

Before the Board of Inquiry  
Waterview Connection Project

---

*in the matter of:* the Resource Management Act 1991

*and*

*in the matter of:* a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Memorandum of Counsel on behalf of the **NZ Transport Agency** in  
relation to supplementary rebuttal evidence

---

Dated: 10 February 2011

---

REFERENCE: Suzanne Janissen (suzanne.janissen@chapmantripp.com)  
Cameron Law (cameron.law@chapmantripp.com)

**Chapman Tripp**  
T: +64 9 357 9000  
F: +64 9 357 9099

23 Albert Street  
PO Box 2206, Auckland 1140  
New Zealand

www.chapmantripp.com  
Auckland, Wellington,  
Christchurch



**MEMORANDUM OF COUNSEL ON BEHALF OF THE NZ TRANSPORT AGENCY IN RELATION TO SUPPLEMENTARY BEBUTTAL EVIDENCE**

- 1 This Memorandum is provided seeking leave to lodge supplementary rebuttal evidence by Amelia Linzey. A copy of that supplementary evidence is provided with this Memorandum.
- 2 The purpose of the supplementary rebuttal evidence is to provide further information in relation to the three options for undergrounding of the Southern Ventilation buildings which had been presented in the rebuttal evidence of Mr Andre Walter.
- 3 As explained in the Ms Linzey's evidence, at the time rebuttal evidence was being prepared, only a limited assessment had been undertaken by the relevant environmental experts of two of these options (Options 2 and 3) given timing constraints and the options more recent emergence during the course of expert caucusing.
- 4 Since the rebuttal evidence was printed, a full multi-disciplinary assessment of the options has been completed and that assessment is presented in the supplementary evidence of Ms Linzey.
- 5 Ms Linzey's evidence attaches an evaluation matrix (Annexure E). It also attaches an assessment of the degree to which the effects on any parties may have been increased by these options and if there are any newly affected parties (Annexure F). Finally, her evidence also provides a more detailed costing undertaken of these underground options (see Annexure G).
- 6 It is submitted that the supplementary rebuttal evidence will be of assistance to the Board and all parties in considering the undergrounding options for the Southern Ventilation buildings. Accordingly, Counsel for the NZTA respectfully seeks leave to lodge that supplementary rebuttal evidence.
- 7 If leave is granted, Counsel proposes that it be immediately circulated to the parties so as to be available prior to the cross examination of Mr Parker and Mr Walter, currently timetabled to occur on Friday, 11 February. Should there be insufficient time for parties to review this supplementary evidence, the NZTA proposes that these witnesses will be available to be recalled as and when required by the Board.

Dated: 10 February 2011

Counsel for the  
**NZ TRANSPORT AGENCY**



---

S M Janissen / C Law

Before the Board of Inquiry  
Waterview Connection Project

---

*in the matter of:* the Resource Management Act 1991

*and*

*in the matter of:* a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Supplementary rebuttal evidence of **Amelia Linzey (Planning)** on behalf of the **NZ Transport Agency**

---

Dated: 9 February 2011

---

REFERENCE: Suzanne Janissen (suzanne.janissen@chapmantripp.com)  
Cameron Law (cameron.law@chapmantripp.com)

**Chapman Tripp**  
T: +64 9 357 9000  
F: +64 9 357 9099

23 Albert Street  
PO Box 2206, Auckland 1140  
New Zealand

www.chapmantripp.com  
Auckland, Wellington,  
Christchurch



## INDEX

<b>INTRODUCTION</b> .....	<b>3</b>
<b>PURPOSE OF SUPPLEMENTARY EVIDENCE</b> .....	<b>3</b>
<b>THE OPTIONS</b> .....	<b>3</b>
<b>COMPARATIVE EVALUATION OF SOUTHERN VENTILATION BUILDING OPTIONS – MULTI-DISCIPLINARY ASSESSMENT</b> .....	<b>4</b>
<b>OUTCOMES OF ASSESSMENT</b> .....	<b>5</b>
ANNEXURE A - OPTION 1: SOUTHERN VENTILATION BUILDING WITHIN A DEEP CUT WITH SURFACE ACCESS RAMPS .....	7
ANNEXURE B – OPTION 2: SOUTHERN VENTILATION BUILDING PLACED PARTIALLY UNDERGROUND ....	8
ANNEXURE C – OPTION 3: SOUTHERN VENTILATION BUILDING WITHIN A DEEP CUT WITH SURFACE ACCESS AND GANTRY BUILDINGS .....	9
ANNEXURE D – BASE OPTION: AS PRESENTED ON BEHALF OF THE NZTA IN THE EVIDENCE IN CHIEF OF MR DAVID GIBB (HIS ANNEXURE A) .....	10
ANNEXURE E – COMPARATIVE EVALUATION OF SOUTHERN VENTILATION BUILDING OPTIONS (MULTI-DISCIPLINARY OPTION ASSESSMENT) .....	11
ANNEXURE F – ASSESSMENT OF CHANGE IN EFFECTS OF NEWLY AFFECTED PERSONS .....	12
ANNEXURE G – COSTS ESTIMATES OF SOUTHERN VENTILATION BUILDING OPTIONS .....	13

## **SUPPLEMENTARY REBUTTAL EVIDENCE OF AMELIA LINZEY ON BEHALF OF THE NZ TRANSPORT AGENCY**

### **INTRODUCTION**

- 1 My full name is Amelia Joan Linzey. I refer the Board of Inquiry to the statement of my qualifications and experience set out in my first and third statements of evidence in chief (EIC) (dated 12 and 13 November 2010).
- 2 I repeat the confirmation given in that statement that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court.

### **PURPOSE OF SUPPLEMENTARY EVIDENCE**

- 3 The purpose of this supplementary rebuttal evidence is to respond to the further option designs that were developed for the Southern Ventilation building in response to evidence (Option 1) and as a result of landscape / visual caucusing (Options 2 and 3).
- 4 These options were presented in the rebuttal evidence of Mr Andre Walter, specifically:
  - 4.1 Option 1 (Annexure G);
  - 4.2 Option 2 (Annexure I); and
  - 4.3 Option 3 (Annexure J).
- 5 As noted in my rebuttal evidence (planning),<sup>1</sup> at the time of preparing rebuttal only a limited assessment had been undertaken by the relevant NZTA environmental experts of these options. Given the time constraints of this option development, a full multi-disciplinary assessment of the options presented in the rebuttal of Mr Walter had not yet been completed.
- 6 Since that time, a multi-disciplinary assessment, including more detailed cost review, has been completed and this information is now presented in this supplementary rebuttal statement.

### **THE OPTIONS**

- 7 As presented in the rebuttal evidence of Mr Walter (paragraph 45), three options have been further developed for undergrounding of the Southern Ventilation building. For ease of reference, these options are provided again in this evidence:

---

<sup>1</sup> Paragraph 9.4.

- 7.1 Option 1 – Southern Ventilation building within a deep cut with surface access ramps (**Annexure A**);<sup>2</sup>
- 7.2 Option 2 – Southern Ventilation building placed partially underground (**Annexure B**);<sup>3</sup> and
- 7.3 Option 3 – Southern Ventilation building within a deep cut with surface access and gantry buildings (**Annexure C**).<sup>4</sup>
- 8 For more detailed description of these options, I refer to the rebuttal evidence of Mr Walter, where he provides a description of:
- 8.1 Option 1 in paragraph 48;
- 8.2 Option 2 in paragraph 52; and
- 8.3 Option 3 in paragraph 56.
- 9 This assessment is a comparative evaluation of the option lodged by the NZTA and modified in evidence presented on behalf of the NZTA, particularly in the evidence in chief of Mr David Gibb (Annexure A). This option is referred to as the 'base option' in this comparative evaluation.
- 10 A copy of the base option is also provided for reference (**Annexure D**)<sup>5</sup>.

