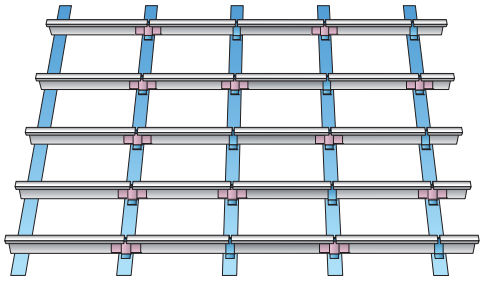
Sheeting rails may be selected as either Zed profile or Cee profile sections. These are formed from the same coils and are each available in the same depth and thickness range. Cees may be substituted for Zeds at window and door framing and at composite cladding joints, etc.

The two types of section can be mixed on the same rail line though it is not possible to locate sleeves on the junction between Zeds and Cees. Each system should be regarded separately between such junctions when considering load capacities.

Three basic systems are given in this manual, i.e. the Sleeved System, the Butted System and the Double Span (Brick Restraint) System. A Heavy End-Bay System can be used though in practice this may be hampered by interaction with door standards, etc, and the designer will require to exercise caution if this system is used (and indeed may require to anticipate the possibilities of future alterations to the wall structure). The design disc provides a method of load assessment for this system.

Sleeved system

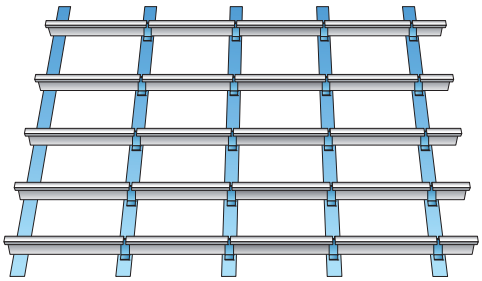
This is a system of single bay length sections with sleeves at penultimate supports and at alternative internal supports. Minimum number of spans is 2 and the maximum span is 12.5 metres.



Sleeved system

Butted system

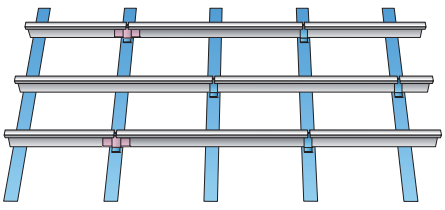
This is a single span system. The system is required for single bay length rails and is efficient for short spans or light wind loadings. Sections can be fitted running past the supports or may be within the depth of supporting sections. Maximum span is 11.4 metres.



Butted system

Double span system (brick restraint)

This is a relatively stiff system intended for use as brickwork restraints, or as window framing. Minimum number of spans is 2 and maximum transport length of section is 15 metres thus maximum span is 7.5 metres. Use double-span sections for the full length if the wall has an even number of bays and use a triple-span rail, ie double-span plus a sleeve, if an odd number of bays. Section thickness may require to increase for the triple-span case to compensate for the reduced stiffness, when compared with the double span system.



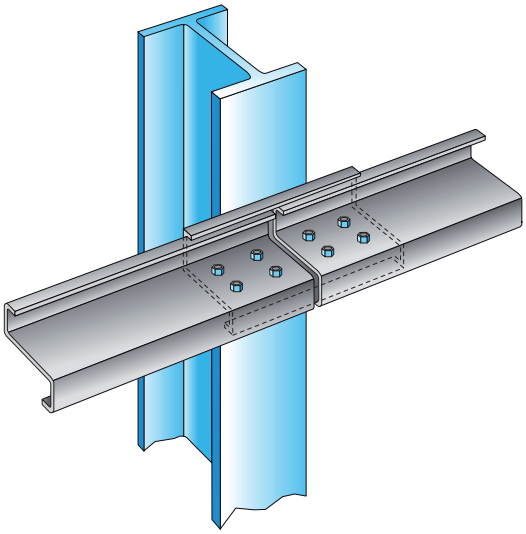
Double span system (brick restraint)

