

NEW EQUIPMENT & SYSTEM APPROVAL PROFORMA

Ref: 10/10024

Note: the prompts given below are only a guide to the information required for approval. Dependent on the type of equipment or system that requires approval delete any section that is not applicable or include additional information if necessary. **Mandatory** fields are marked with an asterisk (*).

1 **Equipment or System to be approved ***
1 in 10 Dual Gauge (SG/NG) Turnout, Fixed K Crossing and Double RBM Crossings (Concrete Bearers and 60kgHH rail), Types A, B, C and D.

2 **Originator ***
Name: Glenn Lorenz/Dale Smith Company: VCA/ARTC

3 **Introduction ***
Dual gauge turnouts (standard and narrow gauge, types A, B, C and D) are required for the section of track from Bromelton to Acacia Ridge in order to provide dual gauge routing as per the scope of the Border to Acacia Ridge Track Upgrade. This is the first time ARTC has installed dual gauge turnouts involving narrow and standard gauge.

4 **Determination of Need ***
The Border to Acacia Ridge Track Upgrade project (BARTU) as part of the Nation Building Program, requires the installation of dual gauge track (Standard and Narrow Gauge, 4 Types) to be installed from Blue Metal Siding (922.6 km) to Acacia Ridge.

5 **Significant Change or Not ***
This change in equipment or system is assessed as SIGNIFICANT.

- 6 **Review Panel ***
- John Furness - Manager Standards
 - Dale Smith - Northern Track and Civil Alliance Co-ordination Manager
 - Abbie Thomas - Track and Civil Standards Engineer
 - Tim Calver - Civil Standards and Technical Services Engineer


7 **Safety**
This design of these turnouts are in use in the WestRail network in WA. During the process of the BARTU project a flaw was discovered in the nose design of the k crossing configuration, and this has since been redesigned. This improved design will be incorporated in all the DG turnouts.
A third party check of the geometry of the turnout has been performed by AECOM - copy attached (Version 4).
A gauge bar (with new and worn wheel profiles) has also been run across the redesigned 'k' crossing confirming the removal of the previous obstruction caused by the previous design 'k' crossing.

8 **Performance and Suitability**
The modifications made to the existing design will provide decrease in risk of crossing damage and significantly reduce risk of derailment under normal operating conditions.
All materials used in manufacture of turnouts comply with Australian Standards when possible, including rail standards AS1085 and other relevant Australian Standards.
Workmanship is carried out in accordance with ARTC Specifications ETA-03-03 and TCS-07.
All material and workmanship is warranted under VCA standard terms and conditions of sale, as per original contract.

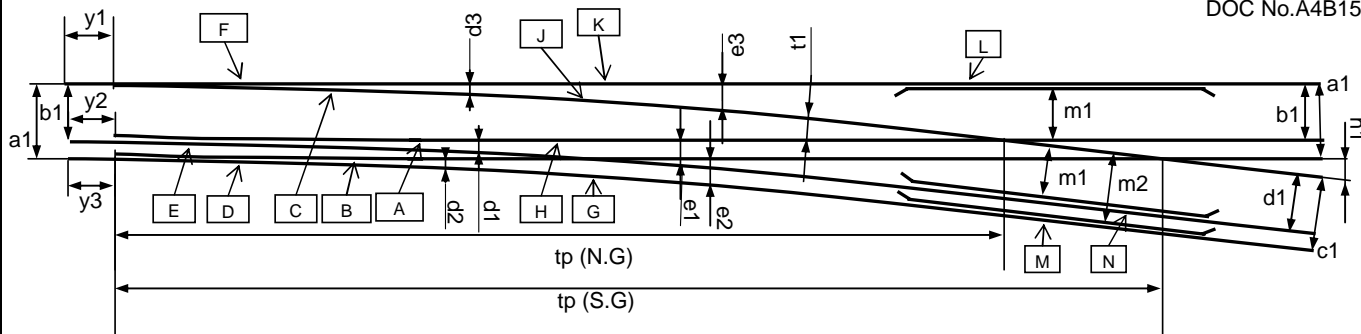
(i) **Use in other rail networks**
The same basic design Dual Gauge Turnouts are currently in use in the WestRail Network WA. The design modifications will decrease in risk of crossing damage and significantly reduce risk of derailment. The modifications to the crossings will not change the original geometric details of the turnout.

