



Global Excellence since 1857



CEE-plus™, ZEE-plus™ and ZED-plus™ Purlin & Girt Design and Installation Guide



LYSAGHT® CEE-plus™, ZEE-plus™ & ZED-plus™ are products specially designed and developed for purlin and girt application, which not only provides economy to the building construction, but also helps in keeping the site clean and environment friendly.

LYSAGHT® CEE-plus™, ZEE-plus™ & ZED-plus™ sections are accurately roll-formed from high strength zinc-coated steel, pre-punched to the required dimensions to provide an efficient, lightweight, economical purlin and girts.

These products are suitable for roof, wall support and portal framing up to a certain span. The system, which includes bridging and a comprehensive range of accessories, is supplied as ready for erection.

Material Specifications

LYSAGHT® CEE-plus™, ZEE-plus™ & ZED-plus™ sections are roll-formed from galvanised steel complying with IS 277-2003. In the grades shown, the number prefixed with 'G' indicates minimum yield stress in MPa; and the number prefixed with Z indicates minimum coating mass in g/m².

1.0 mm BMT: G550, Z275

1.9 mm BMT: G350, Z275

2.4 mm BMT: G350, Z275

Note: LYSAGHT® CEE™ & ZED™ section are also available with Zinc coating of 120 g/m². Please contact nearest Tata BlueScope Steel office for further information.

Bolt Specification

LYSAGHT® purlin bolts and nuts have integral washers.

Tighten all bolts to 55 N-m torque. Nominal section size (mm)

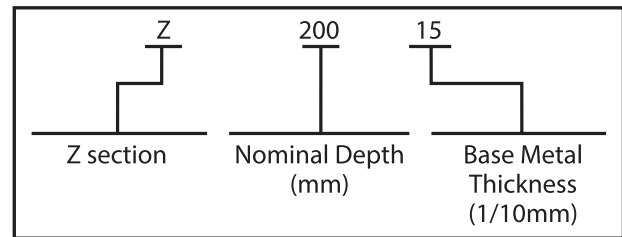
100, 150, 200, 250	M12 purlin bolt standard(grade 4.6) or high strength (grade 8.8)
300*	M16 purlin bolt standard(grade 4.6) or high strength (grade 8.8)

*Non standard items

Size and Dimensions*

The standard sizes for purlins are produced in nominal depth of 100,150,200,240/250 and 300 mm. The sections are generally designed by code number signifying the nominal depth and material thickness and letter prefix to indicate the profile. Purlin are generally produced in thickness of 1.0, 1.2, 1.5, 1.9, 2.4 and 3.0 mm.

* Max 400 mm depth available on request please contact Tata BlueScope Steel office.



Shapes and Sections

Basic cold formed shapes - CEE-plus™, ZEE-plus™ & ZED-plus™ are used for purlins and girts. While each has individual characteristics, perform effectively and in many instances the choice of one section over the other can come down to the personal preference of the designer.



