Appendix K

Weightings for MCA Scores for Alignment Options

Weighting

In addition to the collation of raw scores for each option, further 'weighting' analysis was undertaken to assess the sensitivity of the scores to different 'focus areas'. This testing was done to assist with understanding the advantages and disadvantages of certain options.

This further analysis involved applying different weightings to the raw scores and then assessing the scores for each option based on the weightings applied. The use of weightings allowed for sensitivity testing of the options and gave an indication of the potential 'robustness' (or otherwise) of the outcomes from the MCA process (e.g. if different values were considered more significant or important than others). Decision making by a requiring authority often involves trade-offs and weighting can also assist to identify the merits of certain options if different trade-offs are made. This ensures that the decision makers and technical advisors have a greater range of information and perspectives

Weighting systems are usually much more challengeable than scoring, as they can readily be developed from a range of perspectives. Thus a single result is often vulnerable to criticism that a weighting system is wrong. This risk can be mitigated by using a range of different systems.

For EWL seven different weighting systems were developed, though only six were used against the assessed scores (with Mana Whenua electing not to undertake overall scoring of options but instead confirming a preference for options on the basis of a holistic review of the wider evaluation of the options):

1. Transport: Gave strong emphasis to achievement of the Project Objectives, which all relate to transport matters, and user safety, which is a critical consideration for the Transport Agency and some weight to cost and productivity of land.

2. Natural Environment: Gave strong emphasis to water quality, ecological resources and coastal processes, recognising that these are section 6 and 7 matters and a core component of section 5.

3. Land Take and Impact on Industrial Activity: Gave strong emphasis to viability of land areas and productivity of land recognising the presence of industrial land and businesses along the route and the sub-objectives of the Project about minimising land-take.

4. Landscape and Geological: Gave strong emphasis to natural landscape/character and archaeology and built character, recognising that these are section 6 matters and the route may affect natural features.

5. Social and Community: Emphasises the impact on residents and community assets and public access to the CMA, recognising that these are section 7 matters and social well-being is a core component of section 5.

6. Section 5 and Section 6 Balanced: Sought to apply a balanced approach to the competing matters, including the economic enablement as represented by Project Objectives and the section 6 matters of national importance while giving some emphasis to other relevant section 7 matters.

7. Within each system different values were assigned to different criteria in accordance with the purpose of each system. The details of the different values are included within Appendix 1.

8. As set out in the MCA process, the process of scoring the different criteria was to amalgamate raw criteria scores under the common criteria (e.g. transport performance, cost, natural environment)

9. In a similar way the weighting values for each individual criteria were combined with the values for similar criteria in order to obtain a weighting for each group of criteria. This ensured that the weighting systems aligned with the MCA outcomes reporting. For example, the values for the individual criteria of natural landscape/character, water quality, ecological resources and costal environment were combined to give a weighting value for the "Natural Environment" group of criteria.

10. The process for the application outcome of the weightings involved applying the weighting to the raw score and then adjusting the overall scoring to reflect the score relative to the -5 – 0 - +5 evaluation criteria. In other words, given the summation of the MCA scores against the topics (rather than merging as a single score), the weighting did not seek to amalgamate the scores between the broad topics and retained the graphical reporting of this information.

11. The outcomes of applying the various weightings to the raw scores are shown in [Z]. The outcome of the weighting process was:

    - To confirm that the 'preferred options' were considered robust even if weighting evaluations were used.

Consenting phase MCA criteria	Transport	Mana Whenua Values	Natural Environment	Land Take & Impact on Industrial activity	Landscape and Geological	Social and Community	Part 2 (ss.5&6)
Objective 1							
Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20	10		2	2	2	2	10
Improved travel time reliability between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20	10		2	2	2	2	10
Objective 2							
Improved safety for pedestrians and cyclists	6		2	2	2	2	5
Improved accessibility for local cycling and walking	6		2	2	2	2	5
Improved accessibility for regional cycling and walking (strategic network)	2		2	2	2	2	5
Objective 3							
Improved journey time reliability for buses between SH20 and Onehunga town centre	6		2	2	2	2	5
1A. User Safety	10		2	2	2	2	7
2A. Construction impacts on Utilities and lifeline infrastructure	1		1	6	1	1	2
2B. Construction Cost	5		1	2	1	1	2
3A. Operational Cost	5		1	2	1	1	2
4A. Construction Impact	1		1	2	1	8	5
4B. Built Form and Amenity	1		1	5	1	8	5
4C. Connectivity	1		1	2	1	8	5
4D. Quality of living environment	1		1	2	1	8	5
4E. Viability of land areas	1		1	10	1	1	5
4F. Productivity of land	7		1	10	1	1	5
4G. Public Access to and along the coastal marine area	1		1	1	1	8	7
5A. Natural Landscape / Character	1		5	1	10	2	10
5B. Water quality	1		8	1	1	2	7
5C. Ecological resources	1		10	1	1	2	10
5D. Coastal environment and resources	1		10	1	5	2	7
6A. Mana Whenua values	1		1	1	8	5	10
6B. Archaeological and built heritage	1		5	1	10	6	10

Appendix L

MCA Outcomes for Alignment Options

East West Link – Multi-Criteria Analysis – Princes Street Interchange Outcomes Report

Record of Process:

a) Workshop date: 4 April 2016
b) Comments received: 5 May 2016
c) Finalised: 6 May 2016

Status: Final.

General Comments (from the Option Design Pack issued for the MCA dated 30 March 2016) that informed assessment:

- The yellow marking on the plan should follow the proposed over bridge layout instead of that shown in the information distributed.
- The plans incorrectly detail the pedestrian movement lines – these have been assessed as being on the new road alignment in the general configuration as shown in the information distributed.
- It has been assumed that pedestrian crossing / signals will provide for connections.

Option 1: Over-bridge to the north

This option shifts the existing over-bridge to the north lining up with Princes Street.

- Proximity to existing pylons of the south bound on and off ramps.
- Requires 6% vertical gradient on the over-bridge as it approaches Princes Street to provide 6m high vertical clearance to SH1.
- Requires raising Frank Grey Place by up to 5m, to provide suitable platform for south bound ramps.
- Property requirements shown on the maps do not identify the six additional sites affected along Frank Grey Place which have been included in this assessment.

Option 2: Over-bridge to the south

This option consists of using the existing over-bridge, reconstructing it and lining it up with Princes Street East.

- Proximity to existing pylons of the south bound on and off ramps.
- Requires 9% vertical gradient on the over-bridge as it approaches Princes Street to provide 6m high vertical clearance to SH1.
- North bound ramp terminal configuration is not optimal for traffic operations and may pose concerns for pedestrian access.

Option 3: Single point urban interchange

This option consists of applying a single point urban interchange layout.

- Over-bridge shifted to the north and lines up with Princes Street.

Notes: MCA Workshop #1, Princes Street Interchange

- Realignment of Princes Street East to allow for better connectivity with the proposed over-bridge.
- Removal of traffic island on the north bound ramp to improve cycling and pedestrian flows.
- Proximity to existing pylons of the south bound on and off ramps.
- Requires 5.5% vertical gradient on the over-bridge as it approaches Princes Street to provide 6m high vertical clearance to SH1.
- Requires raising Frank Grey Place by up to 6m, to provide suitable platform for south bound ramps.
- New road connection between Frank Grey Place and Fencible Place.
- Requires raising of the intersection of the Princes Street East and Fencible Place by approx. 3m.
- Pylon needs to be relocated.

Option 4: Full diamond intersection

- Over-bridge shifted to the north and lines up with Princes Street. Realignment of Princes Street East for better connection to the over-bridge.
- Removal of traffic island on the north bound ramp to improve cycling and pedestrian flows.
- Proximity to existing pylons of the south bound on and off ramps.
- Requires 5.5% vertical gradient on the over-bridge as it approaches Princes Street to provide 6m high vertical clearance to SH1.
- Requires raising Frank Grey Place by up to 6m, to provide suitable platform for south bound ramps.
- Requires raising of the intersection of the Princes Street East and Fencible Place by approx. 3m.

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +4** **REASONS:** - Flow of traffic to and from Highbrook to Onehunga. - Scale of changes and operational convenience. - Potential downstream effects may be observed at Highbrook. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All options provide four lanes on SH1 beneath Princes Street, therefore are not differentiated under this criteria. The differentiators were for local movements.	
	Obj 2. *Improved safety for pedestrians and cyclists* *Improved accessibility for local cycling and walking* *Improved accessibility for regional cycling and walking (strategic network)* *Including Crime Prevention Through Environmental Design (CPTED)*	Alison	**SCORE: +3** **REASONS:** - Travel times. - Directness of route to key infrastructure i.e. parks, schools etc. - Travel time delays for this option are greater compared to Option 4. - Number of crossings. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** - Local benefits - Short travel time as most direct. - Safety i.e. crossing over ramps and getting to key infrastructure such as parks, local shops etc. **OTHER COMMENTS:** Closely replicates existing street and movement patterns. **ASSUMPTIONS:** - Princes Street and Frank Grey Place will have a signalised crossing for pedestrians. - There will be no signalisation on Princes Street East.	**SCORE: +3** **REASONS:** - Reduced vehicle and pedestrian conflict. **OTHER COMMENTS:** None **ASSUMPTIONS:** - Princes Street and Frank Grey Place will have a signalised crossing for pedestrians.	**SCORE: +3** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Changes to pedestrian and cycling environment in this location do not relate to project objectives, and therefore not applicable.	Yes, realignment of bridge could improve connections at ramps.
	Obj 3. *Improved journey time*	Andrew	**SCORE: 0**	**SCORE: 0**	**SCORE: 0**	**SCORE: 0**	Not relevant in this location, therefore not scored. However, local bus	

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
	reliability for buses between SH20 and Onehunga town centre		**REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	improvements will be observed on Princes St.	
Road safety	1A. User Safety i. Stacking length of ramps ii. Intersection and interchange complexity iii. Cycling and pedestrian facilities iv. Motorway clearances (vertical and horizontal)	Lloyd	**SCORE: +2** **REASONS:** - Improved length on SH1 south bound off ramp. No change to south bound on ramp. - Complexity in the east increased. - Dog-leg removed in the west. - Bridge widened and shared path over the bridge. - Improved layout and signals - 6m clearance. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** - Improved length on SH1 south bound off ramp and south bound on ramp. - Better eastern layout. - Poor dog-leg on the west. - Dog leg not ideal for pedestrians and cyclists. - Bridge widened and shared path over the bridge. - 6m clearance. **OTHER COMMENTS:** - The changes are limited to local improvements which would retain a similar layout to the existing. - Vehicle stacking along the south bound on ramp to SH1 and on the over bridge would possibly not change however other traffic flows will be improved. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** - Improved SH1 south bound off ramp. No change to south bound onramp. - Complex single point layout for local road connection. Dog-leg removed. - Bridge widened with a new shared path. - Improved dog leg in the west. - Increased crossing points. - 6m clearance. **OTHER COMMENTS:** - Traffic will be moved away from the interchange from part closure of Frank Grey Place. **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** - Improved SH1 south bound off ramp. No change to south bound onramp. - Simple layout in the east with complex layout for local road connection at Frank Grey Place. - Dog-leg removed in the west. - Bridge widened with a new shared path. - Improved dog leg in the west. - Increased crossing points. - 6m clearance. **OTHER COMMENTS:** - Benefits of single point traffic movements. **ASSUMPTIONS:** -	Most items covered by the suggested project objectives criteria have been removed. The reason being road user safety is not a specific project objective but a statutory objective for the New Zealand Transport Agency (NZTA).	
Construction	2A. Construction impacts on Utilities and lifeline	Noel	**SCORE: -1** **REASONS:** - Works in the	**SCORE: -1** **REASONS:** Same reasons as that for	**SCORE: -3** **REASONS:** - Work requires	**SCORE: -1** **REASONS:** Same reasons as that		

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
	infrastructure		vicinity of the pylon, approx. 2m. - Construction of walls/bunds can be a risk. **OTHER COMMENTS:** It is recognised that engagement with Transpower important but assume works in proximity less significant than relocation requirements. **ASSUMPTIONS:** -	Option 1. **OTHER COMMENTS:** Same as Option 1. **ASSUMPTIONS:** -	removal of the pylon. - Regionally significant due to the affected infrastructure but can be done. - Works will be short-medium term. **OTHER COMMENTS:** None **ASSUMPTIONS:**	for Option 1. **OTHER COMMENTS:** Same comments as that for Option 1. **ASSUMPTION:** -		
	2B. Construction Cost, **including property costs**.	Noel	**SCORE: -2** **REASONS:** - Changes to Frank Grey Place including property acquisition. - Bridge demolition and construction of a new bridge. \ **OTHER COMMENTS:** None	**SCORE: -1** **REASONS:** - Staging the bridge construction so part of the bridge is operational. This will avoid long term diversion of traffic through the underpass. - Less property requirements. - Frank Grey Place stays very much the same as that at present. - Bridge demolition. **OTHER COMMENTS:** This option could be improved to provide better pedestrian and cyclist connectivity	**SCORE: -3** **REASONS:** - Cost of pylon relocation. This will also require a longer construction timeframe. - A large quantity of fill will be required. - The property requirements will also be extensive. - Bridge demolition. **OTHER COMMENTS:** There is an opportunity associated with the residue land (across the park) from the properties acquired for intensive development for instance to take advantage of the park. This however cannot be relied upon for the present assessment and MCA scoring. It is anticipated that the residue land will be kept vacant.	**SCORE: -2** **REASONS:** - Similar to the reasons for Option 3 in terms of construction and property requirements. - Bridge demolition. **OTHER COMMENTS:** None	All have same impact on SH1, except Option 3 relative to the pylon relocation. The cost of property take has been factored into the scores.	Yes, reduce property costs.

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: 6m clearance over motorway	**ASSUMPTIONS:** 6m clearance over motorway	**ASSUMPTIONS:** 6m clearance over motorway	**ASSUMPTIONS:** 6m clearance over motorway		
Operation	3A. Operational Cost	Noel	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** Note that the ponds proposed under each option will cater for the NZTA network and not the local roads. This is the present arrangement. Note weighting has not been applied in here i.e. construction costs have been considered under another criteria.	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** Same assumption as that for Option 1.	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** Same assumption as that for Option 1.	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** Same assumption as that for Option 1.	All options have similar costs associated with ongoing maintenance including ponds and their access requirements. The various number of stormwater ponds including the existing pond in each option have been accounted for in the construction costs. In terms of operation the setup costs vary depending on the number of additional ponds, however their associated costs are marginal and not of a scale that differentiates costs between options.	

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Social & Economic	4A. Construction Impact	Amelia	**SCORE: -2** **REASONS:** - Smaller property take (circa 15) and disruption. - Length and occupation of the construction zone. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** - Least number of property-take (circa 6) and change from current footprint. - Does not require traffic diversion. **OTHER COMMENTS:** None **ASSUMPTIONS:** Construction works maintain existing Princes Street Bridge access.	**SCORE: -3** **REASONS:** - Purchase of properties includes area between Fencible Place and Frank Grey Place. - Use of park for construction anticipated. This use may mean more impact on wider local community. - Traffic impact on neighbourhood. - Changes to Fencible Place and surrounding road network. Given the nature of this change and impacts for access to those properties to the north of the peninsula, the scale of effects is considered high (local greater than single CAU). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Same reasons as that for Option 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All options will cause disruption to nearby residents at varying scales.	Yes, potential to reduce property take and costs.
	4B. Built Form and Amenity The measure for this criterion is visual and streetscape character, and legibility.	Lynne	**SCORE: -2** **REASONS:** - Less property take and disruption. - Length and occupation of the construction zone.	**SCORE: -2** **REASONS:** - Embankments on Princes Street East create sense of alienation of public space, making the park seem inaccessible (visually/physically). - Large area of ramps including alongside existing neighbourhood shop	**SCORE: -2** **REASONS:** - Motorway environment created by curving ramp design. - Large areas of retaining wall. - Removal of properties on Frank Grey and Princes Street East together with embankments that preclude active uses edging the street.	**SCORE: -2** **REASONS:** - Large areas of retaining wall. - Removal of properties on Frank Grey and Princes Street East together with embankments that preclude active uses bordering the street.	The scoring of these options has been based on long term and wider 'place' outcomes including ability to understand the street and built form hierarchy, as well as immediate visual impacts. All options have some negative impact on neighbourhood character (noting however that the existing character is not strong at present). Changes to the urban form i.e. changes to the street pattern, reading the place, local connections were also part of this MCA assessment.	Yes

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			OTHER COMMENTS: None **ASSUMPTIONS:** -	**OTHER COMMENTS:** The on ramp and off ramp to SH1 are existing, both of which are shifting towards each other. **ASSUMPTIONS:** -	**OTHER COMMENTS:** Traffic flows have been considered under other criteria for residences. **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4C. Connectivity, including CPTED.	Lynne / Alison	**SCORE: 0** **REASONS:** Improved movement choice and safer for pedestrians/cycles than existing, and retains linkages to network for vehicle. Fewer crossing points and shorter / more direct route for walking/cycling than existing. Slight negative with steep gradient over SH1 (affects directional views). Signalised intersections in the motorway environment. Slight decrease in travel distance and hence directness i.e. walking and cycling along Princes Street.	**SCORE: 0** **REASONS:** Improved movement choice and safer for pedestrians/cycles than existing, and retains linkages to network for vehicles. Fewer crossing points than existing. Slight negative with steep gradient over SH1 (affects directional views). At grade visual / physical connection with park retained. Signalised intersections in the motorway environment. No change in directness i.e. walking and cycling along Princes Street.	**SCORE: 0** **REASONS:** Neighbourhood wide, a somewhat clearer and more legible connection but amenity for pedestrians/cycles compromised by motorway style ramp geometry, multiple crossings of ramps, long waiting times. The numbers of crossing points remain the same for key desire lines. Signalised intersections in the motorway environment. Slight decrease in travel distance and hence directness i.e. walking and cycling along Princes Street. Potential to significantly impact south bound traffic (local road to SH1 connection) on the block between Fencible Place and the motorway, i.e. alongside the park – plus the walking path inside the corner is lost to embankment. Ability for local north-south traffic to use Frank Grey Place, turn left and then across Princes Street, thereby avoiding the major intersection at the bridge. A somewhat clearer and	**SCORE: +1** **REASONS:** Neighbourhood wide, a somewhat clearer and more legible connection, and ability for north-south traffic to avoid major intersection (separates local from motorway movements). There are fewer crossing points for key desire lines from those existing. Signalised intersections in the motorway environment. Most direct. Highest reduction in the travel distance for walking and cycling along Princes Street. A somewhat clearer and more legible east-west connection. Ability for local north-south traffic to use Frank Grey Place, turn left and then across Princes Street, thereby avoiding the major intersection at the bridge.	All options have neutral or positive outcomes as movement choice is maintained or enhanced. Walking and cycling infrastructure are provided in all options.	Option 1: • Reduce gradient of over-bridge. Option 2: • A signalised crossing at the off ramp from SH1 north bound to Princes Street would change the score a positive manner. • Additional shared path south of Princes Street with crossing onto south side of bridge would shorten the real travel distance through the corridor. • A signalised crossing is still desired.

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
					more legible east-west connection. **OTHER COMMENTS:** Landscaping between ramps is an opportunity to soften large areas of paving (not scored). **ASSUMPTIONS:** All arms of intersection at Frank Grey Place are signalized. All arms of intersections at Frank Grey Place are signalised. Addition of cycling and walking infrastructure on southern side of Princes Street between Albert Street and SH1.	**OTHER COMMENTS:** None **ASSUMPTIONS:** All arms of intersections at Frank Grey Place, and on and off ramps are signalised.		
	4D. Quality of living environment **This contains a number of sub parts which add towards an overall score for each option i.e. parks, retail etc.**	Amelia	**SCORE: -2** **REASONS:** Lower impact by comparison to Options 3 and 4. **OTHER COMMENTS:** Avoided considering the accessibility benefits as considered above. **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Lower impact by comparison to Options 3 and 4. **OTHER COMMENTS:** Few local benefits except improved accessibility which is assessed above. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** - Road configuration and impact on residents, Frank Grey Place to Fencible Place. - Adverse effects on parks. - Park located below road level. **OTHER COMMENTS:** Shifting Princes Street East to the North would straighten the road, allow more area for the park, this applies to Option 3. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Same reasons as that for Option 3. In addition, there are adverse effects on parks as park located below road level. **OTHER COMMENTS:** **ASSUMPTIONS:** -	Access to, effect of the works and importance of local features were key contributors to the MCA scoring. These include basketball court, skate park, parks, sports facilities, local shops on Princes Street, Sikh temple on Princes Street and the Schools to the west of the intersection.	Options 3 and 4 provide opportunity to mitigate post construction, with new land and road configuration (more substantial change in urban form and land development of the area). However, opportunity not specifically assessed as development not 'project' but rather integration with surrounding land use. Also, note that the improvements to road configuration will make access to park land including Otahuhu Football Club more seamless. Park upgrade with Options 3 and 4 likely, but not assessed at this stage. Correct design could change this from negative to positive impact (though still issues for residential area).
	4E. Viability of land areas	Phil Osborne	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	Neutral	

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			-	-	-	-		
	4F. Productivity of land	Phil Osborne	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Not applicable	
	4G. Public Access to and along the coastal marine area	Gavin Lister	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Not applicable	
Natural Environment	5A. Natural Landscape / Character	Gavin Lister	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Neutral	
	5B. Water quality	Dale Paice	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Neutral	
	5C. Ecological resources	Gerry Kessels	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Not applicable	
	5D. Coastal environment and resources	Stephen Priestley	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	**SCORE:** **REASONS:** **OTHER COMMENTS** None	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	Not applicable	

Notes: MCA Workshop #1, Princes Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -		
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Mana Whenua groups provided feedback at a hui held on 6 May 2016. Notes have been recorded in the hui minutes.	
	6B. Archaeological and built heritage	Matt Felgate	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Neutral	

East West Link – Multi-Criteria Analysis – Neilson Street Interchange Outcomes Report

Record of Process:

a) Workshop date: 6 April 2016
b) Comments received: 26 May 2016
c) Finalised: 27 May 2016

Status: Final

General Comments (from the Option Design Pack issued for the MCA dated 24 March 2016 and Option 4 discussed over an MCA workshop on 5 May 2016) that informed assessment:

All options:

- Rail link to airport is not precluded.
- Provides for a direct link to the town centre for buses.
- No pylons are disturbed.
- Yacht club is not affected.
- Sea Scouts clubhouse is not affected for Options 2, 3 and 4.
- Impact on Outstanding Natural Feature (ONF) is significant from a cultural perspective including impact on ground water and aquifers.

Option 1:

- All proposed changes would occur at the existing intersection. This means the footprint of the works is much larger than for the other options.
- New local road connection to the port has been introduced through the feedback process. This local connection will keep EWL and local traffic separate.
- Consideration has been given to the gas line (lesser impact than other options) and basalt feature.
- Lesser impact on the ONF with only ramps to be built, and at ground level.
- The stormwater pond shown on the plans is annotated for ecological significance in the Proposed Auckland Unitary Plan.
- Geometrics of the alignment have led to the move towards and into the Coastal Marine Area (CMA).
- Selwyn Street property is part of this project but has not been factored into the land requirements.

Option 2:

- There will be no bridge over SH20 and the existing configuration is largely maintained. A link from SH20 to EWL is provided via a cut and cover tunnel. Cut and cover route follows alignment of the gas line. The challenge with this is the soft ground materials and the multi-storey development on Onehunga Mall.
- Cut and cover is not an option for linking EWL to the port due to geometrics.
- High pressure gas line needs to be relocated. The new location and property requirements for which is yet to be determined.

Notes: MCA Workshop #2, Neilson Street Interchange

- There are significant cultural heritage concerns around the level of earthworks, and impact on ground water and aquifers for this option.
- Land requirements are much less compared with the other options.
- EWL will need to start rising (on a structure) further back and off the EWL route to maintain height clearance above the harbour, leading up and over the harbour (running parallel and east of the Manukau Harbour Crossing (MHX)) over Rimu Road, and under the over bridge to Mangere Bridge.

Option 3:

- Limited number of traffic signals. As a result, traffic is directed where to go in terms of connectivity.
- Outside of CMA.
- In this option, the port development that requires the bridge would need to be built whereas in Option 1 it would likely be staged to a later date to tie in with the development of the port land.
- EWL does not provide access to Onehunga at the intersection; traffic would need to change movement at Captain Springs.
- More land required than Option 1 over Port Land, as the coastal works have been reduced.

Option 4:

- This option is similar to Option 3 which either avoids or has a lower impact on features such as historical and known cultural sites, ecological areas and natural features.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +3** **REASONS:** Improved access to SH20 (both directions), however, local and business movements all occur at the one interchange leading to some extent of inefficiency. **OTHER COMMENTS:** EWL to Onehunga local traffic can be through Neilson Interchange instead of Captains Springs exit. More direct. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** More direct connection compared with Option 1 from EWL to and from SH20. However, the Onehunga/Penrose traffic will no longer be able to go to Mahunga industrial area via Rimu Road. More resilient with the separate harbour crossing. Attracting more traffic, hence scoring lower in terms of enduring benefits as it also caters for other traffic. **OTHER COMMENTS:** EWL to Onehunga local traffic must use Captains Springs exit. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Removes signals of option 1 and provides the most direct movement. **OTHER COMMENTS:** EWL to Onehunga local traffic must use Captains Springs exit. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Some positives i.e. local movement improvements and some negative such a longer route from Onehunga to SH20 Northbound. Overall similar characteristics to option 3. **OTHER COMMENTS:** EWL to Onehunga local traffic can be through Neilson Interchange instead of Captains Springs exit. More direct. **ASSUMPTIONS:** -		The current port access will be maintained until such time that the future development of the port prompts the need for the bridge construction shown in Option 1. This is an opportunity and does not form part of the MCA scoring.
	Obj 2. *Improved safety for pedestrians and cyclists* *Improved accessibility for local cycling and walking* *Improved accessibility for regional cycling and walking (strategic network)*	Alison	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** The connections between Mangere Bridge residential area and schools/ employment areas to the north bring higher benefits. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** There are amenity disadvantages with this option. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** This option forces more traffic through Onehunga Harbour Road and Neilson Road intersection. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** Similar effect as the other options. **ASSUMPTIONS:** -	All options are positive in terms of linkages at both local and regional levels.	Option 1 has an opportunity to improve cycle connections. This includes extension of the existing Waikaraka cycle way towards the town centre (south-east of Gloucester Park), and a new connection north of Gloucester Park. These have not formed part of the present assessment and MCA scoring.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
	Obj 3. *Improved journey time reliability for buses between SH20 and Onehunga town centre*	Andrew	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Slightly less efficient than Option 3 for bus movements accessing Onehunga from SH20. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Regionally significant bus connection between SH20, Onehunga interchange and Onehunga rail station.	
Road safety	1A. User Safety	Lloyd	**SCORE: +2** **REASONS:** - Increased traffic signals. - More traffic signals in this option. - Some ramps are shortened with more complex merge points, although still compliant to standards. - Issue with no EWL west bound connection at interchange to Onehunga. - Lower speeds which is similar to existing situation. **OTHER COMMENTS:** - Movement speed and design has mitigated risks or balanced the overall rating. **ASSUMPTIONS:** None	**SCORE: +3** **REASONS:** - Higher speeds result from the larger roadway curves. - Better ramp merging. - Less signals which means less conflict points. - More logical interchange layout than other options and provides all movements. **OTHER COMMENTS:** Potential further safety risk to this option with trucks using the tunnel to transport dangerous goods. Tunnel systems can be designed to cope with these issues **ASSUMPTIONS:** None	**SCORE: +3** **REASONS:** - Generally safer interchange with less conflict points for traffic. - Significant merging of ramps which are of concern. - Some increased stacking provided to the on ramps. - Issue with no EWL west bound connection at interchange to Onehunga **OTHER COMMENTS:** None **ASSUMPTIONS:** None	**SCORE: +2** **REASONS:** - Similar assessment to Option 3, now with grade separation at Galway Street. - Access improvements to Onehunga with all links provided. - Overall interchange split into two distinct areas which makes it more complex. **OTHER COMMENTS:** None **ASSUMPTIONS:** None	The EWL does not exist at present and the Neilson Street Interchange operates as a standard interchange, hence there are no specific safety issues. The baseline is zero with improvements/issues common to all options being: - removal of traffic from local streets (benefit) - improved cycling connections (benefit) - tighter geometry (issue) - increased traffic signals with general reduction in conflict points (benefit).	
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: -1** **REASONS:** Two pylons require special attention on either side of SH20.	**SCORE: -2** **REASONS:** Presence of two pylons near the trench.	**SCORE: -1** **REASONS:** Presence of two pylons in the vicinity of works.	**SCORE: -1** **REASONS:** Similar impact as that for Options 1 and 3.	All options have similar impact.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			Construction of the embankment and presence of gas main will be key contributors. **OTHER COMMENTS:** **ASSUMPTIONS:** -	Relocation of the gas main. **OTHER COMMENTS:** Future rail line to the airport would run parallel and west of MHX. The bridge crossing for this option runs parallel and to the east of MHX. **ASSUMPTIONS:** -	Need for large retaining structures. Impact of the embankment over gas main **OTHER COMMENTS:** None **ASSUMPTIONS:**	**OTHER COMMENTS:** None **ASSUMPTIONS:** None		
	2B. Construction Cost, excluding property costs.	Noel	**SCORE: -2** **REASONS:** There are a lot more structures with this option. The footprint is wider with a lot more traffic shit and an average costs (mid ground). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -5** **REASONS:** The cut and cover tunnels add significant cost. It has greater temporary works and an additional long bridge structure crossing the inlet. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS**: A smaller footprint and easier to construct despite large retaining wall on soft ground. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Slightly higher costs compared with Option 1, however not significant enough to score lower. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Working within contaminated land.	
Operation	3A. Operational Cost	Noel	**SCORE: -1** **REASONS:** Options 1 and 3 have similar operation and maintenance costs. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -5** **REASONS:** The tunnel, pumping of water/stormwater, and tunnel ITS and fire control adds a significant cost. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** This option has less maintenance as there are less signals, less truck stoppings and smaller footprint. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Similar impact as that for Options 1 and 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Social & Economic	4A. Construction Impact	Amelia	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar impact to that for Option 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -4** **REASONS:** Impact on recreational reserve, Gloucester Park, sports club/reserve which has regional importance. Duration of impact would be long for this option. Scale of construction impact of tunnel section and impacts on residents. Scale and duration of impact due to link to Rimu Road. **OTHER COMMENTS:** Use of Gloucester Park as a sports club gives it regional status. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar to Option 1. The reason being disruption to residences and businesses close by but less so than a cut and cover in Option 2 **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar to Options 1 and 3. The reason being disruption to residences and businesses close by but less so than a cut and cover in Option 2 **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Disruption to businesses, other facilities, residents, transport networks will be evident for all options.	Potential to mitigate construction impacts of all options, however scale of impact for Option 2 more significant and potentially more challenging to mitigate. Cycle ways would be rebuilt in all options.
	4B. Built Form and Amenity The measure for this criterion is visual and streetscape character, and legibility.	Lynne / Gavin	**SCORE: -4** **REASONS:** The retaining walls and additional structures have significant impact on area character and create visual severance. Sea Scouts building impacted. Southern loop 'spreads' the footprint and impacts views to and from local streets.	**SCORE: -3** **REASONS:** This option presents less severance of the local road network. Fewer tall structures near town centre although trenching approaches create severance. It presents language of a place rather than motorway, and takes out a building which is under construction.	**SCORE: -4** **REASONS:** This option takes out block pattern west of Gloucester Park Road. It proposes additional structure in tuff ring and retaining walls including a large retaining structure along the western edge which has a high visual impact. It presents language of motorway rather than 'place'.	**SCORE: -4** **REASONS:** This option takes out block pattern west of Gloucester Park Road. It proposes a 4m high retaining wall across end of Wharangi Street which is visually severing. The two large retaining walls (8m high x 130m, 2-4m x 110m) divide / sever the tuff ring more than now as roads slice through (both visually and physically). Additional structures generally between town centre area and the harbour have significant visual impact as it relates to area character / sense of place. Galway Street bridge adds	The measures for this criteria included: - built form - urban character - place outcomes - opportunities to max green space and place - sightlines to the harbor - streetscape improvements - enhancement and/or retention of existing sightline.	Potential to mitigate Option 1, and change its scoring. Option 2 may have more adverse effects as details of the works are formed which can increase its negative scoring. Option 4 presents the potential buildout / enhanced setting for Sea Scouts building to ameliorate impacts. Treatment of Neilson retaining wall is also possible mitigation for visual impact. Shared path on Onehunga Harbour

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			OTHER COMMENTS: None **ASSUMPTIONS:** Sea Scout building assumed lost and would need to be relocated (if the structure is to be retained).	**OTHER COMMENTS:** Extent of additional likely structures associated with trench not known. **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	another large elevated structure and ramps which somewhat offset by no additional loop inside tuff ring but scale of impact remains in same band. **OTHER COMMENTS:** None **ASSUMPTIONS:** None		Road, would contribute to AC requirement to activate Gloucester Park sports field. Pedestrian/cycle-friendly intersection of Neilson and Onehunga Harbour Road. Landscape treatment of tuff ring / interchange spaces including walkways / improved access to active and passive recreation areas.
	4C. Connectivity	Lynne / Alison	**SCORE: 0** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road. It also provides: - decision points and movement choice via signalised intersections while supporting legibility - shared street / local connection between Onehunga Port / foreshore and the town centre enhances pedestrian/cycle network. It also moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Improved safety for cyclist connecting to Onehunga	**SCORE: +1** **REASONS:** **Lynne** This option has no severance of local roads and provides many options for movement choice supporting place based outcomes. It enables a slower speed environment for walking / cycling on Onehunga Harbour Road leading towards town centre. It moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Same reason as that for Option 1.	**SCORE: 0** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road and presents less 'self-explaining' road environment – decision points earlier, less choice once within the interchange. Moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Same reason as that for Option 1.	**SCORE: +1** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road and more choice on/off Darley Street which is a relatively direct and a legible north-south connection. Supports strategic route between Onehunga and Sylvia Park generally. Enables some choice on Darley Street. Introduction of 4m high retaining walls creates north south visual severance around Gloucester Park Road. Some isolation / separation for shared path users from roads (limited casual surveillance) alongside large retaining walls, but on the positive side, a separation of highly trafficked environment and quieter coastal edge. **Alison (+2)** Same reason as that for Option 1.	The measures for this criterion and associate scores included: - journey time - movements - amenity/experience - directness - impact on movement and desire lines - quality of the ped/cycle experience - safety - severance - sightlines - movement and desire lines. - place making opportunities. Scoring reflects balance between local impacts and wider connections, and between quantitative enhancements and quality outcomes for the ped/cycle network	Option 4, potential to retain access to properties off Gloucester Park Road either with realignment or by leaving the road in the same position - could then keep Gloucester Park Road open / signalised at Nielson which would be a positive for connectivity. Wide, direct shared paths, high level of finish / signage / facilities. Location of shared paths for optimum surveillance & connection to foreshore. Landscape Ped/cycle-friendly intersection of Neilson and Onehunga Harbour Road.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			Mall. Following key desire line to the destination. **OTHER COMMENTS:** - Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection.	**OTHER COMMENTS:** Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection. Missing link along Onehunga Harbour Road (refer Options 1 and 3) is included.	**OTHER COMMENTS:** Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses ' **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection.	**OTHER COMMENTS:** Pedestrians/cycles not to use Galway Street but Onehunga Mall Road only. Galway bridge and roundabout enable doubling back / multiple movements. Score reflects positive of Galway for more regional traffic coming into the industrial area; against slight loss of Gloucester Park Road for more local - if that could not be severed, score would increase to +2. Lower traffic volumes at Neilson / Onehunga Park Road similar to Option 3. **ASSUMPTIONS:** Movement choice: new shared path along outside of bund and existing retained along existing inner path past cemetery (Galway Street bridge goes over).		
	4D. Quality of living environment	Amelia	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents **OTHER COMMENTS:** None	**SCORE: +2** **REASONS:** Additional Harbour bridge crossing would potentially bring in more freight traffic into residential areas, from Rimu Road, means score less than Options 1 and 3. Challenging access for residential apartments on Onehunga Harbour Road **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents Preserves the Sea Scouts clubhouse, however disruption impacts on this are relevant. **OTHER COMMENTS:**	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents Preserves the Sea Scouts clubhouse, however disruption impacts on this are relevant. **OTHER COMMENTS:** None	The measure used for this criterion were based on the land uses in the area i.e. parks, facilities, recreation, clubs, the landing, residential, retail etc. The broad areas were: 1. open space 2. residential, all negative with respect of air quality 3. facilities, all of which would face similar impact. 4. Ability of all options to remove traffic movements from Onehunga residential/town centre area to new Link. Negative effects from all options would be experienced by nearby residents, however the benefits on the wider area and people were higher and hence the positive effects.	All options would have the ability to mitigate noise, vibration and air quality effects. Option 2 may provide greater opportunity to mitigate these effects due to nature of the cut and cover sections.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** Sea Scouts can retain their access.	**ASSUMPTIONS:** -		
	4E. Viability of land areas	Phil Osborne	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Distribution to vulnerable business is less while exhibiting marginally greater access to the town centre. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Options 1, 3 and 4 are similar for business land requirements. This does not factor in new location of gas line and associated land requirements. Economics assessment should also include access changes.	
	4F. Productivity of land	Phil Osborne	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All positive effects.	
	4G. Public access to and along the coastal marine area	Gavin Lister Sean Burke	**SCORE: +1** **REASONS:** **<u>Access to CMA (-1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. The option maintains existing walking and cycling connection to the CMA. An additional shared path is provided seaward of the proposed embankment.	**SCORE: +1** **REASONS:** **<u>Access to CMA (+1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections with the addition of the embankment coastal edge connection.	**SCORE: +1** **REASONS:** **<u>Access to CMA (+1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections with the addition of the embankment coastal edge connection. Consequently there is a small improvement in access.	**SCORE: +1** **REASONS:** **<u>Access to CMA (0)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections to the CMA. An additional shared path is provided seaward of the proposed embankment and structure in the vicinity of Galway Street.	The evaluation was based on the following categories: - visual - quality - physical. Alternative Option, Selwyn Street Connection, overall score 0. Alternative Option, Additional Access to wharf area, overall score 0.	Level of remedy and mitigation this project promises in terms of landscape for the road needs to be quite high. Mitigation design is key to the scores and changes may be seen as a result. Pedestrians and cyclists on the waterside. Note: Keep opportunities for mitigation as opportunities rather than part of the project.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			The option provides no direct connection to the water. The portion on the bridge structure is further removed from the CMA (physical connection to water) than is currently the case. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to modern standard. **Visual Connection (+1)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option is substantively similar to the existing scenario with the exception of the proposed new bridge structure adjacent Aotea Sea Scouts. By its nature this structure will provide greater visual connection to the Manukau Harbour than currently existing. **OTHER COMMENTS:** signals in this network present better opportunity for connection to the shore. **ASSUMPTIONS:** -	Consequently there is a small improvement in access. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to modern standard. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option does not substantively change the existing level of visual connection. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to current standard. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option does not substantively change the existing level of visual connection. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	The option provides no connection to the water and as such is consistent with the current situation. Overall response is neutral. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. This option provides an improved quality of access due to construction to modern standards. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option is substantively similar to the existing scenario. The proposed bridge will not accommodate walking and cycling, and will not increase visual connection to the harbour. The proposed walkway to the seaward side of the embankment in the vicinity of Galway Street will offset loss of visual connection from the Waikaraka walkway. Overall, this option is neutral. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Natural Environment	5A. Natural Landscape / Character	Gavin Lister Sean Burke	**SCORE: -3.5** **REASONS:** **<u>Natural Landscape (-4)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option builds over the natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility and defines the crater breach allowing historic tidal access. Overall the option will significantly adversely affect the legibility of the natural feature. Bridges proposed on the western edge of the natural feature will further reduce its legibility, particularly closing off the tidal breach. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as an SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has	**SCORE: -3** **REASONS:** **<u>Natural Landscape (-3)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option trenched portion will require removal of a portion of the Tuff Ring which is considered adverse. The option will remove a portion of the remnant saltmarsh. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as a SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial	**SCORE: -4** **REASONS:** **<u>Natural Landscape (-3)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option requires ramps to be built over tuff ring reducing its legibility and necessitating some removal of the feature. In particular the southwest return portion of the tuff ring will be adversely affected. This portion is important as it strongly contributes to the form of the ring and definition of the original tidal breach. The option largely preserves the SEA. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as an SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has been highly modified through historic infilling of	**SCORE: -2** **REASONS:** **<u>Natural Landscape (-2)</u>** The Hopua Crater constitutes an SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option reduces impact on the natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility of the tuff ring as it defines the crater breach allowing historic tidal access. While the option reduces actual effects on the Tuff ring the proposed bridge and retaining wall structures will reduce its legibility. The proposed walking and cycling route is likely to impact on the volcanic outcrop adjacent the Aotea sea scouts. The proposed expressway alignment within the CMA between Onehunga Harbour Road and Galway Street will remove some and land lock the remainder of existing mangrove and saltmarsh vegetation providing a potential adverse effect on underlying vegetation patterns. **<u>Natural Character (-2)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a	Key consideration for the evaluation included: - coastal edges - topography - ONF/Geological features - vegetation. Alternative Option, Selwyn Street Connection, overall score -3.5. Alternative Option, Additional Access to wharf area, overall score 0.	Opportunity to purchase tuff land and put it in as public land.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by SH20 and the adjacency of MHX has further modified the feature. The SEA presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature natural character is assessed as low-moderate. This option builds over the outstanding natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility of the ONF and defines the crater breach allowing historic tidal access. Overall the option will significantly adversely affect the legibility of the natural feature. The option builds bridge structures against the feature as well as extending the road network around the feature perimeter and adds additional road way to the crater basin. These additional built elements will affect the existing balance of natural character. The cumulative effects	and residential buildings on its rim. Further modification from the perimeter road and the bisection by State Highway 20 and the adjacency of MHX has further modified the feature. The Significant Ecological Area presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature natural Character is assessed as low-moderate. This option removes a portion of the Tuff ring particularly to the south east (it appears the North West portion has been previously removed) and removes a portion of the significant ecological area. Due to cumulative effect on these elements the option is assessed as adverse. The natural character effects are largely driven by the additional roadway formed within the CMA under MHX. A further contribution is provided through the reduction of and proximity to the significant ecological area as the roads move closer. The option is assessed as reducing natural character to Low on a	the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by State Highway 20 and the adjacency of MHX has further modified the feature. The Significant Ecological Area presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature Natural Character is assessed as low-moderate. This option requires ramps to be built over tuff ring reducing its legibility and necessitating some removal of the Outstanding Natural Feature. In particular the southwest return portion of the tuff ring will be adversely affected. This portion is important as it strongly contributes to the form of the ring and definition of the original tidal breach. The natural character effects are largely driven by the additional roadway formed within the CMA under MHX with a contribution provided through the reduction of and proximity to the significant ecological area. The option is assessed as reducing natural character to Low on a scale of Pristine	portion of the southwestern crater floor as an SEA (Land Based) The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater has been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by SH20 and the adjacency of MHX has further modified the feature. The SEA presents on site as a saltmarsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature existing natural character is assessed as low to moderate. This option avoids the tuff ring southeast of SH20. It builds bridge structures and retaining walls against the feature as well as extending the road network around the feature perimeter while creating additional road way to the crater basin. These additional built elements will affect the existing balance of natural character due to their presence and visibility. The SH20 north bound off ramp is in the same position as existing and therefore will not adversely affect the existing saltmarsh area.		

