

Mount Isa System Information Pack

Stuart to Mount Isa

Flynn to Phosphate Hill

Version Information

Version 3.1: 20/02/2017

- Updated References Queensland Rail Network to Queensland Rail
- Updated References Queensland Transport to DTMR
- Removed references 2005 Access Undertaking
- EPA changed to Department
- Inserted Coal Dust information
- Updated Standards references
- Updated Line Diagrams
- Updated Climate Information
- Updated Track Grade
- Updated Network Control Regions & Signalling Centres
- Updated Safeworking Systems
- Updated Level Crossing Information
- Updated Description of Railway
- Updated Reference Rolling Stock Outline drawing
- Updated Train Length Definition

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Introduction

The detail provided in this pack relates to infrastructure and operational information necessary to develop a conceptual operating plan/Access Application. It is envisaged that Access Seekers will liaise closely with Queensland Rail to formulate a detailed operating specification as part of a full access agreement negotiation. Operational parameters outlined in this pack may be varied by mutual agreement with **Queensland Rail**.

All railway operators, wishing to operate in Queensland, require Accreditation under the Transport Infrastructure Act 1994 (Qld) and need to consider, but not limited to, the following aspects of typical rail operations:-

- Provisioning, stabling or stowing areas for rollingstock
- Train crewing
- Safeworking
- Training
- Route knowledge
- Environmental requirements
- Track standards
- Signalling and traction systems standards and constraints
- Safety training
- Management of risk
- Rollingstock registration and Train authorisation
- Legal issues as contained in Queensland Rail's Access Undertaking, Access Agreements and information contained in this pack.

Operators will be required to have accreditation with the Department of Transport and Main Roads, hold an Access Agreement with **Queensland Rail** and meet any conditions and precedents specified in the Access Agreement prior to commencing operations.

Accreditation means an applicant has confirmed that they are able to meet the requirements to carry out railway operations in Queensland. The Director-General, the Department of Transport and Main Roads, must be satisfied that the applicant has demonstrated:

- Effective management and control of rolling stock
- Competence and capacity to manage risks to safety associated with railway operations
- Competence and capacity to implement the required safety management system and has met the legislative requirements
- Financial capacity, or public risk insurance arrangements for potential liabilities.

Contact details are:

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Ph: 07 3066 2689
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Post: PO Box 673
Fortitude Valley QLD 4006
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Operators need to be aware of and comply with other general legislation such as but not limited to Workplace Health & Safety, Environmental legislation and Heritage legislation.

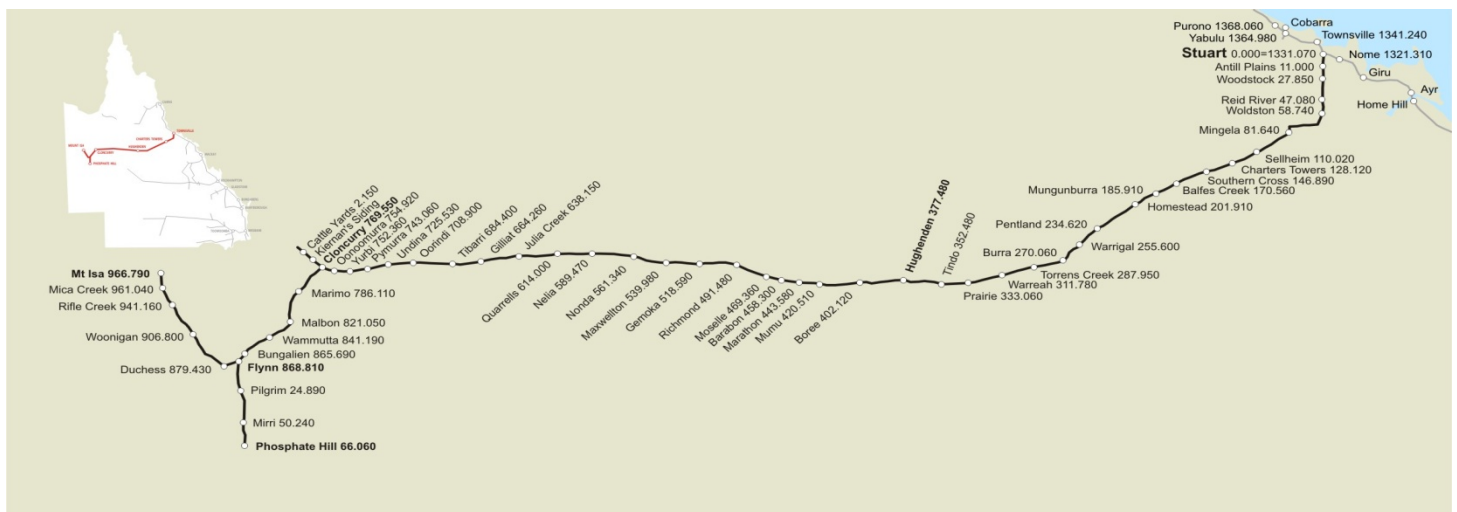
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General Information

The Mount Isa System is located in North Queensland between latitude 19°21'S and 21°53'S and longitude 139°29' E and 146°50'E.

The Mount Isa Line commences at Stuart on the North Coast Line, 10 km south of Townsville. The system is 1032km in length (which includes the Phosphate Hill Branch). It is a single line, narrow gauge system with 46 passing loops and incorporates the balloon loops at Yurbi, Phosphate Hill and Mount Isa.



The line services a number of communities along the line through passenger transport and the conveyance of general freight. The line is the critical link from the North West Minerals Province to the Port of Townsville, where the majority of bulk products are exported.

The Mount Isa Line is of particular national interest as it runs along some of the world's largest deposits of copper, lead, zinc, silver and phosphate rock. The region surrounding the Mount Isa Line produces 75% of Queensland's non-coal mineral output.

Descriptive distances within this document (unless otherwise stated) are based on physical kilometre posts in the field and are to be used only as location descriptors ie they do not compensate for equalities resulting from deviations. Access charges and performance statistics are generated using actual through distances derived from relevant Working Plan and Sections and reflected on Line Code Diagrams. Generally distances originate from the junction of the branch and commence at 0 km.

General Climate

The Mount Isa Line is subject to some of the harshest weather conditions in Queensland including periods of extreme heat and flooding monsoonal rain.

The following sub-sections specify general climatic parameters. For latest and more specific information potential railway operators should consult The Australian Bureau of Meteorology at its Internet Website: <http://www.bom.gov.au/climate>

Cyclones

Tropical lows, which develop from November to April, occasionally deepen to cause tropical cyclones. Tropical cyclones frequently foster high winds, heavy flood-producing rainfall and coastal storm surges. The high wind risk does not usually extend further inland than 50 km, however the rainfall associated with tropical cyclones have been known to impact the Mount Isa Line.

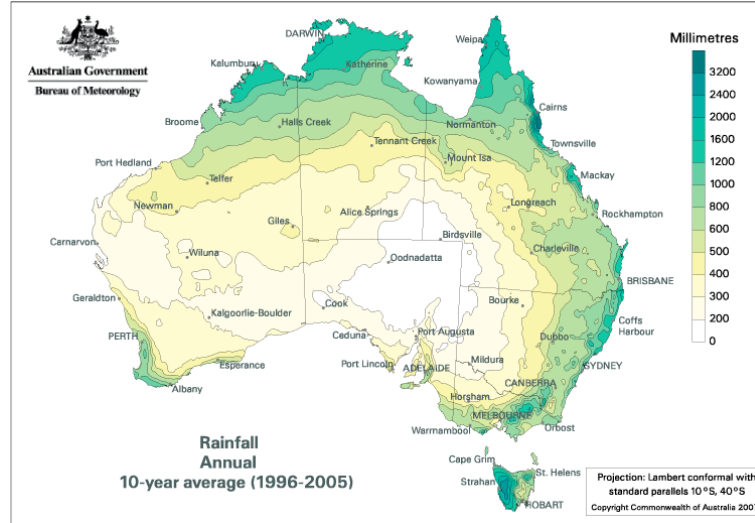
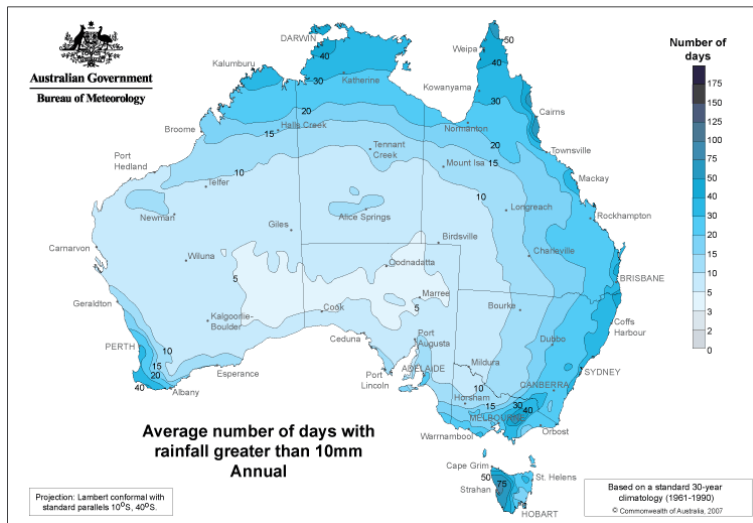
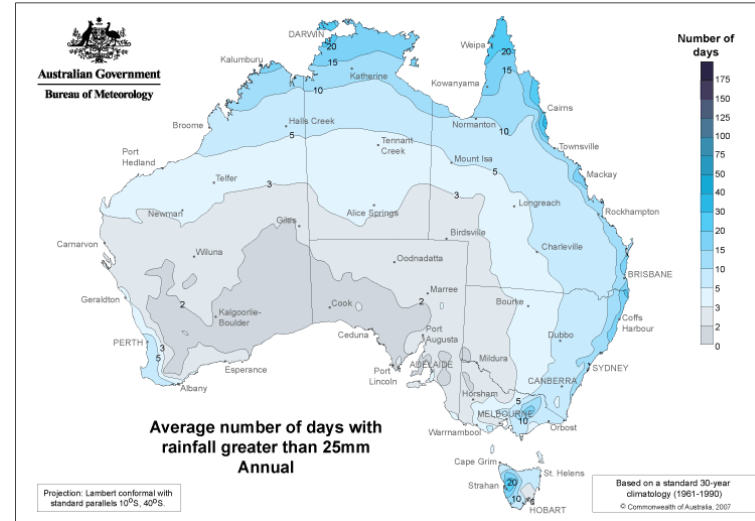
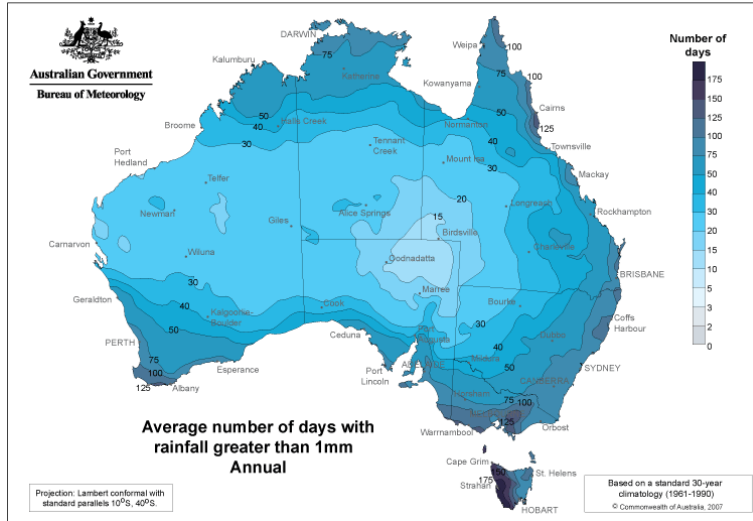
Humidity

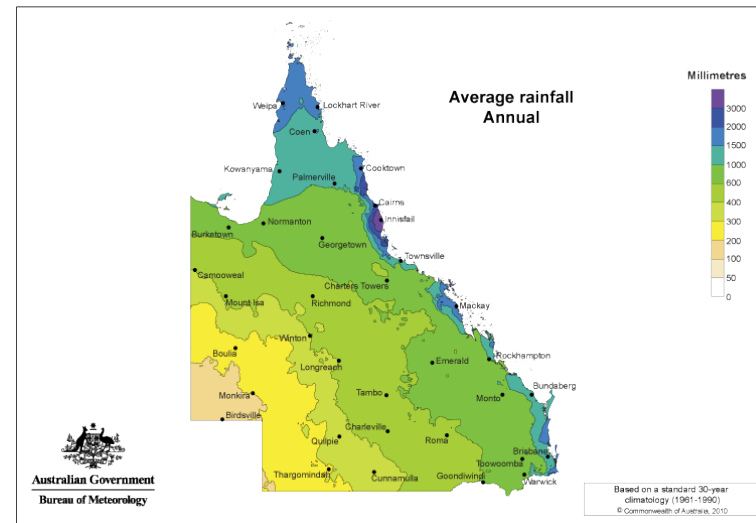
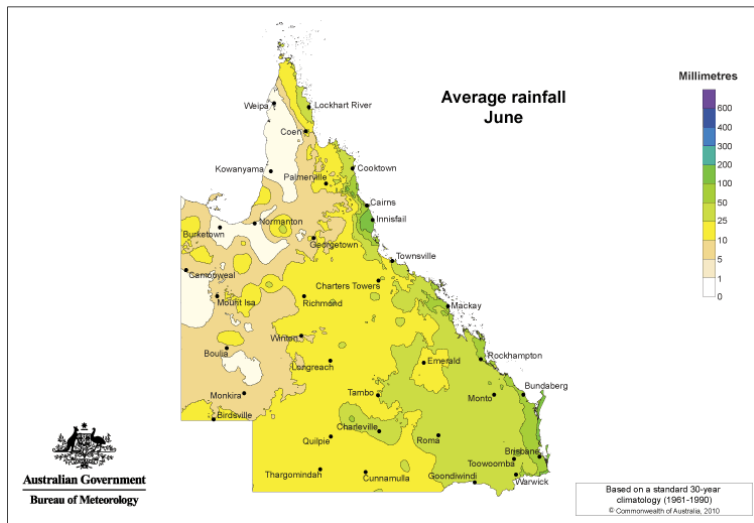
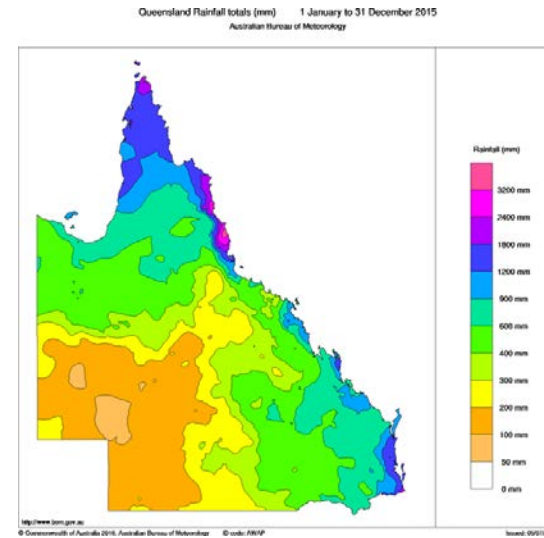
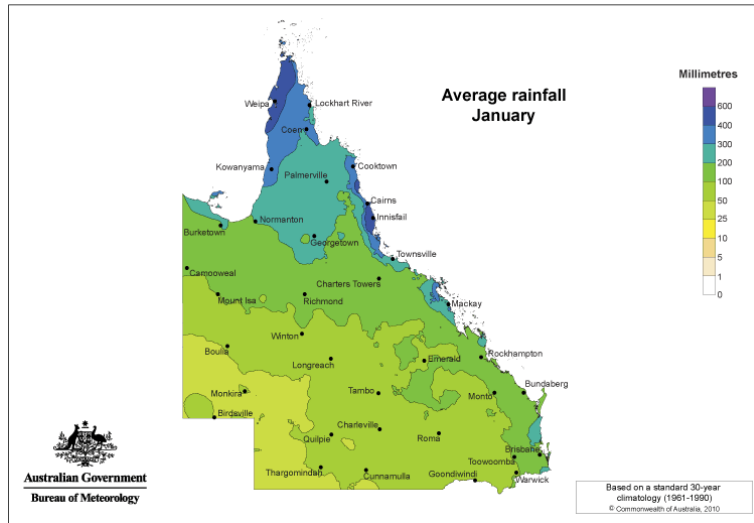
This region can experience prolonged periods of high humidity and potential rail operators should consider this when planning/designing rollingstock and machinery to operate on this system.

Rainfall

Rainfall on the Mount Isa Line is mostly confined to the summer months where in excess of 90% of the annual total is recorded between November and April. This rain is mostly associated with monsoonal troughs.

The wet season in Queensland is predominantly from January to April when monthly rainfalls of 400 mm or more can occur. The Mount Isa Line is built along flood plains and a portion is subject to flooding during the summer months.

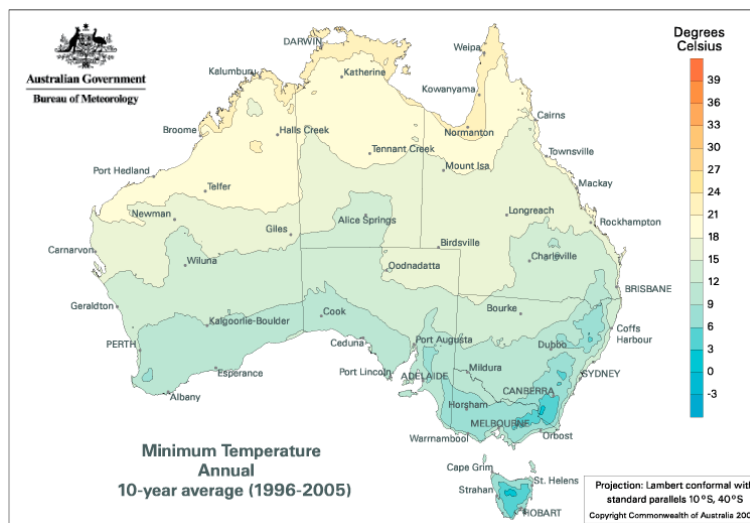
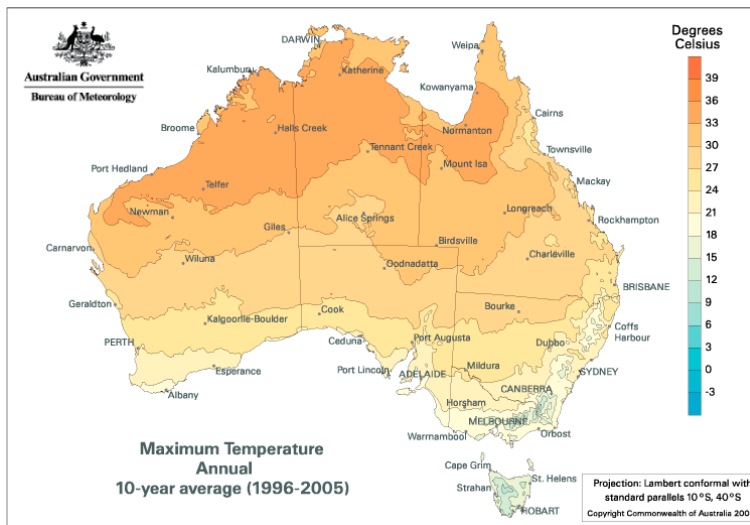




Temperatures

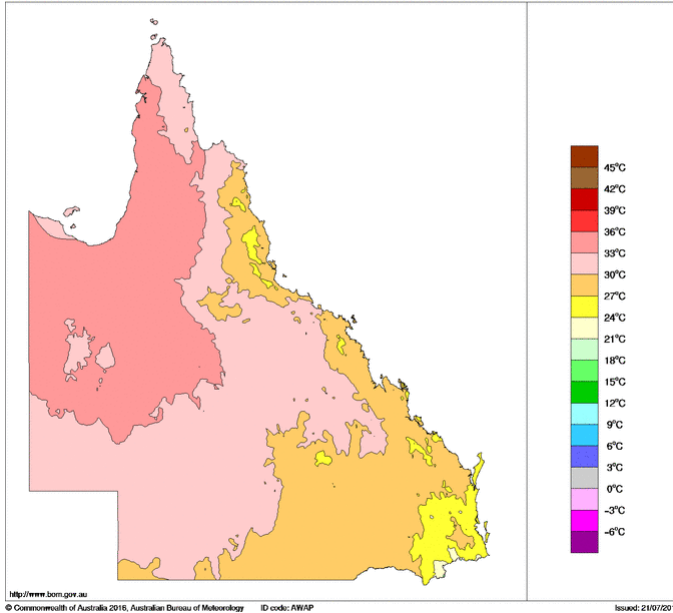
The ambient temperatures on the Mount Isa Line vary significantly throughout the year. Summer temperatures can reach above 45°C whilst minimum temperatures during winter can be below 3°C.

At times during periods of high temperatures it may be an operational requirement to impose temporary speed restrictions – heat restrictions (reducing the train operating speed) over various sections of the track to minimise the risk of incident.

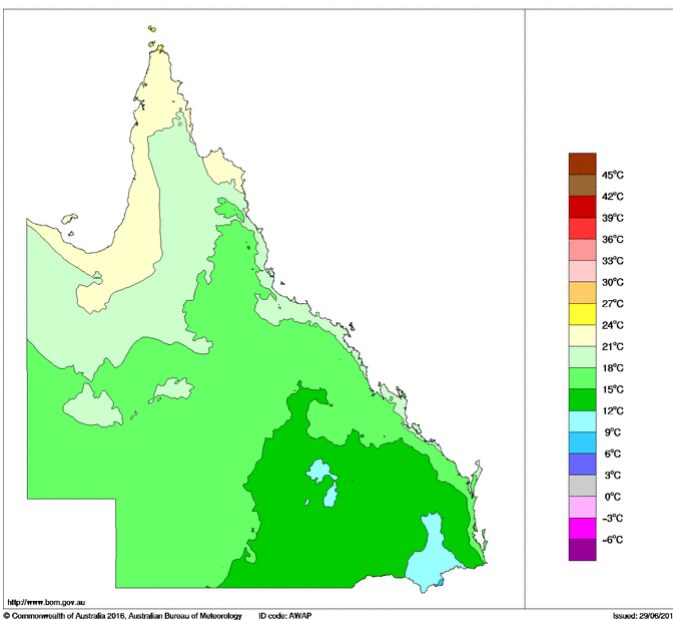


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 Mount Isa System
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Maximum Temperature (°C) 1 July 2015 to 30 June 2016
 Australian Bureau of Meteorology



Minimum Temperature (°C) 1 January to 31 December 2015
 Australian Bureau of Meteorology



Weather Monitoring Stations

As part of Queensland Rail's infrastructure management system, remote weather monitoring stations are located at sites historically impacted by seasonal flooding. These stations provide critical real time information on flood (river level) and waterway flow, air temperature, rainfall gauge and rail temperature.

Alerts are sent to both field staff and the Townsville Control Centre as a warning for increased monitoring. The current weather monitoring stations are located at:

Location	KM Point
Calcium	36.520km
Pandanus Creek	84.310km
Sellheim Yard	110.020km
Southern Cross	144.630km
Polwathanga Creek	160.490km
Homestead Creek	201.000km
Betts Creek	233.680km
Skull Creek	349.700km
Walker Creek	423.770km
Namoi Creek	456.930km
O'Connell Creek	494.520km
Chatfield Creek	530.530km
Boundary Creek	555.200km
Corella Creek	593.000km
Eastern Creek	658.620km
McKinnons Creek	665.320km
Holy Joe Creek	681.860km
Box Creek	687.640km
Fullerton Creek	702.940km
Bishops Creek	740.320km
Duck Creek	814.900km
Mairindi Creek	883.380km
Browns Creek	947.140km

Description of the Railway

Total Track:	1032km single track	Gauge:	Narrow (1067mm)
Rail Size:	41, 47, 50, 53 & 60kg/m	Axle Load:	20 tal
Train Control:	Townsville Control Centre	Safeworking:	Direct Traffic Control
Crossing Loops:	46	Balloon Loops:	3
Traffic:	Circa 5mpta	Sleepers:	Steel/Concrete
Track Speed:	80km/hr STU-HGD 60km/hr HGD-ISA/PHH	Bridges:	>200
		Hot Box Detectors:	3
Weather Monitoring Stations:	23	Dragging Equip Detectors:	23
Min Loop Length:	1009m	Max Loop Length:	1240m
Level Crossings:	198	Overload Detectors:	2

Basic Track Configuration

Basic track configuration is detailed on **APPENDIX B - SCHEMATIC LAYOUTS**.

Stuart to Hughenden (377km)

Crossing Loops	<i>Antill Plains</i>	1116m
	<i>Woodstock</i>	1105m
	<i>Reid River</i>	1117m
	<i>Woldston</i>	1137m
	<i>Mingela</i>	1149m
	<i>Sellheim</i>	1240m
	<i>Charters Towers</i>	Yard
	<i>Southern Cross</i>	1122m
	<i>Balfes Creek</i>	1132m
	<i>Mungunburra</i>	1121m
	<i>Homestead</i>	1129m
	<i>Pentland</i>	1101m
	<i>Warrigal</i>	1089m
	<i>Burra</i>	1124m
	<i>Torrens Creek</i>	1216m
	<i>Warreah</i>	1126m
	<i>Prairie</i>	1125m
	<i>Tindo</i>	1140m
Level Crossings	<i>Public</i>	54
	<i>Occupation</i>	25
	<i>Flashing Lights</i>	8
	<i>Boom gates</i>	2
Track Structure	<i>Rail Mass</i>	41, 47, 50, 53 and 60kg
	<i>Jointed</i>	Continuously Welded Rail (CWR)
	<i>Sleeper</i>	Concrete & Steel
Height Restriction	<i>Max Container Height</i>	3.05m

The maximum grade (not compensated for horizontal alignment) that an up train - (travelling west) may encounter is 1 in 32 over a distance of 50m between the 111 to 112km whilst for a down train (travelling east) is 1 in 35 over a distance of 100m between the 111-112km and 40m between the 117-118km.

Existing minimum nominal horizontal curve radii are as follows:

Main Line	300m
Crossing Loop	280m
Sidings & Depots	140m
Turning Angles	100m

Hughenden to Cloncurry (392 km)

This section of the Mount Isa Line is built along the black soil Flinders plains and is susceptible to flooding during the summer months. The black soil is relatively unstable as it swells in the wet season and contracts during the cooler winter months. The resulting track speed is limited to 60km/hr to compensate for these fluctuations.

Track structure is 41, 47, 50 and 60 kg/m rail on steel and concrete sleepers allowing 20 tal traffic travelling at a maximum speed of 80 kph between Cloncurry and Flynn.

The maximum grade (not compensated for horizontal alignment) that an up train - (travelling west) may encounter is 1 in 55 whilst for a down train (travelling east) is 1 in 50.

Crossing Loops	<i>Hughenden</i>	1075m
	<i>Boree</i>	1096m
	<i>Mumu</i>	1021m
	<i>Marathon</i>	1009m
	<i>Moselle</i>	1026m
	<i>Richmond</i>	1191m
	<i>Gemoka</i>	1021m
	<i>Maxwellton</i>	1039m
	<i>Nonda</i>	1035m
	<i>Nelia</i>	1021m
	<i>Quarrells</i>	1022m
	<i>Julia Creek</i>	1024m
	<i>Gilliat</i>	1021m
	<i>Tibarri</i>	1021m
	<i>Oorindi</i>	1072m
	<i>Undina</i>	1046m
	<i>Pymurra</i>	1020m
	<i>Oonoomurra</i>	1033m
Level Crossings	<i>Public</i>	33
	<i>Occupation</i>	31
	<i>Flashing Lights</i>	4
	<i>Boom gates</i>	0
Track Structure	<i>Rail Mass</i>	41, 47, 50, and 60kg

	<i>Jointed</i>	Continuously Welded Rail (CWR)
	<i>Sleeper</i>	Concrete & Steel
Height Restriction	<i>Max Container Height</i>	3.05m

There is a balloon loop at Yurbi which is 47kg/m rail on steel sleepers, with a minimum curvature of 204m and a grade of 1 in 116 against the up train. The loop is 2.080km in length.

The maximum grade (not compensated for horizontal alignment) that an up train - (travelling west) may encounter is 1 in 48 over 60m between the 487 to 488km whilst for a down train (travelling east) is 1 in 50 over 110m between the 486 and 487km.

Existing minimum nominal horizontal curve radii are as follows:

Main Line	401m
Crossing Loop	300m
Siding & Depots	140m
Balloon Loop (Yurbi)	204m

Cloncurry to Mount Isa (197 km)

Crossing Loops	<i>Cloncurry</i>	1026m
	<i>Marimo</i>	1024m
	<i>Malbon</i>	1020m
	<i>Wammutta</i>	1019m
	<i>Bungalien</i>	1021m
	<i>Duchess</i>	1034m
	<i>Woonigan</i>	1063m
	<i>Rifle Creek</i>	1021m
Level Crossings	<i>Public</i>	16
	<i>Occupation</i>	20
	<i>Flashing Lights</i>	3
	<i>Boom gates</i>	3
Track Structure	<i>Rail Mass</i>	41, 47, 50 and 60kg
	<i>Jointed</i>	Continuously Welded Rail (CWR)
	<i>Sleeper</i>	Concrete & Steel
Height Restriction	<i>Max Container Height</i>	3.05m

The maximum grade (not compensated for horizontal alignment) that an up train - (travelling west) may encounter is 1 in 38 over a distance of 40m between the 960 to 961km whilst for a down train (travelling east) is 1 in 46 (Lena Creek) 150m between the 963 - 964 km.

Existing minimum nominal horizontal curve radii are as follows:

Main Line	225m
Crossing Loop	300m
Siding and Depot	140m
Balloon Loop (Mount Isa)	100m

Flynn to Phosphate Hill (66 km)

This single track and balloon loop carries acid and mineral traffic and has been constructed using 47 kg/m rail on concrete sleepers.

Crossing Loops	<i>Pilgrim</i>	1054m
	<i>Miri</i>	1050m
Level Crossings	<i>Public</i>	1
	<i>Occupation</i>	5
	<i>Flashing Lights</i>	0
	<i>Boom gates</i>	0
Track Structure	<i>Rail Mass</i>	47kg
	<i>Jointed</i>	Continuously Welded Rail (CWR)
	<i>Sleeper</i>	Concrete
Height Restriction	<i>Max Container Height</i>	3.05m

The maximum grade (not compensated for horizontal alignment) that an up train - (loaded - travelling south) may encounter is 1 in 125 over 340m between the 0 to 0.340km whilst for a Down train (empty - travelling north) is 1 in 119 over 340m between 3.020 - 3.360km.

Existing minimum nominal horizontal curve radii are as follows:

Main Line	1200m
Crossing Loop	300m
Siding and Depot	140m
Balloon Loop (Phosphate)	204m

Description of the Track

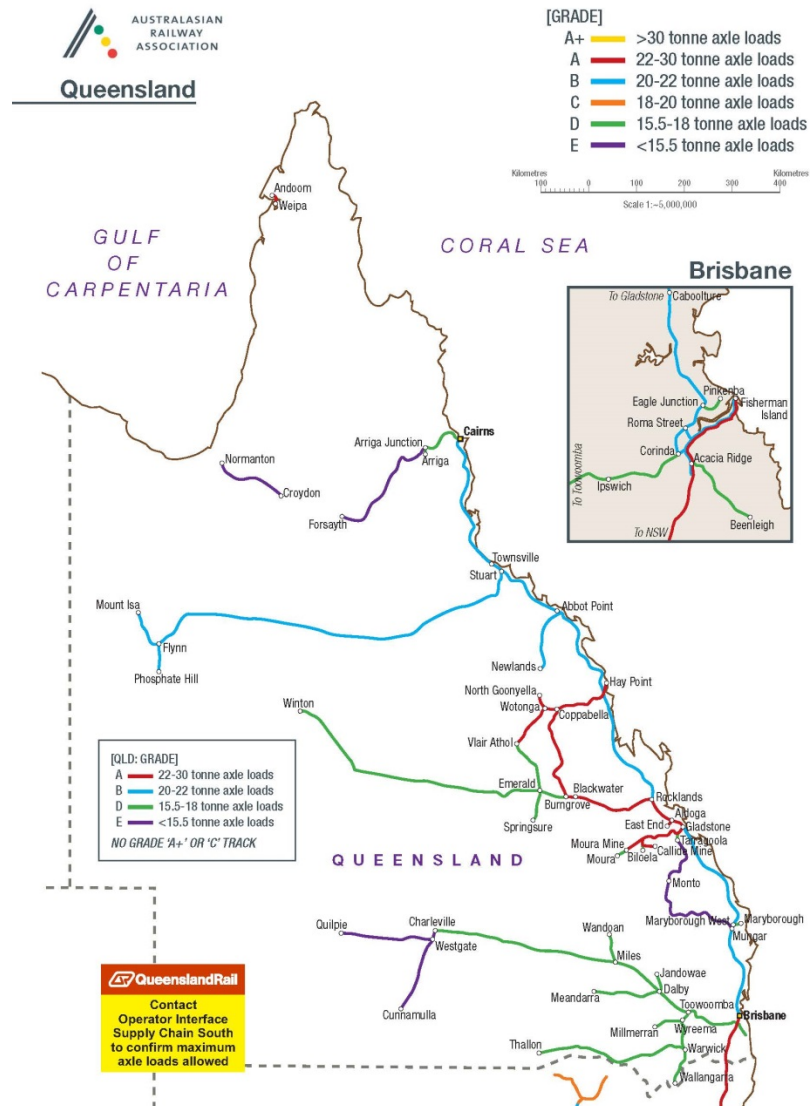
The track on this system is a mix of 41, 47, 50, 53 & 60kg/m with the associated sleeper types namely steel and timber on crushed rock ballast. The rails are continuously welded.

Speeds through the curved leg of turnouts are governed by the angle of that turnout i.e.

1 in 12	25 km/h
1 in 16	50 km/h
1 in 25	80 km/h

In general, curves (with the exception of turnout curves) are transitioned.