#### **COMPARATIVE EVALUATION OF SOUTHERN VENTILATION BUILDING OPTIONS – MULTI-DISCIPLINARY ASSESSMENT**

- 11 At the time of preparing rebuttal evidence, some members of the NZTA's environmental and technical team had not seen the plans for these options. Since lodgement of rebuttal evidence, an assessment has now been completed so as to be consistent with the multi-disciplinary assessments undertaken on other design options on the Project.
- 12 In summary, in leading this assessment I have worked with the members of the environmental and technical team and the following process occurred:
- 12.1 With the Planning team, I have scoped the potential environmental and technical issues associated with the design option;

---

<sup>2</sup> Being Andre Walter rebuttal evidence, Annexure G.

<sup>3</sup> Being Andre Walter rebuttal evidence, Annexure I.

<sup>4</sup> Being Andre Walter rebuttal evidence, Annexure J.

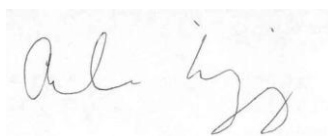
<sup>5</sup> Being David Gibbs evidence in chief, Annexure A, drawing 3.

- 12.2 I have prepared the comparative evaluation matrix and distributed it to the relevant members of the environmental and technical team;
- 12.3 The environmental assessments have been undertaken by the relevant members of the environmental and technical team;
- 12.4 I have then reviewed and discussed the option evaluation with some members of the assessment team, to confirm the comparative evaluation and the details of some design elements; and
- 12.5 I have completed the evaluation matrix (**Annexure E: Comparative Evaluation of Southern Ventilation Building Options**).
- 13 As this option assessment is post-lodgement and the notification of the Project designation / consent applications, we have also undertaken an additional and specific assessment on the degree to which the effects on any parties may have increased and, in particular, if there are any newly affected parties from the Options being considered.
- 14 This assessment has also been undertaken by the relevant members of the environmental and technical team (**Annexure F: Assessment of any Change To or Change in Nature of Effect on Affected Persons**).
- 15 In completing this multi-disciplinary evaluation, a more detailed costing has also been undertaken and this is provided in **Annexure G** to this evidence.

#### **OUTCOMES OF ASSESSMENT**

- 16 Of the three options developed:
- 16.1 Option 3 provides the greatest opportunity for environmental benefits compared to the 'base option';
- 16.2 Options 1 and 2 are both considered to have greater adverse than positive effects.
- 17 Overall, Option 3 is preferred from a 'social' perspective (including landscape / visual, amenity, land use, community and open space). However, it is considered to have greater adverse impacts on cost and constructability (i.e. technical risks / complexity and potential for time delays in construction associated with these).
- 18 In considering the change in effects between the options and the 'base option', it is noted that there are no newly affected people identified for any of the three options.

- 19 There are three cases where there may be an increase in the potential adverse effects of an option (compared to the base option):
- 19.1 For Visual Impact, the relocated stack would change the visual effects for 79 – 89 Hendon Avenue (odd numbered properties only) for Options 1, 2 and 3, and Option 3 would also increase exposure of properties 96 and 98 Methuen Road (and surrounding properties) to the southern ventilation building. On balance, this is not considered a significant change and a minor effect (particularly when balanced with other positive environmental effects on these properties such as operation noise);
- 19.2 For Vibration effects during construction, Option 1 would have an increased impact on 49 – 81 Hendon Avenue (odd numbered properties only) and the Avondale Motorcamp. To a lesser extent, Option 2 would have increased impacts for 57-81 Hendon Avenue (odd numbered properties only) and the Avondale Motorcamp). For Option 1 this would be a significant change in construction effects for these properties but of limited duration (would be managed through the Construction Noise and Vibration Management Plan); and
- 19.3 For Social effects, the residential properties 81 – 89 Hendon Avenue may have minor increase in effects due to proximity to structures and access roads (including perception issues of vent buildings at rear of property). However, this is considered a minor change in effect (particularly when balanced with other positive environmental effects on these properties, such as operational noise).



---

**Amelia Linzey**  
**9 February 2011**



**ANNEXURE A - OPTION 1: SOUTHERN VENTILATION BUILDING  
WITHIN A DEEP CUT WITH SURFACE ACCESS RAMPS**

H E N D O N A V E N U E

47 49 51 57 59 61 71 73 75 77 79 81 83 85 87 89

Railway Corridor Designation  
Future Avondale - Southdown link

Ramp can start at this point

Sports field parking

Control Building

Car access to control building

Revised design option shown for comparison purposes

Large retaining wall for reverse area

Ventilation building within cut & cover below grade

South-bound lanes

Worker Parking and Manoeuvring

Stack

North-bound lanes

Truck access via 210m long ramp

Ramp finishes at this point

3,920 m<sup>2</sup>

O a k l e y C r e e k

Difficult reverse manoeuvre to exit

Truck access 8m underground

Stair and Lift access

15 m<sup>2</sup>

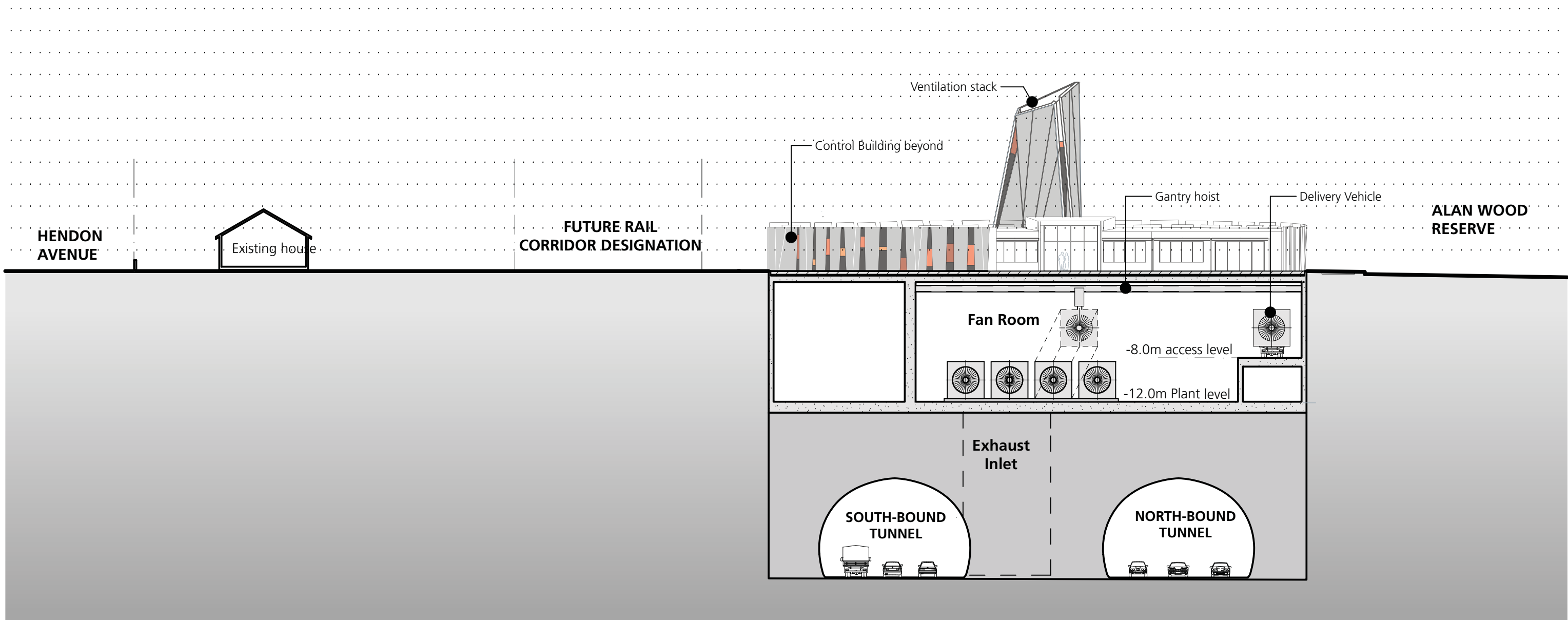
Location of portal for revised design option