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			provided by this option are expected to reduce the natural character balance to low overall on a scale from Pristine to Highly Modified. The cumulative effects proposed by this option will adversely affect the outstanding natural feature due to reduction in legibility and further loss of original form. **OTHER COMMENTS:** **-** **ASSUMPTIONS:** **-**	scale of Pristine to Highly Modified. **OTHER COMMENTS:** Note: Structures in or on the tuff ring. What is the impact, covering is positive from a landscape/visual perspective. **ASSUMPTIONS:** -	to Highly Modified. **OTHER COMMENTS:** **-** **ASSUMPTIONS:** **-**	An additional bridge structure will terminate Galway Street and will connect to the expressway. Both these elements are within the CMA and will provide some adverse effects on the existing balance of natural character. Overall due the presence of additional structures within and adjacent to the CMA will reduce the existing natural character balance to low. However, the option reduces effects on the ONL which is considered positive and is reflected in the scoring of this option. **OTHER COMMENTS:** - **ASSUMPTIONS:** -		
	5B. Water quality - Stormwater - groundwater	Tony Cain Ann W	**SCORE:** **SW: +2** **GW: -1** **REASONS:** Alignment of Northbound on ramp to SH20, impacts on existing stormwater treatment pond. However, this can be rebuilt in a slightly different location within the current NZTA designation. All local roads within the interchange would receive proprietary stormwater treatment using proprietary devices as a matter of course. Therefore overall all roads would be receiving	**SCORE:** **SW: 0** **GW: -2** **REASONS:** Alignment of Northbound off ramp from SH 20 impacts on the "salt marsh" areas within the Tuff ring, from Water Quality perspective this would have no effect on the road runoff treatment but may have potential impact on groundwater. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a	**SCORE:** **SW: +2** **GW: -1** **REASONS:** Alignment of Northbound on ramp to SH20 may impacts on the existing SW treatment pond within the Tuff ring. However, this can be rebuilt in a slightly different location within the current NZTA designation. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a matter of course.	**SCORE:** **SW: +2** **GW: 0** **REASONS:** Slightly better alignment with respect to water quality as it provides additional area in which to provide a new sw wetland. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a matter of course. Therefore, overall all roads would be receiving SW treatment, where currently none exists. No effects on groundwater.	Basalt under the tuff which is how water passes, 10m deep. Basalt is the main aquifer. Stormwater disposal would be a challenge.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			SW treatment, where currently none exists **OTHER COMMENTS:** Cuts and retaining walls on mostly the east of the interchange if permanently drained may result in ground settlement affecting existing building to the north-east. **ASSUMPTIONS:** Adequate separation will be provided and maintained between sw treatment ponds and the natural saline lake to avoid changes to water quality and levels.	matter of course. Therefore, overall all roads would be receiving SW treatment, where currently none exists In addition the cut and cover tunnel would sever the SW pipework off the existing SW channel running parallel to Gloucester Park Road and additional land and also route would need to be defined to maintain the existing SW flow path. **OTHER COMMENTS:** The tunnel will impede ground water flow, resulting in ground water level on up gradient side and lowering on the seaward side. This may allow further saline intrusion on the seaward side, and increase flooding on the up gradient side. **ASSUMPTIONS:** Same as that for Option 1.	Therefore, overall all roads would be receiving SW treatment, where currently none exists. **OTHER COMMENTS:** Similar effect as that for Option 1. **ASSUMPTIONS:** Same as that for Option 1.	**OTHER COMMENTS:** **ASSUMPTIONS:** **ASSUMPTIONS:** Same as that for Option 1.		
	5C. Ecological resources	Sharon De Luca Leigh Bull Eddie Sides Katherine Muchna Shona Meyers	**SCORE: -2** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Avi-Fauna: -2; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** effect from bridge piers for road – moderate magnitude – effect	**SCORE: -3** <u>Marine Ecology: -2; Terrestrial Vegetation: -3; Avi-Fauna: -3; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** walking and cycling route impinges on CMA - low magnitude of effect –	**SCORE: -3** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Avi-Fauna: -3; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** walking and cycling route within CMA – low magnitude of	**SCORE: -2** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Herpetofauna: -2; Avi-Fauna: -2</u> **REASONS:** Similar effects to the Option 1. Avoids salt marsh and no additional bund reclamation in the Galway Street area,		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			low. **<u>Terrestrial Vegetation:</u>** avoids wetland, ramps built over ground of volcanic feature (ONF) - impact on wetland nil to negligible, but for the ONF (geological feature) moderate magnitude, overall effect low. **<u>Avi-Fauna:</u>** effect from bridge piers for road, potential loss of some shorebird foraging habitat – negligible magnitude – effect low. **<u>Herpetofauna:</u>** effect from disturbance/removal/shading to restoration planting area under SH20 onramps and off ramps – moderate magnitude – value medium. **OTHER COMMENTS:** None **ASSUMPTIONS:** **<u>Marine Ecology:</u>** Neilson Street: - assumed moderate ecological values. **<u>Terrestrial Vegetation:</u>** It is assumed that wetland identified as SEA, in association with volcanic crater, is of moderate ecological value. It is an ONF of regional value.	effect low. **<u>Terrestrial Vegetation:</u>** edge of wetland impacted; ONF impacted by trench - moderate magnitude for both wetland and ONF. **<u>Avi-Fauna:</u>** walking and cycling route impinges on CMA, potential loss of some shorebird foraging habitat - low magnitude of effect – effect moderate. **<u>Herpetofauna:</u>** effect from removal of some of wetland/grass habitat, but remaining area bisected by road - low magnitude of effect – value medium. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.	effect – effect low. **<u>Terrestrial Vegetation:</u>** edge of wetland affected but less than above; ramps built over ground of ONF - low impact on wetland, moderate magnitude for ONF – overall. **<u>Avi-Fauna:</u>** walking and cycling route within CMA, potential loss of some shorebird foraging habitat – low magnitude of effect – effect moderate. **<u>Herpetofauna:</u>** effect from disturbance/removal/shading to restoration planting area under SH20 onramps and off ramps – moderate magnitude – value medium **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.	**OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			NB: we have considered volcanic crater in our ecological assessment but it is a geological feature. However the two features are ecological interrelated, which is why it is included in our assessment. **<u>Herpetofauna:</u>** The vegetation on the Neilson St interchange is isolated, and restoration planting although good quality for lizards, looks relatively recent so skinks are unlikely. As such, the following scores are very conservative, assuming native skinks are present. This has been scored presuming no mitigation/lizard salvage.					
	5D. Coastal environment and resources	Stephen Priestley	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Not applicable	
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Mana whenua groups provided feedback at a hui held on 6 May 2016. Notes have been recorded in the hui minutes.	
	6B. Archaeological and built heritage	Matt Felgate (Archaeology) Bruce Petrie (Built Heritage)	**SCORE: -1** **REASONS:** The works associated with the link road may generate minor archaeological effects.	**SCORE: -3** **REASONS:** Permanent adverse impact at a local level which can be mitigated to some extent, effects on potential archaeological remains i.e. the former foreshore and tuff ring /	**SCORE: -1** **REASONS:** The works associated with the link road may generate minor archaeological effects.	**SCORE: 0** **REASONS:** No differentiable effect.	Bruce had no comments to make to this criterion.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
				archaeological site. **OTHER COMMENTS:** **ASSUMPTIONS:** Cut and cover construction methodology.				
			OTHER COMMENTS: **ASSUMPTIONS:** -		**OTHER COMMENTS:** **ASSUMPTIONS:**	**OTHER COMMENTS:** **ASSUMPTIONS:**		

East West Link – Multi-Criteria Analysis – Anns Creek Outcomes Report

Record of Process:

a) Workshop date: 8 April 2016
b) Comments received: 4 May 2016 and then 4 July 2016
c) Finalised: 26 May 2016
d) Updated: 4 July 2016.

Status: Final

General Comments (from the Option Design Pack issued for the MCA dated 22 March 2016, the revision issued on 15 April 2016 and the workshops on 5 May 2016 and 27 June 2016) that informed assessment:

All options:

- Majority of the area is occupied as rail corridor.
- Area is ecologically significant.
- Transpower towers (towers) affected (x3).
- Mighty River Power (MRP) site affected in some options.

Option 1:

- Alignment avoids MRP site.
- Easterly movement only, HJDr.
- Park contaminated and within/near a Significant Ecological Area (SEA).
- A tower needs to be raised due to the alignment being raised
- Cycle way is separated from the alignment at HJDr.
- Cycle way running along the south of the alignment for better outlook/aesthetics.
- Cycle connection to AMETI and cycle connection to the south, possible opportunities.
- No impact on gas main.

Option 2:

- Alignment runs through MRP site.
- Signalised intersection at HJDr and EWL (two manoeuvers), safe left turn east bound, pressure to allow right turn travelling west bound, HJDr reviewed (a bit more land required on either side).
- Ramps to reduce disturbance of the contaminated park area.
- Possible impact on gas main from construction of abutments.
- A tower may need to be raised by 1m over HJDr.
- Pedestrian and cycle way delays for crossing.
- 2-3m high existing embankment, coastal cycle way under the EWL along the railway to HJDr.

Option 3:

Notes: MCA Workshop #3, Anns Creek

- Similar to Option 2 but rather than a signalised intersection at HJDr a free flow movement is proposed with a roundabout for the link to HJDr.
- This alignment reduces ramp radii but has a larger impact on the natural features.
- Ramps would disturb contaminated park area.
- Cycle way runs along EWL. Cyclist travelling west bound will be directed beneath EWL to link with HJDr.
- Structures have been added where there are planning overlays. All other locations have embankments.
- Possible impact on gas main from construction of abutments.
- Requires at least 1 tower to be raised.

Option 4:

- Alignment avoids MRP site, Anns Creek ecological sites and CMA.
- HJDr east bound left turn not signalised and west bound via slip lane. HJDr will pass under EWL.
- EWL encroaches the Ports land.
- Spans over the railway are longer than other options.
- Ramp installation will likely disturb contaminated parks site.
- Walking and cycling facility will run along the southern part of EWL.
- Requires at least 3 towers to be raised.
- No impact on gas main.
- The variables considered under this option included ramps to and from EWL onto HJDr, and T-Intersection (EWL and HJDr) controlled by signals. As well as how much of the alignment is on structure or over an embankment.

Option 5:

- Alignment mostly avoids MRP site however will pass through the Anns Creek ecological sites and CMA.
- Signalised intersection at HJDr and EWL, left turn out only east bound from HJDr.
- EWL encroaches the Ports land.
- Long span over railway corridor (~90m).
- Cycle way is separated from the alignment at HJDr.
- Cycle way running along the south of the alignment for better outlook/aesthetics.
- Moderate impact on high pressure gas mains (both Westfield-Hillsborough and Oaonui-Southdown) which will need to be relocated. Gas station main line valve will need to be relocated away from beneath the bridge.
- No towers are required to be relocated or modified.
- Preferable horizontal and vertical geometric alignment.

A mana whenua perspective on imperatives to this MCA process:

The *East West Modal Link Project Team (EWMLP)* seeks to incorporate mana whenua values in order to understand issues and opportunities for inclusion in the design, construction, operation as well as the maintenance of this project. In this context four key aspects are expressed as cornerstones being economic, social, cultural as well as environmental - terms that align with the holistic wellbeing in the intergenerational succession for those mana whenua entities engaged with the *emerging relationship* for the EWL project.

Notes: MCA Workshop #3, Anns Creek

The inclusion of the listed Mana Whenua entities as Treaty partners adds both richness as well as complexity. The overarching policy aim is *to increase real, per capita human welfare resulting in wellbeing* through the EWMLP developments. The accrued outputs from this *emerging relationship* are expected to create genuine savings on a continuing basis, consistent with the agreed cultural, economic, environmental and social objectives.

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
Performance against project objectives	*Obj 1. Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +3** **REASONS:** HJDr link adds resilience and improved access without delay on EWL. It could be difficult to manage too much through traffic on HJDr. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** HJDr link adds resilience and improved access but with extra signal delay on EWL. However, signals could help to manage thru traffic on HJDr. Potential constraint from the structure at GSR and EWL intersection. Slightly lower impact overall compared with Option 1 but not to a whole point reduction **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** HJDr link adds resilience and improves access without delay on EWL. It could be difficult to manage too much through traffic on HJDr. Potential constraint from the structure at GSR and EWL intersection. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** HJDr link adds resilience and improved access without delay on EWL. It could be difficult to manage too much through traffic on HJDr. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Indistinguishable from other options. **OTHER COMMENTS:** **ASSUMPTIONS:** -	Regionally significant element but impact is less as common to all. Hence scale up to +4. Connection gives opportunity to access HJDr but need to balance this against too much through-traffic. HJDr connection adds to resilience. Grade Separation at GSR would improve reliability and endurance but increase speed environment and risk loss of connections to HJDr drive and create weave issues on Sylvia Park Road.	
	Obj 2. Improved safety for pedestrians and cyclists Improved accessibility for local cycling and walking Improved accessibility for regional cycling and walking (strategic network)	Alison / Julian	**SCORE: +3** **REASONS:** Significant link reduction from existing cycle route to that proposed. Local link is restricted to HJDr. **OTHER COMMENTS:** Preference is to have the path on the northern side of EWL- views. **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** Preference is to have the path on the northern side of EWL- views. **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** Preference is to have the path on the northern side of EWL- views. **ASSUMPTIONS:** Missing link between north side between HJDr and GSR (presumed this is an oversight in mapping and can be fixed).	**SCORE: +3** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** Preference is to have the path on the northern side of EWL- views. **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Same reasons as that for Option 1. **OTHER COMMENTS:** Preference is to have the path on the northern side of EWL- views. **ASSUMPTIONS:** -	Key indicators: - Safety - Local links - Regional links. At the moment if people want to ride this route they are doing it onroad with many heavy vehicles. This significantly improves the situation through separate cycle way provision. Linking into destinations at HJDr. No other destinations in vicinity. Sub-Regional Audience. Contributing to a strong regional link into Sylvia Park.	
	Obj 3. Improved journey time reliability for buses between SH20 and Onehunga town centre	Andrew	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	**SCORE:** **REASONS:** **OTHER COMMENTS** None	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	**SCORE:** **REASONS:** **OTHER COMMENTS:** None	Not assessed as objective is relevant to Onehunga connection.	Wider connections: Local Board Plans and greenways connections for walkway and cycle way along the kiwi rail land. Frequent Network 32 which is providing bus connections between Mangere, Otahuhu

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -		and Sylvia Park.
Road safety	1A. User Safety	Lloyd / Julian	**SCORE: +2** **REASONS:** A tighter geometry that slows traffic. No pedestrian conflict with incorporation of an underpass. Traffic pulled off the local road network. Weave issues with GSR and west bound off ramp. Merge/diverge, creates a conflict point but traffic movements do not cross opposing traffic. **OTHER COMMENTS:** None **ASSUMPTIONS:** All options assume the same cross section of roadway on structures. All options assumes designs meet necessary standards for geometrics and edge protection safety	**SCORE: +1** **REASONS:** Speed similar to base option due to straight alignment. Pedestrians to cross intersection at-grade, with traffic signals. Traffic pulled off the local road network. No significant weave. Merge creates a conflict point but traffic movements do not cross opposing traffic. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that stated for Option 1.	**SCORE: +1** **REASONS:** Speed similar to base option due to straight alignment. No pedestrian conflict with incorporation of an underpass. Traffic pulled off the local road network. Weave issues with GSR and west bound off-ramp. Merge/diverge, creates a conflict point but traffic movements do not cross opposing traffic. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that stated for Option 1.	**SCORE: +2** **REASONS:** A tighter geometry slows traffic. No pedestrian conflict with incorporation of an underpass. Traffic pulled off local road network. Slight weave issue with GSR and west bound off ramp. Merge/diverge, creates a conflict point but traffic movements do not cross opposing traffic. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that stated for Option 1.	**SCORE: +2** **REASONS:** Same reasons as that for Option 4. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that stated for Option 1.	Base case is neutral and assumes: - straight Roadway - pedestrians crossing at-grade, without traffic signals - pulls traffic off local roads - no intersection so no traffic conflict - does not have a weave issue with GSR.	
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: -2** **REASONS:** This option impacts on towers, crosses the gas line, and crosses two rail corridors that require a long span. **OTHER COMMENTS:** - **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** This option impacts on towers, one which may needs to be raise, crosses over rail but shorter, crosses over gas line at three locations that may need one to be relocated. **OTHER COMMENTS:** **-** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** One tower is affected and the gas line is affected at five locations. **OTHER COMMENTS:** - **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** This option impacts on towers, crosses the gas line and two rail corridors that may require a long span. **OTHER COMMENTS:** - **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Less impact than that from Option 4. It does not impact on towers in KiwiRail land, and does not impact as adversely on rail sidings. Similar impact on high pressure gas line just at different locations. The line south of MRP has a gas take off point that will require relocation. **OTHER COMMENTS:** - **ASSUMPTIONS:** -		

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
	2B. Construction Cost	Noel	**SCORE: -3** **REASONS:** Southdown Reserve, timing – regional level, stormwater and stream crossing, tower relocation and dealing with asbestos are the key challenges with this option. **OTHER COMMENTS:** Alternative connection to HJDr could reduce construction issues with Southdown Reserve. **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** This option presents a longer structure, has substation conflict and presents a simpler connection to HJDr. MRP property may not be available. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** The key areas of concern relate to cut within the contaminated area, gas main relocation, substation and dealing with asbestos. MRP property may not be available. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Dealing with asbestos and the Scout bound reserve are the key challenges. Slight reduction in costs for a T intersection. **OTHER COMMENTS:** Alternative connection to HGDr could reduce property impacts **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Construction over water is slightly more complex than on land, assuming use of super Tees with a 35m span" however possibly not a point difference. **OTHER COMMENTS:** Alternative connection to HGDr could reduce property impacts **ASSUMPTIONS:** -		The reserve area may be an opportunity.
Operation	3A. Operational Cost	Noel	**SCORE: -1** **REASONS:** Operational costs do not differ significantly. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Operational costs do not differ significantly. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Operational costs do not differ significantly. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Operational costs do not differ significantly. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Operational costs do not differ significantly based on an assumption the construction of concrete. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Accessibility Contamination.	
Social & Economic	4A. Construction Impact	Amelia	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** - **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All options have a similar construction impact. Impact on residents (none in the direct vicinity), so the impact is mainly from public using cycle way and walkway (leisure and commuter). Also disruption for businesses on HJDr would be similar for all options.	
	4B. Built Form and Amenity	Lynne	**SCORE: -2** **REASONS:** This option presents grade separation, while high, the structure is tucked back towards the shore, and has	**SCORE: -2** **REASONS:** At grade HJDr connection has least impact in terms of perceived extent of structure.	**SCORE: --3** **REASONS:** A large footprint and convoluted movements – not particularly legible.	**SCORE: -3** **REASONS:** Large footprint and grade separated.	**SCORE: -3** **REASONS:** When compared with Option 4, pulling the structure further south will increase its visibility from	Negligible impact on lot pattern or built form in this section. Visual impact of the EWL structures – most relevant. Base case: only	Design mitigation - form of bridge, particular attention to minimising number / area of columns in CMA; slender horizontal emphasis;

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			potential to be screened on the inlet side. **OTHER COMMENTS:** Grade separation is required for this option if the MRP site is to be retained as a viable land use with access there is no change to vertical alignment therefore no effect on score if there was no HJDr connection. **ASSUMPTIONS:** Access still required from HJDr to Mighty River Power site therefore needs underpass – HJD becomes underpass for local traffic and for pedestrian/cycle link to bund shared path and foreshore path	**OTHER COMMENTS:** No HJDr connection means no visual impact in relation to elevated structure views from the inlet. **ASSUMPTIONS:** -	**OTHER COMMENTS:** No HJDr connection still needs elevation to cross rail corridors but large reduction in ramps / footprint assumed, so goes from -3 to -2. **ASSUMPTIONS:** Access still required from HJDr to Mighty River Power site therefore needs underpass – HJDr becomes underpass for local traffic and for pedestrian/cycle link to bund shared path and foreshore path	**OTHER COMMENTS:** No HJDr connection reduces visual impact because no grade separated structures but not to affect score **ASSUMPTIONS:** -	the existing cycle / walking path (it is understood the EWL structure will be approx. 10m above MHWS in this location), with the walking path going beneath the structure in two locations. The form (and detailing) of the underside of the structure will be important along this edge, where visible from the existing pathways and particularly where the pathways pass beneath. **OTHER COMMENTS:** - **ASSUMPTIONS:** -	elevated structure is small existing pedestrian /cycle rail overbridge No HJDr connection, removes existing pedestrian/cycle link that is part of urban structure / movement network – consideration for legibility as well as connectivity but can be mitigated with new bridge GSR grade separation is possible. This would increase footprint of interchange considerably even though would be fewer lanes. There will be no change to the score.	integrated of landscape with bridge design
	4C. Connectivity,	Lynne / Alison	**SCORE: +3** **REASONS:** There are positives common to all options. Differentiators include walk uphill at steeper grade and the option goes under EWL. Benefits include retention of recreational route as well as direct through route. Enhanced (elevated) views of inlet. Good casual surveillance from roadway	**SCORE: +3** **REASONS:** There are positives common to all options. The key differentiator is grade signalised crossing of EWL, which is optimum for visibility. Benefits include retention of recreational route as well as direct through route. Good casual surveillance from roadway.	**SCORE: +2** **REASONS:** There are positives common to all options. Differentiators include: - HJDr is convoluted and isolated. - Underpass under EWL. - Issues of isolation and lack of passive surveillance are not resolved for those going to and from HJDr.	**SCORE:+2** **REASONS:** There are positives common to all options. Differentiators include pedestrian/cyclists crossing un-signalised off ramp, which is a safety issue.	**SCORE: +2** **REASONS:** The existing walking / cycle path will need to go beneath the structure in two locations – while it is understood that there will be sufficient clearance for pedestrians and cyclists beneath structure, this provides a connection that is not as open as existing connections. The form (and detailing) of the underside of the structure will be important in these	Base case – existing distance HJDr to Sylva Park is 3.5km via road network. Foreshore shared path experience in this section is currently 'recreational', although views are limited through this section by mangroves. All options contribute to strong regional link into Sylvia Park and more direct route from Mangere Inlet, with cycling currently on road with	No HJDr connection presents potential remains for pedestrian/cycle overbridge linking HJDr with foreshore paths even if no vehicular connection For the GSR grade separation the quality of experience / CPTED issues for all options depend on having pedestrians/cyclists at grade as much as possible and with

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
							locations. **OTHER COMMENTS:** -	many heavy vehicles. This significantly improves the situation through separate cycle way provision. Safety risk significantly reduced. No HJDr connection would remove some safety risks identified with the options, but potentially detracts from functionality of shared path network / strategic links to Sylvia Park & local area. It creates severance of existing path / desire line. It also removes ability for shared path users to exit, particularly impacts on perception of safety (CPTED) as well as actual movement choice. GSR grade separation could potentially improve safety for pedestrians / cyclists with less crossing distance / fewer lanes. Unresolved where / how pedestrians/cycles come up to grade to connect to GSR shared paths (ref. AT cycle map) and Sylvia Park Road if shared path is to be on the south side.	choice of routes / clear and safe connections to GSR.
			OTHER COMMENTS: No HJDr connection would score +1. **ASSUMPTIONS:** No difference between options in access for vehicles between EWL and HJDr (i.e. No E the N travel) Opportunity: Minimise length of underpass-maximise openness of underpass and clear views. Lighting also.	**OTHER COMMENTS:** No HJDr connection would score +1. **ASSUMPTIONS:** -	**OTHER COMMENTS:** No HJDr connection would score +1. Potential remains for pedestrian/cycle overbridge linking HJDr with foreshore paths even if no vehicular connection. **ASSUMPTIONS:** - No difference between options in access for vehicles between EWL and HJDr (ie. No E the N travel) Opportunity: Minimise length of underpass-maximise openness of underpass and clear views. Lighting also.	**OTHER COMMENTS:** No HJDr connection would score +1. **ASSUMPTIONS:** - No difference between options in access for vehicles between EWL and HJDr (ie. No E the N travel) Opportunity: Minimise length of underpass-maximise openness of underpass and clear views. Lighting also.	**OTHER COMMENTS:** - **ASSUMPTIONS:** -		
	4D. Quality of living environment - Community facilities - Parks - Air quality - Noise - CPTED	Amelia	**SCORE: -1** **REASONS:** Impact on Southdown Reserve from construction of HJDr link as you are reducing this area, however EWL provides a 'barrier' between reserve and asbestos dump site which is potentially a positive outcome. **OTHER COMMENTS:** None	**SCORE: 0** **REASONS:** No land take from Southdown Reserve, however there is no opportunity to provide a buffer to the southern site, so 'no change'. **OTHER COMMENTS:** None	**SCORE: -1** **REASONS:** No land take from Southdown Reserve, however there is no opportunity to provide a buffer to the southern site, so 'no change'. Cycling connections under EWL structure. **OTHER COMMENTS:** None	**SCORE: -1** **REASONS:** At grade crossing for the west bound off-ramp with no signals with a shared path that goes under EWL to HJDr. There is a small property take from reserve, 'barrier' provided between reserve and asbestos dump site, potential being a positive outcome. No change to the T intersection. **OTHER COMMENTS:** None	**SCORE: -1** **REASONS:** As for Option 4, recognising that slight shift of alignment to the south may reduce scale of impacts (e.g. potentially closer to 0). **OTHER COMMENTS:** None	The Southdown Reserve is classified as a reserve and zoned for open space, however it is not currently utilised as a community facility due to the on-going risk of asbestos exposure from the site to the south which is a known historical asbestos dump.	Opportunity to improve if we remediate contamination of the park (and if risk of asbestos exposure is reduced by earthworks/remediation on site to the south).

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: That contamination from the reserve is primarily from the site to the south and that a barrier would reduce contamination in reserve.	**ASSUMPTIONS:** Level crossing for pedestrians and cyclists accessing HJDr.	**ASSUMPTIONS:** Cycling connections under new link.	**ASSUMPTIONS:** That contamination from the reserve is primarily from the site to the south and that a barrier would reduce contamination in reserve.	**ASSUMPTIONS:** -		
	4E. Viability of land areas	Phil Osborne	**SCORE: -1** **REASONS:** Larger land take price rather than use, differentiator is the area of land required. All localised impact. This option may impact a building. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Larger land take price rather than use, differentiator is the area of land required. All localised impact. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	**SCORE: -1** **REASONS:** Larger land take price rather than use, differentiator is the area of land required. All localised impact. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	**SCORE: -2** **REASONS:** Greater land take. Inclusion of Port land increases overall impact on vulnerability. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Reduced land take than Option 4 and not reducing vulnerability of the business activity affected. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4F. Productivity of land	Phil Osborne	**SCORE: +3** **REASONS:** This option and Option 3 have very similar impact. Regional level due to HJDr connection. No HJDr would reduce the scoring. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Regionally significant positive impact. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	**SCORE: +3** **REASONS:** This option and Option 1 have very similar impact. Regional level due to HJDr connection. No HJDr would reduce the scoring. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	**SCORE: +3** **REASONS:** No change to overall productivity. Differentiates between local and regional traffic. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Regionally significant positive impact. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4G. Public access to and along the coastal marine area	Gavin Lister George Woolford	**SCORE: +2** **REASONS:** **<u>Access to CMA (+2)</u>** Potential impediment of existing route – retention under bridge structure assumed possible near rail corridor but requires clarification. Crossing point required end of Hugo Johnston Dr where	**SCORE: +2** **REASONS:** **<u>Access to CMA (+2)</u>** Potential impediment of existing route – retention under bridge structure assumed possible near rail corridor but requires clarification. Crossing point required end of Hugo Johnston Dr where	**SCORE: +2** **REASONS:** **<u>Access to CMA (+2)</u>** Potential impediment of existing route – retention under bridge structure assumed possible near rail corridor but requires clarification. Crossing point required end of Hugo Johnston Dr where	**SCORE: +2** **REASONS:** **<u>Access to CMA (+1)</u>** Existing walking and cycling connections are provided by the Waikaraka Cycleway including connections from the west (Onehunga, Waikaraka Cemetery and Miami	**SCORE: +2** **REASONS:** Same reasons as that for Options 1 to 3.	Quality and visual connectivity.	

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			currently access is unimpeded. Provision of additional access from Great South Road and Sylvia Park road will open CMA access to a wider catchment, provide additional choices and is considered positive. **<u>Quality of Access (+1)</u>** Existing quality of access is variable. Existing access is quite overgrown / dilapidated with limited sightlines. Conversely existing access has moderate natural values provided by mangrove fringe and saltmarsh. Proposed access at minimum standard will provide greater than existing quality of access in terms of physical parameters. However offset by loss of experiential quality due to immediate presence of the motorway. Overall requires generous design intervention to	currently access is unimpeded. Provision of additional access from Great South Road and Sylvia Park road will open CMA access to a wider catchment, provide additional choices and is considered positive. **<u>Quality of Access (+1)</u>** Existing quality of access is variable. Existing access is quite overgrown / dilapidated with limited sightlines. Conversely existing access has moderate natural values provided by mangrove fringe and saltmarsh. Proposed access at minimum standard will provide greater than existing quality of access in terms of physical parameters. However offset by loss of experiential quality due to immediate presence of the motorway. Overall requires generous design intervention to	currently access is unimpeded. Provision of additional access from Great South Road and Sylvia Park road will open CMA access to a wider catchment, provide additional choices and is considered positive. Overall the quantum of new access appears the same as in the previous two options **<u>Quality of Access (+1)</u>** Existing quality of access is variable. Existing access is quite overgrown / dilapidated with limited sightlines. Conversely existing access has moderate natural values provided by mangrove fringe and saltmarsh. Proposed access at minimum standard will provide greater than existing quality of access in terms of physical parameters. However offset by loss of experiential quality due to immediate presence of the motorway. Overall requires generous design intervention to	Creek) and east (HJDr). In the vicinity of HJDr a separate walkway provides some connectivity to the CMA through the provision of steps within the constructed low seawall. This option provides a walking and cycling route to the south of the road alignment. It is understood to have a connection to HJDr via an underpass between EWL. It is assumed that the connection to the coastal edge over the existing rail corridor will remain. The option will provide additional access along the CMA from Great South Road and Sylvia Park Road but will not provide any additional direct access to the CMA. Overall the level of existing access and that provided by the Anns Creek is considered to be of minor positive benefit. **<u>Quality of Access (+1)</u>** The existing access is from the railway overbridge at the end of HJDr. There will be some loss of amenity due to the presence of the expressway. However this will be offset by the increase of actual and perceived passive surveillance also provided by the expressway. Access along the expressway will be constructed to modern standards and will be spacious with good			

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			provide a defendable positive outcome. **<u>Visual Connection (+3)</u>** Generally poor view to the wider inlet with the exception of from the existing rail overbridge to the upper Mangere Inlet. Close views of the mangrove fringe considered relevant and indicative of the upper Mangere inlet environment. Elevated bridge structure will provide greater than existing visual connection the wider Mangere Inlet and Manukau harbor. A portion of close views to the intertidal vegetated area currently with limited visual accessibility will be provided. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	provide a defendable positive outcome. **<u>Visual Connection (+3)</u>** Generally poor view to the wider inlet with the exception of from the existing rail overbridge to the upper Mangere Inlet. Close views of the mangrove fringe considered relevant and indicative of the upper Mangere inlet environment. Elevated bridge structure and elevated embankment over Mighty River Power will provide greater than existing visual connection the wider Mangere Inlet and Manukau harbor (than in option 1). A portion of close views to the intertidal vegetated area currently with limited visual accessibility will be provided however the proposal affects a greater portion of the subject than in option 1. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	provide a defendable positive outcome. **<u>Visual Connection (+3)</u>** Generally poor view to the wider inlet with the exception of from the existing rail overbridge to the upper Mangere Inlet. Close views of the mangrove fringe considered relevant and indicative of the upper Mangere inlet environment. Elevated bridge structure and elevated embankment over Mighty River Power will provide greater than existing visual connection the wider Mangere Inlet and Manukau Harbour than in option 1. However slightly less than option 2. A portion of close views to the intertidal vegetated area currently with limited visual accessibility will be provided however the proposal affects a greater portion of the subject than in option 1 and is equivalent to option 2. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	sightlines. Overall it is considered that there will be a small positive benefit due to the increase in passive surveillance of the existing Cycle way. **<u>Visual Connection (+3)</u>** Much of the coastal edge at Anns Creek is fringed with Mangroves. Though Mangroves are in themselves indicative of the marine environment in this area, they do prevent views to the wider Mangere Inlet and Manukau Harbour. The proposed cycle and walkway will be mostly on elevated structure and will therefore provide very good visual connection the Mangere Inlet in particular and the Manukau Harbour beyond. Increased visual connection is assessed as a positive impact for the reasons given above. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -		
Natural Environment	5A. Natural Landscape / Character	Gavin Lister	**SCORE: -3** **REASONS:** **<u>Natural Landscape (-3)</u>** A high proportion of indigenous saltmarsh vegetation is present within the Anns Creek area within remaining intertidal areas and extending towards	**SCORE: -3** **REASONS:** **<u>Natural Landscape (-3)</u>** A high proportion of indigenous saltmarsh vegetation is present within the Anns Creek area within remaining intertidal areas and extending towards	**SCORE: -3.5** **REASONS:** **<u>Natural Landscape (-4)</u>** A high proportion of indigenous saltmarsh vegetation is present within the Anns Creek area within remaining intertidal areas and extending towards	**SCORE: -2** **REASONS:** **<u>Natural Landscape (-3)</u>** Anns Creek area contains a number of existing natural lava flows features between railway land between the inland port.	**SCORE: -3** **REASONS:** **<u>Natural Landscape (-3)</u>** Anns Creek Inlet is the only natural remnant of such an inlet on the northern side of Māngere Inlet. The natural landscape has a subtle but distinctive collection of		Opportunity is severance of the alignment going inland, planting opportunities under and around the structures when compared with when the alignment is within the marine

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			Mutukaroa. The saltmarsh is fronted by an established mangrove fringe. Vegetated area extends to Southdown Reserve which is similarly tidal. Anns Creek area contains a number of existing natural lava flow features between railway land between the inland port. This option limits impact on the existing saltmarsh vegetation within Anns Creek bounded by the rail sidings and Transpower Transmission Lines. This option requires an embankment over the tidal Southdown Reserve which is considered an adverse effect. This option bisects the natural geological and saltmarsh /mangrove fringe in the lower Anns Creek embayment and significantly reduces its integrity as a cohesive landscape. **<u>Natural Character (-3)</u>** Anns Creek area is identified as an SEA and Anns Creek as an ONF in PAUP. Existing lavas flows are identified as ONF in PAUP. The area is in proximity to Mutukaroa and Otahuhu	Mutukaroa. The saltmarsh is fronted by an established mangrove fringe. Vegetated area extends to Southdown Reserve which is similarly tidal. Anns Creek area contains a number of existing natural lava flow features between railway land between the inland port. This option significantly impacts on the existing saltmarsh vegetation within Anns Creek bounded by the rail sidings and Transpower Transmission Lines. This option bisects the natural geological and saltmarsh /mangrove fringe in the lower Ann's Creek embayment and significantly reduces its integrity as a cohesive landscape. In particular the alignment impacts on the large lava flow headland due to its closer proximity when compare to option 1. This option avoids Southdown Reserve which is considered positive. **<u>Natural Character (-3)</u>** Anns Creek area is identified as an SEA and Anns Creek as an ONF in PAUP. Existing lava flows are identified as ONF in PAUP. The area is in proximity to Mutukaroa and Otahuhu	Mutukaroa. The saltmarsh is fronted by an established mangrove fringe. Vegetated area extends to Southdown Reserve which is similarly tidal. Anns Creek area contains a number of existing natural lava flow features between railway land between the inland port. This option notably impacts on saltmarsh vegetation and geological outcrops within Anns Creek to a degree which is considered significant. This option affects natural vegetation in the areas identified as Marine 1 and Marine 2 SEAs however the effects are reduced due to the bridge structure. This option avoids impact natural vegetation contained within Southdown Reserve. **<u>Natural Character (-3)</u>** Anns Creek area is identified as an SEA and Anns Creek as an ONF in PAUP. Existing lava flows are identified as ONF in PAUP. The area is in proximity to Mutukaroa and Otahuhu	A high level of indigenous saltmarsh vegetation is present within the Anns Creek area within remaining intertidal areas and extending towards Mutukaroa. The saltmarsh is fronted by an established mangrove fringe. It is understood that the saltmarsh area provides habitat for vulnerable native bird species including Banded Rail and New Zealand Bitten. The Inland route avoids effects on the Anns Creek lava flows through providing a bridge structure over inland port land. Southdown Reserve is reduced by approximately half due to the presence of a fill batter proposed as part of a ramp connection to HJDr adversely affecting vegetation and tidal channels. It is understood that this area could be constructed as structure and the effects avoided. A portion of the Anns Creek saltmarsh estimated as approximately 1/10th will be removed within the area bound by the rail corridor, GSR and the Transpower transmission line. The cumulative effects of this removal are considered significant. **<u>Natural Character (-2)</u>** Anns Creek area is identified as an SEA and Anns Creek as an ONF in PAUP. Existing lavas flows are identified as ONF in PAUP. The area is in proximity to Mutukaroa and Otahuhu	features. The shoreline comprises the toe of lava flows, which in places, has a pāhoehoe surface. Areas of the lava are classified as ONF. There is a distinctive vegetation community associated with the lava which is understood to contain rare and endangered plants. Anns Creek itself contains a sequence between mudflats, mangrove forest, salt marsh, and brackish wetland. It is the remnant of an ecotone that would once have extended to a freshwater marshland around the toe of Mutukaroa-Hamlins Hill. Physical impacts of this option on the natural landscape would be limited by the extent to which the highway is on structure. However, the bridge would dominate the landscape, crossing over the inlet and bisecting the upper portion of Anns Creek. It will reduce its integrity as a cohesive landscape. In particular, it appears the bridge piers would have unavoidable adverse effects on lava features classified as ONF. This option avoids Southdown Reserve which is considered positive. **<u>Natural Character (-3)</u>** The Anns Creek area is considered to have moderate natural character. It has high natural science value because of the lava, vegetation and ecological aspects. The lava features are classified as ONF, and both land and CMA areas are classified as an SEA. At		environment. Diversity could be increased with Option 4. The corner may be reserved for other uses.

