.3	37.4	70.5	127.4	188.9	509.9
15.0	16.0	30.4	55.7	61.8	102.8	20.2	38.3	69.9	79.1	123.2	23.1	44.3	74.8	85.7	175.7	29.2	55.6	98.6	113.7	210.9	30.2	57.2	101.5	137.1	307.7	35.4	66.6	120.9	184.2	476.4
15.5	15.1	28.8	52.8	58.8	96.3	19.1	36.2	66.1	74.8	115.4	21.9	41.9	71.3	82.1	164.6	27.6	52.5	93.9	108.9	197.5	28.6	54.1	96.6	132.7	288.1	33.5	63.0	115.0	179.5	446.2
16.0	14.3	27.2	50.0	56.0	90.4	18.1	34.3	62.6	70.8	108.3	20.7	39.6	68.0	78.4	154.4	26.2	49.8	89.5	104.0	185.3	27.1	51.2	92.1	128.3	270.4	31.8	59.7	108.9	174.8	418.7
16.5	13.6	25.8	47.4	53.3	85.0	17.1	32.6	59.3	67.1	101.8	19.7	37.5	65.0	75.0	145.2	24.9	47.2	85.5	99.3	174.3	25.7	48.6	87.9	123.9	254.3	30.2	56.6	103.2	170.0	393.7
17.0	12.9	24.6	45.0	50.6	80.0	16.3	31.0	56.4	63.7	95.9	18.7	35.6	62.2	71.7	136.8	23.7	44.8	81.7	95.0	164.2	24.5	46.2	84.0	119.5	239.5	28.8	53.9	98.0	165.3	370.9
17.5						15.5	29.5	53.6	60.6	90.5	17.8	33.9	59.5	68.7	129.1	22.5	42.7	78.2	91.0	154.9	23.3	43.9	80.4	115.1	226.0	27.4	51.3	93.2	160.5	350.0
18.0						14.7	28.1	51.1	57.7	85.6	17.0	32.3	57.1	65.9	122.0	21.5	40.7	74.5	87.2	146.4	22.2	41.9	76.5	110.8	213.6	26.2	48.9	88.8	155.7	330.8

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - INTERNAL SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5	58.5	75.7	83.5	88.3	728.6	81.9	106.3	117.4	124.3	909.4	73.9	87.5	93.3	97.2	1588.8															
4.0	50.6	70.7	80.3	86.4	557.8	70.0	99.2	112.9	121.7	696.3	67.2	83.8	91.0	96.0	1216.4															
4.5	42.9	65.4	76.9	84.3	440.7	58.0	91.8	108.1	118.7	550.1	60.4	79.7	88.5	94.7	961.1	85.1	112.5	124.8	133.6	1203.0	111.9	148.5	165.0	176.8	1438.3	84.2	103.9	112.0	118.1	1942.1
5.0	36.5	60.1	73.3	82.1	357.0	48.6	84.1	102.9	115.5	445.6	53.7	75.5	85.7	93.2	778.5	75.5	106.4	121.0	131.6	974.4	97.5	140.4	159.8	174.1	1165.0	77.0	99.9	109.5	116.9	1573.1
5.5	31.0	54.7	69.5	79.7	295.0	41.5	76.4	97.5	112.1	368.2	47.0	71.0	82.9	91.6	643.4	66.1	100.2	116.9	129.4	805.3	83.8	132.0	154.4	171.2	962.8	69.9	95.6	106.8	115.6	1300.1
6.0	26.8	49.3	65.5	77.1	247.9	35.9	68.0	91.9	108.5	309.4	41.3	66.5	79.8	89.9	540.6	57.4	93.7	112.6	127.0	676.7	72.5	123.4	148.6	168.0	809.0	62.8	91.1	104.0	114.2	1092.4
6.5	23.4	44.0	61.5	74.4	211.2	31.5	59.7	86.2	104.6	263.6	36.7	61.8	76.6	88.1	460.6	50.1	87.2	108.1	124.5	576.6	63.5	114.6	142.6	164.6	689.4	55.8	86.5	101.0	112.7	930.8
7.0	20.7	39.4	57.5	71.6	182.1	28.0	52.7	80.4	100.6	227.3	32.9	57.2	73.3	86.2	397.2	44.3	80.6	103.4	121.8	497.1	56.3	105.1	136.3	161.0	594.4	50.0	81.7	97.8	111.1	802.6
7.5	18.5	35.3	53.4	68.7	158.6	25.1	46.9	74.6	96.5	198.0	29.5	52.7	70.0	84.2	346.0	39.5	74.2	98.7	118.9	433.1	50.4	95.5	130.0	157.2	517.8	45.0	76.9	94.5	109.4	699.1
8.0	16.6	31.6	49.4	65.7	139.4	22.7	42.1	68.2	92.3	174.0	26.4	48.2	66.5	82.1	304.1	35.5	67.7	93.8	116.0	380.6	45.4	86.1	123.5	153.3	455.1	40.9	72.1	91.2	107.6	614.5
8.5	15.1	28.5	45.4	62.7	123.5	20.6	38.1	61.9	87.9	154.1	23.8	44.0	63.1	80.0	269.3	32.1	61.7	88.9	112.9	337.1	41.3	77.8	117.0	149.2	403.1	37.3	67.4	87.7	105.7	544.3
9.0	13.7	25.8	41.7	59.6	110.1	18.9	34.7	56.2	83.6	137.5	21.7	40.4	59.6	77.7	240.2	29.3	56.0	84.0	109.8	300.7	37.5	70.7	110.3	145.0	359.5	34.1	62.6	84.2	103.8	485.5
9.5	12.6	23.6	38.4	56.6	98.9	17.4	31.7	51.3	79.1	123.4	19.8	37.3	56.2	75.4	215.6	26.9	51.1	79.1	106.5	269.9	34.1	64.7	102.9	140.7	322.7	31.0	57.9	80.6	101.8	435.7
10.0	11.6	21.6	35.4	53.5	89.2	16.1	29.2	47.0	74.7	111.4	18.2	34.6	52.8	73.1	194.6	24.8	46.8	74.3	103.2	243.6	31.3	59.5	95.7	136.2	291.2	28.3	53.6	77.0	99.7	393.2
10.5	10.8	20.0	32.5	50.4	80.9	15.0	27.0	43.3	69.7	101.0	16.8	32.1	49.4	70.7	176.5	22.9	43.2	69.5	99.8	220.9	28.8	54.9	88.7	131.7	264.1	26.0	49.8	73.5	97.6	356.7
11.0	10.0	18.5	30.0	47.4	73.7	13.9	25.1	40.1	64.9	92.0	15.6	29.9	46.1	68.3	160.8	21.2	39.9	64.8	96.4	201.3	26.5	50.9	82.0	127.1	240.7	24.0	46.5	69.9	95.4	325.0
11.5	9.4	17.2	27.8	44.3	67.4	12.9	23.3	37.3	60.1	84.2	14.5	27.7	43.2	65.9	147.1	19.6	37.1	60.3	93.0	184.2	24.6	47.4	76.1	122.4	220.2	22.3	43.5	66.3	93.1	297.3
12.0	8.8	16.0	25.9	41.5	61.9	12.1	21.8	34.8	55.7	77.3	13.5	25.7	40.5	63.4	135.1	18.2	34.6	56.1	89.5	169.1	22.8	44.3	70.9	117.8	202.2	20.7	40.8	62.8	90.9	273.1
12.5	8.2	15.0	24.2	39.0	57.1	11.2	20.5	32.5	51.9	71.3	12.7	24.0	38.2	60.9	124.5	17.0	32.4	52.3	86.0	155.9	21.3	41.5	66.3	113.0	186.4	19.3	38.3	59.2	88.6	251.7
13.0	7.8	14.1	22.6	36.7	52.8	10.4	19.3	30.5	48.4	65.9	11.9	22.5	36.0	58.5	115.1	15.9	30.4	49.0	82.5	144.1	19.9	39.0	62.1	107.9	172.3	18.0	36.1	55.8	86.2	232.7
13.5						9.6	18.2	28.7	45.3	61.1	11.2	21.1	34.0	56.0	106.7	14.9	28.6	46.0	79.0	133.6	18.6	36.8	58.4	102.6	159.8	16.9	34.0	52.8	83.8	215.7
14.0						8.9	17.2	27.1	42.5	56.8	10.5	19.9	32.2	53.6	99.3	14.0	26.9	43.3	75.5	124.2	17.4	34.8	55.0	97.4	148.6	15.9	31.9	50.0	81.5	200.6
14.5											9.9	18.7	30.5	51.2	92.5	13.1	25.5	40.8	72.0	115.8	16.3	32.9	52.0	92.2	138.5	14.9	30.0	47.4	79.1	187.0
15.0											9.3	17.7	28.8	48.7	86.5	12.4	24.1	38.6	68.5	108.2	15.2	31.2	49.2	87.1	129.4	14.1	28.3	45.0	76.7	174.7
15.5											8.8	16.8	27.2	46.4	81.0	11.7	22.9	36.5	65.2	101.4	14.2	29.5	46.7	82.2	121.2	13.3	26.7	42.9	74.2	163.6
16.0											8.4	15.9	25.8	44.2	76.0	11.1	21.8	34.7	62.0	95.1	13.4	27.9	44.4	77.8	113.7	12.6	25.3	40.9	71.8	153.6
16.5											7.9	15.2	24.5	42.2	71.4	10.5	20.8	33.0	58.7	89.4	12.6	26.5	42.3	73.8	106.9	12.0	24.0	39.0	69.4	144.4
17.0																9.9	19.8	31.4	55.7	84.2	11.8	25.1	40.3	70.1	100.7	11.4	22.8	37.3	67.0	136.0
17.5																9.4	18.9	30.0	53.0	79.5	11.2	23.9	38.5	66.6	95.1	10.8	21.6	35.6	64.7	128.4
18.0																8.9	18.1	28.6	50.4	75.1	10.5	22.8	36.9	63.5	89.8	10.3	20.6	34.1	62.3	121.3

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - INTERNAL SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0																														
4.5	104.9	129.5	139.5	147.1	2240.4	138.3	171.2	184.6	194.7	2684.5	122.4	142.9	150.9	157.2	3827.9															
5.0	95.9	124.4	136.4	145.6	1814.7	126.3	164.5	180.5	192.8	2174.4	114.7	138.7	148.4	156.1	3100.6															
5.5	86.9	119.1	133.1	144.0	1499.7	114.2	157.3	176.0	190.7	1797.0	106.8	134.3	145.8	154.9	2562.5															
6.0	78.0	113.5	129.6	142.3	1260.2	102.2	149.8	171.3	188.4	1510.0	98.7	129.7	142.9	153.6	2153.2	130.6	171.9	189.4	203.6	2583.8	134.7	177.7	196.1	213.7	3769.5					
6.5	69.3	107.7	125.8	140.4	1073.8	89.7	142.1	166.3	185.9	1286.6	90.6	124.8	139.9	152.2	1834.6	119.8	165.4	185.4	201.8	2201.6	123.5	171.0	191.8	212.2	3211.9					
7.0	61.9	101.8	121.9	138.4	925.8	78.8	134.2	161.1	183.3	1109.4	82.7	119.8	136.7	150.7	1581.9	109.2	158.7	181.1	199.8	1898.3	112.4	164.0	187.4	210.6	2769.4	134.3	197.9	226.8	258.8	4288.4
7.5	55.7	95.8	117.8	136.3	806.5	69.9	126.1	155.6	180.5	966.4	74.8	114.6	133.3	149.1	1378.0	98.6	151.8	176.7	197.8	1653.6	101.5	156.8	182.7	209.0	2412.4	120.9	189.0	221.0	257.1	3735.6
8.0	50.0	89.8	113.6	134.1	708.8	62.6	118.0	150.0	177.6	849.4	68.0	109.3	129.8	147.4	1211.1	89.5	144.8	172.0	195.6	1453.4	92.1	149.4	177.9	207.2	2120.3	108.9	179.9	215.0	255.4	3283.3
8.5	45.0	83.8	109.3	131.8	627.9	56.4	110.0	144.2	174.5	752.4	62.2	103.9	126.2	145.7	1072.8	81.7	137.6	167.2	193.2	1287.4	84.0	142.0	172.8	205.3	1878.2	98.0	170.7	208.8	253.6	2908.3
9.0	40.7	77.8	104.9	129.4	560.1	51.1	102.0	138.3	171.4	671.1	57.1	98.6	122.4	143.8	956.9	74.5	130.4	162.2	190.8	1148.3	76.5	134.5	167.6	203.3	1675.3	88.8	161.5	202.4	251.6	2594.2
9.5	37.1	71.9	100.4	126.9	502.6	46.6	93.6	132.3	168.1	602.3	52.7	93.2	118.6	141.9	858.9	67.8	123.2	157.2	188.3	1030.6	69.7	127.0	162.3	201.3	1503.6	80.9	152.3	195.8	249.6	2328.3
10.0	33.9	66.5	95.9	124.4	453.6	42.7	85.6	126.3	164.6	543.6	48.7	87.8	114.7	139.9	775.1	62.0	116.0	152.0	185.7	930.1	63.8	119.5	156.9	199.1	1357.0	74.1	143.1	189.2	247.5	2101.3
10.5	31.2	61.8	91.4	121.7	411.5	39.3	78.6	120.3	161.1	493.0	45.3	82.5	110.8	137.8	703.0	57.0	108.9	146.7	182.9	843.7	58.6	112.2	151.4	196.9	1230.8	68.2	134.0	182.4	245.3	1905.9
11.0	28.8	57.6	86.9	119.0	374.9	36.3	72.5	114.2	157.5	449.2	41.9	77.2	106.8	135.7	640.6	52.6	101.8	141.4	180.1	768.7	54.1	104.7	145.9	194.6	1121.5	63.1	124.9	175.6	243.0	1736.6
11.5	26.7	53.7	82.4	116.2	343.0	33.6	67.2	108.2	153.8	411.0	38.8	72.3	102.7	133.5	586.1	48.8	95.2	136.0	177.2	703.3	50.2	98.0	140.3	192.2	1026.1	58.5	116.7	168.7	240.7	1588.8
12.0	24.8	49.8	78.0	113.4	315.0	31.3	62.4	102.2	150.1	377.5	36.0	67.8	98.7	131.3	538.3	45.3	89.3	130.6	174.2	645.9	46.7	91.9	134.7	189.7	942.3	54.4	108.6	161.7	238.2	1459.2
12.5	23.2	46.4	73.5	110.5	290.3	29.2	58.2	96.1	146.2	347.9	33.6	63.9	94.7	128.9	496.1	42.3	84.0	125.2	171.2	595.3	43.5	86.4	129.1	187.2	868.4	50.8	101.2	154.8	235.7	1344.8
13.0	21.7	43.4	69.3	107.6	268.4	27.3	54.4	89.7	142.3	321.6	31.4	60.2	90.6	126.6	458.6	39.5	79.1	119.8	168.1	550.4	40.7	81.4	123.5	184.6	802.9	47.6	94.5	147.9	233.1	1243.3
13.5	20.3	40.6	65.4	104.6	248.9	25.6	51.0	84.0	138.4	298.2	29.4	57.0	86.6	124.2	425.3	37.1	74.3	114.5	164.9	510.3	38.2	76.3	117.9	181.9	744.5	44.7	88.6	141.1	230.4	1152.9
14.0	19.1	38.1	61.9	101.7	231.4	24.1	47.9	78.8	134.4	277.3	27.6	53.9	82.7	121.7	395.4	34.9	69.7	109.2	161.7	474.5	35.9	71.7	112.4	179.2	692.3	42.1	83.2	134.3	227.7	1072.1
14.5	18.0	35.9	58.7	98.7	215.7	22.7	45.1	74.2	130.4	258.5	26.0	51.2	78.6	119.3	368.6	32.9	65.6	103.7	158.4	442.4	33.9	67.4	106.8	176.4	645.4	39.7	78.4	127.4	224.9	999.4
15.0	17.0	33.8	55.7	95.7	201.6	21.4	42.6	69.9	126.4	241.6	24.6	48.6	74.8	116.7	344.5	31.0	61.9	98.6	155.0	413.4	32.0	63.6	101.5	173.5	603.1	37.5	74.0	120.9	222.0	933.9
15.5	16.1	32.0	52.8	92.6	188.8	20.3	40.3	66.1	122.4	226.2	23.2	46.3	71.3	114.2	322.6	29.3	58.5	93.9	151.7	387.1	30.3	60.1	96.6	170.7	564.8	35.5	69.9	115.0	219.1	874.6
16.0	15.2	30.3	50.0	89.6	177.2	19.2	38.1	62.6	118.4	212.3	22.0	44.1	68.0	111.6	302.7	27.8	55.3	89.5	148.3	363.3	28.7	56.9	92.1	167.7	530.0	33.7	66.3	108.9	216.1	820.8
16.5	14.4	28.7	47.4	86.6	166.6	18.2	36.2	59.3	114.3	199.6	20.9	41.8	65.0	109.1	284.7	26.4	52.5	85.5	144.8	341.6	27.3	54.0	87.9	164.8	498.4	32.0	62.9	103.2	213.1	771.8
17.0	13.7	27.3	45.0	83.6	156.9	17.3	34.4	56.4	110.3	188.1	19.8	39.7	62.2	106.5	268.2	25.1	49.9	81.7	141.4	321.8	25.9	51.3	84.0	161.8	469.5	30.5	59.8	98.0	210.0	727.0
17.5	13.1	26.0	42.8	80.6	148.1	16.4	32.7	53.6	106.3	177.5	18.9	37.7	59.5	103.8	253.1	23.9	47.5	78.2	137.9	303.7	24.7	48.8	80.4	158.7	443.1	29.1	56.9	93.2	206.9	686.1
18.0	12.4	24.8	40.7	77.7	140.0	15.7	31.2	51.1	102.3	167.7	18.0	35.9	57.1	101.2	239.2	22.8	45.2	74.5	134.4	287.0	23.6	46.5	76.5	155.7	418.8	27.7	54.3	88.8	203.7	648.5

