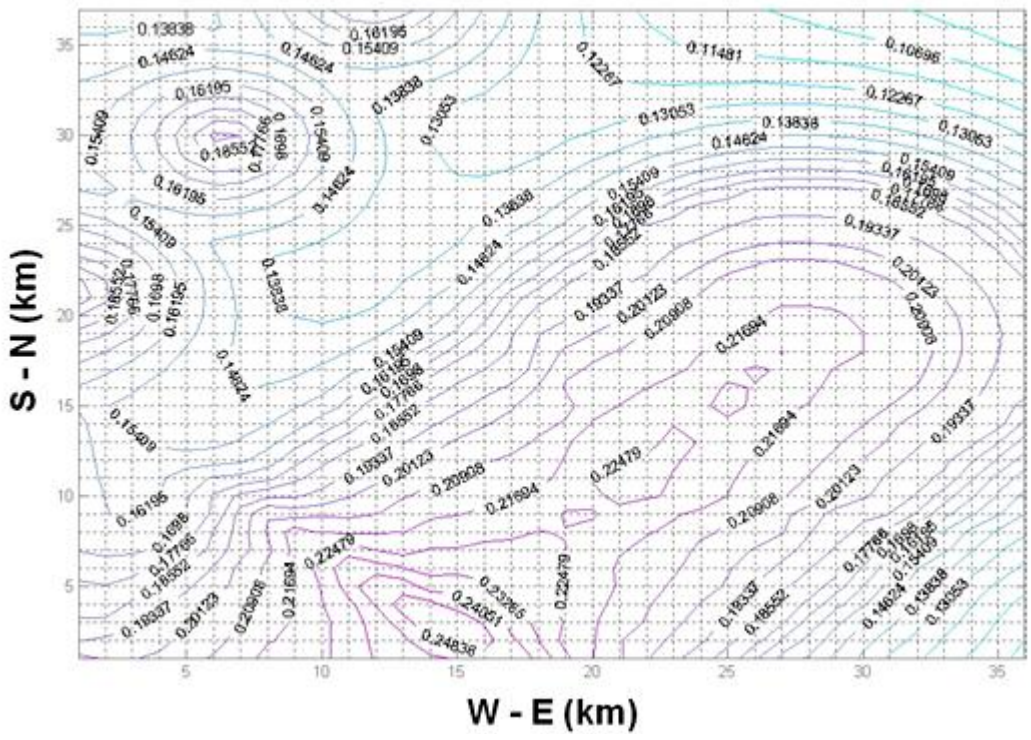

Figure 7. Contours of rock level PGA with 10% probability of exceedance in 50 years

The rock level PGA in this case varies from 0.106g to 0.248g. The site classification study has been carried out for 38 representative sites in Chennai city based on the NEHRP classification. The V_{s-30} procedure (Kramer and Stewart 2004) which considers the weighted average shear wave velocity in the upper 30 m, is used in this study. In general, V_{s-30} method is based on the principle that the first 30m of the soil layer participate in the amplification phenomenon of the bed rock motion. The geographical distribution of PGA for 2% probability of exceedance in 50 years for the 38 representative areas in Chennai is presented in Table 5. The estimated V_{s-30} values and their corresponding site classification for each area are also presented in Table 6. It can be observed from Table 5 that all the areas fall under either of the B, C or D classification. However, most of the areas in the city are categorized under site classification C compared to other site classes. It can be observed that the site class B is found predominantly at the southern parts of the city. Whereas site class D is found predominantly at the western parts of the city. Majority site class, C is found at Northern, Eastern and Central parts of the city.

Table 5. Details of representative sites and the geographical distribution of PGA

S.No	Area	Latitude (º)	Longitude (º)	Thickness of overburden, m	V_{s-30}, m/s	Site Classif-ication	PGA (g) for 2500 years RP
1	Abiramapuram	80.2591	13.0292	30	251	D	0.219
2	Adyar	80.2564	13.0073	25	345	D	0.199
3	Alwarpet	80.2483	13.0354	24	430	C	0.219
4	Ambattur	80.1570	13.0989	20	515	C	0.279
5	Anna Nagar	80.2149	13.0888	28	260	D	0.259
6	Ashok nagar	80.2181	13.0315	21	431	C	0.249
7	Avadi	80.1060	13.1123	12	776	B	0.289
8	Aynavaram	80.2273	13.0956	28	346	D	0.259
9	Balaji Nagar	80.2666	13.0707	12	731	C	0.229
10	Cpr Road	80.2602	13.0357	34	271	D	0.189
11	Guindy	80.2364	13.0263	9	788	B	0.239
12	Kolathur	80.2207	13.1177	12	769	B	0.249
13	Korattur	80.1835	13.1018	20	484	C	0.269
14	Koyambedu	80.2030	13.0712	26	391	C	0.279
15	Madavaram	80.2389	13.1461	28	241	D	0.189
16	Manali	80.2613	13.1664	22	438	C	0.179
17	Mandaveli	80.2677	13.0236	21	491	C	0.199
18	Nandambakkam	80.1987	13.0149	5	918	B	0.259
19	Nandanam	80.2390	13.0237	19	496	C	0.239
20	Nesapakkam	80.1855	13.0358	17	579	C	0.269
21	Nungambakkam	80.2436	13.0582	18	530	C	0.249
22	Palavakkam	80.2531	12.9603	12	723	C	0.169
23	Perambur	80.2591	13.1103	17	637	C	0.209
24	Perungudi	80.2373	12.9561	10	747	C	0.179
25	Poes	80.2509	13.0403	20	485	B	0.219
26	Ramapuram	80.1817	13.0313	12	728	C	0.269
27	RA Puram	80.2609	13.0201	20	474	C	0.199
28	Royapuram	80.2985	13.1016	12	756	C	0.149
29	Saidapet	80.2114	13.0229	8	809	B	0.259
30	Santhome	80.2808	13.0324	25	345	D	0.169
31	Tambaram	80.1423	12.9252	5	915	B	0.209
32	Thoapakkam	80.2358	12.9511	14	680	C	0.179
33	Tiruvottiyur	80.3054	13.1644	22	398	C	0.139
34	T. Nagar	80.2136	13.0582	25	399	C	0.259
35	Vadapalani	80.2174	13.0542	19	538	C	0.259
36	Velachery	80.2263	12.9795	10	768	B	0.189
37	Vepery	80.2684	13.0845	17	557	C	0.209
38	Vyasarpadi	80.2574	13.1342	18	594	C	0.199

12. CONCLUSIONS

A comprehensive study has been carried out to assess the seismic hazard of Chennai city based on probabilistic approach. A detail study on the seismicity and

seismotectonics of the region was carried out and a fault map was developed covering 300 km radial distance from the city. The Probabilistic Seismic Hazard Analysis was carried out with the developed MATLAB code considering the 36 seismic sources within 300 km from the city. The entire city and its surroundings are divided into 1 km x 1 km grid size, and the hazard level has been assessed for each node of the grid. The hazard towards the southern parts is mainly found to be resulting from the nearness of the cluster of faults in those regions. Minimal hazard in the north-eastern parts indicates the lower seismic source potential in that region. Similarly, rock level PGA contours have been plotted for 10% probability of exceedance in 50 years and the rock level PGA varies from 0.106g to 0.248g. Site classification was also carried out using the V_{s-30} method and site class "C" was found to be the majority site class.

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