Track Data and Grade Diagrams for the following major route are included in Appendix E.



Operational Constraints - Infrastructure

Queensland Rail is focused on the safety of its employees, customers and the general public. As such, Queensland Rail may impose blanket speed restrictions on the network as a precautionary measure during extreme heat in the summer months. These hot weather protocols are aimed at reducing the risk of an incident from track instability.

When the air temperature reaches 35°C a hot weather patrol will be undertaken by Queensland Rail personnel to observe and determine the condition of the track structure. On the basis of this inspection, a blanket speed restriction may be imposed if signs of track instability have been observed. All rail operators will be informed of the speed restriction and duration of restriction by the Townsville Train Control Centre. Uniform measures for hot weather are specified in the safety standard *MD-10-143 Civil-Hot Weather Precaution for Track Stability*. A copy of this standard is available on request.

Temporary speed restrictions may also be put in place during and after the completion of maintenance activities. The extent of the restriction will depend upon the type of maintenance activity and the risk of track misalignments. All speed restrictions put in place on the network due to maintenance activities will be appropriately signed for drivers.

Force Majeure Events may also see the imposition of speed restrictions or track closures. The extent and severity of any speed restrictions are dependent on the event.

Trackside Detection Equipment

Queensland Rail continues to focus on derailment prevention technologies along the Mount Isa Line. These systems provide a simultaneous alarm to the train driver and Townsville Network Control Centre that detects problems outside normal operating parameters. These alarms indicate a potential failure, allowing intervention by train drivers and train control to reduce the risk of derailments on the line.

Dragging Equipment Detectors (DED)

Dragging Equipment Detectors (DEDs) detect anything that may be dragging underneath a train which may indicate that a wheel or wagon is derailed and provides appropriate alarms. Dragging equipment detectors are located at the following sites:

Antill Plains - Woodstock	22.9km
Woldston - Mingela	61.3km
Mingela - Sellheim	92.0km
Mingela - Sellheim	104.74km
Sellheim - Charters Towers	110.00km
Charters Towers - Southern Cross	135.5km
Homestead - Pentland	229.3km
Tindo - Hughenden	358.0km
Boree - Mumu	409.2km

<i>Mumu - Marathon</i>	432.5km
<i>Marathon - Barabon</i>	452.6km
<i>Barabon - Moselle</i>	463.8km
<i>Richmond - Gemoka</i>	504.1km
<i>Quarrells - Julia Creek</i>	626.0km
<i>Julia Creek - Gilliat</i>	648.0km
<i>Pymurra - Oonoomurra</i>	748.0km
<i>Cloncurry - Marimo</i>	780.0km
<i>Marimo - Malbon</i>	811km
<i>Wammutta - Bungalien</i>	848.1km
<i>Flynn - Duchess</i>	873.0km
<i>Woonigan - Rifle Creek</i>	927.2km
<i>Rifle Creek - Mica Creek</i>	960.9km
<i>Mirri (PHH Branch)</i>	54.1km

Hot Box Detectors/Hot Wheel Detectors

These devices detect faulty bearings on rollingstock that are projecting heat and noise signatures outside the normal operating parameters. On the Mount Isa Line, Hot Box Detectors/Hot Wheel Detectors are located at:

<i>Antill Plains - Woodstock</i>	18.2km
<i>Gilliat – Tibarri</i>	673.9km
<i>Woonigan-Rifle Creek</i>	927.2km

Overload and Imbalanced Load Detectors

Queensland Rail's overload and imbalanced load detectors (OILDs) are non-trade certified weighbridges strategically located to detect overloaded or unevenly loaded freight wagons. Overloaded or unevenly loaded wagons can cause excessive train and track forces that can lead to a derailment. OILDs measure passing wheel and axle weights and will issue alarms if the values recorded exceed set thresholds. The Overload and Imbalanced Load Detectors are located at:

<i>Thalanga</i>	190.3km
<i>Pymurra - Oonoomurra</i>	747.7km
<i>Rifle Creek – Mica Creek</i>	943.7km

Wheel Impact Load Detectors

Queensland Rail has recently invested in this new technology which identifies flat wheels on rollingstock. Left undetected, these defective rollingstock wheels can cause severe damage to the network resulting in the closure of the track, which can now be avoided with these detectors. The wheel impact load detector on the Mount Isa line is located at:

<i>Toonpan</i>	18.2km
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Axle Counters

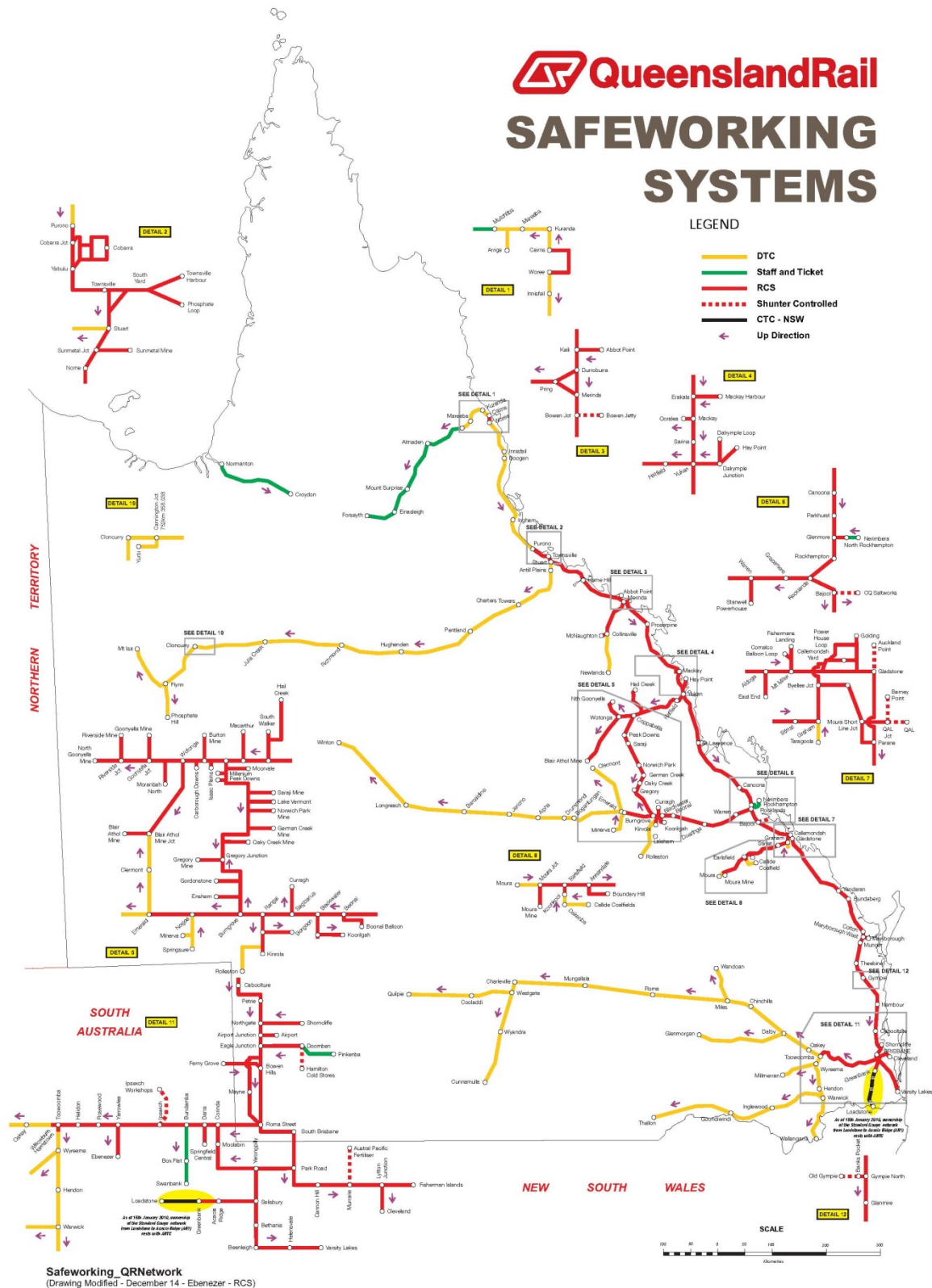
There are no axle counters used on the Mount Isa Line.

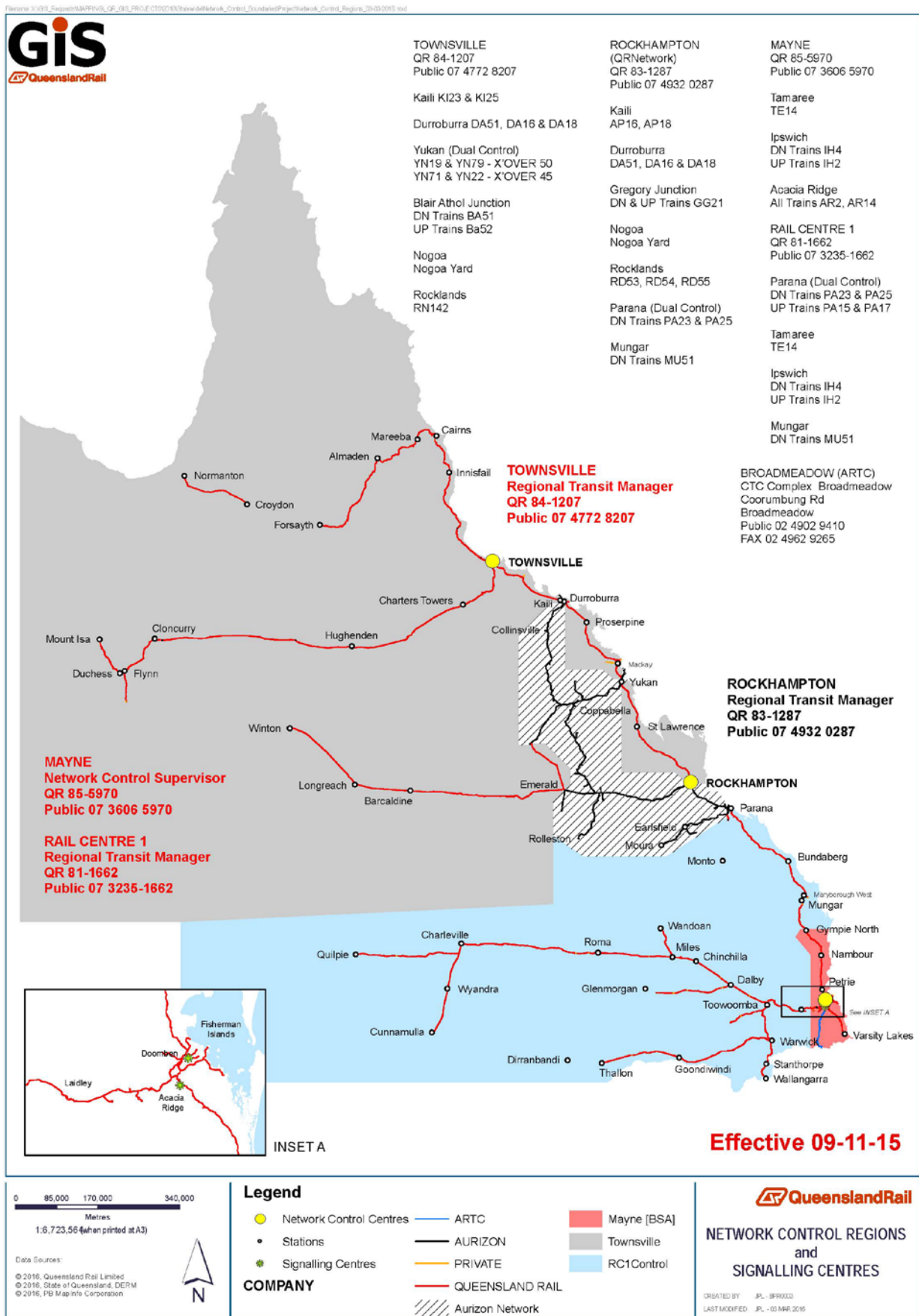
Operational Systems & Train Control

The Mount Isa system is operated by Remote Control Signalling (RCS) between Stuart and Antill Plains and Direct Traffic Control (DTC) with Automatic Train Protection (ATP) between Antill Plains and Mount Isa. Phosphate Hill with all train movements controlled from the Townsville Train Control Centre. The Townsville Train Control Centre also controls yard movements in Charters Towers, Hughenden, Cloncurry and Mount Isa Yards by Universal Yard Control (UYC)

Direct traffic control is an electronic safeworking system used to control the movement of trains in non-signalled territory. The movement of rail traffic is governed by instructions contained in DTC Authorities issued by the Network Control Officer to rail traffic crew. Direct traffic control operates on the principle of absolute block working which provides that only one rail traffic movement will be authorised on any one block, at any one time.

Queensland Rail does not warrant the fitness for purpose or accuracy of this information
Mount Isa System
Information Pack





Information Systems

ViziRail is the key software system designed as a tool for use in integrated scheduling, possession planning, monitoring and reporting on the Queensland Rail network.

Functionality includes modules:

- Train notices
- Actual train running (ATR)
- Incidents
- Train consists (Train Builder)
- Speed restrictions
- Rollingstock allocations
- Rollingstock maintenance
- Fresh turnouts
- Planning graphs
- Scheduling enhancements
- Possession enhancements
- OTIS (Operational to Information Systems) - which converts train steps to actual arrival and departure train information.

Operational Constraints - Rollingstock

All rollingstock that operates on the Mount Isa Line must be authorised by Queensland Rail. All rollingstock configurations must also be authorised by Queensland Rail.

As part of the Access Process, the Rail Operator must demonstrate that the rollingstock has been designed, constructed, modified, appropriately tested and configured in a manner that complies with the agreed Rollingstock Interface Standards in its Interface Risk Management Plan.

Rollingstock that does not have this authorisation will not be permitted on the network.

Communications

Communications on the Mount Isa System between Driver and Controller is via a UHF radio system (Train Control Radio - TCR) utilising a number of Queensland Rail channels and frequencies. Frequency specification and coverage details are available as part of the Access Request Process.

Access to the Maintenance Supervisory Radio System (MSR) can be gained by using Queensland Rail telephone extensions depending on location or UHF radio system utilising Queensland Rail channels.

In addition, all locomotives and other power vehicles must carry a UHF radio operating on Queensland Rail Channel 1. This provides on-board and wayside communications including end to end, train to train and train to track gangs over a distance on average of 8 - 10 km.

Communications systems must be compatible with Queensland Rail systems. These are detailed in the safety standard MD-10-86 Telecommunications – Mobile Voice Radio Communications Systems.

Sectional Running Times

The sectional running times, expressed as minutes, for various types of trains currently operating on the system are contained in **APPENDIX F**.

It should be noted, that the sectional running times presented are “**Pass to Pass**” times for a running move and therefore do not include any acceleration or deceleration allowance.

Proposed train configurations would need to be confirmed by the relevant operator against the infrastructure constraints to determine if the sectional running times can be achieved. If the sectional running times cannot be achieved then different arrangements, including for access charges, may need to be negotiated as part of the access agreement negotiations.

Changes to the sectional running times for the system are also possible over time. Any changes would be confirmed as part of the access agreement negotiations.

Trains travelling on the Mount Isa System in the Up Direction are travelling towards Mount Isa.

Incident Recovery Time and Management

Incident recovery times and management is dependent on the nature, severity and location of each unique incident that may occur on the Mount Isa Line.

To enable a quick response in case of emergency, latitudes and longitudes of some passing loops are detailed below:

Location	KM Point	Latitude	Longitude
Townsville Station	1340.5km (NCL)	19° 16' S	146° 48' E
Stuart	1331.2km (NCL)	19° 21' S	146° 50' E
Woodstock	27.850km	19° 35' S	146° 50' E
Woldston	58.740km	19° 83' S	146° 76' E
Charters Towers	128.120km	20° 05' S	146° 15' E
Pentland	234.620km	20° 31' S	145° 23' E
Torrens Creek	287.950km	20° 46' S	145° 01' E
Prairie	333.060km	20° 52' S	144° 35' E
Hughenden	377.480km	20° 50' S	144° 11' E
Richmond	491.480km	20° 44' S	143° 08' E
Julia Creek	638.150km	20° 39' S	141° 44' E
Cloncurry	769.550km	20° 42' S	140° 30' E
Malbon	821.050km	21° 04' S	140° 17' E
Bungalien	865.690km	21° 18' S	139° 59' E
Flynn	868.810km	21° 19' S	139° 57' E
Duchess	879.430km	21° 21' S	139° 51' E
Mount Isa	966.790km	20° 43' S	139° 29' E
Phosphate Hill	66.060 (PHH Branch)	21° 53' S	139° 59' E

Rail / Road Interfaces

Operators on the West Moreton System will encounter 338 Rail / Road Interfaces (see Appendix C for details) categorised as follows:-

Public (Active with Flashing Light/Boom Gate Protection)	-	46
Public (with Passive Protection - Signs)	-	138
Occupation (Private Access)	-	154

Rail Operations and the Environment

Queensland Rail is committed to managing its service and operational activities in an environmentally responsible manner to meet legal, social and moral obligations. We seek to be proactive in developing means by which our business can grow in an environmentally sustainable manner.

Queensland Rail's environmental management information can be viewed at:
<http://www.queenslandrail.com.au/inthecommunity/environment/environmentalmanagement>

All rail operators operating on the Queensland Rail network are required to comply with all current state and federal legislation relating to the management and protection of the environment. Environmental and noise management issues are included and agreed in all Access Agreements.

Railway operators must ascertain with the Department of Environment and Heritage Protection or Other Regulatory Body their responsibilities in regard to obtaining an environmental authority (i.e.) for the type of operation proposed. Copies of all environmental authorities administered by the Department of Environment and Heritage Protection within Queensland are available upon request from the department which can be found at:

<http://www.ehp.qld.gov.au/>

Environmental Noise

The Environmental Protection (Noise) Policy (EPP Noise) recognises a railway as a beneficial asset, which is necessary for the community's environmental, social and economic well-being. The Environmental Protection (Noise) Policy is available via the Office of the Queensland Parliamentary Council website at

<http://www.legislation.qld.gov.au/OQPChome.htm>

The EPP Noise nominates "planning levels" for railway noise which may be used as a guide in deciding a reasonable noise level for the activity. The EPP Noise recognises, however, those levels may not be appropriate for an existing railway. It envisages that it may be reasonable to apply the levels only in the long term to allow time to progressively reduce any significantly adverse effects on the environmental values from its operation. The long term planning levels are:

L_{Aeq} (24 hour)	65dBA
L_{Amax}	87dBA

They are to be assessed one (1) metre in front of the most exposed part of the building facade of an affected noise sensitive place.

<http://www.queenslandrail.com.au/inthecommunity/environment/noisemanagement>

Noise Management

While noise from the operation of a railway is exempt from environmental nuisance provisions under the Queensland Environment Protection Act 1994, Queensland Rail strives to manage noise associated with both its rail operations and network wherever reasonable and practical.

As the rail manager, Queensland Rail works closely with customers regarding environmental issues, and provides feedback to Rail Operators to allow them to investigate and address as applicable, noise related issues that may be associated with their locomotives and wagons.

There are various sources of noise from a railway and to aid efficient and effective noise reduction, a range of noise management measures are utilised by Queensland Rail. These are detailed at:

<http://www.queenslandrail.com.au/inthecommunity/environment/noisemanagement>

Wheel Squeal & Flanging

Wheel Squeal is caused by friction forces between the top of rail and wheel interface. Whereas, flanging noise is predominantly caused by friction forces between the side of rail and wheel interface. Continuous or sustained wheel squeal produced primarily on the low rail side, is distinct from discontinuous “flanging noise” that is produced on the high rail side. Continuous wheel squeal is of a high level, and Queensland Rail’s experience is that it may cause significant community reaction, while flanging noise is of a lower level and is more accepted by the community.

Generally, tighter radius curves (i.e. under 300 metre radius) when associated with a number of rollingstock factors that promote wheel squeal, may result in squeal being produced. Rollingstock factors that may promote wheel squeal include:

- Higher wheel hardness
- Stiff primary suspensions
- High centre plate friction
- Worn wheel treads
- Misaligned axles
- Unmatched wheel tread diameters, and
- Incorrectly adjusted sidebearers

Noise Complaints

Queensland Rail is corporately committed to act towards its neighbours in a considerable and reasonable manner. This good neighbour commitment assumes a reasonable degree of tolerance from neighbours and a commitment by Queensland Rail to take action where appropriate.

Where Queensland Rail receives complaints about noise from railway activities for which Queensland Rail may be responsible, Queensland Rail responds to those complaints and maintains records of those complaints in accordance with its Environmental Management System (EMS).

Where available, generic data will be supplied on request to a third party operator who is proposing operations within a defined network. That data will indicate those areas where Queensland Rail has received prior complaints relating to its train operations. It will be made available when a third party operator is undertaking the development of its Environmental Investigation and Risk Management Report as part of its Access Agreement conditions.

Third Party Requirements

Any railway operator obtaining access to Queensland Rail's Network shall be required to commission an environmental investigation of the proposed operations. This investigation will be conducted by a suitably qualified person, reasonably acceptable to both parties.

In response to the findings of such an investigation, the operator shall produce an Environmental Investigation and Risk Management Report that identifies the risks of Environmental Harm associated with the operation and provides proposed controls to address the risks. This shall be reviewed by, and agreed with, Queensland Rail.

In addition, the operator shall have in place an EMS, which, amongst other things, has regard for the issues, risk and control measures identified in the Environmental Investigation and Risk Management Report. Further details on requirements for environmental issues can be found in Queensland Rail's Access Undertaking.

Queensland Rail has determined that it holds no EMS documentation that, without disclosure to a third party operator, would either:

- Compromise or restrict a third party's operations or increase or place at risk the environmental performance of the third party operator or itself, and
- Limit or restrict the abilities of a third party operator to develop such documentation that would not be reasonably expected of the operator to develop on its own behalf, commensurate with the size and subsequent environmental risks of the proposed operations and the organisational resources available to it, to undertake such operations.

Any EMS documentation (wholly or partially) identified as specifically relating to the control of corridor infrastructure (below rail) environmental issues, will be made available to the operator to assist in formulating appropriate and consistent operational (above rail) controls within their Environmental Investigation and Risk Management Report and EMS.

Maximum Train Length

The maximum length of trains is determined by:

- restrictions for crossing/passing other trains
- requirements for braking performance of the train
- capacity of the route
- drawgear capacity
- train handling
- requirements for road/pedestrian access across the track

The maximum train length permitted on the Mount Isa line is 1009m. This length only applies west of Stuart, limitations/restrictions apply between Stuart and Townsville Jetty and reduced lengths apply on other lines such as the North Coast line.

Variations of train length for a particular train configuration are possible, however all changes need to be agreed as part of access agreement negotiations.

Rollingstock Braking Rate

The signalling system and flashing light protection at rail / road interfaces has been designed to cater for the variety of trains that currently use this system.

Signal design parameters and train braking characteristics will be compared during the development of the Interface Risk Management Plan.

Future Infrastructure Improvements

Infrastructure Improvements

Queensland Rail has developed a planning program of works to upgrade the infrastructure of the network to increase the long term stability of the line which includes:

- Replacing steel sleepers with concrete sleepers; and
- Replacing light rail with heavy 60kg/m rail.

Queensland Rail aims to continue the resleepering and rerailing to complete the transformation of the entire system. The current timing of the program is dependent on sufficient growth occurring on the line to provide the additional funding for these works. Should significant additional tonnes be contracted on the network, the works program will need to be accelerated to coincide with the increased traffic.

Capacity Enhancements

Queensland Rail welcomes opportunities to work with customers with a view to transporting additional tonnages on the Mount Isa Line.

We encourage Rail Operators, mining companies and/or processors to engage with Queensland Rail at the earliest possible opportunity. This will allow sufficient time to work through detailed capacity analysis and to determine the network upgrades necessary and negotiate appropriate commercial arrangements.

Capacity enhancements will continue to be delivered for future projects provided that contracted tonnages:

- Are sufficient to justify the necessary capital investment on commercial terms; and
- Adequate notice is given from the time of contracting capacity to deliver the required enhancements.

Over-Dimensional Road Loads

Permission is required from Queensland Rail to take over-dimensional road loads (ODRL) across Queensland Rail infrastructure. Typical examples of such loads are houses, earthmoving equipment, transformers, machinery or agricultural equipment.

If a road load exceeds any of the requirements listed below, and it is required to transport the load across Queensland Rail infrastructure, a permit must be issued by Queensland Rail. This permit ensures safe travel over all Queensland Rail infrastructure. The type of authority will depend on the type of load being transported and the required route.

Where approval is required

Approval must be obtained where a vehicle's load meets at least one of the following descriptions:

- Over-weight vehicles, long vehicles, wide vehicles and high vehicles
- The total of all axle mass weight for the vehicle is over 105 tonnes
- The axle mass for any single axle of the vehicle is over 12 tonnes
- The total of all axle masses for any 9 meters of the vehicle's length is over 48 tonnes.
- The vehicle is longer than 35 meters on a railway crossing
- The vehicle is wider than 5.5 meters wide; or the distance between the posts of a height barrier for the crossing. Enquiries regarding Over-Dimensional Road Loads should be directed to (07) 3072 1719 email roads@qr.com.au

Infrastructure Management and Access

APPENDIX B - SCHEMATIC LAYOUT is colour coded to indicate Management of Infrastructure and Access.

Third party access to non-Queensland Rail managed infrastructure is by commercial arrangement with the relevant party.

The initial point of contact for Queensland Rail managed below rail assets is:

General Manager Access Revenue

Level 9 | 305 Edward Street
Brisbane Qld 4001
Telephone 61 07 3072 1145
Facsimile 61 07 3072 8248
Email: aarf@qr.com.au

APPENDIX A

Definitions (Statewide)

Access Agreement

Access Agreement means an agreement between Queensland Rail and an Access Holder for the provision of Access.

Access Undertaking

A document approved by the Queensland Competition Authority (QCA) in accordance with the QCA Act 1997 (Q) that sets out principles for negotiating access to Queensland Rail's declared services.

Accreditation

Accreditation in accordance with part 4, Chapter 6 of the Transport Infrastructure Act 1994 (Qld) and "Accredited" has a similar meaning.

ATP (Automatic Train Protection)

Automatic Train Protection is a computer controlled system designed to make sure the train

- does not exceed the current speed limit
- does not exceed the limit of authority generated by the interlocking (and usually indicated by a signal at STOP)
- does not make unreasonable train movements during shunting, when stationary, or at startup

AWS (Automatic Warning System)

Automatic Warning System is designed to

- provide an in-cab visible and audible indication of the aspect displayed in the next signal
- prompt and warn the train driver of a RESTRICTED signal aspect displayed in the next signal
- stop the train if the driver fails to acknowledge the AWS alarm of a RESTRICTED signal aspect

Axle Counters

At some locations in Remote Controlled Signalling (RCS) Territory an axle counter system has been provided to detect occupancy of a section of track.

An axle counter at each end of a section determines whether an axle is entering or leaving the section and counts the number of axles passing the counter in each direction. By keeping an accurate count of axles into the section, then the number of axles out of the section, the system can determine if the section is occupied or not.

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Block Train

A train consisting entirely of similar classes of wagons of axle loads over 12.2 tonnes marshalled together for a certain class of traffic. The definition is also extended to cover trains in which 12 or more such wagons loaded to more than 12.2 tonnes gross per axle are included within a length of 315 metres or less of the train.

Crossing Loop Length

The maximum length in metres of the train which can be accommodated in the loop to allow normal operation of the signalling systems for crossing or passing movements.

Daily Train Plan (DTP)

Collectively, the scheduled times for all Train Services operating on Queensland Rail's Rail Infrastructure and any Planned Possession on a particular day.

Declared Services

Services declared as available for access by third party operators in accordance with the QCA Act 1997 (Q).

Declared Infrastructure

Infrastructure declared as available for access by third party operators in accordance with the QCA Act 1997 (Q).

Design Neutral Temperature

The rail temperature at which the track is designed to be stress free as defined in Queensland Rail's Civil Engineering Publication #26 "Rail Stressing Manual".

Direct Traffic Control (DTC)

Direct Traffic Control (DTC) is an absolute block safeworking system used to control the movement of trains in non-signalled territory.

Central to DTC is an on-board DTC computer which displays authorities stored in its database. The relevant authority is activated by the train crew following an exchange of codes between the crew and the controller. Codes are exchanged verbally using the train control radio.

The procedures governing the operation of DTC are detailed in Queensland Rail's Standard MD-10-113 "Direct Traffic Control Manual".

Dragging Equipment Detectors (DED)

A mechanism positioned on sections of track to detect any dragging equipment on train.

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Dragging Equipment Detectors Alarm (DED Alarm)

Part of the Queensland Rail System which advises the Train Controller either by a computer prompt message that a D.E.D. has been activated and the train driver by a recorded voice message.

Electromagnetic Compatibility (EMC)

The ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

Electric Train Staff

A 'token' system of train working between Interlockings on single lines in non track- circuited areas, where release of a token is controlled by electrically connected and interlocked instruments.

EPP (Noise)

Environmental Protection (Noise) Policy 1997; Subordinate Legislation to the Queensland Environmental Protection Act 1994.

Force Majeure Event

Means any cause, event or circumstance, or combination of causes, events or circumstances, which is beyond the reasonable control of the Party affected thereby and which by the exercise of due diligence such Party is not reasonably able to prevent or overcome, including but not limited to, results of abnormal weather conditions, act of God, breakdown of any facilities or machinery or unavailability of essential equipment, strikes or other industrial dispute.

Hot Wheel & Bearing Detectors (HWD/HBD)

Heat sensors located at strategic locations on the system that identify abnormal temperatures in wheels and wheel bearings as the train passes over, transmits a signal to the train control panel that necessitates an inspection of the suspect wagon and remedial action

Line Code

Line Code, a unique alpha-numeric identifier applied to a section of track on Queensland Rail's network and usually run from junction point to junction point. Each numeric identifier is unique and can be further rolled up into Corridors using the alpha identifier.

LWR

Long welded rail. Rail that has mechanical rail joints spaced at intervals between 110m and 220m.

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LSC

Line Section Code, a unique alpha-numeric identifier applied to a section of Queensland Rail's network.

Master Train Plan (MTP)

Collectively, the scheduled times as advised by Queensland Rail from time to time for all Train Services operating on Queensland Rail's Rail Infrastructure where such scheduled times remain unchanged from week to week, and any Planned Possessions.

Nominal Rail Size

Rail sizes 20, 31 and 41 kg/m are all nominal rail sizes used to group together a range of rail types and sizes originally designated in the imperial unit "lb/yd". The term "nominal" is used in recognition of the variation in the dimensions, mass and engineering properties of the rails in this category.

Ordinary Staff and Ticket Working

A token based system of safeworking where the movement of trains on bi-directional single lines is on possession of a staff token or ticket. Each section of single line has a unique token.

Staff & Ticket

The Staff and Ticket System allows for the movement of trains over a bidirectional track.

The Staff and Ticket System operates (in accordance with Queensland Rail's Standard MD-10-114) on the principle of absolute block working, which provides that only one train will be authorised to be on any one section at any one time.

Railway Operator

A person who has, or is seeking, Access from Queensland Rail to operate Train Services on the Rail Infrastructure and who is, or who will become, Accredited in respect of those Train Services.

Remote Controlled Signalling (RCS)

A system of Safeworking where train movements are governed by aspects displayed in Colour Light Signals which are controlled from a remote location and by the passage of trains. Some colour light signals and points may be released by the Train Controller to be operated from a local area by using:

- a local control panel;
- an electrically released shunting frame;
- a zone released shunting system, or
- emergency push buttons.

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Railway Operators trains are expected to meet existing signalling standards to ensure track circuits and other signalling equipment operate safely and effectively - in particular Queensland Rail's Standard MD-10-76 "Principles for the Signalling of Trains" must be complied with.

Rollingstock Authorisation Process

The process for determining and validating rollingstock compliance and registration as detailed in Queensland Rail's Standard MD-10-140 - Rollingstock Validation, Acceptance and Registration

Remote Train Overview Application (RTOA)

A PC based system providing real time operational information, gathering information on train running and rail network status for immediate and continuously updated display and historical analysis.

Being a multi-tier client-server application, different levels of access/security ensure confidentiality of an Operator's train performance statistics.

SN Speed Boards

Speed Normal Boards are speed boards that place the onus on the Driver of a train to travel at speeds considered safe for that section of track being travelled over. These boards are gradually being phased out in accordance with Queensland Rail's Civil Standard MD-10-87 - SPEED BOARDS

Standard Train

The predominant type of train operating on the line/system.

SWR

Short welded rail. Rail that has mechanical rail joints spaced at intervals less than 110m.

Train Authorisation

The process for acceptance of a train configuration whose rollingstock is registered under Queensland Rail's Standard MD-10-140 - Rollingstock Validation, Acceptance and Registration.

Train Length

The total length in metres of a train including the locomotives. For the purposes of comparison with the length of crossing loops, it is defined as the static train length plus:

- 2% of the static Train length for train handling allowance; and
- 125mm per vehicle for coupler and drawgear tolerances.

Unit Train

A train composed entirely of the one class and one drawgear classification of rollingstock.

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Universal Traffic Control (UTC)

A PC based train control supervisory system that provides the means to remotely control train movements over a large area and provide management and train users with real time train related information.

ViziRail

A fully integrated scheduling, possession planning, monitoring and reporting tool for managing the Queensland Rail below-rail network.

ViziRail also supports the provision of all QCA and the Department of Transport and Main Roads reporting requirements.

Weather Monitoring System (WMS)

Remote weather monitoring stations providing critical information regarding temperature, rainfall and stream levels.

Wheel Impact Load Detector (WILD)

In track monitoring system to identify wheel flats.

