




| | Curriculum Document | | |
|-------------------|----------------------|-----------|---|
| Occupational Code | Qualification Title | NQF Level | |
| 734212-000-00-00 | Railway Track Master | 4 |  |

| | Name | Email | Phone | Logo | | | | | | | | |
|------------------------------------|--|---|--|---|----------------|----------------------------------|-----------|----------------------|-----|---------------|--|---|
| Development Quality Partner | Transport Education and Training Authority (TETA) | <table border="1"> <tr> <td>Physical Address</td> <td>TETA House 344 Pretoria Avenue Randburg Gauteng</td> </tr> <tr> <td>Postal Address</td> <td>Private Bag X10016 Randburg 2125</td> </tr> <tr> <td>Telephone</td> <td>(011) 577-7000/ 7040</td> </tr> <tr> <td>Fax</td> <td>086 76 505 14</td> </tr> </table> | Physical Address | TETA House 344 Pretoria Avenue Randburg Gauteng | Postal Address | Private Bag X10016 Randburg 2125 | Telephone | (011) 577-7000/ 7040 | Fax | 086 76 505 14 | |  |
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| Assessment Quality Partner | National Artisan Moderating Body (NAMB) | http://www.dhet.gov.za | 012 312 5911 0800 87 2222 086 999 0123 |  <p>higher education & training Department: Higher Education and Training REPUBLIC OF SOUTH AFRICA</p> | | | | | | | | |

QUALIFICATION DETAILS

Qualification Title: Occupational Certificate: Railway Track Master.

Occupational Code: 734212.

Quality Assuring Body: Quality Council for Trades and Occupations (QCTO).

Sub-Framework: Occupational Qualifications Sub-Framework.

Field: Field 12 – Physical Planning and Construction.

Subfield: Civil Engineering Construction.

NQF Level: 4.

Credits: 578.

Originator/Development Quality Partner (DQP): Transport Education and Training Authority (TETA)

Qualification Type: Occupational Certificate.

Registered qualifications and or learning programmes to be replaced:

- SAQA ID: 49759; National Certificate: Rail Construction and Maintenance; NQF Level 03; 138 credits; and
- SAQA ID: 61670; Further Education and Training Certificate: Railway Construction and Maintenance; NQF Level 04; 136 credits.

RATIONALE

This qualification will equip learners with the appropriate knowledge skills and work experience required to be recognised as a Tradesperson who will be able to build and maintain railway tracks nationally and internationally.

The development of railway infrastructure is a key driver for economic development. In South Africa, one of the key barriers to accelerated economic development is the provisioning of cost effective and reliable mass transport systems for both freight and passenger services. One of the key strategies in the National Development Plan is the improvement and proper maintenance of infrastructure. Currently and in the future, we will require a dynamic railway sector with the skills and abilities to build and maintain an ever-growing railway network. This qualification is targeted at mobilising and capacitating the fundamental human resource capabilities required to deliver this strategy.

The knowledge and skills components of the qualification is aligned with the International Railway Construction standards (IRIS). The qualification incorporates three-part qualifications that will enable smooth career progression and it will contribute towards skills flexibility and mobility within the sector.

This qualification provides an opportunity for learners, with limited formal education, to enter the trade and will then capacitate them to exit with an NQF Level 4 trade which could be internationally accepted as an entry for articulation into related careers and/or further studies within the Civil Engineering Construction field.

The three, part qualifications, contained in this parent qualification are:

- Railway Track Welder;
- Railway Track Constructor; and
- Railway Track Construction and Maintenance Practitioner.

Each of these part qualifications will enable qualified learners to gain meaningful employment within the Railway sector. Structuring the qualification in this way also meets the needs of the various stakeholders and will therefore contribute towards cost efficiency and productivity.

PURPOSE

The purpose of this qualification is to prepare a learner to operate as a Railway Track Master

A Railway Track Master constructs, aligns, repairs and maintains permanent way infrastructure and associated works in the field of Civil Engineering to ensure the safe running of trains.

A qualified learner will be able to:

- Execute basic construction, maintenance and rehabilitation tasks on railway lines;
- Execute specialised railway construction and maintenance work;
- Ensure the ongoing upgrading of the railway tracks; and
- Manage rail construction and maintenance projects and processes.

RULES OF COMBINATION

This qualification is made up of the following compulsory Knowledge, Practical Skills and Work Experience Modules:

Knowledge Modules

- 734212-000-00-00 KM-01 Fundamental principles and theories of welding, NQF Level 2, Credits 15
- 734212-000-00-00 KM-02 Concepts and principles of per-way construction and maintenance, NQF Level 3, Credits 72
- 734212-000-00-00 KM-03 Railway Track Diagnostics, NQF Level 4, Credits 33
- 734212-000-00-00 KM-04 Concepts of managing and supervising per-way construction and maintenance, NQF Level 4, Credits 66

Total number of credits for Knowledge Modules: 186

Practical Skill Modules

- 734212-000-00-00 PM-01 Operate and care for engineering hand and power tools within a railway construction and maintenance environment, NQF Level 2, 16 Credits
- 734212-000-00-00 PM-02 Execute basic per-way maintenance and construction work, NQF Level 2, Credits 24
- 734212-000-00-00 PM-03 Execute basic grinding and welding work to install and repair railway lines, NQF Level 3, Credits 24
- 734212-000-00-00 PM-04 Execute generic railway maintenance and construction tasks, NQF Level 3, Credits 24
- 734212-000-00-00 PM-05 Join and repair railway rails using welding techniques, NQF Level 3, Credits 24
- 734212-000-00-00 PM-06 Build and construct specialised railway lines and related infrastructure, NQF Level 4, Credits 16
- 734212-000-00-00 PM-07 Execute advanced rail joining, repair and maintenance work, NQF Level 4, Credits 24
- 734212-000-00-00 PM-08 Supervise and oversee the execution of rail construction and maintenance activities, NQF Level

Total number of credits for Practical Skill Modules: 168

Work Experience Modules

- 734212-000-00-00 WM-01 Apply generic processes and procedures of constructing and maintaining a Railway Lines, NQF Level 2, Credits 16
- 734212-000-00-00 WM-02 Execute basic per-way maintenance and construction work, NQF Level 2, Credits 16
- 734212-000-00-00 WM-03 Execute basic grinding and welding work to install and repair railway lines NQF Level: 2, Credits: 32
- 734212-000-00-00 WM-04 Execute generic railway maintenance and construction tasks, NQF Level 3, Credits 32
- 734212-000-00-00 WM-05 Join and repair railway rails using welding techniques, NQF Level 4, Credits 32
- 734212-000-00-00 WM-06 Build and construct specialised railway lines and related infrastructure, NQF Level 4, Credits 32
- 734212-000-00-00 WM-07 Execute advanced rail joining, repair and maintenance work, NQF Level 4, Credits 32
- 734212-000-00-00 WM-08 Supervise and oversee the execution of rail construction and maintenance activities, NQF Level 4, Credits 32

Total number of credits for Work Experience Modules: 224

ENTRY REQUIREMENTS

NQF level 2 with communication, science and maths literacy; Compliance with the medical fitness requirements for employment as a railway worker.

EXIT LEVEL OUTCOMES AND ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1

Apply specific welding and joining techniques to execute basic and specialised railway construction, maintenance and rehabilitation tasks on railway lines.

Associated Assessment Criteria

- Wheel spin burns/battered rail ends are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Rail Manufactured frogs are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Railway switchblades are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Preventative grinding is executed using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Exothermic joints are cast using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Rail bound 14% cast manganese frogs are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice.

Exit Level Outcome 2

Apply civil construction processes and techniques to execute basic and specialised railway construction, maintenance and rehabilitation tasks on railway lines.

Associated Assessment Criteria

- Broken block joints/rails are identified, and the different types of breaks are described indicating the most likely causes for these breaks;
- Detailed planning of how to replace railway block joints/tracks describe all the required steps, materials that must be used and accurately indicates the potential risks and delineates a feasible time line for the work;
- The Clearances for a range of railway situations are accurately measured and evaluated indicating any deviations from standard;
- Explanations of the actions required to correct sub-standard clearances are according to internationally accepted railway standards and in accordance with local legislation and related codes of practice;
- Hand screening of railway ballast is executed according to the accepted standard and completed within the time frame and in compliance with all Occupational Health and Safety requirements;
- Constructed railway turnouts are evaluated, all defective components are identified and replaced according the internationally accepted railway standards and in compliance with all occupational health and safety standards and related legal determinations;
- Track geometry is accurately calculated in order to determine the relevant railway track standard and classification;
- Using the required tools and equipment the stress-free temperatures of various sections of railway track lines are determined and the most appropriate method for destressing the line is described according to the internationally accepted processes and the tested best practices.

Exit Level Outcome 3

Manage rail construction and maintenance projects and processes

Associated Assessment Criteria

- Measured results of track conditions are accurately read, interpret and the priority actions to deal with defects are listed and described in terms of internationally accepted railway practices and local legislative requirements;
- Various sections of railway tracks are inspected and the quality of the construction and maintenance work on these tracks are assessed. Reports on this assessment is accurate and indicates all the defects, problems and potential problems associated with the completed work;
- Reflection on the appropriate application of the occupational health, safety and environmental requirements associated with the work being done during railway track construction and

maintenance demonstrates a deep understanding of the practical hazards and risks associated with railway construction and maintenance work;

- Planning for the execution of rail construction and maintenance activities are completed within the parameters of an approved budget and time frames and in compliance with all Occupational Health safety and environmental requirements;
- End products delivered by construction and maintenance machines are evaluated and quality assured according to the international leading practices for such work, all defects are identified, and the potential short, medium and long-term consequences of these defects are described.

1.3.2 Assessment Standards for Phases

There are no phase assessments

INTERNATIONAL COMPARABILITY

For purposes of establishing an international comparability this qualification was compared with similar qualifications in Australia and the United Kingdom. In each of these countries there are suites of qualifications that should be viewed in total in order to conduct a meaningful comparison.

Australia

In Australia there are two government sponsored qualifications that are used for the training of Railway Track Workers. By definition an Australian Railway Track Worker executes a similar set of tasks to those expected from the South African Railway Track Master. These tasks are:

- spreading and tamping ballast to provide firm foundation for sleepers
- cutting rails to length and grinding worn and rough rail ends
- placing sleepers across roadbeds, and positioning and fastening rails on sleepers
- drilling bolt holes, and bolting and welding rail sections
- removing and replacing worn and damaged rails, sleepers and switches
- cleaning and lubricating switches
- examining track, lubricating wheel bearings on rolling stock and maintaining switch signal lamps
- installing and repairing signals and other equipment

The two certificates that are offered by the Centre for Excellence in Rail Training in Brooklyn and Ballarat in Victoria State Australia covers the range of learning units as set out in the table below. For comparative proposes an indication is given of how these learning units compare with the learning modules in the three part qualifications of the South African Qualification.

| Certificate II in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|---|--------------|-------------------|--------------------|
| <ul style="list-style-type: none"> • Erect and dismantle restricted height scaffolding | | | |

| | | | |
|--|----------|----------|----------|
| • Apply OHS requirements, policies and procedures in the construction industry | x | x | x |
| • Carry out measurements and calculations | x | x | x |
| • Read and interpret plans and job specifications | x | x | x |
| • Carry out manual excavation | | x | |
| • Spread and compact materials manually | | x | |
| • Carry out basic levelling | | x | |
| • Carry out concrete work | | x | |
| • Operate elevating work platform | | | |
| • Conduct roller operations | | | |
| • Conduct civil construction skid steer loader operations | | | |
| • Conduct backhoe/loader operations | | | |
| • Conduct civil construction excavator operations | | | |
| • Conduct civil construction wheeled front end loader operations | | | |
| • Conduct civil construction tracked front end loader operations | | | |
| • Conduct civil construction water cart operations | | | |
| • Work safely at heights | x | x | |
| • Control traffic with stop-slow bat | x | x | |
| • Implement traffic management plan | | | x |
| • Maintain and use hand tools | x | x | |
| • Clean equipment and restore worksite | x | x | |
| • Check and assess operational capabilities of equipment | x | x | |
| • Maintain poles and associated hardware | | x | |
| • Carry out routine maintenance of structures | | x | |
| • Apply track fundamentals | x | x | |
| • Apply awareness of structures fundamentals | x | x | |
| • Measure and record track geometry | | x | |
| • Operate minor mechanical equipment | x | x | |
| • Install and maintain guard rails | x | x | |
| • Maintain rail joints | x | | |
| • Travel medium or heavy self-propelled on-track equipment | | | |
| • Propel and operate light on-track equipment | | x | |
| • Operate road/rail vehicle | | x | |
| • Shift materials safely using manual handling methods | x | x | |

| | | | |
|--|----------|----------|----------|
| • Participate in basic workplace communication | x | x | x |
| • Follow work health and safety procedures | x | x | x |
| • Apply fatigue management strategies | x | x | |
| • Apply awareness of safe working rules and regulations | x | x | x |
| • Safely access the rail corridor | x | x | x |
| • Work effectively with others | | | |
| • Use info technology devices in the workplace | | | x |
| • Install and maintain rail bonding systems | | | |
| • Install overhead wiring structure | | | |
| • Install and maintain surface track drainage | | x | |
| • Carry out track ballasting | | x | |
| • Install railway sleepers | | x | |
| • Install and repair temporary track supports | | x | |
| • Install and repair rail fastening systems | | x | |
| • Install and repair fences and gates | | x | |
| • Carry out rail installation | | x | |
| • Apply environmental procedures to rail infrastructure | x | x | |
| • Operate under track protection rules | x | x | x |
| • Identify the principles of ballast cleaning operations | | x | |
| • Identify the principles of ballast regulator operations | | x | |
| • Identify the principles of dynamic track stabiliser operations | | | |
| • Identify the principles of self-propelled rail grinder operations | x | x | |
| • Identify the principles of tamping machine operations | | x | |
| • Identify the principles of mechanised track laying operations | | x | |
| • Place and remove temporary speed restriction equipment | | x | |
| • Heat and cut materials using oxy-LPG equipment for the rail industry | x | x | |

| Certificate III in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|--|--------------|-------------------|--------------------|
| Operate and maintain chainsaws | | | |
| Control vegetation on a site | | x | |

| | | | |
|--|----------|----------|----------|
| Carry out measurements and calculations | x | x | |
| Read and interpret plans and job specifications | x | x | x |
| Apply site risk management system | | | x |
| Measure and record track geometry | | x | |
| Check and repair track geometry | | x | |
| Check and repair points and crossings | | x | |
| Examine track infrastructure | | | x |
| Visually inspect track infrastructure | | x | |
| Adjust rail | | x | |
| Install and maintain pole mounted switches and transformers | | | |
| Process workplace documentation | x | x | x |
| Conduct workplace information briefings | | | x |
| Apply accident-emergency procedures | | | x |
| Implement and monitor work health and safety procedures | | | x |
| Apply safe working rules and regulations to rail functions | | | x |
| Implement fatigue management policies and procedures for rail infrastructure | | | |
| Work effectively with others | | | x |
| Lead a work team or group | | | x |
| Apply customer service skills | | | x |
| Apply quality systems | | | x |
| Install and service rail lubrication equipment | | x | |
| Install and maintain surface track drainage | | x | |
| Install and repair temporary track supports | | x | |
| Install and repair fences and gates | | x | |
| Test rail using ultrasonic equipment | | | |
| Test rail using non-destructive testing equipment | | x | |
| Implement ballast unloading | | x | |
| Implement track maintenance and construction | | x | |
| Install and repair rail earthworks | | x | |
| Construct concrete or steel points and crossings | | | |
| Construct timber or composite points and crossings | | | |
| Install turnouts | | x | |
| Implement and monitor environmental protection policies and procedures | | | x |
| Grind rails | x | x | |
| Grind switches and crossings | x | x | |
| Weld rail using aluminothermic welding process | x | | |

| | | | |
|---|---|---|--|
| Weld rail using flashbutt welding process | x | | |
| Operate minor track equipment | | x | |

As indicated there is a significant correlation between the Australian Certificates and the South African Trade Qualification. In the South African Qualification the operation of equipment is limited to those utilised on site and this training will take place during the work experience component of the Qualification.

United Kingdom

In the United Kingdom the City and Guilds training organisation conducts training for Track Workers leading to the completion of an apprentice programme. The training caters for learners who would want to start a career in the rail industry and progress either through an apprenticeship or proving competence of the skills and knowledge required for each of the following areas: track, traction and rolling stock, electrification, signalling and telecoms.

They have five qualifications that covers these specialisation areas:

- The Certificate in Rail Engineering Underpinning Knowledge provides serves as an introduction to the railway industry and prepares them for the NVQs in Rail Engineering;
- The NVQs in Rail Engineering will enables the development of professional skills and knowledge in a wide range of specialist areas;
- The Certificate in Rail Engineering Underpinning Knowledge is aimed at apprentices within the rail engineering industry; and
- The NVQs are aimed at anyone working in railways engineering, including those preparing for a specialised role or management responsibility.

The qualifications contain a similar range of learning modules to those included in the South African qualification.

Conclusion

This qualification compares favourably with the various qualifications used in Australia and the United Kingdom as far as content is concerned. In all cases the technical standards are guided by international guidelines. In both Australia and the United Kingdom there are no formal educational entry requirements and in both cases a learner can progress to complete a full trade. The South African qualification might be structured differently but is similar in terms of entry, content, duration and level.

INTEGRATED ASSESSMENT

Integrated formative assessment

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied

knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL for access to the external integrated summative assessment

Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification

Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

ARTICULATION

Horizontal

This qualification articulates horizontally with the following qualification:

- National Certificate: Vocational: Civil Engineering and Building Construction: NQF Level 4

Vertical

This qualification articulates vertically with the following qualifications:

- National Diploma: Management of Civil Engineering Construction Processes: NQF Level 5.

NOTES

Qualifying for External Assessment

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of statements of results and work experience records including the Foundational Learning Competence.

Additional Legal or Physical Entry Requirements

None

Criteria for the Accreditation of Providers

Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The curriculum title and code are: Railway Track Master: 734212-000-00-00

Encompassed Trades

This qualification encompasses the following trades as recorded on the NLRD:

734212 Railway Track Master

Assessment Quality Partner (AQP)

National Artisan Moderating Body (NAMB).

Completing the Full Trade

In order to complete the full trade candidates must have successfully completed all three the part qualifications.

MODULES


| Component | ID | MODULE TITLE | NQF LEVEL | CREDITS |
|--------------------------------|------------------|---|-----------|------------|
| Knowledge | 734212-000-KM-01 | Fundamental principles and theories of welding | 2 | 15 |
| Knowledge | 734212-000-KM-02 | Concepts and principles of per-way construction and maintenance | 3 | 72 |
| Knowledge | 734212-000-KM-03 | Railway Track Diagnostics | 4 | 33 |
| Knowledge | 734212-000-KM-04 | Concepts of managing and supervising per-way construction and maintenance | 4 | 66 |
| TOTAL CREDITS KNOWLEDGE | | | | 186 |
| Practical | 734212-000-PM-01 | Operate and care for engineering hand and power tools within a railway construction and maintenance environment | 2 | 16 |
| Practical | 734212-000-PM-02 | Execute basic per-way maintenance and construction work | 2 | 24 |
| Practical | 734212-000-PM-03 | Execute basic grinding and welding work to install and repair railway lines | 3 | 24 |
| Practical | 734212-000-PM-04 | Execute generic railway maintenance and construction tasks | 3 | 24 |
| Practical | 734212-000-PM-05 | Join and repair railway rails using welding techniques | 3 | 24 |
| Practical | 734212-000-PM-06 | Build and construct specialised railway lines and related infrastructure | 4 | 16 |
| Practical | 734212-000-PM-07 | Execute advanced rail joining, repair and maintenance work | 4 | 24 |



| | | | | |
|--|------------------|--|---|------------|
| Practical | 734212-000-PM-08 | Supervise and oversee the execution of rail construction and maintenance activities | 4 | 16 |
| TOTAL CREDITS PRACTICAL SKILLS | | | | 168 |
| Work Experience | 734212-000-WM-01 | Apply generic processes and procedures of constructing and maintaining a Railway Lines | 2 | 16 |
| Work Experience | 734212-000-WM-02 | Execute basic per-way maintenance and construction work | 2 | 16 |
| Work Experience | 734212-000-WM-03 | Execute basic grinding and welding work to install and repair railway lines | 2 | 32 |
| Work Experience | 734212-000-WM-04 | Execute generic railway maintenance and construction tasks | 3 | 32 |
| Work Experience | 734212-000-WM-05 | Join and repair railway rails using welding techniques | 4 | 32 |
| Work Experience | 734212-000-WM-06 | Build and construct specialised railway lines and related infrastructure | 4 | 32 |
| Work Experience | 734212-000-WM-07 | Execute advanced rail joining, repair and maintenance work | 4 | 32 |
| Work Experience | 734212-000-WM-08 | Supervise and oversee the execution of rail construction and maintenance activities | 4 | 32 |
| TOTAL CREDITS WORK EXPERIENCE | | | | 224 |
| TOTAL CREDITS FOR THE QUALIFICATION | | | | 578 |

PART QUALIFICATIONS

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|---|-----------|---------|
| | 734212-000-00-01 | Railway Track Welder | 3 | 303 |
| | 734212-000-00-02 | Railway Track Constructor | 4 | 320 |
| | 734212-000-00-03 | Railway Track Maintenance and Construction Practitioner | 4 | 114 |

PART QUALIFICATION 1

| | Curriculum Document | | |
|-------------------|--------------------------|-----------|---|
| Occupational Code | Part Qualification Title | NQF Level |  |
| 734212-000-00-01 | Railway Track Welder | 3 | |

| | Name | Email | Phone | Logo | | | | | | | | |
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| Assessment Quality Partner | National Artisan Moderating Body (NAMB) | http://www.dhet.gov.za | 012 312 5911 0800 87 2222 086 999 0123 |  <p>higher education & training Department: Higher Education and Training REPUBLIC OF SOUTH AFRICA</p> | | | | | | | | |

QUALIFICATION DETAILS

Qualification Title: Occupational Certificate: Railway Track Welder.

Occupational Code: 734212.

Quality Assuring Body: Quality Council for Trades and Occupations (QCTO).

Sub-Framework: Occupational Qualifications Sub-Framework.

Field: Field 12 – Physical Planning and Construction.

Subfield: Civil Engineering Construction.

NQF Level: 3.

Credits: 303.

Originator/Development Quality Partner (DQP): Transport Education and Training Authority (TETA)

Qualification Type: Occupational Certificate.

Registered qualifications and or learning programmes to be replaced:

- SAQA ID: 49759; National Certificate: Rail Construction and Maintenance; NQF Level 03; 138 credits; and
- SAQA ID: 61670; Further Education and Training Certificate: Railway Construction and Maintenance; NQF Level 04; 136 credits.

RATIONALE

This part qualification will equip learners with the appropriate knowledge skills and work experience required to execute the work of a Railway Track Welder who will be able to use specialised welding techniques to participate in the construction and maintenance of railway tracks nationally and internationally.

The development of railway infrastructure is a key driver for economic development. In South Africa, one of the key barriers to accelerated economic development is the provisioning of cost effective and reliable mass transport systems for both freight and passenger services. One of the key strategies in the National Development Plan is the improvement and proper maintenance of infrastructure. Currently and in the future, we will require a dynamic railway sector with the skills and abilities to build and maintain an ever-growing railway network. This qualification is targeted at mobilising and capacitating the fundamental human resource capabilities required to deliver this strategy.

The knowledge and skills components of the qualification is aligned with the International Railway Construction standards (IRIS). The qualification incorporates three-part qualifications that will enable smooth career progression and it will contribute towards skills flexibility and mobility within the sector.

This qualification provides an opportunity for learners, with limited formal education, to enter a trade and will then capacitate them to exit with an NQF Level 3 and progress to the full trade at NQF Level 4.

This part qualifications will enable qualified learners to gain meaningful employment within the Railway sector. The qualification meets the needs of the various stakeholders and will therefore contribute towards cost efficiency and productivity.

PURPOSE

A Railway Track Welder refurbishes rail lines and assets using specific welding and grinding processes and joins rails of various sizes to extend the lifespan of the railway lines.

RULES OF COMBINATION

This qualification is made up of the following compulsory Knowledge Practical Skills and Work Experience Modules:

Knowledge Modules

Total number of credits for Knowledge Modules: 87

Practical Skill Modules

Total number of credits for Practical Skill Modules: 88

Work Experience Modules

Total number of credits for Work Experience Modules: 128

ENTRY REQUIREMENTS

NQF level 2 with communication, science and maths literacy; Compliance with the medical fitness requirements for employment as a railway worker.

EXIT LEVEL OUTCOMES AND ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1

Apply specific welding and joining techniques to execute basic and specialised railway construction, maintenance and rehabilitation tasks on railway lines.

Associated Assessment Criteria

- Wheel spin burns/battered rail ends are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Rail Manufactured frogs are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made

- accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
- Railway switchblades are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
 - Preventative grinding is executed using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
 - Exothermic joints are cast using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice;
 - Rail bound 14% cast manganese frogs are repaired using the appropriate grinding and welding techniques, appropriately selected tools, materials and equipment. All required measurements are made accurately according to the given diagrams and drawings, all OHS requirements are complied with in terms of the regulatory requirements and relevant codes of practice.

INTERNATIONAL COMPARABILITY

For purposes of establishing an international comparability this qualification was compared with similar qualifications in Australia and the United Kingdom. In each of these countries there are suites of qualifications that should be viewed in total in order to conduct a meaningful comparison.

Australia

In Australia there are two government sponsored qualifications that are used for the training of Railway Track Workers. By definition an Australian Railway Track Worker executes a similar set of tasks to those expected from the South African Railway Track Master. These tasks are:

- spreading and tamping ballast to provide firm foundation for sleepers
- cutting rails to length and grinding worn and rough rail ends
- placing sleepers across roadbeds, and positioning and fastening rails on sleepers
- drilling bolt holes, and bolting and welding rail sections
- removing and replacing worn and damaged rails, sleepers and switches
- cleaning and lubricating switches
- examining track, lubricating wheel bearings on rolling stock and maintaining switch signal lamps
- installing and repairing signals and other equipment

The two certificates that are offered by the Centre for Excellence in Rail Training in Brooklyn and Ballarat in Victoria State Australia covers the range of learning units. The units for That correspond with the Part Qualification for Railway Track Welder are:

| Certificate II in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|--|--------------|-------------------|--------------------|
| <ul style="list-style-type: none"> • Apply OHS requirements, policies and procedures in the construction industry | x | x | x |

| | | | |
|--|---|---|---|
| • Carry out measurements and calculations | x | x | x |
| • Read and interpret plans and job specifications | x | x | x |
| • Work safely at heights | x | x | |
| • Control traffic with stop-slow bat | x | x | |
| • Implement traffic management plan | | | x |
| • Maintain and use hand tools | x | x | |
| • Clean equipment and restore worksite | x | x | |
| • Check and assess operational capabilities of equipment | x | x | |
| • Apply track fundamentals | x | x | |
| • Apply awareness of structures fundamentals | x | x | |
| • Operate minor mechanical equipment | x | x | |
| • Install and maintain guard rails | x | x | |
| • Maintain rail joints | x | | |
| • Shift materials safely using manual handling methods | x | x | |
| • Participate in basic workplace communication | x | x | x |
| • Follow work health and safety procedures | x | x | x |
| • Apply fatigue management strategies | x | x | |
| • Apply awareness of safe working rules and regulations | x | x | x |
| • Safely access the rail corridor | x | x | x |
| • Apply environmental procedures to rail infrastructure | x | x | |
| • Operate under track protection rules | x | x | x |
| • Identify the principles of self-propelled rail grinder operations | x | x | |
| • Heat and cut materials using oxy-LPG equipment for the rail industry | x | x | |

| Certificate III in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|---|--------------|-------------------|--------------------|
| Carry out measurements and calculations | x | x | |
| Read and interpret plans and job specifications | x | x | x |
| Process workplace documentation | x | x | x |
| Grind rails | x | x | |
| Grind switches and crossings | x | x | |
| Weld rail using aluminothermic welding process | x | | |
| Weld rail using flashbutt welding process | x | | |

United Kingdom

In the United Kingdom the City and Guilds training organisation conducts training for Track Workers leading to the completion of an apprentice programme. The training caters for learners who would want to start a career in the rail industry and progress either through an apprenticeship or proving competence of the skills and knowledge required for each of the following areas: track, traction and rolling stock, electrification, signalling and telecoms.

They have five qualifications that covers these specialisation areas:

- The Certificate in Rail Engineering Underpinning Knowledge provides serves as an introduction to the railway industry and prepares them for the NVQs in Rail Engineering;

- The NVQs in Rail Engineering will enable the development of professional skills and knowledge in a wide range of specialist areas;
- The Certificate in Rail Engineering Underpinning Knowledge is aimed at apprentices within the rail engineering industry; and
- The NVQs are aimed at anyone working in railways engineering, including those preparing for a specialised role or management responsibility.

The qualifications contain a similar range of learning modules to those included in the South African qualification.

Conclusion

This qualification compares favourably with the various qualifications used in Australia and the United Kingdom as far as content is concerned. In all cases the technical standards are guided by international guidelines. In both Australia and the United Kingdom there are no formal educational entry requirements and in both cases a learner can progress to complete a full trade. The South African qualification might be structured differently but is similar in terms of entry, content, duration and level.

INTEGRATED ASSESSMENT

Integrated formative assessment

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL for access to the external integrated summative assessment

Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification

Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

ARTICULATION

Horizontal

This part qualification articulates horizontally with the following qualification currently being developed:

- National Certificate: Vocational: Civil Engineering and Building Construction; NQF Level 3

Vertical

This part qualification articulates vertically with the following qualification currently being developed

- Occupational Certificate: Railway Construction and Maintenance Practitioner; NQF Level 3.

NOTES

Qualifying for External Assessment

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of statements of results and work experience records.

Additional legal or physical entry requirements

None

Criteria for the Accreditation of Providers

Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The curriculum title and code is: Upholstery Frame Preparer: 683401-000-00-01

Encompassed Trades

This qualification encompasses the following trades as recorded on the NLRD:

- This is not a trade qualification

Assessment Quality Partner (AQP)

National Artisan Moderating Body (NAMB).

MODULES

| Component | ID | MODULE TITLE | NQF LEVEL | CREDITS |
|-----------|-----------------|--|-----------|---------|
| Knowledge | 734212000-KM-01 | Fundamental principles and theories of welding | 2 | 15 |

| | | | | |
|-----------------|------------------|---|---|----|
| Knowledge | 734212000-KM-02 | Concepts and principles of per-way construction and maintenance | 3 | 72 |
| Practical | 734212-000-PM-01 | Operate and care for engineering hand and power tools within a railway construction and maintenance environment, NQF Level 2, 16 Credits; | 2 | 16 |
| Practical | 734212-000-PM-03 | Execute basic grinding and welding work to install and repair railway lines | 3 | 24 |
| Practical | 734212-000-PM-04 | Execute generic railway maintenance and construction tasks | 3 | 24 |
| Practical | 734212-000-PM-05 | Join and repair railway rails using welding techniques | 3 | 24 |
| Work Experience | 734212-000-WM-01 | Apply generic processes and procedures of constructing and maintaining a Railway Lines | 2 | 16 |
| Work Experience | 734212-000-WM-02 | Execute basic per-way maintenance and construction work | 2 | 16 |
| Work Experience | 734212-000-WM-03 | Execute basic grinding and welding work to install and repair railway lines | 2 | 32 |
| Work Experience | 734212-000-WM-05 | Join and repair railway rails using welding techniques | 4 | 32 |
| Work Experience | 734212-000-WM-07 | Execute advanced rail joining, repair and maintenance work | 4 | 32 |

PARENT QUALIFICATION


| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|----------------------|-----------|---------|
| | 734212-000-00-00 | Railway Track Master | 4 | 578 |


PART QUALIFICATIONS

Part qualifications related to this part qualification

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|---|-----------|---------|
| | 734212-000-00-02 | Railway Track Constructor | 4 | 320 |
| | 734212-000-00-03 | Railway Track Construction and Maintenance Practitioner | 4 | 114 |

PART QUALIFICATION 2

| | Curriculum Document | | |
|-------------------|---------------------------|-----------|---|
| Occupational Code | Part Qualification Title | NQF Level |  |
| 734212-000-02 | Railway Track Constructor | 4 | |

| | Name | Email | Phone | Logo | | | | | | | | |
|------------------------------------|--|---|--|---|----------------|----------------------------------|-----------|----------------------|-----|---------------|--|--|
| Development Quality Partner | Transport Education and Training Authority (TETA) | <table border="1"> <tr> <td>Physical Address</td> <td>TETA House 344 Pretoria Avenue Randburg Gauteng</td> </tr> <tr> <td>Postal Address</td> <td>Private Bag X10016 Randburg 2125</td> </tr> <tr> <td>Telephone</td> <td>(011) 577-7000/ 7040</td> </tr> <tr> <td>Fax</td> <td>086 76 505 14</td> </tr> </table> | Physical Address | TETA House 344 Pretoria Avenue Randburg Gauteng | Postal Address | Private Bag X10016 Randburg 2125 | Telephone | (011) 577-7000/ 7040 | Fax | 086 76 505 14 | |  <p>Transport Education Training Authority Heart of Skills Innovation</p> |
| Physical Address | TETA House 344 Pretoria Avenue Randburg Gauteng | | | | | | | | | | | |
| Postal Address | Private Bag X10016 Randburg 2125 | | | | | | | | | | | |
| Telephone | (011) 577-7000/ 7040 | | | | | | | | | | | |
| Fax | 086 76 505 14 | | | | | | | | | | | |
| Assessment Quality Partner | National Artisan Moderating Body (NAMB) | http://www.dhet.gov.za | 012 312 5911 0800 87 2222 086 999 0123 |  <p>higher education & training Department: Higher Education and Training REPUBLIC OF SOUTH AFRICA</p> | | | | | | | | |

QUALIFICATION DETAILS

Qualification Title: Occupational Certificate: Railway Track Constructor.

Occupational Code: 734212.

Quality Assuring Body: Quality Council for Trades and Occupations (QCTO).

Sub-Framework: Occupational Qualifications Sub-Framework.

Field: Field 12 – Physical Planning and Construction.

Subfield: Civil Engineering Construction.

NQF Level: 4.

Credits: 320.

Originator/Development Quality Partner (DQP): Transport Education and Training Authority (TETA)

Qualification Type: Occupational Certificate.

Registered qualifications and or learning programmes to be replaced:

- SAQA ID: 49759; National Certificate: Rail Construction and Maintenance; NQF Level 03; 138 credits; and
- SAQA ID: 61670; Further Education and Training Certificate: Railway Construction and Maintenance; NQF Level 04; 136 credits.

RATIONALE

This part qualification will equip learners with the appropriate knowledge skills and work experience required to execute the work of a Railway Track Constructor who will be able to use specialised construction techniques to participate in the construction and maintenance of railway tracks nationally and internationally.

The development of railway infrastructure is a key driver for economic development. In South Africa, one of the key barriers to accelerated economic development is the provisioning of cost effective and reliable mass transport systems for both freight and passenger services. One of the key strategies in the National Development Plan is the improvement and proper maintenance of infrastructure. Currently and in the future, we will require a dynamic railway sector with the skills and abilities to build and maintain an ever-growing railway network. This qualification is targeted at mobilising and capacitating the fundamental human resource capabilities required to deliver this strategy.

The knowledge and skills components of the qualification is aligned with the International Railway Construction standards (IRIS). The qualification incorporates three-part qualifications that will enable smooth career progression and it will contribute towards skills flexibility and mobility within the sector.

This qualification provides an opportunity for learners, with limited formal education, to enter a trade and will then capacitate them to exit with an NQF Level 4 and progress to the full trade.

This part qualifications will enable qualified learners to gain meaningful employment within the Railway sector. The qualification meets the needs of the various stakeholders and will therefore contribute towards cost efficiency and productivity.

PURPOSE

A Railway Track Constructor maintains rail track infrastructure to ensure the optimum availability and reliability thereof.

RULES OF COMBINATION

This qualification is made up of the following compulsory Knowledge Practical Skills and Work Experience Modules:

Knowledge Modules

Total number of credits for Knowledge Modules: 120

Practical Skill Modules

Total number of credits for Practical Skill Modules: 104

Work Experience Modules

Total number of credits for Work Experience Modules: 96

ENTRY REQUIREMENTS

NQF level 2 with communication, science and maths literacy; Compliance with the medical fitness requirements for employment as a railway worker.

EXIT LEVEL OUTCOMES AND ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1

Apply civil construction processes and techniques to execute basic and specialised railway construction, maintenance and rehabilitation tasks on railway lines.

Associated Assessment Criteria

- Broken block joints/rails are identified, and the different types of breaks are described indicating the most likely causes for these breaks;
- Detailed planning of how to replace railway block joints/tracks describe all the required steps, materials that must be used and accurately indicates the potential risks and delineates a feasible time line for the work;
- The Clearances for a range of railway situations are accurately measured and evaluated indicating any deviations from standard;

- Explanations of the actions required to correct sub-standard clearances are according to internationally accepted railway standards and in accordance with local legislation and related codes of practice;
- Hand screening of railway ballast is executed according to the accepted standard and completed within the time frame and in compliance with all Occupational Health and Safety requirements;
- Constructed railway turnouts are evaluated, all defective components are identified and replace according the internationally accepted railway standards and in compliance with all occupational health and safety standards and related legal determinations;
- Track geometry is accurately measured and calculated in order to determine the relevant railway track standard and classification;
- Using the required tools and equipment the stress-free temperatures of various sections of railway track lines are determined and the most appropriate method for destressing the line is described according to the internationally accepted processes and the tested best practices.

INTERNATIONAL COMPARABILITY

For purposes of establishing an international comparability this part qualification was compared with similar qualifications in Australia and the United Kingdom. In each of these countries there are suites of qualifications that should be viewed in total in order to conduct a meaningful comparison.

Australia

In Australia there are two government sponsored qualifications that are used for the training of Railway Track Workers. By definition an Australian Railway Track Worker executes a similar set of tasks to those expected from the South African Railway Track Master. These tasks are:

- spreading and tamping ballast to provide firm foundation for sleepers
- cutting rails to length and grinding worn and rough rail ends
- placing sleepers across roadbeds, and positioning and fastening rails on sleepers
- drilling bolt holes, and bolting and welding rail sections
- removing and replacing worn and damaged rails, sleepers and switches
- cleaning and lubricating switches
- examining track, lubricating wheel bearings on rolling stock and maintaining switch signal lamps
- installing and repairing signals and other equipment

The two certificates that are offered by the Centre for Excellence in Rail Training in Brooklyn and Ballarat in Victoria State Australia covers the range of learning units. The units that are relevant to this part qualification are listed below:

| Certificate II in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|--|--------------|-------------------|--------------------|
| <ul style="list-style-type: none"> • Apply OHS requirements, policies and procedures in the construction industry | x | x | x |

| | | | |
|--|----------|----------|----------|
| • Carry out measurements and calculations | x | x | x |
| • Read and interpret plans and job specifications | x | x | x |
| • Carry out manual excavation | | x | |
| • Spread and compact materials manually | | x | |
| • Carry out basic levelling | | x | |
| • Carry out concrete work | | x | |
| • Work safely at heights | x | x | |
| • Control traffic with stop-slow bat | x | x | |
| • Maintain and use hand tools | x | x | |
| • Clean equipment and restore worksite | x | x | |
| • Check and assess operational capabilities of equipment | x | x | |
| • Maintain poles and associated hardware | | x | |
| • Carry out routine maintenance of structures | | x | |
| • Apply track fundamentals | x | x | |
| • Apply awareness of structures fundamentals | x | x | |
| • Measure and record track geometry | | x | |
| • Operate minor mechanical equipment | x | x | |
| • Install and maintain guard rails | x | x | |
| • Maintain rail joints | x | | |
| • Propel and operate light on-track equipment | | x | |
| • Operate road/rail vehicle | | x | |
| • Shift materials safely using manual handling methods | x | x | |
| • Participate in basic workplace communication | x | x | x |
| • Follow work health and safety procedures | x | x | x |
| • Apply fatigue management strategies | x | x | |
| • Apply awareness of safe working rules and regulations | x | x | x |
| • Safely access the rail corridor | x | x | x |
| • Install and maintain surface track drainage | | x | |
| • Carry out track ballasting | | x | |
| • Install railway sleepers | | x | |
| • Install and repair temporary track supports | | x | |
| • Install and repair rail fastening systems | | x | |
| • Install and repair fences and gates | | x | |
| • Carry out rail installation | | x | |

| | | | |
|--|----------|----------|----------|
| • Apply environmental procedures to rail infrastructure | x | x | |
| • Operate under track protection rules | x | x | x |
| • Identify the principles of ballast cleaning operations | | x | |
| • Identify the principles of ballast regulator operations | | x | |
| • Identify the principles of self-propelled rail grinder operations | x | x | |
| • Identify the principles of tamping machine operations | | x | |
| • Identify the principles of mechanised track laying operations | | x | |
| • Place and remove temporary speed restriction equipment | | x | |
| • Heat and cut materials using oxy-LPG equipment for the rail industry | x | x | |

| Certificate III in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|---|--------------|-------------------|--------------------|
| Control vegetation on a site | | x | |
| Carry out measurements and calculations | x | x | |
| Read and interpret plans and job specifications | x | x | x |
| Measure and record track geometry | | x | |
| Check and repair track geometry | | x | |
| Check and repair points and crossings | | x | |
| Visually inspect track infrastructure | | x | |
| Adjust rail | | x | |
| Process workplace documentation | x | x | x |
| Install and service rail lubrication equipment | | x | |
| Install and maintain surface track drainage | | x | |
| Install and repair temporary track supports | | x | |
| Install and repair fences and gates | | x | |
| Test rail using non-destructive testing equipment | | x | |
| Implement ballast unloading | | x | |
| Implement track maintenance and construction | | x | |
| Install and repair rail earthworks | | x | |
| Install turnouts | | x | |
| Grind rails | x | x | |
| Grind switches and crossings | x | x | |
| Operate minor track equipment | | x | |

As indicated there is a significant correlation between the Australian Certificates and the South African Part Qualification. In the South African Qualification the operation of equipment is limited to those utilised on site and this training will take place during the work experience component of the Qualification.

United Kingdom

In the United Kingdom the City and Guilds training organisation conducts training for Track Workers leading to the completion of an apprentice programme. The training caters for learners who would want to start a career in the rail industry and progress either through an apprenticeship or proving competence of the skills and knowledge required for each of the following areas: track, traction and rolling stock, electrification, signalling and telecoms.

They have five qualifications that covers these specialisation areas:

- The Certificate in Rail Engineering Underpinning Knowledge provides serves as an introduction to the railway industry and prepares them for the NVQs in Rail Engineering;
- The NVQs in Rail Engineering will enables the development of professional skills and knowledge in a wide range of specialist areas;
- The Certificate in Rail Engineering Underpinning Knowledge is aimed at apprentices within the rail engineering industry; and
- The NVQs are aimed at anyone working in railways engineering, including those preparing for a specialised role or management responsibility.

The qualifications contain a similar range of learning modules to those included in the South African qualification.

Conclusion

This qualification compares favourably with the various qualifications used in Australia and the United Kingdom as far as content is concerned. In all cases the technical standards are guided by international guidelines. In both Australia and the United Kingdom there are no formal educational entry requirements and in both cases a learner can progress to complete a full trade. The South African qualification might be structured differently but is similar in terms of entry, content, duration and level.

INTEGRATED ASSESSMENT

Integrated formative assessment

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL for access to the external integrated summative assessment

Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification

Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

ARTICULATION

Horizontal

This part qualification articulates horizontally with the following qualification currently being developed:

- Occupational Certificate: Railway Construction and Maintenance Practitioner, NQF Level 04.

Vertical

This part qualification articulates vertically with the following qualification currently being developed:

- National Diploma: Management of Civil Engineering Construction Processes; NQF Level 05.

NOTES

Qualifying for External Assessment

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of statements of results and work experience.

Additional Legal or Physical Entry Requirements

None

Criteria for the Accreditation of Providers

Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The curriculum title and code are: Railway Track Constructor: 734212-000-00-02

Trades encompassed

This qualification encompasses the following trades as recorded on the NLRD:

- This is not a trade qualification.

Assessment Quality Partner (AQP)

National Artisan Moderating Body (NAMB).

MODULES

| Component | ID | MODULE TITLE | NQF LEVEL | CREDITS |
|-----------------|------------------|---|-----------|---------|
| Knowledge | 734212000-KM-01 | Fundamental principles and theories of welding | 2 | 15 |
| Knowledge | 734212000-KM-02 | Concepts and principles of per-way construction and maintenance | 3 | 72 |
| Knowledge | 734212000-KM-03 | Railway Track Diagnostics | 4 | 33 |
| Practical | 734212-000-PM-01 | Operate and care for engineering hand and power tools within a railway construction and maintenance environment, NQF Level 2, 16 Credits; | 2 | 16 |
| Practical | 734212-000-PM-02 | Execute basic per-way maintenance and construction work | 2 | 24 |
| Practical | 734212-000-PM-04 | Execute generic railway maintenance and construction tasks | 3 | 24 |
| Practical | 734212-000-PM-06 | Build and construct specialised railway lines and related infrastructure | 4 | 16 |
| Practical | 734212-000-PM-07 | Execute advanced rail joining, repair and maintenance work | 4 | 24 |
| Work Experience | 734212-000-WM-01 | Apply generic processes and procedures of constructing and maintaining a Railway Lines | 2 | 16 |
| Work Experience | 734212-000-WM-02 | Execute basic per-way maintenance and construction work | 2 | 16 |
| Work Experience | 734212-000-WM-04 | Execute generic railway maintenance and construction tasks | 3 | 32 |
| Work Experience | 734212-000-WM-06 | Build and construct specialised railway lines and related infrastructure | 4 | 32 |

PARENT QUALIFICATION

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|-----------------|-------|-----------|---------|
|---------|-----------------|-------|-----------|---------|


| | | | | |
|--|------------------|-----------------------|---|-----|
| | 683401-000-00-00 | Furniture Upholsterer | 4 | 549 |
|--|------------------|-----------------------|---|-----|



PART QUALIFICATIONS

Part qualifications related to this part qualification

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|---|-----------|---------|
| | 734212-000-00-01 | Railway Track Welder | 3 | 303 |
| | 734212-000-00-03 | Railway Track Construction and Maintenance Practitioner | 4 | 114 |

PART QUALIFICATION 3

| | | Curriculum Document | |
|-------------------|--|---------------------|---|
| Occupational Code | Part Qualification Title | NQF Level | |
| 734212-000-03 | Railway Track Construction and Maintenance Practitioner | 4 |  |

| | Name | Email | Phone | Logo | | | | | | | | |
|------------------------------------|--|---|--|---|----------------|----------------------------------|-----------|----------------------|-----|---------------|--|---|
| Development Quality Partner | Transport Education and Training Authority (TETA) | <table border="1"> <tr> <td>Physical Address</td> <td>TETA House 344 Pretoria Avenue Randburg Gauteng</td> </tr> <tr> <td>Postal Address</td> <td>Private Bag X10016 Randburg 2125</td> </tr> <tr> <td>Telephone</td> <td>(011) 577-7000/ 7040</td> </tr> <tr> <td>Fax</td> <td>086 76 505 14</td> </tr> </table> | Physical Address | TETA House 344 Pretoria Avenue Randburg Gauteng | Postal Address | Private Bag X10016 Randburg 2125 | Telephone | (011) 577-7000/ 7040 | Fax | 086 76 505 14 | |  |
| Physical Address | TETA House 344 Pretoria Avenue Randburg Gauteng | | | | | | | | | | | |
| Postal Address | Private Bag X10016 Randburg 2125 | | | | | | | | | | | |
| Telephone | (011) 577-7000/ 7040 | | | | | | | | | | | |
| Fax | 086 76 505 14 | | | | | | | | | | | |
| Assessment Quality Partner | National Artisan Moderating Body (NAMB) | http://www.dhet.gov.za | 012 312 5911 0800 87 2222 086 999 0123 |  | | | | | | | | |

QUALIFICATION DETAILS

Qualification Title: Occupational Certificate: Railway Track Construction and Maintenance Practitioner.

Occupational Code: 734212.

Quality Assuring Body: Quality Council for Trades and Occupations (QCTO).

Sub-Framework: Occupational Qualifications Sub-Framework.

Field: Field 12 – Physical Planning and Construction.

Subfield: Civil Engineering Construction.

NQF Level: 4.

Credits: 114.

Originator/Development Quality Partner (DQP): Transport Education and Training Authority (TETA)

Qualification Type: Occupational Certificate.

Registered qualifications and or learning programmes to be replaced:

- SAQA ID: 49759; National Certificate: Rail Construction and Maintenance; NQF Level 03; 138 credits; and
- SAQA ID: 61670; Further Education and Training Certificate: Railway Construction and Maintenance; NQF Level 04; 136 credits.

RATIONALE

This part qualification will equip learners with the appropriate knowledge skills and work experience required to execute the work of a Railway Track Construction and Maintenance Practitioner who will be able to use specialised construction and construction management techniques to lead the construction and maintenance of railway tracks nationally and internationally.

The development of railway infrastructure is a key driver for economic development. In South Africa, one of the key barriers to accelerated economic development is the provisioning of cost effective and reliable mass transport systems for both freight and passenger services. One of the key strategies in the National Development Plan is the improvement and proper maintenance of infrastructure. Currently and in the future, we will require a dynamic railway sector with the skills and abilities to build and maintain an ever-growing railway network. This qualification is targeted at mobilising and capacitating the fundamental human resource capabilities required to deliver this strategy.

The knowledge and skills components of the qualification is aligned with the International Railway Construction standards (IRIS). The qualification incorporates three-part qualifications that will enable smooth career progression and it will contribute towards skills flexibility and mobility within the sector.

This qualification provides an opportunity for learners, with limited formal education, to enter a trade and will then capacitate them to exit with an NQF Level 4 and progress to the full trade.

This part qualifications will enable qualified learners to gain meaningful employment within the Railway sector. The qualification meets the needs of the various stakeholders and will therefore contribute towards cost efficiency and productivity.

PURPOSE

A Railway Track Construction and Maintenance Practitioner oversees and manages the total track maintenance and construction activities and guides and coordinate the delivery of quality track maintenance and construction work.

