



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Construct A Railway Line Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 119978 · NQF Level 3 · 10 Credits · 7 Days

COURSE OVERVIEW

This course equips learners with the competencies required to construct a railway line, covering planning, earthworks, track laying, and quality assurance. It ensures adherence to South African railway construction standards and safety regulations, enabling participants to contribute effectively to railway infrastructure projects.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	119978
Accreditation	SAQA Accredited · NQF Level 3 · 10 Credits
Duration	7 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply railway construction principles and interpret technical drawings for track layout and alignment.
- Implement earthworks and drainage systems according to railway specifications and safety standards.
- Demonstrate correct procedures for laying rails, sleepers, and fastenings, including ballasting and tamping.
- Analyze quality control measures and conduct inspections to ensure compliance with project specifications.
- Evaluate and mitigate risks associated with railway construction activities using relevant safety protocols.
- Design a basic railway construction plan incorporating resource allocation and scheduling.

WHO SHOULD ATTEND

- This course is designed for construction supervisors, civil engineering technicians, and site managers involved in railway line construction projects.
- It is also suitable for individuals seeking to enter the railway construction sector.

COURSE OUTLINE

Day 1: Introduction to Railway Construction and Safety

- Overview of railway systems and construction phases.
- Occupational Health and Safety (OHS) Act and relevant legislation.
- Site induction, hazard identification, and risk assessment.
- Basic track components: rails, sleepers, fastenings, ballast.
- Introduction to track gauge and alignment standards.
- Environmental considerations and waste management.
- Team communication and reporting structures.
- Emergency procedures and first aid basics.

Day 2: Surveying, Setting Out, and Earthworks

- Surveying instruments: levels, theodolites, GPS.
- Setting out horizontal and vertical alignments.
- Cut and fill calculations and slope stability.
- Subgrade preparation: compaction tests and layer thickness.
- Drainage systems: culverts, ditches, and subsoil drains.
- Material selection for embankments and cuttings.
- Quality assurance: density checks and tolerances.
- Environmental controls during earthworks.

Day 3: Ballast, Sleepers, and Rail Installation

- Ballast types, grading, and placement techniques.
- Sleeper types: timber, concrete, steel – advantages and applications.
- Rail profiles and handling procedures.
- Fastening systems: clips, baseplates, insulators.
- Rail jointing: mechanical joints and welding basics.
- Initial alignment using lining and levelling tools.
- Gauge setting and tolerance checks.
- Safety during lifting and handling of heavy components.

Day 4: Track Geometry and Alignment

- Track geometry parameters: gauge, twist, alignment, cross-level.
- Cant theory: balancing speed and comfort on curves.
- Transition curves and spiral length calculations.
- Manual and mechanical tamping methods.
- Lining and levelling techniques.
- Use of track geometry trolleys and electronic recording.
- Defect identification and corrective actions.
- Standards for geometric tolerances (e.g., SANS 1200).

Day 5: Turnouts, Crossings, and Special Trackwork

- Turnout components: switch blades, stock rails, frog, guard rails.
- Types of turnouts: symmetrical, asymmetrical, diamond crossings.
- Assembly sequence and alignment of turnouts.
- Switch operation and locking mechanisms.
- Clearance checks and gauge adjustments at frogs.

- Welding and grinding of special trackwork.
- Inspection and maintenance of crossings.
- Safety precautions during turnout installation.

Day 6: Welding, Stress Management, and Rail Defects

- Aluminothermic welding process: preparation, moulding, ignition.
- Post-weld finishing: grinding and inspection.
- Principles of CWR: stress-free temperature and breathing lengths.
- Expansion joints and stress adjustment methods.
- Rail defect types: head checks, squats, transverse defects.
- Ultrasonic testing and visual inspection.
- Rail flaw detection equipment.
- Safety during welding and stress management.

Day 7: Quality Assurance, Handover, and Maintenance Planning

- Final geometry verification and load testing.
- Inspection checklists and defect rectification.
- Handover documentation: as-built drawings, test results.
- Introduction to track maintenance: patrolling, spot repairs.
- Scheduled maintenance cycles and predictive techniques.
- Asset management systems and data recording.
- Environmental rehabilitation after construction.
- Course review and assessment.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **10 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 28,200.00	R 28,200.00
1	In-House	R 36,700.00	R 36,700.00
1	On-Campus (Pretoria)	R 42,300.00	R 42,300.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	11 Aug 2026	On-Campus	Cape Town, South Africa
04 Aug 2026	12 Aug 2026	On-Campus	Dubai, UAE
05 Aug 2026	13 Aug 2026	On-Campus	Pretoria, South Africa
05 Aug 2026	13 Aug 2026	On-Campus	Lagos, Nigeria
06 Aug 2026	14 Aug 2026	On-Campus	Johannesburg, South Africa
07 Aug 2026	17 Aug 2026	On-Campus	Mauritius
10 Aug 2026	18 Aug 2026	On-Campus	Dubai, UAE
11 Aug 2026	19 Aug 2026	On-Campus	Pretoria, South Africa

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 119978) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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