

National Weigh Right Programme

ADDENDUM to the ROAD SAFETY AUDIT of DETAIL DESIGNS: SH1, MacKays Crossing

**A REPORT PREPARED FOR
NEW ZEALAND TRANSPORT AGENCY**

**Reference: 19359
August 2020**

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1.0 INTRODUCTION

1.1 Road safety audit procedure

Road safety audit is a term used internationally to describe an independent review of a future road project to identify any safety concerns that may affect the safety performance. The safety audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement.

A road safety audit is therefore a formal examination of a road project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc.), carried out by an independent competent team who identify and document road safety concerns.

The primary objective of a road safety audit is to deliver a project that achieves an outcome consistent with Road to Zero Safe System approach, that is, working towards elimination of death and serious injury. The road safety audit is a safety review used to identify all areas of a project that are inconsistent with a safe system and bring those concerns to the attention of the client in order that the client can make a value judgement as to appropriate action(s) based on the guidance provided by the safety audit team.

The key objective of a road safety audit is summarised as:

To deliver completed projects that contribute towards a safe road system that is ultimately free of death and serious injury by identifying and ranking potential safety concerns for all road users and others affected by a road project.

A road safety audit should desirably be undertaken at the following project milestones:

- Concept stage
- Scheme or Preliminary design stage
- Detailed design stage, and
- Pre-opening / Post-construction stage.

A road safety audit is not intended as a technical or financial audit and does not substitute for a design check on standards or guidelines. Any recommended treatment of an identified safety concern is intended to be indicative only to focus the designer on the type of improvements that might be appropriate. It is not intended to be prescriptive and other ways of mitigating the road safety concerns identified should also be considered.

In accordance with the procedures set down in the revised draft NZ Transport Agency Guideline “Road Safety Audit Procedures for Projects” (Interim Release May 2013) this is a report to the client who then refers the report to the designer. The designer should consider the report and comment to the client on each of the concerns identified,

including their cost implications where appropriate, and make a recommendation to either accept or reject the safety audit report recommendation.

For each audit team recommendation that is accepted, the client shall make the final decision and brief the designer to make the necessary changes and/or additions. As a result of this instruction the designer shall action the approved amendments. The client may involve a safety engineer to provide commentary to aid with the decision.

Decision tracking is an important part of the road safety audit process. A decision tracking table is embedded into the report format at the end of each set of recommendations to be completed by the designer, safety engineer and client for each issue documenting the designer response, client decision and action taken.

A copy of the report including the designer's response to the client and the client's decision on each recommendation shall be given to the road safety audit team leader as part of the feedback loop. The road safety audit team leader will disseminate this to team members.

1.2 The project

The project for which this is the road safety audit is the installation of infrastructure to increase heavy vehicle weight compliance. The project includes an increase in the number of weight enforcement sites, known as commercial vehicle safety centres (CVSC), and the use of technology to target non-compliant vehicles. The new infrastructure is for the installation of vehicle screening systems (VSS) which incorporate weighing in motion (WIM), number plate recognition and variable message signage (VMS) to tell a driver to pull into the CVSC.

This road safety audit reviews the design for the site located near MacKays Crossing, Paekakariki. This site is a new location for one that was previously safety audited (see **Figure 1**) and the scope of the works comprises new CVSC, VSS and some road widening at the CVSC access to enable a right turn bay to be installed. Some of the works related to this facility fall within the Transmission Gully project that is currently under construction.

The design was prepared by Jacobs, Wellington, and the principal drawings provided to the safety audit team are shown in the Appendix (**Figures 13 – 16**). The safety audit team was also provided with the following:

- MacKays Transport Assessment prepared by Jacobs and dated 17 July 2020;
- Transmission Gully project road alignment drawings TG-AEU-DRG-NTH-AL-1001 to 1006, dated 20.05.16.

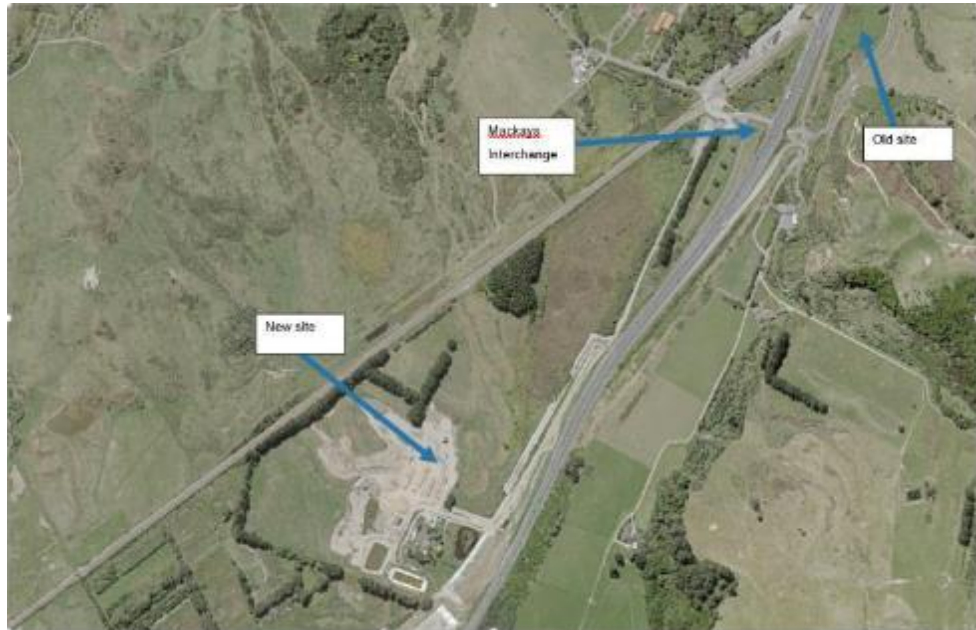


Figure 1: Site location

1.3 The road safety audit team

The road safety audit was carried out, as far as practicable, in accordance with the NZ Transport Agency Guideline “Road Safety Audit Procedures for Projects” (Interim Release May 2013) by:

- Steve Reddish, Senior Associate, Traffic Planning Consultants Ltd, Hawke’s Bay;
- Colin Brodie, Road Safety Consultant, NZ Transport Agency;

The safety audit team (SAT) was provided with the information noted in section 1.2.

