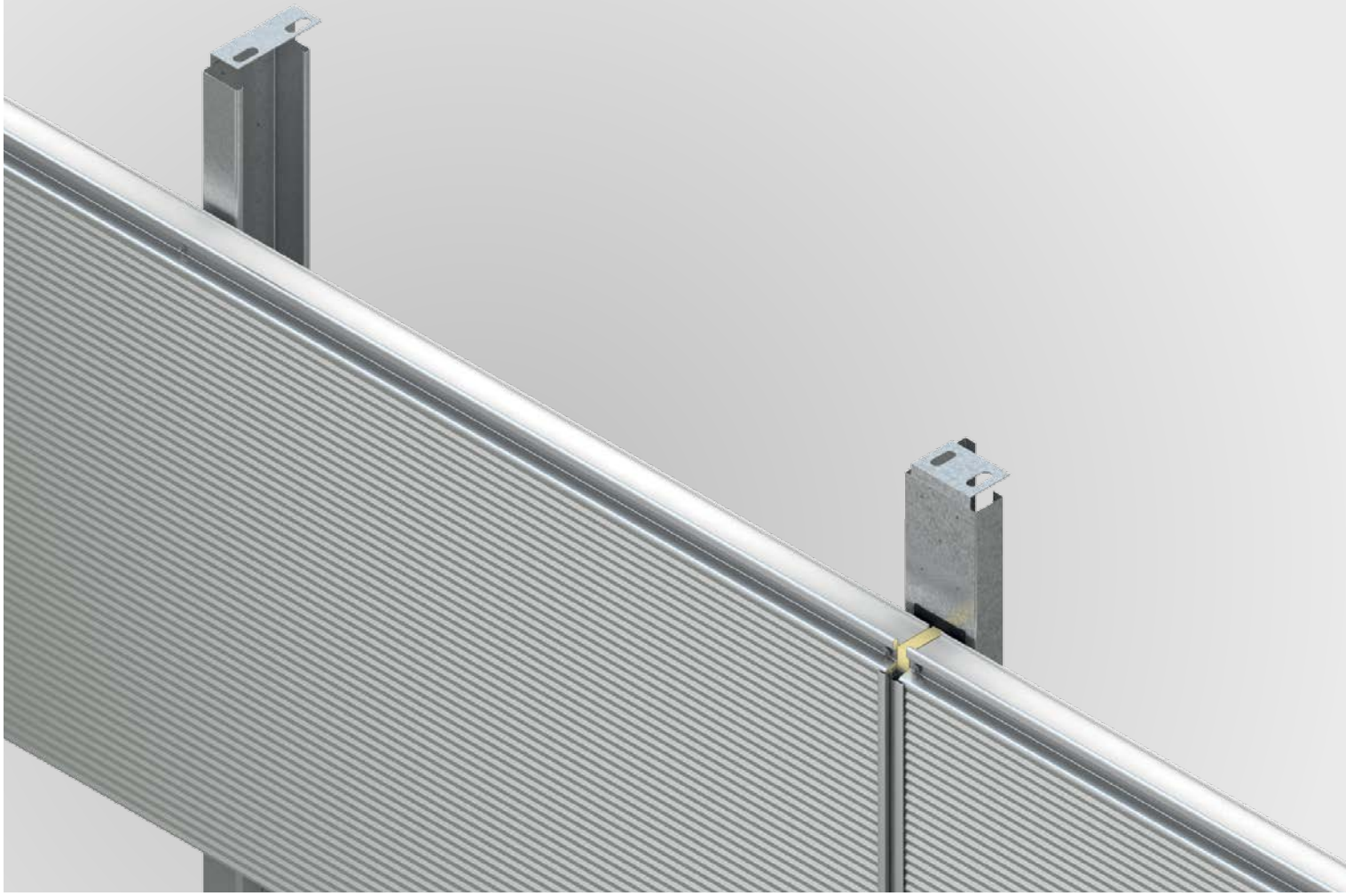
Structural Products & Systems
United Kingdom

Multichannel
Pre-assembled Horizontal Cladding Support System



Kingspan®

Multichannel
Contents

Multichannel
Introduction

To complement the existing Structural Products & Systems range we now offer a pre-assembled vertical support system for horizontally laid composite panels. These are available exclusively to clients detailing our components within Tekla Structures and utilising the benefits of its parametric modelling macros.

This system can only be detailed for manufacture using Tekla Structures version 21 service release 3, and version 21.1 service release 1 and above.

To assist users of Tekla Structures detailing this support system, a range of help videos can be viewed at: www.kingspanpanels.co.uk/structural/resource-centre

We recommend users check the support requirements of the cladding system with the manufacturer prior to use.

Notes:
These components are for use in building envelopes operating with ambient internal temperatures.

Multichannel

1. Horizontal Rail System, Sleeves & Stays

Due to the cleated connections required, the horizontal rails can only be multichannel sections L14570*, L17570, L20570, L23570 or L26570 adopting 18mm diameter holes for all bolted connections. This includes the use of 18mm diameter countersunk holes with the exception of the sleeved joint where these are not available.

The horizontal rail support system can be designed using the Toolkit design software (or from published load tables) for multichannel sections supporting horizontally-laid composite panels.

The following must be adhered to when specifying the horizontal rail system:

- All horizontal rails on the elevation must have the same section depth;
- Horizontal members (including eaves beam) must be parallel to each other;
- The outside face of the rails and eaves beam must be aligned;
- Wherever possible it is recommended that panel side joints do not line up with the horizontal rail positions;
- The sleeve used with this system (referenced CSV) requires 8 no. 16mm diameter bolts. Countersunk holes are not available in the sleeve;
- When countersunk connections are required, an 8mm packer is recommended. This component is not supplied by Kingspan Structural Products;
- All bolted connections are to be grade 8.8;
- Two types of column stays are available for use with this system;
- The dimensioned components and details described above can be found in section 4 of this document.

Notes:
* When L14570 horizontal rails are used, a minimum sheeting line of 181mm is required.

2. Connection at Column

The rail connection to the column, when using this support system requires the Kingspan supplied cleat referenced HZ***BV(M).

Connection to the column using this cleat is made via 2 no. 16mm diameter bolts at 80mm centres.

Connection to rail made by 4 no. 16mm diameter bolts at 70mm centres.

Notes:
A welded flat plate cleat option can be detailed within Tekla and supplied by others if preferred.

2.1 Standard Rail Column Cleat

Referenced HZ***BV#. Available as bolt-on only, manufactured from S355 JR steel and available in 8mm, 10mm and 12mm thickness.

Finishes available in black, powder coated and galvanised. The hole arrangements are as shown and no variation of these are offered.

The standard sheeting line for use with these cleats is rail depth +6mm matching the standard Kingspan rail system.

The connection of incoming diagonal members to this cleat must be made to the hole nearest the column (or directly back to the column) in all cases.

Notes:
The L145 horizontal rail system can only be used on a 181mm sheeting line due to restrictions from interconnecting verticals.

2.2 Multihole Rail Column Cleat

Referenced HZ***BV#M. Allows 175mm through 265mm rails to be connected on a maintained sheeting line.

Finish, thickness and other stipulations as per HZ***BV# above.

The dimensioned components and details described above can be found in section 4 of this document.

Specification of the above cleats can be carried out using the information in appendix A.

Multichannel

3. Secondary Cladding Support Members & Diagonal Ties

These components are supplied pre-assembled with riveted end cleats.

Four types of preassembled vertical support are available.

Intermediate cladding supports - L145150V & L145200V provide 70mm fixing face.

Panel joint supports – G140150V & G140200V provide 140mm fixing face.

These sections can be designed for spans up to 2.5m using the load / span tables in Appendix B.

These preassembled components suit a number of scenarios of rail orientation and can be detailed and installed left or right facing.

Notes:
Minimum assembly length is 390mm

3.1 L145V & G140V Section Properties (Eurocode)

Section	Gauge	Area	Weight	Major Axis			Minor Axis		Radius of Gyration	
	t_{nom}	A_0	w	Iyy	W_{ei} +	W_{ei} -	Izz	$W_{el}zz$	iyy	izz
	(mm)	(cm^2)	(kg/m)	(cm^4)	(cm^3)	(cm^3)	(cm^4)	(cm^3)	(cm)	(cm)
G140150V	1.50	5.06	3.97	77.18	22.45	9.02	162.58	28.53	3.91	5.67
G140200V	2.00	6.78	5.32	103.19	29.82	12.02	217.42	38.01	3.90	5.66
L145150V	1.50	4.60	3.45	156.23	21.56	21.56	32.14	5.88	5.85	2.65
L145200V	2.00	6.11	4.63	205.84	28.40	28.40	41.65	7.91	5.82	2.62

3.2 Diagonal Ties

Diagonal ties are to be installed at a minimum of 30 degrees to the horizontal rails as our existing system. Two types of diagonal are available:

- Diagonal tie wire (DBV) used where panels are butt jointed at columns only;
- Diagonal tie rod (TRHDV) used where panels are butt jointed in the bay.
- A maximum wall height of 8m per set of diagonals should not be exceeded, this is based on a maximum cladding weight of 0.14kN/m^2.

Wherever possible the configuration of the diagonals should be as shown in section 6.11 and 6.12.

Multichannel

4. Standard Components

The following components are to be used specifically with the pre-assembled vertical support system for horizontally-laid cladding panels.

This system can only be detailed for manufacture using Tekla Structures version 21 service release 3, and version 21.1 service releases 1 and above.

Notes:
Please note these components are for use in building envelopes operating with ambient internal temperatures.

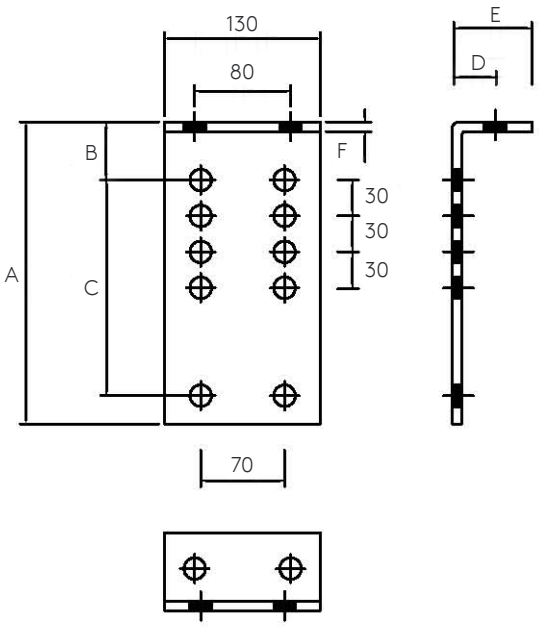
4.1 Column Cleat (Multihole & Standard)

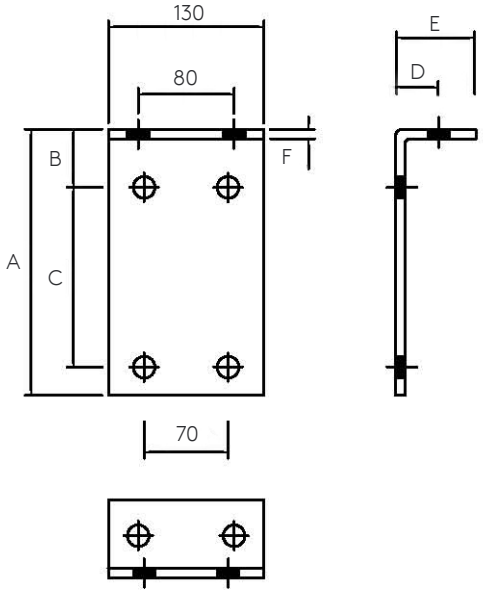
Section	HZ***BVM#					
	A	B	C	D	E	F
175	162.00	48.50	90.00	35.00	65.00	#
205	192.00	48.50	120.00	35.00	65.00	#
235	222.00	48.50	150.00	35.00	65.00	#
265	252.00	48.50	180.00	35.00	65.00	#

Notes:
L145V horizontal rails can only be used on min. 181mm sheeting line.
= 8mm, 10mm or 12mm thickness.
All holes 18mm diameter.
All cleats available in black, powder coated or galvanized finish.

