

**AD Southwest Type 5 GP, 5 MD, 7 GP and 7 HD**  
**N791 - Restrained and Unrestrained Beam Ratings**  
**D949 - Unrestrained Beam Ratings only**

Minimum Thickness Required on Beam for Size and Rating Indicated, in.  
**Normal Weight Concrete**

Unrestrained Beam Rating					Member W/D		Restrained Beam Rating*				
1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr			1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr
0.490	0.700	0.910	1.400	2.030	W4x13	0.65	0.490	0.560	0.700	1.050	1.400
0.490	0.700	0.910	1.400	2.030	W5x16	0.65	0.490	0.560	0.700	1.050	1.400
0.450	0.643	0.836	1.287	1.866	W5x19	0.76	0.450	0.515	0.643	0.965	1.287
0.619	0.884	1.149	1.768	2.563	W6x9	0.39	0.619	0.707	0.884	1.326	1.768
0.552	0.788	1.025	1.577	2.286	W6x12	0.51	0.552	0.631	0.788	1.182	1.577
0.486	0.694	0.903	1.389	2.014	W6x16	0.66	0.486	0.556	0.694	1.042	1.389
0.482	0.689	0.896	1.378	1.998	W6x20	0.67	0.482	0.551	0.689	1.033	1.378
0.431	0.616	0.801	1.232	1.787	W6x26	0.82	0.431	0.493	0.616	0.924	1.232
0.631	0.902	1.173	1.804	2.616	W8x10	0.37	0.631	0.722	0.902	1.353	1.804
0.572	0.818	1.063	1.636	2.371	W8x13	0.47	0.572	0.654	0.818	1.227	1.636
0.537	0.768	0.998	1.535	2.226	W8x15	0.54	0.537	0.614	0.768	1.151	1.535
0.524	0.748	0.972	1.496	2.169	W8x18	0.57	0.524	0.598	0.748	1.122	1.496
0.486	0.694	0.903	1.389	2.014	W8x21	0.66	0.486	0.556	0.694	1.042	1.389
0.475	0.678	0.882	1.357	1.967	W8x24	0.69	0.475	0.543	0.678	1.017	1.357
0.438	0.625	0.813	1.250	1.813	W8x28	0.80	0.438	0.500	0.625	0.938	1.250
0.441	0.629	0.818	1.259	1.826	W8x31	0.79	0.441	0.504	0.629	0.944	1.259
0.414	0.591	0.769	1.182	1.715	W8x35	0.88	0.414	0.473	0.591	0.887	1.182
0.383	0.547	0.711	1.094	1.586	W8x40	1.00	0.383	0.438	0.547	0.820	1.094
0.375	0.492	0.639	0.983	1.426	W8x48	1.18	0.375	0.393	0.492	0.737	0.983
0.375	0.435	0.566	0.871	1.262	W8x58	1.41	0.375	0.375	0.435	0.653	0.871
