Noise Assessment

3.1 Information Requested

MCC Request Item (2) "Noise Assessment"

"The noise assessment should specifically address the effects of the project without noise mitigation, comparing that with the project with mitigation. It is considered that a comparison with the "do-minimum" option is not helpful. Refer to attached notes prepared by Garth Vipond at MCC.

Noise Barriers – Dimensions, Placement

1. Cross-sections – on each of the cross-sections provided, a graphical representation of the edge of the designation and the location and height of noise mitigation barriers. It is considered that this may reveal that in some cases, the noise mitigation measures may not be particularly effective.

2. For the noise mitigation barriers, a more explicit consideration of the height, location and visual impact of the structures, and the factors that have gone into locating the barriers where they are. In this regard, it is noted that any motorway reserve space between the noise barrier and the designation boundary will be land with an ambiguous status and not good crime-reducing design."

3.2 Response

Marshall Day Acoustics (MDA) has prepared a response report to Mr Vipond's request for further information, which was attached to the request for further information letter from Resource and Environmental Management Limited on behalf of MCC. The MDA response is included at the end of this section of the report. Cross-section drawings indicating the location and height of noise mitigation barriers in relation to the proposed works and to property boundaries are also included at the end of the section.

3.2.1 Height, Location and Visual Impact of Noise Barriers

The proposed noise barriers are a necessary mitigation measure to ensure that the predicted and evaluated traffic noise levels comply with *Transit New Zealand Guidelines for the Management of Road Traffic Noise – State Highway Improvements*. The height and location of the required noise barriers are affected by the nature and extent of proposed works, topography, land area and adjacent land uses. The attached MDA report discusses the location of individual noise barriers.

Detailed design of the project works is required in order to confirm the final position and construction detail of the required noise barriers. The design of these barriers will be carried out in consultation with adjacent property owners as appropriate, and details presented in the Outline Plan of Works.

3.2.2 Motorway Reserve and Crime Reducing Design

Noise barriers will be constructed in the motorway reserve along the majority of the western flank of the motorway alignment between Coronation Road and Rimu Road, and also along the eastern flank of the Walmsley Road off-ramp. MCC has raised concerns that the area of motorway reserve between the noise barriers and designation boundary will represent land of "ambiguous status" and "poor crime reducing design". These concerns are responded to as follows: -

Ownership and Maintenance

The motorway reserve between the edge of the carriageway and the designation boundary is owned by the Crown and under the jurisdiction of Transit. Transit is responsible for the upkeep and maintenance of the motorway network which includes the motorway reserve. It is anticipated that this area will be planted in low maintenance trees to provide a visual barrier to and from the motorway. Maintenance will be undertaken periodically and as required.

Design Out Crime

MCC has prepared the document, *Design Out Crime – Crime Prevention Through Environmental Design - Dealing With Public Realm 'Hot Spots' guidelines*. The document focuses on the globally recognised "situational crime prevention" initiative, "Crime Prevention Through Environmental Design" (CPTED), which is based on the basic principle that the design of the environment has an effect on criminal behaviour and that good design leads to reduced crime and fear of crime.

The CPTED principles include:

- Activity Support – Places that are active ensure people are there to provide help for the victim and create the risk of detection for the criminal.

- Natural Surveillance – Places that have people passing by or windows that overlook a place, provide the victim with the possibility of help and the criminal with the risk of detection.

- Natural Access Control – Limits ease of access to places for those that should not be there. This also ensures that those seen in places they do not have the right to be, will feel vulnerable to detection and possible capture.

- Territorial Control – Places that are clearly seen as being owned by someone, sends out a message that these places have guardianship and that criminal activity will not be tolerated.

- Management and Maintenance – Places that are seen as being managed and maintained, send out a message that these places are cared for and that criminal activity will not be tolerated.

- Target Hardening – Covers active security measures, such as fitting locks, CCTV, security guards, etc, that make crime harder to commit and raise the risk of detection and possible capture.

The detailed design for the project will include consideration of how to manage the motorway reserve between the noise barriers and the designation boundary. Crime prevention through environmental design principles will form an essential part of the process. The results of consultation with property owners immediately adjoining the designation boundary and the requirements for the noise barriers will also influence the process.

Each block likely will be considered on a case by case basis. In any event the CPTED principles most applicable to the scenario will be applied. Natural access controls in the form of fencing could be erected along all public boundaries to limit access, territorial controls through the erection of "no access" signage and target hardening by securing access gates used by Transit's maintenance staff / contractors. Low level natural surveillance may also be provided from properties immediately adjoining the designation.

MHX REF: X009

MARSHALL DAY
ACOUSTICS

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4 August 2006

URS New Zealand
PO Box 821
Auckland

Attention: Belinda Petersen

Dear Belinda,

MANUKAU HARBOUR CROSSING – RESPONSE TO REQUEST FOR FURTHER INFORMATION FROM MANUKAU CITY COUNCIL

Marshall Day Acoustics (MDA) has received, from Resource and Environmental Management Ltd on behalf of Manukau City Council, a Request for further Information (dated 21 June 2006) in accordance with Section 92 of the RMA, in relation to the Manukau Harbour Crossing project. The request is in response to a review of Appendix 6 of the Assessment of Environmental Effects (AEE) accompanying the application.

Issues raised are addressed as follows.

Further Information Request 1.1 – Traffic Noise Evaluation

Further information is sought relating to traffic noise effects for a '2021 Do Minimum' circumstance (better described as 2021 Do Nothing), i.e. without the proposed scheme in place, compared to the 'Actual 2021', ie. the proposed scheme, but with no mitigation measures in place.

Response:

An amended table that forms part of Appendix D to Appendix 6 of the AEE has been included. The information relating to 2021 Do Nothing scenario has been retained, and incorporated into the table is a column showing the noise effects of the proposed scheme in 2021, but without any mitigation being used (Proposed Scheme 2021 Without Barriers).

We do not accept that the 2021 Do Nothing column can be disregarded, as this contains information relevant to the overall assessment of noise effects. It is understood that when considering capacity demand, this option may not be realistic, but from the perspective of noise effects on those local receivers, it is still a valid comparison.

The traffic data used to model the 2021 Do Nothing scenario is significantly higher than that used for the modelling of the 2006 existing situation (refer Appendix G of MDA report no. 2003180A (6)(b)), and it can be seen from the table that the noise levels at the receivers generally tend to increase.

It is noted therefore that without the proposed scheme being implemented, traffic noise would increase over time for those residents living in close proximity to the study area due to increased traffic flow. This is considered to be valid as periods of peak traffic flow would inevitably increase.

As can be seen from the table, the predicted noise levels as a result of the scheme being implemented, but without mitigation in place, show that in general noise levels increase at the receiver locations. This is due, in the vast majority of cases, as a result of the predicted increase in traffic flows.

For some receivers, the increase is also due to the proposed realignment which would move the road closer to some residences. It can also be seen that for some receivers, noise levels would be lower with the proposed scheme than if nothing were done.

Further Information Request 2.1 and 2.2 – Noise Barriers

This request relates to the provision of revised plans for the scheme and is perhaps best addressed by other members of the project team.

Further Information Request 2.4 - Noise Barrier (north of Coronation on-ramp)

Further information is sought relating to an evaluation of alternative mitigation measures for the stretch of SH20 where the 2.5 metre high barrier has been proposed (just north of the Coronation Road on-ramp).

Response:

A further iteration of the noise model has been undertaken, whereby the noise barrier is moved closer to the carriageway and reduced in height to 2m. The barrier has also been reduced in length. The results of the revised modelling show that it would not be possible to screen this area and comply with the Transit Criteria with a lower barrier.

However, it should be noted from Figure G2 of Appendix 6 of the AEE, that the need for a barrier is mainly as a result of the exceedance of the Transit design levels at the MCC subdivision 1 and MCC subdivision 2 receivers (refer Figure G2 and the table appended to this letter). These are located on ground higher than the carriageway and therefore the barrier is in the most effective location for acoustical purposes.

It is accepted that the barrier does not have to extend as far south as originally shown, rather only to the point shown on revised Figure D appended to this letter.

However, there is also a general intent to protect the whole subdivision area as far as practicable from the noise effects of the proposed scheme and the southern part of the barrier was included for this purpose. Therefore, for this reason, the longer barrier may remain appropriate.

The use of TL4 or TL5 type barriers closer to the carriageway without a further barrier on the boundary would not provide the required screening to reduce the noise to acceptable levels. Also, the use of the TL4 or TL5 type barriers would not enable the height of any proposed barrier to be reduced.

The screening effects of any safety barrier at the carriageway edge are insignificant in this case. The reason for this is that noise from traffic on both the north and southbound carriageways contributes to the predicted noise levels at the receivers. The height of these safety barriers is insufficient, in relation to the horizontal distances involved between the road and receiver. In other words, they would provide no benefit in this case.

It is our understanding that Transit has undertaken consultation relating to the proposal and is in the best position to advise as to what extent such consultation has taken place in this location.