Section	HZ***BV#					
	A	B	C	D	E	F
145	162.00	78.50	60.00	35.00	65.00	#
175	162.00	48.50	90.00	35.00	65.00	#
205	192.00	48.50	120.00	35.00	65.00	#
235	222.00	48.50	150.00	35.00	65.00	#
265	252.00	48.50	180.00	35.00	65.00	#

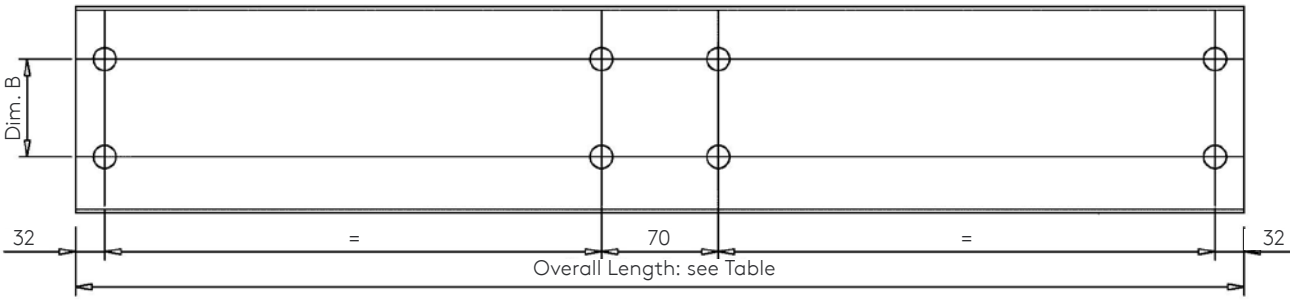
Notes:
L145V horizontal rails can only be used on min. 181mm sheeting line.
= 8mm, 10mm or 12mm thickness.
All holes 18mm diameter.
All cleats available in black, powder coated or galvanized finish.

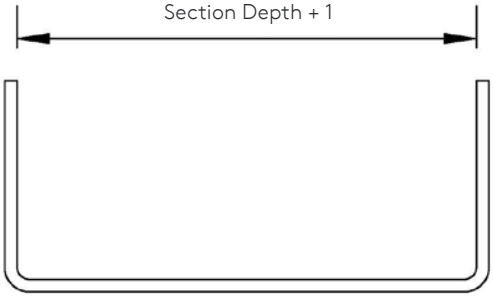




Multichannel

4.2 Sleeve

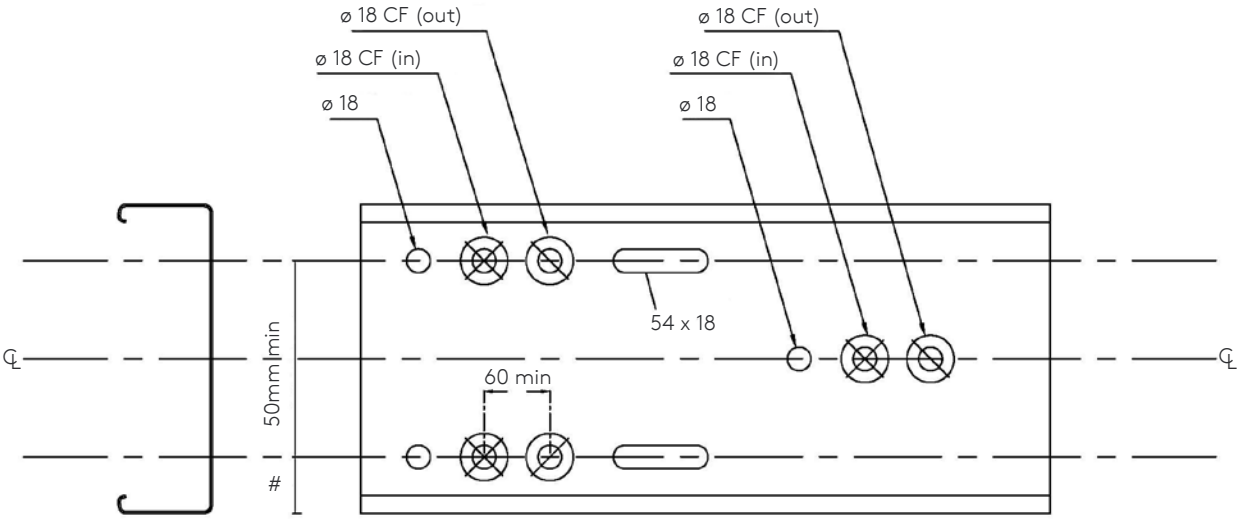




Channel Depth	o/a Length (mm)	Dim. B (mm)
145	614	60
175	714	90
205	834	120
235	954	150
265	1054	180

Notes:
Sleeve for use with this system is referenced CSV*** (to suit Multichannel depth).

4.3 Multichannel Hole Options

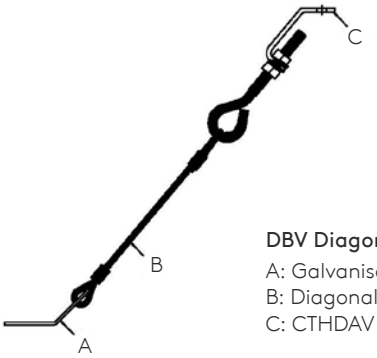


Section	# (mm)	Centres (mm)
145	42.50	60
175	42.50	90
205	42.50	120
235	42.50	150
265	42.50	180

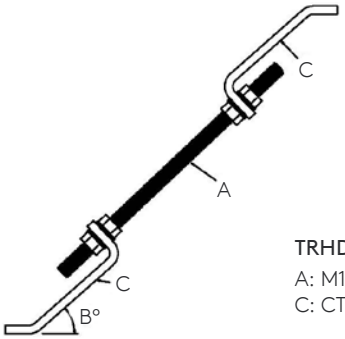
Notes:
Hole arrangements and options:
ø18mm hole (typ positions shown);
ø18mm x 54mm slot (typ positions shown);
Counterformed in/out option available;
Minimum channel length = 125mm.

Multichannel

4.4 Diagonal Ties



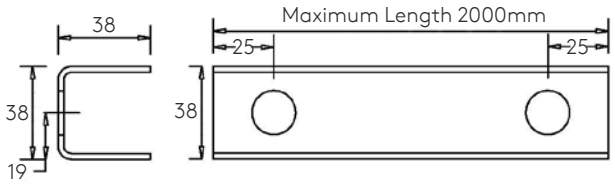
DBV Diagonal Tie Wire Assembly
A: Galvanised end cleat.
B: Diagonal wire.
C: CTHDAV end cleat.



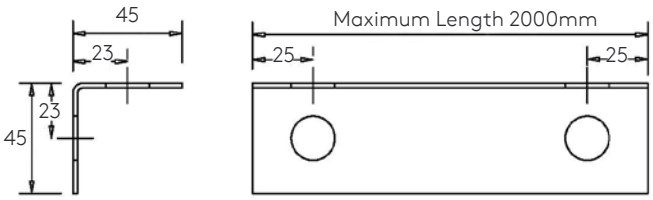
TRHDV Diagonal Tie Rod Assembly
A: M12 threaded rod.
C: CTHDAV end cleat.

Notes:
CTHDAV end cleats are available in 5 degree increments from 30 to 60 degrees. Default angle B = 50 degrees. CTHDAV end cleats are available in a black, powder coated or galvanised finish.

4.5 Column Stays



RNAV Gauge = 2.4mm, all holes 18mm diameter

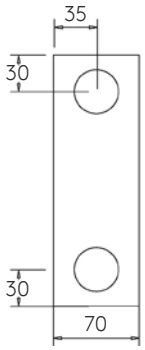


RNBV Gauge = 2.0mm, all holes 18mm diameter

4.6 Packer Plate

Ref. (***)	Section	Centres (mm)	Length (mm)
145	145	60	120
175	175	90	150
205	205	120	180
235	235	150	210
265	265	180	240

Notes:
Packer plate thickness = 8mm, all holes ø36mm.
Packer plate is recommended where countersunk connections are required.
This component is not supplied by Kingspan Structural Products.

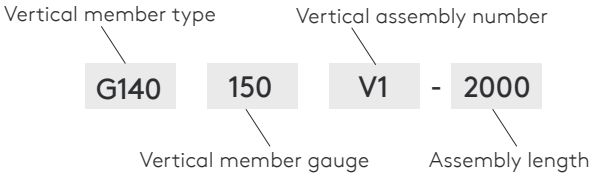


Multichannel

5. Pre-Assembled Verticals

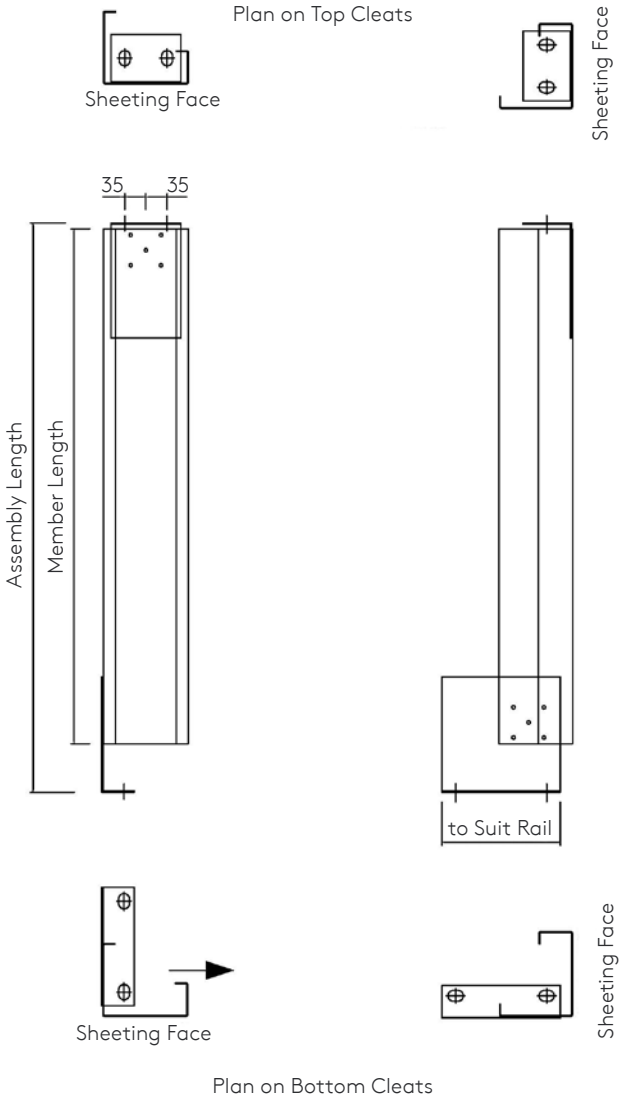
Reference

The vertical members in this section are referenced as below:



