

**Table 1** Parameters to be used in Eq. (5)

Hysteretic model	Site class	Post-yield stiffness ratio	Relative intensity	Regression parameters					
				$b_1$	$b_2$	$b_3$	$b_4$	$b_5$	$b_6$
Bilinear	C	-1%	$\nabla PGA=0.5$	-0.022	0.556	-0.001	0.331	0.248	-1.076
			$\nabla PGA=0.8$	-0.018	0.488	0.030	0.311	0.584	-1.032
			$\nabla PGA=1.0$	-0.017	0.452	0.050	0.304	0.729	-1.015
		0%	$\nabla PGA=0.5$	0.325	-1.722	-1.228	0.324	-0.218	-1.124
			$\nabla PGA=0.8$	-0.019	0.476	0.027	0.314	-0.217	-0.944
			$\nabla PGA=1.0$	-0.018	0.439	0.047	0.297	0.460	-0.545
		1%	$\nabla PGA=0.5$	-0.029	0.509	0.047	0.334	-1.729	-1.222
			$\nabla PGA=0.8$	-0.028	0.452	0.077	0.342	-2.923	-1.133
			$\nabla PGA=1.0$	-0.027	0.420	0.094	0.348	-3.591	-0.941
		3%	$\nabla PGA=0.5$	-0.036	0.459	0.101	0.325	-1.722	-1.228
			$\nabla PGA=0.8$	-0.034	0.407	0.130	0.325	-3.422	-1.089
			$\nabla PGA=1.0$	-0.033	0.378	0.147	0.326	-4.787	-0.847
		10%	$\nabla PGA=0.5$	-0.022	0.295	0.185	0.151	-1.096	-1.139
			$\nabla PGA=0.8$	-0.022	0.264	0.212	0.138	-2.503	-0.941
			$\nabla PGA=1.0$	-0.022	0.246	0.228	0.135	-3.370	-0.691
	D	-1%	$\nabla PGA=0.5$	-0.033	0.568	0.016	0.445	0.116	-1.109
			$\nabla PGA=0.8$	-0.0230	0.519	0.047	0.422	0.518	-1.033
			$\nabla PGA=1.0$	-0.029	0.491	0.066	0.409	0.731	-0.977
		0%	$\nabla PGA=0.5$	-0.030	0.534	0.031	0.429	-0.255	-1.202
			$\nabla PGA=0.8$	-0.026	0.488	0.057	0.406	-0.166	-1.081
			$\nabla PGA=1.0$	-0.024	0.460	0.077	0.388	0.079	-0.896
		1%	$\nabla PGA=0.5$	-0.034	0.510	0.054	0.442	-1.316	-1.243
			$\nabla PGA=0.8$	-0.033	0.469	0.084	0.437	-2.136	-1.142
			$\nabla PGA=1.0$	-0.032	0.444	0.103	0.429	-2.537	-0.995
		3%	$\nabla PGA=0.5$	-0.034	0.453	0.088	0.429	-1.682	-1.195
			$\nabla PGA=0.8$	-0.034	0.414	0.124	0.420	-2.992	-1.067
			$\nabla PGA=1.0$	-0.033	0.391	0.144	0.412	-3.940	-0.920
		10%	$\nabla PGA=0.5$	-0.024	0.304	0.129	0.345	-1.755	-1.129
			$\nabla PGA=0.8$	-0.024	0.280	0.168	0.337	-4.587	-0.939
			$\nabla PGA=1.0$	-0.024	0.265	0.190	0.328	-6.978	-0.748
Degrading	C	-1%	$\nabla PGA=0.5$	-0.025	0.356	0.040	0.597	0.296	-1.196
			$\nabla PGA=0.8$	-0.021	0.309	0.083	0.548	0.477	-1.180
			$\nabla PGA=1.0$	-0.018	0.283	0.107	0.522	0.493	-1.204
		0%	$\nabla PGA=0.5$	-0.026	0.355	0.026	0.629	-1.153	-0.725
			$\nabla PGA=0.8$	-0.022	0.306	0.048	0.548	0.632	0.043
			$\nabla PGA=1.0$	-0.019	0.279	0.057	0.574	0.003	0.236
		1%	$\nabla PGA=0.5$	-0.026	0.341	0.044	0.641	-2.184	-0.499
			$\nabla PGA=0.8$	-0.022	0.288	0.075	0.571	0.307	0.070
			$\nabla PGA=1.0$	-0.081	0.392	0.058	0.705	2.197	-0.005
		3%	$\nabla PGA=0.5$	-0.025	0.317	0.061	0.644	-2.304	-0.358
			$\nabla PGA=0.8$	-0.022	0.270	0.093	0.607	-0.504	-0.056
			$\nabla PGA=1.0$	-0.019	0.246	0.113	0.556	0.190	0.114
		10%	$\nabla PGA=0.5$	-0.021	0.253	0.081	0.613	-2.500	-0.303
			$\nabla PGA=0.8$	-0.019	0.218	0.117	0.586	-1.093	0.033
			$\nabla PGA=1.0$	-0.018	0.203	0.137	0.563	-1.100	0.001
		-1%	$\nabla PGA=0.5$	-0.029	0.350	0.038	0.768	0.182	-1.221
			$\nabla PGA=0.8$	-0.026	0.319	0.072	0.723	0.481	-1.143
			$\nabla PGA=1.0$	-0.024	0.302	0.090	0.699	0.568	-1.128
		0%	$\nabla PGA=0.5$	-0.029	0.342	0.039	0.784	-0.852	-0.955

	D		$\nabla PGA=0.8$	-0.026	0.312	0.068	0.741	-0.146	-0.544
			$\nabla PGA=1.0$	-0.026	0.292	0.084	0.694	0.838	-0.127
		1%	$\nabla PGA=0.5$	-0.030	0.330	0.053	0.798	-2.279	-0.879
			$\nabla PGA=0.8$	-0.026	0.293	0.083	0.764	-0.184	-0.091
			$\nabla PGA=1.0$	-0.103	0.434	0.052	1.002	2.635	-0.016
		3%	$\nabla PGA=0.5$	-0.029	0.307	0.066	0.807	-2.454	-0.747
			$\nabla PGA=0.8$	-0.025	0.270	0.099	0.771	-0.059	-0.014
			$\nabla PGA=1.0$	-0.102	0.412	0.060	1.014	2.643	-0.017
		10%	$\nabla PGA=0.5$	-0.022	0.234	0.091	0.793	-3.298	-0.667
			$\nabla PGA=0.8$	-0.020	0.212	0.126	0.769	-2.239	-0.313
			$\nabla PGA=1.0$	-0.019	0.194	0.147	0.756	-0.645	0.026