FREESTONE PLACE: CONNECTION TO SUMMERLAND DRIVE

(Waitakere Community Board, 6 April 2004)

PURPOSE OF THE REPORT

This report is the technical appendix to the Agenda Report 'Freestone Place Road Closure'

BACKGROUND

Freestone Place is local road connecting Hillwell Drive and Summerland Drive. The carriageway width is generally 8 m but is reduced to 3.5 m near Summerland Drive. Further east there is a central traffic island providing angled parking space. The existing situation, referred to as Option 1, is illustrated in Appendix 1.

The narrow 'link' is about 60 m long and 6 m wide. The land is vested in Council as road; vestment was completed on 8 October 2001. Confirmation of this is provided by a Memorandum from the Acting Legal Services Manager in Appendix 6.

The infrastructure consists of grass verges of varying width, a standard plain concrete footpath (running along most of the southern side just proud of the carriageway,), and an exposed-aggregate concrete carriageway in 3 distinct parts:

1. the middle is 1 lane wide and about 25 m long, to be shared by traffic going each way
2. the Summerland Drive end is 2 lanes wide and about 20 m long
3. the Freestone Place end is 2 lanes wide and about 15 m long

13 and 20 Freestone Place, and 81 and 83 Summerland Drive border the link and have high wooden fences on the boundary over the middle part of the link. With the exception of 20 Freestone Place the properties are not fenced at the ends.

In September/October 2003 Mr Lawford of 13 Freestone Place communicated with Council staff over the safety of the walkway between Checkerbury Place and Freestone Place, and of the subject link with Summerland Drive.

Prior to Mr Lawfords's becoming owner and resident of 13 Freestone Place a car had been driven illegally up the walkway from Checkerbury Place, crashing into the letterbox and high fence of number 13, before departing via the Freestone Place link into Summerland Drive. In response to this the Council installed wooden bollards to prevent any motor vehicle from illegally using the Checkberry walkway. A photograph of these boillards is provided in Appendix 7..

In regard to the link to Summerland Drive Mr Lawford was advised that it could not simply be closed as he had suggested, but that the safety issues would be considered in terms of a minor safety improvement project. The issues raised by Mr Lawford included traffic speed, child pedestrians, traffic going the wrong way around the central traffic island in order to get a faster approach speed into the narrow section, and conflicts between opposing drivers on the shared single lane.

On 19 December 2003 Council received a complaint [RFS 270770] from Sgt Maude of the New Zealand Police to the effect that the 'walkway was being used as a short cut for traffic'

In consultation with the Chair: Waitakere Community Board, action was then taken to mitigate the safety concerns, in a temporary way, prior to the Christmas New Year holiday period. A circular was delivered to some 100 households in the vicinity to explain the apparent need for the measures taken, and Sgt Maude was also informed in writing. The measures taken were:

1. Road markings to delineate the passing bays each end and the shared lane in the middle.
2. Shared-lane priority control signs each end to assist drivers giving way to highlight the nature of the roadway.
3. Road-marking arrows and arrow signs centreline marking to direct drivers left around the central parking island.
4. Relocation and doube-siding of an existing slow down sign to ensure its visibility from each direction.
5. No-stopping lines at the Summerland Drive intersection to preserve visibility lines at that end.

On 19 January 2004 Council received an 'Urgent Notification of Road Hazard" notice from Sgt Maude of the New Zealand Police. Salient points made were that:

1. The link appears to be single lane right of way drive.
2. The signs erected in no way alleviate the problem.
3. Vehicles are still going through at reportedly no less than 40 km/hr,..., which is idiotic.
4. There still exists the very likely car versus pedestrian or cyclist collision.
5. The high fences on both sides preclude any reasonable visibility.
6. The ONLY sensible thing to do is to close the link entirely.
7. Failure to undertake immediate action ... could result in blame being levelled at Council.

On 20 January 2004 the Service Manager: Transport Assets replied to the New Zealand Police. Salient points made were:

1. There are further improvements that can be made to more strongly restrain traffic speed and distinguish between the footpath and carriageway... and (these) will be raised at a site meeting with Mr Lawford.
2. Parts of the police notification appear emotive and exaggerated.
3. The New Zealand Police would continue to be kept fully up to date.

On 28 January 2004 a meeting was held at the 13 Freestone Place with Sgt Maude and Mr Lawford. The Chair of the Waitakere Community Board and 3 staff represented the Council. Mr Lawford played a video showing cars arriving from the wrong side of the circular traffic island, and at apparently high speeds for the conditions. Solutions were discussed, including the use of humps, or bollards along the traffic lane edge, to slow cars down, and of low fences along the unfenced frontages to stop running across the carriageway. Humps could be noisy, and it was agreed that the bollards-and-fences is option should be pursued.

Council staff (traffic engineers and a landscape architect) immediately started the development of the agreed concept. Traffic surveys were undertaken to find the actual numbers and speeds of cars, and numbers and types of pedestrians using the link.

The results of this work were distributed to the owners of the 4 fronting properties a week prior to a meeting with them held on 1 March 2004. The landscape architect's illustrations are produced in Appendix 4 at page ....xxx. Of the 4 parties, 3 attended, whilst a letter was received from the forth thanking the Council for its efforts and supporting the proposed scheme.

At the meeting further issues were raised including the safety of parking in the central traffic island, effect of traffic signs on property value, noise from vehicles crossings, safety of the Checkerberry crossing, and questions were raised about the validity of Council's work, including it's advise that the link was road vested I Council. It was decided to implement the proposed scheme and report to the following meeting of the Waitakere Community Board. However, Mr Lawford expressed considerable dissatisfaction, and his intention to confront the Council in court if there was a fatality.

Shortly, following that meeting the Chief Executive instructed 'a temporary road closure of Freestone Place and that a report be submitted to the April 2004 meeting of the Waitakere Community Board recommending its permanent closure, depending on community feedback'.

Following the erection on site, of the required information signs advising the public of the Council's intensions, users of the link called for a meeting opposing the closure. This was attended by some 12 parties, the chairs of the Waitakere Community Board and the local branch of the Residents and Ratepayers Association, and Councillor Yates. Representatives of the objectors are to make a presentation to the Community Board at it's April 2004 meeting.

STRATEGIC CONTEXT

The Council has established 9 strategic platforms for the support of a sustainable future. The 2 platforms relevant to the consideration of the Freestone Place Link are:

1. *Integrated Transport and Communication,* for which the vision includes that 'travel demonstrates integrated, environmentally responsible, innovative design'

2. *Strong Communities*, for which the vision includes that 'people feel safe and connected to others'.

