

WestConnex King Georges Road M5 Interchange: Homes damaged

Ongoing structural damage to homes at and Elouera St Beverly Hills, during and after King Georges Road - M5 Interchange Upgrade (KGRM5IU) March 2018

1.0 Introduction

This is a story of a massive engineering and mitigation failure by WestConnex to protect people's homes from construction damage.

Our homes are just the first of many properties likely to suffer damage from construction and tunnelling. It's therefore important for a proper compensation process and budget to be set by the Government. It's critical that WestConnex does not set a precedent of denial of liability.

No family should be left to pay the repair bills for damages caused by WestConnex construction nor be put through the protracted and unnecessary stress that WestConnex have cruelly put us through. This is a story of two families taking the extraordinary step to take on the Premier and the NSW Government in court to get compensation and to ensure that every family across the WestConnex route is not taking on the personal financial risk from construction damage.



Figure 1 Hallway of No 8 identifying induced strain on internal brickwork



Figure 2 Hallway of No 8 identifying warped doorways

2.0 Brief

The issues being experienced now by residents are the entirely predictable consequence of deep excavation and changed drainage. Not only have WestConnex failed to identify and mitigate a known engineering risk, they now endeavour to hide this outcome by issuing structural and geotechnical assessments that claim “no fault” and lays the blame for the continued deterioration of our homes by clutching at reasons, like a “dripping garden tap”.

Given our experience of the dishonesty we have encountered with WestConnex staff over the last 3 years, we engaged our own engineer to review the WestConnex assessments. Our engineer identified significant omissions contained in these reports including ignoring the probability that deep excavation just 30 metres from our homes is the likely cause of changed groundwater conditions.

Westconnex are also withholding vital information from residents. To date we have paid \$8,500 for a structural report from a reputable independent engineering firm. This report cannot be completed until they have the original WestConnex geotechnical assessments. These are critical reports that the public has a right to access, but are being withheld by WestConnex. Why?

We are left with the knowledge that no responsible body is holding WestConnex to account to rectify home damages. Directions from the Department Planning and Stuart Ayers, Minister for WestConnex are seemingly ignored.

The strategy is to stonewall residents to avoid compensation payments, as similar to the unfair property acquisition practices. They are deliberately making it so expensive and difficult to seek redress, that many families will find the stress, effort, delay and costs prohibitive in seeking compensation.

The number of families impacted by WestConnex property damage can only be set to rise as construction progresses. The reason is due to a huge swathe of the inner west – from Ryde to Kogarah – is built on the residual clays from the weathering of Ashfield shales. This is a highly reactive soil type that reacts to lowered moisture content brought about by significant new drainage and deep excavations. Older homes are particularly vulnerable.

Summary of construction at Beverly Hills

The Westconnex King Georges Road M5 Interchange upgrade involved the addition of and extending the length of the on and off ramps, the deep excavation and widening of the existing M5, and extending the Coolangatta Road Bridge to accommodate the extended ramps between King Georges Road and the M5 East. The eighteen months of construction for this section was finished in December 2016.



Figure 3 KGRM5 Interchange construction footprint. The blue dot represents the location of damaged buildings.



Figure 4 M5 KGR Interchange excavation under construction.

M5KGR1U excavation penetrated into the groundwater table around 6.4 to 7.4 metres below ground level, with new sub-soil drainage at the base of the excavation, and dewatering activities to facilitate the boring of over 50 pilings to a depth of some 8 metres for the vertical piled retaining walls. As can be indicated in Figure 2, the distance of the M5 road surface drainage system shifted much closer to homes from 48 metres to 30 metres. This additional drainage has caused dewatering of the groundwater table that would naturally flow towards Wolli Creek situated behind our homes, to now flow forwards to the significantly deeper M5 drain at the front of these premises.

3.0 Summary of issues

The new drainage has changed the soil conditions resulting in the contraction of soil beneath our homes. The consequence is that the foundations are settling unevenly, called “differential settlement”. This results in the movement of the buildings and tensile strain on the masonry. (Refer Figure 1). We have witnessed the onset of damage, such as cracked plaster work, misaligned windows and doors, and our 20 year old extension show indications it is separating from the original 1929 section. (Refer Figure 6).

Despite the continued worsening condition of our homes, WestConnex continue to avoid their responsibilities.

Our engineer has recommended that our homes require remedial work to the foundations to address the introduced strain on the structures. Otherwise, there is little point spending over \$10,000 + to fix the internal damage to the plaster walls, built-in wardrobes, door and window frames as the continued tensile strain will cause cracks to return.

