

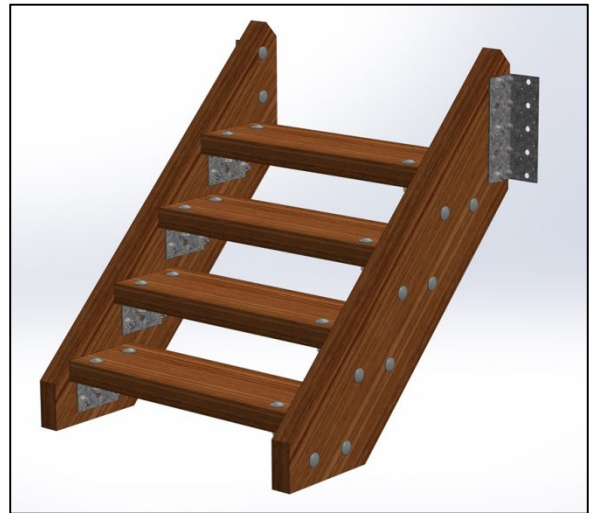
Trussforte Fixing Brackets are based on a general purpose design that can be used in multiple configurations for DIY projects or specifically engineered purposes based on the capacities listed in the accompanying literature.

The Fixing Bracket capacities have been calculated in accordance with the appropriate relevant standards, and have been certified by an external structural engineering company accordingly. The following Australian Standards have been used:

- AS1720.1 Timber structures Part 1: Design methods
- AS4600 Cold-formed steel structures
- AS4100 Steel structures

Additional standards are referenced in the accompanying literature, and are to do with hardware and fasteners that should be used with the fixing brackets for suitable jointing as indicated in the relevant standards.

All steel used for the manufacture of the Fixing Brackets is based on a metallic coated product that is sourced locally from Australia where possible, and meets AS/NZS1365 and AS1397. The metallic coated steel properties have a minimum of 250MPa tensile strength, and also have a zinc coating class of Z275 (which is approximately 40 microns thick (0.04mm) and has a coating mass factor of 290 g/m² as per Bluescope sheet and coil product literature).



Design joint capacities (maximum Limit State Design loads) that are tabulated are for arrangements based on type 1 and type 2 joint groups (single shear loading and axial loading respectively) as per AS1720.1. The capacity per screw is listed for the following load arrangements:

- $K_1 = 0.57 (1.35G)$ - Permanent Action for Dead load.
- $K_1 = 0.69 (1.2G + 1.5Q)$ - Permanent and short term imposed action on Roof and Floor live loads.
- $K_1 = 1.14 (1.2G + W_u + \psi_c Q)$ - Permanent, wind and imposed action load.

