

SAP2000

Project _____
 Job Number _____
 Engineer _____

EN 1999:2007 ALUMINUM SECTION CHECK Units: KN, m, C

FRAME ELEMENT INFORMATION

	Frame ID	Section ID	Stat Loc	FilletRad	Principal Axes
	99	HEA600	7,433	0,027	0, degrees
	L	K	iBraceLoc	jBraceLoc	LTB Restraint
Axes					Buckl./Bend.
Major	7,433	1,	0,	7,433	No
Geometric					
Minor	7,433	1,	0,	7,433	
LTB	7,433	1,	0,	7,433	

DESIGN INFO GammaM1 1,1 GammaM2 1,25 LLRF 1, PLLF 0,75 Torsion considered No

MATERIAL PROPERTIES

Designation	E	fo	fu	G	Epsilon	Buckling Class A
6082-T6 Wrought Alloy	70000000,	260000,	310000,	26923076,9	0,981	

SECTION PROPERTIES

A	Iy	Iz	iy	iz	It	Iw
0,023	0,001	1,127E-04	0,25	0,071	4,070E-06	8,994E-06
Wel,yc	Wel,yt	Wel,zc	Wel,zt	Wpl,y	Wpl,z	
0,005	0,005	7,513E-04	7,513E-04	0,005	0,001	

Axial capacity exceeded
 Combined D/C ratio exceeded

COMBINED RATIO EQUATION - EC9 (6.48) - GOVERNS THE DESIGN

COMBINED RATIO 2,917 = NEd/NbRd
 COMBINED RATIO LIMIT 1,

w0	Xi0	n0	y0	wx	wxLT	nc	Xiyc	Xizc
yc 1,1,56	1,205	2,	1,56	1,	1,	0,8	1,073	0,8

Combo	P	MyEd	MzEd	VyEd	VzEd
DEMANDS DALM16	-3316,267	-101,007	11,664	13,636	-27,855
CAPACITIES	1136,933	1242,142	257,149	957,981	1958,266
DEMAND/CAPACITY	2,917	0,081	0,045	0,014	0,014

AXIAL - TENSION	Area Ag	Area An	NoRd	NuRd	NtRd	NtvRd
Overwrite NtRd	0,023	0,023	5341,818	5044,32	5044,32	5044,32
N/A						

AXIAL - COMPRESSION Calculated NRk 5363,463 Overwrite NRk N/A Buckling Axes Geometric

GLOBAL BUCKLING	Curve	Alpha	LambdaBar0	LambdaBar	Phi	Chi	Kappa
NbRd							
Flex-Major	1,	0,2	0,1	0,551	0,697	0,89	1,
Flex-Minor	1,	0,2	0,1	1,951	2,588	0,233	1,
Tor-Flex	2,	0,35	0,4	1,277	1,468	0,456	1,

ys	zs	is	beta	Ncry	Ncrz	NcrT
NcrTF	0,	0,	0,26	1,	17656,32	1409,254
3291,271						3291,271