The safety audit team undertook a desk top review of the drawings provided and a site visit was undertaken by the safety audit team leader on Tuesday 28th July 2020.

1.4 Report Format

The potential road safety problems identified have been ranked as follows.

The expected crash frequency is qualitatively assessed based on expected exposure (how many road users will be exposed to a safety issue) and the likelihood of a crash resulting from the presence of the issue. The severity of a crash outcome is qualitatively assessed based on factors such as expected speeds, type of collision, type of vehicle, and road user involved.

Reference to historic crash rates or other research for similar elements of projects, or projects as a whole, have been drawn on where appropriate to assist in understanding

the likely crash types, frequency and likely severity that may result from a particular concern.

The frequency and severity ratings are used together to develop a combined qualitative risk ranking for each safety issue using the Assessment Matrix in **Table 1** below. The qualitative assessment requires professional judgement and a wide range of experience in projects of all sizes and locations.

Table 1: Assessment Matrix

Likelihood of death or serious injury	Probability of a crash			
	Frequent	Common	Occasional	Infrequent
Very Likely	Serious	Serious	Significant	Moderate
Likely	Serious	Significant	Moderate	Moderate
Unlikely	Significant	Moderate	Minor	Minor
Very Unlikely	Moderate	Minor	Minor	Minor

While all safety concerns should be considered for action, the client or nominated project manager will make the decision as to what course of action will be adopted based on the guidance given in this ranking process with consideration to factors other than safety alone. As a guide a suggested action for each category of concern is given in **Table 2**.

Table 2: Categories of Concern

Concern	Suggested action
Serious	Major concern that must be addressed and requires changes to avoid serious safety consequences.
Significant	Significant concern that should be addressed and requires changes to avoid serious safety consequences.
Moderate	Moderate concern that should be addressed to improve safety.
Minor	Minor concern that should be addressed where practical to improve safety.

In addition to the ranked safety issues, it is appropriate for the safety audit team to provide additional comments with respect to items that may have a safety implication, but which lie outside the scope of the road safety audit. A comment may include: items where the safety implications are not yet clear due to insufficient detail for the stage of

project, items outside the scope of the audit such as existing issues not directly impacted by the project, or an opportunity for improved safety that is not necessarily linked to the project itself. While typically comments do not require a specific recommendation, in some instances suggestions may be given by the safety auditors.

All potential concerns, comments and recommendations set out in this safety audit report should be noted and acted upon if appropriate.

1.5 Disclaimer

The findings and recommendations in this report are based on an examination of available relevant plans, the specified road and environs, and the opinions of the safety audit team. However, it must be recognised that eliminating safety concerns cannot be guaranteed since no road can be regarded as absolutely safe. Furthermore, no warranty is implied that all safety issues have been identified in this report. Road safety audits do not constitute a design review or an assessment of standards with respect to engineering or planning documents.

Readers are urged to seek specific advice on matters raised and not rely solely on the report. While every effort has been made to ensure the accuracy of the report, it is made available strictly on the basis that anyone relying on it does so at their own risk without any liability to members of the safety audit team or their organisations.

2.0 SAFETY AUDIT FINDINGS

Preamble:

1. This road safety audit concentrates on highway safety issues and does not cover the off-road infrastructure and layout of the commercial vehicle safety centre itself which the safety audit team (SAT) assumes is based on sound design principles for the safe operation.
2. Throughout this report the following abbreviations are used:
WIM: weigh in motion facility
VMS: variable message sign
CVSC: commercial vehicle safety centre
3. Whilst this report should be read in conjunction with the previous road safety audit report dated 30 August 2019, a number of the concerns raised in the previous report also pertain to the new CVSC location. These are repeated here for completeness as the SAT has not been provided with completed decision tracking tables related to the safety issues noted for the previous MacKays Crossing CVSC site.
4. The SAT is of the view that the proposed new location for the CVSC at MacKays Crossing offers a more appropriate site for this facility as it is no longer proposed to be within a rural community on a road that would present road safety challenges to all users of that road.

2.1 Moderate Concern – Routes between SH1 and the CVSC

Probability of Crash Occurring – Occasional

Likelihood of Serious/Fatal Injury – Likely

Outcome – Moderate

The drawings and traffic assessment provided to the SAT indicate that the route between SH1 and the CVSC will be via MacKays interchange for both directions of travel on SH1 (southbound on Raumati expressway and northbound on Transmission Gully). The SAT was advised that for southbound traffic, consideration was being given to directing trucks to the CVSC via the new Paekakariki interchange located some 1.75 km south of the MacKays interchange, though the infrastructure for this was not shown on any drawings.