Location of portal for this design option

Avondale Motor Camp

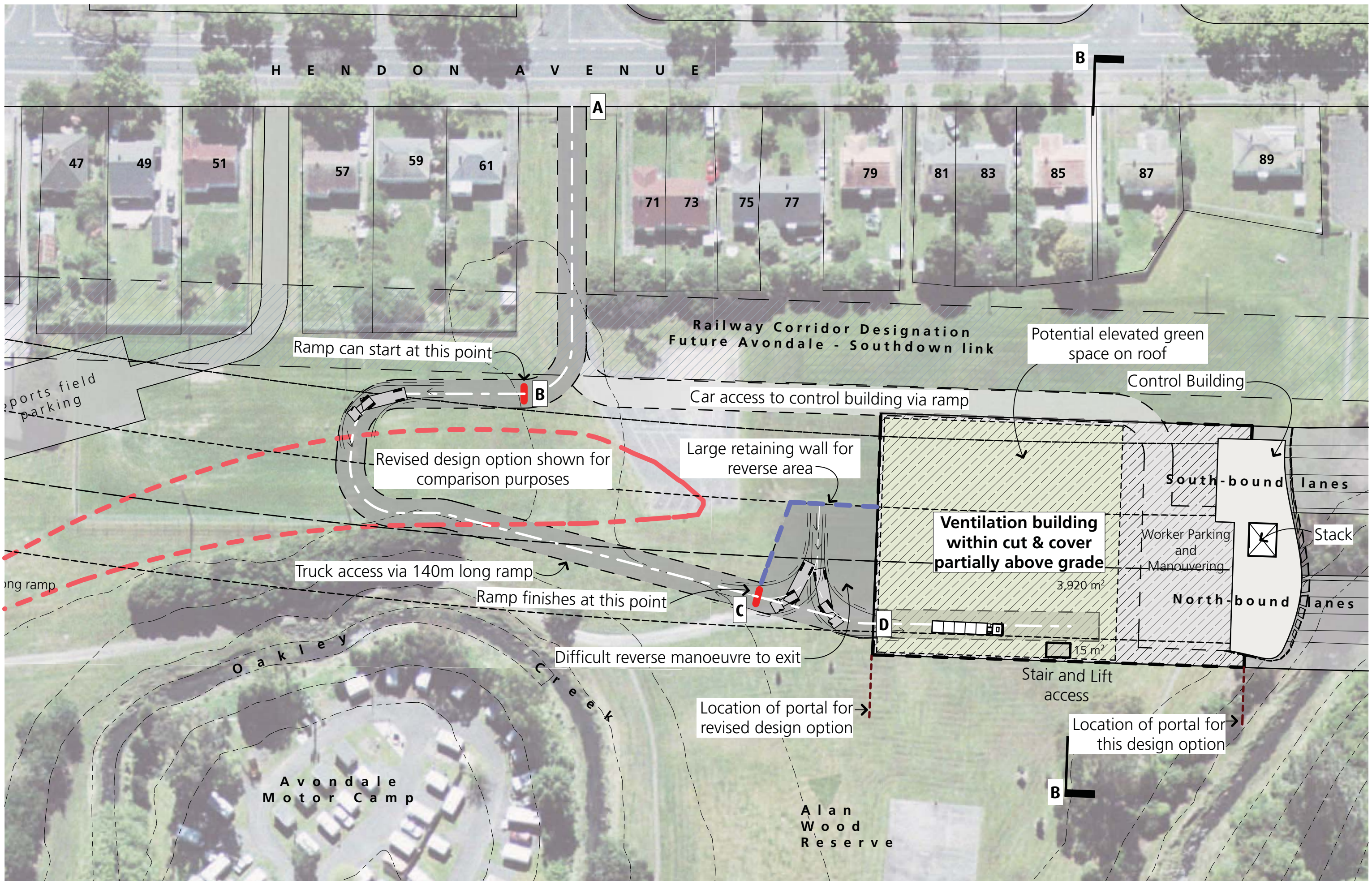
Alan Wood Reserve

<b>VENT - SOUTH</b>	<b>DWG 001</b>
<b>UNDERGROUND OPTION</b>	Scale: 1:1000@A4

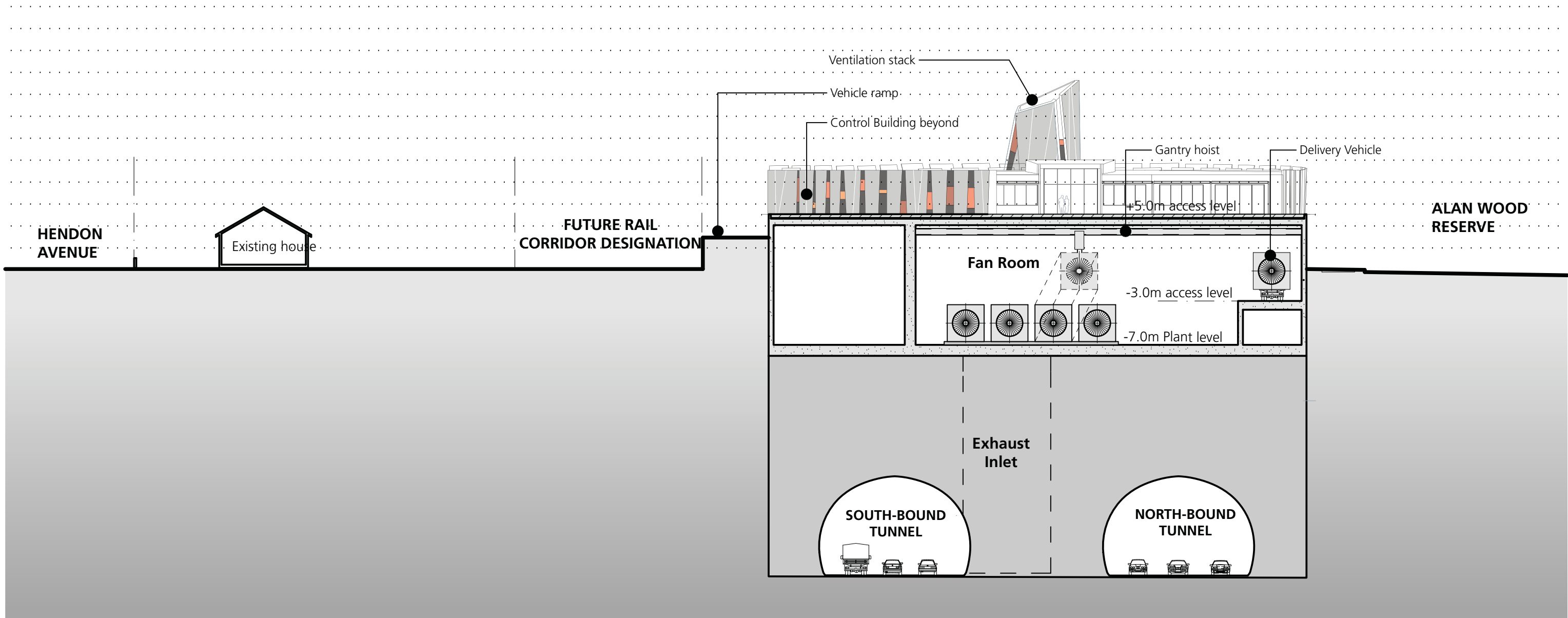


<b>VENT - SOUTH</b>	<b>DWG 001a</b>
<b>UNDERGROUND OPTION: SECTION AA</b>	Scale: 1:500@A4

**ANNEXURE B – OPTION 2: SOUTHERN VENTILATION BUILDING  
PLACED PARTIALLY UNDERGROUND**



<b>VENT - SOUTH</b>	<b>DWG 002</b>
PARTIAL UNDERGROUND OPTION	Scale: 1:1000@A4



<b>VENT - SOUTH</b>	<b>DWG 002a</b>
<b>PARTIAL UNDERGROUND OPTION: SECTION BB</b>	Scale: 1:500@A4

**ANNEXURE C – OPTION 3: SOUTHERN VENTILATION BUILDING  
WITHIN A DEEP CUT WITH SURFACE ACCESS AND GANTRY  
BUILDINGS**

H E N D O N A V E N U E

47 49 51 57 59 61 71 73 75 77 79 81 83 85 87 89

Railway Corridor Designation  
Future Avondale - Southdown link

Sports field parking

Control Building

Revised design option shown for comparison purposes

Ventilation Building within cut-and cover below ground

3,920 m<sup>2</sup>

Access hatches, Gantry building above ground

524 m<sup>2</sup>

Stair and Lift access

South-bound lanes

Worker Parking and Manoeuvring

Stack

North-bound lanes

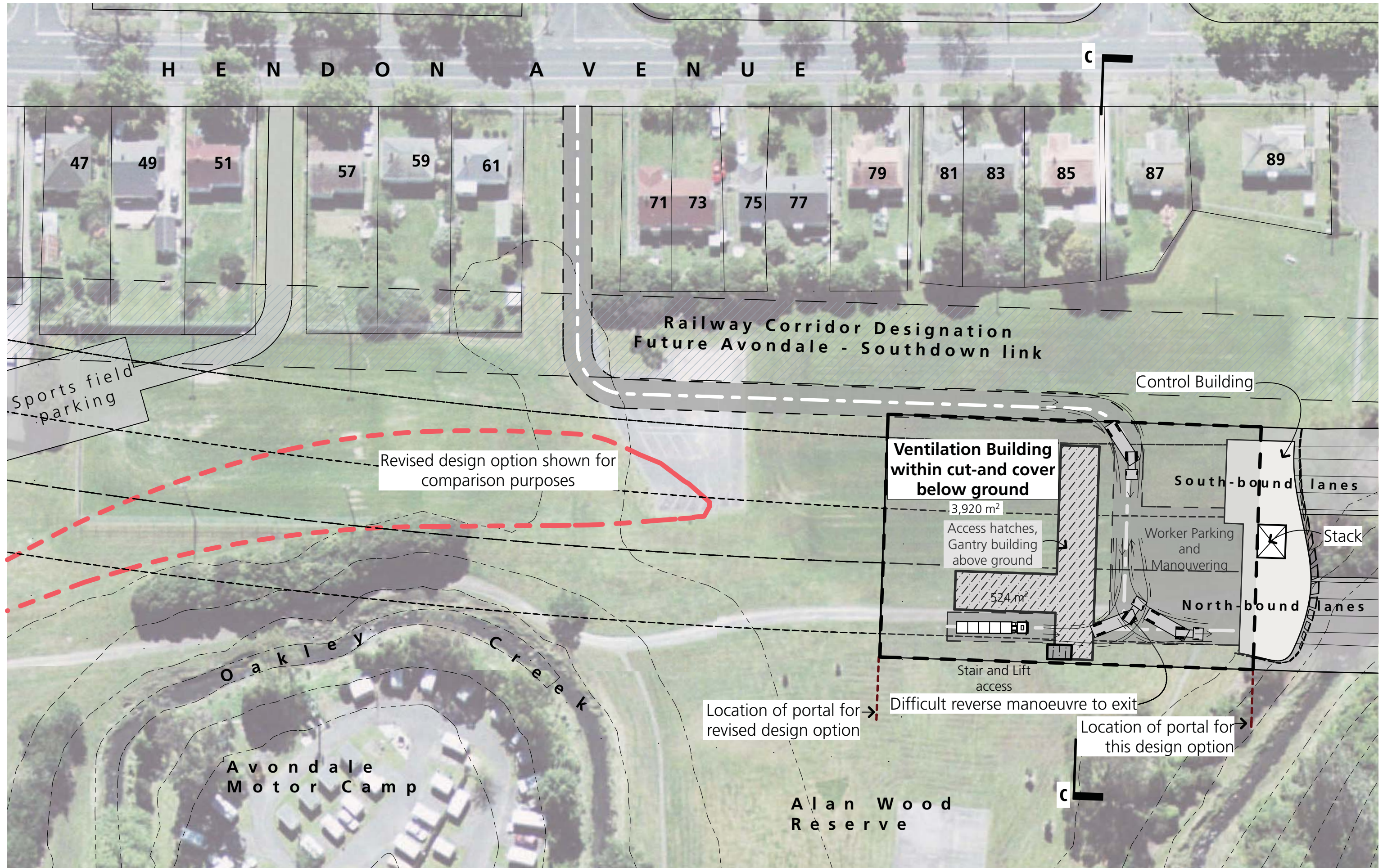
Location of portal for revised design option