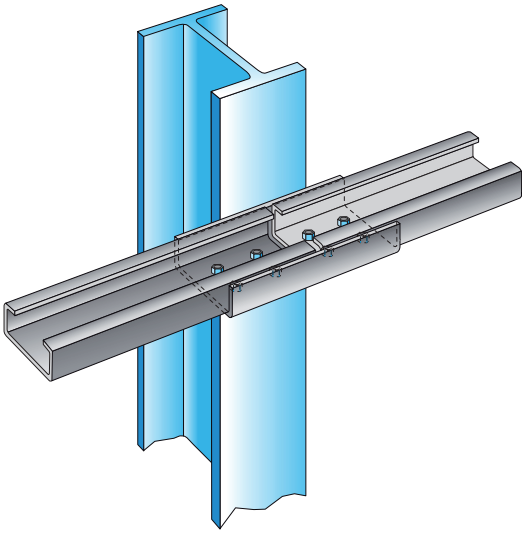
DESIGN DISK ALLOWS FOR VARIATION IN DEFLECTION FACTOR

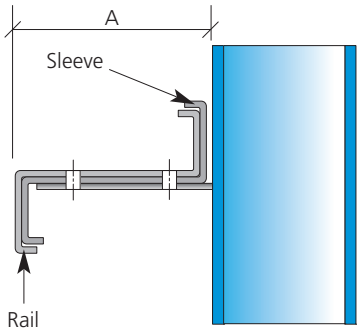
Sleeved rail system

Typical connections are illustrated for sleeved joints for both Zed and Cee Sections.

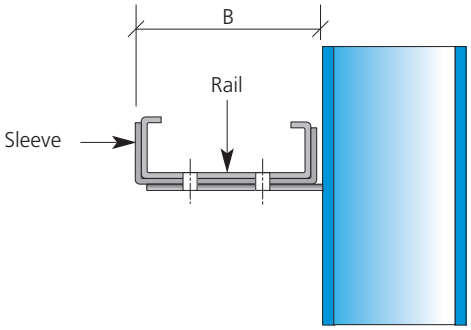
Note that the sleeves for the Zed System may be the same thickness as the rail section but sleeves for the Cee System are provided in one standard thickness for each rail depth.