Residents have been demanding that the RMS and WestConnex rectify our damages for well over twelve months. This damage has been identified in the Dilapidation Reports as occurring during, and continues to this day, since the major construction and drainage works commenced.

WestConnex have abrogated their responsibility to the sub-contractors, Fulton-Hogan, despite the obvious cause being the flawed engineering design of the motorway works. Likewise, Fulton-Hogan has denied any responsibility for the property damage incurred by the construction works.

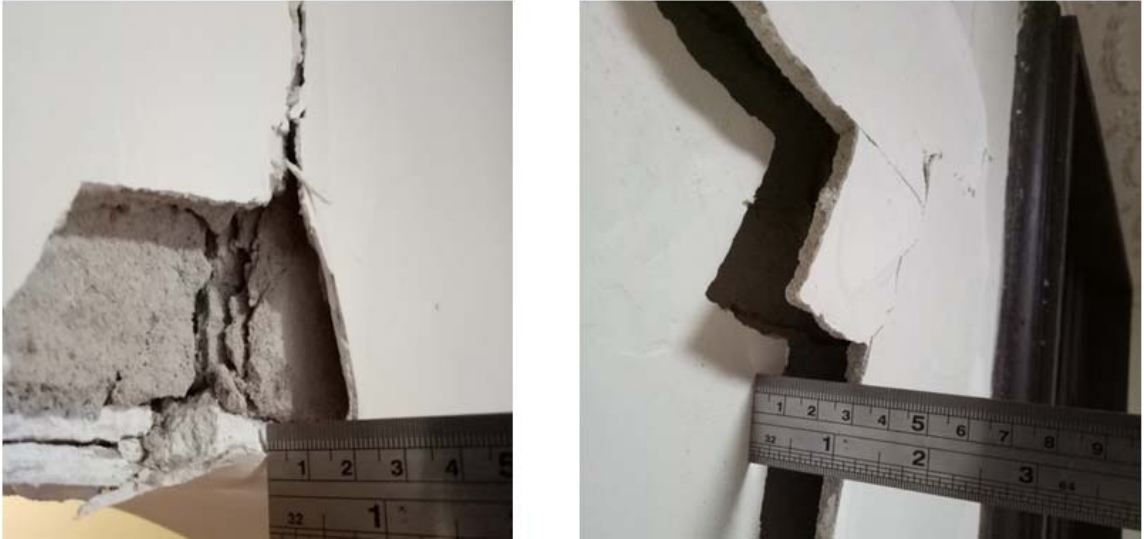


Figure 5 Major cracks in plaster work – alleged possible cause a “dripping garden tap”



Figure 6 Pattern of initial damage through No 10 and No 8 suggesting a groundwater fault line. Damage is now extended through both homes.



Figure 7 Separation of 1999 extension from original 1929 section

4.0 Westconnex KGRM5IU design failures.

The analysis of excavation on groundwater drawdown and subsoil settlement at this excavation was never conducted nor even considered for the KGRM5IU EIS.

The EIS does not mention nor did the Department of Planning stipulated any conditions on the sub-contractor, Fulton-Hogan, to even consider this in their construction let alone adopt damage mitigation strategies.

This omission represents a failure by the WestConnex engineers, AECOM, to incorporate a known engineering risk within the design and to develop protection strategies for adjacent buildings. This omission contrasts with the 72 pages of the later New M5 EIS devoted to documenting the risks of groundwater drawdown caused by vertical excavation and the expectation of adjacent building property damage.

Section 9.8.5 Assessment of Potential Construction Impacts (p185) of KGRM5IU EIS stated "Interference to aquifers resulting in a decrease or change in groundwater levels ... are considered

low risk impacts as construction activities would not interfere with any aquifers and no dewatering would be required for piling activities.”

The dewatering of piles located directly opposite the affected premises was actually observed during the M5KGR1U construction and has also been independently identified in a structural engineer’s investigative report on the most likely causes of the damage to these premises.

5.0 Westconnex New M5 design groundwater impact inclusions.

Interestingly, the EIS for the WestConnex New M5 now features significant attention to this design aspect. The New M5 Proponent is required to

1. prepare and use a geotechnical model of geological and groundwater conditions; and
2. assess the predicted settlement, ground movement, stress redistribution and horizontal strain profiles caused by excavation and tunnelling on adjacent properties and infrastructure; and
3. undertake a review of property and infrastructure at risk from damage to determine appropriate settlement criteria to prevent damage, prior to commencement of construction activities that may pose a settlement risk.