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			both of which are identified as ONFs in PAUP. Historic and current industrial land use, the rail corridor and other infrastructure including MRP have impacted on the natural character of Anns Creek. However relatively natural or under restoration natural features such as Mutukaroa (Hamlin's Hill) and Otahuhu (Mt Richmond) contribute strongly to the balance of naturalness. Particular land uses such as the railway sidings present as post-industrial. In the case of the sidings they are low set and of an immediate scale and usage sympathetic with the natural areas. The post-industrial character is reinforced by the presence of the defunct MRP Station. Together these aspects combined with the mangroves and saltmarsh has an influence on natural character by providing a landscape character that is considered 'Industrial Scenic' or as having aspects of the Sublime. On balance with particular weighting to natural areas and patterns (rather than landscape character) the existing natural character is assessed as Moderate. This option limits impact on the upper significant ecological area which is identified as land. This option affects the Marine 1 and Marine 2 SEAs however the effects are reduced due to the bridge structure. Natural character is adversely affected by the	both of which are identified as Outstanding Natural Features in the PAUP. This option adversely impacts on the upper significant ecological area which is identified as land This option affects the Marine 1 and Marine 2 significant ecological areas however the effects are reduced due to the bridge structure compared to an embankment in the same location. This option avoids impact on Southdown Reserve (significant ecological area). Historic and current industrial land use, the rail corridor and other infrastructure including Mighty River Power have impacted on the Natural Character of Ann's Creek. However relatively natural or under restoration natural features such as Mutukaroa (Hamlin's Hill) and Otahuhu (Mt Richmond) contribute strongly to the balance of naturalness. Particular land uses such as the railway sidings present as post-industrial. In the case of the sidings they are low set and of an immediate scale and usage sympathetic with the natural areas. The post-industrial character is reinforced by the presence of the defunct Mighty River Power Station. Together these aspects combined with the mangroves and saltmarsh have an influence on Natural Character by providing a landscape character that is considered 'Industrial Scenic' or as having	both of which are identified as ONF in PAUP. This option adversely impacts on the upper significant ecological area which is identified as land. This option adversely impacts the Significant Natural Feature adjacent MRP. This option affects the Marine 1 and Marine 2 SEAs however the effects are reduced due to the bridge structure compared to an embankment in the same location. This option avoids impact on Southdown Reserve (SEA). Historic and current industrial land use, the rail corridor and other infrastructure including MRP have impacted on the natural character of Anns Creek. However relatively natural or under restoration natural features such as Mutukaroa (Hamlin's Hill) and Otahuhu (Mt Richmond) contribute strongly to the balance of naturalness. Particular land uses such as the railway sidings present as post-industrial. In the case of the sidings they are low set and of an immediate scale and usage sympathetic with the natural areas. The post-industrial character is reinforced by the presence of the defunct MRP Station. Together these aspects combined with the mangroves and saltmarsh have an influence on natural character by providing a landscape character that is considered Industrial Scenic or as	both of which are identified as ONFs in PAUP. The inland layout will have significant effects on natural features/landscapes including geological features. These effects can be substantially reduced through extending the bridge structure at least through to HJDr and provision of a retained section to reduce land take from the Anns Creek SEA. Historic and current industrial land use, the rail corridor and other infrastructure including MRP have impacted on the natural character of Anns Creek. However relatively natural or under restoration natural features such as Mutukaroa (Hamlin's Hill) and Otahuhu (Mt Richmond) contribute strongly to the balance of naturalness. Particular land uses such as the railway sidings present as post-industrial. In the case of the sidings they are low set and of an immediate scale and usage sympathetic with the natural areas. The post-industrial character is reinforced by the presence of the defunct MRP Station. Together these aspects combined with the mangroves and saltmarsh have an influence on natural character by providing a landscape character that is considered 'Industrial Scenic' or as having aspects of the Sublime. On balance with particular weighting to natural areas and patterns (rather than landscape character) the existing natural character is	the same time Anns Creek is significantly modified, partitioned by causeways, and has a prominent industrial backdrop. This option will have a moderate adverse effect on natural character. While the physical impacts on natural features may be limited by the extent to which the highway is on structure (acknowledging that there are still potential physical effects) the highway will nevertheless be a dominant structure over Anns Creek and will adversely detract from the perceptions of the area's natural character. As discussed above, it appears the bridge piers would have unavoidable adverse effects on lava features classified as ONF.		

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			presence and in particular position of an additional large scale structure. Further impacts are on the perceptual aspects of natural character within the current strong distinction between the natural and human made aspects of the catchment. An embankment through Southdown Reserve will impede natural processes within this area with a consequent reduction of natural character within the Anns Creek catchment. Overall it is expected that the current Moderate level of natural character will reduce to Low natural character. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	aspects of the Sublime. On balance with particular weighting to natural areas and patterns (rather than landscape character) the existing Natural Character is assessed as Moderate. Natural character is adversely affected by the presence and position of the additional large scale road structure. Particular impacts are on the perceptual aspects of Natural Character within the current strong distinction between the natural and human-made aspects of the catchment. This option has significant ecological area closest to Great South Road is substantially reduced affecting the ability of natural processes to continue providing a consequent adverse effect on Natural Character. Natural Character is expected to reduce to Low with Option 2. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	having aspects of the Sublime. On balance with particular weighting to natural areas and patterns (rather than landscape character) the existing natural character is assessed as Moderate. Natural character is adversely affected by the presence and position of the additional large scale road structure. Particular impacts are on the perceptual aspects of natural character within the current strong distinction between the natural and human-made aspects of the catchment. The SEA closest to GSR is substantially reduced affecting the ability of natural processes to continue providing a consequent adverse effect on natural character. Natural character is expected to reduce to Low with this option. **OTHER COMMENTS:** None **ASSUMPTIONS:** **-**	assessed as Moderate. Natural character is potentially adversely affected by the presence large scale road bridge structure; however positioning is significantly better than in options 1-3. Particular impacts are on the perceptual aspects of natural character, within the current strong distinction between the natural and human-made aspects of the catchment, are reduced again due to position. There is potential to design the bridge in a manner which is sympathetic with the existing Moderate natural character over and above the current bridge proposal. Also affected are the ability of natural processes to occur and the fragmentation of locally rare landscapes such as the proposed embankment over Southdown Reserve and its tidal tributary. As above it is noted that this area could be a structure and the effects avoided. Overall it is considered that the existing balance of natural character will reduce to Low-Moderate with the Inland alinement with the potential through considered bridge design to maintain the existing Moderate natural character (and thus scored as -1 or 0). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -		

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
	5B. Water quality	Tony Cain	**SCORE: -3** **REASONS:** Local adverse effect on water quality in Southdown Reserve, reduced treatment capacity and also effect on existing SW flows from wider catchment. Limited available land in which to provide SW treatment for wider catchment New Road runoff will be treated through proprietary devices where vegetated systems cannot be provided. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE -1** **REASONS:** Local adverse effect on water quality in wetland adjacent to TR Group. New Road runoff will be treated through proprietary devices where vegetated systems cannot be provided. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Same reasons as that for Option 2. Note that the east bound off ramp is cut beneath EWL. Depending on final design may have an impact on being able to treat SW on this section of road and being able to discharge to outfall **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Local adverse effect on water quality in Southdown Reserve, reduced treatment capacity and also effect on existing SW flows from wider catchment. Limited available land in which to provide SW treatment for wider catchment New Road runoff will be treated through proprietary devices where vegetated systems cannot be provided. **OTHER COMMENTS:** If put on structure from Southdown Reserve to GSR then score will be -1 as there will be less impact on existing Southdown wetland reserve. **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** Local adverse effect on water quality in wetland adjacent to TR Group. New Road runoff will be treated through proprietary devices where vegetated systems cannot be provided. **OTHER COMMENTS:** **ASSUMPTIONS:** -	There is no differentiator for water quality, Ann W.	
	5C. Ecological resources	Sharon De Luca Leigh Bull Eddie Sides Katherine Muchna Shona Meyers	**SCORE: -4** Marine Ecology: -4; Terrestrial Vegetation: -4; Avi-Fauna: -4; Herpetofauna: -4; Freshwater Ecology: -4 **REASONS:** **Marine Ecology:** loss of CMA for bridge piers, disturb to mangrove habitat – moderate magnitude of effect. **Terrestrial Vegetation:** crosses mangroves in Anns Creek SEA but ramp constructed over Southdown Reserve -	**SCORE: -4** Marine Ecology: -4; Terrestrial Vegetation: -4; Avi-Fauna: -4; Herpetofauna: 0; Freshwater Ecology: 0 **REASONS:** **Marine Ecology:** loss of CMA for bridge piers, disturb to mangrove habitat – moderate magnitude of effect. **Terrestrial Vegetation:** alignment through mangroves at Anns Creek SEA - moderate magnitude. SEA and TR Group land affected but not southdown.	**SCORE: -4** Marine Ecology: -4; Terrestrial Vegetation: -4; Avi-Fauna: -4; Herpetofauna: 0; Freshwater Ecology: 0 **REASONS:** **Marine Ecology:** loss of CMA for bridge piers, disturb to mangrove habitat – moderate magnitude of effect. **Terrestrial Vegetation:** alignment through mangroves at Anns Creek SEA (similar to above) - moderate- magnitude. Similar impact that for	**SCORE: -3 (Op4A – 3)** Marine Ecology: -1 (Op4A ,-1); Terrestrial Vegetation: -3 (Op4A, -3); Avi-Fauna: -2 (Op 4A, -2); Herpetofauna: -4; (Op 4A, 0); Freshwater Ecology: -4 (Op4A, -2) **REASONS:** **Marine Ecology:** Both avoid structure within the CMA, 4 and 4A. Minor magnitude of effect. **Terrestrial Vegetation:** avoids most of Anns Creek SEA but ramp constructed over Southdown Reserve - moderate magnitude Op4A avoids reclamation in Southdown Reserve, minor	**SCORE: -4** Marine Ecology: -4 Terrestrial Vegetation: -4 Avi-Fauna: -4 Herpetofauna: -1 Freshwater Ecology: -2 **REASONS:** **Marine Ecology:** Same reason as that Options 1 to 3. **Terrestrial Vegetation:** Same reason as that for other options.	DoC is interested in an area for its biodiversity values, location unknown. Advised to avoid areas with endangered species as their relocation can be challenging particularly finding a suitable new location.	

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			moderate magnitude **Avi-Fauna:** loss of CMA for bridge piers, disturbance to shorebird and banded rail habitat – moderate magnitude of effect. **Herpetofauna:** primary effect from on-ramp in Southdown Reserve – moderate magnitude of effect. **Freshwater Ecology:** large reclamation in Southdown Reserve– High value and high magnitude of effect. **OTHER COMMENTS:**	Worse than Option 1. **Avi-Fauna:** loss of CMA for bridge piers, disturbance to shorebird and banded rail habitat – moderate magnitude of effect. **Herpetofauna:** no known lizard habitat in road footprint – no impact. **Freshwater Ecology:** no impact on freshwater ecosystems - negligible value and negligible effect. **OTHER COMMENTS:**	Option 2 and worse than that for Option 1. **Avi-Fauna:** loss of CMA for bridge piers disturbance to shorebird and banded rail habitat – moderate magnitude of effect. **Herpetofauna:** no known lizard habitat in road footprint – no impact. **Freshwater Ecology:** no impact on freshwater ecosystems - negligible value and negligible effect. **OTHER COMMENTS:**	magnitude of effects. SEA and TR Group land affected. **Avi-Fauna:** no loss of CMA for bridge piers, minor disturbance to shorebird and banded rail habitat – minor magnitude of effect. Both options. **Herpetofauna:** primary effect from on-ramp in Southdown Reserve – moderate magnitude of effect. Op4A avoids effects on lizard habitat, no impact. **Freshwater Ecology:** large reclamation in Southdown Reserve– High value and high magnitude of effect. Op4A, avoids reclamation of Southdown Reserve, minor effects. **OTHER COMMENTS:** Regionally significant values are affected. Need to confirm if these features are affected. Desirable to stay near Southdown. Structure will reduce score	**Avi-Fauna:** Loss of CMA for bridge piers, closer to potential breeding habitat for banded rail and maybe bittern. Less effect on shorebirds but greater effect on wading birds. Greater effect on Anns Creek channel (would be good to avoid piers in channel and a higher bridge is also better).If spans could be wider that would help to reduce effect. **Herpetofauna:** No known lizard habitat in the footprint. Marginal habitat limited to patchy weeds and rock piles that may be provide some habitat for native lizards. However, site not surveyed yet – low effect. **Freshwater Ecology:** Additional length of culvert at Southdown Reserve. Assume that the freshwater wetland at the top of TR site is not affected. **OTHER COMMENTS:** The -4 score for terrestrial vegetation can increase to -5 based on the extent/level of damage the bridge construction would cause. A potentially longer bridge		

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
						by 1. Option 4 may be better but this needs to be assessed. Suggestion to lower the footprint of on and off ramps at HJDr. Option 4A, avoids the CMA by an inland route. Avoids reclamation of the Southdown Reserve either by a structure or alignment further to the south. For terrestrial ecology 4A is preferred over 4. Option refinement has managed to move alignment south which avoids the Southdown Reserve. Noel, 12 May 2016.	span would require a different design (i.e. steel) which would require more maintenance over time and has water quality concerns from zinc runoff. Changing the pier locations and minimizing the number of piers is likely to reduce the effects on: • marine ecological values reducing the score to possibly -3, • avifauna, however, the score is likely to remain -4, and • terrestrial ecology provided the piers do not touch the lava vegetation, reducing the score to -4.		
			ASSUMPTIONS: **<u>Marine ecology:</u>** It is assumed moderate to high ecological values (conservatively used high here). **<u>Terrestrial Vegetation:</u>** It is assumed that wetlands identified as SEA, are of high ecological value. **<u>Avi-Fauna:</u>** Anns Creek: assumed high values (range of Threatened and At Risk species present). **<u>Herpetofauna:</u>** Assumed high ecological values for Southdown Reserve (potential ornate skink habitat). Anns creek itself has no particular known lizard value. **<u>Freshwater Ecology:</u>** Anns Creek Reserve – freshwater wetland but south of the project area, no	**ASSUMPTIONS:** Same as that noted for Option 1.	**ASSUMPTIONS:** Same as that noted for Option 1.	**ASSUMPTIONS:** Same as that noted for Option 1.	**ASSUMPTIONS:** Same as that noted for Option 1.		

Notes: MCA Workshop #3, Anns Creek

Consenting Phase MCA								General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Common to all Options**	**Yes – No and Action Plan**
			effects. Southdown Reserve – large freshwater stream, inanga observed.						
	5D. Coastal environment and resources	Stephen Priestley	**SCORE: -1** **REASONS:** Piers in CMA. Minor and very local effects. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Piers in CMA. Minor and very local effects. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Piers in CMA. Minor and very local effects. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** Outside the CMA. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Piers in CMA. Minor and very local effects. Tidal currents are slack and wave energy low. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Limited to the bridge and its piers and impact during the construction phase. Coastal Plan, prohibited reclamation status is prompting bridges as alternatives/options.	
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Mana whenua groups provided feedback at a huis. Notes have been recorded in the hui minutes.	Reclamation is seen as opportunity and mitigation for previous dumping etc.
	6B. Archaeological and built heritage	Matt Felgate	**SCORE: 0** **REASONS:** Same effects as that for Option 4. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** Same effects as that for Option 4. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** Potential adverse effects of greater scale relative to the alignment and its footprint within the former foreshore area. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** Potentially minor (relatively) negative impact from the piles to support the structures. **OTHER COMMENTS:** None **ASSUMPTIONS:** Sensitive construction methodology to manage effects and footprint of works.	**SCORE: 0** **REASONS:** Potentially minor (relatively) negative impact from the piles to support the structures. **OTHER COMMENTS:** None **ASSUMPTIONS:** Sensitive construction methodology to manage effects and footprint of works.	Note: Nothing here to differentiate between Options 1, 2, 4 and 5.	

Notes: MCA Workshop #3, Anns Creek

East West Link – Multi-Criteria Analysis – Foreshore Bund/Embankment Outcomes Report

Record of Process:

a) Workshop date: 12 April 2016
b) Comments received: 5 May 2016
c) Finalised: 27 May 2016

Status: Final

General Comments (from the Option Design Pack issued for the MCA dated 23 March 2016) that informed assessment:

Presentations: Overall Route - Lloyd de Beer [LdB]; **Coastal** - Stephen Priestley [SP]; **Stormwater** - Dale Paice [DP]; **Geotechnical** - Gavin Alexandra [GA]; **Groundwater** - Ann Williams [AW]; **and Landscaping** - Sean Burke [SB] and George Woolford [GW].

General Comments that informed assessment:

All options:

- Waikaraka Cemetery, Heliport, landfills are key challenges along this 3km route. (LdB)
- 25% of the harbour has been reclaimed over time and narrowing of the harbour has been observed over time, particularly around the present MHX. [SP]. Nearly 4m spring tidal range with large intertidal area.
- High ecological value, Marine Area 2 at eastern end. [SP]
- Reclamation will reduce the tidal prism, which reduces tidal current and would lead to sedimentation. Mitigation to balance this change would be intertidal dredging but this would have adverse effects on ecology. [SP]
- PAUP requires consideration of at least a 1m sea level rise over 100 years. The NZCPS gives high regard to CMA values. [SP]
- The catchment treats stormwater runoff from upstream of 670ha. Key indicators include stormwater treatment or not, and treatment methods. The treatments are those which have been employed and expected from council. The assumption is that if treatment exists then that is the baseline. Other differentiators include:
    - Whether the treatment (this is for the catchment) is inside or outside i.e. road is inside or outside the stormwater pond/leachate interception.
    - Flood protection for the 1% event (rainfall and tide) and overland flows. Design relies on pipes (primary flow which leads to a pond) for lower properties and these have low resilience.
    - Flood risk and coastal inundation. A bund provides an opportunity to protect coastal properties from inundation.
    - Future proofing /resilience and opportunities, includes ability for the bund to be a coastal barrier i.e. built up later similar to an embankment. The bund option also provides opportunity for intertidal habitat to re-establish within the bund. Here the tides are separated from the landfill and hence the contamination risk is avoided compared with the embankment options. [DP]
- Landfill is present inland. Basalt exists along the coastal edge with soft marine sediments above and Tauranga Group sediments below. There is an existing rock bund which separates

Notes: MCA Workshop #4, Foreshore Bund/Embankment

the landfill from the coast assumed to have basalt underneath over much of its length. Reclamation will need to factor in the existing geology i.e. soft sediments. Inland road will need to consider loading over existing ground and its stability. Embankment off shore will need to consider a combination of the land and reclamation geology (sediments) noted earlier. [GA]

- Majority of the catchment area is basalt (and associated volcanic deposits) that overlie a combination of other sediments and Waitemata Group sandstone and siltstone at depth. Groundwater rapidly flows through the volcanics to the shore as a result. An embankment fronting the foreshore would make the journey longer for the groundwater, assuming the embankment is constructed from mudcrete or similar with a low permeability. Importantly, flow within the near shore contaminated fills would be prevented from directly discharging to the harbor, and where there is no basalt beneath the embankment, travel times could be slowed further because the sediments would consolidate under the weight of the embankment. A combination of embankment and outer bund reduces the travel time even further and would allow attenuation of 100% of contaminants held in groundwater. [AW]
- Maximise the opportunities i.e. cultural values, ecological habitat enhancement, treatment of wetlands, coastal access and restoration of natural character along the coast (similar to Onehunga Foreshore project). [GW]
- Assumptions include benefit of reclamation as an extension and opportunity to realise benefits. Treatment of the harbour-edge is an important opportunity. [SB]

Option 1: Inner inlet bridge

- Bridge, outside the CMA and away from the gas main. The bridge can be shifted landwards.
- This option has no regional stormwater treatment. Stormwater from EWL will be treated.
- Existing shared path will remain and an additional shared path is proposed.
- No reclamation anticipated.
- Gas main is unaffected.

Option 2: Bridge with stormwater treatment bund

- Discounted as agreed in the 9 March 2016 workshop.

Option 3: Reserve edge embankment

- 7.5ha of reclamation, approx. 20m in width (excluding Waikaraka Cemetery). Embankment extending approx. 20m into the CMA.
- No regional stormwater treatment. Runoff from EWL will be treated.
- Existing shared path will be removed and new path created.
- Gas main will be relocated.
- Large part of EWL will be constructed over landfill.

Option 4: Reserve edge embankment alignment with additional outer bund

- Embankment similar to Option 3 with an additional bund to contain a wetland for stormwater. Overall CMA encroachment is approx. 80m.
- Existing shared path will be removed and new path created north of EWL. An additional shared path will be created on the bund to allow access to the harbour. The latter may not serve the objectives of the Agency. Separability and risks associated with consenting and maintenance are important considerations.
- Requires relocation of the gas main.
- Regional stormwater treatment proposed.
- Large part of EWL will be constructed over landfill.

Notes: MCA Workshop #4, Foreshore Bund/Embankment

Option 5: Inner inlet embankment alignment

- 15ha of reclamation. The embankment will encroach approx. 50m into the CMA.
- No regional stormwater treatment. Runoff from EWL will be treated.
- Existing shared path will remain and an additional shared path is proposed.
- Gas main is unaffected.

Option 6: Outer inlet embankment alignment

- 30ha of reclamation. Embankment proposed approx. 50m from CMA boundary to provide a wetland between the existing foreshore and the embankment. Total CMA encroachment is approx. 100m.
- Regional stormwater treatment proposed.
- Existing shared path will remain and an additional shared path is proposed.
- Gas main is unaffected.

Option 7: Tunnel

- Discounted as agreed in the 9 March 2016 workshop.

Option 8: Inland alignment

- This route stays outside of CMA with the embankment proposed inland over private properties. Assumption is that there will be no land take from the cemetery.
- There is potential for small reclamations i.e. around the Waikaraka Park area.
- Large part of EWL will be constructed over landfill.
- No regional stormwater treatment. Runoff from EWL will be treated.
- Existing shared path will remain in its current location along the harbour.
- Gas main is unaffected.
- Large property acquisition.

Option 9: Inner inlet embankment with mechanical stormwater treatment

- The embankment will encroach approx. 50m within the CMA.
- Regional stormwater treatment proposed which will occupy the EWL footprint beneath the road.
- Existing shared path will remain and an additional shared path is proposed.
- Gas main is unaffected.

Option 10: Inner Inlet Embankment and Outer Bund

- 36 ha (10m) reclamation. An embankment with an additional bund to contain a wetland for stormwater will encroach approx. 130m into the CMA.
- Regional stormwater treatment proposed, and requires relocation of the gas main.
- Existing shared path will remain and an additional shared path is proposed

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
Performance against project objectives	*Obj 1. Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** New arterial provides improved Regional access to Onehunga-Penrose **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Consistency and reliability of speed, and strategic accessibility were key criteria. All options provide the same functionality in this regard and hence the options are not differentiable. The form of some options may make it harder to manage the speed environment to the desired arterial level, however not considered likely to differentiate a full score change at this level of analysis.	
	Obj 2. Improved safety for pedestrians and cyclists Improved accessibility for local cycling and walking Improved accessibility for regional cycling and walking (strategic network)	Alison	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	**SCORE: +3** **REASONS:** Regular connections into local area-Onehunga and Foreshore. **OTHER COMMENTS:** None **ASSUMPTIONS:** Inner cycle way is retained and new cycle way introduced.	All positive, however safety is improved including local and strategic connections. Note that the existing shared route is targeted to local trips and new route would target more leisure uses and as a strategic connection. This is a potential risk.	
	Obj 3. Improved journey time reliability for buses between SH20 and Onehunga town centre	Andrew	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	This criteria is not relevant to this element, so was not scored.	
Road safety	1A.User Safety	Lloyd	**SCORE: +1** **REASONS:** Similar to other options due to removal of traffic	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	**SCORE: +2** **REASONS:**	All positive and similar with difference being bridge structure as specifically noted. The removal of vehicles off the local streets and	

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			off local streets, but the concrete barriers and narrow corridor is expected to feel like a motorway environment and potentially encourage higher speeds. **OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	reduction in intersections and conflict points is expected to improve road safety.	
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Impact on gas main. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Impact on gas main. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -		The gas main is relocatable however, it has added costs, safety implications, and affect reliability of the infrastructure.
	2B. Construction Cost	Noel	**SCORE: -3** **REASONS:** Construction of the bridge is most expansive but with low construction risks. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Construction over the mud has lower costs relative to a bridge construction. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Similar reasons to that for Option 3 plus the inclusion of stormwater treatment system. This option is a bit more challenging to build. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Simple option with the bunds, no stormwater treatment. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Stormwater treatment. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** On land option thus associated property costs. No stormwater treatment. Allowed for a more robust construction. **OTHER COMMENTS:** Factoring in the programme reliability. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** Bridge embanked or embankment costs. **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** SW with bund. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	The assumption is that if the gas main was to be relocated, it will be relocated within the project footprint and therefore no additional property costs.	

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
Operation	3A. Operational Cost	Noel	**SCORE: -2** **REASONS:** Bridge maintenance includes maintenance of proprietary devices. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Differential settlement issues to maintain. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Additional stormwater wetlands to maintain. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** No additional stormwater treatment plus consistent building platform. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Additional stormwater wetlands to maintain. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** In land option, landfill mitigation vs ongoing costs. . **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -5** **REASONS:** Mechanical stormwater treatment device very high cost of maintenance. **OTHER COMMENTS:** As above for 2B relative to Option 9. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Additional stormwater wetlands to maintain. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
Social & Economic	4A. Construction Impact	Amelia / Sarah	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Relocation and potential temporary closure of Waikaraka shared path during construction. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Relocation and potential temporary closure of Waikaraka walkway/ cycleway during construction. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Avoidance of land take from cemetery, however works will be in close proximity, increase noise impacts. Land take of southern area of Waikaraka Park, with planned development for sports fields **OTHER COMMENTS:** None **ASSUMPTIONS:** Option is away from Waikaraka Park..	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Impact on residents and community during construction. The surrounding area is occupied primarily by business land with some residential properties to the west near Gloucester Park. The Waikaraka shared path, park and cemetery are community infrastructure.	Possible mitigation is to stay away from the Park. All options would have the ability to mitigate construction impacts to some degree, however Option 8 this would be more challenging due to more impact on quality of business environments and residential receivers due to it being inland.
	4B. Built Form and Amenity	Lynne	**SCORE: -3** **REASONS:** Bridge is a structure and hence creates a high degree of	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views	**SCORE: --2** **REASONS:** Keeps new structures inland / away from view but impacts on	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views between	**SCORE: -2** **REASONS:** Change to existing edge character / blocks views between	The measure for this criterion is visual and character, and legibility. Noting that in this section there are no significant built structures impacted,	Ability to soften the options: op 1 fewest opportunities.

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			change from the existing low level 'natural' interface between land and water. The ability to mitigate the impact of such structure is limited to architectural treatments. **OTHER COMMENTS:** Consideration could be given to a separate shared path structure (boardwalk) on the outside which could soften / moderate the bridge. **ASSUMPTIONS:** -	between the cemetery and inlet. **OTHER COMMENTS:** **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	between the cemetery and inlet. Two bunds means more structure but conversely the lower outer bund moderates the apparent scale of the inner so scores the same as for other bund options **OTHER COMMENTS:** None **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	between the cemetery and inlet. Although 'tight' against existing edge and could be a -1.5, on balance is a -2. **OTHER COMMENTS:** None **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	between the cemetery and inlet. Bund pushes out into inlet **OTHER COMMENTS:** None **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	existing built form to larger extent. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	the cemetery and inlet. **OTHER COMMENTS:** None **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	the cemetery and inlet Two bunds mean more structure but conversely the lower outer bund moderates the apparent scale of the inner – so scoring the same as for other bund options. **OTHER COMMENTS:** None **ASSUMPTIONS:** All bund options have the ability for mitigation through design i.e. variation to the profile to soften the edge / landscape treatments.	focus is the land/sea interface including the relationship with the shared path and Waikaraka cemetery. Elevated views from SH1 as well as oblique along foreshore considered. Base case is coastal shared path.	
	4C. Connectivity, including quality of experience, journey time and CPTED.	Lynne / Alison	**SCORE: +1** **REASONS:** Outer shared path hard up against carriageway on both sides – a traffic environment (noise, fumes, vibration). Inner path outlook	**SCORE: +2** **REASONS:** Shared path close to carriageway on both sides – a traffic environment (noise, fumes). The most 'compressed' of the bund options.	**SCORE: +3** **REASONS:** Outer bund creates a separate and distinct shared path with direct connection to the inlet - positive for outlook as well as journey experience.	**SCORE: +2** **REASONS:** Good separation between inner (existing) shared path and road although outlook from inner path somewhat compromised.	**SCORE: +2** **REASONS:** Inner path a long way from bund – both +ve and -ve – good for separate, quieter journey, not so good for isolation and lack of passive surveillance.	**SCORE: +2** **REASONS:** Existing outlook retained although proximity of new road lessens quality of experience.	**SCORE: +2** **REASONS:** Good separation between inner (existing) shared path and road although outlook from inner path somewhat compromised.	**SCORE: +3** **REASONS:** Outer bund creates a separate and distinct shared path with direct connection to the inlet - positive for outlook as well as journey experience.	New path is wider and connects to centres i.e. Sylvia Park, which results in similar and positive outcomes. Overall scores are positive reflecting extended pedestrian/cycle network; variation reflects different sub-scores for quality of experience and ability to	Mitigation would be the landscape treatment.

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			compromised by being lower than bridge. **OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	**OTHER COMMENTS:** None **ASSUMPTIONS:** All options have paths on both sides of the corridor. All options have the same number of connections from shared path back to the local area	enhance it. The quality component of this criterion as a differentiator overlaps with natural character. Base case is that shared path is flat, quiet, wide, with undisturbed views out over the inlet. Journey time at the moment is dependent on the Waikaraka shared path which is close to Onehunga destinations (being landside). The route on the south side of the road will be of a higher quality and so people are likely to be able to travel faster even though journey distances may be very slightly longer. Also impacts on missing links to Sylvia Park.	
	4D. Quality of living environment	Amelia / Sarah	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** Potential to lower all scores due to presence of heavy vehicles along foreshore where	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	**SCORE: -2** **REASONS:** Ongoing, more negative Impact on local receivers such as Waikaraka Park, the cemetery due to close proximity of the road. The effects on the cemetery are more significant due to the nature of this area being for reflection etc. **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None	All options would have a negative impact in regards to operational air quality and noise for users of the Waikaraka shared path. They would all have an induced traffic impact. Potential for increased use of open space area along the foreshore due to additional linkages into residential / business areas and opportunities for access into other areas these provide.	Potentially more difficult to mitigate Option 8 due to close proximity to receivers. Options 4 and 3, shared path(s) are located very close to the road, which would make mitigation for these options in terms of noise and air quality more challenging than other options.

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			previously none etc. **ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** -		
	4E. Viability of land areas	Phil Osborne	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Significant land take of vulnerable activities and their ability to relocate or chances of becoming unviable. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Other consideration is flood risk i.e. likely impact of an awareness of this risk. This will have a slightly positive effect for all options as a result of the bund proposal except for Option 1.	
	4F. Productivity of land	Phil Osborne	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Significant infrastructure with regional significance.	
	4G. Public access to and along the coastal marine area - quality of access - visual connectivity	George Woolford / Sean Burke	**SCORE: -3** **REASONS:** <u>Access to the CMA (-3)</u> Inner bridge alignment will retain the existing Waikaraka Cycleway and therefore the existing level of access to and along the CMA is retained. However	**SCORE: -3** **REASONS:** <u>Access to the CMA (-2)</u> The existing Waikaraka Cycleway is removed as the alignment is constructed over the existing reserve. Walking and cycling provision is made on both sides of the	**SCORE: -2** **REASONS:** <u>Access to the CMA (-2)</u> The existing Waikaraka Cycleway is removed as the alignment is constructed over the existing reserve. Walking and cycling provision is made on the landward side of	**SCORE: -3** **REASONS:** <u>Access to the CMA (-2)</u> Inner Inlet Embankment Alignment will retain the existing Waikaraka Cycleway and therefore the existing level of access to and along the CMA is retained.	**SCORE: -3** **REASONS:** <u>Access to the CMA (-3)</u> Outer Inlet Embankment Alignment will retain the existing Waikaraka Cycleway however the existing foreshore will be developed as a 50m wide	**SCORE: -2** **REASONS:** <u>Access to the CMA (-2)</u> The inland alignment is constructed landward of the existing Waikaraka Cycleway which is therefore kept. Assuming the same or very similar connections	**SCORE: -3** **REASONS:** <u>Access to the CMA (-3)</u> Inner Inlet Embankment Alignment will retain the existing Waikaraka Cycleway and therefore the existing level of access to and along the CMA is retained. However	**SCORE: -2** **REASONS:** <u>Access to the CMA (-2)</u> Inner Inlet Embankment Alignment will retain the existing Waikaraka Cycleway and therefore the existing level of access to and along the CMA is retained. However potential access	Provision of a shared path along the coast was the basis of the assessment and associated scores. Give consideration to how access can be gained to the harbour-edge with design options.	

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	Criteria	Owner	Option 1	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9	Option 10	Common to all options	Yes/No and Action Plan
			potential access into the Mangere Inlet from the walkway is precluded due to the presence of the bridge. <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high tide) presents well in terms of overall amenity An inner bridge alignment will adversely affect the quality of access due to the physical presence of the bridge adjacent and partly on the embankment edge. <u>Visual Connection (-2)</u> The existing embankment	alignment and the seaward cycleway will provide assess along the CMA. The proposed 2.5:1 fill batter will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high tide) presents well in terms of overall amenity. The presence of the road embankment and associated traffic will reduce the quality of access due to the structural bulk of the road	the alignment while a separate bund approximately 50m seaward will provide assess along the CMA. The proposed 2.5:1 fill batter of the bund will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-2)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high tide) presents well in terms of overall amenity. The presence of the road embankment and associated traffic will reduce the quality of	However potential access into the Mangere Inlet from the walkway is precluded due to the presence of the Inner Inlet Embankment Alignment. Walking and cycling provision is made on the seaward side of the alignment and will provide assess along the CMA. The proposed 2.5:1 fill batter will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align	wetland fronted by another 50m road embankment. Therefore the Waikaraka Cycleway will not provide access to the CMA. Walking and cycling provision is made on the seaward side of the Outer Inlet alignment and will provide assess along the CMA. The proposed 2.5:1 fill batter will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align	across the alignment the access to the CMA is neutral <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high tide) presents well in terms of overall amenity. The adjacent inland Road alignment will reduce the amenity of the access through the infrastructure of the road itself, presence of vehicles and noise. The likely removal of existing screening vegetation (such that it is) will provide a contributing factor.	potential access into the Mangere Inlet from the walkway is precluded due to the presence of the Inner Inlet Embankment Alignment. Walking and cycling provision is made on the seaward side of the alignment and will provide assess along the CMA. The proposed 2.5:1 fill batter will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-3)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high	into the Mangere Inlet from the walkway is precluded due to the presence of the Inner Inlet Embankment Alignment. Walking and cycling provision is made on the seaward side of the alignment and will provide assess along the CMA. The proposed 2.5:1 fill batter will limit access to the CMA but is noted as being not inconsistent with the existing embankment profile. <u>Quality of access (-2)</u> The existing embankment is removed from the road network through most of its length meaning that it is reasonably quiet. Although constructed, the existing embankment has become vegetated which has added to its amenity value. While the embankment is exposed to the predominant southwesterly wind, it is open to afternoon sun and when conditions align (such as on high tide) presents well in		

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	Criteria	Owner	Option 1	Option 3	Option 4	Option 5	Option 6	Option 8	Option 9	Option 10	Common to all options	Yes/No and Action Plan
			currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. There will be a loss of visual connection from the existing Waikaraka Cycleway to the Mangere Inlet due to the presence of the bridge. Visual connection that remains will be across the bridge which is in the foreground and will diminish in quality. Elevated bridge structure with a cycleway to the seaward edge will provide very good visual connection to the Mangere Inlet however a diminishment of experience is likely due to the presence of traffic.	infrastructure, the presence of traffic and associated noise. <u>Visual Connection (-2)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The reserve edge embankment option will maintain very good views from the seaward side however views from the landward side will be compromised due to the presence of the embankment in the foreground.	access on the landward side due to the structural bulk of the road infrastructure, the presence of traffic and associated noise. The separated bund will allow much of the existing level of amenity to be retained though overall all the presence of the road (unmitigated) is expected to reduce the currently level of amenity despite the 50m separation. <u>Visual Connection (-2)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The reserve edge embankment with separated bund option, will maintain very good views from the seaward side however views from the landward side will be compromised due to the presence of the embankment in	(such as on high tide) presents well in terms of overall amenity. In terms of the existing Waikaraka cycleway, the presence of the road embankment and associated traffic will reduce the quality of access due to the structural bulk of the road infrastructure, the presence of traffic and associated noise. The seaward cycleway will provide access along the coastal edge however the presence of the road and associated traffic will reduce the quality of access. <u>Visual Connection (-2)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The Inner Inlet Embankment Alignment option will provide very good views from the seaward side however views from the landward side	(such as on high tide) presents well in terms of overall amenity. The separated bund will allow much of the existing level of amenity (Waikaraka Cycleway) to be retained though overall all the presence of the road (unmitigated) is expected to reduce the currently level of amenity despite the 50m separation. The seaward cycleway on the outer bund will provide access along the coastal edge however the presence of the road and associated traffic will reduce the quality of access. <u>Visual Connection (-3)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The Outer Inlet Embankment Alignment option will provide very good views from the seaward side however views from the landward	<u>Visual Connection (-1)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The Inland Alignment will not alter the visual connection to the Mangere Inlet and Manukau Harbour from the Waikaraka Cycleway. A proposed cycle/walkway on the landward side of the alignment will have views to the Mangere Inlet achievable across the inlet.	tide) presents well in terms of overall amenity. In terms of the existing Waikaraka cycleway, the presence of the road embankment and associated traffic will reduce the quality of access due to the structural bulk of the road infrastructure, the presence of traffic and associated noise. The seaward cycleway will provide access along the coastal edge however the presence of the road and associated traffic will reduce the quality of access. <u>Visual Connection (-3)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The Inner Inlet Embankment Alignment option will provide very good views from the seaward side however views from the landward side will be compromised due to the	terms of overall amenity. In terms of the existing Waikaraka cycleway, the presence of the road embankment and associated traffic will reduce the quality of access due to the structural bulk of the road infrastructure, the presence of traffic and associated noise. The seaward cycleway will provide access along the coastal edge however the presence of the road and associated traffic will reduce the quality of access. <u>Visual Connection (-2)</u> The existing embankment currently enjoys very good visual connection with the Mangere Inlet along the embankment edge. The Inner Inlet Embankment Alignment (with additional outer bund) option will provide very good views from the seaward outer bund however views from the landward side will be compromised due to the		

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
					the foreground.	will be compromised due to the presence of the embankment in the foreground.	(Waikaraka Cycleway) side will be compromised due to the presence of the wetland in the foreground and the outer bund carrying the road.		presence of the embankment in the foreground.	presence of the embankment in the foreground.		
			OTHER COMMENTS: None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -		
Natural Environment	5A. Natural Landscape / Character	George Woolford / Sean Burke	**SCORE: -3** **REASONS:** <u>Natural landscape (-3)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -3** **REASONS:** <u>Natural landscape (-3)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -2.5** **REASONS:** <u>Natural landscape (-3)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -2** **REASONS:** <u>Natural landscape (-2)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -2** **REASONS:** <u>Natural landscape (0)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -2** **REASONS:** <u>Natural landscape (0)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such.	**SCORE: -2** **REASONS:** <u>Natural landscape (-2)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such. This option will affect the Pikes	**SCORE: -3** **REASONS:** <u>Natural landscape (-3)</u> Remnant lava outcrops at Pikes Point and near MHX are identified as SEAs under the PAUP. Adjacent typically larger outcrops at Anns Creek are identified as ONFs but it is noted that the remnant outcrops described above are not similarly identified. In my view the remnant outcrops are indicative of the pre-existing landform prior to the embankment reclamation and have value as such. This option will affect the Pikes Point and	The assessment should take into account the degree of change in the environment, i.e. modified reclaimed area, industrial surrounds, landfill etc., where the natural processes are re-establishing. Does this include vegetation alteration along the coast i.e. impact on existing trees?	A possible mitigation is comprehensive treatment of the harbour-edge. This would bring the score back up. Options 2 to 10 need more design work. Opportunities to address the issue with stormwater.