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED END SPAN

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0	64.7	78.4	85.8	86.1	536.2	90.7	110.2	120.8	121.3	669.2	78.9	89.6	95.3	95.8	1169.1															
3.5	56.5	73.3	82.8	83.2	393.9	79.1	102.9	116.6	117.2	491.7	72.2	85.8	93.2	94.0	858.9															
4.0	48.3	67.8	79.5	80.0	301.6	66.6	95.1	111.9	112.6	376.4	65.3	81.6	90.9	91.9	657.6	92.1	115.2	128.3	129.7	823.2	121.3	152.0	169.7	171.6	984.2	89.3	105.9	114.4	115.8	1328.9
4.5	40.7	62.1	75.9	76.5	238.3	54.8	87.0	106.7	107.7	297.4	58.2	77.1	88.4	89.6	519.6	82.1	108.8	124.8	126.5	650.4	107.5	143.6	164.9	167.3	777.6	82.0	101.7	112.1	113.9	1050.0
5.0	34.4	56.3	72.1	72.8	193.0	46.0	78.8	101.3	102.4	240.9	51.3	72.4	85.7	87.1	420.9	72.3	102.2	120.9	123.0	526.8	92.9	134.7	159.8	162.6	629.9	74.6	97.2	109.6	111.8	850.5
5.5	29.3	50.5	68.1	68.9	159.5	39.3	70.0	95.6	96.8	199.1	44.7	67.6	82.8	84.4	347.8	62.8	95.3	116.8	119.2	435.4	79.4	125.5	154.3	157.6	520.5	67.2	92.5	107.0	109.5	702.9
6.0	25.3	44.8	63.9	64.9	134.0	34.1	61.0	89.7	91.1	167.3	39.3	62.7	79.7	81.5	292.2	54.2	88.4	112.5	115.2	365.8	68.8	116.2	148.5	152.2	437.4	59.9	87.6	104.2	107.1	590.6
6.5	22.1	39.7	59.7	60.8	114.2	30.0	53.3	83.7	85.2	142.5	34.9	57.8	76.5	78.6	249.0	47.4	81.4	108.0	111.0	311.7	60.4	106.3	142.5	146.6	372.7	53.1	82.6	101.2	104.5	503.2
7.0	19.6	35.3	55.5	56.6	98.4	26.7	47.0	77.6	79.2	122.9	31.2	52.9	73.2	75.5	214.7	41.9	74.5	103.3	106.6	268.8	53.6	96.0	136.2	140.7	321.3	47.5	77.6	98.0	101.8	433.9
7.5	17.5	31.4	51.3	52.4	85.7	24.0	41.9	71.1	73.0	107.0	27.8	48.1	69.8	72.3	187.0	37.5	67.6	98.5	102.1	234.1	48.0	85.9	129.8	134.7	279.9	42.8	72.5	94.8	99.0	378.0
8.0	15.8	28.1	47.1	48.3	75.4	21.7	37.6	64.4	66.3	94.1	25.0	43.7	66.4	69.0	164.4	33.7	61.1	93.7	97.5	205.8	43.3	77.1	123.4	128.5	246.0	38.8	67.4	91.4	96.0	332.2
8.5	14.3	25.4	43.0	44.2	66.7	19.8	34.1	58.0	59.8	83.3	22.6	39.9	63.0	65.7	145.6	30.6	55.1	88.8	92.8	182.3	39.0	69.7	116.8	122.2	217.9	35.4	62.4	88.0	93.0	294.3
9.0	13.1	23.0	39.4	40.5	59.5	18.2	31.0	52.5	54.1	74.3	20.5	36.7	59.5	62.4	129.9	27.9	50.0	83.9	88.0	162.6	35.4	63.4	110.1	115.8	194.4	32.1	57.4	84.5	89.9	262.5
9.5	12.1	21.1	36.1	37.2	53.4	16.8	28.4	47.8	49.2	66.7	18.8	33.8	56.0	59.1	116.5	25.6	45.7	79.0	83.3	145.9	32.3	58.1	102.7	109.1	174.4	29.3	52.9	81.0	86.8	235.6
10.0	11.1	19.3	33.0	34.0	48.2	15.6	26.2	43.7	45.0	60.2	17.3	31.3	52.6	55.7	105.2	23.5	41.9	74.1	78.5	131.7	29.5	53.4	95.5	101.9	157.4	26.8	49.0	77.4	83.6	212.6
10.5	10.3	17.8	30.3	31.2	43.7	14.5	24.2	40.1	41.3	54.6	16.0	28.9	49.2	52.4	95.4	21.6	38.7	69.2	73.8	119.4	27.2	49.4	88.4	94.9	142.8	24.6	45.5	73.8	80.3	192.8
11.0						13.5	22.5	37.0	38.1	49.7	14.8	26.7	45.9	49.2	86.9	20.0	35.8	64.6	69.1	108.8	25.1	45.8	81.7	87.9	130.1	22.7	42.4	70.3	77.0	175.7
11.5						12.4	21.0	34.3	35.2	45.5	13.8	24.7	43.0	46.0	79.5	18.5	33.3	60.1	64.5	99.5	23.2	42.7	75.8	81.4	119.0	21.0	39.7	66.7	73.8	160.7
12.0											12.9	23.0	40.4	43.1	73.0	17.2	31.1	55.9	60.1	91.4	21.6	39.9	70.6	75.6	109.3	19.5	37.2	63.2	70.5	147.6
12.5											12.1	21.5	38.0	40.6	67.3	16.0	29.1	52.1	56.0	84.2	20.1	37.4	66.0	70.4	100.7	18.2	34.9	59.6	67.3	136.0
13.0											11.3	20.1	35.8	38.2	62.2	15.0	27.3	48.8	52.3	77.9	18.7	35.2	61.8	65.8	93.1	17.0	32.7	56.2	64.0	125.8
13.5											10.6	18.9	33.9	36.1	57.7	14.0	25.7	45.7	48.9	72.2	17.5	33.2	58.1	61.6	86.4	16.0	30.6	53.2	60.8	116.6
14.0																13.2	24.2	43.0	45.9	67.2	16.3	31.4	54.7	57.9	80.3	15.0	28.7	50.3	57.6	108.4
14.5																12.4	22.9	40.6	43.2	62.6	15.2	29.7	51.6	54.5	74.9	14.1	27.0	47.8	54.7	101.1
15.0																					14.2	28.1	48.8	51.4	69.9	13.3	25.5	45.4	52.0	94.5
15.5																					13.3	26.6	46.3	48.6	65.5	12.6	24.1	43.2	49.5	88.5
16.0																					12.5	25.2	43.9	46.0	61.5	11.9	22.8	41.2	47.2	83.0
16.5																										11.3	21.6	39.3	45.0	78.1
17.0																														
17.5																														
18.0																														

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED END SPAN

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0	111.3	131.9	142.5	144.3	1533.0	146.9	174.4	188.5	191.0	1836.9	127.8	144.8	153.2	155.1	2619.3															
4.5	102.2	126.7	139.7	141.9	1211.3	134.7	167.5	184.8	187.9	1451.4	120.1	140.6	151.0	153.3	2069.6															
5.0	92.9	121.1	136.6	139.3	981.1	122.2	160.1	180.7	184.5	1175.6	112.0	136.0	148.6	151.4	1676.3															
5.5	83.6	115.3	133.3	136.5	810.8	109.7	152.2	176.3	180.8	971.6	103.8	131.2	145.9	149.2	1385.4	137.4	173.9	193.4	197.9	1662.5	141.7	179.8	200.3	209.1	2425.4					
6.0	74.3	109.2	129.8	133.5	681.3	97.2	144.1	171.6	176.8	816.4	95.4	126.1	143.1	147.0	1164.1	126.2	167.1	189.7	194.9	1396.9	130.1	172.7	196.3	206.7	2038.0					
6.5	65.9	102.9	126.1	130.3	580.5	84.6	135.7	166.6	172.6	695.6	87.1	120.7	140.1	144.5	991.9	115.1	160.0	185.7	191.7	1190.3	118.6	165.3	192.1	204.1	1736.5	141.9	199.5	232.6	252.4	2688.9
7.0	58.9	96.6	122.2	127.0	500.5	74.4	127.2	161.4	168.1	599.8	78.9	115.3	136.9	141.9	855.2	104.0	152.7	181.4	188.3	1026.3	107.1	157.7	187.7	201.3	1497.3	127.7	190.1	227.2	249.7	2318.5
7.5	52.8	90.2	118.1	123.5	436.0	66.0	118.6	156.0	163.4	522.5	71.2	109.7	133.5	139.2	745.0	93.8	145.2	177.0	184.7	894.0	96.5	149.9	183.1	198.4	1304.3	114.9	180.5	221.4	246.8	2019.7
8.0	47.2	83.8	113.9	119.8	383.2	59.1	110.0	150.4	158.6	459.2	64.7	104.0	130.1	136.4	654.8	85.2	137.7	172.4	181.0	785.8	87.6	142.0	178.2	195.3	1146.3	102.8	170.8	215.5	243.7	1775.1
8.5	42.4	77.5	109.6	116.1	339.4	53.2	101.5	144.7	153.6	406.7	59.1	98.2	126.5	133.4	580.0	77.6	130.0	167.6	177.1	696.0	79.8	134.0	173.3	192.0	1015.4	92.5	161.0	209.3	240.5	1572.4
9.0	38.4	71.2	105.3	112.2	302.8	48.3	92.6	138.8	148.5	362.8	54.3	92.5	122.8	130.3	517.4	70.3	122.3	162.7	173.0	620.8	72.2	126.1	168.1	188.7	905.7	83.9	151.1	203.0	237.2	1402.5
9.5	35.0	65.6	100.8	108.3	271.7	44.0	84.2	132.9	143.2	325.6	50.1	86.8	119.0	127.1	464.3	64.0	114.7	157.6	168.8	557.2	65.8	118.2	162.8	185.2	812.9	76.5	141.4	196.5	233.7	1258.8
10.0	32.0	60.7	96.4	104.3	245.2	40.3	77.0	126.9	137.9	293.9	46.3	81.2	115.1	123.9	419.0	58.6	107.2	152.5	164.5	502.9	60.2	110.4	157.5	181.5	733.6	70.1	131.7	189.8	230.1	1136.0
10.5	29.5	56.4	91.9	100.2	222.4	37.1	70.8	120.9	132.5	266.5	42.9	75.6	111.2	120.6	380.1	53.8	99.7	147.3	160.1	456.1	55.4	102.6	152.0	177.8	665.4	64.5	122.3	183.1	226.4	1030.4
11.0	27.2	52.2	87.4	96.1	202.7	34.3	65.3	114.9	127.1	242.9	39.6	70.6	107.2	117.2	346.3	49.7	93.0	142.0	155.6	415.6	51.1	95.6	146.5	174.0	606.3	59.6	113.7	176.3	222.5	938.9
11.5	25.2	48.3	82.9	92.1	185.4	31.8	60.5	108.9	121.6	222.2	36.6	66.1	103.2	113.7	316.8	46.1	87.0	136.6	151.0	380.2	47.4	89.4	140.9	170.1	554.7	55.3	105.3	169.4	218.5	859.0
12.0	23.5	44.9	78.5	88.0	170.3	29.6	56.2	102.9	116.1	204.1	34.0	62.0	99.2	110.2	291.0	42.8	81.5	131.3	146.4	349.2	44.1	83.8	135.4	166.1	509.5	51.5	97.8	162.6	214.5	788.9
12.5	21.9	41.8	74.0	83.9	156.9	27.6	52.4	96.8	110.7	188.1	31.7	58.4	95.2	106.7	268.2	39.9	76.4	125.9	141.7	321.8	41.1	78.6	129.8	162.1	469.5	48.1	91.1	155.7	210.3	727.0
13.0	20.5	39.0	69.8	79.9	145.1	25.8	49.0	90.5	105.3	173.9	29.6	55.1	91.2	103.2	247.9	37.4	71.4	120.5	137.0	297.5	38.5	73.4	124.2	157.9	434.1	45.0	85.2	148.8	206.1	672.2
13.5	19.2	36.6	65.9	75.8	134.5	24.2	46.0	84.7	99.8	161.2	27.8	52.0	87.2	99.6	229.9	35.0	66.9	115.2	132.3	275.9	36.1	68.7	118.7	153.8	402.5	42.3	79.9	142.0	201.8	623.3
14.0	18.0	34.4	62.4	71.8	125.1	22.8	43.2	79.5	94.1	149.9	26.1	49.3	83.2	96.1	213.8	32.9	62.8	109.9	127.5	256.5	34.0	64.6	113.2	149.6	374.3	39.8	75.0	135.2	197.4	579.6
14.5	17.0	32.3	59.2	68.1	116.6	21.4	40.7	74.8	88.5	139.7	24.6	46.7	79.2	92.5	199.3	31.0	59.1	104.5	122.8	239.1	32.0	60.8	107.6	145.3	348.9	37.5	70.7	128.3	192.9	540.3
15.0	16.0	30.5	56.2	64.7	109.0	20.2	38.4	70.5	83.4	130.6	23.2	44.4	75.4	89.0	186.2	29.3	55.7	99.4	118.1	223.5	30.3	57.3	102.2	141.1	326.0	35.5	66.7	121.9	188.5	504.9
15.5	15.2	28.8	53.3	61.6	102.0	19.1	36.3	66.7	78.8	122.3	21.9	42.0	71.8	85.5	174.4	27.7	52.7	94.6	113.4	209.3	28.6	54.2	97.3	136.8	305.3	33.6	63.1	115.9	183.9	472.8
16.0	14.4	27.3	50.4	58.7	95.8	18.1	34.4	63.1	74.6	114.8	20.8	39.7	68.5	82.0	163.7	26.3	49.9	90.2	108.7	196.4	27.2	51.3	92.8	132.5	286.5	31.9	59.8	109.8	179.3	443.7
16.5	13.6	25.9	47.8	56.0	90.0	17.2	32.7	59.8	70.7	107.9	19.7	37.6	65.4	78.4	153.9	25.0	47.3	86.1	104.0	184.7	25.8	48.7	88.6	128.2	269.4	30.3	56.8	104.1	174.8	417.2
17.0	13.0	24.6	45.4	53.3	84.8	16.3	31.0	56.8	67.2	101.6	18.7	35.7	62.6	75.0	145.0	23.7	45.0	82.3	99.4	174.0	24.5	46.3	84.6	124.0	253.8	28.8	54.0	98.9	170.1	393.1
17.5	12.3	23.4	43.1	50.7	80.0	15.5	29.6	54.1	63.9	95.9	17.8	34.0	60.0	71.9	136.8	22.6	42.8	78.8	95.2	164.2	23.4	44.1	81.0	119.7	239.5	27.5	51.4	94.0	165.5	370.9
18.0	11.8	22.3	41.1	48.3	75.7	14.8	28.2	51.5	60.9	90.7	17.0	32.4	57.5	69.0	129.3	21.5	40.8	75.1	91.3	155.2	22.3	42.0	77.2	115.5	226.4	26.3	49.1	89.6	160.9	350.6