From a road safety perspective, the SAT considers that all truck movements between SH1 and the CVSC should be via MacKays interchange for the following reasons:

1. if trucks are directed via the Paekakariki interchange they will have to negotiate the staggered X-intersection at the Coast Road route/Paekakariki on-ramp at a point where drivers are accelerating onto the on-ramp. There is a significant crash risk

associated with difficult and slow manoeuvres involving right turning then left turning trucks, compounded by right turn vehicle movements out of the new link road on which the CVSC is to be located. Furthermore, vulnerable road users will be crossing the on-ramp at this location – see intersection layout in **Figure 2**.

(NB This route would be acceptable from a safety perspective if the staggered X-intersection were to be reformed as a roundabout.)



Figure 2: Staggered intersection at Coast Road/Paekakariki northbound on-ramp

2. directing southbound and northbound movements to/from the CVSC via MacKays interchange will simplify the signage requirements which in turn reduces the risk of wrong turns and unsafe manoeuvres being undertaken. (refer also to section 2.x.)

Recommendations:

- a. Direct trucks on SH1 to/from the CVSC via MacKays interchange.
- b. If southbound trucks are to be directed to the CVSC via the Paekakariki interchange, change the road layout at the coast road/on-ramp intersection from a staggered X-road arrangement to a roundabout.

Designer Response:	<p>a) Northbound SH1 traffic travelling along Transmission Gully can only access the CVSC from Mackays Interchange, as the Paekakariki Interchange is north-facing ramps. The local community groups have expressed concerns regarding Southbound SH1 vehicles using Mackays Interchange, due to the narrow underpass and adjacent shared path, and directing the Southbound vehicles to the Paekakariki Interchange to access the CVSC will address some of the local community groups concerns.</p> <p>For access back onto SH1 for Southbound traffic, vehicles will need to use Mackays Interchange. Northbound traffic will be directed by static signage to use the Mackays Interchange as well, to mitigate any weaving when joining at the Paekakariki on-ramp.</p>
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	<p>b) Agree with SAT recommendation. However, this intersection is part of the Transmission Gully works, and as such, we would recommend that any recommendations to change the road layout will need to be addressed by the TG project team.</p>
<p>Safety Engineer:</p>	<p>Mike Pilgrim: <u>Trucks accessing the CVSC using the MacKays crossing off ramp need to cross the shared path once at the end of the off-ramp, if trucks were directed to the Paekakriki interchange they would need to cross the shared path three times. As highlighted by the SAT the shared path through the underpass at MacKays is a 2.6m wide path and heavy vehicle travel speeds through the underpass are low. As a result of these two factors the number of high-risk interactions between heavy vehicles and vulnerable road users is less when heavy vehicles use the MacKays crossing off ramp compared with the Paekakriki exit.</u></p> <p><u>Importantly, and as highlighted by the SAT, the right/ left turn movement required by heavy vehicles if they were to use the Paekakariki exit is difficult and results in additional conflicts with other traffic compared with the MacKays crossing exit.</u></p> <p><u>Traffic volumes on the link road between the two interchanges are low at approximately 100vph, compared with 426vph at the Paekakriki interchange northbound on-ramp. Again as highlighted by the SAT vehicles are likely to be accelerating onto the onramp at Paekakariki resulting in higher speeds than are likely on the link road. Both of these factors increase the risk for the right turn associated with the Paekakariki interchange approach to the CVSC when compared to the Mackays crossing approach.</u></p> <p><u>Due to the spacing of the interchanges and requirements of the weigh in motion, installing the hardware for the weigh in motion between the interchanges is not possible. This means signage associated with getting vehicles to exit SH1 at the MacKays crossing will be simpler as it can refer to "this Exit", the signage once off the SH1 will also be simplified by using the MacKays exit over the Paekakariki exit.</u></p> <p><u>Given all of these factors having vehicles exit the highway at Mackays crossing as recommended by the SAT is seen as safer than exiting at the Paekakariki interchange.</u></p> <p>JRH <u>I agree with the SE comments above. The preference is for northbound traffic to turn south out of the CVSC before effectively 'U-turning' onto the on-ramp to go north.</u> <u>In addition, given the proximity of the two northbound on-ramps and the railway level crossing, my preference would be to close the northernmost of the two ramps.</u></p> <p><u>Southbound trucks exiting the CVSC will have to use the underpass to access the southbound on-ramp at McKays anyway. So it seems a safer option to allow the use of the McKays southbound off-ramp for trucks to enter the CVSC, rather than Pakekariki southbound off-ramp. And</u></p>

	these trucks will be on the opposite side to the shared path through the underpass, when going towards the CVSC. And will be at a low speed. Further discussion is required with TG team in order to make the Paekakariki road layout amended to be a roundabout, which will provide a safer turning option for trucks and other users, if McKays is not used.
Client Decision:	
Action Taken:	

2.2 Moderate Concern – Impact on road safety at MacKays interchange

Probability of Crash Occurring – Infrequent

Likelihood of Serious/Fatal Injury – Likely (if vulnerable road user involved)

Outcome – Moderate

The change in CVSC location is not significant in terms of impact on the roading network given the small number of additional trucks expected to be directed to the CVSC (up to 4 southbound trucks in the peak hour which equates to 8 truck movements through the underpass).

It is acknowledged that MacKays interchange is considered smaller than most interchanges and somewhat tight through the underpass, though the carriageway is 7m wide (excluding channels). Observations show that trucks can relatively easily negotiate the roundabout (see **Figure 3**) and speeds through the underpass were noted at approx. 30-35 km/h. Visibility to the off-ramp limit line from the underpass is approx. 55m and within safe stopping sight distance.

Vulnerable road users have a segregated 2.6m wide shared use path to use through the underpass (see **Figure 4**). To the west of the underpass, a new shared path to provide an off-road link to Queen Elizabeth Park is to be constructed as part of the Transmission Gully project (see **Figure 5**).

