

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 70	X Mid: 0,000	Combo: COMB15	Design Type: Column
Length: 4,500	Y Mid: 2,000	Shape: C36X36X2.5	Frame Type: OMF
Loc : 4,500	Z Mid: 2,250	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis		
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed	
AlphaPr/Py=0,028	AlphaPr/Pe=0,004	Tau_b=1,000	EA factor=0,800 EI factor=0,800
Ignore Seismic Code? No	Ignore Special EQ	Load? No	D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,034	I33=6,301E-04	r33=0,137	S33=0,004	Av3=0,018
J=9,399E-04	I22=6,301E-04	r22=0,137	S22=0,004	Av2=0,018
E=20389019,16	fy=25310,507	Ry=1,500	z33=0,004	
RLLF=1,000	Fu=40778,038		z22=0,004	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
4,500	23,432	0,993	-5,360	-0,270	1,672	0,473

PMM DEMAND/CAPACITY RATIO (H1.2,H1-1b)

D/C Ratio: 0,082 = 0,015 + 0,010 + 0,056
 = (1/2) (Pr/Pc) + (Mr33/Mc33) + (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1.2,H1-1b)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	1,000
Minor Bending	1,000	1,000	1,000	1,000	1,000	1,000

	Lltb	Kltb	Cb
LTB	1,000	1,305	1,704

	Pu Force	phi*Pnc Capacity	phi*Pnt Capacity
Axial	23,432	721,062	763,112

	Mu Moment	phi*Mn Capacity	phi*Mn No LTB
Major Moment	0,993	96,044	96,044
Minor Moment	-5,360	96,044	

	Tu Moment	Tn Capacity	phi*Tn Capacity
Torsion	0,473	84,298	75,868

SHEAR CHECK

	Vu Force	phi*Vn Capacity	Stress Ratio	Status Check
Major Shear	0,271	194,764	0,001	OK
Minor Shear	1,773	194,764	0,009	OK

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 28	X Mid: 1,500	Combo: COMB15	Design Type: Beam
Length: 3,927	Y Mid: 8,325	Shape: Riostra 7X7X3	Frame Type: OMF
Loc : 2,945	Z Mid: 4,500	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis		
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed	
AlphaPr/Py=0,101	AlphaPr/Pe=0,379	Tau_b=1,000	EA factor=0,800 EI factor=0,800
Ignore Seismic Code? No	Ignore Special EQ	Load? No	D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,001	I33=0,000	r33=0,023	S33=1,780E-05	Av3=6,067E-04
J=1,246E-06	I22=0,000	r22=0,023	S22=1,780E-05	Av2=6,067E-04
E=20389019,16	fy=25310,507	Ry=1,500	z33=2,465E-05	
RLLF=1,000	Fu=40778,038		z22=2,465E-05	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
2,945	-3,082	0,058	0,002	0,002	0,001	0,016

PMM DEMAND/CAPACITY RATIO (H1-1a)

D/C Ratio: $0,571 = 0,480 + 0,091 + 0,003$
 $= (Pr/Pc) + (8/9) (Mr33/Mc33) + (8/9) (Mr22/Mc22)$

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1-1a)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	0,992
Minor Bending	1,000	1,000	1,000	1,000	1,000	0,968

	Lltb	Kltb	Cb
LTB	1,000	1,000	1,008

	Pu Force	phi*Pnc Capacity	phi*Pnt Capacity
Axial	-3,082	6,418	27,480

	Mu Moment	phi*Mn Capacity	phi*Mn No LTB
Major Moment	0,058	0,561	0,561
Minor Moment	0,002	0,561	

	Tu Moment	Tn Capacity	phi*Tn Capacity
Torsion	0,016	0,586	0,528

SHEAR CHECK

	Vu Force	phi*Vn Capacity	Stress Ratio	Status Check
Major Shear	0,002	8,244	0,000	OK
Minor Shear	0,001	8,244	0,000	OK