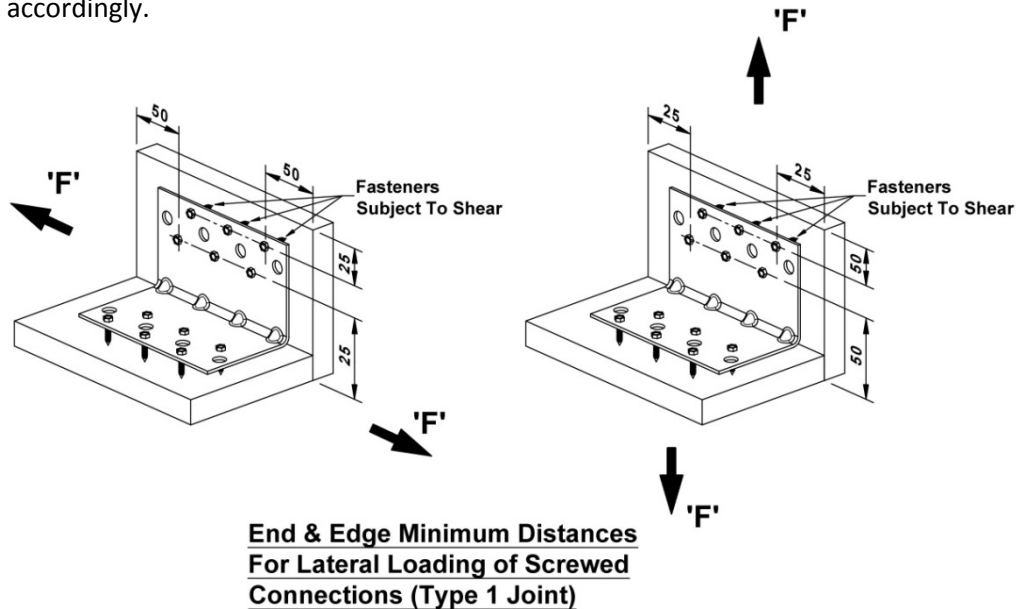


Capacities for all Joint Groups (seasoned and unseasoned timbers) have been given, and are all based on category 2 capacity factors as per AS1720.1. For all other category requirements, appropriate factors should be used and applied to the tabulated load capacities.

All screws must conform to AS 3566 and be fitted with correctly pre-drilled pilot holes to prevent timber splitting. The diameter of the hole for the threaded portion of the screw should not exceed the root diameter of the screw, and the clearance hole for the screw shall be equal to the shank diameter of the screw itself. Also ensure that all screws are tightened correctly.

Joint Strength - Type 1 Joint (single shear)

Shear joint strength values are listed based on the calculated capacities of loads in both the perpendicular and parallel directions relative to the timber grain direction. The lower of the values for each joint group have been tabulated accordingly.



Joint Group	Capacity (kN) per #10 screw† in side grain					
	$K_1 = 0.57 (1.35G)$ (Permanent Action for Dead load)		$K_1 = 0.69 (1.2G + 1.5Q)$ (Permanent and short term imposed action on Roof and Floor live loads)		$K_1 = 1.14 (1.2G + W_u + \psi_c Q)$ (Permanent, wind and imposed action load)	
	25mm thick Timber embedment	50mm thick Timber embedment	25mm thick Timber embedment	50mm thick Timber embedment	25mm thick Timber embedment	50mm thick Timber embedment
J1	1.25	1.76	1.51	2.12	2.50	3.51
J2	0.98	1.38	1.19	1.66	1.96	2.75
J3	0.71	0.99	0.85	1.20	1.41	1.98
J4	0.50	0.70	0.60	0.84	0.99	1.39
J5	0.35	0.50	0.42	0.60	0.70	0.99
J6	0.24	0.33	0.28	0.39	0.47	0.65
JD1	1.73	2.43	2.09	2.94	3.46	4.85
JD2	1.31	1.84	1.59	2.22	2.62	3.67
JD3	1.03	1.44	1.24	1.74	2.05	2.87
JD4	0.74	1.04	0.90	1.25	1.48	2.07
JD5	0.52	0.73	0.63	0.88	1.04	1.45
JD6	0.37	0.52	0.45	0.62	0.74	1.03

Notes:

G = permanent action (self-weight or 'dead' action).

W_u = ultimate wind action.

ψ_c = combination factor for imposed action.