The main safety issue is to the east of the underpass where the link for vulnerable road users would benefit from improvements so that cyclists and equestrians are not forced or encouraged onto the carriageway (see **Figures 6 and 7**). Work on this side of the underpass is not part of the Transmission Gully project, so improvements for the benefit of vulnerable road users at the interchange should be undertaken as part of the Weigh Right project or maintenance works.



Figure 3: Large truck and trailer unit negotiating roundabout at MacKays



Figure 4: Shared use path through underpass



Figure 5: Planned shared use paths west of the underpass



Figure 6: Unsealed section of path east of the underpass



Figure 7: Signs and streetlight obstructing the path on the eastern side of the southbound off-ramp

Recommendation:

Upgrade the shared use path at MacKays interchange between the underpass and Emerald Glen Road.

Designer Response:	Improvements to this section of shared path will be discussed with the client, as it is out of the scope of the CVSC works.
Safety Engineer:	Agree with designers response. Happy to be involved in the discussion (should also invite multi modal team)
Client Decision:	
Action Taken:	

2.3 Minor Concern – Acceleration lane on new link road at CVSC exit

Probability of Crash Occurring – Infrequent

Likelihood of Serious/Fatal Injury – Unlikely

Outcome – Minor

An acceleration lane is proposed to assist trucks turning left onto the new link road at the CVSC exit. Acceleration lanes are designed to allow slow vehicles to accelerate and merge into through traffic without interrupting the higher speed flow. The link road is forecast to carry approx. 220 vehicles per hour at peak times. Despite the road having a 50 km/h speed limit, speeds are likely to be noticeably higher as the road will have a 10m wide carriageway, safety barriers and no side friction.

The low traffic flow will mean significant gaps in traffic for trucks to safely exit the CVSC. However, when a truck is seen by a northbound driver to be exiting, there is the likelihood that some drivers will attempt to speed past the truck before it reaches the merge area. Given the low traffic flow, the SAT considers that it may be more appropriate not to have an acceleration lane for exiting trucks so that any northbound driver closing in on the truck is forced to slow down rather than potentially accelerate.

Recommendation:

Reconsider the need for the proposed acceleration lane at the CVSC exit.

Designer Response:	There is no acceleration lane proposed here, just the extended right turn bay to allow trucks to stack safely when turning into the CVSC. SAT to provide clarification on this issue.
Safety Engineer:	Agree with designers response. Traffic volumes will be very low, if any, and no acceleration lane is required. Not sure an extended right turn lane is required, due to very few through traffic (where would the through traffic be going to or coming from – only those heading northbound and trying to access Paekakariki would be using this link road).
Client Decision:	
Action Taken:	

2.4 Comment – CVSC access

The SAT endorses the proposals to widen the new link road to provide a right turn bay at the CVSC access and to square up the CVSC access to 90° to the alignment of the new link road.

It was noted in the Traffic Assessment that the access has a sight line distance of 100m. It is assumed that this is due to the curvature in the road and the trees on the southern boundary of the site (see **Figures 8 and 9**), though there would appear to be more than 100m of clear visibility. Whilst the sight distance appears to be adequate for safe

operation, it would be prudent to check this when the trees on the boundary have full foliage and cut back any vegetation that restricts visibility to oncoming traffic.



Figure 8: Google satellite view of the site



Figure 9: View to the south from the access (trees on boundary not in leaf)

Designer Response:	Noted. The possible removal of trees will be addressed in relation to any visual screening requirements given by the Council and Jacobs will provide advice on any visibility requirements.
Safety Engineer:	Agree with designers response. Ensure adequate sight distance is provided for the expected operating speed of traffic.
Client Decision:	

2.5 Minor Concern – Signage issues

Probability of Crash Occurring – Occasional
Likelihood of Serious/Fatal Injury – Unlikely

Outcome – Minor

The drawings provided to the SAT for this road safety audit do not show any changes to the signage developed for the previous location of the CVSC. Obviously, there is now the need to direct trucks from the southbound off-ramp at MacKays interchange to turn right and from the northbound off-ramp to turn left with appropriate signage at the CVSC.

Trucks leaving the CVSC should be directed back to SH1 (northbound and southbound) by signage at the exit directing them to turn left. This is considered preferable from a safety perspective than having northbound trucks use the Paekakariki interchange on-ramp. Signage at the MacKays interchange to be installed as part of the TG project will then provide the necessary direction.

In the road safety audit report for the previous CVSC location at MacKays Crossing, a number of signage issues were raised which also relate to the new CVSC location and are repeated here for completeness:

1. The SAT notes that the northbound SH1 WIM and VMS will be on the Transmission Gully (TG) motorway. Checking the locations for these facilities against the TG design drawings did not highlight any safety issues other than signage:

TG project drawing NTH-LS-1004 is annotated with a static sign to be erected at approx. Ch 720 stating “Commercial Vehicle Safety Centre Use Paekakariki Exit.” This exit is only 300m further along and to avoid any confusion, it is suggested that the wording be “This Exit” rather than “Paekakariki Exit” in conformity with other motorway signage (refer tourist destination sign at Ch 860 that uses the wording “This Exit”).

It should also be noted that the “pull-in” VMS will be at Ch 760, almost adjacent to this static sign. The VMS will need to display wording that tells the truck driver to take the next exit (“This Exit”?) which may make the requirement for the static sign superfluous.