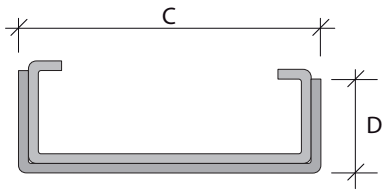


Zed rails



Cee rails

ZED RAIL FLANGE TO THE CLADDING MUST TOE UPHILL FOR FIBRE-CEMENT, HOOK BOLT FIXED

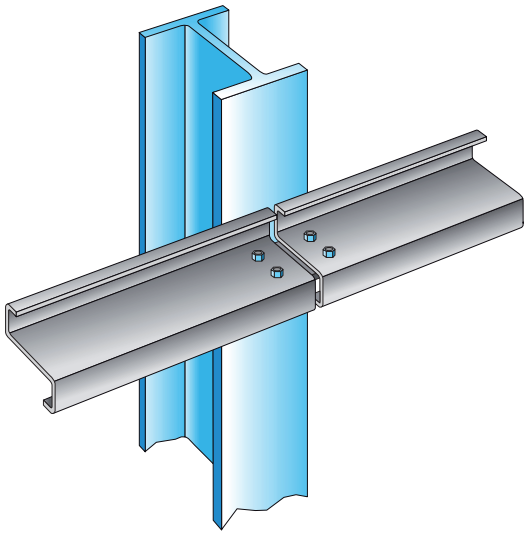


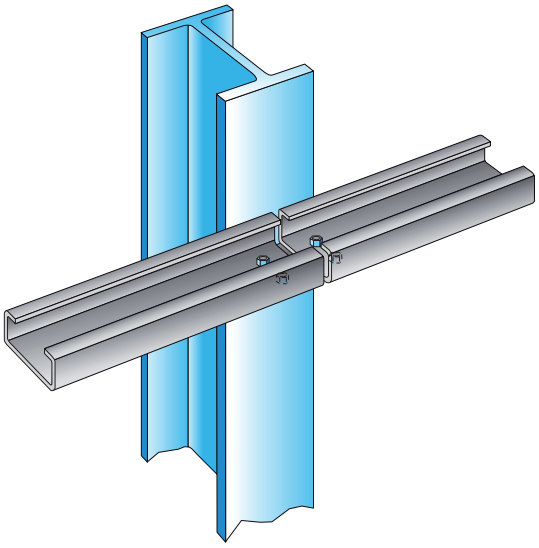
Section at sleeved Cee section rail

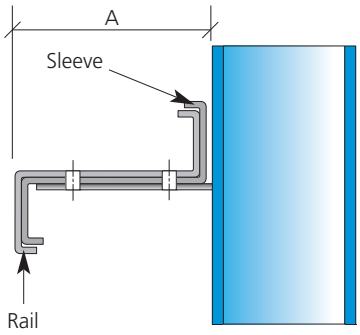
Rail Depth	Dimension A	Dimension B	Dimension C	Dimension D	Thickness for Cee Sleeve
140	148	147	146	60	2.0
170	178	177	177	60	2.5
200	208	207	207	70	2.5
240	248	247	248	70	3.0
300	308	307	308	90	3.0

Butted & double span rail system

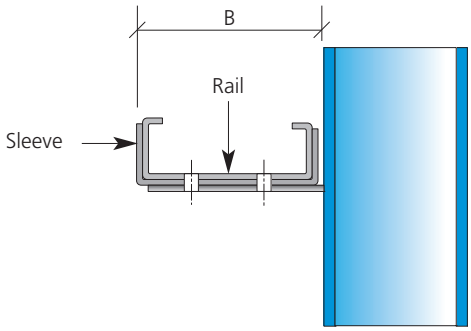
The connections for these two systems are identical except that the Butted System has a butted connection at every frame and the double-span system has a butted joint at alternative connections and is continuous over intermediate supports.







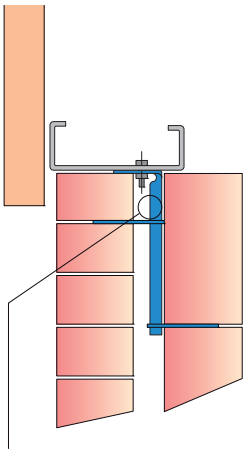
Zed rails



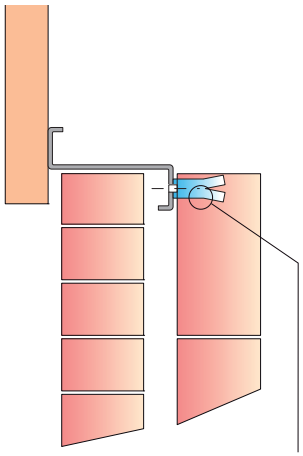
Cee rails

Typical brick restraint details

Typical details are indicated for illustration. The brickwork designer is responsible for design of the blockwork to rail connections and should select rails on the basis of a suitable deflection limit. A deflection limit of span/300 is commonly employed and the design program defaults to that limit for double span systems. The user may alter this as required.



Steel strap fixing
Steel straps and ties to Engineers requirements



Steel tie fixing
Proprietary steel straps fixed to Engineers requirements

Sheeting rail sag-system requirements

The user should note that it is assumed in the development of details and load tables that wall claddings will provide a diaphragm action and will be positively fixed to the rails, thereby eliminating vertical bending in the rails. Any claddings which do not meet these criteria should be referred to Steadmans, or the program may be used with the cladding weight included.

The number of rows of sags members for normal use is provided in the table, shown below for restraining-type metal cladding and fibre-cement cladding. The table also provides limiting dimensions for a number of cases.