Dimensions and Sectional Properties of LYSAGHT® Purlin & Girts

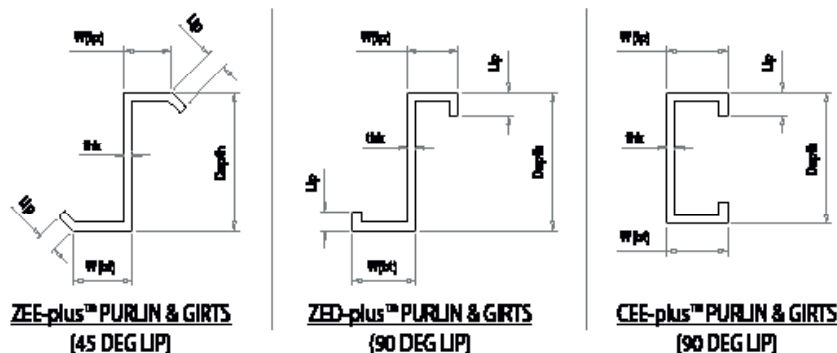


Table 1: LYSAGHT® ZEE-plus™ (45° LIP) PURLIN & GIRTS PROPERTIES

Name	Depth mm	W(Tp) mm	W(Bt) mm	Thk mm	Lip mm	Rad mm	Lip angle deg	Area cm ²	Wt (Kg/m) (275GSM)	Yb mm	Ix cm ⁴	SxTop cm ³	SxBot cm ³	Rx mm	Iy cm ⁴	Sy cm ³	Ry mm
Z15010	152	60	60	1	16	5	45	2.96	2.36	76	108.73	14.31	14.31	60.61	27.06	3.82	30.23
Z15012	152	60	60	1.2	17	5	45	3.57	2.86	76	130.76	17.21	17.21	60.54	33.42	4.68	30.61
Z15015	152	60	60	1.5	18	5	45	4.47	3.56	76	163.34	21.49	21.49	60.42	42.84	5.95	30.94
Z15019	152	60	60	1.9	19	5	45	5.68	4.49	76	206.19	27.13	27.13	60.24	55.43	7.65	31.23
Z15024	152	60	60	2.4	20	5	45	7.18	5.64	76	258.82	34.06	34.06	60.02	71.23	9.76	31.49
Z20015	200	70	70	1.5	19.8	5	45	5.55	4.46	100	343.29	34.33	34.33	78.66	66.12	7.94	34.52
Z20019	200	70	70	1.9	23	5	45	7.13	5.7	100	439.8	43.98	43.98	78.57	91.19	10.69	35.78
Z20020	200	70	70	2.0*	23	5	45	7.49	6	100	461.98	46.2	46.2	78.52	95.7	11.22	35.74
Z20024	200	70	70	2.4	23.8	5	45	9	7.17	100	552.39	55.24	55.24	78.35	116.19	13.57	35.93
Z20030	200	70	70	3	24.8	5	45	11.25	9.1	100	685.89	68.59	68.59	78.08	146.91	17.08	36.14
Z24015	240	70	70	1.5	27.3	5	45	6.37	5.13	120	549.62	45.8	45.8	92.86	82.53	9.32	35.98
Z24019	240	70	70	1.9	28	5	45	8.08	6.46	120	693.76	57.81	57.81	92.69	105.38	11.86	36.13
Z24024	240	70	70	2.4	28.8	5	45	10.2	8.13	120	872.13	72.68	72.68	92.47	134.17	15.05	36.27
Z24030	240	70	70	3.0	29.8	5	45	12.75	10.28	120	1084.05	90.34	90.34	92.21	169.5	18.92	36.46
Z30019	300	95	95	1.9	23	5	45	9.94	7.98	150	1341.32	89.42	89.42	116.18	185.03	17.11	43.15
Z30024	300	95	95	2.4	23.8	5	45	12.56	10.04	150	1689.92	112.66	112.66	115.99	236.47	21.77	43.39
Z30030	300	95	95	3*	24.8	5	45	15.7	12.52	150	2103.74	140.25	140.25	115.75	298.31	27.37	43.59

Please contact Tata BlueScope Steel office before adopting for design. Non standard thickness & sizes are also available on special request.

Table 2: LYSAGHT® ZED-plus™ (90° LIP) PURLIN & GIRTS PROPERTIES

Name	Depth mm	W(Tp) mm	W(Bt) mm	Thk mm	Lip mm	Rad mm	Lip angle deg	Area cm ²	Wt (Kg/m) (275GSM)	Yb mm	Ix cm ⁴	SxTop cm ³	SxBot cm ³	Rx mm	Iy cm ⁴	Sy cm ³	Ry mm
Z15010	152	65	61	1	13	5	90	2.91	2.36	77.04	105.86	14.12	13.74	60.36	23.66	3.73	28.54
Z15012	152	65	61	1.2	16	5	90	3.55	2.86	77.02	128.88	17.19	16.73	60.28	30.77	4.86	29.45
Z15015	152	65	61	1.5	17	5	90	4.44	3.56	77.02	160.54	21.41	20.84	60.12	38.87	6.15	29.58
Z15019	152	65	61	1.9	18	5	90	5.63	4.49	77.01	201.92	26.93	26.22	59.9	49.42	7.84	29.64
Z15024	152	65	61	2.4	20	5	90	7.15	5.64	77.01	253.9	33.86	33.97	59.61	64.02	10.2	29.93
Z20015	203	79	74	1.5	16	5	90	5.58	4.46	102.85	355.03	35.45	34.52	79.75	63.76	8.27	33.8
Z20019	203	79	74	1.9	20	5	90	7.19	5.7	102.83	455.5	45.47	44.3	79.62	87.48	11.38	34.89
Z20024	203	79	74	2.4	22	5	90	9.11	7.17	102.82	574.04	57.3	55.83	79.36	112.92	14.74	35.2
Z250Z15	254	79	74	1.5	18	5	90	6.41	5.13	128.48	607.53	48.4	47.29	97.38	67.14	8.7	32.37
Z250Z19	254	79	74	1.9	19	5	90	8.12	6.46	128.48	766.79	61.09	59.68	97.2	85.38	11.09	32.43
Z250Z24	254	79	74	2.4	21	5	90	10.29	8.13	128.47	968.23	77.13	75.37	97	110.3	14.38	32.74
Z30019	300	100	93	1.9	27	5	90	10.05	7.98	151.97	1357.77	91.72	89.34	116.21	187.31	19.21	43.16
Z30024	300	100	93	2.4	28	5	90	12.69	10.04	151.97	1706.16	115.26	112.27	115.95	236.14	24.29	43.14
Z30030	300	100	93	3*	30	5	90	15.89	12.52	151.96	2126.24	143.63	139.92	115.66	298.65	30.81	43.35

