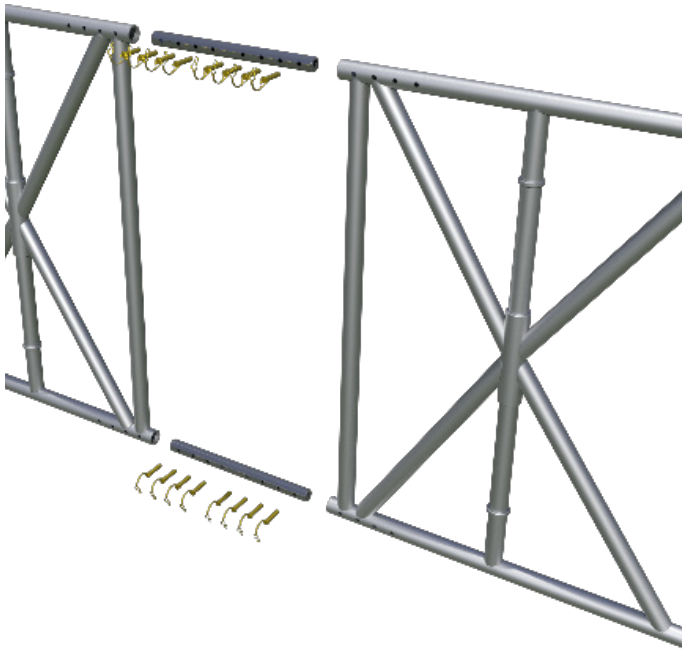
GENERATION

Lattice Beam
User Guide

LW/06.19



Generation UK Ltd
Trinity Street, Off Tat Bank Road,
Oldbury, West Midlands, B69 4LA
Tel: 0800 779 7113
Email: enquiries@generationuk.co.uk
www.generationuk.co.uk

ALTRAD
GENERATION
HIRE & SALE
SCAFFOLDING
ACCESS
GROUNDWORKS

GENERATION SCAFFOLDING AND ACCESS
SUPPORT FOR CONSTRUCTION AND INDUSTRY

Generation is the largest UK supplier of access, scaffolding, safety and training products.
Our customer promise is to deliver the:

BEST **QUALITY**
We work in partnership with our suppliers to ensure we deliver consistent quality every time. We guarantee that our hire and sales products will meet and conform or exceed all statutory requirements and not let you down.

BEST **AVAILABILITY**
We have the largest available UK inventory of scaffolding, access and safety products. Our branch network and delivery fleet will ensure that we deliver what you need, when you need it.

BEST **PARTNERSHIP**
We provide a full range of engineering, design and business services to partner and work with our customers. Talk to us today about how we can help you to grow your business.

BEST **PRICES**
We use our position as the largest UK supplier of scaffolding products to negotiate the best rates for you. We guarantee you will get the best value products and service when you hire or buy from us.

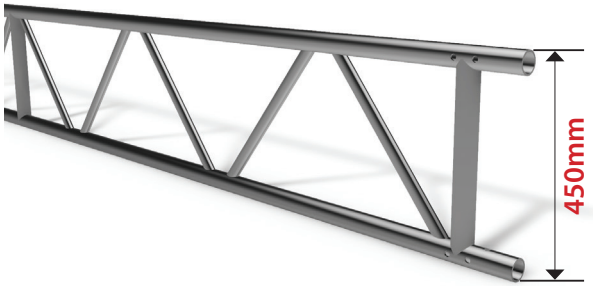
Contents

450 Beam

Permissable Moment - 20.2kNm
Permissable Shear - 11.7kN

BS EN 1999-1 (1.2m Restraints)		
Code	**Product**	**Weight**
277499	4.1m Beam	16.18kg
277490	6.1m Beam	23.94kg
277500	8.1m Beam	31.70kg
277501	Spigot	2.50kg
277631	Spring Clip	0.025kg