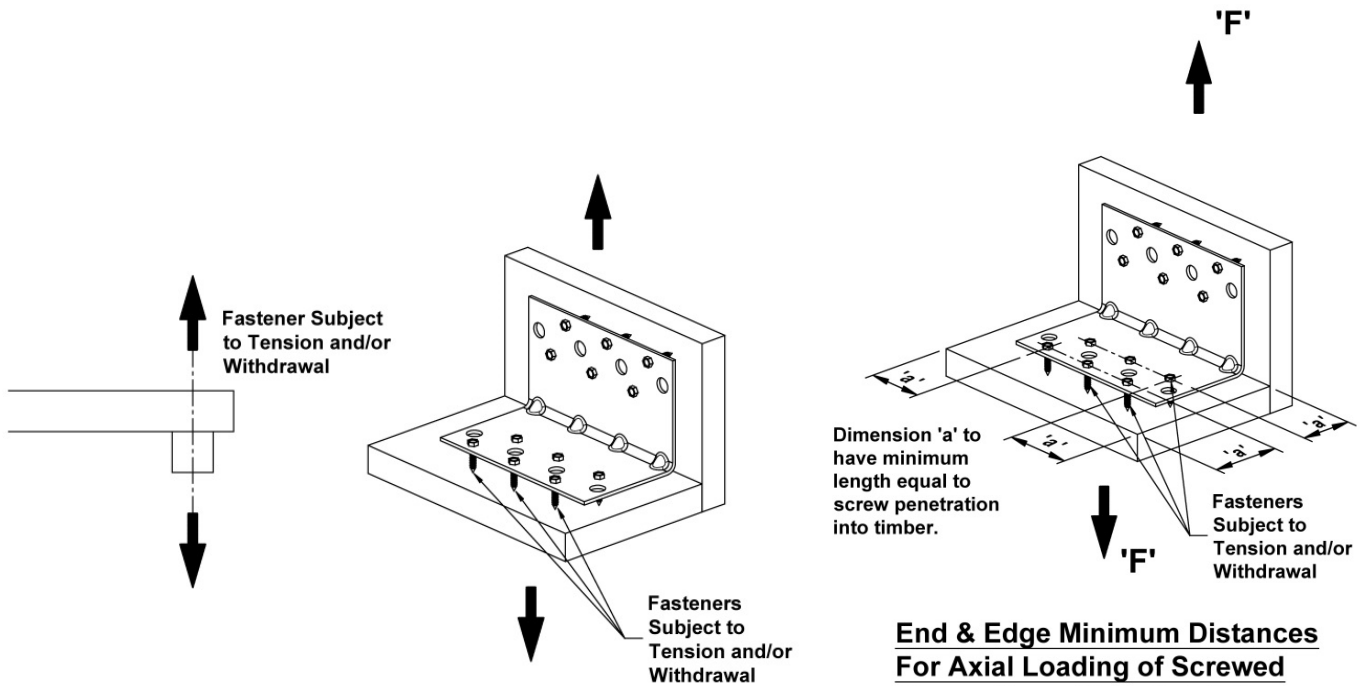
Q = imposed action (due to occupancy and use 'live' action).

† Steel #10 screws conforming to AS 3566.

Prebored maximum hole diameter = root diameter of screw.

For end grain use - these capacities must be reduced by 40%.

Joint Strength - Type 2 Joint (axial loads)



Type 2 Joint Arrangement

**End & Edge Minimum Distances
For Axial Loading of Screwed
Connections (Type 2 Joint)**

Joint Group	Capacity (kN) per #10 ⁺ screw in side grain					
	$K_1 = 0.57 (1.35G)$ (Permanent Action for Dead load)		$K_1 = 0.69 (1.2G + 1.5Q)$ (Permanent and short term imposed action on Roof and Floor live loads)		$K_1 = 1.14 (1.2G + W_u + \psi_c Q)$ (Permanent, wind and imposed action load)	
	25mm thick Timber embedment	50mm thick Timber embedment	25mm thick Timber embedment	50mm thick Timber embedment	25mm thick Timber embedment	50mm thick Timber embedment
J1	1.00	2.00	1.21	2.42	2.00	4.00
J2	0.76	1.52	0.92	1.84	1.52	3.05
J3	0.58	1.15	0.70	1.39	1.15	2.30
J4	0.41	0.82	0.50	0.99	0.82	1.65
J5	0.35	0.70	0.42	0.84	0.70	1.40
J6	0.26	0.52	0.31	0.63	0.52	1.05
JD1	1.46	2.92	1.77	3.54	2.92	5.85
JD2	1.11	2.22	1.34	2.69	2.22	4.45
JD3	0.86	1.72	1.04	2.08	1.72	3.45
JD4	0.65	1.30	0.79	1.57	1.30	2.60
JD5	0.51	1.02	0.62	1.24	1.02	2.05
JD6	0.40	0.80	0.48	0.96	0.80	1.60

Notes:

G = permanent action (self-weight or 'dead' action).

