



JOB NO.: U0000-000-000

DATE: 01/00/00

DESIGNED: 0

CHECKED: 0

PROJECT: 0.00

SUBJECT: STUDS & OTHER MEMBERS

**DESIGN LOADS (psf)**

	Dead	Live	Snow
Roof	15	20	35
Floor	15	40	
Exterior Wall	15		
Interior Wall	8		

**LOADING PARAMETERS**

Label:	2x4at24"O.C.	2x4at16"O.C.	2x6at24"O.C.	2x6at16"O.C.
Wind/Wall Tributary (ft)	2	1.33	2	1.33
Bending Axis	Strong	Strong	Strong	Strong
Roof Tributary 1 (ft)	20	20	20	20
Roof Tributary 2 (ft)	2	1.33	2	1.33
Floor Tributary 1 (ft)		10	10	20
Floor Tributary 2 (ft)	2	1.33	2	1.33
Additional Dead Load (lbs)				
Additional Floor Live Load (lbs)				
Additional Roof Live Load (lbs)				
Additional Snow Load (lbs)				
Location for Wind Loading	C&C Zone 4	C&C Zone 4	C&C Zone 4	C&C Zone 4
Mean Roof Height (ft)	15	25	25	35
Design Wind Speed (mph)	130	130	130	130
Exposure	C	C	C	C
Axial Loads (lbs):				
Dead	744	695	1044	894
Floor Live	0	532	800	1064
Roof Live	800	532	800	532
Snow	1400	931	1400	931
Bending Load (plf):				
Wind	76.5	56.7	85.3	60.9

**MEMBER PROPERTIES**

Strong-Axis Effective Length, $l_{e1}$ (ft)	9.625	9.625	9.625	9.625
Weak-Axis Effective Length, $l_{e2}$ (ft)	1	1	1	1
Compression Edge Unbraced Length, $l_u$ (ft)	1	1	1	1
Grade	DFL#2	DFL#2	Stud	Stud
Size	2x4	2x4	2x6	2x6
Quantity of Members	1	1	1	1

**SPECIAL CONDITIONS**

Moisture Category	Normal	Normal	Normal	Normal
Temperature Category	$\leq 100^\circ$	$\leq 100^\circ$	$\leq 100^\circ$	$\leq 100^\circ$
Incising?	No	No	No	No
Repetitive Member Category	Rep. (Special)	Rep. (Special)	Rep. (Special)	Rep. (Special)
Finish Type	Flexible	Flexible	Flexible	Flexible

**SECTION PROPERTIES**

Width, b (in)	1.5	1.5	1.5	1.5
Depth, d (in)	3.5	3.5	5.5	5.5
Moment of Inertia, I (in <sup>4</sup> )	5.359375	5.359375	20.796875	20.796875
Section Modulus, S (in <sup>3</sup> )	3.0625	3.0625	7.5625	7.5625

**DESIGN VALUES**

$F_{bx}$ (psi)	900	900	700	700
$F_{by}$ (psi)	900	900	700	700
$F_c$ (psi)	1350	1350	850	850
$E_{xx}$ (psi)	1600000	1600000	1400000	1400000
$E_{yy}$ (psi)	1600000	1600000	1400000	1400000
$E_{minxx}$ (psi)	580000	580000	510000	510000
$E_{minyy}$ (psi)	580000	580000	510000	510000

**RESULTS**

D+L	35%	57%	36%	38%
D+Lr	71%	56%	32%	25%
D+S	99%	75%	44%	33%
D+0.75L+0.75Lr	62%	68%	39%	37%
D+0.75L+0.75S	83%	83%	49%	44%
D+0.6W	107%	79%	75%	53%
D+0.75L+0.42W+0.75Lr	147%	142%	74%	54%
D+0.75L+0.42W+0.75S	273%	219%	85%	60%
Deflection Limit (L/)	120	120	120	120
Deflection (L/)	160	215	486	680
Column Slenderness, $I_e/d$	33.0	33.0	21.0	21.0
Beam Slenderness, $R_B$	6.2	6.2	7.8	7.8
Unity Check	<b>273%</b>	<b>219%</b>	<b>85%</b>	<b>60%</b>

**WIND PRESSURE CALCULATIONS**

Effective Wind Area	30.88020833	30.88020833	30.88020833	30.88020833
Effective Wind Area Rounded Up	20	20	20	20
Height & Exposure Coefficient	1.21	1.35	1.35	1.45
pn <sub>et30</sub>	31.6	31.6	31.6	31.6
Topographic Factor, K <sub>zt</sub>	1	1	1	1
Design C&C Wind Pressure (psf)	38.236	42.66	42.66	45.82
Design Bending Load, w (lbs/in)	6.372666667	4.72815	7.11	5.078383333
Design Bending Moment, M (in-lbs)	10626.62081	7884.33788	11856.14719	8468.362908

