Pearson
BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence)

Specification

New Apprenticeship Standards –
Competence-based qualification (England only)

First registration November 2017

Edexcel, BTEC and LCCI qualifications

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All information in this specification is correct at time of publication.

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1 Introducing BTEC Competence-based qualifications for the New Apprenticeship Standards

Overview

In October 2013, the government began the implementation of the plan to reform apprenticeships in England. The reform includes changes that move the design of apprenticeships into the hands of employers with the aim of making them more rigorous and responsive to employers' needs. Employer groups, referred to as Trailblazers, now lead on the development of apprenticeships for occupations where they identify the need for apprentices.

Pearson has been working closely with different Trailblazers in developing assessment programmes and different types of qualification to support the delivery of these new apprenticeships. One type of qualification that Trailblazers have valued as a part of these new apprenticeships is competence-based qualifications.

Within the new apprenticeships, competence-based qualifications give learners the opportunity to develop and demonstrate their competence in line with the Apprenticeship Standards developed by Trailblazers. These new Apprenticeship Standards describe the knowledge, skills and behaviours (KSBs) required to undertake a specific occupation well and to operate confidently within a sector. They focus on how an apprentice should demonstrate mastery of an occupation, and meet professional registration requirements in sectors, where these exist.

Competence-based qualifications are outcome-based with no fixed learning programme, therefore allowing flexible delivery to meet the individual needs of learners and their employers. Learners will work towards their qualification in the workplace or in settings that replicate the working environment as specified in the assessment requirements from the Trailblazers.

Employers, or colleges and training centres working in partnership with employers, can offer these qualifications as long as they have access to appropriate physical and human resources and the necessary quality assurance systems in place.

Sizes of Competence-based qualifications

For all regulated qualifications, we specify a total number of hours that learners are expected to undertake in order to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The TQT value indicates the size of a qualification.

Within the TQT, we identify the number of Guided Learning Hours (GLH) that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.

As well as guided learning, there may be other required learning that is directed by tutors or assessors. This includes, for example, private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

As well as TQT and GLH, qualifications can also have a credit value – equal to one tenth of TQT, rounded to the nearest whole number.

TQT and credit values are assigned after consultation with employers and training providers delivering the qualifications.

2 Qualification summary and key information

Qualification title	Pearson Edexcel Level 2 Diploma in Rail Engineering Operative (Foundation Competence)
Qualification Number (QN)	603/2572/0
Regulation start date	31/10/2017
Operational start date	01/11/2017
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from embarking on this qualification. Please refer to the assessment requirements in *Section 8 Assessment*.
Total Qualification Time (TQT)	360
Guided learning (GL)	360
Assessment	Portfolio of evidence (internal assessment).
Grading information	The qualification and units are graded pass/fail.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. However, centres must follow the Pearson Access and Recruitment policy (see *Section 7 Access and recruitment*).
Funding	Qualifications eligible and funded for post-16-year-olds can be found on the funding hub. The Skills Funding Agency also publishes a funding catalogue that lists the qualifications available for 19+ funding.

Centres will need to use the Qualification Number (QN) when they seek public funding for their learners. The qualification title, unit titles and QN will appear on each learner's final certificate. Centres should tell learners this when recruiting them and registering them with Pearson. There is more information about certification in our *UK Information Manual,* available on our website qualifications.pearson.com

3 Qualification purpose

Qualification objectives

The Pearson BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence) is for learners who work in, or who want to work in the Rail Engineering sector. The qualification gives learners the opportunity to:

- develop the technical skills, role-related knowledge and understanding, and behaviours required to work in a job role such as Rail Engineering Operative
- demonstrate competence in the relevant job roles
- have existing skills recognised
- achieve a nationally-recognised Level 2 qualification
- develop personal growth and engagement in learning.

Relationship with previous qualifications

This is a new qualification.

Apprenticeships

The Pearson BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence) is a mandatory requirement within the Apprenticeship Standard for Rail Engineering Operative. Learners must achieve this qualification before progressing to the end-point assessment.

The published Apprenticeship Standard and Assessment Plan for Rail Engineering Operative can be found at:

www.gov.uk/government/uploads/system/uploads/attachment_data/file/517326/Rail_Engineering_Operative_L2.pdf

Progression opportunities

Learners who achieve the Pearson BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence) can use the qualification as evidence of learning for the on-programme development phase of the Rail Engineering Operative Apprenticeship. The knowledge, skills and behaviours gained from the qualification will enable them to progress to the end-point assessment (EPA) for the apprenticeship. Learners could also progress to rail engineering operative job roles or continue their studies in rail engineering at Level 3 or to other related Level 3 qualifications.

Industry support and recognition

The Pearson BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence) was developed through close collaboration with the Rail Engineering Trailblazer Group, professional bodies and other awarding organisations.

This qualification is recognised by:

- employers
  - AB Schenker
  - Alstom Transport UK Limited
  - Amey
  - Automation Holdings Limited
  - BB Rail
  - Babcock International Group – Network Engineering
  - Carillion plc
  - DB Schenker Rail UK Limited
  - DEG Signal Ltd
  - Docklands Light Railway
  - Eurostar International Ltd
  - First Group
  - High Speed Two Limited
  - Hitachi Rail Europe Ltd
  - London Midland
  - Merseyrail Electrics 2002 Limited
  - MGB Engineering Ltd
  - Network Rail
  - Northern Rail
  - Siemens Rail Systems
  - Signalling Solutions Ltd
  - Stagecoach South Western Trains Limited
  - Telent Technology Services Ltd
  - Transport for London
  - Virgin Trains East Coast
  - VolkerRail Ltd
- professional organisations
  - The Institute of Engineering and Technology (IET)
  - The Institute of Mechanical Engineers (IMechE)
  - The Institute of Railway Signal Engineers (IRSE)

- The sector skills council, SEMTA – the sector skills council for engineering
- The National Skills Academy for Rail (NSAR).

4 Qualification structure

Pearson BTEC Level 2 Diploma in Rail Engineering Operative (Foundation Competence)

The learner will need to meet the requirements outlined below before the qualification can be awarded.

To achieve this qualification learners must complete **all three mandatory units plus a selection of units from their chosen pathway.**
(See below for detailed requirements).

Unit number	Mandatory units	Level	Guided learning	Total Unit Time (builds up to TQT)
1	Complying with Statutory Regulations and Organisational Safety Requirements	2	100	100
2	Using and Interpreting Engineering Data and Documentation	2	50	50
3	Working Efficiently and Effectively as a Rail Engineering Operative	2	50	50

Unit number	Pathway 1 Signalling mandatory units (complete all units)	Level	Guided learning	Total Unit Time (builds up to TQT)
4	Determine Requirements for the Safe Access to Work Locations for Signal Engineering	2	30	30
5	Assist in the Removal of Signalling Equipment	2	30	30
6	Assist in the Replacement of Signalling Equipment	2	30	30
7	Reinstate the Work Area after Signal Engineering Activities	2	20	20
Signalling optional unit Group 1 (choose *at least one* of the following)				
8	Establish Information for Signal Engineering Installation	2	30	30
9	Establish Information for Signal Engineering Maintenance or Fault-finding	2	30	30
Signalling optional unit Group 2 (choose *at least one* of the following)				
10	Installation of Signalling Equipment Using Non-complex Processes	2	30	30
11	Maintenance of Signalling Equipment Using Non-complex Processes	2	30	30
12	Assist with Tests and Checks of Signalling Equipment	2	30	30

Unit number	Pathway 2 Telecoms mandatory units (complete all units)	Level	Guided learning	Total Unit Time (builds up to TQT)
13	Determine Requirements for the Safe Access to Work Locations for Telecoms Engineering	2	30	30
14	Assist in the Removal of Telecoms Equipment	2	30	30
15	Assist in the Replacement of Telecoms Equipment	2	30	30
16	Reinstate the Work Area After Telecoms Engineering Activities	2	20	20
Telecoms optional unit Group 1 (choose *at least one* of the following)				
17	Establish Information for Telecoms Engineering Installation	2	30	30
18	Establish Information for Telecoms Engineering Maintenance and/or Fault-finding	2	30	30
Telecoms optional unit Group 2 (choose at least one of the following)				
19	Installation of Telecoms Equipment Using Non-complex Processes	2	30	30
20	Maintenance of Telecoms Equipment Using Non-complex Processes	2	30	30
21	Assist with Tests and Checks of Telecoms Equipment	2	30	30
	Pathway 3 **Track mandatory units (complete all units)**			
22	Restore Rail Switches and Crossings to Operational Condition	2	50	50
23	Restore Track Geometry Faults to Operational Condition by the Manual Repair of Permanent Way Assets and Components	2	30	30
24	Restore Plain Line Track Geometry to Operational Condition	2	50	50
25	Undertake Replacement of Permanent Way Assets and Components	2	40	40

Unit number	Pathway 4 Traction and Rolling Stock mandatory unit (complete this unit)	Level	Guided learning	Total Unit Time (builds up to TQT)
26	Assist in the Installation of Traction and Rolling Stock Equipment	2	50	50
Traction and Rolling Stock optional units (choose *at least two* of the following)				
27	Carry Out Scheduled Maintenance on Traction and Rolling Stock Mechanical Equipment	2	60	60
28	Carry Out Scheduled Maintenance on Traction and Rolling Stock Electrical Equipment	2	60	60
29	Carry Out Scheduled Maintenance on Traction and Rolling Stock Communications-electronic Equipment	2	60	60
30	Carry Out Scheduled Maintenance on Traction and Rolling Stock Fluid Power Equipment	2	60	60

Unit number	Pathway 5 Electrification mandatory units (complete all units)	Level	Guided learning	Total Unit Time (builds up to TQT)
31	Plan Railway Electrification Engineering Activities	2	30	30
32	Assist in Preparing Resources for Railway Electrification Engineering Activities	2	30	30
33	Establish the Operational Condition of Electrification and Plant Assets	2	40	40
34	Assist with Maintenance on Railway Electrification Equipment and Components	2	40	40
35	Assist in Preventative and Corrective Maintenance of Traction Cabling Systems	2	40	40
Pathway 6 Overhead Line Equipment mandatory unit (complete this unit)				
36	Access Overhead Line Equipment Construction Sites	2	40	40
Overhead Line Equipment optional units (choose *at least three* of the following)				
37	Undertake Overhead Line Equipment Main Steelwork Installation Under Direction	2	40	40
38	Undertake Overhead Line Equipment Small Part Steelwork Installation Under Direction	2	40	40
39	Undertake Overhead Line Equipment Wiring Installation Under Direction	2	40	40
40	Undertake Installation of Overhead Line Equipment Sectioning, Insulation, Registration and In-span Components Under Direction	2	40	40
41	Undertake Installation, Enhancement and Renewal of Overhead Line Equipment Earthing and Bonding Under Direction	2	40	40

5 Programme delivery

Centres are free to offer these qualifications using any mode of delivery that meets learners' and employers' needs.

Learners must be employed as an apprentice in the job role specified in the Apprenticeship Standard and have an apprenticeship agreement in place at the start of the apprenticeship programme. Centres must make sure that learners have access to specified resources and to the sector specialists delivering and assessing the units. Centres must adhere to the Pearson policies that apply to the different models of delivery. Our policy *Collaborative arrangements for the delivery of vocational qualifications* can be found on our website.

There are various approaches to delivering a successful, competence-based qualification; the section below outlines elements of good practice that centres can adopt, as appropriate to the requirements of the apprenticeship programme.

Elements of good practice

- Carrying out a thorough induction for learners to ensure that they completely understand the apprenticeship programme and what is expected of them. The induction could include, for example, the requirements of the apprenticeship programme, an initial assessment of current competency levels, assessment of individual learning styles, identification of training needs, an individual learning plan, details of training delivery and the assessment process.
- Having regular progress meetings with the learner to keep them engaged and motivated, and ensuring that there are open lines of communication among all those involved in delivering the training and assessment.
- Using a range of flexible delivery and assessment approaches to meet the needs of the learner and the business context and requirements, for example virtual learning environments (VLEs), online lectures, video, printable online resources, virtual visits, webcams for distance training, e-portfolios.
- Balancing on-the-job and off-the-job training to meet the requirements of the apprenticeship. It is a mandatory requirement in the new apprenticeships that learners have a minimum of 20% or equivalent off-the-job training. Trainers need to use a range of teaching and learning methods to deliver this training effectively while still meeting varying learner needs. Examples of teaching and learning methods include enquiry-based learning, real-world problem solving, reflective practice, questioning and discussions, demonstration, practising ('trial and error'), simulation and role-play, peer learning and virtual environments. Trainers also need to plan opportunities for the development and practising of skills on the job. The on-the-job element of the programme offers opportunities for assessment and plays an important role in developing the learner's routine expertise, resourcefulness, craftspersonship and business-like attitude. It is important that there is intentional structuring of practice and guidance to supplement the learning and development provided through engagement in everyday work activities. Teaching and learning methods, such as coaching, mentoring, shadowing, observation, collaboration and consultation, could be used in this structured on-the-job learning.

- Developing a holistic approach to assessment by matching evidence to the required competencies, as appropriate and wherever possible, to reduce the assessment burden on learners and assessors. It is good practice to draw up an assessment plan that aligns the competencies to be achieved with the learning process to indicate how and when assessment will take place.
- Discussing and agreeing with the learner and their line manager suitable times, dates and work areas where assessment will take place. Learners and managers should be given regular and relevant feedback on performance and progress.
- Ensuring that learners are allocated a mentor in the workplace to assist them in the day-to-day working environment and to act as a contact for the assessor/trainer.
- Ensuring that sufficient and relevant work is given to learners in order to allow them to gain wider employment experience and enable them to develop the competencies and the related knowledge, skills and behaviours stated in the Apprenticeship Standard within their contracted working hours.
- For further information on the delivery and assessment of the New Apprenticeships Standards, please refer to *The Trailblazer Apprenticeship Funding Rules* at: www.gov.uk/government/collections/sfa-funding-rules

6 Centre resource requirements

As part of the approval process, centres must make sure that the resource requirements below are in place before offering the qualification.

- Centres must have the appropriate physical resources to support delivery and assessment of the qualification. For example, a workplace in line with industry standards, or a realistic working environment (RWE), where permitted, as specified in the assessment strategy for the sector, equipment, IT, learning materials, teaching rooms.
- Where an RWE is permitted, it must offer the same conditions as the normal, day-to-day working environment, with a similar range of demands, pressures and requirements for cost-effective working.
- Centres must meet any specific human and physical resource requirements outlined in the assessment strategy in *Annexe A*. Staff assessing learners must meet the occupational competence requirements within the overarching assessment strategy for the sector. There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have appropriate health and safety policies, procedures and practices in place for the delivery and assessment of the qualification.
- Centres must have in place robust internal verification systems and procedures to ensure the quality and authenticity of learners' work as well as the accuracy and consistency of assessment decisions between Assessors operating at the centre. For information on the requirements for implementing assessment processes in centres, please refer to the *NVQ Quality Assurance Centre Handbook* and the *Pearson Edexcel NVQs, SVQs and competence-based qualifications – Delivery Requirements and Quality Assurance Guidance* on our website.
- Centres must deliver the qualification in accordance with current equality legislation. For further details on Pearson's commitment to the Equality Act 2010, please see *Section 7 Access and recruitment*. For full details on the Equality Act 2010, visit www.legislation.gov.uk

7 Access and recruitment

Our policy on access to our qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres must ensure that their learner recruitment process is conducted with integrity. This includes ensuring that applicants have appropriate information and advice about the qualification to ensure that it will meet their needs.

All learners undertaking an Apprenticeship Standard must be employed and have a contract of employment at the start of the first day of their apprenticeship.

Centres should review applicants' prior qualifications and/or experience, considering whether this profile shows that they have the potential to achieve the qualification.

Prior knowledge, skills and understanding

No prior knowledge, understanding, skills or qualifications are required for learners to register for this qualification.

Access to qualifications for learners with disabilities or specific needs

Equality and fairness are central to our work. Pearson's *Equality Policy* requires all learners to have equal opportunity to access our qualifications and assessments and that our qualifications are awarded in a way that is fair to every learner.

We are committed to making sure that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve from undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

For learners with disabilities and specific needs, the assessment of their potential to achieve the qualification must identify, where appropriate, the support that will be made available to them during delivery and assessment of the qualification. Please see the information regarding reasonable adjustments and special consideration in *Section 8 Assessment*.

8 Assessment

To achieve a pass for this qualification, the learner must achieve all the units required in the stated qualification structure.

Language of assessment

Assessments for the units in this qualification are in English only.

A learner taking the qualification may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Adjustments for candidates with disabilities and learning difficulties, Access Arrangements, Reasonable Adjustments and Special Consideration, General and Vocational qualifications*. The document is available on our website.

Internal assessment

The units in this qualification are assessed through an internally and externally quality assured Portfolio of Evidence made up of evidence gathered during the course of the learner's work.

Each unit has specified learning outcomes and assessment criteria. To pass each unit the learner must:

- achieve **all** the specified learning outcomes
- satisfy **all** the assessment criteria by providing sufficient and valid evidence for each criterion
- prove that the evidence is their own.

The learner must have an assessment record that identifies the assessment criteria that have been met. The assessment record should be cross-referenced to the evidence provided. The assessment record should include details of the type of evidence and the date of assessment. Suitable centre documentation should be used to form an assessment record.

It is important that the evidence provided to meet the assessment criteria for the unit and learning outcomes:

valid	is relevant to the standards for which competence is claimed
authentic	is produced by the learner
current	is sufficiently recent to create confidence that the same skill, understanding or knowledge persist at the time of the claim
reliable	indicates that the learner can consistently perform at this level
sufficient	fully meets the requirements of the standards.

Recognition of Prior Learning (RPL) – where a learner can demonstrate that they can meet a unit's requirements through knowledge, understanding or skills they already possess without undertaking a course of development. They must submit sufficient, reliable, authentic and valid evidence for assessment. Evidence submitted that is based on RPL should give the centre confidence that the same level of skill, understanding and knowledge exists at the time of claim as existed at the time the evidence was produced. RPL is acceptable for accrediting a unit, several units, or a whole qualification at the employer's discretion.

Further guidance is available in our policy document *Recognition of Prior Learning Policy and Process*, available on our website.

Assessment strategy

The assessment strategy for the qualification is included in *Annexe A*. It sets out the overarching assessment principles and the framework for assessing the units to ensure that the qualification remains valid and reliable. It has been developed by SEMTA in partnership with the National Skills Academy for Rail (NSAR), employers, training providers, awarding organisations and the regulatory authorities.

Types of evidence

To achieve a unit, the learner must gather evidence that shows that they have met the required standard specified in the assessment criteria, Pearson's quality assurance arrangements (please see *Section 10 Quality assurance of centres*) and the requirements of the assessment strategy given in *Annexe A*.

In line with the assessment strategy, evidence for internally-assessed units can take a variety of forms as indicated below:

- direct observation of the learner's performance by their assessor (O)
- outcomes from oral or written questioning (Q&A)
- products of the learner's work (P)
- personal statements and/or reflective accounts (RA)
- professional discussion (PD)
- authentic statements/witness testimony (WT)[1]
- expert witness testimony (EWT)
- evidence of Recognition of Prior Learning (RPL).

Learners can use the abbreviations in their portfolios for cross-referencing purposes.

[1] Please refer to the assessment strategy for guidance on the use of witness testimony

Learners can also use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. It is not necessary for learners to have each assessment criterion assessed separately. They should be encouraged to reference evidence to the relevant assessment criteria. However, the evidence provided for each unit must clearly reference the unit being assessed. Evidence must be available to the Assessor, the Internal Verifier and the Pearson Standards Verifier.

Any specific evidence requirements for a unit are given in the *Assessment* section of the unit.

Further guidance on the requirements for centre quality assurance and internal verification processes is available on our website. Please see *Section 12 Further information and useful publications* for details.

Assessment of knowledge and understanding

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide sufficient evidence for knowledge-based learning outcomes and assessment criteria. Where the learner's knowledge and understanding is not apparent from performance evidence, it must be assessed through other valid methods and be supported by suitable evidence. The evidence provided to meet these learning outcomes and assessment criteria must be in line with the SEMTA's assessment strategy. Any specific assessment requirements are stated in the *Unit assessment requirements* section of each unit in *Section 11 Unit format*.

Appeals

Centres must have a policy for dealing with appeals from learners. Appeals may relate to incorrect assessment decisions or unfairly conducted assessment. The first step in such a policy is a consideration of the evidence by a Lead Internal Verifier or other member of the programme team. The assessment plan should allow time for potential appeals after learners have been given assessment decisions.

Centres must document all learners' appeals and their resolutions. Further information on the appeals process can be found in our *Enquiries and Appeals about Pearson vocational qualifications policy,* available on our website.

Dealing with malpractice

Malpractice means acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actions (or attempted actions) of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where incidents (or attempted incidents) of malpractice have been proven.

Malpractice may arise or be suspected in relation to any unit or type of assessment within the qualification. For further details on malpractice and advice on preventing malpractice by learners, please see *Pearson's Centre Guidance: Dealing with Malpractice*, available on our website.

Internal assessment

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Mal*practice document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe that a centre is failing to conduct internal assessment according to our policies. The above document gives more information and examples, and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

The head of centre is required to report incidents of suspected learner malpractice that occur during Pearson examinations. We ask centres to complete *JCQ Form M1* (www.jcq.org.uk/malpractice) and email it with any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc.) to the Investigations Team at pqsmalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Teacher/centre malpractice

The head of centre is required to inform Pearson's Investigations Team of any incident of suspected malpractice by centre staff, before any investigation is undertaken. The head of centre is requested to inform the Investigations Team by submitting a JCQ M2 (a) form (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations Team will conduct the investigation directly or may ask the head of centre to assist.

Incidents of maladministration (accidental errors in the delivery of Pearson qualifications that may affect the assessment of learners) should also be reported to the Investigations Team using the same method.

Heads of centres/principals/chief executive officers or their nominees are required to inform learners and centre staff suspected of malpractice of their responsibilities and rights, please see *6.15 of JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures*.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

We reserve the right to withhold certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties.