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			This option will affect the Pikes Point and adjacent MHX SEAs, and is likely to require removal of these features although it may be possible to pile around them. <u>Natural character (-3)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural character is adversely affected by the presence of an additional significant structure and the probable significant effects on the remnant landforms and ecologies with limited	This option will affect the Pikes Point and adjacent MHX SEAs, and is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural character is adversely affected by the presence of an additional significant embankment	This option will affect the Pikes Point and adjacent MHX SEAs, and is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural character is adversely affected by the presence of an additional significant embankment	This option will affect the Pikes Point and adjacent MHX SEAs, and is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural character is adversely affected by the presence of an additional significant embankment	This option will not affect the Pikes Point and adjacent MHX SEAs. This option is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural Character is adversely affected by the presence of an	This option is located substantially inland from the existing coastal esplanade reserve and will not effects the existing natural features noted above. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. While this option is not in the CMA, it will impact on the natural character. While the road physically is not inconsistent with the existing land use, the associated vehicle movement and noise will provide the additional adverse effects on natural character.	Point and adjacent MHX SEAs. This option is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character is adversely affected by the presence of an additional significant embankment and roadway, and the significant effects on the remnant landforms and ecologies. As with all options while there is an option to integrate design and mitigation, this has not been assessed.	adjacent MHX SEAs, and is likely to require removal of these features – although it may be possible to move them in part. From a natural landscape perspective the preferred outcome is to retain the features in situ. <u>Natural character (-2)</u> There are no ONLs immediately affected by this option. Natural character along the embankment is considered to be moderate to low with the moderate areas reflective of the remnant outcrops and associated ecological significance and the greater perception of original coastline against the industrialised backdrop. Natural character is adversely affected by the presence of an additional significant embankment and roadway and the significant effects on the remnant landforms and ecologies. Particular		

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			opportunity for mitigation (or integrative design). Particular additional impacts are on the perceptual aspects of natural character within the current strong distinction between the natural and human made aspects of the embankment. **OTHER COMMENTS:** Limited ability for mitigation. **ASSUMPTIONS:** -	and roadway and the significant effects on the remnant landforms and ecologies and the processes associated with these features. Particular additional impacts are on the perceptual aspects of natural character provided by the existing mix of natural and constructed embankment. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	and roadway and the significant effects on the remnant landforms and ecologies along with overall perception. This option provides for a wetland between an inner and outer bund. This wetland provides for some redress of natural character along this edge albeit at the expense of existing seabed ecologies **OTHER COMMENTS:** None **ASSUMPTIONS:** -	and roadway and the significant effects on the remnant landforms and ecologies. Particular additional impacts are on the perceptual aspects of natural character within the current strong distinction between the natural and human made aspects of the embankment. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	additional significant embankment, roadway and wetland within the CMA and the significant effects on sea bed natural elements and processes. Particular additional impacts are on the perceptual aspects of natural character provided by a road embankment within the CMA and modification of the seafloor to wetland. This option provides for a wetland between an inner and outer bund. This wetland provides for some redress of natural character along this edge albeit at the expense of existing seabed ecologies and is more easily perceived. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	additional impacts are on the perceptual aspects of natural character within the current strong distinction between the natural and human made aspects of the embankment. Option provides for a wetland between an inner and outer bund. This wetland provides for some redress of natural character along this edge albeit at the expense of existing seabed ecologies and as it is more easily perceived. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	5B. Water quality	Dale Paice (DP) Stormwater Ann Williams (AW) Groundwater	**SCORE:** **0** **0** **REASONS:** **DP**	**SCORE:** **0** **+1** **REASONS:** **DP**	**SCORE:** **+4** **+2** **REASONS:** **DP**	**SCORE:** **0** **+2** **REASONS:** **DP**	**SCORE:** **+4** **0** **REASONS:** **DP**	**SCORE:** **0** **-1** **REASONS:** **DP**	**SCORE:** **+3** **0** **REASONS:** **DP**	**SCORE:** **+4** **+4** **REASONS:** **DP**	Risk of flooding and protection from inundation. It is possibly better placed under social than natural environment.	How big is the problem now i.e. quality of stormwater now and how it will be treated?

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			Base case, no change stormwater quality or flood risk. No potential coastal inundation benefits (all other options have this) **AW** None **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Greater coastal inundation benefits than other options but consequently less flood resilience to overland flow and primary flooding. **AW** Reduce seawater access to fill; reduces leachate production/ transfer to the sea. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Greater coastal inundation benefits than other options but consequently less flood resilience to overland flow and primary flooding. Significant stormwater treatment opportunity for the wider catchment. **AW** Reduced access of seawater and rainfall to fill; leachate discharge slowed; but piles required through landfill which may result in transfer of leachate to basalt or freshwater to fill (generating further leachate); outer bund further lengthens flow path. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**AW** Reduced access of seawater to fill; contaminants travelling in groundwater have slowed longer path; allows attenuation. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	SW treatment is inside, less flood resilience than where treatment is outside. **AW** No change to status quo for discharge of contaminants in groundwater. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**AW** Piles required through landfill which may result in transfer of leachate to basalt or freshwater from basalt to fill (generating further leachate). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	This option is unlikely to be practical for treatment. Treatment standard not quite as good as wetland. **AW** No change to status quo for discharge of contaminants in groundwater. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**AW** High benefits for reduction in contaminant discharge to the harbor: Reduced access of seawater to fill; contaminants travelling in groundwater (slowed longer path allows attenuation). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Flood risk entered on its own below as the “quantity” / flood risk component was taken out during the MCA process.	
	Water quantity i.e. flood risk	Dale Paice	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -2** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	Potential benefit from decrease in coastal inundation captured in property line. This analysis captures the difference in flood resilience (overland, primary and coastal) between the options.	

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
			-	-	-	-	-	-	-	-		
	5C. Ecological resources	Sharon De Luca Leigh Bull Eddie Sides Katherine Muchna Shona Meyers	**SCORE: -2** **REASONS:** Some loss of intertidal habitat and organisms through location of piers. Minor changes to coastal processes (scour) around the piers. **OTHER COMMENTS:** None **ASSUMPTIONS:** Contaminants levels are elevated. Moderate ecological value. Stormwater area creates adverse marine habitat effects but also has benefits i.e. stormwater quality and habitat regeneration through planting.	**SCORE: -3** **REASONS:** Loss of marine habitat (7.5ha). **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -4** **REASONS:** Treating stormwater and loss of large area of CMA (24ha). Positive effect of water quality. Not sure if the benefits of treating stormwater from land justifies the loss of CMA habitat **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -4** **REASONS:** Loss of marine habitat (15ha), but no treatment of stormwater. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -4** **REASONS:** Loss of marine habitat (30ha) but benefits of treating stormwater from land. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -1** **REASONS:** Minimal/no reclamation. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -3** **REASONS:** 15ha reclamation, similar to option 5, but this option treats stormwater. Less reclamation than for Options 4, 6, and 10. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	**SCORE: -4** **REASONS:** Very large reclamation and treats regional stormwater. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that noted for Option 1.	Options 4, 6 and 10 all involve significant adverse effects on the marine environment, but none tip into national scale effects. 10 worst, followed by 6 then 4.	
	5D. Coastal environment and resources This criterion focuses on coastal processes only and excludes footprint of reclamation. The latter has been	Stephen Priestley	**SCORE: -1** **REASONS:** Piers in CMA. Minor local effects. **OTHER COMMENTS:** None	**SCORE: -2** **REASONS:** Loss of tidal prism. Slightly increased inlet sedimentation. **OTHER COMMENTS:** Historic	**SCORE: -3** **REASONS:** Impedes the tidal channel. Expect changes in local morphology. **OTHER COMMENTS:** Scope for	**SCORE: -2** **REASONS:** Same reasons as that for Option 3. **OTHER COMMENTS:** Same as that	**SCORE: -3** **REASONS:** Same reasons as that for Option 4. **OTHER COMMENTS:** Same as that	**SCORE: 0** **REASONS:** No CMA works. **OTHER COMMENTS:** None	**SCORE: -2** **REASONS:** Same reasons as that for Option 3. **OTHER COMMENTS:** Same as that	**SCORE: -3** **REASONS:** Same reasons as that for Option 4 **OTHER COMMENTS:** Same as that		

Notes: MCA Workshop #4, Foreshore Bund/Embankment

CONSENTING PHASE MCA											GENERAL COMMENTS	ABILITY TO MITIGATE
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 8**	**Option 9**	**Option 10**	**Common to all options**	**Yes/No and Action Plan**
	considered under the criterion for ecology (5C above).		**ASSUMPTIONS:** -	response to reclamation in the inlet has been relatively benign. **ASSUMPTIONS:** -	mitigation i.e. coastal fringe works and redirection of tidal channel. **ASSUMPTIONS:** -	noted for Option 3. **ASSUMPTIONS:** -	noted for Option 4. **ASSUMPTIONS:** -	**ASSUMPTIONS:** -	noted for Option 3. **ASSUMPTIONS:** -	noted for Option 4. **ASSUMPTIONS:** -		
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Mana whenua groups provided feedback at a hui held on 6 May 2016. Notes have been recorded in the hui minutes.	
	6B. Archaeological and built heritage	Matt Felgate	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** The area is largely reclaimed and if the earthworks are not significant, the effects remain neutral. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	No differentiable information for all options except Option 8.	

Notes: MCA Workshop #4, Foreshore Bund/Embankment

East West Link – Multi-Criteria Analysis – Otahuhu Creek Outcomes Report

Record of Process:

a) Workshop date: 27 April 2016
b) Comments received: 5 May 2016
c) Finalised: 26 May 2016

Status: Final

General comments (from the Original Design Pack issued for MCA dated 29 March 2016) that informed assessment:

All options:

- The project is intending to achieve four lanes in each direction between Mt Wellington and Otahuhu. This requires widening of existing culverts beneath SH1 within the Otahuhu Creek.
- All options allow for cycle way connections to be created however these do not form part of the current project. Auckland Council will likely provide these through their greenways project.

Option 1: Single Span Bridge Extension

- New single span bridge which spans over existing culvert. Existing culvert will remain and as a result potential climate change impacts on SH1 will not be addressed by this option.
- Abutment on both sides of the culvert with retaining walls to support the widening.
- Embankment will be within the causeway but CMA will not be affected.
- Works can be undertaken while SH1 is in full operation.

Option 2: Four span bridge extension

- Bridge details same as that for Option 1 but without the retaining walls. Works can undertaken without disrupting the operation of SH1.
- Abutment on either side of culvert with piers within the CMA. Widened embankment where CMA is not affected.
- Existing culvert will remain and as a result potential climate change impacts on SH1 will not be addressed by this option.

Option 3: Culvert extension

- Embankment within the causeway for extra lane, existing culvert to remain, and climate change realisation not possible.
- Retaining walls on either side of culvert and within the CMA. Widened embankment where CMA is not affected.
- Works can be undertaken while SH1 is in full operation.

Notes: MCA Workshop #5, Otahuhu Creek

Option 4: New bridge

- Mana whenua groups recommended this as an option that removes of entire culvert and replaces it with a new bridge. This has opportunities to provide better clearance above the creek and possible connection beneath SH1.
- The bridge can be constructed with four lane traffic shift and maintain three lanes in both directions.
- Temporary bridging and road works will be required as well as additional property to construct temporary road.

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +5** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: +5** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: +5** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: +5** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	Options are not differentiable. However, SH1 in this location is nationally significant and all options add capacity to SH1 to accommodate the new EWL ramps. So impacts here score +5 on all options	
	Obj 2. *Improved safety for pedestrians and cyclists* *Improved accessibility for local cycling and walking* *Improved accessibility for regional cycling and walking (strategic network)*	Alison	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE: +2** **REASONS:** This option will require an additional traffic lane during construction. **OTHER COMMENTS:** None **ASSUMPTIONS:** That the traffic lane required during construction will become a shared path or similar post-construction.	Options are not differentiable.	
	Obj 3. *Improved journey time reliability for buses between SH20 and Onehunga town centre*	Andrew	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:**	This criteria is not relevant to this element, so was not scored.	
Road safety	1A.User Safety	Lloyd	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Not distinguishable, all positive. Existing barrier protecting the culvert is substandard and as a result of the widening over the Creek, all barriers need to be upgraded to a higher protection standard.	
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: -1**	**SCORE: -1**	**SCORE: -1**	**SCORE: -2**		

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
			REASONS: Minor impact on traffic with the construction of the auxiliary lanes. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**REASONS:** Minor impact on traffic with the construction of the auxiliary lanes. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**REASONS:** Minor impact on traffic with the construction of the auxiliary lanes. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**REASONS:** More than minor impact on traffic with the construction of new bridge across the full width of the motorway. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	2B. Construction Cost	Noel	**SCORE: -1** **REASONS:** Low cost option with complexity of working in CMA. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** This option is slightly easier to construct than options 1 and 3 but not significantly different. It is slightly more expensive to construct this option as more structures are involved compared to Options 1 and 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Low cost option with complexity of working in CMA. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Significantly higher cost option and construction staging complexity **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
Operation	3A. Operational Cost	Noel	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** Life of the culverts is yet to be determined. **ASSUMPTIONS:** -	Neutral and not differentiable.	
Social & Economic	4A. Construction Impact	Amelia / Sarah	**SCORE: -1** **REASONS:**	**SCORE: -1** **REASONS:**	**SCORE: -1** **REASONS:**	**SCORE: -2** **REASONS:** More prolonged construction impact compared to other options	Negative localised effects on residential, industrial and education activities during construction from all options. Residential properties located on three corners of SH1 at this location.	

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
			OTHER COMMENTS: None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4B. Built Form and Amenity The measure for this criterion is visual and character, and legibility.	Lynne	**SCORE: 0** **REASONS:** Barely seen (if at all) from very few (private) vantage points – no change. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** Barely seen (if at all) from very few (private) vantage points – no change. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** Barely seen (if at all) from very few (private) vantage points – no change. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** If the creek is made navigable it opens up potential for more people to see it (from the water and potentially from future open space connections). Offers opportunities for treatment of structure and for landscaping around it during the design process. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Structure not visible from surrounding properties or public land (Options 1-3). Should the creek become navigable under Option 4, it would become visible and design would play an important role (in collaboration with iwi). The structure could then be a built feature of the environment, adding to amenity.	
	4C. Connectivity	Alison / Lynne	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** Options 1 to 3 are not differentiable. These options have do not preclude a provision for a future cycleway/ walkway there will not be one constructed as part of this project. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** This option will require an additional traffic lane during construction. Post-construction it could be turned into a walkway and cycleway. Opportunities for navigable waterway and connections to open space network. **OTHER COMMENTS:** None **ASSUMPTIONS:**		
	4D. Quality of living environment - Community facilities - Parks - Air quality - Noise - CPTED	Amelia Sarah	**SCORE: 0** **REASONS:** No Change	**SCORE: 0** **REASONS:** No Change	**SCORE: 0** **REASONS:** No Change	**SCORE: 0** **REASONS:** Opportunity for recreational uses and connections to open space and schools –	All options assessed to have a minimal impact on the living environment so all scored for no change	

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
			OTHER COMMENTS: None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	**OTHER COMMENTS:** None **ASSUMPTIONS:** -	however this is covered by other criteria **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4E. Viability of land areas	Phil Osborne	**SCORE: 0** **REASONS:** No business land affected. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** No business land affected. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** No business land affected. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** No business land affected. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	4F. Productivity of land	Phil Osborne	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** This option may have short term impact but in the long term achieves the same benefits as the other options. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All regionally significant.	
	4G. Public access to and along the coastal marine area - quality of access - visual connectivity	George Woolford	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +1** **REASONS:** Opportunities for navigable waterway and connections to open space network. **OTHER COMMENTS:** None **ASSUMPTIONS:** If regional connections exist then score will be reviewed.		
Natural Environment	5A. Natural Landscape / Character	George Woolford	**SCORE: 0** **REASONS:**	**SCORE: -1** **REASONS:**	**SCORE: 0** **REASONS:**	**SCORE: +3** **REASONS:**		

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
			Retaining wall and bridge. **OTHER COMMENTS:** Limited ability for mitigation. **ASSUMPTIONS:** -	Minimum landscape character impact but within the CMA. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Retaining wall in CMA, widening berm and batter, opportunity to increase landscape. This option still requires some work within the CMA. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Significant positive contribution to the catchment. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		
	5B. Water quality - operation of sw (quantity and quality) - ground water	Tony Cain	**SCORE: +2** **REASONS:** From a road runoff SW treatment perspective this option would have no more or less impact than the other options. **OTHER COMMENTS:** From a SW flow perspective. The existing culvert was constructed in the mid-1950s. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** From a road runoff SW treatment perspective this option would have no more or less impact than the other options. **OTHER COMMENTS:** From a SW flow perspective. The existing culvert was constructed in the mid-1950s. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** From a road runoff SW treatment perspective this option would have no more or less impact than the other options. **OTHER COMMENTS:** From a SW flow perspective. The existing culvert was constructed in the mid-1950s. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** From a flow perspective this option removes the existing culvert and may have added benefits for water quality within the Otahuhu Creek, these would need to be assessed further From a road runoff SW treatment perspective this option would have no more or less impact than the other options. **OTHER COMMENTS:** From a SW flow perspective. The existing culvert was constructed in the mid-1950s. I've scored this as +2 assuming that a degree of declamation would also be carried out allowing a free-er flow of water within the existing channel. **ASSUMPTIONS:** -	There is only one stormwater treatment within this area and therefore all options present positive local benefits. No differentiator with relative to ground water, Ann W.	
	5C. Ecological resources	Sharon De Luca Leigh Bull	**SCORE: -1** **REASONS:** Some loss of habitat and ecological values	**SCORE: -1** **REASONS:** No work in CMA except installation of	**SCORE: -2** **REASONS:** Exacerbates effects of existing culverts, works	**SCORE: +1** **REASONS:** Exacerbates effects of existing culverts, works	All ecological values generally low-moderate in this area. Small loss of terrestrial	

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
		Eddie Sides Katherine Muchna Shona Meyers	although small in the wider context. Little change to existing environment for all ecology. **OTHER COMMENTS:** None **ASSUMPTIONS:**	piles. Little change to existing environment for all ecology. **OTHER COMMENTS:** None **ASSUMPTIONS:**	in CMA required (biggest footprint). **OTHER COMMENTS:** None **ASSUMPTIONS:**	in CMA required (biggest footprint). **OTHER COMMENTS:** Likely short–term changes, but long term positive effect on marine ecology **ASSUMPTIONS:** Baseline is the existing culvert and its conditions.	vegetation and mangroves for all except Option 4. For all options, disturbance to avi fauna during construction can be avoided by construction occurring outside the breeding season.	
	5D. Coastal environment and resources - coastal processes only - excl footprint of reclamation which has been considered under ecology (5C above)	Stephen Priestley	**SCORE: -1** **REASONS:** Process will not change much and scour holes will remain intact. **OTHER COMMENTS:** **ASSUMPTIONS:** It is anticipated there is scouring. There are also signs of reclamation. The estuary has been forced into a throttled environment and has a local effect. It may have navigation constraints. Scouring would have fixed the estuary's natural movement. Low potential for release of contaminants from the removal of the throttle.	**SCORE: 0** **REASONS:** Does not change the existing situation. Slightly increased resilience to climate change. **OTHER COMMENTS:** There is possibility for the culvert to be changed to a bridge in future. **ASSUMPTIONS:** Same as that outlined for Option 1.	**SCORE: -2** **REASONS:** Transferring scour holes. Reclamations. Local effects. **OTHER COMMENTS:** **ASSUMPTIONS:** Same as that outlined for Option 1.	**SCORE: +2** **REASONS:** Allows estuary to behave more naturally. Removes scour holes. Removes part of the existing reclamations. Navigational benefits. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.		

Notes: MCA Workshop #5, Otahuhu Creek

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all options**	**Yes/No and Action Plan**
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Mana whenua groups provided feedback at a hui held on 6 May 2016. Notes have been recorded in the hui minutes.	
	6B. Archaeological and built heritage	Matt Felgate	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** There is no known direct effect. **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** Removal of existing reclamation and restoring the navigation path for canoes would enhance the amenity values related to the archaeological landscape. There is high potential for a lot unrecorded archaeological features and well known historical values associated with the waterway. **OTHER COMMENTS:** There is opportunity for a walking connection along the waterway. If this was to be provided, the scoring for this would increase to +4. **ASSUMPTIONS:** Assumed that the bridge would enable navigation by small craft.		

Notes: MCA Workshop #5, Otahuhu Creek

Appendix M

Unweighted Multi Criteria Analysis Scores for Alignment Options

Unweighted Multi Criteria Analysis Scores for Alignment Options

The figures below provide a graphical summary of the outcomes from the MCA evaluation and reporting on the key considerations which informed the option selection for each segment. The 'best performing' option identified from the assessment process is highlighted in red f or each sector, with those criteria scoring as 'positive' showing above the neutral line (in the blue area of the figure) and those scoring 'negatively' showing below the neutral impact line (in the red are of the figure).

As noted above, mana whenua did not provide a single 'score' for the mana whenua values criteria. Where relevant comment is provided on their preference for options considered in each sector.

Attachment 7 provides comparative evaluation of the weighted scores, presented for the purpose of sensitivity testing only.

Figure 1: Neilson Street Interchange

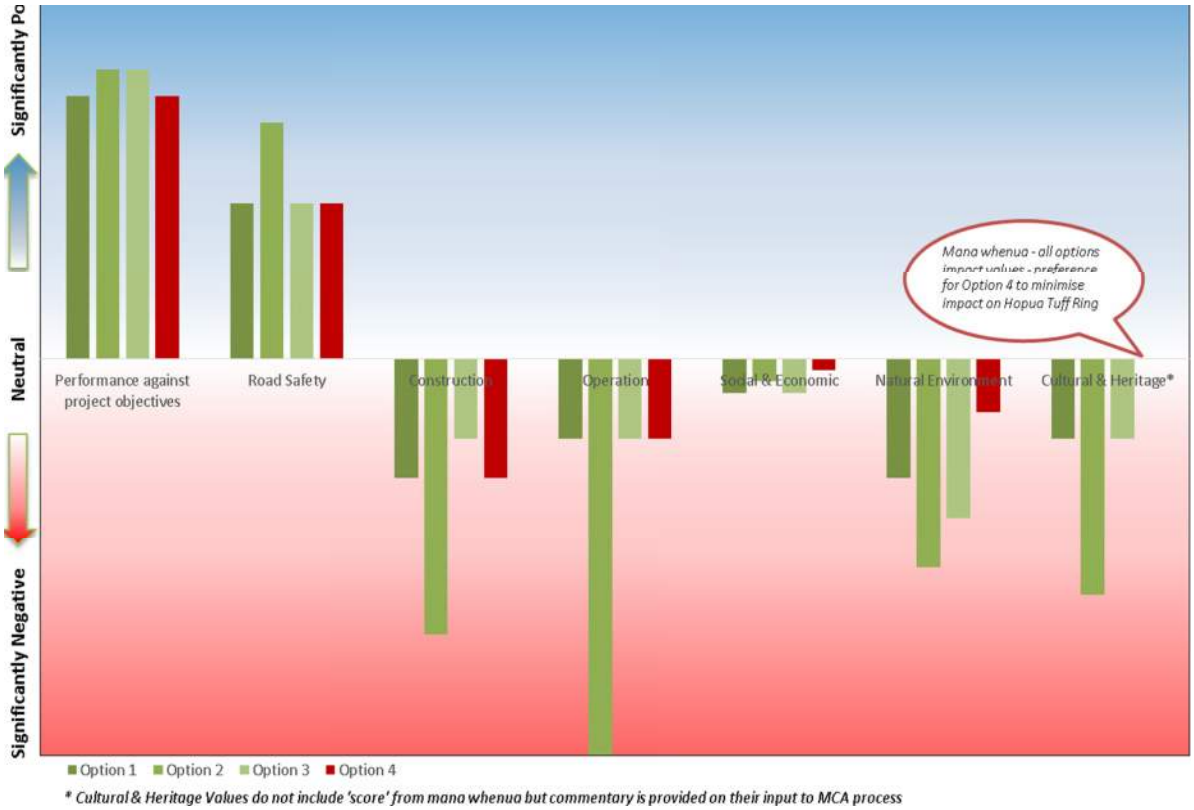


Figure 2: Foreshore Alignment Options

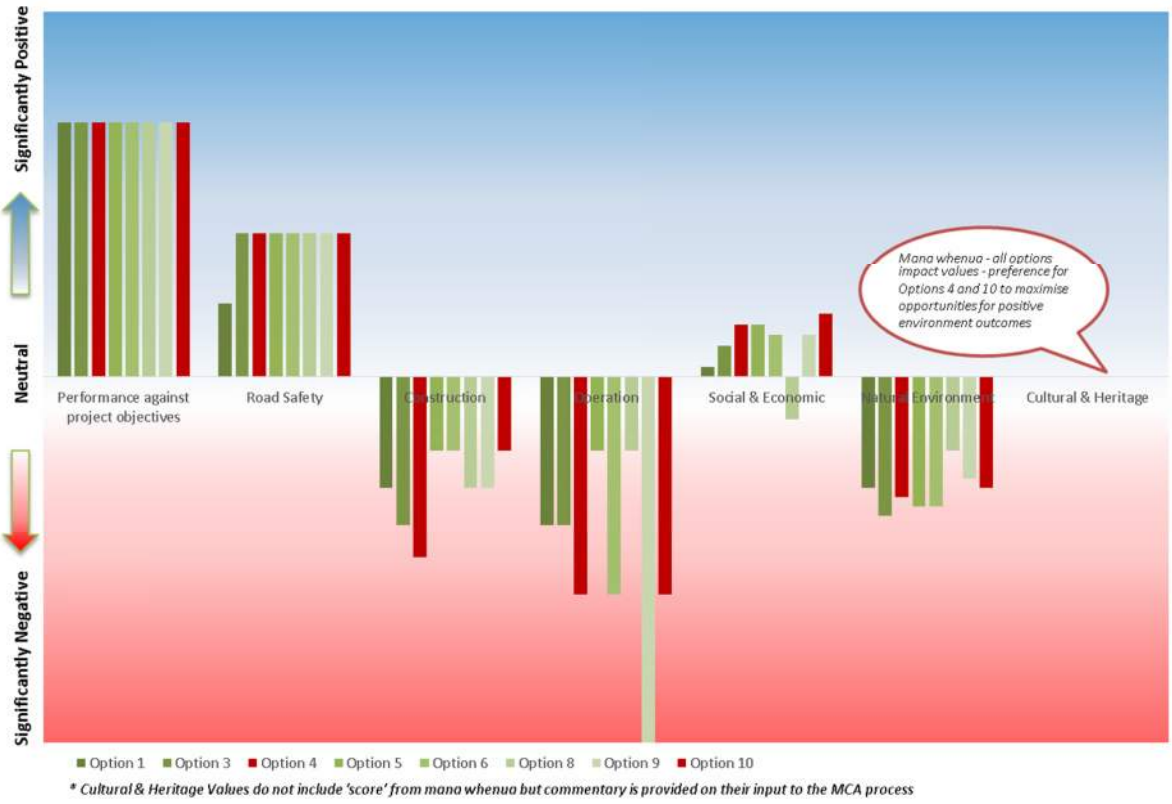


Figure 3: Anns Creek Evaluation

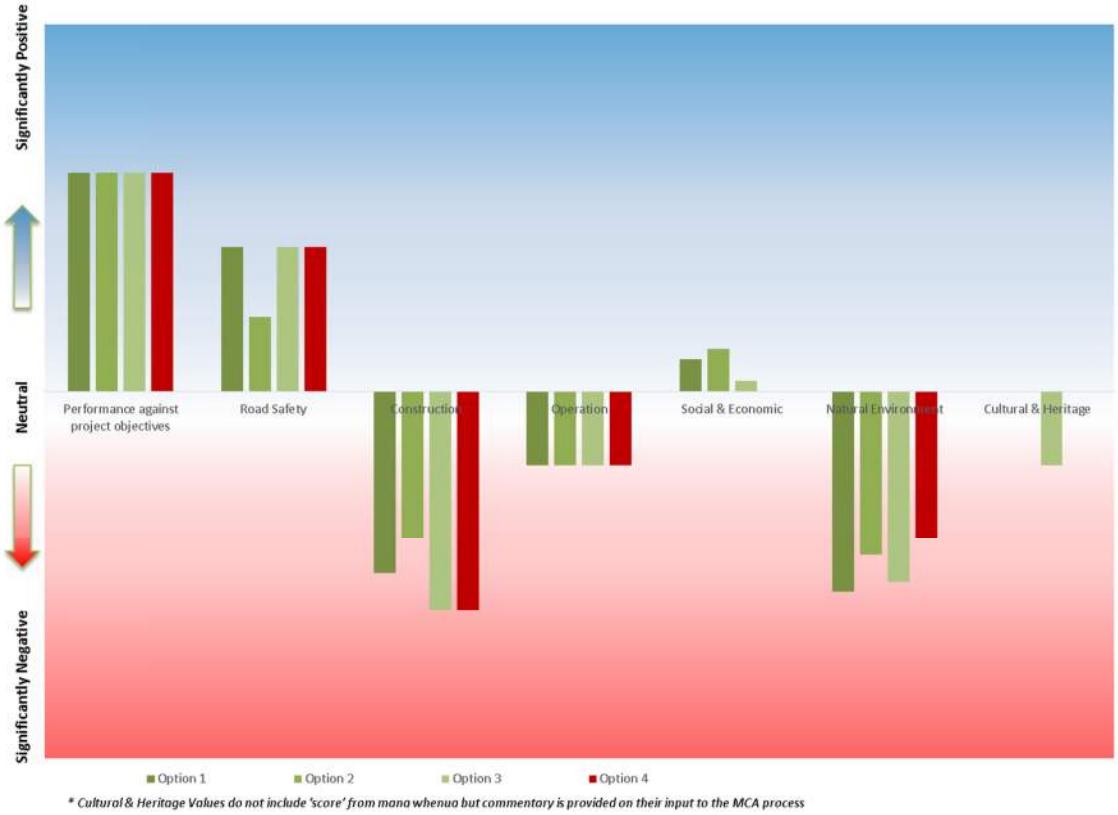


Figure 4: Ōtāhuhu Creek Evaluation

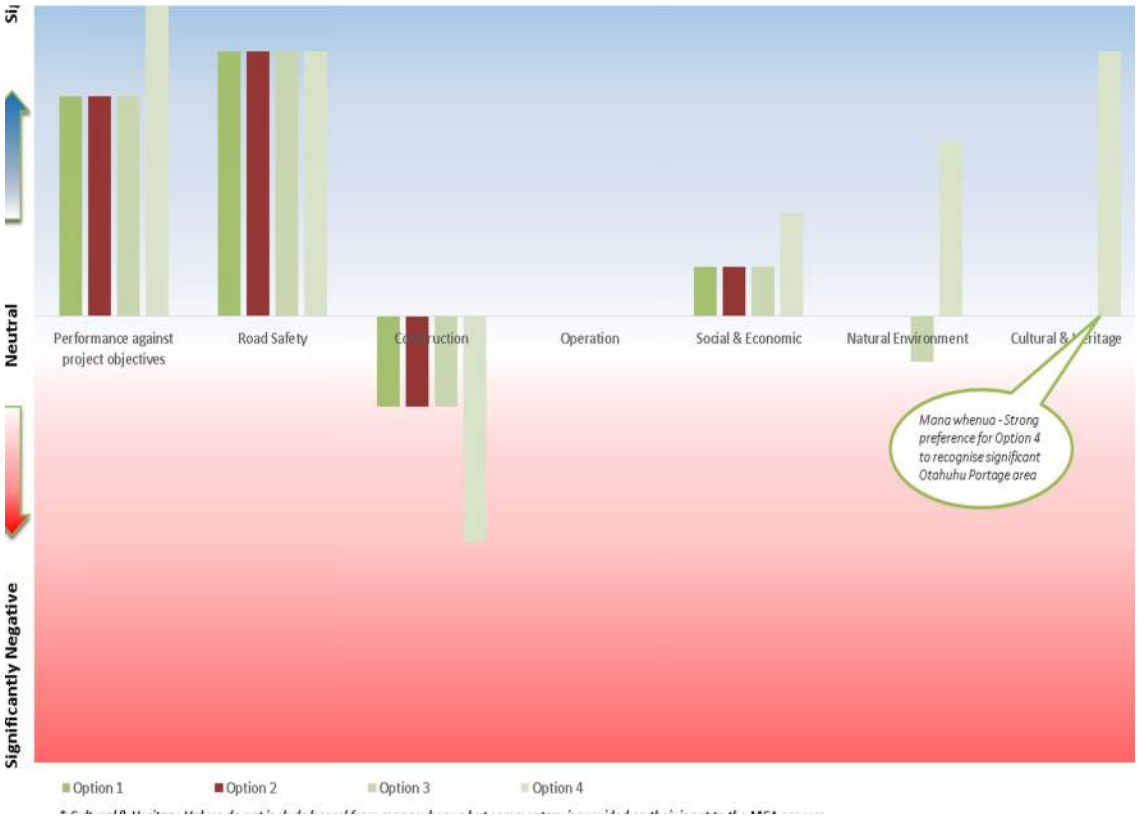
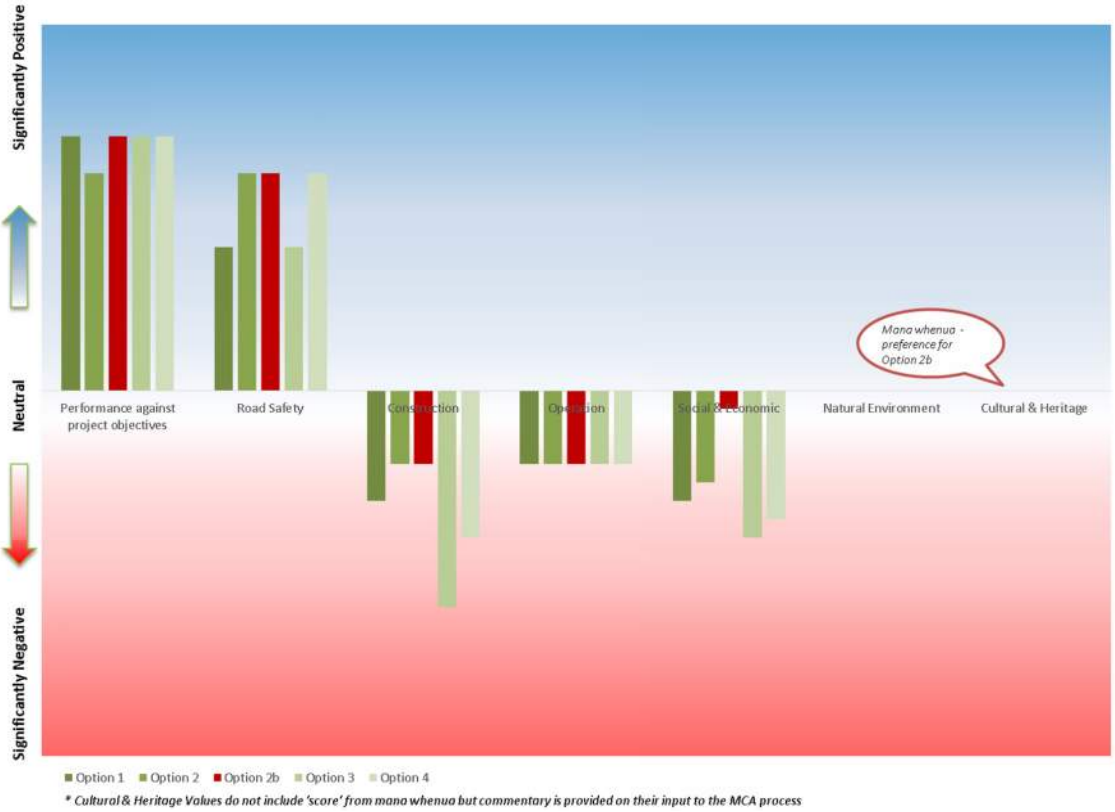
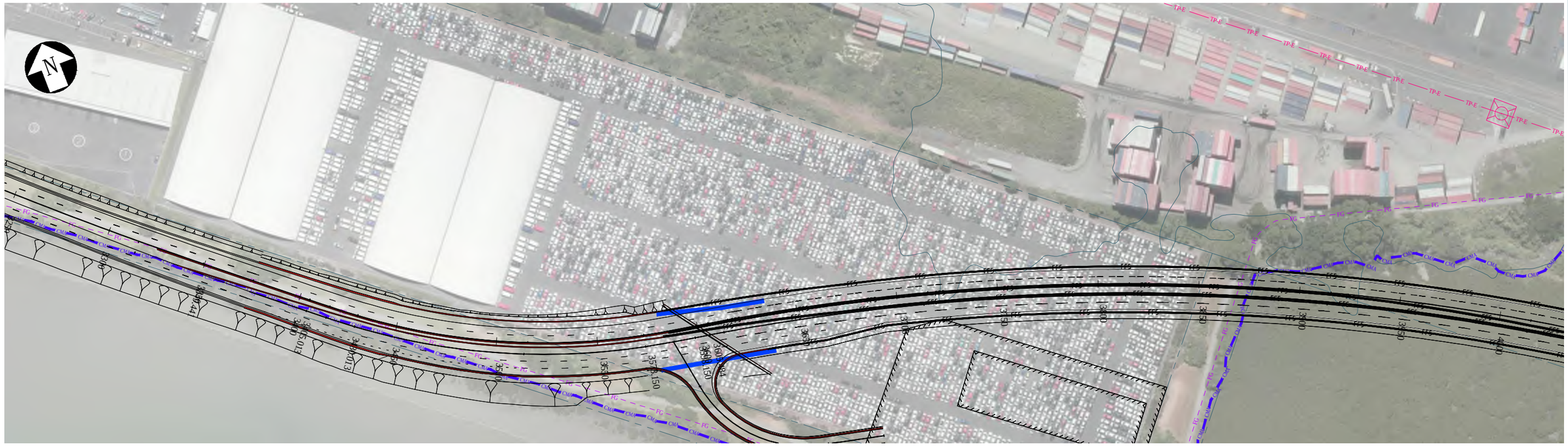


Figure 5: Princes Street Evaluation

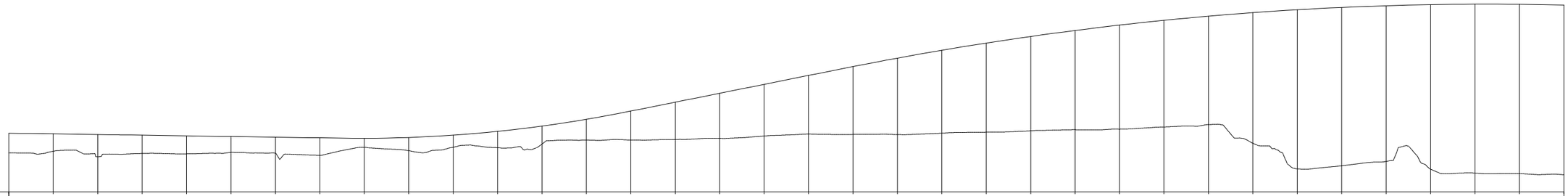


Appendix N

Anns Creek Further Refinements



DATUM=0.00



CHAINAGE ON MC00	3300	3320	3340	3360	3380	3400	3420	3440	3460	3480	3500	3520	3540	3560	3580	3600	3620	3640
DESIGN TO GROUND LEVEL DIFFERENCE	1.77	1.56	2.00	1.64	1.62	1.42	1.44	1.56	0.81	1.18	1.08	1.47	1.61	1.86	2.60	3.35	4.05	4.64
DESIGN LEVEL	5.264	5.204	5.144	5.084	5.024	4.964	4.904	4.844	4.801	4.876	5.084	5.425	5.900	6.507	7.248	8.048	8.848	9.648
GROUND LEVEL	3.49	3.64	3.14	3.44	3.40	3.54	3.46	3.28	3.99	3.69	4.00	3.96	4.28	4.65	4.65	4.70	4.79	5.01
HORIZONTAL GEOM	R=-2000.00 L=168.35			D=55.57			CL	R=-325.00 L=143.14							CL	D	R=1100.00 L=461.24	
VERTICAL GEOM																		
CROSSFALL																		
DESIGN SPEED	ARTERIAL ROAD 70KM/H																	

CHAINAGE ON MC00	3660	3680	3700	3720	3740	3760	3780	3800	3820	3840	3860	3880	3900	3920	3940	3960	3980	4000
DESIGN TO GROUND LEVEL DIFFERENCE	5.26	6.10	6.87	7.44	8.00	8.47	8.91	9.35	9.57	9.73	11.73	14.29	14.22	13.98	14.78	15.17	15.20	15.24
DESIGN LEVEL	10.448	11.246	12.004	12.706	13.354	13.947	14.485	14.968	15.395	15.768	16.085	16.348	16.556	16.708	16.805	16.848	16.835	16.767
GROUND LEVEL	5.18	5.15	5.13	5.26	5.35	5.47	5.58	5.62	5.82	6.03	4.36	2.06	2.34	2.73	2.03	1.68	1.63	1.53
HORIZONTAL GEOM																		
VERTICAL GEOM																		
CROSSFALL																		
DESIGN SPEED																		

DRAFT
FOR DISCUSSION
23/06/2016

VERTICAL 1:400
@ A3 SIZE
0 2 4 6 8 10m
HORIZONTAL 1:2000
@ A3 SIZE
0 10 20 30 40 50m

PRELIMINARY

No.	Issued Status	Drawn	Check'd	App'd	Date
A	ISSUED FOR ACCESSMENT	AR			

DISCLAIMER
The information shown on this drawing is solely for the purpose of supporting application under the RMA for resource consents and/ or designations.
All information shown is subject to final design and review for compliance with any approved consents and/ or designations.
This Drawing must not be used for construction.