2. TG project drawing NTH-LS-1006 does not show any signage directing trucks to turn left from the Coast Road/northbound on-ramp onto the new link road to MacKays Crossing interchange. Clear directional signage is needed in advance of and at the intersection to mitigate any late or unsafe left turns.
3. For southbound trucks being directed off the expressway at the MacKays Crossing interchange, it would be beneficial if the CVSC was included on the advance destination sign (ADS) sign on the off-ramp (refer to TG drawing NTH-LS-1002), especially as the advance view to the roundabout and any signage there is so poor (see **Figure 10**).



Figure 10: Poor forward view to roundabout at the end of the southbound off-ramp

Recommendations:

- a. Provide revised static direction signage for the new CVSC location.
- b. Address the signage issues 1–3 raised above.

Designer Response:	<ul style="list-style-type: none"> a) The signage layout will be updated as part of the revised detailed design to be carried out for the new CVSC location. b) Issue 1 – Northbound traffic on TG can only exit at Mackays, as there is no proposed Northbound exit at the Paekakariki Interchange. We will review the location and wording of the static signage as part of the revised detailed design. Issue 2 – We will review the provision of static directional signage on the Coast Road, to ensure that the route to the CVSC from Coast Road is clear to drivers as part of the revised detailed design. Issue 3 – We have discussed this with NZTA previously and it has been confirmed that under the TCD rule, white CVSC panels cannot be included on ADS signage. However, we will review providing additional directional signage specific for the CVSC as part of the revised detailed design, dependent upon which exit the southbound vehicles are directed to use.
Safety Engineer:	Agree with designers response. Please liaise with the safety team on all signage matters.
Client Decision:	
Action Taken:	

2.6 Moderate Concern – Safe maintenance access to WIM and VMS sites

Probability of Crash Occurring – Occasional

Likelihood of Serious/Fatal Injury – Likely

Outcome – Moderate

In the previous safety audit report for the initial tranche of CVSC sites, the SAT noted that a number of the WIM or VMS sites did not clearly show how a maintenance vehicle can safely access the infrastructure. On all high speed roads and motorways, it is important from a safety viewpoint that maintenance vehicles can easily and safely pull onto the shoulder and then reverse behind the safety barrier that protects the infrastructure. The drawings provided to the SAT for this current safety audit do not show infrastructure maintenance access on SH1 (Transmission Gully and Raumati Expressway), so this general concern is repeated here for completeness.

Recommendation:

Ensure that safe access by maintenance vehicles can be achieved at the WIM and VMS sites on SH1.

Designer Response:	The provision of safe access to the maintenance areas will be addressed as part of the revised detailed design for the SH1 Southbound and Coast Road sites. For the WIM and VMS sites within TG, we will ensure that the TG project team is aware of this requirement as part of their works to construct the WIM and VMS.
Safety Engineer:	Agree with designers response.
Client Decision:	
Action Taken:	

2.7 Moderate Concern – Safety barrier for rear of TG “pull-in” VMS installation

Probability of Crash Occurring – Infrequent

Likelihood of Serious/Fatal Injury – Likely

Outcome – Moderate

In the road safety audit report for the previous CVSC location at MacKays Crossing, it was noted that Transmission Gully project drawing NTH-AL-5004 is annotated with the VMS sign at Ch 760 for TG northbound traffic will be protected along TG by a concrete barrier to be installed as part of the TG project. However, it is not clear to the SAT what protection there will be for the rear of the VMS installation, the concrete plinth for which will be adjacent to the Coast Road at that point.

Recommendations:

Provide safety barrier protection for the rear of the northbound TG “pull-in” VMS installation, on the eastern side of the Coast Road, plus provision of safe maintenance access.

Designer Response:	As this WIM is within the TG extents of work, we will inform the TG project team to include safe maintenance access and will advise them of the requirement for barrier protection on the realigned Coast Road.
Safety Engineer:	Agree with designers response.
Client Decision:	
Action Taken:	

2.8 Comment – Locations of WIM and VMS on Coast Road

The WIM is to be located and safety barrier protected in an area where there is adequate room for maintenance vehicles to access the equipment (see **Figure 11**). This area is also used by drivers who stop to watch activity associated with the Steam Incorporated railway heritage society based alongside the highway. The unsealed area has a number of potholes and the safety barrier will direct drivers to enter at one location – it will be important that drivers can safely enter the area from the 80 km/h highway without encountering potholes.

There was also concern previously expressed that the power poles along the western side of Coast Road would limit visibility to the VMS. The SAT does not feel this would be an issue (see **Figure12**).



Figure 11: Proposed location of WIM infrastructure



Figure 12: Proposed location of VMS on Coast Road (northbound)

Designer Response:	The surfacing behind the Coast Road WIM will be reviewed and addressed as part of the revised detailed design, to ensure safe access to the area.
Safety Engineer:	Agree with designers response. This area to be surfaced if at all possible. It is regularly used by all vehicles, and there are regular events at Steam Incorporated.
Client Decision:	

3.0 AUDIT STATEMENT

We certify that we have used the documents noted in section 1.2 and the Appendix and visited the sites to identify features of the project that could be addressed to improve safety. The issues identified have been noted in this report, together with recommendations, which should be studied for implementation.



Signed :.....Date: 03 August 2020

Steve Reddish, BSc(Eng), CMEngNZ, MCIHT, FITE, DipTE
Senior Associate
Traffic Planning Consultants Ltd, Hawke's Bay



Signed:.....Date: 02 August 2020

Colin Brodie, NZCE (Civil and Traffic), CTPM&C (UNSW), CEng
Road Safety Consultant
NZ Transport Agency

Designer: Name Simon Ingamells Position Senior Civil Engineer (Jacobs)

Signature  Date 13 August 2020

Safety Engineer: Name..... Position.....

Signature..... Date.....

