

## Reconnaissance Report of Structural Damage in the Kalgoorlie-Boulder Area

The magnitude 5.0 earthquake that occurred at 8:17 am on 20 April near Kalgoorlie Boulder WA caused some building damage, mainly in the Boulder city centre along and around Burt Street. It also caused two minor injuries. This is the fourth earthquake that has caused damage in Western Australia since the Meckering earthquake in 1968.

I started making contact with the State Emergency Service in the afternoon on 20 April, trying to visit the site to see the structural damage and also possibly to collect some structural data. I was informed on Friday 23rd April that the City of Kalgoorlie-Boulder and the Local Recovery Coordination Committee approved my visit to the damaged site. However, to enter any damaged building would require permission of the respective building owner or tenant.

I arrived at the Earthquake Information Center set up by the city of Kalgoorlie- Boulder on Burt Street at about 1:45 pm on Sunday 25th April. I met Mr. Alex Wiese, Manager, Health & Compliance, City of Kalgoorlie-Boulder, who is coordinating the structural assessment, safety and recovery activities; Mr. Chris Kirwin, Director of Construction, Regional and Primary Industries, Department of Commerce, Government of Western Australia, Mr. Gary Scott and Mr. Jeff Kennedy, Worksafe, Department of Commerce, Government of Western Australia and another three people (did not get their business card). I showed them the letter of introduction from AEES President Kevin McCue, and briefed them on the purpose of my visit. Mr. Gary Scott told me that my request to enter or even get close to damaged structures was not possible for safety reason. They did not have keys to most of the damaged buildings either. Mr. Jeff Kennedy offered to introduce me to owners or construction workers at the damaged building, if there were any around. However, he could not guarantee that I could enter the building.

Mr. Wiese briefed me on the statistics of damage, and walked with me for about one and a half hour to each damaged building. I then spent the rest of the afternoon in the damaged area and took many photos.

### Statistics:

- 1) Most damages occurred in the Boulder city center along and around Burt St;
- 2) About 80 to 90% of buildings in this area suffered some damage; but most damage is architectural such as cracks on plasters.
- 3) About 25 buildings suffered minor structural damage, ie, cracks on masonry walls, falling parapet walls and or collapsed chimneys.
- 4) 3 buildings suffered moderate to severe damage with large extended cracks on walls and falling roofs. They might need to be demolished;
- 5) Damage mainly occurred to 2-storey masonry buildings built about 100 years ago;
- 6) Damage to one storey buildings was limited to chimneys and some minor cracks in the walls;
- 7) Mortar of the damaged masonry seems to have quite low strength. I could crush it between my fingers.
- 8) Most damage are failures in the east-west direction, indicating possibly stronger shaking in this direction. However, the super pit is located directly to the east of Burt St. Repeated mining blasting might also have weakened structural components in this direction. Only one resident indicated that she also felt a vertical impulse besides horizontal shaking;
- 9) No damage to infrastructures such as power and water supplies, bridges and pipelines was observed.