(NSW Dept Planning & Environment, Modification Requests WestConnex New M5, D August 2017; D6 & D7)

I. Relationship between excavation and damage to adjacent buildings

The WestConnex New M5 EIS(Vol 1C, Ch 19) document directly connects the relationship between excavation, groundwater drawdown, subsoil settlement, soil swell and shrinkage and damage to adjacent buildings:

- Settlement may occur in some areas as a result of volume loss during excavation, groundwater drawdown and subsequent ground consolidation. Areas most likely to be affected by settlement are usually where tunnelling is closest to the surface, around the main alignment tunnel portals and on and off ramps.(Ch 13-53)
- Settlement of the surface can create tensile strains in buildings above and around the settlement.(Ch 13-53)
- Where project-induced settlement is deemed the cause of cracking, cracks would be filled, new external masonry cracks would be repointed for weather tightness.(13-53)
- During construction large inflows (of groundwater) can be experienced.(19-32)
- To reduce groundwater inflows, pre-excavation pressure grouting would be undertaken to allow groundwater inflows to be more easily managed(19-33)
- Groundwater drawdown due to construction activities and temporary dewatering could impact the local groundwater table ...(19-33)
- The settlement that occurs due to groundwater drawdown generally occurs very slowly, possibly over years, and is often indistinguishable from settlement that is already occurring due to groundwater drawdown that might already be occurring and seasonal effects related to swell and shrinkage of the soil.(Ch19-62)

For the New M5, there is no question of the directness of this cause-and-effect relationship, but apparently for the construction of the nearby earlier KGRM5IU, the engineering design did not consider the effects of ground water drawdown and the subsequent differential settlement on the adjacent buildings.

6.0 Timeline

The post construction Dilapidation Report issued December 2016 concluded that the clearly evident damage “could not be ascertained to be a direct result of the construction work.” Fulton-Hogan Constructions consequently concluded that this damage was not caused by their construction and that no repairs to either premises were required.

We approached our insurers for possible redress, but our claims were denied on 11 February 2017 following their engineers’ inspection:

“Our assessment has shown that the damage to your property was caused by construction work that was completed in front of your property which caused vibration and cracks to appear”.

Residents of 8 & 10 Elouera St South, Beverly Hills commenced the formal claims process for property damage from WestConnex Delivery Authority and the sub-contractors Fulton-Hogan in February 2017.

The inaction from WestConnex and Fulton-Hogan resulted in our State representative, Mr Chris Minns arranging for my husband, John English to meet with the Minister for WestConnex Stuart Ayers to intervene. Present at this meeting were Chris Minns, Fulton-Hogan representative Alex Rizzo and WestConnex Community Liaison Rachel Elazzi. The issue of damage to these premises and the absence of commitment to reparation was discussed and quickly resolved for amendment by the WestConnex representatives present. The directive was clearly understood by all present, but unfortunately no minutes from this meeting have yet been received by residents, despite reminders.

Following this meeting, Mr. Steve Tinellis (Project Manager, Fulton-Hogan) and Ms. Rachel Elazzi arranged for yet another inspection of the two properties on Tuesday 16 and 23 May 2017. During these inspections, no details of repair work were discussed in any reassuring detail. Instead, Mr. Tinellis proposed further inspections by structural engineers. He would only commit to be guided by this structural engineers’ assessment of the cause of the damage to each premises. Outcomes are described in section 7.0.

7.0 Independent Assessments by WestConnex Sub-contractor

The residents considered this should only be conducted by a large, reputable geo-technical engineering company beyond the influence or bias of the sub-contractor Fulton-Hogan or WestConnex. This was ignored, with the appointment by Fulton-Hogan of a sole operator consultancy, Inglis Engineering, which seeks contracts with Fulton-Hogan for on-going work. It is reasonable for residents to conclude this appointment was not at arms-length and therefore biased. This report was heavily criticised as containing inconsistencies and misleading by our own senior engineer of 40 years experience.

I. “Independent Assessment Conclusion”

The 19 July 2017 “Independent Assessment” commissioned by the sub-contractor Fulton-Hogan and conducted by a sole-operator Inglis Engineering “concluded” that the extensive cracking to our homes is due to either seasonable moisture variations and abnormal soil conditions and that the damage “may be attributed to the continuous settlement and movement of the building.” Given that these premises are 88 and 77+ years old this “settlement and movement” is not due to their recent construction!

In referencing possible causes, the Inglis Report referenced only selected parts of AS2870-2011,

ignoring part (b) “unusual moisture conditions caused by drains, channels, ponds, dams or tanks which are to be maintained or removed from the site”. Only an experienced Engineer, with access to the Australian Standards documents (as residents do not), could observe the significance of this key omission and alert the homeowner.