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3.** $\phi_c N_{ex}$: Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED INTERNAL SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 150/12					DHS 150/15					DHS 200/12					DHS 200/15					DHS 200/18					DHS 250/13				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0	51.1	70.8	80.1	87.4	605.3	70.9	99.5	112.6	123.0	755.5	67.5	83.8	90.7	96.6	1319.9															
4.5	43.4	65.6	76.6	85.5	478.2	59.0	92.1	107.7	120.4	596.9	60.8	79.8	88.2	95.4	1042.8															
5.0	37.1	60.3	73.0	83.5	387.4	49.5	84.5	102.5	117.5	483.5	54.1	75.5	85.4	94.1	844.7	76.2	106.6	120.5	132.9	1057.3	98.7	140.6	159.2	175.8	1264.2	77.3	99.7	108.9	117.6	1706.9
5.5	31.5	54.9	69.1	81.3	320.1	42.3	76.9	97.1	114.5	399.6	47.5	71.1	82.4	92.7	698.1	66.8	100.3	116.3	130.9	873.8	85.1	132.2	153.6	173.2	1044.7	70.1	95.4	106.1	116.5	1410.7
6.0	27.2	49.6	65.2	79.0	269.0	36.7	68.7	91.5	111.2	335.7	41.8	66.5	79.3	91.2	586.6	58.2	93.9	111.9	128.8	734.2	73.7	123.7	147.8	170.4	877.9	63.0	90.9	103.2	115.2	1185.3
6.5	23.8	44.4	61.2	76.6	229.2	32.3	60.5	85.8	107.7	286.1	37.1	62.0	76.1	89.6	499.8	50.9	87.4	107.4	126.5	625.6	64.7	115.0	141.7	167.3	748.0	56.1	86.2	100.1	113.9	1010.0
7.0	21.1	39.7	57.1	74.0	197.6	28.7	53.4	80.0	104.1	246.7	33.2	57.4	72.8	87.9	430.9	45.0	80.9	102.7	124.1	539.4	57.4	105.7	135.4	164.1	645.0	50.2	81.5	96.8	112.5	870.8
7.5	18.9	35.7	53.1	71.4	172.1	25.8	47.6	74.2	100.3	214.9	29.9	52.8	69.4	86.1	375.4	40.1	74.5	97.9	121.6	469.9	51.4	96.2	129.0	160.7	561.8	45.2	76.7	93.4	110.9	758.6
8.0	17.0	31.9	49.1	68.6	151.3	23.4	42.8	67.8	96.4	188.8	26.8	48.3	65.9	84.2	329.9	36.1	68.1	93.0	118.9	413.0	46.1	86.9	122.5	157.2	493.8	41.0	71.8	89.9	109.3	666.7
8.5	15.4	28.8	45.1	65.9	134.0	21.3	38.8	61.6	92.5	167.3	24.2	44.2	62.4	82.2	292.2	32.8	62.2	88.1	116.1	365.8	41.5	78.6	115.9	153.5	437.4	37.4	67.0	86.4	107.7	590.6
9.0	14.1	26.2	41.4	63.0	119.5	19.6	35.4	55.9	88.4	149.2	22.0	40.6	58.9	80.2	260.7	29.9	56.4	83.1	113.3	326.3	37.7	71.5	109.1	149.7	390.1	34.3	62.3	82.8	105.9	526.8
9.5	13.0	23.9	38.2	60.2	107.3	18.1	32.4	51.1	84.3	133.9	20.1	37.5	55.5	78.1	234.0	27.3	51.5	78.2	110.3	292.9	34.3	65.5	101.8	145.7	350.1	31.2	57.6	79.1	104.1	472.8
10.0	12.0	22.0	35.1	57.3	96.8	16.8	29.9	47.0	80.2	120.8	18.5	34.8	52.1	76.0	211.1	25.0	47.3	73.4	107.3	264.3	31.4	60.3	94.6	141.7	316.0	28.5	53.3	75.4	102.3	426.7
10.5	11.1	20.3	32.3	54.4	87.8	15.6	27.7	43.4	76.0	109.6	17.1	32.3	48.6	73.8	191.5	23.0	43.6	68.5	104.2	239.7	28.9	55.7	87.6	137.5	286.6	26.2	49.5	71.7	100.3	387.0
11.0	10.4	18.8	29.9	51.5	80.0	14.6	25.7	40.2	71.5	99.9	15.9	30.1	45.4	71.6	174.5	21.3	40.4	64.0	101.1	218.4	26.7	51.8	81.1	133.3	261.1	24.2	46.2	68.1	98.3	352.6
11.5	9.7	17.5	27.7	48.7	73.2	13.3	24.0	37.4	66.9	91.4	14.8	27.9	42.5	69.3	159.6	19.7	37.6	59.5	97.9	199.8	24.7	48.3	75.4	129.0	238.9	22.4	43.2	64.4	96.3	322.6
12.0	9.1	16.4	25.8	45.8	67.2	12.2	22.5	34.9	62.3	83.9	13.8	26.0	40.0	67.0	146.6	18.3	35.1	55.4	94.6	183.5	23.0	45.1	70.3	124.7	219.4	20.8	40.5	60.9	94.2	296.3
12.5	8.6	15.3	24.1	43.0	61.9	11.3	21.2	32.7	58.0	77.3	12.8	24.3	37.6	64.7	135.1	17.1	32.8	51.7	91.4	169.1	21.4	42.3	65.8	120.3	202.2	19.4	38.1	57.2	92.1	273.1
13.0	8.1	14.4	22.6	40.5	57.3	10.4	19.9	30.8	54.2	71.5	12.0	22.7	35.5	62.4	124.9	16.0	30.8	48.4	88.1	156.4	20.0	39.6	61.7	115.9	187.0	18.1	35.9	54.0	90.0	252.5
13.5	7.7	13.6	21.3	38.2	53.1	9.7	18.8	29.0	50.7	66.3	11.3	21.3	33.6	60.1	115.8	15.0	29.0	45.5	84.8	145.0	18.7	37.1	58.1	111.5	173.4	17.0	33.7	51.0	87.8	234.1
14.0	7.3	12.8	20.0	36.0	49.4	9.0	17.9	27.4	47.6	61.6	10.6	20.1	31.8	57.8	107.7	14.0	27.4	42.8	81.5	134.8	17.5	34.9	54.8	106.4	161.2	16.0	31.7	48.3	85.6	217.7
14.5						8.4	17.0	25.9	44.7	57.4	10.0	19.0	30.1	55.5	100.4	13.2	25.9	40.4	78.2	125.7	16.4	32.8	51.8	101.5	150.3	15.0	29.8	45.8	83.3	202.9
15.0						7.8	16.1	24.6	42.2	53.7	9.4	18.0	28.4	53.2	93.8	12.5	24.6	38.3	75.0	117.4	15.3	31.0	49.2	96.6	140.4	14.2	28.1	43.5	81.1	189.6
15.5											8.9	17.0	26.9	51.0	87.9	11.8	23.3	36.3	71.7	110.0	14.3	29.3	46.6	91.8	131.5	13.4	26.5	41.4	78.9	177.6
16.0											8.4	16.2	25.5	48.7	82.4	11.1	22.1	34.5	68.4	103.2	13.4	27.7	44.1	86.9	123.4	12.7	25.1	39.5	76.6	166.6
16.5											8.0	15.4	24.2	46.5	77.5	10.5	21.0	32.8	65.3	97.0	12.6	26.3	41.8	82.4	116.0	12.1	23.8	37.7	74.3	156.7
17.0											7.6	14.7	23.0	44.5	73.0	10.0	19.9	31.3	62.3	91.4	11.9	25.0	39.8	78.2	109.3	11.5	22.6	36.0	72.1	147.6
17.5											7.2	14.0	22.0	42.6	68.9	9.5	18.9	29.9	59.2	86.3	11.2	23.8	37.8	74.4	103.2	10.9	21.5	34.4	69.8	139.3
18.0																8.9	18.0	28.6	56.4	81.5	10.6	22.6	36.1	70.9	97.5	10.4	20.5	32.8	67.6	131.7

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM LOAD SPAN TABLES - LAPPED INTERNAL SPANS

Axial Compression Capacities (kN) $\phi_c N_c$

	DHS 250/15					DHS 250/18					DHS 300/15					DHS 300/18					DHS 350/18					DHS 400/20				
Span (m)	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$	1B	2B	3B	FR	$\phi_c N_{ex}$
3.0																														
3.5																														
4.0																														
4.5																														
5.0																														
5.5	87.2	118.8	132.2	145.1	1627.3	114.6	157.0	174.9	192.1	1949.9	107.0	134.1	145.1	155.7	2780.4															
6.0	78.3	113.2	128.6	143.6	1367.4	102.6	149.5	170.0	190.1	1638.5	99.0	129.5	142.1	154.5	2336.3															
6.5	69.6	107.4	124.7	141.9	1165.1	90.2	141.7	164.8	187.9	1396.1	91.0	124.6	138.9	153.3	1990.7															
7.0	62.2	101.4	120.6	140.2	1004.6	79.2	133.7	159.3	185.6	1203.8	83.0	119.5	135.6	152.0	1716.5	109.6	158.3	179.8	201.5	2059.8	112.9	163.6	185.9	212.0	3005.0					
7.5	56.0	95.4	116.4	138.3	875.1	70.3	125.6	153.7	183.1	1048.6	75.1	114.3	132.1	150.6	1495.2	99.1	151.4	175.1	199.7	1794.3	101.9	156.3	181.1	210.5	2617.7					
8.0	50.2	89.4	112.0	136.3	769.1	62.9	117.5	147.9	180.5	921.6	68.3	109.0	128.5	149.1	1314.2	89.9	144.3	170.3	197.7	1577.0	92.5	148.9	176.1	208.9	2300.7	109.5	179.3	212.8	257.1	3562.6
8.5	45.2	83.4	107.6	134.3	681.3	56.7	109.4	141.9	177.8	816.4	62.4	103.6	124.7	147.5	1164.1	82.1	137.1	165.3	195.7	1396.9	84.4	141.5	170.8	207.3	2038.0	98.5	170.1	206.3	255.5	3155.8
9.0	40.9	77.4	103.1	132.1	607.7	51.4	101.4	135.9	174.9	728.2	57.3	98.2	120.9	145.9	1038.3	74.9	129.9	160.2	193.5	1246.0	77.0	133.9	165.5	205.5	1817.8	89.3	160.8	199.7	253.8	2814.9
9.5	37.3	71.4	98.5	129.9	545.4	46.8	93.0	129.8	171.9	653.5	52.9	92.8	116.9	144.2	931.9	68.1	122.7	154.9	191.2	1118.3	70.1	126.4	160.0	203.7	1631.5	81.4	151.6	193.0	252.0	2526.3
10.0	34.1	66.1	93.9	127.5	492.2	42.9	85.0	123.6	168.8	589.8	49.0	87.4	112.9	142.4	841.1	62.4	115.5	149.6	188.9	1009.3	64.1	118.9	154.5	201.8	1472.4	74.5	142.3	186.1	250.1	2280.0
10.5	31.4	61.4	89.3	125.1	446.5	39.5	78.1	117.4	165.7	535.0	45.5	82.1	108.9	140.5	762.9	57.3	108.3	144.2	186.4	915.4	58.9	111.5	148.8	199.8	1335.5	68.6	133.2	179.2	248.2	2068.0
11.0	29.0	57.2	84.7	122.7	406.8	36.5	72.0	111.2	162.4	487.4	42.1	76.7	104.8	138.6	695.1	52.9	101.1	138.7	183.9	834.1	54.4	104.1	143.1	197.7	1216.9	63.4	124.1	172.1	246.1	1884.3
11.5	26.8	53.3	80.1	120.1	372.2	33.8	66.7	105.0	159.0	446.0	39.0	71.8	100.6	136.6	635.9	49.0	94.6	133.2	181.3	763.1	50.4	97.4	137.4	195.5	1113.4	58.8	116.0	165.1	244.0	1724.0
12.0	25.0	49.5	75.6	117.6	341.8	31.5	62.0	98.9	155.6	409.6	36.2	67.4	96.5	134.6	584.0	45.6	88.8	127.7	178.6	700.9	46.9	91.3	131.6	193.3	1022.5	54.7	107.8	158.0	241.8	1583.3
12.5	23.3	46.1	71.1	114.9	315.0	29.4	57.8	92.4	152.1	377.5	33.8	63.5	92.4	132.5	538.3	42.5	83.5	122.2	175.9	645.9	43.8	85.8	125.9	191.0	942.3	51.1	100.5	150.9	239.6	1459.2
13.0	21.8	43.1	67.0	112.2	291.2	27.5	54.0	86.3	148.5	349.0	31.6	59.9	88.3	130.4	497.6	39.8	78.7	116.7	173.0	597.2	40.9	80.9	120.2	188.7	871.2	47.8	93.9	143.9	237.2	1349.1
13.5	20.4	40.3	63.3	109.5	270.1	25.8	50.6	80.8	144.9	323.6	29.6	56.6	84.2	128.2	461.5	37.3	73.8	111.2	170.2	553.8	38.4	75.8	114.5	186.3	807.9	44.9	88.0	136.9	234.8	1251.0
14.0	19.2	37.9	59.9	106.8	251.1	24.2	47.6	75.8	141.3	300.9	27.8	53.6	80.1	125.9	429.1	35.0	69.2	105.7	167.2	514.9	36.1	71.2	108.8	183.8	751.2	42.3	82.7	129.8	232.4	1163.3
14.5	18.1	35.6	56.7	104.0	234.1	22.8	44.8	71.3	137.6	280.5	26.2	50.9	76.1	123.7	400.0	33.0	65.1	100.3	164.2	480.0	34.1	67.0	103.2	181.3	700.3	39.9	77.8	123.1	229.9	1084.4
15.0	17.1	33.6	53.8	101.2	218.7	21.5	42.3	67.3	133.8	262.1	24.7	48.3	72.4	121.4	373.8	31.2	61.4	95.4	161.2	448.5	32.2	63.2	98.1	178.7	654.4	37.7	73.4	116.9	227.3	1013.3
15.5	16.1	31.8	50.8	98.4	204.9	20.4	40.0	63.6	130.1	245.5	23.3	46.0	68.9	119.0	350.0	29.5	58.1	90.8	158.1	420.1	30.4	59.7	93.4	176.1	612.8	35.7	69.5	110.7	224.7	949.0
16.0	15.3	30.1	48.1	95.6	192.2	19.3	37.9	60.2	126.3	230.4	22.1	43.8	65.8	116.7	328.5	28.0	55.0	86.6	155.0	394.2	28.9	56.5	89.0	173.5	575.1	33.9	65.8	104.7	222.0	890.6
16.5	14.5	28.5	45.6	92.8	180.8	18.3	35.9	57.1	122.5	216.6	21.0	41.5	62.8	114.3	308.9	26.5	52.1	82.6	151.8	370.7	27.4	53.6	85.0	170.8	540.8	32.2	62.5	99.3	219.2	837.4
17.0	13.8	27.1	43.2	89.9	170.3	17.4	34.2	54.2	118.8	204.1	19.9	39.4	60.1	111.9	291.0	25.2	49.5	79.0	148.6	349.2	26.1	51.0	81.2	168.0	509.5	30.6	59.4	94.3	216.4	788.9
17.5	13.1	25.8	41.1	87.1	160.7	16.5	32.5	51.6	115.0	192.6	19.0	37.5	57.6	109.5	274.6	24.0	47.1	75.2	145.4	329.5	24.8	48.5	77.3	165.2	480.8	29.2	56.6	89.7	213.6	744.5
18.0	12.5	24.6	39.2	84.3	151.9	15.8	31.0	49.2	111.2	182.0	18.1	35.7	55.2	107.0	259.5	22.9	44.9	71.6	142.2	311.5	23.7	46.2	73.6	162.4	454.4	27.9	53.9	85.5	210.7	703.7

1. 1B, 2B & 3B: Load Capacity for 1, 2 and 3 rows of bracing. **2. FR:** Load Capacity for fully restrained compression flange. **3. $\phi_c N_{ex}$:** Elastic buckling capacity about the X-X axis.