**NDS CALCULATIONS**

CD for LC: D+L	1	1	1	1
CD for LC: D+Lr	1.25	1.25	1.25	1.25
CD for LC: D+S	1.15	1.15	1.15	1.15
CD for LC: D+0.75L+0.75Lr	1.25	1.25	1.25	1.25
CD for LC: D+0.75L+0.75S	1.15	1.15	1.15	1.15
CD for LC: D+0.6W	1.6	1.6	1.6	1.6
CD for LC: D+0.75L+0.42W+0.75Lr	1.6	1.6	1.6	1.6
CD for LC: D+0.75L+0.42W+0.75S	1.6	1.6	1.6	1.6
CM for F <sub>b</sub>	1	1	1	1
CM for F <sub>c</sub>	1	1	1	1
CM for E, E <sub>min</sub>	1	1	1	1
C <sub>t</sub> for E, E <sub>min</sub>	1	1	1	1
C <sub>t</sub> for F <sub>b</sub> , F <sub>c</sub>	1	1	1	1
CF for F <sub>b</sub>	1.5	1.5	1	1
CF for F <sub>c</sub>	1.15	1.15	1	1
C <sub>fu</sub>	1	1	1	1
C <sub>i</sub> for E, E <sub>min</sub>	1	1	1	1
C <sub>i</sub> for F <sub>b</sub> , F <sub>c</sub>	1	1	1	1
Cr	1.5	1.5	1.35	1.35
CT	1	1	1	1
CV	1	1	1	1
Cc	1	1	1	1
CI	1	1	1	1
l <sub>e</sub> (in)	24.72	24.72	24.72	24.72
RB	6.201075176	6.201075176	7.773459118	7.773459118
E <sub>min</sub> ' (psi)	580000	580000	510000	510000
F <sub>bE</sub> (psi)	18099.8613	18099.8613	10127.97882	10127.97882
F <sub>b</sub> * for LC: D+L (psi)	2025	2025	945	945
F <sub>b</sub> * for LC: D+Lr (psi)	2531.25	2531.25	1181.25	1181.25
F <sub>b</sub> * for LC: D+S (psi)	2328.75	2328.75	1086.75	1086.75
F <sub>b</sub> * for LC: D+0.75L+0.75Lr (psi)	2531.25	2531.25	1181.25	1181.25
F <sub>b</sub> * for LC: D+0.75L+0.75S (psi)	2328.75	2328.75	1086.75	1086.75
F <sub>b</sub> * for LC: D+0.6W (psi)	3240	3240	1512	1512
F <sub>b</sub> * for LC: D+0.75L+0.42W+0.75Lr (psi)	3240	3240	1512	1512
F <sub>b</sub> * for LC: D+0.75L+0.42W+0.75S (psi)	3240	3240	1512	1512