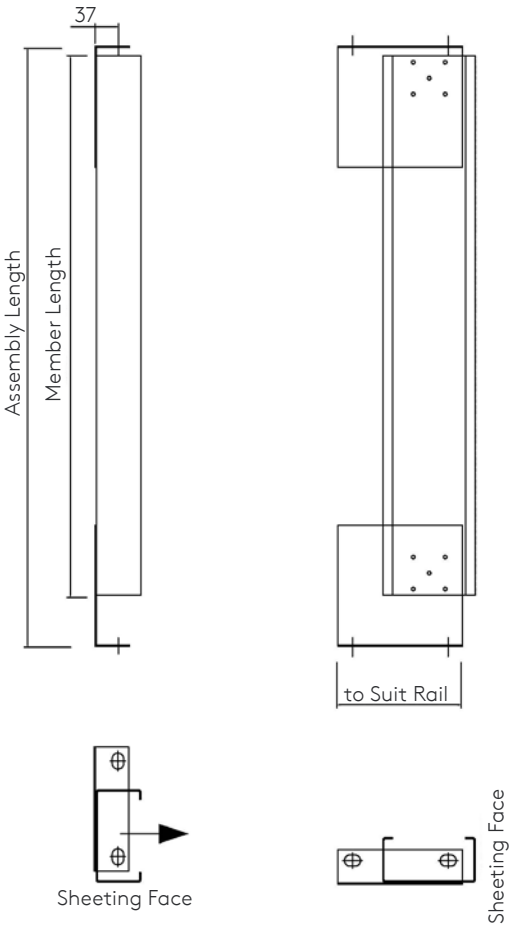
Notes:
All assemblies shown within this section are shown right facing.
Assemblies are available either left or right facing.
Assemblies are supplied complete with riveted end cleats, slotted holes in these cleats assist with alignment on site.
Please note, minimum assembly length is 390mm.

5.1 Assembly 1: G140V at Column Position



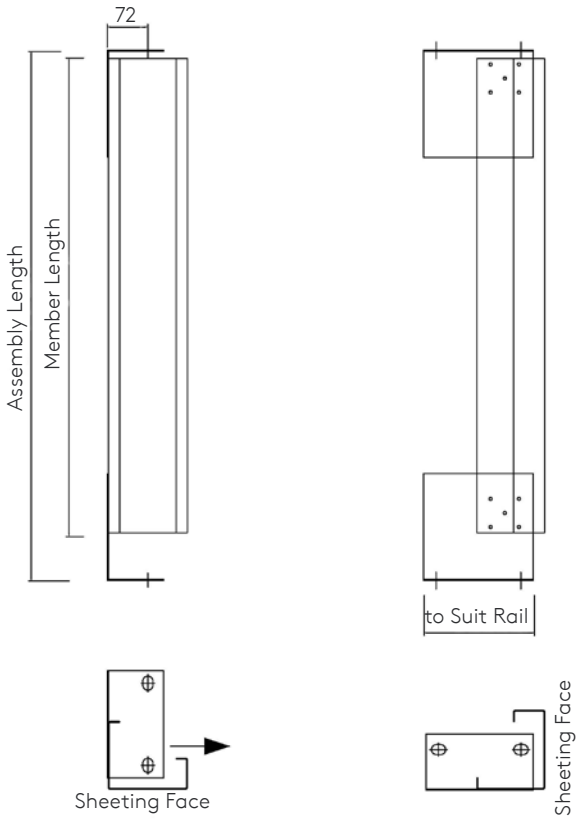
Multichannel

5.2 Assembly 2: L145V in Span & Column Position



Plan on Bottom Cleats

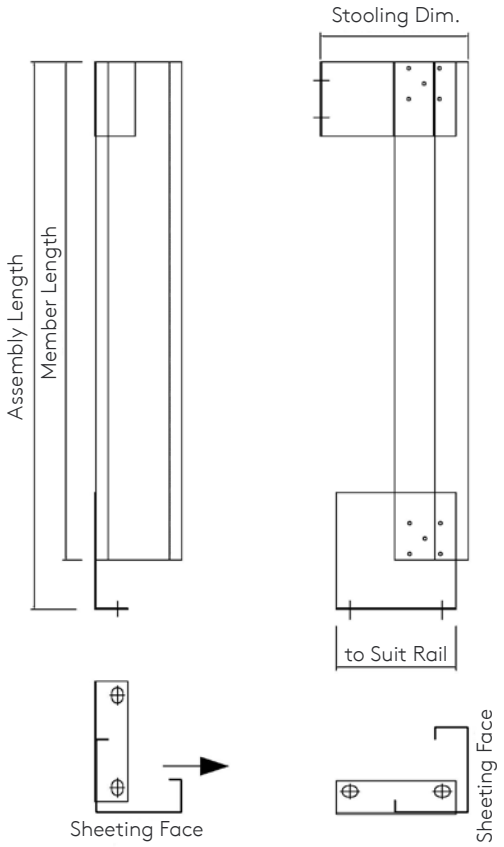
5.3 Assembly 3: G140V in the Span



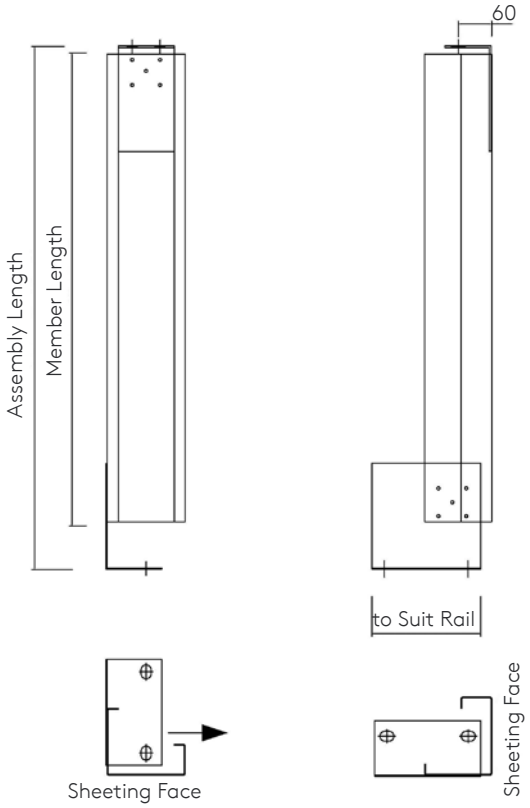
Plan on Bottom Cleats

Multichannel

5.4 Assembly 4: G140V at Column (top rail down)



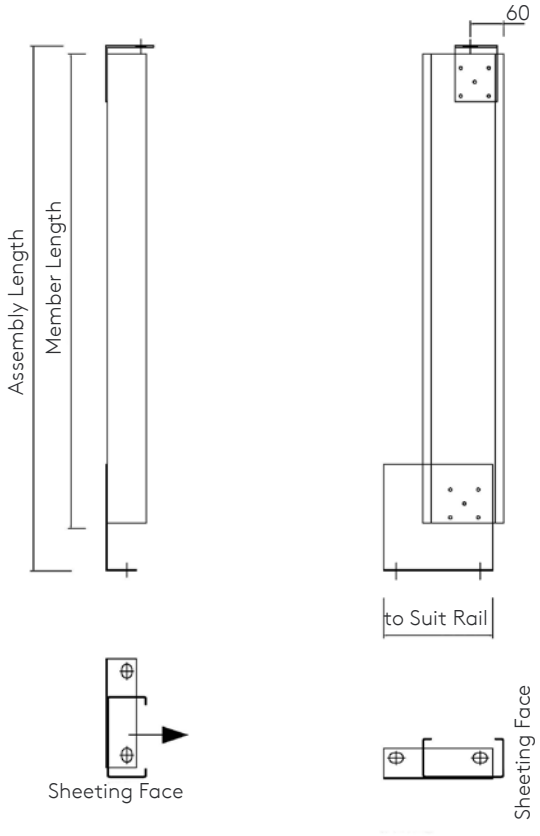
5.5 Assembly 5: G140V to Eaves Beam in Span