As far as Waitakere City is concerned, minor road links have long been regarded as conducive to integrated transport; travel distances are reduced, and alternative routes provide additional capacity that can be used in busy periods.

Likewise, in regard to strong communities minor road links are advocated, since cul-de-sacs discourage interaction between places that are actually close together. Minor road links also improve personal security through encouraging some traffic through places that would otherwise be isolated; this facilitates the informal surveillance of these places by passing drivers, and is deterrence to crime.

These advantages accrue for Freestone Place through the existence of its minor connection with Summerland Drive. However, in regard to the strategic platforms, Council's actions need to ensure that road design supports pedestrian friendly environments for all ages, and safe routes to school for all children. The safety of the existing facility has been called into question and safety is the prime issue for resolution.

ISSUES

Residents Issues

Safety issues raised by the residents of the 4 properties fronting the link are:

1. High traffic speeds (over 50 km/hour alleged).
2. Danger to children, and in particular those coming from the Checkerberry Place walkway.
3. Pedestrians walking on the carriageway rather than the footpath.
4. Danger to themselves when mowing verges, also private lawns.
5. Narrowness of the carriageway.
6. Traffic from the east going the wrong way around the traffic island.
7. A hazard of 'un-parking' from the central traffic island owing to lack of visibility to through traffic.

Other issues raised by the residents of the 4 properties fronting the link are:

1. Arguments between drivers having to give way to each other.
2. Loss of visual amenity owing to the erection of traffic control signs
3. Noise of traffic going over the vehicle crossings at each end.
4. Rainwater ponding on the carriageway.
5. Too much traffic will use the link after the Paremuka Stream bridge is opened.

Actual Use of the Link

To provide factual information on the use of the link Council has carried out traffic and pedestrian surveys for the morning and evening rush periods, the before and after school periods, the mid-day period and a late night period. Pertinent results are:

1. Traffic Volume

- The maximum observed was 13 veh/hour, occurring 8-9 am, and 5-6 pm.
- The minimum observed was 0 veh/hour, occurring 11-12 pm.
- The typical daytime volume is 5 veh/hour approximately, equivalent to 1 car per 12 minutes.
- The weekday volume is 80 veh/day approximately.

2. Traffic Speed (maximum speed reached by each vehicle observed)

- The average observed was 22 km/hour for the 63 cases measured.
- 27% of the speeds exceeded 25 km/hour.
- The maximum observed was 36 km/hour, occurring in 6% of cases.
- The minimum observed was 9 km/hour, occurring in 6% of cases.

3. Traffic Island and Single Lane Section

- of the 65 vehicles observed, 1 went the wrong way round the traffic island but this was from a property fronting the northern side of the island

- there is ample width in the roadway to create a safety zone for drivers un-parking
- no conflicts were observed between vehicles using the single traffic lane in the middle of the link

4. Pedestrians

- 53 groups were observed.
- The maximum volume observed was 8 groups/hour, occurring 8-9 am.
- The minimum volume observed was 1 group/hour, occurring 10.30-11.30 am and 12.30-1.30 pm (apart from 10-12 pm when no pedestrians were observed).
- 36% of groups observed walked on the carriageway; of these most were adolescents.
- 75% of groups included at least 1 adult.

It appears that driver behaviour has improved relative to advice from the New Zealand Police and Mr Lawford as a result of the measures taken by Council prior to Christmas.

Link Layout

To enable confirmation of the safety of visibility lines Council has carried out a topographical survey of the link; features such as fences, driveways, markings and kerb lines have been accurately located.

Option 1: Current Situation

This option is illustrated in Appendix 1.

The current design is clearly consistent with the Integrated Transport and Strong Community platforms through contributing to connectivity and security, and indeed would have been required by Council on that basis. The one lane section for 2-directional traffic has the potential to engender lower traffic speeds and greater driver alertness than a comparable minor 2-lane connection. Indeed it can be regarded as an elongated slow point and could be developed as such.

However, from the measured data the existing upper speed range is high for the conditions. Even though the probability of such an event is very small, Council has the concern that a child could run out unexpectedly from 81 Summerland Drive or from 13 Freestone Place, just as a car is approaching the end of the high fences. The high fences partially block drivers' visibility of the unfenced part of these properties. For the same reasons Council is also concerned about the cross-route for pedestrians at the eastern end of the link. In this case cars parked in the traffic island could also partially block visibility on the approach from the east.

Option 2: Option 1 with Additional Low Fences, Carriageway-edge Bollards, Traffic Island Edge and Planting

This option is illustrated in Appendix 2.

The proposed 600 mm high fences will actually prevent any child running heedlessly across the link, and will not obstruct drivers' sight lines.

The proposed 150 mm square, 800 mm high, wooden bollards will generally be in pairs 2.6 m apart, with zero clearance to the painted edge lines of the single traffic lane. This separation is sufficient for continuance with the present rubbish collection route.

It is well known that obstructions, with zero clearance each side of 2 narrow traffic lanes, reduce capacity by in the order of 40%. The highest speeds measured (about 35 km/hr) will be very substantially reduced (to in the order of 25 km/hr or less) owing to drivers' concern to not scrape the close-by, solid, wooden bollards.

Furthermore, the lateral position of the traffic lane can be adjusted to increase the clearance of the edge of the traffic lane from the northern boundary to about 1.2 m, 0.5 m more than before the existing improvements were implemented. This extra clearance and the protection provided by the bollards themselves with improve edge safety along the northern side. Bollards are also proposed on the edge s of the 2-lane parts of the link in response to residents concerns about those parts.

The proposed new edge line for the central traffic island will increase the deflection of the vehicle path around the island into the Summerland connection, and this will marginally reduce traffic speed and increase safety.

The planting proposed has been selected for its hardiness and minimal maintenance. It is offered to soften the visual impact of the wooden safety fences referred to above; see illustrations in Appendix 4

Further in regard to aesthetics, the existing single-lane priority control signs each end could be removed. The adverse visual impact of these signs is a concern of the residents. The justification for removal of the signs is 3-fold:

1. The low traffic volumes
2. The low traffic speeds anticipated
3. The interpretation of the minor link as a slow point

It is proposed to complete the footpath on the southern side of the link to encourage walking on the footpath rather than the carriageway, and to properly complete the network with Checkerberry Place.