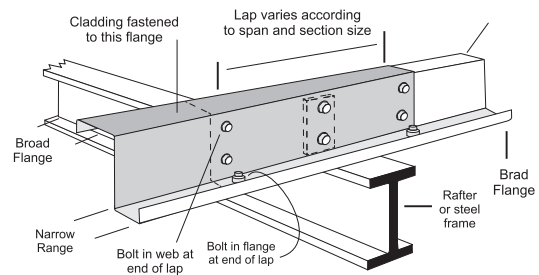
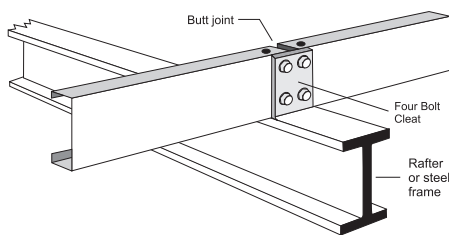
Please contact Tata BlueScope Steel office before adopting for design. Non standard thickness & sizes are also available on special request.

Table 3: LYSAGHT® CEE-plus™ PURLIN & GIRTS PROPERTIES

Name	Depth mm	W(Tp) mm	W(Bt) mm	Thk mm	Lip mm	Rad mm	Lip angle deg	Area cm ²	Wt (Kg/m) (275GSM)	Yb mm	Ix cm ⁴	SxTop cm ³	SxBot cm ³	Rx mm	Iy cm ⁴	Sy cm ³	Ry mm
C10010	102	51	51	1	12.5	5	90	2.16	1.75	51	36.38	7.13	7.13	41.08	7.55	2.19	18.71
C10012	102	51	51	1.2	12.5	5	90	2.58	2.09	51	43.25	8.48	8.48	40.98	8.92	2.59	18.61
C10015	102	51	51	1.5	13.5	5	90	3.22	2.59	51	53.74	10.54	10.54	40.81	11.24	3.29	18.67
C10019	102	51	51	1.9	14.5	5	90	4.09	3.27	51	67.32	13.2	13.2	40.58	14.24	4.21	18.66
C10024	102	51	51	2.4	16	5	90	5.18	4.11	51	83.98	16.47	16.47	40.27	18.09	5.42	18.69
C15010	152	64	64	1	14	5	90	2.95	2.36	76	107.81	14.19	14.19	60.5	15.66	3.46	23.06
C15012	152	64	64	1.2	14.5	5	90	3.53	2.86	76	128.96	16.97	16.97	60.4	18.81	4.17	23.07
C15015	152	64	64	1.5	15.5	5	90	4.43	3.56	76	160.68	21.14	21.14	60.25	23.68	5.29	23.13
C15019	152	64	64	1.9	16.5	5	90	5.61	4.49	76	202.15	26.6	26.6	60.04	30.03	6.75	23.14
C15024	152	64	64	2.4	18.5	5	90	7.12	5.64	76	254.34	33.47	33.47	59.76	38.61	8.79	23.28
C20015	200	76	76	1.5	16.9	5	90	5.55	4.46	100	343.47	34.35	34.35	78.68	40.69	7.43	27.08
C20019	200	76	76	1.9	20.4	5	90	7.12	5.7	100	439.19	43.92	43.92	78.51	54.3	10.11	27.61
C20024	200	76	76	2.4	21.6	5	90	9.00	7.17	100	551.03	55.1	55.1	78.25	68.53	12.84	27.6
C20030	200	76	76	3	23.1	5	90	11.25	9.1	100	683.3	68.33	68.33	77.93	85.65	16.17	27.59
C24015	240	76	76	1.5	24.4	5	90	6.37	5.13	120	548.26	45.69	45.69	92.74	49.78	9.09	27.94
C24019	240	76	76	1.9	25.4	5	90	8.07	6.46	120	691.4	57.62	57.62	92.53	63	11.56	27.93
C24024	240	76	76	2.4	26.6	5	90	10.2	8.13	120	868.23	72.35	72.35	92.27	79.41	14.66	27.9
C24030	240	76	76	3	28.1	5	90	12.75	10.28	120	1077.81	89.82	89.82	91.94	99.08	18.42	27.88
C25015	252	76	76	1.5	16.5	5	90	6.32	5.13	126	588.75	46.73	46.73	96.74	43.19	7.53	26.15
C25019	252	76	76	1.9	18.1	5	90	8.02	6.46	126	745.83	59.19	59.19	96.4	55.53	9.76	26.31
C25024	252	76	76	2.4	20.1	5	90	10.18	8.13	126	941.91	74.76	74.76	96.21	71.39	12.66	26.49
C25030	252	76	76	3	22.5	5	90	12.78	10.28	126	1176.56	93.38	93.38	95.97	90.95	16.32	26.68
C30019	300	96	96	1.9	24.1	5	90	9.92	7.98	150	1336.87	89.13	89.13	116.06	115.76	16.38	34.15
C30024	300	96	96	2.4	26.1	5	90	12.58	10.04	150	1687.56	112.5	112.5	115.84	148.06	21.11	34.31
C30030	300	96	96	3	28.5	5	90	15.78	12.52	150	2107.12	140.47	140.47	115.57	187.65	27	34.49