Plan on Bottom Cleats

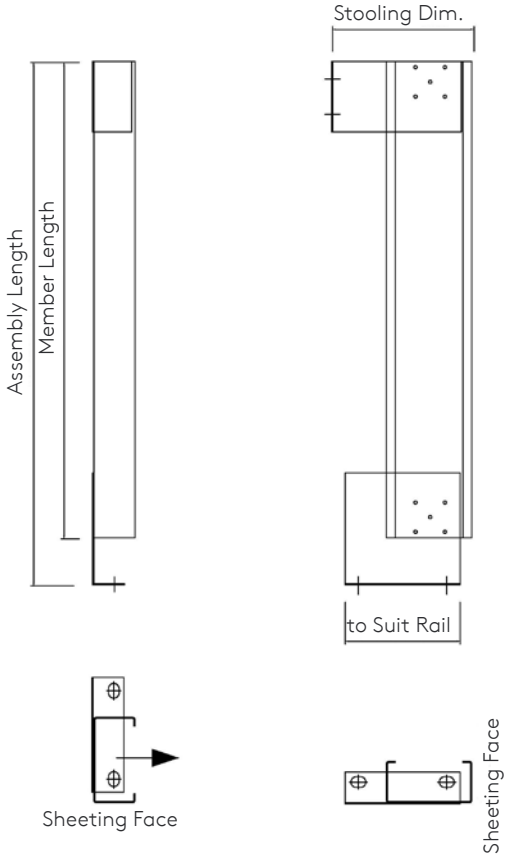
Multichannel

5.6 Assembly 6: L145V to Eaves Beam in Span



Plan on Bottom Cleats

5.7 Assembly 7: L145V to Eaves Beam at Column



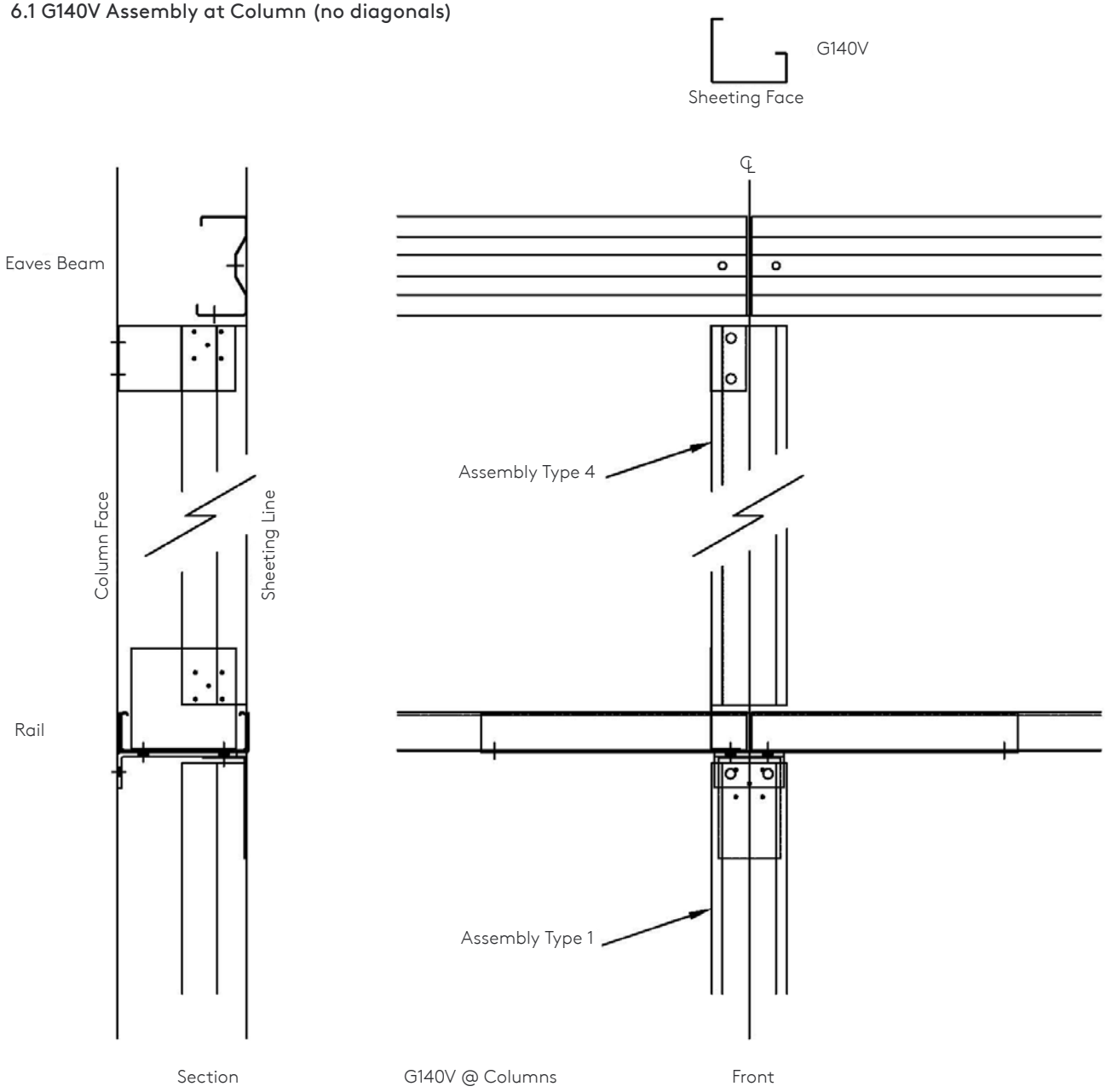
Multichannel

6. Assembly Details

The following shows standard details for the support of horizontally- laid cladding panels using pre-assembled vertical supports.

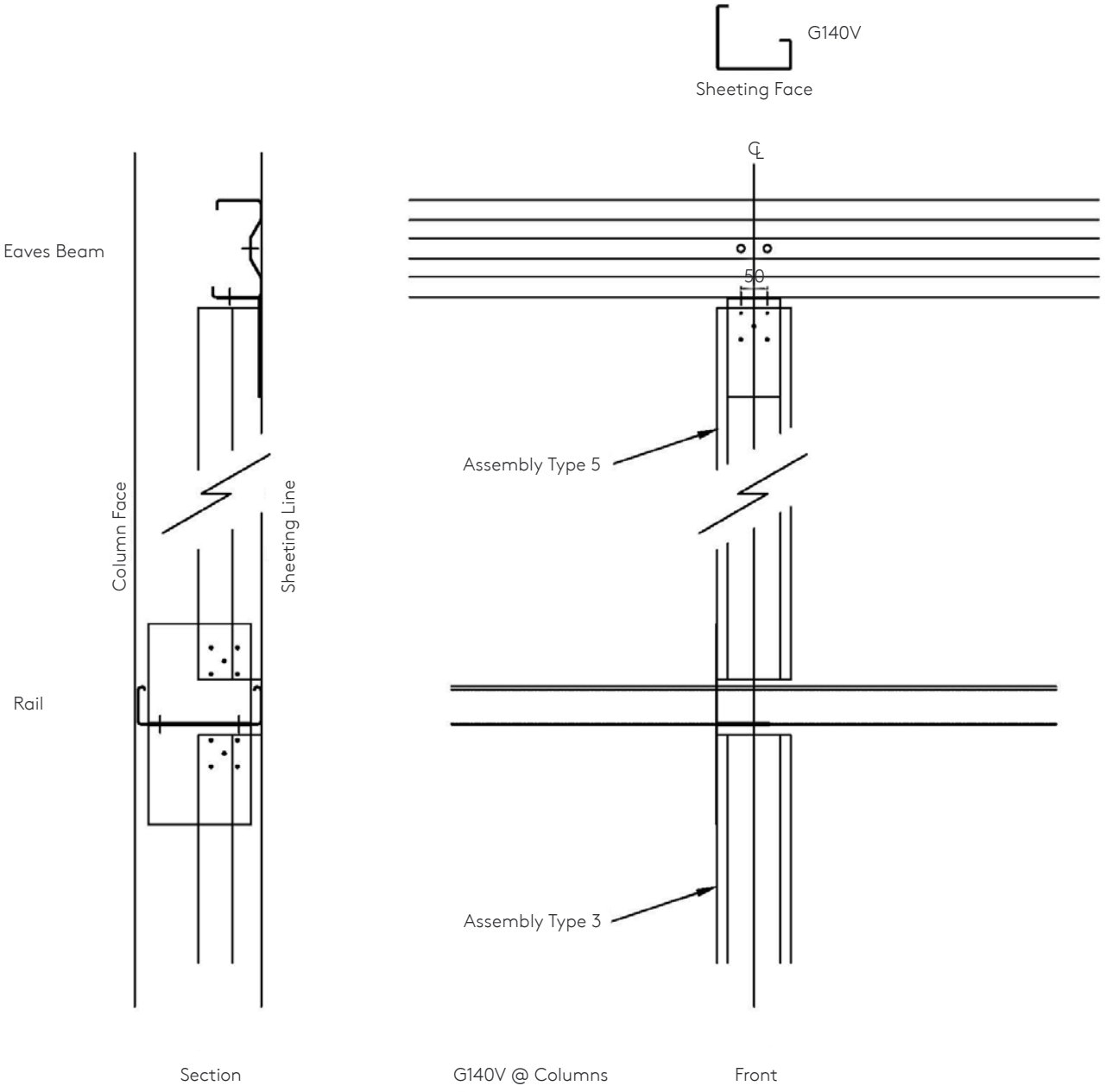
This system can only be detailed for manufacture using Tekla Structures version 21 service release 3, and version 21.1 service releases 1 and above.