Where learner malpractice is evidenced, penalties may be imposed such as:

- mark reduction for affected external assessments
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures, we may impose sanctions such as:

- working with you to create an improvement action plan
- requiring staff members to receive further training
- placing temporary blocks on your certificates
- placing temporary blocks on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centres (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in our *Enquiries and Appeals policy*, on our website. In the initial stage of any aspect of malpractice, please notify the Investigations Team (via pqsmalpractice@pearson.com) who will inform you of the next steps.

Reasonable adjustments to assessment

Centres are able to make adjustments to assessments to take account of the needs of individual learners in line with the guidance given in the document *Pearson Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*. In most instances, adjustments can be achieved by following the guidance; for example, allowing the use of assistive technology or adjusting the format of the evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. Any reasonable adjustment must reflect the normal learning or working practice of a learner in a centre or working within the occupational area.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Adjustments for candidates with disabilities and learning difficulties, Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational qualifications*.

Both documents are on our website.

Special consideration

Centres must operate special consideration in line with the guidance given in the document *Pearson Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*. Special consideration may not be applicable in instances where:

- assessment requires the demonstration of practical competence
- criteria have to be met fully
- units/qualifications confer licence to practice.

Centres cannot apply their own special consideration; applications for special consideration must be made to Pearson and can be made only on a case-by-case basis. A separate application must be made for each learner and certification claims must not be made until the outcome of the application has been received.

Further information on special consideration can be found in the Joint Council for Qualifications (JCQ) document *Access Arrangements, Reasonable Adjustments and Special Consideration, General and Vocational qualifications*.

Both of the documents mentioned above are on our website.

9 Centre recognition and approval

Centre recognition

Centres offering New Apprenticeship Standards qualifications must be listed on the Skills Funding Agency's Register of Training Organisations and have a contract to deliver the New Apprenticeship Standards.

Centres that have not previously offered Pearson competence-based qualifications need to apply for and be granted centre recognition and approval to offer individual qualifications.

Existing Pearson centres seeking approval to offer New Apprenticeship Standards qualifications, will be required to submit supplementary evidence for approval, aligned with the associated New Apprenticeship Standards and Assessment Strategies.

Guidance on seeking approval to deliver Pearson vocational qualifications is available at:

qualifications.pearson.com/en/support/support-for-you/work-based-learning.html

Approvals agreement

All centres are required to enter into an approval agreement, which is a formal commitment by the head or principal of a centre, to meet all the requirements of the specification and any associated codes, conditions or regulations. Pearson will act to protect the integrity of the awarding of qualifications. If centres do not comply with the agreement, this could result in the suspension of certification or withdrawal of approval.

10 Quality assurance of centres

Quality assurance is at the heart of vocational qualifications and Apprenticeships.

Centres are required to declare their commitment to ensuring quality and to giving learners appropriate opportunities that lead to valid and accurate assessment outcomes.

Pearson uses external quality assurance processes to verify that assessment, internal quality assurance and evidence of achievement meet nationally defined standards. Our processes enable us to recognise good practice, effectively manage risk and support centres to safeguard certification and quality standards.

Our Standards Verifiers provide advice and guidance to enable centres to hold accurate assessment records and assess learners appropriately, consistently and fairly. Centres offering competence-based qualifications as part of the New Apprenticeship Standards will receive at least one visit from our Standards Verifier, followed by on-going support and development. This may result in more visits or remote support, as required to complete standards verification. The exact frequency and duration of Standards Verifier visits/remote sampling will reflect the level of risk associated with a programme, taking account of the:

- number of assessment sites
- number and throughput of learners
- number and turnover of assessors
- number and turnover of internal verifiers
- amount of previous experience of delivery.

If a centre is offering a competence-based qualification and a knowledge qualification related to the same Apprenticeship Standard, wherever possible we will allocate the same Standards Verifier for both qualifications.

Following registration, centres will be provided with further quality assurance and sampling guidance.

11 Unit format

Each unit has the following sections.

Unit number

The number is in a sequence in the specification. Where a specification has more than one qualification, numbers may not be sequential for an individual qualification.

Unit title

This is the formal title of the unit, which will appear on the learner's certificate.

Level

All units and qualifications have a level assigned to them. The level assigned is informed by the level descriptors defined by Ofqual, the qualifications regulator.

Guided learning (GL)

Guided Learning Hours (GLH) is the number of hours that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.

Pearson has consulted with users of the qualification and has assigned a number of hours to this activity for each unit.

Unit summary

This summarises the purpose of the unit and the learning the unit offers.

Unit assessment requirements

This outlines the requirements for the assessment of the unit. Learners must provide evidence according to each of the requirements stated in this section.

Learning outcomes

The learning outcomes set out what a learner will know, understand or be able to do as the result of a process of learning.

Assessment criteria

The assessment criteria specify the standard the learner is required to meet to achieve a learning outcome.

Unit 1: Complying with Statutory Regulations and Organisational Safety Requirements

Level:	**2**
Guided learning:	**100 hours**
Total unit time	**100 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in dealing with statutory regulations and organisational safety requirements. The unit does not deal with specific safety regulations or detailed requirements but does cover the more general health and safety requirements that apply to working in an industrial environment.

Learners will be expected to:

- comply with all relevant regulations that apply to their area of work, as well as their general responsibilities as defined in the Health and Safety at Work etc. Act 1974
- be able to identify the relevant qualified first aiders and know the location of the first-aid facilities
- have knowledge and understanding of the procedures to be adopted in the case of accidents involving injury and in situations where there are dangerous occurrences or hazardous malfunctions of equipment, processes or machinery
- be fully conversant with their organisation's procedures for fire alerts and the evacuation of premises
- be required to identify the hazards and risks that are associated with their job. Typically, these will focus on their working environment, the tools and equipment that they use, the materials and substances that they use, any working practices that do not follow laid-down procedures, and manual lifting and carrying techniques.

Unit assessment requirements

This unit must be assessed in a work environment and must be assessed in accordance with the assessment strategy in *Annexe A*.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to comply with statutory regulations and organisational safety requirements	1.1	Comply with their duties and obligations as defined in the Health and Safety at Work etc. Act 1974			
		1.2	Demonstrate their understanding of their duties and obligations to health and safety by: • applying in principle their duties and responsibilities as an individual under the Health and Safety at Work etc. Act 1974 • identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as: • eye protection and personal protective equipment (PPE) • Control of Substances Hazardous to Health Regulations 2002 (COSHH) • risk assessments • identifying the warning signs and labels of the main groups of hazardous or dangerous substances • complying with the appropriate statutory regulations at all times			
		1.3	Present themselves in the workplace suitably prepared for the activities to be undertaken			
		1.4	Follow organisational accident and emergency procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	Comply with emergency requirements, to include: • identifying the appropriate qualified first aiders and the location of first aid facilities • identifying the procedures to be followed in the event of injury to themselves or others • following organisational procedures in the event of fire and the evacuation of premises • identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment			
		1.6	Recognise and control hazards in the workplace			
		1.7	Identify the hazards and risks that are associated with the following: • their working environment • the equipment that they use • materials and substances (where appropriate) that they use • working practices that do not follow laid-down procedures			
		1.8	Use correct manual lifting and carrying techniques			
		1.9	Demonstrate one of the following methods of manual lifting and carrying: • lifting alone • with assistance of others • with mechanical assistance			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.10	Apply safe working practices and procedures to include: • maintaining a tidy workplace, with exits and gangways free from obstruction • using equipment safely and only for the purpose intended • observing organisational safety rules, signs and hazard warnings • taking measures to protect others from any harm resulting from the work that they are carrying out			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to comply with statutory regulations and organisational safety requirements	2.1	Describe the roles and responsibilities of themselves and others under the Health and Safety at Work etc. Act 1974, and other current legislation such as: • The Management of Health and Safety at Work Regulations 1999 • Workplace Health and Safety and Welfare Regulations 1992 • Personal Protective Equipment at Work Regulations 1992 • Manual Handling Operations Regulations 1992 • Provision and Use of Work Equipment Regulations 1998 • Display Screen at Work Regulations 1992 • Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013			
		2.2	Describe the specific regulations and safe working practices and procedures that apply to their work activities			
		2.3	Describe the warning signs for the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations			
		2.4	Explain how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.5	Explain what constitutes a hazard in the workplace such as: • moving parts of machinery • electricity • slippery and uneven surfaces • poorly placed equipment • dust and fumes • handling and transporting • contaminants and irritants • material ejection • fire • working at height • environment • pressure/stored energy systems • volatile, flammable or toxic materials • unshielded processes • working in confined spaces			
		2.6	Describe their responsibilities for identifying and dealing with hazards and reducing risks in the workplace			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.7	Describe the risks associated with their working environment such as: • the tools, materials and equipment that they use • spillages of oil, chemicals and other substances • not reporting accidental breakages of tools or equipment • not following laid-down working practices and procedures			
		2.8	Describe the processes and procedures that are used to identify and rate the level of risk such as: • safety inspections • the use of hazard checklists • carrying out risk assessments, COSHH assessments			
		2.9	Describe the first aid facilities that exist within their work area and within the organisation in general and the procedures to be followed in the case of accidents involving injury			
		2.10	Explain what constitutes dangerous occurrences and hazardous malfunctions, and why these must be reported even if no-one is injured			
		2.11	Describe the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report their presence at the appropriate assembly point			
		2.12	Describe the organisational policy with regard to firefighting procedures; the common causes of fire and what they can do to help prevent them			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.13	Describe the protective clothing and equipment that is available for their areas of activity			
		2.14	Explain how to safely lift and carry loads, and the manual and mechanical aids available			
		2.15	Explain how to prepare and maintain safe working areas; the standards and procedures to ensure good housekeeping			
		2.16	Describe the importance of safe storage of tools, equipment, materials and products			
		2.17	Describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 2: Using and Interpreting Engineering Data and Documentation

Level:	**2**
Guided learning:	**50 hours**
Total unit time	**50 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in making effective use of textual, numeric and graphical information by interpreting and using technical information extracted from specified documents in accordance with approved procedures. Documents will include engineering drawings, technical manuals, reference tables, specifications, technical sales/marketing documentation and charts or electronic displays.

Learners will be required to extract information from the various documents in order to establish and carry out the work requirements and to make valid decisions about the work activities based on the information extracted.

Unit assessment requirements

This unit must be assessed in a work environment and in accordance with the assessment strategy in *Annexe A*.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to use and interpret engineering data and documentation	1.1	Use the approved source to obtain the required data and documentation			
		1.2	Use the data and documentation and carry out all of the following: • check the currency and validity of the data and documentation used • exercise care and control over the documents at all times • correctly extract all necessary data in order to carry out the required tasks • seek out additional information where there are gaps or deficiencies in the information obtained • deal with or report any problems found with the data and documentation • make valid decisions based on the evaluation of the engineering information extracted from the documents • return all documents to the approved location on completion of the work • complete all necessary work-related documentation such as production documentation, installation documentation, maintenance documentation, planning documentation			
		1.3	Correctly identify, interpret and extract the required information			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	Extract information that includes three of the following: • materials or components required • dimensions • tolerances • build quality • installation requirements • customer requirements • timescales • financial information • operating parameters • surface texture requirements • location/orientation of parts • process or treatments required • dismantling/assembly sequence • inspection/testing requirements • number/volumes required • repair/service methods • method of manufacture • weld type and size • operations required • connections to be made • surface finish required			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
			• shape or profiles • fault-finding procedures • safety/risk factors • environmental controls • specific data (such as component data, maintenance data, electrical data, fluid data) • resources (such as tools, equipment, personnel) • utility supply details (such as electricity, water, gas, air) • location of services, including standby and emergency backup systems • circuit characteristics (such as pressure, flow, current, voltage, speed) • protective arrangements and equipment (such as containment, environmental controls, warning and evacuation systems and equipment) other specific related information			
		1.5	Use the information obtained to ensure that work output meets the specification			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.6	Use information extracted from documents to include one from the following: • drawings (such as component drawings, assembly drawings, modification drawings, repair drawings, welding/fabrication drawings, distribution and installation drawings) • diagrams (such as schematic, fluid power diagrams, piping, wiring/circuit diagrams) • manufacturer's manuals/drawings • approved sketches • technical illustrations • photographic representations • visual display screen information • technical sales/marketing documentation • contractual documentation • other specific drawings/documents			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.7	Use information extracted from related documentation, to include two from the following: • instructions (such as job instructions, drawing instructions, manufacturer's instructions) • specifications (such as material, finish, process, contractual, calibration) • reference materials (such as manuals, tables, charts, guides, notes) • schedules • operation sheets • service/test information • planning documentation • quality control documents • company-specific technical instructions • national, international and organisational standards • health and safety standards relating to the activity (such as COSHH) • other specific related documentation			
		1.8	Deal promptly and effectively with any problems within their control and report those which cannot be solved			
		1.9	Report any inaccuracies or discrepancies in documentation and specifications			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to use and interpret engineering data and documentation	2.1	Explain what information sources are used for the data and documentation that they use in their work activities			
		2.2	Explain how documents are obtained, and how to check that they are current and valid			
		2.3	Explain the basic principles of confidentiality (including what information should be available and to whom)			
		2.4	Describe the different ways/formats that data and documentation can be presented such as: • drawings • job instructions • product data sheets • manufacturers' manuals • financial spreadsheets • production schedules • inspection and calibration requirements • customer information			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.5	Explain how to use other sources of information to support the data such as: • electronic component pin configuration specifications • reference charts • standards • bend allowances required for material thickness • electrical conditions required for specific welding rods • mixing ratios for bonding and finishing materials • metal specifications and inspection requirements • health and safety documentation			
		2.6	Describe the importance of differentiating fact from opinion when reviewing data and documentation			
		2.7	Describe the importance of analysing all available data and documentation before decisions are made			
		2.8	Describe the different ways of storing and organising data and documentation to ensure easy access			
		2.9	Describe the procedures for reporting discrepancies in the data or documentation, and for reporting lost or damaged documents			
		2.10	Describe the importance of keeping all data and documentation up to date during the work activity, and the implications of this not being done			
		2.11	Explain the care and control procedures for the documents, and how damage or graffiti on documents can lead to scrapped work			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.12	Explain the importance of returning documents to the designated location on completion of the work activities			
		2.13	Explain what basic drawing conventions are used and why there needs to be different types of drawings such as: • isometric and orthographic • first and third angle • assembly drawings • circuit and wiring diagrams • block and schematic diagrams			
		2.14	Explain what types of documentation are used and how they interrelate such as: • production drawings • assembly drawings • circuit and wiring diagrams • block and schematic diagrams			
		2.15	Explain the imperial and metric systems of measurement; tolerancing and fixed reference points			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Describe the meaning of the different symbols and abbreviations found on the documents that they use such as: • surface finish • electronic components • weld symbols • linear and geometric tolerances • pressure and flow characteristics			
		2.17	Describe the extent of their own responsibility, when to act on their own initiative to find, clarify and evaluate information, and to whom they should report if they have problems that they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 3: Working Efficiently and Effectively as a Rail Engineering Operative

Level:	**2**
Guided learning:	**50 hours**
Total unit time	**50 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in working efficiently and effectively in the workplace, in accordance with approved procedures and practices. Before undertaking the engineering activity, learners will be required to carry out all necessary preparations within the scope of their responsibility. This may include preparing the work area and ensuring that it is in a safe condition to carry out the intended activities, ensuring they have the appropriate job specifications and instructions and that any tools, equipment, materials and other resources required are available and in a safe and usable condition.

Learners will maintain effective working relationships with colleagues, understanding the limits of their own authority, knowing who to report to and with whom to discuss any issues they may have. They will review and know the importance and benefits of personal training and development and be aware of the training opportunities available in their workplace.

Unit assessment requirements

This unit must be assessed in a work environment and in accordance with the assessment strategy in *Annexe A*.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to work efficiently and effectively in engineering	1.1	Work safely at all times, complying with health and safety and other relevant regulations and guidelines			
		1.2	Prepare the work area to carry out the engineering activity			
		1.3	Prepare to carry out the engineering activity, taking into consideration all of the following, as applicable to the work to be undertaken: • the work area is free from hazards and suitably prepared for the activities to be undertaken • any required safety procedures are implemented • any necessary personal protection equipment is obtained and is in a usable condition • tools and equipment required are obtained and checked that they are in a safe and useable condition • all necessary drawings, specifications and associated documentation is obtained • job instructions are obtained and understood • the correct materials or components are obtained • storage arrangements for work are appropriate • appropriate authorisation to carry out the work is obtained			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	Check that there are sufficient supplies of materials and/or consumables and that they meet work requirements			
		1.5	Ensure completed products or resources are stored in the appropriate location on completion of the activities			
		1.6	Complete work activities, to include all of the following: • returning tools and equipment • returning drawings and work instructions • completing all necessary documentation accurately and legibly • identifying, where appropriate, any unusable tools, equipment and components • arranging for the safe disposal of waste materials			
		1.7	Tidy up the work area on completion of the engineering activity			
		1.8	Deal promptly and effectively with problems within their control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.9	Deal with problems affecting the engineering process, to include two of the following: • materials • tools and equipment • drawings • job specification • quality • people • timescales • safety • activities or procedures			
		1.10	Contribute to organisational procedures for identifying opportunities for improvement to **one** of the following: • working practices • working methods • quality • safety • tools and equipment • supplier relationships • internal communication • customer service • training and development • teamwork			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.11	Maintain effective working relationships with colleagues to include two of the following: • colleagues within their own working group • people outside their normal working group • line management • external contacts			
		1.12	Review personal training and development as appropriate to the job role			
		1.13	Review personal development objectives and targets to include one of the following: • dual or multi-skilling • training on new equipment/technology • increased responsibility • applying of company working practices, procedures, plans and policies			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to work efficiently and effectively in engineering	2.1	Describe the safe working practices and procedures to be followed whilst preparing and tidying up their work environment			
		2.2	Describe the correct use of any equipment to protect the health and safety of themselves and their colleagues			
		2.3	Describe the procedure for ensuring that all documentation relating to the work being carried out is available and current, prior to starting the activity			
		2.4	Describe the action that should be taken if documentation received is incomplete and/or incorrect			
		2.5	Describe the procedure for ensuring that all tools and equipment are available prior to undertaking the activity			
		2.6	Describe the checks to be carried out to ensure that tools and equipment are in full working order, prior to undertaking the activity			
		2.7	Describe the action that should be taken if tools and equipment are not in full working order			
		2.8	Describe the checks to be carried out to ensure that all required materials are correct and complete, prior to undertaking the activity			
		2.9	Describe the action that should be taken if materials do not meet the requirements of the activity			
		2.10	Explain whom to inform when the work activity has been completed			
		2.11	Describe the information and/or documentation that others will require to confirm that the activity has been completed			
		2.12	Explain what materials, equipment and tools can be re-used			
		2.13	Explain how any waste materials and/or products are transferred, stored and disposed of			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.14	Explain where tools and equipment should be stored and located			
		2.15	Describe the importance of maintaining effective working relationships within the workplace			
		2.16	Describe the procedures for dealing with and reporting any problems that can affect working relationships			
		2.17	Describe the importance of making a contribution to improving working practices			
		2.18	Describe the procedure and format for making suggestions for improvements			
		2.19	Describe the benefits for the work area if improvements can be identified			
		2.20	Describe the difficulties that can occur in working relationships			
		2.21	Describe the regulations that affect how they should be treated at work (such as Equal Opportunities Act, Race and Sex Discrimination, Working Time Directive)			
		2.22	Describe the benefits of continuous personal development			
		2.23	Describe the training opportunities that are available in the workplace			
		2.24	Describe the importance of reviewing their training and development			
		2.25	Explain with whom to discuss training and development issues			
		2.26	Describe the extent of their own authority and to whom they should report if they have any problems that they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 4: Determine Requirements for the Safe Access to Work Locations for Signal Engineering

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge that learners need to be able to demonstrate competence in ensuring safe access to work locations prior to undertaking a signal engineering activity in line with relevant processes and procedures. These activities could involve the maintenance, fault-finding, installation or testing of signalling equipment.

The level and extent of responsibility will include own safety and that of others. Learners will be expected to refer to others for authorisation when required, be responsible for the implementation of instructions, and work within set procedures and processes. Learners will be able to identify and agree the necessary safety requirements, protection and disconnection arrangements and ensure their implementation throughout the duration of the signal engineering activity.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to determine requirements for the safe access to work locations for signal engineering	1.1	Comply with organisational procedures working safely at all times			
		1.2	Identify the location of the activity and determine the access arrangements			
		1.3	Take action to ensure that the requirements for safe access meets organisational procedures			
		1.4	Take action to advise other people as required of the requirements for safe access			
		1.5	Identify and analyse any necessary changes to safety requirements on arrival at site including the prompt report to relevant personnel			
		1.6	Take action to ensure the requirements for safe access to work are implemented and remain in place for the duration of the activity			
		1.7	Establish and maintain communication with relevant personnel			
		1.8	Deal effectively with problems within limits of own authority and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to determine requirements for the safe access to work locations for signal engineering	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe the different methods and techniques for conducting safety assessments, including assessment of risk			
		2.3	Explain how to locate and safely access the work area/site			
		2.4	Explain how to source and interpret information and document systems relating to the work area/site and activity			
		2.5	Describe the relevant railway possession and protection arrangements for the work site and equipment to provide a safe system of work and how to check these are in place			
		2.6	Explain how to secure the work area/system for maintenance/ fault finding/installation/testing purposes			
		2.7	Explain how to identify, agree and implement safe access requirements			
		2.8	Describe the organisational approved reporting lines and procedures			
		2.9	Describe the limits of own authority and responsibility in relation to establishing information for signal engineering maintenance and fault finding			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 5: Assist in the Removal of Signalling Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in the removal of signalling systems and equipment under direction as part of maintenance or fault-finding activities, including the use of correct tools and equipment in accordance with organisational procedures. The signalling equipment can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will be required to use the appropriate tools and equipment throughout the removal activities, to apply a range of disconnection methods and techniques to remove the equipment safely, and to make safe any connections as appropriate to the equipment removed. Where appropriate, learners may also assist in working with computers or electronic controllers, making disconnections and removing hardware. The removal activities will include making sure that any removed signalling equipment is moved and stored safely before it is repaired, refitted or disposed of.