Difficult reverse manoeuvre to exit

Location of portal for this design option

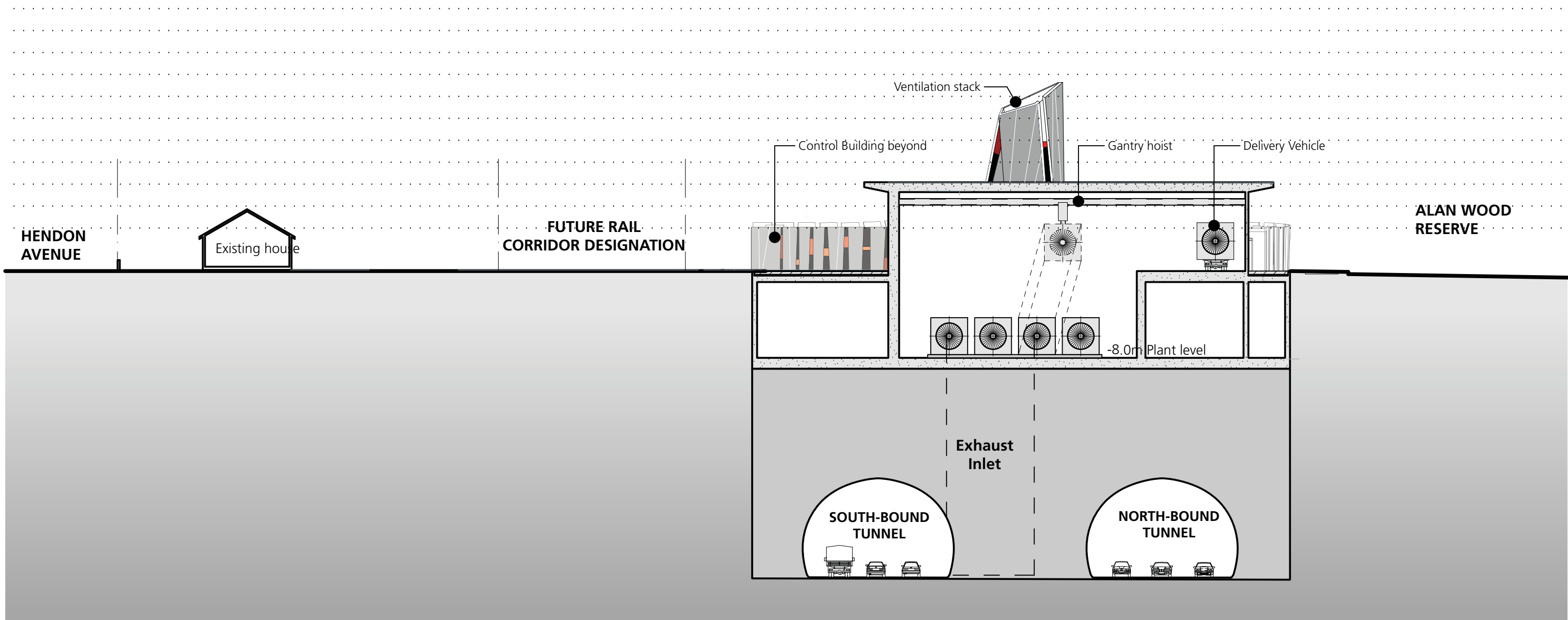
Avondale Motor Camp

Alan Wood Reserve



<b>VENT - SOUTH</b>	<b>DWG 003</b>
<b>PARTIAL UNDERGROUND, SERVICED BY GANTRY OPTION</b>	Scale: 1:1000@A4

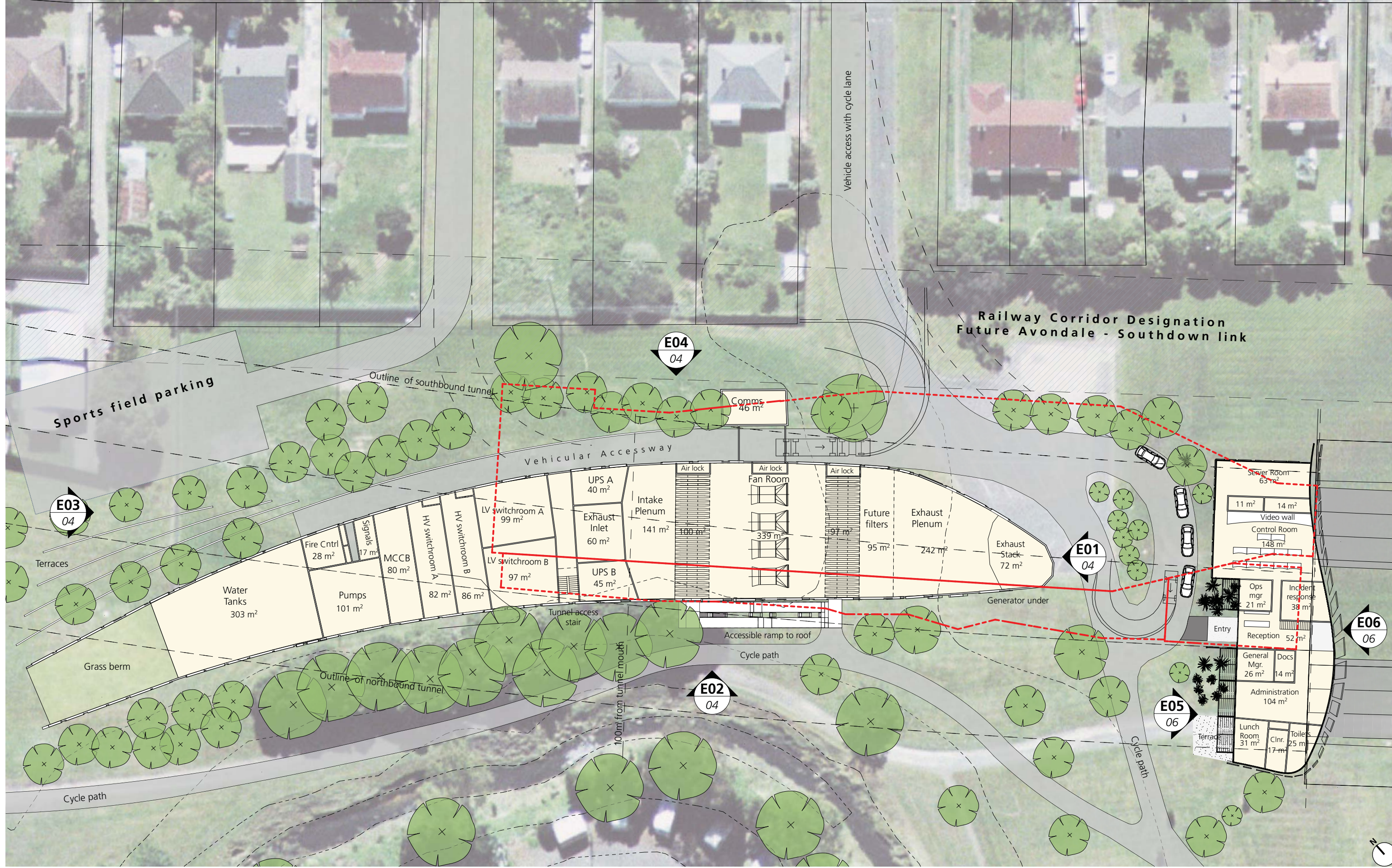




<b>VENT - SOUTH</b>	<b>DWG 003a</b>
<b>PARTIAL UNDERGROUND, SERVICED BY GANTRY OPTION: SECTION CC</b>	Scale: 1:500@A4

**ANNEXURE D – BASE OPTION: AS PRESENTED ON BEHALF OF THE  
NZTA IN THE EVIDENCE IN CHIEF OF MR DAVID GIBB (HIS  
ANNEXURE A)**

# H E N D O N A V E N U E



--- outline of building shown on lodged plans

**ANNEXURE E – COMPARATIVE EVALUATION OF SOUTHERN  
VENTILATION BUILDING OPTIONS (MULTI-DISCIPLINARY OPTION  
ASSESSMENT)**

## Annexure E: Comparative Evaluation of Southern Ventilation Building Options

### Process:

Members of the appropriate technical and environmental teams (as specified in the Evaluation Matrix's below) are asked to provide an assessment of the potential impacts of providing each potential southern vent building option.

The purpose of this is to evaluate the potential adverse effects/impact in terms of the **Impact Scale Key** below. **For the purpose of this as a comparative evaluation, these options are assessed against the Base Option (as it is the option as assessed in the NZTA application / evidence to date).**

In addition, the team has provided comments to explain why this particular impact score has been assigned, whether any assumptions have been made in coming to this conclusion, and whether there are any outstanding risks/issues with the potential option.

### Evaluation Matrix:

#### Impact Scale Key:

Impact Key	
+++	The potential effects of the option are considered to be <b>significant positive effects</b>
++	The potential effects of the option are considered to be <b>moderate positive effects</b>
+	The potential effects of the option are considered to be <b>minor positive effects</b>
0	The potential effects of the option are considered to be <b>insignificant (no effects)</b>
-	The potential effects of the option are considered to be <b>minor adverse effects</b>
--	The potential effects of the option are considered to be <b>moderate adverse effects</b>
---	The potential effects of the option are considered to be <b>significant adverse effects</b>

**Base Option** – Concept plans for Southern Ventilation Building as presented in the EIC of Mr David Gibbs (Annexure A, particularly Drawings 1 – 3). For the purpose of comparative evaluation, **this option is assumed to be '0'**

**Option 1** – Southern Ventilation building within a deep cut with surface access ramps – Shown on Attached Drawing 001 and Cross Section 001a (**Annexure A**). It places the building completely within the deep cut prior to the driven tunnel portal. An access ramp of 210m maximum length can be provided between points B and C. This is deemed to be the minimum length that could be accommodated without increasing the amount of land required from within the Alan Wood Reserve for the access road.

**Option 2** – Southern Ventilation building placed partially underground – Shown on Attached Drawing 002 and 002a (**Annexure B**). It places the building partially within the deep cut prior to the driven tunnel portal. The building is elevated by 3m above the existing ground levels over its full extent; and

**Option 3** – Southern Ventilation building within a deep cut with surface access and gantry buildings – Shown on Drawing 003 and 003a (**Annexure C**). It places the building completely within the deep cut prior to the driven tunnel portal, with surface buildings provided to accommodate the gantry cranes for removal and replacement of the ventilation fans and power equipment.