DHS PURLIN SYSTEM DESIGN EXAMPLES

EXAMPLE: SINGLE SPAN AND LAPPED SPAN

Loadings

Dead Load, G = 0.12kPa Live Load, Q = 0.25kPa Snow Load, S_u = 0.50kPa

Outward Limit State Wind Loads, W_u = – 0.95kPa and W_s = – 0.66kPa

Inward Wind Loading is not significant for this roof.

Building Constraints

Portal Spacing, L_P = 7.5m Rafter Length, L_R = 16.0m (distance from eaves purlin to ridge purlin)

Roof Pitch = 10 degrees Roofing Profile = BB900 x 0.55mm BMT

Critical Design Load Combinations for the Ultimate Limit State (from AS/NZS 1170)

i) $W^*_{ULS}\downarrow$ = 1.2G + 1.5Q = (1.2 x 0.12) + (1.5 x 0.25) = 0.52kPa

ii) $W^*_{ULS}\downarrow$ = 1.2G + S_u + ψ_lQ = 1.2 x 0.12 + 0.50 + (0.0 x 0.25) = 0.64kPa

iii) $W^*_{ULS}\uparrow$ = 0.9G + W_u = (0.9 x 0.12) + (–0.95) = –0.84kPa

Critical Design Load Combinations for the Serviceability Limit State

i) $W^*_{SLS}\downarrow$ = L_P/300 under G & ψ_lQ = (0.12 + 0.0 x 0.25) x 300/150 = 0.24kPa

ii) $W^*_{SLS}\uparrow$ = L_P/150 under W_s = – 0.66 = –0.66kPa

For i) we have converted the load by a factor of 300/150 in order to compare the load directly with W_s in the DHS load span tables as these are based on span/150.

Optimise Roofing Profile Spans

In this case we have a restricted access roof where the point load requirement limits the intermediate span of the BB900 x 0.55mm BMT profile to 3.0m. End spanning capability of the roofing is reduced to 2.0m, i.e. two thirds of the intermediate span. Generally these spans will not 'fit' the rafter length exactly, hence the requirement to optimise.

The optimised roofing profile intermediate span is based on the rafter length and the number of purlins, NP (assuming at least four) and is given by the term: $PS_i = L_R \,/\, [NP - 1.66]$ where PS_i is the Internal purlin spacing and purlins at each end are two thirds of PS_i.

Try 6 Purlins, $PS_i = 16.0/(6 - 1.66)$ = 3.69m No good

Try 8 Purlins, $PS_i = 16.0/(8 - 1.66)$ = 2.52m Not controlling

Try 7 Purlins, $PS_i = 16.0/(7 - 1.66)$ = 3.0m Intermediate spans and 2.0m edge spans

From this, 7 purlins are required and the purlin spacings may be rationalised to 3.0m intermediate spans and 2.0m spans at the sheet ends.

1. Single Span Purlin Design

Assuming the top flange of the DHS purlin is restrained by screw-fastened roof sheeting. (If the top flange is not fully restrained then use the load capacity for the 1, 2 or 3 brace case as appropriate to check both uplift and gravity combinations.)

Try DHS 250/18 Purlin

Check design capacities (using those given in the single span DHS load span tables): $W^*_{ULS} \le \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 3.0 x 0.64 = 1.92kN/m < FR, 3.01kN/m ∴ O.K.

$W^*_{ULS}\uparrow$ = 3.0 x –0.84 = –2.52kN/m < 2 Braces, 3.01kN/m ∴ O.K.

Check deflections

$W^*_{SLS}\uparrow$ = 3.0 x –0.66 = –1.98kN/m < Ws, 1.94kN/m ∴ O.K.

Therefore use DHS 250/18 purlins at 2.9m intermediate spacings and 2.0m at sheet ends, with 2 rows of Fastbrace (or standard bolted DB89/12 braces) brace channels per bay.

2. Lapped Span Purlin Design

a) End Bays

Try DHS 200/18 Purlin

Check design capacities (using those given in the lapped end span DHS load span tables):

$W^*_{ULS} \leq \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 3.0 x 0.64 = 1.92kN/m < FR, 2.76kN/m ∴ O.K.

$W^*_{ULS}\uparrow$ = 3.0 x −0.84 = −2.52kN/m < 1 Brace, 2.76kN/m ∴ O.K.

Check deflections

$W^*_{SLS}\uparrow$ = 3.0 x 0.66 = −1.98kN/m < Ws, 2.68kN/m ∴ O.K.

b) Internal Bays

Try DHS 200/15 Purlin

Check design capacities (using those given in the lapped internal span DHS load span tables):

$W^*_{ULS} \leq \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 3.0 x 0.64 = 1.92kN/m < FR, 3.49kN/m ∴ O.K.

$W^*_{ULS}\uparrow$ = 3.0 x −0.84 = −2.52kN/m < 1 Brace, 3.49kN/m ∴ O.K.

Check deflections

$W^*_{SLS}\uparrow$ = 3.0 x 0.66 = −1.98kN/m < Ws, 4.84kN/m ∴ O.K.

Therefore use,

End Bays: DHS 200/18 purlins at 3.0m intermediate spacings and 2.0m at sheet ends, with 1 row of Fastbrace (or standard bolted DB89/12 braces) brace channels per bay.

Internal Bays: DHS 200/15 as per the end bay purlin spacings and bracing layout.

In the calculation of wall elements, optimisation follows the same logic as illustrated for roofing with the exception that foot traffic limitations do not apply, leaving the spanning ability of the cladding dependent on face loads caused by wind.

EXAMPLE: DEFLECTION

a) The W_S loading for a DHS 250/18 purlin on a 9.0m single span is 1.13kN/m. It is desired to limit the DHS purlin deflection to span/200. Therefore the serviceable load in the DHS purlin at a deflection of span/200 is expressed as:

$$\frac{1.13 \times 150}{200} = 0.85\text{kN/m}$$

b) The design Linear Load for deflection of a DHS 250/18 on a 9.0m single span has been calculated as 0.94 kN/m.

The relative deflection is shown as, $\dfrac{0.94 \times \text{span}}{1.13 \times 150} = \dfrac{\text{span}}{180}$

The actual deflection is then, $\dfrac{\text{span}}{180} = \dfrac{9000\text{mm}}{180} = 50\text{mm}$

EXAMPLE: COMBINED BENDING AND COMPRESSION

There are three equations governing the design for combined bending and compression. Assuming there is no minor axis component for flexure, where $N^*/\phi_c N_c \leq 0.15$.

Using the purlin example, option 2 for a DHS 200/18 on a 7.5m lapped end span with 1 brace, the DHS purlin is required to resist a 4.0kN axial load (resulting from wind on the end wall) in addition to the $W^*_{ULS\uparrow}$ load combination. The remaining axial capacity is checked given the known flexural loads:

W_x^* = 2.52kN/m (Design uniformly distributed bending load; $W^*_{ULS\uparrow}$)

$\phi_b W_{bx}$ = 2.76kN/m (Uniformly loaded bending capacity from load span tables)

N^* = 4kN (Design axial compressive load as calculated)

$\phi_c N_c$ = 48.08kN (Axial compression capacity from load/span tables)

Solving for N*,

$$N^* = \left(1 - \frac{W_x^*}{\phi_b W_{bx}}\right)\phi_c N_c$$ (solving Equation 1 from Combined Bending and Compression Design in Section 2.3.2)

$$= \left(1 - \frac{2.52}{2.76}\right) 48.08 = 4.18\text{kN} > 4.0\text{kN} \ \therefore \text{O.K.}$$

Check $N^*/\phi_c N_c \leq 0.15$ for the above formula to remain valid: 5.57/48.08 = 0.12 $\therefore$ O.K.

If the above formula is not valid, i.e. $N^*/\phi_c N_c > 0.15$, then N* needs to be solved to satisfy whichever of the following equations gives the lowest N* value.

$$\frac{N^*}{\phi_c N_c} + \frac{C_{mx} W_x^*}{\phi_b W_{bx} \alpha_{nx}} \leq 1.0$$ (solving Equation 2 from Combined Bending and Compression Design in Section 2.3.2)

$$N^* = \left(1 - \frac{W_x^*}{\phi_b W_{bx}}\right)\phi_c N_s$$ (solving Equation 3 from Combined Bending and Compression Design in Section 2.3.2)

EXAMPLE: BOLT SIZING

Taking the previous purlin example option 1 where we have a single span DHS 250/18 purlin spaced at 3.0m apart, with 2 rows of bracing.

Critical load combination (ULS) = 0.84kPa

This converts to design shear force at the supports, V* = 0.84 x 3.0 x 7.5/2 = 9.45kN per end connection.

As there are 2 bolts at each end V* = 9.45/2 = 4.73kN per bolt (from Connection Design in Section 2.3.2 for 1.75mm thickness).

Try 12mm diameter bolts

End tearing	ϕV_f	=	19.2kN per bolt
Bearing	ϕV_b	=	18.1kN per bolt
Bolt shear	ϕV_{fn}	=	15.1kN per Grade 4.6 bolt > 4.73kN ∴ O.K.

EXAMPLE: BRACING SYSTEM

Consider a design case with purlin span 10m.

Ultimate uplift design load 1kPa.

Desired purlin spacing 3.6m on internal spans.

Proposed purlin design

DHS 300/18 on internal lapped spans. 1 row bracing using Fastbrace.

Design load = 1kPa x 3.6m = 3.6kN/m

This is less than $\phi_b W_{bx}$ = 3.85kN/m from DHS load span tables. ∴ O.K.

Check brace capacity

From Bracing System Design Method in Section 2.3.2.

Check bending moment on the brace channel.

M* = 0.75 $\phi_b W_{bx}$ l_b m, assuming screw fixings of the roof sheets will restrain the top flange, where $\phi_b W_{bx}$ is the purlin capacity. (Note: The designer may choose to use the design load instead of $\phi_b W_{bx}$, although it is recommended that brace strength is designed to match the purlin capacity.)

In this example, use $\phi_b W_{bx}$ = 3.85kN/m.

l_b = 10 x 0.5m (contributing length factor table)

m = 42.6mm (distance from shear centre to mid plane table)

Therefore, M* = 0.75 x 3.85 x 5 x 0.0426

= 0.61kNm

Brace Member Moment Capacity (from Bracing System Design Method in Section 2.3.2)

M_b = 0.45kN/m < 0.61 kN/m No Good.

Therefore either reduce purlin spacing or use 2 rows bracing.

Check for 2 rows bracing

l_b = 10 x 0.31 (contributing length factor table)

M* = 0.75 x 3.85 x 3.1 x 0.0426 = 0.38kN/m < 0.45kNm. ∴ O.K.

Therefore use 2 rows bracing for DHS 300/18 purlins on lapped internal spans of 10m, with purlins spaced at 3.6m centres.

DHS PURLIN SYSTEM MATERIAL SPECIFICATION

Dimond Structural DHS Purlins are manufactured by roll forming galvanised steel coil produced to AS 1397.

	Base Metal Thickness BMT (mm)	Steel Grade, G	Yield Strength f_y (MPa)	Zinc Weight, Z (g/m^2)
DHS Purlins and Girts	< 1.5	G500	500	275
	> 1.5	G450	450	275
Brace Channel	1.15	G250	250	450
End Cleats	2.00	G250	250	450

Z450 galvanised zinc coil can be supplied with order lead times of up 12 weeks. Contact Dimond Structural on 0800 Dimond (0800 346 663).

Tolerances

Length:	DHS Purlins	±6mm	Bracing System	±2mm
Depth/Width:	DHS Purlins	±2mm	Bracing System	±1mm
Holes Centres:	±1.5mm			
Web/Flange Angle:	89-93 degrees			

DHS PURLIN SYSTEM SHORT FORM SPECIFICATION

The purlin system will be Dimond Structural DHS **(1)**, manufactured from G450-G500 grade steel with a **(2)** g/m^2 galvanised zinc weight.

The sizes, lengths, span configuration and lap lengths (where required) are as detailed on the drawings.

All hole sizes, hole shapes and positions are as shown on the drawings.

The bracing system is to be **(3)**. The bracing channel size is 89mm x 34mm x 1.15mm BMT with a 450g/m^2 galvanised zinc weight.

All bolts to be Grade **(4)**, **(5)** diameter, **(6)** finish.

(1) Choose from: 150/12, 150/15, 200/12, 200/15, 200/18, 250/13, 250/15, 250/18, 300/15, 300/18, 350/18, 400/20

(2) Choose from: 275 or 450

(3) Choose from: Fastbrace (DHS 150 - 300 only) or Bolted Brace Channel (DHS 150 - 400)

(4) Choose from: 4.6 or 8.8

(5) Choose from: 12mm or 16mm

(6) Choose from: Electro galvanised or Hot Dip galvanised.

DHS PURLIN SYSTEM COMPONENTS

FASTBRACE

Fastbrace is a lock-in bracing system which runs in continuous lines between all purlins/girts and uses cleats with specially shaped lock-in tabs attached to each end of 89mm x 1.15mm (89/12) brace channel, suitable for use with DHS purlins from DHS 150/12 up to DHS 300/18. Fastbrace is fitted each side of the DHS purlin through pre-punched 18mm diameter round bracing holes, locking together to lower erection time. When a line of Fastbrace has been installed, the system provides resistance to restrict lateral movement of the DHS purlin system.

The end brace at the first and last bracing position is secured using the standard bolted connection on the outermost cleat end. To ensure straight alignment of the bracing system, the bracing holes can be offset from the bracing line by 25mm over the last purlin spacing to accommodate the bolted cleat. If not, an angle of approximately two degrees from a straight alignment on the end braces is created.

Cranked Sag Rods are used in the lower bolt position to tie the bracing lines each side of the rafter together at the ridge (or at a step in the roof).

Where back to back DHS purlins are used, bolted end brace components are required each side, where the bolts can accommodate the extra purlin thickness, spacer cleats etc.

