

## Grey Lynn Tunnel - RMA Section 92 Comments & Reponses

<b>Project :</b>	Grey Lynn Tunnel				
<b>Application:</b>	NoR: D.002166.01 / RC: BUN60334952, LUC60334953, WAT60334954				
<b>Response Date:</b>	5/04/2019				
<b>Reference Document:</b>	Settlement Assessment of Grey Lynn Tunnel and Tawariki Street Shafts, Rev. 3. 31 January 2019				
Comment No.	Comment	Comment by	Response	Response by	Status
RC42	Please also present the projected ground settlements arising from the groundwater drawdown on the cross sections requested above.	Jeffrey Peng & Richard Simonds	See response to comment RC41.	Victor Romero	
RC43	No Groundwater and Ground Settlement Monitoring and Contingency Plan (GSMCP) in support of the consent application has been provided. This should be provided so that the proposed extent and number of monitoring points can be reviewed and so council can understand how adverse effects will be avoided, remedied and mitigated before the application is limited notified.	Jeffrey Peng & Richard Simonds	This will be prepared by the contractor prior to construction.	Amber Tsang	
RC44	The proposed total settlement limit of 50 mm in condition 3.31 (Ref. 6) is considerably hgiher than the assessed maximum total settlement of 14 mm. Futhermore, the settlement contours shown in Appendix A of the settlement assessment report (Ref 1) indicates the maximum settlment of 14 mm is expected to occur in the playing fields area of St Paul's College. Buildings on Tawariki Street and Moira Street are shown to be outside the 10 mm settlement contour.	Jeffrey Peng & Richard Simonds	Noted. The predicted maximum settlements (e.g., 14mm) are not predicted to result in building damage.	Victor Romero	
RC45	The FLAC shaft modelling assumptions presented in Appendix C of Ref. 1 indicate that no relaxation of the MW ECBF rock has been considered. This assumption may underestimate the amount of deflection as rock relaxation is likely to occur immediately after removal of the confining stress from the 2.5 m high lifts, prior to application of the shotcrete. The shotcrete is modelled to act as shoring of the MW ECBF rock face from arching effects, rather than just providing protection against ravelling of the rock face. Please comment if this has the potential to underestimate displacement of the shaft wall.	Jeffrey Peng & Richard Simonds	Ignoring the ground relaxation and treating the shotcrete as a structural lining on rock face would underestimate the shaft wall deflection. However, additional deflection and resulting surface settlement would be minimal (in an order of about 1 mm) if a 100% ground relaxation would be assumed and shorcrete would be neglected, judging by the results from the settlement analysis. The assumptions used in the analysis did not significantly underestimate the settlements.	Yiming Sun	
RC46	Please provide calculations for the derived groundwater drawdown induced settlement curves shown on Figure 5-5 (Ref. 1).	Jeffrey Peng & Richard Simonds	See "GLT ConsolidationSettlement Calculations.pdf" attached.	Victor Romero	
RC47	The predicted shaft wall deflection (Figure 5-4) from the FLAC model shows outward displacement within the MW ECBF rock of about 1.5 to 4.5 mm at 10 to 28 m depth down the shaft. Given that this displacement occurs in the lower portion of the shaft excavation, please comment on the potential for associated ground settlement to occur at a distance back from the shaft wall (rather than immediately behind the shaft).	Jeffrey Peng & Richard Simonds	The analysis captured the potential ground surface settlements at various distances from the shaft wall up to 50m from the shaft centreline. This distance was judged far enough to capture the effect of wall deflections at 10m to 28m depth. Therefore, the results presented in Appendix C reflect this potential effect.	Yiming Sun	
RC48	The proposed pre-construction condition surveys (Section 3.10 of Ref. 6) should also include 24 and 26 Sackville Street given the buildings also appear to lie within the gully area founded on Tauranga Group alluvium where the tunnel depth is less than 20 m.	Jeffrey Peng & Richard Simonds	Agree.	Victor Romero	