Learners will be required to comply with organisational policy and procedures for the removal activities undertaken, and to report any problems with the activities, tools or equipment used that cannot be personally resolved, or are outside learners' permitted authority, to the relevant people. Learners must check that all tools, equipment and materials used in the activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

The removal activity may be carried out as a team effort, but learners must demonstrate a significant personal contribution to the activities, in order to satisfy the requirements of the unit, and they must demonstrate competence in all the areas required by the unit.

Learners' underpinning knowledge will be sufficient to provide a sound basis for their work, and will enable them to adopt an informed approach to applying procedures for the removal of signalling equipment. They will have an understanding of the equipment being removed and its disconnection requirements, in adequate depth to provide a sound basis for carrying out the removal process safely and effectively.

Learners will understand the safety precautions required when carrying out the removal activities, especially those for ensuring the safe isolation of services. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Safety is a key theme throughout this standard and learners will be able to identify all the necessary safety requirements and take the relevant action to ensure the safety of themselves, others and railway operations.

Unit assessment requirements

This unit must be assessed in a work environment and must be assessed in accordance with the assessment strategy in *Annexe A*.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the removal of signalling equipment	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Identify any necessary changes to safety requirements on arriving at site, including prompt reporting to the relevant person(s)			
		1.3	Locate and identify the equipment to be removed			
		1.4	Follow all relevant diagrams and specifications			
		1.5	Establish and, where appropriate, mark component/equipment orientation for re-assembly			
		1.6	Ensure that any stored energy or substances are released safely and correctly			
		1.7	Label relevant wiring and components and note the configuration settings			
		1.8	Remove the required equipment using approved tools and techniques			
		1.9	Take suitable precautions to prevent damage to equipment during removal			
		1.10	Provide appropriate electrostatic protection for electronic equipment, where appropriate			
		1.11	Store or discard the removed equipment in accordance with your organisation's procedures			
		1.12	Deal promptly and effectively with problems within your control and report those which cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the removal of signalling equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to locate and identify the equipment to be removed			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.5	Identify the classification of different voltage levels and the authority requirements for working on them			
		2.6	Explain what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the removal activities			
		2.9	Explain the importance of ensuring any stored energy or substances are released safely and correctly			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.10	Describe hazards associated with carrying out signalling removal activities such as: • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures • and how to minimise these and reduce any risks			
		2.11	Explain the importance of marking the component/equipment orientation for re-assembly and how to undertake this			
		2.12	Identify the relevant methods, techniques and procedures for the removal activities			
		2.13	Describe how to source and follow the relevant technical information, standards, diagrams, instructions, specifications and schedules for the removal of signalling equipment			
		2.14	Describe own organisation's procedures for the use, care and control of tools and equipment			
		2.15	Outline the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			
		2.16	Explain how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			
		2.17	Explain how to identify the various types of connectors used and the correct tools and equipment to make the disconnections correctly			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.18	Identify the different types of mounting, connecting and cable supporting systems used by the signalling equipment			
		2.19	Describe how to label and store removed equipment for re-use, repair or disposal			
		2.20	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.21	Describe the limits of your own authority and responsibility and those of others involved (Safe Work Leader)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 6: Assist in the Replacement of Signalling Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit identifies the skills and knowledge in which learners will need to demonstrate competence when assisting with the replacement of signalling systems and equipment under direction, including the use of correct tools and equipment in accordance with organisational procedures. The signalling equipment in this unit can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will be required to use the appropriate tools and equipment throughout the replacement activities, apply a range of removal and installation methods and techniques to replace the equipment, and to make connections as appropriate to the equipment installed. Where appropriate, learners may also assist in working with computers or electronic controllers, making connections, installing hardware and loading and updating software. The replacement activities will include making checks and adjustments in line with their own permitted authority, and assisting others to ensure that the replaced equipment functions to the required specification.

Learners will be required to comply with organisational policy and procedures for the replacement activities undertaken, and to report any problems with the activities, tools or equipment used that they cannot personally resolve, or are outside their permitted authority, to the relevant people. Learners must check that all tools, equipment and materials used in the replacement activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

The replacement activity may be carried out as a team effort, but learners must demonstrate a significant personal contribution to the activities in order to satisfy the requirements of the unit, and they must demonstrate competence in all the areas required by the unit.

Learners will be able to adopt an informed approach to applying procedures for the replacement of signalling equipment. They will develop an understanding of the equipment being removed, and its installation requirements, in adequate depth to provide a sound basis for carrying out the process safely and effectively.

Learners will understand the safety precautions required when carrying out the replacement activities, especially those for ensuring the safe isolation of services. They will be required to demonstrate safe working practices throughout, and will understand their own responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the replacement of signalling equipment	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Identify any necessary changes to safety requirements on arriving at site, including prompt reporting to the relevant person(s)			
		1.3	Obtain the required equipment and ensure that it is in a suitable condition for replacement and fit for purpose			
		1.4	Follow all relevant diagrams and specifications			
		1.5	Replace the equipment in the correct sequence using appropriate tools and techniques			
		1.6	Take suitable precautions to prevent damage to equipment during the replacement activity			
		1.7	Make any necessary settings or adjustments to the equipment to ensure it will function correctly			
		1.8	Ensure that the replacement is complete and that all components are free from damage including checking that all necessary connections to the equipment are complete			
		1.9	Observe sufficient operations of the equipment to confirm it is functioning correctly			
		1.10	Deal promptly and effectively with problems within your control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the replacement of signalling equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to locate and identify the equipment to be replaced			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.5	Identify the classification of different voltage levels and the authority requirements for working on them			
		2.6	Explain what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe hazards associated with carrying out signalling replacement activities such as: • stored energy • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures and how to minimise these and reduce any risks			
		2.10	Identify the relevant methods, techniques and procedures for removal and installation activities			
		2.11	Describe how to source and follow relevant technical information, standards, diagrams, instructions, specifications and schedules for replacement of signalling equipment			
		2.12	Describe own organisation's procedures for the use, care and control of tools and equipment			
		2.13	Outline the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			
		2.14	Explain how and when damage may occur to equipment during replacement			
		2.15	Explain how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Explain how to identify the various types of connectors used and the correct tools and equipment to make the disconnection and connections correctly			
		2.17	Identify the different types of mounting, connecting and cable supporting systems used in the replacement of the signalling equipment			
		2.18	Identify the correct mode of operation of the equipment relevant to the activity			
		2.19	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.20	Describe the limits of your own authority and responsibility and those of others involved (Safe Work Leader)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 7: Reinstate the Work Area after Signal Engineering Activities

Level:	**2**
Guided learning:	**20 hours**
Total unit time	**20 hours**

Unit summary

This unit covers the skills and knowledge required for learners to demonstrate competence in reinstating the work area after maintaining, rectifying, installing or testing equipment and systems. The unit covers the safe storage of reusable materials and equipment.

Learners will be able to ensure that the work area is left in a condition that meets their own organisation's procedures. This will include ensuring that any scrap material, plant, tools and test equipment that cannot be removed is marked for later collection and secured where it will not interfere with the safe operation of the railway. Safety is a key theme throughout this unit and learners will be able to identify all the necessary safety requirements and take the relevant action to ensure their own safety and that of others.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Reinstate the work area after signal engineering activities	1.1	Comply with organisational procedures working safely at all times			
		1.2	In line with organisational procedures withdraw all possession and protection measures			
		1.3	Take the appropriate action to confirm that the work area is secured on completion of the work			
		1.4	Restore the work areas to a safe condition in accordance with agreed requirements and schedules			
		1.5	Take action to separate equipment, components and materials for re-use from waste items			
		1.6	Take action to store reusable materials and equipment in an appropriate location			
		1.7	Identify, mark and secure any waste items that cannot be removed immediately maintaining the safe operation of the railway at all times			
		1.8	Identify all plant, tools and test equipment that cannot be removed and ensure that it is secured and stored where they do not interfere with the safe operation of the railway			
		1.9	Dispose of waste materials in line with organisational procedures			
		1.10	Deal promptly and effectively with problems within own control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to reinstate the work area after signal engineering activities	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe the relevant railway possession and protection arrangements for the work site and equipment to provide a safe system of work and how to check these have been withdrawn			
		2.3	Explain the organisational procedures for restoring the work area			
		2.4	Describe the work area security requirements			
		2.5	Explain the organisational procedures for storing material and equipment			
		2.6	Explain the different types of materials and equipment to be stored			
		2.7	Describe the different types, methods and procedures for the disposal of waste and hazardous substances which have organisational approval			
		2.8	Explain the relevant reporting lines and approved organisational procedures			
		2.9	Describe the limits of own authority and responsibility and those of others involved in relation to reinstating the work area after signal engineering activities			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 8: Establish Information for Signal Engineering Installation

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in sourcing and interpreting information for the installation of wiring signalling equipment. Examples of the information they will cover are design drawings, installation plans, handbooks, installation standards and equipment specific requirements. The signalling equipment in this unit can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will be able to source and interpret the information required to undertake the allocated installation tasks in accordance with their own organisation's procedures. They will be required to extract the necessary data from the various specifications and related documentation in order to establish and carry out the work requirements and to make valid decisions about the work activities based on the information extracted.

Learners will be required to comply with organisational policy and procedures for obtaining and using the documentation applicable to the activity. Learners will be expected to report any problems with the use and interpretation of the data that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. Learners will be expected to work to instructions, with a minimum of supervision, and to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Learners' underpinning knowledge will provide a good understanding of the types of documentation available for use, and will provide an informed approach to applying signal engineering instructions and procedures. Learners will be able to read and interpret the documentation available and will know about the conventions, symbols and abbreviations used in adequate depth to provide a sound basis for carrying out the activities to the required specification.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to establish information for installation	1.1	Identify and source the information required for installation activities			
		1.2	Source and interpret accurate and relevant information on technical requirements			
		1.3	Ensure that the information is current, authorised and contains all essential data			
		1.4	Identify and deal promptly with information that is inadequate, contradictory and/or ambiguous			
		1.5	Identify and deal promptly and effectively with any problems occurring with the requirements and their interpretation			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to establish information for installation	2.1	Describe how to source and interpret technical information for installation activities			
		2.2	Describe procedures for documentation care and control and the requirements for the retention of records in own organisation			
		2.3	Explain how to ensure that documents are current and authorised and accurately reflect the required level of detail			
		2.4	Describe how to interpret site and equipment diagrams, engineering drawings and specifications including: • relevant conventions • symbols • terminology • abbreviation • terminology			
		2.5	Explain the relevant methods and techniques covering installation and how to interpret them			
		2.6	Describe how to identify, evaluate and respond to problems occurring with the information and its interpretation			
		2.7	Describe the relevant reporting lines and procedures that are approved by own organisation			
		2.8	Explain the limits of own authority and responsibility and those of others involved in the activity			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 9: Establish Information for Signal Engineering Maintenance or Fault-finding

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in obtaining the technical and detailed information required from a variety of technical sources before undertaking maintenance and/or fault-finding activities. Technical information could be from a variety of sources such as drawings, defect history, fault reports, handbooks, maintenance specifications, instructions, procedures and schedules. The signalling equipment can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will be able to source and interpret the information required to undertake the allocated maintenance and/or fault-finding tasks in accordance with their organisation's procedures. They will be required to extract the necessary data from the various specifications and related documentation in order to establish and carry out the work requirements, and to make valid decisions about the work activities based on the information extracted.

Their responsibilities will require them to comply with organisational policy and procedures for obtaining and using the documentation applicable to the activity. They will be expected to report any problems with the use and interpretation of the data that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, and to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Unit assessment requirements

This unit should be assessed predominantly in the workplace through observation. This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as, witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to establish information for maintenance or fault finding	1.1	Identify and obtain the required details for the maintenance or fault finding activity			
		1.2	Obtain and interpret accurate and relevant information on technical requirements			
		1.3	Ensure that the information is current, authorised and contains all essential data			
		1.4	Identify and deal promptly with information that is inadequate, contradictory or ambiguous			
		1.5	Identify and deal promptly and effectively with any problems occurring with the requirements and their interpretation			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to establish information for maintenance or fault finding	2.1	Describe how to obtain and interpret technical information for maintenance or fault finding activities			
		2.2	Describe procedures for documentation care and control and the requirements for the retention of records in own organisation			
		2.3	Explain how to ensure that documents are current and authorised and accurately reflect the required level of detail			
		2.4	Describe how to interpret site and equipment diagrams, engineering drawings and specifications including: • relevant conventions • symbols • terminology • abbreviation • terminology			
		2.5	Describe the relevant methods and techniques covering maintenance or fault finding and how to interpret them			
		2.6	Describe how to identify, evaluate and respond to problems occurring with the information and its interpretation			
		2.7	Describe the relevant reporting lines and procedures that are approved by own organisation			
		2.8	Describe the limits of own authority and responsibility and those of others involved in the activity			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 10: Installation of Signalling Equipment Using Non-complex Processes

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in installing signalling equipment within the limits of their own authority under direction, using non-complex processes. This includes following all relevant diagrams and specifications for the installation being carried out, identifying the correct tools and equipment for the installation in accordance with organisational procedures, and checking that they are in a safe and usable condition and calibrated. The signalling equipment in this standard can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will be required to use the appropriate tools and equipment throughout the installation activities, to apply a range of installation methods and techniques to position, level and align the equipment, and to make connections as appropriate to the equipment installed. Where appropriate, learners may also assist in working with computers or electronic controllers, making connections, installing hardware and loading and updating software. The installation activities will include making checks and adjustments in line with their permitted authority, and assisting others to ensure that the installed equipment functions to the required specification.

Learners must check that all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

The installation activity may be carried out as a team effort, but learners must demonstrate a significant personal contribution to the installation activities in order to satisfy the requirements of the unit. They must demonstrate competence in all the areas required by the unit.

Learners' underpinning knowledge will enable them to adopt an informed approach to applying procedures for the installation of signalling equipment. They will have an understanding of the equipment being installed, and its installation requirements, in adequate depth in order to carry out the installation process safely and effectively.

Learners will understand the safety precautions required when carrying out the installation activities, especially those for ensuring the safe isolation of services. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Safety is a key theme throughout this unit and learners will be able to identify all the necessary safety requirements and take the relevant action to ensure the safety of themselves and others.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out the installation of signalling equipment using non-complex processes	1.1	Comply with organisational procedures, working safely at all times			
		1.2	Follow all relevant diagrams and specifications for the installation being carried out in line with organisational procedures			
		1.3	Carry out all installation activities within the limits of own authority and responsibility			
		1.4	Identify the correct tools and equipment for the installation and check that they are in a safe and usable condition and calibrated			
		1.5	Install, position and label location cases, housings, racks, equipment, components and cables in accordance with the specifications and standards			
		1.6	Take action to run, secure and terminate wires and cables correctly			
		1.7	Identify and correctly label wires and cables in accordance with installation requirements			
		1.8	Undertake an inspection to ensure that the installation is complete and that all components are free from damage; this should include checking that all necessary connections to the equipment are complete and all waste items are dealt with in line with organisational procedures			
		1.9	Deal promptly and effectively with problems within own control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out the installation of signalling equipment using non-complex processes	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe how to locate and safely access where the installation of signalling equipment needs to be undertaken			
		2.3	Describe the different methods, techniques and procedures for installation activities			
		2.4	Describe how to follow relevant technical information, standards, diagrams, instructions, specifications and schedules for installation of signalling equipment			
		2.5	Explain the organisational procedures for use, care and control of equipment			
		2.6	Describe how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			
		2.7	Explain the relevant reporting lines and approved organisational procedures			
		2.8	Explain when independent testing is required			
		2.9	Describe the limits of own authority and responsibility and those of others involved in relation to reinstating the work area after signal engineering activities			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 11: Maintenance of Signalling Equipment Using Non-complex Processes

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in maintaining signalling equipment within the limits of own authority and responsibility, using non-complex processes. This includes the use of correct tools and equipment in accordance with their organisation's procedures and applying a range of methods and techniques to maintain the equipment. Where appropriate, learners may also assist in working with computers or electronic controllers, making connections, maintaining hardware and loading and updating software. The maintenance activities will include making checks and adjustments, in line with their permitted authority, and assisting others to ensure that the maintained equipment functions to the required specification. The signalling equipment can be for overground or underground rail transportation systems and can be applicable for the new European Train Control System (ETCS).

Learners will know how to comply with organisational procedures and will have a sound understanding of the equipment being maintained in order to carry out the process safely and effectively. They will know how to deal promptly and effectively with problems within their own control and to whom to report those that cannot be resolved. Learners will be able to list the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity. They will understand the safety precautions required when carrying out the maintenance activities, especially those for ensuring the safe isolation of services and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Learners will be able to check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. They will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

The maintenance activity may be carried out as a team effort, but the learner must demonstrate a significant personal contribution to the activities in order to satisfy the requirements of the standard, and they must demonstrate competence in all the areas required by the standard.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out the maintenance of signalling equipment using non-complex processes	1.1	Carry out the following maintenance activities as applicable to the equipment being maintained and within the limits of your own authority: • visual and aural checks • electrical measurements and adjustments • mechanical measurements and adjustments • routine servicing • cleaning • lubricating • other specific signalling maintenance activity			
		1.2	Work in line with organisational procedures follow all relevant diagrams and specifications for the maintenance being carried out			
		1.3	Carry out all installation activities within the limits of own authority and responsibility			
		1.4	Identify the correct tools and equipment for the installation and check that they are in a safe and usable condition and calibrated			
		1.5	Install, position and label location cases, housings, racks, equipment, components and cables in accordance with the specifications and standards			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.6	Take action to run, secure and terminate wires and cables correctly			
		1.7	Identify and correctly label wires and cables in accordance with installation requirements			
		1.8	Undertake an inspection to ensure that the installation is complete and that all components are free from damage; this should include checking that all necessary connections to the equipment are complete and all waste items are dealt with in line with organisational procedures			
		1.9	Deal promptly and effectively with problems within own control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out the installation of signalling equipment using non-complex processes	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe how to locate and safely access where the installation of signalling equipment needs to be undertaken			
		2.3	Describe the different methods, techniques and procedures for installation activities			
		2.4	Describe how to follow relevant technical information, standards, diagrams, instructions, specifications and schedules for installation of signalling equipment			
		2.5	Explain the organisational procedures for use, care and control of equipment			
		2.6	Describe how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			
		2.7	Explain the relevant reporting lines and approved organisational procedures			
		2.8	Explain when independent testing is required			
		2.9	Describe the limits of own authority and responsibility and those of others involved in relation to reinstating the work area after signal engineering activities			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 12: Assist with Tests and Checks of Signalling Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge required for learners to demonstrate competence in assisting with tests and checks of signalling equipment to establish compliance with specifications.

Examples of checks include:

- inspection
- wire count
- security
- profile
- labelling
- correlation
- compliance to diagram
- physical condition.

Examples of tests include:

- continuity
- insulation
- earth arrangements.

The range of signalling equipment and its associated infrastructure may include:

- points
- train control
- power supplies
- train detection.

Train control equipment may include:

- signal
- other methods of authorising train movements.

Train detection may include:

- track circuits
- axle counters.

Safety is a key theme to this unit so learners must identify all the necessary safety requirements and take the relevant action to ensure their own safety and that of others.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Assist with tests and checks of signalling equipment	1.1	Comply with organisational procedures, working safely at all times			
		1.2	Identify and follow, as directed, the relevant diagrams and specifications for the equipment being checked or tested			
		1.3	Identify and use all the correct tools and inspection equipment and check that they are in a useable condition			
		1.4	Accurately carry out the checks and tests, as directed, in the correct sequence within the appropriate timescales and using approved methods and procedures			
		1.5	Report any instances where the test or checks cannot be completed			
		1.6	Carry out tests and checks in a way that minimises the risk of damage or disturbance to the equipment under test and other systems			
		1.7	Ensure that all testing and checking equipment and tools are removed or stored in line with organisational procedures			
		1.8	Report completion of compliance activities in line with organisational procedures			
		1.9	Identify and report any defects or variations from the specification			
		1.10	Deal promptly and effectively with problems within own control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist with tests and checks of signalling equipment	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe how to locate and safely access the place where the replacement of components testing will be undertaken			
		2.3	Describe the activities which may compromise system functionality and integrity, including the operational constraints to carrying out testing and checking activities			
		2.4	Describe how to source and following engineering diagrams and specifications relevant to the activity			
		2.5	Describe the methods used to locate and identify the equipment to be tested or checked			
		2.6	Describe the different methods and techniques and procedures for assisting with tests and checks to establish compliance			
		2.7	Describe the operational constraints and authorisation procedures for carrying out tests and checks under direction			
		2.8	Describe how to select the correct tools and confirm that they are calibrated			
		2.9	Describe organisational procedures for the use, care and control of inspection tools and test equipment			
		2.10	Explain how to use test equipment so as to ensure that accurate measurements are taken			
		2.11	Describe the relevant reporting lines and organisational procedures relevant to testing and checking signalling equipment			
		2.12	Describe the limits of own authority and responsibility, and those of others involved, in relation to assisting with tests and checks of signalling equipment			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 13: Determine Requirements for the Safe Access to Work Locations for Telecoms Engineering

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in determining the requirements for safe access to work locations prior to undertaking a telecoms engineering activity. These activities could involve the maintenance, fault-finding, installation or testing of telecoms equipment. The type of work locations that the activities will take place in could be from a range of different sites such as trackside, internal and public, each requiring different access requirements. The telecoms equipment in this unit can be for overground or underground rail transportation systems.

The level and extent of responsibility shall include learners' own safety and that of others working alongside them. They will be expected to refer to others for authorisation when required, be responsible for the implementation of instructions, and work within set procedures and processes. Their actions should not compromise the safety of others. Learners will be able to identify and agree the necessary safety requirements. They will ensure the implementation of the necessary safety requirements, protection and disconnection arrangements, ensuring that they remain in place throughout the duration of the telecoms engineering activity.

Learners' underpinning knowledge will provide a good understanding of the relevant processes and procedures for the safe access to a work location prior to undertaking a telecoms engineering activity.