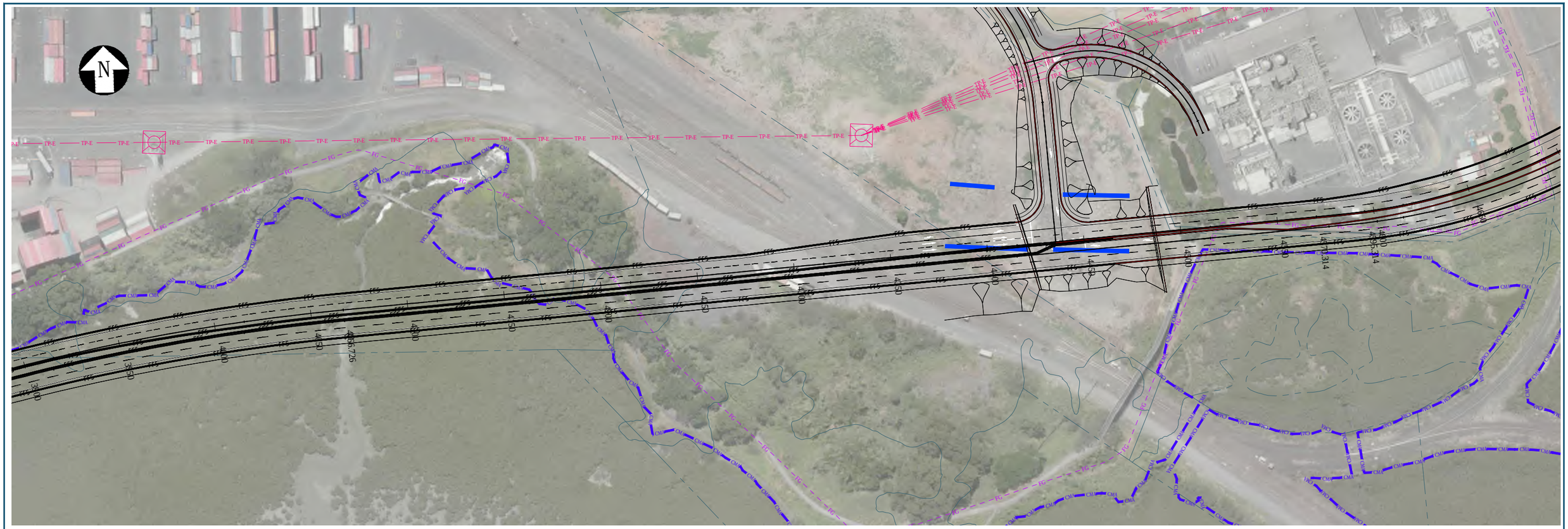
NZ TRANSPORT AGENCY
WAKA KOTAHI
East West Link

Drawn: A RAM
Drafting Check:
Reviewed Design Manager:
Approved Alliance Manager:
Designed:
Design Check:
Scale: Original Scale (A1)   Reduced Scale (A3)   AS SHOWN
Contract No: PA4041

Drawing Title:
ROAD ALIGNMENT
DESIGN HOLD - ALTERNATIVE OPTION - MC00
PLAN AND LONG SECTION - SHEET 6

Drawing Number: Z-01-C-206
Rev No.: A

Plot Date: 23 June 2016 - 9:32 AM   Plotted by: Raymond Tan   Cad File No: W:\CAD\AutoCAD\DWGs\001 Alternative option\Z-01-C-201-205.dwg



0 10 20 30 40 50m
SCALE 1:2,000 @ A3 SIZE

DATUM=-1.00

DESIGN TO GROUND LEVEL DIFFERENCE	15.24	15.32	15.33	15.57	15.52	15.11	14.72	14.44	14.45	13.14	10.29	8.91
DESIGN LEVEL	16.767	16.668	16.568	16.468	16.368	16.268	16.168	16.068	15.968	15.868	15.768	15.668
GROUND LEVEL	1.53	1.35	1.24	0.89	0.85	1.16	1.45	1.63	1.52	2.73	5.47	6.76
CHAINAGE ON MC00	4000	4020	4040	4060	4080	4100	4120	4140	4160	4180	4200	4220

DESIGN TO GROUND LEVEL DIFFERENCE	8.50	8.08	8.46	9.01	8.83	8.63	9.10	9.21	3.74	4.63	4.65	4.89
DESIGN LEVEL	15.568	15.468	15.368	15.268	15.168	15.068	14.968	14.868	14.768	14.668	14.568	14.468
GROUND LEVEL	7.07	7.39	6.90	6.25	6.34	6.43	5.87	5.66	11.02	10.04	9.92	9.58
CHAINAGE ON MC00	4240	4260	4280	4300	4320	4340	4360	4380	4400	4420	4440	4460

DESIGN TO GROUND LEVEL DIFFERENCE	4.10	7.87	7.82	7.71	7.64	7.52	7.42	7.34	7.25	6.99	6.68	7.46
DESIGN LEVEL	14.368	14.268	14.168	14.068	13.968	13.868	13.768	13.668	13.568	13.468	13.368	13.268
GROUND LEVEL	10.26	6.40	6.34	6.36	6.32	6.35	6.35	6.33	6.32	6.47	6.68	5.80
CHAINAGE ON MC00	4480	4500	4520	4540	4560	4580	4600	4620	4640	4660	4680	4700

HORIZONTAL GEOM	R=1100.00 L=461.24	D=503.59	CL	R=-315.00 L=235.20
VERTICAL GEOM				
CROSSFALL				

ARTERIAL ROAD 70KM/H

DRAFT
FOR DISCUSSION
23/06/2016

VERTICAL 1:400
@ A3 SIZE
0 2 4 6 8 10m
HORIZONTAL 1:2000
@ A3 SIZE
0 10 20 30 40 50m

PRELIMINARY

A	ISSUED FOR ACCESSMENT	AR			
No.	Issued Status	Drawn	Check'd	App'd	Date

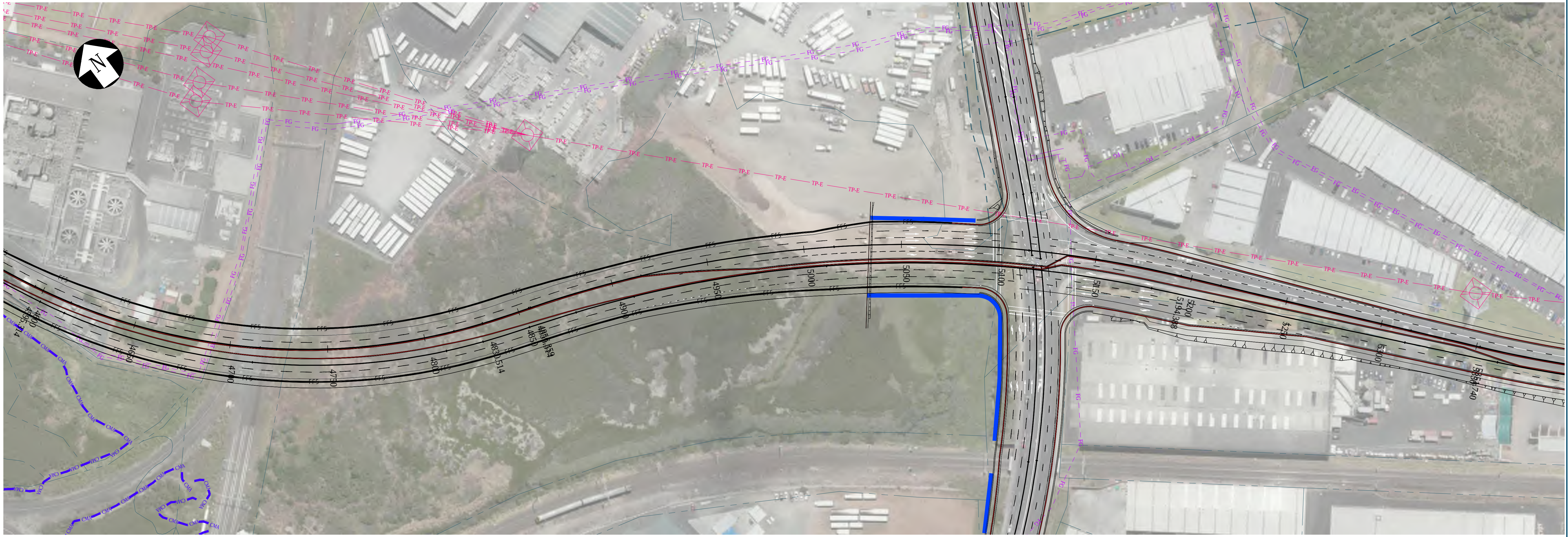
DISCLAIMER
The information shown on this drawing is solely for the purpose of supporting application under the RMA for resource consents and/ or designations.
All information shown is subject to final design and review for compliance with any approved consents and/ or designations.
This Drawing must not be used for construction.

NZ TRANSPORT AGENCY
WAKA KOTAHI
East West Link

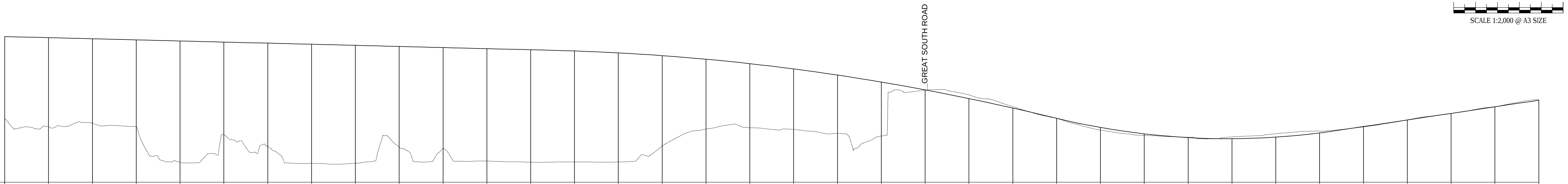
Drawn A RAM
Drafting Check
Reviewed Design Manager
Approved Alliance Manager
Designed
Design Check
Scale: Original Scale (A1)
Reduced Scale (A3) AS SHOWN
Contract No PA4041

Drawing Title
ROAD ALIGNMENT
DESIGN HOLD - ALTERNATIVE OPTION - MC00
PLAN AND LONG SECTION - SHEET 7
Drawing Number Z-01-C-207
Rev No. A

Plot Date: 23 June 2016 - 9:33 AM
Plotted by: Raymond Tan
Cad File No: W:\CAD\AutoCAD\DWGs\001 Alternative option\Z-01-C-201-205.dwg



0 10 20 30 40 50m
SCALE 1:2,000 @ A3 SIZE



DATUM=0.00

DESIGN TO GROUND LEVEL DIFFERENCE	7.46	8.11	7.68	7.91	11.07	8.44	9.40	10.85	10.75	9.19	9.20	10.24
DESIGN LEVEL	13.268	13.168	13.068	12.968	12.868	12.768	12.668	12.568	12.468	12.368	12.268	12.168
GROUND LEVEL	5.80	5.06	5.38	5.06	1.80	4.33	3.27	1.72	1.72	3.18	3.07	1.93
CHAINAGE ON MC00	4700	4720	4740	4760	4780	4800	4820	4840	4860	4880	4900	4920
HORIZONTAL GEOM	R=-315.00 L=235.20							CL	D R=600.00 L=338.03			
VERTICAL GEOM												
CROSSFALL												

DESIGN TO GROUND LEVEL DIFFERENCE	10.25	10.12	9.95	8.23	6.36	5.84	5.51	5.31	4.91	0.02	-0.33	-0.13
DESIGN LEVEL	12.068	11.959	11.785	11.534	11.205	10.800	10.318	9.759	9.123	8.411	7.621	6.754
GROUND LEVEL	1.82	1.84	1.84	3.30	4.85	4.96	4.81	4.45	4.21	8.39	7.95	6.88
CHAINAGE ON MC00	4940	4960	4980	5000	5020	5040	5060	5080	5100	5120	5140	5160
HORIZONTAL GEOM												
VERTICAL GEOM												
CROSSFALL												

DESIGN TO GROUND LEVEL DIFFERENCE	0.00	0.24	0.15	-0.04	-0.16	-0.31	-0.17	0.03	-0.01	0.00	-0.01	-0.07
DESIGN LEVEL	5.813	4.989	4.405	4.063	3.963	4.104	4.487	5.067	5.667	6.267	6.867	7.467
GROUND LEVEL	5.81	4.75	4.26	4.10	4.13	4.42	4.65	5.04	5.68	6.26	6.88	7.54
CHAINAGE ON MC00	5180	5200	5220	5240	5260	5280	5300	5320	5340	5360	5380	5400
HORIZONTAL GEOM		D=157.35								R=-600.00 L=108.10		
VERTICAL GEOM												
CROSSFALL												

ARTERIAL ROAD 70KM/H

DRAFT
FOR DISCUSSION
23/06/2016

VERTICAL 1:400
@ A3 SIZE
HORIZONTAL 1:2000
@ A3 SIZE
0 2 4 6 8 10m
0 10 20 30 40 50m

PRELIMINARY

No.	Issued Status	Drawn	Check'd	App'd	Date
A	ISSUED FOR ACCESSMENT	AR			

NZ TRANSPORT AGENCY
WAKA KOTAHI

East West Link

Drawn: A RAM
Drafting Check:
Reviewed Design Manager:
Approved Alliance Manager:
Designed:
Design Check:
Scale: Original Scale (A1) / Reduced Scale (A3): AS SHOWN
Contract No: PA4041

Drawing Title:
ROAD ALIGNMENT
DESIGN HOLD - ALTERNATIVE OPTION - MC00
PLAN AND LONG SECTION - SHEET 8

Drawing Number: Z-01-C-208
Rev No.: A

Plot Date: 23 June 2016 - 9:34 AM
Plotted by: Raymond Tan
Cad File No: W:\CAD\AutoCAD\DWGs\001 Alternative option\Z-01-C-201-205.dwg

DRAFT
FOR INFORMATION
22/08/2016

PRELIMINARY

No.	Issued Status	Drawn	Check'd	App'd	Date
A	ISSUED FOR INFORMATION ONLY	AR			

DISCLAIMER
The information shown on this drawing is solely for the purpose of supporting application under the RMA for resource consents and/ or designations.
All information shown is subject to final design and review for compliance with any approved consents and/ or designations.
This Drawing must not be used for construction.

NZ TRANSPORT AGENCY WAKA KOTAHI

East West Link

Drawn: A RAM	Drafting Check	Reviewed: Design Manager	Approved: Alliance Manager	
Designed	Design Check			
Scale: Original Scale (A1)	Reduced Scale (A3)	AS SHOWN	Contract No. PA4041	

Drawing Title: ECOLOGY
VOLCANIC ASSESSMENT/ VEGETATION TYPES
ANNS CREEK

Drawing Number: Z-EF-041

Rev No: A

Plot Date: 22 August 2016 - 8:41 p.m. Plotted by: Ajeshni Ram Cad File No: \\252.100.100\Data\CAD\Auto\CAD\DWG\Z-EF-041.dwg

Appendix O

Onehunga Business Association Option Evaluation

East West Link Alliance

Purpose: File Note documenting revised MCA for OBA Option

From: Amelia Linzey & Noel Nancekivell **Date:** 25/10/2016

Subject: MCA Review for Onehunga Business Association Option

Purpose

To provide a comparative evaluation and update to the MCA scoring of a revised Option 2, being the Alignment Design undertaken by the Onehunga Business Association. The Onehunga Business Association option provides for grade separated connections between EWL and SH20 including two additional bridge structures across the Manukau Harbour in the vicinity of the existing two Manukau Harbour Crossing bridges (being the north and south movements for SH20).

Attachments

To assist in the comparative evaluation of the OBA Option from the initial 'Option 2' provided in the MCA scoring, the following documents (Attachments 1 – 5) should be read in conjunction with this file note:

1. The Onehunga Business Association design summary;
2. The OBA Design Option, prepared by the EWL Alliance to assist in providing evaluation;
3. The MCA Criteria used for evaluation of alignment options, April 2016;
4. The Outcomes Report for the Neilson Street Interchange MCA (May 2016), which provides the initial technical MCA for the four alignment options considered at the interchange (with Option 2 being the design based on initial concept plans from TOES and Option 4 being the 'preferred' option from that MCA process).
5. The summary reporting of the four alignment options;
6. The summary reporting comparing 'Option 2', 'The OBA Option' and the EWL Alliance Option (as at design hold).

It is important to note that Option 4 as summarised in the MCA report has been through further design development (to address impacts identified at the time of that assessment). Where there has been design work that might reduce the impact scores of the MCA this is noted for completeness. However, **the MCA scores reported in this document relate to the original assessment of the Option 4 alignment design**.

Comparison of OBA Option and 'Option 4'

In summary, the key elements of difference between the OBA Option and Option 4 include:

In transport terms, the key functional differences are at the Neilson Street interchange end, and include (relative to the AEE option):

- Removal of the SH20 overbridge at Gloucester Park
- Removal of the Galway Street link to EWL
- New, direct ramps between SH20 and the EWL, via:
    - New structures crossing the Manukau Harbour for the movement between the EWL and SH20 south
    - New, direct ramps between the EWL and SH20 north
- Retention of the existing on/off ramps between SH20 and Onehunga, via Neilson Street and Onehunga Harbour Road.
- A more direct link to EWL via Angle Street, rather than via the 'Port Link' (with its subsequent connection to Miami Parade/Angle Street)
- Use of roundabouts at the EWL intersections rather than traffic signals
- The additional ramps means that the SH20 southbound off-ramp will diverge to both Neilson St and direct to EWL

The OBA design option concept, from which the engineering design is based, included additional local road connections via a new 'Old Mangere Bridge' connection and additional reclamation around the western coastal edge (adjacent to Onehunga Harbour Road / Orpheus Drive). These elements are not specifically included in the MCA, as they are considered 'additional' design elements that could be included (or not) with the Alliance option. However, commentary is provided on the potential impacts and resulting scorings (both positive and negative) for these elements where relevant.

The OBA design option concept also indicates a new connection from Alfred St to the new EWL corridor. The design undertaken by the EWL Alliance does not provide for the OBA Option to connect Alfred Street to the EWL, due to the proximity of the diverges required for the EWL to SH20 connection.

Comparative MCA Notes

The following provides a revised 'MCA Score' for the OBA option, compared to the initial Option 2 evaluation (see **Attachment 4**). A summary is provided of the MCA score compared to Option 4 and any further commentary on changes since made to Option 4 (since design hold) is noted. To assist legibility, the evaluation is summarised in respect of the MCA criteria.

Performance Against Project Objectives: Objective 1

The analysis for the OBA Option has included preliminary traffic modelling, for the year 2026. The modelling undertaken is considered sufficient to inform a high-level view on the likely transport outcomes of this alternative option.

The Overall Assessment of the OBA Option in respect of Objective 1 is **+4**. This is the same score as for Option 2 and for Option 4 (the preferred alignment option from the MCA).

The key predicted 2026 time savings, relative to the 2026 No Project scenario indicate the following:

- The OBA option generally has bigger time savings to/from SH20 south, due to the more direct ramps

- The time savings for the OBA option are generally neutral or the same as for Option 4 for other access movements (e.g. the time savings are the same for movements from Captain Springs Road to SH1)

- Importantly, the OBA option creates new congestion on the SH20 northbound through movement, due to the double-on-ramp at Neilson Street and the extra traffic attracted to this corridor. This results in an extra delay to existing SH20 users of over 5 minutes. This is considered a significant negative impact on SH20. To address this impact, it is likely that additional widening of SH20 would be required between Neilson Street and Queenstown Road (to accommodate the extra merging traffic), as well as the potential need for widening (lane capacity increases) of SH20 between SH20a and the Manukau Harbour Crossing. These projects have not been included in the OBA design (e.g. excluded from both cost and design) but are reflected in consideration of traffic performance.

Performance Against Project Objectives: Objective 2

The Overall Assessment of the OBA Option in respect of Objective 2 is **+4**. This is the same score as for Option 4 (the preferred alignment option from the MCA).

Options 4 and the OBA options offer similar overall reductions in travel time for buses travelling between Mangere and Onehunga. There is less savings in travel time for Option 4 in the morning peak but a greater travel time saving for buses in the evening peak.

Performance Against Project Objectives: Objective 3

This assessment is focussed mainly at the Onehunga end of the Project, as the connections to Sylvia Park are assumed to be consistent between options. Overall, given the quality of connections and the opportunities for these connections through the EWL connections in the OBA Option, the OBA Option has been **scored +1.5 compared to the +2 score** of both Option 4 and the earlier Option 2 (the TOES derived design option).

Factors that reduced the positive scoring for pedestrian connections with the OBA option include:

- It is assumed that the same local walking/cycle connections could be provided for both options, using Onehunga Mall to connect the Old Mangere Bridge to Onehunga Town centre.

- The proposed roundabouts on the EWL be less suitable pedestrian / cycle crossing points of the EWL, particularly for pedestrians and vulnerable cyclists. This would need to be mitigated either by use of traffic signals, or by additional bridge crossings. Even with additional bridge crossings, the quality of connections to the foreshore cycle facility is expected to be worse for the OBA option, and not consistent with the quality of access and safety.

- The OBA option has noticeably higher traffic flows on Onehunga Mall (south), than Option 4 (which provides the Galway Street link). This would mean a lower level of amenity for pedestrians/cyclists on this route and reduced capacity to provide shared path provision on this corridor.

Road Safety

The OBA Option Score **+3**, which is the same as Option 2 and is higher than for Option 4 (+2). All of the options are considered positive, however the slightly more complex layout of Option 4 with the split interchange (relative to Option 2) were reasons for the slight difference in the scores.

It is noted at the time of the MCA, the connection at Galway Street was proposed via grade separated ramps. This design element has been amended (since the MCA) to a signalised intersection. It is expected this would improve road user safety as the complexity of movements and reduction in conflict points. This has not been reassessed in the MCA scores reported for this paper (e.g. as part of the review of the OBA option).

Construction

Two topic areas were considered in the evaluation of construction impacts. These related to impacts on lifeline utilities and infrastructure and construction costs.

The OBA Option scored **-2** in respect of utilities (the same as Option 2) and a greater negative score than for Option 4 (which was -1). The impacts identified included the impacts on Transpower pylons, which are likely to require realignment and there is a lesser impact from Option 4.

The Construction Cost (which excludes property costs for all options) is **-4.5** for the OBA Option, compared to **-2** for Option 4. This score is more adverse for the OBA Option as the incremental increase in costs for the Option is estimated to be approximately $400M compared to Option 4, factoring tunnelling, additional bridging costs of the CMA and construction works. Also as discussed above significant additional works would be required to the wider network if this option was to be adopted. The latter costs (for additional works on SH20, have not been taken into account in the construction costs, but have been considered in the assessment of traffic performance).

It is also noted that the costs of the Neilson Street interchange have increased relative to the earlier evaluation Option 4 (reported in the MCA). This is due to the inclusion of a trench on Onehunga Harbour Road (to provide local road access to Onehunga Wharf). As with other assessments, this revised cost has not been 're-scored' in the MCA reported in this assessment. For completeness, the cost differential between the OBA option and the current Neilson Street interchange design is approximately $300M.

Operational Cost

The costs of maintaining and operating both a cut-cover tunnel and two additional bridge crossings of the Manukau Harbour are considered greater for the OBA Option compared to Option 4. Tunnelling is considered a significantly higher operational cost than road, providing for pumping, tunnelling ITS and fire control.

It is noted that the operational costs of the OBA option are considered less than Option 2, which had a greater length of tunnel. The score for the OBA Option is assessed to be **-3** (compared to -1 for Option 4 and -5 for the original Option 2). It is also noted that the trenching of the EWL to provide for a local road connection on Onehunga Harbour Road will require pumping for stormwater (however, the length of trench proposed will not require air ventilation, tunnel ITS or specific fire safety costs).

Social Impact and Amenity

The following specific assessment areas contribute to the Social Impact and Amenity score, with commentary provided for each:

- Construction Impact – all options were considered negative, but construction impacts for the OBA Option was **-4** compared to -3 for Option 4. This scoring reflects the longer construction period anticipated (including cut-cover tunnelling and bridge construction works) and the extent of impact extending through both the Onehunga and Mangere Bridge areas.

- Built Form and Amenity – The OBA option was identified as more positive in the Onehunga area, reducing tall structures near the Onehunga town centre. However, conversely there were new structures introduced through the ramps that need to be bought over the EWL to provide connections to Rimu Road (Mangere Bridge) and the character and legibility of the connection between Mangere Bridge and Onehunga, with additional bridge crossings was considered negative. On balance, both the OBA option and Option 4 were scored **-4**, albeit for different impacts.

- Connectivity, including CPTED – Option 4 was considered positive due to reductions in traffic through Onehunga town centre. Comparatively, the OBA option does less to reduce these traffic flows, including traffic volumes on Onehunga Harbour Road. For cyclists all options are considered positive, but the OBA option was considered less positive due to both round-abouts and the ramps from EWL to SH20 that would provide complexity and potential perceived safety issues for cyclists on the Waikaraka / Foreshore route. Comparatively, the OBA Option scored **+0.5** compared to +1.0 for Option 4.

- Quality of living environment – The induced traffic on EWL will increase the traffic flow for residents (few) around Onehunga Harbour Road. Traffic impacts will be greater with ramp connections to/from EWL to SH20 for residents at Mangere Bridge (with increased potential for some properties to be required for project works). Assumes residential apartments at Gloucester Park will be removed. But overall reduction of traffic in Town Centre and for people using Onehunga area considered positive. Therefore OBA Option assessed as **+2.0** compared to +3.0 for Option 4.

- Economic viability of remnant land areas – property take required, in case of the OBA Option this is likely to require full acquisition of apartments at Gloucester Park / Onehunga Harbour Road and high potential severance impact for Storage King site. While Option 4 requires some land from Onehunga Port site, consider remnant land still viable for economic use. On balance both options considered **-3**.

- Economic productivity of surrounding area – all options considered positive for remaining commercial areas – OBA and Option 4 assessed as **+3** impact.

- Public Access to Coast – potential for improved access to and along the Coastal Marine area. However, OBA option considered potentially lower / negative score with ramps connecting between EWL and SH20 providing both physical barrier and amenity issue for access to Manukau Harbour foreshore / Waikaraka walkway. OBA Option 0 (compared to +1 for Option 4).

Natural Environment

The following specific assessment areas contribute to the Natural Environment score, with commentary provided for each:

- Natural Landscape / Character – Impacts considered adverse including potential impacts on Volcanic View Shafts (2), disruption to Hopua Tuff Ring with tunnelling construction (and potentially greater impact if westward reclamation were considered). On balance impacts considered **-3**, compared to -2 for Option 4 (which reduces impact on Tuff Ring

and avoids volcanic viewshafts). Note extent of infringement to viewshafts could raise cultural values impacts.

- Water quality & quantity (for flooding risk) – potential groundwater and flow issues associated with tunnelling, particularly for SEA wetland area. Potential negative impacts off-set by benefits of stormwater treatment associated with new road works (compared to existing local road network). On balance, OBA option scored **+0.5** compared to +1.0.

- Ecological Resources / Values – additional construction impacts and potential disruption to SEA in Gloucester Park and construction impacts in CMA associated with bridge structures (including potential for impacts on Mangere Bridge / Southern shoreline). Score for OBA Option considered to be **-3** (compared to -2 for Option 4). Negative score greater if increase in reclamation on western coastal area.

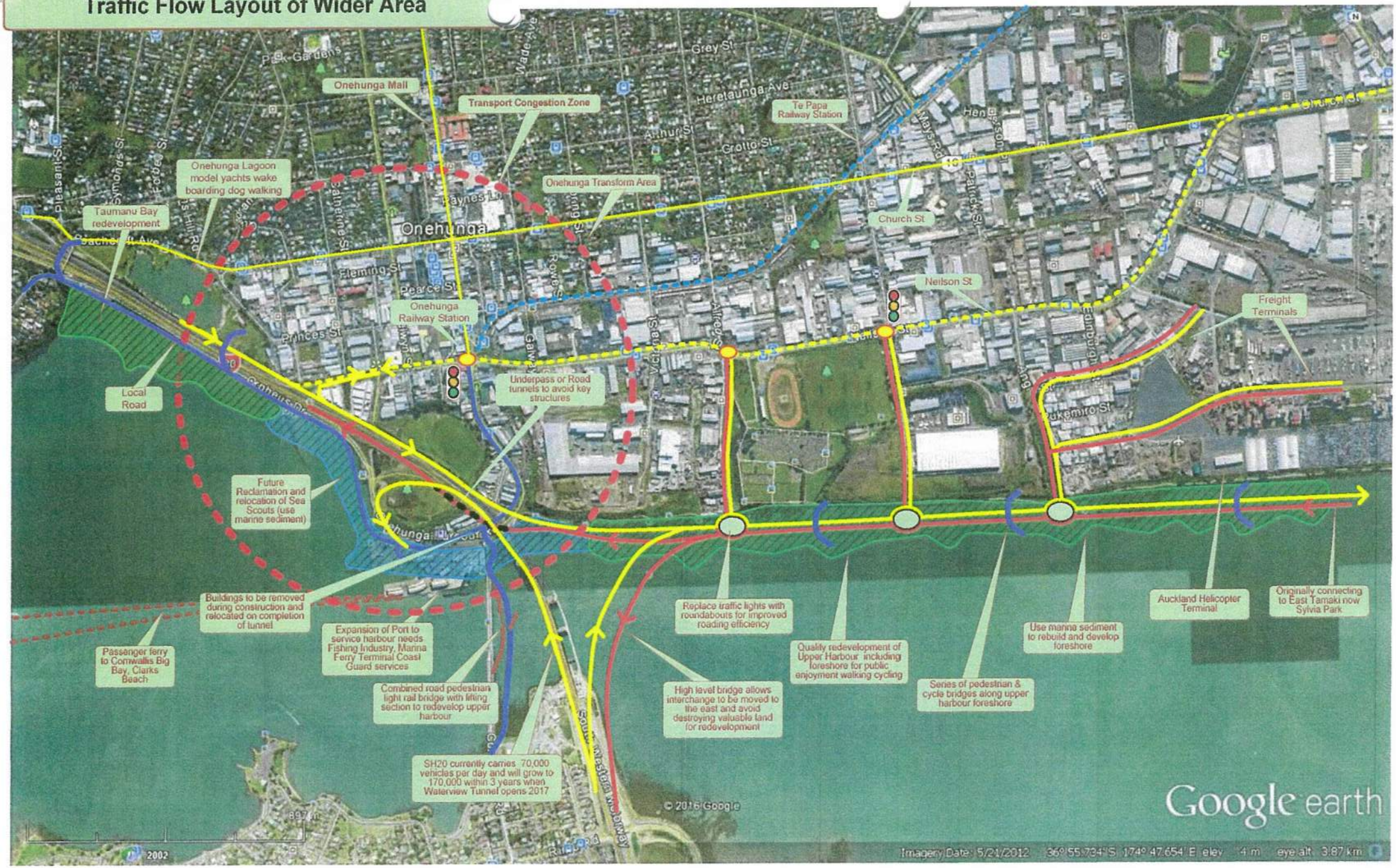
- Coastal environment and processes – no specific scoring undertaken for Neilson Street. however, consideration of impacts of piers (of numerous bridges) in Mangere Inlet channel would require specific consideration. No specific assessment of additional reclamation undertaken.

Heritage Sites and Places

Mana whenua criteria not specifically scored, but noted that preference for Option 4 (reduced impact on Hopua Tuff Ring and avoids impacts on volcanic viewshafts). Heritage impacts associated with structures in CMA, works in Gloucester Park (site of value to Mana Whenua) noted. OBA Option scored **-1**, Option 4 scored 0.

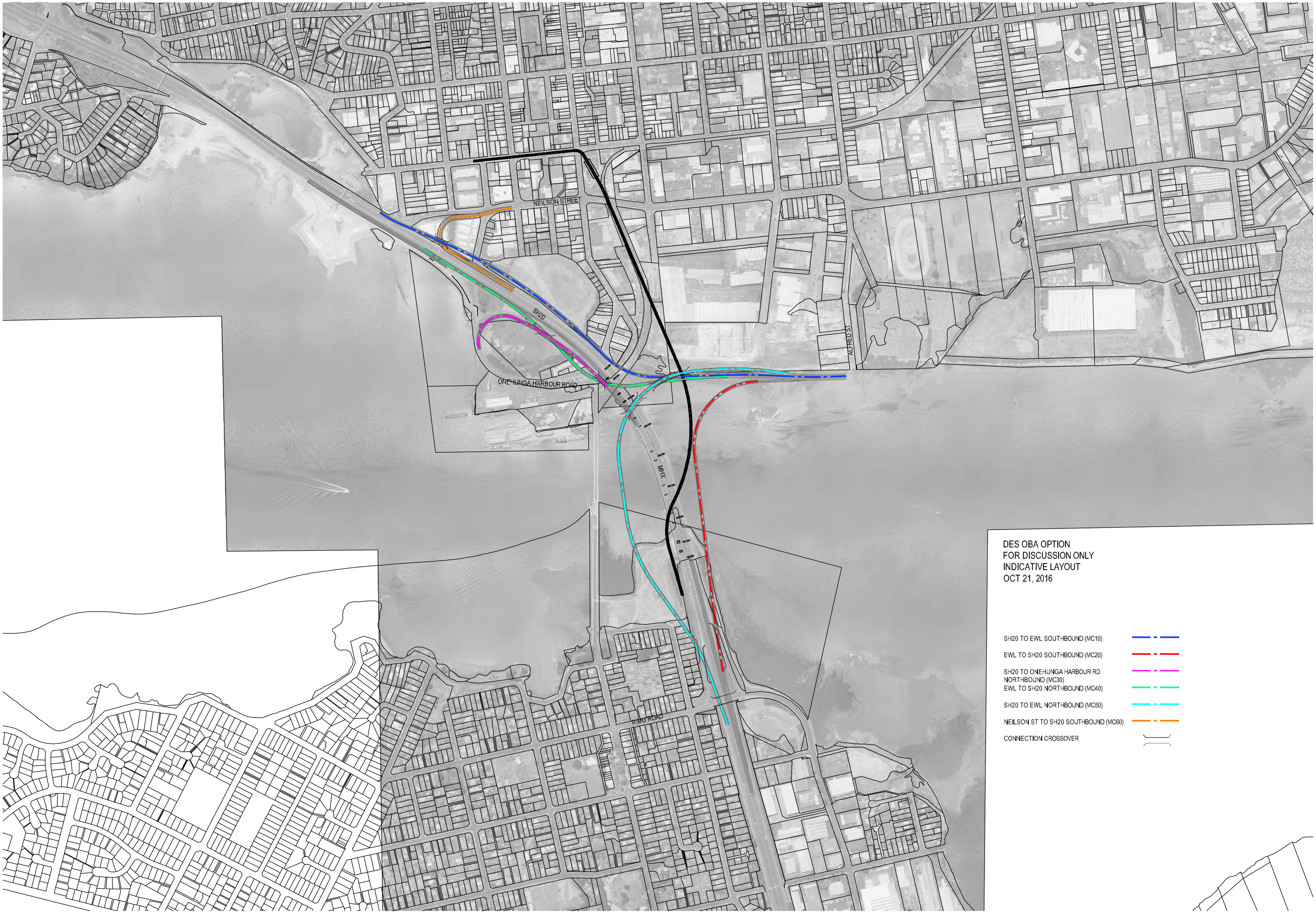
1 The Onehunga Business Association design summary

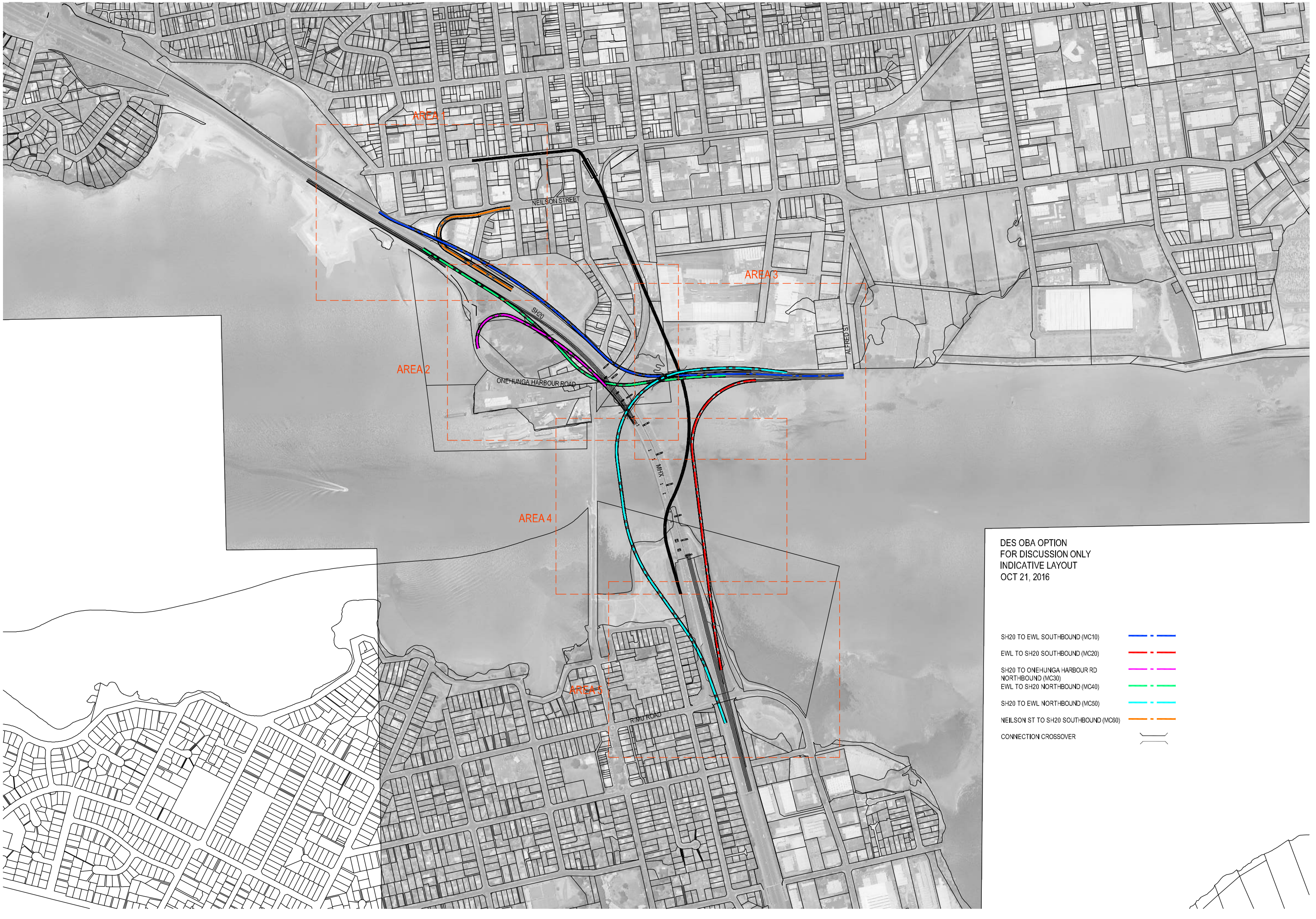
Traffic Flow Layout of Wider Area



DATE	REVISED	FULL FILENAME	PAGE
8/1/2016	8/1/2016	U:\EAST WEST LINK\OBA OPTION A\EWL OBA DESIGN OPTION A.VSD	1 OF 3

2 The OBA Design Option, prepared by the EWL Alliance to assist in providing evaluation;


NEILSON STREET
SH20
ONEHUNGA HARBOUR ROAD
ALFRED ST
MFX
RIMU ROAD
DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
OCT 21, 2016
SH20 TO EWL SOUTHBOUND (MC10)
EWL TO SH20 SOUTHBOUND (MC20)
SH20 TO ONEHUNGA HARBOUR RD NORTHBOUND (MC30)
EWL TO SH20 NORTHBOUND (MC40)
SH20 TO EWL NORTHBOUND (MC50)
NEILSON ST TO SH20 SOUTHBOUND (MC60)
CONNECTION CROSSOVER


AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
NEILSON STREET
SH20
ONEHUNGA HARBOUR ROAD
ALFRED ST
MHX
RIMU ROAD
DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
OCT 21, 2016
SH20 TO EWL SOUTHBOUND (MC10)
EWL TO SH20 SOUTHBOUND (MC20)
SH20 TO ONEHUNGA HARBOUR RD NORTHBOUND (MC30)
EWL TO SH20 NORTHBOUND (MC40)
SH20 TO EWL NORTHBOUND (MC50)
NEILSON ST TO SH20 SOUTHBOUND (MC60)
CONNECTION CROSSOVER

NEILSON ST TO SH20 SOUTHBOUND(MC60)
LAND TAKE AT STORAGE KING

RECONFIGURE NEILSON
ST/GLOUCESTER PARK ROAD
INTERSECTION

NEILSON STREE

SH20 TO EWL SOUTHBOUND(MC10)
RECONFIGURE EXISTING OFF-RAMP

NEILSON ST TO SH20 SOUTHBOUND(MC60)
RELOCATE/REPLACE EXISTING DRAINAGE CULVERT

LANDTAKE AT STORAGE KING

BRIDGE OVER SOUTHBOUND ON-RAMP

LANDTAKE AT STORAGE KING

EXISTING POWER PYLON
AND OVERHEAD
POWERLINES

AREA 1

EWL TO SH20 NORTHBOUND (MC40)

DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
AREA 1
OCT 21, 2016

BRIDGE/VIADUCT

TUNNEL

CLOSE
GLOUCESTER PARK
ROAD

TIE-IN TO EXISTING
ON-RAMP

EWL TO SH20 NORTHBOUND (MC40)
CLOSE PROXIMITY TO EXISTING SH20 ON-RAMP

NOTE:
ALL ON AND OFF RAMPS ARE
ASSUMED TO BE SINGLE LANE
CONNECTIONS. CONSIDERATIONS FOR
FUTURE RAMP METERING AND
WIDENING NEEDS TO BE TAKEN IN TO
ACCOUNT

AREA 2

DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
AREA 2
OCT 21, 2016

BRIDGE/VIADUCT

TUNNEL

NOTE:
ALL ON AND OFF RAMPS ARE ASSUMED TO BE SINGLE LANE CONNECTIONS. CONSIDERATIONS FOR FUTURE RAMP METERING AND WIDENING NEEDS TO BE TAKEN IN TO ACCOUNT

RAISE AND RECONFIGURE RAMP TERMINAL/ORPHEUS DRIVE/ONEHUNGA HARBOUR ROAD INTERSECTION

SH20 TO EWL SOUTHBOUND (MC10) LANDTAKE AND STRUCTURE OVER GLOUCESTER PARK

SH20 TO EWL SOUTHBOUND (MC10) POTENTIAL LIGHT GLARE AND NOISE CONCERNS

SH20 TO EWL SOUTHBOUND (MC10) STRUCTURE OVER ONEHUNGA HARBOUR ROAD

INDICATIVE AT LRT ALIGNMENT

ONEHUNGA HARBOUR ROAD OFF-RAMP OVER SH20 ON-RAMP

EWL TO SH20 NORTHBOUND (MC40) LAND TAKE AND TRENCH STRUCTURE INSIDE GLOUCESTER PARK

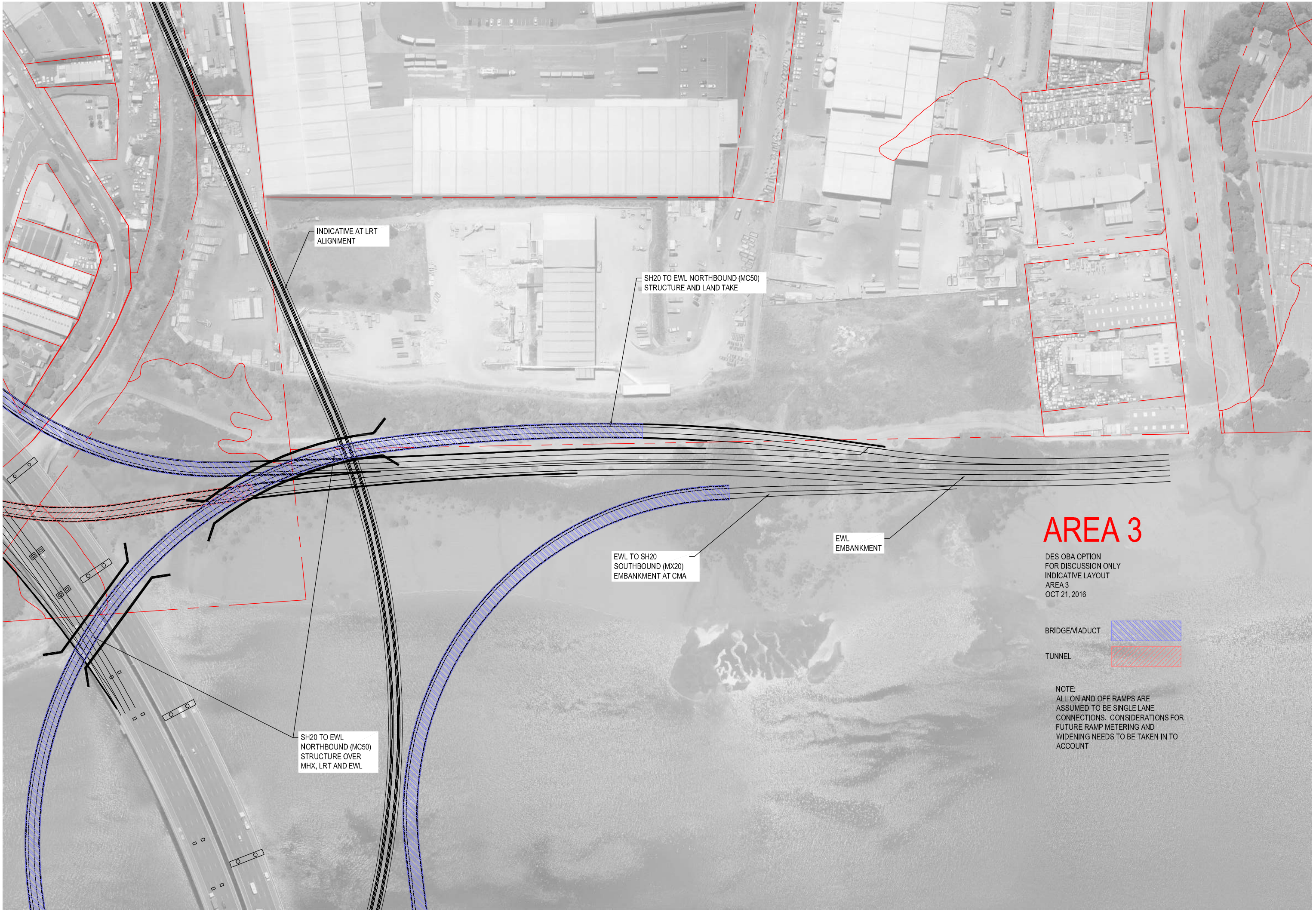
ONEHUNGA HARBOUR ROAD OFF-RAMP OVER SH20 LAND TAKE AND STRUCTURES REQUIRED

EWL TO SH20 NORTHBOUND (MC40) TUNNNEL UNDERNEATH EXISTING BUILDING

SH20 NORTHBOUND TO ONEHUNGA HARBOUR ROAD (MC30)

SH20 NORTHBOUND TO ONEHUNGA HARBOUR ROAD (MC30) REQUIRES CONNECTION TO MHX BRIDGE STRUCTURE

SH20 TO EWL NORTHBOUND (MC50) STRUCTURE OVER MHX


INDICATIVE AT LRT ALIGNMENT
SH20 TO EWL NORTHBOUND (MC50) STRUCTURE AND LAND TAKE
EWL TO SH20 SOUTHBOUND (MX20) EMBANKMENT AT CMA
EWL EMBANKMENT
SH20 TO EWL NORTHBOUND (MC50) STRUCTURE OVER MHX, LRT AND EWL
AREA 3
DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
AREA 3
OCT 21, 2016
BRIDGE/VIADUCT
TUNNEL
NOTE:
ALL ON AND OFF RAMPS ARE ASSUMED TO BE SINGLE LANE CONNECTIONS. CONSIDERATIONS FOR FUTURE RAMP METERING AND WIDENING NEEDS TO BE TAKEN IN TO ACCOUNT

EWL TO SH20 SOUTHBOUND (MC20)
STRUCTURE OVER MANGERE INLET
MHWS AND CLIMATE CHANGE REQUIREMENTS

SH20 TO EWL NORTHBOUND (MC50)
STRUCTURE OVER MANGERE INLET
MHWS AND CLIMATE CHANGE REQUIREMENTS

INDICATIVE AT LRT
ALIGNMENT

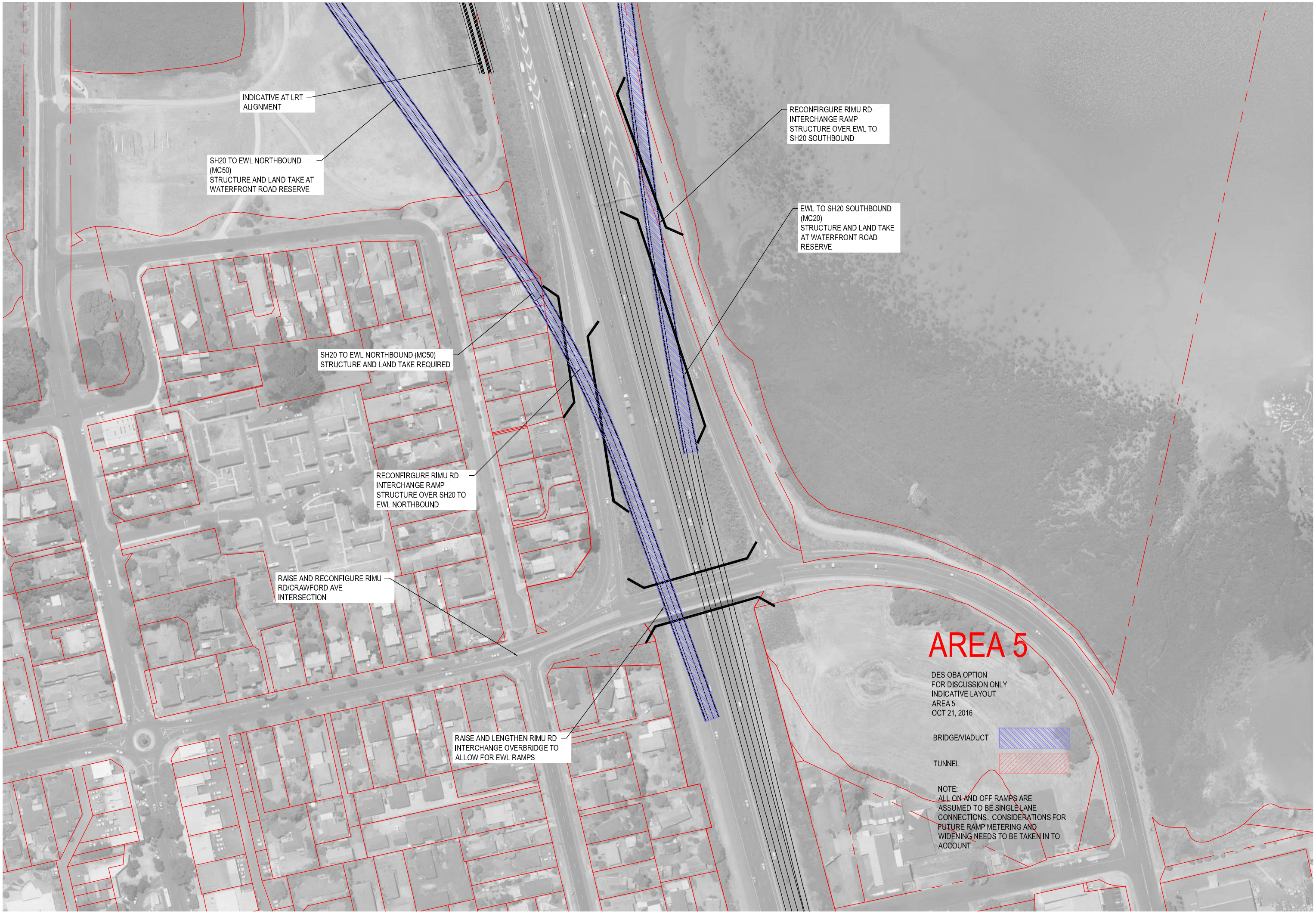
AREA 4

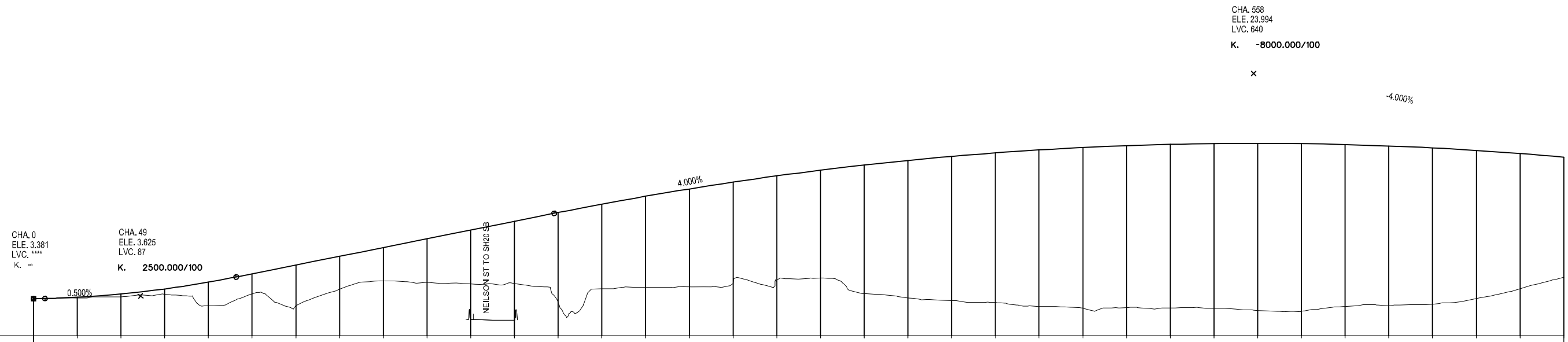
DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
AREA 4
OCT 21, 2016

BRIDGE/VIADUCT

TUNNEL

NOTE:
ALL ON AND OFF RAMPS ARE ASSUMED TO BE SINGLE LANE CONNECTIONS. CONSIDERATIONS FOR FUTURE RAMP METERING AND WIDENING NEEDS TO BE TAKEN IN TO ACCOUNT


INDICATIVE AT LRT ALIGNMENT
SH20 TO EWL NORTHBOUND (MC50) STRUCTURE AND LAND TAKE AT WATERFRONT ROAD RESERVE
SH20 TO EWL NORTHBOUND (MC50) STRUCTURE AND LAND TAKE REQUIRED
RECONFIRGURE RIMU RD INTERCHANGE RAMP STRUCTURE OVER SH20 TO EWL NORTHBOUND
RAISE AND RECONFIGURE RIMU RD/CRAWFORD AVE INTERSECTION
RAISE AND LENGTHEN RIMU RD INTERCHANGE OVERBRIDGE TO ALLOW FOR EWL RAMPS
RECONFIRGURE RIMU RD INTERCHANGE RAMP STRUCTURE OVER EWL TO SH20 SOUTHBOUND
EWL TO SH20 SOUTHBOUND (MC20) STRUCTURE AND LAND TAKE AT WATERFRONT ROAD RESERVE
AREA 5
DES OBA OPTION
FOR DISCUSSION ONLY
INDICATIVE LAYOUT
AREA 5
OCT 21, 2016
BRIDGE/VIADUCT
TUNNEL
NOTE:
ALL ON AND OFF RAMPS ARE ASSUMED TO BE SINGLE LANE CONNECTIONS. CONSIDERATIONS FOR FUTURE RAMP METERING AND WIDENING NEEDS TO BE TAKEN IN TO ACCOUNT



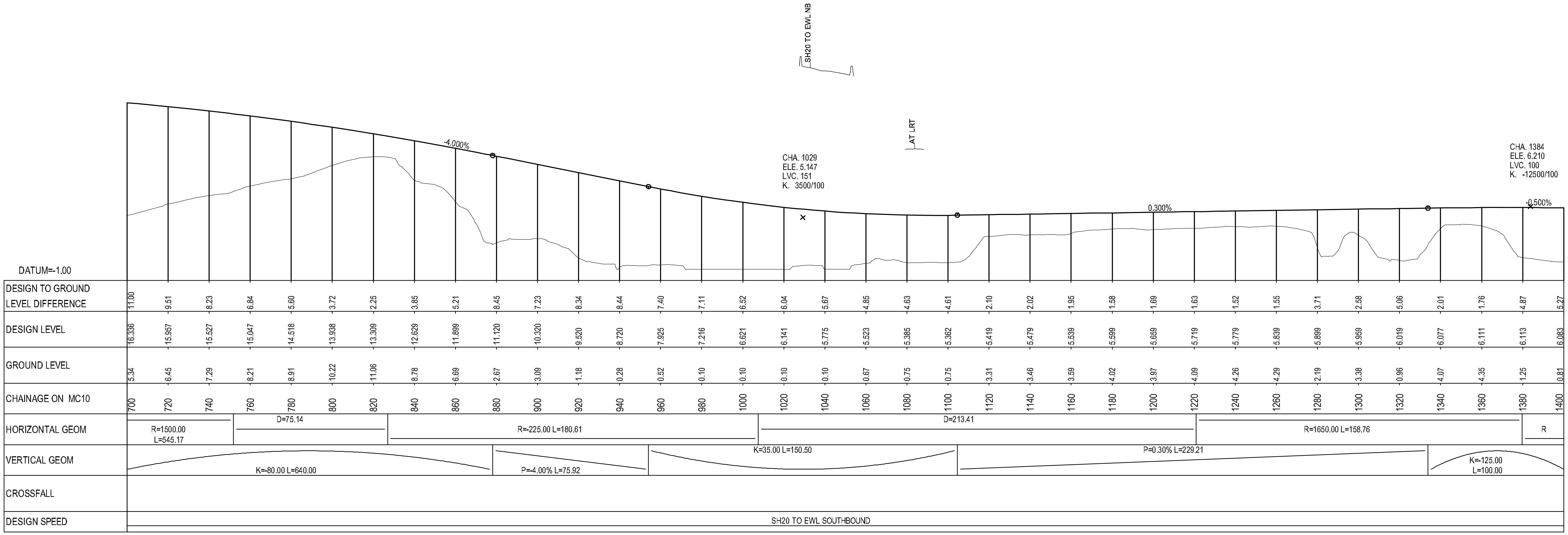
DATUM=0.00

CHAINAGE ON MC10	GROUND LEVEL	DESIGN LEVEL	DESIGN TO GROUND LEVEL DIFFERENCE
0	3.38	3.381	0.00
20	3.47	3.524	0.06
40	3.57	3.823	0.25
60	3.79	4.281	0.49
80	2.74	4.899	2.16
100	3.83	5.667	1.84
120	2.73	6.467	3.73
140	4.25	7.267	3.02
160	5.00	8.067	3.06
180	4.88	8.867	3.99
200	4.74	9.667	4.92
220	4.79	10.467	5.68
240	3.01	11.267	8.25
260	4.29	12.037	7.75
280	4.44	12.758	8.32
300	4.48	13.428	8.94
320	4.76	14.048	9.28
340	5.03	14.619	9.59
360	5.27	15.139	9.87
380	3.86	15.610	11.75
400	3.45	16.030	12.58
420	3.22	16.401	13.18
440	3.04	16.721	13.68
460	2.68	16.991	14.31
480	2.53	17.212	14.69
500	2.57	17.382	14.81
520	2.53	17.503	14.97
540	2.51	17.573	15.06
560	2.31	17.593	15.28
580	2.23	17.564	15.33
600	2.68	17.484	14.81
620	2.76	17.355	14.60
640	2.89	17.175	14.28
660	3.41	16.945	13.53
680	4.31	16.666	12.35
700	5.34	16.336	11.00

HORIZONTAL GEOM	D R=-300.00 L=57.56 D=138.43 R=1500.00 L=545.17
VERTICAL GEOM	P K=25.00 L=87.50 P=4.00% L=145.46 K=-80.00 L=640.00
CROSSFALL	
DESIGN SPEED	SH20 TO EWL SOUTHBOUND

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC10
SHEET 1 OF 3
20/10/16



CHAINAGE ON MC10	700	720	740	760	780	800	820	840	860	880	900	920	940	960	980	1000	1020	1040
DESIGN TO GROUND LEVEL DIFFERENCE	11.00	9.51	8.23	6.84	5.60	3.72	2.25	3.85	5.21	8.45	7.23	8.34	8.44	7.40	7.11	6.52	6.04	5.67
DESIGN LEVEL	16.336	15.957	15.527	15.047	14.518	13.938	13.309	12.629	11.899	11.120	10.320	9.520	8.720	7.925	7.216	6.621	6.141	5.775
GROUND LEVEL	5.34	6.45	7.29	8.21	8.91	10.22	11.06	8.78	6.69	2.67	3.09	1.18	0.28	0.52	0.10	0.10	0.10	0.10

CHAINAGE ON MC10	1060	1080	1100	1120	1140	1160	1180	1200	1220	1240	1260	1280	1300	1320	1340	1360	1380	1400
DESIGN TO GROUND LEVEL DIFFERENCE	4.85	4.63	4.61	2.10	2.02	1.95	1.58	1.69	1.63	1.52	1.55	3.71	2.58	5.06	2.01	1.76	4.87	5.27
DESIGN LEVEL	5.523	5.385	5.362	5.419	5.479	5.539	5.599	5.659	5.719	5.779	5.839	5.899	5.959	6.019	6.077	6.111	6.113	6.083
GROUND LEVEL	0.67	0.75	0.75	3.31	3.46	3.59	4.02	3.97	4.09	4.26	4.29	2.19	3.38	0.96	4.07	4.35	1.25	0.81

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC10
SHEET 2 OF 3

1:1000h 1:200v A1

20/10/16

CHA. 1586
ELE. 5.200
LVC. ****
K. ∞

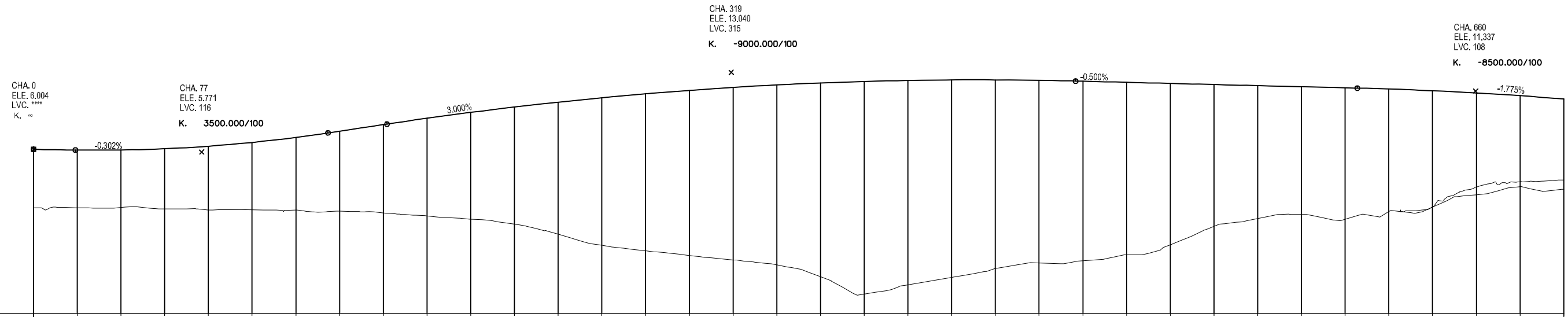
DATUM=-1.00

DESIGN TO GROUND LEVEL DIFFERENCE	5.27	5.30	4.92	5.05	5.07	5.07	5.20	5.16	5.10	5.05
DESIGN LEVEL	6.083	6.021	5.929	5.829	5.729	5.629	5.529	5.429	5.329	5.229 5.200
GROUND LEVEL	0.81	0.72	1.00	0.78	0.66	0.55	0.33	0.27	0.23	0.18 0.17
CHAINAGE ON MC10	1400	1420	1440	1460	1480	1500	1520	1540	1560	1580 1586
HORIZONTAL GEOM	R=-1650.00 L=206.10									
VERTICAL GEOM	K	P=-0.50% L=152.02								
CROSSFALL										
DESIGN SPEED	SH20 TO EWL SOUTHBOUND									

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC10

20/10/16



CHAINAGE ON MC20	DESIGN TO GROUND LEVEL DIFFERENCE	DESIGN LEVEL	GROUND LEVEL
0	5.36	6.004	0.64
20	5.30	5.943	0.64
40	5.25	5.945	0.69
60	5.51	6.061	0.55
80	5.84	6.291	0.45
100	6.16	6.636	0.47
120	6.63	7.095	0.47
140	7.30	7.664	0.36
160	8.07	8.264	0.19
180	8.94	8.845	-0.09
200	9.77	9.383	-0.38
220	10.70	9.875	-0.82
240	12.07	10.323	-1.75
260	13.50	10.727	-2.77
280	14.35	11.086	-3.27
300	15.11	11.401	-3.71
320	15.78	11.672	-4.11
340	16.46	11.898	-4.57
360	17.73	12.079	-5.65
380	19.46	12.216	-7.24
400	18.70	12.309	-6.39
420	18.06	12.357	-5.70
440	17.25	12.361	-4.89
460	16.71	12.320	-4.39
480	16.43	12.236	-4.19
500	15.78	12.136	-3.64
520	14.76	12.036	-2.72
540	12.98	11.936	-1.05
560	12.15	11.836	-0.32
580	11.68	11.736	0.05
600	12.02	11.636	-0.39
620	11.22	11.523	0.30
640	10.65	11.366	0.72
660	9.31	11.161	1.85
680	8.31	10.909	2.60
700	8.24	10.611	2.37

HORIZONTAL GEOM: D; R=200.00 L=327.89; D=488.66

VERTICAL GEOM: P; K=35.00 L=115.57; P; K=90.00 L=315.00; P=0.50% L=128.86; K=85.00 L=108.36

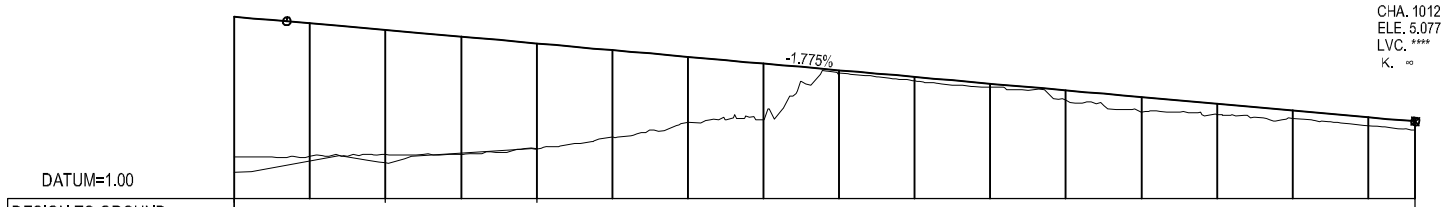
CROSSFALL

DESIGN SPEED: EWL TO SH20 SOUTHBOUND

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC20
SHEET 1 OF 2

20/10/16

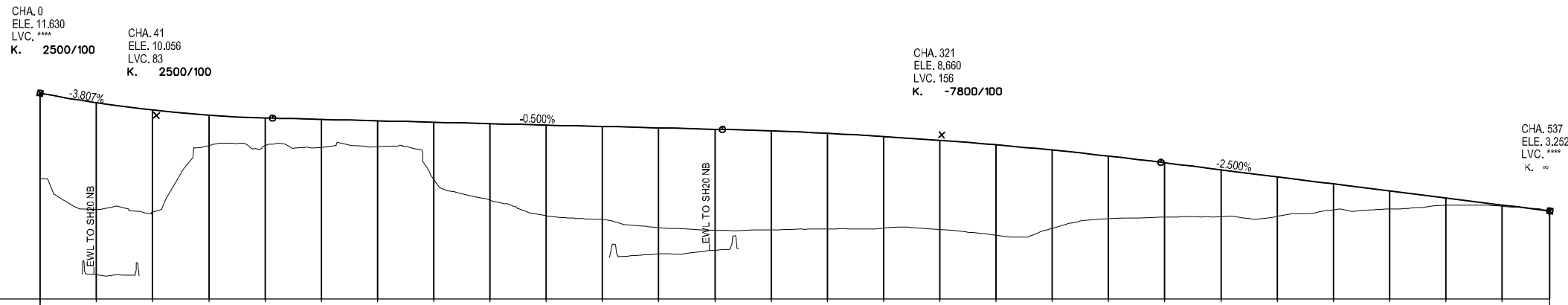


DATUM=1.00																	
DESIGN TO GROUND LEVEL DIFFERENCE	8.24		7.02		5.57												
DESIGN LEVEL	10.611	10.267	9.912	9.557	9.202	8.847	8.492	8.137	7.782	7.427	7.072	6.717	6.362	6.007	5.652	5.298	5.077
GROUND LEVEL	2.37	-999.00	2.89	-999.00	3.63	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00
CHAINAGE ON MC20	700	720	740	760	780	800	820	840	860	880	900	920	940	960	980	1000	1012
HORIZONTAL GEOM	D=488.66							R=-2688.77 L=186.48									
VERTICAL GEOM	K	P=-1.77% L=298.54															
CROSSFALL																	
DESIGN SPEED	EWL TO SH20 SOUTHBOUND																

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC20

20/10/16

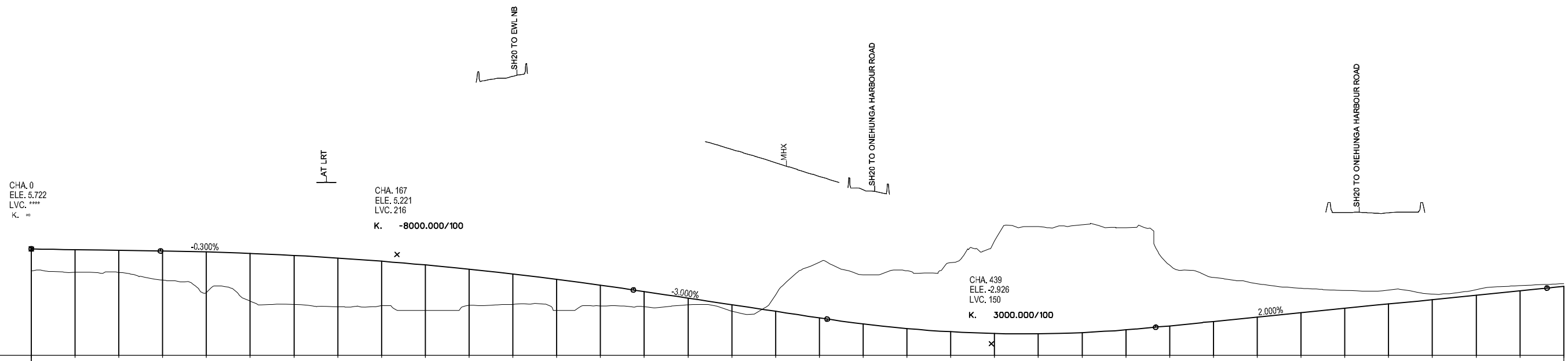


DATUM=-3.00

DESIGN TO GROUND LEVEL DIFFERENCE	6.12	7.59	7.23	2.16	1.97	2.01	1.84	4.07	5.44	6.46	6.63	7.09	7.18	7.03	6.80	6.51	6.35	6.42	5.58	4.45	3.86	3.32	2.80	1.84	1.29	0.52	0.09	
DESIGN LEVEL	11.630	10.949	10.427	10.066	9.865	9.763	9.663	9.563	9.463	9.363	9.263	9.163	9.063	8.944	8.774	8.552	8.280	7.956	7.581	7.154	6.677	6.177	5.677	5.177	4.677	4.177	3.677	3.252
GROUND LEVEL	5.51	3.36	3.20	7.90	7.90	7.76	7.82	5.49	4.02	2.90	2.64	2.07	1.88	1.91	1.97	2.04	1.93	1.53	2.00	2.70	2.82	2.86	2.88	3.34	3.39	3.65	3.59	3.25
CHAINAGE ON MC30	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	537
HORIZONTAL GEOM	D	R=-900.00 L=339.11																	R=-76.65 L=178.93									
VERTICAL GEOM	K=25.00 L=82.68				P=-0.50% L=159.99								K=-78.00 L=156.00								P=-2.50% L=138.31							
CROSSFALL																												
DESIGN SPEED	SH20 TO ONEHUNGA HARBOUR ROAD																											

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC30
SHEET 1 OF 1
20/10/16



DESIGN TO GROUND LEVEL DIFFERENCE	1.98	2.08	2.02	2.66	3.73	4.36	4.46	4.43	4.07	4.17	3.31	2.79
DESIGN LEVEL	5.722	5.662	5.602	5.542	5.454	5.317	5.129	4.892	4.604	4.267	3.879	3.442
GROUND LEVEL	3.74	3.58	3.58	2.88	1.72	0.96	0.67	0.46	0.54	0.10	0.57	0.65
CHAINAGE ON MC40	0	20	40	60	80	100	120	140	160	180	200	220

DESIGN TO GROUND LEVEL DIFFERENCE	2.85	1.89	1.38	0.61	0.59	-1.52	-5.09	-4.49	-5.28	-6.32	-8.43	-9.78
DESIGN LEVEL	2.955	2.417	1.831	1.231	0.631	0.031	-0.569	-1.124	-1.547	-1.838	-1.995	-2.019
GROUND LEVEL	0.10	0.53	0.46	0.62	0.04	1.55	4.52	3.36	3.74	4.48	6.43	7.76
CHAINAGE ON MC40	240	260	280	300	320	340	360	380	400	420	440	460

DESIGN TO GROUND LEVEL DIFFERENCE	-9.83	-9.33	-5.53	-4.01	-3.04	-2.23	-1.63	-1.26	-0.48	-0.51	-0.46	-0.25
DESIGN LEVEL	-1.909	-1.666	-1.297	-0.897	-0.497	-0.097	0.303	0.703	1.103	1.503	1.903	2.300
GROUND LEVEL	7.92	7.66	4.23	3.12	2.55	2.13	1.93	1.97	1.59	2.01	2.37	2.55
CHAINAGE ON MC40	480	500	520	540	560	580	600	620	640	660	680	700

HORIZONTAL GEOM: D | R=2000.00 L=269.03 | R=225.00 L=228.34 | D | R=1001.60 L=290.41

VERTICAL GEOM: P=-0.30% L=59.02 | K=-80.00 L=216.00 | P=-3.00% L=88.53 | K=30.00 L=150.00 | P=2.00% L=178.83 | K

CROSSFALL

DESIGN SPEED: EWL TO SH20 NORTHBOUND

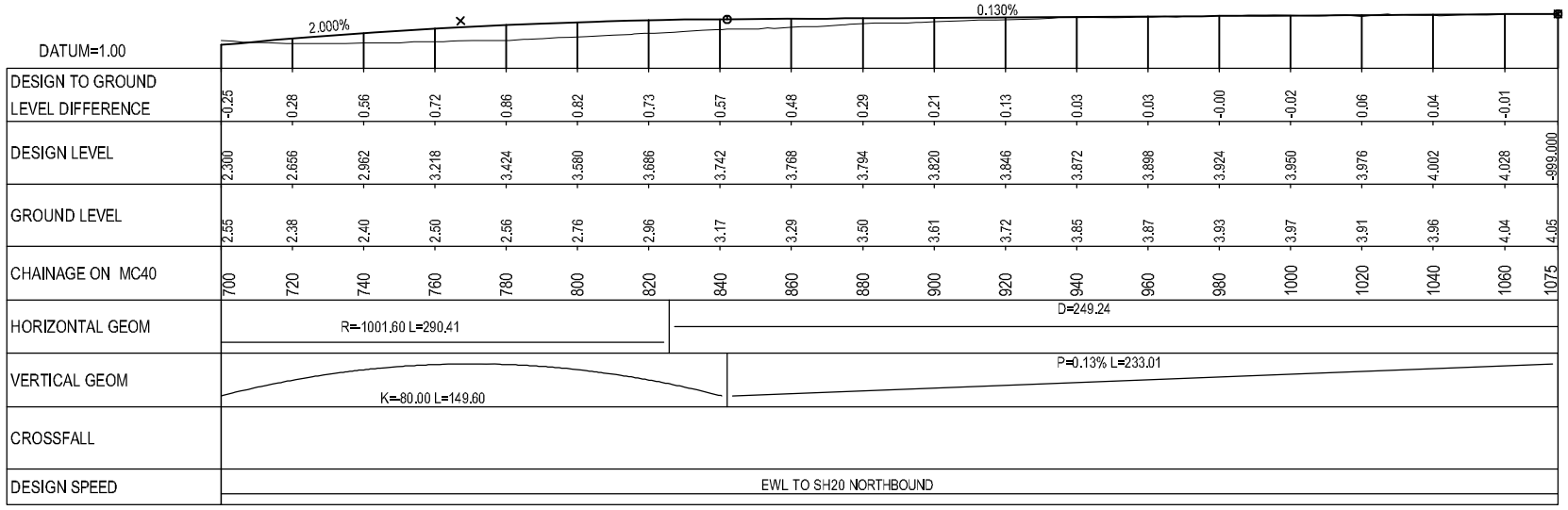
1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC40
SHEET 1 OF 2

20/10/16

CHA. 767
ELE. 3.647
LVC. 150
K. -8000/100

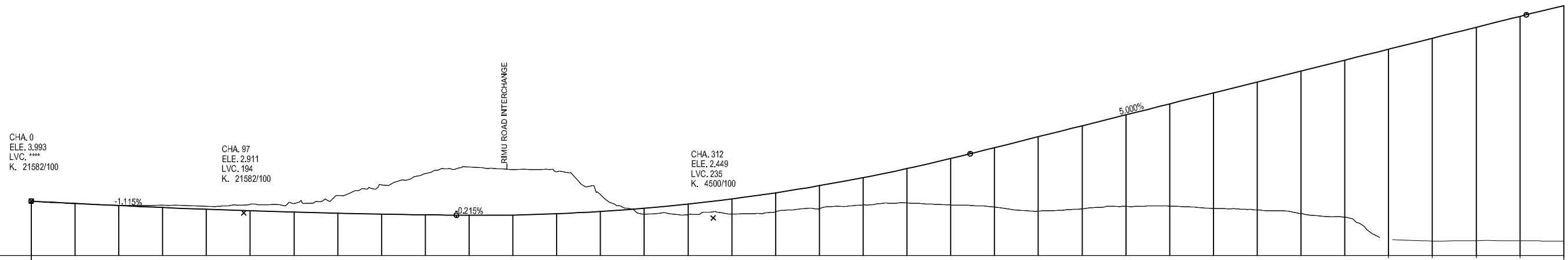
CHA. 1075
ELE. 4.047
LVC. ****
K. ∞



1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC40

20/10/16



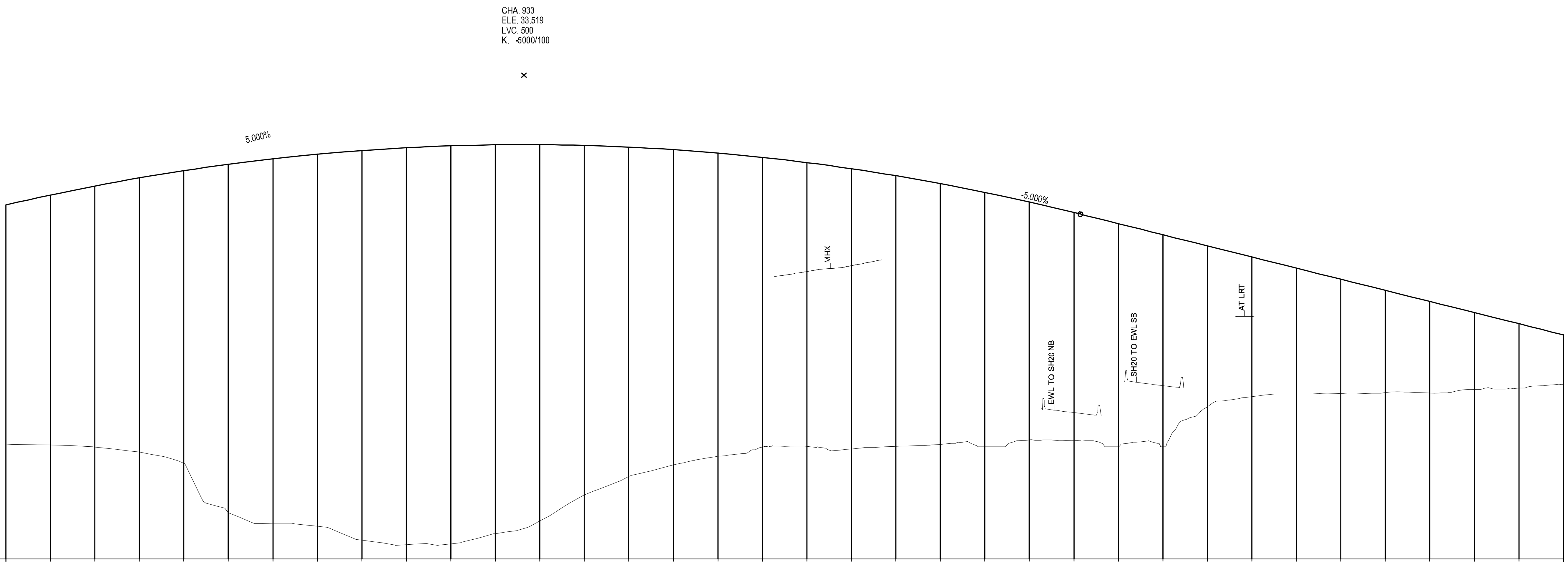
CHAINAGE ON MC50	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340
DESIGN TO GROUND LEVEL DIFFERENCE																		
DESIGN LEVEL	3.993	3.779	3.584	3.407	3.249	3.110	2.989	2.886	2.802	2.737	2.693	2.720	2.836	3.041	3.335	3.718	4.190	4.750
GROUND LEVEL	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00
HORIZONTAL GEOM	D=156.15								R=600.00 L=164.53								D=168.10	
VERTICAL GEOM	K=215.82 L=194.16										K=45.00 L=234.69							
CROSSFALL																		
DESIGN SPEED	SH20 TO EWL NORTHBOUND																	

