



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

Restore Track Alignment Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 119979 · NQF Level 3 · 15 Credits · 12 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to safely and effectively restore track alignment in rail environments. It covers the principles of track geometry, alignment adjustment techniques, and adherence to safety standards, ensuring operational efficiency and risk mitigation.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	119979
Accreditation	SAQA Accredited · NQF Level 3 · 15 Credits
Duration	12 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate understanding of track alignment principles and the effects of misalignment on rail operations.
- Apply safe work procedures and use appropriate tools to restore track alignment.
- Analyze track geometry data to determine alignment correction requirements.
- Implement alignment restoration techniques in compliance with relevant standards and regulations.
- Evaluate the restored track alignment for accuracy and operational readiness.
- Document alignment restoration activities and report deviations as per organizational procedures.

WHO SHOULD ATTEND

- This course is designed for rail maintenance personnel, track workers, and supervisors responsible for track infrastructure.
- It is also suitable for individuals seeking to gain competency in track alignment restoration within the railways sector.

COURSE OUTLINE

Day 1: Introduction to Track Alignment and Safety

- Overview of railway track systems
- Safety protocols and PPE for track work
- Track geometry basics: gauge, cross-level, alignment, and twist
- Consequences of poor track alignment
- Introduction to relevant SAQA unit standards and legislation

Day 2: Track Alignment Measurement Principles

- Alignment parameters: versine, chord length, offset
- Manual measurement techniques: string lining and gauge measurement
- Introduction to track recording vehicles and automated systems
- Data recording and documentation procedures
- Practical exercise: manual measurement on training track

Day 3: Understanding Track Forces and Stresses

- Thermal forces: rail creep, buckling, and pull-aparts
- Dynamic forces from train loading and speed
- Stress in continuous welded rail (CWR)
- Identifying stress-related defects: sun kinks, cracked sleepers
- Practical calculation of neutral temperature

Day 4: Track Alignment Defects and Causes

- Types of defects: horizontal alignment, vertical profile, cross-level
- Causes: subgrade settlement, drainage issues, worn components
- Defect classification using standards (e.g., TSI, SAQR)
- Prioritisation matrix for repair scheduling
- Case studies of alignment failures

Day 5: Track Alignment Correction Techniques

- Manual lining: use of lining bars and jacks
- Mechanical tamping: operation of tamping machines
- Stone blowing as an alternative to tamping
- Work planning for possession windows
- Practical demonstration: manual lining exercise

Day 6: Advanced Alignment Adjustment with Machinery

- Types of lining machines: on-track and off-track
- Machine setup: sensors, controls, and calibration
- Automated lining process: measuring, calculating, adjusting
- Post-correction measurement and verification
- Practical session: machine lining on training track

Day 7: Track Alignment in Curves and Turnouts

- Curve geometry: radius, chord, and versine relationships
- Superelevation and transition curves
- Turnout alignment: switch, crossing, and lead geometry
- Alignment tolerances for curves and turnouts

- Practical exercise: measuring and adjusting a curve

Day 8: Quality Assurance and Inspection

- Inspection frequency and methods
- Visual inspection: walking the track, looking for defects
- Measured inspection: using track geometry cars and manual tools
- Reporting and documentation standards
- Quality control checklists and sign-offs

Day 9: Track Alignment and Drainage Interaction

- Drainage principles: water flow, erosion, and subgrade saturation
- Drainage structures: culverts, ditches, and drains
- Impact of poor drainage on alignment: settlement, ballast contamination
- Drainage maintenance and repair techniques
- Case study: alignment failure due to drainage

Day 10: Environmental and Vegetation Management

- Vegetation impact: root damage, ballast fouling, sight lines
- Vegetation control: herbicides, mechanical cutting, manual removal
- Environmental management plans (EMP) for track work
- Waste disposal and spill prevention
- Practical session: vegetation clearance on training track

Day 11: Emergency Response and Fault Finding

- Emergency scenarios: rail buckling, flood damage, derailment
- Fault-finding methodology: visual clues, measurements, history
- Temporary repair techniques: speed restrictions, shoring, clamping
- Communication protocols during emergencies
- Simulation exercise: emergency response drill

Day 12: Practical Integration and Assessment

- Full-day practical: inspect a section of track, identify defects, plan correction
- Perform manual and machine alignment correction
- Document all work and complete quality assurance forms
- Final assessment: written and practical tests
- Course review and feedback

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 **15 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 41,000.00	R 41,000.00
1	In-House	R 53,300.00	R 53,300.00
1	On-Campus (Pretoria)	R 61,500.00	R 61,500.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	18 Aug 2026	On-Campus	Mauritius
04 Aug 2026	19 Aug 2026	On-Campus	Cape Town, South Africa
05 Aug 2026	20 Aug 2026	On-Campus	Dubai, UAE
06 Aug 2026	21 Aug 2026	On-Campus	Pretoria, South Africa
06 Aug 2026	21 Aug 2026	On-Campus	Lagos, Nigeria
07 Aug 2026	24 Aug 2026	On-Campus	Johannesburg, South Africa
10 Aug 2026	25 Aug 2026	On-Campus	Cape Town, South Africa
11 Aug 2026	26 Aug 2026	On-Campus	Dubai, UAE

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 119979) 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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