For use, handling and maintenance guidelines, refer Environments 2.1.3, Handling And Storage 2.5.2 and Maintenance 2.1.6.

FASTBRACE COMPONENTS

Standard Brace

This is the standard Fastbrace component used almost everywhere in the system. It locks into other standard brace components, adjustable brace components, or end brace components.

End Brace

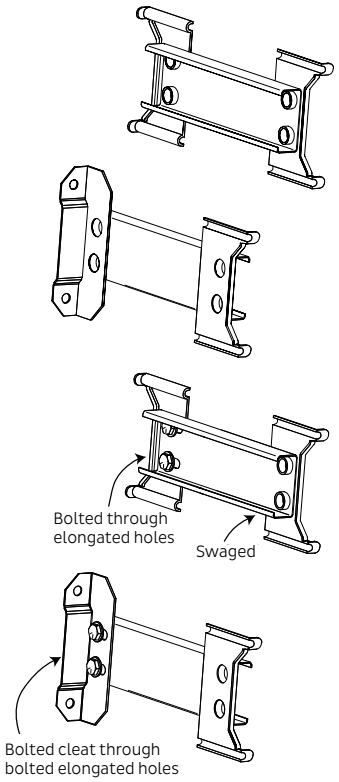
End brace is used at the end of a purlin bracing line, i.e. eaves or ridge, each side of a roof step, or at top and bottom girts on a wall. The end brace locks into either standard or adjustable brace at one end and is fitted between the DHS purlin lips and bolted into position at the other end.

Adjustable Brace

This is the adjustable component in the Fastbrace system and is used where some level of adjustment on the purlin line is required. The purlin is adjusted into line and the hexagonal flange bolts on the brace tightened. The adjustable brace offers up to 20mm of adjustment.

Adjustable End Brace

Where the end purlin spacing is less than 800mm, an adjustable end brace with a bolted end cleat is available, as twisting of the end cleat is not practical. The adjustable cleat can be rotated up to 15 degrees from normal, to accommodate the change in angle from vertical portal to the roof slope of the rafter.



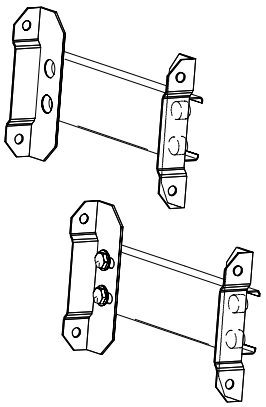
BOLTED BRACE CHANNEL

Bolted Brace Channel is a bolted bracing system running in continuous lines between all purlins/girts and uses cleats clinched to each end of 89mm x 1.15mm (89/12) bracing channel, fastened with bolts through the DHS purlins (two bolts each end). Bolted Brace Channel is suitable for use on all DHS Purlin sizes.

Cranked Sag Rods are used in the lower bolt position to tie the bracing lines each side of the rafter together at the ridge (or at a step in the roof).

For use, handling and maintenance guidelines, refer Environments 2.1.3, Handling And Storage 2.5.2 and Maintenance 2.1.6.

BOLTED BRACE CHANNEL COMPONENTS



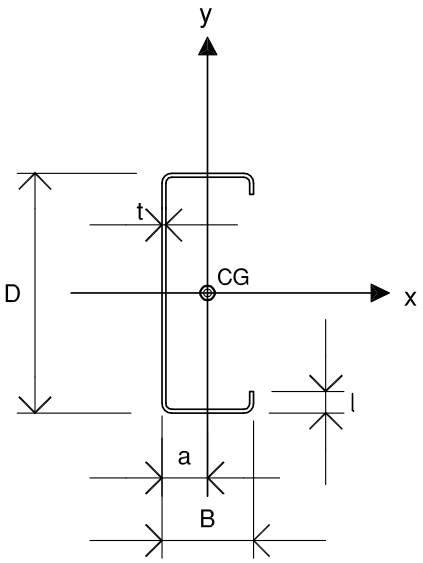
Bolted Brace Channel

This is the standard component used in the bolted brace channel system and is used almost everywhere.

Adjustable Bolted Brace Channel

This is the adjustable component in the bolted brace channel system and is used where some level of adjustment on the purlin line is required. The purlin is adjusted into line and the hexagonal flange bolts on the brace tightened. The adjustable brace offers up to 20mm of adjustment.

BRACE CHANNEL SECTION PROPERTIES



Tabulated properties are based on full unreduced sections.

Code	D x B (mm)	t (mm)	Mass (kg/m)	Weight (kN/m)	Area (mm^2)	l (mm)	a (mm)	I_x (10^6 mm^4)	I_y (10^6 mm^4)	Z_x (10^3 mm^3)	Column Properties	
											J (mm^4)	I_w (10^9 mm^6)
DB 89/12	89 x 34	1.15	1.52	0.015	186.3	6	9.17	0.223	0.024	5.00	84.13	0.040

Note: Mass assumes a total coated weight for the zinc coating of 450g/m^2

C100/19 PURLIN

Dimond Structural can supply a C100/19 Cee section (100mm x 50mm x 1.85mm BMT) for economy as a small section purlin or girt. Any limitation placed on the design and use of the Dimond Structural Purlin Systems as detailed in this manual also apply to the C100/19 Purlin. C100/19 purlins are typically braced with Sag Rods.

Design information for the C100/19 purlin can be provided by contacting Dimond Structural on 0800 Roofspec (0800 766 377).

PORTAL CLEATS

Portal Cleats are supplied by the fabricator or installer and welded on to the portal frame. Cleat thicknesses generally range from 6mm to 12mm thickness. The hole centres are laid out to suit hole punchings in the DHS purlin, refer CAD Details on-line (**www.dimondstructural.co.nz/products/dhs-purlins**). The cleat height may need to be increased where an expansion step in the roof is detailed.

GENERAL PURPOSE BRACKET

General Purpose Brackets are supplied by Dimond Structural and are typically used to connect trimmer purlins etc. General purpose brackets are not load rated and are suitable for application only in non-structural elements. Holes and cleat dimensions are set-out to suit use with the DHS Purlin System only, refer CAD Details on-line (**www.dimondstructural.co.nz/products/dhs-purlins**).

SAG RODS

Purpose-made cranked sag rods are installed at each bracing line in the lower holes on the DHS ridge purlins to tie the bracing lines on each side of the rafter together at the ridge. Sag Rods are fully tightened up upon installing purlin bracing.

Supplied by steel erectors and fabricators in 12mm diameter engineering round bar Grade 250MPa, galvanised or electroplated finishes, with double nuts and washers each end. Where loads require, 16mm diameter engineering round bar can be used.

TIMBER BATTENS

Where Timber Battens are to be fastened to the DHS Purlin System, Dimond Structural recommend using an ex 50mm x 50mm timber batten or a depth of batten to account for insulation and ventilation requirements, gauged two sides and treated to H3.1 timber preservation such as boric or LOSP (low organic solvent preservative). Avoid the use of CCA treated timber, as chemicals used in the CCA treatment (e.g. copper and chromium) could contact the galvanised purlin surface and the fasteners, causing dissimilar metal corrosion.

The batten is fixed onto the top flange of the DHS Purlins, once the netting or safety mesh has been laid on the structure. For ex 50mm x 50mm battens, fixings are to be 10g – 16 x 75mm Countersunk Rib Head Wingteks. The coating finish is a zinc plated AS 3566 class 2 finish. Longer, other types of fixings may need to be considered when the timber depth is greater.

Spacing of the Wingteks is dependent on the DHS material thickness it is being fixed into. To achieve a maximum outward load of 5.0kN/m on the Timber Batten, refer to faster centres in the following table.

DHS Purlin Base Metal Thickness (mm)	Maximum Fastener Centres (mm)
1.15	250
1.25 to 2.0	300

DHS PURLIN SYSTEM CAD DETAILS

For the latest DHS Purlin System CAD details, please download from the Dimond Structural website **www.dimondstructural.co.nz/products/dhs-purlins**

Please note, the DHS Purlin System CAD details are to be used as a guide only and are not intended for construction. Specific design details are required to be provided by the design engineer.

SPECIFIC DESIGN – TOP NOTCH PURLIN SYSTEM

DESIGN BASIS

Dimond Structural Top Notch Purlin Systems have been designed to comply with AS/NZS 4600:1996. Appropriate design limit state load combinations should be determined in accordance with AS/NZS 1170. It is recommended these be expressed as uniformly distributed bending loads (kN/m) for direct comparison with the tabulated data in this manual.

Self weight of the Top Notch Purlin System is not included in any load tables and must be calculated as part of the total dead load of the building elements supported by the purlin.

Top Notch Purlin Systems are typically used as purlins and girts in lightweight building applications, for example farm buildings and light commercial sheds.

DESIGN CONSIDERATIONS

Data presented in this manual is intended for use by structural engineers. Load situations other than uniformly distributed loads will require specific design.

Design capacities in the limit state format have been derived by the application of a capacity factor, ϕ_b = 0.90 for bending.

A design yield strength as outlined in Material Specification 2.4.6 has been used for the Top Notch Purlin System.

These tables are intended for use where roofing or cladding provides full restraint to the top flange of the Top Notch purlin or girt. Loads are assumed to be applied about the major axis of symmetry (X-X).

The fixing type and size is critical to achieve the outward design loads. Refer Connection Design in this section.

The Top Notch Purlin System does not require bracing to provide restraint. Therefore the loads are represented as inward and outward cases. However bracing battens can be fastened transversely along the underside of the purlins to enhance the performance of Top Notch purlins and are recommended where supports/restraints are further than 30 times the Top Notch purlin depth apart.

Gravity type loads can be assumed to act perpendicular to the roof plane for pitches up to 10 degrees. For pitches greater than 10 degrees, load components about the minor axis of symmetry (Y-Y) should also be considered.

When designing Top Notch purlins to be used as girts, it is assumed cladding and girt gravity loads are taken by a stiff eaves member such as a DHS Purlin.

Span Guide

As a guide, single spans are used most frequently for ease of installation. Deflections may govern on larger spans.

Double span configurations may be used where lower deflections are required.

Lapped end and lapped internal configurations are more economical on large purlin spans where better strength and lower deflections are required.

Deflection Guidelines

As a guide to acceptable deflection limits for serviceability of the Top Notch Purlin System, the following limits are recommended for wind load and dead load actions where there is no ceiling,

Deflection for W_s ⊁ Span/150

Deflection for G ⊁ Span/300

For further guidance on deflection limits, refer to AS/NZS 1170.

Specific Design

Specific design to AS/NZS 4600 is required where Top Notch purlins -

- are used as cantilever members.
- have suspended loads present (such as ducting and piping). Suspended loads must be connected to both Top Notch bottom flanges or with straps tied over the Top Notch top flange.
- have holes present.
- are subject to axial loading.
- are subject to combined loading.
- are subject to out of plane loading about the minor Y-Y axis.

Connection Design

Dimond Structural supply a range of self-drilling fasteners for fixing into both steel or timber.

- When fixing into mild steel, a Metal Tek with a hardened drill point should be used.
- When fixing into timber, a Type 17 self-drilling fastener should be used.

In order to achieve the loads shown in the Top Notch purlin design tables, the following size and number of self-drilling fasteners are required for the support condition and type of material.

Fixings

				Number of Fasteners/Fastener Gauge				
	Support Member			Top Notch Purlin Size				
Support Condition	Material	Grade	Minimum Thickness (mm)	60 x 0.75 60 x 0.95	100 x 0.75 100 x 0.95	120 x 0.75 120 x 0.95	150 x 0.95	150 x 1.15
End	Cold-formed Steel	G450	1.45	2/12g	2/12g	2/14g	2/14g	2/14g
	Steel	G300	3	2/12g	2/12g	2/14g	2/14g	2/14g
	Timber	G300	37*	2/12g	2/12g	2/14g	2/14g	2/14g
Internal	Cold-formed Steel	G450	1.45	4/12g	6/12g	6/14g	6/14g	8/14g
	Steel	G300	3	2/12g	4/12g	4/14g	4/14g	6/14g
	Timber	G300	37*	2/12g	4/12g	4/14g	4/14g	6/14g

*Minimum fastener embedment into timber support.

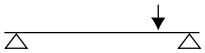
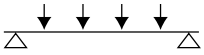
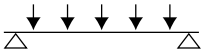
Notes:
- Cold-formed Steel: Example 2/14g - 2 x 14 gauge fasteners connected to G450 cold-formed steel support member of 1.45mm minimum thickness.
- Steel: Example 2/14g - 2 x 14 gauge fasteners connected to G300 hot-rolled steel support member of 3.0mm minimum thickness.
- Timber: Example 2/14g - 2 x 14 gauge Type 17 x 50mm long fasteners connected into timber to achieve a minimum embedment of 37mm.
- Lap End Fasteners: 2 fasteners each end of the lap for 60 and 100 deep Top Notch purlins and 4 fasteners each end of the lap for 120 and 150 deep Top Notch purlins - to the same gauge (diameter) as fasteners recommended in the above table. The same rationale applies where 14 gauge fasteners are required.
- When the number of specified fixings above cannot be fixed into the Top Notch purlin and/or Top Notch purlin is being installed in cyclonic regions, an additional hold-down strap should be used. Refer CAD details on-line (**www.dimondstructural.co.nz/products/top-notch-purlins**).
- Specific Design is required where less fasteners or other types of support members are used.

Point Load Conversion Guide

The following formula may be used as a guide in converting point loads to equivalent uniformly distributed bending loads specific to the Top Notch Purlin System.

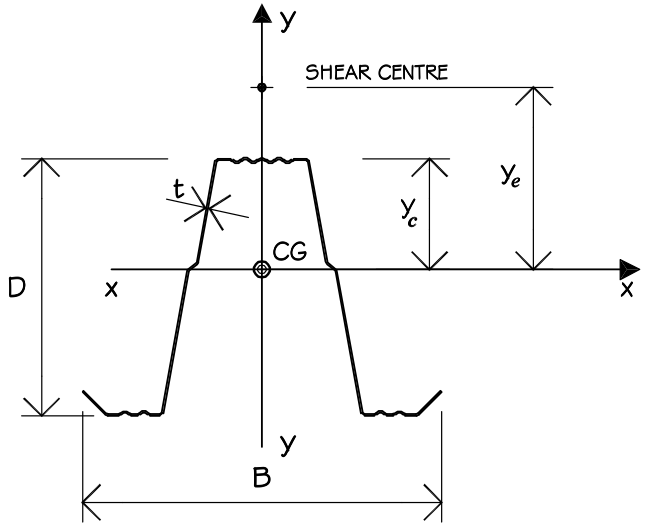
Formula $W = F \times \frac{P}{L}$

Where W = Uniform bending load
F = Factor "F" from table below
P = Point load ↓
L = Length of span

Type	Symbol	Factor "F"			
		Simple	End Span	Lapped End	Lapped Internal
One equidistant point load		2	2.25	2.25	2
One eccentric point load		1.5	2	2	1.5
Two equidistant point loads		2.67	3.25	3.25	2.25
Three equidistant point loads		4	4.25	4.25	3.5
Four equidistant point loads		4.8	5.5	5.5	4.25
Five equidistant point loads		6	6.75	6.75	5.5

Notes:
1. This conversion guide and factors (F) is only applicable to the Top Notch Purlin System.
2. The conversion factors (F) are an approximation to the pure derivation and are to be used as a guide only.
3. The conversion formula assumes all point loads are equal in magnitude.

