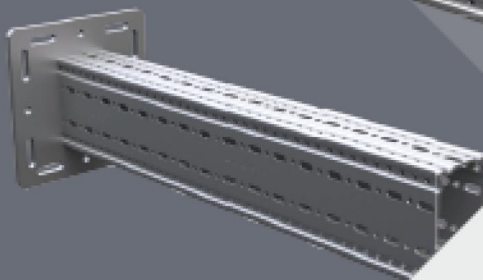
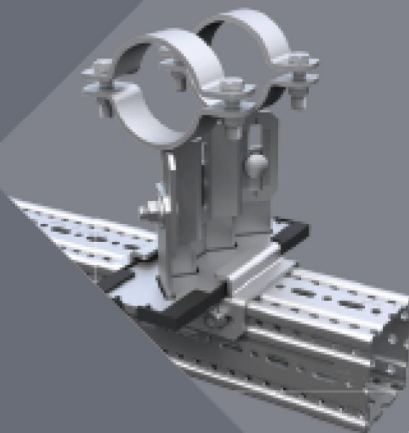
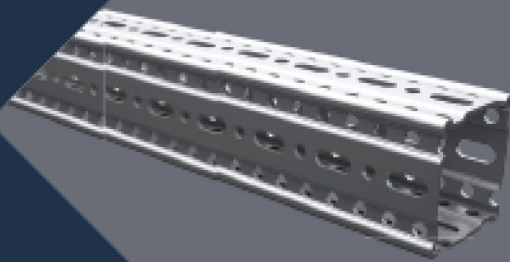


sikla



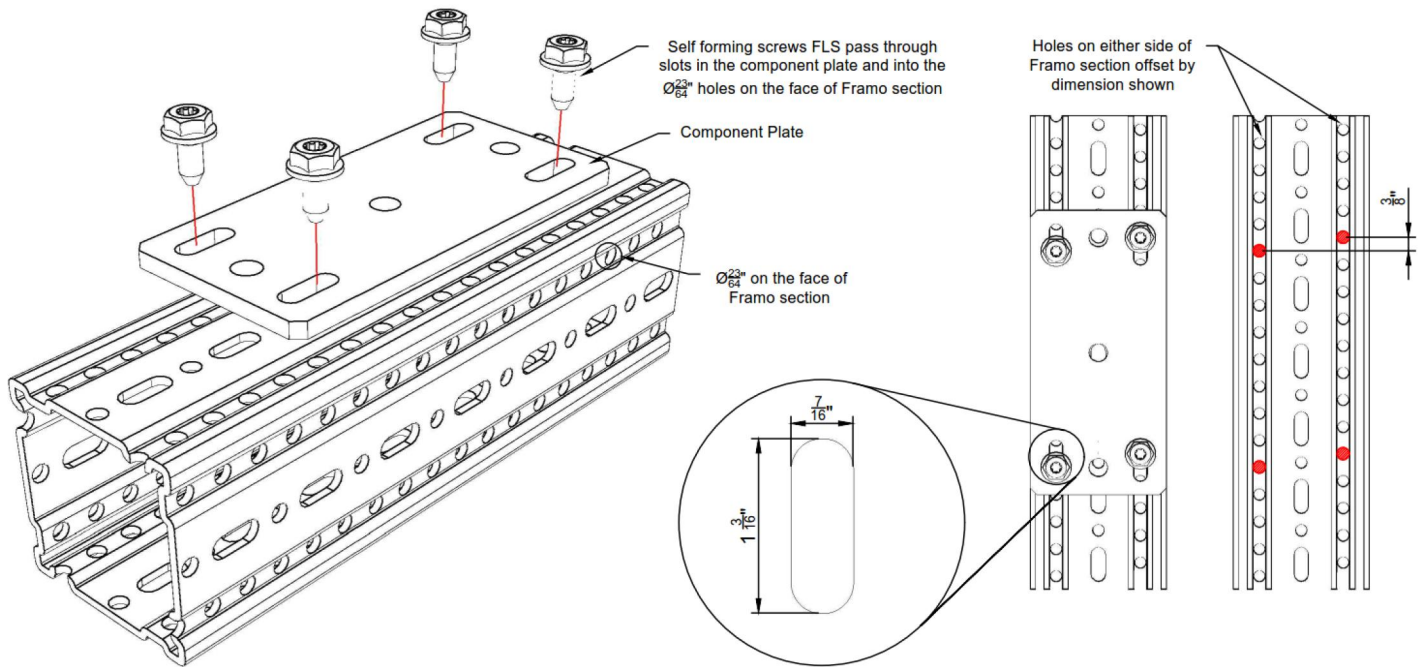
Sikla USA

Assembly Guideline 2017

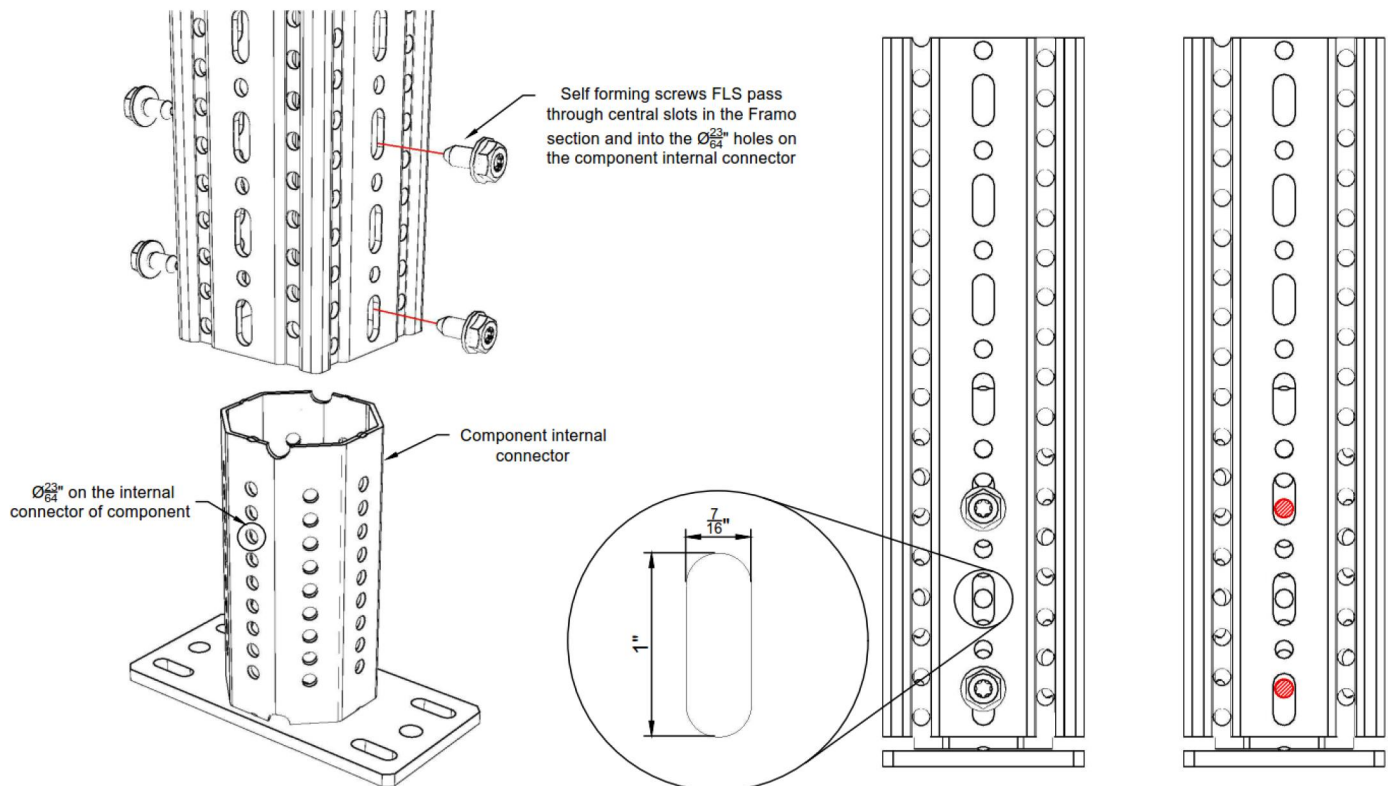
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Plate to Face connection



Internal Connection

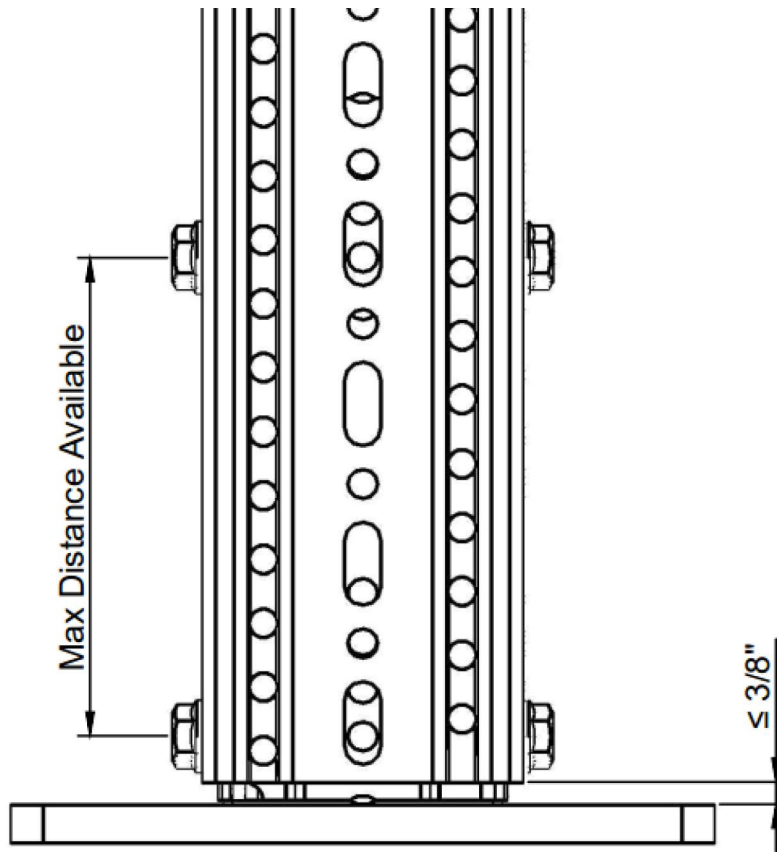


Self Forming Screw - FLS



Assembly using Self Forming Screws FLS can be made using a hand-held impact driver.
Maximum torque applied must not exceed 44 lb-ft

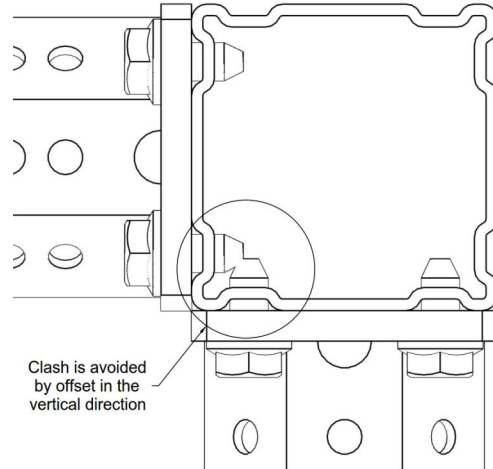
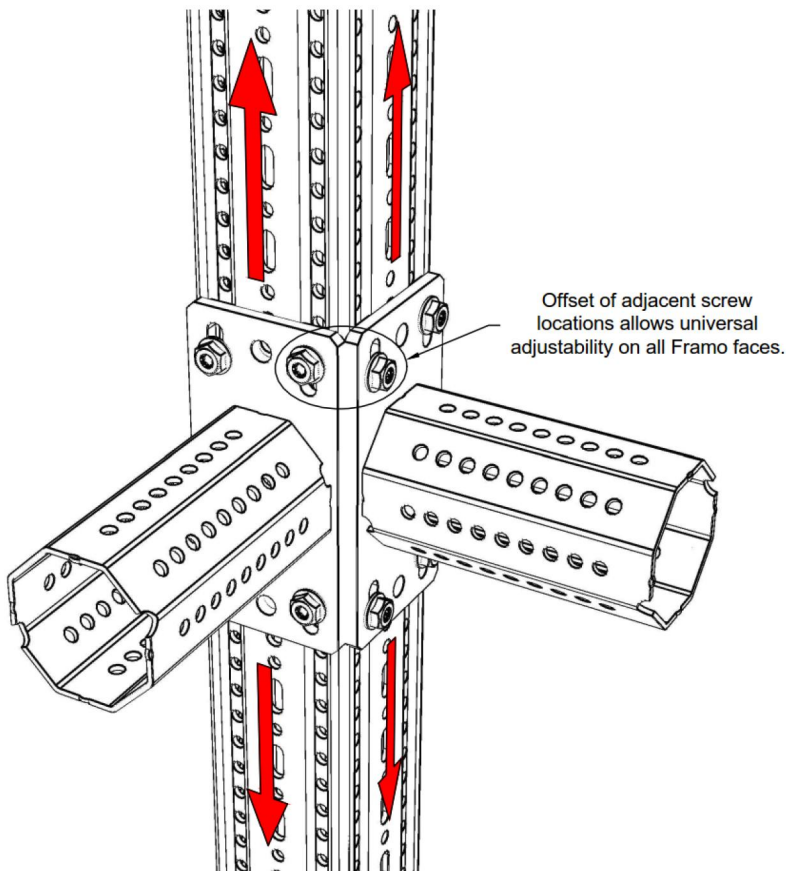
Screw Positioning



FLS screws used to fasten internal components should be spaced as far apart as possible.
The maximum allowable distance between the end face of the Framo section and the component plate should be 3/8".

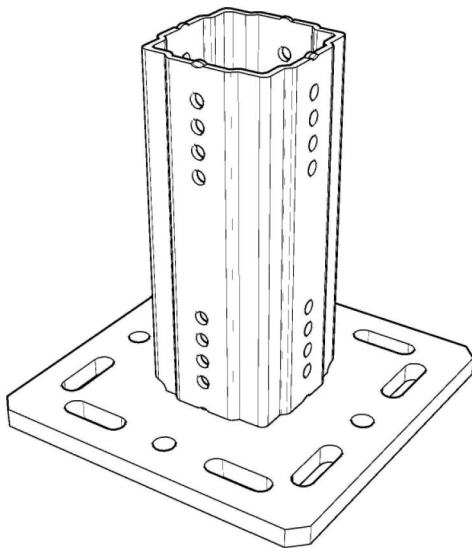
Stepless Adjustability

Adjustment is possible along the full available surface of Framo beam section.