Assessment Criteria	Assessor	Base Option Construkt design	Option 1 Deep cut and surface entry ramps (Drawings 001 and 001a)	Option 2 Partially Underground (Drawings 002 and 002a)	Option 3 Deep cut with surface entry ramps and gantry buildings (Drawing 003)	Commentary
The extent to which the option will achieve compliance with the relevant noise criteria	Noise (Siiri Wilkening)	<b>0</b>	<b>+</b>	<b>+</b>	<b>++</b>	Two main noise issues with the layouts: <b>Ventilation Stack:</b> Options 1, 2 and 3 are minor positive due to long distance from stack to closest dwelling. Base Option is as previously assessed. <b>Noise from building:</b> Options 1, 2 and 3 are moderately positive as noise breakout is effectively and entirely mitigated through burying of building. Base Option is neutral as heavy building materials can achieve similar results.
		Vent Stack: 0 Bldg noise: 0  Combined: 0	Vent Stack: + Bldg noise: ++  Combined +	Vent Stack: + Bldg noise: ++  Combined +	Vent Stack: + Bldg noise: ++  Combined +  <i>Note preferred over options 1 and 2 due to driveway arrangement but acknowledged not a significant noise source</i>	
Cost Implications	Cost (Andre Walter and Mike Collins)	<b>0</b>	<b>--</b>	<b>--</b>	<b>--</b>	Base Option and Option 1 costings prepared pre-lodgement, based on scheme design. For Options 2 and 3 revised costings have been undertaken by Mike Collins, Bond Construction Management Ltd (February 2011), from the architectural concepts (Annexures B and C) and are provided in Annexure G. <b>Cost estimates scoring:</b> Up to 0.5% increase on project base cost = (-) Between .05 - 1% increase = (--) Over 1% increase on project base cost = (---)
		Base: \$8.6M	+\$10.1 million (+0.5%) (\$18.7M)	+\$15.2 million (+0.8%) (\$23.8M)	+\$12.9 million (0.7%) (\$21.5M)	
The visual impact of the building (including the maintenance and enhancement of amenity values)	Visual (Stephen Brown)	<b>0</b>	<b>+</b>	<b>0</b>	<b>++</b>	Assessed against the potential 'sculptural features within Alan Wood Reserve' for the base option <b>but</b> also the height, scale and overall mass of the building for viewing audiences.
			Undergrounding of the ventilation building would clearly benefit nearby residents by reducing its profile, but the ramp would compromise the appearance of the residual open space of Alan Wood Reserve.	A 'reservoir-like' building would emerge that covers a very large area of open space. Although much lower than the base option building, this bulky structure would still be both prominent and substantially devoid of character. The ramping down into it would still compromise the residual open space at a key 'neck' within Alan Wood Reserve.	Although revealing a structure that is more elevated than Options 1 and 2, the much narrower profile of the ventilation building and its side-on alignment relative to Hendon Ave would help to reduce its impacts on that quarter. The removal of ramping would afford a greater degree of visual cohesion and continuity within the residual open space of Alan Wood Reserve.	
Aesthetic issues relating to context and integration with other proposed works and surrounding land uses	Urban Design (Lynne Hancock)	<b>0</b>	<b>--</b>	<b>--</b>	<b>++</b>	Preference for Option 3 is no reflection on design quality of Construkt base option – it is founded in the urban design principle that the most 'truly' underground option with the least impact on the area character, and the most ability to be integrated with the park and adjacent residential environment, is preferred.
		Considerable positive design work has resulted in a built form as attractive as it can be, given it is above ground. I consider the proposal is a bold and appealing architectural response to the context (as noted, would be better if useable not just a fortress in the park).	This option alienates a large area between car access to control bulding, ramps and building that could contribute to open space character (and be used) (assessed further below). Effectively a larger footprint of structures and access ramps than the Construkt option. Ramps are a significant 'cut' that (with any fencing) would create a local visual as well as a physical barrier – an impact on park character just as above-ground structures are. Reversing area is a large hole in the ground – could have a lid but would still 'read' as heavily structured.	As for Option 1 but to a slightly lesser extent, given shorter length of ramp. Noted that ventilation building roof could be accessible – this is a positive but is still marooned between ramps and an island in the park rather than integrated with the open space. However, this being elevated, and the area between portals apparently for worker parking only, this has the potential to further constrain the alignment of the pedestrian/cycleway which is a poor aesthetic and integration outcome.	A much smaller footprint than any of the other options, with the ability to mound up around it and visually integrate with the open space - the most respectful of existing character and context because it is effectively the most 'fully' underground (when surface ramps are considered as well as the building). If the area next to 'stair and lift access' for truck parking could be integrated with the building (and possibly with any mounding) so that it was not highly visible, this would be a further improvement that would minimise the industrial character.	

Assessment Criteria	Assessor	Base Option Construct design	Option 1 Deep cut and surface entry ramps (Drawings 001 and 001a)	Option 2 Partially Underground (Drawings 002 and 002a)	Option 3 Deep cut with surface entry ramps and gantry buildings (Drawing 003)	Commentary
The Social Impacts of the options (specifically attitudes and expectations, wellbeing, culture and community cohesion).	Social (Amelia Linzey)	0	+	-	++	The base option has been the subject of several submissions and is identified as a significant impact for the community. Key issues for the Base Option: <u>Attitudes and expectations</u> - relate to the communities understand that the building would be below ground and therefore issues of feeling 'misinformed'. <u>Wellbeing and 'way of life'</u> – reserve linkages and accessibility to reserve areas and the 'industrialisation of the park area'. Perceptions of health impacts associated with the stack. The base option provides for some improved pedestrian / cycle connectivity from New Windsor to areas such as Pak'n Save, Mt Owairaka / Owairaka Domain, Mt Albert College and Owairaka District School (links back from Owairaka to Avondale more likely to use existing New North Road route). <u>Culture</u> – some potential for the sculptural form to become a feature of the area, however this is highly dependent on final design and approach to the design process. Oakley Creek identified for cultural values (longest stream in urban Auckland). <u>Communities</u> – current disconnection of Owairaka and New Windsor by Oakley Creek is mitigated to some degree by bridges and cycleway linkages over the portal area. However, road and building will to some extent reinforce the 'barrier' between these two communities.
			Option 1, is furthest extent of building underground and should have positive social impacts. However, it is noted that the deep cuts and surface entry (with associated restrictions to access and use of this area) has potential issues as the useability and accessibility of areas not altered from Base Option. Connectivity between New Windsor and Owairaka similar though perception of improved access by reduced scale of buildings (e.g. ramp would constrain access but would do so in a less perceptible manner). Assumes the car accesses and parking of very low use and therefore not a pedestrian 'conflict'.	Assume this building / ramp configuration would push pedestrian / cycle access further west towards Harlston Road (which does not have direct access opportunities through to Mount Albert Area (e.g. Owairaka Domain or District Shool). While building scale reduced would still reinforce 'barrier' between communities, particularly south Owairaka / New Windsor.	While this option has a building it is shifted to the south and maintains Alan Wood Reserve connectivity to Owairaka. With the pedestrian / cycle connection, this enhances accessibility across this area and to other community sites / resources of Mount Albert (e.g. Owairaka Domain). Improves the separation of the building / project from the 'sensitive' community of Avondale Motorcamp (the long term residents of this facility are considered generally a more vulnerable group in the community - with less resource to 'move on').	
The extent to which the option would comply with relevant safety Standards and guidelines	Design (Andre Walter)	0	--	-	0	
		Fully complies	Access road does not comply	Access road is improved over Option 1 but remaining operation issues	Fully Complies	
The technical feasibility of undertaking the building option	Construction (Andre Walter)	0	--	---	-	
		Constructing a building at surface has no complexities	Due to the elevated nature of the structural frame, this would be more complex to construct and could not be done while tunnelling is in progress. May therefore have a time impact for construction programme, with added complexity of the access road.	Due to the extended elevated nature structural frame, this would be more complex piling and retaining methods and could not be done while tunnelling is in progress. May therefore have a time impact for construction programme.	As for Option 1, without the impact on the access road.	
The availability of sufficient land to implement and maintain the proposed measure(s) and the extent to which the road controlling authority/developer would need to acquire land, or interests in land, in order to carry out or maintain building.	Planning (Amelia Linzey)	0	0	0	+(++)	Issues considered include: 1. Rail corridor 2. Land take requirements 3. Proximity to residential neighbours
			No change from base option	Very minor potential for improved use by rail of the SP3 Zone, but not considered sufficient to change rating.	Maintains area of open space land between 71 and 79 Hendon Ave and potential for improved utilisation by rail of the SP3 Zone / existing Designation corridor to the north. <i>Note if the latter confirmed then ++ would be appropriate scoring as reduces proximity of rail to properties on Hendon Ave north of the Project to New North Road.</i>	
Any potential effects of the option on public access to the coastal marine area, rivers, or lakes	Social (Amelia Linzey)	0	0	0	0	No direct change to access along Oakley Creek, though it is noted that the Options may improve the use of some areas of reserve adjoining the Creek (assessed and reflected elsewhere in this assessment matrix).