2 Spigots required per connection
8 Spring Clips required per connection

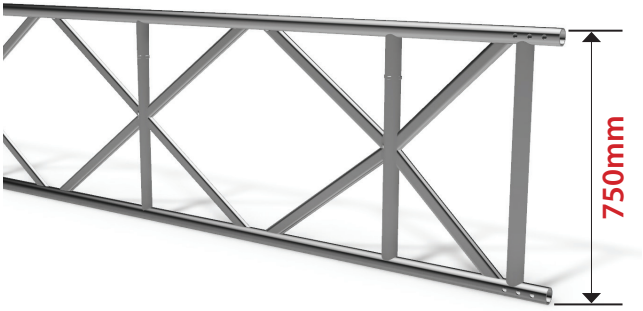


Asterix 750 Beam

Permissable Moment - 41.3kNm
Permissable Shear - 23.7kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
397010	1.0m Beam	8.50kg
397020	2.0m Beam	15.00kg
397030	3.0m Beam	21.60kg
397040	4.0m Beam	28.20kg
397050	5.0m Beam	34.75kg
397060	6.0m Beam	41.40kg
397001	Spigot	0.72kg
227631	Spring Clip	0.025kg

2 Spigots required per connection
12 Spring Clips required per connection

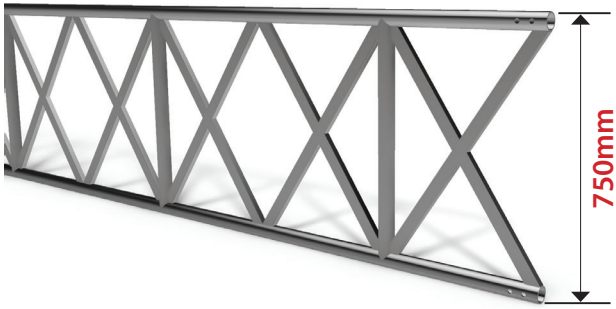


X Beam

Permissable Moment - 35.0kNm
Permissable Shear - 35.0kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
395001	1.0m Beam	6.30kg
395003	3.0m Beam	19.00kg
395004	4.0m Beam	25.30kg
395010	Spigot	2.00kg
277631	Spring Clip	0.025kg

2 Spigots required per connection
8 Spring Clips required per connection



D78 Beam

Permissable Moment - 38.8kN
Permissable Shear - 23.7kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
398010	1.0m Beam	6.34kg
398020	2.0m Beam	11.63kg
398030	3.0m Beam	16.92kg
398040	4.0m Beam	22.21kg
398001	Spigot	1.49kg
277631	Spring Clip	0.025kg

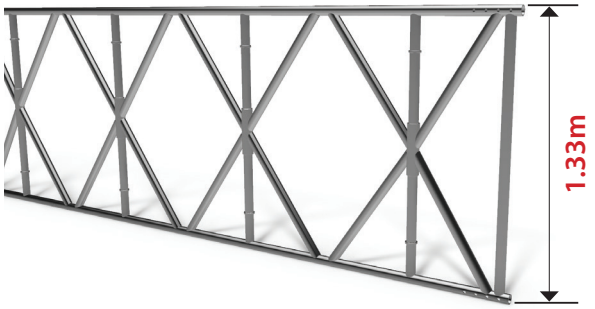
2 Spigots required per connection
12 Spring Clips required per connection

Heavy Duty Asterix Beam

Permissable Moment - 102.2kNm
Permissable Shear - 32.6kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
396055	1.33 x 0.55 Beam	6.33kg
396100	1.33 x 1.0 Beam	13.33kg
396200	1.33 x 2.0 Beam	22.60kg
396300	1.33 x 3.0 Beam	31.87kg
396400	1.33 x 4.0 Beam	41.13kg
396900	Spigot	1.44kg
277631	Spring Clip	0.025kg

2 Spigots required per connection
16 Spring Clips required per connection

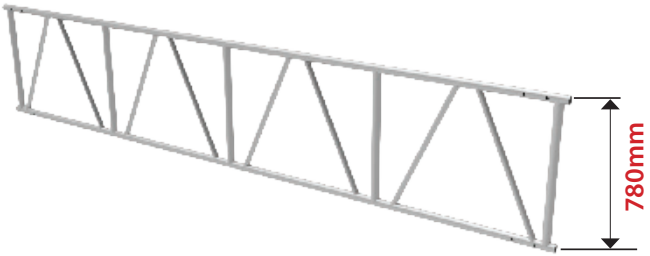


UBIX Beam

Permissable Moment - 36.5kNm
Permissable Shear - 23.7kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
440007	3.0m Beam	16.92kg
440008	4.0m Beam	22.21kg
440009	5.0m Beam	27.50kg
440010	6.0m Beam	32.79kg
440011	Spigot	1.49kg
277631	Spring Clip	0.025kg