Less limiting conditions can be applied for support of restraining type metal cladding, in certain cases. Where the cladding weight can be carried by floors, brick wall heads or eaves beams or by diaphragm action, and where the reduced wind load capacity is acceptable then 0 rows of sag bars may be adopted up to a 6.3m span, and a single row may be used up to a 7.6m span. In the case of 0 rows being adopted then temporary supports may be required to prevent sag in the rails during erection.

The usual system of rail restraints comprises the use of 45 x 45 x 2 angle section rail struts, with diagonal ties, as indicated on the next page.

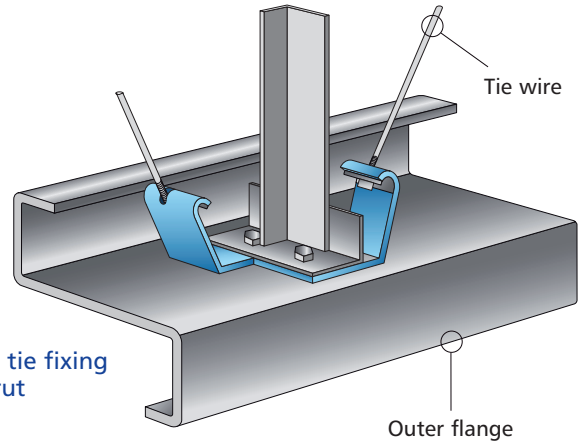
Cladding Type	Case	Number of rows of Sag members			
		0	1	2	3
Restraining type metal cladding	Maximum span for Normal Sag System	3.0m	6.3m	10.0m	12.5m
	Maximum panel height /set of diagonal braces	n/a	10.0m	10.0m	7.5m
Fibre-cement cladding	Maximum span	2.4m	5.1m	7.6m	10.0m
	Maximum panel height /set of diagonal braces	n/a	7.0m	7.0m	6.0m

Additional Notes

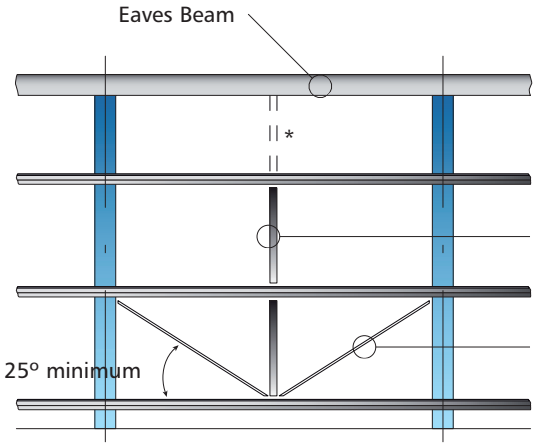
1. In the case of multiple rows of rails the maximum number of rails per set of diagonals should be limited to 8.
2. For double-row sag systems in walls the sag members are placed at 1/3 spans for a uniform appearance. For triple row systems place sag members at 1/4 spans.
3. For spans in excess of 10m use heavy duty angular diagonal ties in place of tie wires.
4. Advice should be sought from Steadmans when supporting any special claddings, such as clip fixed, which offer less restraint and reduced diaphragm action.
5. Support cleats should be checked for their capacity to handle wall cladding weight where this exceeds 13kg/m^2 or where flat plate cleats are used. Similarly if wall glazing or other deflection sensitive claddings are used then the designer should confirm that the cleats have adequate bending resistance and consideration should be given to using heavy duty angular diagonal ties in such conditions.

