Appendix C

# Value Improvement Process Schedules

Table C.1 – VIP 1 Outcomes

| Category | Action |
|---|---|
| General Civil | ▪ Overall width of footprint tested, with a view to considering how narrow this can be made. The wider the footprint the greater the extent of earthworks and ground improvements, both generally along the route and at embankments and bridges. Consider median width, clear zone and edge treatment<br>▪ Review layouts at Kāpiti Road. Two layouts were presented, one with more extensive road upgrading than the other, including alterations at Milne Drive/Te Roto Drive and Arawhata Street.<br>▪ Carry out sanity check on previous decisions on overs/unders considering the seismic issues and protection to embankments associated with bridges. |
| Geotechnical | ▪ Peat areas: review acceptance criteria for settlements, durations of surcharge and pavement implications.<br>▪ Seismic/liquefaction: confirm lifeline requirement for this highway, coordinated with other RoNS. Consider effects/acceptable performance of high embankments on liquefiable sands<br>▪ MSE wall options to be considered. |
| Structures | ▪ Single versus twin structures<br>▪ Pier position relative to footpath and road reserve (shorter spans)<br>▪ Steel superstructure versus concrete<br>▪ Width of rural overbridges<br>▪ Reduced shoulder on Waikanae Bridge |
| Drainage | ▪ Swales, one side or both<br>▪ Relationship with ecological areas |
| Urban Design | ▪ Keep cycleway close to existing ground to minimize earthworks<br>▪ Review location and number of east/west connections |
| Pavements | ▪ Consider staged construction and delaying OGOA surfacing<br>▪ Further design and whole of life costing to be carried out |
| Miscellaneous Civil | ▪ Identify ITS requirements<br>▪ Follow up with Transpower regarding sharing the designation |
| Landscape/Ecology | ▪ Consider reduced designation and scope of work in unused areas of designation |
| Construction | ▪ Identify benefits from opening early<br>▪ Identify float in programme<br>▪ Traffic effects on local roads |

Table C.2 – VIP 2 Outcomes

| Category | Decision or Action | Maximum Cost Saving |
|---|---|---|
| Roading | ▪ Reduced median width, 4 m wide at southern end up to south of Raumati Road, 6 m wide through to north of Mazengarb Road and then 4 m wide to northern end. Optimises urban design principles (daylight between bridges in urban areas) while minimizing footprint in large peat areas, through Wāhi tapu area and at longer bridges. | ▪ -$2.5m |
| | ▪ Reduce footprint by steepening side slopes to swales to 4:1, steepen at high embankments to 3:1 and add barriers. | ▪ -$2.0m |
| | ▪ Remove southbound slip lane at Poplar Avenue roundabout. | ▪ -$0.5m |
| | ▪ Te Moana interchange: reduce northbound offramp to single lane. | ▪ -$1.0m |
| Geotechnical | ▪ Review of overs versus unders: additional cost of seismic treatment of Expressway embankments at bridges outweighed by other impacts of changing to local road over (property costs, visual). No change. | |
| | ▪ Preload/surcharge versus excavate and replace peat. Increase areas where peat will be left in place with preload. Less certainty of long term settlement but significant cost saving. | ▪ -$10.0m |
| | ▪ Long term settlement criteria. Further work identified to establish settlement criteria. Meet with NZTA. | |
| | ▪ Seismic stability of high embankments. Provide geotextile in high embankments to assist in limiting displacements. | ▪ +$5.0m |

Table C.2 – VIP 2 Outcomes *(continued)*

| Category | Decision or Action | Maximum Cost Saving |
|---|---|---|
| Structures | ▪ Consider separate, lower bridge for cyclists crossing Waikanae River, as potential cost saving. This was not proceeded with following discussions with GWRC on floodway issues. | ▪ |
| | ▪ Shorter spans for bridges crossing Expressway. Reduce spans from 25 m to around 20 m pus steepen up spill-through abutment slope. Discussions with KCDC are required to agree on options for shortening bridge spans further in some cases with piers inside road reserve. | ▪ -$5.0m |
| | ▪ Steel deck versus concrete deck: No significant cost saving identified so not considered further. | ▪ |
| | ▪ Width of rural overbridges. Discuss with KCDC regarding widths required for these bridges. Potential saving if these can be reduced. | ▪ -$1.0 m |
| | ▪ Single versus double bridges: included in reduced median described above. Single bridges where 4 m median, double bridges where 6 m median. | ▪ |
| Drainage | ▪ Swales both sides versus swales on one side. Due to additional piping required if swales on one side only, decided to stay with swales both sides. | ▪ Nil |
| Pavements | ▪ Delay OGPA surfacing for 2 years to allow thinner pavement. This was considered unlikely to meet consent conditions and not considered further. | ▪ Nil |
| Landscaping | ▪ Reduce landscaping extent. It was noted there is a high public expectation for significant visual mitigation. It was agreed not to adopt this at this stage in the project<br>Note: *At the June PAB meeting it was agreed not to include the $500,000 landscaping reduction as it was felt more design needed to be undertaken to confirm the true landscaping requirements* | ▪ -$0.5m |

Table C.3: – VIP 3 Outcomes

| Category | Decision or Action |
|---|---|
| Geotechnical | ▪ Results of peat trial at northern end. This confirmed excavation and replacement is feasible in peat at the northern end. Southern end needs further investigation. |
| | ▪ Proposed a long term settlement criteria over 10 years (compatible with pavement resurfacing requirements). These were transvers differential of 1% of crossfall and longitudinal differential of 30 mm over 10 m. |
| | ▪ Include measures to limit movements at embankments under seismic loading, estimated cost $10m. |
| | ▪ Te Moana interchange: reduce northbound offramp to single lane. |
| Structures | ▪ Architectural concepts presented, including pier arrangements. |
| | ▪ Design standards were presented for clearances, shoulders, spans. Clearances were challenged, as to why greater than the bridge manual vertical clearances were being used. |
| | ▪ Bridge spans were also challenged. Approach is to place piers outside the KCDC required local road reserve. This was further reviewed with KCDC at a separate meeting. |
| | ▪ Options for single span (no intermediate piers), and different spill through abutment slopes were presented. |
| Cycleway/walkway | ▪ Confirmed QE Park south end alternative<br>▪ Confirmed two crossings of the Expressway, Leinster/Raumati and Kāpiti/Mazengarb<br>▪ Not using service lanes/accessways for cycleway |
| Stormwater | ▪ Update on Waikanae River stop bank breach scenarios. |
| Noise | ▪ Noise modeling had not been completed by this time.<br>▪ Raised the possibility of providing better than the minimum requirements at two sensitive areas (Leinster and Puriri Road). This depends on what the noise modeling actually requires.<br>▪ Consider use of alternatives for bunds (e.g. peat) |

Table C.3 – VIP 3 Outcomes (*continued*)

| Category | Decision or Action |
|---|---|
| Lighting | ▪ Presented proposals for lighting of the Expressway.<br>▪ Base case for lighting agreed to be low spill in rural areas, semi-cutoff in urban areas and lighting across full interchange. |
| ITS | ▪ Presented NZTA Operations requirements for ITS. |
| Pavements | ▪ Advised that whole of life costs for the options being considered were very close and a risk profile and maintenance regime is to be agreed with NZTA. |
| Construction | ▪ Construction methodology and sequence was presented. |