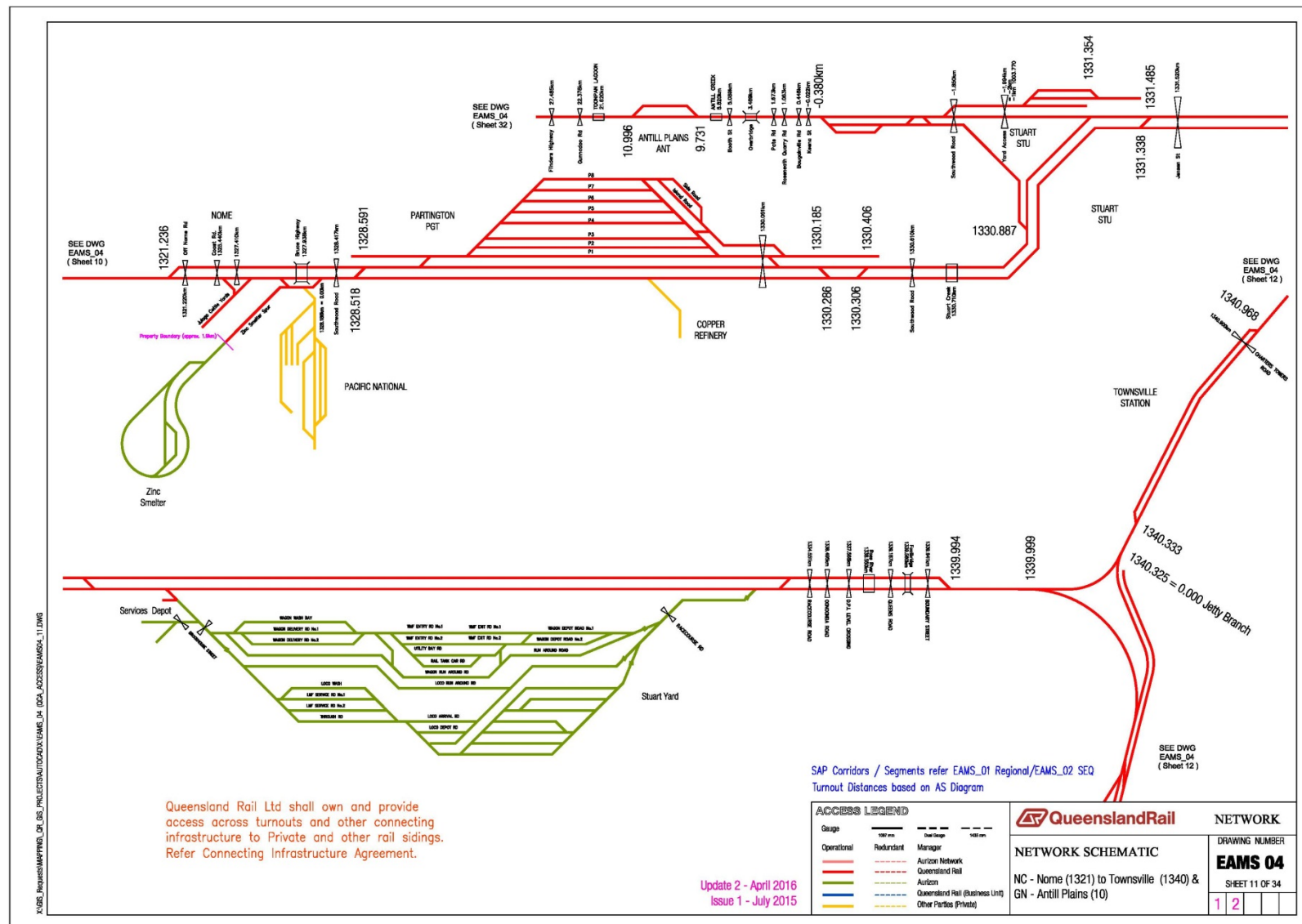
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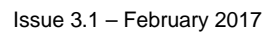
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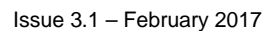
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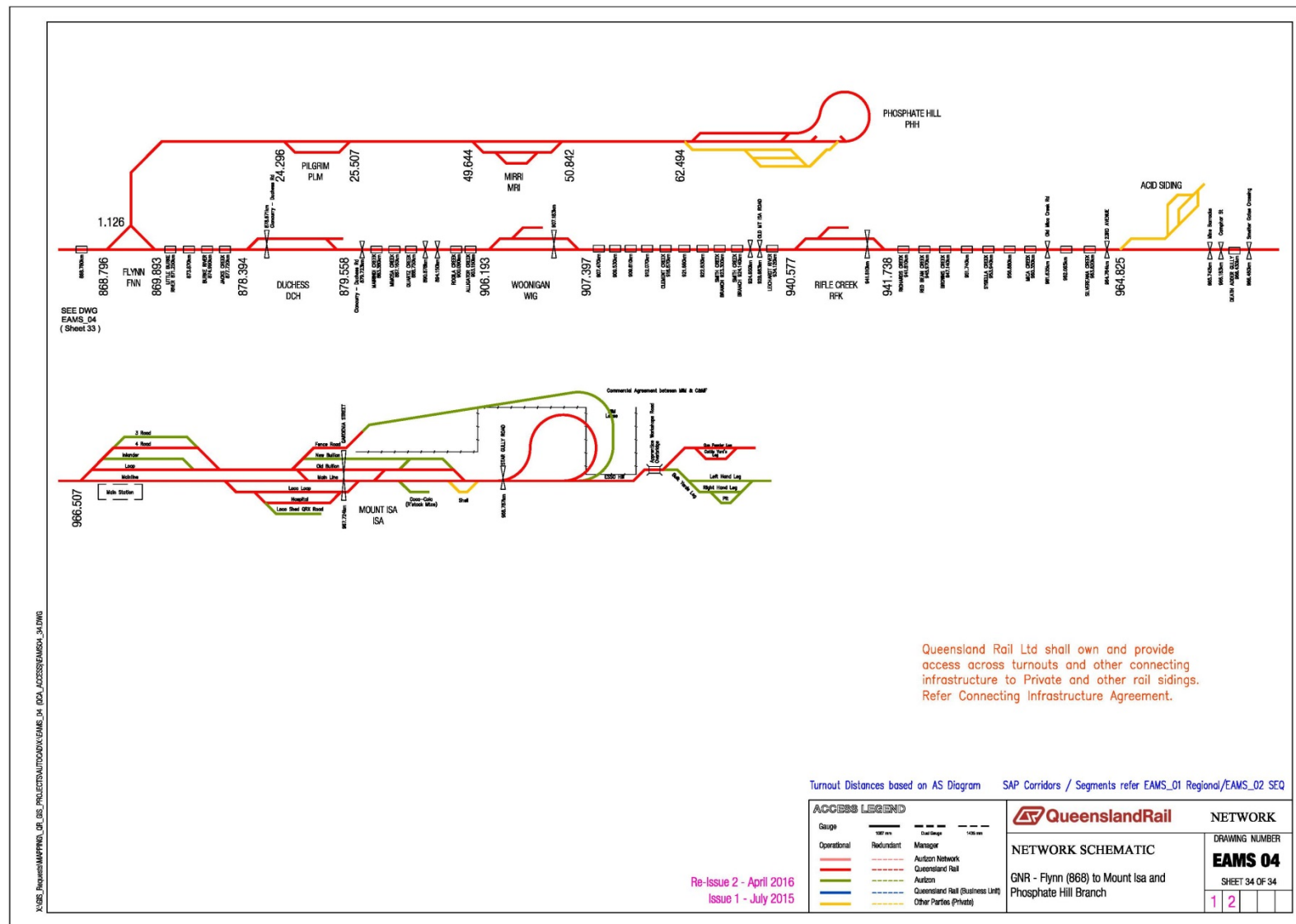


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APPENDIX C

Rail/Road Interface Details

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CROSSINGS BY LINE AND KILOMETRAGE



SURVEY SECTION

Description of Signage Types

G	Giveway	PWB	Pedestrian Warning	T	Triangle
N	New Signage Type	S	Stop	U	Unknown
O	Other	SC	School Crossing	X	Crossbuck

Line Section Code	Km	Road Name	Type	Vehicular Protection	Signs	Open Status	Responsible Authority
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GREAT NORTHERN LINE

633	-1.999	Stuart Station Access Road	Public Level	Signs	X T	Open	LGA
633	-1.870	Southwood Road	Public Level	Half Boomgates		Open	LGA
633	-0.040	Kerena Street	Public Level	Signs	X T	Open	LGA
633	0.445	Bougainville Street	Public Level	Signs	X T	Open	LGA
633	1.080	Roseneath Quarry Road	Public Level	Flashing Lights		Open	LGA
633	1.680	Pats Road	Public Level	Signs	X T	Open	LGA
633	5.090	Booth Street	Public Level	Flashing Lights		Open	MRD
633	22.378	Gunnado Road	Public Level	Signs	X S	Open	
633	27.485	Flinders Highway (old road)	Public Level	Flashing Lights		Open	LGA
633	30.320	CSIRO Access Road	Public Level	Signs	X T	Open	LGA
633	31.820	CSIRO Access Road	Public Level	Signs	X T	Open	LGA
633	34.398	Manton Quarry Road	Public Level	Signs	X S	Open	LGA
633	36.720	Calcium Road	Public Level	Signs	X S	Open	LGA
633	41.310	Marathon Quarries Access Road	Public Level	Signs	X T	Open	LGA
633	45.256		Public Level	Signs	X T	Open	LGA
633	48.158	Ellenvale Road	Public Level	Signs	X T	Open	LGA
633	56.939		Occupation	Signs	X T	Open	PRI
633	59.226	Property Access Road	Occupation	Signs	X T	Open	PRI
633	64.636		Occupation	Signs	X T	Open	PRI
633	66.668		Occupation	Signs	X T	Open	PRI
633	67.821		Public Level	Signs	X T	Open	LGA
633	70.081	Houghton Valley Homestead Road	Occupation	Signs	X T	Open	PRI
633	73.175		Public Level	Signs	X T	Open	LGA
633	81.774	Mingela Road	Public Level	Signs	X T	Open	LGA
633	86.195	Property Access Road	Occupation	Signs	X T	Open	PRI
633	90.474	Heathfield Amity Road	Public Level	Signs	X T	Open	LGA
633	96.574		Public Level	Signs	X T	Open	LGA
633	104.625	Macrossan Defence Depot Road	Public Level	Signs	X S	Open	LGA
633	106.582	Fanning Down Road	Public Level	Signs	X T	Open	LGA
633	109.838	Sellheim Road	Public Level	Signs	X S	Open	LGA
633	111.618		Public Level	Signs	X T	Open	LGA
633	114.155	Property Access Road	Occupation	Nil		Open	PRI
633	114.819		Occupation	Signs	X S	Open	PRI
633	120.950	Plum Tree Creek Road	Public Level	Signs	X T	Open	LGA
633	128.180	Gill Street	Public Level	Half Boomgates		Open	LGA
880	130.410	Pyrites Road	Public Level	Signs	X S	Open	LGA
880	131.360	Chloride Street	Public Level	Signs	X S	Open	LGA

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Line Section Code	Km	Road Name	Type	Vehicular Protection	Signs	Open Status	Responsible Authority
880	133.795	Knuth's Road (Black Jack Road)	Public Level	Signs	X S	Open	LGA
880	139.525	Flinders Highway	Public Level	Flashing Lights		Open	MRD
880	143.700	Property Access Road	Occupation	Signs	X S	Open	PRI
880	144.962	Severn Vale Road	Public Level	Signs	X S	Open	LGA
880	148.000	Kapunda Road	Public Level	Signs	X S	Open	LGA
880	152.380	Ulgula Road	Public Level	Signs	X S	Open	LGA
880	160.280	Powlathanga Station Road	Occupation	Signs	X S	Open	PRI
880	169.680	Lakeview Road	Public Level	Signs	X S	Open	LGA
880	170.790	Balfes Creek Road	Public Level	Signs	X S	Open	
880	182.020		Occupation	Signs	X	Open	PRI
880	186.030	Mungunburra Yard Road	Public Level	Signs	X	Open	LGA
880	190.980	Thalanga Mine Access Road	Public Level	Flashing Lights		Open	LGA
880	192.180		QR	Nil		Open	QR
880	194.130		Occupation	Signs	X S	Open	PRI
880	199.840		Public Level	Signs	X S	Open	LGA
880	201.635	Homestead Road	Public Level	Signs	X S	Open	LGA
880	215.505		Public Level	Signs	X S	Open	LGA
880	224.500	Property Access Road	Occupation	Signs	X T	Open	PRI
880	225.830	Glen Houghton Road	Public Level	Signs	X T	Open	LGA
880	233.320	Brook Dale Road	Public Level	Signs	X T	Open	LGA
880	234.485	Flinders Highway (Paterson Road)	Public Level	Signs	X S	Open	LGA
881	239.750		Occupation	Signs	X T	Open	PRI
881	244.580		Public Level	Nil		Open	LGA
881	252.710		Occupation	Signs	X T	Open	PRI
881	255.320		Occupation	Signs	X T	Open	PRI
881	262.110		QR	Nil		Open	QR
881	262.520		QR	Nil		Open	QR
881	264.995		QR	Nil		Open	QR
881	268.970	Property Access	Occupation			Proposed	PRI
881	269.648		Occupation	Signs	X T	Open	PRI
881	276.820		Public Level	Signs	X T	Open	LGA
881	286.495	Hazel Rig - Alba Road	Public Level	Signs	X	Open	LGA
881	288.445		Public Level	Signs	X G	Open	LGA
881	302.771		Occupation	Nil		Open	PRI
881	309.012		Occupation	Signs	X T	Open	PRI
881	311.235		Public Level	Signs	X G	Open	LGA
881	320.431		Occupation	Signs	X T	Open	PRI
881	330.689		Occupation	Signs	X T	Open	PRI
881	332.831	Muttaburra Road	Public Level	Signs	S G	Open	LGA
881	334.130	Property Access Road	Occupation	Signs	X T	Open	PRI
881	341.681		Public Level	Signs	X T	Open	LGA
881	348.610	Ellington Road	Public Level	Signs	X T	Open	LGA
881	356.368		Public Level	Signs	X T	Open	LGA
881	362.597	Flinders Highway	Public Level	Flashing Lights		Open	LGA
881	368.589	Access To Station	Occupation	Signs	X T	Open	PRI
881	370.120		Occupation			Open	
881	372.563	Access To Station	Occupation	Signs	X T	Open	PRI
881	375.080	To Hughenden Bypass	Public Level	Flashing Lights		Open	LGA
881	375.759		Public Level	Signs	X T	Open	LGA

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Line Section Code	Km	Road Name	Type	Vehicular Protection	Signs	Open Status	Responsible Authority
881	376.867	Flinders Street	Public Level	Signs	X T	Open	LGA
881	377.086	Gray Street	Public Level	Flashing Lights		Open	LGA
881	378.509	Hughenden Bypass Access Road	Public Level	Signs	X G	Open	LGA
637	378.918	Kennedy Development Road	Public Level	Signs	X T	Open	LGA
637	381.009		Occupation	Signs	X T	Open	PRI
637	383.987		Occupation	Signs	X T	Open	PRI
637	390.800		Public Level	Signs	X T	Open	LGA
637	397.294		Public Level	Signs	X T	Open	LGA
637	399.424		Public Level	Signs	X T	Open	LGA
637	400.654		Public Level	Signs	X T	Open	LGA
637	404.556		Occupation	Signs	X T	Open	PRI
637	409.359		Occupation	Signs	X T	Open	PRI
637	413.475	Dunluce Station Access Road	Occupation	Signs	X T	Open	PRI
637	416.867		Occupation	Signs	X T	Open	PRI
637	421.095		Public Level	Nil		Open	LGA
637	425.148	Access To Thornhill Station	Occupation	Signs	X T	Open	PRI
637	431.460	Nindi Road	Public Level	Signs	X T	Open	LGA
637	443.899	Access Road To Stamford	Public Level	Signs	X T	Open	LGA
637	448.658		Occupation	Signs	X T	Open	PRI
637	452.256	Telstra Repeater Tower Access Road	Occupation	Signs	X T	Open	PRI
637	458.200	Barabon / Arjuna Road	Public Level	Signs	X T	Open	LGA
637	459.620	Property Access Road	Occupation	Signs	X S	Open	PRI
637	468.317		Occupation	Signs	X T	Open	PRI
637	469.250		Occupation	Signs	X T	Open	PRI
637	478.058	Wilburra Downs Station Access Road	Occupation	Signs	X T	Open	PRI
637	486.384	Benean Station Access Road	Public Level	Signs	X T	Open	LGA
638	489.300	Allaru Station Access Road	Public Level	Signs	X G	Open	LGA
638	490.920	Burke Street	Public Level	Signs	X T	Open	LGA
638	491.710	Flinders Highway	Public Level	Flashing Lights		Open	MRD
638	492.795	Bypass	Public Level	Signs	X T	Open	LGA
638	496.710		Occupation	Signs	X T	Open	PRI
638	502.090	Lonesome Dove Road	Public Level	Signs	X T	Open	LGA
638	509.931		Occupation	Signs	X T	Open	PRI
638	518.400		Occupation	Signs	X	Open	PRI
638	523.720		Occupation	Signs	X T	Open	PRI
638	530.420		Occupation	Signs	X T	Open	PRI
638	534.714		Public Level	Signs	X T	Open	LGA
638	539.980	Maxwelton Yard	Public Level	Signs	X S T	Open	LGA
638	540.350	Maxwelton Yard	Public Level	Signs	X T	Open	LGA
638	550.985	Property Access Road	Occupation	Signs	X T	Open	PRI
638	560.570	Nonda Road	Public Level	Signs	X T	Open	LGA
638	561.450	Nonda Yard	Public Level	Signs	X T	Open	
638	568.540		Occupation	Nil		Open	PRI
638	579.022	Nonda West Road	Public Level	Signs	X T	Open	LGA
638	589.379	Nelia Yard	Public Level	Signs	X T	Open	LGA
638	601.873	Flinders Highway	Public Level	Flashing Lights		Open	MRD
638	612.762		Occupation	Signs	X T	Open	PRI
638	621.680		Occupation	Signs	X T	Open	PRI
638	635.999	Yorkshire Road	Public Level	Signs	X T	Open	LGA

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Line Section Code	Km	Road Name	Type	Vehicular Protection	Signs	Open Status	Responsible Authority
638	638.026	Matthews Street	Public Level	Signs	X T	Open	LGA
638	638.250	Julia Creek Goods Shed	Public Level	Signs	X S T	Open	LGA
638	638.703	Allison Street	Public Level	Signs	X S T	Open	LGA
459	640.568	Airport Road	Public Level	Signs	X T	Open	LGA
459	650.354		Occupation	Signs	X T	Open	PRI
459	664.380	Mokinlay Road	Public Level	Signs	X T	Open	LGA
459	666.645	Property Access Road	Occupation	Nil		Open	PRI
459	673.000	Property Access Road	Occupation	Nil		Open	PRI
459	673.681	Property Access Road	Occupation	Signs	X T	Open	PRI
459	679.796		Public Level	Signs	X T	Open	LGA
459	680.787	Property Access Road	Occupation	Signs	X S	Open	PRI
459	681.908		QR			Open	QR
459	685.037		Occupation	Signs	X T	Open	PRI
459	690.124		Public Level	Signs	X T	Open	LGA
459	693.215		Occupation			Open	PRI
459	697.197	Bookin Road	Public Level	Signs	X	Open	LGA
459	702.020		QR	Nil		Open	QR
459	707.170		QR	Nil		Open	QR
459	708.807	Oorindi Road	Public Level	Signs	X	Open	
459	726.065		Occupation	Nil		Open	PRI
459	745.233		Occupation	Signs	X T	Open	PRI
459	748.780		Occupation	Signs	X S	Open	PRI
460	755.640	Landsborough Highway	Public Level	Flashing Lights		Open	MRD
460	768.505	Cloncurry Road	Public Level	Flashing Lights		Open	LGA
460	769.369	Hutchinson Parade	Public Level	Signs	X T	Open	LGA
884	770.892	Cloncurry Road	Occupation	Signs	X T	Open	PRI
884	772.565	Power House Road	Public Level	Signs	X T	Open	LGA
884	786.233		Occupation	Signs	X T	Open	PRI
884	795.103	Cloncurry / Dajarra Road	Public Level	Signs	X G	Open	LGA
884	800.699		Occupation	Signs	X T	Open	PRI
884	806.709	Mitakoodi Road	Public Level	Signs	X T	Open	LGA
884	810.695		Occupation	Signs	X T	Open	PRI
884	816.989		Public Level	Signs	X G	Open	MRD
884	820.652	Selwyn Mine Road	Public Level	Signs	X	Open	LGA
884	824.161	Cloncurry / Dajarra Road	Public Level	Signs	X G	Open	LGA
884	831.171		Occupation	Signs	X T	Open	PRI
884	835.137		Occupation	Signs	X T	Open	PRI
884	845.640		Occupation	Signs	X T	Open	PRI
884	853.460		Occupation	Signs	X T	Open	PRI
885	878.670	Cloncurry / Dajarra Road	Public Level	Signs	X S	Open	LGA
645	879.710	Duke Street	Public Level	Signs	X G	Open	LGA
645	890.300		Occupation	Signs	X T	Open	PRI
645	894.158	Myubee Siding Access Road	QR	Signs	X T	Open	QR
645	898.785	Bushy Park Road	Occupation	Signs	X T	Open	PRI
645	907.184	Woonigan Yard Access Road	Occupation	Signs	X T	Open	PRI
645	915.960	Malbonvale Station (proposed)	Occupation	Signs	X S	Proposed	PRI
645	924.653		Occupation	Signs	X T	Open	PRI
645	928.680	Duchess / Mt Isa Road	Public Level	Signs	X	Open	LGA
645	941.700		QR	Nil		Open	QR

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<u>Line Section Code</u>	<u>Km</u>	<u>Road Name</u>	<u>Type</u>	<u>Vehicular Protection</u>	<u>Signs</u>	<u>Open Status</u>	<u>Responsible Authority</u>
645	941.719		Occupation			Proposed	PRI
645	946.320		Occupation			Proposed	PRI
645	951.900		Occupation			Proposed	PRI
645	956.280	Property Access Road	Occupation	Signs	X S	Open	PRI
645	961.570	Old Mica Creek Road	Public Level	Signs	X S	Open	LGA
645	963.040	Old Mica Creek Road (On Boral Siding)	Public Level	Signs	X T	Open	
645	964.760	23rd Avenue	Public Level	Flashing Lights		Open	LGA
645	965.740	Mine Barracks Access Road	Public Level	Signs	X S	Open	LGA
645	966.180	Camphor Street	Public Level	Flashing Lights		Open	LGA
645	966.460	Smelter Gates Crossing	Public Level	Flashing Lights		Open	LGA
645	967.800	Gardenia Street	Public Level	Signs	X S	Open	LGA
645	968.700	Starr Gully Road	Public Level	Signs	X S	Open	LGA
645	968.900		Occupation	Signs	X S	Open	PRI
645	968.975		Occupation	Nil		Open	PRI
KAJABBI BRANCH							
641	1.050	Douglas Street	Public Level	Signs	X S	Open	
641	1.112	McIlwraith Street	Public Level	Flashing Lights		Open	MRD
641	2.150		Public Level	Signs	X	Open	
641	3.000	Aerodrome Road	Public Level	Signs	T	Open	
PHOSPHATE HILL BRANCH							
644	5.550	Cloncurry - Dajarra Road	Public Level	Signs	X G	Open	MRD
644	10.830		Occupation	Signs	X T	Open	PRI
644	27.860		Occupation	Signs	X T	Open	PRI
644	49.450	Property Access Road	Occupation	Signs	X T	Open	PRI
644	61.360	Osborne Mine Access Road	Occupation	Signs	X T	Open	PRI
644	64.000	Mine Access Road	Occupation			Open	

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APPENDIX D

Speed Boards

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				EXISTING SPEED BOARDS	
LINE CODE	TRACK	DISTANCE km	FEATURE	DOWN TRAIN TO STUART	UP TRAIN TO MT. ISA
MT. ISA LINE - STUART TO HUGHENDEN					
	GN 633	MAIN	-2.255	T.O.S. 60kg - 1:16 RBM LH on Concrete (To Mt. Isa line)	
GN 633	MAIN	-1.769		L25,R25/50	L25/70
GN 633	MAIN	-1.620		50	
GN 633	SINGLE	-0.363		R25/70	80
GN 633	SINGLE	1.649		80	
GN 633	SINGLE	1.772			60
GN 633	SINGLE	3.884		60	70
GN 633	SINGLE	4.647		70	80
GN 633	SINGLE	9.711		80p	25
GN 633	SINGLE	11.000	ANTIL PLAINS		
GN 633	SINGLE	11.016		25	
GN 633	SINGLE	11.133			80
GN 633	SINGLE	27.428		80	
GN 633	SINGLE	27.555			25
GN 633	UP MAIN	27.850	WOODSTOCK		
GN 633	SINGLE	28.865		25	
GN 633	SINGLE	28.892			80p
GN 633	SINGLE	43.891		80	70
GN 633	SINGLE	44.976		70	80
GN 633	SINGLE	46.805		80	R25/80
GN 633	MAIN	47.080	REID RIVER		
GN 633	SINGLE	48.168		L25/80	80
GN 633	SINGLE	51.328		80	60
GN 633	SINGLE	52.446		60	80
GN 633	SINGLE	58.073		80p	25
GN 633	UP MAIN	58.740	WOLDSTON		
GN 633	SINGLE	59.392		25	80
GN 633	SINGLE	68.698		80	
GN 633	SINGLE	68.791			60
GN 633	SINGLE	70.041		60	50
GN 633	SINGLE	70.445		50	60
GN 633	SINGLE	78.865		60	
GN 633	SINGLE	78.983			80
GN 633	SINGLE	80.303			60
GN 633	SINGLE	80.346		80	
GN 633	SINGLE	81.251		60	25
GN 633	UP MAIN	81.640	MINGELA		
GN 633	SINGLE	82.592		25	60
GN 633	SINGLE	83.945		60	
GN 633	SINGLE	83.997			80
GN 633	SINGLE	86.287		80	70
GN 633	SINGLE	86.637		70	80
GN 633	SINGLE	89.026		80	70
GN 633	SINGLE	89.422		70	60
GN 633	SINGLE	90.016		60	80

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LINE CODE	TRACK	DISTANCE km	FEATURE	DOWN TRAIN TO STUART	UP TRAIN TO MT. ISA
GN 633	SINGLE	92.690		80	70
GN 633	SINGLE	93.843		70	80
GN 633	SINGLE	94.888		80	70
GN 633	SINGLE	95.846		70	80
GN 633	SINGLE	96.400		80	70
GN 633	SINGLE	97.632		70	80
GN 633	SINGLE	101.135		80	
GN 633	SINGLE	101.237			70
GN 633	SINGLE	103.722		70	80
GN 633	SINGLE	108.546		80	
GN 633	SINGLE	108.645			60
GN 633	SINGLE	109.752		60	
GN 633	SINGLE	109.831			25
GN 633	UP MAIN	110.020	SELLHEIM		
GN 633	SINGLE	111.264		25	
GN 633	SINGLE	111.387			80
GN 633	SINGLE	117.069		80	
GN 633	SINGLE	117.169			60
GN 633	SINGLE	119.002		60	80
GN 633	SINGLE	120.654		80	60
GN 633	SINGLE	121.270		60	
GN 633	SINGLE	121.399			80
GN 633	SINGLE	124.284		80	70
GN 633	SINGLE	127.601		70	25
GN 633	MAIN	128.120	CHARTERS TOWERS		
GN 880	SINGLE	130.249		25	70
GN 880	SINGLE	132.195		70	80
GN 880	SINGLE	146.297		80	70
GN 880	SINGLE	146.552		70p	25
GN 880	UP MAIN	146.890	SOUTHERN CROSS		
GN 880	SINGLE	147.862		25	60
GN 880	SINGLE	148.338		60	80
GN 880	SINGLE	170.167		80	25
GN 880	UP MAIN	170.560	BALFES CREEK		
GN 880	SINGLE	171.487		25	80
GN 880	SINGLE	178.976		80	70
GN 880	SINGLE	179.799		70	80
GN 880	SINGLE	185.280		80	25
GN 880	UP MAIN	185.910	MUNGUNBURRA		
GN 880	SINGLE	186.582		25	80
GN 880	SINGLE	189.868		80	25
GN 880	MAIN	190.330	THALANGA		
GN 880	SINGLE	190.869		25	80p
GN 880	SINGLE	201.513		80p	25
GN 880	UP MAIN	201.910	HOMESTEAD		
GN 880	SINGLE	202.863		25	80

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LINE CODE	TRACK	DISTANCE km	FEATURE	DOWN TRAIN TO STUART	UP TRAIN TO MT. ISA
GN 880	SINGLE	211.797		80	60
GN 880	SINGLE	214.167		60	80
GN 880	SINGLE	233.299		80	60
GN 880	SINGLE	234.520		60	25
GN 880	UP MAIN	234.620	PENTLAND		
GN 881	SINGLE	235.802		25	80p
GN 881	SINGLE	241.524		80	60
GN 881	SINGLE	243.384		60	70
GN 881	SINGLE	244.515		70	80
GN 881	SINGLE	254.386		70	80
GN 881	SINGLE	254.868		70	25
GN 881	UP MAIN	255.620	WARRIGAL		
GN 881	SINGLE	256.169		25	80p
GN 881	SINGLE	260.433		80	
GN 881	SINGLE	260.526			60
GN 881	SINGLE	263.867		60	80
GN 881	SINGLE	269.405		80	25
GN 881	UP MAIN	270.060	BURRA		
GN 881	SINGLE	270.711		25	80p
GN 881	SINGLE	288.108		80	25
GN 881	UP MAIN	288.330	TORRENS CREEK		
GN 881	SINGLE	289.521		25	80p
GN 881	SINGLE	311.128		80p	25
GN 881	UP MAIN	311.780	WARREAH		
GN 881	SINGLE	312.439		25	80
GN 881	SINGLE	332.728		80	25
GN 881	UP MAIN	333.060	PRAIRIE		
GN 881	SINGLE	334.056		25	80p
GN 881	SINGLE	342.073		80	
GN 881	SINGLE	342.163			60
GN 881	SINGLE	343.769		60	80
GN 881	SINGLE	351.816		80	25
GN 881	UP MAIN	352.480	TINDO		
GN 881	SINGLE	353.138		25	80p
GN 881	SINGLE	368.654		80	
GN 881	SINGLE	368.703			60
GN 881	SINGLE	369.021		60	
GN 881	SINGLE	369.061			80
GN 881	SINGLE	374.750		80	25
HUGHENDEN BYPASS (ON DOWN LINE)					
	GN 881 BYPASS	375.070			50
HUGHENDEN LOOP					
HU 468	MAIN	375.206		25	50
HU 468	MAIN	376.355		50	25
HU 468	MAIN	377.420	HUGHENDEN		

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LINE CODE	TRACK	km	FEATURE	DOWN TRAIN TO STUART	UP TRAIN TO MT. ISA
MT. ISA LINE - HUGHENDEN TO CLONCURRY					
637	SINGLE	378.700		25	50
637	SINGLE	379.356			25R
637	SINGLE	379.782		50	60
637	SINGLE	401.481		60	25
637	UPMAIN	402.120	BOREE		
637	SINGLE	402.761		25	60p
637	SINGLE	411.940	DUNLUCE		
637	SINGLE	419.909		60	25
637	UPMAIN	420.510	MUMU		
637	SINGLE	421.113		25	60p
637	SINGLE	442.777		60	25
637	UPMAIN	443.580	MARATHON		
637	SINGLE	443.975		25	60p
637	SINGLE	458.300	BARABON		
637	SINGLE	458.378		60	R25/60
637	SINGLE	458.858		L25/60	60
637	SINGLE	468.565		60p	25
637	UPMAIN	469.360	MOSELLE		
637	SINGLE	469.777		25	60
638	SINGLE	490.345		60	25
638	UPMAIN	491.480	RICHMOND		
638	SINGLE	491.719			60p
638	SINGLE	491.862		25	
638	SINGLE	518.383		60	25
638	UPMAIN	518.590	GEMOKA		
638	SINGLE	519.587		25	60p
638	SINGLE	539.266		60	25
638	DNMAIN	539.980	MAXWELTON		
638	SINGLE	541.033		25	60p
638	SINGLE	560.984		60	25
638	UPMAIN	561.340	NONDA		
638	SINGLE	562.210		25	60p
638	SINGLE	589.208		60	25
638	UPMAIN	589.470	NELIA		
638	SINGLE	590.419		25	60p
638	SINGLE	613.397		60p	25
638	UPMAIN	614.000	QUARRELLS		
638	SINGLE	614.608		25	60
638	SINGLE	637.407		60	25
638	UPMAIN	638.150	JULIA CREEK		
638	SINGLE	638.693		25	40
459	SINGLE	641.613		40	60
459	SINGLE	663.165		60	25

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LINE CODE	TRACK	km	FEATURE	DOWN TRAIN TO STUART	UP TRAIN TO MT. ISA
459	UPMAIN	664.260	GILLIAT		
459	SINGLE	664.387		25	60p
459	SINGLE	683.801		60	25
459	UPMAIN	684.400	TIBARRI		
459	SINGLE	685.009		25	60p
459	SINGLE	708.718		60p	25
459	UPMAIN	708.900	OORINDI		
459	SINGLE	709.932		25	60p
459	SINGLE	724.885		60p	25
459	DNMAIN	725.530	UNDINA		
459	SINGLE	726.090		25	60
459	SINGLE	742.456		60	25
459	UPMAIN	743.060	PYMURRA		
459	SINGLE	743.664		25	60p
459	SINGLE	752.338		60	L25/60
460	SINGLE	752.360	YURBI		
460	SINGLE	754.312		60	25
460	DNMAIN	754.920	OONOOMURRA		
460	SINGLE	755.528		25	60
460	SINGLE	767.596		60	50
460	SINGLE	768.289			25
460	SINGLE	768.414		50	L25
460	MAIN	769.241		25	
460	DNMAIN	769.550	CLONCURRY		