Safety is a key theme throughout this unit and learners will be able to identify all the necessary safety requirements and take the relevant action to ensure the safety of themselves and others.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to determine requirements for the safe access to work locations for telecoms engineering	1.1	Comply with organisational procedures, working safely at all times			
		1.2	Identify the location of the activity and determine the access arrangements			
		1.3	Take action to ensure that the requirements for safe access meets organisational procedures			
		1.4	Identify and analyse any necessary changes to safety requirements on arrival at site, including the prompt reporting to relevant personnel within limits of own authority			
		1.5	Take action to advise other people, as required, of the requirements for safe access			
		1.6	Take action to ensure the requirements for safe access to work are implemented and remain in place for the duration of the activity			
		1.7	Establish and maintain communication with relevant personnel			
		1.8	Deal effectively with problems within limits of own authority and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to determine requirements for the safe access to work locations for telecoms engineering	2.1	Deal effectively with problems within limits of own authority and report those that cannot be resolved			
		2.2	Describe the different methods and techniques for conducting safety assessments, including assessment of risk			
		2.3	Explain how to locate and safely access the work area/site			
		2.4	Explain how to source and interpret information and document systems relating to the work area/site and activity			
		2.5	Describe the relevant railway possession and protection arrangements for the work site and equipment to provide a safe system of work and how to check these are in place			
		2.6	Explain how to secure the work area/system for maintenance/ fault finding/installation/testing purposes			
		2.7	Explain how to identify, agree and implement safe access requirements			
		2.8	Describe the organisational approved reporting lines and procedures			
		2.9	Describe the limits of own authority and responsibility in relation to establishing information for telecoms engineering maintenance and fault finding			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 14: Assist in the Removal of Telecoms Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in the removal of operational telecoms systems and equipment under direction as part of maintenance or fault-finding, including the use of correct tools and equipment in accordance with organisational procedures. The telecoms equipment in this unit can be for overground or underground rail transportation systems.

Learners will be required to use the appropriate tools and equipment and apply a range of disconnection methods and techniques to remove the equipment safely, making safe any connections where equipment has been removed. Where appropriate, learners may also assist in working with computers or electronic controllers, making disconnections and removing hardware. The removal activities will include making sure that any removed telecoms equipment is moved and stored safely before it is repaired, refitted or disposed of.

Learners will be required to comply with organisational policy and procedures for the removal activities undertaken, and to report any problems with the activities, tools or equipment used that they cannot personally resolve, or are outside their permitted authority, to the relevant people. Learners must check that all tools, equipment and materials used in the activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work they carry out.

The removal activity may be carried out as a team effort, but learners must demonstrate a significant personal contribution to the activities in order to satisfy the requirements of the unit, and they must demonstrate competence in all the areas required by the unit.

Learners' underpinning knowledge will give them a sufficient understanding of the equipment being removed and its disconnection requirements in order to carry out the removal process safely and effectively.

Learners will understand the safety precautions required when carrying out the removal activities, especially those for ensuring the safe isolation of services. They will be able to identify all the necessary safety requirements and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace. They will be required to demonstrate safe working practices throughout.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the removal of telecoms equipment	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Identify any necessary changes to safety requirements on arriving at site, including prompt reporting to the relevant person(s)			
		1.3	Locate and identify the equipment to be removed			
		1.4	Follow all relevant diagrams and specifications			
		1.5	Establish and, where appropriate, mark component/equipment orientation for re-assembly			
		1.6	Ensure that any stored energy or substances are released safely and correctly			
		1.7	Label relevant wiring and components and note the configuration settings			
		1.8	Remove the required equipment using approved tools and techniques			
		1.9	Take suitable precautions to prevent damage to equipment during removal			
		1.10	Provide appropriate electrostatic protection for electronic equipment, where appropriate			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.11	Store or discard the removed equipment in accordance with your organisation's procedures			
		1.12	Deal promptly and effectively with problems within your control and report those which cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the removal of telecoms equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to locate and identify the equipment, components and cables to be removed			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.5	Identify the classification of different voltage levels and the authority requirements for working on them			
		2.6	Explain what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the removal activities			
		2.9	Describe hazards associated with carrying out telecom removal activities such as: • stored voltages • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures and how to minimise these and reduce any risks			
		2.10	Explain the importance of marking the component/equipment orientation for re-assembly and how to undertake this			
		2.11	Identify the relevant methods, techniques and procedures for the removal activities			
		2.12	Describe how to source and follow the relevant technical information, standards, diagrams, instructions, specifications and schedules for the removal of telecoms equipment			
		2.13	Describe own organisation's procedures for the use, care and control of tools and equipment			
		2.14	Outline the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.15	Explain how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			
		2.16	Explain how to identify the various types of connectors used and the correct tools and equipment to make the disconnections correctly			
		2.17	Identify the different types of mounting, connecting and cable supporting systems used by the telecoms equipment			
		2.18	Describe how to label and store removed equipment for re-use, repair or disposal			
		2.19	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.20	Describe the limits of your own authority and responsibility and those of others involved (Safe Work Leader)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 15: Assist in the Replacement of Telecoms Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in replacing telecoms systems and equipment, including the use of correct tools and equipment in accordance with organisational procedures as part of the maintenance and/or fault-finding tasks. The telecoms equipment in this unit can be for overground or underground rail transportation systems.

Learners must be able to identify all the necessary safety requirements and take relevant action to ensure the safety of themselves, others and railway operations, including ensuring the safe release of any stored energy from a variety of systems such as pneumatic, hydraulic, electrical or mechanical.

Learners will be required to apply a range of removal and installation methods and techniques to replace the equipment and to make connections, as required, to the equipment installed. Where appropriate, they may also assist in working with computers or electronic controllers, making connections, installing hardware and loading and updating software. The replacement activities will include making checks and adjustments, in line with their permitted authority, and assisting others to ensure that the replaced equipment functions to the required specification.

Learners will be required to comply with organisational policy and procedures for the replacement activities undertaken, and to report any problems with the activities, tools or equipment used that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They must check that all tools, equipment and materials used in the replacement activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. They will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

The replacement activity may be carried out as a team effort, but learners must demonstrate a significant personal contribution to the activities in order to satisfy the requirements of the unit, and they must demonstrate competence in all the areas required by the unit.

Learners' underpinning knowledge will enable them to adopt an informed approach to applying procedures for the replacement of telecoms equipment. They will have an understanding of the equipment being removed, and its installation requirements, in adequate depth to provide a sound basis for carrying out the process safely and effectively.

Learners will understand the safety precautions required when carrying out the replacement activities, especially those for ensuring the safe isolation of services. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Safety is a key theme throughout this unit and learners will be able to identify all the necessary safety requirements and take the relevant action to ensure the safety of themselves and others.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the replacement of telecoms equipment	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Identify any necessary changes to safety requirements on arriving at site, including prompt reporting to the relevant person(s)			
		1.3	Obtain the required equipment and ensure that it is in a suitable condition for replacement and fit for purpose			
		1.4	Follow all relevant diagrams and specifications			
		1.5	Replace the equipment in the correct sequence using appropriate tools and techniques			
		1.6	Take suitable precautions to prevent damage to equipment during the replacement activity			
		1.7	Make any necessary settings or adjustments to the equipment to ensure it will function correctly			
		1.8	Ensure that the replacement is complete and that all components are free from damage, including checking that all necessary connections to the equipment are complete			
		1.9	Observe sufficient operations of the equipment to confirm it is functioning correctly			
		1.10	Deal promptly and effectively with problems within your control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the replacement of telecoms equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to locate and identify the equipment to be replaced			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.5	Identify the classification of different voltage levels and the authority requirements for working on them			
		2.6	Explain what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe hazards associated with carrying out telecom replacement activities such as: • stored voltages • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures and how to minimise these and reduce any risks			
		2.10	Identify the relevant methods, techniques and procedures for removal and installation activities			
		2.11	Describe how to source and follow relevant technical information, standards, diagrams, instructions, specifications and schedules for replacement of telecoms equipment			
		2.12	Describe own organisation's procedures for the use, care and control of tools and equipment			
		2.13	Outline the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			
		2.14	Explain how and when damage may occur to equipment during replacement			
		2.15	Explain how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Explain how to identify the various types of connectors used and the correct tools and equipment to make the disconnection and connections correctly			
		2.17	Identify the different types of mounting, connecting and cable supporting systems used in the replacement of the telecoms equipment			
		2.18	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.19	Describe the limits of your own authority and responsibility and those of others involved (Safe Work Leader)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 16: Reinstate the Work Area After Telecoms Engineering Activities

Level:	**2**
Guided learning:	**20 hours**
Total unit time	**20 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in reinstating the work area after maintaining, rectifying, installing or testing telecoms equipment and systems. It includes the safe storage of reusable materials and equipment. The telecoms equipment in this unit can be for overground or underground rail transportation systems.

Learners will comply with organisational procedures and report any problems with reinstating the work area that they cannot personally resolve, or are outside their permitted authority, to the relevant people.

Learners will be expected to work to instructions, alone or in conjunction with others, taking full responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Learners will understand the safe storage requirements for the equipment, reusable/waste materials and will be able to carry out the activities safely and correctly in line with procedures and identify potential problems. Learners will understand the safety precautions to take when handling the equipment and materials. They will be required to demonstrate safe working practices throughout, taking relevant action to ensure their own safety and that of others. Learners will be able to ensure that any scrap material, plant, tools and test equipment that cannot be removed is marked for later collection and secured where it will not interfere with the safe operation of the railway.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to reinstate the work area after telecoms engineering activities	1.1	Comply with organisational procedures, working safely at all times			
		1.2	In line with organisational procedures, withdraw all possession and protection measures			
		1.3	Take the appropriate action to confirm that the work area is secured on completion of the work			
		1.4	Restore the work areas to a safe condition in accordance with agreed requirements and schedules			
		1.5	Take action to separate equipment, components and materials for re-use from waste items			
		1.6	Take action to store reusable materials and equipment in an appropriate location			
		1.7	Identify, mark and secure any waste items that cannot be removed immediately, maintaining the safe operation of the railway at all times			
		1.8	Identify all plant, tools and test equipment that cannot be removed and ensure that they are secured and stored where they do not interfere with the safe operation of the railway			
		1.9	Dispose of waste materials in line with organisational procedures			
		1.10	Deal promptly and effectively with problems within own control and report those that cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to reinstate the work area after telecoms engineering activities	2.1	List the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe the relevant railway possession and protection arrangements for the work site and equipment to provide a safe system of work and how to check these have been withdrawn			
		2.3	Explain the organisational procedures for restoring the work area			
		2.4	Describe the work area security requirements			
		2.5	Explain the organisational procedures for storing material and equipment			
		2.6	Explain the different types of materials and equipment to be stored			
		2.7	Explain how the planned use of resources could alter and the implications that may follow			
		2.8	Describe the different types, methods and procedures for the disposal of waste and hazardous substances which have organisational approval			
		2.9	Explain the relevant reporting lines and approved organisational procedures			
		2.10	Describe the limits of own authority and responsibility and those of others involved in relation to reinstating the work area after telecoms engineering activities			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Additional assessment guidance

When assessing the unit, the following points should be covered as appropriate.

Assessment criterion 2.1

- The organisation's safety management system
- Relevant sections of the Health and Safety at Work (HSWA) etc. Act 1974
- Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- Track access restrictions
- Track work instructions
- Task risk control sheets
- Current rule book
- Regulations for working under Overhead Line Equipment (OHLE) and in the vicinity of direct current (DC) lines
- Manual handling regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
- Safety sign regulations
- Personal protective equipment (PPE).

Assessment criterion 2.2

The methods and procedures include, as appropriate:

- your organisation's procedures
- local policies and procedures
- site security and safety
- surface preparation
- site access and egress
- safety signs
- water provision
- power and lighting
- toilets and hygiene facilities
- storage areas
- accommodation
- identification and protection arrangements for all services, including those that are buried
- notifying neighbouring residents and businesses.

Unit 17: Establish Information for Telecoms Engineering Installation

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge required for learners to demonstrate competence in establishing information for telecoms engineering installation from a variety of sources such as design drawings, installation plans, handbooks, installation standards and equipment-specific requirements before undertaking telecom installation activities.

Learners will be able to source and interpret the information required to undertake the allocated installation tasks in accordance with their own organisation's procedures. This will enable them to make valid decisions about work activities based on the information extracted. Learners will be required to comply with organisational policy and procedures for obtaining and using the documentation applicable to the activity. Learners will be expected to report any problems with the use and interpretation of the data that cannot personally be resolved, or that are outside their permitted authority, to the relevant people. Learners will also be expected to work to instructions, with a minimum of supervision, and to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Establish information for telecoms engineering installation	1.1	Identify and interpret the details required for installation activities			
		1.2	Obtain and interpret relevant information on technical requirements			
		1.3	Confirm that the information is current, authorised and contains all essential data			
		1.4	Identify information which is inadequate, contradictory and/or ambiguous and deal with it promptly			
		1.5	Identify any problems occurring with the requirements and their interpretation and deal promptly with the problems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to establish information for telecoms engineering installation	2.1	Describe how to obtain and interpret sources of technical information for the installation activity			
		2.2	Describe organisational procedures for documentation care and control and the requirements for the retention of records			
		2.3	Explain how documents are reviewed to ensure they are current and authorised and reflect the required level of detail			
		2.4	Describe how to interpret site and equipment diagrams, engineering drawings and specifications, including: • relevant conventions • symbols • terminology • abbreviations			
		2.5	Describe the relevant methods and techniques covering installation and how to interpret them			
		2.6	Explain how to identify, evaluate and respond to problems occurring with the information and its interpretation			
		2.7	Describe the organisational approved reporting lines and procedures			
		2.8	Describe the limits of own authority and responsibility and those of others involved in relation to telecom engineering installation			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 18: Establish Information for Telecoms Engineering Maintenance and/or Fault-finding

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in establishing technical and detailed information prior to undertaking maintenance and/or fault-finding activities. This could be from a variety of sources such as drawings, defect history, fault reports, handbooks, maintenance specifications, instructions, procedures and schedules. The telecoms equipment in this standard can be for overground or underground rail transportation systems.

Learners will be able to source and interpret the information required to undertake the allocated maintenance and/or fault-finding tasks in accordance with their own organisation's procedures. They will be required to extract the necessary data from the various specifications and related documentation in order to establish and carry out the work requirements and to make valid decisions about the work activities based on the information extracted.

Learners will be expected to report any problems with the use and interpretation of the data that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, and to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Underpinning knowledge will provide a good understanding of the types of documentation available for use, and will provide an informed approach to applying telecom engineering instructions and procedures. Learners will be able to read and interpret the documentation available, and will know about the conventions, symbols and abbreviations used, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to establish information for telecoms engineering and/or fault finding	1.1	Identify and interpret the details required for the maintenance and/or fault finding activities			
		1.2	Obtain and interpret relevant information on technical requirements			
		1.3	Confirm that the information is current, authorised and contains all essential data			
		1.4	Identify information which is inadequate, contradictory and/or ambiguous and deal with it promptly			
		1.5	Identify any problems occurring with the requirements and their interpretation and deal promptly with the problems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to establish information for telecoms engineering maintenance and/or fault finding	2.1	Describe how to obtain and interpret sources of technical information			
		2.2	Describe organisational procedures for documentation care and control and the requirements for the retention of records			
		2.3	Explain how documents are reviewed to ensure they are current and authorised and reflect the required level of detail			
		2.4	Describe how to interpret site and equipment diagrams, engineering drawings and specifications, including: • relevant conventions • symbols • terminology • abbreviation • telecoms terminology			
		2.5	Describe the relevant methods and techniques used covering maintenance and/or fault finding of telecoms equipment and how to interpret them			
		2.6	Describe how to identify, evaluate and respond to problems occurring with the information and its interpretation			
		2.7	Describe the organisational approved reporting lines and procedures			
		2.8	Describe the limits of own authority and responsibility in relation to establishing information for telecoms engineering maintenance and fault finding			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 19: Installation of Telecoms Equipment Using Non-complex Processes

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge required for learners to demonstrate competence in the installation of operational telecoms systems and equipment under direction, including the use of correct tools and equipment in accordance with their own organisation's procedures.

Learners will be required to use the appropriate tools and equipment throughout the installation activities, to apply a range of installation methods and techniques to position, level and align the equipment, and to make connections as appropriate to the equipment installed. The installation activities will include making checks and adjustments, in line with their permitted authority, and assisting others to ensure that the installed equipment functions to the required specification.

Learners will be required to report any problems with the activities, tools or equipment used that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions and for the quality and accuracy of the work they carry out. Learners will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to install telecoms equipment using non-complex processes	1.1	Work safely at all times, complying with organisational procedures and following the health and safety legislation, regulations and safe working practices and procedures, as applicable to the work location and activities			
		1.2	Identify the access requirements related to **two** of the following types of site installation locations: • trackside • internal (such as signal box, equipment room) • areas to which the public have access • confined spaces • elevated structures			
		1.3	Follow all relevant diagrams, specifications and procedures for the installation being carried out			
		1.4	Assist in the completion of the relevant installation records, to include **one** of the following, and pass to the appropriate people: • job card • installation log and action report • company reporting procedures • other industry specific installation records			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	Carry out all installation activities within the limits of own authority, responsibility and competence			
		1.6	Use the correct tools and equipment for the installation and check that they are in a safe, usable condition and calibrated			
		1.7	Identify and correctly label wires and cables in accordance with installation requirements			
		1.8	Ensure that the installation is complete and that all components are free from damage, including checking that all necessary connections to the equipment are complete and all waste items are dealt with in line with your organisation's procedures			
		1.9	Deal promptly and effectively with problems within your control and report those which cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the installation of telecoms equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to locate and identify the equipment, components and cables to be worked on			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secure			
		2.5	State the classification of different voltage levels and the authority requirements for working on them			
		2.6	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the installation activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Identify hazards associated with carrying out telecom installation activities such as: • stored voltages • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures • and how to minimise these and reduce any risks			
		2.10	Identify the relevant methods, techniques and procedures for installation activities			
		2.11	Describe how to follow relevant technical information, standards, diagrams, instructions, specifications and schedules for installation of telecoms equipment			
		2.12	Describe your organisation's procedures for the use, care and control of tools and equipment			
		2.13	Describe the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			
		2.14	Explain how to select the correct tools for the activity, including how to confirm that they are calibrated and stored correctly after use			
		2.15	Describe how to identify the various types of connectors used and the correct tools and equipment to make the connections correctly			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Identify the different types of mounting, connecting and cable supporting systems used in the installation of telecoms equipment			
		2.17	Identify the relevant reporting lines and procedures that are approved by your organisation			
		2.18	Outline the limits of your own authority and responsibility and those of others involved such as the Safe Work Leader (SWL)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 20: Maintenance of Telecoms Equipment Using Non-complex Processes

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in the maintenance of operational telecoms systems and equipment under direction, including the use of correct tools and equipment in accordance with their own organisation's procedures.

Learners will be required to use the appropriate tools and equipment throughout the maintenance activities and to apply a range of methods and techniques to maintain the equipment. The maintenance activities will include making checks and adjustments, in line with their permitted authority, and assisting others to ensure that the maintained equipment functions to the required specification.

Learners will be required to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with the activities, tools or equipment used that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out. Learners will have knowledge of the equipment that is being maintained in adequate depth to carry out the maintenance process safely and effectively and in line with maintenance procedures.

Learners will be able to check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will be required to demonstrate safe working practices throughout and know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to maintain telecoms equipment using non-complex processes	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Identify the area of work and the equipment which is to be maintained			
		1.3	Follow the relevant maintenance schedules or procedures to carry out the required work			
		1.4	Carry out the maintenance activities within the limits of your own authority			
		1.5	Carry out the maintenance activities in the specified sequence and in an agreed timescale, ensuring that the work does not interfere with any operational railway systems			
		1.6	Select and use the correct tools and equipment, including measuring instruments, and check that they are in a safe usable condition and calibrated			
		1.7	Ensure waste items and tools are removed or stored in line with your organisation's procedures			
		1.8	Deal promptly and effectively with problems within your control and report those which cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to maintain telecoms equipment using non-complex processes	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Explain how to check authorisation is in place for maintenance activities			
		2.4	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.5	State the classification of different voltage levels and the authority requirements for working on them			
		2.6	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.7	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Identify hazards associated with carrying out telecom maintenance activities such as: • stored voltages • radio frequency radiation • electrical supplies, electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures and how to minimise these and reduce any risks			
		2.10	Identify how to locate and identify the equipment to be worked on			
		2.11	Describe how to follow maintenance schedules, procedures, instructions specifications, site and equipment diagrams			
		2.12	Identify the methods, techniques and procedures for the maintenance of telecoms systems and equipment			
		2.13	Describe the types of operational constraints that could occur when carrying out telecoms maintenance activities			
		2.14	Describe your organisation's procedures relating to maintenance records and documentation including how to access and version control			
		2.15	Describe your organisation's procedures for the use, care and control of tools and equipment, including calibration			
		2.16	Describe the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.17	Explain how to check the maintenance activity to ensure compliance with the original specification			
		2.18	State the types of damage or disturbance that could occur to operational equipment when undertaking a maintenance activity			
		2.19	Describe your organisation's procedures for disposing/storing of waste items			
		2.20	Identify the relevant reporting lines and procedures that are approved by your organisation			
		2.21	Outline the limits of your own authority and responsibility and those of others involved such as the Safe Work Leader (SWL)			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 21: Assist with Tests and Checks of Telecoms Equipment

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in the tests and checks of operational telecoms systems and equipment under direction, including the use of correct tools and test equipment in accordance with their own organisation's procedures.

