

General Standard

Mobile Plant Exclusion Zones

Purpose

The purpose of this document is to set clear exclusion zones for operating mobile plant within the rail corridor to protect our people and assets at all times.

Document Control

Document No.	G-ST-AL-9132	Issue No.	Issue 1.0
Date Effective	16/10/2019	Author	Strachan Crang
Prepared (P)		Checked and Approved By	Engineering Services Interface – Technical Committee
Reviewed (R)		Authorised for Release By	Chief Engineer
Amended (A)			

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1. Revision Procedure and History

This is a 'living' document, that will be up dated every five years or whenever KiwiRail determines that changes to it and processing requirements documented herein are appropriate.

If changes arise from the review this document will be reissued, however, if no changes arise from the review, the current version of this document will remain in force.

Refer to the **Briefing Note(s) for G-ST-AL-9132 Mobile Plant Exclusion Zones** and **Document History** (at the end of this document) for full document changes.

Issue No	Prepared (P) Reviewed (R) Amended (A)	Authorised for Release By	Date Effective

1.1 Changes in this issue

Issue No	Section	Description	Page(s)

1.2 Withdrawn, closed and superseded

Old Reference	Title	Replaced by

2. Associated Documents

Level	Number	Title
		Track Safety Rules Rule 902(b)
	KRNF-SA-0018	Job Plan Book (TS90) (Version 2 dated February 2019)
	KRG ZH 1809-004	Zero Harm Alert

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3. Acronyms and Definitions

Acronyms	Definition
HRV	HiRail Vehicle
Mobile Plant	Any self-propelled machinery under the direct control of an operator, may include Hi-Rail Vehicles, Diggers / Excavators, Dump Trucks etc.
MPC	Mobile Plant Controller – refer to Track Safety Rules 902 (b) The person responsible for: <ul style="list-style-type: none"> authorising the movements of Mobile Plant within the Worksite authorising Rail Personnel access to the defined exclusion zones of the Mobile Plant during its operation in the worksite coordinating the activities of the Mobile Plant and Rail Personnel to ensure that there are no conflicting movements that may result in harm to any person.
Rail Personnel	Employees, agents, contractors or voluntary individuals engaged for the purposes of carrying out rail activities
Exclusion Zone	A defined area where Rail Personnel shall not enter or remain in when working around mobile plant
Controlled Zone	A defined area where Rail Personnel are able perform duties with authorisation from the Mobile Plant Controller
Road Mode	When Mobile Plant is powered under its own tracks, rubber wheels or any other mechanical system other than retractable steel wheels
Rail Mode	When Mobile Plant has its retractable steel, wheels placed on the railway track and is able to move in either direction
Isolation Mode	When the excavator has been made safe and the isolation bar engaged disabling the excavator from movement in any direction or swing. When other mobile plant, not fitted with an isolation device, is in neutral or park and the hand break applied.

3.1 Notes, caution and warnings

Icon	Definition
	Note(s) to point out something of special importance
	Caution or warning – drawing special attention to anything of important reminder or a safety message

4. Scope

This Standard sets Exclusion Zones for Mobile Plant working in Protected Work Areas whilst there are Rail Personnel on the ground within the Rail Corridor.

4.1 Use in the field

This document has been designed to be used in the field. It is expected that this document will be opened in an iPad via 'Colligo' and used as reference to complete the task. Note as written on the front cover the controlled version is held on iKon. **Printed copies of this document are uncontrolled.**