Further Information Request 2.5- Noise Barrier (north of 114 Crawford Avenue)

Further information is requested relating to an evaluation of alternative mitigation measures for the stretch of SH20 where the 2.8 metre high barrier has been proposed (adjacent to SH20 from the boundary of 114 Crawford Avenue in the south to Hasties Place in to the north).

Response:

The iterative process of selecting appropriate barrier heights was, in this location, the most complex. A number of scenarios were tested and the results presented in the AEE were the final iteration. The final barrier design was at a height that ensured that at the worst case receiver location, the noise level just complied with the Transit design noise level.

Predictions at alternative barrier locations and with alternative heights were undertaken but the heights required to achieve the criteria were considered too great (being greater than the proposed barrier height).

However, a revised barrier design that splits the barrier into two discrete parts has been modelled. It consists of 2.5m high barrier on the boundary, (rather than adjacent to the bus lane) for the section of barrier north of 102 Crawford Avenue, until the barrier reaches Hasties Place, where it is aligned with the barrier running further north.

The smaller section between 104 and 114 Crawford Avenue has been retained at the current height and location. This is because the original modelling shows this is the area where compliance with the deign levels was the most difficult to achieve, and hence represents the optimum barrier location for this area. The barrier is located on the highest point, relative to the carriageway and the receiver, and hence provides the most screening. However, for other receivers, a degree of screening is provided, greater than that required by the Transit design levels.

If the barrier were moved (ie. to a lower elevation) then the height would have to increase to provide the same amount of screening. This increase in height was predicted to be significant and hence was discarded in the modelling process.

The re-modelling of a 2.5m barrier north of 102 Crawford Avenue was possible as houses north of this point were being screened to a greater extent by the 2.8m barrier.

The results show that this design is sufficient to ensure compliance with the Transit design levels. Further, the modelling shows that the barrier can be located either adjacent to the bus lane or on the boundary.

As stated in the previous section, the use of a combination of safety barriers at the carriageway edge and a lower barrier height, will, in this case, not be sufficient to meet the Transit design noise levels.

In summary, the barrier location presented in the AEE is in the optimum position, in terms of height and elevation to achieve compliance with the design levels. However, north of 102 Crawford Avenue, the barrier could be reduced in height to 2.5m and located either adjacent to the bus lane or on the boundary.

Further Information Request 2.6 – Noise Barrier (north of Hasties Place)

Further information is sought in relation to an evaluation of alternative mitigation measures for the stretch of SH20 where the 2.5 metre high barrier has been proposed (running adjacent to SH20 from the boundary of Hasties Place in the south to Miro Road in to the north).

Response:

Once again, an iterative process of selecting appropriate barrier heights was undertaken. A number of scenarios were tested and the results presented in the AEE were the final iteration. The final barrier design was at a height that ensured that at the worst case receiver location, the noise level just complied with the Transit design noise level.

Predictions at alternative barrier locations and with alternative heights were undertaken but the heights required to achieve the criteria were considered too great in relation to the proposed specification.

Again, a revised barrier design that splits the barrier into two discrete parts has been modelled. The discontinuation of the barrier at the end of Miro Road has also been addressed and modified. The original barrier is continuous at this location.

The barrier has been modelled at 1.8m high adjacent to the bus lane for the section of barrier north of 50C Crawford Avenue

The section between Hasties Place and 50C Crawford Avenue has been retained at the current height (2.5m) and location (adjacent to the bus lane). This is because the original modelling shows this is the area where compliance with the deign levels was the most

difficult to achieve, and hence represents the optimum barrier location for this area. The barrier is located on the highest point, relative to the carriageway and the receiver, and hence provides the most screening. However, for other locations, the degree of screening provided, is greater than that required by the Transit Criteria. .

If the barrier were moved (ie to a lower elevation) then the height would have to increase to provide the same amount of screening. This increase in height was predicted to be significant and hence was discarded in the modelling process.

The results show that this design is also sufficient to ensure compliance with the Transit design levels.

As stated in the previous section, the use of a combination of safety barriers at the carriageway edge and a lower barrier height, will, in this case, not be sufficient to meet the Transit design noise levels.

In summary, the barrier location presented in the AEE is in the optimum position, in terms of height and elevation to achieve compliance with the design levels. However, north of 50C Crawford Avenue, the barrier could be reduced in height to 1.8m (located adjacent to the bus lane).

Further Information Request 2.7 - Noise Barrier (adjacent to the southbound Walmsley Road off-ramp)

Further information is sought relating to an assessment of noise effects resulting from moving the barrier currently proposed at the top of the cutting adjacent to the southbound Walmsley Road off-ramp, to a position lower "down the bank".

Response:

Predictions at alternative locations (lower down) and with alternative heights were undertaken but the design levels could not be met.

The barrier provides enough screening to ensure the Transit design level is just met at the worst case receiver location. If the barrier were moved (ie on a lower elevation) then the barrier height would have to increase to provide the same amount of screening. This height increase was predicted to be significant and hence was discarded in the modelling process.

There is a potential conflict between barriers utilised for noise control purposes, particularly their height, and the visual impact of such barriers.. However, the noise assessment has identified the minimum barrier design required to achieve compliance with the Transit design noise levels. There is no further scope in this case to reduce the height, or change the location and still meet the noise design objectives.

Further Information Request 3.2 – Noise Barrier/Landscape/Visual Trade-offs

Further information is requested, addressing the potential conflict between the requirements of noise barriers from an acoustic and visual point of view.

Response:

The agreed trade-off between these requirements is understood to form part of the consultation process undertaken with the affected property owners, and hence will need input from the acoustic and visual amenity experts at that time. This is essentially part of the detailed design phase and would be addresses at that time.

Further Information Request 4.1 – Extent of Designation for Construction Depot

An explanation is requested as to the justification of the location of the Waterfront construction yard with respect to noise.

Response:

It is our opinion that those parts of the construction yard used for noisy activities should be sited at a distance greater than 100m from the nearest residences and additionally, that screening in the form of a solid acoustic barrier should be provided. Other, quieter activities such as storage could take place at closer distances and with no need for shielding. It is predicted that the implementation of these measures would ensure compliance with the relevant limits of the Construction Noise Standard.

It is understood that the final location of the construction yards has yet to be confirmed, but consideration of the above factors should be undertaken when making that decision

Further Information Request 5.1 – New Pedestrian/Cycle Bridge

This request relates to the provision of revised plans for the scheme and is perhaps best dealt with by other members of the project team.

We trust that the information presented here is sufficient for your purposes, but in any event please feel free to contact either myself or Siiri Wilkening at this office if you require further clarification or information,

Yours faithfully
MARSHALL DAY ACOUSTICS LTD

pp Siiri Wilkening

Steve Peakall
Consultant

Receiver	2006	Design Noise Level	Do Nothing 2021	Proposed Scheme 2021	
				Without Barriers	With Barriers
	Leq 24 Hour dB(A)				
17 Queenstown Road	64	67	66	67	66
15 Queenstown Road	66	69	68	68	68
15A Queenstown Road	68	70	70	70	70
13 Queenstown Road	66	69	68	68	68
112 Frederick Street (c)	60	63	63	63	63
118 Frederick Street (b)	63	66	65	66	66
119 Frederick Street	62	65	64	65	65
115 Frederick Street	59	62	62	62	62
27 Seacliffe Road (a)	62	65	65	65	63
27 Seacliffe Road (b)	61	64	64	65	60
27 Seacliffe Road (c)	65	68	68	69	67
29 Seacliffe Road (b)	61	64	64	65	64
31 Seacliffe Road	61	64	63	64	64
28A Seacliffe Road	67	70	70	70	70
28 Seacliffe Road	65	68	68	68	68
28 Seacliffe Road	67	70	70	70	70
32A Seacliffe Road	64	67	66	67	67
34A Seacliffe Road	61	64	63	64	64
32 Seacliffe Road	60	63	63	63	63
30C Beechcroft Avenue	59	62	62	62	60
30B Beechcroft Avenue	63	66	66	66	64
30A Beechcroft Avenue	63	66	66	66	64
30G Beechcroft Avenue	63	66	66	67	64
32 Beechcroft Avenue	64	67	66	67	65
30F Beechcroft Avenue	59	62	62	63	62
34 Beechcroft Avenue	64	67	67	68	66
36 Beechcroft Avenue	63	66	66	67	64
38 Beechcroft Avenue	62	65	65	66	64
1 Pleasant Street	60	63	62	63	61
40 Beechcroft Avenue	64	67	67	68	66
42 Beechcroft Avenue	64	67	67	69	66
3 Arthur Street	62	65	65	66	65
44 Beechcroft Avenue	65	68	68	69	68
7 Arthur Street	63	66	66	67	66
50 Beechcroft Avenue	64	67	67	68	67
50B Beechcroft Avenue	64	67	67	68	67
52 Beechcroft Avenue	63	66	65	67	64
17 Arthur Street	61	64	64	65	64
10 Arthur Street	58	62	61	62	61
19 Arthur Street	61	64	63	64	64
21 Arthur Street	61	64	64	65	64
62 Beechcroft Avenue	62	65	65	66	64
64 Beechcroft Avenue	62	65	65	66	64
66 Beechcroft Avenue	60	63	62	63	62
70 Beechcroft Avenue	61	64	64	65	64
72 Beechcroft Avenue	62	65	64	65	64
74 Beechcroft Avenue	61	64	64	65	63
76 Beechcroft Avenue	60	63	62	63	61
78 Beechcroft Avenue	61	64	63	64	61
80 Beechcroft Avenue	60	63	63	64	61
82 Beechcroft Avenue	60	63	63	64	61
4 Normans Hill Road	59	62	62	63	60
2 Church Street (a)	59	62	62	63	60
2 Church Street (b)	59	62	61	62	59
4 Church Street	59	62	61	62	59
6 Church Street (a)	59	62	61	62	59
6 Church Street (b)	58	62	61	62	59
8 Church Street	58	62	60	61	58
13 Church Street	58	62	60	61	59
Shopping Village Onehunga	60	63	62	63	60
98 Beechcroft Avenue	60	63	63	64	61
100 Beechcroft Avenue	60	63	62	63	61
102 Beechcroft Avenue	60	63	62	63	61
104 Beechcroft Avenue	60	63	63	64	62
106 Beechcroft Avenue	60	63	62	63	62
2 Princes Street	61	64	63	64	63
1 Princes Street	63	66	66	67	65
1 Princes Street	66	69	69	70	69
3 Princes Street (b)	61	64	63	64	64
3 Princes Street (a)	66	69	68	68	69