CONNECTION SHEAR FORCES FOR BEAMS

	VMajor Left	VMajor Right
Major (V2)	0,002	0,002

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 235	X Mid: 1,500	Combo: COMB15	Design Type: Brace
Length: 5,408	Y Mid: 2,000	Shape: Riostras en colum	Frame Type: OMF
Loc : 5,408	Z Mid: 2,250	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis		
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed	
AlphaPr/Py=0,020	AlphaPr/Pe=0,014	Tau_b=1,000	EA factor=0,800 EI factor=0,800
Ignore Seismic Code? No	Ignore Special EQ	Load? No	D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,018	I33=9,115E-05	r33=0,072	S33=9,115E-04	Av3=0,010
J=1,340E-04	I22=9,115E-05	r22=0,072	S22=9,115E-04	Av2=0,010
E=20389019,16	fy=25310,507	Ry=1,500	z33=0,001	
RLLF=1,000	Fu=40778,038		z22=0,001	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
5,408	-9,005	0,088	0,440	0,015	0,111	-0,118

PMM DEMAND/CAPACITY RATIO (H1-1b)

D/C Ratio: 0,035 = 0,015 + 0,003 + 0,017
 = (1/2) (Pr/Pc) + (Mr33/Mc33) + (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1-1b)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	0,677
Minor Bending	1,000	1,000	1,000	1,000	1,000	0,997

	Lltb	Kltb	Cb
LTB	1,000	1,000	1,565

	Pu Force	phi*Pnc Capacity	phi*Pnt Capacity
Axial	-9,005	296,607	398,640

	Mu Moment	phi*Mn Capacity	phi*Mn No LTB
Major Moment	0,088	26,339	26,339
Minor Moment	0,440	26,339	

	Tu Moment	Tn Capacity	phi*Tn Capacity
Torsion	-0,118	22,337	20,104

SHEAR CHECK

	Vu Force	phi*Vn Capacity	Stress Ratio	Status Check
Major Shear	0,015	85,423	0,000	OK
Minor Shear	0,111	85,423	0,001	OK

BRACE MAXIMUM AXIAL LOADS

	P Comp	P Tens
Axial	N/C	9,380

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 365	X Mid: 0,750	Combo: COMB15	Design Type: Brace
Length: 7,159	Y Mid: 21,000	Shape: tubos	Frame Type: OMF
Loc : 7,159	Z Mid: 8,000	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis	
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed
AlphaPr/Py=0,298	AlphaPr/Pe=2,166	Tau_b=1,000
Ignore Seismic Code? No	Ignore Special EQ	EA factor=0,800
		EI factor=0,800
		Load? No
		D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,002	I33=1,404E-06	r33=0,030	S33=3,119E-05	Av3=7,944E-04
J=2,807E-06	I22=1,404E-06	r22=0,030	S22=3,119E-05	Av2=7,944E-04
E=20389019,16	fy=25310,507	Ry=1,500	z33=4,241E-05	
RLLF=1,000	Fu=40778,038		z22=4,241E-05	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
7,159	11,940	0,202	0,014	-0,003	0,004	1,730E-04

PMM DEMAND/CAPACITY RATIO (H1.2,H1-1a)

D/C Ratio: 0,517 = 0,331 + 0,186 + 0,013
 = (Pr/Pc) + (8/9) (Mr33/Mc33) + (8/9) (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1.2,H1-1a)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	1,000
Minor Bending	1,000	1,000	1,000	1,000	1,000	1,000

	Lltb	Kltb	Cb
LTB	1,000	1,000	3,278

	Pu	phi*Pnc	phi*Pnt
	Force	Capacity	Capacity
Axial	11,940	4,350	36,068

	Mu	phi*Mn	phi*Mn
	Moment	Capacity	No LTB
Major Moment	0,202	0,966	0,966
Minor Moment	0,014	0,966	