TOP NOTCH PURLIN SYSTEM SECTION PROPERTIES



Top Notch Section	Depth D (mm)	Width B (mm)	Thickness t (mm)	Area A (mm^2)	Mass per unit length (kg/m)	Second Moment of Area (Full Section)		Section Modulus (Full Section)		Radius of Gyration		Centre of Gravity y_c (mm)	Shear Centre y_e (mm)	Torsion Constant J (mm^4)	Warping Constant I_w (10^6mm^6)	Monosymmetry Constant β_x (mm)
						I_x (10^6mm^4)	I_y (10^6mm^4)	Z_x (10^3mm^3)	Z_y (10^3mm^3)	r_x (mm)	r_y (mm)					
60 x 0.75	60	108	0.75	150	1.24	0.077	0.122	2.57	2.26	22.6	28.5	31.5	44.2	28.2	16.0	111
60 x 0.95	60	108	0.95	191	1.56	0.097	0.155	3.23	2.87	22.6	28.5	31.5	44.2	57.3	20.3	111
100 x 0.75	100	163	0.75	248	2.04	0.340	0.450	6.80	5.52	37.0	42.6	55.2	67.4	46.5	238.6	163
100 x 0.95	100	163	0.95	314	2.56	0.430	0.570	8.60	6.99	37.0	42.6	55.2	67.4	94.5	302.2	163
120 x 0.75	120	170	0.75	278	2.28	0.530	0.546	8.83	6.42	43.7	44.3	65.6	82.3	52.1	363.3	190
120 x 0.95	120	170	0.95	352	2.86	0.671	0.691	11.18	8.13	43.6	44.3	65.6	82.3	106.0	460.2	190
150 x 0.95	150	183	0.95	411	3.34	1.166	0.920	15.55	10.05	53.3	47.3	81.0	103.9	123.5	758.4	231
150 x 1.15	150	183	1.15	497	4.02	1.411	1.114	18.81	12.17	53.3	47.3	81.0	103.9	219.1	918.0	231

Note: Mass assumes a total coated weight for the standard zinc coating of $275g/m^2$.

TOP NOTCH PURLIN SYSTEM LOAD SPAN TABLES

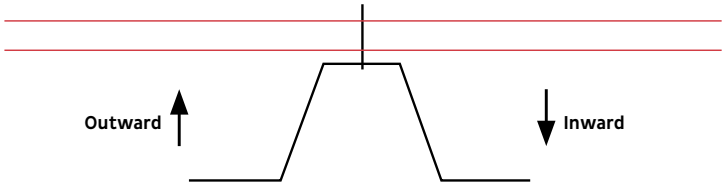
Uniformly loaded bending capacities (kN/m) are given for the Top Notch Purlin System for spans between 1.25m and 10.0m in the following configurations -

Inward Ultimate - Load pushing inward on the Top Flange

Outward Ultimate - Load pulling outward on the Top Flange

Ws Serviceability - Load at which midspan deflection equates to span/150.

As deflection is proportional to loading, Ws loads may be factored by the deflection ratio for any deflection within the limit of the linear load capacities.

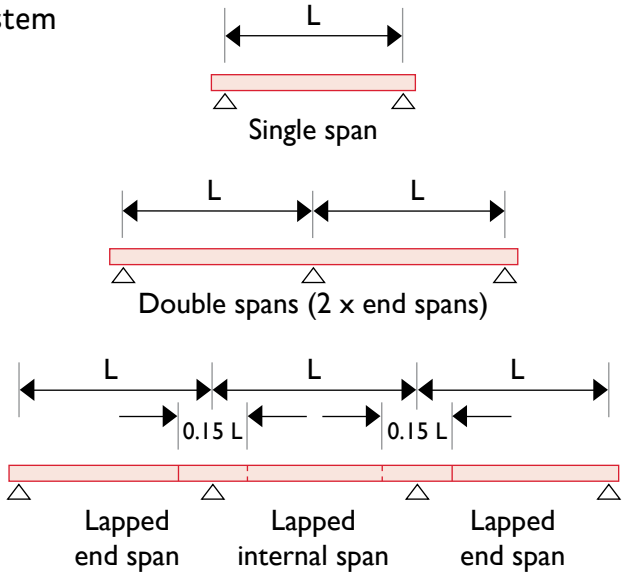


The following notes apply to the load tables in this section -

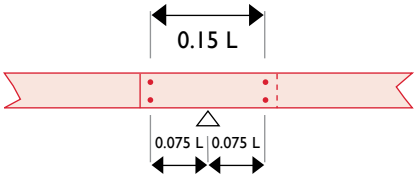
1. It is assumed that the top flange of the Top Notch purlin is continuously restrained by screw-fastened roof sheeting. If not, specific design to AS/NS 4600 is required.
2. Use of lapped end span tables with corresponding lapped internal span tables assumes that the lapped span is within plus 5% or minus 25% of the lapped internal spans, otherwise specific design to AS/NZS 4600 is required.
3. Outward loads are based on both section capability and the capability of the fastener connections, refer Connection Design in Section 2.4.2.
4. Shaded areas of the table relate to spans which will not support a point load of 1.4kN (refer AS/NZS 1170). This assumes no load sharing between purlins.
5. No member rotation has been allowed for at fixed ends.
6. Linear interpolation is permitted for Loads between intermediate Top Notch purlin spans.

Typical Top Notch Purlin System Span Configurations

L = Span length



All lap lengths are to be a minimum of 0.15 of the maximum span measured from fixing points each end of the lap, positioned equally each side of the portal rafter. Refer CAD Details on-line (**www.dimondstructural.co.nz/products/top-notch-purlins**).



TOP NOTCH PURLIN SYSTEM LOAD SPAN TABLES - SINGLE SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	60 x 0.75			60 x 0.95			100 x 0.75			100 x 0.95			120 x 0.75			120 x 0.95			150 x 0.95			150 x 1.15		
Span (m)	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S
1.00																								
1.25	5.90	4.00	3.59																					
1.50	4.10	2.78	2.08	5.48	3.76	2.75																		
1.75	3.01	2.04	1.31	4.03	2.76	1.73																		
2.00	2.30	1.56	0.88	3.08	2.11	1.16	4.54	3.22	3.90															
2.25	1.82	1.23	0.62	2.44	1.67	0.81	3.59	2.55	2.74	5.37	3.56	3.74												
2.50	1.47	1.00	0.45	1.97	1.35	0.59	2.91	2.06	2.00	4.35	2.88	2.73	3.52	2.46	2.95	5.24	3.68	4.20						
2.75	1.22	0.83	0.34	1.63	1.12	0.45	2.40	1.70	1.50	3.60	2.38	2.05	2.91	2.03	2.22	4.33	3.07	3.15						
3.00				1.37	0.94	0.34	2.02	1.43	1.16	3.02	2.00	1.58	2.45	1.71	1.71	3.64	2.58	2.43	4.57	3.07	3.91			
3.25							1.72	1.22	0.91	2.57	1.70	1.24	2.08	1.45	1.34	3.10	2.19	1.91	3.90	2.70	3.08	5.39	2.83	4.09
3.50							1.48	1.05	0.73	2.22	1.47	0.99	1.80	1.25	1.08	2.68	1.89	1.53	3.36	2.33	2.46	4.65	2.63	3.28
3.75							1.29	0.92	0.59	1.93	1.28	0.81	1.57	1.09	0.87	2.33	1.65	1.24	2.93	2.03	2.00	4.05	2.45	2.66
4.00							1.14	0.81	0.49	1.70	1.13	0.67	1.38	0.96	0.72	2.05	1.45	1.02	2.57	1.78	1.65	3.56	2.30	2.19
4.25							1.01	0.71	0.41	1.51	1.00	0.56	1.22	0.85	0.60	1.81	1.28	0.85	2.28	1.58	1.38	3.15	2.16	1.83
4.50							0.90	0.64	0.34	1.34	0.89	0.47	1.09	0.76	0.51	1.62	1.14	0.72	2.03	1.41	1.16	2.81	2.00	1.54
4.75										1.21	0.80	0.40	0.98	0.68	0.43	1.45	1.03	0.61	1.82	1.26	0.99	2.52	1.79	1.31
5.00										1.09	0.72	0.34	0.88	0.61	0.37	1.31	0.93	0.52	1.65	1.14	0.85	2.28	1.62	1.12
5.25													0.80	0.56	0.32	1.19	0.84	0.45	1.49	1.03	0.73	2.07	1.47	0.97
5.50																1.08	0.77	0.39	1.36	0.94	0.63	1.88	1.34	0.84
5.75																0.99	0.70	0.34	1.25	0.86	0.56	1.72	1.22	0.74
6.00																0.91	0.64	0.30	1.14	0.79	0.49	1.58	1.12	0.65
6.25																			1.05	0.73	0.43	1.46	1.04	0.58
6.50																			0.97	0.67	0.38	1.35	0.96	0.51
6.75																			0.90	0.63	0.34	1.25	0.89	0.46
7.00																			0.84	0.58	0.31	1.16	0.83	0.41
7.25																						1.08	0.77	0.37
7.50																						1.01	0.72	0.33
7.75																						0.95	0.67	0.30
8.00																								
8.25																								
8.50																								
8.75																								
9.00																								
9.25																								
9.50																								
9.75																								
10.00																								

1. **Inward:** Load pushing inward on the top flange.
2. **Outward:** Load pulling outward on the top flange.
3. **Ws:** Load at a deflection of span/150.
4. ■ Shaded areas relate to spans which will not support a point load of 1.4kN (refer AS/NZS 1170).

TOP NOTCH PURLIN SYSTEM LOAD SPAN TABLES - DOUBLE SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	60 x 0.75			60 x 0.95			100 x 0.75			100 x 0.95			120 x 0.75			120 x 0.95			150 x 0.95			150 x 1.15		
Span (m)	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S
1.00																								
1.25	5.90	3.73	7.88																					
1.50	4.10	3.11	4.56	5.48	3.55	5.95																		
1.75	3.01	2.66	2.87	4.03	3.04	3.75																		
2.00	2.30	2.30	1.92	3.08	2.66	2.51																		
2.25	1.82	1.82	1.35	2.44	2.37	1.76	5.09	2.99	5.92															
2.50	1.47	1.47	0.98	1.97	1.97	1.29	4.12	2.69	4.32	5.42	4.03	5.80	4.19	2.94	6.55									
2.75	1.22	1.22	0.74	1.63	1.63	0.97	3.41	2.40	3.24	4.48	3.60	4.35	3.81	2.68	4.92	5.82	4.01	6.73						
3.00	1.02	1.02	0.57	1.37	1.37	0.74	2.85	2.02	2.50	3.77	3.02	3.35	3.41	2.45	3.79	4.89	3.64	5.18	5.60	3.68	8.64			
3.25	0.87	0.87	0.45	1.17	1.17	0.59	2.38	1.72	1.97	3.21	2.57	2.64	2.91	2.08	2.98	4.17	3.10	4.08	5.17	3.40	6.79			
3.50	0.75	0.75	0.36	1.01	1.01	0.47	2.01	1.48	1.57	2.77	2.22	2.11	2.49	1.80	2.39	3.60	2.68	3.26	4.49	3.15	5.44			
3.75				0.88	0.88	0.38	1.71	1.29	1.28	2.39	1.93	1.72	2.13	1.57	1.94	3.13	2.33	2.65	3.82	2.93	4.42	5.35	3.93	5.67
4.00				0.77	0.77	0.31	1.46	1.14	1.05	2.05	1.70	1.42	1.84	1.38	1.60	2.75	2.05	2.19	3.28	2.57	3.64	4.66	3.56	4.67
4.25							1.26	1.01	0.88	1.76	1.51	1.18	1.59	1.22	1.33	2.41	1.81	1.82	2.83	2.28	3.04	4.02	3.15	3.89
4.50							1.09	0.90	0.74	1.52	1.34	0.99	1.39	1.09	1.12	2.10	1.62	1.54	2.45	2.03	2.56	3.48	2.81	3.28
4.75							0.94	0.81	0.63	1.32	1.21	0.85	1.22	0.98	0.95	1.84	1.45	1.31	2.13	1.82	2.18	3.03	2.52	2.79
5.00							0.82	0.73	0.54	1.15	1.09	0.72	1.07	0.88	0.82	1.62	1.31	1.12	1.86	1.65	1.87	2.64	2.28	2.39
5.25							0.72	0.66	0.47	1.00	0.99	0.63	0.94	0.80	0.71	1.43	1.19	0.97	1.62	1.49	1.61	2.31	2.07	2.07
5.50							0.64	0.60	0.41	0.90	0.90	0.54	0.83	0.73	0.62	1.26	1.08	0.84	1.42	1.36	1.40	2.02	1.88	1.80
5.75							0.58	0.55	0.35	0.82	0.82	0.48	0.74	0.67	0.54	1.12	0.99	0.74	1.29	1.25	1.23	1.83	1.72	1.57
6.00							0.54	0.50	0.31	0.76	0.76	0.42	0.65	0.61	0.47	0.99	0.91	0.65	1.19	1.14	1.08	1.68	1.58	1.38
6.25										0.70	0.70	0.37	0.59	0.56	0.42	0.88	0.84	0.57	1.09	1.05	0.96	1.55	1.46	1.22
6.50										0.64	0.64	0.33	0.55	0.52	0.37	0.78	0.78	0.51	1.01	0.97	0.85	1.44	1.35	1.09
6.75													0.51	0.48	0.33	0.73	0.72	0.45	0.94	0.90	0.76	1.33	1.25	0.97
7.00													0.47	0.45	0.30	0.67	0.67	0.41	0.87	0.84	0.68	1.24	1.16	0.87
7.25																0.63	0.62	0.37	0.81	0.78	0.61	1.15	1.08	0.78
7.50																0.59	0.58	0.33	0.76	0.73	0.55	1.08	1.01	0.71
7.75																0.55	0.55	0.30	0.71	0.69	0.50	1.01	0.95	0.64
8.00																			0.67	0.64	0.46	0.95	0.89	0.58
8.25																			0.63	0.60	0.42	0.89	0.84	0.53
8.50																			0.59	0.57	0.38	0.84	0.79	0.49
8.75																			0.56	0.54	0.35	0.79	0.74	0.45
9.00																			0.53	0.51	0.32	0.75	0.70	0.41
9.25																						0.71	0.67	0.38
9.50																						0.67	0.63	0.35
9.75																						0.64	0.60	0.32
10.00																						0.61	0.57	0.30

1. **Inward:** Load pushing inward on the top flange.
2. **Outward:** Load pulling outward on the top flange.
3. **Ws:** Load at a deflection of span/150.
4. ■ Shaded areas relate to spans which will not support a point load of 1.4kN (refer AS/NZS 1170).