CHAINAGE ON MC50	360	380	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
DESIGN TO GROUND LEVEL DIFFERENCE														17.25	18.53	19.49	20.51	21.52
DESIGN LEVEL	5.400	6.138	6.966	7.882	8.873	9.873	10.873	11.873	12.873	13.873	14.873	15.873	16.873	17.873	18.873	19.873	20.873	21.844
GROUND LEVEL	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	0.63	0.34	0.38	0.37	0.32
HORIZONTAL GEOM								R=500.00 L=241.09										
VERTICAL GEOM					P=5.00% L=254.05													K
CROSSFALL																		
DESIGN SPEED																		

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC50
SHEET 1 OF 3

20/10/16



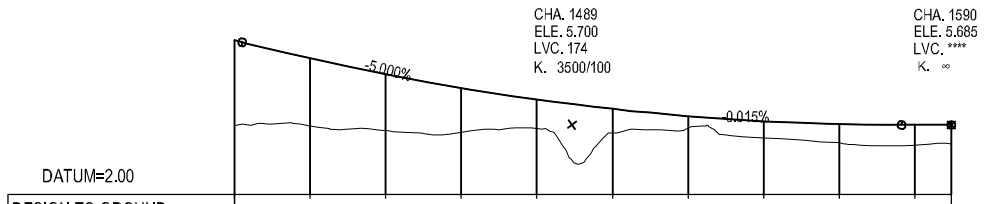
DATUM=-10.00

DESIGN TO GROUND LEVEL DIFFERENCE	21.52	22.48	23.48	24.67	26.31	31.32	32.77	33.47	35.04	35.69	35.79	34.96	33.83	31.43	29.64	28.36	27.27	26.07
DESIGN LEVEL	21.844	22.736	23.547	24.279	24.931	25.502	25.994	26.405	26.737	26.989	27.160	27.252	27.264	27.195	27.047	26.818	26.510	26.122
GROUND LEVEL	0.32	0.26	0.07	-0.39	-1.39	-5.82	-6.78	-7.06	-8.31	-8.70	-8.63	-7.71	-6.57	-4.24	-2.59	-1.54	-0.76	0.06
CHAINAGE ON MC50	700	720	740	760	780	800	820	840	860	880	900	920	940	960	980	1000	1020	1040
HORIZONTAL GEOM	R=500.00 L=241.09		D=155.30								R=250.00 L=393.05							
VERTICAL GEOM	K=-50.00 L=500.00																	
CROSSFALL																		
DESIGN SPEED	SH20 TO EWL NORTHBOUND																	

DESIGN TO GROUND LEVEL DIFFERENCE	25.52	25.19	24.33	23.48	22.88	21.40	20.50	20.06	19.06	14.48	12.55	11.32	10.28	9.20	8.24	6.92	5.79	4.49
DESIGN LEVEL	25.653	25.105	24.477	23.768	22.980	22.112	21.163	20.164	19.164	18.164	17.164	16.164	15.164	14.164	13.164	12.164	11.164	10.164
GROUND LEVEL	0.13	-0.09	0.14	0.29	0.10	0.71	0.67	0.10	0.10	3.68	4.62	4.85	4.88	4.96	4.93	5.25	5.37	5.68
CHAINAGE ON MC50	1060	1080	1100	1120	1140	1160	1180	1200	1220	1240	1260	1280	1300	1320	1340	1360	1380	1400
HORIZONTAL GEOM												R=1025.00 L=275.43						
VERTICAL GEOM							P=-5.00% L=219.13											
CROSSFALL																		
DESIGN SPEED																		

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC50
SHEET 2 OF 3
20/10/16

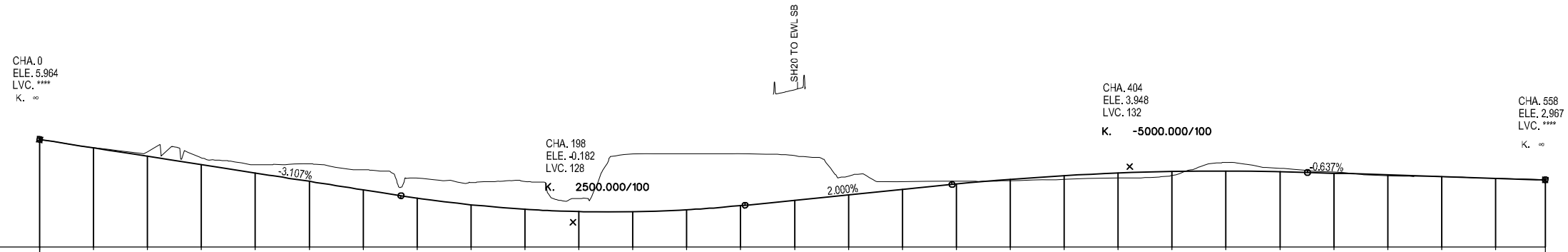


DATUM=2.00											
DESIGN TO GROUND LEVEL DIFFERENCE	4.49	3.57	2.98	2.35	1.53	1.27	0.63	0.88	0.98	1.08	
DESIGN LEVEL	10.164	9.210	8.370	7.644	7.032	6.535	6.152	5.883	5.729	5.687	5.685
GROUND LEVEL	5.68	5.64	5.38	5.30	5.50	5.26	5.52	5.00	4.75	4.61	4.68
CHAINAGE ON MC50	1400	1420	1440	1460	1480	1500	1520	1540	1560	1580	1590
HORIZONTAL GEOM	R=1025.00 L=275.43								D=35.97		
VERTICAL GEOM	P	K=35.00 L=174.47								P	
CROSSFALL											
DESIGN SPEED	SH20 TO EWL NORTHBOUND										

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC50

20/10/16



DATUM=-2.00

DESIGN TO GROUND LEVEL DIFFERENCE	-0.00	0.00	-0.32	-0.51	-0.61	-1.29	-1.47	-1.49	-1.65	-2.06	-0.97	-4.28	-4.17	-3.84	-3.30	-1.37	-0.58	-0.20	0.10	0.27	0.37	0.29	-0.62	-0.25	-0.09	0.05	-0.01	-0.01	
DESIGN LEVEL	5.964	5.343	4.721	4.100	3.479	2.857	2.236	1.622	1.129	0.795	0.622	0.608	0.755	1.062	1.461	1.861	2.261	2.661	3.015	3.288	3.482	3.595	3.629	3.583	3.466	3.338	3.211	3.084	2.967
GROUND LEVEL	5.96	5.34	5.04	4.61	4.09	4.15	3.71	3.11	2.77	2.86	1.60	4.89	4.92	4.90	4.76	3.23	2.84	2.86	2.91	3.02	3.11	3.30	4.25	3.83	3.56	3.28	3.23	3.09	2.97
CHAINAGE ON MC60	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	558
HORIZONTAL GEOM	D		R	D=37.27		R=250.00 L=46.61		D=38.80		R=-60.00 L=151.53								D=234.96											
VERTICAL GEOM	P=-3.11% L=134.01							K=25.00 L=127.66						P=2.00% L=76.73				K=-50.00 L=131.84							P=-0.64% L=88.15				
CROSSFALL																													
DESIGN SPEED	NEILSON ST TO SH20 SOUTHBOUND																												

1:1000h 1:200v A1

EAST WEST LINK
DESIGN OBA OPTION
SCALE: 1:1000 (H) 1:200 (V) DATE: 20/10/16
DES OBA - CONTROL LINE MC60
SHEET 1 OF 1
20/10/16

3 The MCA Criteria, April 2016

Consenting Phase MCA			
MCA Topic	**Criteria**	**Measure**	**Lead Assessor**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20* *Improved travel time reliability between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	• *Improved journey time of business to the strategic network (SH1 and SH20)* • *Improved journey time reliability of business to the strategic network (SH1 and SH20)* • *Accessibility of businesses to the arterial / freight network* • *Accessibility to alternative routes within the network (contribution to network resilience)* • *The extent to which the improved travel times and travel time reliability is enduring under predicted traffic growth.*	Andrew Murray
	Obj 2. *Improved safety for pedestrians and cyclists between Māngere Bridge, Onehunga and Sylvia Park, and access into Otahuhu East*	• *Reduced conflict points with motorized vehicles, measured as predicted reduction in truck flows on local network)*	Andrew Murray
	Improved accessibility for local cycling and walking between Māngere Bridge, Onehunga and Sylvia Park, and access into Otahuhu East	• *Improved connections to the strategic network, including reduction in flows at the Onehunga Mall/Neilson Street intersection*	
	Improved accessibility for regional cycling and walking (strategic network)	• *% retention / completion of quality strategic link Māngere Bridge / Onehunga / Sylvia Park*	
	Obj 3. *Improved journey time and reliability for buses between SH20 and Onehunga town centre*	• *Improved journey time and reliability for buses between SH20 and Onehunga town centre*	Andrew Murray
1. Road safety	1A. User Safety	• *Safety for road users*	Lloyd de Beer
2. Construction	2A. Construction impacts on Utilities and lifeline infrastructure	*Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction*	Noel Nancekivell
	2B. Construction Cost	*Assessed cost for construction of options including:* • *Complexity and risk in construction* • *Complexity in programme* • *Cost and complexity of undertaking works on contaminated land (including health and safety)*	Noel Nancekivell
3. Operation	3A. Operational Cost	• *Whole of life including maintenance and operational costs* • *Safety – maintenance*	Noel Nancekivell
4. Social & Economic	4A. Construction Impact	*Includes:* • *Disruption from traffic, dust, noise* • *Potential adverse economic effects associated with disruption to businesses and other activities over the construction period* • *Potential adverse amenity effects for businesses and the users of these businesses during construction* • *Potential adverse effects on the bus network* • *Potential adverse effects associated with disruption to residences*	Amelia Linzey
	4B. Built Form and Amenity	*The extent of effects on:* • *Built form and urban character, including lot pattern, street frontages, significant buildings and other structures* • *Onehunga place outcomes in the Auckland Plan, Auckland Council's*	Lynne Hancock

Consenting Phase MCA			
MCA Topic	**Criteria**	**Measure**	**Lead Assessor**
		aspirations for future use of Onehunga port area, Auckland Council's aspirations for Sylvia Park	
	4C. Connectivity	• *Severance (of communities)* • *Impacts on movements and desire lines between community facilities / 'attractors'* • *Quality and amenity of the walking and cycling network*	Lynne Hancock [Alison Lee – cycling]
	4D. Quality of living environment	*The impacts of the options on:* • *community facilities and open spaces, including use of these spaces* • *residential activities* • *CPTED* • *noise and vibration (operational); and* • *air quality (operational)*	Amelia Linzey
	4E. Viability of land areas	*(land take and associated effects)* • *The extent of land take (footprint) Impact of land take on current and future use of industrial and business land* • *Ease of relocation (of the activities occurring on the property – difficulty of re-consenting elsewhere)* • *Availability of large industrial lots*	Phil Osborne
	4F. Productivity of land	*(consequential economic outcomes, change in land value)* • *Accessibility – and associated potential change in land values*	Phil Osborne
	4G. Public Access to and along the coastal marine area	*Public access to coastal marine area, quality of access, visual connectivity to Māngere Inlet and Manukau Harbour.*	Gavin Lister
5. Natural Environment	5A. Natural Landscape / Character	*The extent of effects on:* • *the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography* • *natural character and outstanding natural features/landscapes including geological features*	Gavin Lister
	5B. Water quality	• *Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).* • *Groundwater*	Dale Paice
	5C. Ecological resources	*Extent of effects on:* • *significant indigenous vegetation;* • *significant habitats of indigenous fauna;* • *indigenous biodiversity; and* • *other significant marine areas.*	Sharon de Luca
	5D. Coastal environment and resources	*Extent of effects on:* • *existing coastal processes; and* • *physical footprint within the coastal marine area.*	Stephen Priestley
6. Cultural and heritage	6A. Mana Whenua values	*Extent of effects on:* • *the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga; and* • *areas of protected customary rights.*	Sarah MacCormick [coordinator for Mana Whenua]
	6B. Archaeological and built heritage	*Extent of effects on:* • *sites and places of valued heritage buildings and places.* • *extent of effects on sites and places of archaeological value.* • *extent of effects on sites and places of cultural heritage value.*	Matt Felgate

MCA Scoring guide

MCA Scoring Guide

In undertaking assessment against the criteria, each nominated evaluator will be responsible for determining an overall 'score' on the attached 11-point scale. In considering the score, it has been agreed that the following evaluation matters will be considered / assessed. The final overall score will be based on a qualitative assessment of the composite elements of effect (not a quantitative averaging process).

In addition, for each Overall Score, a final consideration will be given on 'scope to avoid, remedy or mitigate impacts identified'. If this is considered 'good or high' the assessment will be qualified ("*") and further review of the design option / design development may be undertaken (e.g. designs and consequential cost reviews completed) to enable a revised assessment to be undertaken.

Scoring	Significance of 'Feature' or Area affected	Extent of Impact / Scale of Impact	Duration of Impact	Overall Score
-5	National or greater The works will impact on a nationally significant resource / or will be experienced by national scale audience	Substantial / complete impact on the feature identified	Permanent (or more than 20yr)	Significantly Adverse Impact
-4	Regional – impact on a regionally significant resource / experienced by regional audience	High extent of impact	Long Term – 10 – 20yr	Highly Adverse Impact
-3	Local I – impact on a locally significant resource (e.g. significant within an ecological district or within a catchment) or will impact on a local board community / geographic scale	Some extent of impact	Medium Term – 5-10yr	Adverse Impact
-2	Local II – The impact of the works impact on a lesser scale local resource (e.g. within a defined local environment or sub-catchment) or at a community / CAU level.	Moderate extent of impact on the feature / resource identified	Short Term – 1 – 5yr	Low Adverse Impact
-1	Individual (s) – The works impact on resources not otherwise identified for values or are otherwise innominate value. Or experienced by few (e.g. less than 20 households / 50 people)	Low extent of impact on the feature / resource identified	Very Short Term < 1yr	Minor Adverse Impact
0	No Impact	No Impact	No Impact	No Impact
1	Individual (s) – The benefits will be experienced for resources not otherwise identified for their values or are otherwise of innominate value. The benefits will be experienced by few (e.g. less than 20 households / 50 people)	Low or small extent of benefits identified	Very Short Term < 1yr	Minor Positive Impact
2	Local II – The benefits will be realised on a defined local environment or sub-catchment or at a community / CAU level.	Moderate extent of benefits identified	Short Term – 1 – 5yr	Low positive Impact

Scoring	Significance of 'Feature' or Area affected	Extent of Impact / Scale of Impact	Duration of Impact	Overall Score
3	Local l – The benefits will be experienced for values of ecological district or within a catchment) or at a local board community / geographic scale	Some extent of benefit (not able to be more fully quantified)	Medium Term – 5-10yr	Positive Impact
-4	Regional – The benefits will be experienced for a sub-regionally significant resource / experienced by subregional audience	High extent of benefit (confident of benefit being realised)	Long Term – 10 – 20yr	Highly Positive Impact
-5	Regional or greater benefit The benefits will be experienced by a whole region or across regions (including nation) or will be to a regionally or nationally significant resource	Substantial benefits and high degree of confidence of benefits being realised	Permanent (or more than 20yr)	Significantly Positive Impact

4 The Outcomes Report for the Neilson Street Interchange MCA (May 2016)

East West Link – Multi-Criteria Analysis – Neilson Street Interchange Outcomes Report

Record of Process:

a) Workshop date: 6 April 2016
b) Comments received: 26 May 2016
c) Finalised: 27 May 2016

Status: Final

General Comments (from the Option Design Pack issued for the MCA dated 24 March 2016 and Option 4 discussed over an MCA workshop on 5 May 2016) that informed assessment:

All options:

- Rail link to airport is not precluded.
- Provides for a direct link to the town centre for buses.
- No pylons are disturbed.
- Yacht club is not affected.
- Sea Scouts clubhouse is not affected for Options 2, 3 and 4.
- Impact on Outstanding Natural Feature (ONF) is significant from a cultural perspective including impact on ground water and aquifers.

Option 1:

- All proposed changes would occur at the existing intersection. This means the footprint of the works is much larger than for the other options.
- New local road connection to the port has been introduced through the feedback process. This local connection will keep EWL and local traffic separate.
- Consideration has been given to the gas line (lesser impact than other options) and basalt feature.
- Lesser impact on the ONF with only ramps to be built, and at ground level.
- The stormwater pond shown on the plans is annotated for ecological significance in the Proposed Auckland Unitary Plan.
- Geometrics of the alignment have led to the move towards and into the Coastal Marine Area (CMA).
- Selwyn Street property is part of this project but has not been factored into the land requirements.

Option 2:

- There will be no bridge over SH20 and the existing configuration is largely maintained. A link from SH20 to EWL is provided via a cut and cover tunnel. Cut and cover route follows alignment of the gas line. The challenge with this is the soft ground materials and the multi-storey development on Onehunga Mall.
- Cut and cover is not an option for linking EWL to the port due to geometrics.
- High pressure gas line needs to be relocated. The new location and property requirements for which is yet to be determined.

Notes: MCA Workshop #2, Neilson Street Interchange

- There are significant cultural heritage concerns around the level of earthworks, and impact on ground water and aquifers for this option.
- Land requirements are much less compared with the other options.
- EWL will need to start rising (on a structure) further back and off the EWL route to maintain height clearance above the harbour, leading up and over the harbour (running parallel and east of the Manukau Harbour Crossing (MHX)) over Rimu Road, and under the over bridge to Mangere Bridge.

Option 3:

- Limited number of traffic signals. As a result, traffic is directed where to go in terms of connectivity.
- Outside of CMA.
- In this option, the port development that requires the bridge would need to be built whereas in Option 1 it would likely be staged to a later date to tie in with the development of the port land.
- EWL does not provide access to Onehunga at the intersection; traffic would need to change movement at Captain Springs.
- More land required than Option 1 over Port Land, as the coastal works have been reduced.

Option 4:

- This option is similar to Option 3 which either avoids or has a lower impact on features such as historical and known cultural sites, ecological areas and natural features.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: +3** **REASONS:** Improved access to SH20 (both directions), however, local and business movements all occur at the one interchange leading to some extent of inefficiency. **OTHER COMMENTS:** EWL to Onehunga local traffic can be through Neilson Interchange instead of Captains Springs exit. More direct. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** More direct connection compared with Option 1 from EWL to and from SH20. However, the Onehunga/Penrose traffic will no longer be able to go to Mahunga industrial area via Rimu Road. More resilient with the separate harbour crossing. Attracting more traffic, hence scoring lower in terms of enduring benefits as it also caters for other traffic. **OTHER COMMENTS:** EWL to Onehunga local traffic must use Captains Springs exit. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Removes signals of option 1 and provides the most direct movement. **OTHER COMMENTS:** EWL to Onehunga local traffic must use Captains Springs exit. **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Some positives i.e. local movement improvements and some negative such a longer route from Onehunga to SH20 Northbound. Overall similar characteristics to option 3. **OTHER COMMENTS:** EWL to Onehunga local traffic can be through Neilson Interchange instead of Captains Springs exit. More direct. **ASSUMPTIONS:** -		**The current port access will be maintained until suc time that the future development of the port prompts the need for the bridge construction shown Option 1. This is an opportunity and does not form part of the MCA scoring.**
	Obj 2. *Improved safety for pedestrians and cyclists* *Improved accessibility for local cycling and walking* *Improved accessibility for regional cycling and walking (strategic network)*	Alison	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** The connections between Mangere Bridge residential area and schools/ employment areas to the north bring higher benefits. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** There are amenity disadvantages with this option. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** This option forces more traffic through Onehunga Harbour Road and Neilson Road intersection. **ASSUMPTIONS:** -	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** Similar effect as the other options. **ASSUMPTIONS:** -	All options are positive in terms of linkages at both local and regional levels.	Option 1 has an opportunity to improve cycle connections. This includes extension of the existing Waikaraka cycle way towards the town centre (south-east of Gloucester Park)**, and a new connection north of Gloucester Park. These have no formed part of the present assessment and MCA scoring.**

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
	Obj 3. *Improved journey time reliability for buses between SH20 and Onehunga town centre*	Andrew	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS** None **ASSUMPTIONS:** -	**SCORE: +5** **REASONS:** Improves travel time for buses between Mangere Bridge and the Onehunga town center. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +4** **REASONS:** Slightly less efficient than Option 3 for bus movements accessing Onehunga from SH20. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Regionally significant bus connection between SH20, Onehunga interchange and Onehunga rail station.	
Road safety	1A. User Safety	Lloyd	**SCORE: +2** **REASONS:** - Increased traffic signals. - More traffic signals in this option. - Some ramps are shortened with more complex merge points, although still compliant to standards. - Issue with no EWL west bound connection at interchange to Onehunga. - Lower speeds which is similar to existing situation. **OTHER COMMENTS:** - Movement speed and design has mitigated risks or balanced the overall rating. **ASSUMPTIONS:** None	**SCORE: +3** **REASONS:** - Higher speeds result from the larger roadway curves. - Better ramp merging. - Less signals which means less conflict points. - More logical interchange layout than other options and provides all movements. **OTHER COMMENTS:** Potential further safety risk to this option with trucks using the tunnel to transport dangerous goods. Tunnel systems can be designed to cope with these issues **ASSUMPTIONS:** None	**SCORE: +3** **REASONS:** - Generally safer interchange with less conflict points for traffic. - Significant merging of ramps which are of concern. - Some increased stacking provided to the on ramps. - Issue with no EWL west bound connection at interchange to Onehunga **OTHER COMMENTS:** None **ASSUMPTIONS:** None	**SCORE: +2** **REASONS:** - Similar assessment to Option 3, now with grade separation at Galway Street. - Access improvements to Onehunga with all links provided. - Overall interchange split into two distinct areas which makes it more complex. **OTHER COMMENTS:** None **ASSUMPTIONS:** None	The EWL does not exist at present and the Neilson Street Interchange operates as a standard interchange, hence there are no specific safety issues. The baseline is zero with improvements/issues common to all options being: - removal of traffic from local streets (benefit) - improved cycling connections (benefit) - tighter geometry (issue) - increased traffic signals with general reduction in conflict points (benefit).	
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: -1** **REASONS:** Two pylons require special attention on either side of SH20.	**SCORE: -2** **REASONS:** Presence of two pylons near the trench.	**SCORE: -1** **REASONS:** Presence of two pylons in the vicinity of works.	**SCORE: -1** **REASONS:** Similar impact as that for Options 1 and 3.	All options have similar impact.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			Construction of the embankment and presence of gas main will be key contributors. **OTHER COMMENTS:** **ASSUMPTIONS:** -	Relocation of the gas main. **OTHER COMMENTS:** Future rail line to the airport would run parallel and west of MHX. The bridge crossing for this option runs parallel and to the east of MHX. **ASSUMPTIONS:** -	Need for large retaining structures. Impact of the embankment over gas main **OTHER COMMENTS:** None **ASSUMPTIONS:**	**OTHER COMMENTS:** None **ASSUMPTIONS:** None		
	2B. Construction Cost, excluding property costs.	Noel	**SCORE: -2** **REASONS:** There are a lot more structures with this option. The footprint is wider with a lot more traffic shit and an average costs (mid ground). **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -5** **REASONS:** The cut and cover tunnels add significant cost. It has greater temporary works and an additional long bridge structure crossing the inlet. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS**: A smaller footprint and easier to construct despite large retaining wall on soft ground. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Slightly higher costs compared with Option 1, however not significant enough to score lower. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Working within contaminated land.	
Operation	3A. Operational Cost	Noel	**SCORE: -1** **REASONS:** Options 1 and 3 have similar operation and maintenance costs. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -5** **REASONS:** The tunnel, pumping of water/stormwater, and tunnel ITS and fire control adds a significant cost. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** This option has less maintenance as there are less signals, less truck stoppings and smaller footprint. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Similar impact as that for Options 1 and 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Social & Economic	4A. Construction Impact	Amelia	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar impact to that for Option 3. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: -4** **REASONS:** Impact on recreational reserve, Gloucester Park, sports club/reserve which has regional importance. Duration of impact would be long for this option. Scale of construction impact of tunnel section and impacts on residents. Scale and duration of impact due to link to Rimu Road. **OTHER COMMENTS:** Use of Gloucester Park as a sports club gives it regional status. **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar to Option 1. The reason being disruption to residences and businesses close by but less so than a cut and cover in Option 2 **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Lower impact than Option 2 but similar to Options 1 and 3. The reason being disruption to residences and businesses close by but less so than a cut and cover in Option 2 **OTHER COMMENTS:** None **ASSUMPTIONS:** -	Disruption to businesses, other facilities, residents, transport networks will be evident for all options.	Potential to mitigate construction impacts of all options, however scale of impact for Option 2 more significant and potentially more challenging to mitigate. Cycle ways would be rebuilt in all options.
	4B. Built Form and Amenity The measure for this criterion is visual and streetscape character, and legibility.	Lynne / Gavin	**SCORE: -4** **REASONS:** The retaining walls and additional structures have significant impact on area character and create visual severance. Sea Scouts building impacted. Southern loop 'spreads' the footprint and impacts views to and from local streets.	**SCORE: -3** **REASONS:** This option presents less severance of the local road network. Fewer tall structures near town centre although trenching approaches create severance. It presents language of a place rather than motorway, and takes out a building which is under construction.	**SCORE: -4** **REASONS:** This option takes out block pattern west of Gloucester Park Road. It proposes additional structure in tuff ring and retaining walls including a large retaining structure along the western edge which has a high visual impact. It presents language of motorway rather than 'place'.	**SCORE: -4** **REASONS:** This option takes out block pattern west of Gloucester Park Road. It proposes a 4m high retaining wall across end of Wharangi Street which is visually severing. The two large retaining walls (8m high x 130m, 2-4m x 110m) divide / sever the tuff ring more than now as roads slice through (both visually and physically). Additional structures generally between town centre area and the harbour have significant visual impact as it relates to area character / sense of place. Galway Street bridge adds	The measures for this criteria included: - built form - urban character - place outcomes - opportunities to max green space and place - sightlines to the harbor - streetscape improvements - enhancement and/or retention of existing sightline.	Potential to mitigate Option 1, and change its scoring. Option 2 may have more adverse effects as details of the works are formed which can increase its negative scoring. Option 4 presents the potential buildout / enhanced setting for Sea Scouts building to ameliorate impacts. Treatment of Neilson retaining wall is also possible mitigation for visual impact. Shared path on Onehunga Harbour

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			OTHER COMMENTS: None **ASSUMPTIONS:** Sea Scout building assumed lost and would need to be relocated (if the structure is to be retained).	**OTHER COMMENTS:** Extent of additional likely structures associated with trench not known. **ASSUMPTIONS:** None	**OTHER COMMENTS:** None **ASSUMPTIONS:** None	another large elevated structure and ramps which somewhat offset by no additional loop inside tuff ring but scale of impact remains in same band. **OTHER COMMENTS:** None **ASSUMPTIONS:** None		Road, would contribute to AC requirement to activate Gloucester Park sports field. Pedestrian/cycle-friendly intersection of Neilson and Onehunga Harbour Road. Landscape treatment of tuff ring / interchange spaces including walkways / improved access to active and passive recreation areas.
	4C. Connectivity	Lynne / Alison	**SCORE: 0** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road. It also provides: - decision points and movement choice via signalised intersections while supporting legibility - shared street / local connection between Onehunga Port / foreshore and the town centre enhances pedestrian/cycle network. It also moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Improved safety for cyclist connecting to Onehunga	**SCORE: +1** **REASONS:** **Lynne** This option has no severance of local roads and provides many options for movement choice supporting place based outcomes. It enables a slower speed environment for walking / cycling on Onehunga Harbour Road leading towards town centre. It moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Same reason as that for Option 1.	**SCORE: 0** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road and presents less 'self-explaining' road environment – decision points earlier, less choice once within the interchange. Moves traffic away from Onehunga / Neilson intersection thereby facilitating access to / from town centre for residential and business communities. **Alison (+2)** Same reason as that for Option 1.	**SCORE: +1** **REASONS:** **Lynne** This option provides severance of Gloucester Park Road and more choice on/off Darley Street which is a relatively direct and a legible north-south connection. Supports strategic route between Onehunga and Sylvia Park generally. Enables some choice on Darley Street. Introduction of 4m high retaining walls creates north south visual severance around Gloucester Park Road. Some isolation / separation for shared path users from roads (limited casual surveillance) alongside large retaining walls, but on the positive side, a separation of highly trafficked environment and quieter coastal edge. **Alison (+2)** Same reason as that for Option 1.	The measures for this criterion and associate scores included: - journey time - movements - amenity/experience - directness - impact on movement and desire lines - quality of the ped/cycle experience - safety - severance - sightlines - movement and desire lines. - place making opportunities. Scoring reflects balance between local impacts and wider connections, and between quantitative enhancements and quality outcomes for the ped/cycle network	Option 4, potential to retain access to properties off Gloucester Park Road either with realignment or by leaving the road in the same position - could then keep Gloucester Park Road open / signalised at Nielson which would be a positive for connectivity. Wide, direct shared paths, high level of finish / signage / facilities. Location of shared paths for optimum surveillance & connection to foreshore. Landscape Ped/cycle-friendly intersection of Neilson and Onehunga Harbour Road.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			Mall. Following key desire line to the destination. **OTHER COMMENTS:** - Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection.	**OTHER COMMENTS:** Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection. Missing link along Onehunga Harbour Road (refer Options 1 and 3) is included.	**OTHER COMMENTS:** Amenity at 'crossover' to Port area will depend on good casual surveillance between modes and adjacent (future) land uses ' **ASSUMPTIONS:** Design of shared path is for wide, direct, high quality connection.	**OTHER COMMENTS:** Pedestrians/cycles not to use Galway Street but Onehunga Mall Road only. Galway bridge and roundabout enable doubling back / multiple movements. Score reflects positive of Galway for more regional traffic coming into the industrial area; against slight loss of Gloucester Park Road for more local - if that could not be severed, score would increase to +2. Lower traffic volumes at Neilson / Onehunga Park Road similar to Option 3. **ASSUMPTIONS:** Movement choice: new shared path along outside of bund and existing retained along existing inner path past cemetery (Galway Street bridge goes over).		
	4D. Quality of living environment	Amelia	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents **OTHER COMMENTS:** None	**SCORE: +2** **REASONS:** Additional Harbour bridge crossing would potentially bring in more freight traffic into residential areas, from Rimu Road, means score less than Options 1 and 3. Challenging access for residential apartments on Onehunga Harbour Road **OTHER COMMENTS:** None	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents Preserves the Sea Scouts clubhouse, however disruption impacts on this are relevant. **OTHER COMMENTS:**	**SCORE: +3** **REASONS:** Reduction in traffic movements from Onehunga Town Centre area, resulting in positive impacts in this area for residents Preserves the Sea Scouts clubhouse, however disruption impacts on this are relevant. **OTHER COMMENTS:** None	The measure used for this criterion were based on the land uses in the area i.e. parks, facilities, recreation, clubs, the landing, residential, retail etc. The broad areas were: 1. open space 2. residential, all negative with respect of air quality 3. facilities, all of which would face similar impact. 4. Ability of all options to remove traffic movements from Onehunga residential/town centre area to new Link. Negative effects from all options would be experienced by nearby residents, however the benefits on the wider area and people were higher and hence the positive effects.	All options would have the ability to mitigate noise, vibration and air quality effects. Option 2 may provide greater opportunity to mitigate these effects due to nature of the cut and cover sections.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			ASSUMPTIONS: -	**ASSUMPTIONS:** -	**ASSUMPTIONS:** Sea Scouts can retain their access.	**ASSUMPTIONS:** -		
	4E. Viability of land areas	Phil Osborne	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Distribution to vulnerable business is less while exhibiting marginally greater access to the town centre. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Options 1, 3 and 4 are similar for business land requirements. This does not factor in new location of gas line and associated land requirements. Economics assessment should also include access changes.	
	4F. Productivity of land	Phil Osborne	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**SCORE: +3** **REASONS:** **OTHER COMMENTS:** None **ASSUMPTIONS:** -	All positive effects.	
	4G. Public access to and along the coastal marine area	Gavin Lister Sean Burke	**SCORE: +1** **REASONS:** **<u>Access to CMA (-1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. The option maintains existing walking and cycling connection to the CMA. An additional shared path is provided seaward of the proposed embankment.	**SCORE: +1** **REASONS:** **<u>Access to CMA (+1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections with the addition of the embankment coastal edge connection.	**SCORE: +1** **REASONS:** **<u>Access to CMA (+1)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections with the addition of the embankment coastal edge connection. Consequently there is a small improvement in access.	**SCORE: +1** **REASONS:** **<u>Access to CMA (0)</u>** Existing walking and cycling connections providing access to the CMA include Waikaraka Cycleway, Orpheus Drive Cycle way, Old Mangere Bridge connection, Onehunga Mall connection. No direct connection to the CMA i.e. the water is provided by existing walking and cycling routes. This option maintains the existing connections to the CMA. An additional shared path is provided seaward of the proposed embankment and structure in the vicinity of Galway Street.	The evaluation was based on the following categories: - visual - quality - physical. Alternative Option, Selwyn Street Connection, overall score 0. Alternative Option, Additional Access to wharf area, overall score 0.	Level of remedy and mitigation this project promises in terms of landscape for the road needs to be quite high. Mitigation design is key to the scores and changes may be seen as a result. Pedestrians and cyclists on the waterside. Note: Keep opportunities for mitigation as opportunities rather than part of the project.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			The option provides no direct connection to the water. The portion on the bridge structure is further removed from the CMA (physical connection to water) than is currently the case. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to modern standard. **Visual Connection (+1)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option is substantively similar to the existing scenario with the exception of the proposed new bridge structure adjacent Aotea Sea Scouts. By its nature this structure will provide greater visual connection to the Manukau Harbour than currently existing. **OTHER COMMENTS:** signals in this network present better opportunity for connection to the shore. **ASSUMPTIONS:** -	Consequently there is a small improvement in access. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to modern standard. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option does not substantively change the existing level of visual connection. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	**Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. The proposed access is likely to be similar – however pathways are likely to be more generous to bring them up to current standard. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option does not substantively change the existing level of visual connection. **OTHER COMMENTS:** None **ASSUMPTIONS:** -	The option provides no connection to the water and as such is consistent with the current situation. Overall response is neutral. **Quality of Access (+1)** The existing access is against the infrastructure corridor and along congested local roads. This option provides an improved quality of access due to construction to modern standards. **Visual Connection (0)** Good visual connections to the Mangere Inlet and Manukau Harbour are provided under the existing scenario. This option is substantively similar to the existing scenario. The proposed bridge will not accommodate walking and cycling, and will not increase visual connection to the harbour. The proposed walkway to the seaward side of the embankment in the vicinity of Galway Street will offset loss of visual connection from the Waikaraka walkway. Overall, this option is neutral. **OTHER COMMENTS:** None **ASSUMPTIONS:** -		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
Natural Environment	5A. Natural Landscape / Character	Gavin Lister Sean Burke	**SCORE: -3.5** **REASONS:** **<u>Natural Landscape (-4)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option builds over the natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility and defines the crater breach allowing historic tidal access. Overall the option will significantly adversely affect the legibility of the natural feature. Bridges proposed on the western edge of the natural feature will further reduce its legibility, particularly closing off the tidal breach. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as an SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has	**SCORE: -3** **REASONS:** **<u>Natural Landscape (-3)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option trenched portion will require removal of a portion of the Tuff Ring which is considered adverse. The option will remove a portion of the remnant saltmarsh. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as a SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial	**SCORE: -4** **REASONS:** **<u>Natural Landscape (-3)</u>** The Hopua Crater constitutes a SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option requires ramps to be built over tuff ring reducing its legibility and necessitating some removal of the feature. In particular the southwest return portion of the tuff ring will be adversely affected. This portion is important as it strongly contributes to the form of the ring and definition of the original tidal breach. The option largely preserves the SEA. **<u>Natural Character (-3)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a portion of the southwestern crater floor as an SEA (Land Based). The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater is has been highly modified through historic infilling of	**SCORE: -2** **REASONS:** **<u>Natural Landscape (-2)</u>** The Hopua Crater constitutes an SNF consisting of the breached tuff ring, coastal volcanic outcrops extending to the CMA, and crater floor consisting of remnant saltmarsh and tidal area reclaimed as grassed sports field. This option reduces impact on the natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility of the tuff ring as it defines the crater breach allowing historic tidal access. While the option reduces actual effects on the Tuff ring the proposed bridge and retaining wall structures will reduce its legibility. The proposed walking and cycling route is likely to impact on the volcanic outcrop adjacent the Aotea sea scouts. The proposed expressway alignment within the CMA between Onehunga Harbour Road and Galway Street will remove some and land lock the remainder of existing mangrove and saltmarsh vegetation providing a potential adverse effect on underlying vegetation patterns. **<u>Natural Character (-2)</u>** Under the PAUP Hopua crater is identified as an ONF. This includes the portion seaward of the existing road network in the vicinity of the Aotea Sea Scout building. Similarly PAUP identifies a	Key consideration for the evaluation included: - coastal edges - topography - ONF/Geological features - vegetation. Alternative Option, Selwyn Street Connection, overall score -3.5. Alternative Option, Additional Access to wharf area, overall score 0.	Opportunity to purchase tuff land and put it in as public land.

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by SH20 and the adjacency of MHX has further modified the feature. The SEA presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature natural character is assessed as low-moderate. This option builds over the outstanding natural feature (Hopua Tuff Ring) in particular the portion of the tuff ring to the west and south of SH20. This portion is important with respect to legibility of the ONF and defines the crater breach allowing historic tidal access. Overall the option will significantly adversely affect the legibility of the natural feature. The option builds bridge structures against the feature as well as extending the road network around the feature perimeter and adds additional road way to the crater basin. These additional built elements will affect the existing balance of natural character. The cumulative effects	and residential buildings on its rim. Further modification from the perimeter road and the bisection by State Highway 20 and the adjacency of MHX has further modified the feature. The Significant Ecological Area presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature natural Character is assessed as low-moderate. This option removes a portion of the Tuff ring particularly to the south east (it appears the North West portion has been previously removed) and removes a portion of the significant ecological area. Due to cumulative effect on these elements the option is assessed as adverse. The natural character effects are largely driven by the additional roadway formed within the CMA under MHX. A further contribution is provided through the reduction of and proximity to the significant ecological area as the roads move closer. The option is assessed as reducing natural character to Low on a	the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by State Highway 20 and the adjacency of MHX has further modified the feature. The Significant Ecological Area presents on site as a salt marsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature Natural Character is assessed as low-moderate. This option requires ramps to be built over tuff ring reducing its legibility and necessitating some removal of the Outstanding Natural Feature. In particular the southwest return portion of the tuff ring will be adversely affected. This portion is important as it strongly contributes to the form of the ring and definition of the original tidal breach. The natural character effects are largely driven by the additional roadway formed within the CMA under MHX with a contribution provided through the reduction of and proximity to the significant ecological area. The option is assessed as reducing natural character to Low on a scale of Pristine	portion of the southwestern crater floor as an SEA (Land Based) The ONF is legible to the trained eye but requires enhancement to increase its legibility to the general public. The Hopua Crater has been highly modified through historic infilling of the tidal basin, development of Onehunga Wharf and establishment of commercial, industrial and residential buildings on its rim. Further modification from the perimeter road and the bisection by SH20 and the adjacency of MHX has further modified the feature. The SEA presents on site as a saltmarsh and as such provides a remnant of the original process of tidal inundation and coastal ecology. Given the level of modification balanced against the significance of the feature existing natural character is assessed as low to moderate. This option avoids the tuff ring southeast of SH20. It builds bridge structures and retaining walls against the feature as well as extending the road network around the feature perimeter while creating additional road way to the crater basin. These additional built elements will affect the existing balance of natural character due to their presence and visibility. The SH20 north bound off ramp is in the same position as existing and therefore will not adversely affect the existing saltmarsh area.		

