TECHNICAL NOTE

JOHN HOLLAND

Civil

Issue Date **02/07/2021**

Expiry Date **Until withdrawn**

CCT 21/04

Introduction of 38°C neutral temperature on selected lines

AUDIENCE	MAIN POINTS	VERSION HISTORY
~ Civil Maintenance Engineer ~ Routine Maintenance Manager ~ Maintenance Superintendent ~ Project Engineers ~ Rail Adjusters	~ Introduction of 38°C neutral temperature on selected lines	~ 1st Issue

BRIEFING REQUIREMENTS					
Information only		Briefed by line management and record of briefing supplied to the PCTE	✓	Briefed by PCTE or delegate	

1. Introduction

Due to geographic and climactic variation across the CRN it is appropriate to tailor rail neutral temperatures to suit the risk profile of individual line segments. John Holland has reviewed climate data, and found that the adoption of two neutral temperatures of 35°C and 38°C would be appropriate.

The nominated sections are shown in *Appendix 1- Map of Tailored Neutral Temperature. The* aim is to progressively achieve neutral temperatures across the required areas when large scale adjustments occur.

This technical note provides guidelines for implementation of the tailoredneutral temperature.

2. Guidelines for Installation of Tailored Neutral Temperature

Planning is required to correctly implement tailored neutral temperatures.

For lines nominated as 35°C neutral temperature no change in approach is required.

For lines nominated as 38°C neutral temperature a Maintenance Superintendent or their representative with minimum EA level 3 is to oversee the implementation of the tailored neutral temperature as part of the adjustment planning process, and generally to adopt the following;

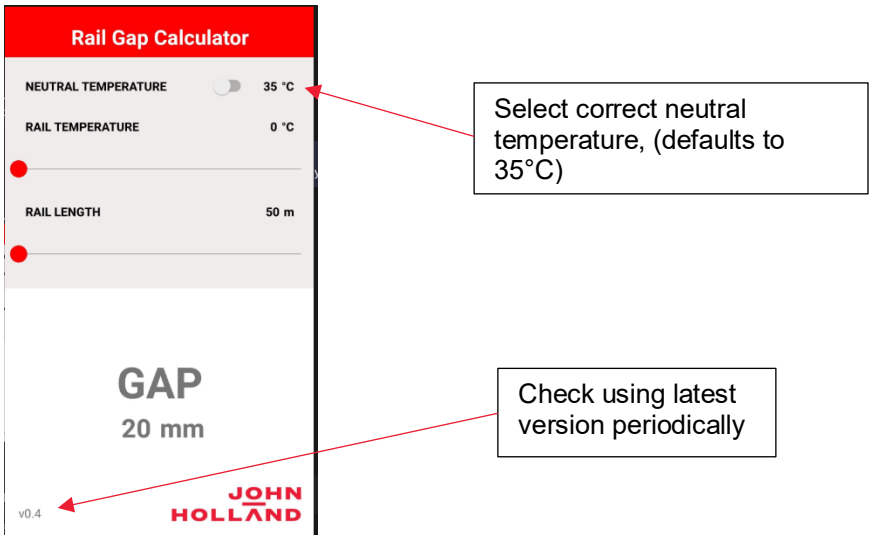
- Avoid fragmented sections of 35°C to 38°C neutral temperature sections as much as possible,
- Position transitions at fixed points where possible,
- For small adjustments such as a lengths of 500m or 1000m sections, adopt the neutral temperature consistent with the adjacent track,
- If track on one side of the adjustment is 35°C and the other side is 38°C take the opportunity to extend the 38°C section,
- Larger adjustment projects or longer re-adjustments should take the opportunity to adopt 38°C.

The Asset Management Database has a feature to capture the actual neutral temperature implemented and is to be updated as part of configuration management process for all rail adjustment works.

3. Implementing the Tailored Neutral Temperature

This technical note and the local implications must be briefed in detail by Superintendents to all team leaders, supervisors and adjusting supervisors. All must be aware of the line diagram attached to this CTN and the controls listed below

- Adjusting plans must nominate the selected neutral temperature for the superintendent to review
- Adjusting supervisors must have access to the rail adjustment calculation application version v0.4 (or later), OR use the correct formula (note the charts and table in CM 223 Rail Adjustment remain and can be used for 35°C adjustments only)



Formulas

35°C neutral temperature

Rail gap(mm) = (35 - rail temperature(°C)) x 0.0115 x rail length(m)

38°C neutral temperature

Rail gap(mm) = (38 - rail temperature(°C)) x 0.0115 x rail length(m)

- Weld adjusting returns - are to include a prominent comment stating the actual neutral temperature used for each adjustment

COMMENTS (Such as; Any remaining defects, Removed/defect welds, Track alignment issues, Reference other records)
Used stress free temperature 38degrees for this adjustment
Sleepers will be packed by excavator tomorrow

Example comment advising the stress free temperature

- Admin staff are to extract the neutral temperature and add this information to a new field in the weld database (field will be available to populate 8 July 2021).
- ACR to capture the neutral temperature from the Weld Adjust forms and populate the adjusting feature of the asset register

Action if incorrect neutral temperature is used - if an adjusting superviser applies the incorrect neutral temp they must flag the error to the RM Superintendent or representative urgently for review and advice on correction, if any, required.

4. Welded Track Stability Assessment

Welded Track Stability Assessment (WTSA) hinges on the temperature error relative to design neutral temperature. This isn't changing with a tailored neutral temperature. The defect classification will likewise be unchanged.

5. WOLO and heat defensive measures

WOLO and heat defensive measures are unchanged for all lines retain the existing WOLO temperatures thresholds and heat defenses.