The gross cost of Option 2 is estimated as $5000. It is expected that 48% will be recovered from Transfund New Zealand in terms of its policy supporting minor safety projects.

Safety Assessment of Options 1 and 2: Traffic Movement

The safety of Option 1 and of Option 2, have been assessed quantitatively, through analyses of possible conflicts between a car coming-through or going-into the link and a young child running heedlessly across the link from the side. This is a severe test and a conservative combination of parameter values has been used for the calculations. The driver needs a sufficient view to see the child in time to stop the car before the potential collision point. The view could be blocked by, for example, a high fence, or a parked car.

The test is that the driver can see the child from the safe stopping distance [S] when child is at the running distance [s] that would result in a collision. Details of the analyses are produced in Appendix 5.

1. Car from west, child from north on public footpath past 13 Freestone Place
2. Car from east, child from north on public footpath past 13 Freestone Place
3. Car from west, child from north of driveway of 13 Freestone Place
4. Car from west, child from north on front yard of 13 Freestone Place 2m east of high fence

In situations 1, 3 and 4 the potential obstruction to visibility is the high fence on the boundary to 13 Freestone Place. In situation 2 the potential obstruction to visibility is a vehicle parked in the western-most parking space of the central traffic island.

Option 2 proposes the use of bollards along the edge of the traffic lane to control speed, increase awareness, improving the safe stopping distance; also, the use of low fences to prevent headless running across the traffic lane; also a new edge line for the traffic island to constrain the approach to the link from Freestone Place. The conclusions form the analyses are:

1. The proposed bollards would make the intersection of the public footpath and eastern end of the link safe. The available stopping and visible running distances would be greater than those required by the test.
2. The proposed bollards would make the intersection of the driveway of 13 Freestone Place and the link safe. The available stopping and visible running distance would be greater than or equal to those required by the test.
3. The proposed low fence would make the frontage to 13 Freestone Place safe. The fence would prevent a young child from running heedlessly onto the link from 'behind' the high fence. Notwithstanding conclusion 2 above, a gate for the driveway would a further desirable improvement, to go with the fence.
4. The proposed new island edge is desirable to improve the safety of the western approach.

Safety Assessment of options 1 and 2: Parking

The proposed new edge line round the central traffic island in Freestone Place would significantly improve the efficiency and safety of movements from parking spaces on the island. Council's experience with the safety of angle parking at the Rangiwai Road shops in Titirangi Village is that a safety zone of 1. 5 ~ 2.0 m behind parked vehicles is effective, and acceptable to the public.

Option 3: Closure of Summerland Connection to Motor-vehicles by Barriers

This option is illustrated in Appendix 3.

In light of Council's ability to make the connection safe at low cost, a decision to close the connection to motor vehicles would be contrary to Council's strategic direction, as indicated above through the Integrated Transport and Strong Communities platforms. Furthermore, the reaction of existing users to the temporary closure is an indication that the link is fulfilling its intended functions.

If a decision is made to proceed with permanent closure of the connection to motor-vehicles the following will be required pursuant to the Local Government Act:

1. A explanation for the closure will be prepared
2. Plans of the existing and proposed alternative route will be prepared.
3. These will be available at Council offices for inspection.
4. No less than 2 public notices, not less than 7 days apart, will be advertised.
5. Objections will be taken in writing, over a period of 40 days following the first public notice.
6. Detailed Information signs will be maintained for the period at each end of the link.
7. If no objections are received Council can publish that the road is stopped.
8. If objections are received the objections and full details of the proposals will be sent to the Environment Court.
9. The Environmental Court will rule on the objections and Council's explanations and the Court's decisions will be final and conclusive.
10. If the Court reverses the Council's decision the matter will not be advanced again for at least 2 years.
11. If the Court supports the Council's decision the necessary legal processes will be completed.

The removal of the public's right to use a vested road is clearly a very significant event.

Should the Summerland connection be successfully stopped, appropriate permanent and safe barriers will need to be erected at each end. Council will need to consider refurbishing the area if the area is to be respected and not to become a trouble spot. The cost of physical works could vary between a few to several thousand dollars depending on what the Council decides is appropriate.

CONCLUSION

In making its determination the Waitakere Community Board needs to weigh the important over-riding issues of 'safety' and 'removal of the public's right to use a vested road', and in full consideration of Council's Strategic Integrated Transport and Strong community Platforms which support the principle of providing safe network connectivity.

The evidence presented suggests that measures already taken to improve safety have been partially effective, and that further significant improvements to the existing situation can be readily and quickly made at low cost. These safety improvements satisfy the critical test devised for their evaluation. Furthermore, amenity improvement, a concern of the affected residents, is also allowed for through provision for landscape planting in the cost estimate.

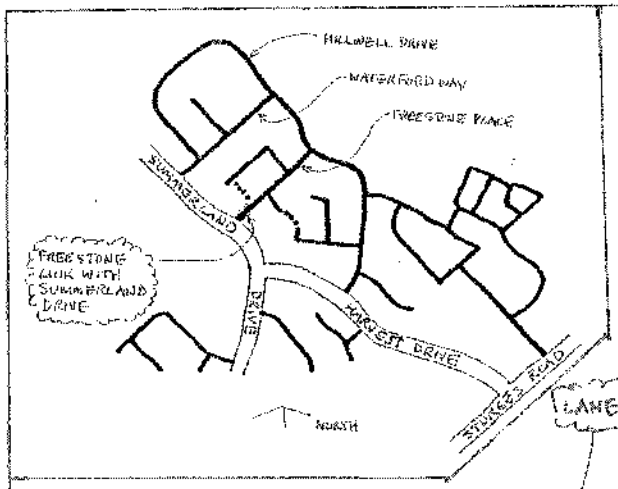
Option 1 should not be recommended.