TOP NOTCH PURLIN SYSTEM LOAD SPAN TABLES - LAPPED END SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	60 x 0.75			60 x 0.95			100 x 0.75			100 x 0.95			120 x 0.75			120 x 0.95			150 x 0.95			150 x 1.15		
Span (m)	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S
1.00																								
1.25																								
1.50	6.00	3.55	4.70																					
1.75	4.34	3.04	2.96	5.88	3.04	3.87																		
2.00	3.19	2.54	1.98	4.33	2.66	2.59																		
2.25	2.40	2.00	1.39	3.26	2.37	1.82	5.84	4.48	5.50															
2.50	1.84	1.62	1.02	2.51	2.13	1.33	4.73	4.26	4.45															
2.75	1.43	1.34	0.76	1.95	1.82	1.00	3.91	3.67	3.34	5.84	3.67	4.49	4.49	4.01	4.42									
3.00	1.13	1.13	0.59	1.53	1.53	0.77	3.28	3.28	2.58	4.91	3.36	3.46	3.97	3.97	3.91	5.92	4.27	5.34						
3.25	0.96	0.96	0.46	1.30	1.30	0.60	2.80	2.80	2.03	4.18	3.10	2.72	3.39	3.39	3.07	5.04	3.40	4.20						
3.50	0.83	0.83	0.37	1.12	1.12	0.48	2.41	2.41	1.62	3.61	2.88	2.18	2.92	2.92	2.46	4.35	3.15	3.37	5.46	3.66	5.23			
3.75				0.98	0.98	0.39	2.10	2.10	1.32	3.14	2.69	1.77	2.54	2.54	2.00	3.79	2.94	2.74	4.76	2.94	4.56			
4.00				0.86	0.86	0.32	1.85	1.85	1.09	2.76	2.52	1.46	2.24	2.24	1.65	3.33	2.76	2.25	4.18	2.76	3.76	5.78	3.68	4.82
4.25							1.64	1.64	0.91	2.45	2.37	1.22	1.98	1.98	1.37	2.95	2.60	1.88	3.70	2.60	3.13	5.12	3.46	4.02
4.50							1.46	1.46	0.76	2.18	2.17	1.02	1.77	1.77	1.16	2.63	2.45	1.58	3.30	2.45	2.64	4.57	3.27	3.38
4.75							1.31	1.31	0.65	1.96	1.95	0.87	1.59	1.59	0.98	2.36	2.32	1.35	2.96	2.32	2.24	4.10	3.10	2.88
5.00							1.18	1.18	0.56	1.77	1.76	0.75	1.43	1.43	0.84	2.13	2.13	1.15	2.68	2.21	1.92	3.70	2.94	2.47
5.25							1.07	1.07	0.48	1.60	1.59	0.65	1.30	1.30	0.73	1.93	1.93	1.00	2.43	2.10	1.66	3.36	2.80	2.13
5.50							0.98	0.98	0.42	1.45	1.45	0.56	1.18	1.18	0.63	1.76	1.76	0.87	2.21	2.01	1.45	3.06	2.68	1.85
5.75							0.89	0.89	0.37	1.33	1.33	0.49	1.08	1.08	0.56	1.61	1.61	0.76	2.02	1.92	1.26	2.80	2.56	1.62
6.00							0.82	0.82	0.32	1.22	1.22	0.43	0.99	0.99	0.49	1.48	1.48	0.67	1.86	1.84	1.11	2.57	2.45	1.43
6.25										1.12	1.12	0.38	0.92	0.92	0.43	1.36	1.36	0.59	1.71	1.71	0.99	2.37	2.36	1.26
6.50										1.04	1.04	0.34	0.85	0.85	0.38	1.26	1.26	0.53	1.58	1.58	0.88	2.19	2.19	1.12
6.75										0.96	0.96	0.30	0.79	0.79	0.34	1.17	1.17	0.47	1.47	1.47	0.78	2.03	2.03	1.00
7.00													0.73	0.73	0.31	1.09	1.09	0.42	1.37	1.37	0.70	1.89	1.89	0.90
7.25																1.01	1.01	0.38	1.27	1.27	0.63	1.76	1.76	0.81
7.50																0.95	0.95	0.34	1.19	1.19	0.57	1.65	1.65	0.73
7.75																0.89	0.89	0.31	1.11	1.11	0.52	1.54	1.54	0.66
8.00																			1.05	1.05	0.47	1.45	1.45	0.60
8.25																			0.98	0.98	0.43	1.36	1.36	0.55
8.50																			0.93	0.93	0.39	1.28	1.28	0.50
8.75																			0.87	0.87	0.36	1.21	1.21	0.46
9.00																			0.83	0.83	0.33	1.14	1.14	0.42
9.25																			0.78	0.78	0.30	1.08	1.08	0.39
9.50																						1.03	1.03	0.36
9.75																						0.97	0.97	0.33
10.00																						0.93	0.93	0.31

1. **Inward:** Load pushing inward on the top flange.
2. **Outward:** Load pulling outward on the top flange.
3. **Ws:** Load at a deflection of span/150.
4. Shaded areas relate to spans which will not support a point load of 1.4kN (refer AS/NZS 1170).

TOP NOTCH PURLIN SYSTEM LOAD SPAN TABLES - LAPPED INTERNAL SPAN

Uniformly Loaded Bending Capacities (kN/m) $\phi_b W_{bx}$

	60 x 0.75			60 x 0.95			100 x 0.75			100 x 0.95			120 x 0.75			120 x 0.95			150 x 0.95			150 x 1.15		
Span (m)	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S	Inward	Outward	W_S
1.00																								
1.25																								
1.50																								
1.75	6.00	3.81	5.38																					
2.00	4.42	3.33	3.61	5.99	3.33	4.71																		
2.25	3.33	2.78	2.53	4.52	2.96	3.31																		
2.50	2.55	2.25	1.85	3.47	2.66	2.41																		
2.75	1.98	1.86	1.39	2.69	2.42	1.81	5.41	4.58	5.41															
3.00	1.56	1.56	1.07	2.11	2.11	1.39	4.54	4.20	4.54															
3.25	1.33	1.33	0.84	1.80	1.80	1.10	3.87	3.87	3.68	5.79	3.88	4.95	4.03	4.03	4.03									
3.50	1.15	1.15	0.67	1.55	1.55	0.88	3.34	3.34	2.95	4.99	3.60	3.96	3.74	3.74	3.96	6.00	3.94	6.00						
3.75	1.00	1.00	0.55	1.35	1.35	0.71	2.91	2.91	2.40	4.35	3.36	3.22	3.50	3.50	3.50	5.24	3.68	4.97	5.60	3.68	5.60			
4.00	0.88	0.88	0.45	1.19	1.19	0.59	2.56	2.56	1.98	3.82	3.15	2.65	3.10	3.10	3.00	4.61	3.45	4.10	5.25	3.45	5.25			
4.25	0.78	0.78	0.38	1.05	1.05	0.49	2.26	2.26	1.65	3.39	2.96	2.21	2.74	2.74	2.50	4.08	3.25	3.42	4.94	3.25	4.94			
4.50				0.94	0.94	0.41	2.02	2.02	1.39	3.02	2.80	1.86	2.45	2.45	2.11	3.64	3.07	2.88	4.57	3.07	4.57			
4.75				0.84	0.84	0.35	1.81	1.81	1.18	2.71	2.65	1.58	2.20	2.20	1.79	3.27	2.91	2.45	4.10	2.91	4.08	5.68	3.87	5.23
5.00				0.76	0.76	0.30	1.64	1.64	1.01	2.45	2.43	1.36	1.98	1.98	1.54	2.95	2.76	2.10	3.70	2.76	3.50	5.13	3.68	4.48
5.25							1.48	1.48	0.87	2.22	2.20	1.17	1.80	1.80	1.33	2.68	2.63	1.81	3.36	2.63	3.02	4.65	3.50	3.87
5.50							1.35	1.35	0.76	2.01	2.01	1.02	1.64	1.64	1.15	2.44	2.44	1.58	3.06	2.51	2.63	4.24	3.35	3.37
5.75							1.24	1.24	0.67	1.84	1.84	0.89	1.50	1.50	1.01	2.23	2.23	1.38	2.80	2.40	2.30	3.88	3.20	2.95
6.00							1.14	1.14	0.59	1.69	1.69	0.79	1.38	1.38	0.89	2.05	2.05	1.21	2.57	2.30	2.02	3.56	3.07	2.59
6.25							1.05	1.05	0.52	1.56	1.56	0.70	1.27	1.27	0.79	1.89	1.89	1.07	2.37	2.21	1.79	3.28	2.94	2.30
6.50							0.97	0.97	0.46	1.44	1.44	0.62	1.17	1.17	0.70	1.75	1.75	0.96	2.19	2.12	1.59	3.03	2.83	2.04
6.75							0.90	0.90	0.41	1.33	1.33	0.55	1.09	1.09	0.62	1.62	1.62	0.85	2.03	2.03	1.42	2.81	2.73	1.82
7.00							0.83	0.83	0.37	1.24	1.24	0.50	1.01	1.01	0.56	1.50	1.50	0.76	1.89	1.89	1.27	2.62	2.62	1.63
7.25							0.78	0.78	0.33	1.16	1.16	0.45	0.94	0.94	0.50	1.40	1.40	0.69	1.76	1.76	1.15	2.44	2.44	1.47
7.50							0.73	0.73	0.30	1.08	1.08	0.40	0.88	0.88	0.45	1.31	1.31	0.62	1.65	1.65	1.04	2.28	2.28	1.33
7.75										1.01	1.01	0.36	0.82	0.82	0.41	1.23	1.23	0.56	1.54	1.54	0.94	2.13	2.13	1.20
8.00										0.95	0.95	0.33	0.77	0.77	0.37	1.15	1.15	0.51	1.45	1.45	0.85	2.00	2.00	1.09
8.25										0.89	0.89	0.30	0.73	0.73	0.34	1.08	1.08	0.47	1.36	1.36	0.78	1.88	1.88	1.00
8.50													0.69	0.69	0.31	1.02	1.02	0.43	1.28	1.28	0.71	1.77	1.77	0.91
8.75																0.96	0.96	0.39	1.21	1.21	0.65	1.67	1.67	0.84
9.00																0.91	0.91	0.36	1.14	1.14	0.60	1.58	1.58	0.77
9.25																0.86	0.86	0.33	1.08	1.08	0.55	1.50	1.50	0.71
9.50																0.82	0.82	0.31	1.03	1.03	0.51	1.42	1.42	0.65
9.75																			0.97	0.97	0.47	1.35	1.35	0.60
10.00																			0.93	0.93	0.44	1.28	1.28	0.56

1. **Inward:** Load pushing inward on the top flange.
2. **Outward:** Load pulling outward on the top flange.
3. **Ws:** Load at a deflection of span/150.
4. ■ Shaded areas relate to spans which will not support a point load of 1.4kN (refer AS/NZS 1170).

TOP NOTCH PURLIN SYSTEM DESIGN EXAMPLES

EXAMPLE: SINGLE SPAN AND LAPPED SPAN

Loadings

Dead Load, G = 0.12kPa Live Load, Q = 0.25kPa Snow Load, S_u = 0.5kPa

Outward Limit State Wind Loads, W_u = – 0.95kPa (ultimate state) and W_s = – 0.66kPa (serviceability state).

Inward Wind Loading is not significant for this roof.

Building Constraints

Portal Spacing, L_P = 5m		Rafter Length, L_R =	10.0m (distance from eaves purlin to ridge purlin)
Roof Pitch, a =	10 degrees	Cladding Profile =	Styleline x 0.40mm BMT

Critical Design Load Combinations for the Ultimate Limit State (from AS/NZS 1170)

i) W^*_{ULS} = 1.2G + 1.5Q = (1.2 x 0.12) + (1.5 x 0.25) = 0.52kPa

ii) W^*_{ULS} = 1.2G + S_u + ψ_lQ = (1.2 x 0.12) + 0.5 + (0.0 x 0.25) = 0.64kPa

iii) W^*_{ULS} = 0.9G + W_u = (0.9 x 0.12) – 0.95 = – 0.84kPa (outward)

Critical Design Load Combinations for the Serviceability Limit State (from AS/NZS 1170)

i) W^*_{SLS} = L_P/300 under G + ψ_lQ = [0.12 + (0.0 x 0.25)] x 300/150 = 0.24kPa

ii) W^*_{SLS} = L_P/150 under W_s = – 0.66 = – 0.66kPa (outward)

For i) we have converted the load by a factor of 300/150 in order to compare the load directly with W_s in the Top Notch purlin load span tables as these are based on span/150.

Optimise Roofing Profile Spans

In this case we have a restricted access roof where the point load requirement limits the intermediate span of the Styleline x 0.40mm BMT profile to 1.6m. End spanning capability of the roofing is reduced to 1.05m, i.e. two thirds of the intermediate span. Generally these spans will not 'fit' the rafter length exactly, hence the requirement to optimise.

The optimised roofing profile intermediate span is based on the rafter length and the number of purlins, NP (assuming at least four) and is given by the term: $PS_i = L_R / [NP - 1.66]$ where PS_i is the internal purlin spacing and purlins at each end are two thirds of PS_i.

Try 7 Purlins, PS_i = 10.0/(7 – 1.66) = 1.87m No good

Try 9 Purlins, PS_i = 10.0/(9 – 1.66) = 1.36m Not controlling

Try 8 Purlins, PS_i = 10.0/(8 – 1.66) = 1.58m Intermediate spans and 1.05m edge spans

From this, 8 purlins are required and the purlin spacings may be rationalised to 1.6m intermediate spans and 1.0m spans at the sheet ends.

The Top Notch purlin load span tables assume the top flange of the Top Notch purlin is continuously restrained by screw-fastened roof sheeting (if not, specific design to AS/NZS 4600 is required).

1. Single Span Purlin Design

All Bays (5m span)

Check design capacities (using Top Notch Purlin System Load Span Tables - Single Span): $W^*_{ULS} < \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 1.6 x 0.64 = 1.02kN/m cf. 1.31kN/m for a 120 x 0.95

$W^*_{ULS}\uparrow$ = 1.6 x –0.84 = –1.34kN/m cf. 1.62kN/m for a 150 x 1.15

Check deflections

W^*_{SLS} = 1.6 x 0.66 = 1.06kN/m cf. 1.12kN/m for a 150 x 1.15

Both outward wind load and deflection govern and a 150 x 1.15 Top Notch purlin is required.

Therefore use 150 x 1.15 Top Notch purlins single span at 1.6m intermediate spacings and 1.0m at sheet ends.
Typically for multiple bay structures it would be more efficient to use a lapped purlin system as shown next.

2. Lapped Span Purlin Design

Check End Bays (5m span)

Check design capacities (using Top Notch Purlin System Load Span Tables - Lapped End Span): $W^*_{ULS} < \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 1.6 x 0.64 = 1.02kN/m cf. 1.18kN/m for a 100 x 0.75

$W^*_{ULS}\uparrow$ = 1.6 x −0.84 = −1.34kN/m cf. 1.76kN/m for a 100 x 0.95

Check deflections

W^*_{SLS} = 1.6 x 0.66 = 1.06kN/m cf. 1.15kN/m for a 120 x 0.95

Deflection wind load governs the end span and a 120 x 0.95 lapped Top Notch purlin is required.

Check Internal Bays (5m span)

Check design (using Top Notch Purlin System Load Span Tables - Lapped Internal Span): $W^*_{ULS} < \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 1.6 x 0.64 = 1.02kN/m cf. 1.64kN/m for a 100 x 0.75

$W^*_{ULS}\uparrow$ = 1.6 x −0.84 = −1.34kN/m cf. 1.64kN/m for a 100 x 0.75

Check deflections

W^*_{SLS} = 1.6 x 0.66 = 1.06kN/m cf. 1.36kN/m for a 100 x 0.95

Deflection wind load governs the internal span and a 100 x 0.95 lapped Top Notch purlin is required.

Therefore use Top Notch 120 x 0.95 lapped purlins at 1.6m intermediate spacings and 1.0m at sheet ends (governed by the end bays).

Top Notch purlins must have the same depth on all bays to keep the roofing in the same plane and different thicknesses are not mixed when specifying Top Notch purlins for practical reasons.

3. Lapped Reduced-End Span Purlin Design

The dependable strength characteristics are higher for internal spans on continuously lapped span purlin systems. Therefore typically a reduction in the end bay spacings of 20% to 30% will result in a more efficient purlin optimisation. Try reducing the end bay span by 20% to 4 metres.

Check End Bays (4m span)

Check design capacities (using Top Notch Purlin System Load Span Tables - Lapped End Span): $W^*_{ULS} < \phi_b W_{bx}$

$W^*_{ULS}\downarrow$ = 1.6 x 0.64 = 1.02kN/m cf. 1.85kN/m for a 100 x 0.75

$W^*_{ULS}\uparrow$ = 1.6 x −0.84 = −1.34kN/m cf. 1.85kN/m for a 100 x 0.75

Check deflections

W^*_{SLS} = 1.6 x 0.66 = 1.06kN/m cf. 1.09kN/m for a 100 x 0.75

All design cases require a 100 x 0.75 lapped Top Notch.