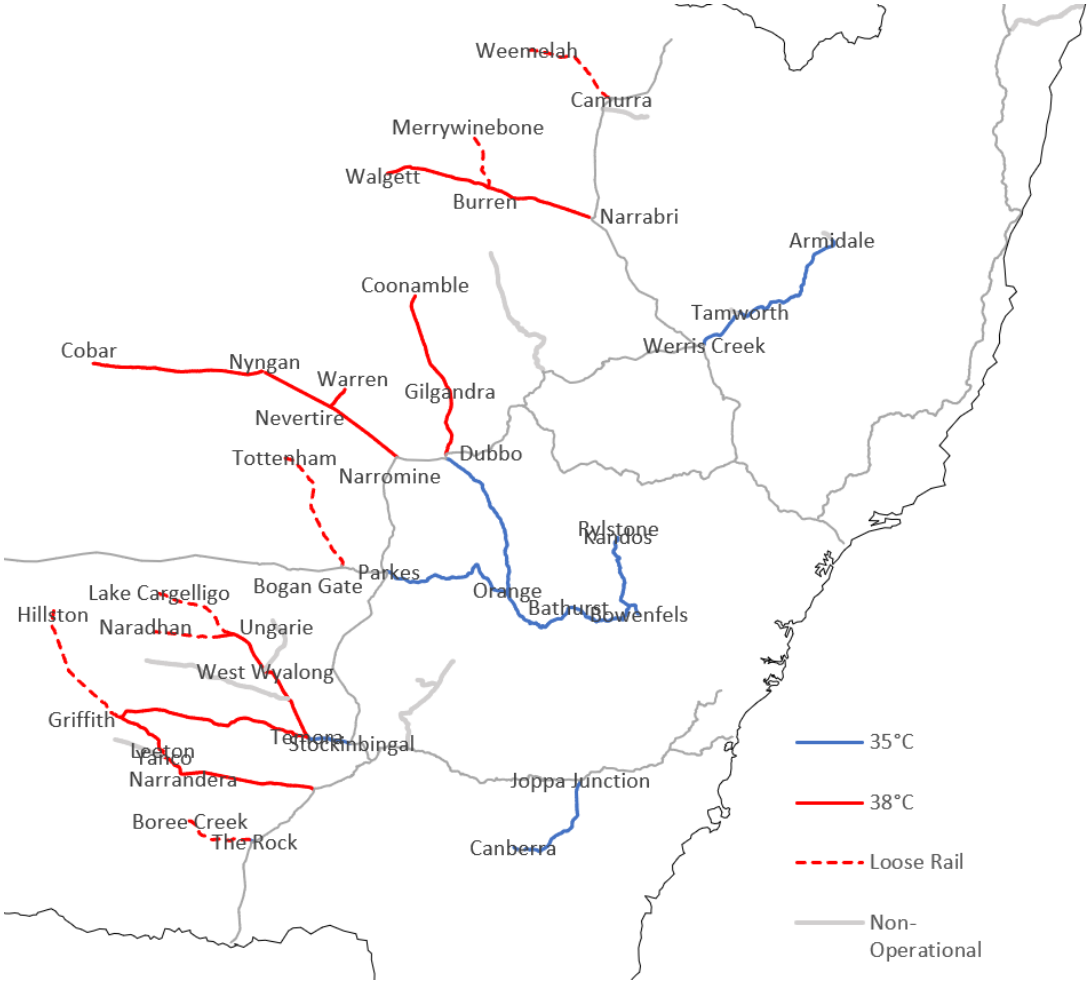
6. Asset Register

The Sharepoint report AR 051 Asset Feature Spec Data Change Template Report (AR051 report) can be used to obtain the current neutral temperature as recorded in Maximo. Select the feature TRRLDA and/or TRRLUA for Down and up rail respectively, and select the attribute CWR NEUTRAL TEMPERATURE). Note that this is a new feature and will largely show no values pending progressive population via ACR's.

Authorised for issue

Michael Wright
Principal Track & Civil Engineer

Appendix 1- Map of Tailored Neutral Temperature



Corridor		Start	Finish	Neutral temp
N00	Werris Creek to Armidale	411.201	579.500	35°C
N23	Camurra to Weemelah	679.040	762.746	Loose Rail
N80	Narrabri to Walgett	564.799	733.130	38°C
N82	Burren Junction	648.480	649.420	38°C
	Burren Junction to Merrywinebone	649.420	716.737	Loose Rail
S45	The Rock	551.075	554.000	35°C
	The Rock to Boree Creek	554.000	607.763	Loose Rail
S50	Joppa Junction to Queanbeyan	230.610	322.500	35°C
S54	Queanbeyan to Canberra	321.665	329.663	35°C
S70	Stockingbingal to Temora	454.906	489.433	35°C
	Temora to Polaris St, Temora	489.433	489.515	35°C
	Polaris St, Temora to West Wyalong	489.515	597.811	38°C
	Ungarie to Lake Cargelligo	597.811	669.175	Loose Rail
S78	Ungarie to Naradhan	597.803	658.251	Loose Rail
S80	Junee to Narandera	486.021	584.032	38°C

Corridor		Start	Finish	Track Class
S80	Narandra to Yanco	584.032	605.812	38°C
S85	Yanco to Leeton	605.812	660.478	38°C
S86	Temora to Polaris St, Temora	489.433	489.515	38°C
	Polaris St, Temora to Griffith	489.515	640.689	38°C
	Griffith to Hillston	605.812	748.045	Loose Rail
W00	Bowenfels to Orange	158.800	379.000	35°C
	Orange to Dubbo	379.000	460.890	35°C
	Narromine to Nyngan	497.809	622.462	38°C
W20	Orange to Parkes	320.813	446.950	35°C
W32	Bogan Gate to Tottenham	486.050	598.446	Loose Rail
W34	Orange to Parkes	627.491	628.744	35°C
W43	Nevertire to Ascott	563.930	580.300	38°C
	Ascott to Warren	580.300	584.089	Loose Rail
W44	Nyngan to Cobar	627.000	754.700	38°C
W50	Wallerawang to Kandos	171.920	249.368	35°C
	Kandos to Rylstone	249.368	257.330	35°C
W61	Troy Junction to Coonamble	466.231	616.175	38°C