

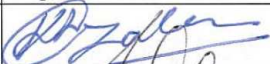
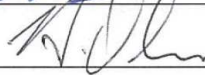
Engineering Instruction

Additional Tamping Requirements for 25kV Electrified Track

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Document Control

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Prepared By:	Name: Kuldeep Zala Title: Rail Engineer		21/02/14
Reviewed By:	Name: Matthew Reedman <i>A. Hany Olsen</i> Title: Senior Rail Network Engineer		21/2/14
Approved By:	Name: Philip Degenhardt <i>A. Matthew Reedman</i> Title: Manager Track & Civil		21/2/14
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1. Introduction

Electrical Multiple Units (EMUs) are powered through a pantograph located on top of the train which is energized by continuous contact with a live contact wire connected to the 25kV overhead traction power system. It is essential that the movement of the contact wire over the pantograph surface is constrained to ensure that the wire does not slip off of the end of the pantograph and cause a dewirement. A dewirement can create a safety hazard for the travelling public. It may also result in infrastructure damage, service interruptions and train delays

A major factor in managing the pantograph/wire interface is to ensure that the railway track on which the train is travelling is maintained within agreed tolerances to its design alignment. The main tool used to ensure that the track is maintained to the tolerances is the tamping machine.

This document provides instructions on the tamping methods to be used to assess and correct track alignments and actions to be taken when the track is outside of tolerance.

2. Purpose

The purpose of this document is to provide additional tamping instructions and track limits to ensure that tamping operations can adequately manage the track to overhead wire interface.

3. Scope

This instruction applies to staff working in:

- PTS Tamping Crews
- PTS Track and Civil Engineering
- PTS Electrical Engineering
- PTS Line Crews
- PTS Major Projects; and
- PTS contractors to the extent specified in their contract.

4. References

- *PTS-AR-MW-TK-RPT-00170046 Track Maintenance Tolerance Limits*
- *LOR Waiver - 003 Allowable Contact Wire Offset at Compound Crossings in Adelaide Yard and at Leader Street near Goodwood*
- *WI-TS-509 Laser Alignment System*
- *WI-TS-504 Use of Mainline and Switch Tamper*
- *WI-EM-TS-402 Mainline Tamper Calibration*
- *CP-TS-956 Code of Practice - Volume two - Train System [cp2] TransAdelaide Infrastructure Services - Track Geometry*
- *AR-MW-TR-PLN-21720344 Determination of Maximum Allowable Stagger and Mid Span Offset (Rev 1)*

5. Acronyms

ACRONYM	FULL NAME
AMPRN	Adelaide Metropolitan Passenger Rail Network
EMUs	Electric Multiple Units
PTSOM	PTS Operations and Maintenance
OHW	Overhead Wire
PTS	Public Transport Services

6. Roles and Responsibilities

6.1. Track Maintenance Manager

The Track Maintenance Manager is responsible for ensuring:

- that tamping work associated with the track to overhead wire interface is managed in accordance with this instruction; and,
- that track maintenance workers comply with this instruction and have the appropriate relevant competencies

6.2. Track Coordinator

The Track Coordinator is responsible for ensuring that:

- this instruction is adhered to when tamping and lining work is performed
- the track is within required tolerances before the track is certified
- the tamping machines have been calibrated

6.3. Manager Track and Civil

The Manager Track and Civil is responsible for:

- ensuring that where the track tolerances cannot be met that the Manager Electrical Engineering is advised
- jointly, with the Manager Electrical Engineering, determining and agreeing on appropriate responses and actions to ensure operational efficiency and safety
- ensuring current track design information (both track centreline data for use by surveyors and geometry information for use by tamper operators) is available
- jointly, with the Manager Electrical Engineering, agreeing and managing track design changes

6.4. Manager Electrical Engineering

The Manager Electrical Engineering is responsible for:

- Where track tolerances cannot be met jointly, with the Manager Track & Civil, determining and agreeing on appropriate responses and actions to ensure operational efficiency and safety
- ensuring design track offset records are maintained

7. Tamper Operation

7.1. Work Preparation

Before commencing work the Track Coordinator must obtain the following:

- Variation from design in track offset and cross level at each monument
- The track design alignment
- Survey resource
- Earthing and Bonding cables locations must be identified and clearly marked. If required PTS Electrical Engineering must be advised to ensure appropriate protection is installed prior to tamping activities.

Plaques provided at OHW support structures indicate the design track height offset and cross level. The OHW design for the AMPRN permits structure spacing of up to 60m. To provide accurate lining using traditional tamping methods it is necessary to know the variation of the track alignment from its design location.

To facilitate lining either:

- pegs shall be installed at intervals no greater than 20m for tangent track and 10m on curves and transitions by a surveyor at a recorded offset before work commences; or,
- a qualified surveyor will accompany tamping operations with equipment that allows the taking of spot measurements and reports automatically the offset from design.

Measurements shall be taken at intervals no greater than 20m for tangent track and 10m on curves and transitions and shall be marked on the track.

Caution: Metallic tapes must not be used to measure from rail to OHW support structures.

Where the change in cross level or alignment is greater than that specified in table below PTS Electrical Engineering must be consulted before work commences.

Change in Alignment	Change in Cross level
30	0
20	5
10	10
0	15

The track shall only be lifted to its design height unless specific instruction is given by PTS Track and Civil Engineering.

The Surveyor shall ensure that start and end points for lifting shall be chosen with careful consideration of fixed points, transitions and vertical curves, so that any required ramp in and ramp out does not coincide with them. The required cross level and lift should be determined at the start and end point. The length of the ramps should be determined by applying lift and cant correction at a rate of 1 in 1000.

The following shall be marked on track so they may be clearly seen by the tamper operator:

- Curve Points
- Offsets
- Start and end points
- Run in and out ramps
- Cross level

7.2. Tamper Operation

Lining using the tamping machine shall be accomplished by:

- A first pass to slew the track to the design offset with manual control using the provided offset data.
- A second pass lining the track to the design versine as specified in the Plasser Tamper Operation Manual.
- Smooth lining may only be used when the machine is clear of transitions and any curve points.

Lifting using the tamping machine shall be accomplished by:

- Constructing a run in ramp so that the correct height and cross level are achieved at the start point.
- On track lengths greater than 50m with constant grade by using laser leveling between:

- o The start or end fixed points
- o Vertical intersection points
- o Vertical curve start and end points
- On track lengths shorter than 60m with constant grade by using the tamping machines chord system.
- Through vertical curves by using the tamping machines chord system. Long vertical curves may require the level to be checked periodically to ensure the tamper is not over lifting.
- Constructing a run out ramp so that the correct height and cross level are transitioned to the adjoining track.

Lining and lifting may occur simultaneously.

7.3. Certifying for Electric Train Operation

Following lining or levelling activities the Track Coordinator shall ensure that the track conforms to CP-TS-956 section 4.0 Track Geometry Requirements for Construction before it is returned to service. In only exceptional cases, the track may be returned to service following:

- an unscheduled track inspection
- it can be determined as within normal maintenance tolerances
- agreement is given jointly by PTS Track and Civil and PTS Electrical Engineering

For the purpose of CP-TS-956 section 4.0 Track Geometry Requirements, pegs or survey points shall also be considered as monuments.