Please contact Tata BlueScope Steel office before adopting for design. Non standard thickness & sizes are also available on special request.

Typical Connection



Handling and Storage

LYSAGHT® CEE-plus™ and ZED-plus™ sections are delivered in strapped bundles. Ideally, deliveries should be arranged so that the period between delivery and installation is minimised. If not required for immediate use, bundles of purlins should be neatly stacked off the ground and on a slight slope so that water can drain away. If in the open, it should be protected with waterproof covers to prevent the entry of water and / or condensation. If bundle becomes wet, the purlins should be separated, wiped dry and covered. Other accessories should be treated similarly. Bolts and nuts

in particular should be kept clean, dry and free of dirt or dust to prevent difficulties when tightening.

Bundles of purlins must be lifted carefully to avoid damage. Long length should be lifted using a separator bar and fabric slings. Care should be taken to prevent local damage at the lifting points.





Application Area

LYSAGHT® ZED-plus™ and ZEE-plus™ sections may be used over single spans, un-lapped continuous and lapped continuous spans in multi-bay buildings. Lapped continuous spans result in a considerable capacity increase in the system. LYSAGHT® CEE-plus™ sections may be used in single spans and un-lapped continuous spans in multi-bay buildings. CEE-plus™ sections are ideal as eave Purlin or where compact sections are required for detailing. CEE-plus™ sections cannot be lapped.

Corrosion Protection

A zinc coating of Z275 (275 g/m² minimum coating mass) is the standard coating class provided with LYSAGHT® CEE-plus™, ZEE-plus™ and ZED-plus™ sections. This will provide a long and trouble-free life for enclosed buildings and open-sided rural buildings,

in a non-aggressive environment. A non-aggressive environment is 1000 m from rough surf, 750 m from industrial emission and fossil fuel combustion and 300 m from calm salt waters. Consideration must be given to the nature of activities performed within the building. For corrosive environment, please seek advice from Tata BlueScope Steel office.

Compatibility with other Steel Products

The zinc coating on purlin is fully compatible with the zinc and aluminum / zinc coatings used on roof and wall sheeting. If minor damage occurs to the purlin coating, the base steel is protected by its own surrounding coating. Furthermore, the protective coating on the sheeting is not corroded by an un-protected base steel nearby.