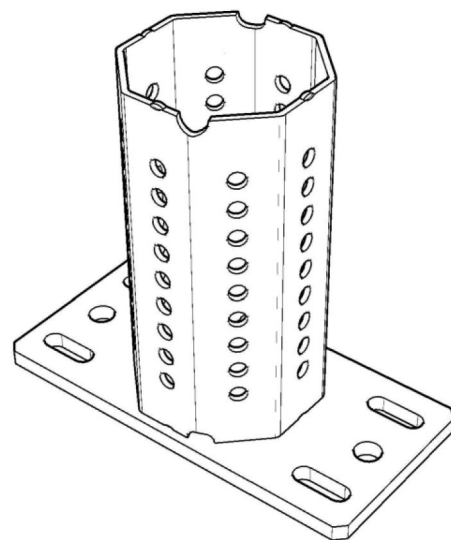


Sikla components can be connected to adjacent and opposite faces of the Sikla beam sections without clashes of fastening screws

Internal Connector Types

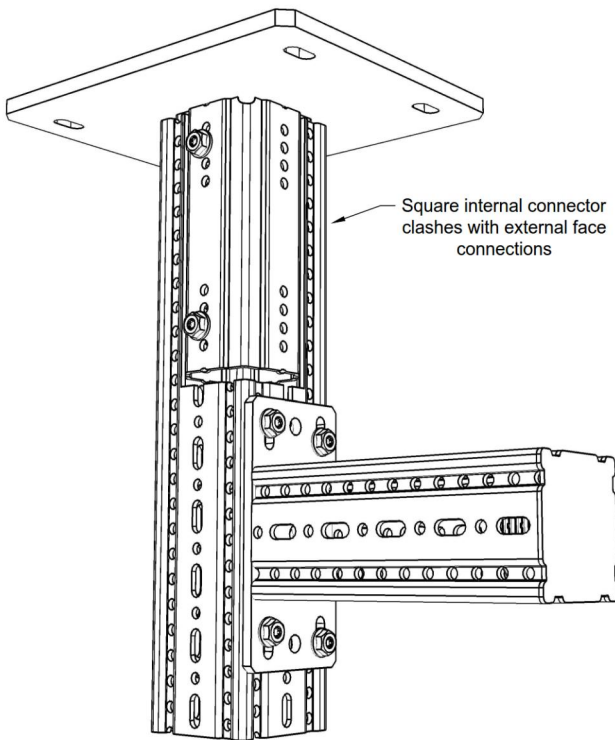


Square internal connector Type
Used mainly for Footplate components

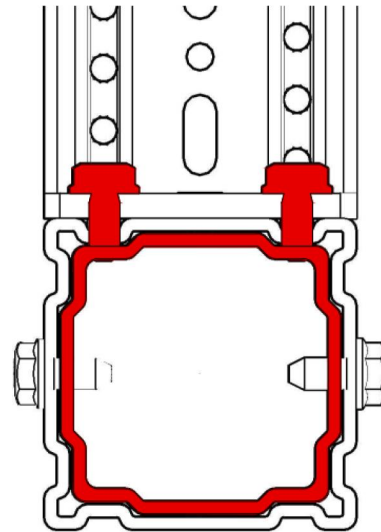


Octagonal Internal Connector Type
Used Mainly for general connections

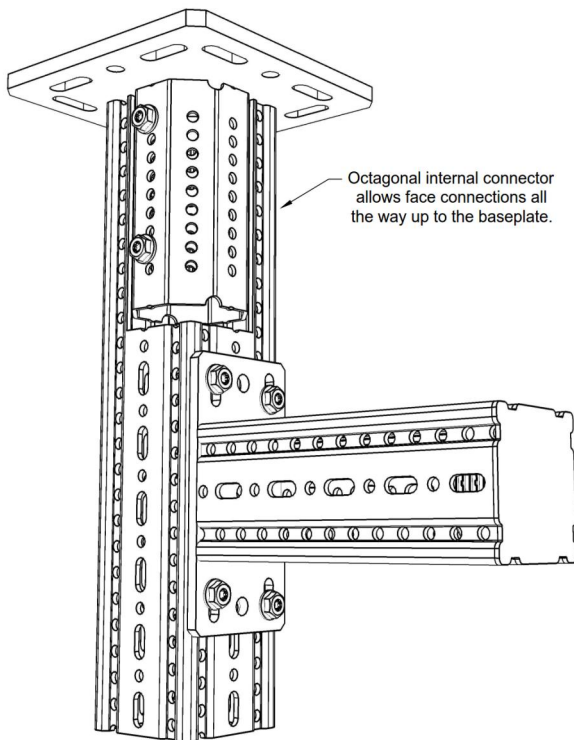
Internal Connector Types



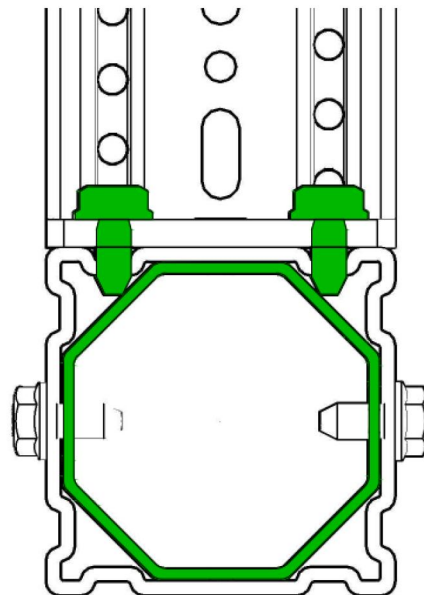
Standard Footplates (WBD) have a square internal connector



The square internal connector will clash with screws used by Framo face connections



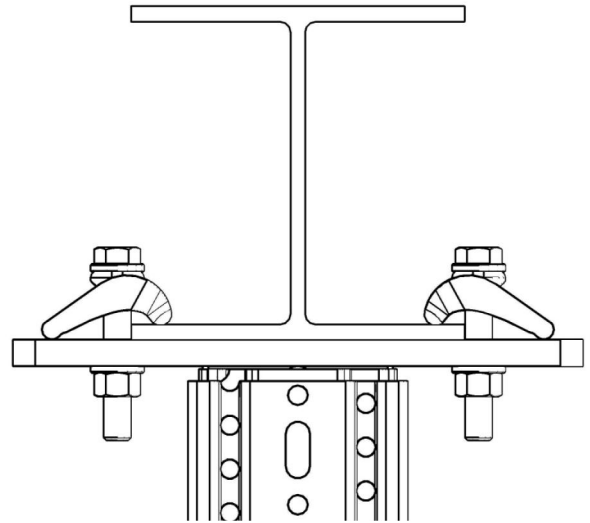
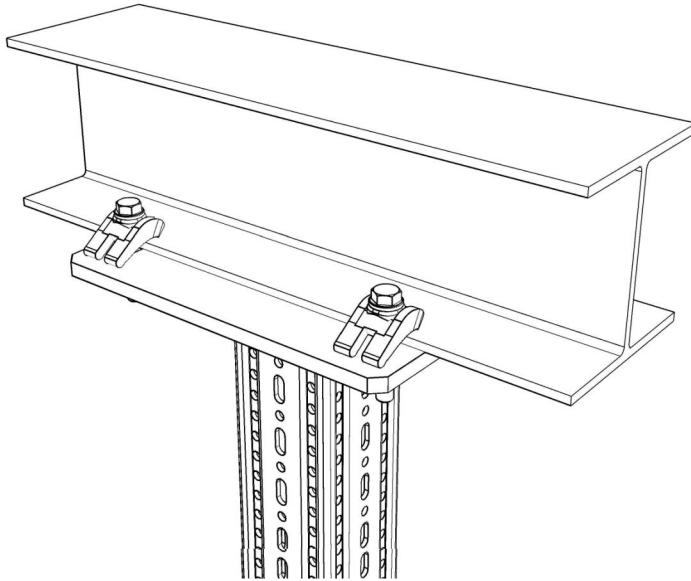
The WBD - T Footplates have an octagonal internal connector



Framo face connections can be made over the octagonal internal connector without clash

Connecting to Primary Steel

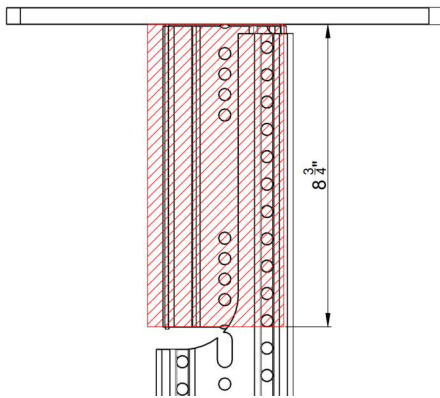
Framo footplate can be clamped to primary steel sections using Sikla standard clamping sets. There are five baseplates available to cover a large range of I-beam flange widths, these can be seen in the table below.



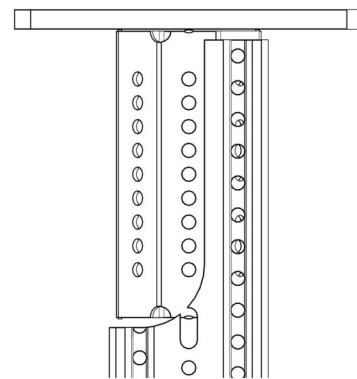
Baseplate clamping ranges

Clamping Range Reference	Flange Width Clamping Range	Dimensions of Plate	Slots in Baseplates
80 / 120	3 1/8" - 4 3/4"	8 5/8" x 8 5/8" x 1/2"	1/2"
121 / 160	4 3/4" - 6 1/4"	14 3/16" x 10 1/4" x 1/2"	1/2"
161 / 200	6 1/4" - 7 7/8"	14 3/16" x 12 1/4" x 1/2"	5/8"
201 / 300	7 7/8" - 11 7/8"	16 1/2" x 8 5/8" x 1/2"	5/8"
T - Type	3 1/8" - 4 3/4"	8 5/8" x 8 5/8" x 1/2"	1/2"

"No Fix Zone"



Standard Baseplate

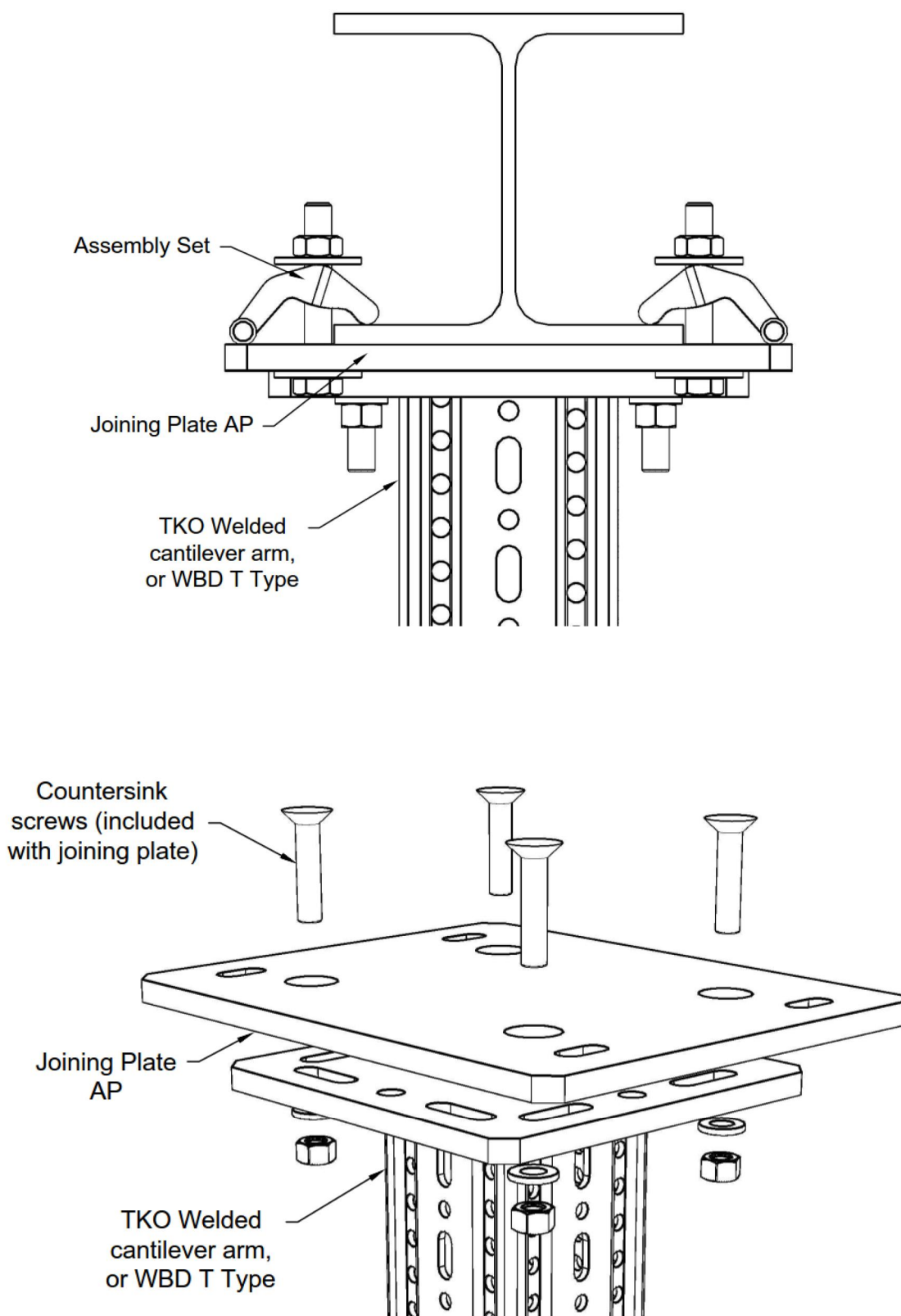


T type baseplate

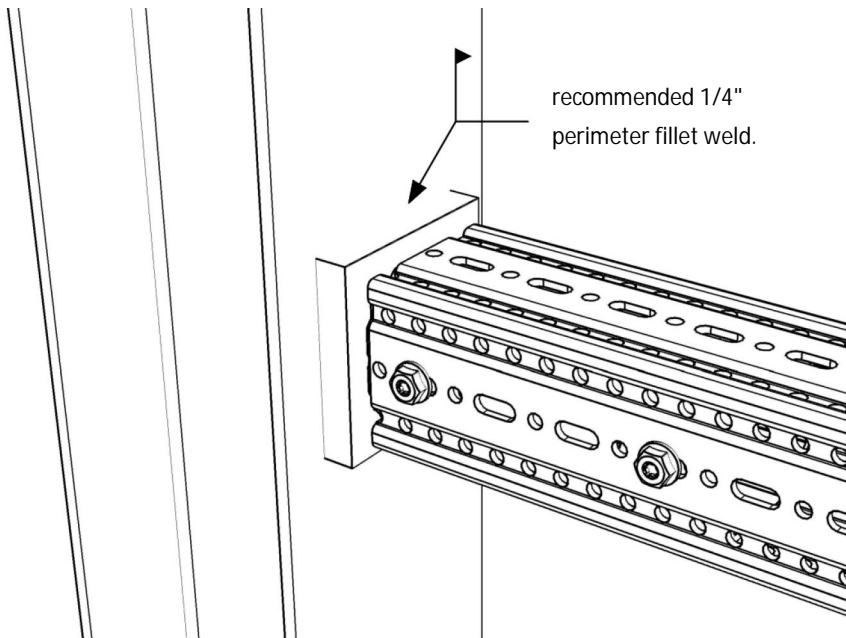
When a footplate is used there is a "No fix zone" near to the baseplate as shown above, where no external fixes may be made. Where a fix close to the baseplate is required a WBD F T type can be used.

Joining Plate AP

Where a WBD T type or welded cantilever TKO is used, beam connections can be made using a Joining Plate AP.



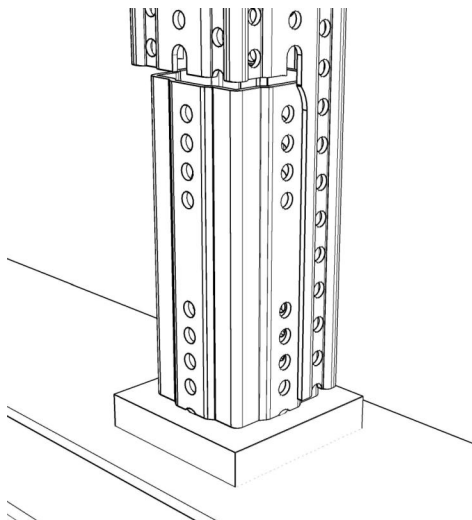
Welding Adapters



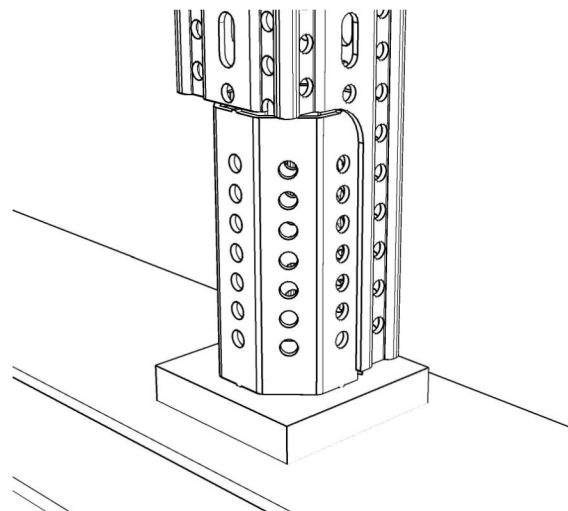
Welding adapter component has a weldable corrosion resistant coating, that conforms with health and safety requirements.