Project Manager: Name..... Position.....

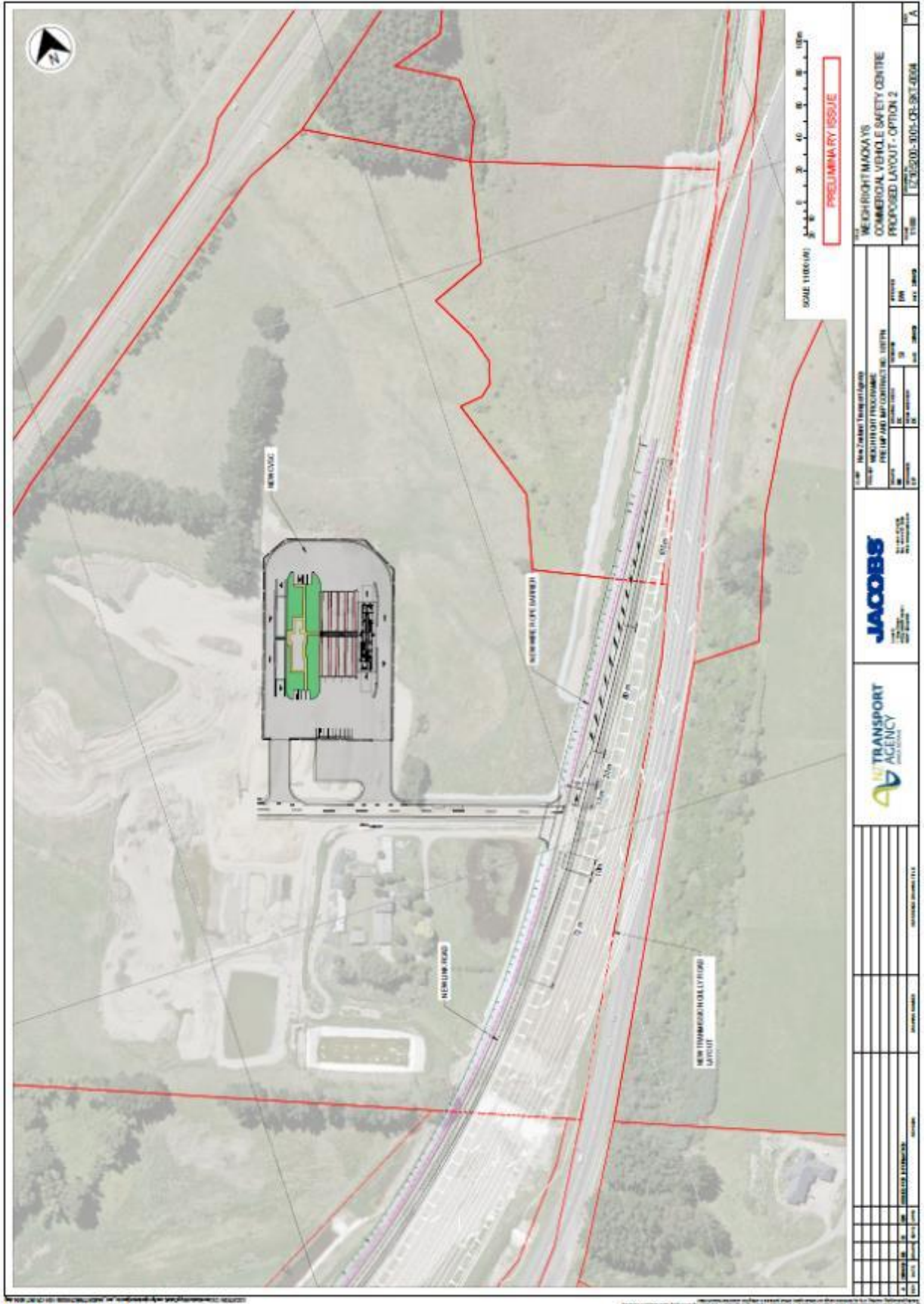
Signature..... Date.....

Action Completed: Name..... Position.....

Signature..... Date.....

Project Manager to distribute audit report incorporating decision to designer, Safety Audit Team Leader, Safety Engineer and project file. Date:.....

APPENDIX



THE HIGHWAY TRANSIT AUTHORITY PRELIMINARY ISSUE			
THE HIGHWAY TRANSIT AUTHORITY COMMERCIAL VEHICLE SAFETY CENTRE PROPOSED LAYOUT - OPTION 2			
DATE	BY	APP'D	SCALE
12/11/2010	J. SMITH	M. SMITH	1:1000
PROJECT NO: 1000-000-000-000-000-000			
DRAWING NO: 1000-000-000-000-000-000			
SHEET NO: 1000-000-000-000-000-000			
SHEET TOTAL: 1000-000-000-000-000-000			
PROJECT MANAGER: J. SMITH			
DESIGNER: M. SMITH			
CHECKER: J. SMITH			
APPROVER: M. SMITH			
DATE: 12/11/2010			

Figure 13: CVSC site, nr MacKays Crossing

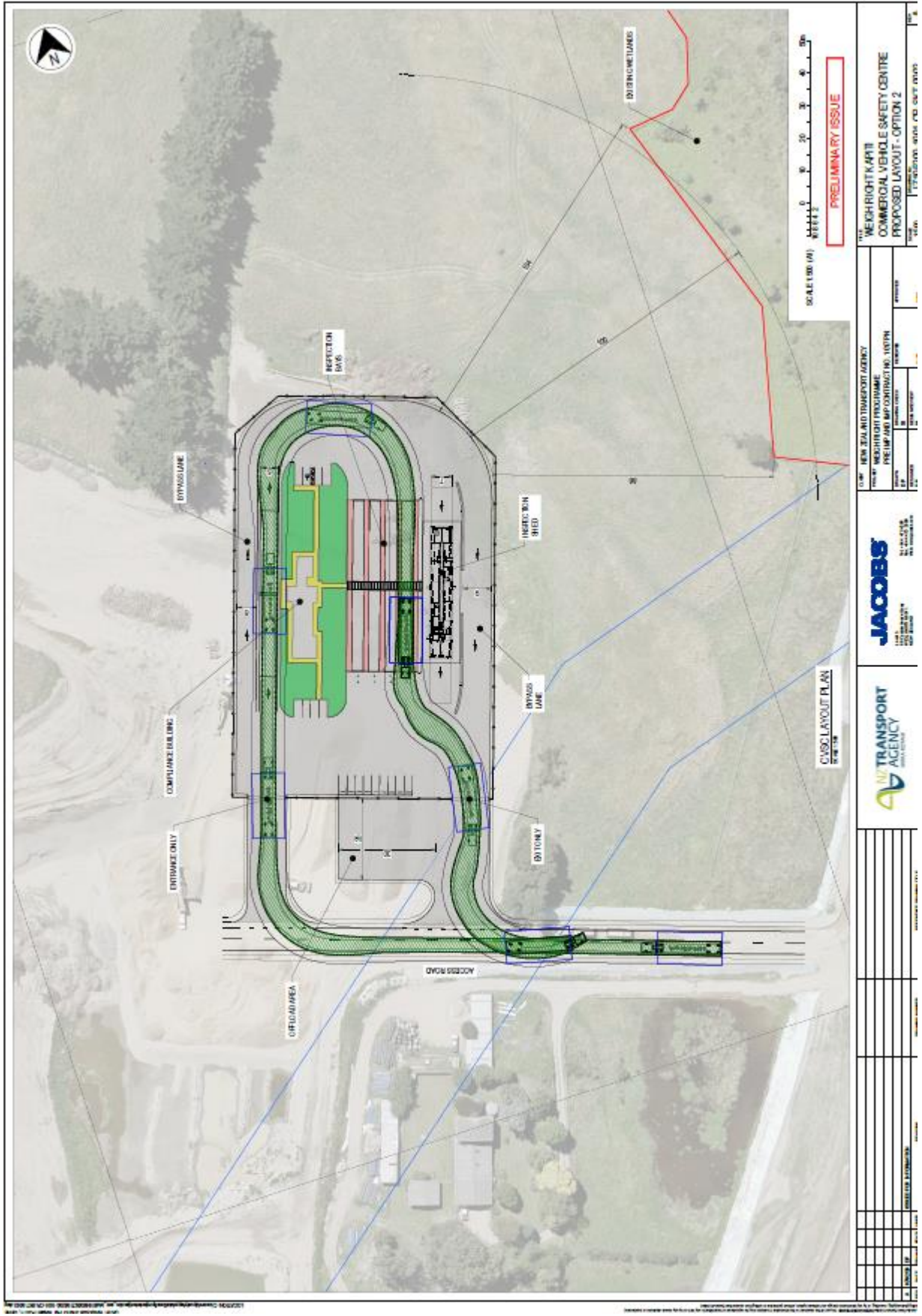


Figure 14: CVSC site layout

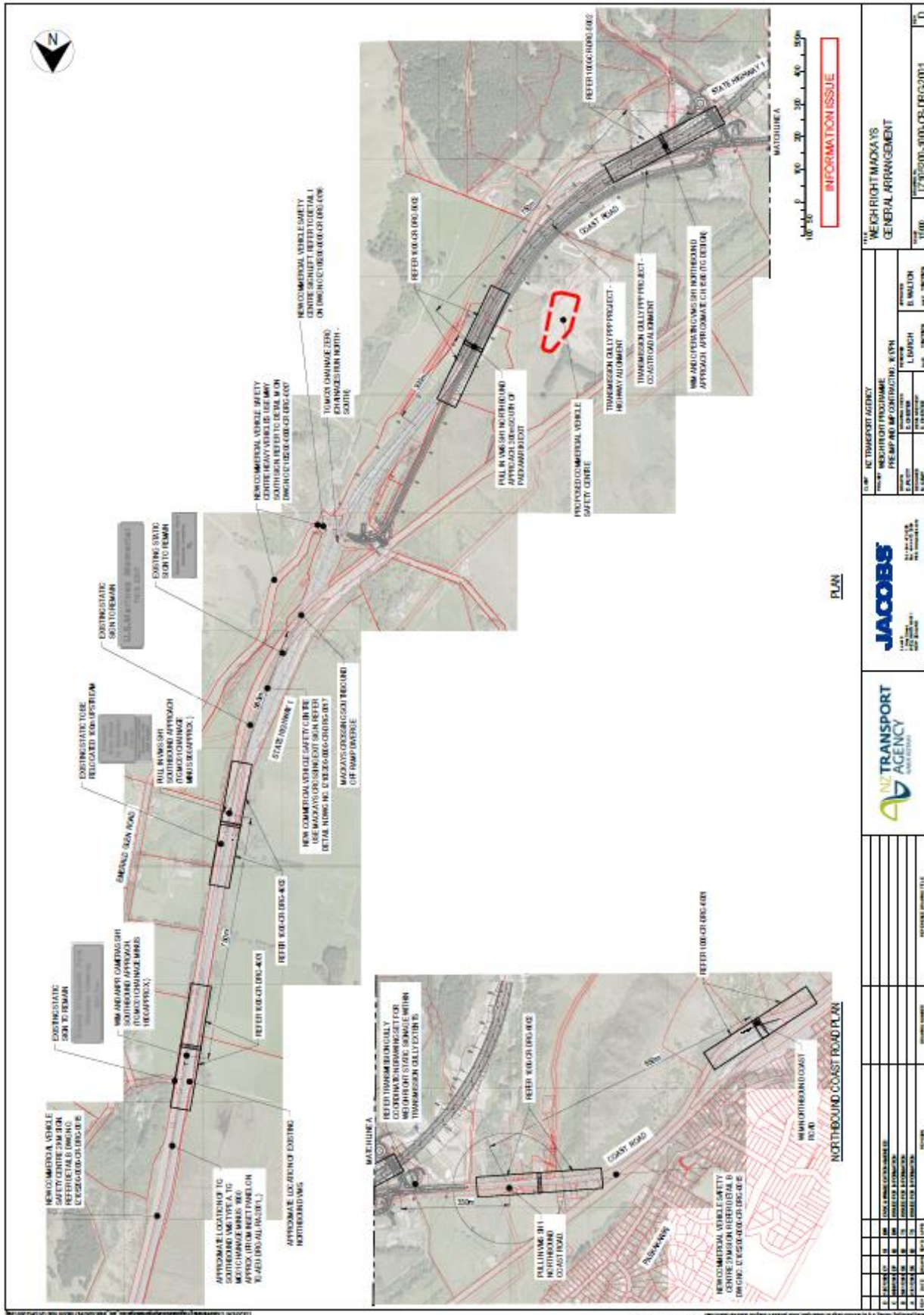