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LOCAL BUCKLING	TopFlange	BotFlange	Web	Corner	Section			
Slenderness Class	Class 3	Class 3	Class 4		Class 4			
Part Type	Outstand	Outstand	Internal					
Element Width b	0,117	0,117	0,486					
Element Thickness t	0,025	0,025	0,013					
Slenderness Beta	4,66	4,66	37,385					
Slenderness Beta 1	2,942	2,942	10,786					
Slenderness Beta 2	4,413	4,413	15,689					
Slenderness Beta 3	5,883	5,883	21,573					
Rhoc	1,	1,	0,688					
Effective Thickness teff	0,025	0,025	0,009					
Effective Area Aeff	0,006	0,006	0,004	0,005	0,021			
Compression Strength NcRd	1376,818	1376,818	1027,403	1094,836	4875,876			
FLEXURE	Calculated MRky	Calculated MRkz	Overwrite MRky	Overwrite MRkz				
Axes								
	1244,475	195,347	N/A	N/A				
Geometric								
LTB BUCKLING	Curve	AlphaLT	LamBar0LT	LamBarLT	PhiLT	ChiLT	Mcr	
MbRd	Major	2,	0,2	0,4	1,657	1,999	0,321	453,05
398,488	Minor	N/A	N/A	N/A	N/A	N/A	1.0	N/A
257,149								
	C1	C2	C3	kw	za	zs	zg	zj
	1,132	0,459	0,525	1,	0,295	0,	0,295	0,
	Kappa_wt	Xi_g	Xi_j	mu_cr	Kappa_wt0	Xi_g0	Xi_j0	
	1,013	1,058	0,	1,153	1,013	1,058	0,	
LOCAL BUCKLING	Ie	Eff. N.A.	Weff,c	Weff,t	Alpha	McRd		
MvRd	Major	0,001	0,295	0,005	0,005	1,098	1242,142	
1242,142	Minor	1,127E-04	0,15	7,513E-04	7,513E-04	1,448	257,149	
257,149								
EFFECTIVE THICKNESS	TopFlange	BotFlange	Web	Section				
Major								
Slenderness Class	Class 1	Class 3	Class 2	Class 3				
Part Type	Outstand	Outstand	Internal					
Stress Condition	Tension	UniComp	Grad					
Stress 1	259999,965	-260000,	-214169,49					
Stress 2	259999,965	-260000,	214169,46					
Stress Ratio Psi	1,	1,	-1,					
Element Width b	0,117	0,117	0,486					
Element Thickness t	0,025	0,025	0,013					
Slenderness Beta	N/A	4,66	14,954					
Slenderness Beta 1	N/A	2,942	11,885					
Slenderness Beta 2	N/A	4,413	17,287					
Slenderness Beta 3	N/A	5,883	23,769					
Rhoc	1,	1,	1,					
Effective Thickness teff	0,025	0,025	0,013					
Minor								
Slenderness Class	Class 3	Class 3	Class 1	Class 3				
Part Type	Outstand	Outstand	Internal					
Stress Condition	Grad	Grad	UniComp					
Stress 1	-260000,	-260000,	-11266,678					
Stress 2	-58066,676	-58066,676	-11266,678					
Stress Ratio Psi	0,223	0,223	1,					
Element Width b	0,117	0,117	0,486					
Element Thickness t	0,025	0,025	0,013					
Slenderness Beta	4,66	4,66	37,385					
Slenderness Beta 1	2,942	2,942	51,816					
Slenderness Beta 2	4,413	4,413	75,369					

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		Slenderness Beta 3	5,883	5,883	103,632			
		Rhoc	1,	1,	1,			
		Effective Thickness teff	0,025	0,025	0,013			
SHEAR								
	h	Lambda	Rhov	Av	Vy	Vb	VRd	VTRd
Red. Fac.								
MAJOR-Web	0,54	0,797	1,041	0,007	957,981	997,095	957,981	957,981
1,								
MINOR-Flange	0,144	0,099	1,117	0,014	1958,266	489,567	1958,266	1958,266
1,								
Bot Flange	0,144	0,099	1,117					
	h/t(Web)		h/t(Top Flange)		h/t(Bottom Flange)			39epsilon
Eta		41,538		5,74		5,74		38,243
1,117								
	Slender		Non-Slender		Non-Slender			
UniComp: Uniform Compression								
Grad: Stress Gradient								
None: No Stress								
N/A: Not Applicable								
N/C: Not Calculated								
N/N: Not Needed								

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EN 1999:2007 ALUMINUM SECTION CHECK Units: KN, m, C

FRAME ELEMENT INFORMATION

	Frame ID	Section ID	Stat Loc	FilletRad	Principal Axes
	100	HEA600	5,5	0,027	0, degrees
	L	K	iBraceLoc	jBraceLoc	LTB Restraint
Axes					Buckl./Bend.
Major	5,5	2,041	0,	5,5	No
Geometric					
Minor	5,5	2,048	0,	5,5	
LTB	5,5	1,	0,	5,5	

