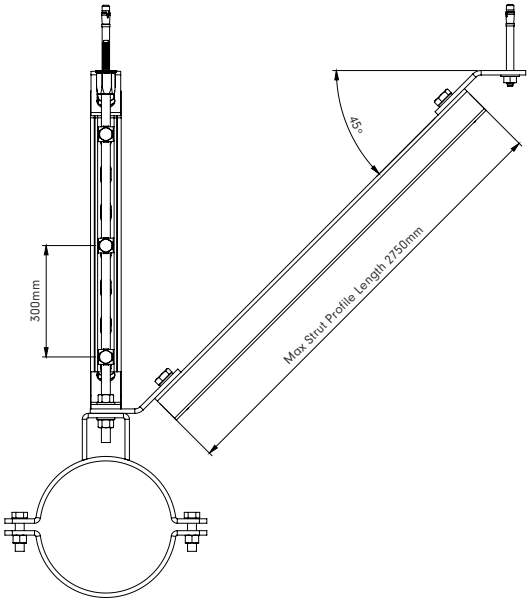
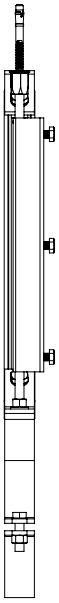
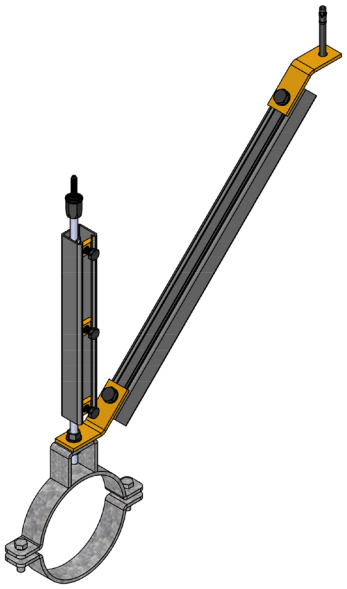
2020 Approved Strut Bracing System

- Tested in accordance with NZS 4541:2020 and FM Testing Requirements.
- Must be used as a complete system from Orbital Fire. Strut Channel, Fixing, Clamps and Seismic Anchors are tested and are required from this compliant system.
- Available in Pre Galv and Hot Dip Galv Finish. Stainless Steel available on request.
- CAD and Revit Files available on request.
- Hanger sizes 150mm and above require a 6mm square washer under the neck of the clamp yoke.

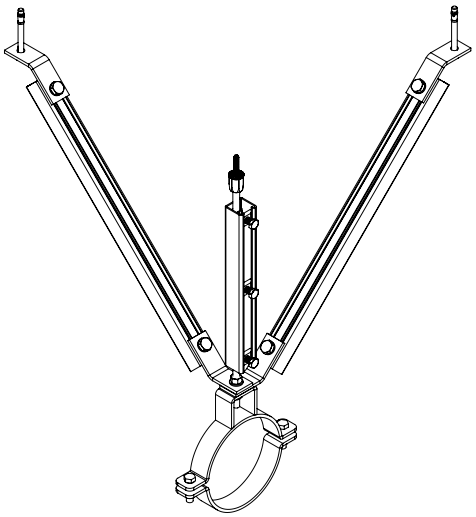
Configuration: **1 Way Brace**

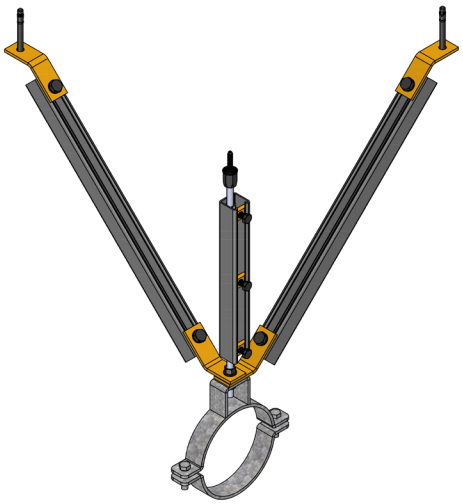






Configuration: **2 Way Brace**





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Pipe Transverse Bracing

Pipe Dia (mm)	Pipe Weight (kN/m)	Pipe Weight (kN/m)
32	0.04	4.19
40	0.05	5.03
50	0.07	7.37
65	0.10	10.30
80	0.14	13.70
100	0.21	21.10
150	0.39	38.80
200	0.67	66.80