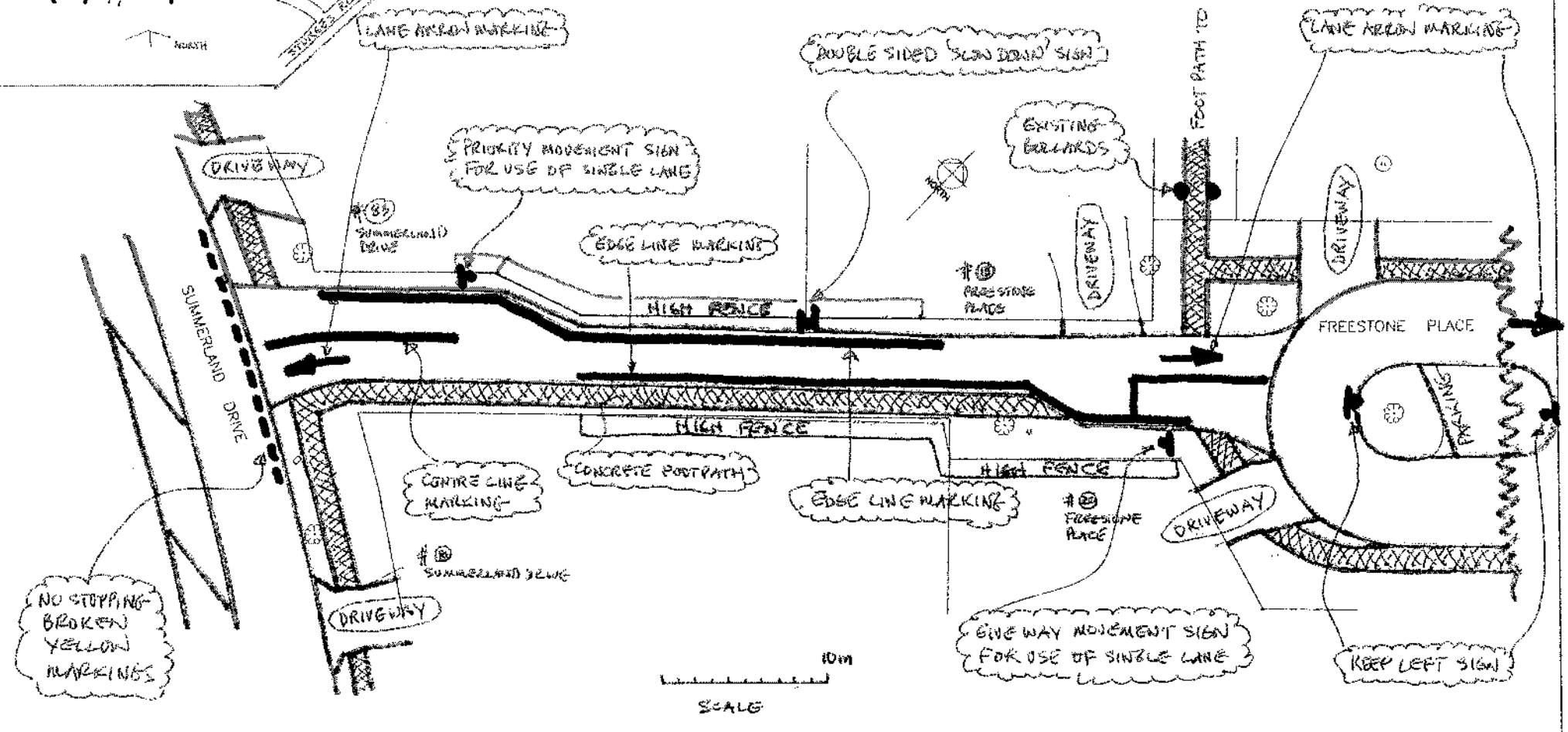
END

Prepared by:

Ross Hill **Service Manager: Transport Assets**

APPENDIX 1





A8

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DESIGNED				
DRAWN				
COMPLETED N. D.	03/04			
DWG CHECK				
DESIGN CHECK				
CAD FILE 201445	03/04			

WAITAKERE CITY COUNCIL

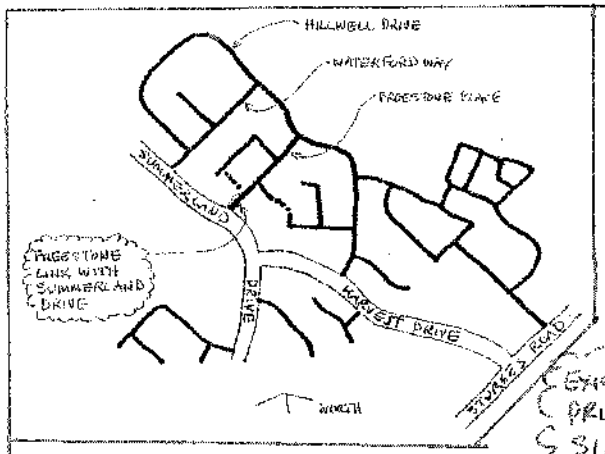
ASSET MANAGER

NA
MANAGER PROJECT SERVICES

OPTION 1: FREESTONE / SUMMERLAND LINK
Existing Situation

ORIGINAL SCALE 1 : 125 (A1)

SHEET 1 OF 1 SHEETS | DRAWING No. 14445 | CONTRACT No. | REVISION A1 ORIGINAL



EXISTING SINGLE LANE PRIORITY MOVEMENT SIGN (OPTIONAL)

DOUBLE SIDED SYMBOLIC 'CHILDREN' SIGN AT LOW LEVEL TO REPLACE 'SLOW DOWN' SIGNS

LOW GATE (OPTIONAL)

LOW FENCE

LOW FENCE

LOW HEDGE

LOW FENCE

LOW HEDGE

SUMMERLAND DRIVE

FREESTONE PLACE

PARKLAND

NEW WOODEN BOLLARDS TO MATCH EXISTING BOLLARDS ON CHECKERBERRY WALKWAY

IMPROVED SEPARATION OF TRAFFIC LAND AND BOUNDARY

EXISTING SINGLE LANE GIVEWAY SIGN (OPTIONAL)

COMPLETION OF FOOT PATH CONNECTION

EDGE LINE FOR TRAFFIC ISLAND

10m Scale

A9

	DATE	REVISION	BY	DATE
SURVEYED N. D.	03/04			
DESIGNED	KM			
DRAWN				
COMPUTED N. D.	03/04			
CHK CHECK				
DESIGN CHECK				
CAD FILE R0114445	03/04			

WAITAKERE CITY COUNCIL

ASSET MANAGER NA

MANAGER PROJECT SERVICES

OPTION 2: FREESTONE / SUMMERLAND LINK
Showing Features Required in Addition (to Option 1)

ORIGINAL SCALE 1 : 125 (A1)