5. Exclusion Zone 1

5.1 When working around HiRail Vehicle in Rail Mode

Situation	HiRail Vehicle (HRV) (excluding an excavator) in Rail Mode in Protected Work Area and Rail Personnel are on the ground.
Primary Hazard	People being in close proximity to moving HRV in Rail Mode.
Control	<p>A designated Mobile Plant Controller must be in place as per Track Safety Rule 902 (b).</p> <p>All movements within a Protected Work Area shall be authorised by a Mobile Plant Controller (MPC).</p> <p>All Rail Personnel must be a safe distance with sufficient clearance to avoid being struck by the HRV (refer to Error! Reference source not found.). The outer limit of the exclusion and controlled zones is 20 metres from the vehicle or consists of vehicles/trailers depending on the direction of travel.</p> <p>The movement of people into the exclusion zones (refer to Figure 8.1) requires authorisation from the Mobile Plant Controller.</p> <p>For rail personnel to perform work duties at the rear of the HRV when it is travelling in a forward direction, the following additional controls shall be applied:</p> <ul style="list-style-type: none"> • The HRV shall not travel at a speed exceeding walking pace. • Authorisation must be provided by the Mobile Plant Controller. • The Mobile Plant Controller has informed the HRV Operator people are working behind the movement. <p>Rail Personnel may only be in the yellow zone (refer to Figure 5.1).</p>

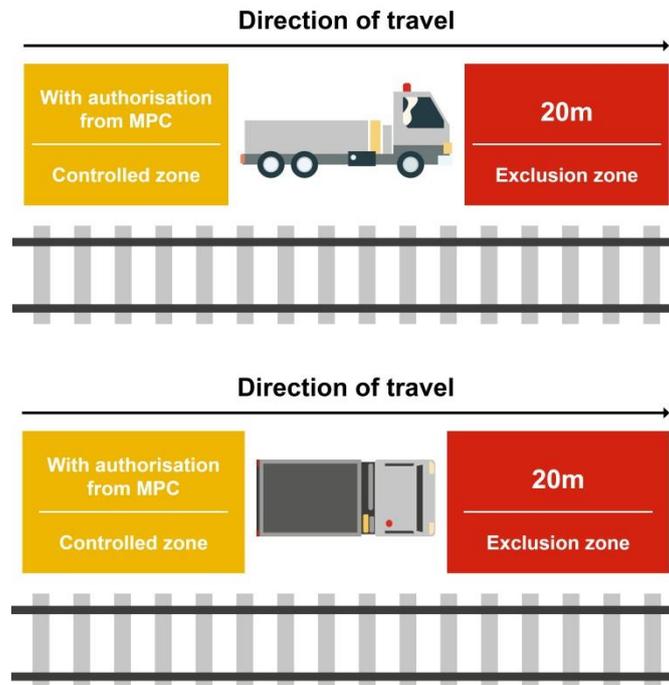


Figure 5.1 Moving HRV in Rail Mode Exclusion Zone 1

6. Exclusion Zone 2

6.1 Excavator working in road mode

Situation	Excavator working in Road Mode and Rail Personnel working on the ground in close proximity.
Primary Hazard	People being in close proximity to moving plant/equipment in Road Mode.
Control	A designated Mobile Plant Controller must be in place as per Track Safety Rule 902 (b).
	Zones to be applied to the entire swing zone of the excavator
	Apply a 225-degree exclusion zone when working around Excavators in road mode (red zone).
	Rail Personnel are to remain clear at all times of the exclusion zone.
	In the event Rail Personnel wish to enter the exclusion zone it may only be authorised by the Mobile Plant Controller and the excavator put into Isolation Mode.
	Apply a 135-degree controlled zone when working around Excavators in Road Mode (yellow zone).
	Rail Personnel are only to be within the controlled zone when authorised by the Mobile Plant Controller.
Outer limits of the zones are to be established relative to the size of excavator in use - maximum reach of the arm and attachments plus the same distance again as a 'safety buffer' (eg 9m boom + 9m safety buffer = 18m exclusion zone).	



Figure 6.1 Excavator working in 'Road Mode' Exclusion Zone 2

7. Exclusion Zone 3

7.1 Excavator working in rail mode

Situation	Excavator working in Rail Mode and Rail Personnel are on the ground in the Protected Work Area.
Primary Hazard	People being in close proximity to moving plant/equipment in Rail Mode.
Control	A designated Mobile Plant Controller must be in place as per Track Safety Rule 902 (b).
	Apply a 360-degree exclusion zone when working around Excavators in rail mode (red zone).
	Rail Personnel are to remain clear at all times of the exclusion zone.
	In the event Rail Personnel wish to enter the exclusion zone it may only be authorised by the Mobile Plant Controller and the excavator put into Isolation Mode.
	Outer limits of the zones are to be established relative to the size of excavator in use – maximum reach of the arm and attachments plus the same distance again as a 'safety buffer' (eg 9m boom + 9m safety buffer = 18m exclusion zone).



