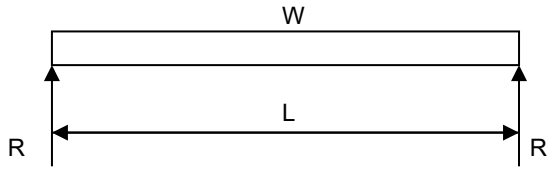
Wood Joists and Simple Beams:

UNIT LOADS *(See Design Criteria)* :

RDL	=	12	PSF	*Roof Dead Load*			
RLL	=	16	PSF	*Roof Live Load*	CD	=	1.25
FDL	=	10	PSF	*Floor Dead Load*			
FLL	=	40	PSF	*Floor Live Load*	CD	=	1.00
ODL	=	11	PSF	*Other Dead Load*			
OLL	=	-24	PSF	*Other Live Load*	CD	=	1.60 *(Wind Uplift)*



Mark	FJ01	FJ02	FJ03	FJ04	RB05	RB06	RB07	RB08	RB09
Span (ft).	12.00	15.00	18.00	20.00	12.00	10.00	9.00	8.00	20.00
Ld. Type	Floor	Floor	Floor	Floor	Roof	Roof	Roof	Roof	Roof
Trib. Width (ft.)	1.33	1.33	1.33	1.33	10.00	10.00	10.00	10.00	20.00
C_R	1.15	1.15	1.15	1.15	1.00	1.00	1.00	1.00	1.00
Size	2x8	2x10	2x12	2x14	(2)-2x12	(2)-2x10	(2)-2x8	(2)-2x8	8x14
Grade	#2DFL-D	#2DFL-D	#1DFL-D	#1DFL-D	#2DFL-D	#2DFL-D	#2DFL-D	#2DFL-D	#1DFL-B
E (psi)	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
Density (PCF)	32	32	32	32	32	32	32	32	32
F_{cperp} (psi)	625	625	625	625	625	625	625	625	625
b (in.)	1.5	1.5	1.5	1.5	3.0	3.0	3.0	3.0	7.5
d (in.)	7.25	9.25	11.25	13.25	11.25	9.25	7.25	7.25	13.50
A (in^2)	10.875	13.875	16.875	19.875	33.75	27.75	21.75	21.75	101.25
S (in^3)	13.141	21.391	31.641	43.891	63.281	42.781	26.281	26.281	227.813
I (in^4)	47.63	98.93	177.98	290.78	355.96	197.86	95.27	95.27	1,537.73
C_F	1.20	1.10	1.00	0.90	1.00	1.10	1.20	1.20	0.99
Beam Wt. (PLF)	2.4	3.1	3.8	4.4	7.5	6.2	4.8	4.8	22.5
Trib. Area (ft^2)	16	20	24	27	120	100	90	80	400
LL Reduction (R)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%
W_{DL} (PLF)	16	16	17	18	128	126	125	125	263
W_{LL} (PLF)[1]	53	53	53	53	160	160	160	160	280
R_{DL} (lbs.)	95	123	154	178	765	631	562	499	2,625
R_{LL} (lbs.)[2]	320	400	480	533	960	800	720	640	3,200
R_{TL} (lbs.)	415	523	634	711	1,725	1,431	1,282	1,139	5,825
L_{brng} (in.)	0.44	0.56	0.68	0.76	0.92	0.76	0.68	0.61	1.24
V_{DL}/C_D (lbs.)	94	123	153	175	717	593	540	471	2,589
V_{L+D}/C_D (lbs.)	373	469	568	632	1,164	968	888	774	3,852
f_v (psi)	51	51	50	48	52	52	61	53	57
F_v (psi)	95	95	95	95	95	95	95	95	85
	54%	53%	53%	50%	54%	55%	64%	56%	67%
M_D/C_D (ft-lbs.)	315	513	769	986	2,550	1,752	1,404	1,110	14,583
M_{L+D}/C_D (ft- lbs.)	1,244	1,962	2,852	3,554	4,140	2,862	2,307	1,823	21,700
f_b (psi)	1,136	1,101	1,082	972	785	803	1,053	832	1,143
F_b (psi)	1,242	1,139	1,150	1,035	900	990	1,080	1,080	1,332
	91%	97%	94%	94%	87%	81%	98%	77%	86%
Δ_{DL} (in.)	0.096	0.118	0.142	0.137	0.104	0.090	0.121	0.075	0.384
=L /	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	893	>1,000	625
Δ_{TL} (in.)	0.423	0.502	0.584	0.550	0.236	0.203	0.276	0.172	0.794

Wood Joists and Simple Beams:

=L /	341	359	370	436	611	590	392	557	302
Δ_{LL} (in.)	0.326	0.384	0.442	0.413	0.131	0.114	0.155	0.097	0.410
=L /	441	469	488	582	>1,000	>1,000	697	992	586
Unbraced Length:									
L_u (ft.)	12.00	15.00	18.00	20.00	12.00	10.00	9.00	8.00	20.00
L_u/d	19.86	19.46	19.20	18.11	12.80	12.97	14.90	13.24	17.78
L_e (ft.)	22.08	27.60	33.12	36.80	22.37	18.61	16.56	14.85	36.80
K_{bE}	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
R_B	29.22	36.90	44.58	51.00	18.32	15.15	12.65	11.98	10.29
F_{bE} (psi)	1,143	717	491	375	2,908	4,252	6,097	6,798	9,209
C_D	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25
F_b* (psi)	1,714	1,440	1,323	1,071	1,125	1,361	1,620	1,620	1,644
C_L	0.617	0.476	0.361	0.341	0.971	0.978	0.983	0.985	0.989
F'_b (psi)	1,058	686	478	366	1,092	1,331	1,592	1,596	1,626
f_b (psi)	1,136	1,101	1,082	972	981	1,003	1,317	1,040	1,429
	107%	161%	226%	266%	90%	75%	83%	65%	88%
[1] *Reduced for T.A.*	[2] *Not Reduced for T.A.*								
Alternate TJI:	22" L65	18" L65	14" L65	11.875" L65	11.875" L65	11.875" L65	11.875" L65	11.875" L65	28" H90
Quantity	1	1	1	1	1	1	1	1	1
M_{cap} (ft.-lbs.)	12,245	9,835	7,655	6,260	6,260	6,260	6,260	6,260	24,580
V_{cap} (lbs.)	2,935	2,535	2,125	1,925	1,925	1,925	1,925	1,925	2,900
EI (lb-in^2) x 10^6	1,967	1,227	678	459	459	459	459	459	5,279
Δ_{DL} (in.)	0.004	0.015	0.060	0.139	0.130	0.062	0.040	0.025	0.179
=L /	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000
Δ_{TL} (in.)	0.016	0.065	0.245	0.558	0.292	0.140	0.092	0.057	0.370
=L /	>1,000	>1,000	825	428	>1,000	>1,000	>1,000	>1,000	>1,000
Δ_{LL} (in.)	0.013	0.050	0.186	0.418	0.163	0.078	0.051	0.032	0.191
=L /	>1,000	>1,000	>1,000	570	>1,000	>1,000	>1,000	>1,000	>1,000