SHEET 1 of 1 SHEETS

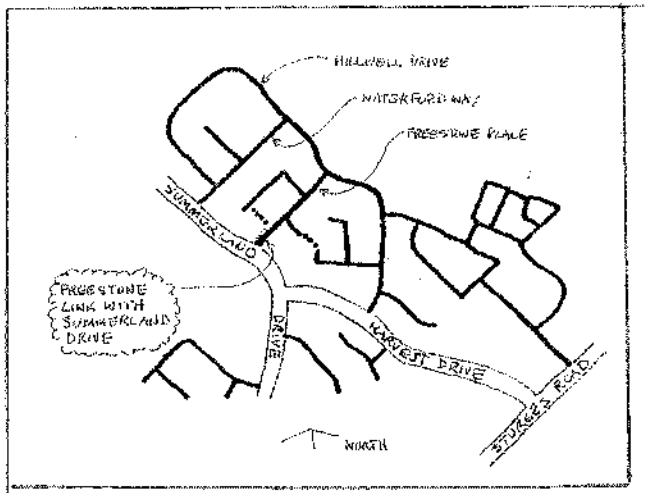
DRAWING No. 14445

CONTRACT No.

REVISION

A1 ORIGINAL

APPENDIX 3



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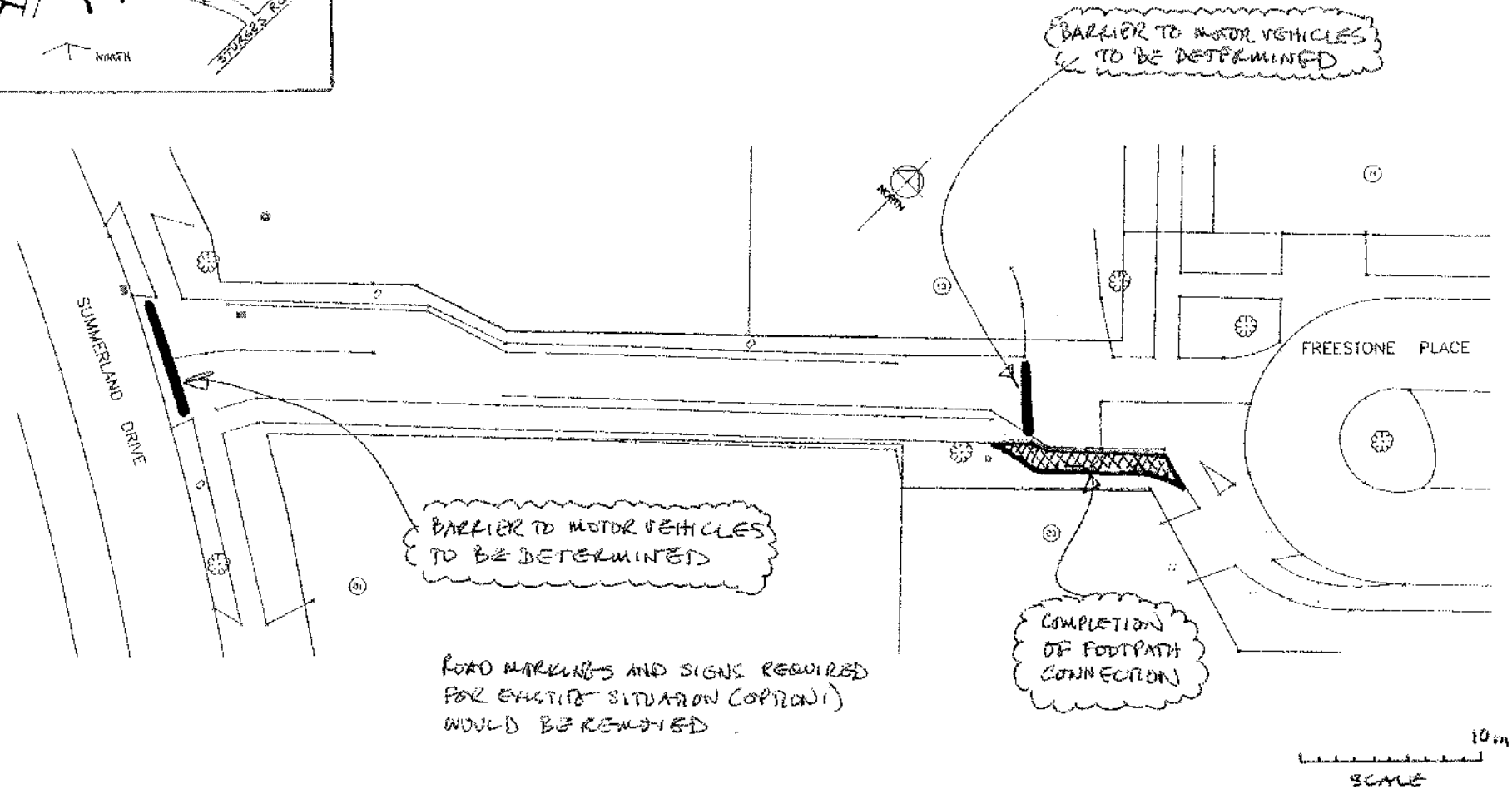

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DESIGN CHECK				
CAD FILE RD14445	03/04			

WAITAKERE CITY COUNCIL

AGILE MANAGER NA MEMBER PROJECT SCHEMES

OPTION 3: FREESTONE / SUMMERLAND LINK
Closure to Motor Vehicles

ORIGINAL SCALE 1 : 125 (A1)

