**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 | 0% | ▽*PGA*= 0.5 | 0.325 | -1.722 | -1.228 | 0.324 | -0.218 | -1.124 |
| ▽*PGA*= 0.8 | -0.019 | 0.476 | 0.027 | 0.314 | -0.217 | -0.944 |
| ▽*PGA*=1.0 | -0.018 | 0.439 | 0.047 | 0.297 | 0.460 | -0.545 |
| 1% | ▽*PGA*= 0.5 | -0.029 | 0.509 | 0.047 | 0.334 | -1.729 | -1.222 |
| ▽*PGA*= 0.8 | -0.028 | 0.452 | 0.077 | 0.342 | -2.923 | -1.133 |
| ▽*PGA*=1.0 | -0.027 | 0.420 | 0.094 | 0.348 | -3.591 | -0.941 |
| 3% | ▽*PGA*= 0.5 | -0.036 | 0.459 | 0.101 | 0.325 | -1.722 | -1.228 |
| ▽*PGA*= 0.8 | -0.034 | 0.407 | 0.130 | 0.325 | -3.422 | -1.089 |
| ▽*PGA*=1.0 | -0.033 | 0.378 | 0.147 | 0.326 | -4.787 | -0.847 |
| 10% | ▽*PGA*= 0.5 | -0.022 | 0.295 | 0.185 | 0.151 | -1.096 | -1.139 |
| ▽*PGA*= 0.8 | -0.022 | 0.264 | 0.212 | 0.138 | -2.503 | -0.941 |
| ▽*PGA*=1.0 | -0.022 | 0.246 | 0.228 | 0.135 | -3.370 | -0.691 |
| D | 0% | ▽*PGA*= 0.5 | -0.030 | 0.534 | 0.031 | 0.429 | -0.255 | -1.202 |
| ▽*PGA*= 0.8 | -0.026 | 0.488 | 0.057 | 0.406 | -0.166 | -1.081 |
| ▽*PGA*=1.0 | -0.024 | 0.460 | 0.077 | 0.388 | 0.079 | -0.896 |
| 1% | ▽*PGA*= 0.5 | -0.034 | 0.510 | 0.054 | 0.442 | -1.316 | -1.243 |
| ▽*PGA*= 0.8 | -0.033 | 0.469 | 0.084 | 0.437 | -2.136 | -1.142 |
| ▽*PGA*=1.0 | -0.032 | 0.444 | 0.103 | 0.429 | -2.537 | -0.995 |
| 3% | ▽*PGA*= 0.5 | -0.034 | 0.453 | 0.088 | 0.429 | -1.682 | -1.195 |
| ▽*PGA*= 0.8 | -0.034 | 0.414 | 0.124 | 0.420 | -2.992 | -1.067 |
| ▽*PGA*=1.0 | -0.033 | 0.391 | 0.144 | 0.412 | -3.940 | -0.920 |
| 10% | ▽*PGA*= 0.5 | -0.024 | 0.304 | 0.129 | 0.345 | -1.755 | -1.129 |
| ▽*PGA*= 0.8 | -0.024 | 0.280 | 0.168 | 0.337 | -4.587 | -0.939 |
| ▽*PGA*=1.0 | -0.024 | 0.265 | 0.190 | 0.328 | -6.978 | -0.748 |
| Degrading | C | 0% | ▽*PGA*= 0.5 | -0.026 | 0.355 | 0.026 | 0.629 | -1.153 | -0.725 |
| ▽*PGA*= 0.8 | -0.022 | 0.306 | 0.048 | 0.548 | 0.632 | 0.043 |
| ▽*PGA*=1.0 | -0.019 | 0.279 | 0.057 | 0.574 | 0.003 | 0.236 |
| 1% | ▽*PGA*= 0.5 | -0.026 | 0.341 | 0.044 | 0.641 | -2.184 | -0.499 |
| ▽*PGA*= 0.8 | -0.022 | 0.288 | 0.075 | 0.571 | 0.307 | 0.070 |
| ▽*PGA*=1.0 | -0.081 | 0.392 | 0.058 | 0.705 | 2.197 | -0.005 |
| 3% | ▽*PGA*= 0.5 | -0.025 | 0.317 | 0.061 | 0.644 | -2.304 | -0.358 |
| ▽*PGA*= 0.8 | -0.022 | 0.270 | 0.093 | 0.607 | -0.504 | -0.056 |
| ▽*PGA*=1.0 | -0.019 | 0.246 | 0.113 | 0.556 | 0.190 | 0.114 |
| 10% | ▽*PGA*= 0.5 | -0.021 | 0.253 | 0.081 | 0.613 | -2.500 | -0.303 |
| ▽*PGA*= 0.8 | -0.019 | 0.218 | 0.117 | 0.586 | -1.093 | 0.033 |
| ▽*PGA*=1.0 | -0.018 | 0.203 | 0.137 | 0.563 | -1.100 | 0.001 |
| D | 0% | ▽*PGA*= 0.5 | -0.029 | 0.342 | 0.039 | 0.784 | -0.852 | -0.955 |
| ▽*PGA*= 0.8 | -0.026 | 0.312 | 0.068 | 0.741 | -0.146 | -0.544 |
| ▽*PGA*=1.0 | -0.026 | 0.292 | 0.084 | 0.694 | 0.838 | -0.127 |
| 1% | ▽*PGA*= 0.5 | -0.030 | 0.330 | 0.053 | 0.798 | -2.279 | -0.879 |
| ▽*PGA*= 0.8 | -0.026 | 0.293 | 0.083 | 0.764 | -0.184 | -0.091 |
| ▽*PGA*=1.0 | -0.103 | 0.434 | 0.052 | 1.002 | 2.635 | -0.016 |
| 3% | ▽*PGA*= 0.5 | -0.029 | 0.307 | 0.066 | 0.807 | -2.454 | -0.747 |
| ▽*PGA*= 0.8 | -0.025 | 0.270 | 0.099 | 0.771 | -0.059 | -0.014 |
| ▽*PGA*=1.0 | -0.102 | 0.412 | 0.060 | 1.014 | 2.643 | -0.017 |
| 10% | ▽*PGA*= 0.5 | -0.022 | 0.234 | 0.091 | 0.793 | -3.298 | -0.667 |
| ▽*PGA*= 0.8 | -0.020 | 0.212 | 0.126 | 0.769 | -2.239 | -0.313 |
| ▽*PGA*=1.0 | -0.019 | 0.194 | 0.147 | 0.756 | -0.645 | 0.026 |