Learners will know how to report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people. Learners will be able to check that all tools, equipment and materials used in the testing and checking activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly. Learners will be expected to work to instructions in conjunction with others, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Learners will gain an underpinning knowledge that will enable them to apply procedures correctly for the testing and checking of telecoms equipment. They will understand the equipment that is being tested and any necessary requirements for checking in adequate depth to provide a sound basis for carrying out the process safely and effectively. Learners will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the tests and checks of telecoms equipment	1.1	Work safely at all times, complying with own organisation's procedures			
		1.2	Follow all relevant diagrams, specifications and procedures for the equipment being checked or tested, including any previous compliance information, if applicable			
		1.3	Identify the tests/checks to be carried out, the sequence in which they are to be performed and the methods to be used			
		1.4	Select and use all the correct tools and inspection equipment and check that they are in a useable condition and calibrated			
		1.5	Carry out the checks and tests in an appropriate sequence, within appropriate timescales and using approved methods and procedures			
		1.6	Report any instances where the test and/or checks cannot be completed			
		1.7	Take suitable precautions to ensure your activities do not interfere with the operational system			
		1.8	Ensure all testing and checking equipment and tools are removed or stored in line with own organisation's procedures			
		1.9	Report completion of compliance activities in line with your organisation's procedures			
		1.10	Deal promptly and effectively with problems within your control and report those which cannot be resolved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the tests and checks of telecoms equipment	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity such as the Safe System of Work Planner (SSOWP)			
		2.2	Explain how to locate and safely access the site			
		2.3	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.4	Identify the classification of different voltage levels and the authority requirements for working on them			
		2.5	Explain what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.6	• Explain how to reduce the risks of an electric shock such as: • insulated tools, • rubber matting • isolating transformers			
		2.7	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the testing activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Describe hazards associated with carrying out telecom test activities such as: • stored voltages • radio frequency radiation • electrical supplies • electrical/electronic interfaces • using damaged or badly maintained tools and equipment • not following laid-down procedures • and how to minimise these and reduce any risks			
		2.9	Identify the activities which may compromise system functionality and integrity, including the operational constraints to carrying out testing/checking activities			
		2.10	Explain how to source and follow engineering diagrams and specifications relevant to the activity			
		2.11	Explain how to locate and identify the equipment to be tested and/or checked			
		2.12	Identify the methods, techniques and procedures for assisting with tests and checks to establish compliance			
		2.13	Describe the operational constraints and authorisation procedures for carrying out tests and checks			
		2.14	Explain how to select the correct tools and confirm that they are calibrated			
		2.15	Describe own organisation's procedures for the use, care and control of inspection tools and equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Outline the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices			
		2.17	Explain how to use test equipment so as to ensure true and accurate measurements are taken			
		2.18	Identify the correct mode of operation of the equipment being tested and/or checked			
		2.19	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.20	Describe the limits of your own authority			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Additional assessment guidance

You must be able to:

Follow the health and safety legislation, regulations and safe working practices and procedures from the following, as applicable to the work location and activities:

- your organisation's safety management system
- relevant sections of the Health and Safety at Work etc. Act 1974 (HSWA)
- Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- safe work plans (such as SSOWP)
- Safe Work Leader (SWL)
- track access restrictions
- track work instructions
- track possession
- task risk control sheets
- current rule book
- regulations for working under overhead line equipment (OHLE) and in the vicinity of direct current (DC) lines (where appropriate)
- equipment disconnections
- manual handling regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
- safety sign regulations
- PPE.

Identify the access requirements related to two of the following types of site testing locations:

- trackside
- internal (such as signal box, equipment room)
- areas to which the public have access
- confined spaces
- elevated structures.

Assist in the testing of one of the following types of telecom equipment:

- transmission systems
- bearer circuits
- telecoms bearers carrying signalling circuits
- Supervisory control and data acquisition (SCADA)
- operational telephones
- switches and systems (such as telephone exchanges and concentrators)
- railway operational information systems

- PA and CCTV
- operational CCTV (such as OPO/DOO)
- Global System for Mobile Communications – Railway (GSM-R)
- other industry-specific telecom equipment.

Use the following types of tools and equipment as applicable to the equipment being tested:

- calibrated hand tools
- uncalibrated hand tools
- calibrated test leads/loads
- computerised test equipment
- test recording equipment
- other specific telecom test equipment.

Assist in the following tests as applicable to the type of telecom equipment being tested:

- bandwidth
- power
- interference
- attenuation
- frequency
- image quality
- alignment
- day/night settings
- Optical Time Domain Reflectometer (OTDR)
- psophometric
- insertion loss measurement
- data error rate
- voltage
- current
- resistance
- continuity
- other industry-specific telecoms tests.

Ensure that testing activities comply with one of the following:

- infrastructure guidelines and standard operating procedures
- equipment manufacturer's documents
- BS, ISO and/or BS EN standards
- Telecoms Maintenance Testing Handbook TMTH
- other industry-specific telecom standards/specifications.

Assist in completion of the relevant test records, to include one of the following, and pass it to the appropriate people:

- job card
- TMTH
- test log and action report
- company reporting procedures
- other industry-specific test records.

Unit 22: Restore Rail Switches and Crossings to Operational Condition

Level:	**2**
Guided learning:	**50 hours**
Total unit time	**50 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in restoring switches and crossings to operational condition by manual or mechanised means.

Learners must be able to mark out and carry out repairs on all types of track, including those with steel, concrete and wood bearers. The complexity of repairs to be carried out will be influenced by geometrical tolerances. The nature of the repairs using mechanical or manual equipment will include, as appropriate, top, alignment, cross level and track gauge. The type of assets to be repaired will be switches and crossings.

The quality standards and accuracy to be achieved will be approved by the learner's organisation and the manufacturer and must include restoring components to within operational tolerances. Dimensional clearances must be taken into account at all times.

Unit assessment requirements

This unit should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to restore rail switches and crossings to operational condition	1.1	Set up a safe system of work in line with organisational procedures and work to the system			
		1.2	Source and interpret the relevant specifications			
		1.3	Prepare the worksite for repair			
		1.4	Carry out the repairs within agreed timescales using approved materials and components, methods and procedures			
		1.5	Ensure that the repaired asset meets the specified operating conditions			
		1.6	Produce accurate and complete records of all repair work carried out			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to restore rail switches and crossings to operational condition	2.1	List the organisation's procedures that define the appropriate safe system of work for the activity			
		2.2	Describe how to source and interpret engineering specifications as approved by own organisation			
		2.3	Describe the methods, techniques and procedures for worksite repair as approved by own organisation, including those that are both temporary and permanent			
		2.4	Describe how incorrectly repaired switches and crossings can affect the safety and performance of the permanent way			
		2.5	Describe own organisation's procedures for the care and control of mechanised equipment, including calibration requirements			
		2.6	Describe own organisation's procedures for recording maintenance activities, including both paper-based and computer-based			
		2.7	Describe own organisation's methods and techniques for ensuring that repaired assets meet the specified operating conditions			
		2.8	Describe the importance of carrying out repair activities in the specified sequence and agreed timescale			
		2.9	Describe the relevant reporting lines and procedures as approved by own organisation			
		2.10	Describe the likely impact of the activity on the operations of other departments and the impact of their work on the activity			
		2.11	Explain the limits of own authority and responsibility and those of others involved			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 23: Restore Track Geometry Faults to Operational Condition by the Manual Repair of Permanent Way Assets and Components

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in restoring track geometry to operational condition by the manual repair of permanent way assets and components. Learners will be expected to work to within their organisation's approved procedures and specifications, and will be responsible for the quality of their work within the limits of their responsibility.

The type of asset to be repaired will be on plain line. Learners will be able to deal with basic manual track repairs as defined by the organisation's standards and procedures. The complexity of repairs to be carried out will be influenced by geometrical tolerances and clearances. This will involve measuring using tapes and gauges. The repairs may include, as appropriate, manual lifting and packing, restoring gauge, restoring alignment and fitting packings.

The quality standards and accuracy to be achieved will be as approved by learners' organisations and manufacturers, and must include restoring components to within operational tolerances.

Unit assessment requirements

This unit should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to restore track geometry faults to operational condition by the manual repair of permanent way assets and components	1.1	Set up a safe system of work in line with organisational procedures and work to the system			
		1.2	Identify the asset to be restored			
		1.3	Follow the relevant specifications for the track to be repaired			
		1.4	Prepare the track for repair			
		1.5	Carry out the repairs within agreed timescale using approved materials and components, methods and procedures			
		1.6	Ensure that the repaired track meets the specified operating conditions			
		1.7	Produce accurate and complete records of all repair work carried out in line with organisational procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to restore track geometry faults to operational condition by the manual repair of permanent way assets and components	2.1	List the organisation's procedures that define the appropriate safe system of work for the activity			
		2.2	Describe how to access and follow the related engineering specifications as approved by own organisation for the components concerned			
		2.3	Describe the methods and techniques for track repair, including those that are temporary and permanent			
		2.4	Describe own organisation's procedures for the use, care and control of tools and equipment including calibration			
		2.5	Describe how incorrectly repaired track can affect the safety and performance of the permanent way			
		2.6	Describe the maintenance recording and documentation procedures for track as approved by own organisation, including: • paper-based records • computer-based records			
		2.7	Describe the relevant reporting lines and procedures as approved by own organisation			
		2.8	Describe the likely impact of the work on the operations of other departments and the impact of their work on the activity			
		2.9	Explain the limits of own authority and responsibility and those of others involved in the activity			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 24: Restore Plain Line Track Geometry to Operational Condition

Level:	**2**
Guided learning:	**50 hours**
Total unit time	**50 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in restoring plain line track geometry to operational condition by manual or mechanised means.

Learners must be able to mark out and carry out repairs on all types of track, including those with steel, concrete and wood bearers. Dimensional clearances must be taken into account at all times. The nature of the repairs using manual equipment may include, as appropriate, top, alignment, cross level and track gauge. The type of assets to be repaired will be plain line.

The quality standards and accuracy to be achieved will be approved by learners' organisations and manufacturers, and must include restoring components to within operational tolerances.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to restore plain line track geometry to operational condition	1.1	Set up a safe system of work in line with organisational procedures and work to the system			
		1.2	Source and interpret the relevant specifications			
		1.3	Prepare the worksite for repair			
		1.4	Carry out the repairs within agreed timescales using approved materials and components, methods and procedures			
		1.5	Ensure that the repaired asset meets the specified operating conditions			
		1.6	Produce accurate and complete records of all repair work carried out			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to restore plain line track geometry to operational condition	2.1	List the organisation's procedures that define the appropriate safe system of work for the activity			
		2.2	Describe how to source and interpret engineering specifications, as approved by own organisation			
		2.3	Describe the methods, techniques and procedures for worksite repair as approved by own organisation, including those that are both temporary and permanent			
		2.4	Describe how incorrectly repaired plain line can affect the safety and performance of the permanent way			
		2.5	Describe own organisation's procedures for the care and control of mechanised equipment, including calibration requirements			
		2.6	Describe own organisation's procedures for recording maintenance activities, including both paper-based and computer-based			
		2.7	Describe own organisation's methods and techniques for ensuring that repaired assets meet the specified operational conditions			
		2.8	Describe the importance of carrying out repair activities in the specified sequence and agreed timescale			
		2.9	Describe the relevant reporting lines and procedures, as approved by own organisation			
		2.10	Describe the likely impact of the activity on the operations of other departments and the impact of their work on the activity			
		2.11	Explain the limits of own authority and responsibility and those of others involved			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Additional assessment guidance

When assessing the unit, the following points should be covered, as appropriate.

Assessment criterion 2.1

- The organisation's safety management system
- Relevant sections of the Health and Safety at Work (HSWA) etc. Act 1974
- Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- Track access restrictions
- Track work instructions
- Task risk control sheets
- Current rule book
- Regulations for working under overhead line equipment (OHLE) and in the vicinity of direct current (DC) lines
- Manual handling regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
- Safety sign regulations
- Personal protective equipment (PPE).

Unit 25: Undertake Replacement of Permanent Way Assets and Components

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in undertaking the replacement of permanent way assets and components during maintenance activities. The type of asset to be worked on will be either plain line or switches and crossings equipment, and associated fastenings.

The type of components to be replaced, in respect of either plain line or switches and crossings, will include, as appropriate, ballast (wet beds), rails, sleeper/bearers, drains, fastenings, insulations, chairs and base plates, fish-plated joints, welded joints (preparatory work) and lubricators.

The assembly methods and techniques to be used will be either manual or mechanical methods and may include the use of small plant and equipment. The complexity of the assembly operations will be influenced by track configuration, using variable/diverse sources of information, track stability and environmental procedures.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as, witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to undertake replacement of permanent way assets and components	1.1	Set up a safe system of work for the activity in line with organisational procedures and work to the system			
		1.2	Follow the appropriate engineering diagrams and related specifications for the components/asset being replaced			
		1.3	Obtain all the required components and ensure that they are in a suitable condition for replacement and fit for purpose			
		1.4	Ensure that any replacement components used meet the required specification			
		1.5	Prevent damage to components, tools and equipment during replacement			
		1.6	Replace the components in the correct sequence using appropriate tools and techniques			
		1.7	Make necessary settings or adjustments to the components to ensure they will function correctly			
		1.8	Deal promptly with problems within own control and report those that cannot be resolved			
		1.9	Maintain documentation in line with own organisation's procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake replacement of permanent way assets and components	2.1	List the relevant health and safety legislation, regulations and safe working practices appropriate to the activity and organisation			
		2.2	Describe how to follow engineering diagrams and related specifications as approved by own organisation			
		2.3	Describe the methods and techniques for component and asset replacement appropriate to own role			
		2.4	Describe the methods and techniques for ensuring that components meet the required specification			
		2.5	Explain how defects in components can affect the performance of the permanent way assets			
		2.6	Describe the methods and techniques for handling equipment including: • manual handling • mechanical handling • use of small tools • equipment handling			
		2.7	Describe the organisation's procedures for the use, care and control of tools and equipment, including calibration			
		2.8	Describe the organisation's approved relevant reporting lines and procedures			
		2.9	Describe the impact of the activity on other departments and the impact of their actions on the activity			
		2.10	Explain the limits of own authority and responsibility and those of others involved			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Additional assessment guidance

When assessing the unit, the following points should be covered, as appropriate.

Assessment criterion 2.1

- The organisation's safety management system
- Relevant sections of the Health and Safety at Work (HSWA) etc. Act 1974
- Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- Track access restrictions
- Track work instructions
- Task risk control sheets
- Current rule book
- Regulations for working under overhead line equipment (OHLE) and in the vicinity of direct current (DC) lines
- Manual handling regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
- Safety sign regulations
- Personal protective equipment (PPE).

Unit 26: Assist in the Installation of Traction and Rolling Stock Equipment

Level:	**2**
Guided learning:	**50 hours**
Total unit time	**50 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in the installation of traction and rolling stock equipment in accordance with approved procedures.

Learners will be required to assist in the installation of a range of equipment, using the appropriate tools, equipment, methods and techniques throughout the installation activities. The installation activities will include making checks and adjustments, in line with their own permitted authority, and assisting others to ensure that the installed equipment functions to the required specification.

Learners will be required to comply with organisational policy and procedures for the installation activities undertaken, and to report any problems that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will be required to demonstrate safe working practices throughout, and will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in the installation of traction and rolling stock	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Follow all relevant instruction documentation for the installation being carried out			
		1.3	Use the correct tools and equipment for the installation operations, and check that they are in a safe and usable condition			
		1.4	Assist in the installation, positioning and securing of the equipment, using appropriate methods and techniques			
		1.5	Assist in checking the installation, and make any adjustments in accordance with the specification			
		1.6	Deal promptly and effectively with problems within your control and report those that cannot be solved			
		1.7	Dispose of waste items in a safe and environmentally acceptable manner			
		1.8	Assist in the completion of installation documentation			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in the installation of traction and rolling stock	2.1	Describe the health and safety requirements of the area in which the installation activity is to take place, and the responsibility these requirements place on you			
		2.2	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secure			
		2.3	Describe the specific health and safety precautions to be applied during the installation procedure, and their effects on others			
		2.4	Describe the hazards associated with installing traction and rolling stock equipment, and with the tools and equipment used, and how they can be minimised			
		2.5	State the classification of different voltage levels and the authority requirements for working on them			
		2.6	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the installation			
		2.7	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.9	Explain how to obtain and interpret information from job instructions and other documentation used in the installation activities (such as installation drawings, specifications, manufacturers' manuals, regulations, symbols and terminology)			
		2.10	Describe the basic principles of how the system functions, and its operating sequence			
		2.11	List methods of preparing the traction and rolling stock for positioning the equipment, and the tools and equipment used for this			
		2.12	List the various mechanical fasteners and locking devices that will be used, and their correct method of installation			
		2.13	Describe methods of lifting, handling and supporting the equipment during the installation activities			
		2.14	Describe methods of levelling and aligning the equipment, and the types of tools, instruments and techniques used			
		2.15	Describe methods of connecting to mechanical power transmission devices such as: • shafts • couplings belt • chain drives			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	List the different types of cabling used in the installation activities, and their methods of termination			
		2.17	List the different types of wiring enclosures that are used, to include: • conduit • trunking • tray work systems			
		2.18	Describe the installation and termination of a range of electrical components such as: • plugs • switches • sockets • lighting • fittings			
		2.19	Explain why electrical bonding is critical, and why it must be both mechanically and electrically secure			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 27: Carry Out Scheduled Maintenance on Traction and Rolling Stock Mechanical Equipment

Level:	**2**
Guided learning:	**60 hours**
Total unit time	**60 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in carrying out scheduled maintenance activities on traction and rolling stock mechanical equipment, in accordance with approved procedures.

Learners will be required to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will know the process of implementing scheduled maintenance activities, the importance of carrying them out at specific times, and of recording the outcomes and actions taken. In addition, learners will be expected to report when the outcomes identify the need for further investigation or maintenance work.

Learners will be required to demonstrate safe working practices throughout, and will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out scheduled maintenance on traction and rolling stock mechanical equipment	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Follow the relevant mechanical maintenance schedules to carry out the required work			
		1.3	Carry out the mechanical maintenance activities within the limits of your personal authority			
		1.4	Carry out the mechanical maintenance activities in the specified sequence and in an agreed time scale			
		1.5	Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule			
		1.6	Complete relevant maintenance records accurately and pass them on to the appropriate person			
		1.7	Dispose of waste materials in accordance with safe working practices and approved procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out scheduled maintenance on traction and rolling stock mechanical equipment	2.1	Identify the health and safety requirements of the area in which the scheduled maintenance activities are to take place, and the responsibility these requirements place on you			
		2.2	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.3	Describe the specific health and safety precautions to be applied during the scheduled maintenance activities, and their effects on others			
		2.4	State the classification of different voltage levels and the authority requirements for working on them			
		2.5	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.6	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber matting • isolating transformers			
		2.7	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Identify the hazards associated with carrying out scheduled maintenance activities on mechanical equipment such as: • handling oils/greases • stored pressure/force • misuse of tools and how they can be minimised			
		2.9	Explain how to obtain and interpret information from job instructions and other documentation used in the maintenance activities such as: • drawings • specifications • manufacturers' manuals • servicing schedules • symbols and terminology			
		2.10	List the various checks to be carried out during the scheduled maintenance procedure			
		2.11	State the maintenance requirements for 'lifed', consumable and on-condition components			
		2.12	Outline the procedure for obtaining the consumables to be used during the scheduled maintenance activity			
		2.13	Describe methods of checking that components are fit for purpose, and the need to replace 'lifed' items			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.14	Explain how to check that any replacement components meet the required specification/operating conditions			
		2.15	Explain how to make appropriate sensory checks such as sight, sound, smell and touch			
		2.16	Identify the appropriate testing instructions to be adopted during the maintenance activity			
		2.17	Explain how to make adjustments to components/assemblies to ensure they function to specification			
		2.18	Describe the basic principles of how the equipment functions, its operating sequence, the working purpose of individual units/components and how they interact			
		2.19	List the different types of bearings that are used and their maintenance requirements			
		2.20	Explain how to complete scheduled maintenance records/logs/reports, in accordance with company policy and procedures			
		2.21	Describe the equipment operating and control procedures, and how to apply them in order to carry out scheduled maintenance			
		2.22	Explain the problems that can occur whilst carrying out the scheduled maintenance activities, and how they can be avoided			
		2.23	Describe the organisational procedure(s) to be adopted for the safe disposal of waste of all types of materials			
		2.24	Identify the extent of your own authority and to whom you should report if you have problems that you cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 28: Carry Out Scheduled Maintenance on Traction and Rolling Stock Electrical Equipment

Level:	**2**
Guided learning:	**60 hours**
Total unit time	**60 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in carrying out scheduled maintenance activities on traction and rolling stock electrical equipment, in accordance with approved procedures.

Learners will be required to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems they cannot personally resolve, or are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will know the process of implementing scheduled maintenance activities, the importance of carrying them out at specific times, and of recording the outcomes and actions taken. In addition, learners will be expected to report where the outcomes identify the need for further investigation or maintenance work.

Learners will be required to demonstrate safe working practices throughout, and will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out scheduled maintenance on traction and rolling stock electrical equipment	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Follow the relevant electrical maintenance schedules to carry out the required work			
		1.3	Carry out the electrical maintenance activities within the limits of your personal authority			
		1.4	Carry out the electrical maintenance activities in the specified sequence and in an agreed time scale			
		1.5	Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule			
		1.6	Complete relevant maintenance records accurately and pass them on to the appropriate person			
		1.7	Dispose of waste materials in accordance with safe working practices and approved procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out scheduled maintenance on traction and rolling stock electrical equipment	2.1	Identify the health and safety requirements of the area in which the scheduled maintenance activities are to take place, and the responsibility these requirements place on you			
		2.2	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.3	Describe the specific health and safety precautions to be applied during the scheduled maintenance activities, and their effects on others			
		2.4	State the classification of different voltage levels and the authority requirements for working on them			
		2.5	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.6	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber mating • isolating transformers			
		2.7	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Identify the hazards associated with carrying out scheduled maintenance activities on electrical equipment such as: • live electrical components • stored energy • misuse of tools and how they can be minimised			
		2.9	Explain how to obtain and interpret information from job instructions and other documentation used in the maintenance activities such as: • drawings • specifications • manufacturers' manuals • servicing schedules • symbols and terminology			
		2.10	List the various checks to be carried out during the scheduled maintenance procedure			
		2.11	State the maintenance requirements for 'lifed', consumables and on-condition components			
		2.12	Outline the procedure for obtaining the consumables to be used during the scheduled maintenance activity			
		2.13	Describe methods of checking that components are fit for purpose, and the need to replace 'lifed' items			
		2.14	Explain how to check that any replacement components meet the required specification/operating conditions			
		2.15	Explain how to make appropriate sensory checks such as sight, sound, smell and touch			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	Describe the appropriate testing instructions to be adopted during the maintenance activity			
		2.17	Explain how to make adjustments to components/assemblies to ensure they function to specification			
		2.18	Describe the basic principles of how the equipment functions, its operating sequence, the working purpose of individual units/components, and how they interact with other systems such as ETCS			
		2.19	Explain how to complete scheduled maintenance records/logs/reports, in accordance with company policy and procedures			
		2.20	Describe the equipment operating and control procedures, and how to apply them in order to carry out scheduled maintenance			
		2.21	Explain the problems that can occur whilst carrying out the scheduled maintenance activities, and how they can be avoided			
		2.22	Describe the organisational procedure(s) to be adopted for the safe disposal of waste of all types of materials			
		2.23	Identify the extent of your own authority and to whom you should report if you have problems that you cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 29: Carry Out Scheduled Maintenance on Traction and Rolling Stock Communications-electronic Equipment

Level:	**2**
Guided learning:	**60 hours**
Total unit time	**60 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in carrying out scheduled maintenance on traction and rolling stock communications-electronic equipment, in accordance with approved procedures. Learners will be required to carry out scheduled maintenance activities on a range of communications-electronic systems, sub-systems and assemblies.