SHEET 1 OF 1 SHEETS | DRAWING No 14445 | REVISION | CONTRACT No. | A1 ORIGINAL

Waitakere City Council
City Services

131 Lincoln Road
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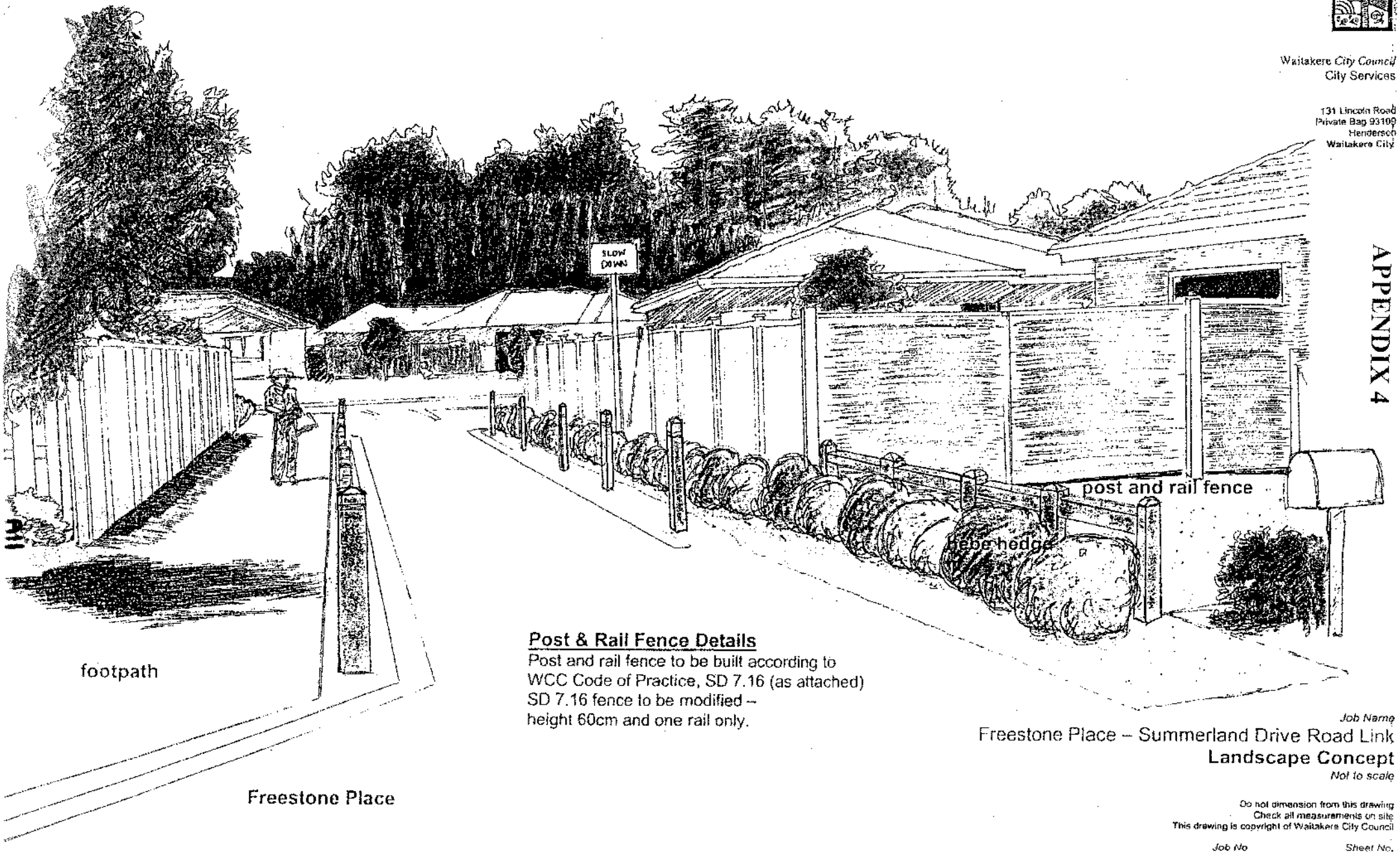
Henderson
Waitakere City

APPENDIX 4



Post & Rail Fence Details

Post and rail fence to be built according to WCC Code of Practice, SD 7.16 (as attached)
SD 7.16 fence to be modified –
height 60cm and one rail only.

Job Name

Freestone Place – Summerland Drive Road Link

Landscape Concept

Not to scale

Job No	*Sheet No.*
016	2 of 3
Drawn By	*Date*
Mandy McMullin	10-02-04

Revisions

Waitakere City Council
City Services

131 Lincoln Road
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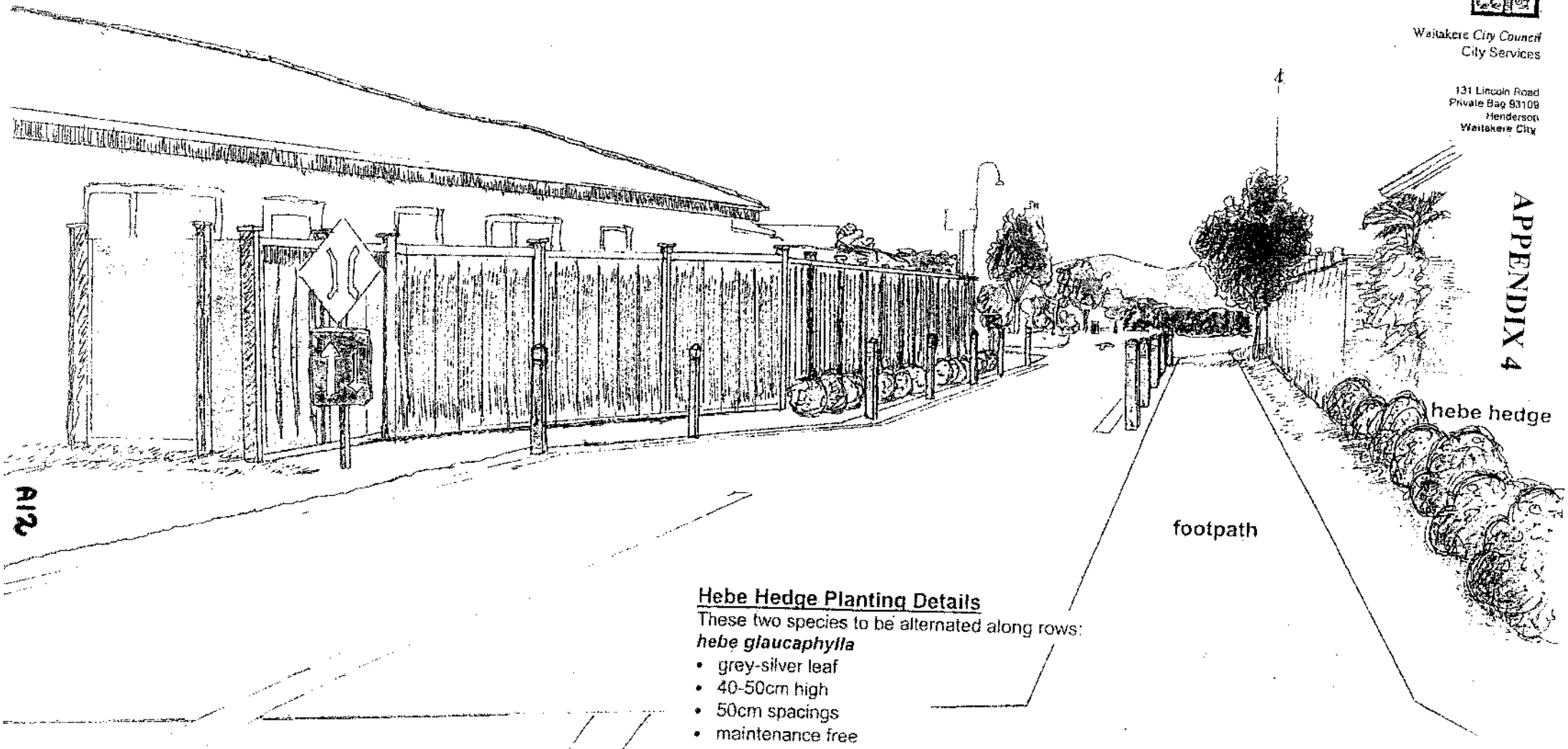
Waitakere City