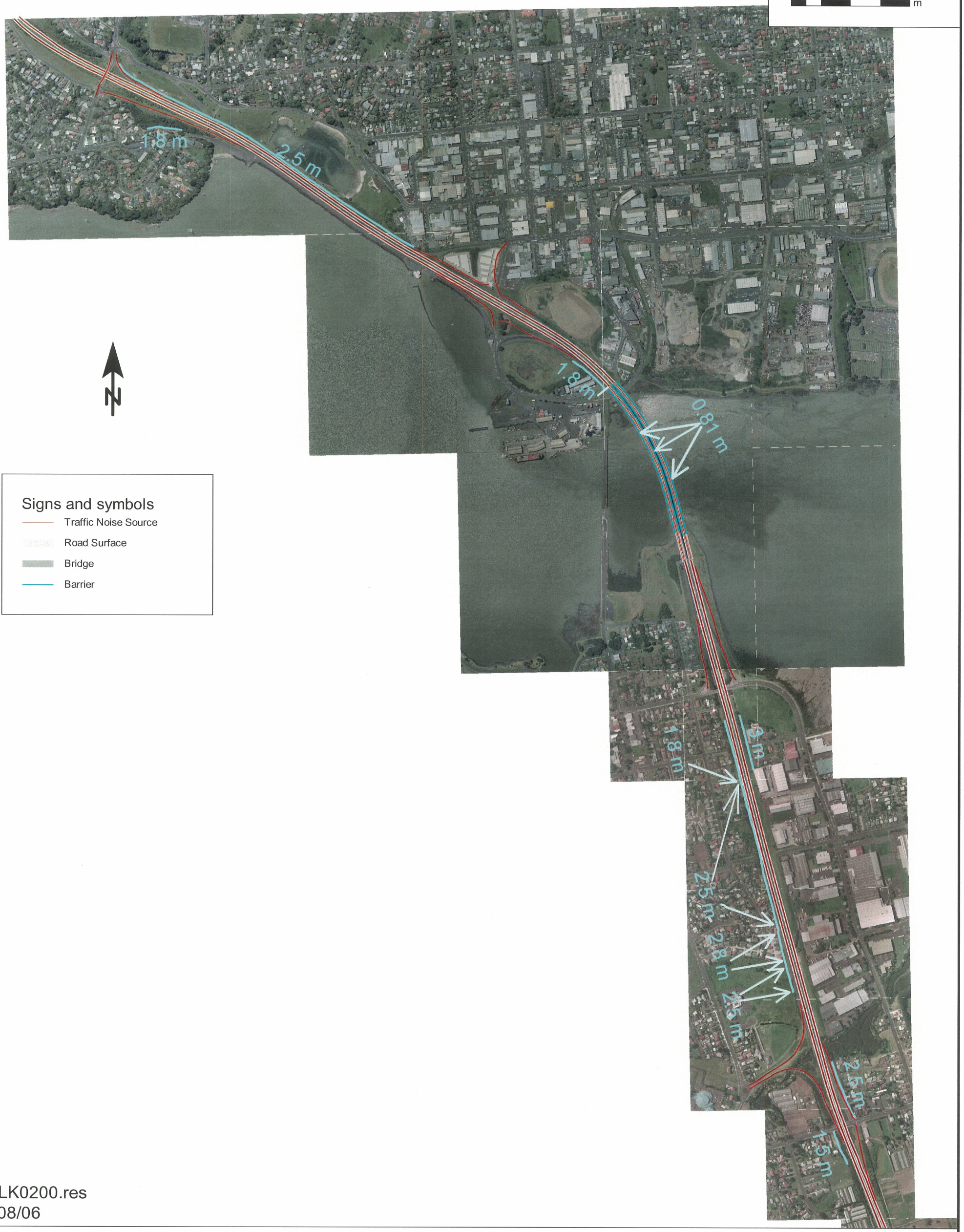
Receiver	2006	Design Noise Level	Do Nothing 2021	Proposed Scheme 2021	
				Without Barriers	With Barriers
	Leq 24 Hour dB(A)				
Lockup 1	70	70	72	72	73
Lockup 1	69	70	71	73	72
Lockup 2	61	64	64	68	65
Lockup 2	64	67	67	69	67
3 Princes Street (d)	60	63	62	60	63
3 Princes Street	52	62	54	55	54
Manukau Sailing Centre	69	70	72	72	72
Onehunga Mall 1	62	65	64	65	65
Onehunga Mall 2	60	63	61	62	62
Onehunga Mall 3	58	62	59	61	61
Onehunga Mall 6	58	62	59	61	61
Onehunga Mall 4	56	62	58	59	60
Onehunga Mall 5	58	62	59	61	61
Onehunga Mall 7	58	62	60	62	62
60 Onehunga Mall	58	62	60	61	62
58 Onehunga Mall	58	62	60	62	62
58 Onehunga Mall (b)	58	62	60	61	62
52 Onehunga Mall	58	62	60	62	62
50 Onehunga Mall	58	62	59	61	61
36 - 44 Onehunga Mall	69	70	71	75	75
35 Onehunga Mall	63	66	64	67	67
24 Onehunga Harbour Road	74	74	75	73	68
24 Onehunga Harbour Road	68	70	70	70	69
5 Waterfront Road	59	62	61	61	61
4 Waterfront Road	58	62	60	60	60
7 Waterfront Road	59	62	61	62	62
9 Waterfront Road	59	62	61	61	61
11 Waterfront Road	60	63	62	62	62
14 Waterfront Road	63	66	65	65	65
13 Waterfront Road	62	65	64	64	64
2 Crawford Avenue	66	69	67	67	67
2 Crawford Avenue	64	67	66	66	66
4 Crawford Avenue	66	69	68	67	67
6 Crawford Avenue	65	68	67	67	67
8 Crawford Avenue	66	69	68	68	68
10 Crawford Avenue	66	69	68	68	68
12 Crawford Avenue (b)	68	70	70	70	70
12 Crawford Avenue (b)	66	69	68	68	68
12 Crawford Avenue (a)	63	66	65	65	65
14 Crawford Avenue (b)	68	70	70	70	70
14 Crawford Avenue (c)	68	70	69	69	69
16 Crawford Avenue (e)	68	70	69	69	69
16 Crawford Avenue (b)	56	62	58	58	58
16 Crawford Avenue (d)	68	70	69	69	69
18 Crawford Avenue (b)	64	67	65	65	65
20 Crawford Avenue	61	64	62	63	63
22B Crawford Avenue	73	73	75	73	73
22A Crawford Avenue	62	65	63	64	64
22 Crawford Avenue	61	64	62	63	63
24 Crawford Avenue (b)	74	74	76	74	74
24 Crawford Avenue (a)	71	71	73	71	71
26 Crawford Avenue	61	64	63	63	63
28 Crawford Avenue	61	64	63	63	63
30 Crawford Avenue	72	72	74	72	70
32 Crawford Avenue	62	65	64	64	63
36B Crawford Avenue (a)	67	70	69	68	65
34 Crawford Avenue	60	63	62	62	62
36B Crawford AVenue (b)	73	73	75	73	70
29 Miro Road	64	67	66	66	63
27 Miro Road	60	63	62	62	61
31 Miro Road	73	73	75	74	71
Marae buildings 1	67	70	69	71	68
Marae buildings 2	66	69	68	70	66
18 Miro Road	61	64	63	63	61
20 Miro Road	65	68	67	67	63
22 Miro Road	73	73	75	73	69
44 Crawford Avenue	61	64	63	63	61
46 Crawford Avenue	58	62	60	61	59
46B Crawford Avenue	68	70	70	69	65
13-14/34 Miro Road	68	70	70	73	68