(ii) **Use in the ARTC network**
Queensland Blue Metal Siding (922.600km) to Acacia Ridge AR1 signal (North Coast Line).

(iii)	Issues arising from usage of the equipment/system	As these items are new to ARTC, new inspection and maintenance regimes will be required for them. These should cover aspects such as – geometric checks, use of crossing gauges for new and worn wheel profiles, regular grinding of the noses of vees, etc.					
(iv)	Changes required to infrastructure or systems for use of the equipment	Required to cover what is developed under (iii) above					
9	Reliability	VCA is a proven supplier of high quality turnouts, so subject to (iii) and (iv) reliability should be satisfactory. It is also considered that, as a result of the modifications proposed, the turnouts will be less likely to have negative issues of wheel rail interaction, thus reducing maintenance and increasing reliability.					
10	Maintainability	<p>While dual gauge turnouts are inherently more difficult to maintain than single gauge, subject to satisfactory resolution of (iii) and (iv) above, it is considered that the maintenance of these turnouts will be manageable.</p> <p>The proposed modifications will not impact on original portions of the turnout which are not affected by the modification i.e. concrete bearers and plating under crossing will remain unchanged.</p> <p>The result of the modifications proposed, the turnouts will be less likely to have negative issues of wheel rail interaction, thus reducing maintenance.</p>					
11	Approval *	1 in 10 Dual Gauge (SG/NG) Turnout, Fixed K Crossing and Double RBM Crossings (Concrete Bearers and 60kg HH rail), Types A, B, C and D, are approved for use from Queensland Blue Metal Siding (922.600km) to Acacia Ridge AR1 signal (North Coast Line).					
12	Conditions of Approval *	<ul style="list-style-type: none"> • The turnouts are to have the following speed limits: <ul style="list-style-type: none"> - Standard Gauge (Through) – 125 kph for Types C & D. - Standard Gauge (Through) – 80 km/h for Types A & B. - Narrow gauge (Through) – 80 kph - Standard Gauge (Turnout Road) – 25 kph - Narrow Gauge (Turnout Road) – 25 kph • Inspection regimes are to be implemented for the turnouts. They shall include as a minimum, aspects such as: <ul style="list-style-type: none"> - Use of crossing gauges with worn and new wheels - Grinding of noses of vees - Geometric checks along the lines of modified versions of VCA Inspection Sheets A4B15044 and A4B15045 					
13	Does the Originator accept the additional Conditions of Approval as set by the Review Panel:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>

14	Sign off	ARTC office use only			
	Review Panel:				
	John Furness		Date:	13/5/2010	
	Dale Smith	see email	Date:	12/5/2010	
	Abbie Thomas	Abbie Thomas	Date:	13/5/2010	
	Tim Calver	see email	Date:	12/5/2010	

Approved by Risk & Safety Committee 17/5/2010



Turnout serial N°	Hand	Turnout angle	Rail type	Drawing N°	Special details	Assembly type	Order ref.
		1:10	AS60kg H.H.	A0B14174/A A0B14180/A	TYPE A & B	complete partial	Client: ARTC

Contract No:	HUV011173	Spec No:	ETA-03-03
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Track gauge +2 / -2 *						Rail head offsets at switch stops ± 2mm *, when closed.				Switchblade length ± 5mm				
Bearer N°	Main line side			Turnout side			Main line side		Turnout side		Design		Actual	
	ref.	Design	Actual	ref.	Design	Actual	Design	Actual	Design	Actual				
a1	1435			c1	1435		10.7		10.8		10000	A		B
b1	1067			d1	1067		21		21.2		10000			C
							32.1		32.3					
							43.9		44.2					
							56.4		56.7					
							69.7		70					

Check rail to crossing T.P. ± 1mm						Versines on turnout								
m 1	1027			m 2	1395									

Flangeway gap ± 2mm **						Other critical points								
17	d1	91		d2	91									
34	e1	621		e2	627									

Crossing End Opening ± 2mm						Straightness of switch or stock rail ± 2mm								
	t 1	297		h1	374									

Switch point opening ± 10 (at locking device position)						Gap between mating faces of switch & stock rail 1mm max. 0.5mm max at locking device area								

