

# Lifting Technician Apprenticeship Tower Crane

## End-point Assessment

### Written (Knowledge) Test

### Guidance Notes and Question Criteria

#### Lifting Technician – Occupation description

##### Categorisation

The standard, training syllabus and achievement through the end-point assessment indicates that the lifting technician has the skills and understanding to safely and proficiently operate a range of tower cranes in a variety of situations and able to undertake the lifting of a variety of loads.

##### Slinging/signalling

The lifting technician will, as part of the role attach and secure loads, signal the movement of suspended loads to guide them to an agreed destination, and leaves the load in a safe condition.

##### Duties

**Slinging:** means the ability to safely attach and secure various types of loads to a lifting hook using the relevant lifting accessory and procedures.

**Signalling:** means the ability to convey information to the lifting equipment operator and others involved in the lift using one or a combination of manual, hand and verbal instructions.

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## End Point Assessment - Notes for employers and assessment organisations

<b>Introduction</b>	<p>The Lifting Technician Trailblazer Apprenticeship Group is providing support to approved assessment organisations for the delivery of an end-point assessment.</p> <p>The end-point assessment is a requirement of the current apprenticeship programmes and must be independent of any training and input of work.</p> <p>On successful completion of the end-point assessment, the apprenticeship for lifting technician is considered complete and for which an apprenticeship completion certificate can be awarded.</p>
<b>End-point Assessment Components</b>	<p>The end point assessment constitutes a number of different independent components of which all need to be passed to be successful. They comprise of:</p> <ul style="list-style-type: none"> <li>- Practical test – Crane pre-use checks (luffing and trolley jib)</li> <li>- Practical test – Crane operation (luffing and trolley jib)</li> <li>- Practical test – Slinger/signaller</li> <li>- Written (theory) – lifting operations.</li> <li>- Professional interview - Experience</li> </ul>
<b>Entry Requirements</b>	<p>To be eligible for the end-point assessment, applicants must have:</p> <ul style="list-style-type: none"> <li>- achieved the NVQ Level 2 Diploma Plant Operations – endorsed tower crane (<i>trolley or luffing jib</i>), and the NVQ Level 2 Diploma in Controlling Lifting Operations – endorsed Slinger Signaller All occupations</li> <li>- attained the minimum number of criteria identified with the Lifting Technician EPA Portfolio</li> <li>- met the minimum time requirement working as an apprentice with an employer as stipulated within apprenticeship operating rules.</li> </ul>
<b>Apprentice EPA Portfolio</b>	<p>Apprentices need to keep a log of work activities identified within the Lifting Technician EPA Portfolio.</p> <p>The completed portfolio will be used as part of the professional discussion</p> <p>The portfolio for tower crane can be downloaded free of charge from <a href="http://www.cpa.uk.net/trailblazer-downloads">www.cpa.uk.net/trailblazer-downloads</a></p>
<b>Assessment delivery</b>	<p>The practical tests, professional interview and written test will be conducted by an approved organisation conducted by approved assessors who can carry out the relevant components of the end-point assessment.</p>
<b>Approved organisations</b>	<p>Centres and trainers who undertook any part of the training programme are ineligible to conduct any part of the end-point assessment for the apprentice.</p>

**Notes for employers and assessment organisations (cont'd)**

<p><b>Theory Testing</b></p>	<p>The written test comprises of questions relating to lifting operations which will require answers to a set of given questions. Topics will include:</p> <ul style="list-style-type: none"> <li>- Crane preparation and inspections</li> <li>- Access and security</li> <li>- Safe working situations</li> <li>- Environmental factors</li> <li>- The lifting team</li> <li>- Planning and supervising requirements</li> <li>- Issues relating to slinging and signaling</li> <li>- Communication</li> <li>- Extracting and using information sources</li> <li>- Hazards and causes of incidents and accidents</li> <li>- Training and competencies</li> </ul>
<p><b>Practical Testing</b></p>	<p>The practical test requires the apprentice to demonstrate practical ability using a tower crane and undertaking slinging/signalling activities. The test is divided into three elements of:</p> <ul style="list-style-type: none"> <li>- Crane checks (luffing and trolley jib)</li> <li>- Crane operating (luffing and trolley jib)</li> <li>- Slinging and signalling</li> </ul> <p>There are specific criteria and grading that the assessor must follow and ensures consistency of the testing process. Each element must be carried out under a test environment from a start-to-finish basis, and cannot be conducted during productive work.</p> <p>Several of the elements have a maximum time which quantifies experience measured against typical industry times to undertake the activities.</p>
<p><b>Test elements</b></p>	<p>The practical test is divided into three elements. Each element details the resources required, activities to be undertaken, supporting notes, activity measurements and how the test is graded.</p> <p>The test elements can be undertaken at different times, locations and even on different types of crane providing the resources for each element is followed.</p> <p>However, once each element is started, it must be completed as a single entity.</p>
<p><b>Test times</b></p>	<p>The tests for crane operating and slinging/signalling have a maximum time for the test to be completed in. Allowances may be made by the assessor due to circumstances beyond the apprentice’s control, such as weather issues. However, the test must not be started unless conditions and other factors will not impinge on the test.</p>