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LINE CODE	TRACK	DISTANCE km	FEATURE	Existing SPEED BOARDS	
				DN TRAIN TO STUART	UP TRAIN TO MT. ISA
MT. ISA LINE - CLONCURRY TO MT.ISA					
884	SINGLE	771.150	DOLOMITE	25	60
884	SINGLE	778.830			
884	SINGLE	784.377	MARIMO	--	--
884	SINGLE	785.506		60	25
884	UP MAIN	786.110	MITAKOODI		
884	SINGLE	786.716		25	60p
884	SINGLE	806.080	MALBON		
884	SINGLE	820.677		60p	25
884	SINGLE	821.885	WAMMUTTA	25	60
884	SINGLE	840.589		60p	25
884	DN MAIN	841.190	BUNGALIEN		
884	SINGLE	841.806		25	60p
884	SINGLE	865.113	WOONIGAN	60p	25
884	DN MAIN	865.413			
884	SINGLE	866.298	DUCHESS	25	60
884	SINGLE	868.776		60	L50/60
885	SINGLE	869.913	RIFLE CREEK	R50/60	60
885	SINGLE	878.374		60	25
885	UP MAIN	879.430	MICA CREEK		
645	SINGLE	879.579		25	40p
645	SINGLE	880.498	MT. ISA		60
645	SINGLE	906.173		60	25
645	UP MAIN	906.800	END OF LINE SECTION		
645	SINGLE	907.416		25	60p
645	SINGLE	940.557	END OF LINE SECTION	60	25
645	DN MAIN	941.160			
645	SINGLE	941.759	END OF LINE SECTION	25	60p
645	SINGLE	944.896		60	50
645	SINGLE	945.264	END OF LINE SECTION	50	60
645	SINGLE	961.040			
645	SINGLE	964.805	END OF LINE SECTION	60	25
645	SINGLE	966.300			15
645	SINGLE	966.446	END OF LINE SECTION	25	
645	MAIN	966.790			
645	MAIN	969.028	END OF LINE SECTION	15	25
645	MAIN	969.664		25	
645	MAIN	970.734	END OF LINE SECTION	25	
		971.610			

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PHOSPHATE HILL LINE

INCREASING DISTANCE IS THE "UP" DIRECTION
LOCATION OF SPEED BOARDS

LINE CODE	TRACK	DISTANCE km	FEATURE	SPEEDBOARDS	
				DOWN TRAIN TO FLYNN	UP TRAIN - TO PHOSPHATE HILL
FLYNN TO PHOSPHATE HILL					
637	MAIN	868.776	SPEED BOARDS	80	L50/80
644	EAST ANGLE	0.100	CURVE SPRING	50	60
644	SINGLE	1.151	SPEED BOARDS	L50/60	80
644	SINGLE	24.276	SPEED BOARDS	80p	25
644	UP MAIN	24.890	PILGRIM		
644	SINGLE	25.507	SPEED BOARDS	25	80
644	SINGLE	49.624	SPEED BOARD	80p	25
644	UP MAIN	50.240	MIRRI		
644	SINGLE	50.862	SPEED BOARD	25	80
644	SINGLE	62.474	SPEED BOARDS	80	25
644	BALLOON	62.689	CURVE END	25	40
644	BALLOON	65.595	SPEED BOARDS	25	40
644	BALLOON	66.060	PHOSPHATE HILL		

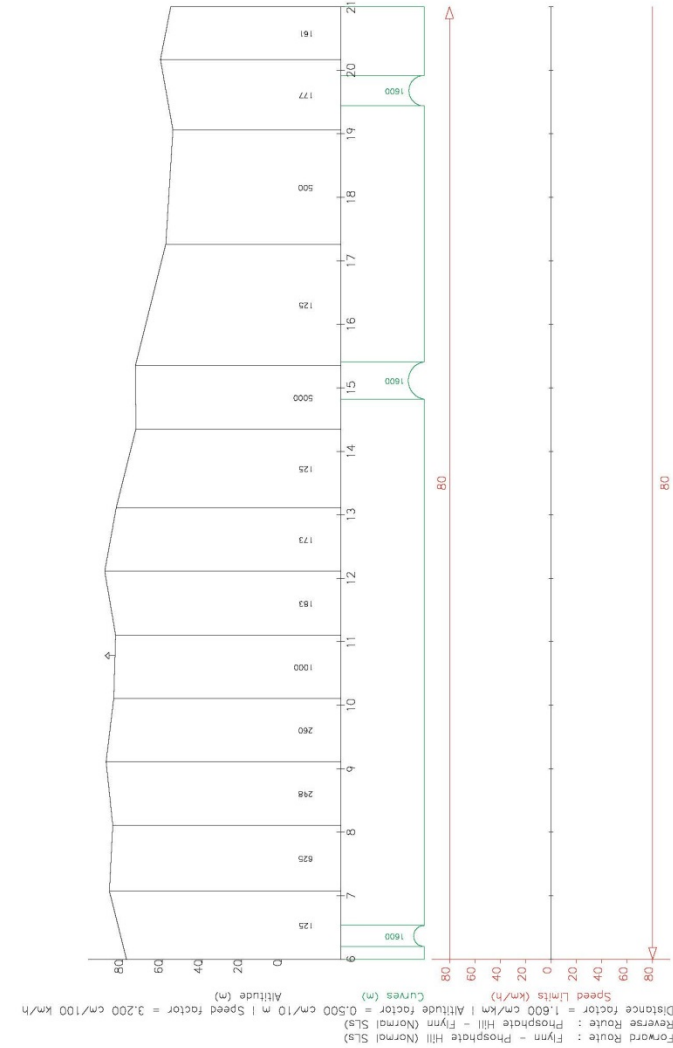
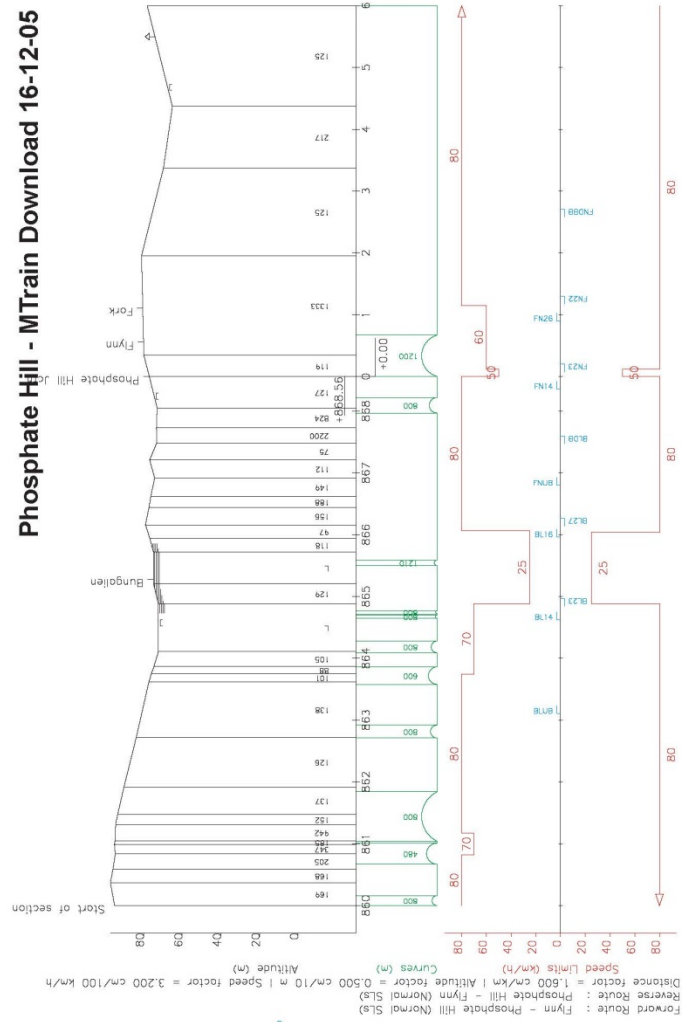
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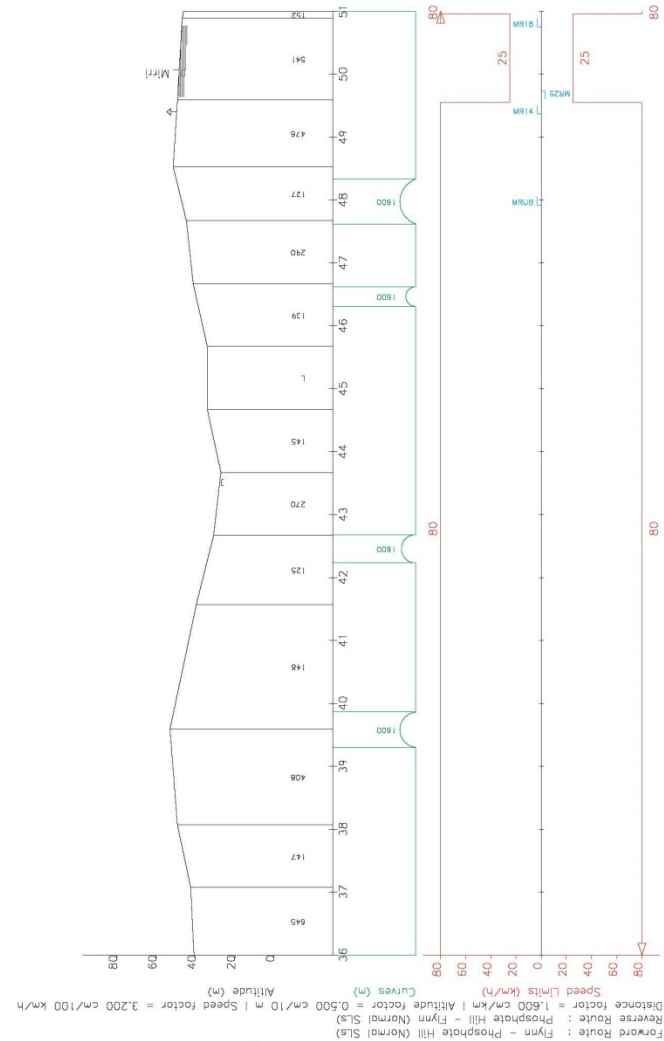
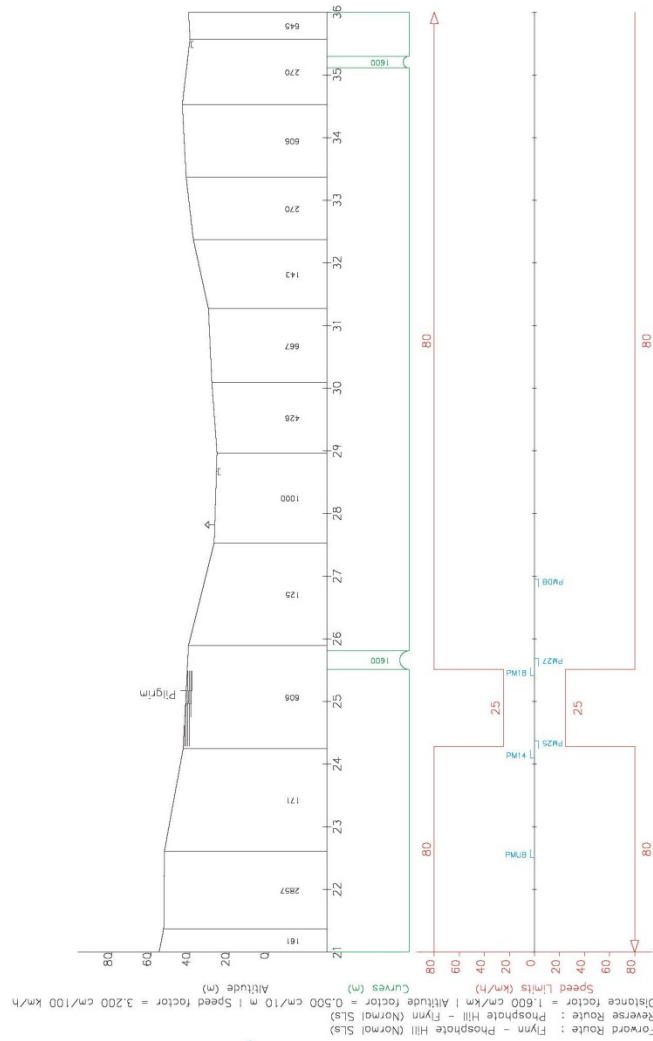
Track Data & Grade Diagrams