Once the weld is complete, all surfaces that exposed to debris from the weld must be checked for damage and re-coated if necessary

"No Fix Zone"



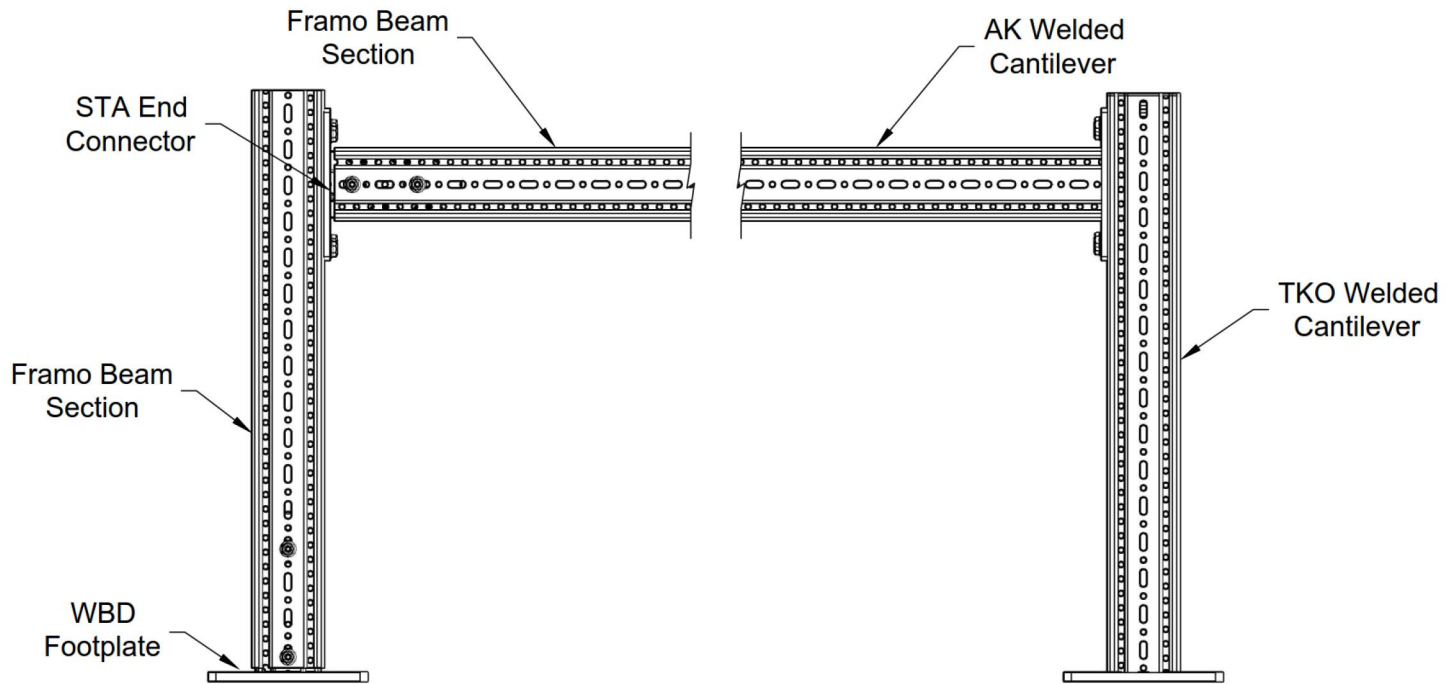
4kt (square adapter)



8kt (octagonal adapter)

Like the range of footplates, there is two types of internal connection available, the square adapter has the same "no fix zone". The octagonal type can be used to extend the fix zone up to the beam, however there is some reduction in load capacity as a results

Economical Design



Poor Economy Structure

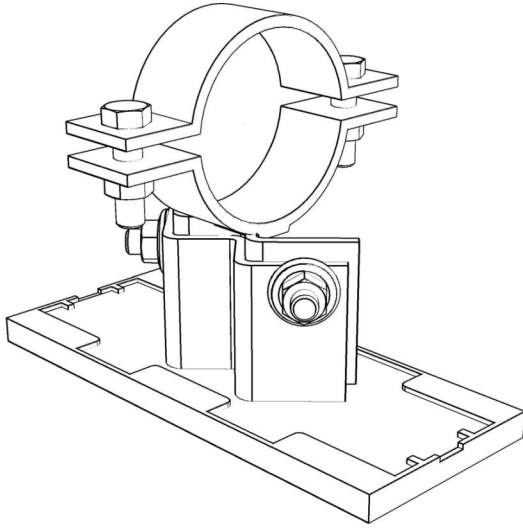
4 Components
12 FLS Screws
2 Connections

Good Economy Structure

2 Components
4 FLS Screws
1 Connection

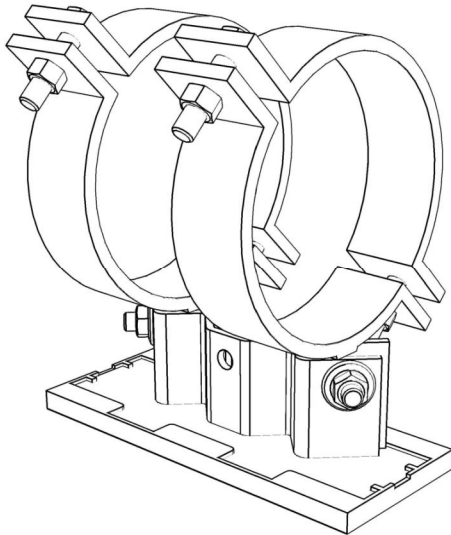
Where possible welded cantilever type components should be used. This reduces number of components, reduces weight, decreases assembly time and improves structural properties in general.

Main Variants



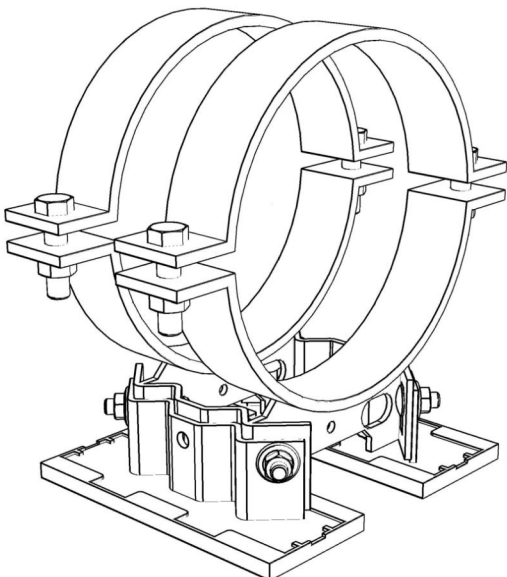
LA-HV

- Single clamp, Single baseplate
- Clamping range 1/2" - 6"
- Height adjustable
- For pipe diameters 1/2" - 6"



LC-HV

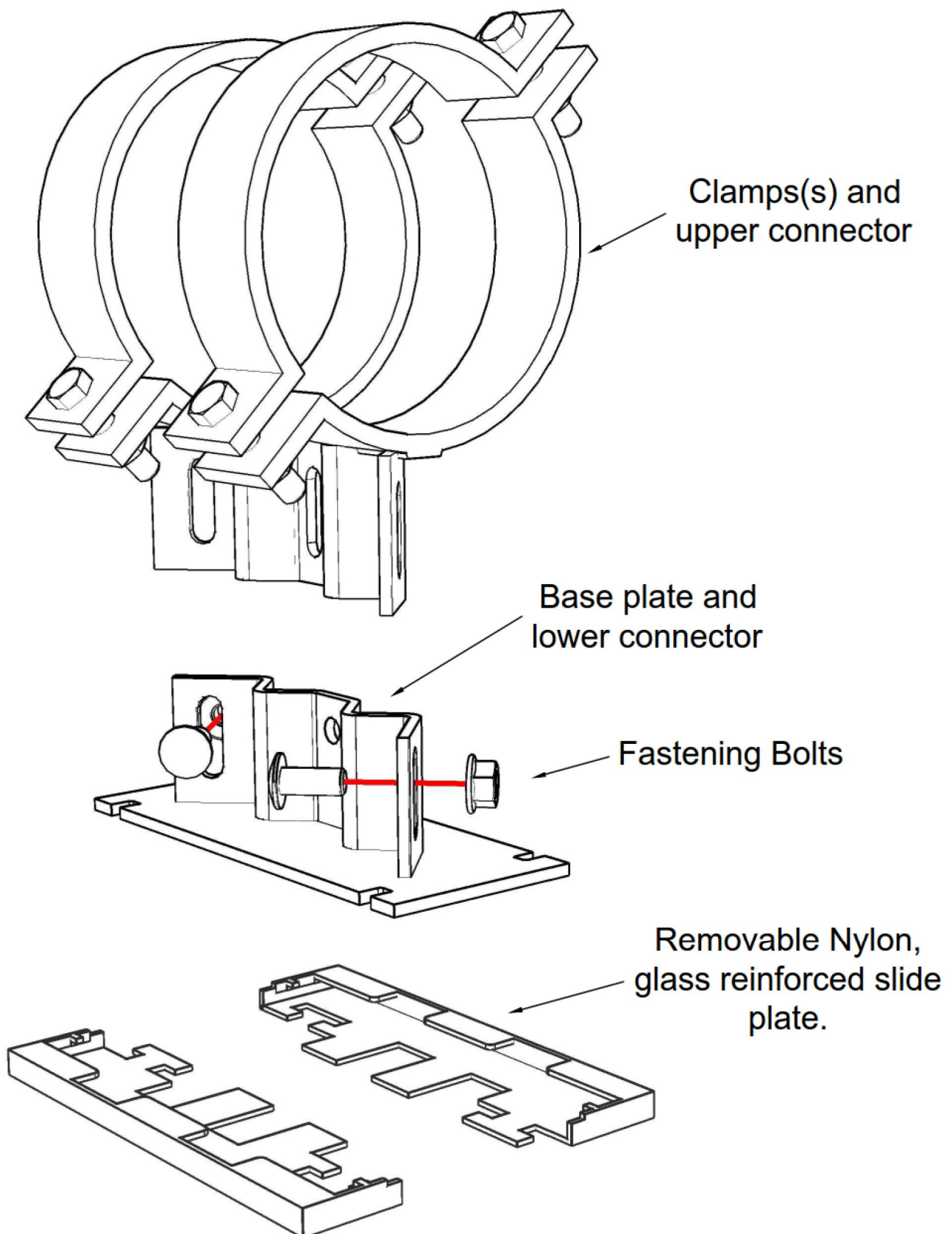
- Double clamp, Single baseplate
- Clamping range 1/2" - 12"
- Height adjustable
- For pipe diameters 1/2" - 12"



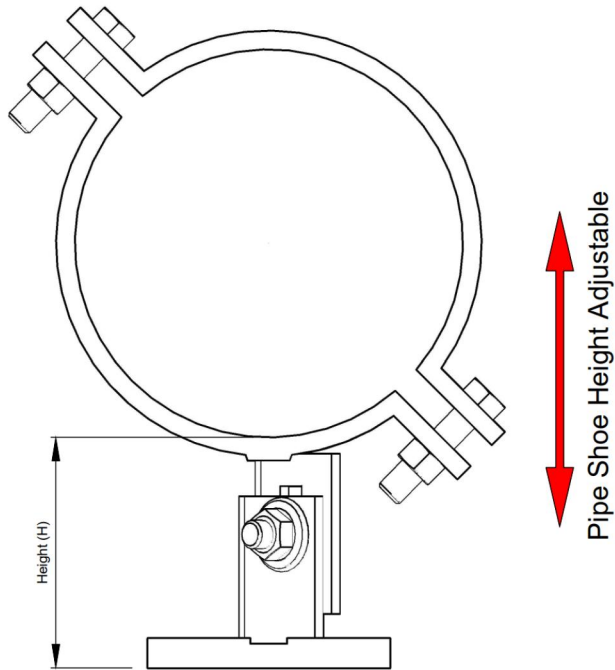
LD-HV

- Double clamp, Double baseplate
- Clamping range 8" - 24"
- Height adjustable
- For pipe diameters 8" - 24"

Anatomy of a pipe shoe

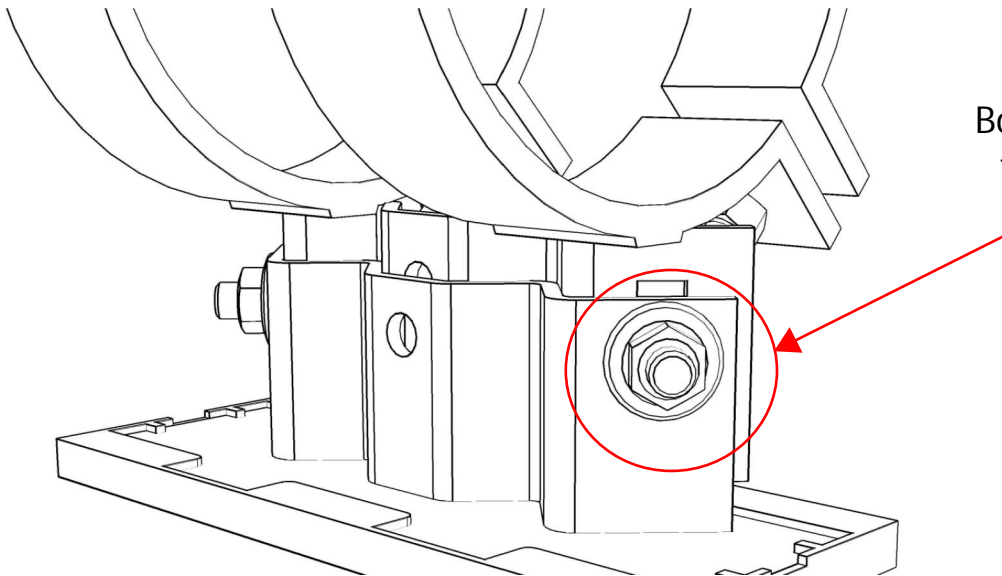


Pipe shoe details



The three main variants (LA,LC,LD) have three height options HV90, HV150 and HV200.