CL for LC: D+L	0.99378427	0.99378427	0.994909529	0.994909529
CL for LC: D+Lr	0.992010422	0.992010422	0.993489698	0.993489698
CL for LC: D+S	0.992731771	0.992731771	0.994065387	0.994065387
CL for LC: D+0.75L+0.75Lr	0.992010422	0.992010422	0.993489698	0.993489698
CL for LC: D+0.75L+0.75S	0.992731771	0.992731771	0.994065387	0.994065387
CL for LC: D+0.6W	0.989353753	0.989353753	0.991389078	0.991389078
CL for LC: D+0.75L+0.42W+0.75Lr	0.989353753	0.989353753	0.991389078	0.991389078
CL for LC: D+0.75L+0.42W+0.75S	0.989353753	0.989353753	0.991389078	0.991389078
Combined CL & CV for LC: D+L	0.99378427	0.99378427	0.994909529	0.994909529
Combined CL & CV for LC: D+Lr	0.992010422	0.992010422	0.993489698	0.993489698
Combined CL & CV for LC: D+S	0.992731771	0.992731771	0.994065387	0.994065387
Combined CL & CV for LC: D+0.75L+0.75Lr	0.992010422	0.992010422	0.993489698	0.993489698
Combined CL & CV for LC: D+0.75L+0.75S	0.992731771	0.992731771	0.994065387	0.994065387
Combined CL & CV for LC: D+0.6W	0.989353753	0.989353753	0.991389078	0.991389078
Combined CL & CV for LC: D+0.75L+0.42W+	0.989353753	0.989353753	0.991389078	0.991389078
Combined CL & CV for LC: D+0.75L+0.42W+	0.989353753	0.989353753	0.991389078	0.991389078
Controlling le/d	33	33	21	21
FcE (psi)	437.7961433	437.7961433	950.6122449	950.6122449
Fc* for LC: D+L (psi)	1552.5	1552.5	850	850
Fc* for LC: D+Lr (psi)	1940.625	1940.625	1062.5	1062.5
Fc* for LC: D+S (psi)	1785.375	1785.375	977.5	977.5
Fc* for LC: D+0.75L+0.75Lr (psi)	1940.625	1940.625	1062.5	1062.5
Fc* for LC: D+0.75L+0.75S (psi)	1785.375	1785.375	977.5	977.5
Fc* for LC: D+0.6W (psi)	2484	2484	1360	1360
Fc* for LC: D+0.75L+0.42W+0.75Lr (psi)	2484	2484	1360	1360
Fc* for LC: D+0.75L+0.42W+0.75S (psi)	2484	2484	1360	1360
c	0.8	0.8	0.8	0.8
CP for LC: D+L	0.263191623	0.263191623	0.728192066	0.728192066
CP for LC: D+Lr	0.213948839	0.213948839	0.651338832	0.651338832
CP for LC: D+S	0.231293769	0.231293769	0.681265302	0.681265302
CP for LC: D+0.75L+0.75Lr	0.213948839	0.213948839	0.651338832	0.651338832
CP for LC: D+0.75L+0.75S	0.231293769	0.231293769	0.681265302	0.681265302
CP for LC: D+0.6W	0.169341869	0.169341869	0.558049842	0.558049842
CP for LC: D+0.75L+0.42W+0.75Lr	0.169341869	0.169341869	0.558049842	0.558049842
CP for LC: D+0.75L+0.42W+0.75S	0.169341869	0.169341869	0.558049842	0.558049842
Fb' for LC: D+L (psi)	2012.413148	2012.413148	940.1895049	940.1895049
Fb' for LC: D+Lr (psi)	2511.02638	2511.02638	1173.559706	1173.559706
Fb' for LC: D+S (psi)	2311.824113	2311.824113	1080.300559	1080.300559
Fb' for LC: D+0.75L+0.75Lr (psi)	2511.02638	2511.02638	1173.559706	1173.559706
Fb' for LC: D+0.75L+0.75S (psi)	2311.824113	2311.824113	1080.300559	1080.300559
Fb' for LC: D+0.6W (psi)	3205.506161	3205.506161	1498.980286	1498.980286
Fb' for LC: D+0.75L+0.42W+0.75Lr (psi)	3205.506161	3205.506161	1498.980286	1498.980286
Fb' for LC: D+0.75L+0.42W+0.75S (psi)	3205.506161	3205.506161	1498.980286	1498.980286
fb for LC: D+L (psi)	0	0	0	0
fb for LC: D+Lr (psi)	0	0	0	0
fb for LC: D+S (psi)	0	0	0	0
fb for LC: D+0.75L+0.75Lr (psi)	0	0	0	0
fb for LC: D+0.75L+0.75S (psi)	0	0	0	0
fb for LC: D+0.6W (psi)	2081.9502	1544.686605	940.653	671.870115
fb for LC: D+0.75L+0.42W+0.75Lr (psi)	1457.36514	1081.280624	658.4571	470.3090805
fb for LC: D+0.75L+0.42W+0.75S (psi)	1457.36514	1081.280624	658.4571	470.3090805
fb/F'b for LC: D+L	0%	0%	0%	0%
fb/F'b for LC: D+Lr	0%	0%	0%	0%
fb/F'b for LC: D+S	0%	0%	0%	0%
fb/F'b for LC: D+0.75L+0.75Lr	0%	0%	0%	0%
fb/F'b for LC: D+0.75L+0.75S	0%	0%	0%	0%
fb/F'b for LC: D+0.6W	65%	48%	63%	45%
fb/F'b for LC: D+0.75L+0.42W+0.75Lr	45%	34%	44%	31%
fb/F'b for LC: D+0.75L+0.42W+0.75S	45%	34%	44%	31%

Fc' for LC: D+L psi	408.6049952	408.6049952	618.9632561	618.9632561
Fc' for LC: D+Lr psi	415.1944658	415.1944658	692.0475085	692.0475085
Fc' for LC: D+S psi	412.9461136	412.9461136	665.9368328	665.9368328
Fc' for LC: D+0.75L+0.75Lr psi	415.1944658	415.1944658	692.0475085	692.0475085
Fc' for LC: D+0.75L+0.75S psi	412.9461136	412.9461136	665.9368328	665.9368328
Fc' for LC: D+0.6W psi	420.6452019	420.6452019	758.9477851	758.9477851
Fc' for LC: D+0.75L+0.42W+0.75Lr psi	420.6452019	420.6452019	758.9477851	758.9477851
Fc' for LC: D+0.75L+0.42W+0.75S psi	420.6452019	420.6452019	758.9477851	758.9477851
fc for LC: D+L (psi)	141.7857143	233.6208333	223.5606061	237.3344697
fc for LC: D+Lr (psi)	294.1666667	233.6208333	223.5606061	172.8496212
fc for LC: D+S (psi)	408.452381	309.6208333	296.2878788	221.2132576
fc for LC: D+0.75L+0.75Lr (psi)	256.0714286	284.2875	272.0454545	253.4556818
fc for LC: D+0.75L+0.75S (psi)	341.7857143	341.2875	326.5909091	289.7284091
fc for LC: D+0.6W (psi)	141.7857143	132.2875	126.5909091	108.3647727
fc for LC: D+0.75L+0.42W+0.75Lr (psi)	256.0714286	284.2875	272.0454545	253.4556818
fc for LC: D+0.75L+0.42W+0.75S (psi)	341.7857143	341.2875	326.5909091	289.7284091
fc/Fc' for LC: D+L	<b>34.7%</b>	<b>57.2%</b>	<b>36.1%</b>	<b>38.3%</b>
fc/Fc' for LC: D+Lr	<b>70.9%</b>	<b>56.3%</b>	<b>32.3%</b>	<b>25.0%</b>
fc/Fc' for LC: D+S	<b>98.9%</b>	<b>75.0%</b>	<b>44.5%</b>	<b>33.2%</b>
fc/Fc' for LC: D+0.75L+0.75Lr	<b>61.7%</b>	<b>68.5%</b>	<b>39.3%</b>	<b>36.6%</b>
fc/Fc' for LC: D+0.75L+0.75S	<b>82.8%</b>	<b>82.6%</b>	<b>49.0%</b>	<b>43.5%</b>
fc/Fc' for LC: D+0.6W	<b>33.7%</b>	<b>31.4%</b>	<b>16.7%</b>	<b>14.3%</b>
fc/Fc' for LC: D+0.75L+0.42W+0.75Lr	<b>60.9%</b>	<b>67.6%</b>	<b>35.8%</b>	<b>33.4%</b>
fc/Fc' for LC: D+0.75L+0.42W+0.75S	<b>81.3%</b>	<b>81.1%</b>	<b>43.0%</b>	<b>38.2%</b>
Combined axial & bending for LC: D+L	<b>12%</b>	<b>33%</b>	<b>13%</b>	<b>15%</b>
Combined axial & bending for LC: D+Lr	<b>50%</b>	<b>32%</b>	<b>10%</b>	<b>6%</b>
Combined axial & bending for LC: D+S	<b>98%</b>	<b>56%</b>	<b>20%</b>	<b>11%</b>
Combined axial & bending for LC: D+0.75L+0	<b>38%</b>	<b>47%</b>	<b>15%</b>	<b>13%</b>
Combined axial & bending for LC: D+0.75L+0	<b>69%</b>	<b>68%</b>	<b>24%</b>	<b>19%</b>
Combined axial & bending for LC: D+0.6W	<b>107%</b>	<b>79%</b>	<b>75%</b>	<b>53%</b>
Combined axial & bending for LC: D+0.75L+0	<b>147%</b>	<b>142%</b>	<b>74%</b>	<b>54%</b>
Combined axial & bending for LC: D+0.75L+0	<b>273%</b>	<b>219%</b>	<b>85%</b>	<b>60%</b>
Flatwise check for LC: D+L	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+Lr	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+S	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+0.75L+0.75Lr	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+0.75L+0.75S	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+0.6W	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+0.75L+0.42W+0.75Lr	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Flatwise check for LC: D+0.75L+0.42W+0.75S	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Unity for LC: D+L	<b>35%</b>	<b>57%</b>	<b>36%</b>	<b>38%</b>
Unity for LC: D+Lr	<b>71%</b>	<b>56%</b>	<b>32%</b>	<b>25%</b>
Unity for LC: D+S	<b>99%</b>	<b>75%</b>	<b>44%</b>	<b>33%</b>
Unity for LC: D+0.75L+0.75Lr	<b>62%</b>	<b>68%</b>	<b>39%</b>	<b>37%</b>
Unity for LC: D+0.75L+0.75S	<b>83%</b>	<b>83%</b>	<b>49%</b>	<b>44%</b>
Unity for LC: D+0.6W	<b>107%</b>	<b>79%</b>	<b>75%</b>	<b>53%</b>
Unity for LC: D+0.75L+0.42W+0.75Lr	<b>147%</b>	<b>142%</b>	<b>74%</b>	<b>54%</b>
Unity for LC: D+0.75L+0.42W+0.75S	<b>273%</b>	<b>219%</b>	<b>85%</b>	<b>60%</b>
DEFLECTION CALCULATIONS				
E' (psi)	1600000	1600000	1400000	1400000
Deflection (in)	0.723274379	0.536627747	0.23766186	0.169752184
Deflection (L/)	159.6904347	215.2330003	485.9845843	680.4036181