6.1 G140V Assembly at Column (no diagonals)



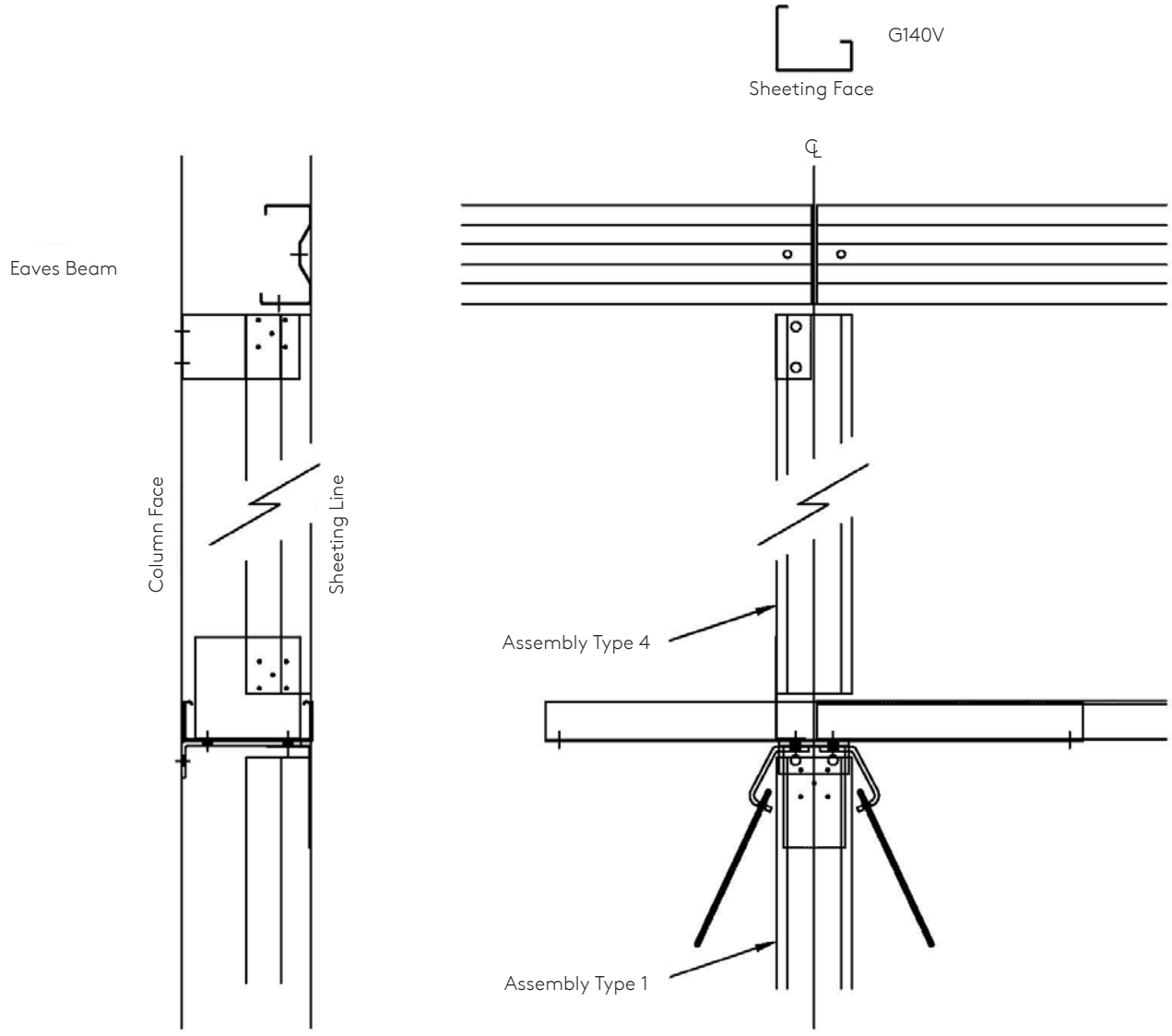
Multichannel

6.2 G140V Assembly in Span (no diagonals)



Multichannel

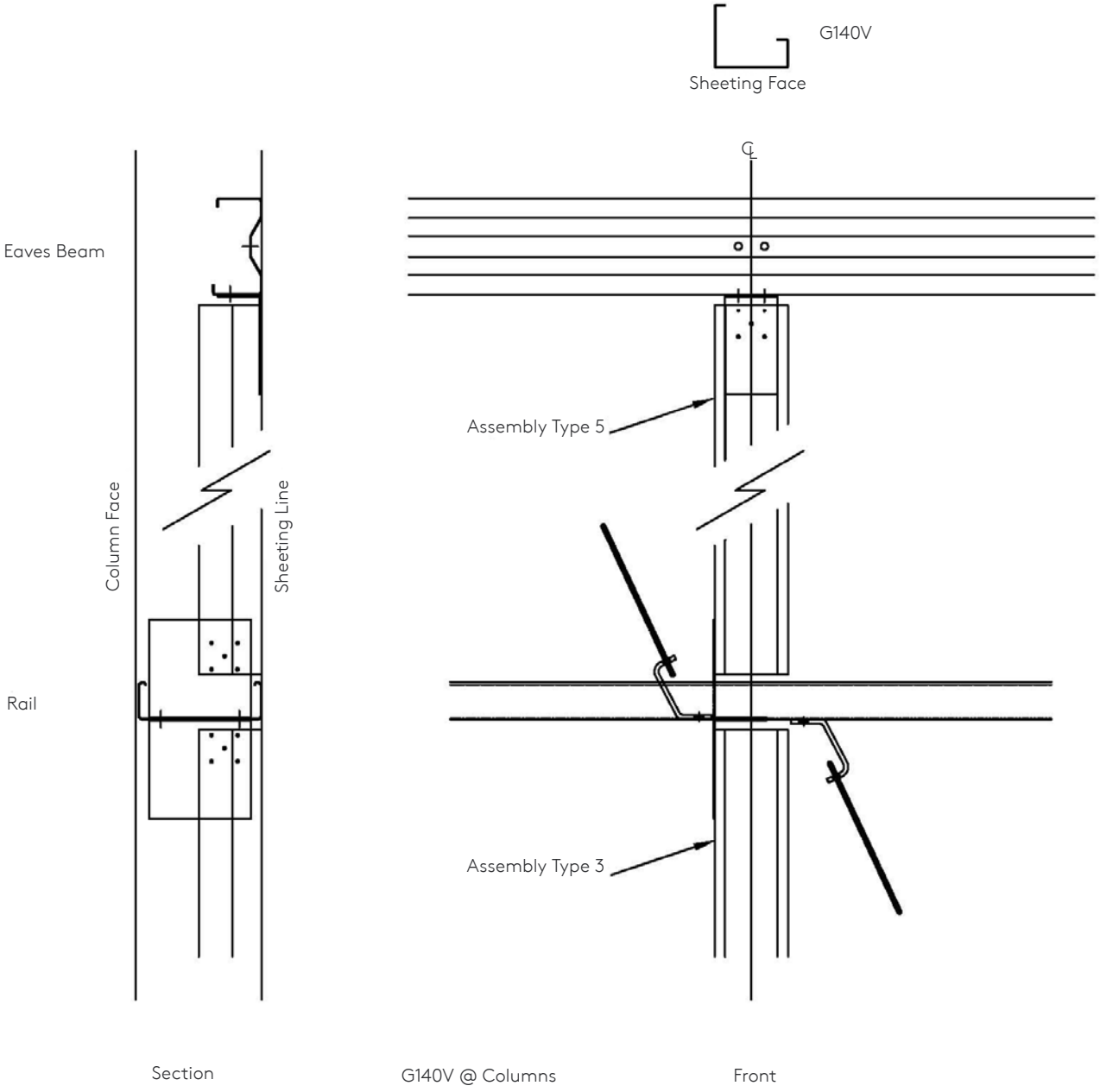
6.3 G140V Assembly at Column (with diagonals)



Section G140V @ Columns Front

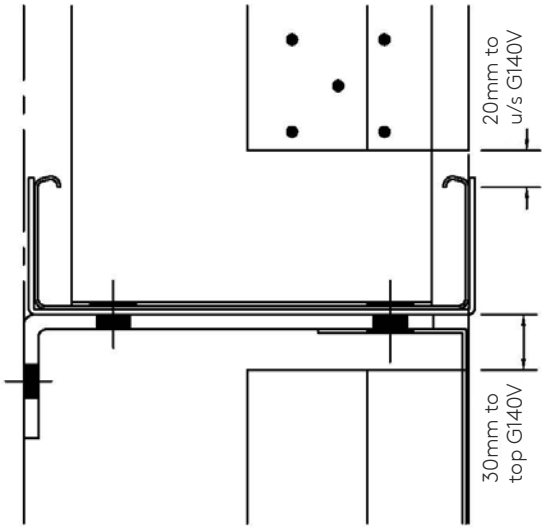
Multichannel

6.4 G140V Assembly in Span (with diagonals)

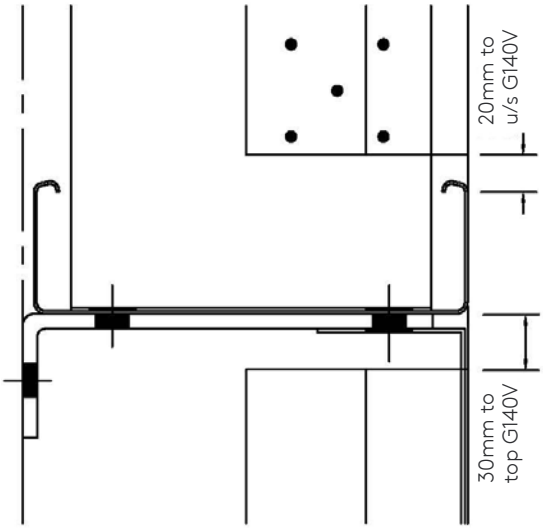


Multichannel

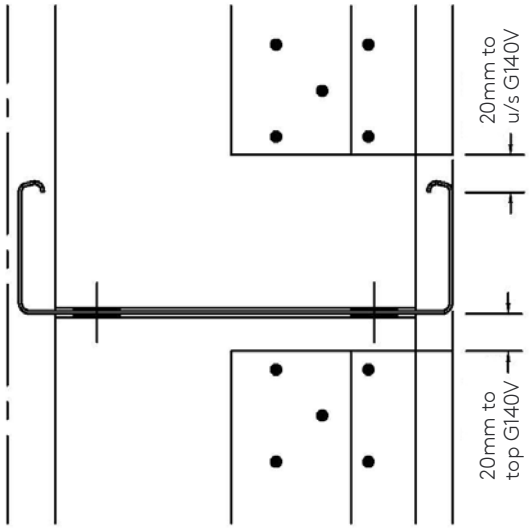
6.5 G140V Assembly Cross Section



G140V at Sleeved Connection



G140V Non-Sleeved Connection

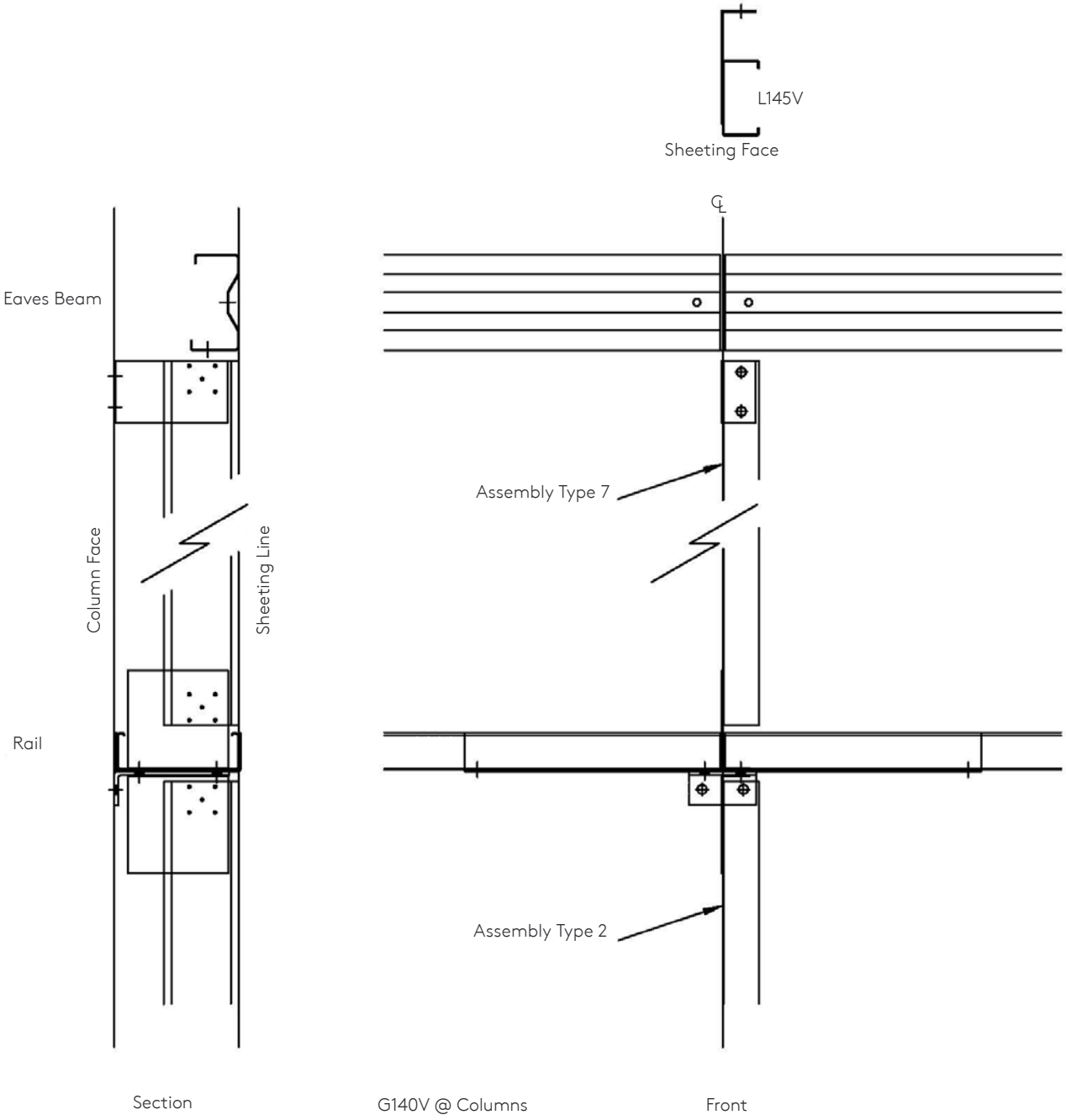


G140V Restraints in the Span

Notes:
Cleats shown are available in 8mm, 10mm or 12mm thickness.

