

date

19.10.2018

reference

28551-SL01_A

receiver

Coinda
Coonabarabran Ltd
Attn: Leanne
Redfern
Neate Street
Coonabarabran
NSW 2357

Dear Leanne,

Structural Investigation into the Failure of Copper Water Pipes at Coinda, Coonabarabran NSW

Jeziah Poole, a Structural Engineer with Barnson Pty Ltd, was requested by Mrs Leanne Redfern the general manager of Coinda Coonabarabran Limited to undertake a forensic investigation into the deterioration of the copper pipes at Coinda Coonabarabran. A site inspection has not been undertaken, however a sample of the damaged pipe has been provided to show the extent and nature of failure to the copper pipe. The investigation included the review and assessment of the following documentation, which has been attached to this report;

- Coonabarabran Water Supply – Chemistry Sample Test Results
- Photo log of damages

The purpose of this letter is to assess the nature of failure of the pipe and provide comment on future performance and expected ongoing maintenance.

The provided one metre length of copper pipe has three pin hole leaks.

The pin hole leaks have been caused by localised corrosion. Potential causes of the corrosion could be due to the chemical composition of the water causing accelerated local corrosion or electrolysis caused by stray electrical charges in the soil.

The attached water supply test result indicates the Coonabarabran water at the time tested had a Ph of 7.5.

From the website <http://www.repairmyleak.com/about/failure-copper.htm>, "Type I pitting is associated with hard or moderately hard waters with a pH between 7 and 7.8, and it is most likely to occur in cold water. The pitting is deep and narrow, and results in pipe failure."

The chlorine content of the water was noted to be 16 mg/l. This level, while not an aesthetic problem, can cause accelerated corrosion.

From available literature copper water pipes have a life expectancy of 40 to 70 years. It has been advised these pipes are at least 40 years of age, and as such they are approaching the end of their design life, considering the water issues noted above.

It has been advised that there have been approximately 6 cases of pin hole failure of the copper lines in the last 2 years. The repair of these leaks involves the breaking out of the floor tiles and concrete slab to locate the leaks, patching of the pin hole leaks, repouring of the concrete slab and renewal of floor tiles. Depending on the location of the leak, this could require the closure of 1 to 4 rooms which would require the relocation of the residents. It has been advised that there are no vacant rooms.

Due to the deterioration of the pipes and their age, it is expected further leakage will continue. There is no method available to control or reduce the cause of the pin hole failure.

It has been advised that a grant has been approved for the creation of 5 additional rooms to the facility.

It is recommended that the existing pipes are renewed, or de-commissioned and new plumbing installed in the roof. This could be facilitated with the creation of the new rooms. All new plumbing should be installed to AS3500 – Plumbers and Drainage Code. This will require the renovation of the bathrooms.

Photos of the sample of copper pipe provided have been attached.

Yours Faithfully
Barnson Pty Ltd



Jeziah Poole
BE (Co-op) MIEAust
Structural Engineer

Attached:

- Photos of the copper pipe
- Photo log of damage from Tim Erskine-Smith
- Coonabarabran Water Supply – Chemistry Sample Test Results