Figure 7.1 Excavator working in 'Rail Mode' Exclusion Zone 3

8. Exclusion Zone 4

8.1 Excavator working in rail mode in exceptional circumstances

Situation	Excavator is required to operate in Rail Mode; workers are performing tasks in close proximity to the digger boom and attachment. Workers on the ground are at most risk of collision with an Excavator whilst it is performing tasks in Rail Mode. Work shall be planned to minimise workers exposure to an Excavator working in Rail Mode. Some tasks are impossible to be completed in Road Mode due to task complexity, variation or because of environmental issues. In those circumstances controls below shall apply.	
	Task complexity example	When the task is working at a level crossing and is the excavator is unable to work in Road Mode because of the site conditions.
	Task variation example	Working in road mode is impossible because the contractor or gang have tools or equipment that restrict the task from being completed in Road Mode
	Environmental issues example	Working on a bridge or other structure where it is impossible for the excavator to work in Road Mode.
Primary Hazard	People being in close proximity to moving plant/equipment in Rail Mode and work cannot be performed in Road Mode.	
Control	A designated Mobile Plant Controller must be in place as per Track Safety Rule 902 (b).	
	Zones to be applied to the entire swing zone of the excavator.	
	Apply a 225-degree exclusion zone when working around Excavators in road mode (red zone).	
	Rail Personnel are to remain clear at all times of the exclusion zone.	
	In the event Rail Personnel wish to enter the exclusion zone it may only be authorised by the Mobile Plant Controller and the excavator put into Isolation Mode.	
	Apply a 135-degree controlled zone when working around Excavators in Road Mode (yellow zone).	
	Rail Personnel are only to be within the controlled zone when authorised by the Mobile Plant Controller.	
	Outer limits of the zones are to be established relative to the size of excavator in use – maximum reach of the arm and attachments plus the same distance again as a 'safety buffer' (eg 10m boom + 10m safety buffer = 20m exclusion zone).	
	Movement of the Excavator no faster than walking pace.	
Stop Think Act Review (STAR) conducted and noted in the Job Plan Book TS90.		

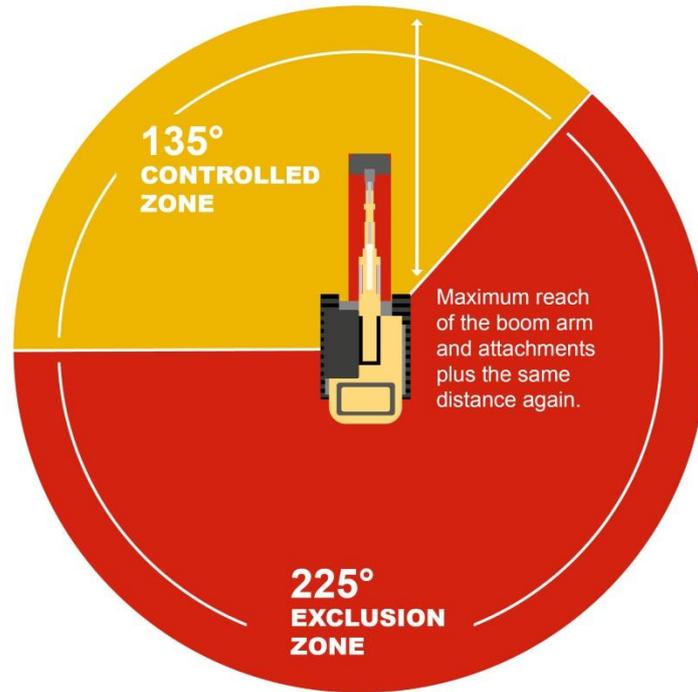


Figure 8.1 Excavator working in 'Rail Mode' in exceptional circumstances Exclusion Zone 4

Briefing Note(s) for G-ST-AL-9132 Mobile Plant Exclusion Zones

Date Effective 16/10/2019 **Issue No.** Issue 1.0

Background

The aim of this document is to set clear exclusion zones for operating mobile plant within the rail corridor to protect our people and assets at all times.