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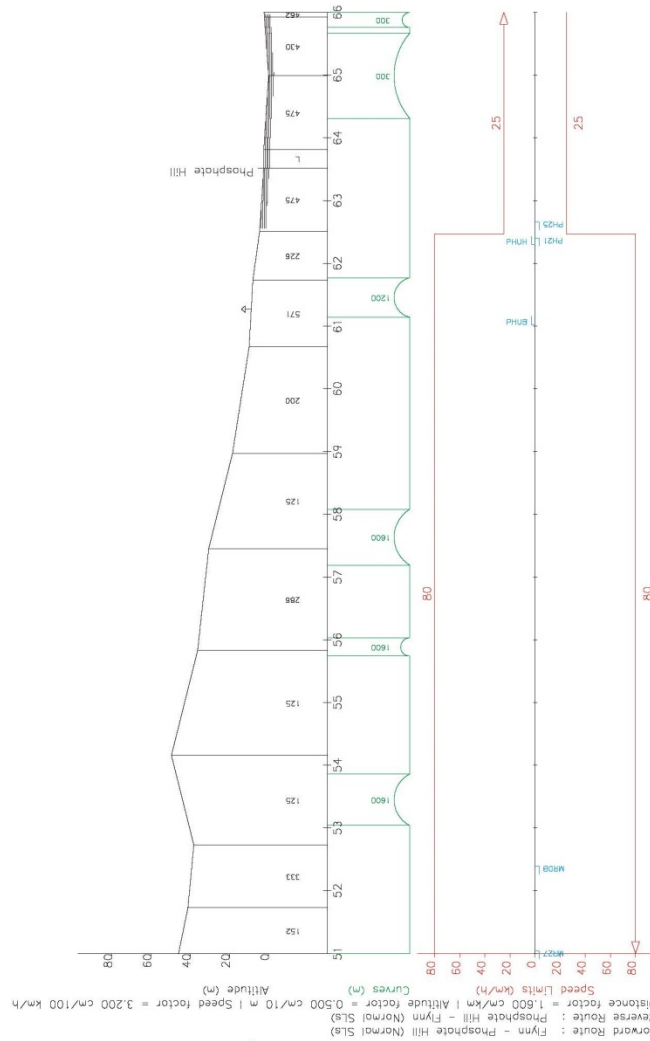
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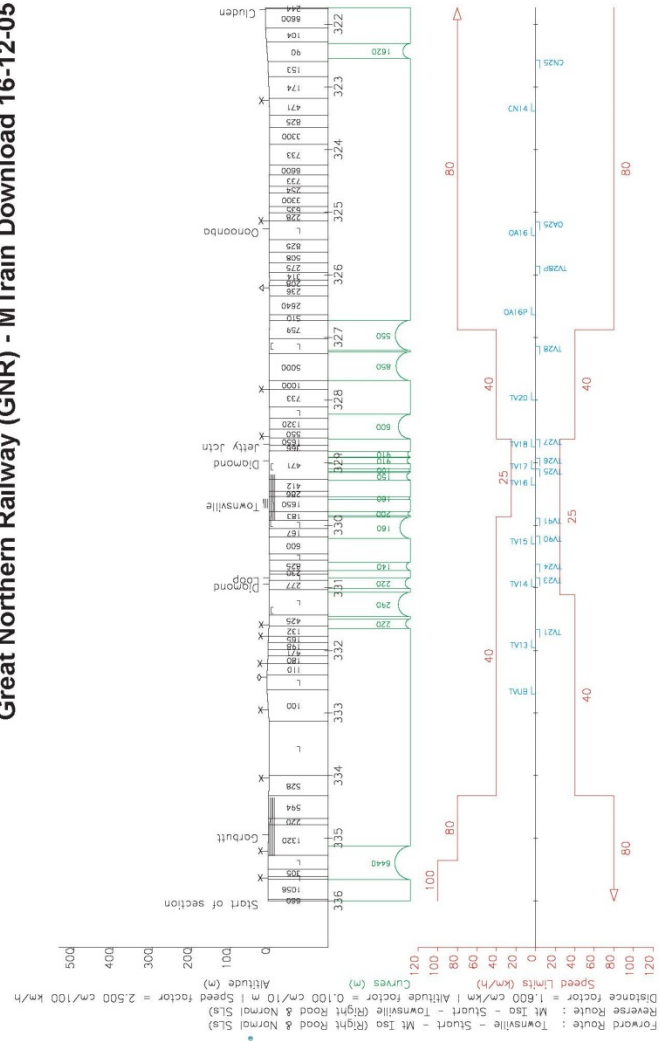
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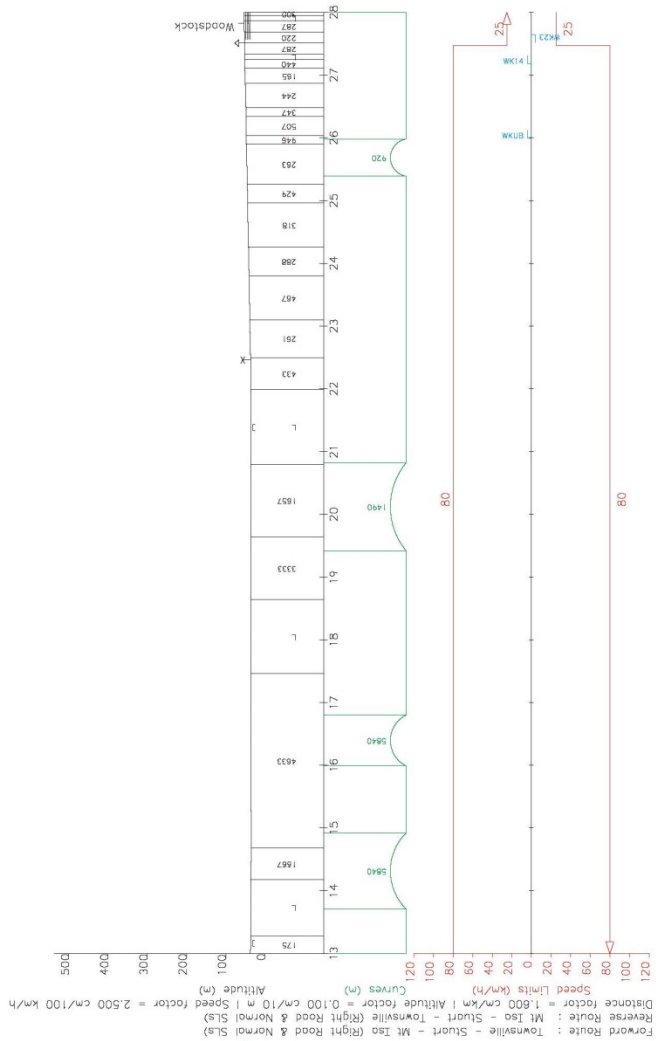
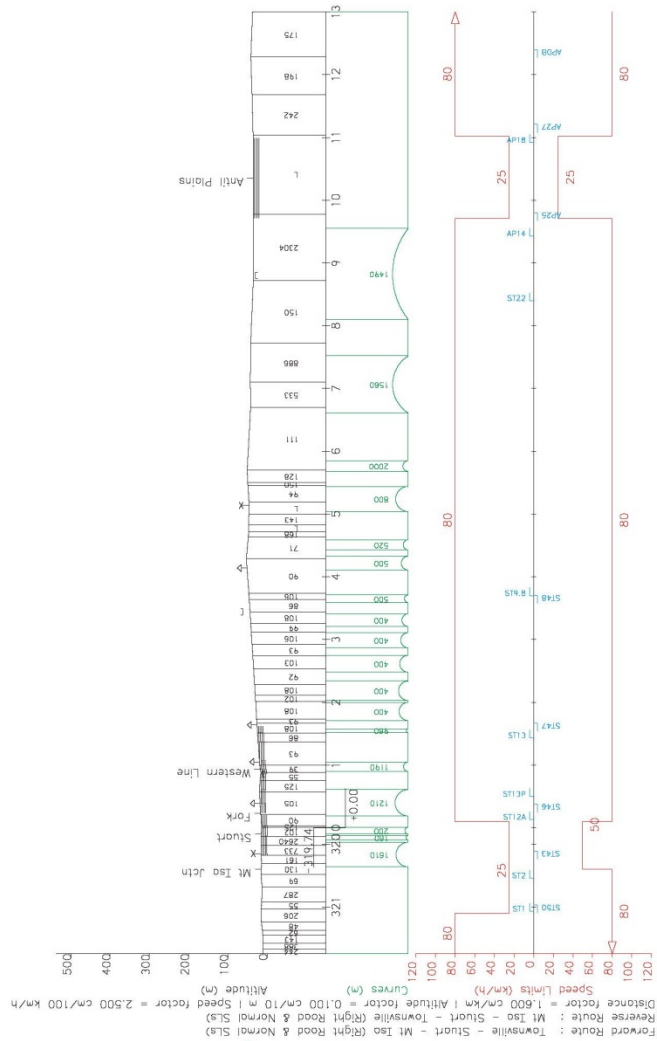
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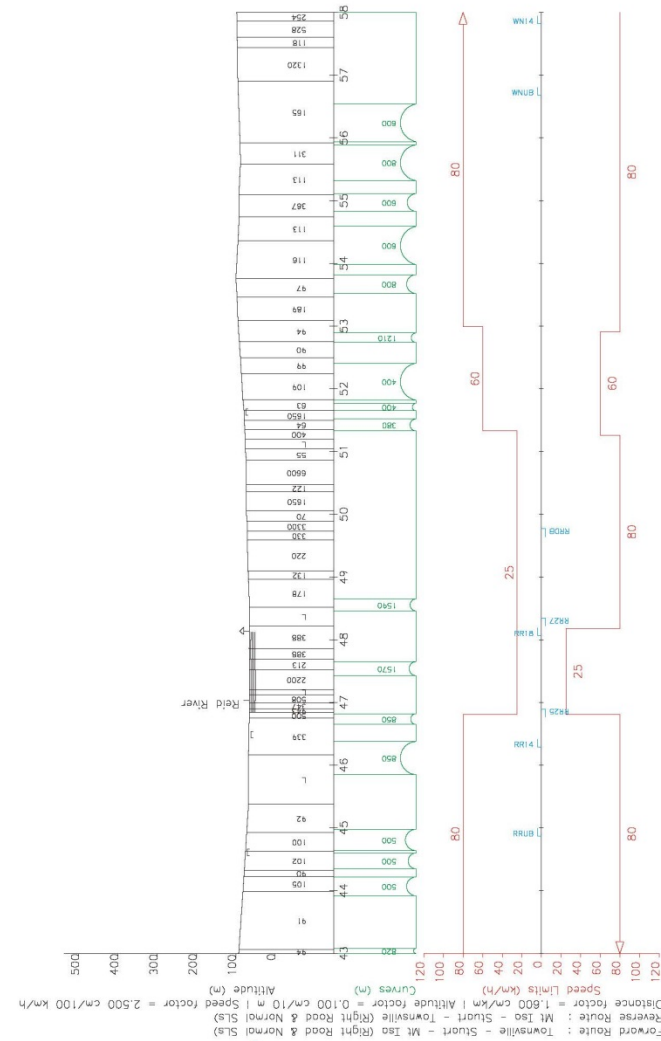
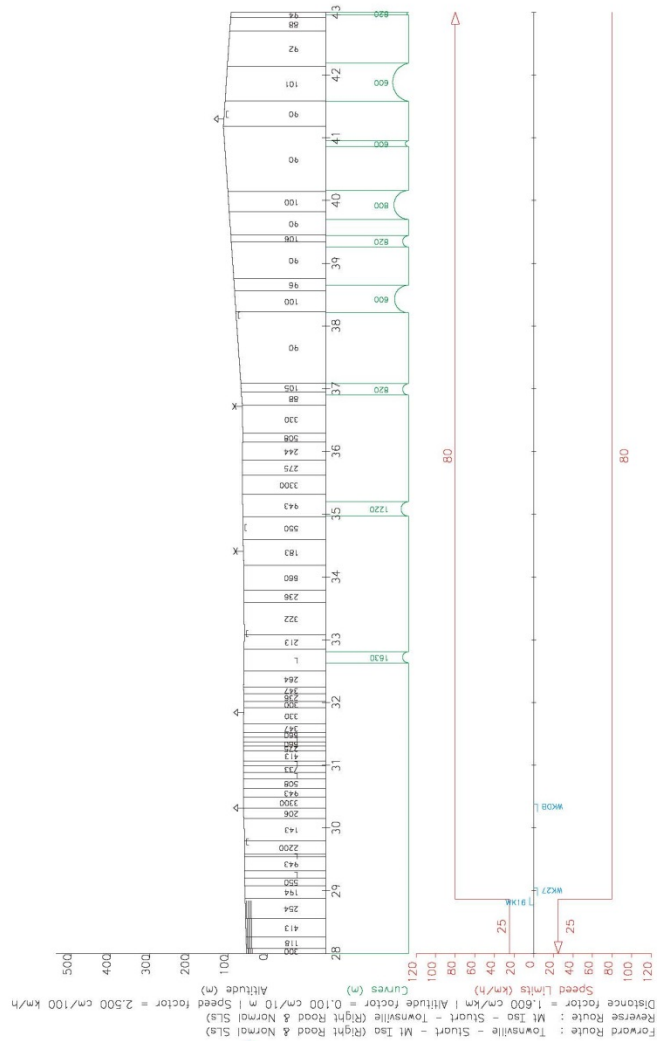
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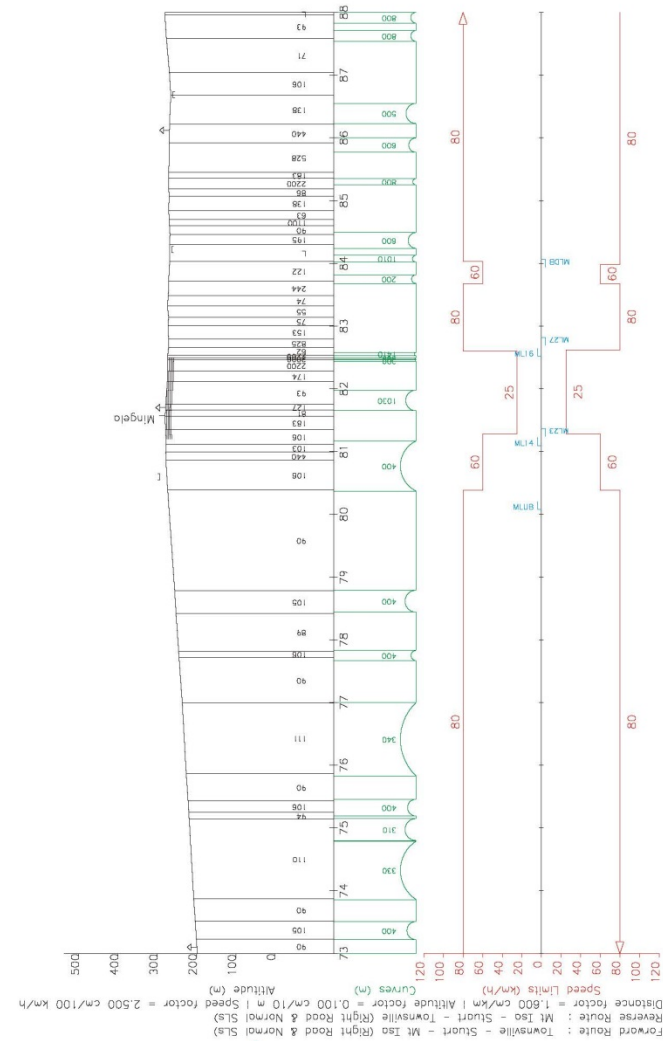
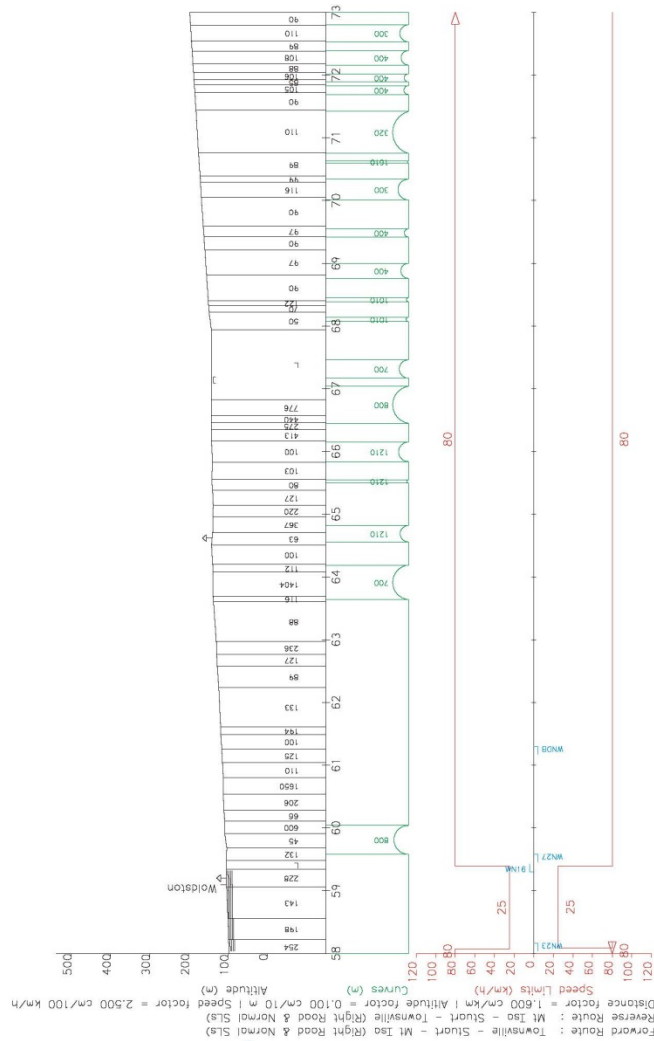
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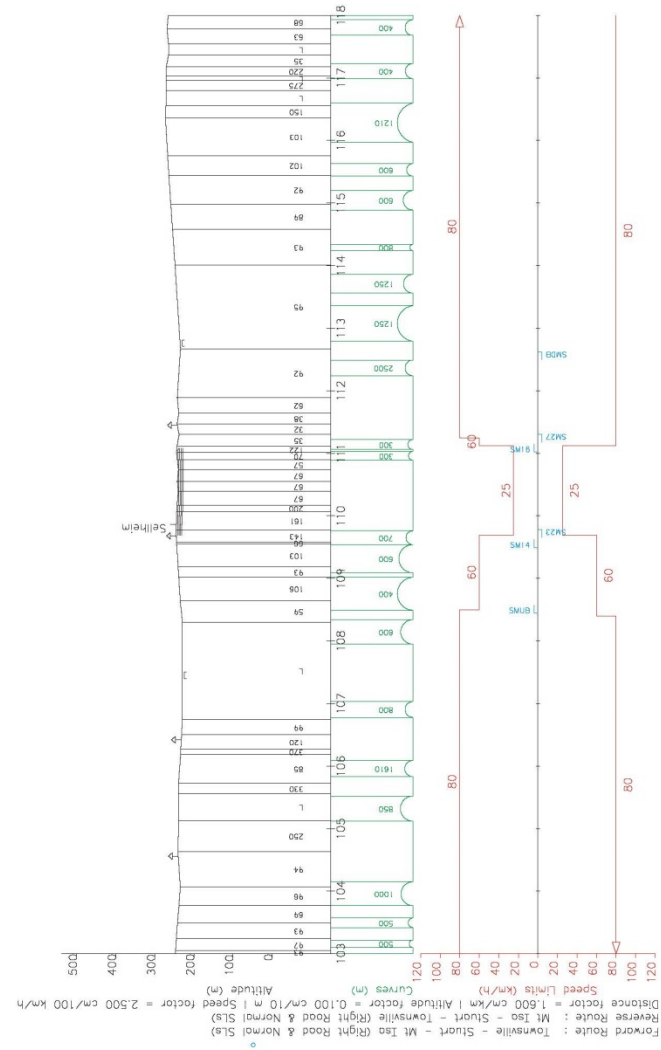
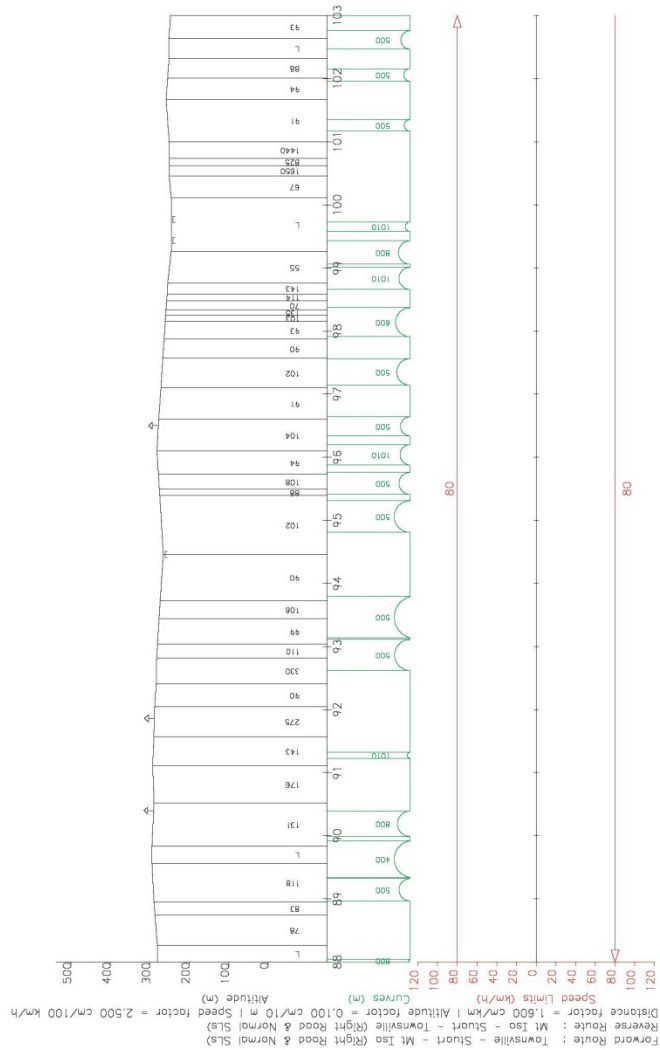
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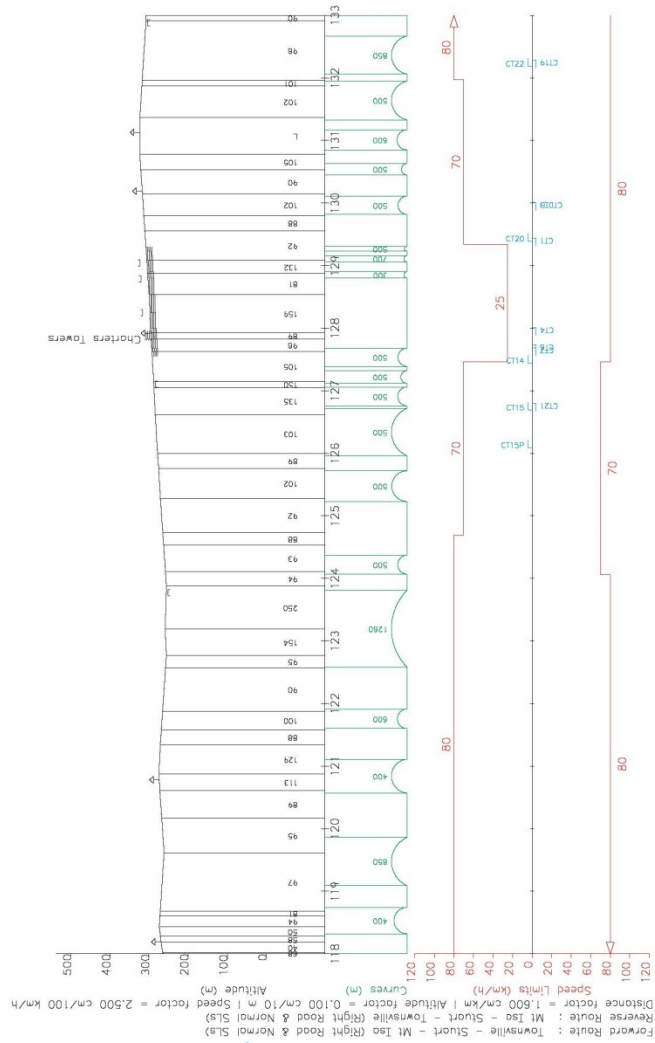
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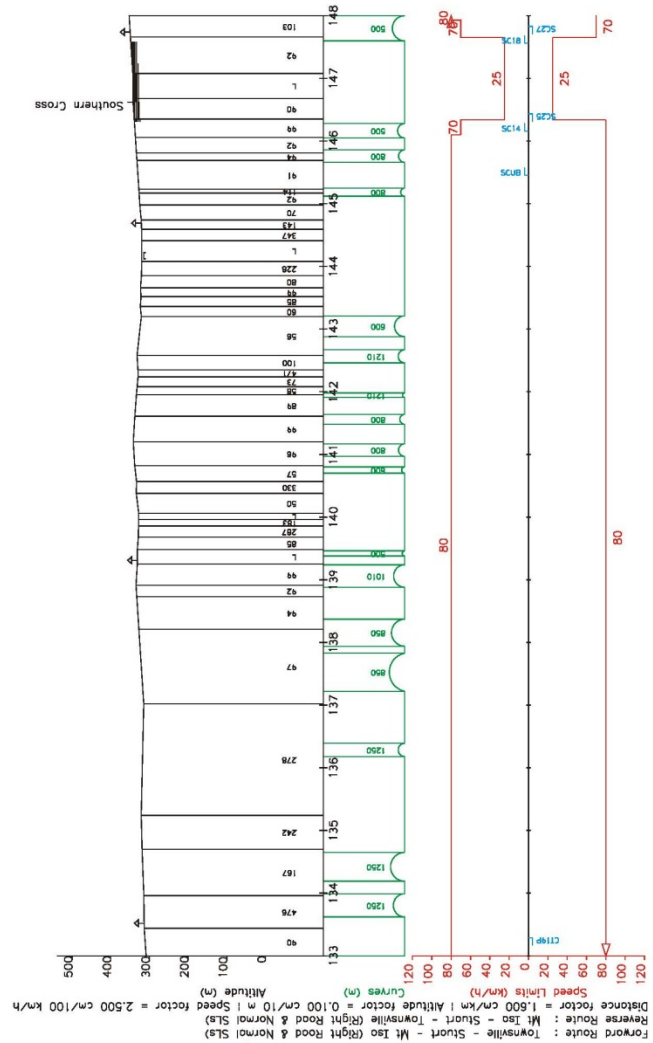
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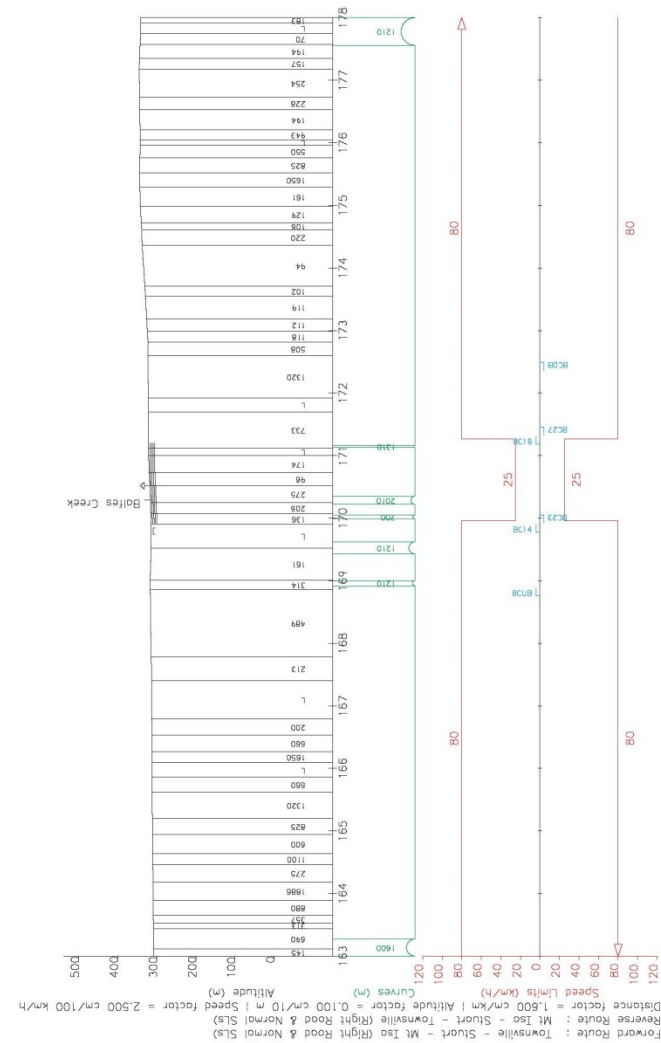
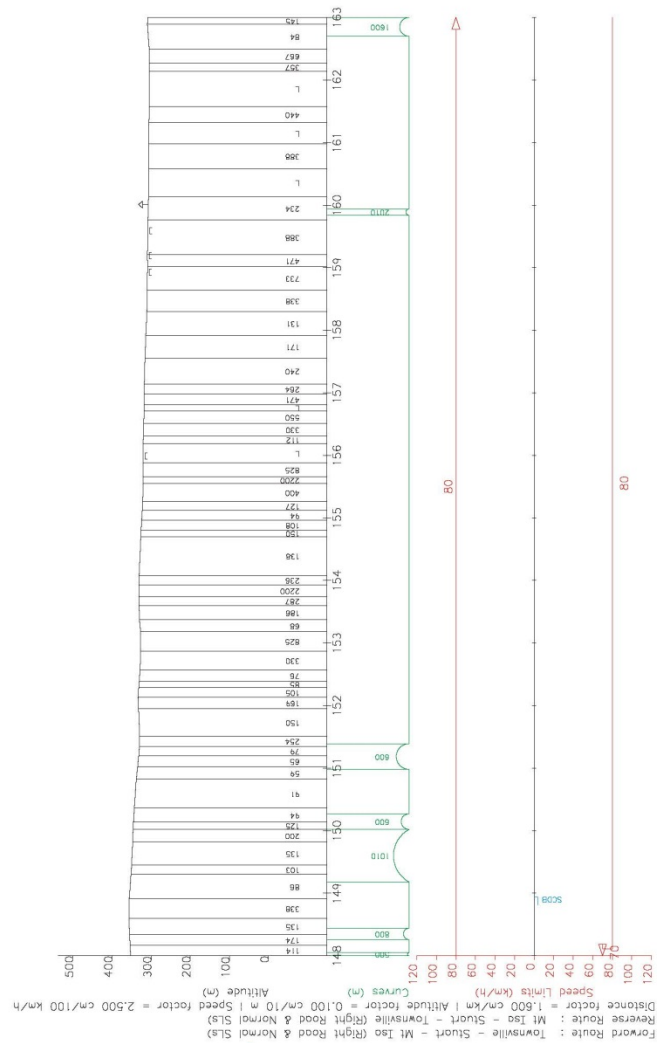
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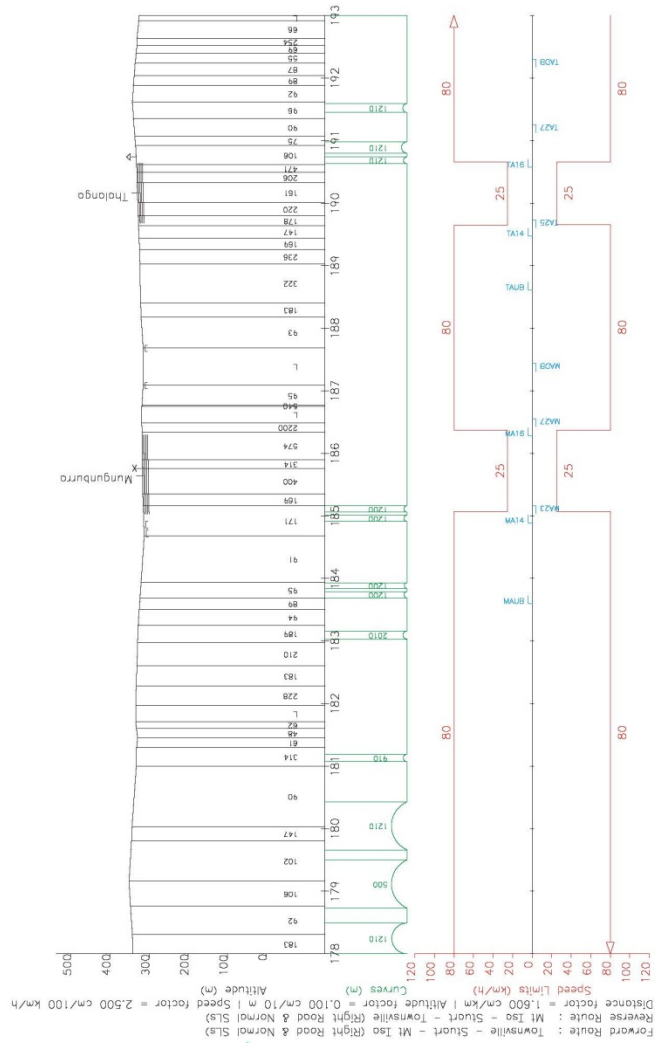
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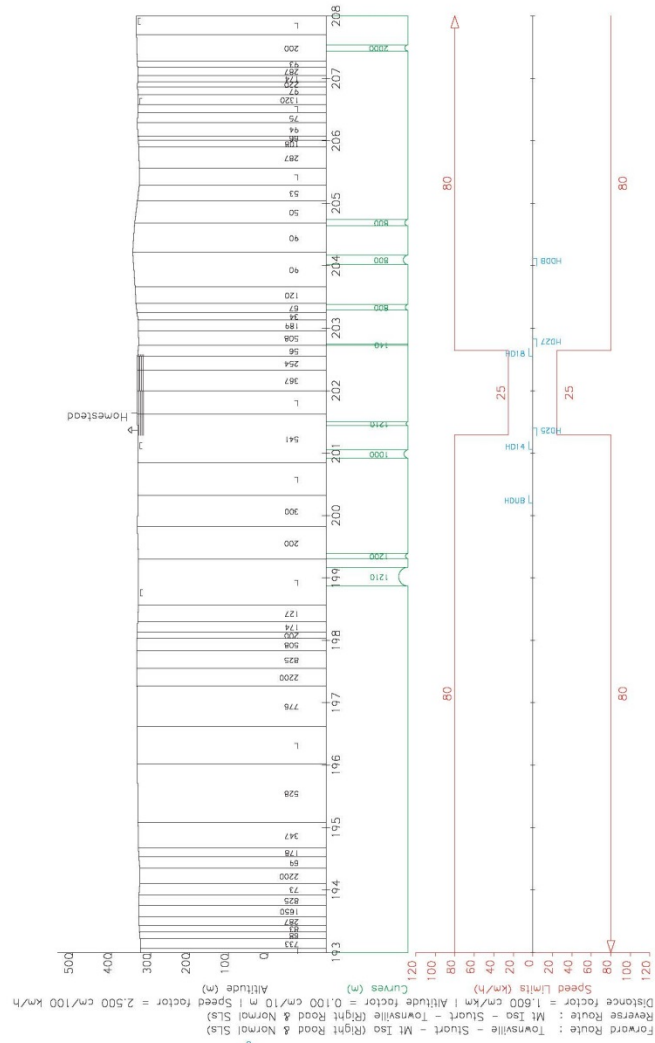
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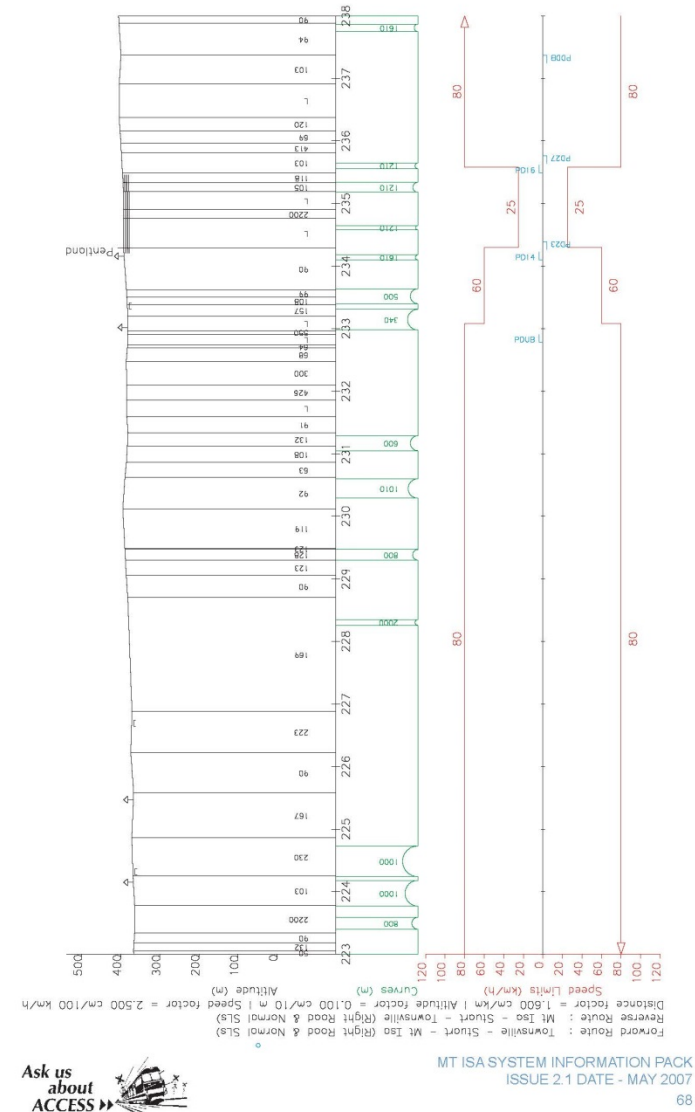
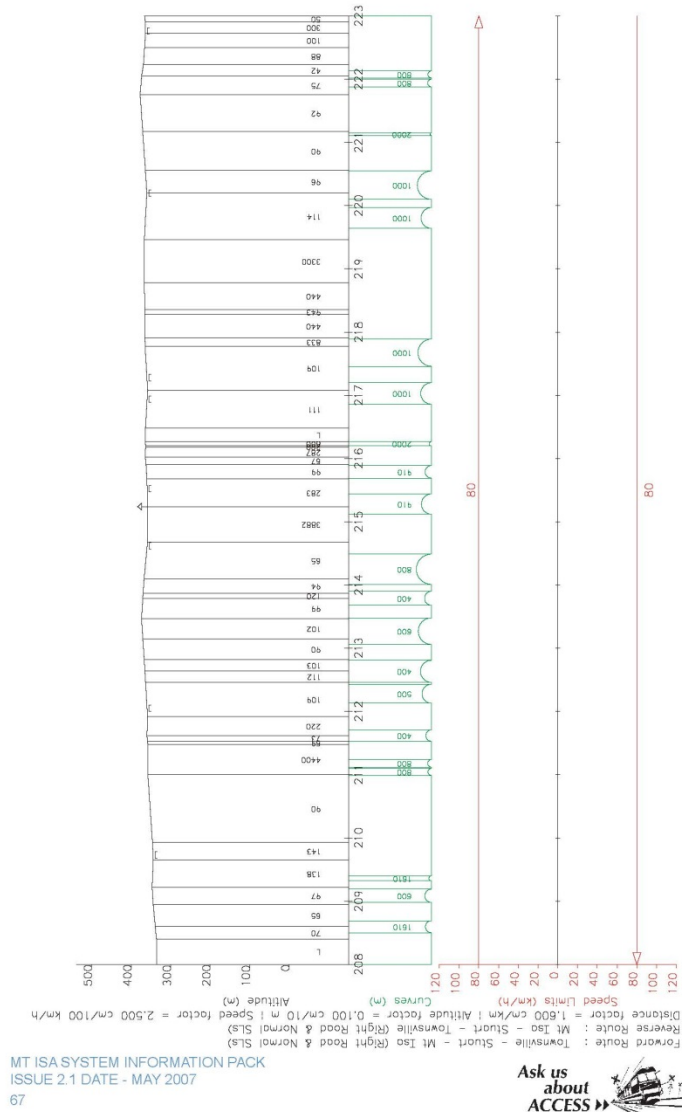
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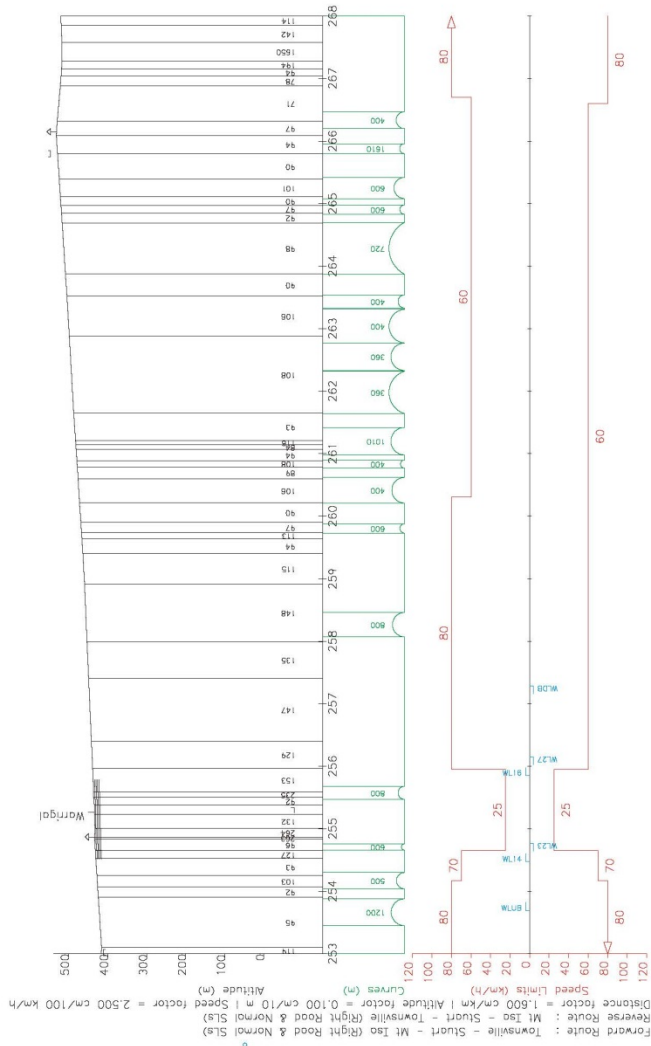
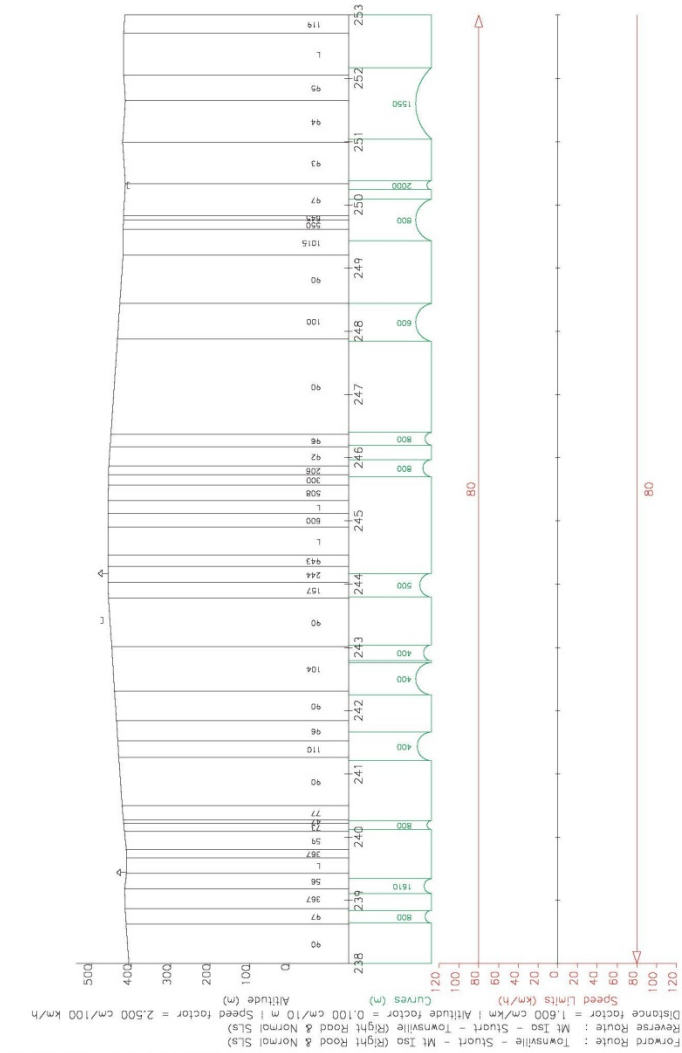
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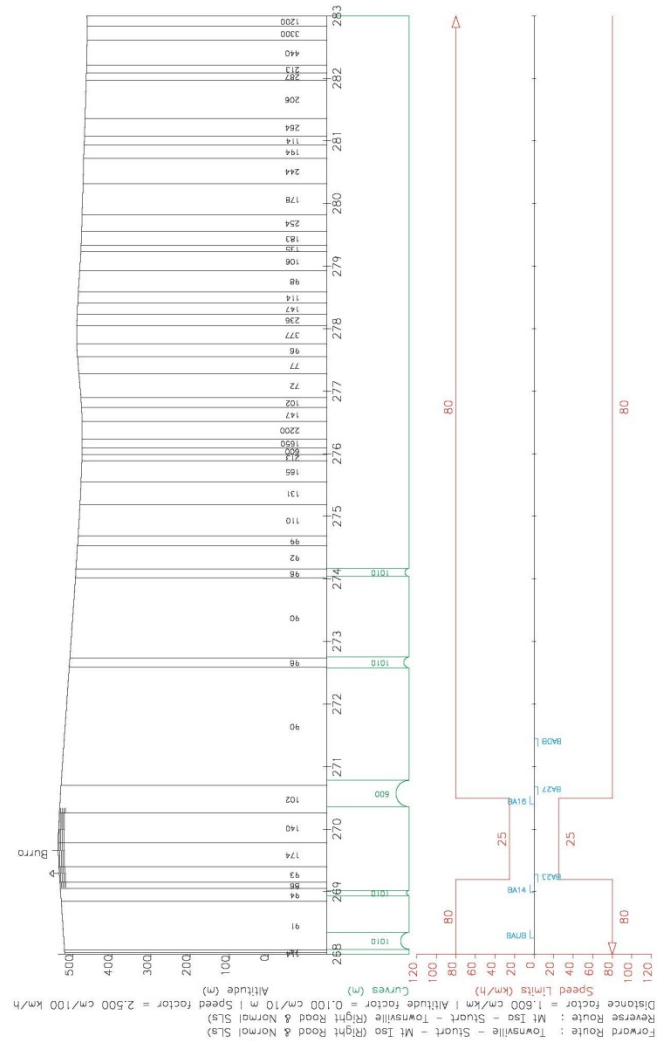
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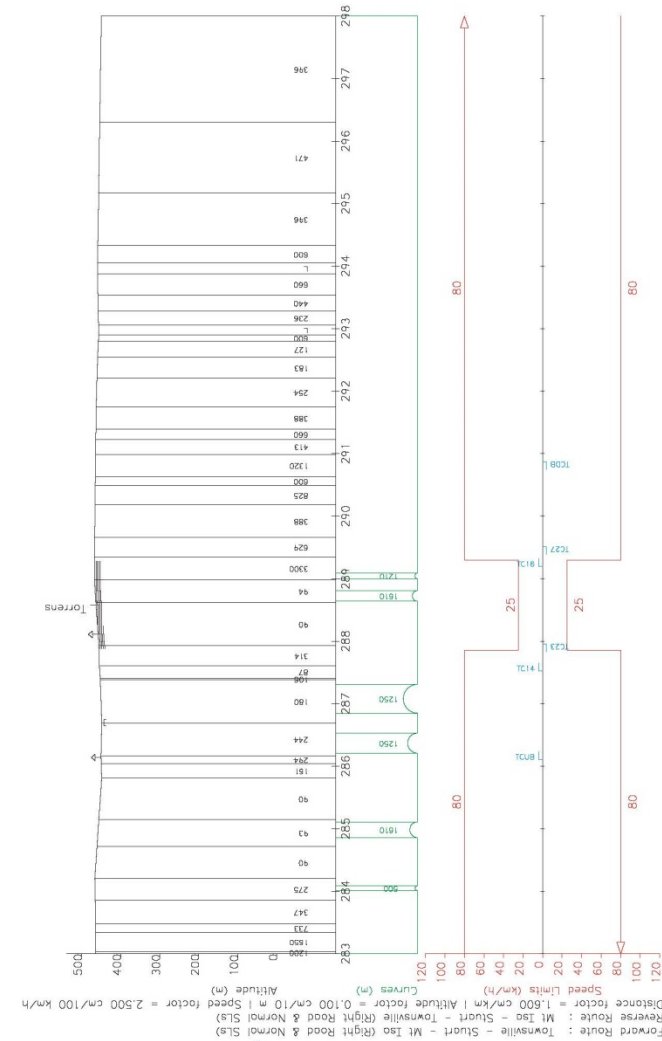


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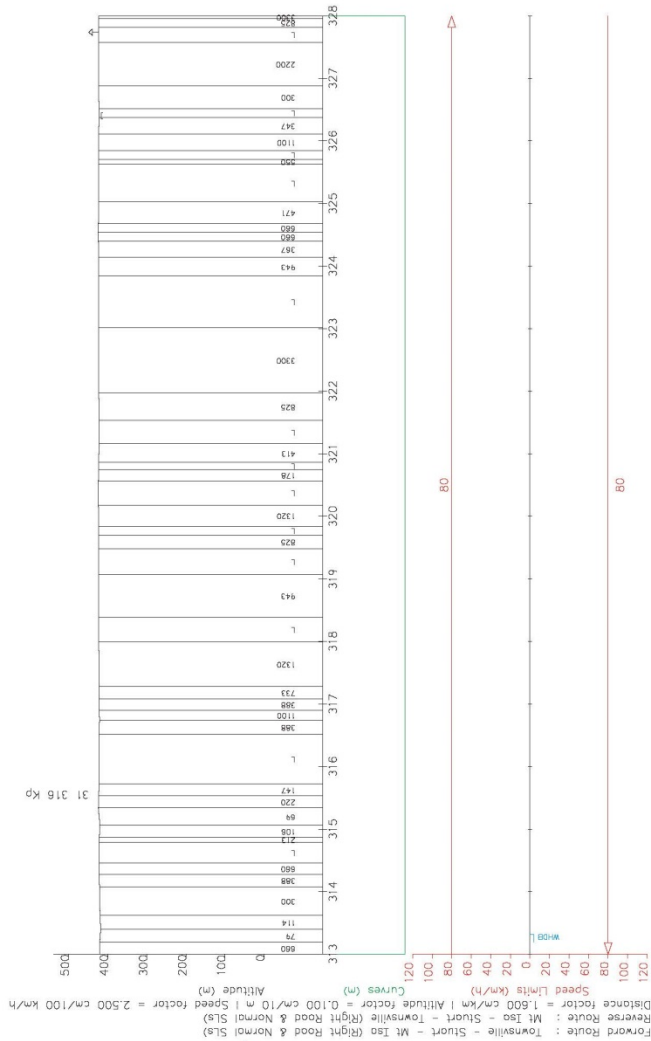
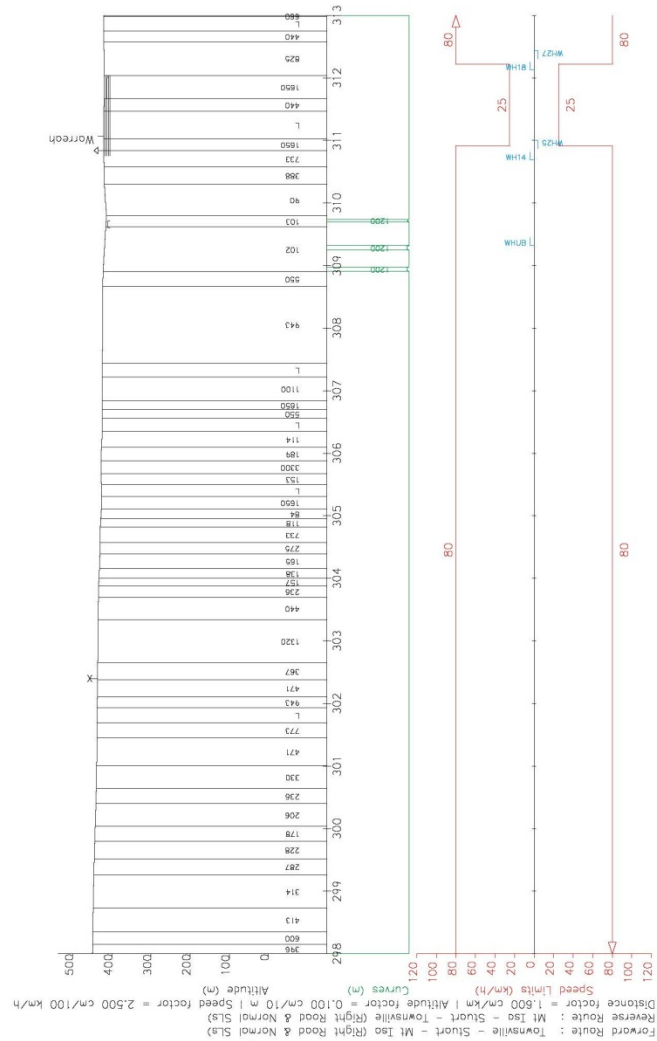