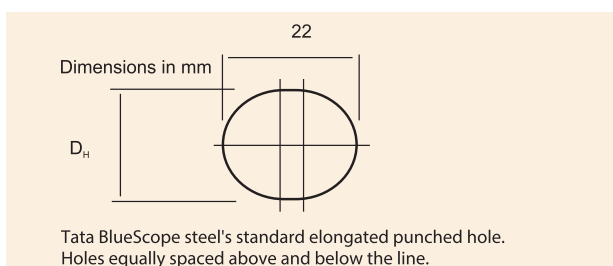
Structural Performance



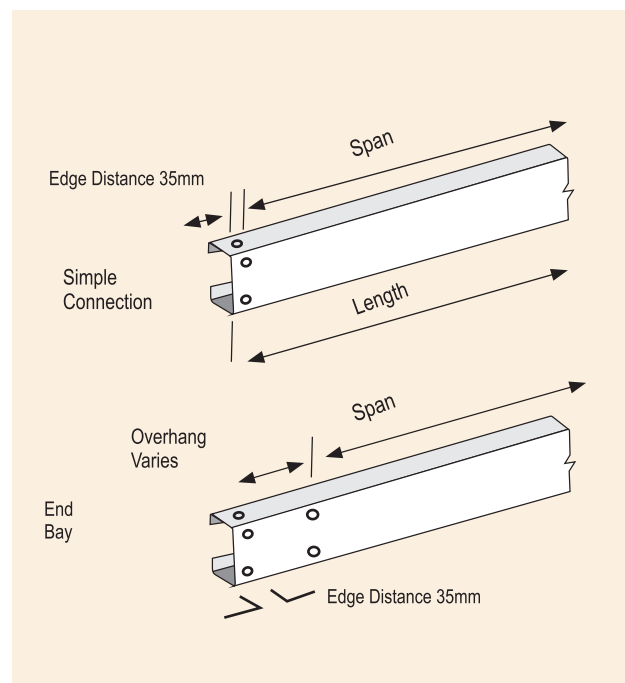
HOLES & CLEATS

LYSAGHT® CEE-plus™, ZEE-plus™ and ZED-plus™ Purlins are normally supplied with holes punched to the Australian Institute of Steel Construction (AISC) gauge lines. The holes are required at cleat supports at ends of laps and at bridging points.

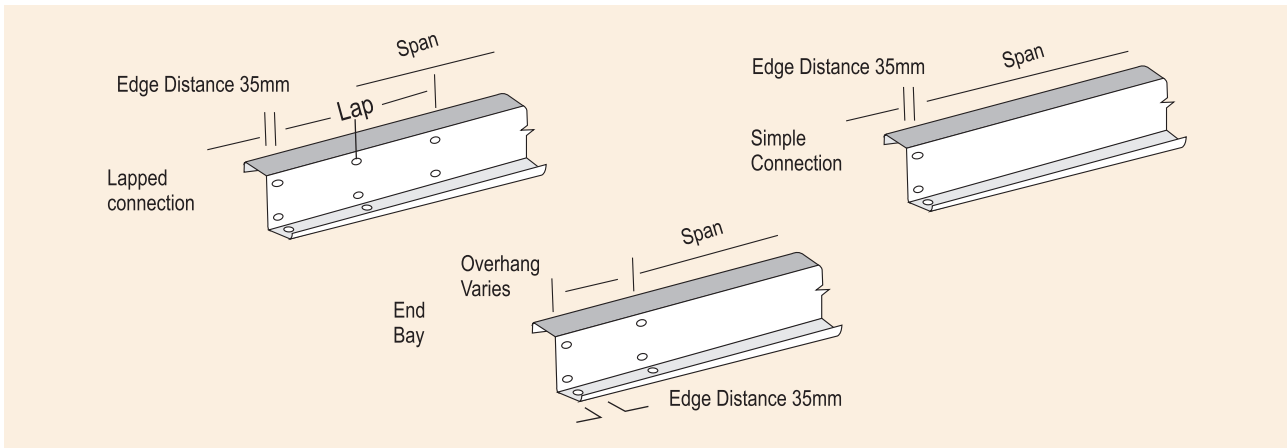
For the 100, 150, 200 and 250 deep sections, our standard hole diameter is 16mm maximum suitable for M12 bolts. For non standard sections like 300, 350 and 400 deep sections, the holes are elongated with dimensions of 18 mm x 22 mm suitable for M16 bolts. Sections are also available un-punched, if required.