Sheeting rail sag systems

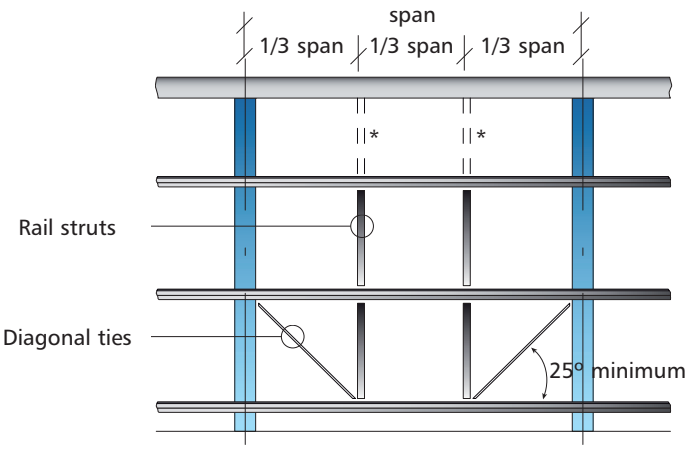
* Note that for restraining type metal cladding up to 10m high the diagonal ties may be removed if the rail struts are taken up and securely fixed to the underside of the eaves beam, provided the eaves beam is designed to carry its tributary weight of wall panel. The fixing to the eaves beam should incorporate a stiffening cleat for wall heights greater than 4m, or with heavy claddings. (See Eaves Beam section for details.)



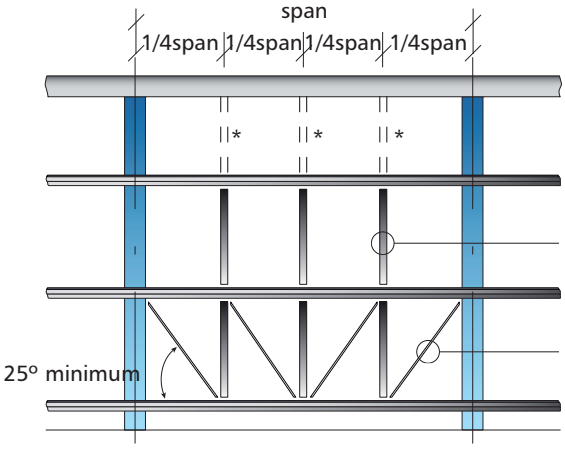
Diagonal tie fixing to rail strut



Single row strut system



Double row strut system



Triple row strut system

DIAGONAL TIES SHOULD BE ANCHORED TO THE CLEAT BOLTS NEAREST THE COLUMN FLANGE

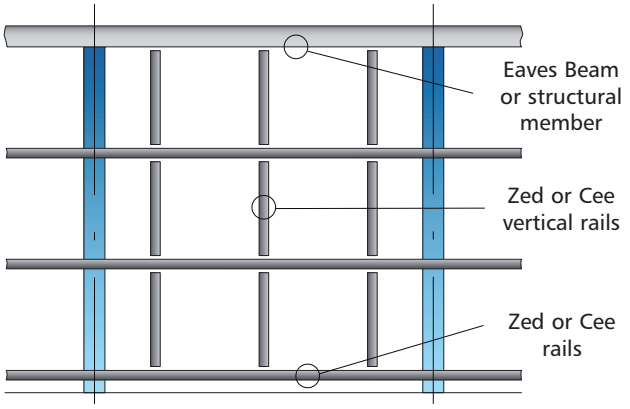
Horizontal wall cladding requirements

Horizontal cladding is often used in conjunction with cold rolled rail systems. Some examples are provided to assist the designer in deciding suitable cladding support. In all cases the eaves beam or structural top member should be checked for horizontal wind loading, in addition to any vertical loading.

TYPE 1

Eaves Beam designed for wall cladding weight.

The number and position of vertical rails will depend on cladding requirements. Horizontal rails should generally be selected as for vertical claddings, but load capacity may require to be reduced when the spacing between vertical rails exceeds 2 metres. (Refer to Steadmans.)

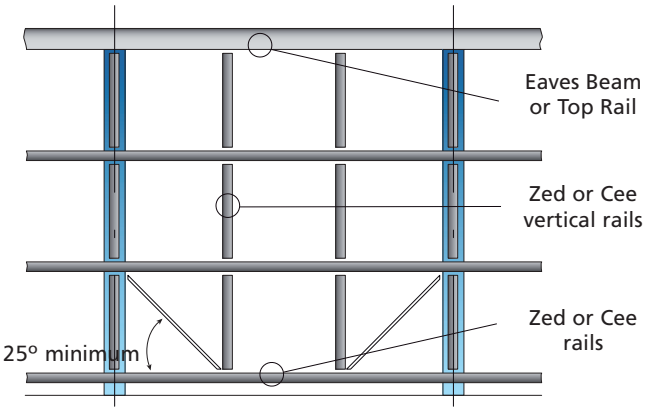


Type 1

TYPE 2

Eaves member not designed to carry wall cladding weight.