Receiver	2006	Design Noise Level	Do Nothing 2021	Proposed Scheme 2021	
				Without Barriers	With Barriers
	Leq 24 Hour dB(A)				
11-12/34 Miro Road	68	70	70	73	68
9-10/34 Miro Road	60	63	62	64	63
1-2/34 Miro Road	55	62	57	58	58
46C Crawford Avenue	69	70	71	70	66
48B Crawford Avenue	70	70	72	71	66
48C Crawford Avenue	70	70	72	72	66
50B Crawford Avenue	70	70	72	71	65
50C Crawford Avenue	69	70	71	71	66
52B Crawford Avenue	72	72	75	74	69
52C Crawford Avenue	72	72	74	73	69
54A Crawford Avenue	61	64	63	64	62
50 Crawford Avenue	60	63	62	62	61
54B Crawford Avenue	70	70	72	72	68
62 Crawford Avenue	64	67	66	67	66
64 Crawford Avenue	62	65	65	65	64
66 Crawford Avenue (b)	66	69	68	68	66
68 Crawford Avenue (e)	65	68	67	68	66
68 Crawford Avenue (d)	63	66	65	66	64
19 Hasties Place	72	72	74	74	72
24 Hasties Place	72	72	74	74	71
22 Hasties Place	64	67	66	67	65
24A Hasties Place	69	70	72	71	68
74 Crawford Avenue	65	68	68	68	67
76 Crawford Avenue	65	68	67	68	67
78 Crawford Avenue	64	67	66	67	66
80 Crawford Avenue	63	66	65	66	65
82 Crawford Avenue	64	67	66	66	65
86 Crawford Avenue	64	67	66	66	64
88 Crawford Avenue	66	69	68	68	66
90 Crawford Avenue (b)	70	70	72	72	69
92 Crawford Avenue (b)	76	76	78	77	74
92 Crawford Avenue (a)	70	70	72	72	68
94 Crawford Avenue	71	71	73	73	69
96 Crawford Avenue	70	70	72	72	69
100 Crawford Avenue	76	76	78	77	76
98 Crawford Avenue	67	70	69	69	66
102 Crawford Avenue	73	73	75	75	73
104 Crawford Avenue	75	75	77	76	73
38 Mahunga Drive	57	62	59	60	60
26 Hasties Place	62	65	64	66	66
106 Crawford Avenue	75	75	77	76	75
108 Crawford Avenue	74	74	77	76	71
110 Crawford Avenue	74	74	76	76	71
112 Crawford Avenue	74	74	76	76	70
114 Crawford Avenue	74	74	76	76	71
101 Crawford Avenue	61	64	63	64	64
113 Crawford Avenue	63	66	65	66	65
11 Mahunga Drive	65	68	67	70	70
Sports Club	59	62	61	62	61
7 Tanners Road	58	62	60	61	61
3 Tanners Road	55	62	55	56	56
155 Coronation Road (a)	58	62	60	61	61
155 Coronation Road (b)	58	62	60	60	60
157 Coronation Road	60	63	62	63	63
157 Coronation Road	60	63	62	62	62
161 Coronation Road	58	62	60	60	60
153 Coronation Road	54	62	56	56	56
147B Coronation Road	57	62	59	60	59
155 Coronation Road (c)	53	62	55	56	56
37 Walmsley Road	67	70	69	70	70
35 Walmsley Road (a)	58	62	61	62	61
38 Walmsley Road	64	67	66	67	66
53 Walmsley Road	68	70	69	70	66
55 Walmsley Road (c)	60	63	62	63	60
3 Waterview Road	61	64	63	64	61
5 Waterview Road (b)	71	71	73	74	71
7 Waterview Road	62	65	64	65	61
9 Waterview Road	57	62	59	60	57
2 Kingfisher Place	69	70	71	72	65
11 Waterview Road (b)	64	67	66	66	61

Receiver	2006	Design Noise Level	Do Nothing 2021	Proposed Scheme 2021	
				Without Barriers	With Barriers
	Leq 24 Hour dB(A)				
13 Waterview Road	57	62	60	60	58
3 Kingfisher Place (a)	70	70	72	74	67
3 Kingfisher Place (b)	70	70	72	74	69
5 Kingfisher Place (a)	61	64	64	65	62
7 Kingfisher Place	56	62	58	57	56
9 Kingfisher Place	58	62	60	61	61
42 Walmsley Road	68	70	70	71	70
56 Walmsley Road (a)	64	67	66	66	66
MCC Subdvision 1	69	70	71	71	69
MCC Subdvision 2	69	70	71	71	70
MCC Subdvision 3	68	70	70	70	69
MCC Subdvision 4	67	70	70	69	69
MCC Subdvision 5	58	62	60	61	61
MCC Subdvision 6	61	64	63	64	63
MCC Subdvision 7	62	65	64	65	65

Scale 1:12500

0 50 100 200 300 400 m



N

Signs and symbols

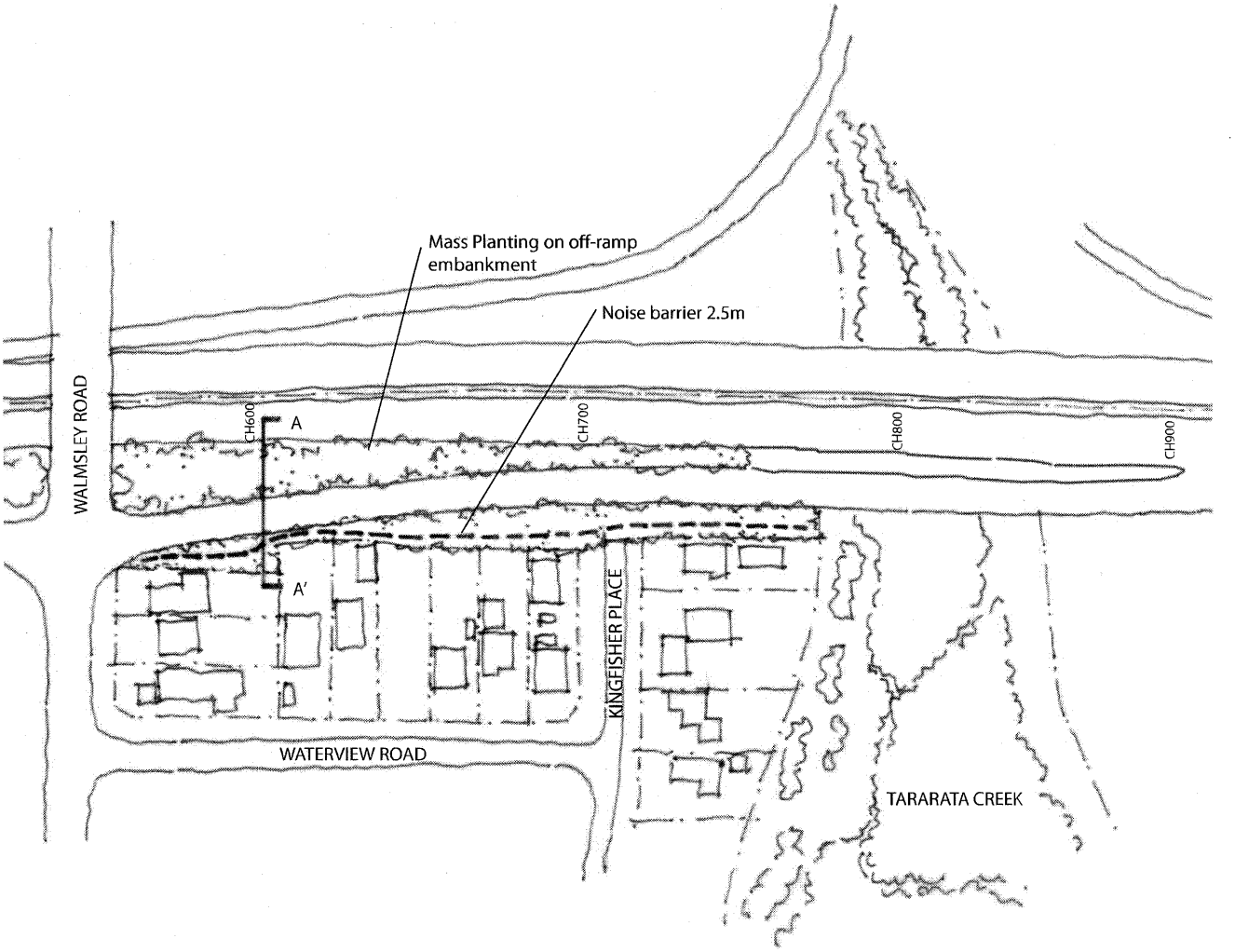
- Traffic Noise Source
- Road Surface
- Bridge
- Barrier