## Written Test - Notes for assessors and assessment organisations

<b>Introduction</b>	This document, devised by the Lifting Technician Trailblazer Apprenticeship Group, outlines the criteria for the written test which forms part of the end point assessment.
<b>Technical Content</b>	The content for knowledge has been based on industry-led technical standards for the operation of tower cranes and the duties of slinging and signalling, and on known issues and incidents involving lifting operations
<b>Question formation</b>	<p>A range of topics are listed from which the assessment organisation needs to devise the minimum number of questions requiring written answers.</p> <p>The questions need to be devised by subject matter experts having the expertise of writing questions that following good practice</p> <p>The questions need to be challenging for the apprentice and allow them to outline the full scope of their knowledge and experiences against each topic area.</p> <p>Questions should be devised that require a reasonable level of written information and not limited to one-line or yes/no answers. As a guide, typical answers should have a minimum of 40 words.</p> <p>Questions that employ the use of diagrams and extracts from technical material are encouraged, as are the creation of diagrams by the apprentice in formulating answers.</p> <p>Questions that require the knowledge or use of formulae are further encouraged</p> <p>Questions may be written that require the extraction of technical information from supplied technical documents or literature, such a crane duty charts.</p>
<b>Question delivery</b>	<p>This will be conducted through an invigilated examination process in a conducive environment where the apprentice can concentrate on answering the questions.</p> <p>The questions will be presented in a pre-devised paper that presents each question in a clear format.</p> <p>A maximum time must be applied to the test, with a time set that allows sufficient time for the apprentice to provide comprehensive answers to each question but which creates a challenging environment. Adjustments may be made for those having additional needs and complies with equal opportunities requirements.</p> <p>If required, the questions may be delivered through smaller multiple tests to mitigate a lengthy singular session.</p> <p>Standard test rules apply that ensures that supplied answers to the given questions are from the named apprentice with no aid or support from other parties, or through the use of electronic aids except as part of approved test resources.</p> <p>The questions will remain confidential and access prior to the test withheld from the apprentice or other interested parties.</p>
<b>Test Invigilation</b>	The test must be invigilated from start to finish and by those who may have superficial - but not necessarily technical – knowledge of the subject area.

## Written Test - Notes for assessors and assessment organisations (cont'd)

<p><b>Grading</b></p>	<p>Each question will be graded through a given mark.</p> <p>The mark will be appropriate to the depth, scope and extent of knowledge needed to be demonstrated.</p> <p>The marking of each question is proportional to the total available mark, and the mark reflecting the strength of the apprentice's answer against each question</p> <p>A set number of safety critical questions will require the full correct answer in order to pass the test.</p> <p>The marks for each question must be totalled.</p> <p>A pass for the test will be where the total marks comprise 85% or above of the maximum available marks, plus the full answer for specified questions.</p>
<p><b>Re-assessment</b></p>	<p>In the case of non-achievement, the apprentice may retake the test at a later date once suitable refresher training has been undertaken. Different questions from the same topic areas will need to be devised.</p>
<p><b>Refreshment of questions</b></p>	<p>The assessment centre needs to ensure that the question bank is regularly reviewed for changes to working good practices, technical and legislative updates, and that each question is replaced on a frequent basis minimising those taking the test having pre-knowledge of the questions.</p>
<p><b>Occupational expertise and qualification requirements for Assessors</b></p>	<p>Assessment centres must ensure that assessors for all elements of the end-point assessment MUST conform with the Assessment Strategy for Construction and the Built Environment – Plant Operations and Lifting Operations National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs).</p> <p>Assessors MUST have sufficient, verifiable, relevant current industry experience, and knowledge and understanding of lifting operations involving tower cranes, slinging and signalling.</p> <p>This experience, knowledge and understanding must be of sufficient depth to be effective and reliable when judging an apprentice's competence during all aspects of the end point assessment.</p> <p>All assessors must have sufficient occupational expertise and have up to date experience, knowledge and understanding of lifting operations with tower cranes. Assessors must only assess in their acknowledged area of occupational competence and have a sound, in-depth knowledge of, and uphold the integrity of, the sector's NOS.</p> <p>Assessors must have a sound knowledge of the assessment requirements for the end-point assessment and have the relevant skills to enable the delivery (where applicable) for conducting a professional discussion, practical skills testing, and setting and/or marking to written technical questions.</p>