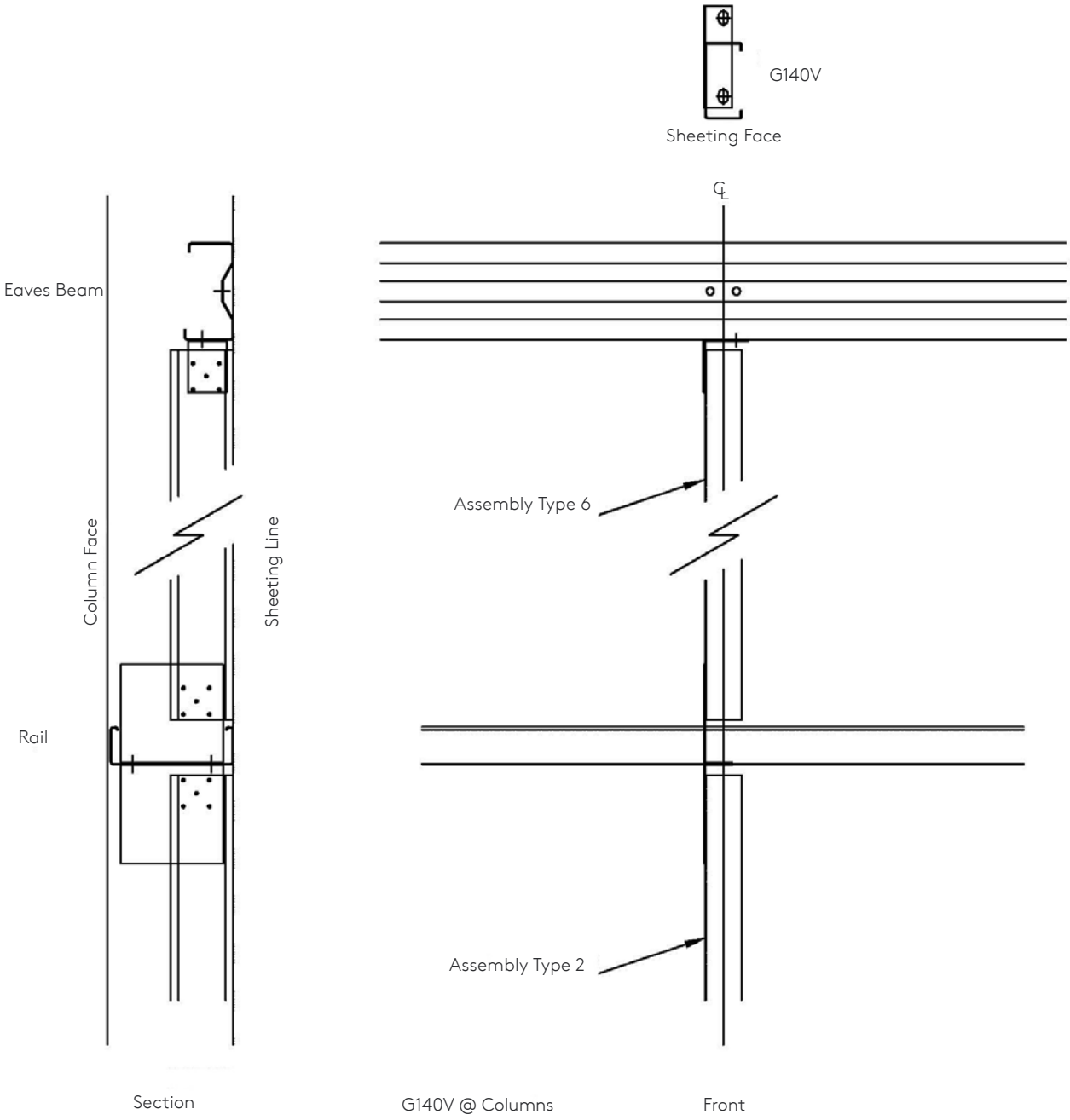
Multichannel

6.6 L145V Assembly at Column (no diagonals)



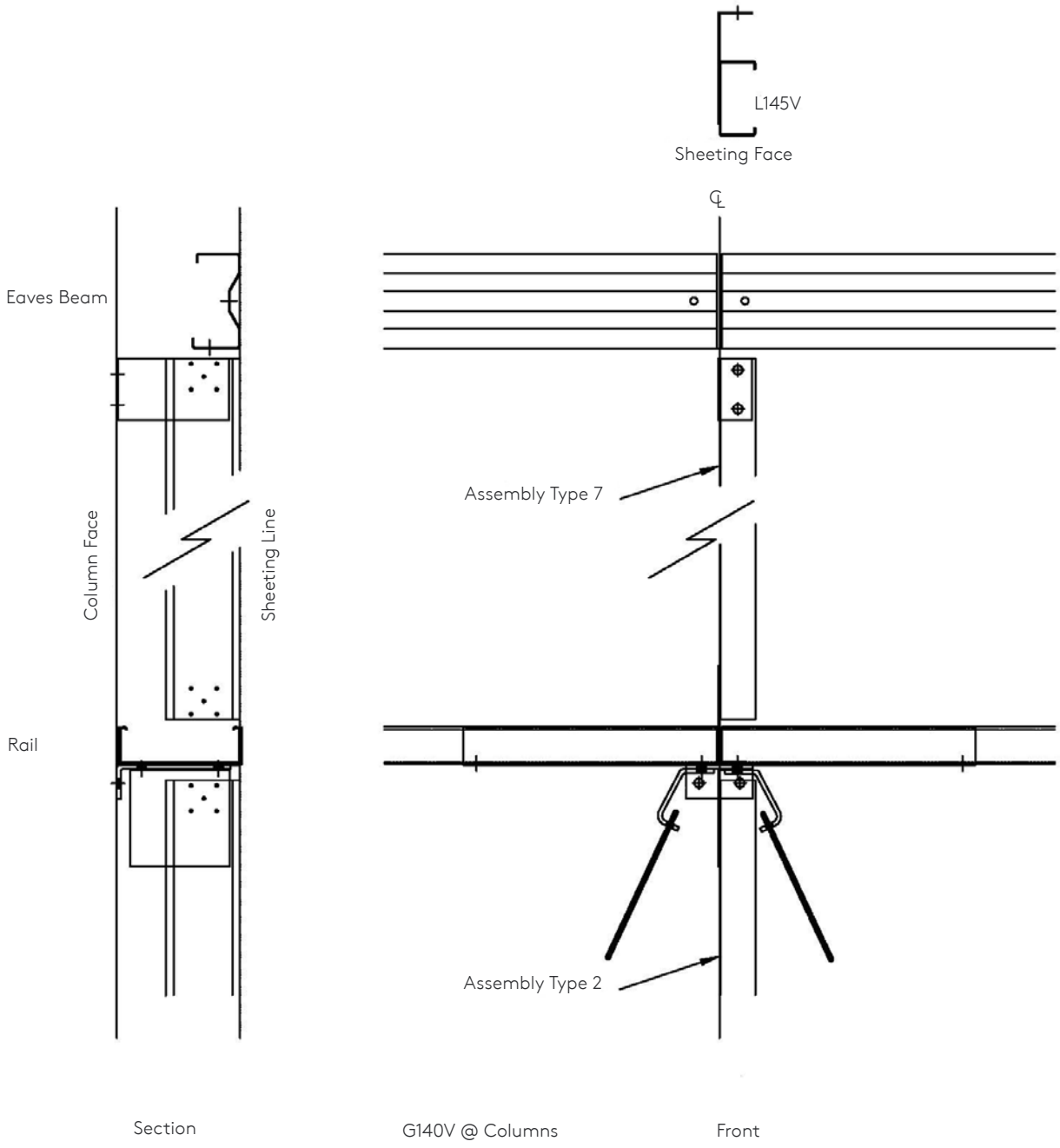
Multichannel

6.7 L145V Assembly in Span (no diagonals)



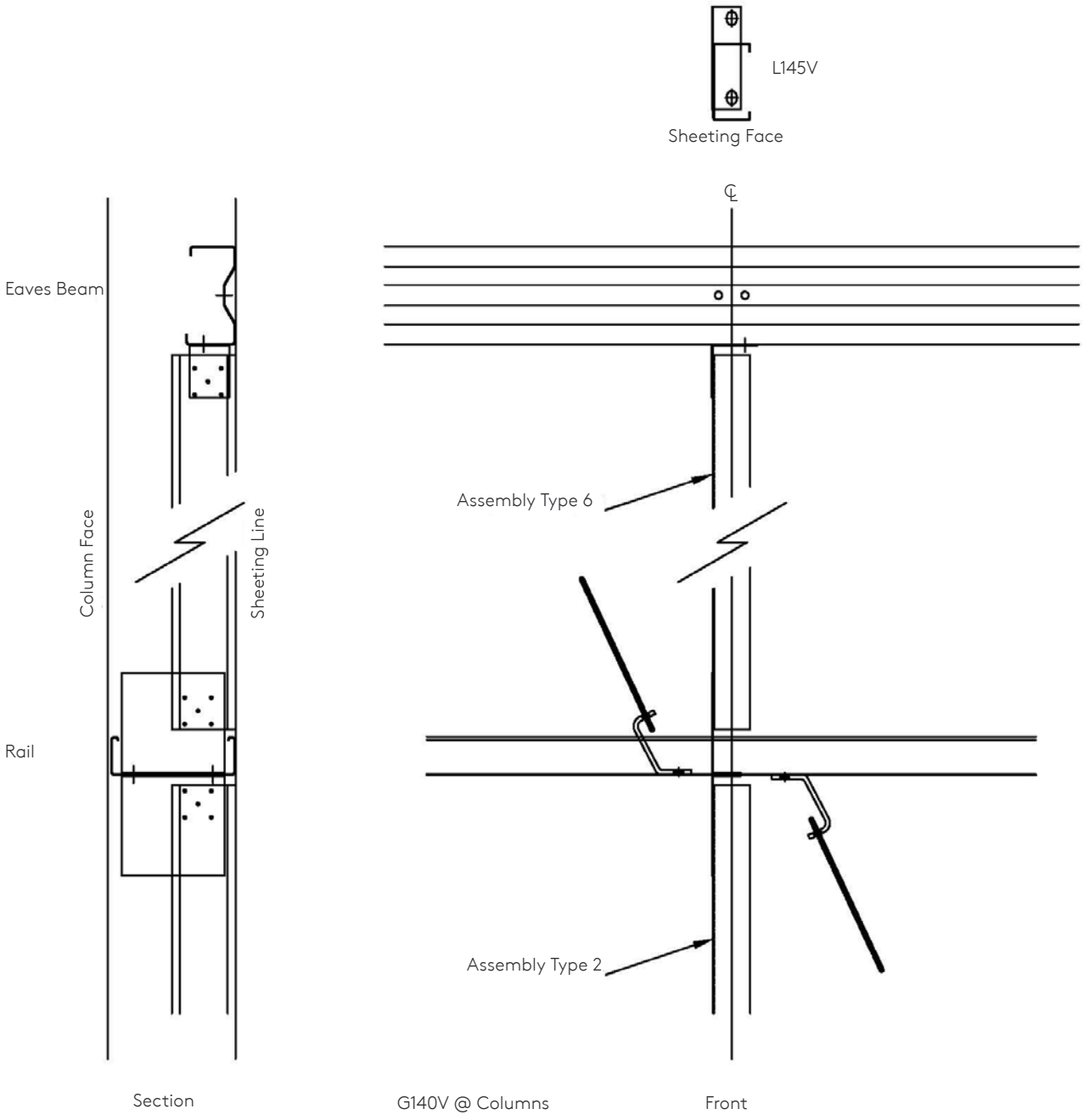
Multichannel

6.8 L145V Assembly at Column (with diagonals)



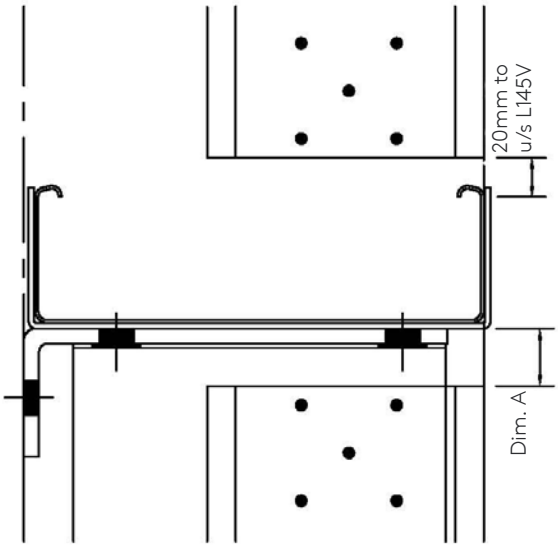
Multichannel

6.9 L145V Assembly in Span (with diagonals)

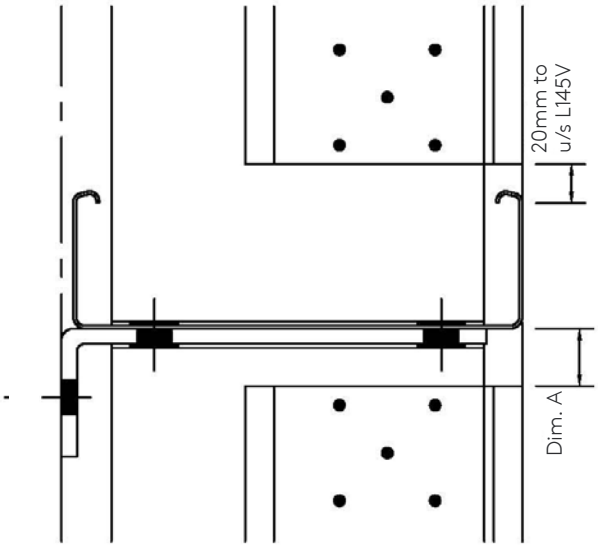


Multichannel

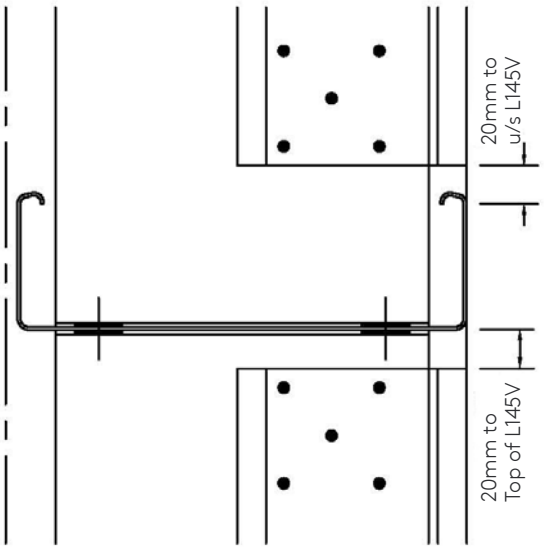
6.10 L145V Assembly Cross Section



L145V at Sleeved Connection



L145V at Non-Sleeved Connection