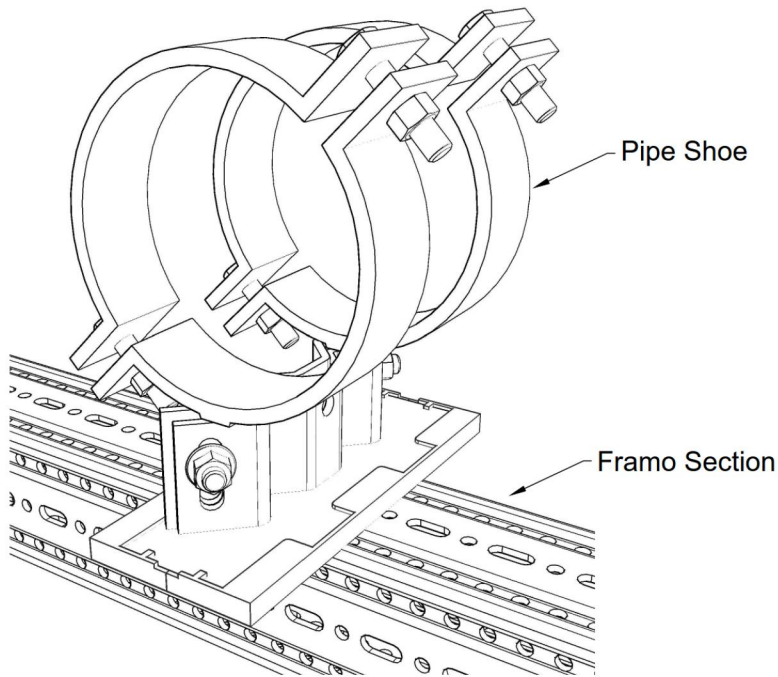
Height Suffix	H - Underside of shoe to B.O.P
HV 90	3 1/2" - 4 1/2"
HV 150	4 9/16" - 6 5/8"
HV 200	6 3/4" - 8 13/16"



Bolts for height adjustability.
Tightening torque 59 lb-ft

Pipe shoe Framo Interfaces

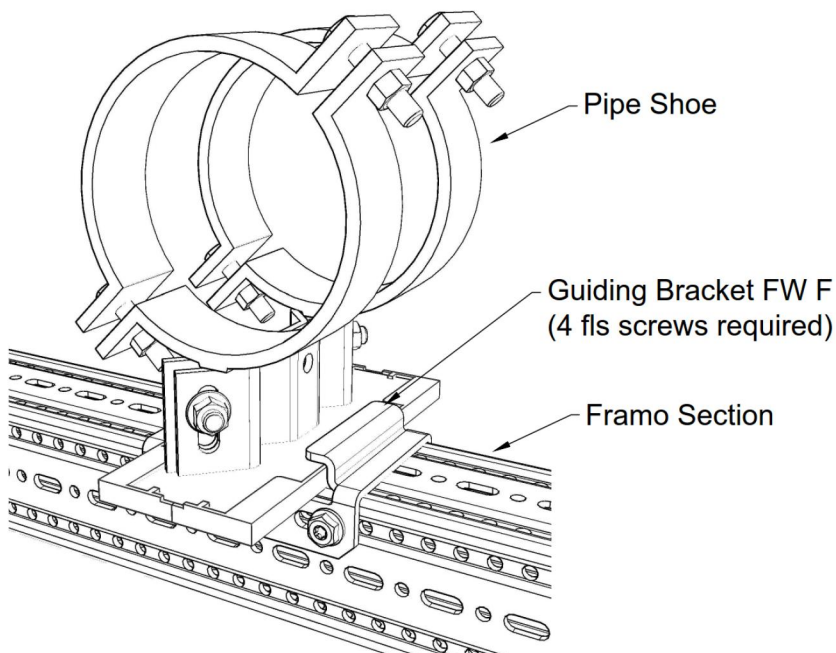
Sliding Support



- Pipe shoe can be rested on Framo secondary steelwork beam. Recommended minimum bearing surface of supporting steelwork is 3 1/8"

- Allowable forces for pipe shoe and interface published at the end of this guide. These should be used in combination with the allowable loads for the supporting Framo system.

Guiding Support

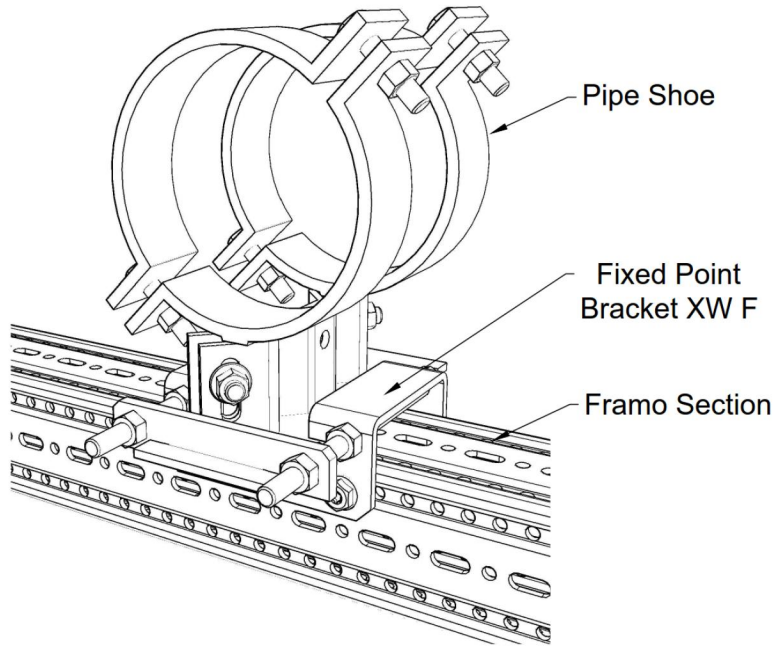


- A guided support can be achieved using the "Guiding Bracket FW F" that matches the Framo section size

- Allowable forces for pipe shoe and interface published at the end of this guide. These should be used in combination with the allowable loads for the supporting Framo system.

Pipe shoe Framo Interfaces

Fixed Point Support



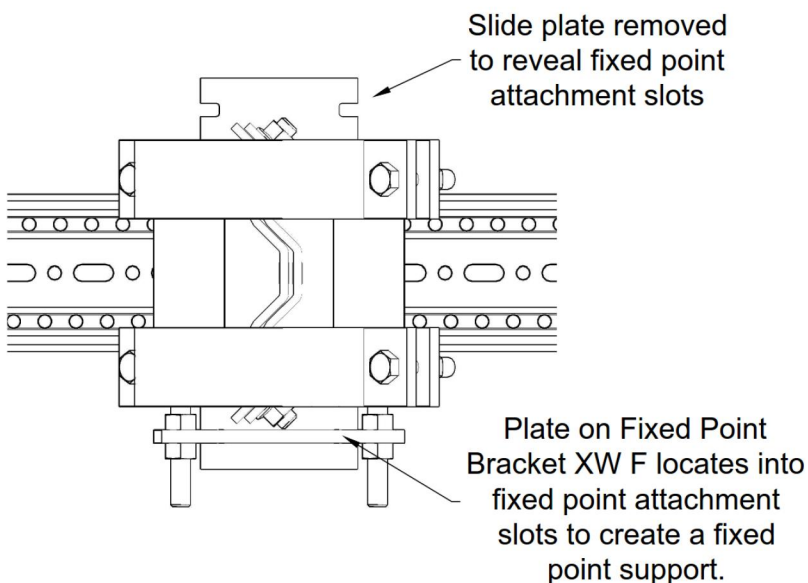
- A Fixed Point or "Line Stop" support can be achieved using the "Fixed Point Bracket XW F" that matches the Framo beam section size.

- The Nylon slide plate is removed from the pipe shoe revealing the fixed point notches in the shoe base plate.

- The plate on the "Fixed Point Bracket XW F" locks into the shoe plate notches to create the fixed point.

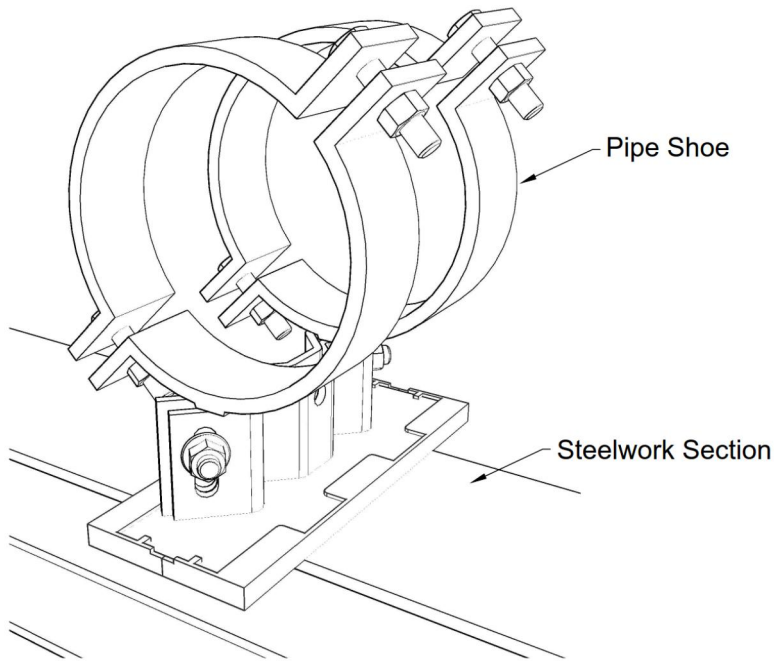
- Allowable forces for pipe shoe and interface published at the end of this guide. These should be used in combination with the allowable loads for the supporting Framo system.

Fixed Point Support - (Plan View)



Pipe shoe I-Beam Interfaces

Sliding Support

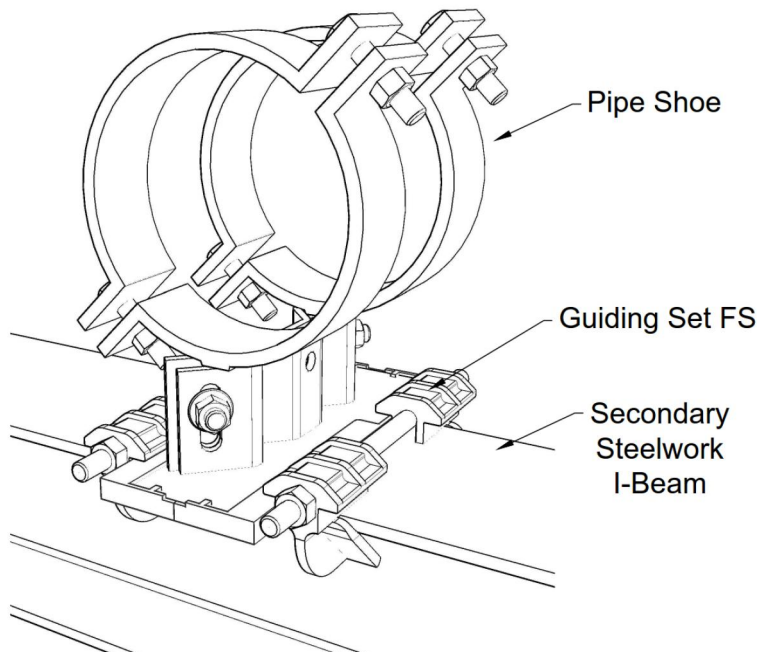


- Pipe shoe can be rested on a secondary steelwork beam.

- Recommended minimum bearing surface of 3 1/8"

- Allowable forces for pipe shoe and interface published at the end of this guide.

Guiding Support

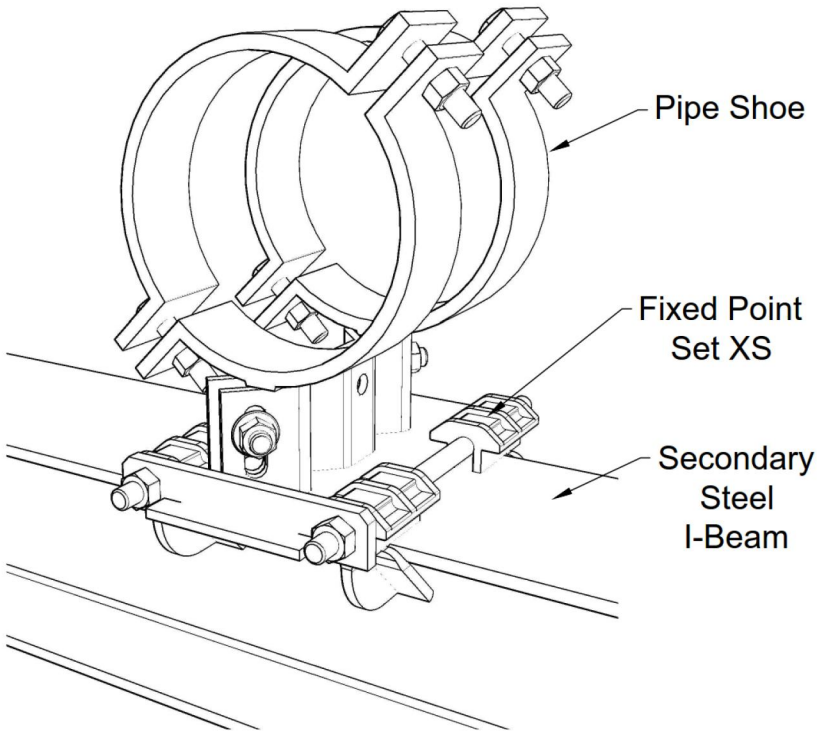


- A guiding support can be achieved using the "Guiding Set FS F" that matches the steel beam flange width.

- Allowable forces for pipe shoe and interface published at the end of this guide.

Pipe shoe I-Beam Interfaces

Fixed Point Support



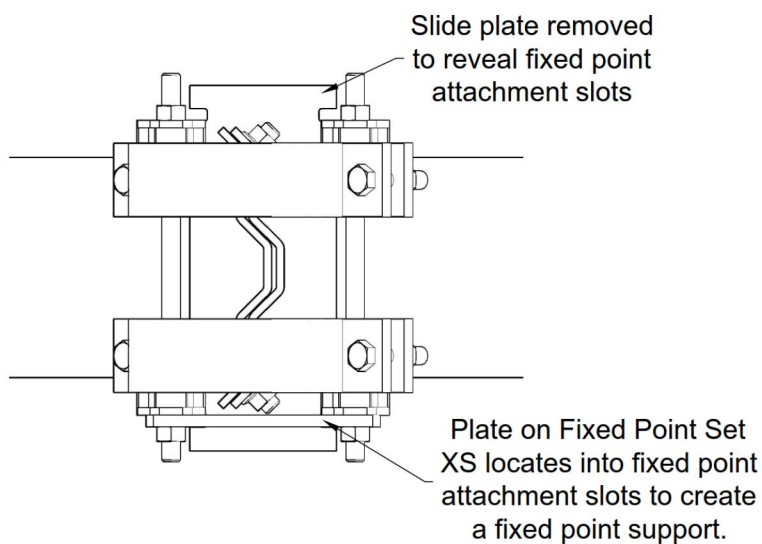
- A Fixed Point or "Line Stop" support can be achieved using the "Guiding Set FS F" that matches the steel beam flange width.

- The Slide plate on the pipe shoe is removed revealing the fixed point notches in the shoe base plate.

- The plate on the "Fixed Point Set X FS" locks into the revealed notches to create the fixed point.

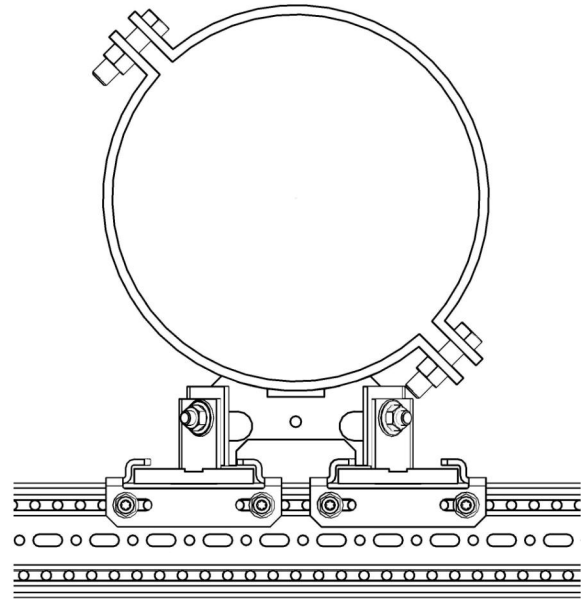
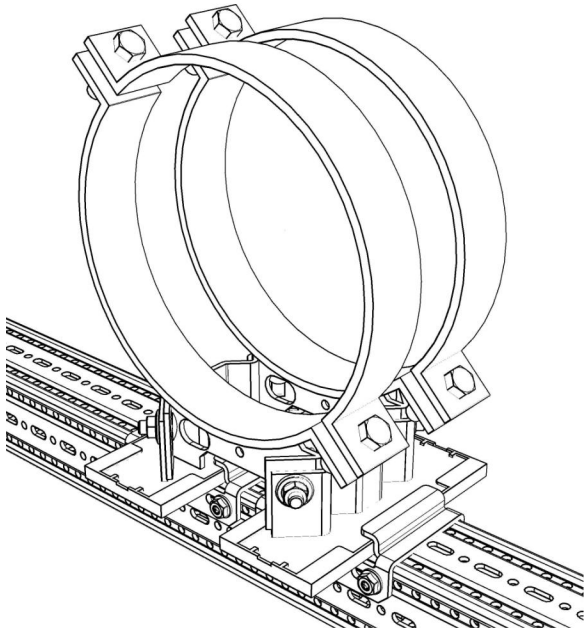
- Allowable forces for pipe shoe and interface published at the end of this guide.