RRLK0200.res
04/08/06

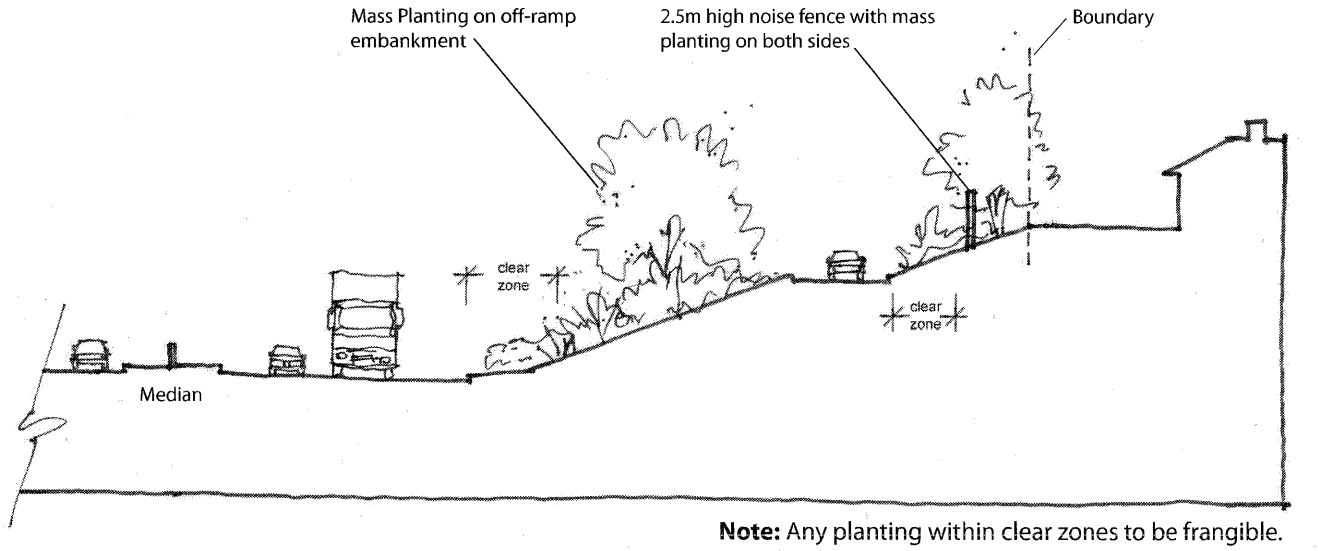
MARSHALL DAY ACOUSTICS

Figure D
Manukau Harbour Crossing

Barrier Heights
Required to achieve compliance with the Transit Guidelines



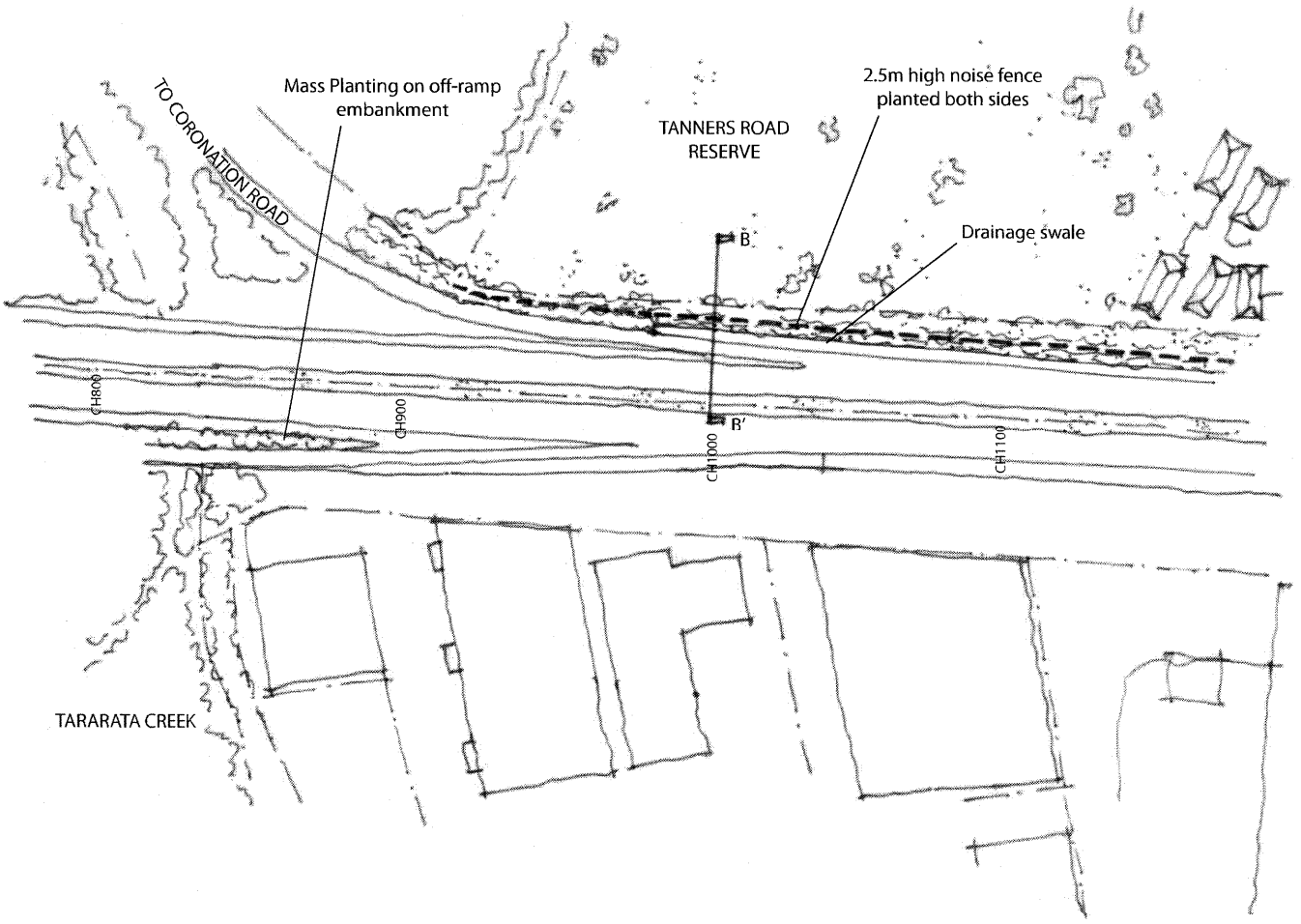
Plan 1:2000 @ A4



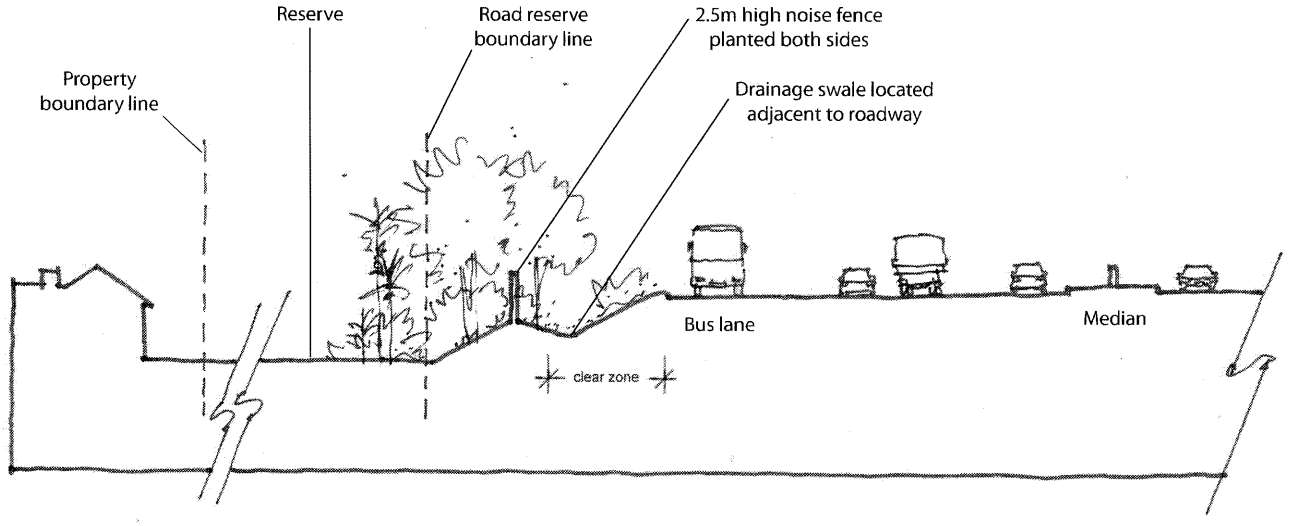
Note: Any planting within clear zones to be frangible.