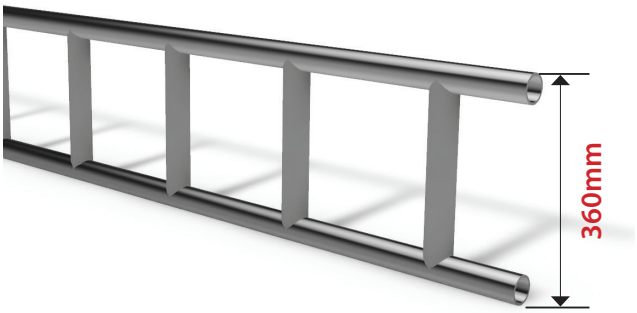
2 Spigots required per connection
8 Spring Clips required per connection



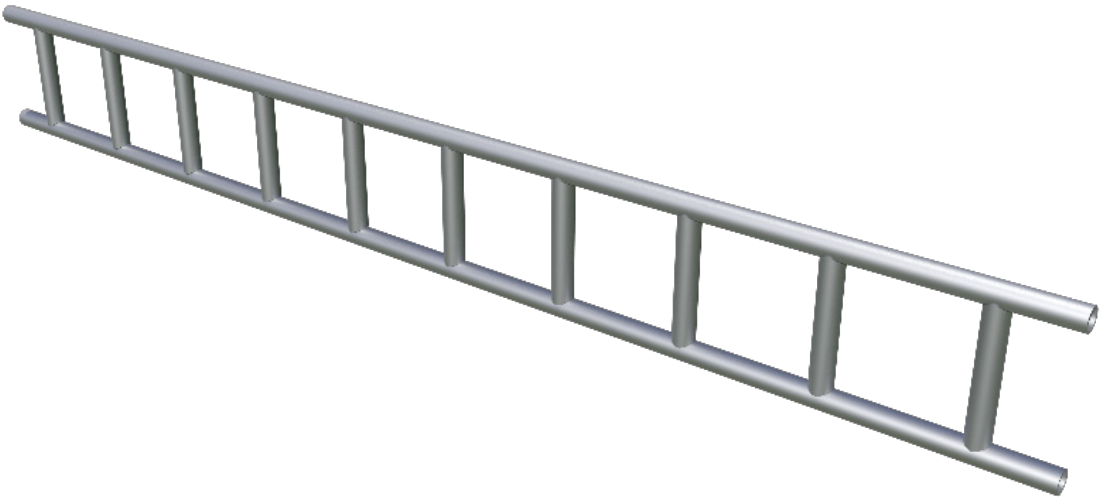
Steel Ladder Beam

Permissable Moment - 11.7kNm
Permissable Shear - 20.0kN

BS EN 1999-1 (1.0m Restraints)		
Code	**Product**	**Weight**
055015	6ft Beam	18.40kg
055073	8ft Beam	24.40kg
055070	10ft Beam	30.70kg
055084	13ft Beam	39.80kg
055075	16ft Beam	50.00kg
055077	21ft Beam	64.30kg



For further information or guidance please call our Technical Department on 0121 543 2950 or email technicaldepartment@generationuk.co.uk



Introduction

This user guide has been prepared in accordance with the guidance set out within BS EN12810-01:2003 clause 8, the NASC Code of Practice and is only applicable to Generation UK lattice beams other applications such as temporary roof systems are outside the scope of this guide and should be designed by a competent engineer.

Safety Information

Scaffold erectors must wear a harness for beams erected or dismantled more than 4m above ground.

Also adhere to all Health and Safety regulations and the requirements of the latest NASC SG04 guidance.