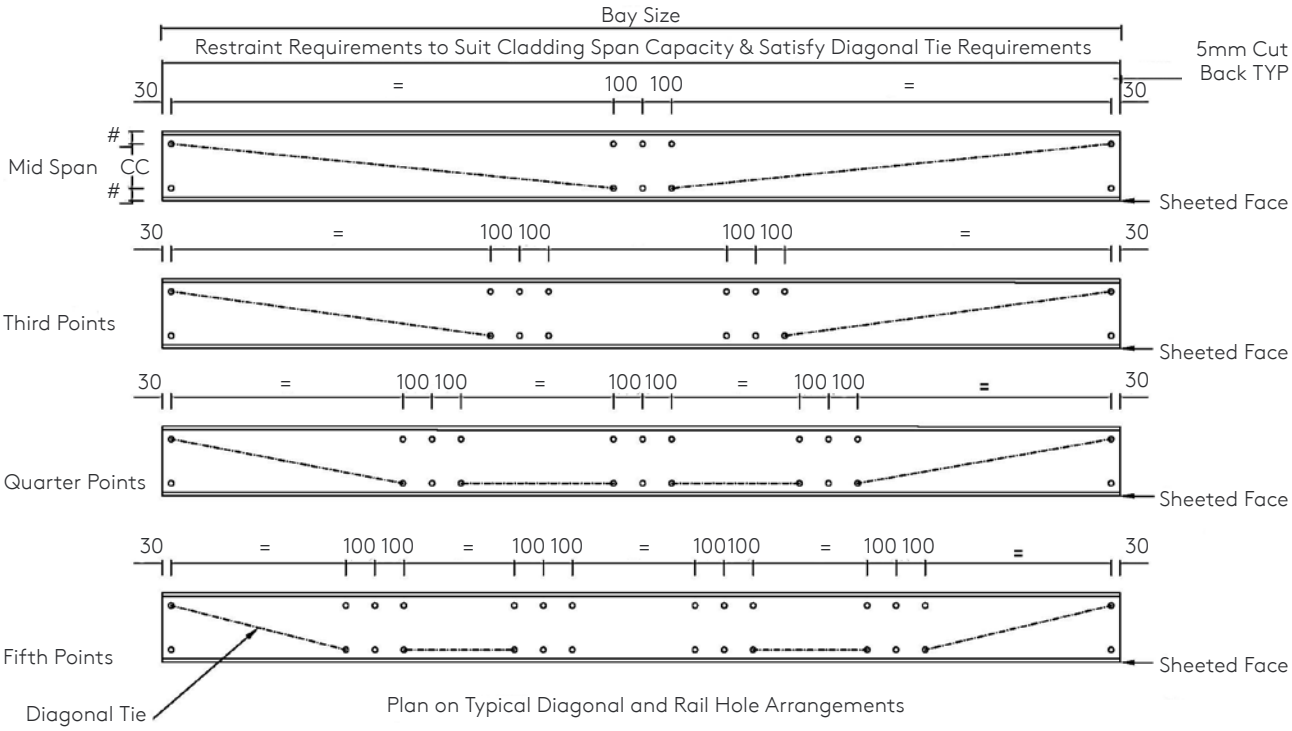


L145V Restraints in the Span

Notes:
Cleats shown are available in 8mm, 10mm or 12mm thickness.
L145 - L205 horizontal rail DIM A = 40mm.
L235 - L265 horizontal rail DIM A = 30mm.

Multichannel

6.11 Diagonal Assembly Arrangement Plan



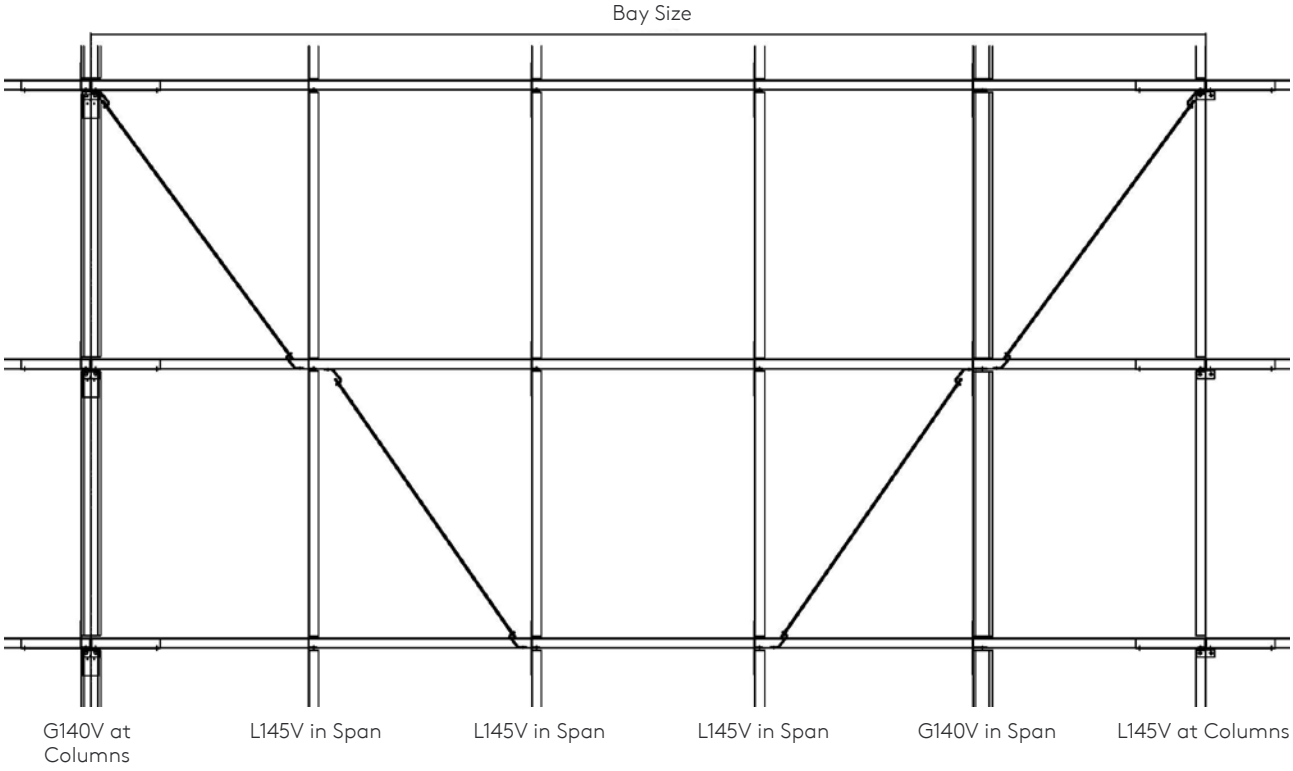
Plan on Typical Diagonal and Rail Hole Arrangements

Section	# (mm)	Centres (mm)
145	42.50	60
175	42.50	90
205	42.50	120
235	42.50	150
265	42.50	180

Notes:
All diagonal layouts are based on a minimum angle of 30 degrees to the horizontal rails Threaded rod diagonals should be used where panel butt joints are in the bay.