Section A-A' South-bound N.T.S.

Case No. 1: Walmsley Road Off-Ramp (CH600)



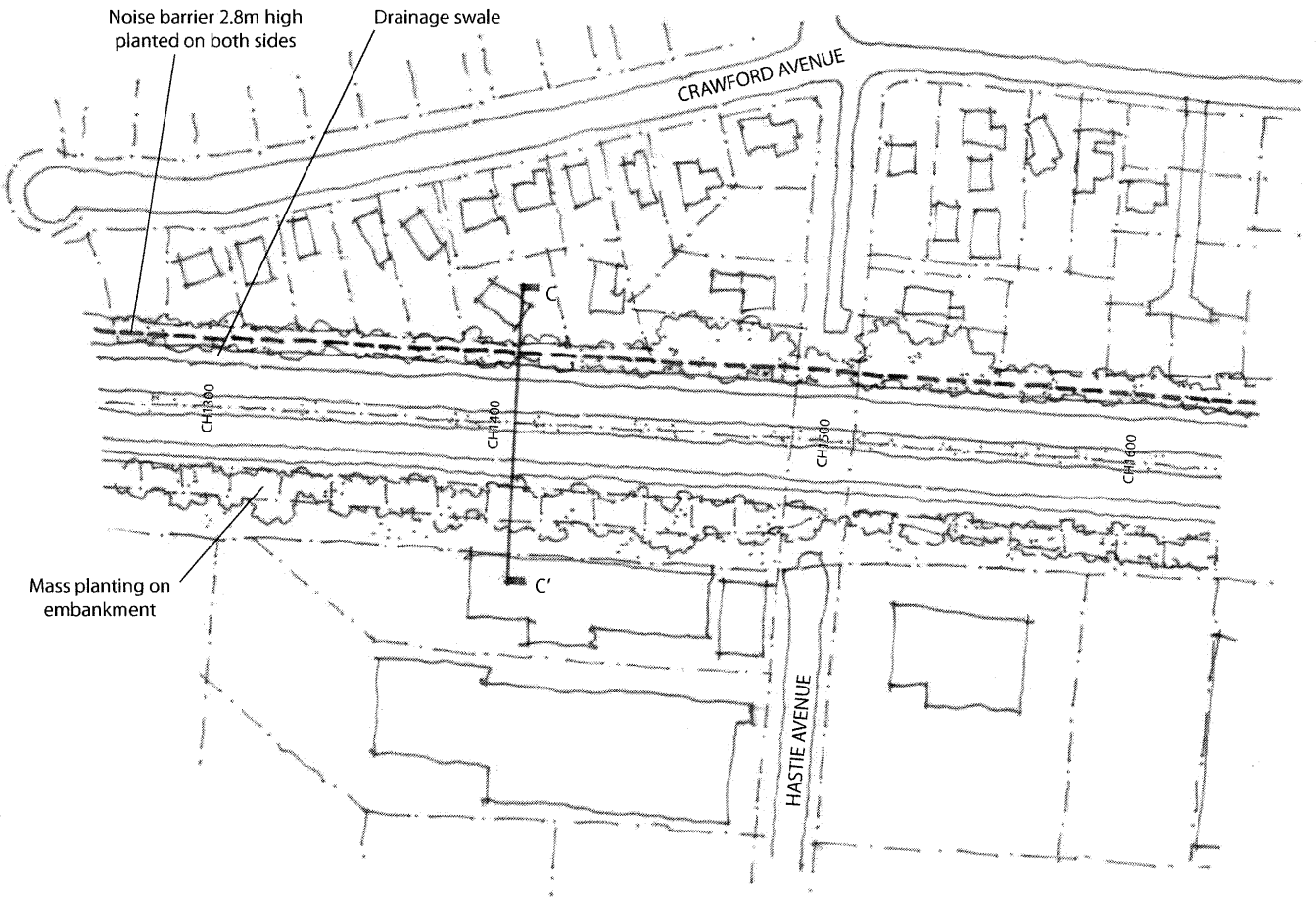
Plan 1:2000 @ A4



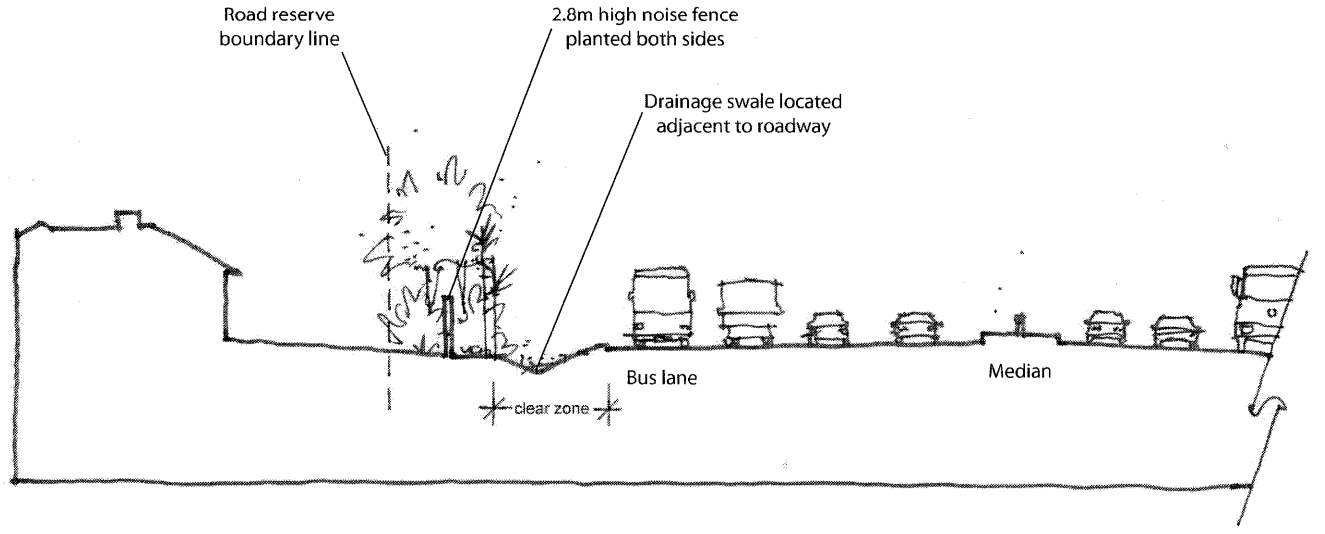
Note: Any planting within clear zones to be frangible.

Section B-B' North-bound N.T.S.

Case No. 2: Tanners Road (CH1000)