Key changes / compliance

This is the first issue of a new document.

Implementation

This document should be cascaded down to all staff impacted by this Standard in the field. The changes contained in this document will become effective as soon as a 'Tool Box' briefing has been conducted for effected staff but no later than 30th December 2019.

Applicability (Select relevant boxes)	General	Civil	Signals and Telecommunication	Structures	Track	Traction and Electrical
Zero Harm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learning and Development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project Management Office	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manager Property Revenue and Grants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Train Control Centre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engineering Services Manager	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Supply Chain and Distribution Manager	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional Head		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Network Services Managers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Region Operations Managers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
STTE Managers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Production Managers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Asset Engineers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Document History

Note page numbers relate to the document at the time of amendment and may not match page numbers in current document.

Issue No.	Section	Description	Page(s)
1.0		First publication	

Document Release Notes

The purpose of this pro forma is to provide a brief history into how the final draft document was developed prior to being sent for formal review and subsequent approval by the KiwiRail Traction and Electrical Engineering Technical Committee (TEETC).

Task Instruction Title	G-ST-AL-9132 Mobile Plant Exclusion Zones
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Version History (Include details of all internal reviews of each draft submitted for checking)

Version	Date	Brief Summary of Changes	Author

Referenced Material Used to Develop Document (e.g. O&M manuals, drawings)

Document Number	Document Title
200-2002-00563	Caterpillar – Construction Vehicle and Equipment Blind Area Diagrams
1809-004	KiwiRail – Zero Harm Alert ZH 1809-004
	WorkSafe NZ – Excavation Safety Good Practice Guideline

Notes (Include any relevant notes if applicable to help provide context to the review)

- Initial exclusion zones developed by Zero Harm in response to the midland line incident. ZH Alert 1809-004
- Company established Critical Risk Network to assess whether People v Plant (PvP) hazard controls are effective across KiwiRail
- Initial focus on Network Operations and how effective PvP hazard controls are when working with Mobile Plant within the rail corridor.
- Established CRN Focus Group for Network Operations which included the following:
 - Wayne Coghlan - Track Maintainer (RMTU Delegate), Lisa Davidson - ESO (HSAT & RMTU Delegate & RMTU Women's Delegate), Gareth Bachop - Track Ganger (RMTU Delegate & Industrial Council Rep), Sacha Montgomery - National Zero Harm Manager, Rowan Hodgson - Track Maintainer (RMTU Delegate), Jake Barbarich - UNI Production Manager (RMTU Member), Karen Fletcher - RMTU H&S Organiser, Liam Sands SHE Risk Manager, Ron Nijssen Track Maintainer (RMTU Delegate), Glen Campbell (Zero Harm Advisor), John Kerr (RMTU Union Organiser), John Bannerman (Field Production Manager Projects), Brendan Gutshlag (Technical Development Designer), Brian McAllister Regional Lead (LSI), Wayne Stewart Regional Infrastructure Leader, Lower North Island, Scott Sargent (Zero Harm Leader Network Services), Telai Sefesi (Business Manager LNI)
- In parallel NZTA issued an s28 notice of compliance to implement a controller when mobile plant and rail personal are working together on the ground. Risk assessment found ZH Alert 1809-004 exclusion zones Partial Effective due to poor design of control
- Group developed and tested new exclusion zones. Trial included live field tests in Dunedin with extensive feedback from frontline and management teams
- Roadshow presentations at contractor engagement sessions
- Sent proposed exclusion zones to all contractors for consultation and incorporated feedback into proposal
- Sent final exclusion zones to all participants of CRN Focus Group participants for approval

Issues (Include any outstanding issues if applicable, the justification for why the issues remains open)