Figure 15: General arrangement

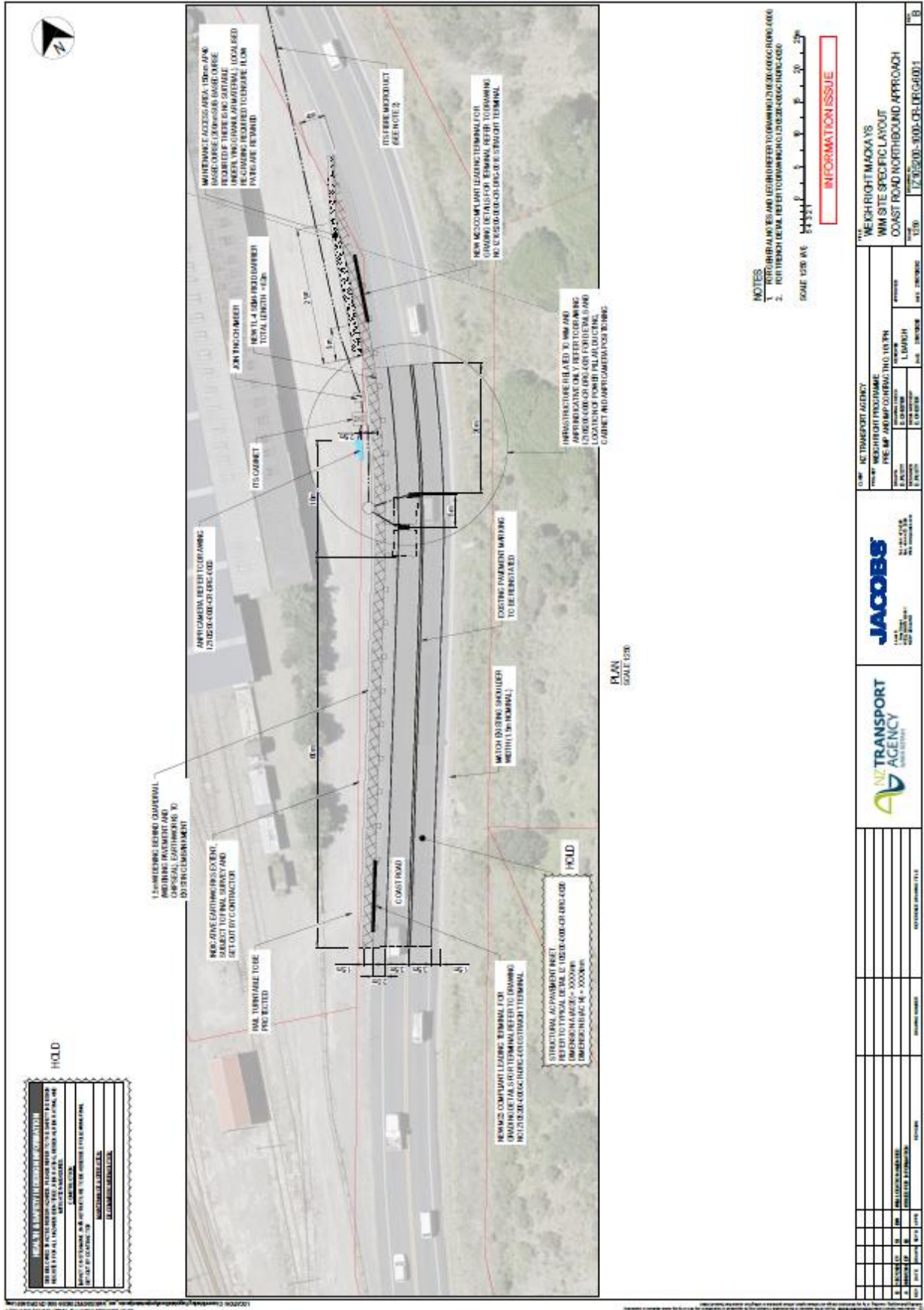


Figure 16: WIM location Coast Road northbound