APPENDIX 4



A12

Hebe Hedge Planting Details

These two species to be alternated along rows:

hebe glaucaphylla

- grey-silver leaf
- 40-50cm high
- 50cm spacings
- maintenance free
- maintains shape
- hardy

***hebe diosmipholia* "Wairua Beauty"**

- lime green
- 60cm high
- 50cm spacings
- small leaf
- compact
- frothy pink flowers

Job Name

Freestone Place – Summerland Drive Road Link

Landscape Concept

Not to scale

Job No	*Sheet No.*
016	3 of 3
Drawn By	*Date*
Mandy McMullin	10-02-04

Revisions

APPENDIX 5

FREESTONE PLACE: Safety Analysis of Proposed Changes

Conflict	Option	Driver					Pedestrian		Minimum Visibility Triangle			Available Visibility Triangle					Safety
Traffic Direction		V	R	D	S	T	v	s	XM	xm	Deg VT	Deg	c	F	XA	xa	Stopping
Location		km/h	s	m/s/s	m	s	km/h	m	m	m			m	m	m	m	Condition
Traffic to Freestone	Do Minimum	35	1.50	6.5	21.9	3.0	14	11.7	24.9	11.7	25.1	33.1	2.8	16.0	21.0	11.8	
Pedestrian Cross Route	Bollards	25	1.25	6.5	12.4	2.3	14	8.0	15.4	9.0	30.4	33.1	2.8	16.0	21.0	11.8	safe
Traffic to Freestone	Do Minimum	35	1.50	6.5	21.9	3.0	14	11.7	24.9	11.7	25.1	33.1	2.8	11.0	16.0	9.0	
Driveway	Bollards	25	1.25	6.5	12.4	2.3	14	8.0	15.4	9.0	30.5	33.1	2.8	11.0	16.0	9.0	safe
Traffic to Freestone	Do Minimum	35	1.50	6.5	21.9	3.0	14	11.7	24.9	11.7	25.1	33.1	2.8	2.0	7.0	3.9	
2 m from Existing Fence	Bollards	25	1.25	6.5	12.4	2.3	14	8.0	15.4	9.0	30.4	33.1	2.8	2.0	7.0	3.9	
Traffic from Freestone	Do Minimum	25	1.50	6.5	14.1	2.6	14	10.0	12.1	10.0	30.3	37.7			22.0	10.0	safe
Pedestrian Cross Route	Island Edging	22.5	1.25	6.5	10.8	2.2	14	8.5	13.8	8.0	31.0	37.7			23.5	10.0	safe

Assumptions: Traffic to Freestone Place (XA and xa are calculated to suit assumptions or measured where shown in red)

1. A small child runs out at 14 km/h headless of traffic, from the walkway to the north.
2. The child must be visible at least before the beginning of the time needed for the driver to react and brake the vehicle to a stop.
3. The child must be within the driver's periferal vision (45 degree each way for low speeds).
4. The driver will pick up the critical view from no further than about 5 m prior to arrival at the end of the existing fence
5. The traffic management will make the drivers more alert and reduce the AUSTROADS reaction time from 1.5 s to 1.25 s.
6. Bollards will reduce the measured maximum speed from about 35 km/hr to about 25 km/hr.
7. The maximum deceleration will be 6.5 m/s/s (corresponding to a wet pavement).
8. The vehicle must stop at least 1 m before the collision point.

Conclusions

1. Install bollards to effectively narrow the carriageway and so constrain speed.
2. Install fences to prevent children running out from properties, and low fences to maintain visibility to pedestrian cross route..
3. The footpath crossing in Freestone Place is sufficiently far from the existing high fence to be safe.
4. The driveway to number 13 Freestone Place is sufficiently far from the existing high fence to be safe but a gate is desirable for young children.

Assumptions: Traffic from Freestone Place (XA and xa are measured from plan in accordance with the assumptions).

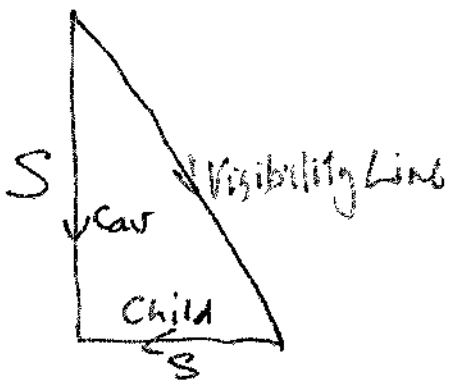
1. A small child runs out at 14 km/h headless of traffic, from the walkway to the north.
2. The child must be visible at least before the beginning of the time needed for the driver to react and brake the vehicle to a stop.
3. The child must be within the driver's periferal vision, (45 degree each way for low speeds).
4. Driver's visibility will be limited by the rear left corner of a vehicle parked in the western most parking space of the island.
5. The driver will pick up the critical view from no further than level with the target point of the eastern circular kerb of the island.
6. The traffic management will make the drivers more alert and reduce the AUSTROADS reaction time from 1.5 s to 1.25 s.
7. Island edging will reduce the likely maximum approach speed from about 25 km/hr to about 22.5 km/hr.
8. The maximum deceleration will be 6.5 m/s/s (corresponding to a wet pavement).
9. The vehicle must stop at least 1 m before the collision point.

Conclusions

1. Install island edging to calm traffic as this will also provide a safety zone for drivers to get visibility when leaving parking spaces.