DESIGN INFO GammaM1 GammaM2 LLRF PLLF Torsion considered

 1,1 1,25 1, 0,75 No

MATERIAL PROPERTIES

	Designation	E	fo	fu	G	Epsilon	Buckling
	6082-T6 Wrought Alloy	70000000,	260000,	310000	26923076,9	0,981	Class A

SECTION PROPERTIES A Iy Iz iy iz It Iw

 0,023 0,001 1,127E-04 0,25 0,071 4,070E-06 8,994E-06

 Wel,yc Wel,yt Wel,zc Wel,zt Wpl,y Wpl,z

 0,005 0,005 7,513E-04 7,513E-04 0,005 0,001

Combined D/C ratio exceeded

COMBINED RATIO EQUATION - EC9 (6.63) - GOVERNS THE DESIGN

COMBINED RATIO 1,484 = [NEd/(Xz*wx*NRd)]^nc + [MyEd/(XLT*wxLT*MyEd)]^yc + [MzEd/(w0

*MzvEd)]^Xizc

COMBINED RATIO LIMIT 1,

	w0	Xi0	n0	y0	wx	wxLT	nc	Xiyc	Xizc
yc									
1,56	1,	1,205	2,	1,56	1,	1,	0,8	0,92	0,8

 Combo P MyEd MzEd VyEd VzEd

DEMANDS DALM16 705,61 -515,81 244,478 125,694 -43,315

CAPACITIES 519,972 1079,487 257,149 957,981 1958,266

DEMAND/CAPACITY 0,14 0,478 0,951 0,131 0,022

AXIAL - TENSION Area Ag Area An NoRd NuRd NtRd NtvRd

Overwrite NtRd 0,023 0,023 5341,818 5044,32 5044,32 5044,32

N/A

AXIAL - COMPRESSION Calculated NRk Overwrite NRk Buckling Axes

 5363,463 N/A Geometric

	GLOBAL BUCKLING	Curve	Alpha	LambdaBar0	LambdaBar	Phi	Chi	Kappa
NbRd								
	Flex-Major	1,	0,2	0,1	0,833	0,92	0,763	1,
3719,549								
	Flex-Minor	1,	0,2	0,1	2,956	5,154	0,107	1,
519,972								
	Tor-Flex	2,	0,35	0,4	1,072	1,192	0,584	1,
2845,672								

 ys zs is beta Ncry Ncrz NcrT

NcrTF 0, 0, 0,26 1, 7738,292 613,823 4669,005

4669,005

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Slenderness Class	Class 3	Class 3	Class 4		Class 4			
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Element Thickness t	0,025	0,025	0,013					
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Axes								
	1244,475	195,347	N/A	N/A				
Geometric								
LTB BUCKLING	Curve	AlphaLT	LamBar0LT	LamBarLT	PhiLT	ChiLT	Mcr	
MbRd	Major	2,	0,2	0,4	0,768	0,831	0,869	2112,075
1079,487	Minor	N/A	N/A	N/A	N/A	N/A	1.0	N/A
257,149								
	C1	C2	C3	kw	za	zs	zg	zj
	2,346	0,	1,	1,	0,295	0,	0,295	0,
	Kappa_wt	Xi_g	Xi_j	mu_cr	Kappa_wt0	Xi_g0	Xi_j0	
	1,369	1,43	0,	3,977	1,369	1,43	0,	
LOCAL BUCKLING	Ie	Eff. N.A.	Weff,c	Weff,t	Alpha	McRd		
MvRd	Major	0,001	0,295	0,005	0,005	1,098	1242,142	
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Red. Fac.								
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1,								
MINOR-Flange	0,144	0,099	1,117	0,014	1958,266	489,567	1958,266	1958,266
1,								
Bot Flange	0,144	0,099	1,117					