W_u = ultimate wind action.

ψ_c = combination factor for imposed action.

Q = imposed action (due to occupancy and use 'live' action).

† Steel #10 screws conforming to AS 3566.

Prebored maximum hole diameter = root diameter of screw.

For end grain use - these capacities must be reduced by 40%.

Bracket Strength Capacity for Screw Joints (gauge 10 size type 17 hex head screws)

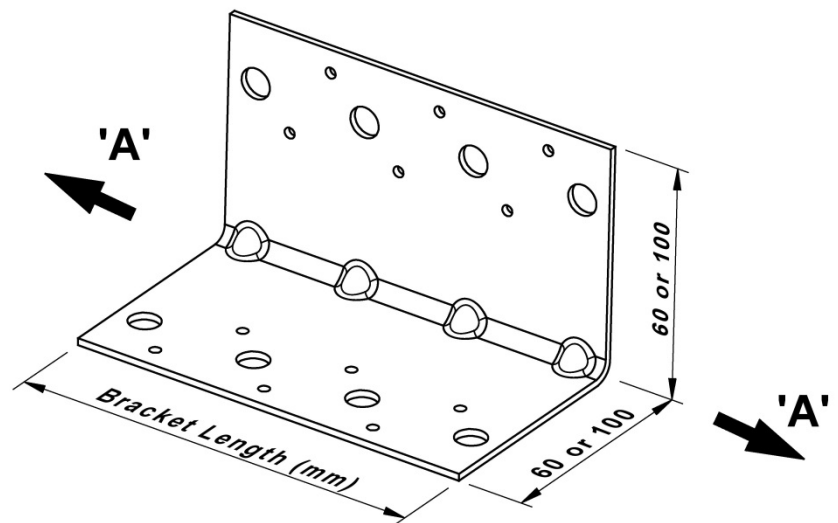
As well as checking the design capacity of the joint arrangement, it is important to verify that the capacity of the bracket also meets the design requirements. It is often overlooked, and can be detrimental to the total joint design. It can sometimes be seen that the joint capacity is the limiting factor (being dependent on the timber materials, embedment depth of the bolts or screws, or number of bolts or screws). Other times it may be found that the bracket itself is the limiting factor in the overall joint arrangement. It is important therefore, to check both the capacity of joints and the bracket strength for each particular arrangement to ensure that the desired strength is obtained.

Loading capacities are tabulated for shear loading in the direction of the bracket length (direction labeled 'A' in the accompanying diagram).

Loading capacities are also tabulated for tensile loading in the direction of pull along the screw axis (direction labeled 'F' in the diagram on the next page).

Loading that is on an angle to any of these directions will have to be calculated accordingly.

Note: Capacities are based on nominal material thicknesses of 1.6mm and 3.0mm metallic coated mild steel for Standard Duty (SD) brackets and Heavy Duty (HD) brackets respectively.



Bracket Loading

Bracket Strength based on Screw connections (#10 screws) - Shear Loading (along 'A' direction)

Bracket	Bracket Capacity 'A' (kN) for Bracket Lengths Listed				
	86mm	136mm	186mm	236mm	286mm
FB6060SD	5.46	5.46	5.46	5.46	5.46
FB60100SD	5.46	5.46	5.46	5.46	5.46
FB100100SD	6.74	10.53	10.53	10.53	10.53
FB6060HD	10.32	10.32	10.32	10.32	10.32
FB60100HD	10.32	10.32	10.32	10.32	10.32
FB100100HD	12.64	19.75	19.75	19.75	19.75

Notes:

All available bolt holes are assumed to be used.

Steel #10 screws conforming to AS 3566.

Brackets are not to provide rotational restraint in any direction.

Bracket Strength based on Screw connections (#10 screws) - Tensile loading (along 'F' direction)

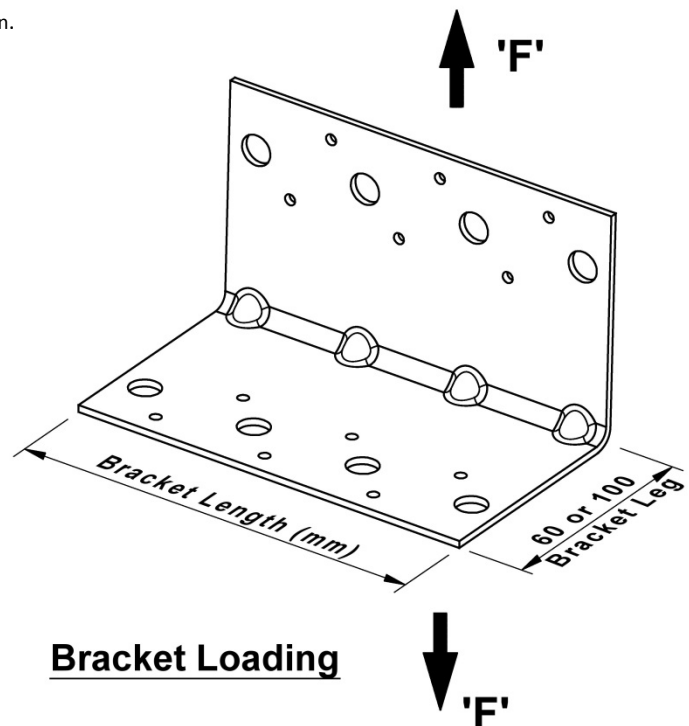
Bracket	Bracket leg size (mm)	Bracket Capacity 'F' (kN) for Bracket Lengths Listed				
		86mm	136mm	186mm	236mm	286mm
FB6060SD	60	0.40	0.67	0.93	1.20	1.47
FB60100SD	60	0.40	0.67	0.93	1.20	1.47
	100	0.12	0.21	0.29	0.37	0.46
FB100100SD	100	0.12	0.21	0.29	0.37	0.46
FB6060HD	60	1.41	2.34	3.28	4.22	5.16
FB60100HD	60	1.41	2.34	3.28	4.22	5.16
	100	0.44	0.73	1.02	1.31	1.60
FB100100HD	100	0.44	0.73	1.02	1.31	1.60

Notes:

All available bolt holes are assumed to be used.

Steel #10 screws conforming to AS 3566.

Brackets are not to provide rotational restraint in any direction.


Available Product Range

(Detailed product drawings can be found on corresponding web pages)

Product Type	Product Description	Leg Lengths (mm)	Material Thickness (mm)	Available Lengths (mm)	Number of Screw Holes per Leg*
FB6060SD	Standard Duty Fixing Bracket	60 x 60	1.6	86, 136, 186, 236, 286	2, 4, 6, 8, 10
FB60100SD	Standard Duty Fixing Bracket	60 x 100	1.6	86, 136, 186, 236, 286	2, 4, 6, 8, 10
FB100100SD	Standard Duty Fixing Bracket	100 x 100	1.6	86, 136, 186, 236, 286	2, 4, 6, 8, 10
FB6060HD	Heavy Duty Fixing Bracket	60 x 60	3.0	86, 136, 186, 236, 286	2, 4, 6, 8, 10
FB60100HD	Heavy Duty Fixing Bracket	60 x 100	3.0	86, 136, 186, 236, 286	2, 4, 6, 8, 10
FB100100HD	Heavy Duty Fixing Bracket	100 x 100	3.0	86, 136, 186, 236, 286	2, 4, 6, 8, 10

Notes:

* Number of screw holes is dependent on bracket length.