Please ensure the following:

- Foundations are capable of resisting all increased design loads.
- Building materials on platforms do not overload the scaffold. All materials should be placed near to supports as possible.
- All lattice beams have adequate lateral restraints to the compression chord. This can be achieved using tube and fittings in accordance with BS EN12811, EN39 & EN74.
- Platform units or boards are secured against lifting.
- All gaps between platform units or boards are not exceeding 25mm.
- All platforms are free from trip hazards.
- All working areas are as level as possible.
- Access and working areas have side protection, a minimum of double guardrails and toe boards in addition to any cladding.
- Lattice beam installations comply with engineer's drawings, also ensure the designer has checked and certified them prior to use.
- Lateral stability is provided by ties to the adjacent building or structure. Further ensure the building or structure can support the intended loads.
- A rigid vertical plane of scaffold by adequately plan and cross bracing lattice beams.
- All connections between beams and spigots are secured and can be easily monitored against accidental disconnection.
- A competent person carries out an inspection of the scaffold before use and report issued and filed.
- Ties are not removed without supervision. When a tie has to be removed first fix alternative ties and seek designers advice on where bracing should be added before use.

General Description of a Lattice Beam

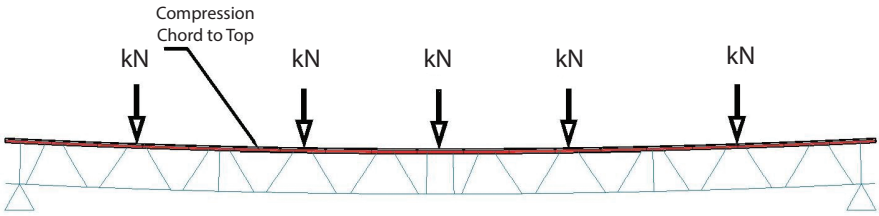
Aluminium Lattice beams consist of top and bottom chords separated by vertical uprights. Lattice members are tubular sections positioned at angles to the chords to allow forces to pass from top chord to bottom chord. Beams work to their capacity when held in place (restrained) along the full length of the compression chord. This fully restrained condition is NOT normal in scaffolding applications; therefore they will tend to buckle between the lateral restraints (lacing) to the compression chord.

Lateral restraints (lacing) are normally tube and fitting members running at 90 degrees to the direction of the beams. As the gap between lacing increases, the capacity of the beam reduces.

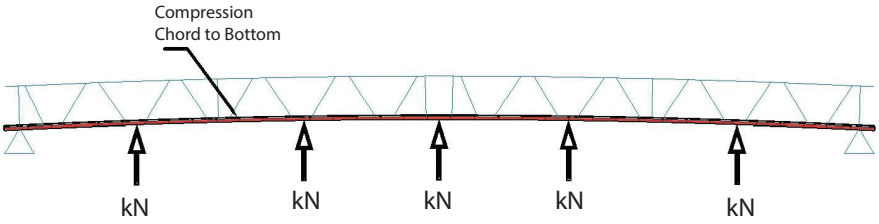
Beam Support Conditions (Showing compression chords)

Simply supported beam arrangement

Beams spanning between two supports with load also acting between supports. For loads acting downwards the top chord will be in compression. For loads acting upwards (wind) the bottom chord will be in compression.



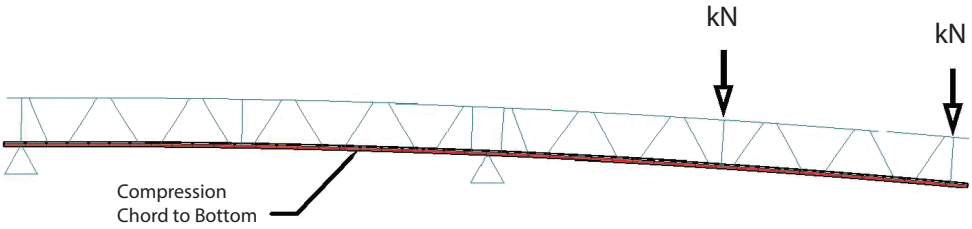
SIMPLY SUPPORTED BEAM
downward loads



SIMPLY SUPPORTED BEAM
upward loads (wind)