Horizontal rails should be selected as above. The minimum number of sets of diagonal ties should be as given in the table on page 4. Vertical rails should be spaced to suit the cladding but should also satisfy the minimum angle shown for diagonal ties. Load capacity for horizontal rails may require to be reduced when the spacing between vertical rails exceeds 2 metres, as noted above. Support cleats should be checked for their capacity to handle wall cladding weight where this exceeds 13kg/m2 or where flat plate cleats are used.

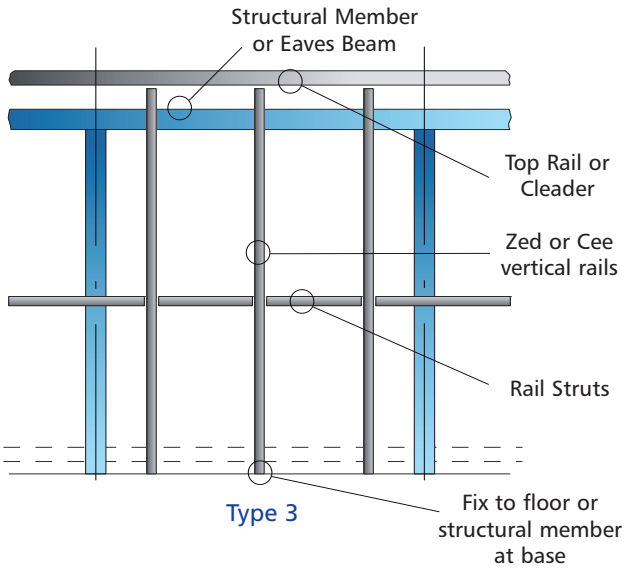


Type 2

TYPE 3

Vertical Rail System.

Vertical rails should be selected as for a Butted rail system of the same span as the vertical distance between top and bottom supports. Use horizontal struts at the minimum number of locations as recommended for sag members for the same span. The top member may be a structural section or eaves beam depending on the nature of construction. The base of the posts may be fixed to the floor or a structural section can be used. Top and bottom members must be designed for horizontal wind loading as dictated by the construction details.



Type 3

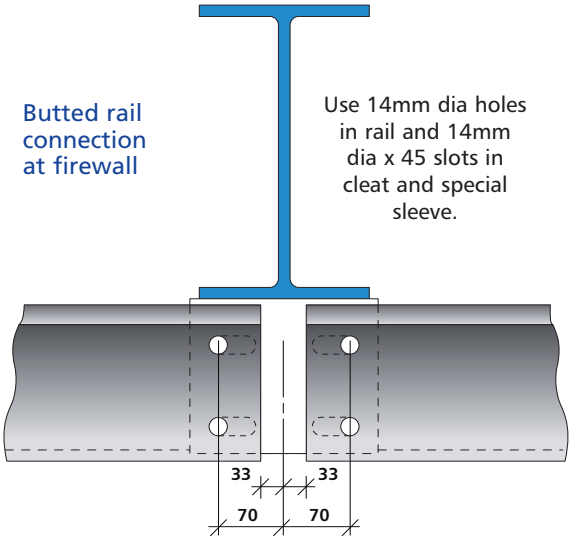
Fire rated boundary walls

Under boundary conditions it is required to provide walls with a fire rating. In these cases the fire rating is provided by the wall cladding and insulation, which are taken to be independent of the rail system in a fire situation. However, rails are required to have slotted end-holings to reduce buckling due to the significant thermal expansion during fire conditions. Connections utilise combustible washers as indicated, to facilitate these thermal movements, whilst providing for normal rail performance during non-fire conditions. (Some approving authorities also require that the eaves beam be fire protected.)