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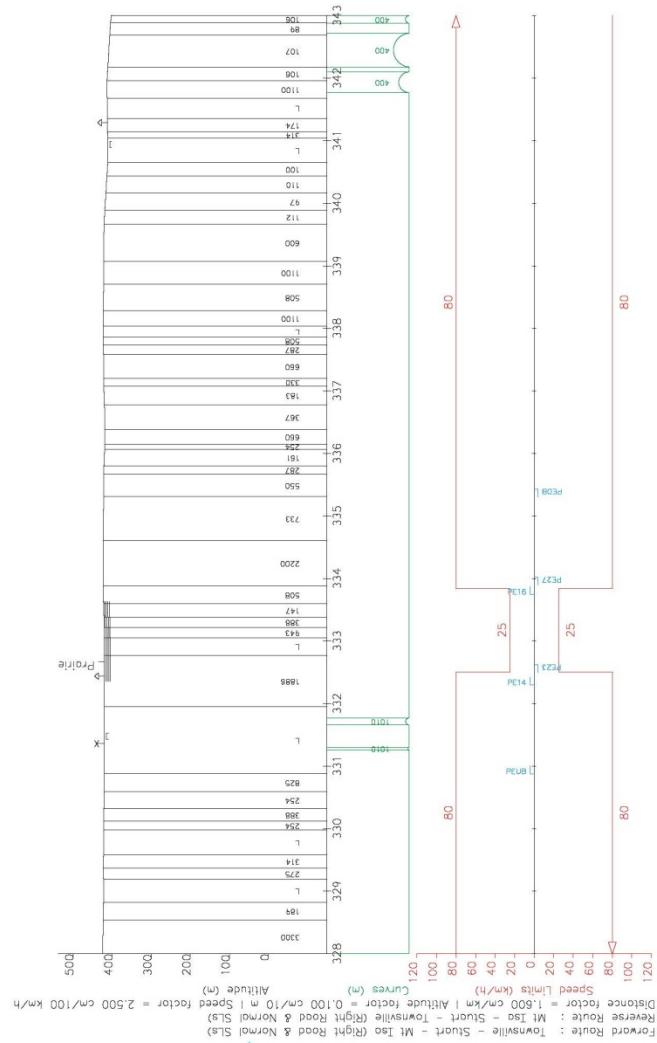
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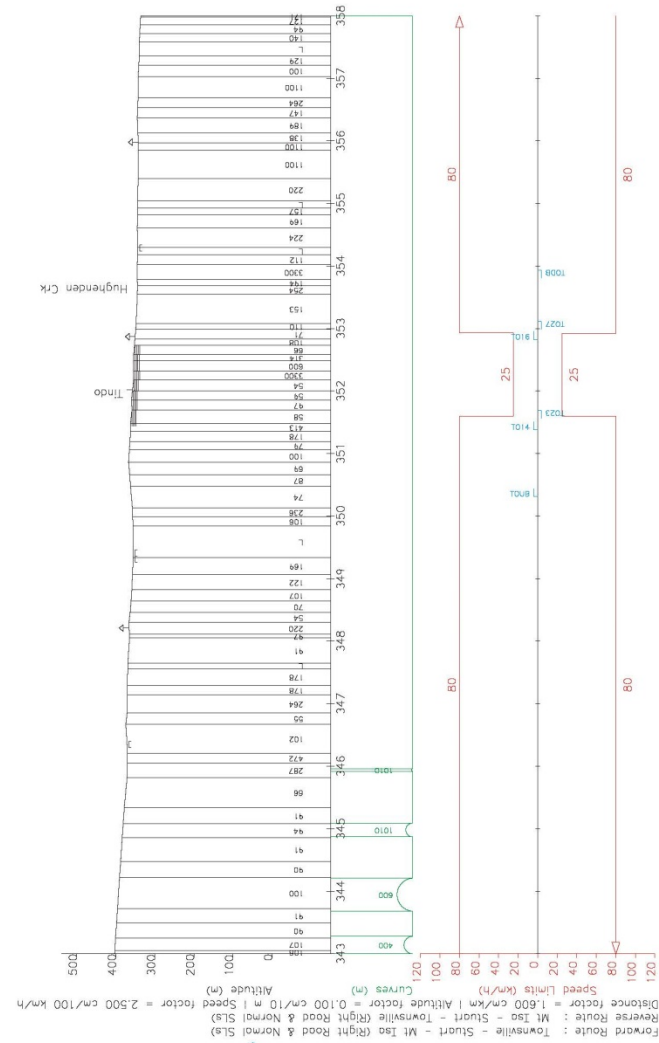
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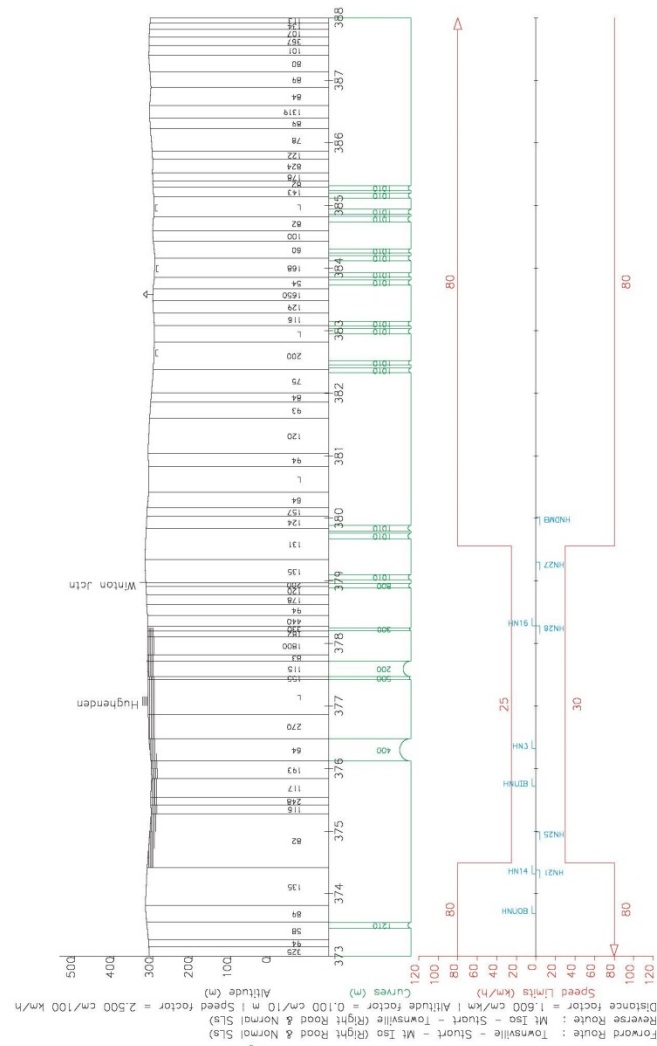
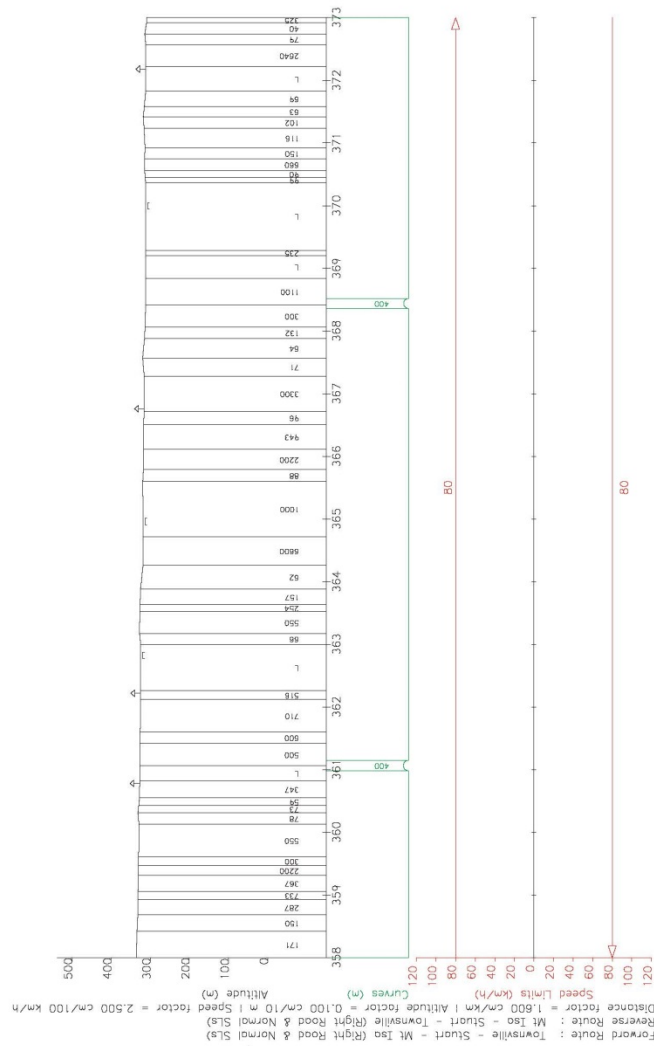
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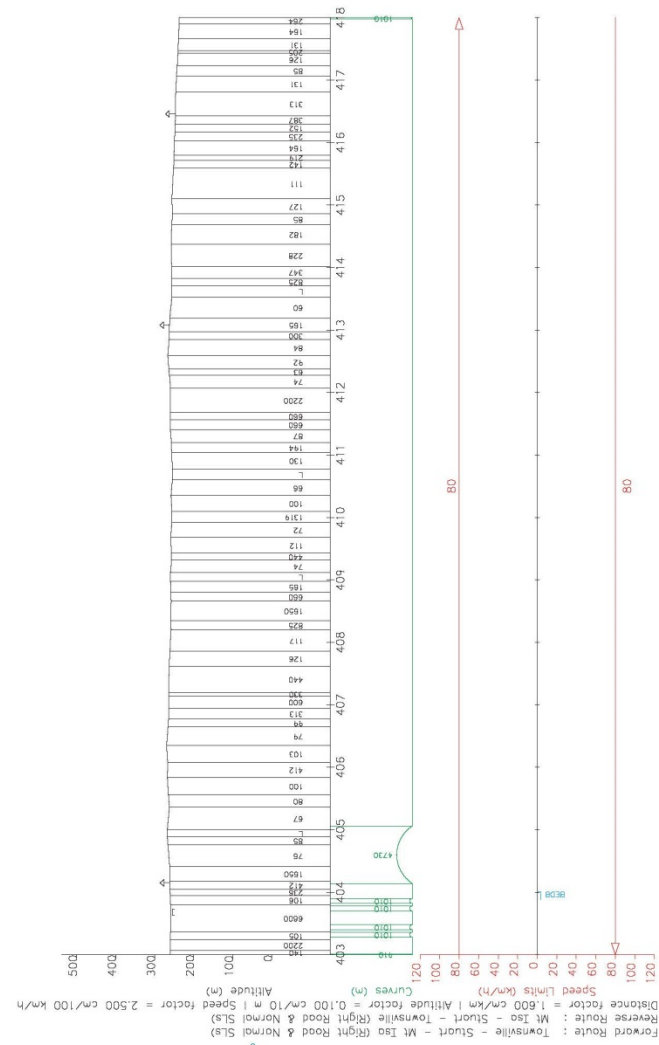
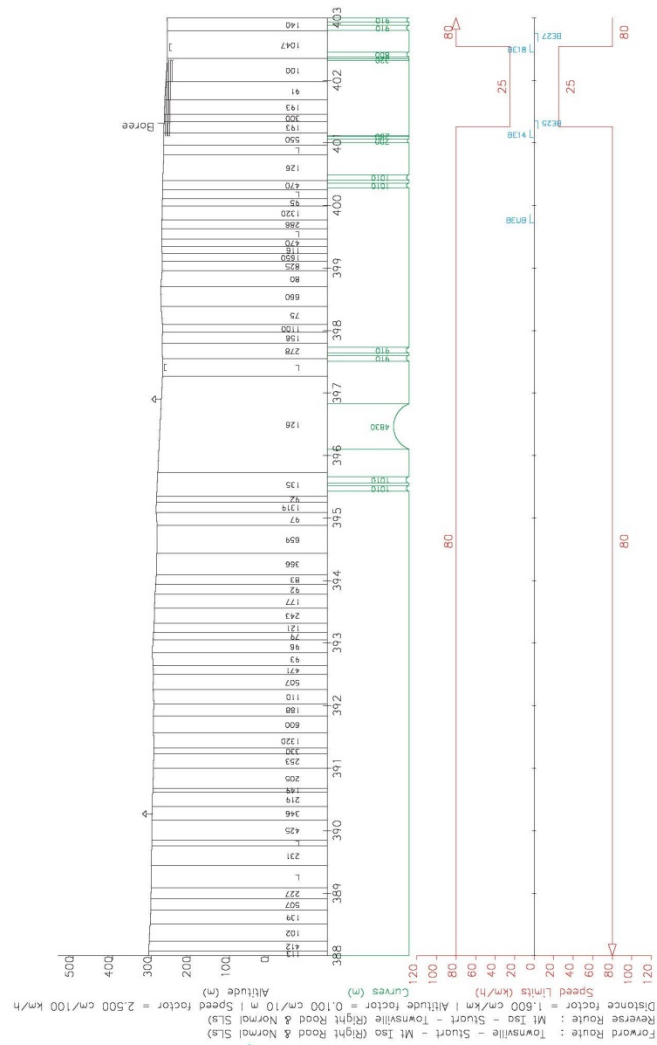
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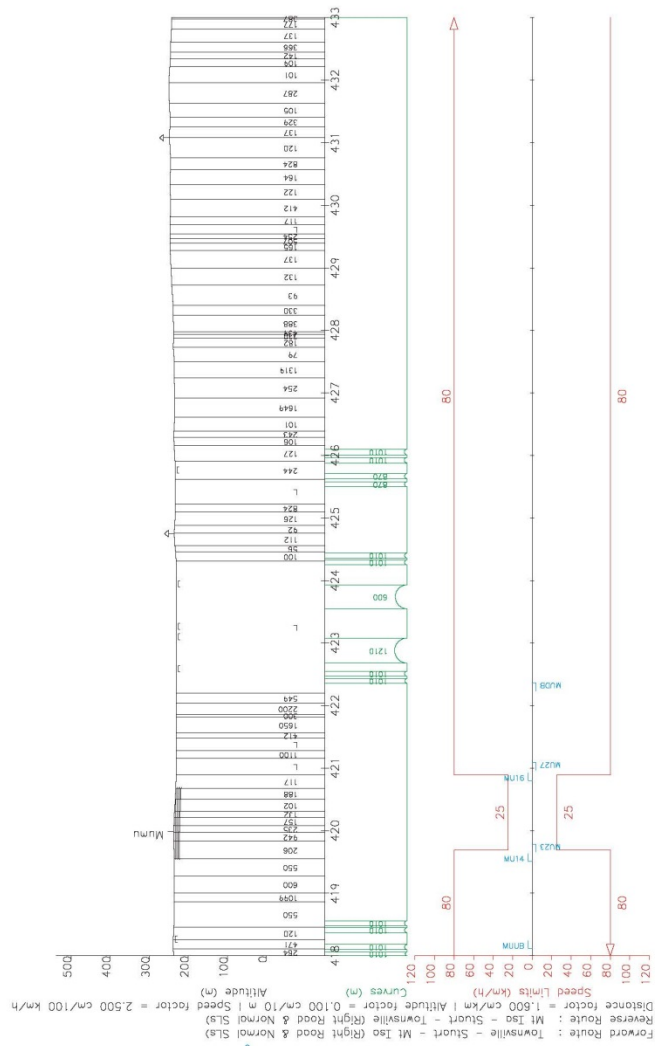
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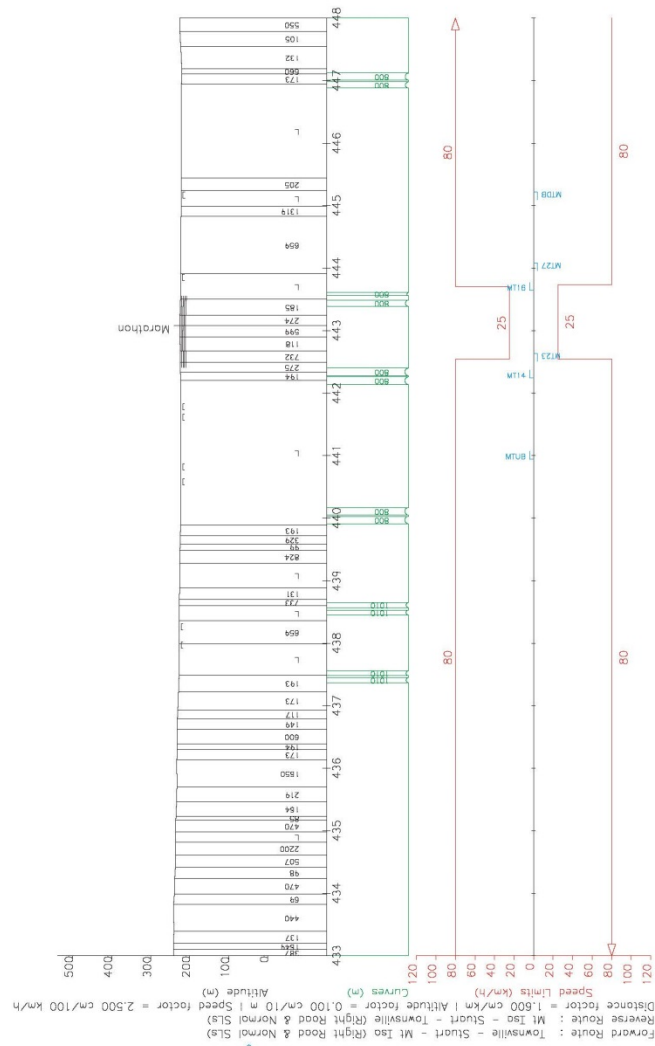


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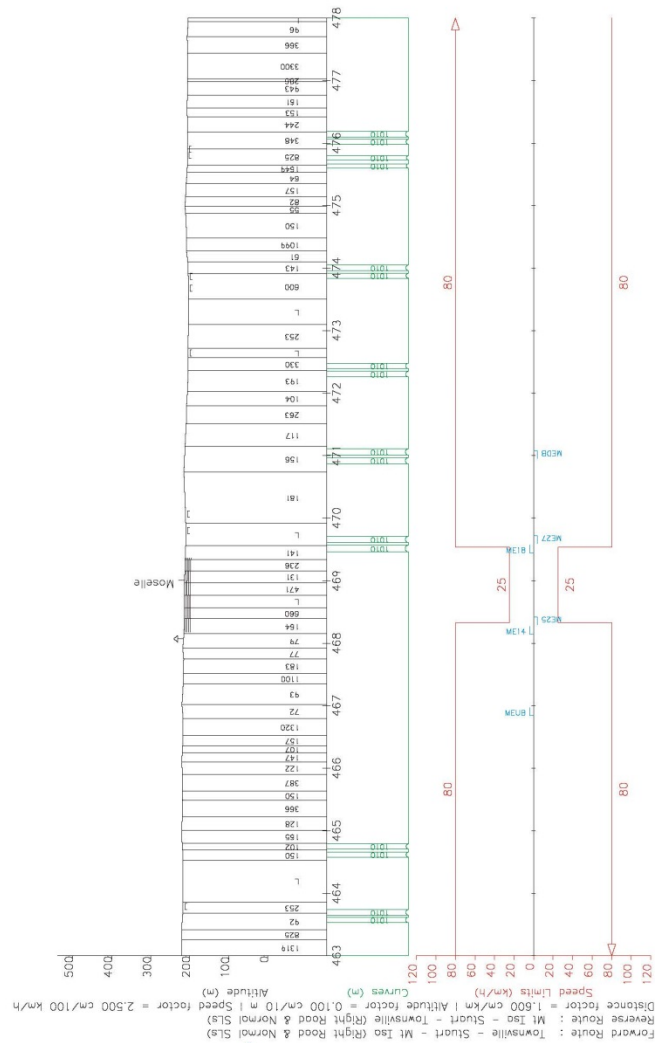
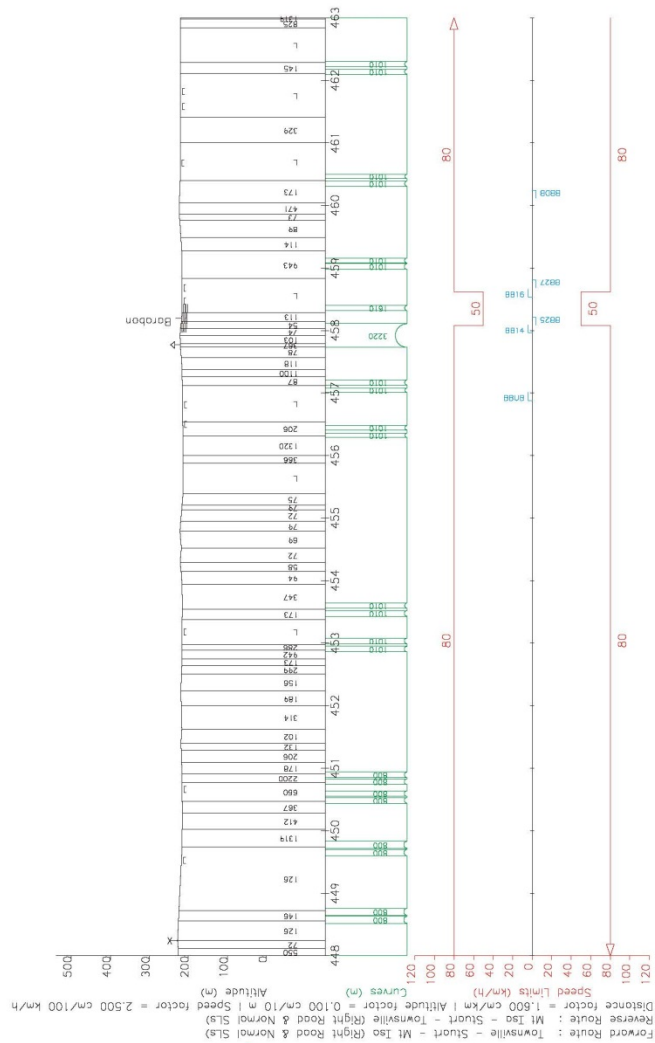


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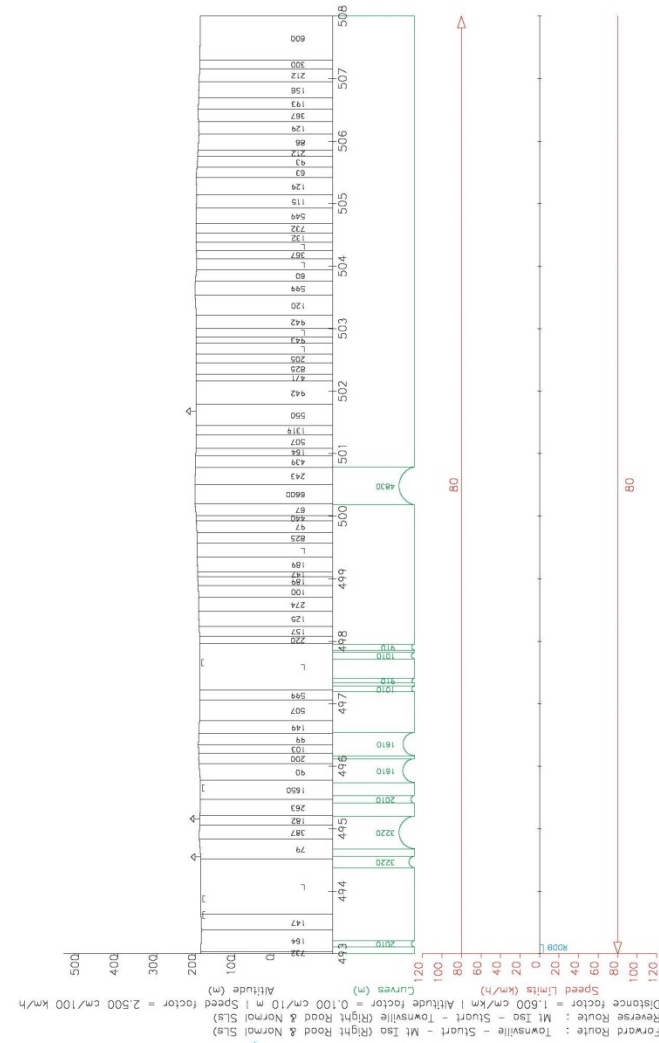
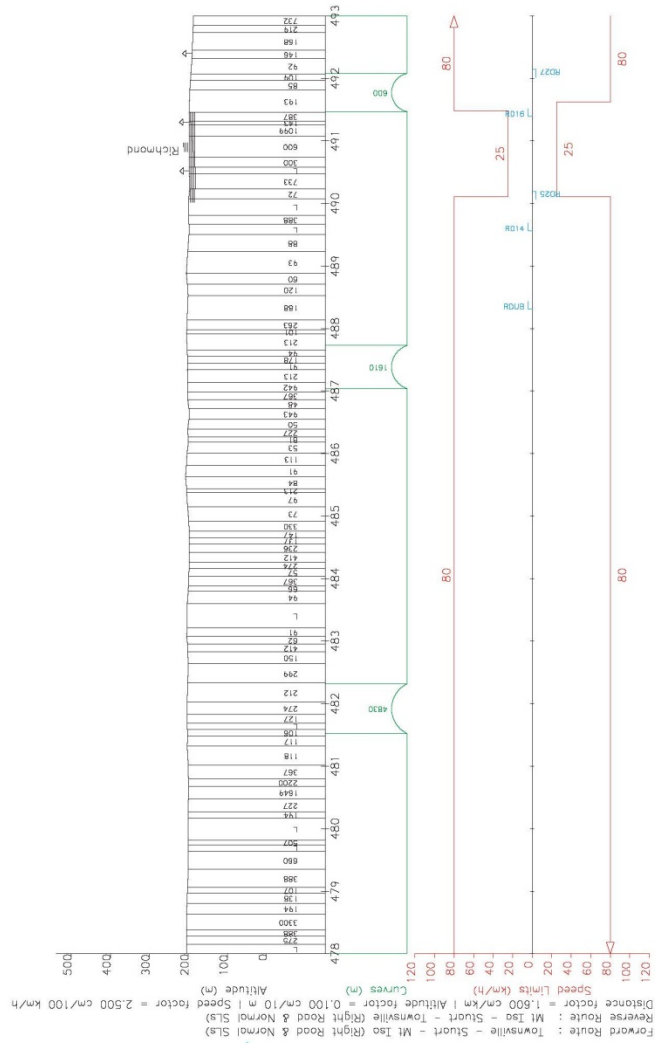
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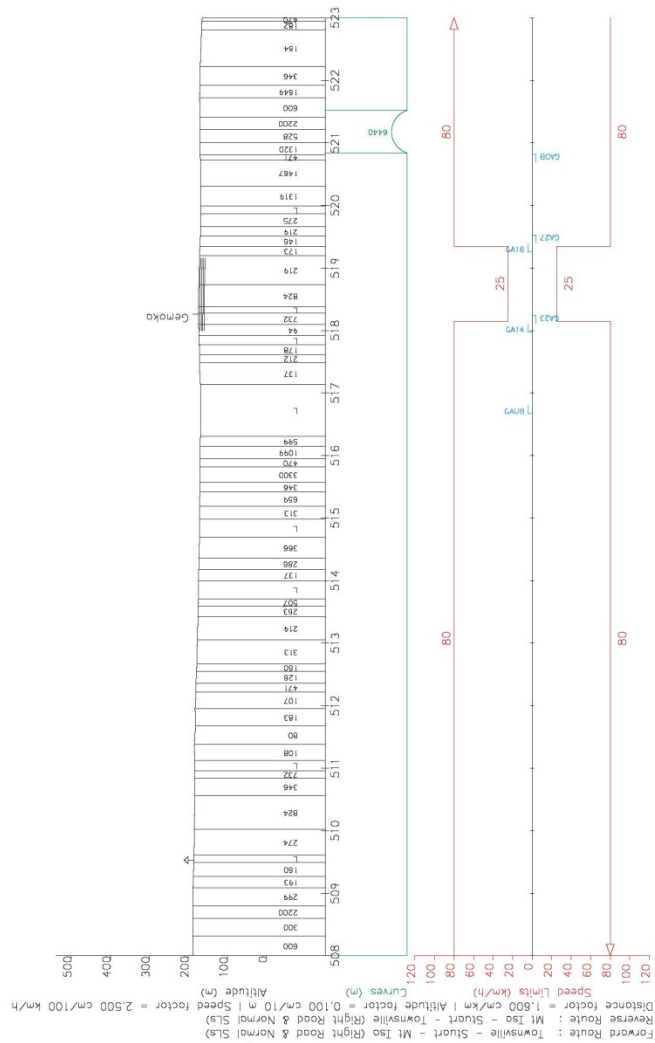
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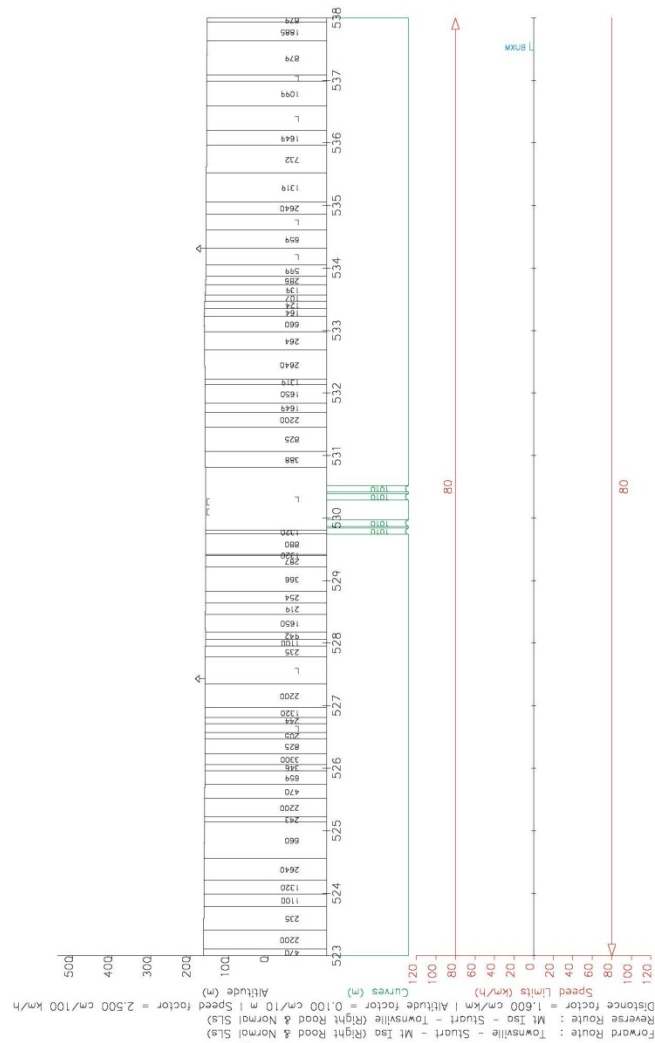
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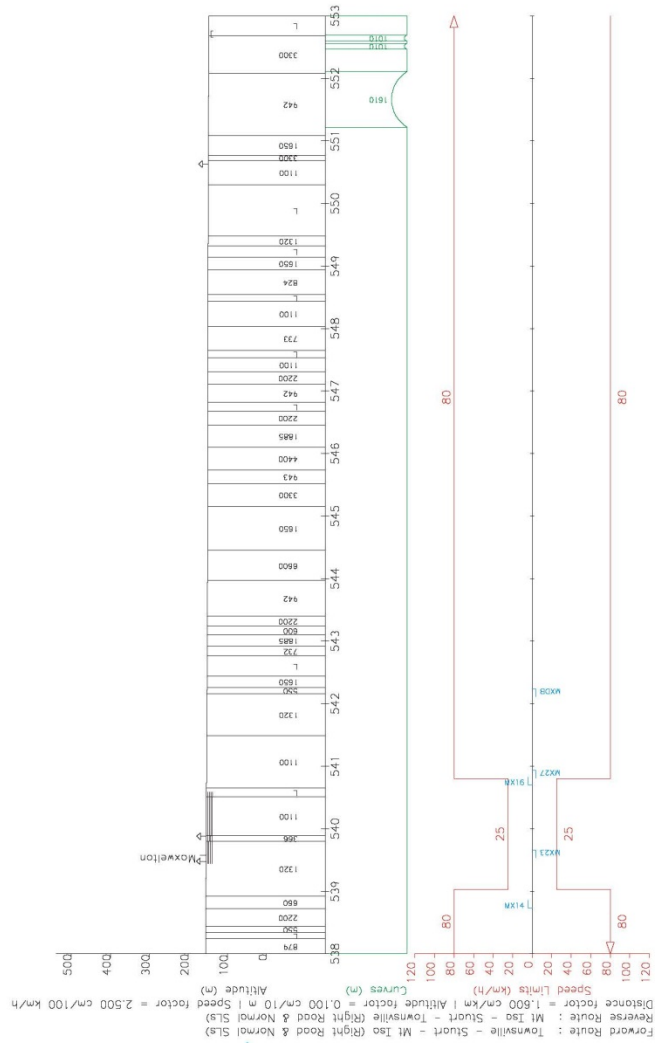
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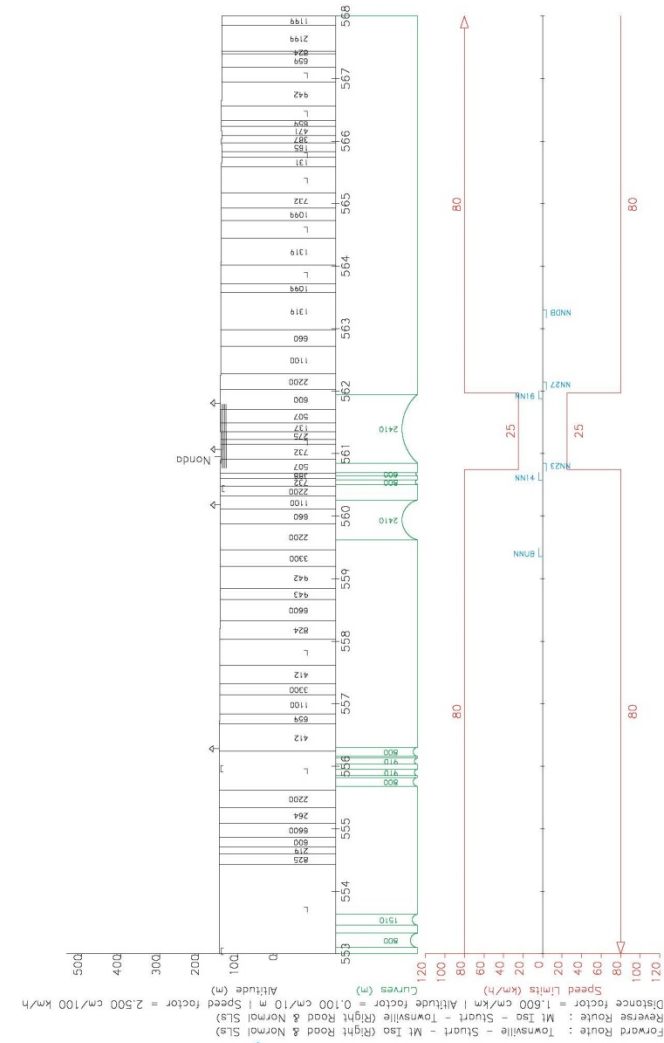