Assessment Criteria	Assessor	Base Option Construct design	Option 1 Deep cut and surface entry ramps (Drawings 001 and 001a)	Option 2 Partially Underground (Drawings 002 and 002a)	Option 3 Deep cut with surface entry ramps and gantry buildings (Drawing 003)	Commentary
Any potential effects on groundwater (quality of the environment)	Groundwater (Ann Williams)	0	--	-	0	Southern portal has been modelled as fully drained, so provided the access remains within the basalt, effects over and above the base case will be minor. The access road cuts are likely to result in a small increase in losses from Oakley Creek, increased drawdown, which for Option 1 would be within the compressible Tauranga Group, and therefore increased settlement. Depending on the nature of the fill encountered in Alan Wood Reserve, it is possible that some contaminated materials will need to be dealt with.
			Requires a cut down to 8m for the access road which will result in draining of Tauranga Group soils as well as the basalt; Draining the Tauranga Group soils will result in increased ground settlements; potential for increased losses from Oakley Creek	Requires a 3m cut which should remain within the basalt; we have assumed southern portal fully drained in modelling – this extends the area of influence a little; likely to be small amount of increased inflows to be discharged and perhaps minor increase in losses from Oakley Creek	No change from the status quo in terms of groundwater assumptions	
Any potential physical effects on surrounding land use (settlement)	Settlement (Gavin Alexander)	0	0	0	0	Minor adverse effects for <u>all</u> options (same as base option), as building damage is predicted in this area and is independent of the scheme propose. This is because all options have the same open cut leading to the driven tunnel portal. Refer Technical Report G.13: Assessment of Ground Settlement Effects, Figure G-4 for damage categories.
			This may have slightly more groundwater settlement (assessed above) but not anticipated to have 'damage' as drawdown leads to gentler curvature of settlement trough.			
Any associated effects with air quality	Air (Gavin Fisher)	0	0	0	0	There is really only one air quality issue with all these options. The discharge point must be at least 15 - 25m above ground. However, there are moderate advantages from having a smaller sized building (to reduce downwash effects). It is noted this should <b>not</b> be held up as a decision criterion, unless the height of the building gets more than 10m.
Any associated effects with vibration	Vibration (Peter Miller)	0	--	-	0	Operational vibrations very small so no tangible improvement for potentially affected receivers.
			This option is likely to require blasting in basalt with the depth of the cut, impacting on properties approximately 49 – 81 Hendon Ave and Motorcamp.	While cutting into basalt still expected at this depth may be through alternative (less impact) methods.		
Effects on open space	Open Space (Dave Little)	0	+	0/+	++	The shifting of the portal east, and resultant increase in overall open space area is a positive for all three options, as Open Space at this point is the least affected by noise impacts. Fencing remains a risk as this has potential to introduce a very 'utilitarian' element into the open space, reducing amenity and perceived safety. This should be minimised regardless of option chosen. CPTED issues for use of open space relating to both the perceived - and actual have been considered in the ratings. All options are generally an improvement over the base option due to a reduction in 'unsurveillance area' screened by built elements. The benefits of options 1 and 2 are marginal – improved surveillance appears to be offset by a reduction in connectivity and 'escape routes'. Option 3 however is very positive, with greatly improved surveillance, connectivity (escape route options) and a reduction in narrow 'pinch points' between any building and the creek.
		Base option. Noted in EIC of Mr Little that although this option takes up open space area, it contributes relatively positively to the surroundings and buffers open space to the west from the motorway corridor. Unresolved concerns regarding structures and ramps of any alternative underground option noted.	Open space amenity would be improved by the reduction in built structures under this option and the more vegetated park backdrop to the north of the ramp. However, the proposed ramp severs much of the open space regained by shifting the portal and restricts east/west connections in a similar manner to the base option. With no pedestrian bridge proposed, this option has negative connectivity impacts.	Fairly neutral impacts. The utilitarian footprint of the built form increases its potential impacts on quality, but its location opens up more open space quantum. The proposed ramp minimises quantity/quality gains as per option one, and connectivity concerns remain. Overall, slightly improved outcome from an open space point of view, but marginal.	Very positive effects overall. The largest usable area of 'high quality' open space created west of the portal (although note that this area may remain rail designation). Proposed cycleway connection to Hendon could be split from the 'utility' area, improving amenity. Proposed utility access does not sever open space, remains at grade (reducing fencing) and the much smaller bulk of the buildings would greatly lessen overall amenity impacts. Fencing, hardstand areas would still need to be carefully considered, but this appears the best option from an OS perspective.	



**ANNEXURE F – ASSESSMENT OF CHANGE IN EFFECTS OF NEWLY  
AFFECTED PERSONS**

## Annexure F: Assessment of any Change To or Change in Nature of Effect on Affected Persons

Given that this design option is being provided **within** the existing proposed designation for the Waterview Connection Project, in addition to the environmental assessment above, a review has been undertaken to assess the degree to which the effects of any parties may have increased and in particular if there are any **newly affected parties**. This assessment is relative to those parties identified in the Base Option assessment.

Assessment Criteria	Responsibility	Option 1 Deep cut and surface entry ramps (Drawings 001 and 001a)		Option 2 Partially Underground (Drawings 002 and 002a)		Option 3 Deep cut with surface entry ramps and gantry buildings (Drawing 003)	
		Newly Affected	Increased Effects	Newly Affected	Increased Effects	Newly Affected	Increased Effects
Noise	S Wilkening	No	Will decrease noise impact on residents 81-89 Hendon (as the were already 'affected' by on property boundary). Stack noise will be different type of noise.	No	Will decrease noise impact on residents 81-89 Hendon (as the were already 'affected' by on property boundary). Stack and building noise will be different type of noise.	No	Will decrease noise impact on residents 81-89 Hendon (as the were already 'affected' by on property boundary). Stack and building noise will be different type of noise.
Visual Impact	S Brown	No	The Base Option is likely to generate a high / significant level of effects in relation to 35 – 77 Hendon Ave, at the very least. Option 2 would more directly affect properties 75 – 89 Hendon Ave with shift in stack location ( <b>so different effects of 79, 81, 83, 85, 89 Hendon</b> ). However, all considered visually affected to some degree by all options (e.g. <u>change</u> in effect not newly affected).	No	The Base Option is likely to generate a high / significant level of effects in relation to 35 – 77 Hendon Ave, at the very least. Option 2 would more directly affect properties 75 – 89 Hendon Ave with shift in stack location ( <b>so different effects of 79, 81, 83, 85, 89 Hendon</b> ). However, all considered visually affected to some degree by all options (e.g. <u>change</u> in effect not newly affected).	No	The Base Option is likely to generate a high / significant level of effects in relation to 35 – 77 Hendon Ave, at the very least. Option 3 would more directly affect properties 75 – 89 Hendon Ave ( <b>so different effects of 79, 81, 83, 85, 89 Hendon</b> ). For <b>96 and 98 Methuen Rd, together with other nearby Methuen properties</b> would be exposed to all options, though Option 3 buildings would be closer (this is considered to be off-set as the buildings have a smaller profile) and future planting / vegetation will provide a substantial buffer in the longer term.
Aesthetics and Integration of Works	L Hancock	No	Nil	No	Nil	No	Nil
Social Impacts	A Linzey	No	May increase impact on residents <b>81-89 Hendon Avenue</b> (already 'affected' by road / designation on property boundary - increased proximity to structures and accessways though effect (low minor))	No	May increase impact on residents <b>81-89 Hendon Avenue</b> (already 'affected' by road / designation on property boundary - increased proximity to structures and accessways though effect (low minor))	No	May increase impact on residents <b>81-89 Hendon Avenue</b> (already 'affected' by road / designation on property boundary - increased proximity to building effect (so <b>minor change</b> ))
Land Use	A Linzey	No	Potential reduced effects for Kiwirail (e.g. the ability to make better use of the existing SP3 Zone / Designation)	No	Potential reduced effects for Kiwirail (e.g. the ability to make better use of the existing SP3 Zone / Designation)	No	Potential reduced effects for Kiwirail (e.g. the ability to make better use of the existing SP3 Zone / Designation)
Open Space	D Little	No	Nil	No	Nil	No	Nil
Public access to CMA, rivers of lakes	A Linzey	No	Nil	No	Nil	No	Nil
Groundwater	A Williams	No	Increased drawdown in compressible soils; losses from Oakley Creek base flow expected to increase	No	Small increase in groundwater drawdown but in non-compressible basalt	No	Nil
Settlement	G Alexander	No	Nil	No	Nil	No	Nil
Air Quality	G Fisher	No	Nil	No	Nil	No	Nil
Vibration	P Millar	No	Increased vibration and noise impacts for <b>49 – 81 Hendon Ave and Avondale Motorcamp</b> (increase in effects on already effected areas).	No	Some increased vibration and noise impacts for <b>57 – 81 Hendon Ave and Avondale Motorcamp</b> (increase in effects on already effected areas).	No	Nil