The Steadmans fire rail system has been developed to provide a suitable facility for expansion through slotted holes on the sleeves and cleats. Thus, the system can be used for sleeved and butted rails without limiting the joint positions, provided the slotted cleats and sleeves are adopted, all as indicated here and in the detailing section. The system may be used for spans up to 10m.

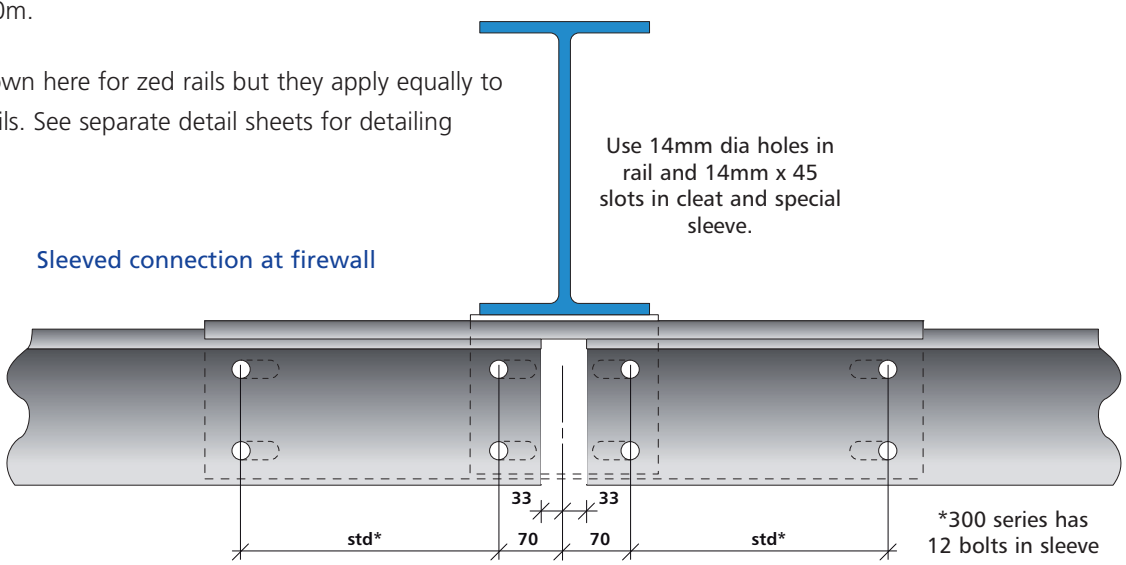
Details are shown here for zed rails but they apply equally to Cee section rails. See separate detail sheets for detailing information.

Butted rail connection at firewall

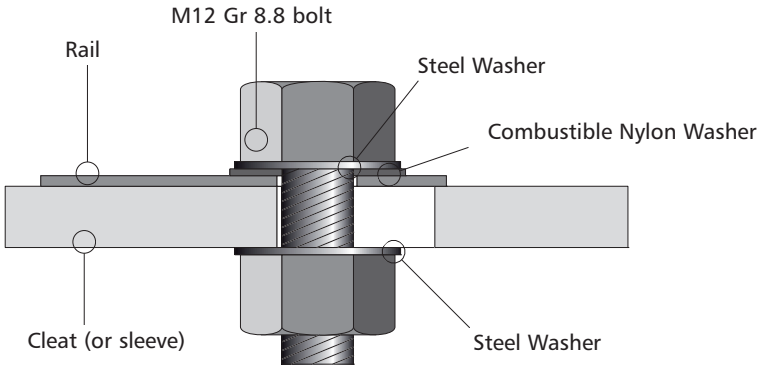


SEE DETAILING SECTION FOR DETAILS OF SPECIAL SUPPORT CLEAT REQUIREMENTS

Sleeved connection at firewall



ENLARGED BOLT DETAIL SHOWING COMBUSTIBLE PLASTIC WASHER



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