PART 2
Collection of Isoseismal Maps for South Africa

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Introduction

In this part a collection of isoseismal maps are presented. These maps date as far back as 1932 and capture the damage footprint of the largest earthquakes recorded by our early inhabitants. It is an essential dataset that will be used the characterise the earthquake hazard in subsequent parts of this work.

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Many seismic intensity scales have been developed. One of the most commonly used is the Modified Mercalli (MM) 12-degree intensity scale proposed by Wood and Neumann (1931) and developed further by Richter (1958). This scale provides a detailed description of the earthquake effects on people, buildings and the environment. The European Macroseismic Scale (EMS; Grunthal 1993), most recently updated in 1998, is the basis for evaluation of seismic intensity in European countries. The INQUA scale was
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The most complete catalogue of earthquake occurrences for South Africa up to 1949 is by Finsen (1950). This catalogue was supplemented with information on early tremors in the vicinity of Cape Town (Theron 1974). Several other works since then dealt with the seismic history of South Africa. A compilation of relevant works was made (Fernandez and Guzman 1976) where a macroseismic catalogue of earthquakes from 1620-1970 was provided. Other work on historical data available includes Fernandez and Guzman (1979), De Klerk and Read (1988) and Brandt et al. (2005). Specifically, for this compilation several isoseismal maps were obtained from the compilations of Krige and Maree (1948) and Fernandez and Labuschagne (1977). Since 1977, no such compilation exists. Isoseismal maps were available in isolated publications as listed in Table 1 below.

**Use and potential of the map collection**

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When there was a large tremor, questionnaires were distributed to local towns to assess the severity of the tremor and the damage it caused. These questionnaires were then analysed, after which isoseismal maps were drawn. These isoseismal maps available in historical reports were revisited and digitised for this study. Five isoseismal maps were prepared by the authors for this study based on questionnaires alone. Most isoseismal maps in the historical record use the MM scale. All maps are therefore provided according to this scale.

Final Maps

Isoseismal maps listed in this collection date as far back as 1932. The most recent event included here is the event of 23 May 2005 that occurred in the mining district of Carletonville.

The characteristics of each event (figure ID, date, location, epicentral intensity and source) are given in Table 1 below. A map showing location of the epicentre of each event is given in Figure 1. Each isoseismal event is then illustrated in the accompanying appendix.
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Figure A19 Isoseismal map of earthquake of 17-Feb-1980

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Source: Fernández, 1980
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Figure A27 Isoseismal map of earthquake of 30-Oct-1994
Figure A28: Isoseismal map of earthquake of 1-Nov-1994

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Figure A29 Isoseismal map of earthquake of 7-Feb-2000
Figure A30 Isoseismal map of earthquake of 6-Sep-2004

Source: Hattingh et al., 2005
Figure A32 Isoseismal map of earthquake of 23-May-2005

Source: Saunders and Molea, 2005