Pipe Dia (mm)	ORB 1000 Brace Capacity (kN)*
32	4.72
40	4.72
50	4.72
65	4.72
80	4.72
100	4.72
150	4.72
200	4.50

*at a 45 degree angle

LOAD (kN)

Pipe dia. (mm)	Seismic Acceleration (g)								
	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.60
32	0.10	0.19	0.26	0.32	0.43	0.50	0.60	0.68	0.75
40	0.12	0.22	0.31	0.39	0.52	0.60	0.72	0.81	0.91
50	0.17	0.33	0.46	0.57	0.76	0.88	1.05	1.19	1.33
65	0.31	0.57	0.77	0.93	1.16	1.24	1.55	1.85	2.22
80	0.41	0.75	1.03	1.23	1.54	1.64	2.06	2.47	2.96
100	0.63	1.16	1.58	1.90	2.37	2.53	3.17	3.80	4.56
150*	1.16	2.13	2.91	3.49	4.37	4.66	4.72	4.72	4.72
200*	2.00	3.67	4.50	4.50	4.50	4.50	4.50	4.50	4.50

MAX TRANSVERSE SPACING IN METERS

Pipe dia. (mm)	Seismic Acceleration (g)								
	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.60
32	9.4	8.8	8.3	7.7	6.9	6.0	5.7	5.4	5.0
40	9.4	8.8	8.3	7.7	6.9	6.0	5.7	5.4	5.0
50	9.4	8.8	8.3	7.7	6.9	6.0	5.7	5.4	5.0
65	12.0	11.0	10.0	9.0	7.5	6.0	6.0	6.0	6.0
80	12.0	11.0	10.0	9.0	7.5	6.0	6.0	6.0	6.0
100	12.0	11.0	10.0	9.0	7.5	6.0	6.0	6.0	6.0
150*	12.0	11.0	10.0	9.0	7.5	6.0	4.9	4.1	3.4
200*	12.0	11.0	9.0	6.7	4.5	3.4	2.7	2.2	1.9

*Requires a 6mm square washer under the clamp yoke.

Pipe Longitudinal Bracing

Pipe Dia (mm)	Pipe Weight (kN/m)	Pipe Weight (kN/m)
32	0.04	4.19
40	0.05	5.03
50	0.07	7.37
65	0.10	10.30
80	0.14	13.70
100	0.21	21.10
150	0.39	38.80
200	0.67	66.80

Pipe Dia (mm)	ORB 1000 Brace Capacity (kN)*
32	4.72
40	4.72
50	4.72
65	4.72
80	4.72
100	4.72
150	4.72
200	4.50

*at a 45 degree angle

LOAD (kN)

Pipe dia. (mm)	Seismic Coefficient (g)								
	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.60
32	0.25	0.50	0.75	1.01	1.51	2.01	2.51	3.02	3.62
40	0.30	0.60	0.91	1.21	1.81	2.41	3.02	3.62	4.35
50	0.44	0.88	1.33	1.77	2.65	3.54	4.42	4.72	4.72
65	0.62	1.24	1.85	2.47	3.71	4.72	4.72	4.72	4.72
80	0.82	1.64	2.47	3.29	4.72	4.72	4.72	4.72	4.72
100	1.27	2.53	3.80	4.72	4.72	4.72	4.72	4.72	4.72
150*	2.33	4.66	4.72	4.72	4.72	4.72	4.72	4.72	4.72
200*	4.01	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50

MAX LONGITUDINAL SPACING IN METERS

Pipe dia. (mm)	Seismic Coefficient (g)								
	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.60
32	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
40	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
50	24.0	24.0	24.0	24.0	24.0	24.0	24.0	21.3	17.8
65	24.0	24.0	24.0	24.0	24.0	22.9	18.3	15.3	12.7
80	24.0	24.0	24.0	24.0	22.9	17.2	13.8	11.5	9.6
100	24.0	24.0	24.0	22.3	14.9	11.2	8.9	7.4	6.2
150*	24.0	24.0	16.2	12.2	8.1	6.1	4.9	4.1	3.4
200*	24.0	13.5	9.0	6.7	4.5	3.4	2.7	2.2	1.9

*Requires a 6mm square washer under the clamp yoke.