## Written Test - Notes for assessors and assessment organisations (cont'd)

<p><b>Occupational expertise and qualification requirements for Assessors (cont'd)</b></p>	<p>The assessor’s experience, knowledge and understanding must be verified (and recorded and available for audit) by at least several of the following:</p> <ul style="list-style-type: none"> <li>- curriculum vitae and employer endorsement,</li> <li>- references,</li> <li>- possession of a relevant NVQ/SVQ, or vocationally related qualification,</li> <li>- corporate membership of a relevant professional institution,</li> <li>- professional interview.</li> </ul> <p>Assessors for the end-point assessment MUST hold a qualification as a minimum as listed within ‘Assessing and Assuring Quality of Assessment’, either in the Regulated Qualification Framework (RQF), or the Scottish Credit and Qualifications Framework (SCQF):</p> <ul style="list-style-type: none"> <li>- Level 3 Award in Assessing Competence in the Work Environment</li> <li>- Level 3 Award in Assessing Vocationally Related Achievement</li> <li>- Level 3 Certificate in Assessing Vocationally Related Achievement</li> <li>- Level 3 Certificate in Assessing Vocational Achievement</li> <li>- an appropriate Assessor qualification as identified by SQA Accreditation</li> </ul> <p>or hold one of the following:</p> <ul style="list-style-type: none"> <li>- A1 Assess candidates using a range of methods</li> <li>- D32/33 Assess candidate performance, using differing sources of evidence</li> </ul> <p><i>Note: Holders of A1 and D32/33 must assess to the current National Occupational Standards (NOS) for Learning and Development.</i></p> <p>All assessors for the end-point assessment must be prepared to participate in all relevant activities for their continued professional development.</p>
<p><b>Quality Control and Auditing</b></p>	<p>Assessment organisations for the end-point assessment must have in place internal quality assurance procedures that ensures that assessment is both delivered and measured in accordance with the standards and delivered using suitable assessors and supporting staff, and that consistency of assessment is provided to all apprentices on the end-point assessment.</p> <p>Employers when selecting an assessment centre should interrogate the organisation’s quality control procedures to ensure that robust processes that ensures effective assessment using experienced assessors and the availability of suitable resources.</p> <p>Many established assessment organisations would likely be accredited under one or more awarding organisations, associations, funding bodies or plant-card schemes, of which the organisation would be subject to regular audits by these bodies.</p> <p>Employers should check with their chosen assessment organisation on how they’ve complied with the accredited bodies quality control requirements.</p>

**Question topics criteria**

Topic area	Suggested number of questions	Questions requiring full correct answer
1. Trolley and luffing jib crane typical applications	1	
2. Factors for ensuring clear access to the lifting area	1	
3. Contents that should be contained within a lift plan	2	
4. The roles and responsibilities of the lifting team	3	
5. Actions to be taken if the lift plan cannot be complied with	1	
6. Factors relating actions to be taken at the end of a shift	1	
7. The need for and when checks, inspections and thorough examinations should take place	2	
8. Working near to utility services and overhead power lines	2	
9. How environmental factors can affect lifting operations and measures to be taken	2	
10. Extracting and deciphering information from crane duties charts	2	
11. Typical hazards for lifting operations using a tower crane	3	
12. Causes of known accidents and they could have been prevented	3	
13. Effective communication methods and issues	2	
14. Safely using of lifting accessories	2	
15. Hazards of handling loads – static and pick-and-carry duties	2	
16. Lifting accessory sling angles and loadings	2	
17. Attaching of accessories to particular load types	2	
18. Advantages and disadvantages of types of lifting accessories	2	
19. Requirements when additional training is required	1	
<b>Suggested total number of questions</b>	<b>36</b>	

**Resources for the devising of questions**

There are a number of sources of information that must and should be used when devising the question bank.

Documents should include:

- Provision and Use of Work Equipment Regulations (PUWER 1998) – L22
- Lifting Operations and Lifting Equipment Regulations (LOLER 1998) – L113
- British Standards (BS) 7121 parts 1, 2 and 5

Regulatory documents can be downloaded from [www.hse.gov.uk](http://www.hse.gov.uk)

Technical and other guidance documents for tower cranes can be found at [www.cpa.uk.net/publications](http://www.cpa.uk.net/publications)

Both the HSE and CPA websites further contains information relating to safe lifting requirements.

Specific crane technical data can be viewed and downloaded from crane manufacturer's websites