Learners will be required to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will know the process of implementing scheduled maintenance activities, the importance of carrying them out at specific times, and of recording the outcomes and actions taken. In addition, learners will be expected to report where the outcomes identify the need for further investigation or maintenance work.

Learners will be required to demonstrate safe working practices throughout, and will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out scheduled maintenance on traction and rolling stock communications electronic equipment	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Follow the relevant communication-electronic maintenance schedules to carry out the required work			
		1.3	Carry out the communications-electronic maintenance activities within the limits of your personal authority			
		1.4	Carry out the communication-electronic maintenance activities in the specified sequence and in an agreed time scale			
		1.5	Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule			
		1.6	Complete relevant maintenance records accurately and pass them on to the appropriate person			
		1.7	Dispose of waste materials in accordance with safe working practices and approved procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out scheduled maintenance on traction and rolling stock communications electronic equipment	2.1	Identify the health and safety requirements of the area in which the scheduled maintenance activity is to take place, and the responsibility they place on you			
		2.2	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the scheduled maintenance activities such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.3	Describe isolation procedures unique to communication-electronic systems, sub-systems or assemblies			
		2.4	Describe the specific health and safety precautions needed to be applied during the scheduled maintenance procedure and their effects on others			
		2.5	State the classification of different voltage levels and the authority requirements for working on them			
		2.6	Identify the hazards associated with carrying out scheduled maintenance activities on communication-electronic systems, sub-systems or assemblies such as: • exposure to live conductors • misuse of tools and how they can be minimised			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.7	Describe what constitutes a hazardous voltage/current and how to recognise victims of electric shock			
		2.8	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities			
		2.9	Explain how to reduce the risks of an electric shock such as: • insulated tools • rubber mating • isolating transformers			
		2.10	Explain how the maintenance activities may affect the work of others, and the procedure for informing them of the work to be carried out			
		2.11	Describe the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD)			
		2.12	Explain how to obtain and interpret information from job instructions and other documentation used in the maintenance activities such as: • drawings • specification • manufacturers' manuals • symbols • terminology			
		2.13	Describe the maintenance schedules and methods to be followed in order to comply with company procedures for scheduled maintenance			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.14	State the various checks to be carried out during the scheduled maintenance procedure			
		2.15	State the maintenance requirements for 'lifed', consumable and on-condition components			
		2.16	Explain how to make sensory checks (by sight, sound, smell or touch)			
		2.17	State company policy on repair/replacement of systems, sub-systems and assemblies during the scheduled maintenance process			
		2.18	Describe methods of checking that systems, sub-systems and assemblies are fit for purpose, and the need to replace 'lifed' items (such as batteries)			
		2.19	Explain how to make adjustments to systems, sub-systems and assemblies to ensure they function correctly			
		2.20	Describe how to generate maintenance documentation and/or reports following the maintenance activity			
		2.21	Describe the health and safety requirements of the area in which the scheduled maintenance activity is to take place, and the responsibility they place on you			
		2.22	Describe the isolation and lock-off procedure or permit-to-work procedure that applies to the system such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.23	Describe isolation procedures unique to communication-electronic systems, sub-systems or assemblies			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 30: Carry Out Scheduled Maintenance on Traction and Rolling Stock Fluid Power Equipment

Level:	**2**
Guided learning:	**60 hours**
Total unit time	**60 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in carrying out scheduled maintenance activities on traction and rolling stock fluid power equipment, in accordance with approved procedures.

Learners will be required to carry out maintenance on pneumatic, hydraulic or vacuum equipment, in order to minimise down time, and to ensure that the equipment performs at optimal levels and functions to specification. Equipment and components will include pumps, cylinders, valves, actuators, compressors, pipework, hoses, switches and sensors.

Learners will be required to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Learners must check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the relevant job/task documentation is completed accurately and legibly.

Learners will be required to demonstrate safe working practices throughout, and will know their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

Unit assessment requirements

This unit should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to carry out scheduled maintenance on traction and rolling stock fluid power equipment	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Follow the relevant fluid power maintenance schedules to carry out the required work			
		1.3	Carry out the fluid power maintenance activities within the limits of your personal authority			
		1.4	Carry out the fluid power maintenance activities in the specified sequence and in an agreed time scale			
		1.5	Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule			
		1.6	Complete relevant maintenance records accurately and pass them on to the appropriate person			
		1.7	Dispose of waste materials in accordance with safe working practices and approved procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to carry out scheduled maintenance on traction and rolling stock fluid power equipment	2.1	Identify the health and safety requirements of the area in which the scheduled maintenance activities are to take place, and the responsibility these requirements place on you			
		2.2	Describe the isolation procedure or permit-to-work procedure that applies to the equipment being maintained such as: • electrical isolation • locking off switchgear • placing of warning notices • proving the isolation has been achieved and secured			
		2.3	Describe the specific health and safety precautions to be applied during the scheduled maintenance activities, and their effects on others			
		2.4	Explain the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities			
		2.5	The hazards associated with carrying out scheduled maintenance on fluid power equipment such as: • handling oils/greases, • stored pressure/force • misuse of tools and how they can be minimised			
		2.6	Explain how to obtain and extract information from job instructions, drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.7	Describe the various checks to be carried out during the scheduled maintenance procedure			
		2.8	Explain the importance of following correct preventive contamination procedures			
		2.9	Describe the effects of contamination in the system			
		2.10	Describe the maintenance requirements for 'lifed', consumable and on condition components			
		2.11	Describe the procedure for obtaining the consumables to be used during the scheduled maintenance activity			
		2.12	Explain methods of checking that components are fit for purpose, and the need to replace 'lifed' items			
		2.13	Explain how to check that any replacement components meet the required specification/operating conditions			
		2.14	Explain how to make appropriate sensory checks (such as sight, sound, smell and touch)			
		2.15	Outline the appropriate testing instructions to be adopted during the maintenance activity			
		2.16	Explain how to make adjustments to components/assemblies to ensure they function to specification			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.17	Describe the basic principles of how the equipment functions, its operating sequence, the working purpose of individual units/components, and how they interact with other systems such as ETCS			
		2.18	Explain how to complete scheduled maintenance records/logs/reports, in accordance with company policy and procedures			
		2.19	Explain the importance of recording an adjustments and modifications to the system and the implications if this is not carried out			
		2.20	Describe the equipment operating and control procedures, and how to apply them in order to carry out scheduled maintenance			
		2.21	Describe the problems that can occur whilst carrying out the scheduled maintenance activities, and how they can be avoided			
		2.22	Describe the organisational procedure(s) to be adopted for the safe disposal of waste of all types of materials			
		2.23	State the extent of your own authority and to whom you should report if you have problems that you cannot resolve			

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(if sampled)

Unit 31: Plan Railway Electrification Engineering Activities

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in planning railway electrification engineering activities. Learners will be able to plan activities in relation to contact systems (overhead line equipment and conductor rails).

Learners will take into consideration the availability of technical documentation, equipment, tools, materials, components and personnel.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to plan electrification engineering activities	1.1	Source and interpret information required for the activity			
		1.2	Identify health and safety issues and safe working practices and procedures that must be followed			
		1.3	Identify the activities to be carried out and determine their sequence			
		1.4	Establish what resources are required			
		1.5	Identify any special requirements and incorporate them in the plan			
		1.6	Identify where technical documentation, equipment, tools, materials, components and/or personnel are not available and deal with the deficiency in line with own organisation's procedures			
		1.7	Estimate the timescales required			
		1.8	Prepare and record the plan			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.9	Demonstrate one of the following methods of manual lifting and carrying: • lifting alone • with assistance of others with mechanical assistance			
		1.10	Apply safe working practices and procedures, to include: maintaining a tidy workplace, with exits and gangways free from obstruction • using equipment safely and only for the purpose intended • observing organisational safety rules, signs and hazard warnings • taking measures to protect others from any harm resulting from the work that they are carrying out			
		1.11	Discuss and agree with the relevant person(s) effective and efficient alternatives where planned activities cannot be achieved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to plan electrification engineering activities	2.1	Describe the relevant health and safety legislation, regulations and safe working practices and procedures as appropriate to the activity			
		2.2	Describe how to source and interpret the types of information required for the activity			
		2.3	Explain the importance of planning the activities in the specified sequence and agreed timescale			
		2.4	Describe the types of resources required			
		2.5	Explain how to estimate the timescales required			
		2.6	Describe how to prepare and record the plan			
		2.7	Describe how to deal with a deficiency of technical documentation, equipment, tools, materials, components and/or personnel			
		2.8	Describe how to identify, evaluate and respond to activities that cannot be achieved			
		2.9	Describe the relevant reporting lines and procedures that are approved by own organisation			
		2.10	Explain the limits of own authority and responsibility and those of others involved in the activity			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 32: Assist in Preparing Resources for Railway Electrification Engineering Activities

Level:	**2**
Guided learning:	**30 hours**
Total unit time	**30 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in preparing resources for railway electrification engineering activities.

Learners will be able to work to a plan and ensure that the required resources are available and fit for purpose, including obtaining all the necessary documentation and reporting to their line manager/supervisor.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist in preparing resources for electrification engineering activities	1.1	Set up a safe system of work and work to the system			
		1.2	Identify the resources to be used			
		1.3	Ensure sufficient resources are available			
		1.4	Prepare resources for engineering activities			
		1.5	Take action when changes to the planned use of resources arise			
		1.6	Take responsibility for the care and use of the resources within the limits of own authority			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in preparing resources for electrification engineering activities	2.1	Describe the relevant health and safety working practices appropriate to the activity and organisation			
		2.2	List the types of resources available, including: • documentation • tools and equipment • materials, assets and components • communications equipment • personnel			
		2.3	Describe how to obtain up-to-date information on engineering activities and the resources required			
		2.4	Describe how to obtain up-to-date documentation on the resources to be used			
		2.5	Describe own organisation's procedures for the care and use of resources, including tools and equipment, identification and calibration			
		2.6	Describe how to follow the relevant schedules and instructions			
		2.7	Describe how the planned use of resources could alter and the implications that may follow			
		2.8	Describe the relevant reporting lines and procedures that are approved by own organisation			
		2.9	Explain the limits of own authority and responsibility and those of others involved in the activity			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 33: Establish the Operational Condition of Electrification and Plant Assets

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in establishing the operational condition of electrification and plant assets. This could include intrusive or non-intrusive inspection such as testing and monitoring or other methods appropriate for the asset. At all times, the inspection or other methods must be approved by the learner's organisation.

The assets may include contact systems such as overhead line equipment (OLE), conductor rails and power supply equipment. They may also include one or more structural, mechanical or electrical components.

The types of activities could vary and will generally be multi-stage processes. At all times, learners will be working within the limits of their own responsibility and will report any instances where the activities cannot be achieved to the relevant person(s). This may include reporting, recording and escalating procedures.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to establish the operational condition of electrification and plant assets	1.1	Work safely at all times, complying with your organisation's procedures			
		1.2	Source and interpret the relevant specifications for the asset(s) being checked			
		1.3	Identify, analyse and determine the sequence of the activities to be undertaken			
		1.4	Identify the equipment and components to be checked			
		1.5	Carry out the activities within the limits of own authority			
		1.6	Carry out the activities in the specified sequence and in an agreed timescale			
		1.7	Confirm the operational condition of the asset(s)			
		1.8	Complete relevant documentation accurately and pass to the appropriate person(s), if applicable			
		1.9	Identify where the operational condition of the asset(s) may affect the functional integrity and safety of the operational system			
		1.10	Report any instances where the activities cannot be fully completed			
		1.11	Complete relevant records accurately and pass them on to the appropriate person(s), if applicable			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to establish the operational condition of electrification and plant assets	2.1	Identify the relevant health and safety legislation, regulations and safe working practices and procedures as defined by your organisation			
		2.2	Explain how to source and interpret specifications and instructions that are approved by your organisation			
		2.3	Explain how to identify discrepancies in specifications and instructions, including, as appropriate, version control			
		2.4	Explain how to identify and analyse the activities to be undertaken			
		2.5	Explain how to identify the equipment and components to be checked			
		2.6	State the operational condition of the asset(s) relevant to your role			
		2.7	Explain importance of carrying out activities in the specified sequence and agreed timescale			
		2.8	Explain the implications of when activities cannot be completed			
		2.9	Describe the types of conditions and activities that would impact on the functional integrity and safety of the operational system			
		2.10	Describe the relevant reporting lines and procedures that are approved by your organisation			
		2.11	State the limits of your own authority and responsibility and those of others involved			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 34: Assist with Maintenance on Railway Electrification Equipment and Components

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting with the maintenance of railway electrification equipment and components.

The types of maintenance activities will be both planned and unplanned but will generally be single-stage processes. At all times, learners will be able to work within the limits of their own responsibility and report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Be able to assist with maintenance on electrification equipment and components	1.1	Set up a safe system of work for the activity and work to the system			
		1.2	Follow the relevant maintenance schedules and instructions			
		1.3	Carry out the maintenance activities within limits of own authority			
		1.4	Report instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule			
		1.5	Dispose of waste materials in line with the organisation's procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist with maintenance on electrification equipment and components	2.1	Describe the relevant health and safety working practices appropriate to the activity and organisation			
		2.2	Describe how to follow the organisation's maintenance schedules and instructions			
		2.3	Describe methods and techniques for carrying out maintenance activities			
		2.4	Describe the importance of carrying out maintenance activities in the specified sequence and agreed timescale			
		2.5	Describe the actions that can be taken when defects arise			
		2.6	Describe the organisation's procedures for waste disposal			
		2.7	Describe the organisation's reporting lines and procedures			
		2.8	Describe the limits of own authority and responsibility and that of those involved in maintaining electrification equipment and components			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Additional assessment guidance

The assessments will cover these types of equipment, components and inter-connections, and may include:

- conductors (overhead wires and rails)
- support and registration assemblies
- in-span equipment such as section insulators and neutral sections
- contact and catenary wire
- earthing and bonding cables and connectors
- insulators
- foundations
- support structures such as masts and portals
- droppers.

These may also be in one or more of the following areas:

- structural
- mechanical
- electrical.

The equipment, components and interconnections will be sub-sets of contact systems (overhead line equipment, conductor rails). Examples of maintenance activities may include:

- lubrication
- cleaning and security of equipment (such as insulation, signage, guarding).

Examples of replacement techniques include:

- crimping
- fastening
- rail drilling
- using tensioning rigs.

Unit 35: Assist in Preventative and Corrective Maintenance of Traction Cabling Systems

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in assisting in preventative and corrective maintenance on traction cabling systems. The maintenance may be routine and could involve replacing, locating, diagnosing, restoring and testing earthing and bonding equipment.

The types of systems may include contact systems such as OLE and conductor rails, and power supply equipment. The types of maintenance activities may include routine and preventative maintenance, replacement, fault-finding, restoration and testing.

This unit may also include working on one or more electrical components associated with power supply systems. The types of activities will be both planned and unplanned but will generally be single-stage processes. At all times, learners will be able to work within the limits of their own responsibility and report any problems they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Assist in preventative and corrective maintenance of traction cabling systems	1.1	Work safely at all times, complying with own organisation's procedures			
		1.2	Follow the relevant maintenance schedules, specifications and instructions to carry out the required activities			
		1.3	Carry out the activities within the limits of your own authority			
		1.4	Carry out the activities in the specified sequence and in an agreed timescale			
		1.5	Confirm that the systems are functioning as defined by the specification			
		1.6	Complete relevant documentation accurately and pass them on to the appropriate person(s), if applicable			
		1.7	Dispose of waste materials in line with own organisation's procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to assist in preventative and corrective maintenance of traction cabling systems	2.1	Identify the relevant health and safety legislation, regulations and safe working			
		2.2	Explain how to follow maintenance schedules, specifications and instructions that are approved by your organisation			
		2.3	Describe your organisation's methods and techniques for carrying out preventative and corrective maintenance activities relevant to your role			
		2.4	Explain the importance of carrying out activities in the specified sequence and agreed timescale			
		2.5	Explain how to confirm the systems are functioning			
		2.6	Describe your organisation's procedures for waste disposal			
		2.7	Identify the relevant reporting lines and procedures that are approved by your organisation			
		2.8	State the limits of your own authority and responsibility and those of others involved			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Additional assessment guidance

The assessments will cover these types of equipment, components and inter-connections, and may include:

- conductors (overhead wires and rails)
- support and registration assemblies
- in-span equipment such as section insulators and neutral sections
- contact and catenary wire
- earthing and bonding cables and connectors
- insulators
- foundations
- support structures such as masts and portals
- droppers.

These may also be in one or more of the following areas:

- structural
- mechanical
- electrical.

The equipment, components and interconnections will be sub-sets of contact systems (overhead line equipment, conductor rails). Examples of maintenance activities include:

- lubrication
- cleaning and security of equipment, such as insulation, signage, guarding.

Examples of replacement techniques include:

- crimping
- fastening
- rail drilling
- using tensioning rigs.

Unit 36: Access Overhead Line Equipment Construction Sites

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in accessing overhead line equipment (OLE) construction sites safely, effectively and in line with relevant processes and procedures.

Learners will know the level and extent of their own responsibility and when to refer to others for authorisation. They will be responsible for the implementation of instructions, and work within set procedures and processes without compromising the safety of others.

Learners will also have to show that they can follow recording, reporting and escalation procedures.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Access overhead line equipment construction sites	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Identify the requirements for site briefings, to include the following: • safety arrangements • nature of work • hazards associated with the site • extent of safe working limits • emergency arrangements • welfare arrangements • PPE requirements • whom they will need to report to while on site • limits of personal responsibility			
		1.3	Adhere to and follow site access requirements for receiving safety briefings and personal safety			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	Identify the types of documentation that apply to access requirements, including: • signing in and off-site register • site briefing attendance • site access authorisation card • personal track safety certificate • track visitor permit			
		1.5	Follow instructions in line with safe access procedure			
		1.6	Adhere to site requirements for personal protective equipment (PPE) including: • safety helmets • approved high visibility clothing • approved safely footwear • gloves • goggles • ear protection • safety harnesses			
		1.7	Follow directions from competent personnel			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.8	Identify the hazards and risks related to the following: • electrified lines • radial loaded and tensioned lines • limited clearances • moving machinery (such as road rail vehicles (RRVs)) • working at height • lifting and moving equipment • overloaded plant and equipment			
		1.9	Carry out on-site activities within the limits of own personal authority			
		1.10	Report any instances where on site activities cannot be achieved or where there are safety issues outside the planned schedule			
		1.11	Comply with all the recording, reporting and escalation procedures including: • emergency procedures • standard reporting procedures associated with projects			
		1.12	Complete relevant records accurately and pass them on to the appropriate person			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to access overhead line equipment construction sites	2.1	Describe the specific safety requirements surrounding construction site access regarding: • moving machinery • working plant and equipment • electrified lines • hazards associated with OLE systems • awareness of working at height • and how the safety requirements can differ at each site of work			
		2.2	List the technical terminology associated with construction sites and how it applies to the safe access to the site			
		2.3	Describe the documentation associated with access to OLE construction sites			
		2.4	Describe the requirements for signing in and off site			
		2.5	Describe the purpose of the briefing by the site access controller before gaining access			
		2.6	Describe the procedures to be followed to ensure operational and personal safety is maintained during the work			
		2.7	Describe the procedures to be followed for visitors to the construction site			
		2.8	Describe how to avoid personal injury while working			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe how the construction activity may affect the safe operation of the railway			
		2.10	State how the OLE is designed to function under normal operating conditions			
		2.11	List the component parts and state how they contribute to the overall operation of the OLE system			
		2.12	List what terminology and methods are used to identify OLE and describe operational status of the equipment			
		2.13	State the recording, reporting lines and escalation procedures			
		2.14	Describe the industry protocols relating to communication of safety information			
		2.15	Describe what the limits of their own responsibility/authority are and whom they should report to if they have a problem they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 37: Undertake Overhead Line Equipment Main Steelwork Installation Under Direction

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in installing overhead line equipment (OLE) main steelwork to pre-prepared foundations under direction. Learners will be able to complete the main steelwork installation, renewal, and enhancement or modification activities in accordance with directions from a specified competent individual.

Learners will know the basic principles and processes associated with the erection and assembly of the steelwork and their application. They will know about the ways of handling main steelwork, the means of fixing them in position and the care and use of the tools and equipment in adequate depth to provide a sound basis for carrying out the activities and ensuring that the finished steelwork structure is produced to the required specification under direction.

Learners will know the safety precautions required when working at height and with main steelwork components, and with their associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will know the responsibility they have for themselves and others in the workplace.