End of stock rail to P.O.S. ± 5 mm						Bolts tightened and clips applied								

P.O.S to T.P ± 5 mm						Bearer quality								

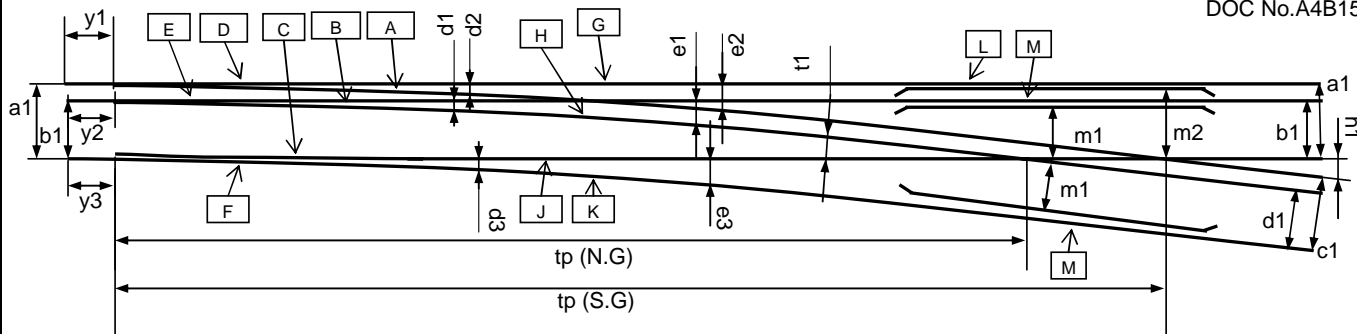
Opening at double full head						Setting out								

# Final adjustment by switch m/c provider.						Component identification								

End of stock rail to P.O.S. ± 5 mm						VCA inspection								

P.O.S to T.P ± 5 mm						ARTC								

Notes:					
* Gauge is to be taken perpendicular to running edge.					
** Dimensions are taken on centre line of sleeper, perpendicular to running edge.					
Comments:					



Turnout serial N°	Hand	Turnout angle	Rail type	Drawing N°	Special details	Assembly type	Order ref.
		1:10	AS60kg H.H.	A0B14170/B A0B14184/B	TYPE C & D	complete partial	Client: ARTC

Contract No:	HUV011173	Spec No:	ETA-03-03
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Track gauge +2 / -2 *						Rail head offsets at switch stops ± 2mm *, when closed.				Switchblade length ± 5mm				
Bearer N°	Main line side			Turnout side			Main line side		Turnout side		Design		Actual	
	ref.	Design	Actual	ref.	Design	Actual	Design	Actual	Design	Actual				
a1	1435			c1	1435		10.7		10.8		10000	A		C
b1	1067			d1	1067		21		21.2		10000	B		
							32.1		32.3		Versines on turnout 0 < abs. < 15 => ±1 16 < abs. < 40 => ±2 40 < abs. => ±3			
							43.9		44.2					
							56.4		56.7					
Check rail to crossing T.P. ± 1mm							69.6		70					
	m 1	1027		m 2	1395									

Flangeway gap ± 2mm **						Other critical points					
Design		Actual		Design		Actual		Design		Actual	
17	d1	91		d2	91	d3	91				
34	e1	625		e2	626	e3	637				

Crossing End Opening ± 2mm						Straightness of switch or stock rail ± 2mm					
Design		Actual		Design		Actual		Design		Actual	
	t 1	297		h1	374						

Switch point opening ± 10 (at locking device position)						Gap between mating faces of switch & stock rail 1mm max. 0.5mm max at locking device area					
Design		Actual		Design		Actual		Design		Actual	

Opening at double full head						Bolts tightened and clips applied					
Design		Actual		Design		Actual		Design		Actual	

# Final adjustment by switch m/c provider.						Bearer quality					
Design		Actual		Design		Actual		Design		Actual	

End of stock rail to P.O.S. ± 5 mm						VCA inspection				ARTC					
Design		Actual		Design		Actual		Design		Actual		Design		Actual	

P.O.S to T.P ± 5 mm						Setting out					
Design		Actual		Design		Actual		Design		Actual	

Notes:

* Gauge is to be taken perpendicular to running edge.

** Dimensions are taken on centre line of sleeper, perpendicular to running edge.

Comments: