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| 1. **What underpins the NZIER assessment about the absolute size of the rebuild?**
 | NZIER advises that it estimates the scale of the construction task to be completed (post 2011) to be 980,000 person months of labour. As detailed on page 7 of the NZIER report, the scale of this task has two dimensions. One is its absolute size. The other is the time over which the work will be completed. The key element of rebuild size is shown on page 6 in Figure 4 of the NZIER report where the total rebuild task is broken down by person months of work and areas of work. As outlined on page 14 of the NZIER report the construction task is measured using typical person months per $1 million dollars of work, based on a bottom up model of project and skill needs. Time to build is assumed to be an average of 7 months. This is a weighted average of project durations for each type of project; these durations range from an assumed average of one month for repair work to an average of nine months for non-residential and infrastructure projects. There will of course be significant variation around these averages. As outlined on page 3 of the June 2013 NZIER report and page 14 of the NZIER report, NZIER has paid attention to the significant uncertainties regarding the cost of the rebuild. The absolute cost of the rebuild was evaluated at an aggregate of $27.6b (in 2010/11) dollars. More recent higher estimates (e.g. $40b) were not used because it cannot be determined the extent to which those different estimates included cost escalation.  |

**ORION CPP PROJECT**

**Response to Orion questions per letter of 29 August 2013 on NZIER July 2013 Report**

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| 1. **Has NZIER conducted sensitivity tests about the impact of its assessment to changes in the size of the absolute size of the rebuild?  If so could it provide a measure of the sensitivity of their wage forecasts to changing this assumption? (as Figure 2 in their 17 June report indicates official estimates of the rebuild costs more than doubled between June 2011 and June 2013).**
 | As set out on page 7 of the NZIER report, the output gap is the key driver of cost escalation. The size of output gap over time is dependent on timing assumptions and the amount of planned work. The sensitivity of the output gap to the absolute size of the rebuild is analogous to the sensitivity of the output gap to the timing assumptions.   |
| 1. **Can the NZIER provide the elasticities that underpin its system dynamics model?**
 | We have assumed that this question is referring to the elasticity of labour supply. The labour supply curve is provided on page 13 of the NZIER report. The implied labour supply elasticity changes depending on the position on the supply curve. |
| 1. **Is NZIER’s 50% labour supply wage elasticity assumption based on more information than published in its two reports?  If so what specific wage and labour supply data was used?  Has it conducted sensitivity tests of its wage forecasts to this labour supply wage elasticity assumption?  If so how sensitive are its results to changing the labour supply wage elasticity assumption?**
 | NZIER’s views on labour supply are based on events observed internationally and in New Zealand as outlined in its earlier June report. NZIER compares its forecasts against events internationally in Figure 3, on page 5, of the NZIER report. In footnote 8 of the NZIER report, NZIER notes: *Estimates of aggregate wage elasticities of supply usually range from around 0.5 to 1. We are not aware of any that rise above 2. This does not matter a great deal as ours are not conventional elasticities. Furthermore, most conventional elasticities deal with marginal changes in wages while our model is dealing with non-marginal changes. By comparison, our supply curve assumption has an implied elasticity 0f 0.86 for wage changes of 1%.*  |
| 1. **What is the empirical basis for assuming symmetry between wage increases and decreases?  Has NZIER conducted sensitivity tests to this symmetry assumption?  If so what is the impact of relaxing the symmetry assumption, eg to halving the maximum decline or even to removing nominal declines?**
 | NZIER advise that it used its professional judgement and expertise in assuming symmetry in the maximum wage increase and decrease of 1% per month.   |
| 1. **Has NZIER conducted sensitivity tests to other potentially critical assumptions, eg the supply adjustment lag, different labour productivity assumptions, changes in build duration assumptions?  If so how sensitive are their wage forecasts to these assumptions?**
 | As described in the introduction to the NZIER report in forecasting labour cost escalation factors, NZIER notes:*The analysis behind our forecasts focuses on the timing of cost escalation and interplay between labour supply, planned construction volumes, desired construction timeframes and, implicitly, willingness to pay or delay in the face of cost escalation.*On page 6 of the NZIER report, NZIER judges the key drivers to be the scale of demand relative to supply and the willingness of buyers to pay higher costs or to defer projects until costs are lower.  The scale of demand relative to supply is discussed on page 7 of the NZIER report, alongside figure 5. Willingness to pay is addressed on page 8 of the NZIER report, alongside Figure 6.  In footnote 6 on page 8 of the NZIER report, NZIER notes that: *We settled on these round numbers as they are jointly compatible with feasible completion and avoidance of exponential cost increase. This 10 year timeframe is inferred by iteration of the model and examination of implied costs and feasibility of meeting the timeframe. It is jointly determined alongside the 1% ‘willingness to pay’ parameter. Large numbers of alternative combinations are possible. By comparison, a 6 year timeframe implies a doubling of cumulative wage costs compared to a 10 year target.* |
| 1. **Can the NZIER provide the implicit construction work put in place profile that underpins its wage forecasts?**
 | See table below *Rebuild work completed.* |