Limited by ORB1000 strut capacity

Transverse Bracing - Running at 90 degrees to the direction of the pipe work.
Longitudinal Bracing - Running in the same direction of the pipe work.
(g) Seismic Coefficient - Calculate using Formula Provided in NZS4541:2020

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Notes

- These brace spacings are for general reference only and should not be solely used as a design or for construction. For a design and PS1 please get in touch with a Orbital Fire Engineer.
- If a bridging member is being used, the capacities of this member must be considered.
- Gravity hanger capacity must be equal to or greater than capacity of brace.
- Connection of the brace to timber or steel soffit to be designed by a Orbital Fire Engineer.
- Approved seismic anchors from Orbital Fire must be used.
- Hanger sizes 150mm and above require a 6mm square washer under the neck of the clamp yoke.
- Brace capacity limited by slip capacity of a bolt in the ORB1000 strut.
- Braces must be at 45-degree angle.
- Braces must not be longer than 2.75m.
- A hanger stiffener is required on hangers longer than 150mm.
- Rod stiffeners at 300mm centers.
- If pipe weights exceed the weights in the table, please get in touch with Orbital Fire Engineering Team.
- For questions or clarifications please contact sales@orbitalfire.co.nz

Part Codes Required

Product Code	Description
ORB1000TG	41 x 41 x 2.5mm x 6mtr Slotted Strut HDG
HTRS-3PCE12G	M12 Threaded Rod Stiffener Galv
ORB-1546G	Angle Bracket External Angle 45°, 60x76mm HDG
ORB-18-060	60mm (50 NB) Medium Duty Two-Piece Yoke Clamp HDG
ORB-18-076	76mm (65 NB) Medium Duty Two-Piece Yoke Clamp HDG
ORB-18-089	89mm (80 NB) Medium Duty Two-Piece Yoke Clamp HDG
ORB-18-114	114mm (100 NB) Medium Duty Two-Piece Yoke Clamp HDG
ORB-18-165	165mm (150 NB) Medium Duty Two-Piece Yoke Clamp HDG
ORB-18-219	219mm (200 NB) Medium Duty Two-Piece Yoke Clamp HDG
MTB10x95G-S	M10 x 95mm Throughbolt Galv - Seismic Rated
MTB12x100G-S	M12 x 100mm Throughbolt Galv - Seismic Rated
MTB16x105G-S	M16 x 105mm Throughbolt Galv - Seismic Rated
NUT-M12SLSG	M12 Long Spring Strut Nut Galv
SS4612x30G	M12 x 30 4.6 Hex Head Set Screw Galv
MVT8x50G	M10 Vertical Concrete Hanger 8 x 50mm Galv - Seismic Rated
MVT8x50G-M12	M12 Vertical Concrete Hanger 8 x 50mm Galv - Seismic Rated
TR4610x2000G	M10 x 2000 Grade 4.6 Threaded Rod Galv 2M
TR4612x2000G	M12 x 2000 Grade 4.6 Threaded Rod Galv 2M
TR4616x2000G	M16 x 2000 Grade 4.6 Threaded Rod Galv 2M
NUT-M10H5G	M10 Hex Nut Galv
NUT-M12H5G	M12 Hex Nut Galv
NUT-M16H5G	M16 Hex Nut Galv
W10x40SQx6G	M10 Square Washer Galv
W12x40SQx6G	M12 Square Washer Galv
W16x40SQx6G	M16 Square Washer Galv

Other Substrate Connection Capacity

FASTENING TYPE	CONNECTION CAPACITY AT 45 DEGREE ANGLE	
	Shear Connection (kN)	Tension Connection (kN)
Seismic Concrete Anchors*		
M10	4.40	5.25
M12	6.65	6.60
M16	10.00	8.85
Details from NZS:4541 - **ENSURE NOTES ARE READ BEFORE USE**		
Bolts to Structural Steel**		
M10	9.05	9.86
M12	12.83	14.18
M16	22.95	25.79
Bolts to BP 450 Purlins**		
M10	5.74	-
M12	6.86	-
M16	9.11	-
Bolts to Timber (minimum thickness 50mm)**		
M12	4.95	-
M16	7.20	-
M20	9.60	-
Coach Screws to Timber**		
M10 x 100mm - Min edge spacing - 50mm	-	2.70
M12 x 120mm - Min edge spacing - 60mm	-	3.90
M16 x 160mm - Min edge spacing - 80mm	-	6.30
M20 x 200mm - Min edge spacing - 100mm	-	9.30

* Seismic Anchor must be sourced from Orbital Fire to ensure compliance.

** Steel and Timber Connections capacities are for general reference only and should not be solely used as a design or for construction. For a design verification and PS1 please get in touch with the engineering team at Orbital Fire.

The loads for timber connections are for dry timber. For green timber reduce the loads by 30%.

If a bridging member is being used, the capacities of this member must be considered.