0.375	0.396	0.515	0.792	1.148	W8x67	1.61	0.375	0.375	0.396	0.594	0.792
0.625	0.893	1.161	1.786	2.589	W10x12	0.38	0.625	0.714	0.893	1.339	1.786
0.567	0.810	1.053	1.620	2.350	W10x15	0.48	0.567	0.648	0.810	1.215	1.620
0.537	0.768	0.998	1.535	2.226	W10x17	0.54	0.537	0.614	0.768	1.151	1.535
0.515	0.735	0.956	1.471	2.132	W10x19	0.59	0.515	0.588	0.735	1.103	1.471
0.515	0.735	0.956	1.471	2.132	W10x22	0.59	0.515	0.588	0.735	1.103	1.471
0.475	0.678	0.882	1.357	1.967	W10x26	0.69	0.475	0.543	0.678	1.017	1.357
0.441	0.629	0.818	1.259	1.826	W10x30	0.79	0.441	0.504	0.629	0.944	1.259
0.447	0.639	0.830	1.277	1.852	W10x33	0.77	0.447	0.511	0.639	0.958	1.277
0.408	0.583	0.758	1.167	1.692	W10x39	0.90	0.408	0.467	0.583	0.875	1.167
0.376	0.537	0.698	1.074	1.557	W10x46	1.03	0.376	0.429	0.537	0.805	1.074
0.385	0.550	0.715	1.101	1.596	W10x49	0.99	0.385	0.440	0.550	0.825	1.101
0.375	0.518	0.673	1.036	1.501	W10x54	1.09	0.375	0.414	0.518	0.777	1.036
0.375	0.486	0.632	0.972	1.410	W10x60	1.20	0.375	0.389	0.486	0.729	0.972
0.375	0.446	0.580	0.893	1.295	W10x68	1.36	0.375	0.375	0.446	0.670	0.893
0.375	0.413	0.537	0.825	1.197	W10x77	1.52	0.375	0.375	0.413	0.619	0.825
0.375	0.377	0.490	0.754	1.094	W10x88	1.72	0.375	0.375	0.377	0.566	0.754
0.375	0.375	0.450	0.692	1.003	W10x100	1.93	0.375	0.375	0.375	0.519	0.692
0.375	0.375	0.415	0.639	0.926	W10x112	2.14	0.375	0.375	0.375	0.479	0.639
0.613	0.875	1.138	1.750	2.538	W12x14	0.40	0.613	0.700	0.875	1.313	1.750
0.583	0.833	1.083	1.667	2.417	W12x16	0.45	0.583	0.667	0.833	1.250	1.667
0.542	0.774	1.007	1.549	2.246	W12x19	0.53	0.542	0.619	0.774	1.162	1.549
0.506	0.723	0.940	1.446	2.097	W12x22	0.61	0.506	0.579	0.723	1.085	1.446
0.510	0.729	0.948	1.458	2.115	W12x26	0.60	0.510	0.583	0.729	1.094	1.458
0.475	0.678	0.882	1.357	1.967	W12x30	0.69	0.475	0.543	0.678	1.017	1.357

**AD Southwest Type 5 GP, 5 MD, 7 GP and 7 HD**  
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Minimum Thickness Required on Beam for Size and Rating Indicated, in.  
**Normal Weight Concrete**

Unrestrained Beam Rating					Member W/D		Restrained Beam Rating*				
1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr			1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr
0.441	0.629	0.818	1.259	1.826	W12x35	0.79	0.441	0.504	0.629	0.944	1.259
0.422	0.603	0.784	1.207	1.750	W12x40	0.85	0.422	0.483	0.603	0.905	1.207
0.395	0.565	0.734	1.129	1.637	W12x45	0.95	0.395	0.452	0.565	0.847	1.129
0.375	0.534	0.694	1.067	1.547	W12x50	1.04	0.375	0.427	0.534	0.800	1.067
0.385	0.550	0.715	1.101	1.596	W12x53	0.99	0.385	0.440	0.550	0.825	1.101
0.375	0.534	0.694	1.067	1.547	W12x54	1.04	0.375	0.427	0.534	0.800	1.067
0.375	0.521	0.677	1.042	1.510	W12x58	1.08	0.375	0.417	0.521	0.781	1.042
0.375	0.518	0.673	1.036	1.501	W12x65	1.09	0.375	0.414	0.518	0.777	1.036
0.375	0.486	0.632	0.972	1.410	W12x72	1.20	0.375	0.389	0.486	0.729	0.972
0.375	0.456	0.592	0.911	1.322	W12x79	1.32	0.375	0.375	0.456	0.684	0.911
0.375	0.429	0.558	0.858	1.244	W12x87	1.44	0.375	0.375	0.429	0.643	0.858
0.375	0.403	0.524	0.806	1.169	W12x96	1.57	0.375	0.375	0.403	0.605	0.806
0.375	0.376	0.488	0.751	1.089	W12x106	1.73	0.375	0.375	0.376	0.563	0.751
0.375	0.375	0.448	0.689	0.999	W12x120	1.94	0.375	0.375	0.375	0.517	0.689
0.375	0.375	0.411	0.632	0.916	W12x136	2.17	0.375	0.375	0.375	0.474	0.632
0.375	0.375	0.379	0.583	0.846	W12x152	2.40	0.375	0.375	0.375	0.438	0.583
0.375	0.375	0.375	0.537	0.778	W12x170	2.66	0.375	0.375	0.375	0.403	0.537
0.375	0.375	0.375	0.496	0.719	W12x190	2.93	0.375	0.375	0.375	0.375	0.496
0.375	0.375	0.375	0.459	0.666	W12x210	3.21	0.375	0.375	0.375	0.375	0.459
0.375	0.375	0.375	0.430	0.623	W12x230	3.47	0.375	0.375	0.375	0.375	0.430
0.375	0.375	0.375	0.401	0.582	W12x262	3.76	0.375	0.375	0.375	0.375	0.401
0.375	0.375	0.375	0.375	0.540	W12x279	4.10	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.506	W12x305	4.41	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.472	W12x336	4.78	0.375	0.375	0.375	0.375	0.375
0.547	0.781	1.016	1.563	2.266	W14x22	0.52	0.547	0.625	0.781	1.172	1.563
0.506	0.723	0.940	1.446	2.097	W14x26	0.61	0.506	0.579	0.723	1.085	1.446
0.498	0.711	0.925	1.423	2.063	W14x30	0.63	0.498	0.569	0.711	1.067	1.423
0.468	0.668	0.868	1.336	1.937	W14x34	0.71	0.468	0.534	0.668	1.002	1.336
0.441	0.629	0.818	1.259	1.826	W14x38	0.79	0.441	0.504	0.629	0.944	1.259
0.422	0.603	0.784	1.207	1.750	W14x43	0.85	0.422	0.483	0.603	0.905	1.207
0.398	0.568	0.739	1.136	1.648	W14x48	0.94	0.398	0.455	0.568	0.852	1.136
0.376	0.537	0.698	1.074	1.557	W14x53	1.03	0.376	0.429	0.537	0.805	1.074
0.375	0.524	0.681	1.048	1.519	W14x61	1.07	0.375	0.419	0.524	0.786	1.048
0.375	0.489	0.635	0.978	1.418	W14x68	1.19	0.375	0.391	0.489	0.733	0.978
0.375	0.465	0.605	0.931	1.350	W14x74	1.28	0.375	0.375	0.465	0.698	0.931
0.375	0.435	0.566	0.871	1.262	W14x82	1.41	0.375	0.375	0.435	0.653	0.871
0.375	0.468	0.608	0.936	1.357	W14x90	1.27	0.375	0.375	0.468	0.702	0.936
0.375	0.440	0.572	0.879	1.275	W14x99	1.39	0.375	0.375	0.440	0.660	0.879
0.375	0.411	0.534	0.822	1.191	W14x109	1.53	0.375	0.375	0.411	0.616	0.822
0.375	0.385	0.501	0.771	1.118	W14x120	1.67	0.375	0.375	0.385	0.578	0.771
0.375	0.375	0.468	0.720	1.044	W14x132	1.83	0.375	0.375	0.375	0.540	0.720
0.375	0.375	0.448	0.689	0.999	W14x145	1.94	0.375	0.375	0.375	0.517	0.689
0.375	0.375	0.420	0.646	0.936	W14x159	2.11	0.375	0.375	0.375	0.484	0.646
0.375	0.375	0.399	0.614	0.890	W14x176	2.25	0.375	0.375	0.375	0.461	0.614
0.375	0.375	0.390	0.599	0.869	W14x193	2.32	0.375	0.375	0.375	0.449	0.599

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Minimum Thickness Required on Beam for Size and Rating Indicated, in.  
**Normal Weight Concrete**

Unrestrained Beam Rating					Member W/D		Restrained Beam Rating*				
1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr			1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr
0.375	0.375	0.375	0.524	0.760	W14x211	2.74	0.375	0.375	0.375	0.393	0.524
0.375	0.375	0.375	0.486	0.705	W14x233	3.00	0.375	0.375	0.375	0.375	0.486
0.375	0.375	0.375	0.452	0.656	W14x257	3.27	0.375	0.375	0.375	0.375	0.452
0.375	0.375	0.375	0.420	0.609	W14x283	3.57	0.375	0.375	0.375	0.375	0.420
0.375	0.375	0.375	0.391	0.566	W14x311	3.88	0.375	0.375	0.375	0.375	0.391
0.375	0.375	0.375	0.375	0.528	W14x342	4.21	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.497	W14x370	4.51	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.470	W14x398	4.80	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.446	W14x426	5.09	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.424	W14x455	5.38	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.395	W14x500	5.82	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.375	W14x550	6.30	0.375	0.375	0.375	0.375	0.375
0.375	0.375	0.375	0.375	0.375	W14x605	6.80	0.375	0.375	0.375	0.375	0.375
0.533	0.761	0.989	1.522	2.207	W16x26	0.55	0.533	0.609	0.761	1.141	1.522
0.490	0.700	0.910	1.400	2.030	W16x31	0.65	0.490	0.560	0.700	1.050	1.400
0.475	0.678	0.882	1.357	1.967	W16x36	0.69	0.475	0.543	0.678	1.017	1.357
0.450	0.643	0.836	1.287	1.866	W16x40	0.76	0.450	0.515	0.643	0.965	1.287
0.422	0.603	0.784	1.207	1.750	W16x45	0.85	0.422	0.483	0.603	0.905	1.207
0.398	0.568	0.739	1.136	1.648	W16x50	0.94	0.398	0.455	0.568	0.852	1.136
0.375	0.524	0.681	1.048	1.519	W16x67	1.07	0.375	0.419	0.524	0.786	1.048
0.375	0.524	0.681	1.048	1.519	W16x77	1.07	0.375	0.419	0.524	0.786	1.048
0.375	0.481	0.625	0.962	1.394	W16x89	1.22	0.375	0.385	0.481	0.721	0.962
0.375	0.405	0.527	0.810	1.175	W16x100	1.56	0.375	0.375	0.405	0.608	0.810
0.486	0.694	0.903	1.389	2.014	W18x35	0.66	0.486	0.556	0.694	1.042	1.389
0.450	0.643	0.836	1.287	1.866	W18x40	0.76	0.450	0.515	0.643	0.965	1.287
0.420	0.599	0.779	1.199	1.738	W18x46	0.86	0.420	0.479	0.599	0.899	1.199
0.417	0.595	0.774	1.190	1.726	W18x50	0.87	0.417	0.476	0.595	0.893	1.190
0.395	0.565	0.734	1.129	1.637	W18x55	0.95	0.395	0.452	0.565	0.847	1.129
0.376	0.537	0.698	1.074	1.557	W18x60	1.03	0.376	0.429	0.537	0.805	1.074
0.375	0.512	0.665	1.023	1.484	W18x65	1.11	0.375	0.409	0.512	0.768	1.023
0.375	0.483	0.628	0.967	1.402	W18x71	1.21	0.375	0.387	0.483	0.725	0.967
0.375	0.512	0.665	1.023	1.484	W18x76	1.11	0.375	0.409	0.512	0.768	1.023
0.375	0.476	0.618	0.951	1.379	W18x88	1.24	0.375	0.380	0.476	0.713	0.951
0.375	0.440	0.572	0.879	1.275	W18x97	1.39	0.375	0.375	0.440	0.660	0.879
0.375	0.413	0.537	0.825	1.197	W18x106	1.52	0.375	0.375	0.413	0.619	0.825
0.375	0.384	0.499	0.768	1.113	W18x119	1.68	0.375	0.375	0.384	0.576	0.768
0.461	0.658	0.855	1.316	1.908	W21x44	0.73	0.461	0.526	0.658	0.987	1.316
0.428	0.612	0.795	1.224	1.774	W21x50	0.83	0.428	0.490	0.612	0.918	1.224
0.400	0.572	0.743	1.144	1.658	W21x57	0.93	0.400	0.458	0.572	0.858	1.144
0.398	0.568	0.739	1.136	1.648	W21x62	0.94	0.398	0.455	0.568	0.852	1.136
0.376	0.537	0.698	1.074	1.557	W21x68	1.03	0.376	0.429	0.537	0.805	1.074
0.375	0.476	0.618	0.951	1.379	W21x83	1.24	0.375	0.380	0.476	0.713	0.951
0.375	0.442	0.574	0.884	1.282	W21x93	1.38	0.375	0.375	0.442	0.663	0.884
0.375	0.463	0.602	0.926	1.343	W21x101	1.29	0.375	0.375	0.463	0.694	0.926
0.375	0.435	0.566	0.871	1.262	W21x111	1.41	0.375	0.375	0.435	0.653	0.871