	Tu	Tn	phi*Tn
	Moment	Capacity	Capacity
Torsion	1,730E-04	1,010	0,909

SHEAR CHECK

	Vu	phi*Vn	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	0,055	10,820	0,005	OK
Minor Shear	0,004	10,820	0,000	OK

BRACE MAXIMUM AXIAL LOADS

	P	P
	Comp	Tens
Axial	N/C	11,940

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 331	X Mid: 1,500	Combo: COMB15	Design Type: Brace
Length: 5,882	Y Mid: 18,069	Shape: T60	Frame Type: OMF
Loc : 5,882	Z Mid: 11,257	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis	
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed
AlphaPr/Py=0,134	AlphaPr/Pe=0,014	Tau_b=1,000
Ignore Seismic Code? No	Ignore Special EQ	EA factor=0,800
		EI factor=0,800
		Load? No
		D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,035	I33=0,001	r33=0,206	S33=0,005	Av3=0,017
J=0,003	I22=0,001	r22=0,206	S22=0,005	Av2=0,017
E=20389019,16	fy=25310,507	Ry=1,500	z33=0,006	
RLLF=1,000	Fu=40778,038		z22=0,006	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
5,882	-117,474	34,687	-27,717	-1,997	1,466	-2,421

PMM DEMAND/CAPACITY RATIO (H1-1b)

D/C Ratio: 0,381 = 0,078 + 0,237 + 0,190
 = (1/2) (Pr/Pc) + (Mr33/Mc33) + (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1-1b)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	0,865
Minor Bending	1,000	1,000	1,000	1,000	1,000	0,877

	Lltb	Kltb	Cb
LTB	1,000	1,000	1,157

	Pu	phi*Pnc	phi*Pnt
	Force	Capacity	Capacity
Axial	-117,474	756,649	789,992

	Mu	phi*Mn	phi*Mn
	Moment	Capacity	No LTB
Major Moment	34,687	146,152	146,152
Minor Moment	-27,717	146,152	

	Tu	Tn	phi*Tn
	Moment	Capacity	Capacity
Torsion	-2,421	152,995	137,696

SHEAR CHECK

	Vu	phi*Vn	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	1,997	236,998	0,008	OK
Minor Shear	1,466	236,998	0,006	OK

BRACE MAXIMUM AXIAL LOADS

	P	P
	Comp	Tens
Axial	N/C	-117,474

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : Tonf, m, C

Frame : 327	X Mid: 1,500	Combo: COMB15	Design Type: Brace
Length: 5,882	Y Mid: -3,037	Shape: T60	Frame Type: OMF
Loc : 0,000	Z Mid: 1,993	Class: Compact	Princpl Rot: 0,000 degrees

Provision: LRFD	Analysis: Direct Analysis	
D/C Limit=0,950	2nd Order: General 2nd Order	Reduction: Tau-b Fixed
AlphaPr/Py=0,215	AlphaPr/Pe=0,022	Tau_b=1,000
Ignore Seismic Code? No	Ignore Special EQ	EA factor=0,800
		EI factor=0,800
		Load? No
		D/P Plug Welded?

Yes

SDC: D	I=1,000	Rho=1,000	Sds=0,500
R=8,000	Omega0=3,000	Cd=5,500	
PhiB=0,900	PhiC=0,900	PhiTY=0,900	PhiTF=0,750
PhiS=0,900	PhiS-RI=1,000	PhiST=0,900	

A=0,035	I33=0,001	r33=0,206	S33=0,005	Av3=0,017
J=0,003	I22=0,001	r22=0,206	S22=0,005	Av2=0,017
E=20389019,16	fy=25310,507	Ry=1,500	z33=0,006	
RLLF=1,000	Fu=40778,038		z22=0,006	

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
0,000	-188,545	107,741	-15,170	9,296	4,156	-1,870

PMM DEMAND/CAPACITY RATIO (H1-1a)

