

Response to engineers' presentation 19 July 2011

On 19 July 2011, two engineers from Engineers Australia provided a presentation to Council regarding the risk analysis for the Laman Street figs. The following comments are made regarding the presentation as given on the night. The comments have been prepared by Council officers who attended the presentation. It was considered by these Council officers that the analysis provided by the two engineers had some significant deficiencies. Some of these are outlined below:

- The QTRA is one of a large number of reports, investigations and background material prepared in relation to the trees. The QTRA report was prepared in the context of this other material. Any analysis of the QTRA report requires further research – analysis of the report cannot be undertaken in isolation. The engineer's analysis did not address any of this other material. The engineer also did not discuss the report with the author or Council's City Arborist at any stage. It is not correct to say that Council has identified these trees for removal based on this one assessment. This statement ignores many years of work and reports from internal arborists and engineers and external consultants. It should be noted that the report reviewed by the engineer is not currently being used to manage the risk of the trees because the risk environment has changed due to the mitigation measures put in place by Council.
- The engineers addressed the trees as structures and did not take into account that they are living things. They likened them to lime mortar for their "self healing" qualities but made no comment on the tendency of living things to have a finite life span. It should be noted that trees redistribute tissue in response to changes in load rather than "heal".
- Neither of the speakers are qualified arborists nor have any experience in the assessment of trees. When asked what experience they had in structural and risk assessment of trees one engineer said he had none and the other did not answer. The entry of professionals into an area outside their expertise without undertaking adequate research is problematic.
- Neither presenter appears to have taken into account the extensive evidence-based research, well documented constrained root plate development and significant asymmetry of the trees in their analysis and presentations.
- Neither presenter appears to have taken into account that the trees are not in their natural state and that to some (probably a significant) extent their stability relies on the infrastructure around them. There is a well-known history of tree failure in the city due to the impact of adjacent infrastructure. There are two examples of Hill's figs (one in Tyrrell Street the other in Civic Park) that either failed or were removed because of unmanageable interactions with infrastructure and their roots. These cases and many more are available on Council's website.
- Neither presenter addressed the problems created for the root plate by public utility and other infrastructure construction, the well-known branch instability caused by defects in this exemplar of the species and inappropriate management practices in the past.
- Neither presenter considered or discounted the issue of branch weakness and failure.
- One of the engineers indicated that people in cars would be safer than pedestrians in the event of tree failure. This overlooked the well documented and recent cases of figs crushing cars, for example Bruce Street in 2007. Because of the size of the tree, anyone in that car would have been at extreme risk of harm.
- One of the engineers in his analysis appears not to have taken into account the many failures identified in the case book history of failures of Figs in the City. These included a number of failures in the last 10

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years of Hill's figs in very similar circumstances to the figs in Laman Street, that is, street trees with constrained root plates and very large crowns.

- One of the engineers advised that the Laman Street figs had survived without failure for many decades. This does not take into account:
 1. The aging of the figs.
 2. The increasing size of the figs' crowns. The height now significantly exceeds the Gallery and Library increasing the exposure to southerly winds.
 3. The constrained root plate.
- One example of this error in logic is the engineer's searching for a complex reason for the movement in the figs in June 2007. The reason he proposed was a combination of heavy rain and significant wind. He reasoned that the figs had survived the 1974 Sygna storm. While it sounds reasonable on the surface it ignores the facts that in 1974 the figs were younger, much shorter (some three or so metres lower than the top of the library) with commensurately smaller crowns. Smaller trees would impart a lower overturning moment at the root plate, lessening the impact of the constrained root plate. This of course is a more probable reason for the figs not failing in 1974. Now the figs are continuing to grow and the crown is becoming more asymmetric and less protected from wind by adjacent buildings.
- One of the engineers provided some views on roots and their interaction with saturated and unsaturated soils. In Council's view, he has not taken into account the situation in Laman Street, which is a constrained root plate with roots using existing infrastructure as well as soil for stability. The infrastructure on which the figs rely for stability has not been designed for that purpose.
- One of the engineers questions why Council was concentrating on southerly winds when easterly wind speeds are higher. This overlooked that the root plate is constrained and weakest in the north south axis. He also criticised Council's closing the street at notification of 50 kph and provided some very interesting mathematics showing how conservative he thought Council officers were in this matter. However, his analysis overlooked that the (publicly available) criteria for closure is mean wind speed of 50 kph with gusts up to 80kph. It is the expected 80kph gust speed for which we close the street, not the 50 kph average. This is based on advice from the Bureau of Meteorology.
- At no time during the briefing did the engineers say the trees were safe.

It should be noted that these comments relate only to the presentation to Council on 19 July 2011.