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1.0 SCOPE

1.1 This Scope of Work (SOW) defines the requirements for the provision of independent metallurgical quality analysis services for R350LHT railway rails and Flash Butt Welds (FBWs) to support quality assurance and compliance verification.

1.2 The appointed service provider shall undertake comprehensive laboratory testing and metallurgical evaluations to determine whether the parent rail material and flash butt welds comply with the technical and quality requirements of the following standards:

- BS EN 14587-2:2009 – Railway applications – Track – Flash Butt Welding of Rails – Part 2: New R220, R260, R260Mn and R350LHT Grade Rails by Mobile Welding Machines at Sites Other than a Fixed Plant.
- BS EN 13674-1:2011 – Railway Applications – Track – Rail – Part 1: Vignole Railway Rails 46 kg/m and above.

1.3 The analyses shall identify any metallurgical, mechanical, or manufacturing anomalies that may compromise the structural integrity, in-service performance, or expected service life of the rail or welded joint.

2.0 TECHNICAL REQUIREMENTS

2.1 The scope of work shall include, but not be limited to, destructive mechanical testing, metallurgical examinations, macro- and microstructural evaluations, hardness profiling, and chemical composition analysis where required, to verify the integrity, quality, and conformity of both the parent rail and flash butt welds.

2.2 Table 1 provides a detailed description of required tests to be conducted.

Table 1: Required Metallurgical and Mechanical Testing Requirements for R350LHT Rails and Flash Butt Welds

	Test Category	**Test**	**Parent Rail**	**Flash Butt Weld**	**Purpose**
1	Visual & Dimensional	Visual inspection	✓	✓	Surface defects, grinding quality, geometry
2	Dimensional	Weld alignment and profile	✓	✓	Verify compliance with rail geometry
3	Chemical	Chemical composition	✓	✓	Confirm rail grade (R260, R350LHT, etc.)
4	Mechanical	Tensile Test	✓	✓	Strength of parent material and weld
5	Mechanical	Hardness Survey (HV10/HV30 or HBW)	✓	✓	Hardness profile across weld, HAZ and parent metal
6	Mechanical	Bend Test	✓	✓	Weld and rail ductility and soundness
7	Metallography	Macro Examination	✓	✓	Fusion quality, upset symmetry, defects
8	Metallography	Microstructure Examination	✓	✓	Grain structure, HAZ characteristics, rail and FBW microstructure
9	Metallography	Inclusion Rating	✓	✓	Steel cleanliness

2.3 The Contractor shall evaluate all test results against the applicable acceptance criteria specified in BS EN 14587-2:2009 and BS EN 13674-1:2011, where such criteria are defined. For tests that are diagnostic in nature and for which no explicit acceptance criteria are prescribed, the Contractor shall provide a detailed metallurgical interpretation, supported by photographic evidence and a clear technical conclusion regarding the condition and integrity of the rail or flash butt weld.

2.4 All testing shall be performed using recognised international test methods by an ISO/IEC 17025 accredited laboratory, with results reported against the acceptance criteria prescribed in BS EN 14587-2:2009 and BS EN 13674-1:2011.

2.5 Technical Evaluation:

2.5.1 The returnable documents should demonstrate the bidder's technical competence**,** laboratory accreditation**,** quality management capability, and ability to produce legally defensible metallurgical test results.

Table 2: Schedule of returnable documents

	Returnable Document	**Requirement**
1	ISO/IEC 17025 Accreditation Certificate	Valid accreditation certificate issued by SANAS or an equivalent internationally recognised accreditation body**.** *Evidence to be submitted: ISO17025 certificate*
2	ISO/IEC 17025 Scope of Accreditation	Current scope confirming accreditation for the proposed test methods (e.g., tensile testing, hardness testing, metallography, chemical analysis, macro-etch examination)**.** *Evidence to be submitted: Formal document on company letterhead, signed and authorised by legal company signatories, confirming scope of accreditation*
3	Proof of relevant Experience	Evidence of completed projects involving metallurgical testing of railway rails, flash butt welds, thermite welds, or similar heavy engineering components, *Evidence to be submitted:* *1. (X2) Anonymised metallurgical laboratory reports demonstrating the quality and format of reporting.* *2. Client reference letter: indicating - Client and supplier company details - Companies' addresses, Companies' representatives, Project/ contract title and/or scope, legal signatories.*
4	Turnaround Time Commitment Letter	Proposed turnaround times from sample receipt to submission of final reports**.** *Evidence to be submitted:* *One (1) Page on company letterhead indicating the turnaround time from PO issuance to service delivery.*
5	Declaration of compliance with the SOW and Absence of conflict of interest	Declaration of compliance with the SOW and confirmation of impartiality and absence of conflicts of interest in performing laboratory analyses**.** *Evidence to be submitted:* *Declaration letter on company letterhead, confirming:* *1. Independence and absence of conflicts of interest,* *2. Compliance with the Transnet SOW.*

4.0 IMPLEMENTATION REQUIREMENTS

4.1. The successful Contractor shall implement the services in a controlled, traceable, and technically compliant manner to ensure the integrity of all laboratory analyses and the reliability of the reported results.

4.2. The Contractor shall, as a minimum, comply with the following implementation requirements:

- Commence services within the period specified in the Purchase Order or Contract Award.
- Nominate a dedicated Project Manager or Technical Lead who shall serve as the single point of contact throughout the contract.

4.3. Sample Receipt and Traceability

- Establish and maintain a documented chain of custody for all samples received from Transnet.
- Assign a unique laboratory identification number to each sample to ensure full traceability throughout receipt, preparation, testing, storage, reporting, and disposal.
- Notify Transnet immediately of any damaged, incomplete, or incorrectly identified samples.

4.4. Testing and Quality Assurance

- Perform all laboratory testing in accordance with the applicable international standards referenced in this Scope of Work.
- Conduct all testing using calibrated equipment and validated test methods within an ISO/IEC 17025 accredited laboratory.
- Ensure that competent and suitably qualified personnel perform all testing and technical evaluations.

4.5. Reporting

- Submit a comprehensive technical report for each sample tested.
- The report shall include all measured values, photographs, macrographs, micrographs, hardness profiles, observations, interpretations, and a statement of conformity or non-conformity where applicable.

4.6. Turnaround Time

- Complete all testing and submit final reports within the agreed turnaround period from the date of receipt of samples.
- Where delays are anticipated, the Contractor shall notify Transnet in writing, stating the reasons for the delay and the revised completion date.

4.7. Confidentiality

Treat all samples, test data, reports, and technical information supplied by Transnet as confidential and not disclose such information to any third party without the prior written approval of Transnet.

4.8. Audit and Verification

Transnet reserves the right to audit the Contractor's laboratory facilities, quality management system, testing procedures, calibration records, and associated documentation during the contract period to verify compliance with the requirements of this Scope of Work.