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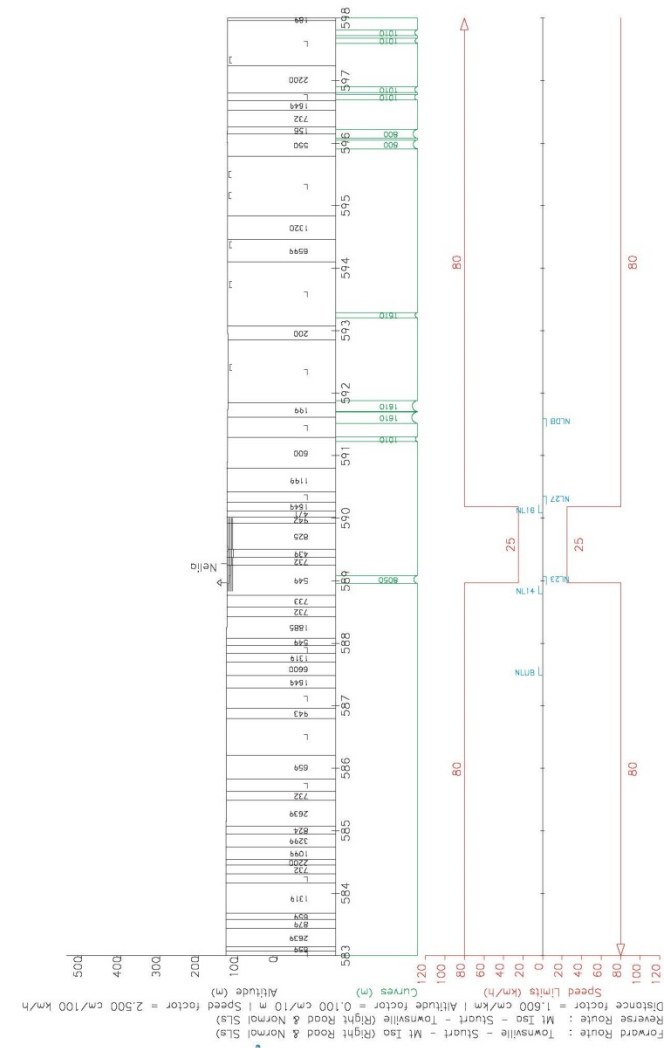
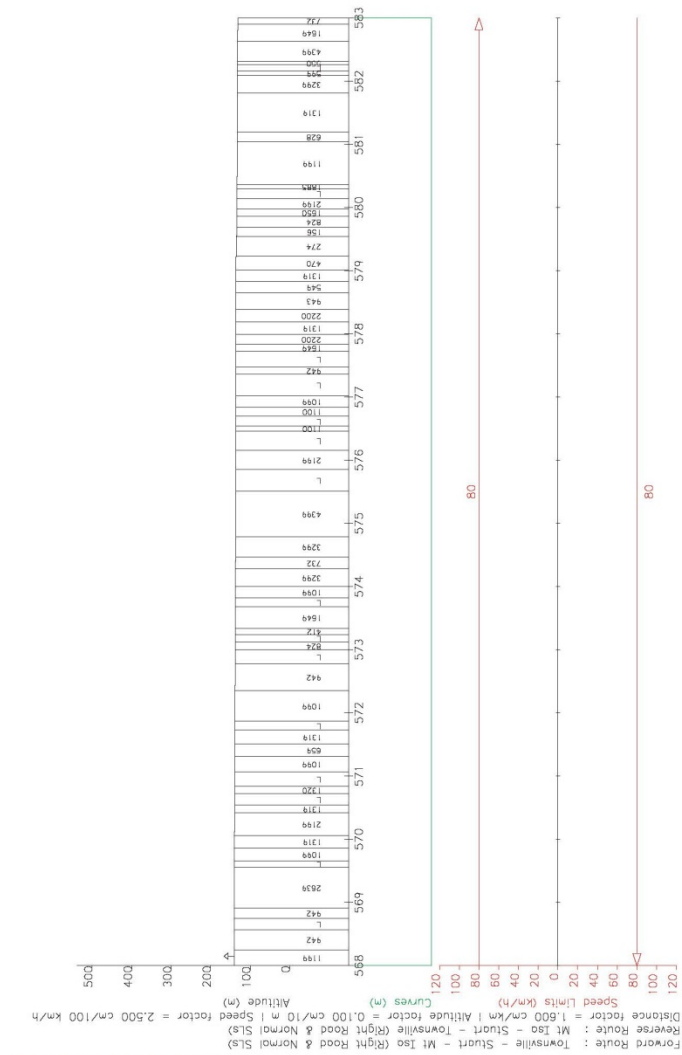


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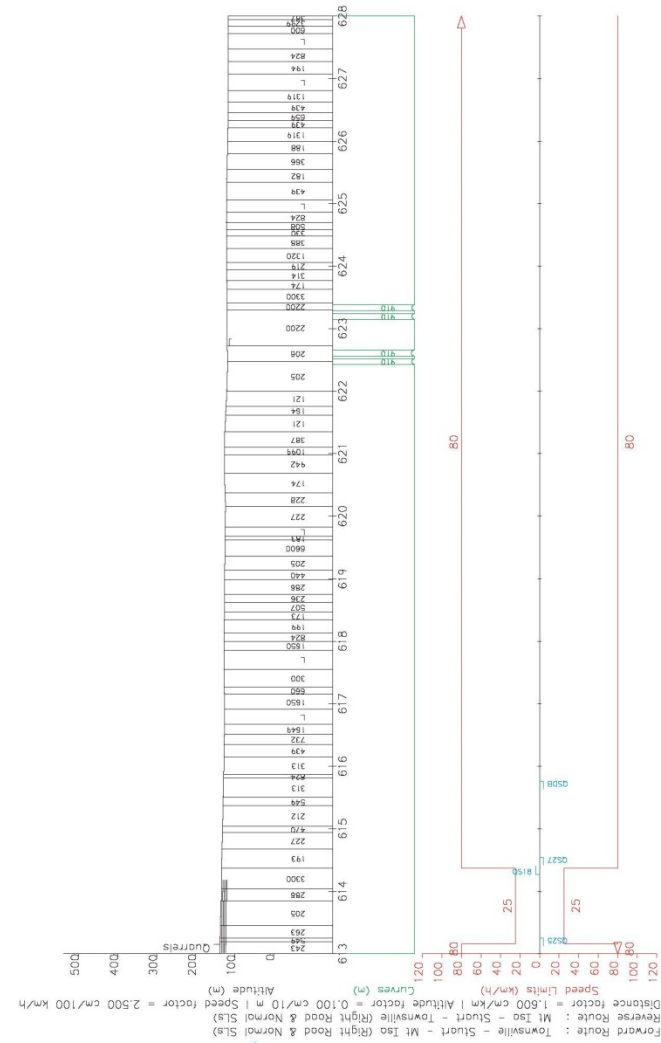
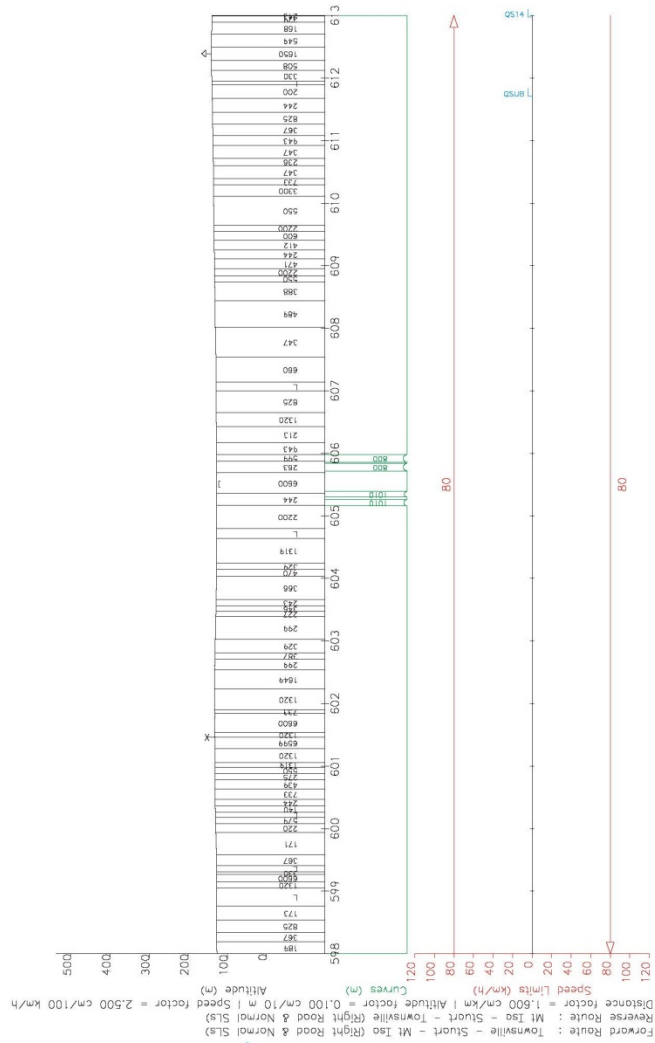
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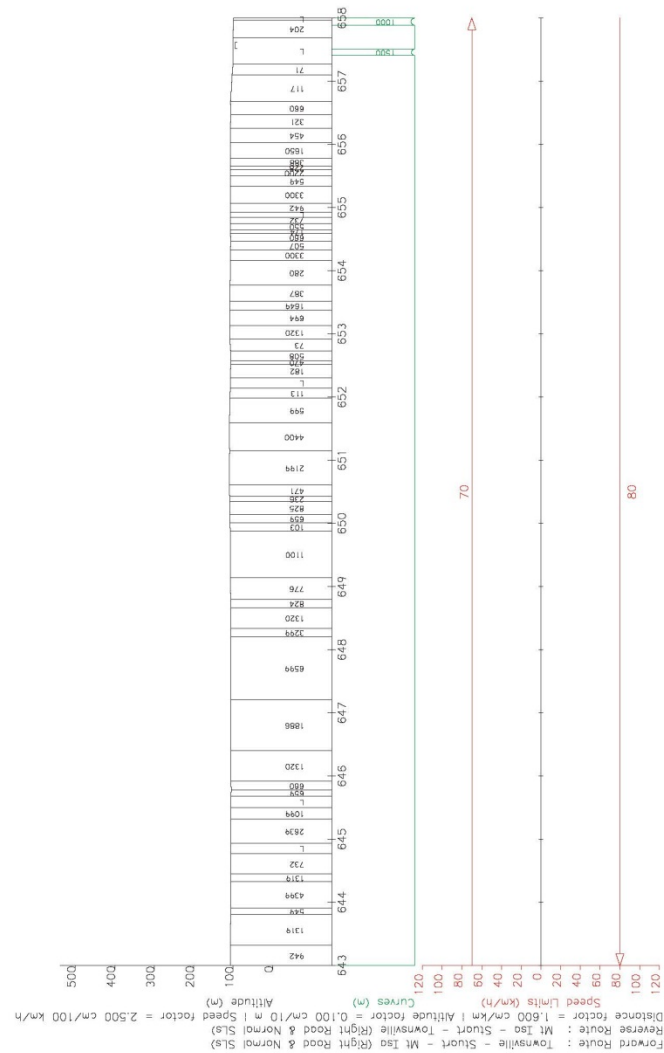
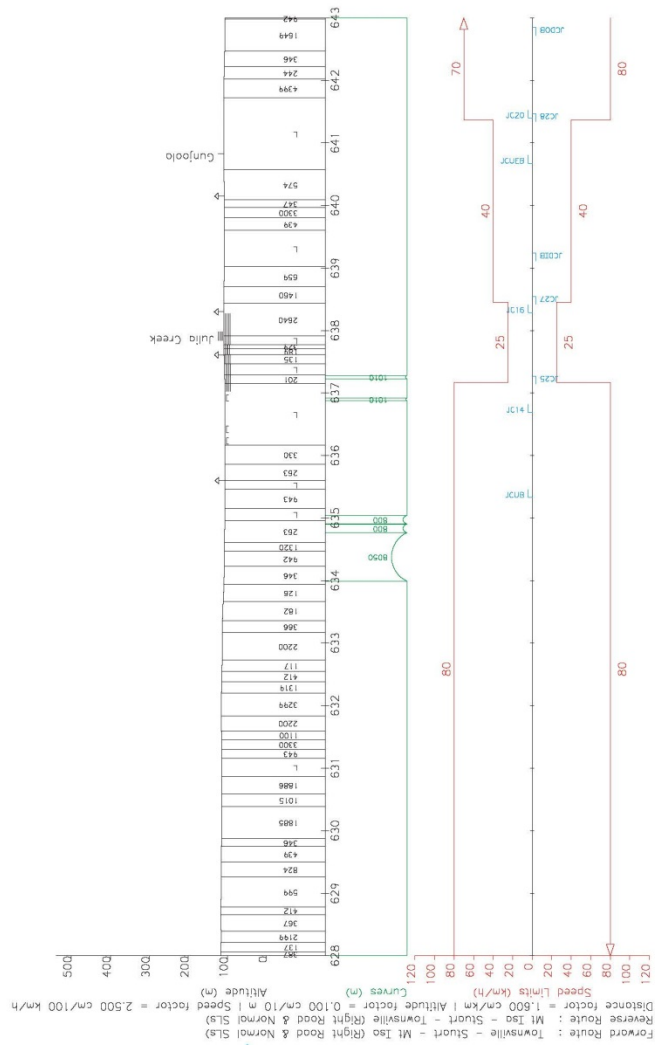
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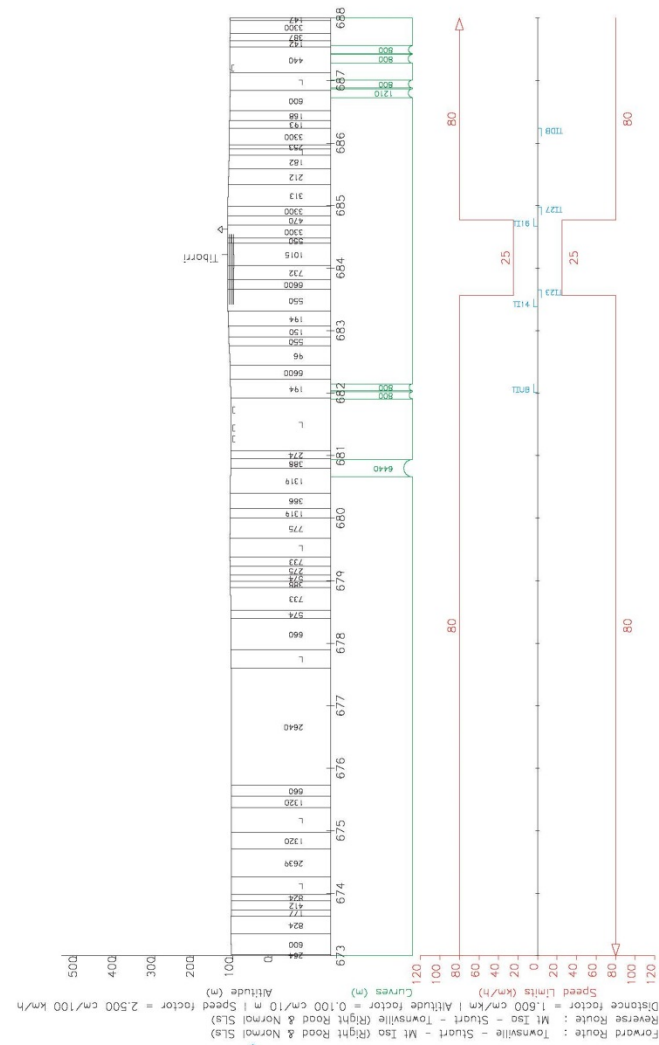
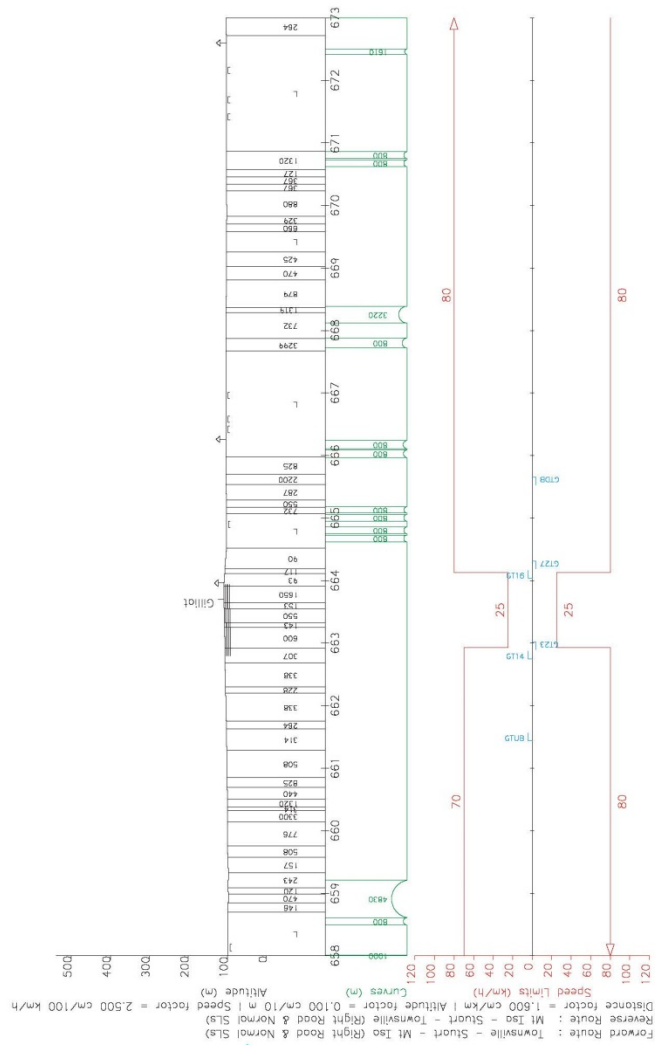
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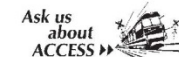
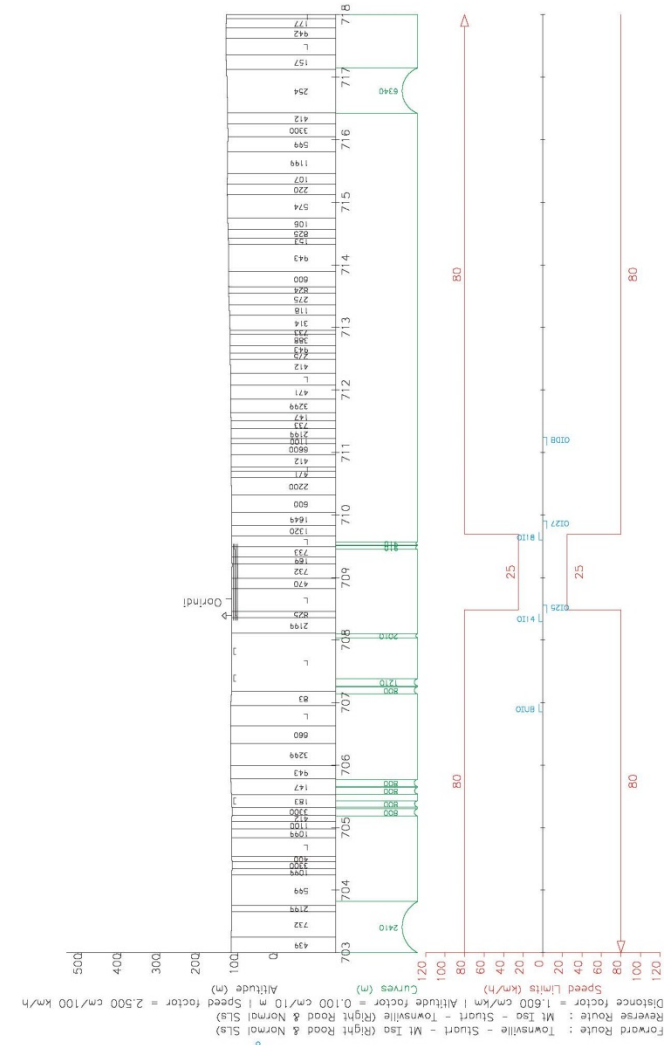
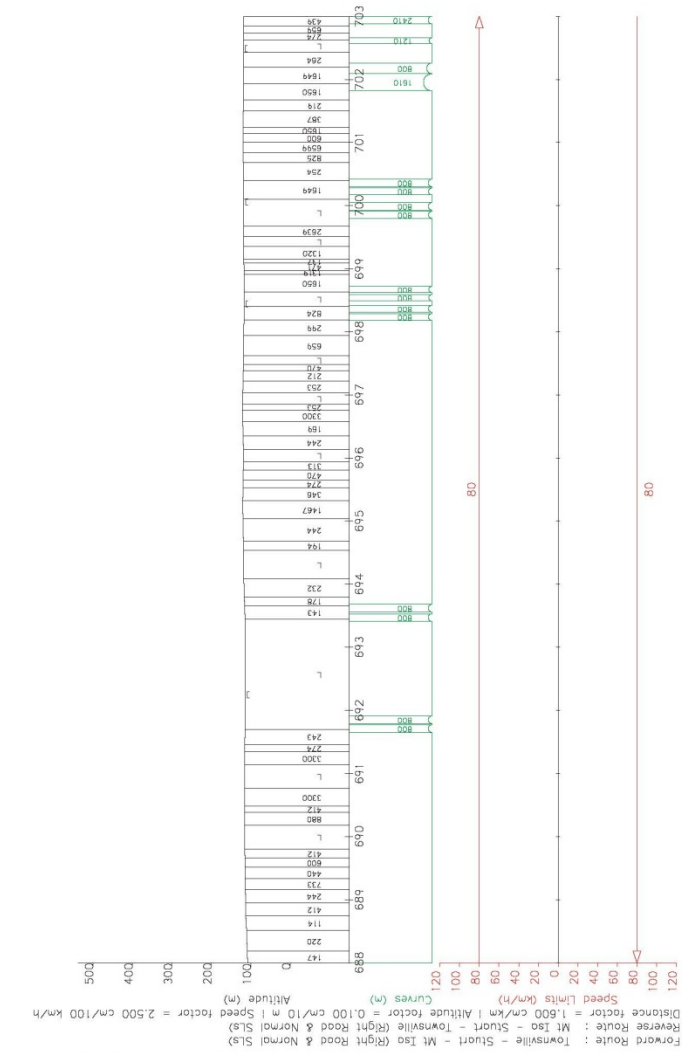
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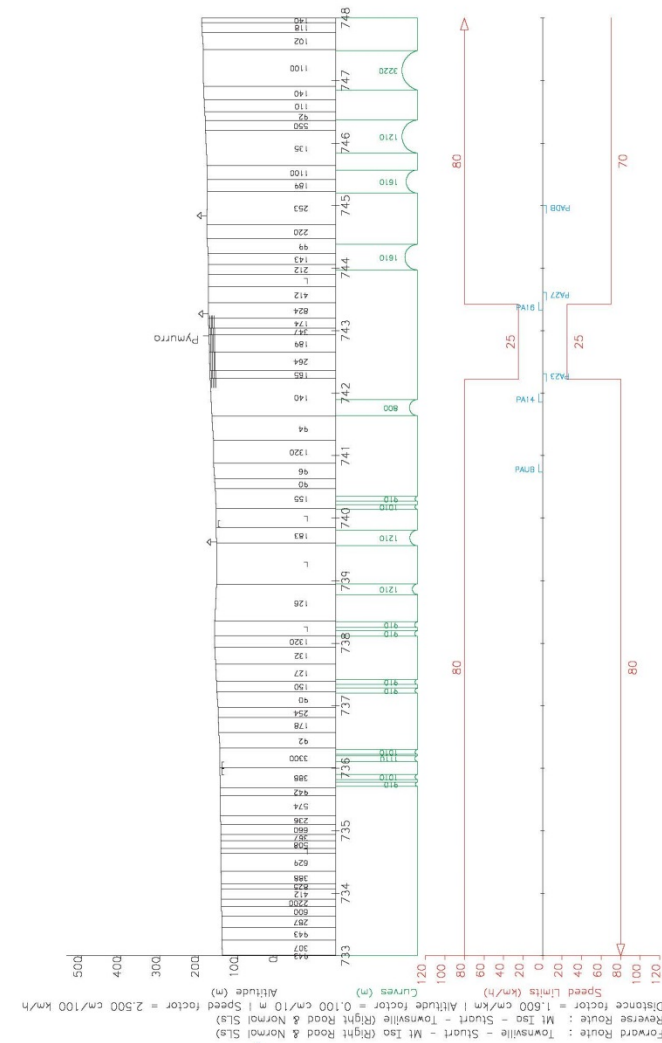
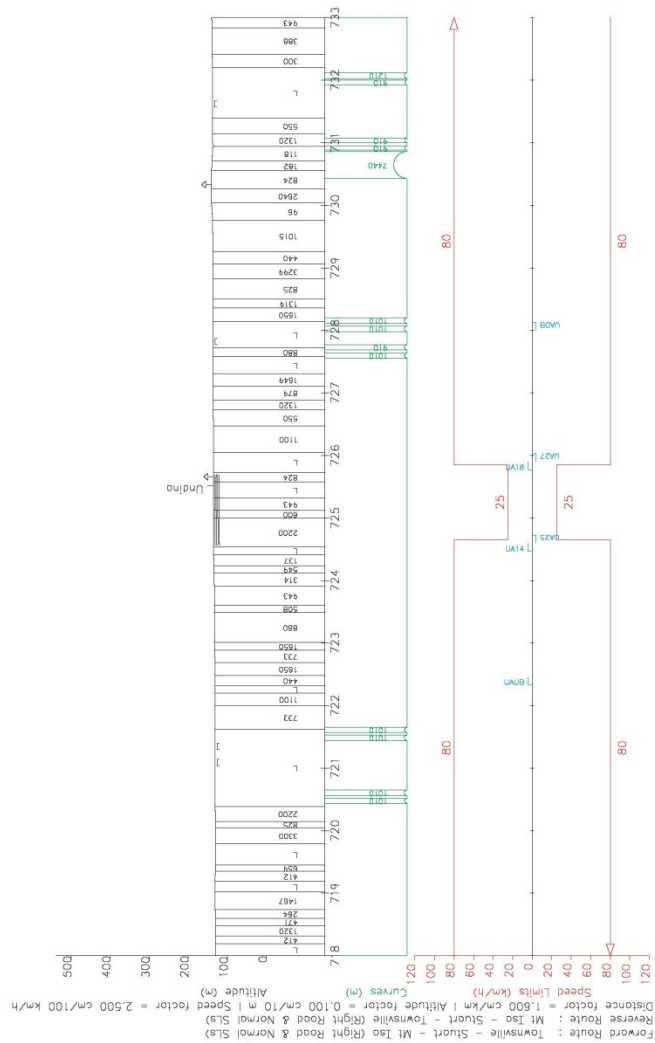
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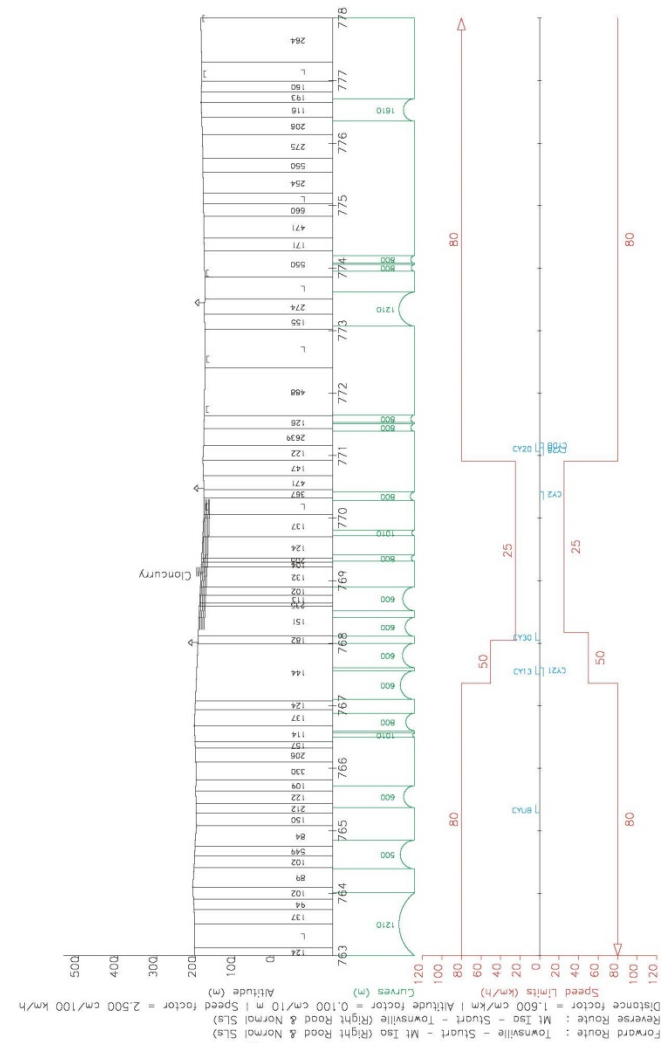
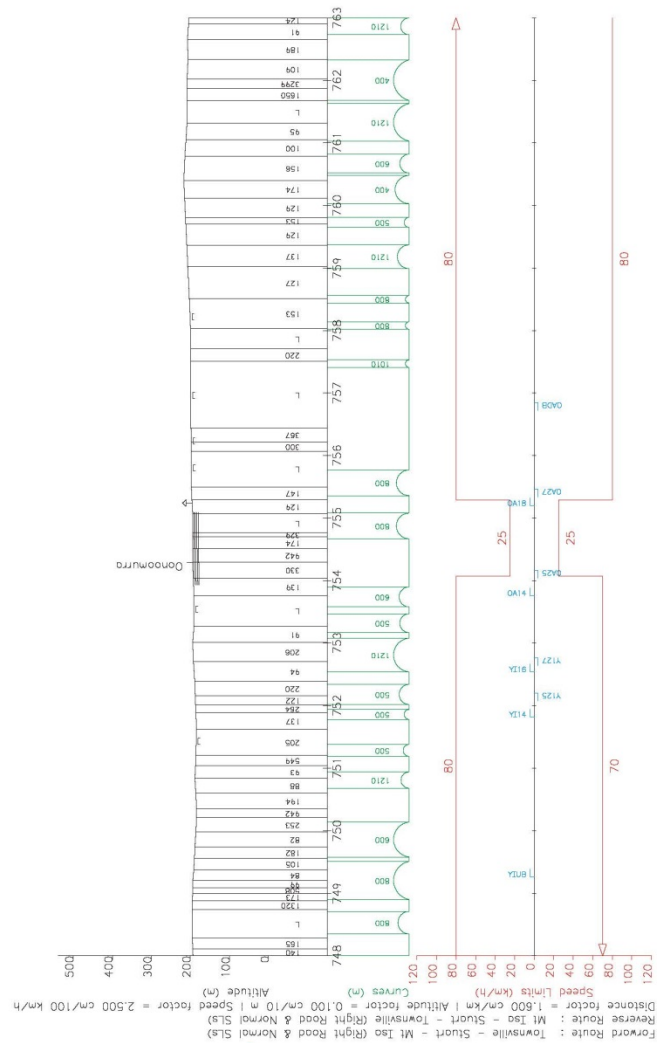
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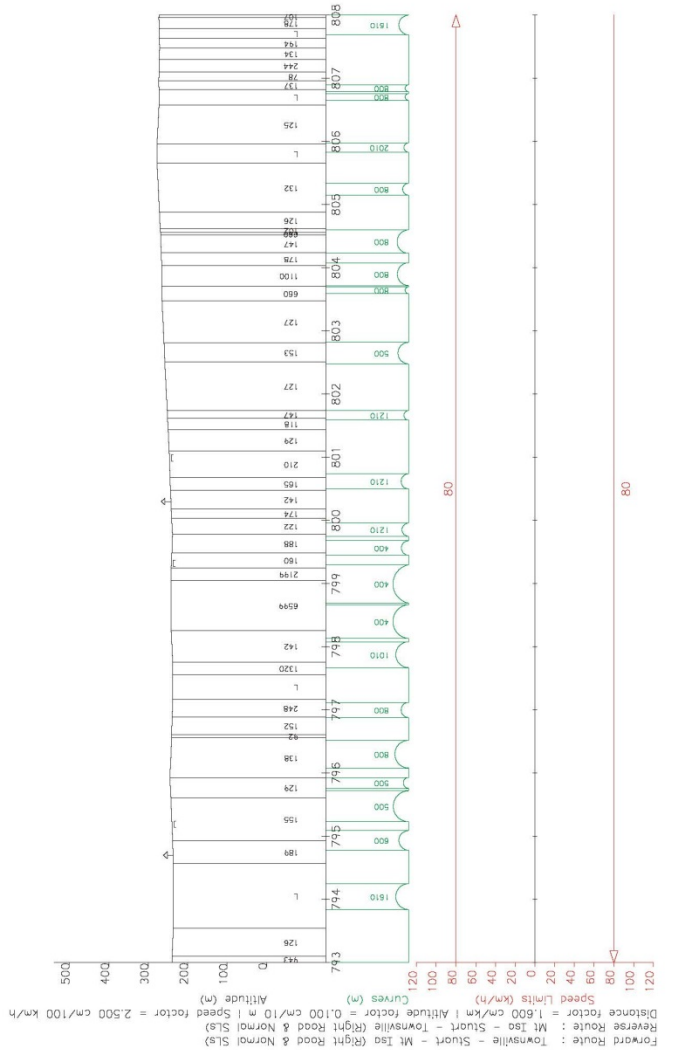
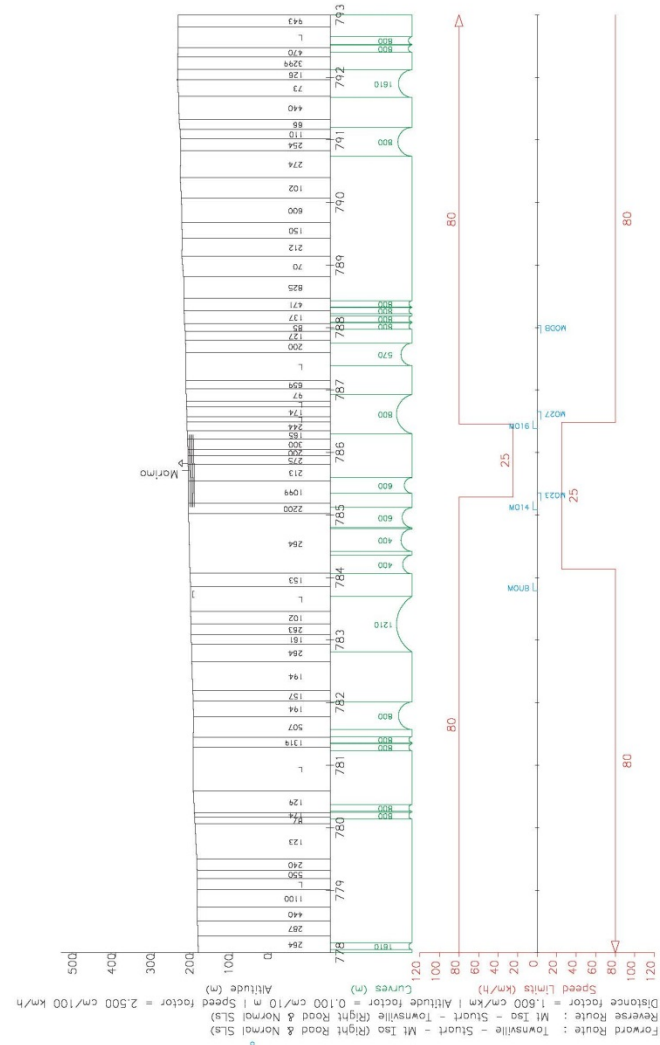
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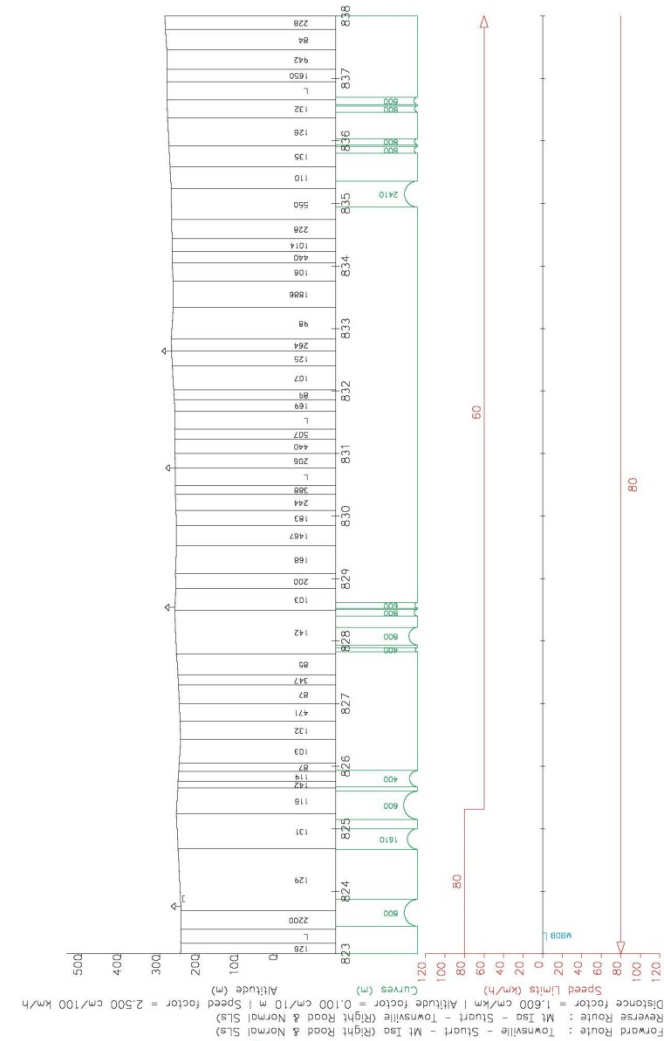
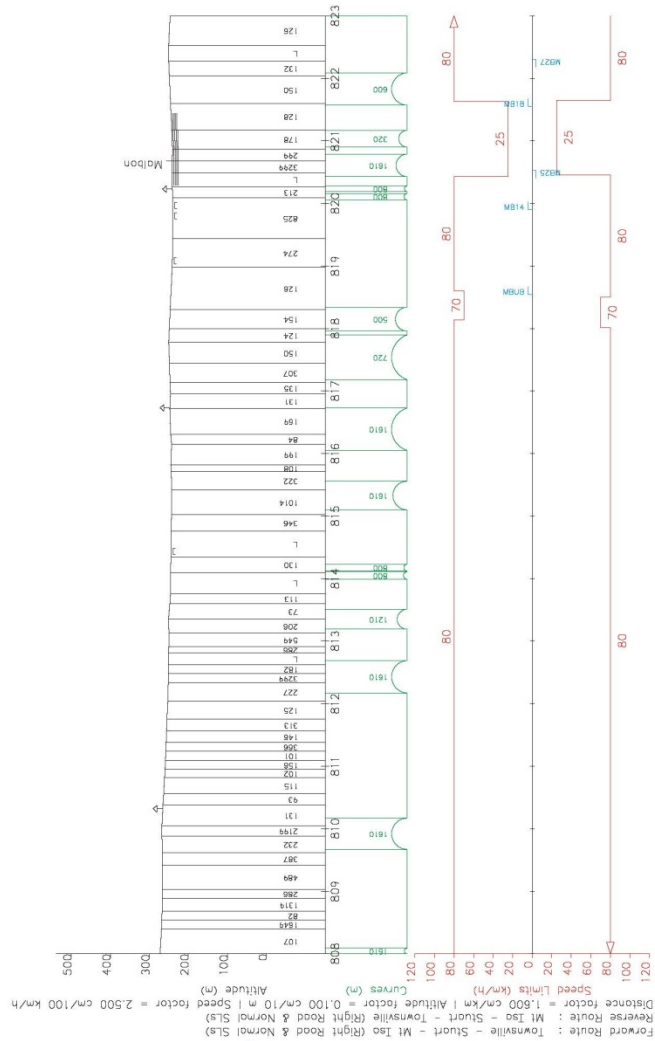
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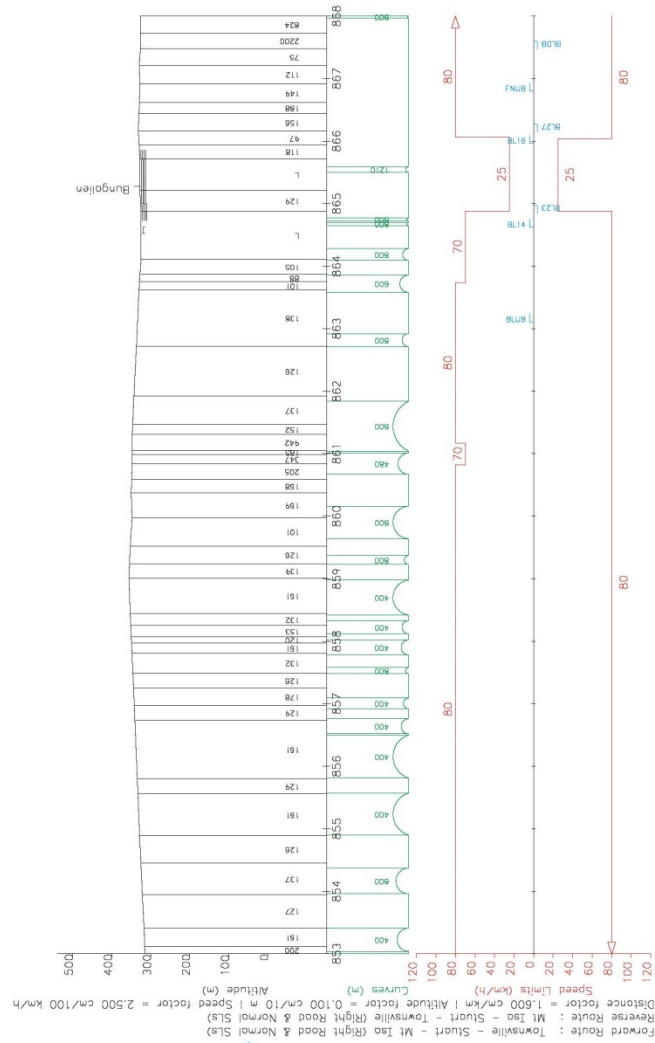
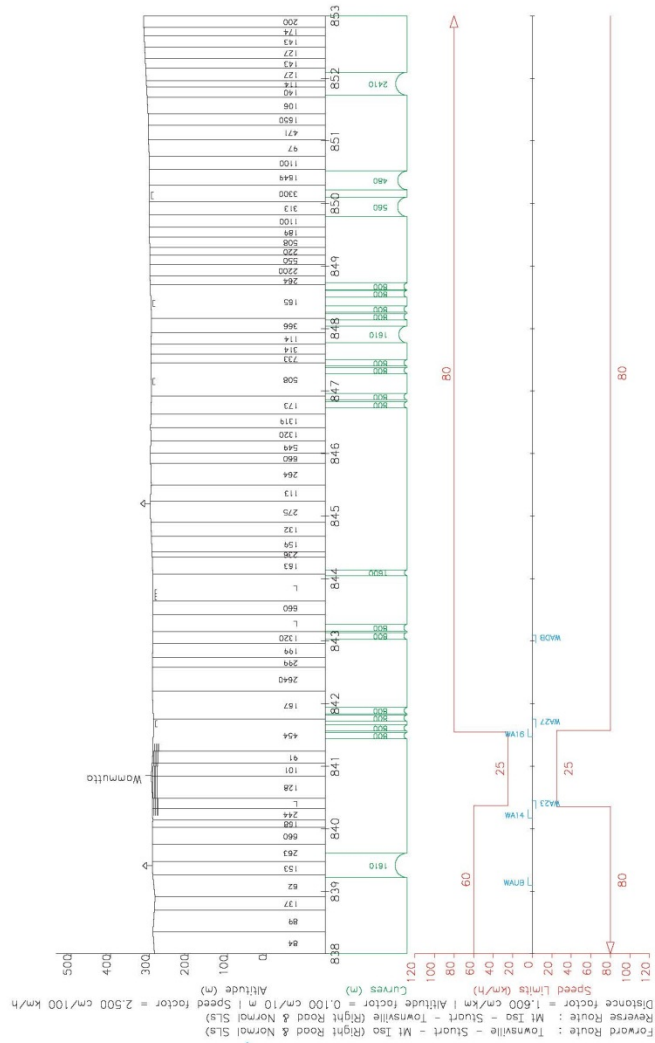
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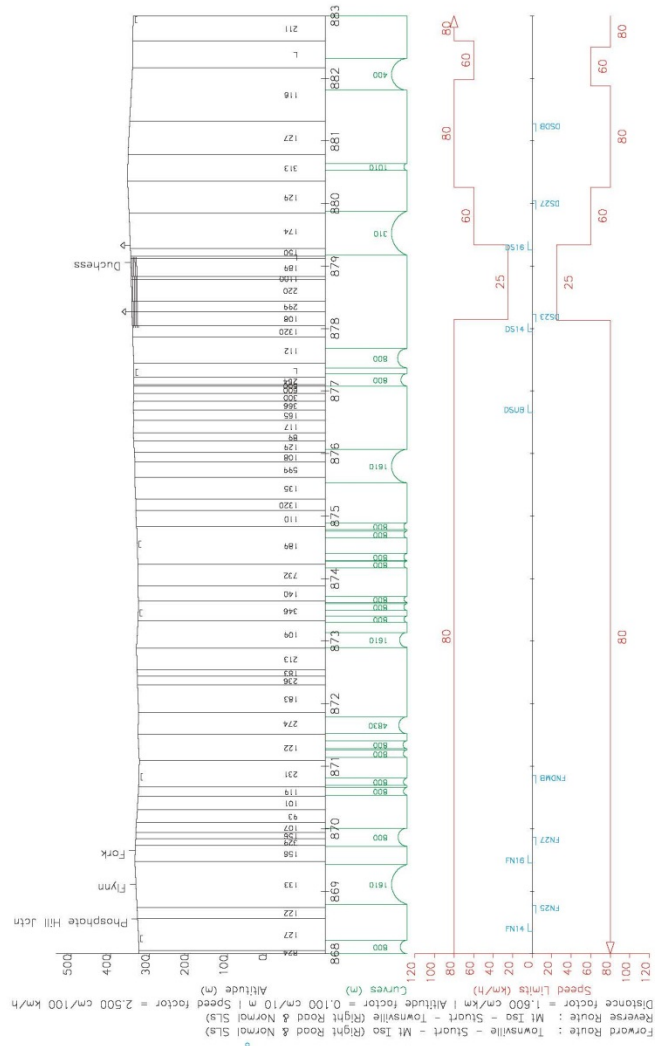
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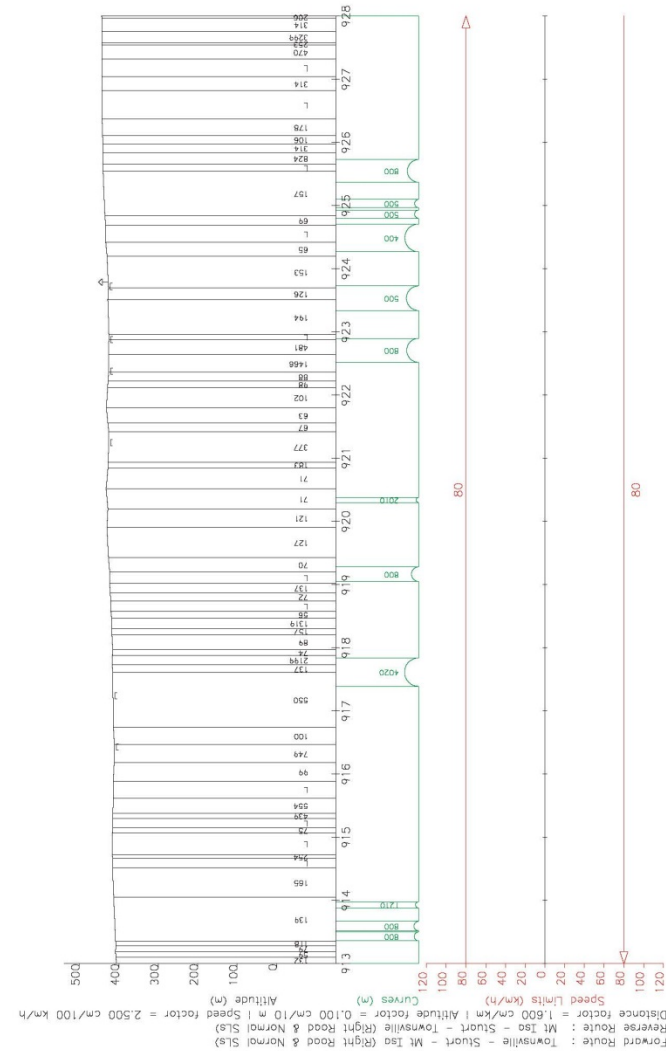
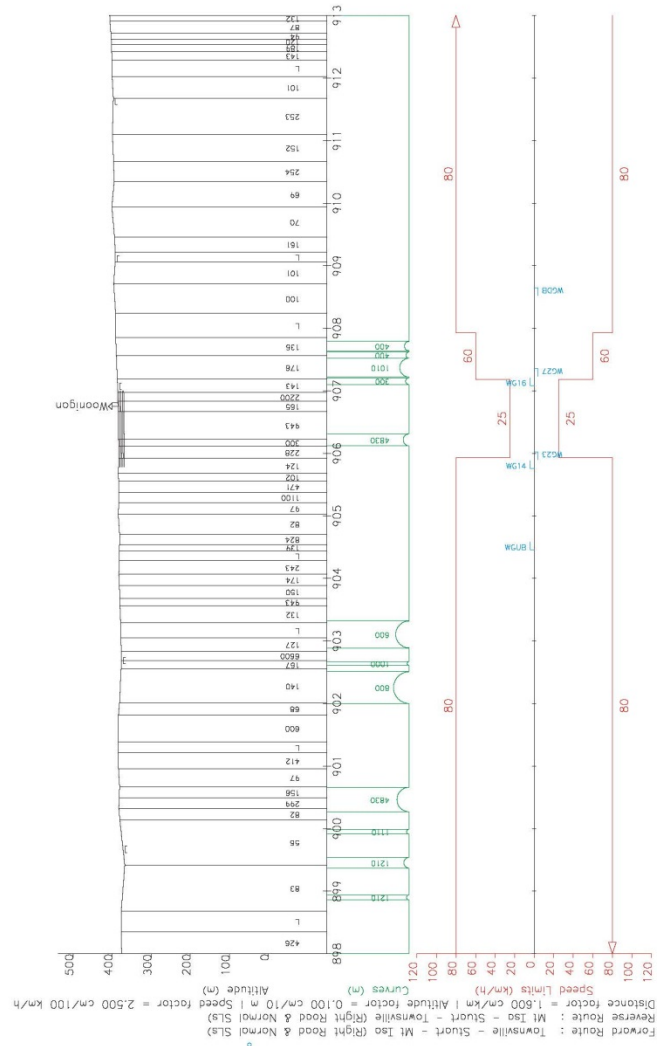
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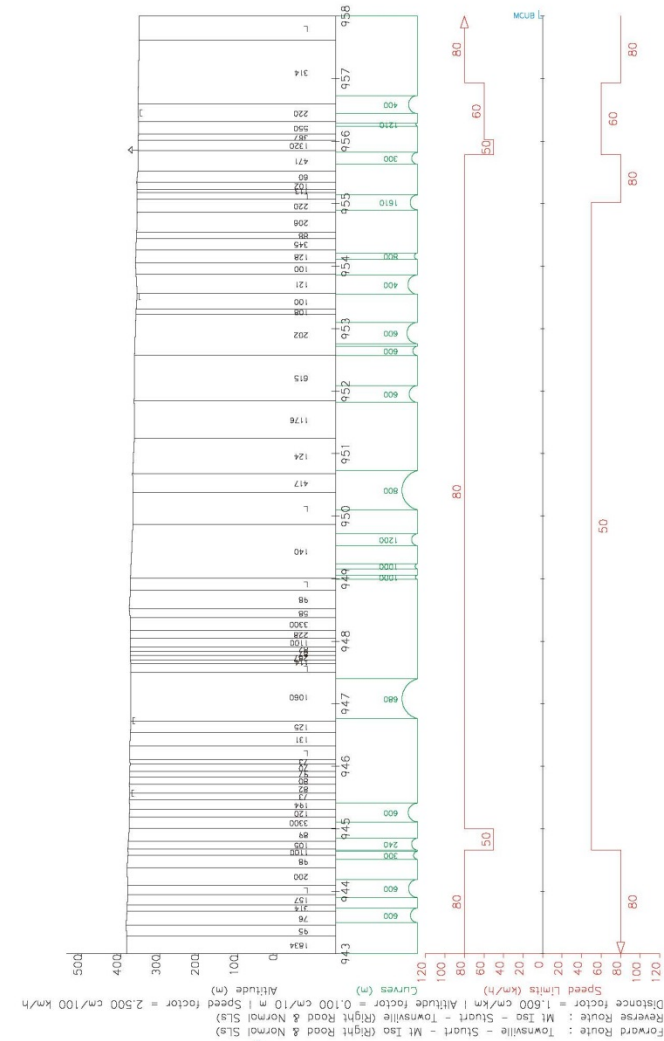
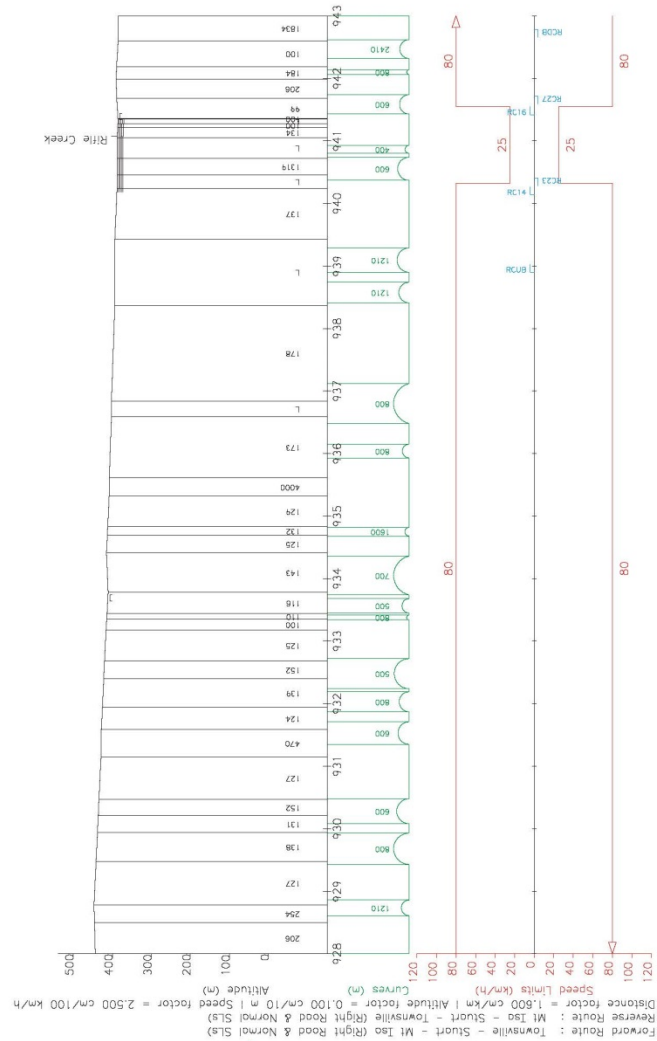
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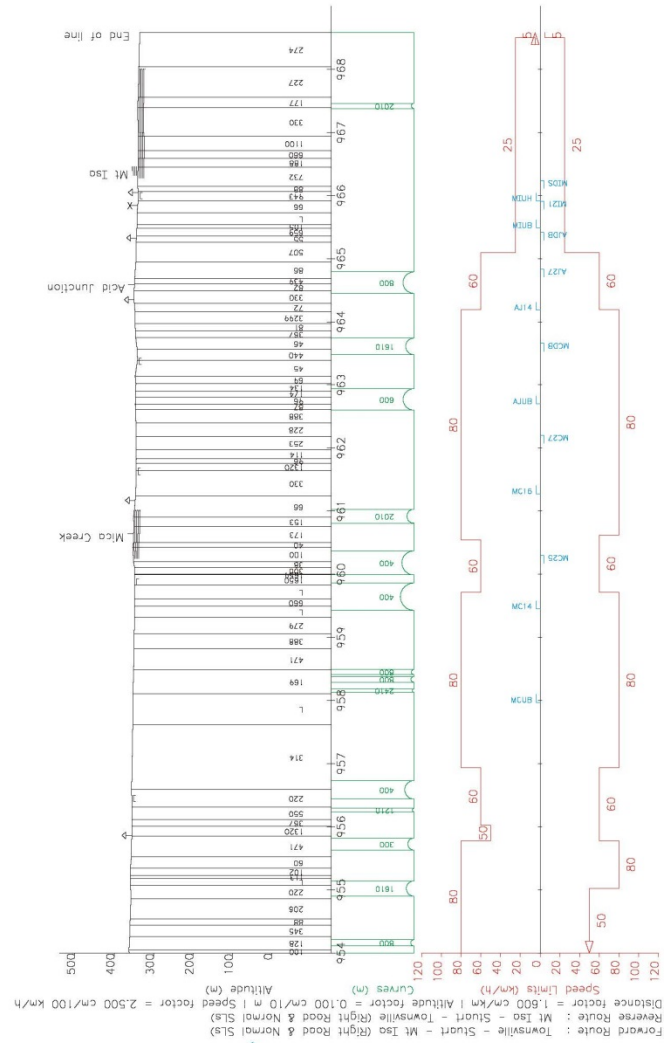
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APPENDIX F