Cantilevering beam arrangement

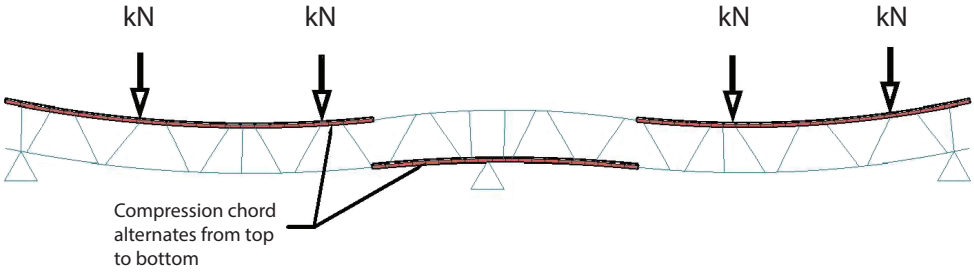
Beam spanning beyond a minimum of two supports, with loading acting outside of supports. For loads acting downwards the bottom chord will be in compression. For loads acting upwards the top chord will be in compression.



CANTILEVER BEAM
downward loads

Continuous beam arrangement

Beams spanning over a minimum of three supports with loads acting upwards or downwards on the spans. The compression chord will vary along the length of the beam.



CONTINUOUS BEAM
upwards loads

Beam Lacing & Bracing

Important note:

It is important to lace and brace (restrain) the compression chord at the correct centres to achieve the loading values stated for our beams. Incorrect installation of lacing & bracing will reduce beam capacity. This may result in collapse.

Lacing is required to every bay of beams with plan and cross bracing normally to every 5th bay.

Plan bracing is required to the compression chord fixed at lacing tube positions along the beams.

Compression chord lacing is normally achieved by using tube & fittings coupled at 90 degrees to beam direction (from compression chord to compression chord). Beam capacities vary according to the spacing of this lacing. (For the required spacing refer to technical information sheet).

Tension chord lacing is required to half of the amount of compression chord lacing. This is positioned at every other compression chord lacing position.

Cross bracing is required from the tension chord to the compression chord in alternate directions at the tension chord lacing positions along the beams. Cross bracing is also required at supports and beam end positions. See figure 1 (page 11) (typical 5No. bay arrangement).

Where the compression chord varies along the length of the beam (continuous beam arrangements), then compression chord lacing & plan bracing will be required to both top and bottom chords.

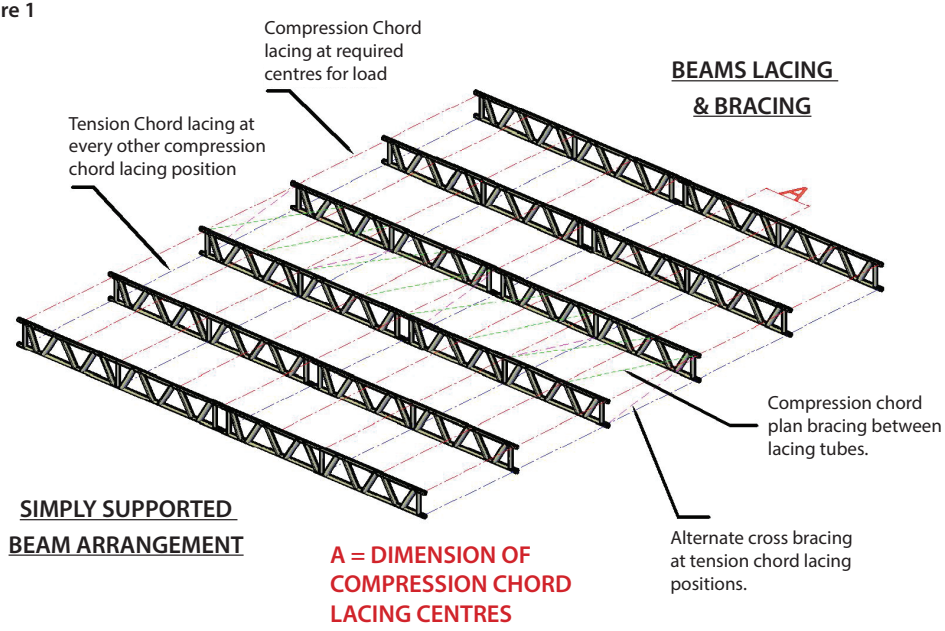
Lacing and bracing to beams will create stability for scaffolding to be built off. This does not apply to roofing systems which require specialist bracing frames fitted to manufactures specification.

