

TO	Network Wide
FROM	Enterprise Services, General Manager Technical Standards
DATE	10/06/2016
SUBJECT	Track and Civil Code of Practice – Section 1 Rail – Technical Note ETC-01-04
Amendment	First Issue

References

Track and Civil Code of Practice Section 1 – Rail

ETM-01-01 – Rail Weld Geometry Standard

AS 1085.1 – Steel Rails

AS 1085.20 – Welding Rail Steels

Issue

This Technical Note is to address deficiencies and ambiguities in ARTC Track and Civil Code of Practice and related engineering documents and Australian Standards on flash butt welding process for continuously welded rail. The technical note also removes references to superseded AS 1085.15 for Aluminothermic welding process.

Status and applicability of this Technical Note

This Technical Note has the status of an ARTC Standard and shall remain in force until such time as the Track and Civil Code of Practice Section 1 Rail is updated to incorporate the Technical Note contents. This Technical Note is applicable network wide.

Inserted paragraphs into Track and Civil Code of Practice Section 1 Rail

1.2.2 Rail welding processes

a) Flash butt welding

Welding rail ends together using flash butt welding shall be carried out using a specified process as set out in Table 1.6 of Track and Civil Code of Practice Section 1- Rail and AS 1085.20. Type and proof testing shall be carried out using the method and frequency defined in AS 1085.20.

In addition to requalification requirements in AS 1085.20, the following occurrences will require requalification of the process;

- Following rectification of a welding machine malfunction (any item that affects the electrical, hydraulic or mechanical setup. (including alignment))
- Following machine overhaul or work other than routine maintenance.
- If the machine has not been used for more than three months.
- Any change to another approved procedure relating to the welding.
- When there is a change from rail supplier, grade or section.
- Any change in the welding parameters or program.

Sample welds for slow bend test shall be in the as welded condition. No straightening is permitted to correct the geometry of these welds. The sample weld shall either be selected from produced welds or prepared by welding together two equal lengths of short piece rails to suit clamping head, usually two 600mm lengths.

Following commencement of production welding, in addition to the inspection and testing of finished welds in AS 1085.20, a sample weld shall be produced or selected after every 2000 welds and subjected to bend testing.

Only rails with the same weight and hardness may be welded by flash butt welding into welded rails. Pulse flashing is preferred over continuous flashing for the following reasons;

- Improved control of flashing process.
- Shorter weld cycle.
- Reduced rail usage.
- Narrower weld and heat affected zone.
- Improved bond strength.

Mobile flash butt welding machine

Procedure approval shall be carried out for each individual machine (no type approval) by testing weld samples produced in accordance to AS1085.20 and this technical note.

Quality

The contractor shall have in place a quality system accepted by ARTC. A system conforming to AS 9001 shall be deemed to satisfy the requirements. The contractor shall also provide a quality plan to be reviewed and accepted by ARTC. The plan is to include weld reporting which should be in the format of a chart and report.

The contractor shall provide the performance specification to monitor the quality of the weld. The minimum specification shall include the following;

- The welding current.
- Upset force or pressure.
- Upset displacement.
- Welding time.

Other aspects such as weld geometry and ultrasonic testing shall be in accordance with ARTC Track and Civil Code of Practice and related engineering procedures, standards and work instructions. In addition foot alignment should not exceed the dimensional tolerances of the joined rails as specified in AS 1085.1 or applicable standard.

b) Aluminothermic welding

Aluminothermic weld materials shall be supplied in accordance with AS 1085.20.

Type and proof testing shall be carried out using the method and frequency defined in AS 1085.20. Welding rail ends together using aluminothermic welding shall be carried out using a specified process as set out in Table 1.7 of Track and Civil Code of Practice Section 1 - Rail.

Transport and storage of weld consumables shall be in accordance with AS1085.20. Consumables affected in any way which will impact on the integrity of the final weld shall not be used.

Deleted or Altered Paragraphs

None

Effectivity

This Technical Note shall apply to all welding activities undertaken on ARTC tracks following its publication and until prior and until such time as the Track and Civil Code of Practice Section 1 Rail is updated and this Technical Note is withdrawn.

Updates to this Technical Note

This Technical Note may be replaced by an updated version if so determined by the undersigned from time to time.

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