RULES OF COMBINATION

This qualification is made up of the following compulsory Knowledge Practical Skills and Work Experience Modules:

Knowledge Modules

Total number of credits for Knowledge Modules: 66

Practical Skill Modules

Total number of credits for Practical Skill Modules: 16

Work Experience Modules

Total number of credits for Work Experience Modules: 32

ENTRY REQUIREMENTS

Successful completion of Part Qualification 1 or 2 (Railway Track Welder or Railway Track Constructor

EXIT LEVEL OUTCOMES AND ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1

Manage rail construction and maintenance projects and processes

Associated Assessment Criteria

- Measured results of track conditions are accurately read, interpreted and the priority actions to deal with defects are listed and described in terms of internationally accepted railway practices and local legislative requirements;
- Various sections of railway tracks are inspected and the quality of the construction and maintenance work on these tracks are assessed. Reports on this assessment is accurate and indicates all the defects, problems and potential problems associated with the completed work;

- Reflection on the appropriate application of the occupational health, safety and environmental requirements associated with the work being done during railway track construction and maintenance demonstrates a deep understanding of the practical hazards and risks associated with railway construction and maintenance work;
- Planning for the execution of rail construction and maintenance activities are completed within the parameters of an approved budget and time frames and in compliance with all Occupational Health safety and environmental requirements;
- End products delivered by construction and maintenance machines are evaluated and quality assured according to the international leading practices for such work, all defects are identified, and the potential short, medium and long-term consequences of these defects are described.

INTERNATIONAL COMPARABILITY

For purposes of establishing an international comparability this qualification was compared with similar qualifications in Australia and the United Kingdom. In each of these countries there are suites of qualifications that should be viewed in total in order to conduct a meaningful comparison.

Australia

In Australia there are two government sponsored qualifications that are used for the training of Railway Track Workers. By definition an Australian Railway Track Worker executes a similar set of tasks to those expected from the South African Railway Track Master. These tasks are:

- spreading and tamping ballast to provide firm foundation for sleepers
- cutting rails to length and grinding worn and rough rail ends
- placing sleepers across roadbeds, and positioning and fastening rails on sleepers
- drilling bolt holes, and bolting and welding rail sections
- removing and replacing worn and damaged rails, sleepers and switches
- cleaning and lubricating switches
- examining track, lubricating wheel bearings on rolling stock and maintaining switch signal lamps
- installing and repairing signals and other equipment

The two certificates that are offered by the Centre for Excellence in Rail Training in Brooklyn and Ballarat in Victoria State Australia covers the range of learning units the units that compare with this part qualification are listed below:

| Certificate II in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|--|--------------|-------------------|--------------------|
| • Apply OHS requirements, policies and procedures in the construction industry | x | x | x |
| • Carry out measurements and calculations | x | x | x |
| • Read and interpret plans and job specifications | x | x | x |
| • Implement traffic management plan | | | x |

| | | | |
|---|---|---|---|
| • Participate in basic workplace communication | x | x | x |
| • Follow work health and safety procedures | x | x | x |
| • Apply awareness of safe working rules and regulations | x | x | x |
| • Safely access the rail corridor | x | x | x |
| • Work effectively with others | | | x |
| • Use info technology devices in the workplace | | | x |
| • Operate under track protection rules | x | x | x |

| Certificate III in Rail Infrastructure | Track Welder | Track Constructor | Track Practitioner |
|--|--------------|-------------------|--------------------|
| Read and interpret plans and job specifications | x | x | x |
| Apply site risk management system | | | x |
| Examine track infrastructure | | | x |
| Process workplace documentation | x | x | x |
| Conduct workplace information briefings | | | x |
| Apply accident-emergency procedures | | | x |
| Implement and monitor work health and safety procedures | | | x |
| Apply safe working rules and regulations to rail functions | | | x |
| Work effectively with others | | | x |
| Lead a work team or group | | | x |
| Apply customer service skills | | | x |
| Apply quality systems | | | x |
| Implement and monitor environmental protection policies and procedures | | | x |

As indicated there is a significant correlation between the Australian Certificates and the South African Trade Qualification. In the South African Qualification the operation of equipment is limited to those utilised on site and this training will take place during the work experience component of the Qualification.

United Kingdom

In the United Kingdom the City and Guilds training organisation conducts training for Track Workers leading to the completion of an apprentice programme. The training caters for learners who would want to start a career in the rail industry and progress either through an apprenticeship or proving competence of the skills and knowledge required for each of the following areas: track, traction and rolling stock, electrification, signalling and telecoms.

They have five qualifications that covers these specialisation areas:

- The Certificate in Rail Engineering Underpinning Knowledge provides serves as an introduction to the railway industry and prepares them for the NVQs in Rail Engineering;
- The NVQs in Rail Engineering will enables the development of professional skills and knowledge in a wide range of specialist areas;
- The Certificate in Rail Engineering Underpinning Knowledge is aimed at apprentices within the rail engineering industry; and
- The NVQs are aimed at anyone working in railways engineering, including those preparing for a specialised role or management responsibility.

The qualifications contain a similar range of learning modules to those included in the South African qualification.

Conclusion

This qualification compares favourably with the various qualifications used in Australia and the United Kingdom as far as content is concerned. In all cases the technical standards are guided by international guidelines. In both Australia and the United Kingdom there are no formal educational entry requirements and in both cases a learner can progress to complete a full trade. The South African qualification might be structured differently but is similar in terms of entry, content, duration and level.

INTEGRATED ASSESSMENT

Integrated formative assessment

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL for access to the external integrated summative assessment

Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification

Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

ARTICULATION

Horizontal

This qualification articulates horizontally with the following qualification currently being developed:

- Occupational Certificate: National Certificate: Vocational: Civil Engineering and Construction; NQF Level 04.

Vertical

This qualification articulates vertically with the following qualification currently being developed:

- National Diploma: Management of Civil Engineering Construction Processes; NQF Level 05.

NOTES

Qualifying for External Assessment

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of statements of results and work experience records including the Foundational Learning Competence.

Additional Legal or Physical entry Requirements

None

Criteria for the Accreditation of Providers

Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The curriculum title and code is: Upholstery Cover Fitter and Template Maker: 683401-000-00-03

Trades Encompassed

This qualification encompasses the following trades as recorded on the NLRD:

- This is not a trade qualification.

Assessment Quality Partner (AQP)

National Artisan Moderating Body (NAMB).

MODULES

| Component | ID | MODULE TITLE | NQF LEVEL | CREDITS |
|-----------------|------------------|---|-----------|---------|
| Knowledge | 734212000-KM-04 | Concepts of managing and supervising per-way construction and maintenance | 4 | 66 |
| Practical | 734212-000-PM-08 | Supervise and oversee the execution of rail construction and maintenance activities | 4 | 16 |
| Work Experience | 734212-000-WM-08 | Supervise and oversee the execution of rail construction and maintenance activities | 4 | 32 |

PARENT QUALIFICATION

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|----------------------|-----------|---------|
| | 734212-000-00-00 | Railway Track Master | 4 | 578 |

PART QUALIFICATIONS

Part qualifications related to this part qualification

| SAQA ID | Curriculum Code | Title | NQF Level | Credits |
|---------|------------------|---------------------------|-----------|---------|
| | 734212-000-00-01 | Railway Track Welder | 3 | 303 |
| | 734212-000-00-02 | Railway Track Constructor | 4 | 320 |