Typical 5 No. bay beam arrangement

The beam layout, lacing and bracing arrangement indicated below is for beams with a simply supported spans and vertical loads (applied downwards between supports).

For dimension' A' refer to technical information sheets. (Lateral Restraints)

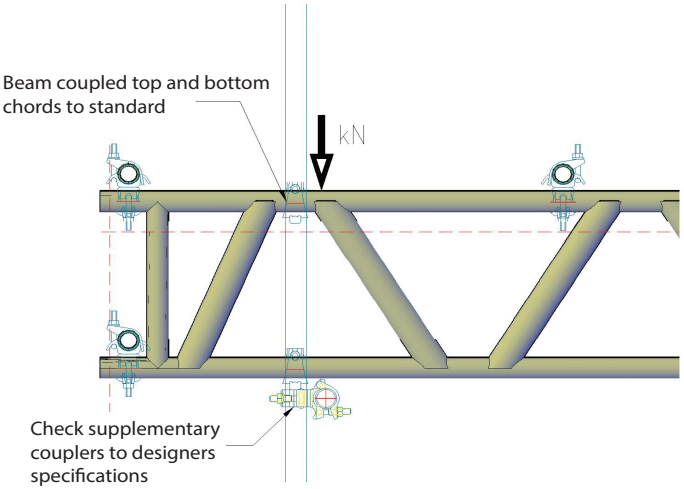
Figure 1



Beam End Connections

At ends of beams loads are often very high, where beams are supported by standards they should be coupled to top and bottom chords with any supplementary/check couplers secured in accordance with the design engineers drawing prior to use.

Figure 2



BEAM END CONNECTION

Support and loading positions should be at node points (see preferred coupling positions) along beams. If this cannot be achieved then refer to chord strengthening notes below.

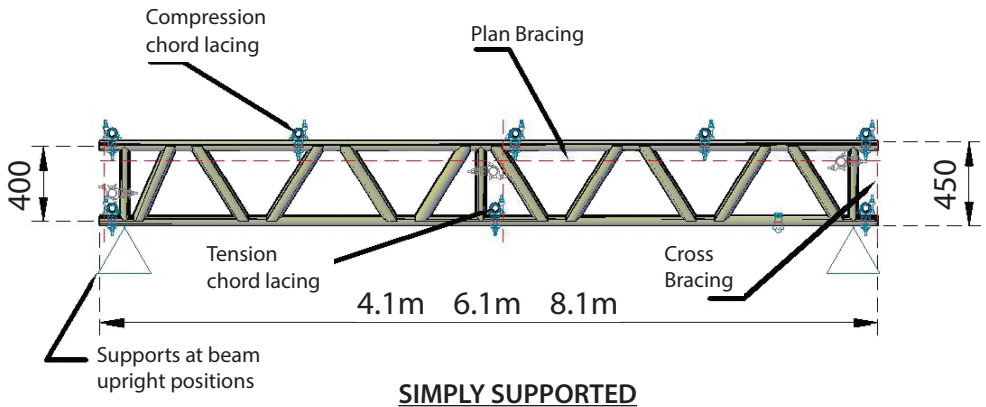
Beam bracing must be installed and checked in accordance with the design engineers' drawings, by a competent scaffold engineer or designer prior to use.

All secondary plan, (to enable loads to pass into a permanent structure via ties) ledger and face bracing (to take loads down to the ground) must also be checked by a competent scaffold engineer or designer prior to use.

Preferred coupling positions (Aluminium Beams)

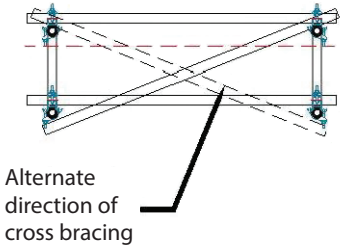
It is preferred for all lacing or bracing couplers to be fixed at points along top and bottom chords. Coupling to uprights should be avoided (as uprights may have thinner wall thickness) See diagram below.