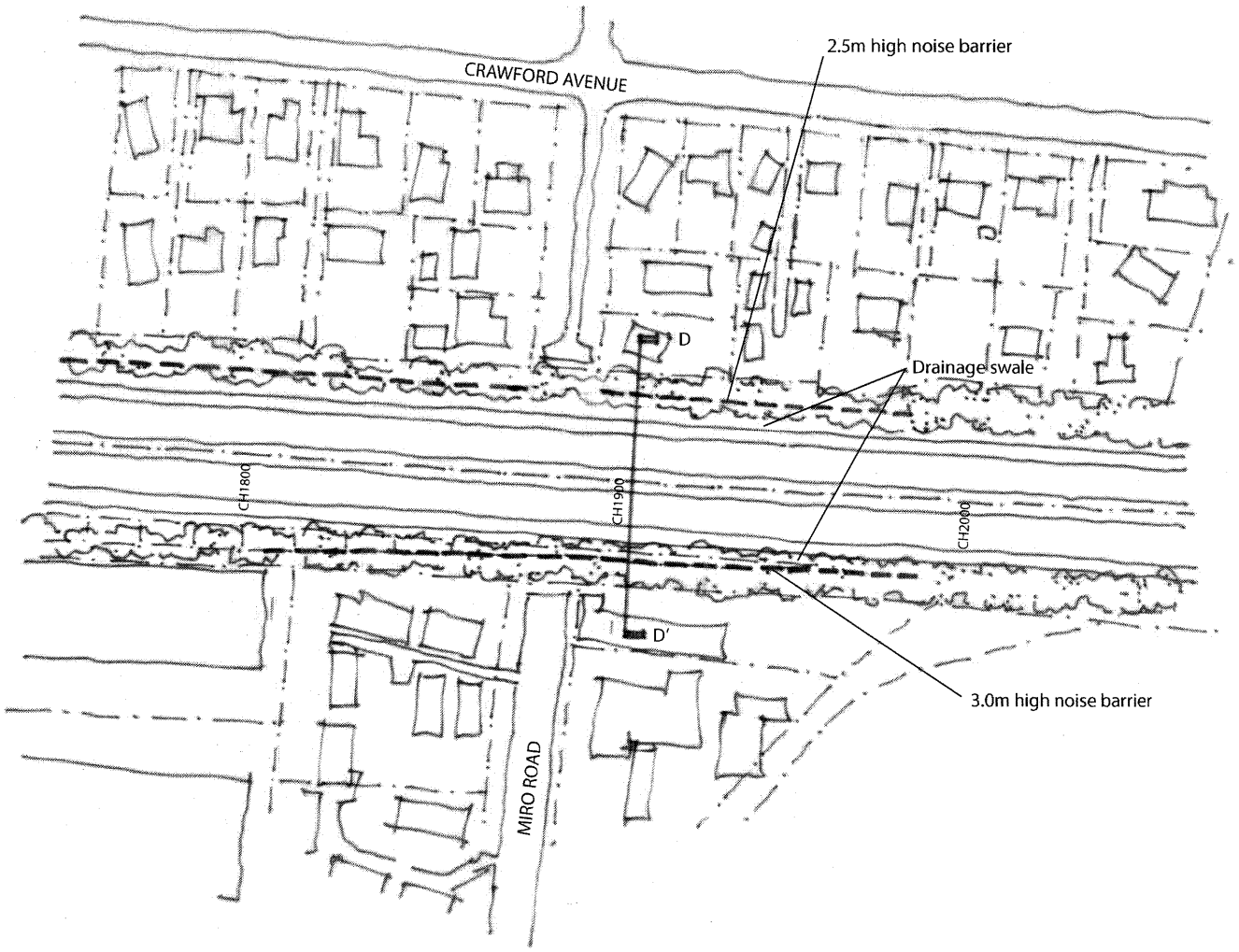
Plan 1:2000 @ A4



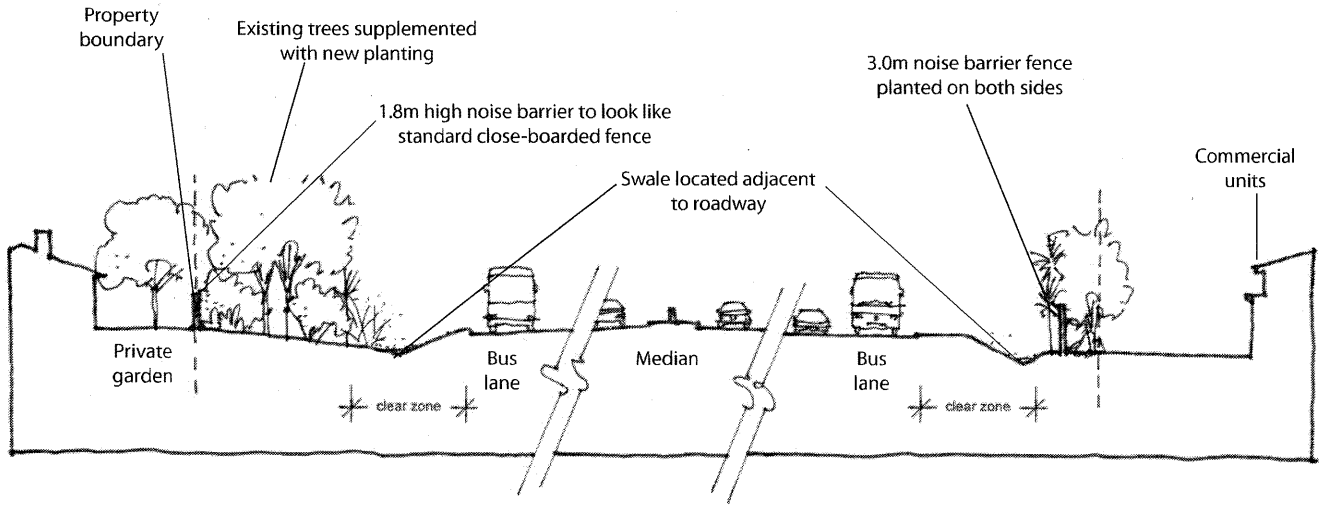
Note: Any planting within clear zones to be frangible.

Section C-C' North-bound N.T.S.

Case No. 3: Hastie Avenue (CH1400)



Plan 1:2000 @ A4



Note: Any planting within clear zones to be frangible.

Section D-D' Both directions

Case No. 4: Miro Road (CH1900)

SECTION 4

Temporary Rimu Road Bridge

4.1 Information Requested

MCC Request Item (3) "Temporary Rimu Road Bridge"

"Insufficient information is provided about how this may work, any restrictions on its use, possible intersection geometry etc. The operation of this bridge has potential to adversely affect properties on Crawford Street. While it may be possible to restrict over-dimensioned or heavy vehicles, public transport operators may still need to use this bridge. What consultation has been held with public transport or heavy transport operators?"

4.2 Response

The Rimu Road Bridge design and its construction methodology or the requirement for a temporary bridge have not yet been finalised. The options being considered are outlined in Section 2.2.2 of this report. If it is determined that a temporary bridge is necessary, the bridge and associated roading will be designed to accommodate all road-legal vehicles, including buses and trucks of B-train or smaller size. Localised diversions will be constructed at each end of the temporary bridge to transition onto the existing road carriageway as efficiently as practicable.

Measures which may be taken to minimise potential impacts on adjoining residential property include the imposition of temporary speed restrictions and placement of temporary or permanent screening and acoustic barriers if necessary to achieve compliance with construction noise standards or the Transit noise guidelines for permanent works.

Transit has been in consultation with public transport and heavy transport operators and this consultation will continue during detailed design and construction. No specific concerns have been raised to date in relation to the Rimu Road works.

The existing north bound on-ramp from Rimu Road has been utilised to trial ramp metering. As part of the project scope, Transit requires that all on ramps be designed to accommodate ramp metering, should a decision be made to implement this. Where ramp metering is in place, it is good practice to provide additional width for bus shoulders to "bypass" the signals, thereby ensuring that public transport is not delayed by the metering. An alteration to the designation is proposed along the rear boundaries of 18 and 20 Crawford Avenue to enable a bus shoulder "bypass" to be provided on the Rimu Road on-ramp. The bus shoulder is shown on Project Drawing Number P-171-5003.

The proposed alteration to the designation at 18 and 20 Crawford Avenue is approximately five metres in width. Compensation Certificates are registered on the Certificates of Title for both properties for motorway works, and the proposed designation alteration is within the areas of land affected by those Certificates.

SECTION 5

Old Mangere Bridge Replacement

5.1 Information Requested

MCC Request Item (4) "Old Mangere Bridge"

"The old Mangere Bridge has an important function in providing both a low-level pedestrian and cycle crossing of the Manukau Harbour (perceived as safer and more attractive than the walkway in the SH20 bridge), and as a location for recreational fishing. These functions, it appears, will be suspended for a period of a year. While an alternative (not particularly attractive) exists for pedestrians and cyclists there does not seem to be an alternative provided for fishermen. Will the bridge construction affect fish? Can an alternative fishing facility (such as a jetty) be provided? Are there any measures available that would reduce the length of time that a low-level pedestrian/cycle crossing is not available (e.g. through building the new bridge next to the old bridge?)."

5.2 Response

Transit proposes to replace the Old Mangere Bridge with a purpose built pedestrian and cycle facility. The demolition of the existing bridge and the construction of a new bridge and associated fender protection structure also require Coastal Permits from ARC.

Applications to demolish the existing bridge and construct a new bridge and fender structure were lodged with ARC in May 2006. The applications were placed on hold pending submission of further information by Transit and have subsequently been withdrawn. The reason for this is that following submission of the applications, the proposed concepts were reviewed and a number of alternative options identified. It is now considered that further consultation with key stakeholders and consideration of options for the replacement bridge and fender structure is appropriate before the concept can be confirmed.

In the meantime, funding has been allocated for some immediate maintenance work on the Old Mangere Bridge and this work will be carried out shortly.

Transit has previously confirmed its commitment to replace the Old Mangere Bridge with a purpose-built pedestrian and cycle facility, and will continue to investigate options for the bridge as part of an integrated transportation package. This further work will include consultation with key stakeholders in relation to those options. Resource consent applications for the Old Mangere Bridge will be resubmitted at a later date as appropriate.

Options for the replacement bridge include construction on the same alignment as existing or construction on a different alignment, possibly enabling access to be retained during construction.

All options would require temporary or permanent access via the existing bridge approaches. For this reason, the bridge approaches are included within the proposed designation to enable the required works.

Options for the replacement bridge and fender protection structure will be considered by Transit in consultation with the community and key stakeholders over the next few months. An Assessment of Effects on the Environment (AEE) will be prepared to support the resource consent applications, and this will address the matters raised by MCC, including recreational use, access during construction and construction effects on fish.

Public Transport

6.1 Information Requested

MCC Request Item (5) "Public Transport"

"What consultation has been held with public transport operators and what was the outcome of that consultation. Mangere Bridge is an important public transport route and will remain so during construction and following commission of the new crossing.

Has provision been made for a future rapid transit link within the project?"