Learners will comply with organisational policy and procedures for the safe installation of the main steelwork and the associated assembly activities to be undertaken. They will report any problems with the component parts, equipment or installation activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Undertake overhead line equipment main steelwork installation under direction	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Carry out all of the following activities during the installation: • adhere to safety briefing instructions, risk assessments, COSHH, safe system of work and other relevant safety standards • obtain authority before carrying out the installation activities and follow the directions given • leave the work area in a safe condition			
		1.3	Select and use correctly **six** of the following types of personal protection equipment: • safety harnesses • safely helmets • approved high visibility clothing • approved safety footwear • gloves • goggles • ear protection (as appropriate) • other specific equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	Undertake activities within the limits of own authority, following recording, reporting and escalation procedures			
		1.5	Follow the relevant renewal, installation or enhancement documentation for the main steelwork to be renewed or installed as directed			
		1.6	Undertake all of the following installation activities under direction: • use of lifting equipment • positioning and fastening of steelwork • adjustments to level, rake and alignment			
		1.7	Install or renew the one of the following types of main steelwork under direction: • cantilever masts • twin track cantilevers • head span masts • portals 'A' frames			
		1.8	Carry out the installation activities within agreed timescales using approved materials and components and method and procedures and under direction			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.9	Apply installation methods and techniques under direction, to include **five** of the following: • hole and fixing preparation • shimming and packing (as applicable) • positioning equipment • securing using mechanical fixings • levelling and aligning equipment • torque loading • applying locking devices (as applicable)			
		1.10	Carry out checks appropriate to the type of steelwork being installed under direction, to include **all** of the following: • assist with checking that the installed steelwork complies with the installation specification • making visual checks for completeness and freedom from damage			
		1.11	Complete activities under direction of competent personnel and using correct tools and equipment as specified within the limits of own authority			
		1.12	Assist with the production of accurate records of work undertaken			
		1.13	Follow relevant recording and reporting procedures, to include **one** of the following: • installation record • handover document • other specific recording document			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake overhead line equipment main steelwork installation under direction	2.1	Describe what health and safety legislation, regulations and safe working practices and procedures apply, including: • current Rule Book • working on or about 25kV AC electrified lines • Health and Safety at Work etc. Act 1974 • control measures • Provision and Use of Work Equipment Regulations 1998 (PUWER) • Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)			
		2.2	Describe the industry protocols relating to communication of important safety information			
		2.3	Describe the procedures to be followed to ensure operational and personal safety is maintained during the work			
		2.4	Describe the system of work associated with safe access and the procedures associated with working under isolated conditions of the OLE			
		2.5	Describe how to avoid personal injury during the work			
		2.6	Describe the hazards associated with working with rail and road/rail machinery			
		2.7	Describe the personal protective equipment (PPE) needed for the activities to be undertaken			
		2.8	Describe the general electrical hazards associated with working on and around overhead line equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe the hazards associated with erecting structural steel components (such as lifting and handling long and heavy components, working at height) and how the risks can be minimised			
		2.10	Describe the correct methods of moving, lifting, handling and supporting heavy structural steel sections			
		2.11	State the purpose of engineering specifications associated with OLE (such as overhead line specifications, work/task instructions, inspection/test plan)			
		2.12	State the purpose for the different types of design drawings used in OLE steelwork installation (such as layouts and cross-section diagrams)			
		2.13	State how the OLE is designed to function under normal operating conditions			
		2.14	State what each of the OLE component parts contribute to the overall operation of the system			
		2.15	State what terminology and methods are used to identify OLE steelwork and to describe the operational status of the steelwork			
		2.16	Describe the tools, plant and equipment used in the installation process and how to use them safely			
		2.17	Describe the torque loading requirements of the fasteners and what to do if these loadings are exceeded or not achieved			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.18	Describe the types of tools and instruments used to position, secure and align the steelwork, including: • podgers • spanners • wrenches • sockets • torque wrenches • levels • alignment and laser devices			
		2.19	Describe the equipment operating, care and control procedures applicable to OLE			
		2.20	Describe the techniques used to position, align, level and adjust the main steelwork			
		2.21	State the inspection and testing procedures needed to be completed prior to hand back			
		2.22	State what authorisation procedures are and the limits of their responsibility and authority			
		2.23	State the reporting documentation and control procedures and reporting lines and escalation procedures			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 38: Undertake Overhead Line Equipment Small Part Steelwork Installation Under Direction

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in completing the safe installation of the small part steelwork, renewal, enhancement or modification activities in accordance with directions from a specified competent individual and in line with organisational policy and procedures.

Learners will know the basic principles and processes associated with the assembly of the small part steelwork and their application. They will know about the ways of handling steelwork and the means of fixing them in position. Learners will understand about the care and use of the tools and equipment in adequate depth to provide a sound basis for carrying out the activities and ensuring the installed small part steelwork is produced to the required specification under direction.

Learners will know the safety precautions required when working at height and with steelwork components, and with their associated tools and equipment. They will know the responsibility they owe to themselves and others in the workplace.

Learners will be responsible for reporting any problems with the component parts, equipment or installation activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Undertake overhead line equipment small part steelwork installation under direction	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Carry out all of the following activities during the installation: • adhere to safety briefing instructions, risk assessments, COSHH, safe system of work and other relevant safety standards • obtain authority before carrying out the installation activities and follow the directions given • leave the work area in a safe condition			
		1.3	Select and use correctly six of the following types of personal protection equipment: • safety harnesses • safely helmets • approved high visibility clothing • approved safety footwear • gloves • goggles • ear protection (as appropriate)			
		1.4	Undertake activities within the limits of own authority, following recording, reporting and escalation procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	Follow the relevant documentation for the overhead line components to be renewed or installed and adjusted as directed			
		1.6	Install or renew one of the following overhead line equipment components under direction: • section insulators • neutral sections and one of the following: • cross-contact assemblies • droppers and jumpers and one of the following: • overlaps • switches and isolators • booster/auxiliary transformers • cross track feeders			
		1.7	Adjust the registration and installed components for all of the following under direction: • stagger • height • tension (as appropriate)			
		1.8	Carry out under direction the installation and adjustment activities within agreed timescale using approved materials, components, methods and procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.9	Carry out under direction checks on the components being installed and adjusted, to include all of the following: • assist with checking that the installed and adjusted components comply with the installation specification • making visual checks for completeness and freedom from damage			
		1.10	Carry out checks under direction on the small part steelwork being installed, to include **all** of the following: • assist with checking that the installed small part steelwork complies with the installation specification • making visual checks for completeness and freedom from damage • checking locking devices			
		1.11	Assist with the production of accurate records of work undertaken			
		1.12	Follow relevant recording and reporting procedures, to include **one** of the following: • installation record • handover document			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake overhead line equipment small part steelwork installation under direction	2.1	Describe what health and safety legislation, regulations and safe working practices and procedures apply, including: • current Rule Book • working on or about 25kV AC electrified lines • Health and Safety at Work Act etc. 1974 • control measures • Provision and Use of Work Equipment Regulations 1998 (PUWER) • Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)			
		2.2	Describe industry protocols relating to communication of important safety information			
		2.3	Describe what procedures need to be followed to confirm operational and personal safety is maintained during the work			
		2.4	Describe the system of work associated with safe access and the procedures associated with working under isolated conditions of the OLE			
		2.5	Describe how to avoid personal injury during the work			
		2.6	Describe working with rail and road/rail machinery and their associated hazards			
		2.7	Describe the personal protective equipment (PPE) needed for the activities to be undertaken			
		2.8	Describe the general electrical hazards associated with working on and around overhead line equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe the hazards associated with installation and registration adjustment activities including: • lifting components • working at height • tensioned wires • radial loads • how the risks can be minimised			
		2.10	Describe the correct methods of moving, lifting, handling and supporting wires and associated components			
		2.11	State the purpose of engineering specifications associated with OLE equipment such as: • overhead line specifications • work/task instructions • inspection/test plan • height/stagger sheet			
		2.12	State the purpose for the different types of design drawings used in OLE wire installation such as: • layouts and cross-section diagrams • OLE system design range (such as OLEMI)			
		2.13	State how the OLE is designed to function under normal operating conditions			
		2.14	State how each of the installed component parts contribute to the overall operation of the system			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.15	State the purpose of contact wire registration, neutral sections and section insulation of the contact wire			
		2.16	Describe the storage and handling precautions to be taken to protect easily damaged components (such as insulators and section insulators)			
		2.17	State the terminology and methods used to identify OLE components and their operational status			
		2.18	Describe the tools, plant and equipment used in the installation and registration adjustment process and how to use them safely			
		2.19	Describe the torque loading requirements of the components or connectors and what to do if these loadings are exceeded or not achieved			
		2.20	Describe the methods of securing the installed components and connectors safely			
		2.21	Describe the types of tools and equipment used to position, adjust, secure, installed components and tension the wiring such as: • torque wrenches • winches • clamps/wedges • tensioners • tension gauges/meters • jumpers for earth continuity			
		2.22	Describe the equipment operating, care and control procedures applicable to OLE equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.23	State the inspection and testing procedures needed to be completed prior to hand back			
		2.24	Outline the authorisation procedures and the limits of own responsibility and authority			
		2.25	Identify the reporting documentation and control procedures, reporting lines and escalation procedures			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 39: Undertake Overhead Line Equipment Wiring Installation Under Direction

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in installing overhead line equipment (OLE) contact wire and associated wiring such as catenary, along-track conductors, droppers and headspans under direction from a specified competent individual.

Learners will know how to apply wire running out, termination, splicing and tensioning procedures. They will know the basic principles and processes associated with the installation of the wiring and their application. They will know about the ways of handling wire, the means of fixing it into position, tensioning, and the care and use of the tools and equipment in adequate depth to provide a sound basis for carrying out the activities and ensuring that the finished wiring is produced to the required specification under direction.

Learners will know the safety precautions required when working at height and with wiring components, and with their associated tools and equipment. Learners will be required to demonstrate safe working practices throughout and will know the responsibility they owe to themselves and others in the workplace. Learners will be responsible for complying with organisational policy and procedures for the safe installation of the wiring and the associated terminating and tensioning activities to be undertaken. They will report any problems with the component parts, equipment or installation activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Undertake overhead line equipment wiring installation under direction	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Carry out all of the following activities during the installation: • adhere to safety briefing instructions, risk assessments, COSHH, safe system of work and other relevant safety standards • obtain authority before carrying out the installation activities and follow the directions given • leave the work area in a safe condition			
		1.3	Select and use correctly **six** of the following types of personal protection equipment: • safety harnesses • safely helmets • approved high visibility clothing • approved safety footwear • gloves • goggles • ear protection (as appropriate)			
		1.4	Undertake activities within the limits of own authority, following recording, reporting and escalation procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	Follow the relevant renewal, installation or enhancement documentation for the wiring and components to be renewed or installed as directed			
		1.6	Carry out **three** of the following wiring installation activities under direction: • recovery of wire • running out wire • splicing of conductors • wire termination • wire tensioning			
		1.7	Install or renew **one** of the following types of wiring under direction: • catenary wire • auxiliary wire (as appropriate) • contact wire • contenary wire • auto transformers feeder • return conductors • earth wire			
		1.8	Install **or** renew one of the following wiring components under direction: • droppers • jumpers			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.9	Use specialist plant and equipment including **all** of the following under direction: • drum carriers • winches • tensioners			
		1.10	Carry out the installation activities under direction within agreed timescale using approved materials, components, methods and procedures			
		1.11	Carry out checks on the wiring being installed under direction, to include **all** of the following: • assist with checking that the installed wiring complies with the installation specification • making visual checks for completeness and freedom from damage			
		1.12	Complete activities under direction of qualified personnel and using correct tools and equipment as specified within the limits of own authority			
		1.13	Assist with the production of accurate records of work undertaken			
		1.14	Follow relevant recording and reporting procedures to include **one** of the following: • installation record • handover document • other specific recording document			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake overhead line equipment wiring installation under direction	2.1	Describe which health and safety legislation, regulations and safe working practices and procedures apply to the installation, including: • current Rule Book • Working on or about 25kV AC electrified lines • Health and Safety at Work etc. Act 1974 • control measures • Provision and Use of Work Equipment Regulations 1998 (PUWER) • Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)			
		2.2	Describe industry protocols relating to communication of important safety information			
		2.3	Describe what procedures need to be followed, to confirm operational and personal safety, is maintained during the work			
		2.4	Describe the system of work associated with safe access and the procedures associated with working under isolated conditions of the OLE			
		2.5	Describe how to avoid personal injury during the work			
		2.6	Describe working with rail and road/rail machinery and their associated hazards			
		2.7	Describe the personal protective equipment (PPE) needed for the activities to be undertaken			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Describe the general electrical hazards associated with working on and around overhead line equipment			
		2.9	Describe the hazards associated with wiring activities including: • lifting and handling wire drums • working at height • tensioning wires • radial load and how the risks can be minimised			
		2.10	Describe the correct methods of moving, lifting, handling, straightening and supporting wires and associated components			
		2.11	State the purpose of engineering specifications associated with OLE equipment such as: • overhead line specifications • work/task instructions • inspection/test plan • height/stagger sheet • dropper schedules			
		2.12	State the purpose for the different types of design drawings used in OLE wire installation such as: • layouts and cross-section diagrams • OLE system design range (such as OLEMI))			
		2.13	State how the OLE is designed to function under normal operating conditions			
		2.14	State how each of the OLE component parts contribute to the overall operation of the system			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.15	Describe the range of cables used in wiring installation			
		2.16	State the terminology and methods used to identify OLE wiring and its operational status			
		2.17	Describe the tools, plant and equipment used in the wiring installation process and how to use them safely			
		2.18	Describe the torque loading requirements of the components or connectors and what to do if these loadings are exceeded or not achieved			
		2.19	Describe the methods of securing the wiring components safely			
		2.20	Describe the types of tools and instruments used to position, secure, terminate and tension the wiring such as: • torque wrenches • winches • tensioners • tension gauges/meters			
		2.21	Describe the equipment operating and care and control procedures applicable to OLE equipment			
		2.22	Describe the techniques used to run out, terminate and tension the wiring			
		2.23	State the inspection and testing procedures needed to be completed prior to hand back			
		2.24	Outline the authorisation procedures and the limits of own responsibility and authority			
		2.25	Identify the reporting of documentation and control procedures, reporting lines and escalation procedures			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 40: Undertake Installation of Overhead Line Equipment Sectioning, Insulation, Registration and In-span Components Under Direction

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in adjusting the position and registration of the overhead line equipment (OLE) conductors to their final positions and installation of discrete assemblies such as section insulators, neutral sections, switches, isolators, jumpers, cross-contact assemblies and in-span components under direction of a specified, competent individual.

Learners will be able to complete the conductor registration, sectioning and insulation activities during the OLE installation, renewal, enhancement or modification activities in accordance with directions from a specified competent individual. Learners will know the safety precautions required when working at height with tensioned conductors and with fragile components, and with their associated tools and equipment. They will be required to demonstrate safe working practices throughout and will know the responsibility they owe to themselves and others in the workplace. Their responsibilities will require them to comply with organisational policy and procedures for the safe adjustment/registration of the conductor and installation of the in-span components to be undertaken. They will know to report any problems with the component parts, equipment or installation activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Undertake installation of overhead line equipment sectioning, insulation, registration and in-span components under direction	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Carry out all of the following activities during the installation: • adhere to safety briefing instructions, risk assessments, COSHH, safe system of work and other relevant safety standards • obtain authority before carrying out the installation activities and follow the directions given • leave the work area in a safe condition			
		1.3	Select and use correctly **six** of the following types of personal protection equipment: • safety harnesses • safely helmets • approved high visibility clothing • approved safety footwear • gloves • goggles • ear protection (as appropriate)			
		1.4	Undertake activities within the limits of own authority, following recording, reporting and escalation procedures			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.5	Follow the relevant renewal, installation or enhancement documentation for the wiring and components to be renewed or installed as directed			
		1.6	Install or renew **one** of the following overhead line equipment components under direction: • section insulators • neutral sections and one of the following: • cross-contact assemblies • droppers and jumpers and one of the following: • overlaps • switches and isolators • booster/auxiliary transformers • cross track feeders			
		1.7	Adjust the registration and installed components for **all** of the following under direction: • stagger • height • tension (as appropriate)			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.8	Carry out under direction the installation and adjustment activities within agreed timescale using approved materials, components, methods and procedures			
		1.9	Carry out under direction checks on the components being installed and adjusted, to include **all** of the following: • assist with checking that the installed and adjusted components comply with the installation specification • making visual checks for completeness and freedom from damage			
		1.10	Complete activities under direction of qualified personnel and using correct tools and equipment as specified within the limits of own authority			
		1.11	Assist with the production of accurate records of work undertaken			
		1.12	Follow relevant recording and reporting procedures to include **one** of the following: • installation record • handover document			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake installation of overhead line equipment sectioning, insulation, registration and in-span components under direction	2.1	Describe what which health and safety legislation, regulations and safe working practices and procedures apply to the installation including: • current Rule Book • working on or about 25kV AC electrified lines • Health and Safety at Work etc. Act 1974 • control measures • Provision and Use of Work Equipment Regulations 1998 (PUWER) • Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)			
		2.2	Describe industry protocols relating to communication of important safety information			
		2.3	Describe what procedures need to be followed, to confirm operational and personal safety, is maintained during the work			
		2.4	Describe the system of work associated with safe access and the procedures associated with working under isolated conditions of the OLE			
		2.5	Describe how to avoid personal injury during the work			
		2.6	Describe working with rail and road/rail machinery and their associated hazards			
		2.7	Describe the personal protective equipment (PPE) needed for the activities to be undertaken			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.8	Describe the general electrical hazards associated with working on and around overhead line equipment			
		2.9	Describe the hazards associated with installation and registration adjustment activities, including: • lifting components • working at height • tensioned wires • radial loads • how the risks can be minimised			
		2.10	Describe the correct methods of moving, lifting, handling and supporting wires and associated components			
		2.11	State the purpose of engineering specifications associated with OLE equipment such as: • overhead line specifications • work/task instructions • inspection/test plan • height/stagger sheet			
		2.12	State the purpose for the different types of design drawings used in OLE wire installation such as: • layouts and cross-section diagrams • OLE system design range (such as OLEMI)			
		2.13	State how the OLE is designed to function under normal operating conditions			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.14	State how each of the installed component parts contribute to the overall operation of the system			
		2.15	State the purpose of contact wire registration, neutral sections and section insulation of the contact wire			
		2.16	Describe the storage and handling precautions to be taken to protect easily damaged components (such as insulators and section insulators)			
		2.17	State the terminology and methods used to identify OLE components and their operational status			
		2.18	Describe the tools, plant and equipment used in the installation and registration adjustment process and how to use them safely			
		2.19	Describe the torque loading requirements of the components or connectors and what to do if these loadings are exceeded or not achieved			
		2.20	Describe the methods of securing the installed components and connectors safely			
		2.21	Describe the types of tools and equipment used to position, adjust, secure, installed components and tension the wiring such as: • torque wrenches • winches • clamps/wedges • tensioners • tension gauges/meters • jumpers for earth continuity			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.22	Describe the equipment operating, care and control procedures applicable to OLE equipment			
		2.23	State the inspection and testing procedures needed to be completed prior to hand back			
		2.24	Outline the authorisation procedures and the limits of own responsibility and authority			
		2.25	Identify the reporting documentation and control procedures, reporting lines and escalation procedures			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 41: Undertake Installation, Enhancement and Renewal of Overhead Line Equipment Earthing and Bonding Under Direction

Level:	**2**
Guided learning:	**40 hours**
Total unit time	**40 hours**

Unit summary

This unit covers the skills and knowledge learners need to be able to demonstrate competence in adjusting renewal of overhead line equipment (OLE) earthing and bonding cables, such as continuity, cross, impedance, rail, red, return, return screen conductor, structure, transposition and yellow bonds, under direction. Learners will be able to complete the earth and bonding installation, renewal, and enhancement or modification activities in accordance with directions from a specified competent individual.

Learners will be required to demonstrate safe working practices when working at height and with cable components, and with their associated tools and equipment, and will know the responsibility they owe to themselves and others in the workplace. Learners will be responsible for complying with organisational policy and procedures for the safe installation of the earthing, bonding and the associated terminating and connection activities to be undertaken. They will know to report any problems with the component parts, equipment or installation activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people.

Unit assessment requirements

This unit must be assessed in accordance with the assessment strategy in *Annexe A*. It should be assessed predominantly in the workplace through observation, along with other sources of evidence such as witness testimony, questioning and professional discussion.