Figure 3



SIMPLY SUPPORTED

450 R Beam Arrangement showing preferred fixing positions

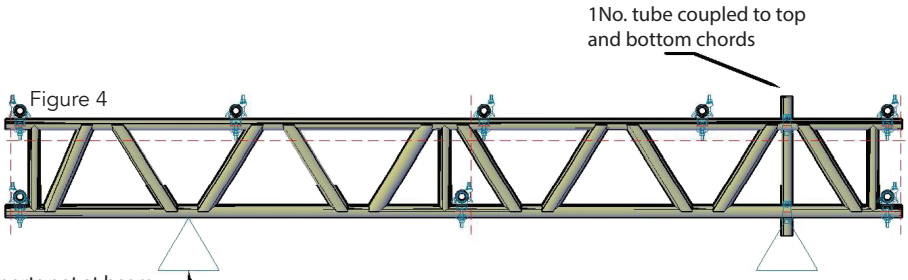


SECTION THROUGH

Chord Strengthening (Aluminium Beams)

Where supports (standards) cannot be coupled to top and bottom chords e.g. if the beam is not adjacent to standard and supported by primary beams then chord strengthening may be required. If a beam must be supported at a weak point along the chord, then firstly look at turning the beam upside down. If this creates a weak point at a support elsewhere along the beam then local strengthening to the chord will be required. (For details of strengthening positions, refer to technical information sheet).

Figure 4



CHORD STRENGTHENER

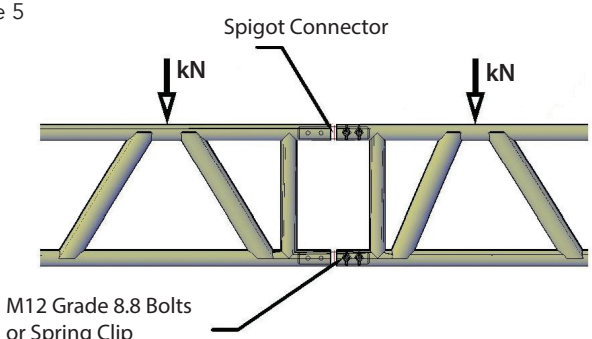
Typical Arrangement

Spigot Connections

Spigot connectors can be inserted at the ends of beams to join two beams together; this will extend the overall beam length. The spigot forms a joint to the top and bottom chords of two separate beams. Spigot connector must be secured in place correctly using M12 Grade 8.8 bolts or spring pins to either end of the spigot (for the quantity of fixings refer to technical information sheet). Regular inspections of the bolts must be performed to ensure they have not worked loose (due to beam deflection).

The allowable tension force in the spigot is high enough to withstand the full design load in the beam chords to pass through the joint safely.

Figure 5

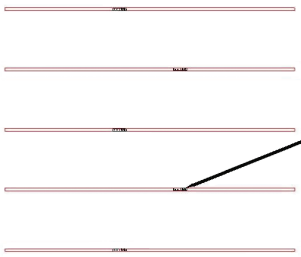


TYPICAL SPIGOT CONNECTION

It is recommended to avoid vertical point loads at spigot joint locations. See figure 5 above

When several bays of multiple beams (spigot jointed) are laced together it is also recommended to use two different lengths of beam to allow the spigot joints to be staggered, thus varying the point of maximum deflection and bending. See figure 6 below.