6.2 Response

6.2.1 Consultation with Public Transport Operators

The Bus & Coach Association (BCA) has been on the Transit stakeholder database since 2003 and has received newsletters containing project information and invitations to all open days. The BCA represents over 80% of licensed bus and coach operators throughout New Zealand and all major operators. Consultation was undertaken with the BCA in November 2003 and a letter of support received later that month. A further letter of support was received in July 2006. Copies of both letters are included at the end of this section of the report. Essentially, BCA endorse the proposal to increase capacity across the Manukau Harbour and recommend provision for bus priority lanes.

The duplicate motorway bridge incorporates dedicated bus lanes for southbound buses. A bus lane will also be provided for northbound buses on the existing motorway bridge.

6.2.2 Rapid Transit Link

A new interchange is proposed at Gloucester Park, within Auckland City. Since submitting the Notice of Requirement in May 2006, further consideration has been given to the form of this interchange and a "Quarter Diamond" arrangement is now proposed. The revised interchange form does not preclude future development of a rail corridor alongside the interchange, but would require modification of the southbound on-ramp in conjunction with any future rail works.

The development of the revised form of the interchange has included consultation with representatives of the Auckland Regional Transport Authority (meetings held in July and August 2006). At those meetings it was acknowledged that the proposed interchange does not specifically provide for the development of rail, but that the interchange could be retrofitted at a later date if rail ever proceeded along this alignment in the future.

At the abutment of the proposed duplicate motorway bridge, works will be required in and over a disused rail corridor. This rail corridor is designated in the Auckland City District Plan and the requiring authority is OnTrack. The most recent meetings held with OnTrack were in August 2006. It is understood that there are no current plans to develop the rail corridor, but that it could be used in the future for Port access. The proposed motorway widening and bridge duplication would not affect the ability of OnTrack to reinstate rail within the corridor in the future.

The proposed duplicate motorway bridge is designed to look similar to the existing bridge and due to the steep gradient, heavy rail would not be able to travel on the proposed bridge.

Whilst there are no specific provisions for a rail link, dedicated bus shoulders have been included throughout the project to provide enhanced passenger transport opportunities.

L3 TOURISM & TRAVEL HOUSE
79 BOULCOTT STREET
P O BOX 9336
WELLINGTON

TELEPHONE 0-4-499 7334
FACSIMILE 0-4-499 7353
EMAIL: info@busandcoach.co.nz

MHX REF: X010

123621.

31 July 2006

Ms S Cronwright
Transit Project Manager
SH20 Manukau Harbour Crossing
P O Box 1459
Auckland

Dear Sarah

Thank you for your letter and brochure about the SH 20 development project. We are delighted to see that bus priority systems will be a key part of the project and we have no doubt that their inclusion will improve passengers' travel times and enhance the attractiveness of bus travel in general.

Please keep us informed as to progress with this important link in Auckland's roading system.

Kind regards

John Collyns
Executive Director

MHX REF: X011

(9)

AUCKLAND BRANCH

c/- Birkenhead Transport Ltd
Verrans Corner
Birkenhead

27th November 2003

OPUS Consultants Ltd
Manukau Harbour Crossing
Private Bag 5848
Auckland

Attention: Consultation Manager – Theresa Walsh

Dear Theresa,

SUBMISSION ON THE PROPOSED MANUKAU HARBOUR CROSSING MANGERE BRIDGE AREA

Further to my discussion with your Ryan Bradley of 26th, please find some input from our Association.
Thank you for ensuring through Stagecoach that we had the opportunity to make some comment and we are very willing to work with you as the project develops to ensure that the very best opportunities for bus priority are identified and implemented.

Our Association represents over 80% of the licensed bus and coach operators in NZ and certainly all of the major ones especially those operating out of Auckland. We therefore have a very keen interest in this project as it is along one of our major operational routes.

The Bus and Coach Association strongly supports the need to both improve facilities and increase the capacity of the SH 20 crossing of the Manukau Harbour at Mangere and looks to see the project incorporate effective bus priority measures.

Many of our services, especially those operating during the extending peak periods and at major holiday times already experience significant 'congestion delays' in the Mangere area and thus your short listed proposal to duplicate the existing bridge has our full endorsement.

We would like to ensure that you fully appreciate the scale of bus and coach services using SH 20 and that you will be able to accommodate some effective bus priorities in your design that ensure that the high passenger capacity buses are not subject to the current ever increasing general traffic congestion with the resulting frustration and costly delays.

General

1) SH 20 at this location acts as a major corridor for bus and coach services providing urban, school, worker, airport, charter and tourist services. Many of which have an origin or destination at the Auckland International Airport.

2) Our levels of service are high throughout the day from around 6am till midnight and 7 days per week. Peak periods are 6.30 – 9.30am and 3.00 – 7.00pm Mon to Fri, but you should be aware that Saturday is now becoming a peak period.

3) As the extension of SH 20 either side of the Mangere Bridge progresses to eventually join the Southern Motorway at Manukau to the Northwestern Motorway around Rosebank/Waterview the use of SH 20 will continue to grow from both our existing services and new ones.

For example we envisage new urban express/limited stop bus services being introduced between transport centres in the following locations:

Manukau City Centre
Botany Downs Centre
Papatoetoe
Henderson
New Lynn
Westgate connecting to the North Shore

In addition more coach/intercity services travelling to and from the Airport or locations to the south of the Bombay hills to tourist destinations in Northland may well choose to bypass Auckland's congestion and use the western route.

Local Factors

4) The majority of southbound coaches SH 20 will enter or leave SH 20 at or west of Queenstown/Pah Rd and will proceed at least as far south as Walmsley Rd with many going to the area around the Auckland International Airport.
In the northern direction the opposite would apply for the majority.

5) Conversely the majority (90%) of urban and school buses would travel south via the Onehunga Transport Centre or Onehunga area and access SH 20 via the street network at Selwyn and Neilson St and the motorway onramp. The vast majority then exit SH 20 at the first interchange, ie. Mahunga Dr/Rimu Rd with most going into the Mangere Bridge township and then further south through the various residential areas. In the northern direction the opposite applies.

Bus and Coach Numbers

In order to try and put a handle on the scale of bus usage we have polled most of our major local Auckland based operators. We have then scaled on the basis of +15% to allow for other locals and out of town coach operators who will also be regularly part of the 'mix'.
The figures for the coaches are based on averages for the busy tourist season and the urban figures reflect a typical day when all services are operating. The urban have not been scaled but include some school services.

Service Type	Direction Northbound			Direction Southbound			Totals		
	AM	PM	Total	AM	PM	Total	AM	PM	Totals
Coaches	66	43	178	50	57	169	116	100	347
Urban	43	32	117	32	47	124	75	79	241
Total	109	75	295	82	104	293	191	179	588

Conservatively this could equate to between 15000 to 20000 passengers everyday.

It is not easy to put an accurate handle on future growth but if current trends in both coach tourism and bus urban passenger numbers are any indication we would suggest that you would be wise to incorporate an allowance of at least 5% growth per annum in any calculations for at least the next 10 years.

Bus Priorities

Thus from the above figures of nearly 600 daily bus and coach crossings you will no doubt agree that there is a convincing case for including in your project some effective bus priorities.

We strongly suggest that these should take the form of one or more of the following relatively low cost measures:

- dedicated separate right of way 24 hour bus lanes (shoulder style are acceptable) for the both north and south directions from at least from Hillsborough to Walmsley Rds

- shoulder lane 24 hour bus priority lanes on the on and off ramps of both interchanges immediately to the north and south of the existing and new bridges

- on street bus priorities on Rimu Rd to and from Mangere Bridge town centre and to and from Onehunga Transport Centre. This should include bus priorities at the major intersections, eg. Neilson St and could be in the form of bus advances/ pockets with signalised 'B' phases.

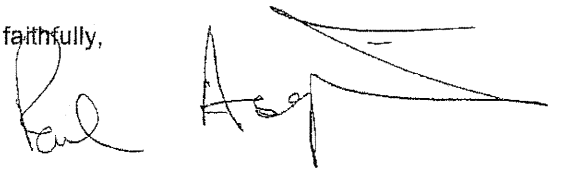
Conclusions

We endorse the proposal to increase the capacity across the Manukau Harbour at Mangere and strongly recommend that preference/priority should be given to the options/solutions that include bus priority before general traffic. There are no doubt some priority measures that could be implemented prior to and during any second bridge construction that would achieve good travel time benefits for bus passengers in the interim before any full benefits came on stream.

During construction care will be required to ensure that traffic control measures do not cause existing bus services to be delayed thus undoing much of the good work we have achieved to grow our patronage in the last few years.

We have taken the liberty of forwarding a copy of this information to the Transportation Planners at both Auckland City and Manukau City as they will no doubt be involved in the provision and funding of the off motorway bus priorities.

Yours faithfully,



Paul Asquith
BCA Co-ordinator Bus Priorities

Copies:
ACC and MCC
ARC
TNZ
Bus Operators
BCA Wg