

Specification

Rail Specification – Vignole Rail

Doc. No.: CE-019-SP-0002

Version: 2.

Date 10/08/2026



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1 PURPOSE

This specification is for the purchasing of Vignole Rail for use within the Metropolitan Tram Network (MTN).

For Information: Vignole Rail is also known as Flange Rail, “T – Rail” or Web Rail.

2 GENERAL

Yarra Trams operates over 250 kilometres of double track within the MTN, of both grooved and Vignole rail. Of this, approximately 20% of the network is in ballast track and use Vignole rail.

The rails shall comply in all aspects of EN13674: Part 4, Railway applications — Track — Rail: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m, unless specified in Section 3 of this rail specification.

Rail must also comply with AS 1085: Railway Track Material, to ensure compatibility with existing MTN, including the relevant sections of:

- AS1085:1 – Steel Rails
- AS1085:12 – Insulated Joint Assemblies
- AS1085:15 – Aluminothermic Rail Welding
- AS1085:19 – Resilient Fastening Assemblies
- AS1085:20 - Welding of steel rail
- AS1085:21 – Turnouts, Switches and Crossings, and
- AS1085:22 – Alternative Material Sleepers.

3 RAIL SPECIFICS

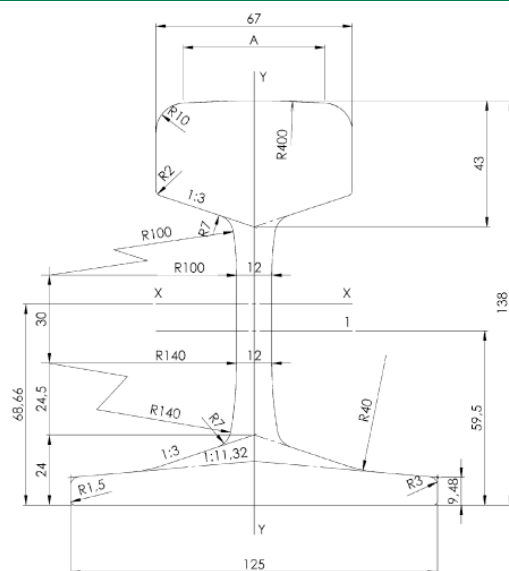
This specification details the following additional information, as detailed within EN13674:

	Section Heading	Refer to:
a)	rail profiles	Section 3.1
b)	steel grades	Section 3.2
c)	lengths of rail including any rails for special purposes	Section 3.3
d)	un-drilled or drilled rail ends to take fish plate bolts and the location and dimensions of holes when required	Section 3.4
e)	any special treatments to be applied to bolt holes	Section 3.5
f)	tolerances for bolt holes to which special processes are to be applied	Section 3.6
g)	cold stamping on the cut surface, if applicable	Section 3.7
h)	paint code requirements	Section 3.8
i)	tolerances for the horizontal and vertical straightness of un-drilled rail ends	Section 3.9

3.1 Rail profile

Yarra Trams has adopted the following rail profile:

Standard rail profile 41E1



3.2 Steel grade

The following section detail both the chemical composition and mechanical properties for:

- Head hardened rail (specific type of heat treating that selectively hardens only the head of the rail)
- Heat treated rail (including full section hardening), and
- Standard rail (as rolled and legacy¹).

¹ Legacy Rail was purchased based on EN13674:2006



3.2.1 Chemical composition

The cast analysis of the steel shall conform to the limits in the table below:

Rail		Chemical Composition (Elements %) in solid state					
		Carbon [C]	Silicon [Si]	Manganese [Mn]	Phosphorus [P] (max)	Sulphur [S] (max)	Vanadium [V] (max)
Specified Rail	Heat treated (R290GHT or alternative)	0.48-0.67	0.13-0.60	0.95-1.30	0.030	0.030	The total content of Cr + Mo + Ni + Cu + V shall be less than 0.35%.
	Standard (EN13674 table 3, R260, R320Cr or alternative)	0.58-0.82	0.13-1.12	0.65-1.25	0.03	0.03	0.2
Legacy Rail ²	Heat treated	0.46-0.54	0.15-0.58	0.9-1.10	0.04	0.05	0.03-0.09
	Standard	0.48-0.55	0.15-0.40	1.20-1.40	0.035	0.035	-

3.2.2 Mechanical properties

Rail		Mechanical Properties			
		0.2% Proof Stress MPa (min) (PTC TM30)	Tensile Strength R _m MPa (min)	% Elongation Gauge Length = 5.65 pS ₀	Surface Hardness HBW
Specified Rail	Heat treated (R290GHT or alternative)	340	960	10-15	290-340
	Standard (EN13674 table 3, R260, R320Cr or alternative)	-	1080	9-10	260-400
Legacy Specified Rail ²	Heat Treated				
	Standard	400	600-800	10-15	220-300

² Should a supplier request to comply with the “Legacy rail supplied Chemical Composition”, this may be considered as an alternative by Yarra Trams, subject to Chief Engineer agreement.



3.3 Length of rail

The rail should be supplied in lengths of 18 metres.

An option is available for the individual length or individual lengths of the rails. Unless otherwise agreed:

- Short lengths (defined as less than 18 meters but greater than 10 meters) shall be supplied in pairs.
- Each short length shall not be less than half the individual length of the standard rails.
- The total mass of the short lengths shall not exceed 10% of the total mass of the order.
- Any exceptions or variations require agreement from Yarra Trams and may be considered on a case-by-case basis.

3.4 Location and dimensions of holes

There shall be no holes.

3.5 Any special treatments to be applied to bolt holes

There shall be no holes.

3.6 Tolerances for bolt holes to which special processes are to be applied

There shall be no holes.

3.7 Cold stamping on the cut surface

Cold stamping is not required.

3.8 Paint code requirements and markings

Rail markings will be as per EN13674: Part 4, for all rail types.

3.9 Tolerances for the horizontal and vertical straightness of un-drilled ends

Not applicable.

4 TYPE APPROVAL

Type Approval shall be required for any new or modified rail (including change of suppliers or place of manufacture).



5 REFERENCE DOCUMENTS

Document Title	Document Reference	Version
Tram Tyre Specification - Yarra Trams	RS-020-ST-0075	4.01
Railway applications — Track — Rail: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m	EN13674: Part 4	Current version (2019)
Standard Drawing - Rail / Wheel Profiles	SND_T0001	A
Railway Track Material: Steel Rails	AS1085:1	
Railway Track Material: Insulated Joint Assemblies	AS1085:12	
Railway Track Material: Aluminothermic Rail Welding	AS1085:15	
Railway Track Material: Resilient Fastening Assemblies	AS1085:19	
Railway Track Material: Welding of steel rail	AS1085:20	
Railway Track Material: Turnouts, Switches and Crossings	AS1085:21	
Railway Track Material: Alternative Material Sleepers	AS1085:22	

6 DOCUMENT VERSION CONTROL

Version History	Date	Detail
1.00	10/08/2026	Original approved issue.