Fixed Point Support - (Plan View)



Pipe shoe interfaces

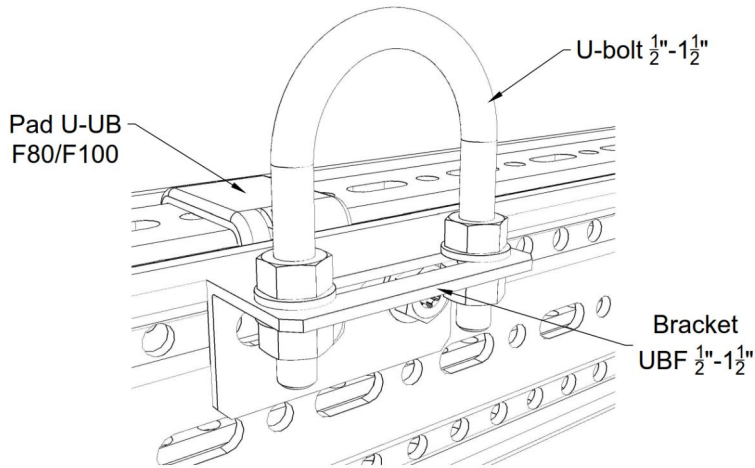
LD-HV (Double Baseplate)



LD-HV type shoes (Double Baseplate) require 2 connections per single pipe shoe unit, when required either as a guided support or fixed point support

U-Bolt Framo Interfaces

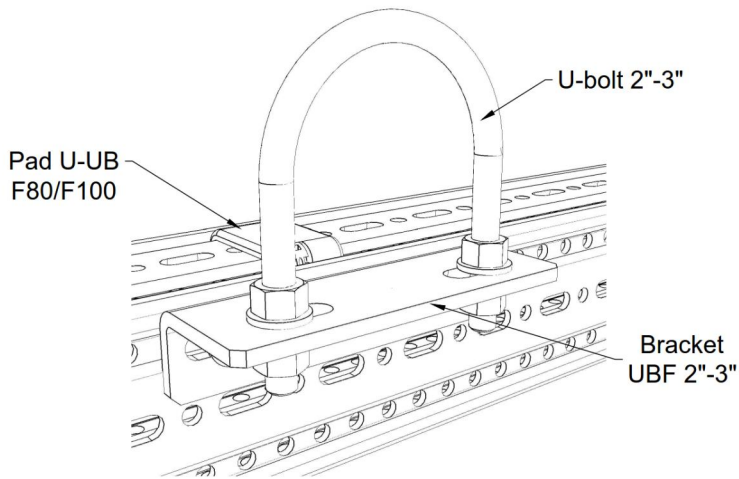
1/2" - 1 1/2" Pipes



- U-bolts 1/2" - 1 1/2" can be attached to Framo beam section using the single bracket (UBF 1/2" - 1 1/2") using 2 FLS screws.

- A Nylon slidepad can be clipped on to the Framo surface to act an insulator and to provide surface protection if required (Pad U-UB F)

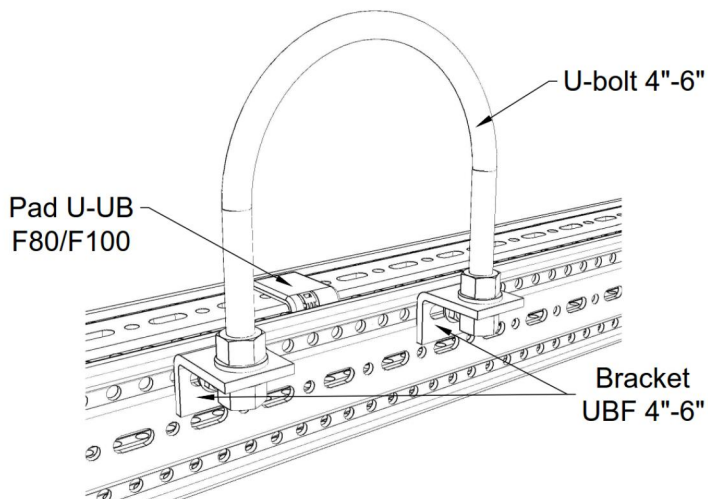
2" - 3" Pipes



- U-bolts 2" - 3" can be attached to Framo profiles using the single bracket (UBF 2" - 1 3") using 2 FLS screws.

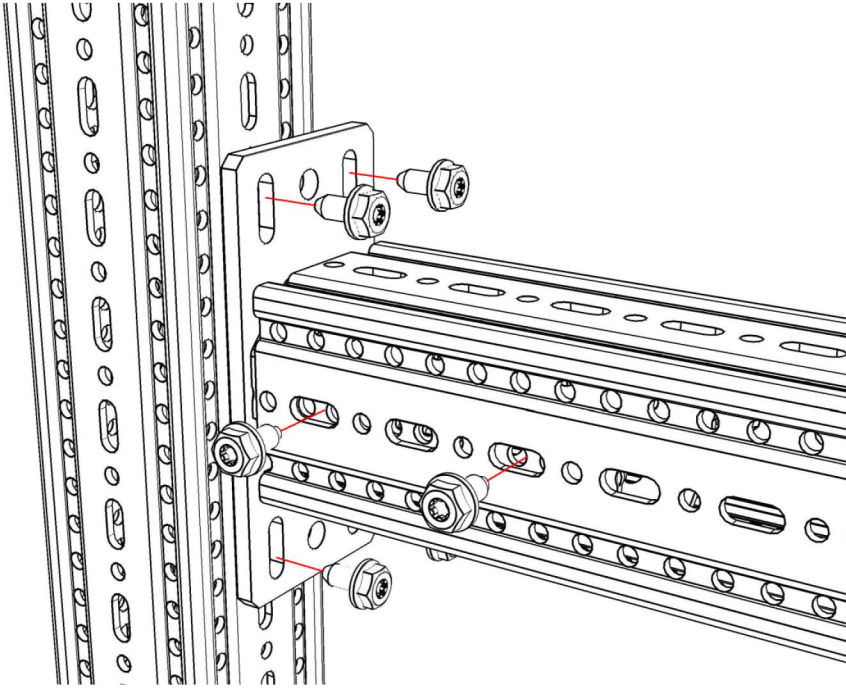
- A Nylon slide pad can be clipped on to the Framo surface to act an insulator and to provide surface protection if required (Pad U-UB F)

4" - 6" / 8" - 12" / 14" - 20" Pipes

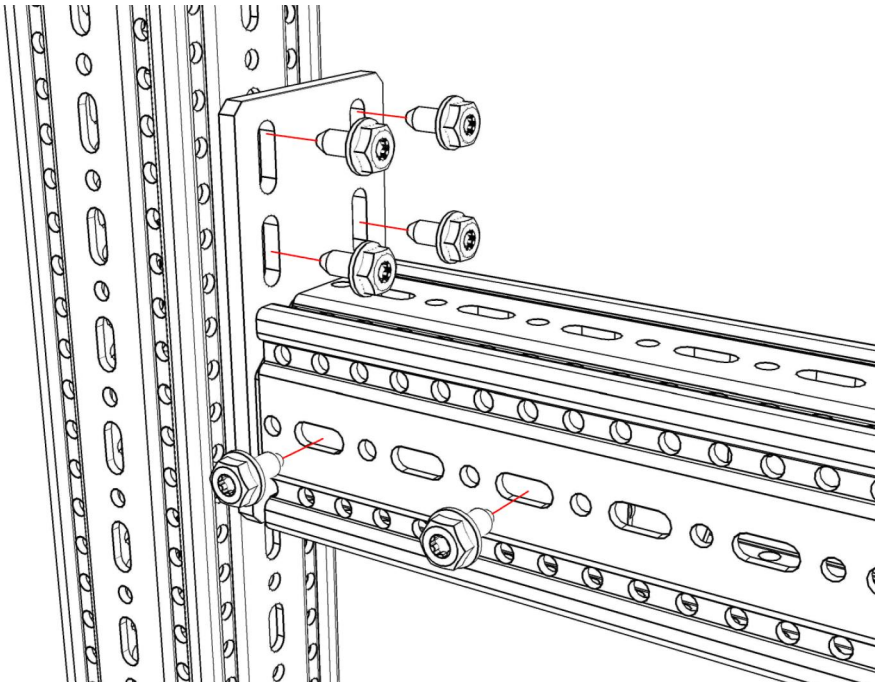


- U-bolts 4" - 6", 8" - 12" or 14" - 20" can be attached to Framo profiles using two brackets (UBF 4" - 6", UBF 8" - 12" or UBF 14" - 20") using 2 FLS screws.

- A Nylon slide pad can be clipped on to the Framo surface to act an insulator and to provide surface protection if required (Pad U-UB F)

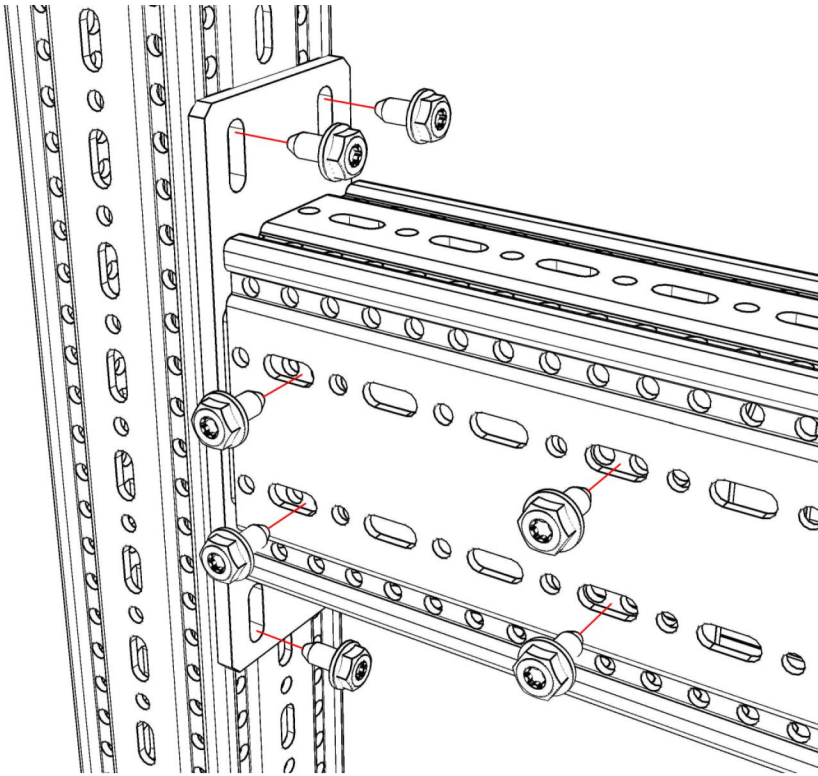
Standard Connections**STA F80 / F100**

General Description
Framo End Connector
Catalogue Description
End Support STA
Beam Section Sizes
F80 / F100
FLS Screws Required
8
Notes
FLS screws attached to internal connector should be in pairs on opposite sides of Framo section
FLS screws attached to internal connector preferably mounted on main axis of imposed force
Maximum of 3/8" between end of section and face of plate

STA F80 / F100 E

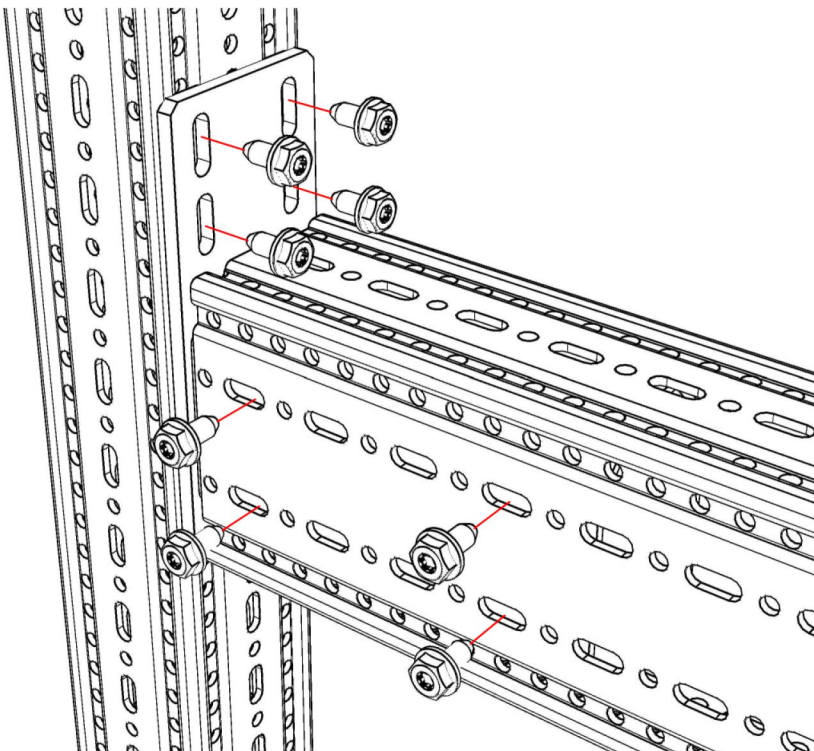
General Description
Framo End Connector
Catalogue Description
End Support STA E
Beam Section Sizes
F80 / F100
FLS Screws Required
8
Notes
FLS screws attached to internal connector should be in pairs on opposite sides of Framo section
FLS screws attached to internal connector preferably mounted on main axis of imposed force
Maximum of 3/8" between end of section and face of plate

STA F100 - 100/160



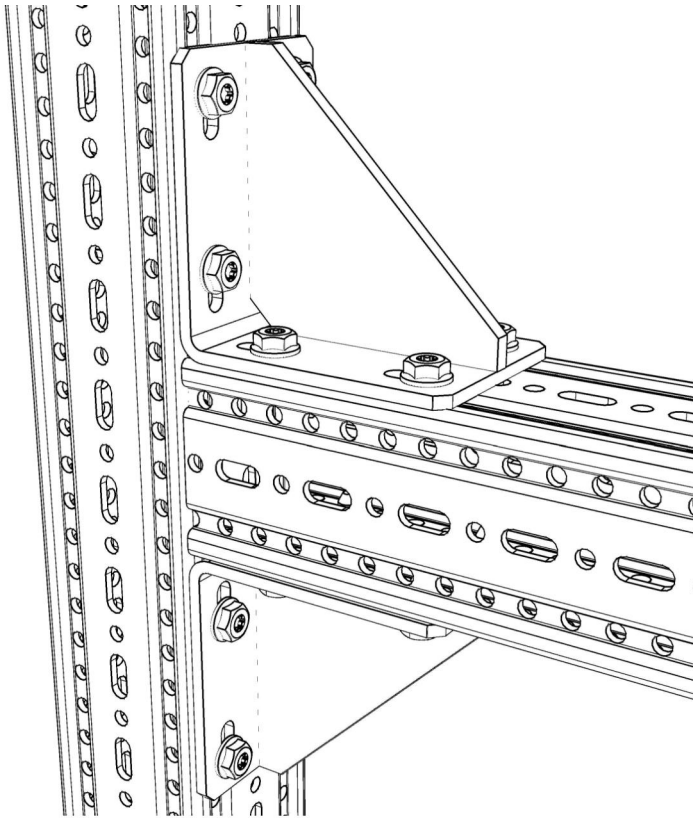
General Description
Framo End Connector
Catalogue Description
End Support STA F100 - 100/160
Beam Section Sizes
F100 / F160
FLS Screws Required
12
Notes
FLS screws attached to internal connector should be in fours on opposite sides of Framo section
Maximum of 3/8" between end of section and face of plate

STA F100 - 100/160 E



General Description
Framo End Connector
Catalogue Description
End Support STA F100 - 100/160 E
Beam Section Sizes
F100 / F160
FLS Screws Required
12
Notes
FLS screws attached to internal connector should be in fours on opposite sides of Framo section
Maximum of 3/8" between end of section and face of plate

WD 140/140



General Description

Corner Bracket

Catalogue Description

Corner Bracket WD 140/140

Beam Section Sizes

F100 / F160

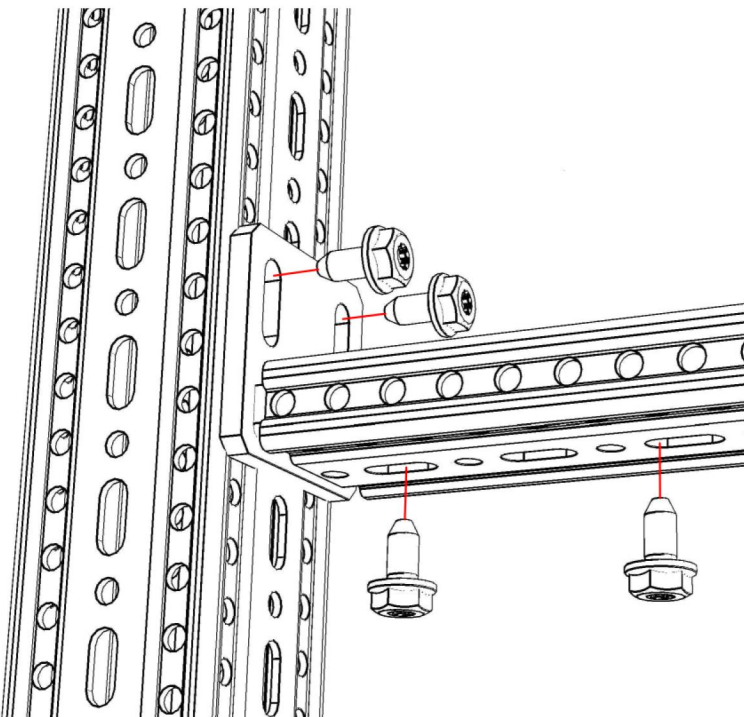
FLS Screws Required

16

Notes

Two brackets required per connection, as shown on left.

STA F80-30



General Description

Framo End Connector

Catalogue Description

End Support STA F80-30

Beam Section Sizes

F80 / F30

FLS Screws Required

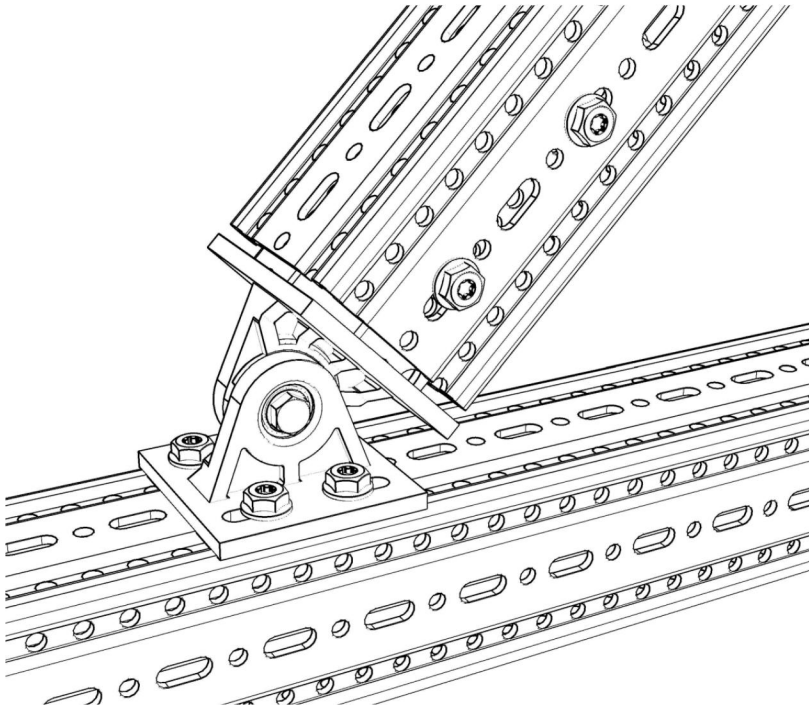
4

Notes

FLS screws attached to the internal connector should be as far apart as possible.

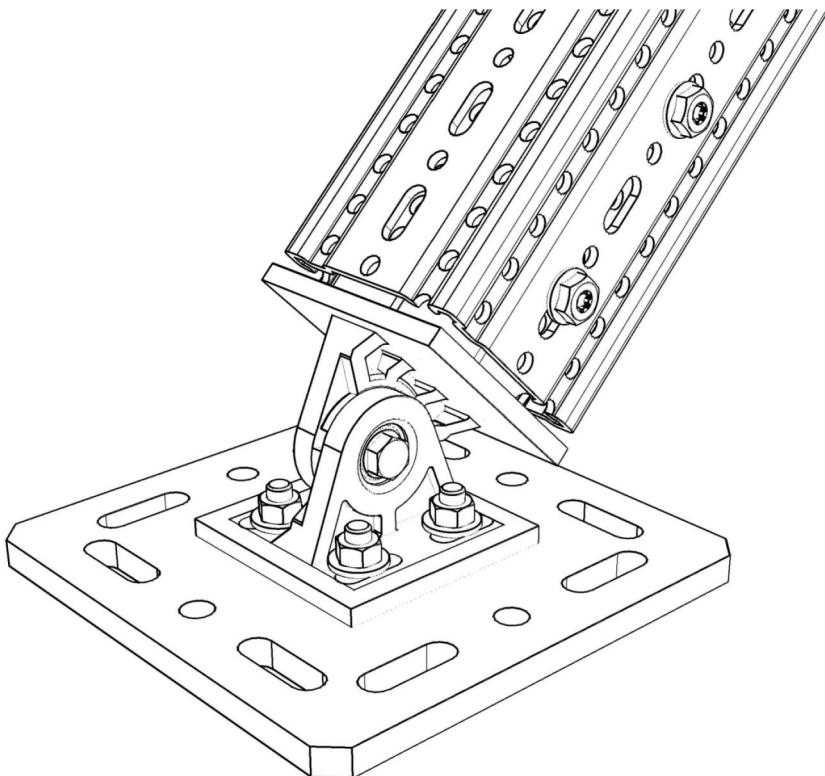
Maximum of 3/8" between end of section and face of plate

Pivot Joint GE



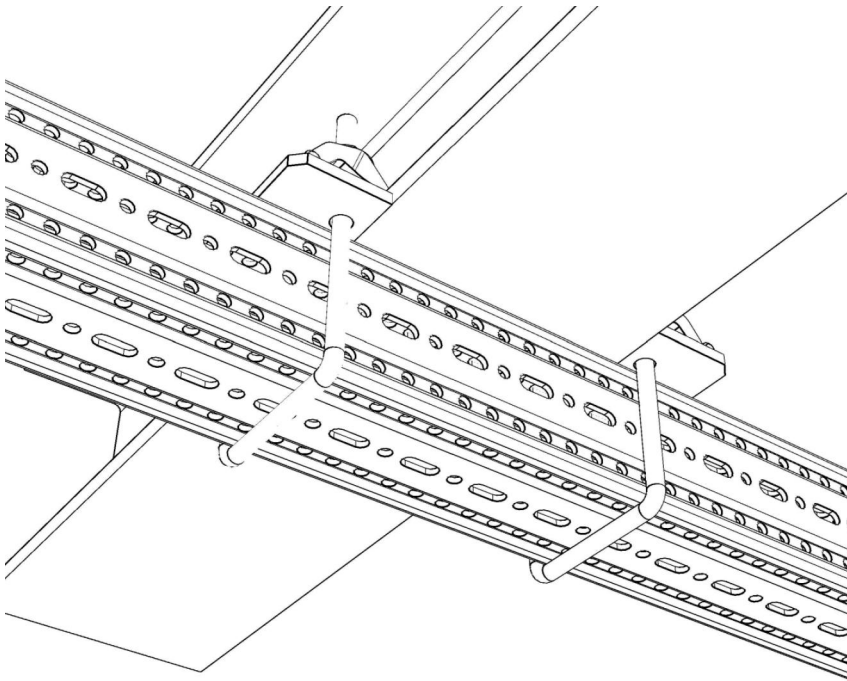
General Description
Pivot Joint
Catalogue Description
Pivot Joint GE
Beam Section Sizes
F80 / F100
FLS Screws Required
8
Notes
FLS Screws attached to internal connector should be in fours on opposite side of Framo section
FLS Screws attached to internal preferably mounted on main axis of structure
Maximum of 3/8" between end of section and face of plate

Pivot Joint GE F (with baseplate)



General Description
Pivot Joint (with baseplate)
Catalogue Description
Pivot Joint GE (with baseplate)
Beam Section Sizes
F80 / F100
FLS Screws Required
4
Notes
FLS Screws attached to internal connector should be in fours on opposite side of Framo section
FLS Screws attached to internal preferably mounted on main axis of structure
Maximum of 3/8" between end of section and face of plate
Variety of baseplates available for clamping or anchoring to structures

U Holder SB



General Description

U-Holder SB

Catalogue Description

U-Holder SB F30 / F80 / F100 / F160

Beam Section Sizes

F30 / F80 / F100 / F160

FLS Screws Required

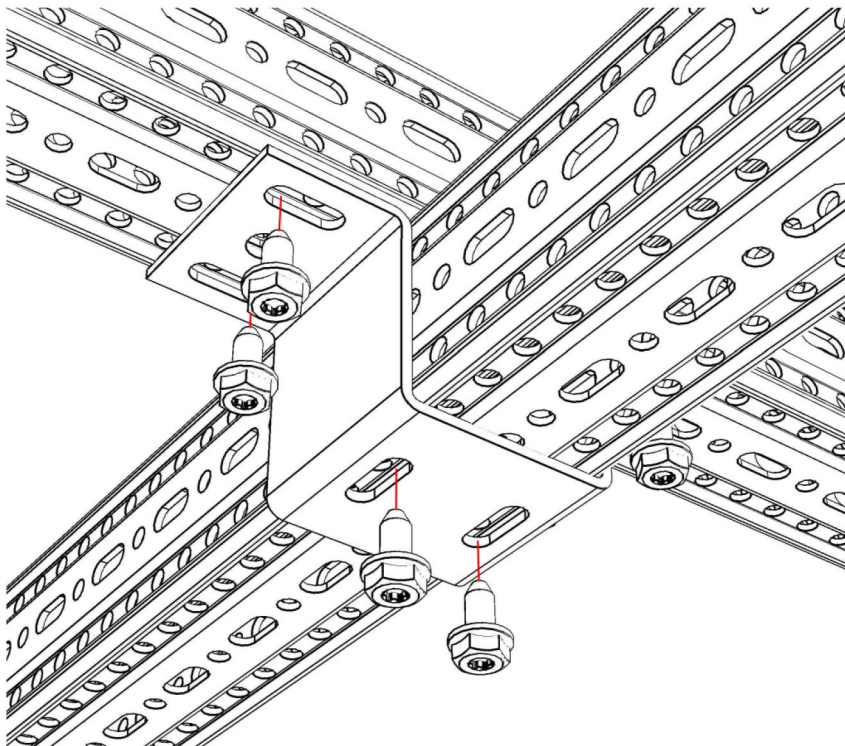
-

Notes

Two variations available, -16 and -40
for flange thicknesses up to 16mm
and 40mm

To be used in pairs

Beam Section Holder TPH-C



General Description

Beam Section Holder TPH C

Catalogue Description

Beam Section Holder TPH F80 / F100 C

Beam Section Sizes

F80 / F100

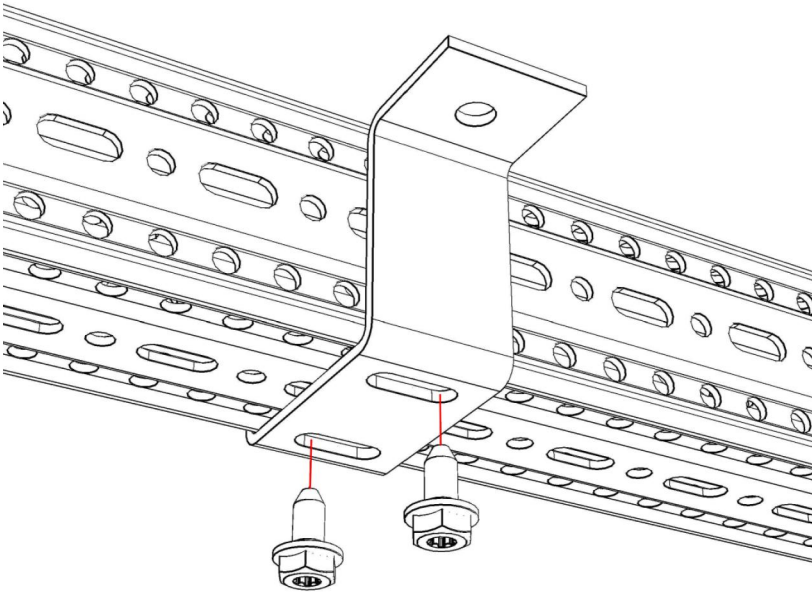
FLS Screws Required

6

Notes

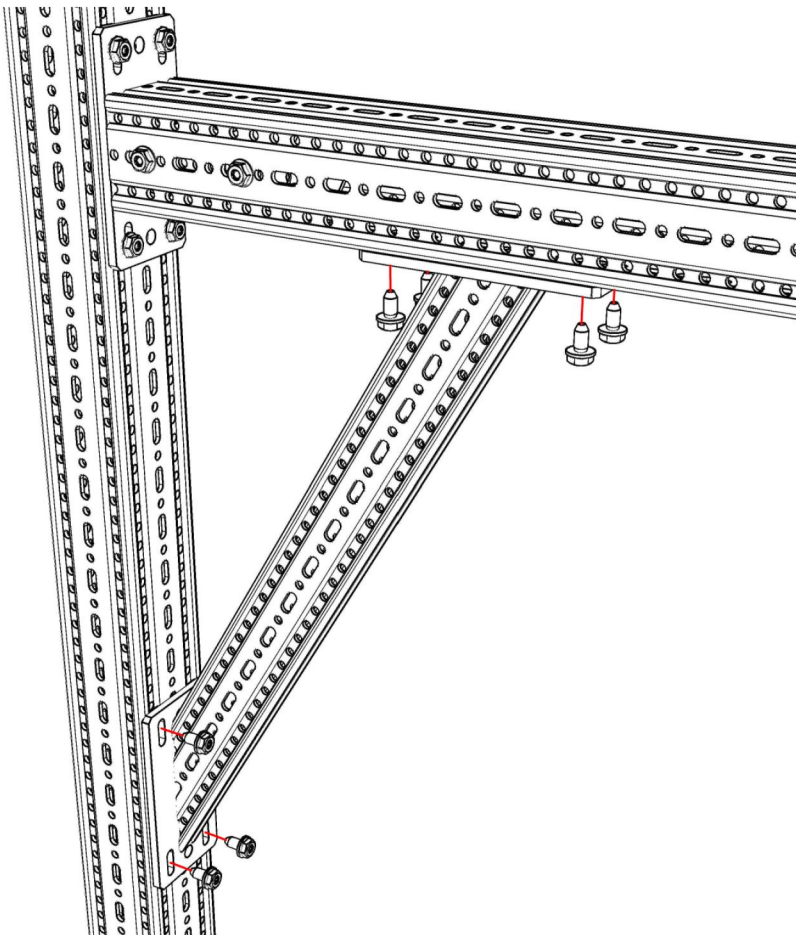
Bracket to connect intersecting beams

Beam Section Holder TPH



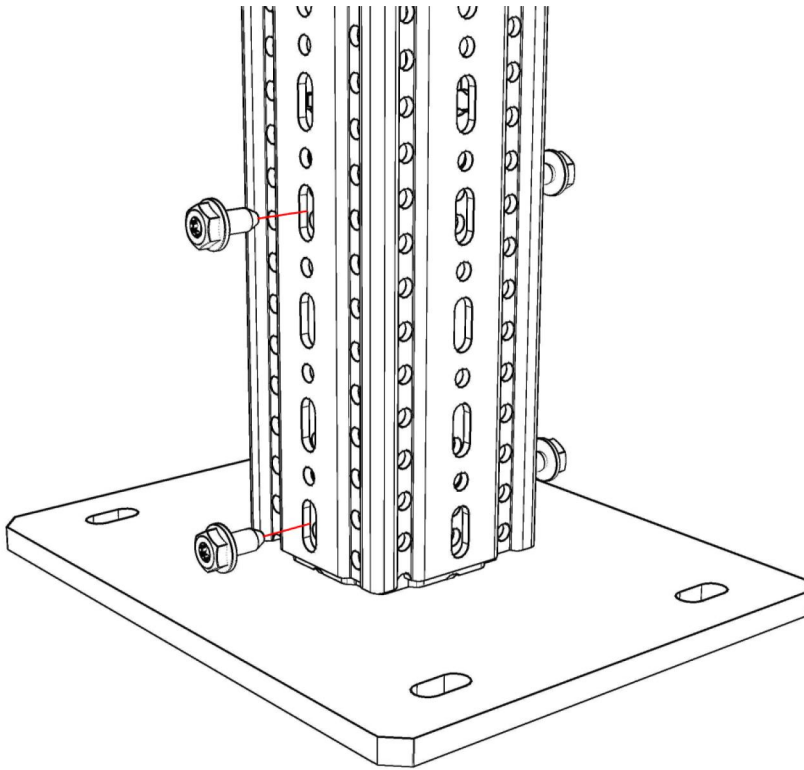
General Description
Beam Section Holder TPH
Catalogue Description
Beam Section Holder TPH F80 / F100
Beam Section Sizes
F80 / F100
FLS Screws Required
2
Notes
Bracket to connect to concrete surfaces / cast-in concrete channels / drilled steelwork sections

Bracing Arm SKO F100



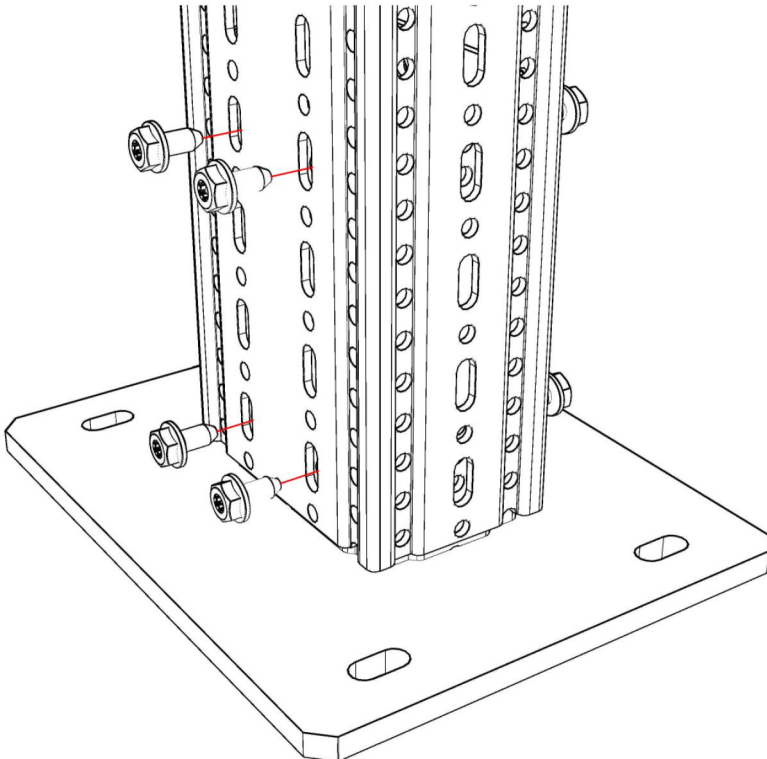
General Description
Bracing Arm
Catalogue Description
Bracing Arm SKO F100
Beam Section Sizes
F100
FLS Screws Required
8
Notes
Four FLS screws on each plate
Suitable anchors may be used to fasten left hand side plate to another building surface if required

WBD F80 / F100



General Description
Framo Footplate
Catalogue Description
WBD F80 / F100
Beam Section Sizes
F80 / F100
FLS Screws Required
4
Notes
FLS Screws attached to internal connector should be in pairs on opposite side of Framo section
FLS Screws attached to internal preferably mounted on main axis of structure
Maximum of 3/8" between end of section and face of plate
Fixed to building structure using suitable heavy duty anchors or frictional connection via Sikla Assembly set.

WBD F100/160

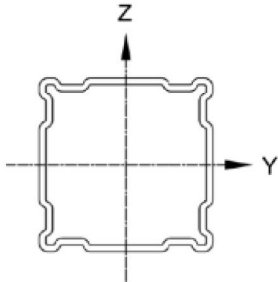


General Description
Framo Footplate
Catalogue Description
WBD F100/160
Beam Section Sizes
F160
FLS Screws Required
8
Notes
FLS Screws attached to internal connector should be in fours on opposite side of Framo section
FLS Screws attached to internal preferably mounted on main axis of structure
Maximum of 3/8" between end of section and face of plate
Fixed to building structure using suitable heavy duty anchors or clamped connection via Sikla Beamclamp set

Working Loads for the Framo system

Beam Properties

Technical Data

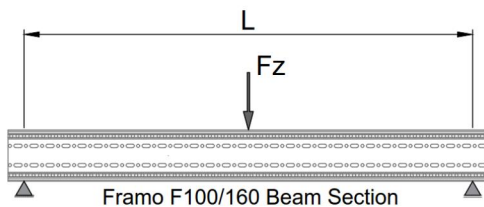
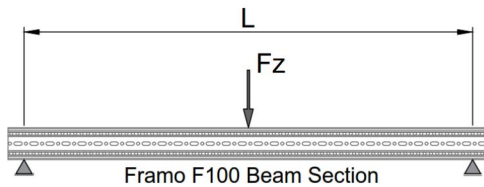
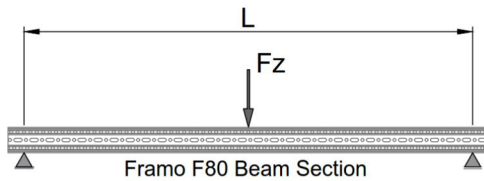


Description Beam Section	Axis	Material Thickness s	Moment of Inertia I_y	Moment of Inertia I_z	Section Modulus W_y	Section Modulus W_z	Radius of Inertia i_y	Radius of Inertia i_z	Torsional Moment I_t	Cross Section A	Weight G
[mm]		[in] (mm)	[in ⁴]	[in ⁴]	[in ³]	[in ³]	[in]	[in]	[in ⁴]	[in ²]	[lb/ft]
TP F 80/30		1/8" (3.0)	0.85 ^{*)}	0.16 ^{*)}	0.63 ^{*)}	0.29 ^{*)}	1.43	0.62	0.27	0.42 ^{*)}	2.89
TP F 80/80		1/8" (3.0)	1.52 ^{*)}		0.96 ^{*)}		1.16		2.36 ^{*)}	1.13	4.30
TP F 100/100		1/6" (4.0)	4.32 ^{*)}		2.25 ^{*)}		1.89		4.36	1.21 ^{*)}	7.26
TP F 100/160		1/6" (4.0)	13.44 ^{*)}	6.74 ^{*)}	4.61 ^{*)}	2.82 ^{*)}	2.43	1.72	9.25	2.28 ^{*)}	9.61

Beam Section TP F, Steel, Hot-dipped-galvanized according to DIN EN ISO 1461 tZn o.
All structural data takes perforation into account.

*) determination of effective values by tests.

Simply Supported Beam

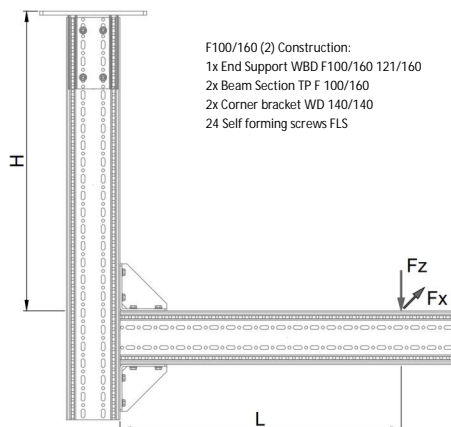
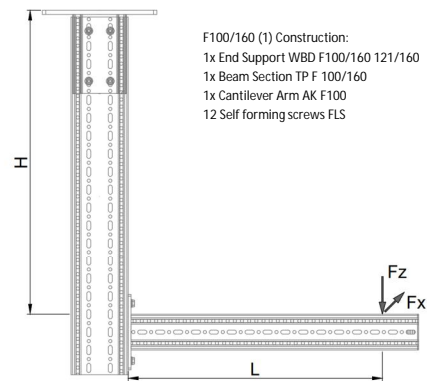
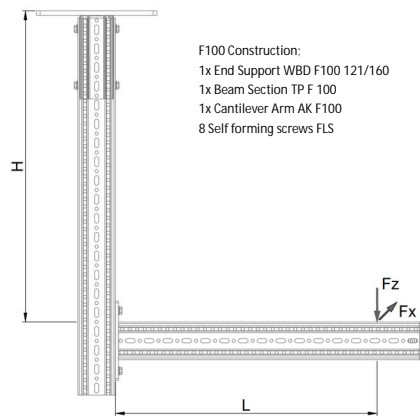
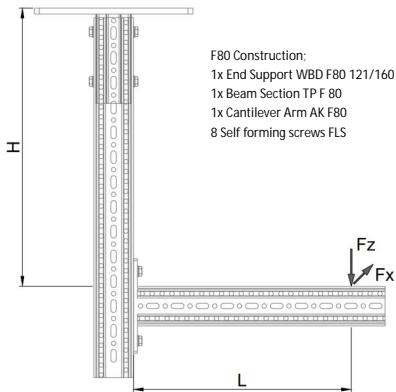


Lmax	Fz.perm
[in]	Framo F80 [kip]
40	3.09
60	2.04
80	1.54
100	1.01
120	0.69

Lmax	Fz.perm	
[in]	Framo F100 [kip]	Framo F100/160 [kip]
40	7.87	16.08
80	3.88	7.98
120	2.22	5.28
160	1.25	3.87
200	0.79	2.48
240	0.54	1.68

Fz as a dead load at L/2Max. Deflection L/200

L-Construction



Hmax [in]	Lmax [in]	Fz perm for F80		Fz perm for F100		Fz perm for F100/160 Type A		Fz perm for F100/160 Type B	
		F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]
20	10	0.61	0.61	-	-	-	-	-	-
	20	0.33	0.33	-	-	-	-	-	-
	30	0.19	0.19	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-
	50	-	-	-	-	-	-	-	-
40	10	0.44	0.44	0.78	0.78	1.16	1.05	1.17	1.17
	20	0.24	0.24	0.45	0.45	0.69	0.69	0.71	0.71
	30	0.16	0.16	0.31	0.31	0.47	0.47	0.50	0.50
	40	-	-	0.23	0.12	0.34	0.34	0.37	0.37
	50	-	-	0.16	0.16	0.24	0.24	0.28	0.28
60	10	0.34	0.34	0.66	0.66	1.50	0.80	1.06	1.06
	20	0.20	0.20	0.39	0.39	0.63	0.63	0.65	0.65
	30	0.11	0.11	0.26	0.26	0.43	0.43	0.46	0.46
	40	-	-	0.19	0.19	0.32	0.32	0.34	0.34
	50	-	-	0.14	0.14	0.23	0.23	0.25	0.25
80	10	-	-	0.57	0.57	0.96	0.65	0.97	0.97
	20	-	-	0.34	0.34	0.58	0.56	0.60	0.60
	30	-	-	0.23	0.23	0.40	0.40	0.42	0.42
	40	-	-	0.17	0.17	0.29	0.29	0.32	0.32
	50	-	-	0.12	0.12	0.21	0.21	0.23	0.23
100	10	-	-	0.51	0.51	0.89	0.55	0.89	0.89
	20	-	-	0.30	0.30	0.54	0.48	0.56	0.56
	30	-	-	0.20	0.20	0.37	0.37	0.39	0.39
	40	-	-	0.15	0.15	0.27	0.27	0.29	0.29
	50	-	-	0.10	0.10	0.20	0.20	0.22	0.22
120	10	-	-	-	-	0.82	0.47	0.83	0.83
	20	-	-	-	-	0.50	0.42	0.52	0.52
	30	-	-	-	-	0.35	0.35	0.36	0.36
	40	-	-	-	-	0.24	0.24	0.25	0.25
	50	-	-	-	-	0.17	0.17	0.18	0.18
140	10	-	-	-	-	0.77	0.42	0.77	0.77
	20	-	-	-	-	0.47	0.38	0.48	0.48
	30	-	-	-	-	0.33	0.33	0.34	0.34
	40	-	-	-	-	0.21	0.21	0.22	0.22
	50	-	-	-	-	0.15	0.15	0.16	0.16
160	10	-	-	-	-	0.72	0.37	0.72	0.72
	20	-	-	-	-	0.44	0.34	0.45	0.45
	30	-	-	-	-	0.31	0.30	0.32	0.32
	40	-	-	-	-	0.18	0.18	0.18	0.18
	50	-	-	-	-	0.12	0.12	0.14	0.14

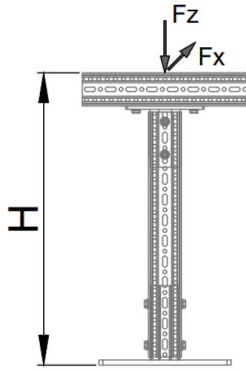
F_z as a dead load at distance L; F_x as a variable load distance L.

Friction coefficient $\mu_0 = 0.2$ in longitudinal direction.

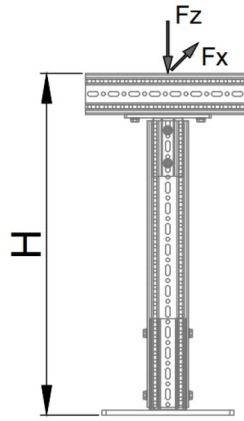
Max deflection H/100; L/100

End Support WBD may be exchanged with welding adapters to achieve the same load rating.

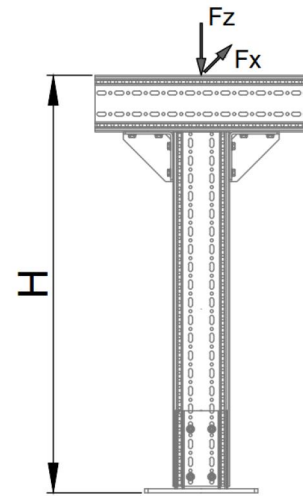
T-Construction



Framo F80 Construction:
 1x End Support WBD F80-121/160
 2x Beam Section TP F 80
 2x End Connector STA F 80
 12x Self Forming Screw FLS



Framo F100 Construction:
 1x End Support WBD F100-121/160
 2x Beam Section TP F 100
 2x End Connector STA F 100
 12x Self Forming Screw FLS



Framo F160/100 Construction:
 1x End Support WBD 100/160-121/160
 2x Beam Section TP F 100/160
 2x Corner Bracket WD F 100
 24x Self Forming Screw FLS

Hmax [in]	Fz perm for F80		Fz perm for F100		Fz perm for F100/160	
	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]
20	2.25	2.23	-	-	-	-
40	2.25	0.89	-	-	-	-
60	2.25	0.50	2.88	1.00	3.44	1.06
80	-	-	2.86	0.68	3.44	0.75
100	-	-	2.85	0.49	3.42	0.55
120	-	-	2.83	0.37	3.39	0.44
140	-	-	-	-	3.37	0.35
160	-	-	-	-	3.37	0.28

F_z as a dead load; F_x as a variable load.