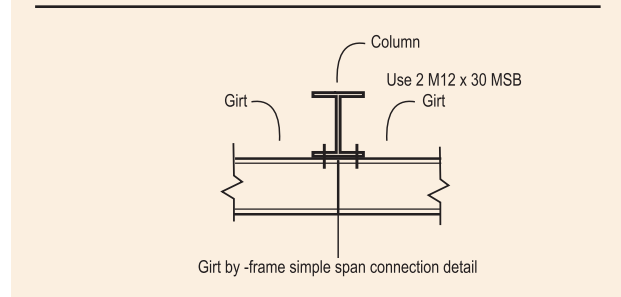
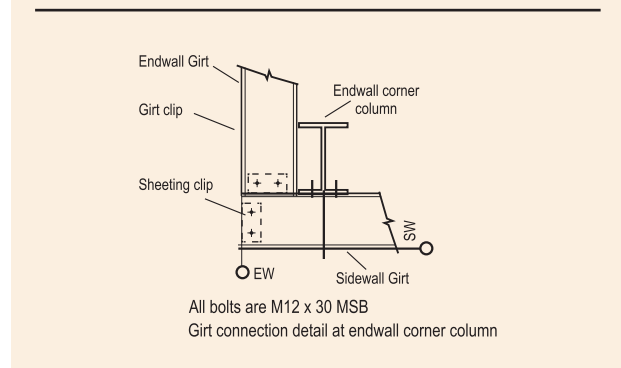
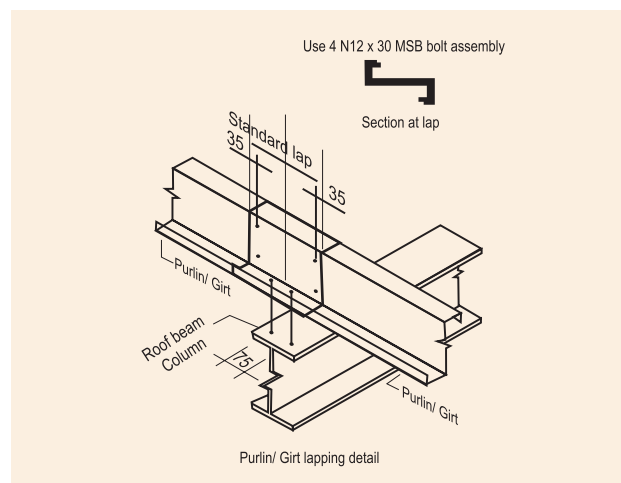
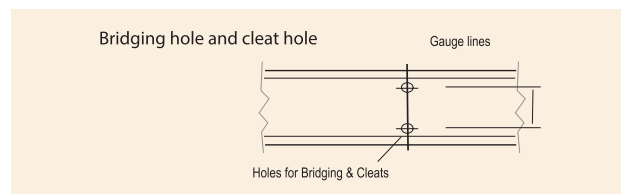
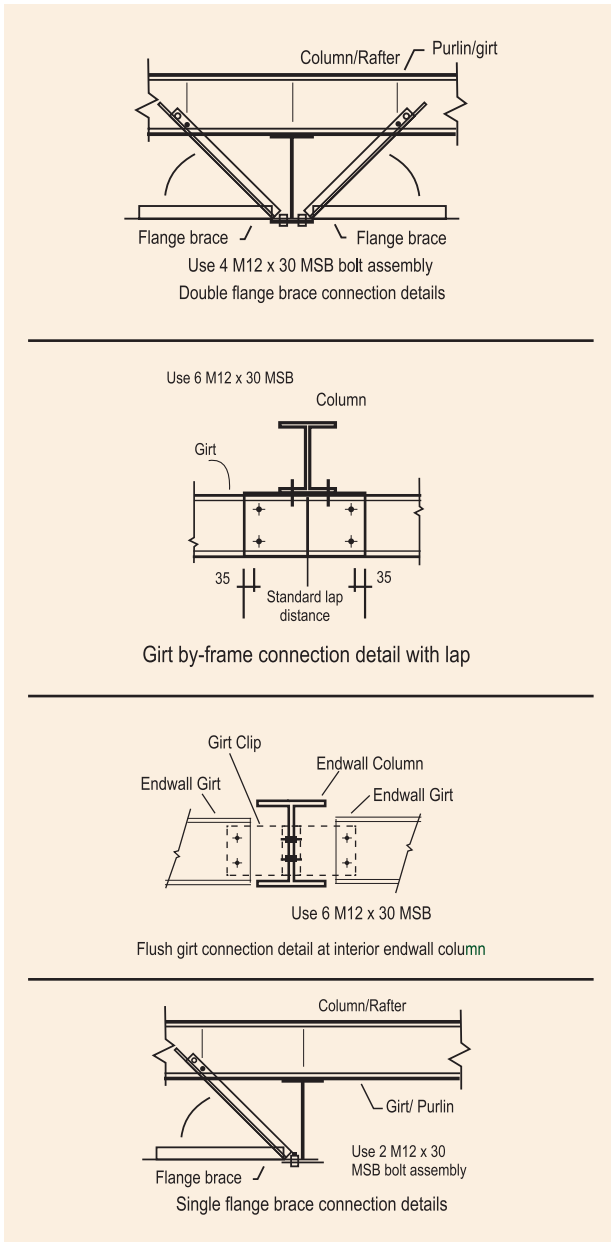
Standard hole for CEE-plus™ sections