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			provided by this option are expected to reduce the natural character balance to low overall on a scale from Pristine to Highly Modified. The cumulative effects proposed by this option will adversely affect the outstanding natural feature due to reduction in legibility and further loss of original form. **OTHER COMMENTS:** **-** **ASSUMPTIONS:** **-**	scale of Pristine to Highly Modified. **OTHER COMMENTS:** Note: Structures in or on the tuff ring. What is the impact, covering is positive from a landscape/visual perspective. **ASSUMPTIONS:** -	to Highly Modified. **OTHER COMMENTS:** **-** **ASSUMPTIONS:** **-**	An additional bridge structure will terminate Galway Street and will connect to the expressway. Both these elements are within the CMA and will provide some adverse effects on the existing balance of natural character. Overall due the presence of additional structures within and adjacent to the CMA will reduce the existing natural character balance to low. However, the option reduces effects on the ONL which is considered positive and is reflected in the scoring of this option. **OTHER COMMENTS:** - **ASSUMPTIONS:** -		
	5B. Water quality - Stormwater - groundwater	Tony Cain Ann W	**SCORE:** **SW: +2** **GW: -1** **REASONS:** Alignment of Northbound on ramp to SH20, impacts on existing stormwater treatment pond. However, this can be rebuilt in a slightly different location within the current NZTA designation. All local roads within the interchange would receive proprietary stormwater treatment using proprietary devices as a matter of course. Therefore overall all roads would be receiving	**SCORE:** **SW: 0** **GW: -2** **REASONS:** Alignment of Northbound off ramp from SH 20 impacts on the "salt marsh" areas within the Tuff ring, from Water Quality perspective this would have no effect on the road runoff treatment but may have potential impact on groundwater. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a	**SCORE:** **SW: +2** **GW: -1** **REASONS:** Alignment of Northbound on ramp to SH20 may impacts on the existing SW treatment pond within the Tuff ring. However, this can be rebuilt in a slightly different location within the current NZTA designation. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a matter of course.	**SCORE:** **SW: +2** **GW: 0** **REASONS:** Slightly better alignment with respect to water quality as it provides additional area in which to provide a new sw wetland. All local roads within the interchange would receive proprietary SW treatment using proprietary devices as a matter of course. Therefore, overall all roads would be receiving SW treatment, where currently none exists. No effects on groundwater.	Basalt under the tuff which is how water passes, 10m deep. Basalt is the main aquifer. Stormwater disposal would be a challenge.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			SW treatment, where currently none exists **OTHER COMMENTS:** Cuts and retaining walls on mostly the east of the interchange if permanently drained may result in ground settlement affecting existing building to the north-east. **ASSUMPTIONS:** Adequate separation will be provided and maintained between sw treatment ponds and the natural saline lake to avoid changes to water quality and levels.	matter of course. Therefore, overall all roads would be receiving SW treatment, where currently none exists In addition the cut and cover tunnel would sever the SW pipework off the existing SW channel running parallel to Gloucester Park Road and additional land and also route would need to be defined to maintain the existing SW flow path. **OTHER COMMENTS:** The tunnel will impede ground water flow, resulting in ground water level on up gradient side and lowering on the seaward side. This may allow further saline intrusion on the seaward side, and increase flooding on the up gradient side. **ASSUMPTIONS:** Same as that for Option 1.	Therefore, overall all roads would be receiving SW treatment, where currently none exists. **OTHER COMMENTS:** Similar effect as that for Option 1. **ASSUMPTIONS:** Same as that for Option 1.	**OTHER COMMENTS:** **ASSUMPTIONS:** **ASSUMPTIONS:** Same as that for Option 1.		
	5C. Ecological resources	Sharon De Luca Leigh Bull Eddie Sides Katherine Muchna Shona Meyers	**SCORE: -2** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Avi-Fauna: -2; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** effect from bridge piers for road – moderate magnitude – effect	**SCORE: -3** <u>Marine Ecology: -2; Terrestrial Vegetation: -3; Avi-Fauna: -3; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** walking and cycling route impinges on CMA - low magnitude of effect –	**SCORE: -3** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Avi-Fauna: -3; Herpetofauna: -2</u> **REASONS:** **<u>Marine Ecology:</u>** walking and cycling route within CMA – low magnitude of	**SCORE: -2** <u>Marine Ecology: -2; Terrestrial Vegetation: -2; Herpetofauna: -2; Avi-Fauna: -2</u> **REASONS:** Similar effects to the Option 1. Avoids salt marsh and no additional bund reclamation in the Galway Street area,		

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			low. **<u>Terrestrial Vegetation:</u>** avoids wetland, ramps built over ground of volcanic feature (ONF) - impact on wetland nil to negligible, but for the ONF (geological feature) moderate magnitude, overall effect low. **<u>Avi-Fauna:</u>** effect from bridge piers for road, potential loss of some shorebird foraging habitat – negligible magnitude – effect low. **<u>Herpetofauna:</u>** effect from disturbance/removal/shading to restoration planting area under SH20 onramps and off ramps – moderate magnitude – value medium. **OTHER COMMENTS:** None **ASSUMPTIONS:** **<u>Marine Ecology:</u>** Neilson Street: - assumed moderate ecological values. **<u>Terrestrial Vegetation:</u>** It is assumed that wetland identified as SEA, in association with volcanic crater, is of moderate ecological value. It is an ONF of regional value.	effect low. **<u>Terrestrial Vegetation:</u>** edge of wetland impacted; ONF impacted by trench - moderate magnitude for both wetland and ONF. **<u>Avi-Fauna:</u>** walking and cycling route impinges on CMA, potential loss of some shorebird foraging habitat - low magnitude of effect – effect moderate. **<u>Herpetofauna:</u>** effect from removal of some of wetland/grass habitat, but remaining area bisected by road - low magnitude of effect – value medium. **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.	effect – effect low. **<u>Terrestrial Vegetation:</u>** edge of wetland affected but less than above; ramps built over ground of ONF - low impact on wetland, moderate magnitude for ONF – overall. **<u>Avi-Fauna:</u>** walking and cycling route within CMA, potential loss of some shorebird foraging habitat – low magnitude of effect – effect moderate. **<u>Herpetofauna:</u>** effect from disturbance/removal/shading to restoration planting area under SH20 onramps and off ramps – moderate magnitude – value medium **OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.	**OTHER COMMENTS:** None **ASSUMPTIONS:** Same as that outlined for Option 1.		

Notes: MCA Workshop #2, Neilson Street Interchange

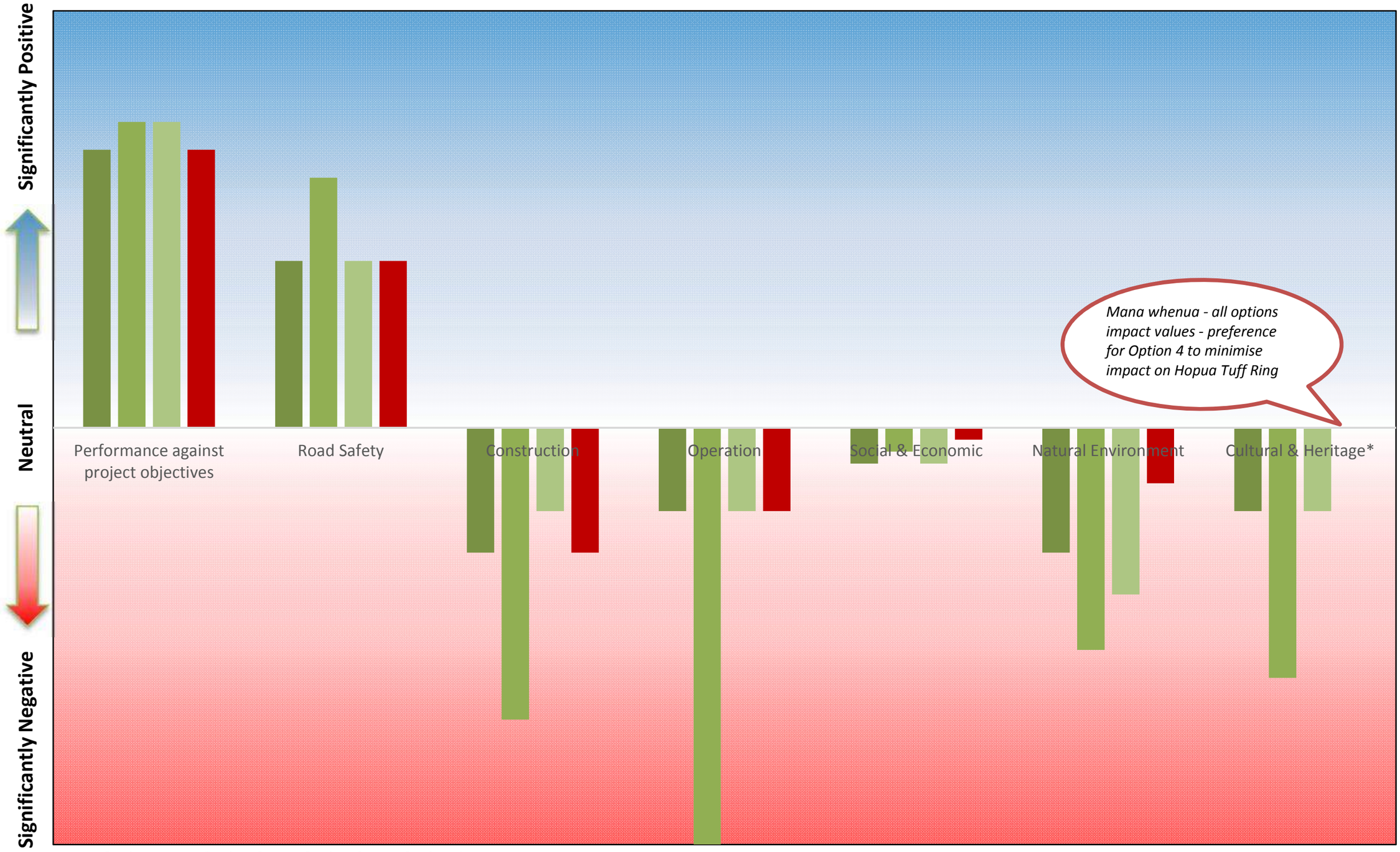
Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
			NB: we have considered volcanic crater in our ecological assessment but it is a geological feature. However the two features are ecological interrelated, which is why it is included in our assessment. **<u>Herpetofauna:</u>** The vegetation on the Neilson St interchange is isolated, and restoration planting although good quality for lizards, looks relatively recent so skinks are unlikely. As such, the following scores are very conservative, assuming native skinks are present. This has been scored presuming no mitigation/lizard salvage.					
	5D. Coastal environment and resources	Stephen Priestley	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Not applicable	
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Mana whenua groups provided feedback at a hui held on 6 May 2016. Notes have been recorded in the hui minutes.	
	6B. Archaeological and built heritage	Matt Felgate (Archaeology) Bruce Petrie (Built Heritage)	**SCORE: -1** **REASONS:** The works associated with the link road may generate minor archaeological effects.	**SCORE: -3** **REASONS:** Permanent adverse impact at a local level which can be mitigated to some extent, effects on potential archaeological remains i.e. the former foreshore and tuff ring /	**SCORE: -1** **REASONS:** The works associated with the link road may generate minor archaeological effects.	**SCORE: 0** **REASONS:** No differentiable effect.	Bruce had no comments to make to this criterion.	

Notes: MCA Workshop #2, Neilson Street Interchange

Consenting Phase MCA							General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Common to all Options**	**Yes – No and Action Plan**
				archaeological site. **OTHER COMMENTS:** **ASSUMPTIONS:** Cut and cover construction methodology.				
			OTHER COMMENTS: **ASSUMPTIONS:** -		**OTHER COMMENTS:** **ASSUMPTIONS:**	**OTHER COMMENTS:** **ASSUMPTIONS:**		

5 The summary reporting of MCA Scoring of Neilson Street alignment options

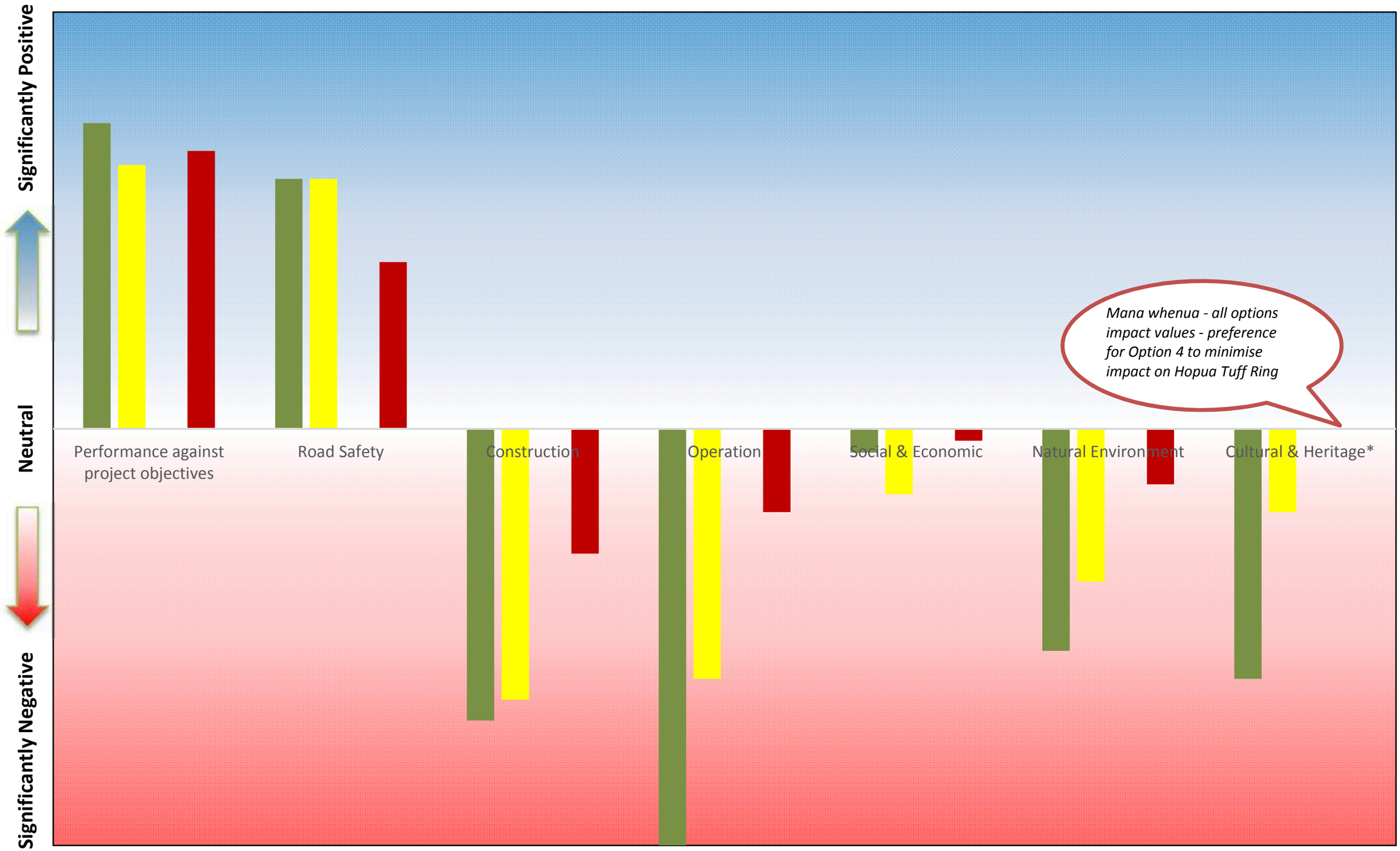
Neilson Street Interchange - Design Hold Assessment



** Cultural & Heritage Values do not include 'score' from mana whenua but commentary is provided on their input to the MCA process*

6 The summary reporting comparing ‘Option 2’, ‘The OBA Option’ and Option 4.

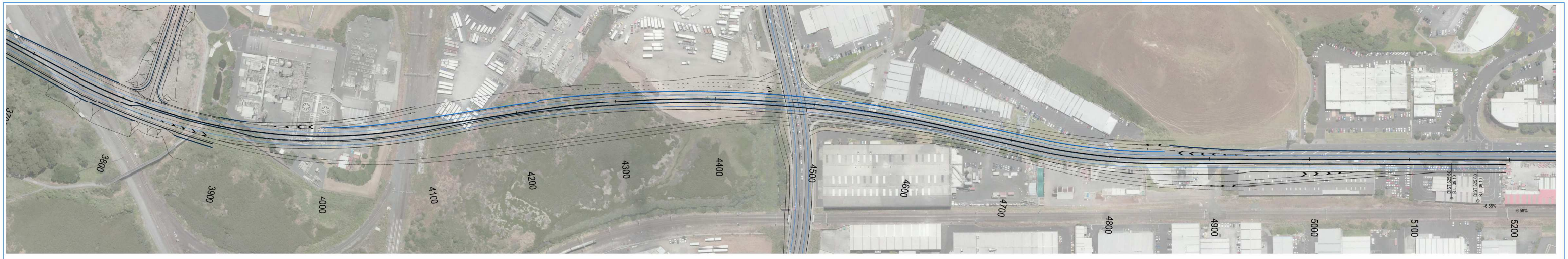
Comparison of OBA Option (revision to Option 2) - Oct 2016

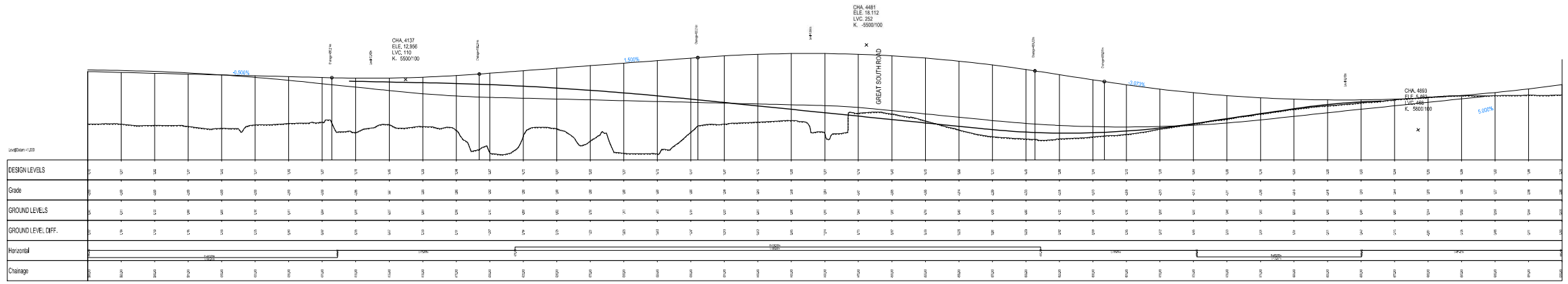


** Cultural & Heritage Values do not include 'score' from mana whenua but commentary is provided on their input to the MCA process*

Appendix P

Great South Road Intersection Assessment





DRAFT
FOR DISCUSSION
28/09/2016

PRELIMINARY

No.	Issued Status	Drawn	Check	Appr.	Date
B	UPDATED LAYOUT	RT			28/09/2016
A	DRAFT ISSUE FOR DISCUSSION	LN			21/09/2016

DISCLAIMER
The information shown on this drawing is solely for the purpose of supporting RMA applications for statutory approvals.
All information shown is subject to review for compliance with approved consents and the outcomes of final design.
This Drawing must not be used for construction.

NZ TRANSPORT AGENCY
WAKA KOTAHI

East West Link

0 10 20 30 40 50m
SCALE 1:1000 AT A1 SIZE

Drawn: L.NEL	Drafting Check:	Reviewed: Design Manager	Approved: Alliance Manager
Designed: L.NEL	Design Check:		
Scale: Original Scale (A1): Reduced Scale (A3):		Contract No: PA4041	

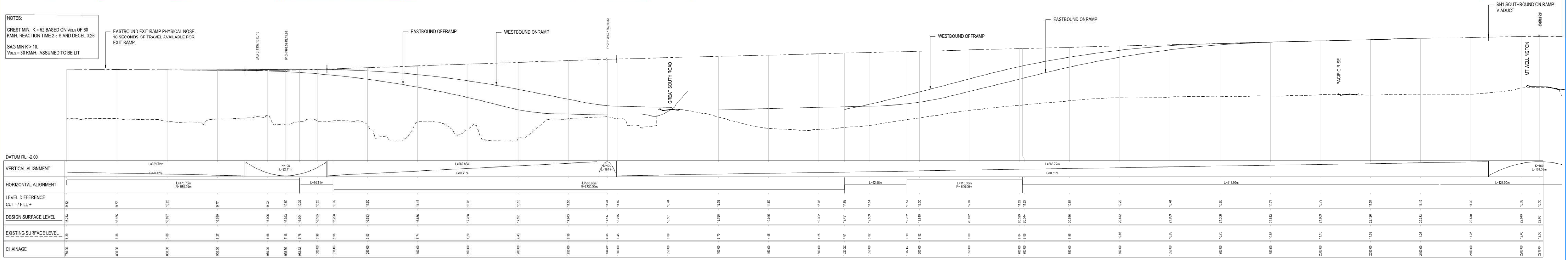
Discipline:	ROAD ALIGNMENT
Drawing Title:	EAST WEST LINK - OPTION 1 GSR GRADE SEPARATION - EASTBOUND
Drawing Number:	Z-007-EB-MCD0
Rev No:	B

Plot Date: 28 September 2016 - 4:53 p.m. Plotted by: Ajantha Ram Cad File No: W:\CAD\MAC\Z-007 EB MCD0_RB.dwg

NOTES:

CREST MIN. K = 52 BASED ON V_{DES} OF 80 KM/H, REACTION TIME 2.5 S AND DECEL 0.26

SAG MIN K > 10.
V_{DES} = 80 KM/H. ASSUMED TO BE LIT



LONGITUDINAL SECTION - ROAD01

HORZ 1:1000 VERT 1:200

No.	Issued Status	Drawn	Check'd	App'd	Date
B	ADDED BACKGROUND INFO	RT			28/09/2016
A	DRAFT ISSUE FOR DISCUSSION	LN			21/09/2016

DISCLAIMER
The information shown on this drawing is solely for the purpose of supporting RMA applications for statutory approvals.
All information shown is subject to review for compliance with approved consents and the outcomes of final design.
This Drawing must not be used for construction.

NZ TRANSPORT AGENCY
WAKA KOTAHI

East West Link

DRAFT
FOR DISCUSSION
28/09/2016

SCALE 1:1000 AT A1 SIZE

PRELIMINARY

Drawn RB
Designed RB
Drafting Check
Design Check
Reviewed Design Manager
Approved Alliance Manager
Scale: Original Scale (A1) Reduced Scale (A3)
Contract No PA4041

Discipline ROAD ALIGNMENT
Drawing Title EAST WEST LINK - OPTION 2 GSR GRADE SEPARATION - EASTBOUND
Drawing Number Z-008-EB-MCD0
Rev No. B

Plot Date: 28 September 2016 - 11:33 AM Plotted by: Raymond Tan Cad File No: W:\CAD\AutoCAD\DWGs\Z-008 EB MCD0.dwg

East West Link – Multi-Criteria Analysis – Great South Road Grade Separation

Record of Workshop Notes: 29 September 2016

Status: Outcomes from Workshop

General comments that informed assessment:

Base Option (At-grade): This is the current option included the AEE and technical assessments prepared for EWL.

Option 1 Grade Separated Separate Structure:

- Assumes grade separation over Great South Road only;
- Assumes that the EWL route goes over GSR.

Option 2 Grade Separated Continuous Structure:

- Assumes grade separation over Great South Road via a continuous bridge structure that connects with SH1;
- Assumes that the EWL route goes over GSR.

Roundabout: Discussed at the workshop but not scored due to lack of information. General comments included -

- May require additional land take (business)
- Assumption that Stratex and other surrounding businesses are still operating businesses with accesses onto or in very close proximity to the roundabout – This will impact on operation of roundabout, making it less efficient
  How will these properties access the local road?
- It is unclear what the impact would be on Mutukāroa – assume no land take from the site?
- Agreed that grade separation of regional walking / cycling facilities may address some impacts identified or create opportunities.
- All workshop attendees agreed that there are no apparent benefits/improvements to either Option 1 or 2 with a roundabout (rather than signals).

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
Performance against project objectives	*Obj 1.* *Improved travel times between businesses in the Onehunga–Penrose industrial area and State Highways 1 and 20*	Andrew	**SCORE: 3.0** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 4.0** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 4.0** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:**	Scored using 5 set sub criteria/objectives used in the IBC – Includes Travel times, travel reliability, accessibility, resilience and endurability. Low resilience as there is no space to provide for bus or cycle facilities which does not meet the aspirations of the community - who at a later date may wish to use some of the space / cycle facilities.	
	Obj 2. *Improved safety for pedestrians and cyclists* *Improved accessibility for local cycling and walking* *Improved accessibility for regional cycling and walking (strategic network)*	Kara Hartshorne	**SCORE: 3.0** **REASONS:** Improved connections on shared path through to Sylvia Park. Delays and multiple crossings at intersection noted. Local connections to Mutukaroa enabled, but convoluted intersection noted. **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 3.0 (potential for 4.0)** **REASONS:** Maintained grade separation and therefore reduced impediment to Sylvia Park access for regional cycling and walking, Local connections to Mutukaroa enabled, but convoluted intersection noted. **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 3.0 (potential for 4.0)** **REASONS:** Potential for grade separation for regional cycling and walking, but not demonstrated in design of option. Local connections to Mutukaroa enabled, but convoluted intersection noted. **OTHER COMMENTS:** **ASSUMPTIONS:**	AT has commented at a recent meeting on the GSR grade separated option that unless separate peds/cyclists facilities are provided (as part of both Option 1 and 2) they are not keen on grade separation (e.g. the standard for cycle path need to be same as road facility).	Option1 and potentially option 2 provide for grade separated structure for shared path / cycle and walking facilities.
	Obj 3. *Improved journey time reliability for buses between SH20 and Onehunga town centre*	Andrew Murray	**SCORE: 1.0** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 1.0** **REASONS:** Improved north-south movements/connectivity along GSR allowing for more opportunities for bus improvements (potential for Bus priority along GSR). **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: 1.0** **REASONS:** Improved north-south movements/connectivity along GSR allowing for more opportunities for bus improvements (potential for Bus priority along GSR). **OTHER COMMENTS:** **ASSUMPTIONS:**		Note that current design for Option 1 and 2 does *not include* bus priority lanes.
Road safety	1A.User Safety	Noel	**SCORE: 0** **REASONS:** Intersection design complies with current standards, however large signalized intersections are seen as still having some safety issues **OTHER COMMENTS:**	**SCORE: +2** **REASONS:** Reducing conflicting volume of traffic at a signalized intersection. **OTHER COMMENTS:** Significant improvement on at-grade option	**SCORE: +1** **REASONS:** Reducing conflicting volume of traffic at a signalized intersection. **OTHER COMMENTS:** Significant improvement on at-grade option	General query as to how a 60kmph speed environment would be maintained if Option 2 were built? If option 1 or 2 are constructed it is almost certain that the through lanes would have a posted speed of 80kph and the at grade links would be 60kph. Option 1 was seen less of a motorway type of environment. With either option specific treatment will be required to provide a lower speed environment on the embankment section of the EWL.	Yes – mitigation measures required to achieve speed environment change transitions, particularly for Option 1.

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
			ASSUMPTIONS:	**ASSUMPTIONS:** Similar to Puhinui interchange through lanes will be posted at 80kph, while local road at 60kph. -	**ASSUMPTIONS:** Similar to Puhinui interchange through lanes will be posted at 80kph, while local road at 60kph.		
Construction	2A. Construction impacts on Utilities and lifeline infrastructure	Noel	**SCORE: -1** **REASONS:** 1 bulk water main affected. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** Transpower tower and watercare bulk mains (x2) **OTHER COMMENTS:** **ASSUMPTIONS:** Mono pole used to maintain T/P lines in same corridor	**SCORE: -2** **REASONS:** Transpower tower and watercare bulk mains (x2) **OTHER COMMENTS:** **ASSUMPTIONS:** Mono pole used to maintain T/P lines in same corridor		Yes - Design work to confirm if monopoles can maintain current transmission corridor.
	2B. Construction Cost	Noel	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** $90M P95 cost increase compared to the Base Option. **OTHER COMMENTS:** Current design is draft and a more precise footprint needs to be established **ASSUMPTIONS:** No land cost included.	**SCORE: -4** **REASONS:** **$**130M P95 cost increase compared to the Base Option. **OTHER COMMENTS:** Current design is draft and a more precise footprint needs to be established **ASSUMPTIONS:** No land cost included. -		
Operation	3A. Operational Cost	Noel	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** No significant differences between the operational costs of the structures **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -2** **REASONS:** No significant differences between the operational costs of the structures **OTHER COMMENTS:** **ASSUMPTIONS:** -		
Social & Economic	4A. Construction Impact	Amelia / Sarah	**SCORE: -1** **REASONS:** **OTHER COMMENTS:**	**SCORE: -2** **REASONS:** Amount of structure to be built will make the impact more substantial for adjacent businesses.	**SCORE: -3** **REASONS:** Amount of structure to be built will make the impact more substantial for adjacent businesses.	Some construction activity may be positive for some businesses, others is traffic and operational disruption issues.	Yes for all options, construction management and liaison can mitigate impacts.

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
			ASSUMPTIONS: -	Will prolong and make traffic management more difficult. **OTHER COMMENTS:** **ASSUMPTIONS:** -	Will prolong and make traffic management more difficult. **OTHER COMMENTS:** **ASSUMPTIONS:** -		
	4B. Built Form and Amenity The measure for this criterion is visual and character, and legibility.	Lynne Hancock /Sarah Johnson	**SCORE: -1** **REASONS:** Larger footprint of intersection (negative) but maintains most of existing industrial land and buildings – i.e. Can still support built form as per current uses. No building or structure opposite Mutukaroa retains some of its presence and signals importance of place / character. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -4** **REASONS:** Loss of potential for reference to Karetu portage (a fundamental driver in the ULDF aspirations and design principles), impact on views and appreciation of Mutukaroa, undermining of dominance of maunga through keeping views to it and space opposite (on the other side of Sylvia Park Road) relatively low key and greened. Widened corridor along Sylvia Park Road brings the road very close to the railway line and provided an opportunity to soften the edge – now gone. Cumulative effect of additional roadway, hard surfaces and structure and loss of green space is a negative for built form character **OTHER COMMENTS:** Concern that this will create the perception of a higher speed environment (i.e. motorway environment) that changes the character and legibility of cross connections (as well as the wider landscape – including the regional park). NOTE – the memo with this MCA says “will provide the opportunity for improved pedestrian and cycle connectivity”. This is no guarantee – and it’s	**SCORE: -4** **REASONS:** Loss of potential for reference to Karetu portage (a fundamental driver in the ULDF aspirations and design principles), impact on views and appreciation of Mutukaroa, undermining of dominance of maunga through keeping views to it and space opposite (on the other side of Sylvia Park Road) relatively low key and greened. Widened corridor along Sylvia Park Road brings the road very close to the railway line and provided an opportunity to soften the edge – now gone. Cumulative effect of additional roadway, hard surfaces and structure and loss of green space is a negative for built form character **OTHER COMMENTS:** Concern that this will create the perception of a higher speed environment (i.e. motorway environment) that changes the character and legibility of cross connections (as well as the wider landscape – including the regional park). NOTE – the memo with this MCA says “will provide the opportunity for improved pedestrian and cycle connectivity”. This is no guarantee – and it’s		Yes - Potential to soften vehicle dominated environment and new large scale ramps in the form of landscaped area alongside shared path (Karetu Portage route). Key issues for mitigation and design planning: 1. Reducing speed and maintaining transition from industrial to urban arterial sections; 2. Reflecting and positively resonding to Karetu portage 3. Provision of appropriate level of design and separation for cycle and shared path facilities.

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
				not clear what the improvement is. It may be an improvement from now just because there will be some sort of path, but it's a reduction in quality from the current (base) option. **ASSUMPTIONS: -**	not clear what the improvement is. It may be an improvement from now just because there will be some sort of path, but it's a reduction in quality from the current (base) option. **ASSUMPTIONS: -**		
	4C. Connectivity(UD perspective – quality and amenity of the ped/cycle network and local roads) Infrastructure provision Safety Pedestrian and cycle experience	Lynne Hancock /Sarah Johnson	**SCORE: +1** **SCORE: +2 (safety and experience)** **REASONS:** New shared path and footpaths provide clear direct ped/cycle movements through the intersection – both towards Sylvia Park and also into regional network (Hamlins Hill). Although wide, the refuges at the intersection also allow for safe crossing / pausing and will not be experienced as a deterrent. Positive score reflects good legibility, clear views, keeping people 'on the ground' but not dominated by structure; also continued access into adjacent uses, all of which moderates the large scale of the road and contributes to amenity and perception of comfort **OTHER COMMENTS:** **ASSUMPTIONS:** Landscape treatment is assumed in the base option (i.e. score includes this). Without landscape option amenity would be much reduced and make this lower – 0 or +1 max	**SCORE: -4** **SCORE: +3 (safety and experience)** **REASONS:** Unclear what the ped/cycle movements are – what side of the road can they use, where do they come down off structure, what are the potential clashes with vehicles (i.e. Can't really score on physical safety). What is clear is that there is a significant loss of amenity (tempted to say complete loss – ped/cycle experience substandard) between Great South Road and Mt Wellington Highway, with the whole corridor and beyond taken up with structure, vehicle lanes and complex movements, loss of any potential for green space to soften the shared path. Instead of being a continuous experience (which the project objective would suggest it should e) it will feel like a fragmented and very vehicle-dominated experience. Not inviting, not pleasant. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -4** **SCORE: +3 (safety and experience)** **REASONS:** Unclear what the ped/cycle movements are – what side of the road can they use, where do they come down off structure, what are the potential clashes with vehicles (ie. Can't really score on physical safety). What is clear is that there is a significant loss of amenity (tempted to say complete loss – ped/cycle experience substandard) between Great South Road and Mt Wellington Highway, with the whole corridor and beyond taken up with structure, vehicle lanes and complex movements, loss of any potential for green space to soften the shared path. Instead of being a continuous experience (which the project objective would suggest it should e) it will feel like a fragmented and very vehicle-dominated experience. Not inviting, not pleasant. **OTHER COMMENTS:** **ASSUMPTIONS:** -		Yes – Allowance for introduction of signage to link ped/cycle network clearly into Hamlins Hill Regional Park (on Great South Road) Provision of green edge able to be created opposite Mutukaroa also mitigates visual impact on it and loss of 'sense of place' with new ramps (vertical elements) – enables integration of cultural markers, interpretive signage, as well as 'breathing space' alongside busy road. Grade separation of cycling and pedestrian facilities would provide for safer regional movement through the intersection (for EWL cycle/ped path)

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
	4D. Quality of living environment - Community facilities - Parks - Air quality - Noise	Amelia/ Sarah	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** That the option will avoid Mutukāroa Amenity of people accessing the park – not significantly worse for access – just more visually unattractive. Assume that power poles are not moved. Power lines may have to be raised.	**SCORE: -2** **REASONS:** Accessing the park is 'uglier' and harder for people than other options **OTHER COMMENTS:** **ASSUMPTIONS:** Will avoid Mutukāroa Amenity of people accessing the park – not significantly worse for access – just more visually unattractive. Assume that power poles are not moved. Power lines may have to be raised.		
	4E. Viability of land areas	Phil Osborne	**SCORE: -2** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -3** **REASONS:** Land take increased for TR Group. Six business units on Sylvia Park Road required. Additional $10m ($209m in total) **OTHER COMMENTS:** **ASSUMPTIONS:** The additional land take *does not* make TR group business unviable. Doesn't include the cost of business loss just the land cost.	**SCORE: -3** **REASONS:** Land take increased for TR Group. Six business units on Sylvia Park Road required. Additional $10m ($209m in total) **OTHER COMMENTS:** **ASSUMPTIONS:** The additional land take *does not* make TR group business unviable. Doesn't include the cost of business loss just the land cost.		
	4F. Productivity of land	Phil Osborne	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** Better access to businesses along GSR/Sylvia Park. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** Better access to businesses along GSR/Sylvia Park. **OTHER COMMENTS:** **ASSUMPTIONS:** -		

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
	4G. Public access to and along the coastal marine area - quality of access - visual connectivity	Sean Burke	**SCORE: +2** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -1** **REASONS:** Visual connectivity decreased. Quality of access the similar. **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: 0** **REASONS:** More visual connectivity achieved via higher structure. **OTHER COMMENTS:** **ASSUMPTIONS:** That views can be achieved. -		
Natural Environment	5A. Natural Landscape / Character	Sean Burke	**SCORE: -3** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: -4** **REASONS:** **OTHER COMMENTS:** Dependent on ecological effects. Hard to understand what these are for this option. **ASSUMPTIONS:** Worse than baseline option. Worse ecological effect	**SCORE: -4** **REASONS:** **OTHER COMMENTS:** Dependent on ecological effects. Hard to understand what these are for this option. **ASSUMPTIONS:** Worse than baseline option. Worse ecological effect	• Need a clearer understanding of what the ecological impacts are of Options 1 and 2. • Impacts on transmission tower lines – triggers ONL. The towers may not need to be removed/replaced but the transmission lines will have to be located higher above ground level. • Visual impact from transmission tower lines and impact on Mutukāroa.	Yes – if exclusion zones can be maintained, if design response can be appropriately managed.
	5B. Water quality - operation of sw (quantity and quality) - ground water		**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Not considered sufficient to differentiate between options	
	5C. Ecological resources	Leigh Bull / Katherine Muchna	**SCORE: -4** **REASONS:** Bundled ecological score from previous exercise. **OTHER COMMENTS:** **ASSUMPTIONS:**	**SCORE: -4** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** • Works moved as far north as possible. • Effects on lava shrubland, raupo and saltmeadow avoided and minimized; • Construction staging to north; • Bridge piers located to avoid lava shrubland and other areas of avoidance.	**SCORE: -4** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** • Works moved as far north as possible. • Effects on lava shrubland, raupo and saltmeadow avoided and minimized; • Construction staging to north; • Bridge piers located to avoid lava shrubland and other areas of avoidance.	• Need to understand extent of design on lava shrubland and raupo wetland. • Option 1 and 2 will be wider, have larger footprint and greater shadow effect than the Base Option. •	• Structure (piers) and the construction staging to be to the north of EWL. • Piers should be located to avoid previously identified 'avoidance areas' (lava shrubland, raupo, glasswort and bachelors button saltmeadow)
	5D. Coastal environment and resources - coastal processes only	Stephen Priestley	**SCORE: not scored** **REASONS:**	**SCORE: not scored** **REASONS:**	**SCORE: not scored** **REASONS:**	Not considered sufficient to differentiate between options	

Consenting Phase MCA						General Comment	Ability to Mitigate
MCA Topic	**Criteria**	**Owner**	**Base Option**	**Option 1**	**Option 2**	**Common to all options**	**Yes/No and Action Plan**
	- excl footprint of reclamation which has been considered under ecology (5C above)		**OTHER COMMENTS:** **ASSUMPTIONS:** -	**OTHER COMMENTS:** **ASSUMPTIONS:** -	**OTHER COMMENTS:** **ASSUMPTIONS:** -		
Cultural and heritage	6A. Mana Whenua values	Sarah MacCormick	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE:** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	To be discussed at a hui scheduled for 6th Oct 2016 – discussed and no preference identified from Mana Whenua on options.	
	6B. Archaeological and built heritage	Matt Felgate	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	**SCORE: not scored** **REASONS:** **OTHER COMMENTS:** **ASSUMPTIONS:** -	Not considered sufficient to differentiate between options	