V	Approach Speed
R	Reaction Time before Deceleration
D	Deceleration
S	Stopping Distance for Vehicle
T	Stopping Time for Vehicle
v	Child's Running Speed
s	Distance Run During Stopping time
XM	Minimum Stopping Distance Required by Driver
xm	Unsafe Distance of Child from Collision Point when First Seen by a Driver at the Minimum Stopping Distance from Collision Point.
XA	Available Stopping Distance for Driver
xa	Corresponding Maximum Distance of Child from Collision Point.
Deg VT	Periferal Angle of Minimum right Angled Visibility Triangle Formed by XM and xm
Deg	Periferal Angle Used and Available
c	Distance from Existing Fence to Line of Travel of Driver's Eye
F	Calculated or Measured Distance from End of Existing Fence to Centreline of Walkway to North

All assumptions in combination have low probability
Eg the highest speeds are not likely to occur in wet conditions.
Eg the occurrence of a fast car and headless child at the critical locations at the same time are unlikely.



APPENDIX 6

Waitakere City Council
Te Tatao o Waitakere

Memorandum

To	ROSS HILL - SERVICE MANAGER – TRANSPORT ASSETS
From	MAURICE HIEATT, ACTING LEGAL SERVICES MANAGER
Date	3 March 2004
Subject	**AREA OF ROAD LINKING FREESTONE PLACE TO SUMMERLAND DRIVE**

1. I refer to your request for written confirmation that the above area has the status of a road and is vested in this Council.

2. The area in question is shown on Sheet 4 of Deposited Plan 206650 as "Lot 402 – 1.8775ha road to vest in Waitakere City Council".

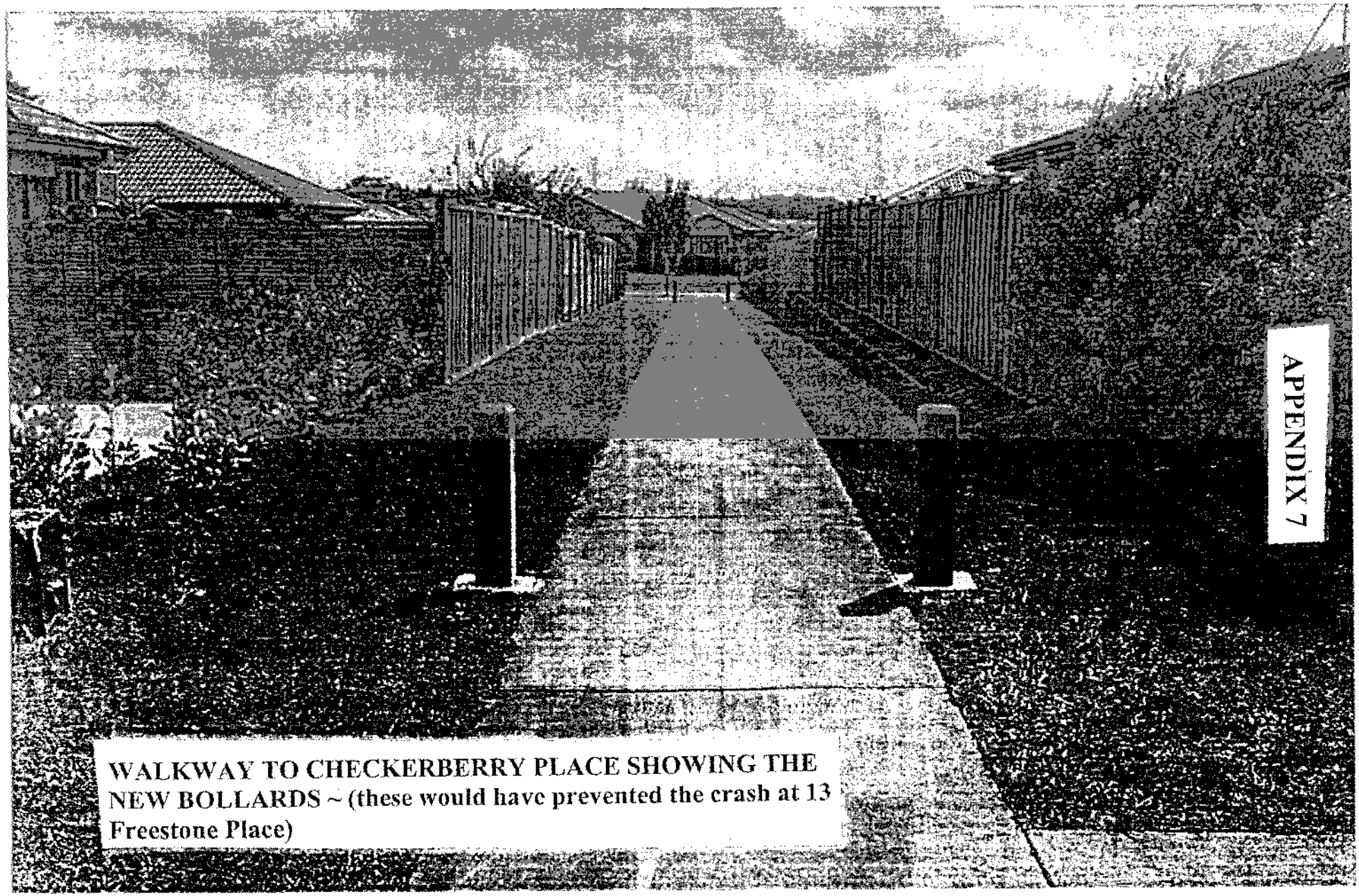
3. Section 238 of the Resource Management Act 1991 states that "When the District Land Registrar .... deposits a Survey Plan ... the land shown on the Survey Plan as road to be vested in a local authority ... vests free from all interests in any land including any encumbrances without the necessity of any instrument of release or discharge or otherwise". The sub-section goes on to say that the road in a case such as this is vested in the territorial authority which in the present case is of course, the Waitakere City Council.

4. Sheet 4 of Deposited Plan 206650 referred to above was deposited on 3 October 2001 and consequently upon that day, the piece of land in question vested in the Waitakere City Council as road.

5. I can therefore positively state that the land to which you are referring has the status of a road and is vested in this Council. Copies of this Deposited Plan and also of the relevant provisions of the Resource Management Act 1991 have already been made available to and are held by Upali Ileperuma.

6. Please advise should any further information be required.

Maurice Hieatt
Acting Legal Services Manager



APPENDIX 7

WALKWAY TO CHECKERBERRY PLACE SHOWING THE NEW BOLLARDS ~ (these would have prevented the crash at 13 Freestone Place)

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