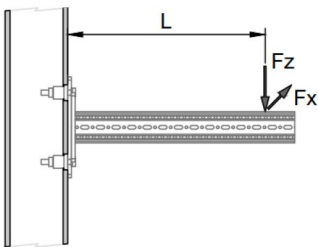
Values allow for a Load placement $\pm 2"$ from the centre of the structure.

Assumed friction coefficient $\mu_0 = 0.2$ in longitudinal direction.

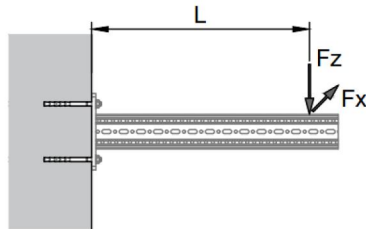
Max deflection H/150

End Support WBD may be exchanged with welding adapters to achieve the same load rating.

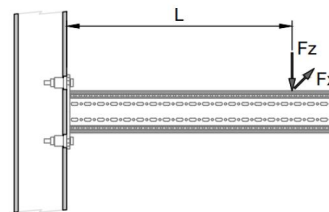
Cantilever Construction



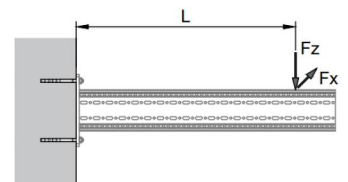
Variant 1 Framo F100
 Clamped to Primary Structure
 1 x Cantilever TKO F100
 1 x Assembly Set P2
 1 x Joining Plate 121/160



Variant 2 Framo F100
 Clamped to Primary Structure
 1 x Cantilever TKO F100
 Anchor bolts to concrete structure.



Variant 1 Framo F100/160
 Clamped to Primary Structure
 1 x Cantilever TKO F100
 1 x Assembly Set P2

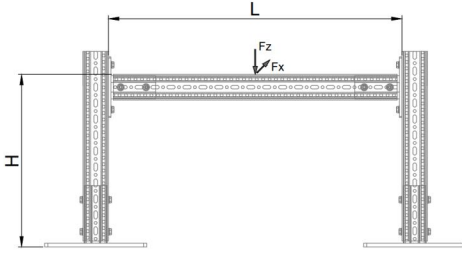


Variant 2 Framo F100/160
 Clamped to Primary Structure
 1 x Cantilever TKO F100/160
 Anchor bolts to concrete structure

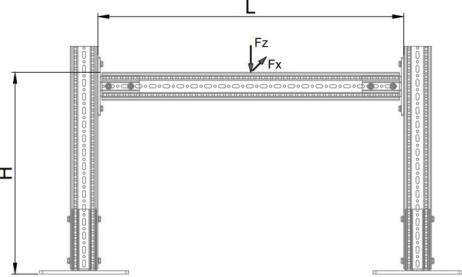
Hmax [in]	Variant 1 Clamped				Variant 2 Anchored				Variant 3 Rigid connection			
	Fz perm for F100		Fz perm for F100/160		Fz perm for F100		Fz perm for F100/160		Fz perm for F100		Fz perm for F100/160	
	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]	F _x = 0 [kip]	F _x = $\mu_0 \cdot F_z$ [kip]
10	2.67	1.65	3.40	2.09	1.46	1.46	1.61	1.61	6.68	5.90	7.51	6.20
20	1.45	0.90	1.84	1.14	1.06	1.06	1.23	1.23	3.77	3.65	4.66	3.76
30	0.98	0.61	1.24	0.76	0.81	0.81	0.97	0.97	2.15	2.15	3.32	2.57
40	0.73	0.45	0.93	0.57	0.62	0.62	0.75	0.75	1.38	1.38	2.50	1.92
50	0.54	0.34	0.69	0.42	0.46	0.46	0.55	0.55	0.83	0.83	1.85	1.43

End Support WBD may be exchanged with welding adapters to achieve the same load rating.

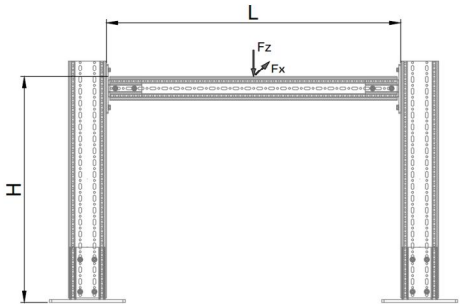
H - Construction



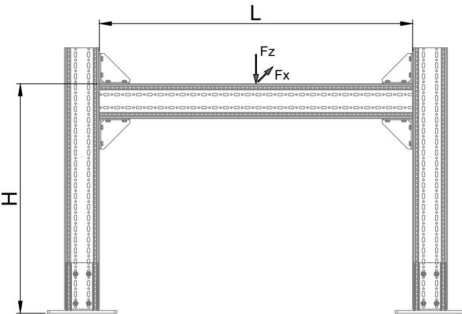
F80 Construction:
 2x End Support WBD F80-121/160
 3x Beam Section TP F 80
 2x End Connector STA F 80
 24x Self Forming Screw FLS



F100 Construction:
 2x End Support WBD F100-121/160
 3x Beam Section TP F 100
 2x End Connector STA F 100
 24x Self Forming Screw FLS



F100/160 Type A Construction:
 2x End Support WBD F100/160-121/160
 2x Beam Section TP F 100/160
 1x Beam Section TP F 100
 2x End Connector STA F 100
 24x Self Forming Screw FLS



F100/160 Type B Construction:
 2x End Support WBD F100/160-121/160
 3x Beam Section TP F 100/160
 4x WD F100 Corner Bracket
 48x Self Forming Screw FLS

Hmax [in]	Lmax [in]	Fz perm for F80		Fz perm for F100		Fz perm for F100/160 Type A		Fz perm for F100/160 Type B	
		Fx = 0 [kip]	Fx = $\mu_0 \cdot F_z$ [kip]	Fx = 0 [kip]	Fx = $\mu_0 \cdot F_z$ [kip]	Fx = 0 [kip]	Fx = $\mu_0 \cdot F_z$ [kip]	Fx = 0 [kip]	Fx = $\mu_0 \cdot F_z$ [kip]
40	40	4.46	3.77	-	-	-	-	-	-
	60	2.22	2.56	-	-	-	-	-	-
	80	2.42	1.91	-	-	-	-	-	-
	100	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-
	140	-	-	-	-	-	-	-	-
	160	-	-	-	-	-	-	-	-
60	40	4.46	1.98	6.09	2.83	6.77	2.10	7.52	2.10
	60	3.22	1.98	5.68	2.76	5.61	2.10	7.47	2.10
	80	2.42	1.93	4.38	2.66	4.25	2.08	7.43	2.08
	100	-	-	3.56	2.50	3.47	2.08	7.27	2.08
	120	-	-	2.70	2.30	2.96	2.08	6.18	2.08
	140	-	-	2.08	1.96	2.58	2.05	5.37	2.07
	160	-	-	1.66	1.56	2.28	1.83	4.77	2.04
80	40	-	-	6.09	1.99	6.82	1.63	7.55	1.65
	60	-	-	5.69	1.96	5.61	1.63	7.45	1.63
	80	-	-	4.38	1.91	4.26	1.63	7.44	1.63
	100	-	-	3.56	1.85	3.47	1.63	7.18	1.63
	120	-	-	2.68	1.76	2.96	1.62	6.12	1.62
	140	-	-	2.06	1.66	2.56	1.61	5.37	1.61
	160	-	-	1.64	1.54	2.29	1.61	4.74	1.61
100	40	-	-	6.09	1.47	6.87	1.32	7.54	1.32
	60	-	-	5.69	1.46	5.51	1.31	7.45	1.31
	80	-	-	4.31	1.44	4.26	1.31	7.44	1.31
	100	-	-	3.57	1.42	3.47	1.31	7.19	1.31
	120	-	-	2.65	1.37	2.93	1.30	6.12	1.30
	140	-	-	2.04	1.32	2.56	1.30	5.34	1.30
	160	-	-	1.62	1.25	2.27	1.29	4.75	1.29
120	40	-	-	6.09	1.15	6.92	1.12	7.46	1.12
	60	-	-	5.57	1.14	5.51	1.12	7.45	1.12
	80	-	-	4.31	1.13	4.26	1.11	7.44	1.11
	100	-	-	3.52	1.12	3.47	1.11	7.18	1.11
	120	-	-	2.68	1.09	2.94	1.11	6.07	1.11
	140	-	-	2.03	1.06	2.56	1.10	5.33	1.10
	160	-	-	1.61	1.03	2.27	1.10	4.71	1.10
140	40	-	-	6.09	0.92	6.92	0.96	7.45	0.96
	60	-	-	5.58	0.92	5.52	0.96	7.45	0.96
	80	-	-	4.32	0.91	4.27	0.96	7.44	0.96
	100	-	-	3.52	0.90	3.48	0.95	7.10	0.95
	120	-	-	2.61	0.89	2.94	0.95	6.06	0.95
	140	-	-	2.05	0.87	2.56	0.94	5.29	0.94
	160	-	-	1.60	0.85	2.27	0.94	4.71	0.94
160	40	-	-	6.09	0.76	2.10	0.85	7.45	0.85
	60	-	-	5.58	0.76	2.10	0.85	7.45	0.85
	80	-	-	4.32	0.75	2.08	0.84	7.44	0.85
	100	-	-	3.51	0.75	2.08	0.84	7.11	0.84
	120	-	-	2.68	0.74	2.08	0.84	6.06	0.84
	140	-	-	2.00	0.73	2.05	0.84	5.29	0.84
	160	-	-	1.62	0.71	1.83	0.83	4.66	0.84

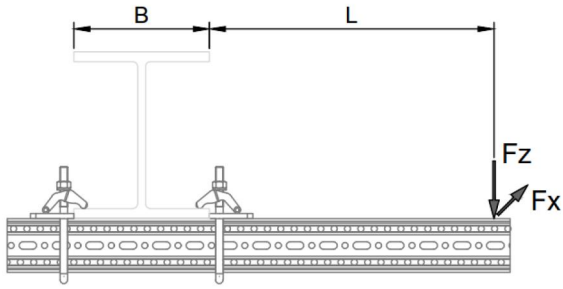
F_z as a dead load at position $L/2$; F_x as a variable load in the same position.

Assumed friction coefficient $\mu_0 = 0.2$ in longitudinal direction.

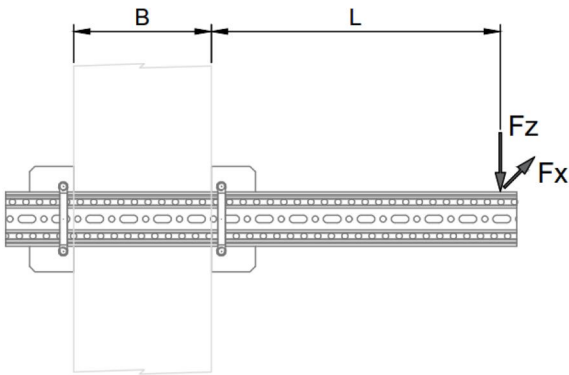
Max deflection $L/200$.

Beam Bracket Connections

Beam Bracket F100 Horizontal Installation



Beam Bracket F100 Vertical Installation

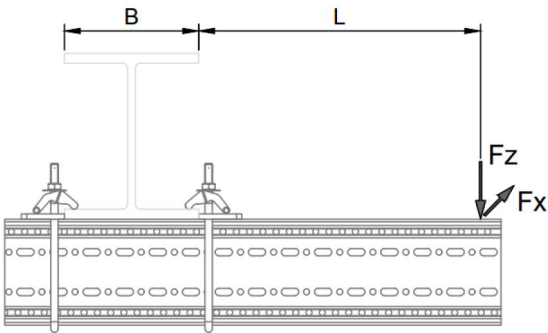


1 x Beam Section TP F100
2 x U-Holder SB F 100-40

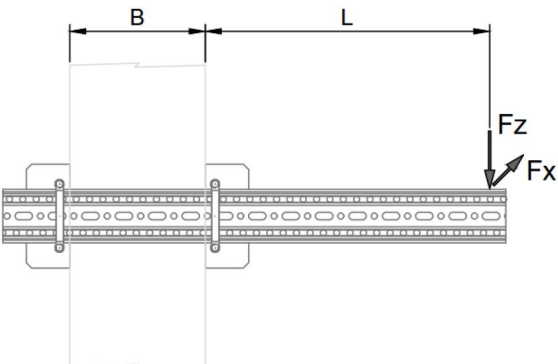
Lmax [in]	B [in]	Fz perm for F100 Vertical Installation		Fz perm for F100 Horizontal Installation	
		$F_x = 0$ [kip]	$F_x = \mu_0 \cdot F_z$ [kip]	$F_x = 0$ [kip]	$F_x = \mu_0 \cdot F_z$ [kip]
10	4	0.12	0.11	0.48	0.23
	6	0.21	0.20	0.86	0.41
	8	0.27	0.26	1.07	0.51
	10	0.31	0.30	1.25	0.59
	12	0.35	0.33	1.39	0.66
20	4	0.09	0.08	0.34	0.16
	6	0.14	0.13	0.55	0.26
	8	0.18	0.17	0.72	0.34
	10	0.22	0.21	0.86	0.41
	12	0.25	0.24	0.99	0.47
30	4	0.06	0.06	0.24	0.11
	6	0.11	0.11	0.44	0.21
	8	0.15	0.14	0.59	0.28
	10	0.18	0.17	0.71	0.34
	12	0.21	0.20	0.82	0.39
40	4	0.05	0.04	0.18	0.09
	6	0.09	0.09	0.37	0.17
	8	0.12	0.12	0.49	0.23
	10	0.15	0.15	0.60	0.29
	12	0.18	0.17	0.71	0.34
50	4	0.03	0.03	0.14	0.06
	6	0.08	0.08	0.33	0.16
	8	0.11	0.11	0.44	0.21
	10	0.14	0.13	0.54	0.26
	12	0.16	0.15	0.64	0.30

F_z as a dead load at position $L/2$; F_x as a variable load in the same position.
Assumed friction coefficient $\mu_0 = 0.2$ in longitudinal direction.
Max deflection $L/100$

Beam Bracket F100/160 Horizontal Installation



Beam Bracket F100/160 Vertical Installation



1 x Beam Section TP F100/160
2 x U-Holder SB F 100/160-40

Lmax [in]	B [in]	Fz perm for F100/160 Vertical Installation		Fz perm for F100/160 Horizontal Installation	
		$F_x = 0$ [kip]	$F_x = \mu_0 \cdot F_z$ [kip]	$F_x = 0$ [kip]	$F_x = \mu_0 \cdot F_z$ [kip]
10	4	0.12	0.11	0.48	0.23
	6	0.21	0.20	0.86	0.41
	8	0.27	0.26	1.07	0.51
	10	0.31	0.30	1.25	0.59
	12	0.35	0.33	1.39	0.66
20	4	0.09	0.08	0.34	0.16
	6	0.14	0.13	0.55	0.26
	8	0.18	0.17	0.72	0.34
	10	0.22	0.21	0.86	0.41
	12	0.25	0.24	0.99	0.47
30	4	0.06	0.06	0.24	0.11
	6	0.11	0.11	0.44	0.21
	8	0.15	0.14	0.59	0.28
	10	0.18	0.17	0.71	0.34
	12	0.21	0.20	0.82	0.39
40	4	0.05	0.04	0.18	0.09
	6	0.09	0.09	0.37	0.17
	8	0.12	0.12	0.49	0.23
	10	0.15	0.15	0.60	0.29
	12	0.18	0.17	0.71	0.34
50	4	0.03	0.03	0.14	0.06
	6	0.08	0.08	0.33	0.16
	8	0.11	0.11	0.44	0.21
	10	0.14	0.13	0.54	0.26
	12	0.16	0.15	0.64	0.30

F_z as a dead load at position $L/2$; F_x as a variable load in the same position.
Assumed friction coefficient $\mu_0 = 0.2$ in longitudinal direction.
Max deflection $L/100$