

SBC5.cou	Fri Dec 8 18:03:17 2023	1
Design Summary		
Connection is OK		
Maximum utility ratio for connection		0.889
Design Inputs		
Design method		ASD
Young's modulus of elasticity		200000.000 MPa
Poisson's ratio		0.300
Connection forces:		
Transfer force (TF)		45000.000 N
Shear force (SF)		90000.000 N
Bolt Details:		
Bolt Diameter		22.000 mm
Number of bolts per clip angle (n)		2.000
Bolt Gage		140.000 mm
Bolt Spacing		70.000 mm
Nominal tensile capacity of bolt		620.000 MPa
Nominal shear capacity of bolt		372.000 MPa
Weld Details:		
Weld thickness		6.000 mm
Weld tensile strength		482.000 MPa
Clip angle dimensions:		
Clip angle size (li x lo x ta)		102x102x9.53 mm
Clip angle length		140.000 mm
Yield strength of clip angle		250.000 MPa
Tensile strenght of clip angle		400.000 MPa
Connecting beam properties:		
Section size		
Depth		409.000 mm
Flange width		179.000 mm
Flange thickness		14.400 mm
Web thickness (tw)		8.760 mm
Yield strength of beam		345.000 MPa
Tensile strength of beam		450.000 MPa
Beam setback from connection member (s)		12.000 mm
Supporting member properties:		
Support type		Column Web
Section size		W360X91
Depth		353.000 mm
Flange width		254.000 mm
Flange thickness		16.400 mm
Web thickness		9.530 mm
Design Calculations		
Bolt Shear Check:		
Shear per bolt		
[Vb=SF/(2*n)]		22500.000 N
Nominal shear strength of bolt (Rn)		141337.680 N
ASD factor in bolt shear (omega)		2.000
Allowable shear strength of bolt		
[Ra=Rn/omega]		70668.840 N
Utility ratio in bolt shear		
[Vb/Ra]		0.318
Bolt Bearing at Clip Angle Check:		
Nominal strength in bearing at clip angle (Rn)		105211.200 N
ASD factor in bolt bearing (omega)		2.000
Allowable strength in bearing at clip angle		
[Ra=Rn/omega]		52605.600 N
Utility ratio in bearing at clip angle		
[Vb/Ra]		0.428
Bolt Bearing at Support Check:		
Nominal strength in bearing at support (Rn)		226432.800 N
ASD factor in bolt bearing (omega)		2.000
Allowable strength in bearing at support		
[Ra=Rn/omega]		113216.400 N
Strength reduction factor to account for backing beam (r)		0.500
Utility ratio in bearing at support		
[Vb/(Ra*r)]		0.397
Bolt Tension Check(without prying:		
Tension per boltwithout prying		
[Tb=TF/(2*n)]		11250.000 N

Nominal bolt strength in tension (Rn)	231231.640 N
ASD factor in bolt tension (omega)	2.000
Allowable bolt strength in tension [B=Rn/omega]	115615.820 N
Utility ratio in bolt tension [Tb/B]	0.097
Clip angle prying action check:	
Bolt strength reduction factor due to clip prying (Q)	0.109
Interaction ratio in clip prying [Tb/(Q*B)]	0.889
Weld Check:	
Maximum stress in weld group (fw)	387.437 N/mm
Nominal strength of weld (Rn)	1226.786 N/mm
ASD factor for weld (omega)	2.000
Allowable weld strength [Ra=Rn/omega]	613.393 N/mm
Utility ratio for weld [fw/Ra]	0.632
Web Rupture at Weld Check:	
Minimum thickness of web at weld (tw`)	5.740 mm
Utility ratio in rupture at weld [tw`/tw]	0.655
Clip Angle Shear Yielding Check:	
Shear in clip angle [Va=sqrt(TF^2+SF^2)/2]	50311.529 N
Nominal shear yeilding strength of clip angle (Rn)	200130.000 N
ASD factor for shear yielding (omega)	1.500
Allowable shear yielding strength of clip angle [Ra=Rn/omega]	133420.000 N
Utility ratio in shear yielding [Va/Ra]	0.377
Clip Angle Shear Rupture Check:	
Nominal shear rupture strength of clip angle (Rn)	210422.400 N
ASD factor for shear rupture (omega)	2.000
Shear rupture strength of clip angle [Ra=Rn/omega]	105211.200 N
Utility ratio in shear rupture [Va/Ra]	0.478