Simulation must not be used to assess this unit.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Undertake installation, enhancement and renewal of overhead line equipment earthing and bonding under direction	1.1	Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines			
		1.2	Carry out all of the following activities during the installation: • adhere to safety briefing instructions, risk assessments, COSHH, safe system of work and other relevant safety standards • obtain authority before carrying out the installation activities and follow the directions given • leave the work area in a safe condition			
		1.3	Select and use correctly **six** of the following types of personal protection equipment: • safety harnesses • safely helmets • approved high visibility clothing • approved safety footwear • gloves • goggles • ear protection (as appropriate)			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.4	Undertake activities within the limits of own authority, following recording, reporting and escalation procedures			
		1.5	Follow the relevant renewal, installation or enhancement documentation for the earthing and bonding components to be renewed or installed as directed			
		1.6	Carry out earthing and bonding activities including **all** of the following under direction: • cutting required length of bond • termination of bond connections • installation of bonds in the correct sequence • correct use of tools and equipment • assist with electrical continuity testing (as appropriate) • removal of temporary bonding (as appropriate)			
		1.7	Install or renew **one** of the following types of bonding systems under direction: • Miles Royston (Glenair) • Cembre			
		1.8	Carry out, under direction, the installation activities within agreed timescale using approved materials, components, methods and procedures			
		1.9	Carry out under direction checks on the earthing and bonding being installed, to include **all** of the following: • assist with checking that the installed bonds comply with the installation specification • making visual checks for completeness and freedom from damage			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		1.10	Complete activities under direction of qualified personnel and using correct tools and equipment as specified within the limits of own authority			
		1.11	Assist with the production of accurate records of work undertaken			
		1.12	Follow relevant recording and reporting procedures to include **one** of the following: • installation record • handover document			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Know how to undertake installation, enhancement and renewal of overhead line equipment earthing and bonding under direction	2.1	Describe what health and safety legislation, regulations and safe working practices and procedures apply including: • current Rule Book • working on or about 25kV AC electrified lines • Health and Safety at Work etc. Act 1974 • control measures • Provision and Use of Work Equipment Regulations 1998 (PUWER) • Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)			
		2.2	Describe industry protocols relating to communication of important safety information			
		2.3	Describe what procedures need to be followed, to confirm operational and personal safety, is maintained during the work			
		2.4	Describe the system of work associated with safe access and the procedures associated with working under isolated conditions of the OLE			
		2.5	Describe how to avoid personal injury during the work			
		2.6	Describe working with rail and road/rail machinery and their associated hazards			
		2.7	Describe the personal protective equipment (PPE) needed for the activities to be undertaken			
		2.8	Describe the general electrical hazards associated with working on and around overhead line equipment			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.9	Describe the hazards associated with earthing and bonding activities including: • working at height • drilling holes • cutting and terminating cables • how the risks can be minimised			
		2.10	Describe the correct methods of moving, lifting, handling, shaping and supporting cables and associated components			
		2.11	State the purpose of engineering specifications associated with OLE equipment such as: • overhead line specifications • work/task instructions • inspection/test plan			
		2.12	State the purpose for the different types of design drawings used in OLE wire installation such as: • layouts and cross-section diagrams • OLE system design range (such as OLEMI)			
		2.13	State how the OLE is designed to function under normal operating conditions			
		2.14	State how each of the earthing and bonding component parts contribute to the overall operation of the OLE and how it interfaces with the signalling system			
		2.15	Describe how to identify the correct type and size of earthing and bonding cables required			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.16	State the basic principles of the electrical checks to be carried out on the earthing and bonding cables			
		2.17	State the terminology and methods used to identify OLE earthing and bonding and their operational status			
		2.18	Describe the tools, plant and equipment used in the earthing and bonding installation process and how to use them safely			
		2.19	Describe the torque loading requirements of the components or connectors and what to do if these loadings are exceeded or not achieved			
		2.20	Describe the types of bonding systems used including: • Miles Royston (Glenair) • Cembre			
		2.21	Describe the types of tools and equipment used to shape, position, adjust, terminate and secure the installed components such as: • drills • presses • pullers • torque wrenches			
		2.22	Describe the equipment operating, care and control procedures applicable to OLE equipment			
		2.23	Describe the methods of securing the installed earthing and bonding components and connections safely			
		2.24	State the inspection and testing procedures needed to be completed prior to hand back			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
		2.25	Outline the authorisation procedures and the limits of own responsibility and authority			
		2.26	Identify the reporting documentation and control procedures reporting lines and escalation procedures			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

12 Further information and useful publications

To get in touch with us visit our 'Contact us' pages:

- Edexcel, BTEC and Pearson Work Based Learning contact details: qualifications.pearson.com/en/support/contact-us.html
- books, software and online resources for UK schools and colleges: www.pearsonschoolsandfecolleges.co.uk

Key publications

- *Adjustments for candidates with disabilities and learning difficulties, Access and Arrangements and Reasonable Adjustments, General and Vocational qualifications* (Joint Council for Qualifications (JCQ))
- *Supplementary guidance for reasonable adjustments and special consideration in vocational internally assessed units* (Pearson)
- *General and Vocational qualifications, Suspected Malpractice in Examination and Assessments: Policies and Procedures* (JCQ)
- *Equality Policy* (Pearson)
- *Recognition of Prior Learning Policy and Process* (Pearson)
- *UK Information Manual* (Pearson)
- *Pearson Edexcel NVQs, SVQs and competence-based qualifications – Delivery Requirements and Quality Assurance Guidance* (Pearson)

All of these publications are available on our website: qualifications.pearson.com

Further information and publications on the delivery and quality assurance of NVQ/Competence-based qualifications are available at our website on the Delivering BTEC pages. Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please go to the resources page of our website.

13 Professional development and training

Professional development and training

Pearson supports customers with training related to our qualifications. This support is available through a choice of training options offered on our website.

The support we offer focuses on a range of issues, such as:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing learner-centred learning and teaching approaches
- building in effective and efficient quality assurance systems.

The national programme of training we offer is on our website. You can request centre-based training through the website or you can contact one of our advisers in the Training from Pearson UK team via Customer Services to discuss your training needs.

Training and support for the lifetime of the qualifications

Training and networks: our training programme ranges from free introductory events through sector-specific opportunities to detailed training on all aspects of delivery, assignments and assessment. We also host some regional network events to allow you to share your experiences, ideas and best practice with colleagues in your region.

Regional support: our team of Regional Quality Managers, based around the country, are responsible for providing quality assurance support and guidance to anyone managing and delivering NVQs/Competence-based qualifications. The Regional Quality Managers can support you at all stages of the standard verification process as well as in finding resolutions of actions and recommendations as required.

To get in touch with our dedicated support teams please visit our website at: qualifications.pearson.com/contactus

Online support: find the answers to your questions in *Knowledge Base*, a searchable database of FAQs and useful videos that we have put together with the help of our subject advisors to support you in your role. Whether you are a teacher, administrator, Assessment Associate (AA) or training provider, you will find answers to your questions. If you are unable to find the information, you need please send us your query and our qualification or administrative experts will get back to you.

14 Contact us

We have a dedicated Account Support team, across the UK, to give you more personalised support and advice. To contact your Account Specialist:

Email: wblcustomerservices@pearson.com
Telephone: 0844 576 0045

If you are new to Pearson and would like to become an approved centre, please contact us by:

Email: wbl@pearson.com
Telephone: 0844 576 0045

Annexe A: Assessment strategy

Apprenticeship Standard Rail Engineering Sector – for employers, training providers and awarding organisations (owned by the Rail Engineering Employer Group)

Introduction

Employers in the rail engineering sector have produced this qualification assessment strategy to:

- support the implementation and delivery of the Apprenticeship Standard in a way that is appropriate, relevant, feasible, manageable and affordable in a wide range of employer contexts
- provide clarity for awarding organisations on what constitutes competent performance
- encourage and promote consistent assessment of Competence and Technical Knowledge requirements
- promote cost-effective delivery and assessment plans
- motivate apprentices to always maintain a high level of skills, knowledge and behaviours throughout the apprenticeship, and not just to do enough to satisfy the minimum requirements, in the knowledge that they will be continually assessed leading to a final end-point assessment with a technical interview (viva) and supported by the achievement of competence and technical knowledge qualifications coupled with a portfolio of evidence
- add value to both the apprentice and the employer by complementing and building on normal company performance management and development tools, including regular performance reviews
- enable and encourage progression and continuing professional development by being linked to professional recognition
- position the apprenticeship not just as a job, but as the starting point for a career in the sector – assessment at the end marks a clear recognition of achievements on which the individual can build
- select assessment methods that will ensure relevance and consistency, irrespective of the specific job role of the apprentice
- ensure costs and practicalities will be appropriate and proportionate to large as well as SME employers
- including those with large or small numbers of apprentices.

This document also provides definitions for:

- the qualifications and experience required for Assessors/trainers/teachers and Verifiers
- the assessment environment for the Foundation and Development Phase Occupational Competence Qualifications
- access to assessment

and requirements relating to:

- carrying out occupational competence assessments
- performance evidence requirements for occupational competence
- assessing knowledge and understanding
- use of witness testimonies
- continuing professional development
- quality control of assessment.

Section 1 – Occupational Competence Qualifications (Foundation and Development Phase)

Assessor requirements to demonstrate effective assessment practice

Assessment must be carried out by competent Assessors that, as a minimum, must hold the QCF Level 3 Award in Assessing Competence in the Work Environment. Current and operational Assessors that hold units D32 and/or D33 or A1 and/or A2 as appropriate to the assessment being carried out will not be required to achieve the QCF Level 3 Award as they are still appropriate for the assessment requirements set out in this assessment strategy. However, they will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up-to-date Employer Units of Competence.

Assessor technical requirements

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant outcomes in the Employer Units of Competence.

This will be demonstrated either by holding a relevant technical qualification or by proven industrial experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the apprentice in the units being assessed.

Assessors must also be fully conversant with the awarding organisation's assessment recording documentation used for the Employer Units of Competence, against which the assessments and verification are to be carried out, plus any other relevant documentation and system and procedures to support the Quality Assurance (QA) process.

Verifier requirements (internal and external)

Internal QA (Internal Verification) must be carried out by competent Verifiers that, as a minimum, must hold the QCF Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practices.

Current and operational Internal Verifiers that hold internal verification units V1 or D34 will not be required to achieve the QCF Level 4 Award, as they are still appropriate for the verification requirements set out in this assessment strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised Assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External QA (External Verification) must be carried out by competent External Verifiers that, as a minimum, must hold the QCF Level 4 Award in the External Quality Assurance of Assessment Processes and Practices.

Current and operational External Verifiers that hold external verification units V2 or D35 will not be required to achieve the QCF Level 4 Award as they are still appropriate for the verification requirements set out in this assessment strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised Assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External and Internal Verifiers will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace quality assurance (verification) of assessment processes and practices to the most up-to-date Employer Units of Competence.

Verifiers, both Internal and External, will also be expected to be fully conversant with the terminology used in the Employer Units of Competence against which the assessments and verification are to be carried out, the appropriate Regulatory Body's systems and procedures and the relevant awarding organisation's documentation, systems and procedures within which the assessment and verification is taking place.

Specific technical requirements for internal and external verifiers

Internal and External Verifiers for the Employer Units of Competence must be able to demonstrate that they have verifiable, sufficient and relevant industrial experience, and must have a working knowledge of the processes, techniques and procedures that are used in the engineering industry.

The table below and on the following page show the recommended levels of technical competence for Assessors, Internal Verifiers and External Verifiers.

Technical requirements for Assessors and Verifiers

Position	Prime activity requirements	Support activity requirements	Technical requirements (see notes)
Assessor	Assessment skills	IV systems	Technical *competence* in the areas covered by the Employer Units of Competence being assessed
Internal Verifier	Verification skills	Assessment knowledge	Technical *understanding* of the areas covered by the Employer Units of Competence being verified
External Verifier	Verification skills	Assessment understanding	Technical *awareness* of the areas covered by the Employer Units Competence being verified

Notes

1. Technical competence is defined here as a combination of practical skills and knowledge, as well as the ability to apply both of these in familiar and new situations, within a real working environment.

2. Technical understanding is defined here as having a good understanding of the technical activities being assessed, together with knowledge of relevant health and safety implications and requirements of the assessments.

3. Technical awareness is defined here as a general overview of the subject area, sufficient to ensure that assessment and evidence are reliable and that relevant health and safety requirements have been complied with.
4. The competence required by the Assessor, Internal Verifier and External Verifier roles in the occupational area being assessed is likely to exist at three levels, as indicated by the shaded zones in the following table.

Technical competence / Required by:	An ability to *discuss* the general principles of the competences being assessed	An ability to *describe* the practical aspects of the competence being assessed	An ability to *demonstrate* the practical competences being assessed
Assessor			
Internal Verifier			
External Verifier			

Assessment environment of the Employer Units of Competence in the Foundation Phase of the Apprenticeship

The Employer Units of Competence are intended to have a wide application throughout the rail engineering sector. It is, therefore, necessary to have a flexible approach to the environment in which the Employer Units of Competence are delivered and assessed during the Foundation Phase of the Apprenticeship.

Therefore, there is much to be gained by acquiring the basic engineering competencies required in the Foundation Phase of the Apprenticeship while working in a sheltered but realistic environment such as in a Training Centre or College. This is due to an ongoing emphasis on safety critical work activities and the need to ensure flexibility of assessment opportunities to both maintain and enhance the provision of competent personnel within the rail engineering industry. These assessment conditions will allow a minimum safe level of skills, knowledge and understanding to be achieved and demonstrated by the apprentice prior to being exposed to the hazards of the industrial environment, thus minimising the risk of injury to themselves and other employees.

For the above reasons, the assessment of the apprentice's competence in a sheltered but realistic environment is acceptable for the Employer Units of Competence included the Foundation Phase of the Apprenticeship, where the environment replicates that expected in industry.

Where applicable, the machinery, tools, materials, equipment and resources used must be representative of industry standards and there must be sufficient equipment/resources available for each apprentice to demonstrate their competence on an individual basis. Work pieces or work outcomes assessed must be the apprentice's own work and should be actual work examples that combine the skills and techniques required by the Employer Units of Competence so that achievement will properly reflect the apprentice's capabilities.

Assessors must, therefore, ensure that the competency assessed in a simulated environment is fully transferable to the workplace. Other aspects that should be considered could include:

- environmental conditions such as lighting conditions, noise levels and the presence of hazards
- pressure of work such as time constraints and repetitive activities
- producing actual work pieces or work outcomes, the consequences of making mistakes and the effect these have on customer, supplier and departmental relationships.

Assessment environment of the Employer Units of Competence in the Development Phase of the Apprenticeship

The evidence put forward for the Employer Units of Competence can only be regarded valid, reliable, sufficient and authentic if achieved and obtained in the working environment where the apprentice is employed and be clearly attributable to the apprentice. However, in certain circumstances, simulation/replication of work activities may be acceptable, but must be kept to an absolute minimum.

The use of high-quality, realistic simulations/replications, which impose pressures consistent with workplace expectations, should only be used in relation to the assessment of the following:

- rare or dangerous occurrences such as those associated with health, safety and the environment issues, emergency scenarios and rare operations at work
- the response to faults and problems for which no opportunity has presented for the use of naturally occurring workplace evidence of learners' competence
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learners' competence.

Simulations/replications will require prior approval from the specific Awarding Organisation and should be designed in accordance with the following parameters:

- the environment in which simulations take place must be designed to match the characteristics of the working environment
- competencies achieved via simulation/replication must be transferable to the working environment
- simulations which are designed to assess competence in dealing with emergencies, accidents and incidents must be verified as complying with relevant health, safety and environmental legislation by a competent health and safety/environmental control officer before being used
- simulated activities should place apprentices under the same pressures of time, access to resources and access to information as would be expected if the activity was real
- simulated activities should require apprentices to demonstrate their competence using plant and/or equipment used in the working environment
- simulated activities which require interaction with colleagues and contacts should require the apprentice to use the communication media that would be expected at the workplace
- for health and safety reasons simulations need not involve the use of genuine substances/materials. Any simulations, which require the apprentice to handle

or otherwise deal with materials/substances should ensure that the substitute takes the same form as in the workplace.

Access to assessment

There are no entry requirements for the Employer Units of Competence, unless this is a legal requirement of the process or the environment in which the apprentice is working. Assessment is open to any apprentice who has the potential to reach the assessment requirements set out in the relevant units.

Aids or appliances which are designed to alleviate disability may be used during assessment, providing they do not compromise the standard required.

Carrying out assessments of the Occupational Competence Qualifications

The Employer Units of Competence have been specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the skills and knowledge required by employers and specified in the apprentice's training plan. The Skills section of the Employer Units of Competence refers to a number of optional items listed in the Skills section of the units (for example 'any three from five'). This is the minimum standard set by employers.

Where the unit requirements give a choice of optional areas, assessors should note that apprentices do not need to provide evidence of the other areas to complete the unit (in the example above, two items), unless specified by the employer, particularly where these additional items may relate to other activities or methods that are not part of the apprentice's normal workplace activities or are not required by the employer.

Performance evidence requirements of the Occupational Competence Qualifications

Performance evidence must be the main form of evidence gathered. In order to demonstrate consistent competent performance for a unit, a minimum of three different examples of performance of the unit activity will be required. Items of performance evidence often contain features that apply to more than one unit, and can be used as evidence in any unit where they are suitable.

Performance evidence must be:

- products of the apprentice's work such as items that have been produced or worked on, plans, charts, reports, standard operating procedures, documents produced as part of a work activity, records or photographs of the completed activity

together with:

- evidence of the way the apprentice carried out the activities, such as witness testimonies, Assessor observations or authenticated apprentice reports of the activity undertaken.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units in the Foundation Phase contain statements that require the apprentice to provide evidence that proves they are capable of combining various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and, therefore, will not be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes suitable evidence, the Internal/External Verifier should be consulted.

Assessing knowledge and understanding requirements in the Occupational Competence Qualifications

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the apprentice's knowledge and understanding are not apparent from performance evidence, they must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways. It is recommended that oral questioning and practical demonstrations are used perhaps while observing the apprentice undertake specific tasks, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the apprentice has an appropriate level of knowledge and understanding, as required by the unit.

Evidence of knowledge and understanding will not be required for those items in the Skills section of the Employer Units of Competence that have not been selected by the employer.

The achievement of the specific knowledge and understanding requirements in the units may not simply be inferred by the results of tests, exams or assignments from other units such as in the technical knowledge qualifications or other training programmes. Where evidence is submitted from these sources, the Assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the apprentice, and meets the full knowledge and understanding requirements of the unit.

Where oral questioning is used, the Assessor must retain a record of the questions asked, together with the apprentice's answers.

Witness testimony

Where observation is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified Assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria by someone else that is in close contact with the apprentice. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the apprentice's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the apprentice. It will be the responsibility of the Assessor to make sure that any witness testimonies accepted as evidence of the apprentice's competency are reliable, auditable and technically valid.

Maximising opportunities to use assessment evidence

One of the critical factors required in order to make this assessment strategy as efficient and effective as possible and to ease the burden of assessment, is the Assessor's ability and expertise to work in partnership with the apprentice and their employer to provide advice and guidance on how to maximise opportunities to cross-reference performance and knowledge evidence to all relevant Employer Units of Competence. For example, if a knowledge statement is repeated in a number of separate Employer Units of Competence and the expected evidence/response to that statement is the same, including the context, then the same piece of evidence should be cross-referenced to the appropriate units.

Section 2 – Technical Knowledge Qualifications (Foundation and Development Phase)

Teacher/trainer/lecturer/Assessor requirements

Staff must:

- have relevant experience in teaching/training/assessing

or

- hold or are working towards an appropriate teaching/training/assessing qualification

and

- be technically knowledgeable in the area(s) for which they are delivering training/assessing, with appropriate qualifications
- be familiar with the Engineering Technician (UK spec) requirements where delivering/assessing Level 3, they will be required to provide a signed declaration confirming they have read and understood the Engineering Technician UK spec and the evidence requirements to meet the engineering technician (UK spec) criteria.

Internal quality assurance requirements

Staff must:

- have experience in quality management/internal verification

or

- hold or be working towards an appropriate internal quality assurance qualification

and

- be familiar with the occupation and technical content covered within the qualification
- be familiar with the Engineering Technician (UK spec) requirements where delivering/assessing Level 3, they will be required to provide a signed declaration confirming they have read and understood the Engineering Technician UK spec and the evidence requirements to meet the engineering technician (UK spec) criteria.

External quality assurance requirements

Staff must:

- have experience in quality management/external verification
- hold or be working towards an appropriate external quality assurance qualification
- be familiar with the occupation and technical content covered within the qualifications
- be familiar with the Engineering Technician (UK spec) requirements for Level 3 and understand the evidence requirements to meet the engineering technician (UK spec) criteria.

Assessments

The qualifications will consist of internal assessments, which could include a range of different methods such as:

- practical assessments
- other appropriate assessment methods.

The assessment methods to be used will be agreed across all awarding organisations (AOs) involved in the development of the units.

Grading

To achieve a pass for this qualification, the learner must achieve all the units required in the stated qualification structure.

The grading criteria have been agreed across all AOs involved in the development of the units.

Section 3 – General requirements

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current technical knowledge of the occupational area, that delivery, mentoring, training, assessment and verification are in line with best practice, technical advancements and that they will take account of any national or legislative developments.

There must be an auditable individual CPD plan in place for all staff assessing and verifying the qualifications within the Rail Engineering Foundation and Development phases, the plan must meet the relevant provider and Rail Engineering employer requirements.

Assessors/teachers/trainers/lecturers (as applicable)

- All must understand the Engineering Technician (UK spec) requirements when providing guidance to Assessors. They will be required to provide a signed declaration confirming they have read and understood the Engineering Technician UK spec and the evidence requirements to meet the engineering technician (UK spec) criteria as it a mandatory requirement that all apprentices complete the Rail Engineering Apprenticeship Standard – Engineering Technician Performance Indicators Recording Document (currently in development). The engineering technician (UK spec) can be found at www.engc.org.uk
- All must understand the requirements of the Rail Engineering Apprenticeship Standard – End of Scheme Assessment Recording Document (currently in development).

Quality control of assessment

General

There are two major points where an awarding organisation interacts with the centre in relation to the external quality control of assessment and these are:

- approval – when a centre takes on new qualifications/units, the awarding organisation, normally through an External Verifier (EV), ensures that the centre is suitably equipped and prepared to deliver the new units/qualification
- monitoring – throughout the ongoing delivery of the qualification/units, the awarding organisation, through EV monitoring and other mechanisms must maintain the quality and consistency of assessment of the units/qualification.

Approval

In granting approval, the awarding organisation, normally through its External Verifiers (EV), must ensure that the prospective centre:

- meets the requirements of the Qualification Regulator
- has sufficient and appropriate physical and staff resources
- meets relevant health and safety and/or equality and access requirements
- has a robust plan for the delivery of the qualification/units.

The awarding organisation may visit the centre to view evidence or may undertake this via other means.

The awarding organisation must have a clear rationale for the method(s) deployed.

Monitoring

Each AO, through EV monitoring and other mechanisms, must ensure:

- that a strategy is developed and deployed for the ongoing AO monitoring of the centre. This strategy must be based on an active risk assessment of the centre. In particular, the strategy must identify the apprentice, Assessors and Internal Verifier's sampling strategy to be deployed and the rationale behind this
- that the centre's internal QA processes are effective in assessment
- that sanctions are applied to a centre where necessary and that corrective actions are taken by the centre and monitored by the AO/EV
- that reviews of the AO's external auditing arrangements are undertaken.

Notes

It is recognised that each AO will have its own guidance and procedure on the internal and external QA process applied to these qualifications. See individual AO websites for further information.

This assessment strategy is "work in progress" and will be amended and re-issued as the Competence and Technical Knowledge qualifications and assessment methodologies are developed and modified, i.e. it is hoped that it will be adapted to meet the requirements of the Aerospace MRO Sector as their Standards and qualification requirements are developed.

The rail engineering sector is mindful that its apprenticeships are and must be available across all four nations in the UK. Therefore, the sector has ensured that the Employer Occupational Brief (EOB) and the associated Employer Units of Competence are directly aligned to the existing format and content of the sector's National Occupational Standards (NOS).

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