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**Normal Weight Concrete**

Unrestrained Beam Rating					Member	W/D	Restrained Beam Rating*				
1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr			1 Hr	1.5 Hr	2 Hr	3 Hr	4 Hr
0.375	0.409	0.532	0.818	1.186	W21x122	1.54	0.375	0.375	0.409	0.613	0.818
0.375	0.387	0.503	0.774	1.123	W21x132	1.66	0.375	0.375	0.387	0.581	0.774
0.375	0.375	0.468	0.720	1.044	W21x147	1.83	0.375	0.375	0.375	0.540	0.720
0.431	0.616	0.801	1.232	1.787	W24x55	0.82	0.431	0.493	0.616	0.924	1.232
0.403	0.576	0.748	1.151	1.669	W24x62	0.92	0.403	0.461	0.576	0.863	1.151
0.400	0.572	0.743	1.144	1.658	W24x68	0.93	0.400	0.458	0.572	0.858	1.144
0.378	0.540	0.702	1.080	1.566	W24x76	1.02	0.378	0.432	0.540	0.810	1.080
0.375	0.506	0.658	1.012	1.467	W24x84	1.13	0.375	0.405	0.506	0.759	1.012
0.375	0.470	0.612	0.941	1.364	W24x94	1.26	0.375	0.376	0.470	0.706	0.941
0.375	0.481	0.625	0.962	1.394	W24x104	1.22	0.375	0.385	0.481	0.721	0.962
0.375	0.446	0.580	0.893	1.295	W24x117	1.36	0.375	0.375	0.446	0.670	0.893
0.375	0.413	0.537	0.825	1.197	W24x131	1.52	0.375	0.375	0.413	0.619	0.825
0.375	0.384	0.499	0.768	1.113	W24x146	1.68	0.375	0.375	0.384	0.576	0.768
0.375	0.375	0.464	0.714	1.036	W24x162	1.85	0.375	0.375	0.375	0.536	0.714
0.378	0.540	0.702	1.080	1.566	W27x84	1.02	0.378	0.432	0.540	0.810	1.080
0.375	0.506	0.658	1.012	1.467	W27x94	1.13	0.375	0.405	0.506	0.759	1.012
0.375	0.478	0.622	0.956	1.387	W27x102	1.23	0.375	0.383	0.478	0.717	0.956
0.375	0.446	0.580	0.893	1.295	W27x114	1.36	0.375	0.375	0.446	0.670	0.893
0.375	0.411	0.534	0.822	1.191	W27x146	1.53	0.375	0.375	0.411	0.616	0.822
0.375	0.384	0.499	0.768	1.113	W27x161	1.68	0.375	0.375	0.384	0.576	0.768
0.375	0.375	0.464	0.714	1.036	W27x178	1.85	0.375	0.375	0.375	0.536	0.714
0.375	0.515	0.669	1.029	1.493	W30x99	1.10	0.375	0.412	0.515	0.772	1.029
0.375	0.486	0.632	0.972	1.410	W30x108	1.20	0.375	0.389	0.486	0.729	0.972
0.375	0.465	0.605	0.931	1.350	W30x116	1.28	0.375	0.375	0.465	0.698	0.931
0.375	0.444	0.577	0.888	1.288	W30x124	1.37	0.375	0.375	0.444	0.666	0.888
0.375	0.425	0.552	0.850	1.232	W30x132	1.46	0.375	0.375	0.425	0.637	0.850
0.375	0.387	0.503	0.774	1.123	W30x173	1.66	0.375	0.375	0.387	0.581	0.774
0.375	0.375	0.470	0.723	1.049	W30x191	1.82	0.375	0.375	0.375	0.542	0.723
0.375	0.375	0.438	0.673	0.976	W30x211	2.00	0.375	0.375	0.375	0.505	0.673
0.375	0.489	0.635	0.978	1.418	W33x118	1.19	0.375	0.391	0.489	0.733	0.978
0.375	0.458	0.596	0.916	1.329	W33x130	1.31	0.375	0.375	0.458	0.687	0.916
0.375	0.435	0.566	0.871	1.262	W33x141	1.41	0.375	0.375	0.435	0.653	0.871
0.375	0.415	0.539	0.829	1.203	W33x152	1.51	0.375	0.375	0.415	0.622	0.829
0.375	0.375	0.478	0.735	1.066	W33x201	1.78	0.375	0.375	0.375	0.551	0.735

These beam protection thicknesses have been calculated for the convenience of users, in accordance with "6. Adjustment of Thickness of Spray-applied Fire Resistive Materials for Restrained and Unrestrained Beams", as detailed in the UL FireResistance Directory - Volume 1, 2007, page 9. While we have taken care to be as accurate as possible, we will not be held responsible for errors or omissions. If any discrepancy is found between these tables and the UL Design information, the UL Design information shall govern.

\* When used to adjust the material thickness for a **Restrained** beam the use of this procedure is limited to steel sections classified as **compact** in accordance with the *Specification for the Design of Structural Steel Buildings* by the American Institute of Steel Construction. Refer to the UL Fire Resistance Directory.