Sectional Running Times

Section	UP	DOWN
Townsville Jetty to Stuart	26	28
Stuart to Antill Plains	23	18
Antill Plains to Woodstock	22	18
Woodstock to Reid River	25	21
Reid River to Woldston	14	12
Woldston to Mingela	42	32
Mingela to Sellheim	34	35
Sellheim to Charters Towers	32	30
Charters Towers to Southern Cross	32	27
Southern Cross to Balfe's Creek	27	29
Balfe's Creek to Mungunburra	22	23
Mungunburra to Thalanga	10	22
Thalanga to Homestead	12	16
Homestead to Pentland	43	46
Pentland to Warrigal	35	29
Warrigal to Burra	31	20
Burra to Torrens Creek	25	24
Torrens Creek to Warreah	24	36
Warreah to Prairie	25	26
Prairie to Tindo	28	26
Tindo to Hughenden	37	42
Hughenden to Boree	37	35
Boree to Mumu	25	24
Mumu to Marathon	38	38
Marathon to Barabon	17	17
Barabon to Moselle	16	16
Moselle to Richmond	31	28
Richmond to Gemoka	38	34
Gemoka to Maxwellton	35	37
Maxwelton to Nonda	30	31
Nonda to Nelia	37	37
Nelia to Quarrells	32	28
Quarrells to Julia Creek	40	40
Julia Creek to Gilliat	35	34
Gilliat to Tibarri	25	25
Tibarri to Oorindi	32	29
Oorindi to Undina	24	20
Undina to Pymurra	27	25
Pymurra to Cannington Junction	15	13
Cannington Junction to Oonoomurra	4	3
Oonoomurra to Cloncurry	28	29
Cloncurry to Marimo	34	33
Marimo to Malbon	38	42
Malbon to Wammutta	25	28
Wammutta to Bungalien	29	29
Bungalien to Flynn	7	7
Flynn to Duchess	13	13
Duchess to Woonigan	29	29
Woonigan to Rifle Creek	46	46
Rifle Creek to Mount Isa	35	26

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APPENDIX G

Altitudes

Metres above Mean Sea Level

Stuart	18
Roseneath	23
Brookhill	35
Stanley	58
Antill Plains	39
Toonpan	39
Barringha	49
Woodstock	64
Manton	73
Calcium	74
Reid River	76
Cardington	101
Woldston	114
Haughton Valley	173
Mingela	290
Eneby	299
Macrossan	242
Sellheim	256
Charters Towers	307
Southern Cross	352
Powlathanga	320
Balfe's Creek	327
Mungunburra	328
Thalanga	341
Homestead	345
Mundic Creek	371
Kimburra	377
Cape River	376
Pentland	403
Warrigal	443
Burra	555
Torrens Creek	467
Warreah	433
Prairie	432
Baronta	424
Tolkuru	382
Tindo	364
Jardine Valley	358
Pooroga	331
Hughenden	329
Ballindalloch	315
Boree	284
Dunluce	276
Mumu	252

Queensland Rail does not warrant the fitness for purpose or accuracy of this information

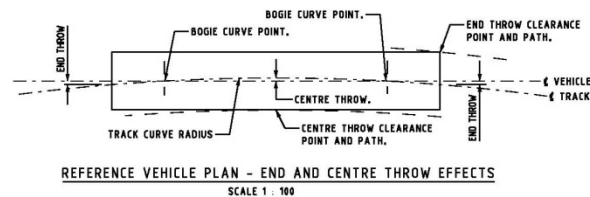
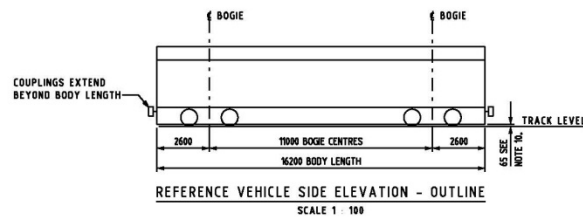
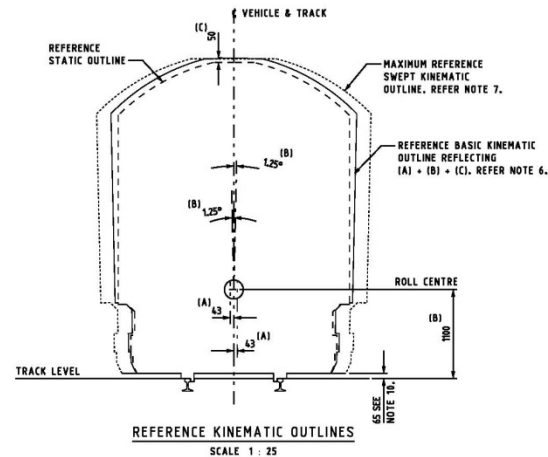
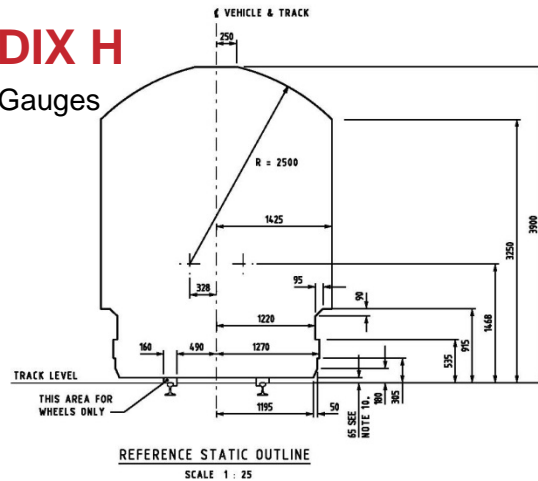
Mount Isa System
Information Pack

Marathon	238
Barabon	235
Moselle	228
Richmond	214
Gemoka	190
Maxwellton	170
Nonda	158
Nelia	142
Quarell's	152
Julia Creek	125
Eddington	124
Gilliat	125
Tibarri	130
Bookin	136
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Undina	151
Pymurra	188
Kaampa	194
Oonomurra	237
Cloncurry	194
Marimo	228
Malbon	256
Mitakoodi	292
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Devoncourt	285
Wammutta	309
Dronfield	330
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Duchess	363
Myubee	391
Woonigan	391
Kurbayia	440
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Mica Creek	364
Mount Isa	353

Pilgrim	307
Phosphate Hill	267

APPENDIX H

Rollingstock Gauges



NOTES:

- | | | | |
|----|--|-----|---|
| 1. | THE REFERENCE BASIC KINEMATIC OUTLINE AND REFERENCE SWEEP KINEMATIC OUTLINE ARE CALCULATED FROM THE REFERENCE STATIC OUTLINE USING THE DYNAMIC MOVEMENTS SPECIFIED IN NOTE 6 AND APPLYING THE METHODS DEFINED IN AS 7597 (PARTS 1 TO 4). | 7. | THE MAXIMUM REFERENCE SWEEP KINEMATIC OUTLINE IS DETERMINED BY APPLYING THE CENTRE AND END THROW EFFECTS OF A 100m RADIUS HORIZONTAL TRACK CURVE TO THE REFERENCE BASIC KINEMATIC OUTLINE. |
| 2. | ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS SHOWN OTHERWISE. | 8. | ROLLING STOCK MUST COMPLY WITH ALL PARTS OF THE REFERENCE ROLLING STOCK OUTLINES <ul style="list-style-type: none"> - WHEN EMPTY AND NEW CONDITION - WHEN FULLY LOADED AND WORN CONDITION - INCLUDING ALLOWANCE FOR CONSTRUCTION TOLERANCES. |
| 3. | A ROLLING STOCK OUTLINE CONSISTS OF THREE (3) PARTS: <ul style="list-style-type: none"> - THE STATIC OUTLINE; - THE BASIC KINEMATIC OUTLINE; AND - SWEEP KINEMATIC OUTLINE. | 9. | OTHER ROLLING STOCK PROPORTIONS (e.g. LENGTH, WIDTH, BOGIE SPACING) MAY BE AUTHORISED BY QUEENSLAND RAIL PROVIDED THAT THE ROLLING STOCK DOES NOT EXTEND BEYOND THE REFERENCE OUTLINES. |
| 4. | A REFERENCE OUTLINE IS DEFINED AS AN OUTLINE ACCEPTED BY QUEENSLAND RAIL AS APPLICABLE TO A SPECIFIED ROUTE. | 10. | 65mm VERTICAL SWEEP PATH HEIGHT FROM TRACK LEVEL TO UNDERSIDE OF THE STATIC AND KINEMATIC OUTLINES TO BE MAINTAINED FOR THE FULL LENGTH OF THE VEHICLE FOR ALL DYNAMIC MOVEMENTS AND ON VERTICAL TRACK CURVES. |
| 5. | THIS DRAWING DEFINES A REFERENCE STATIC OUTLINE AND THE FACTORS TO BE ADDED TO PRODUCE THE ASSOCIATED REFERENCE BASIC KINEMATIC OUTLINE & THE MAXIMUM REFERENCE SWEEP KINEMATIC OUTLINE. | 11. | VERTICAL SWEEP PATH IS TO BE DETERMINED BASED ON A 525m RADIUS TRACK SUMMIT CURVE AND A 300m RADIUS TRACK SAG CURVE. |
| 6. | THE REFERENCE BASIC KINEMATIC OUTLINE IS DETERMINED BY APPLYING THE FOLLOWING DYNAMIC MOVEMENTS TO THE REFERENCE STATIC OUTLINE: <ul style="list-style-type: none"> (A) LATERAL TRANSLATION $\pm 43mm$ (B) BODY ROLL $\pm 1.25^\circ$ ABOUT A ROLL CENTRE 1100mm ABOVE TRACK LEVEL ON THE VEHICLE CENTRELINE (C) BOUNCE UPWARDS 50mm. | 12. | COUPLINGS, HOSES ETC MAY EXTEND BEYOND THE BODY LENGTH PROVIDED THEY DO NOT EXCEED THE REFERENCE OUTLINES SWEEP PATHS. |

<div>1:25</div> <div><div><div><div></div><div>0</div><div>100</div><div>200</div><div>300</div></div><div>0</div><div>100</div><div>200</div><div>300</div></div></div> <div>RS1 DR-C-335</div>											
FILE No	ALTERATIONS				<div>NOTE: THIS DRAWING SUPERSEDES STD. DRG. No. 2236</div>	DESIGNED J.W.C. AUG 12	APPROVED Graham Watkins - 180612 SENIOR CIVIL ENGINEER - SHC	<div> Queensland Rail ACN 132 181 090</div> <div><small>COPYRIGHT PROTECTS THIS PUBLICATION EXCEPT FOR PURPOSES PERMITTED BY THE COPYRIGHT ACT. PRODUCTION OF MATERIALS BEING PERMITTED BY THE PAPER WRITER PERMISSION OF Queensland Rail Limited ENGINEERS SHOULD BE ADDRESSED TO ENGINEERING AND CIVIL ENGINEERING, Queensland Rail, 1000 St. Johns Ave. MELBOURNE VIC</small></div>	Network - Civil Engineering	DRAWING NUMBER	ISSUE
12/8738						DES CHG. Q.W. AUG 12	ISSUED AND NO. 636		REFERENCE ROLLING STOCK OUTLINE	QR-C-S3035	
						DRAWN S.L.V. AUG 12	ISSUE AUTHORIZED		RS1 - CLEARANCE CATEGORY 1		
SCALES SHOWN ARE FOR AN A1 SIZE ORIGIN						DRG CHG. J.W.C. AUG 12	A.J. MATTHEWS - 180612 SENIOR CIVIL ENGINEER - SHC				