Standard hole for ZEE-plus™, ZED-plus™ sections



Typical assembly & connection details





Global Excellence since 1857

Benefits

- High Strength Steel for better load carrying capacity and greater spanning capability.
- Zinc coated to provide corrosion resistance
- Light weight, easy and quick to install
- Pre-punched to avoid welding and cutting at site
- Saves 40-60% steel in comparison with traditional steel
- Lower maintenance cost
- Cladding fixing is easier and quicker

Product Descriptions

- All descriptions, specifications, illustrations, drawings, data, dimensions and weights contained in this catalogue, all technical literature and websites containing information from LYSAGHT® are approximations only. They are intended by LYSAGHT® to be a general description for information and identification purposes and do not create a sale by description. LYSAGHT® reserves the right at any time to:
 - (a) Supply goods with such minor modifications from its drawings and specifications as it sees fit
 - (b) Alter specifications shown in its promotional literature to reflect changes made after the date of such publication

Disclaimer, Warranties and Limitation of Liability

- This publication is intended to be an aid for all trades and professionals involved with specifying and installing LYSAGHT® products and not to be a substitute for professional judgement
- Terms and conditions of sale available at local LYSAGHT® sales offices
- Except to the extent to which liability may not lawfully be excluded or limited, Tata BlueScope Steel will not be under or incur any liability to you for any direct or indirect loss or damage (including, without limitation, consequential loss or damage such as loss of profit or anticipated profit, loss of use, damage to goodwill and loss due to delay) however caused (including, without limitation, breach of contract, negligence and/or breach of statute), which you may suffer or incur in connection with this publication



Standard Colour Range

Explore More



The above colours are only for illustrative purpose and actual colours may vary.

Toll Free: 1800 2708333

Email: contact@tatabluescopesteel.com

Note:

©2023 Tata BlueScope Steel Pvt. Ltd. All rights reserved. This brochure and its content is copyright of Tata BlueScope Steel Pvt. Ltd. No part of this brochure may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopy, recording, or any information storage and retrieval system, without permission in writing from Tata BlueScope Steel Pvt. Ltd.

All brand names mentioned in this brochure are registered trademarks of BlueScope Steel Limited under license to Tata BlueScope Steel Pvt. Ltd.

Authorised EZYBUILD® Solutions Provider



TATA BLUESCOPE STEEL

Tata BlueScope Steel Pvt. Ltd.
CIN : U45209PN2005PTC020270,
Floor no. 9 & 10, Kalpataru Infinia, Wakedwadi, Final Plot no. 21, Sub plot no. 3 at CTS no. 15/1 Shivajinagar, Pune - 411003, India. | Tel: +91 20 6621 8000
Website: www.tatabluescopesteel.com