**ANNEXURE G – COSTS ESTIMATES OF SOUTHERN VENTILATION  
BUILDING OPTIONS**

To: Sumi Eratne, Project Director Western Ring Route  
From: Michael Collins, Estimating Manager, Bond Construction Management  
Date: 10<sup>th</sup> February 2011

## NZTA WATERVIEW CONNECTION PROJECT

---

Attached is the pricing summary for the South Ventilation Building Options, as requested by Mr. Andre Walter to support NZTA's Board of Inquiry evidence on the Waterview Connection Project.

The detailed pricing for the Southern Ventilation building below ground, referred to as Option 1 in Mr. Walter's Rebuttal evidence was undertaken by the quantity surveying firm WT Partnership in May 2010, for Bond Construction Management and NZTA, as part of the options being considered at that time. This pricing was based on the Beca concept design drawings SK-V01 through to SK-V08. There is not considered to be any significant difference between the May 2010 pricing parameters and those applicable currently, and therefore the WT Partnership estimate for Option 1 is not changed (\$18.7m).

The Base Case estimate, above ground, is based on architectural drawings (Drawing 1 through to 7) by Construct dated 12/11/2010. We have assumed the general form of the building is similar to the Beca concept design for Option 1 but with significantly reduced structural and seismic requirements. We have assumed foundations to be a raft slab and that piling is not required. The Base Case building is approximately 1,400 m<sup>2</sup> less than the Option 1 layout and, where we believe appropriate, we have made pro-rata adjustments to quantities. On this basis our estimate for the Base Case Ventilation building is \$8.6m.

The cost estimate for Option 2, partially below ground, is based on the concept layout and indicative section shown in drawings 002 and 002A (attached to Mr. Walter's Rebuttal evidence, Annexure I). We have made an allowance for additional structural strengthening to the Option 1 design as advised by Mr. Walter. On this basis our estimate for the Option 2 Ventilation building is \$23.8m.

The cost estimate for Option 3, gantry option, is based on the concept layout and indicative section shown in drawings 003 and 003A (attached to Mr. Walter's Rebuttal evidence, Annexure J). We have assumed the below ground level portion of the building is the same as the design for Option 1 but with some additional foundations required. We have included for the above ground level Gantry annex of 524 m<sup>2</sup> and an additional 10t gantry crane. On this basis our estimate for the Option 3 Ventilation building is \$21.5m.

### **Bond Construction Management Ltd**

■ 45 Alma Street North / Renwick / Marlborough 7204 / New Zealand / t: 03 572 8496  
■ 55 Fisher Point Drive / Freemans Bay / Auckland 1010 / New Zealand / t: 09 377 5294

1/2

u k.

We have been requested to price the Ventilation building works only and assume the Control building is common to all options. The provision of access ramps and roadways for maintenance operations is not included in our estimates but note this is referred to in Mr. Walter's Rebuttal evidence.

Building costs are expressed as a full sub-contract package as this is more commonly understood when comparing building costs per square metre. The estimates do not include corporate overheads, profit, supervision and design costs and for an alliance project delivery model, on which the project is to be procured, this is in the order of an additional 25%.

An engineering design has not been commissioned for the Options 2 and 3, however based on the work scope and design assumptions outlined above, we consider these estimates to have an accuracy range of +/- 30%. Option 1 is completed in more detail and considered to have an accuracy range of +/- 10%.

M. J. Coe  
10/2/2011.

**Bond Construction Management Ltd**

- 45 Alma Street North / Renwick / Marlborough 7204 / New Zealand / t: 03 572 8496
- 55 Fisher Point Drive / Freemans Bay / Auckland 1010 / New Zealand / t: 09 377 5294

**WATERVIEW CONNECTION PROJECT  
SOUTH PORTAL VENTILATION BUILDING OPTIONS**



ITEM	DESCRIPTION (AREA)	OPTION-1 (3, 692 m2)	BASE CASE (2, 253 m2)	OPTION-2 (3, 692 m2)	OPTION-3 (3, 692 + 524 m2)
1-6	EXCAVATION	585, 720	110, 600	700, 000	610, 000
7-8	PILING	938, 000	-	1, 500, 000	1, 000, 000
9-54	CONCRETE WORK	4, 532, 768	2, 013, 500	6, 000, 000	5, 250, 000
55-62	PRECAST CONCRETE	2, 015, 200	1, 145, 700	2, 500, 000	2, 300, 000
63-78	REINFORCING STEEL	3, 354, 941	1, 121, 100	4, 700, 000	3, 840, 000
79-80	STRUCTURAL STEEL	150, 000	199, 800	350, 000	275, 000
81-83	TANKING	847, 390	338, 000	850, 000	850, 000
84-86	BLOCKWORK	824, 455	615, 000	825, 000	900, 000
87-97	METALWORK	645, 500	517, 700	700, 000	725, 000
98-100	CARPENTRY	651, 505	423, 600	650, 000	675, 000
101-102	JOINERY	43, 000	35, 600	45, 000	50, 000
103-113	PLUMBING & DRAINAGE	87, 162	31, 600	100, 000	100, 000
114	MECHANICAL SERVICES	115, 000	89, 300	150, 000	150, 000
115-117	FIRE PROTECTION	299, 955	232, 900	300, 000	350, 000
118	SECURITY	15, 000	15, 000	15, 000	15, 000
119-120	GANTRY CRANE & LIFT	280, 000	100, 000	300, 000	600, 000
121-123	ELECTRICAL SERVICES	150, 620	119, 000	150, 000	170, 000
124	COMMUNICATION	5, 000	5, 000	5, 000	5, 000
125-126	FLOOR COVERINGS	155, 940	99, 000	156, 000	180, 000
127-128	PAINTING	40, 520	13, 800	60, 000	60, 000
129-130	SITWORKS	122, 540	50, 000	100, 000	100, 000
	S/T	\$ 15, 860, 216	\$ 7, 276, 200	\$ 20, 156, 000	\$ 18, 205, 000
200	PRELIMINARY & GENERAL	1, 982, 530	909, 530	2, 519, 500	2, 275, 630
	S/T	\$ 17, 842, 746	\$ 8, 185, 730	\$ 22, 675, 500	\$ 20, 480, 630
300	SUB-CONTRACTOR'S OVERHEADS & MARGIN	892, 140	409, 290	1, 133, 780	1, 024, 030
	TOTAL	\$ 18, 734, 886	\$ 8, 595, 020	\$ 23, 809, 280	\$ 21, 504, 660
	DIFFERENCE TO BASE CASE	\$ 10, 100, 000		\$ 15, 200, 000	\$ 12, 900, 000