D/C Ratio: 0,911 = 0,249 + 0,655 + 0,092
 = (Pr/Pc) + (8/9) (Mr33/Mc33) + (8/9) (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1-1a)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	0,530
Minor Bending	1,000	1,000	1,000	1,000	1,000	0,846

	Lltb	Kltb	Cb
LTB	1,000	1,000	2,314

	Pu	phi*Pnc	phi*Pnt
Axial	Force	Capacity	Capacity
	-188,545	756,649	789,992

	Mu	phi*Mn	phi*Mn
Major Moment	Moment	Capacity	No LTB
Minor Moment	-15,170	146,152	146,152

	Tu	Tn	phi*Tn
Torsion	Moment	Capacity	Capacity
	-1,870	152,995	137,696

SHEAR CHECK

	Vu	phi*Vn	Stress	Status
Major Shear	Force	Capacity	Ratio	Check
Minor Shear	4,158	236,998	0,118	OK
		236,998	0,018	OK

BRACE MAXIMUM AXIAL LOADS

	P	P
Axial	Comp	Tens
	-188,545	N/C

AISC 360-10 STEEL SECTION CHECK (Summary for Combo and Station)

Units : Tonf, m, C

Frame : 463 X Mid: 1,500 Combo: COMB15 Design Type: Beam
Length: 3,000 Y Mid: 18,461 Shape: TUBO120X60X10 Frame Type: OMF
Loc : 1,500 Z Mid: 4,500 Class: Compact Princpl Rot: 0,000 degrees

Provision: LRFD Analysis: Direct Analysis
D/C Limit=0,950 2nd Order: General 2nd Order Reduction: Tau-b Fixed
AlphaPr/Py=0,001 AlphaPr/Pe=0,002 Tau_b=1,000 EA factor=0,800 EI factor=0,800
Ignore Seismic Code? No Ignore Special EQ Load? No D/P Plug Welded?
Yes

SDC: D I=1,000 Rho=1,000 Sds=0,500
R=8,000 Omega0=3,000 Cd=5,500
PhiB=0,900 PhiC=0,900 PhiTY=0,900 PhiTF=0,750
PhiS=0,900 PhiS-RI=1,000 PhiST=0,900

A=0,003 I33=5,307E-06 r33=0,041 S33=8,845E-05 Av3=0,001
J=3,781E-06 I22=1,627E-06 r22=0,023 S22=5,423E-05 Av2=0,002
E=20389019,16 fy=25310,507 Ry=1,500 z33=1,160E-04
RLLF=1,000 Fu=40778,038 z22=6,800E-05

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo COMB15)

Location	Pu	Mu33	Mu22	Vu2	Vu3	Tu
1,500	0,088	1,650	1,368E-04	0,010	0,001	0,007

PMM DEMAND/CAPACITY RATIO (H1.2,H1-1b)

D/C Ratio: 0,625 = 0,000 + 0,624 + 0,000
= (1/2) (Pr/Pc) + (Mr33/Mc33) + (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1.2,H1-1b)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	1,000	1,000	1,000	1,000	1,000	1,000
Minor Bending	1,000	1,000	1,000	1,000	1,000	1,000

	Lltb	Kltb	Cb
LTB	1,000	1,000	1,157

	Pu Force	phi*Pnc Capacity	phi*Pnt Capacity
Axial	0,088	28,707	72,894

	Mu Moment	phi*Mn Capacity	phi*Mn No LTB
Major Moment	1,650	2,642	2,642
Minor Moment	1,368E-04	1,549	

	Tu Moment	Tn Capacity	phi*Tn Capacity
Torsion	0,007	1,612	1,451

SHEAR CHECK

	Vu Force	phi*Vn Capacity	Stress Ratio	Status Check
Major Shear	0,010	24,602	0,000	OK
Minor Shear	0,001	8,201	0,000	OK

CONNECTION SHEAR FORCES FOR BEAMS

	VMajor Left	VMajor Right
Major (V2)	2,222	2,222