Figure 6



STAGGERED SPIGOT CONNECTION

Hire and Sale Branches Freephone:

0800 779 7113

Birmingham (West)
Trinity Street Off Tat Bank Road,
Oldbury, West Midlands, B69 4LA
T: 0121 544 3355 F: 0121 544 3131
E: birmingham@generationuk.co.uk

Birmingham (East) G
87-93 Amington Road, Birmingham,
West Midlands, B25 8ET
T: 0121 706 0000 F: 0121 706 9832
E: birminghameast@generationuk.co.uk

Bristol
Unit 7, 12-16 Foundry Lane, Fishponds,
Bristol, BS5 7UE
T: 0117 972 4550 F: 0117 972 4502
E: bristol@generationuk.co.uk

Cardiff
Martin Road, Tremorfa Industrial Estate
Cardiff, CF24 5SD
T: 029 2046 3835 F: 029 2046 3246
E: cardiff@generationuk.co.uk

Edinburgh
4 Westerton Road,
East Mains Industrial Estate, Broxburn,
West Lothian, EH52 5AU
T: 01506 863 864 F: 01506 863 916
E: edinburgh@generationuk.co.uk

Frimley (West London)
22-30 Sturt Road, Frimley Green
Camberley, GU16 6HY
T: 01252 838 696 F: 01252 837 614
E: frimley@generationuk.co.uk

Gateshead G
Stoneygate Lane, Abbotsford Road,
Felling, Gateshead, NE10 0EX
T: 0191 469 7504 F: 0191 469 8237
E: gateshead@generationuk.co.uk

Glasgow
Duchess Road, Rutherglen
Glasgow, G73 1AU
T: 0141 647 6969 F: 0141 647 5851
E: glasgow@generationuk.co.uk

Grays G
Europa Business Park, Magnet Road,
Grays, Essex, RM20 4DB
T: 01375 312 120 F: 01375 386 844
E: grays@generationuk.co.uk

Leeds
Unit 2 Ledger Park, Haigh Park Road,
Stourton, Leeds LS10 1RT
T: 0113 277 8822 F: 0113 277 7545
E: leeds@generationuk.co.uk

London (East)
Unit H, Hangman's Wood Ind Park,
Stifford Road, South Ockendon,
Essex, RM15 6RL
T: 020 7473 6056 F: 01708 858 493
E: london@generationuk.co.uk

Newcastle
Forward House, Portobello Road
Portobello Industrial Estate, Birtley,
Tyne and Wear, DH3 2SN
T: 0191 492 1190 F: 0191 411 1148
E: newcastle@generationuk.co.uk

Northampton
Kingsfield Way, Dallington,
Northampton, NN5 7QN
T: 01604 580 444 F: 01604 580 487
E: northampton@generationuk.co.uk

Salsburgh G
Duntilland Road, Shotts, Salsburgh,
North Lanarkshire, ML7 4NZ
T: 01698 870 200 F: 01698 870 159
E: salsburgh@generationuk.co.uk

Stockport
Unit 4 Vauxhall Industrial Estate,
Greg Street, Reddish,
Stockport, SK5 7BR
T: 0161 477 0131 F: 0161 477 7618
E: stockport@generationuk.co.uk

West Thurrock (East London)
4 Riverside Ind. Park, Oliver Road,
West Thurrock, RM20 3ED
T: 020 7476 4760 F: 020 7476 3157
E: westthurrock@generationuk.co.uk

Widnes G
Pitt Street, West Bank, Widnes,
Cheshire, WA8 0TG
T: 0151 420 3331 F: 0151 495 2298
E: widnes@generationuk.co.uk

Altrad Training Services
Unit 20B Greens Industrial Park,
Calder Vale Road, Wakefield, WF1 5PH
T: 01924 370 640 F: 01924 377 530
Freephone: 0800 587 5224
E: training@altraduk.co.uk

Generation Export
Trinity Street, Off Tat Bank Road
Oldbury, West Midlands, B69 4LA
T: +44 (0) 121 543 2964
E: export@generationuk.co.uk

Generation UK Head Office
Trinity Street, Off Tat Bank Road
Oldbury, West Midlands, B69 4LA
T: 0121 543 2950 F: 0121 543 2953
E: enquiries@generationuk.co.uk

G GROUNDWORKS

ALTRAD GENERATION HIRE & SALE SCAFFOLDING ACCESS GROUNDWORKS

GENERATION UK Ltd
Generation Head Office, Trinity Street, Off Tat Bank Road, Oldbury, West Midlands, B69 4LA - United Kingdom
Tel. 0121 543 2950 - Fax. 0121 543 2953 - enquiries@generationuk.co.uk
www.generationuk.co.uk