Check Internal Bays (5m span)

As for the Internal Bays in Example 2 above, a 100 x 0.95 lapped Top Notch purlin is required.

Therefore use Top Notch 100 x 0.95 lapped purlins at 1.6m intermediate spacings and 1.0m at sheet ends, on end and internal bays.

The above examples use the same wind load on the end bays and the internal bays. However a more rigorous wind load analysis is likely to have different wind loads on the end and internal bays.

In the calculation of wall elements, optimisation follows the same logic as illustrated for roofing with the exception that foot traffic limitations do not apply, leaving the spanning ability of the cladding dependent on face loads caused by wind.

TOP NOTCH PURLIN SYSTEM MATERIAL SPECIFICATION

Dimond Structural Top Notch Purlins are manufactured by roll forming galvanised steel coil produced to AS 1397.

Base Metal Thickness (BMT) (mm)	Steel Grade	Yield Strength, f_y (MPa)	Zinc Weight, Z (g/m^2)
0.75	G550	550	275
0.95	G550	550	275
1.15	G500	500	275

Z450 galvanised zinc coil can be supplied with order lead times of up 12 weeks. Contact Dimond Structural on 0800 Dimond (0800 346 663).

Tolerances

Length:		±6mm
Depth/Width:	60 Top Notch purlin:	±1mm
	100/120 Top Notch purlin:	±2mm
	150 Top Notch purlin:	±3mm
Top Flange Width:		±1mm

TOP NOTCH PURLIN SYSTEM SHORT FORM SPECIFICATION

The light steel section will be Dimond Structural **(1)** Top Notch **(2)** mm BMT to a galvanised zinc weight of **(3)** g/m^2.

The sizes, lengths, span configuration, lap length where required and thickness variations are as shown on the drawing.

Fixings to rafters to be **(4)** **(5)** self-drilling fasteners.

(1) Choose from: 60, 100, 120, 150

(2) Choose from: 0.75, 0.95 (for 60, 100 and 120 Top Notch Purlins) - 0.95, 1.15 (for 150 Top Notch Purlins).

(3) Choose from: 275 or 450

(4) Choose from: 2 – 12g, 4 – 12g, 6 – 12g, 2 – 14g, 4 – 14g, 6 – 14g or 8 – 14g

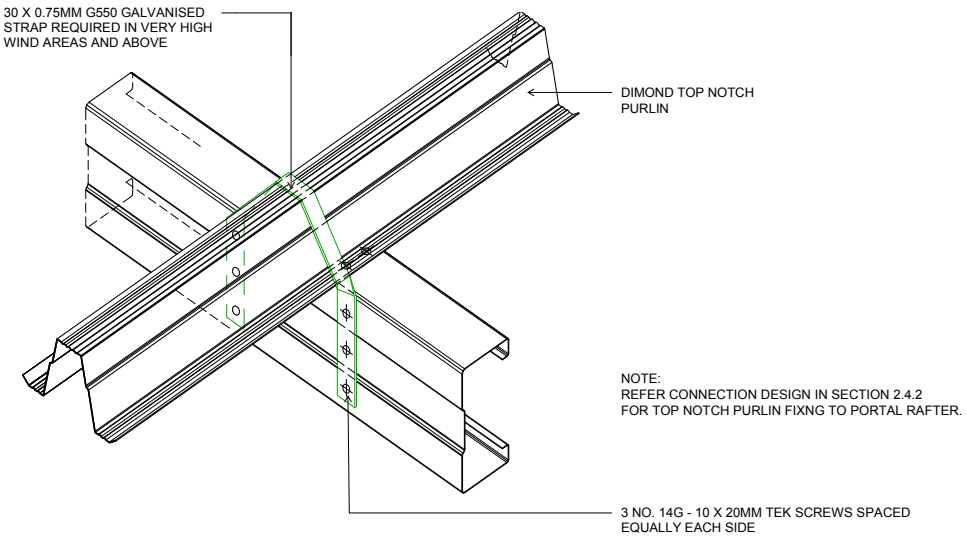
(5) Choose from: Type 17 (timber), Metal Teks (steel).

TOP NOTCH PURLIN SYSTEM COMPONENTS

SUPPORT STRAP

Additional hold-down straps are required in very high wind zones and above for Top Notch purlins in a continuous internal span configuration, as specified by the design engineer.

Manufactured from 0.75mm BMT x 30mm galvanised steel strip, which is tied over the Top Notch purlin and fastened each side into the support structure as detailed below.



TOP NOTCH PURLIN SYSTEM CAD DETAILS

For the latest Top Notch CAD details, please download from the Dimond Structural website
www.dimondstructural.co.nz/products/top-notch-purlins

Please note, the Top Notch CAD details are to be used as a guide only and are not intended for construction. Specific design details are required to be provided by the design engineer.

INSTALLATION - PURLIN SYSTEMS

GENERAL

The fixing of Dimond Structural Purlin Systems is generally carried out by steel fabricators and riggers who are familiar with installation of Dimond Structural Purlin Systems.

Dimond Structural Purlin Systems are not intended to be installed by builders, handymen, home owners etc. without appropriate experience.

SAFETY CONSIDERATIONS

It is important to follow Health and Safety protocol established for the site as well as identifying on-site hazards and hazards during handling and installation of Dimond Structural Purlin Systems, which may include (but are not limited to) the following:

- Weather conditions can cause the steel purlin/girt/bracing surfaces to become slippery.
- Working at height requires suitable fall arrest and/or perimeter barriers, including barriers around open areas.
- Muscle or back strain from manual handling.
- Where required, timber used with Dimond Structural Purlin Systems can cause splinters.
- Inadequate fastening of Dimond Structural Purlin Systems to the support structure can result in collapse during construction.
- Handling of Dimond Structural Purlin Systems requires the use of gloves made from appropriate material to resist cuts from sharp steel edges and corners.
- Lifting of bundles of Dimond Structural Purlin Systems requires attention to correct lifting equipment and attention to hazards with bundles lifted overhead.
- DHS purlins and Top Notch purlins are not suitable for 'walking the purlins' during construction as manufacturing lubricant may be present.

Pre-installation safety checks must include (but are not limited to) the following:

- Ensure all personnel involved on site are aware of the potential hazards and appropriate safety equipment, and PPE is available and all personnel are trained in its use.
- PPE should include at least: safety boots, hard hat (with chin-strap), Hi viz vest, gloves (long sleeves and long pants are advised).
- If temporary structure is to be used, ensure this has been specifically designed and is installed securely prior to placement of Dimond Structural Purlin Systems.

HANDLING AND STORAGE

Correct handling and storage is critical to ensure the Dimond Structural Purlin System is not damaged on site. The following points must be adhered to for maximum product durability and performance over the expected life of the product.

- When delivery is taken on site, a visual inspection of the materials supplied is required to ensure the product is free from damage and the galvanised coating is in good condition to protect the steel substrate.
- Replace any damaged product. Product with a distorted or buckled section shape must not be installed.
- Site storage must be clear of the ground on dunnage to allow the free movement of air around each bundle. When product is stored on site, it must be kept dry using covers over each product bundle. Any product showing white or red rust corrosion is required to be replaced and must not be used without Dimond Structural approval. Contact Dimond Structural on 0800 Roofspec (0800 766 377).
- Move product by lifting rather than dragging as damage to the galvanised coating will occur.
- Bundle labels should be checked to ensure the correct product and lengths are placed in the designated area.
- Bracing Systems must not be relied upon to act as lifting points during craneage of pre-assembled sections.

GENERAL FIXING AND WORKMANSHIP

The following points provide guidance on general fixing and workmanship for Dimond Structural Purlin Systems,

- Bundle labels should be checked to ensure the correct size and type is used for the designated area.
- DHS Purlins/girts are placed on the upside of the portal cleat (or at premarked centres for Top Notch purlins), and fixed onto the cleat or rafter.
- Installation of DHS Purlin Systems relies on the correct bolt type, diameter and washer being located through each cleat hole and tightened.
- Washers are to be used, placed against each side of the DHS purlin/girt under the nut and bolt head.
- Bolts are tightened using the part turn tightening method, commonly termed snug fit. There are two stages, the first involves bringing the mating surfaces of the joint into effective contact by initially tightening the bolt. The second stage involves marking the bolt and nut relative to each other and then completing a further half turn.
- Self-drilling fasteners are installed as per the engineer's specification, and tightened with mechanical drivers set to a preset torque setting. Avoid overtightening as this may damage the galvanised coating.
- Lapped Purlin/Girt Systems require additional fasteners to be installed in the lapped region. Refer CAD Details on-line, for the DHS Purlin System (**www.dimondstructural.co.nz/products/dhs-purlins**) or for the Top Notch Purlin System (**www.dimondstructural.co.nz/products/top-notch-purlins**).
- Additional support straps for Top Notch purlins may be required as specified by the design engineer. Refer Support Strap 2.4.8.1.
- The purlin system must not be subject to or installed on spans that are excessive for the construction loads. All construction loads must have the design engineer's approval, prior to loading.
- All connections including those between the purlin system and primary structural framework must be fully fixed and tightened before any loads are applied. Similarly bracing members must be correctly positioned and fastened prior to installation of the roofing or cladding.
- Gas cutting of holes, or welding of members or connections is not recommended, as these may cause an unacceptable loss of member strength capacity. In addition, gas cutting or welding will remove the galvanised coating locally around the welded area, reducing the product's durability.
- The recommended method for cutting Top Notch purlins is either by hacksaw or shear cut such as tin snips. If using an abrasive disc blade, care must be taken to ensure the swarf doesn't fall on other products causing rust stains. After cutting, the burred cut edge must be cleaned off and primed with a zinc rich primer.
- Roofing and wall cladding sheets can not be installed until the roofing contractor is satisfied that the support structure is complete, sound, and correctly aligned. This includes support around penetrations and openings.
- Curved roofs (whether draped/rolled or crimped) require purlin alignment within ±5mm to minimise the risk of unacceptable finished appearance.
- Suspended loads (such as ducting and piping) must not be hung from DHS purlin lips. Suspended loads are connected to the DHS purlin web or, if this is not possible, to the DHS purlin bottom flange within 25mm of the web. DHS Bracing Systems are not suitable for hanging suspended loads. For Top Notch purlins, suspended loads must be connected to both Top Notch bottom flanges or with straps tied over the Top Notch top flange. Hanging of suspended loads from Dimond Structural Purlin Systems requires specific design by the design engineer.
- Dimond Structural Purlin Systems are not intended to be used as members to which fall arrest anchor points are attached.

BRACING SYSTEM INSTALLATION

Prior to the DHS purlin/girt system being fully installed and loads applied, the bracing system must be installed. Bracing systems are either Fastbrace or Bolted Brace Channel systems which run in continuous lines between all purlins/girts.

Practically, to avoid pulling the weight of all the purlins up the roof slope (or girts up the wall), the bracing system should be installed from the ridge down for DHS purlins (or from the eaves down for DHS girts).

Bolted Brace Channels rely on placing and tightening one bolt/washer/nut assembly through each of the top and bottom bracing holes through the brace cleats each side of the purlin.

Purpose-made cranked sag rods are installed at each bracing line in the lower holes on the DHS ridge purlins, to tie the bracing lines on each side of the rafter together at the ridge (or at a step in the roof). These rods are fitted with washers and double nuts and fully tightened up upon installing purlin bracing.

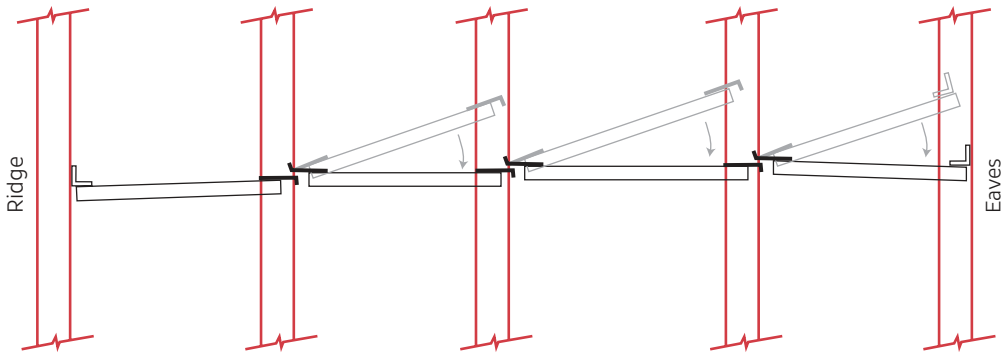
Adjustable Brace channels allow up to 20mm adjustment to be made anywhere in the bracing system, simply by installing this adjustable brace and fully tightening the hexagonal flange bolts. Refer Fastbrace 2.3.8.1 and Bolted Brace Channel 2.3.8.2.

Note, alternating brace channel and sag rods have been superseded by the use of Fastbrace and/or Bolted Brace Channel systems which run in continuous lines between all purlins/girts.

FASTBRACE INSTALLATION

Installation of Fastbrace starts from the ridge and works down the roof slope, but the first row of Fastbrace must be bolted off on the top purlin before beginning the next row. For clarity, the procedure is illustrated for DHS purlins (girts are similar except the procedure starts at the eave and works down the wall).

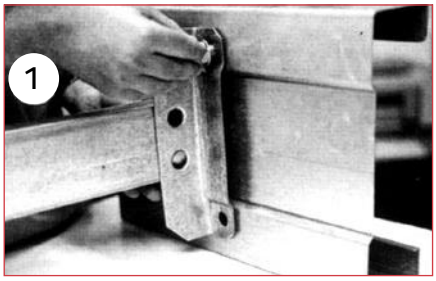
Standard Installation Procedure

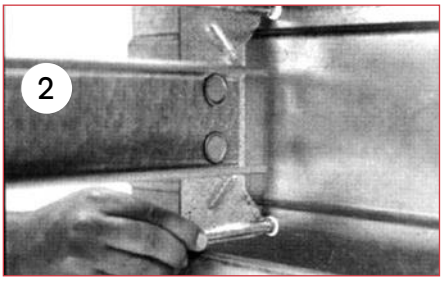


Note: As the eaves and ridge braces are bolted, there is a 25mm offset to the bracing line. This offset can be aligned, refer Fastbrace 2.3.8.1.

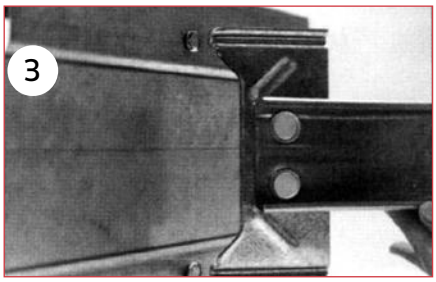
1. The end cleat is bolted to the purlin at the ridge.

   It is critical to ensure that the bolted cleat at the ridge is on the left of the channel component (looking from the ridge down).



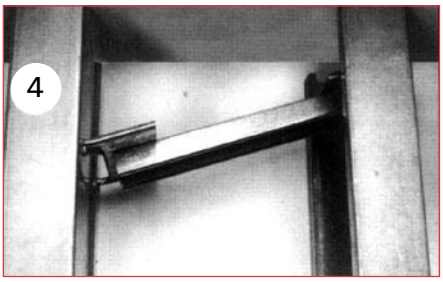


2. The locking tabs at the other end of the brace are then fitted into the second DHS purlin down the rafter and pushed to the right to lock half of the hole (looking from the ridge down).



3. The second brace is then inserted at a 45 degree angle into the other side of the second purlin. The Fastbrace is rotated until square to the purlin, locking the second half of the hole, fully engaging the locking tabs.

   Ensure all locking tabs are fitted into the purlin holes.



4. Fit the other end of the brace into the next purlin. Repeat steps 3 and 4 of the process until the End Brace is bolted to the eave purlin.