Multichannel

6.12 Diagonal Assembly Arrangement Elevation



Notes:
The diagonal arrangement shown above is for panel supports at 1/5 points of the bay which is the maximum permissable. Panel supports at 1/4 points of the bay also require the diagonals to be installed over 3 no. rails. Mid and third point supports should have diagonals over 2 rails. See Appendix A for additional recommended diagonal arrangements. All diagonal layouts are based on a minimum angle of 30 degrees. Threaded rod diagonals should be used for where panel butt joints are in the bay.

Multichannel

7. Appendix A Cleat Specification

To specify column cleat thickness, we recommend the following.

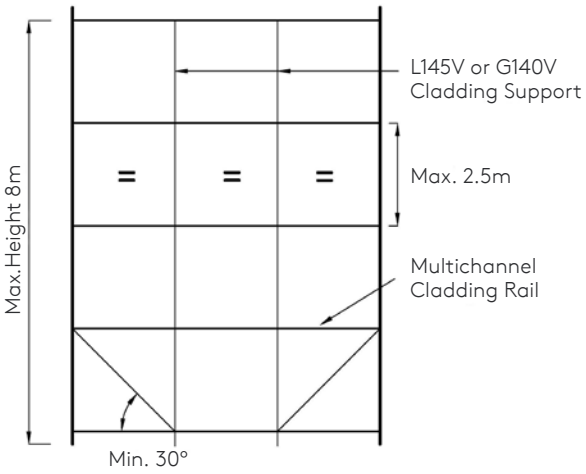
7.1 Geometric Limits

Cleat capacities are based on the following bay arrangements and a maximum cladding weight of 0.14kN/m^2. Where the wall height exceeds 8m in height, include additional diagonals every 8m.

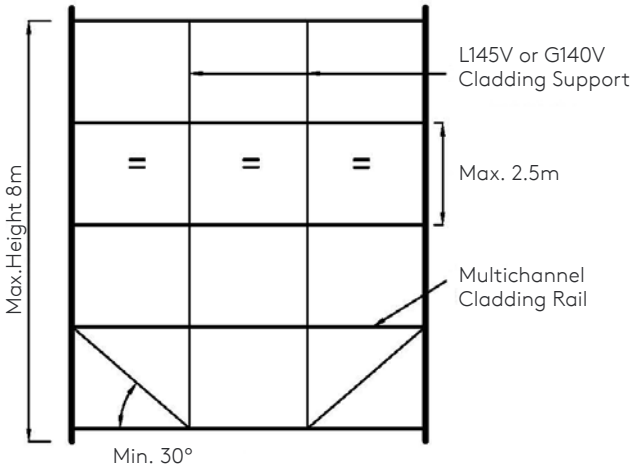
All due care and attention should be taken when installing the siderail system. Siderails should be progressively lined and levelled as they are installed. This may include temporary propping.

We recommend users check the support requirements of the cladding system with the manufacturer prior to use.
The number of vertical supports shown below is the maximum permissible for spans shown in order to size cleat in accordance with section 7.2. Please contact our Structural Products & Systems Technical Department for cladding supports outside these recommendations.

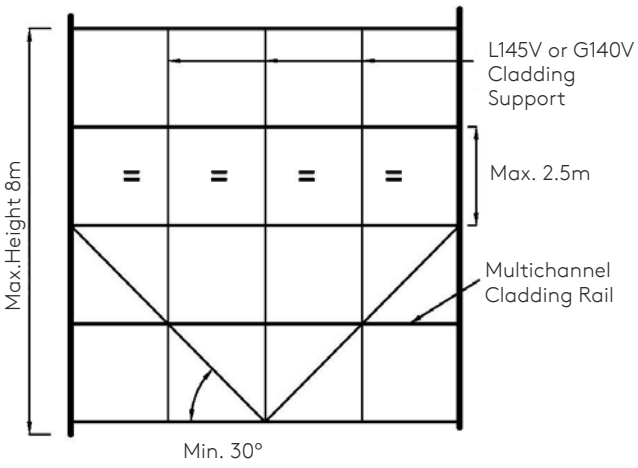
Vertical Supports for up to 6m Bays



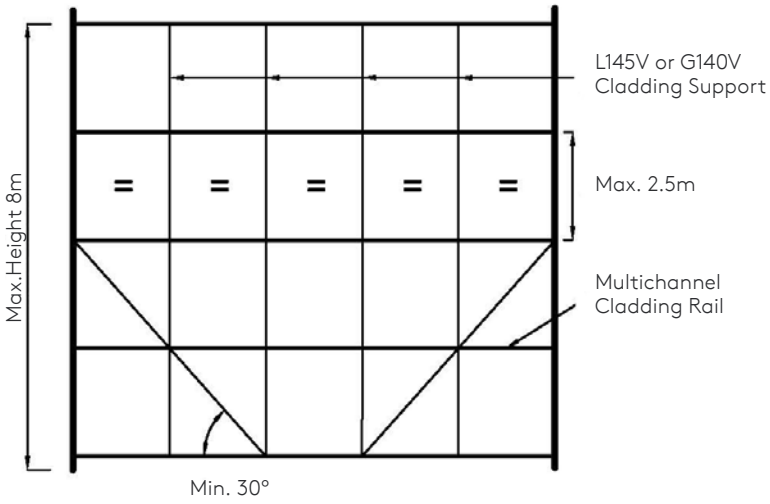
Vertical Supports for up to 7m Bays



Vertical Supports for up to 8m Bays



Vertical Supports for up to 9m Bays



Multichannel

7.2 Cleat Ready Reckoner

8mm Cleat Thickness

		Standard Stooling (rail depth +6mm)				Extended Stooling (see below for reference)						
Rail Depth(mm)		175	205	235	265	145	175	175	205	175	205	235
Stooling(mm)		181	211	241	271	181	211	241	241	271	271	271
Cleat Ref		HZ175BV8	HZ205BV8	HZ235BV8	HZ265BV8	HZ145BV8*	HZ205BVM8 (175)	HZ235BVM8 (175)	HZ235BVM8 (205)	HZ265BVM8 (175)	HZ265BVM8 (205)	HZ265BVM8 (235)
Bay (m)	6.00	✓	✓	✓	✓	✓	✓	×	✓	×	×	✓
	7.00	✓	✓	✓	✓	✓	✓	×	✓	×	×	×
	8.00	✓	✓	✓	×	×	×	×	×	×	×	×
	9.00	✓	✓	×	×	×	×	×	×	×	×	×

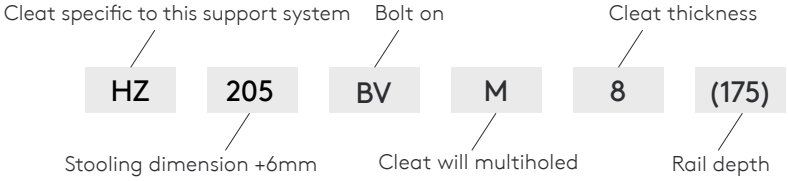
10mm Cleat Thickness

		Standard Stooling (rail depth +6mm)				Extended Stooling (see below for reference)						
Rail Depth(mm)		175	205	235	265	145	175	175	205	175	205	235
Stooling(mm)		181	211	241	271	181	211	241	241	271	271	271
Cleat Ref		HZ175BV10	HZ205BV10	HZ235BV10	HZ265BV10	HZ145BV10*	HZ205BVM10 (175)	HZ235BVM10 (175)	HZ235BVM10 (205)	HZ265BVM10 (175)	HZ265BVM10 (205)	HZ265BVM10 (235)
Bay (m)	6.00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	7.00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	8.00	✓	✓	✓	✓	✓	✓	×	✓	×	×	✓
	9.00	✓	✓	✓	✓	✓	✓	×	✓	×	×	✓

12mm Cleat Thickness

		Standard Stooling (rail depth +6mm)				Extended Stooling (see below for reference)						
Rail Depth(mm)		175	205	235	265	145	175	175	205	175	205	235
Stooling(mm)		181	211	241	271	181	211	241	241	271	271	271
Cleat Ref		HZ175BV12	HZ205BV12	HZ235BV12	HZ265BV12	HZ145BV12*	HZ205BVM12 (175)	HZ235BVM12 (175)	HZ235BVM12 (205)	HZ265BVM12 (175)	HZ265BVM12 (205)	HZ265BVM12 (235)
Bay (m)	6.00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	7.00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	8.00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	9.00	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓

Cleat Reference Key



Notes:
Shaded grey areas denote rail depths not practical for span.
✓Rail cleat suitable for bay geometry.
× Rail cleat unsuitable for bay geometry.
When bay width under consideration exceeds the stated, then the cleat must be selected on next bay increment. For bays over 9m, please consult our Structural Products & Systems Technical Department.
* HZ145BV will be supplied to maintain a min. 181mm stooling when using a 145mm rail depth.

Multichannel

8. Appendix B: Load Table for Horizontal Cladding Supports

L145150V or G140150V

Span (m)	Pressure (kN) uls	Suction (kN) uls	Deflection L/150 (kN) sls
1.50	13.10	14.54	36.00
1.60	12.28	13.63	31.64
1.80	10.91	12.12	25.00
2.00	9.82	10.91	20.25
2.20	8.93	9.92	16.74
2.40	8.18	9.09	14.06
2.50	7.86	8.73	12.96

L145200V or G140200V

Span (m)	Pressure (kN) uls	Suction (kN) uls	Deflection L/150 (kN) sls
1.60	16.99	17.09	42.31
1.80	15.10	16.60	33.43
2.00	13.59	14.94	27.08
2.20	12.36	13.58	22.38
2.40	11.33	12.45	18.80
2.50	10.87	11.95	17.33

Notes:
Values assume cladding provides full restraint to sheeted face and limitations given in section 7 of this document are not exceeded.

UK

Kingspan Limited
Sherburn, Malton
North Yorkshire, YO17 8PQ
T: +44 (0) 1944 712000
F: +44 (0) 1944 710830
www.kingspanstructural.co.uk

Ireland

Kingspan Limited
Carrickmacross Road
Kingscourt, Co.Cavan
T: +353 (0) 420969 8500
F: +353 (0) 420969 8572
www.kingspanstructural.ie

For the product offering in other markets please contact your local sales representative or visit www.kingspanpanels.com

02/2019

Kingspan®