Instead, Inglis Engineering based his opinion of causation for the deterioration of our homes these last 2 years :

- I. Large advanced trees (that has been insitu for some 50+ years)
- II. Overflow/leaks from water tanks (insitu for 15+ years installed by professional plumber and inspected by Sydney Water as we were claiming the rebate)
- III. Removal of a frangipani tree (occurred 15+ years ago)
- IV. Possible subsurface saturation from No 10 (ie the alleged dripping garden tap that the neighbour denies)

Again, only an experienced Engineer can point out that items II to IV ADD moisture to the soil. It's the drying of our highly reactive soil that we consider is the key issue for our damaged homes.

And what about the “elephant in the room” – WestConnex construction 30 metres from our homes? Apparently its “outside the zone of influence”.

II. Failure of Sydney Motorway Corporation to review the results.

The “independent assessment” of our homes commissioned by Fulton-Hogan was deeply flawed and obviously not verified by a suitably qualified engineer at SMC before distribution to residents.

What was missing throughout the report was the elephant in the room. The nearby deep excavation by Fulton Hogan, built according to WestConnex designs and the substantial sub surface drainage which has permanently altered the soil moisture content, resulting in shrinkage of the clay soils and therefore differential settlement of our house foundations.

As stated in the earlier section, the alleged causation of dripping garden tap etc. adds moisture to the soil and thus contradicts the claim of “no cause”.

Our homes sit on clay that reacts substantially to changes in moisture soil content. This is clearly demonstrated in the “Shrink Swell” test undertaken in the report that shows when moisture content was dropped from 38.6% to 36.0%, resulting in open cracking and the strain (tension) increasing from 0% to 4.9%. Inglis Engineering report only provides a summary soil profile and conveniently omits documenting the soil moisture content from the original geotechnical reports. It's obvious they do not want us to see these results!

III. August 2017 Communication from Stuart Ayers Minister WestConnex

“I am advised the assessment found that the cracks were not caused by the interchange works but are due to the abnormal moisture conditions of the site. This causes expansion and contraction of the soil below the house, resulting in movement of the structure and subsequent cracking”.

So let's delve into what caused the abnormal soil conditions of the site to suddenly cause all this damage to our homes.

8.0 Withheld Geotechnical reports.

Residents have a right to access to the details of the pre-construction geotechnical investigations conducted near the damaged homes of Fulton-Hogan, instructed the engineer, hat conducted the Inglis Structural Engineering/Dilapidation Report that “under no circumstances is he to pass on any details of pre-construction geotechnical investigation” to the residents. We need these reports for our own engineer to establish the most likely cause of the ongoing damage incurred to their properties.

While it is agreed that the “abnormal moisture conditions” and “highly reactive soil profile” of this site contribute significantly to the damage to the homes, the reasons for the abnormal moisture conditions when the damage occurred remains speculative and inconclusive.

Remarkably, the Inglis Report is uncertain about dewatering activities at the excavation site. “It is likely groundwater was encountered at the base of the excavation for the roadworks and therefore the works may have caused some modification of the groundwater profile and modification of the subsoil moisture content in the zone of influence of the excavation. (13.5.4)” Such is the freedom of information from Fulton-Hogan in regards to this inquiry.

In the meantime we have paid \$8,500 for our own engineering report that cannot be completed without the original geotechnical reports that include the analysis of soil moisture content. Not an inconsiderable sum for any family.

9.0 Conclusion

The reality is that every homeowner across the route is fully exposed to the financial risk of WestConnex property damage. No family should end up significantly out of pocket repairing the damages caused by WestConnex nor be put through the unnecessary stress that WestConnex have cruelly put me and my family through.

It is distressing the levels of obfuscation, deceit and misleading information given to residents. It is further distressing that the Premier, Gladys Berejiklian, has turned her back on us, not even bothering to acknowledge receipt of our letters and emails.

The number of families impacted by WestConnex can only be set to rise as construction progresses. The reason is due to a huge swathe of the inner west – from Ryde to Kogarah – is built on the residual clays from the weathering of Ashfield shales. This is a highly reactive soil type that reacts substantially to lowered moisture content brought about by significant new drainage, deep excavations for the M5 road profile, the de-watering of piles drilled for the vertical retaining walls of the M5, and the drawing the water down from the clay soils which our homes sits atop, with infrastructure.

Proper processes and budget for compensation need to be put in place.



Contact: