



NCFE Level 1/2 Technical Award in Engineering (603/2963/4)

Internal Synoptic Project

December 2018

Centre instructions

- To be given to learners on or after **17 December 2018**.
- This internal synoptic project is intended for those learners who will be claiming their certificates in **summer 2019 only**.

Learner instructions

- Read the project brief carefully before you start the work.
- You **must** clearly identify all of the work you produce during the supervised time.
- You **must** hand in all of your work to the supervisor at the end of each session.

Learner information

- This internal synoptic project will assess your knowledge and understanding from across the qualification.
- The completion time for this internal synoptic project is **21 hours**.
- All of the work you submit **must** be your own.

Please complete the details below clearly and in BLOCK CAPITALS.

Learner name _____

Centre name _____

Learner number

Centre number

Project Brief

You work for a mechanical engineering company that develops and constructs crane equipment for the construction industry.

You have been asked to develop a new model of a tower crane with a lifting capacity of 12 tonnes (12 000 kg), to a height of 5 metres. You are required to **produce a balanced and working scaled model** of the tower crane.

You have been provided with a basic drawing of a tower crane with all relevant parts labelled. Use this sketch where required throughout the project.

You are required to produce a **portfolio of evidence** to accompany your model of a tower crane.

The portfolio should include:

- CAD **and** hand-drafted engineering drawings of your model tower crane using the given information in the sketch
- a series of tests to investigate:
 - the scaled dimensions to support the structure and lift the weight
 - the properties and characteristics of a variety of materials which could be used to fabricate the tower crane, to include a record of your findings
- a production plan
- an evaluation of the project, making reference to your learner log where appropriate.

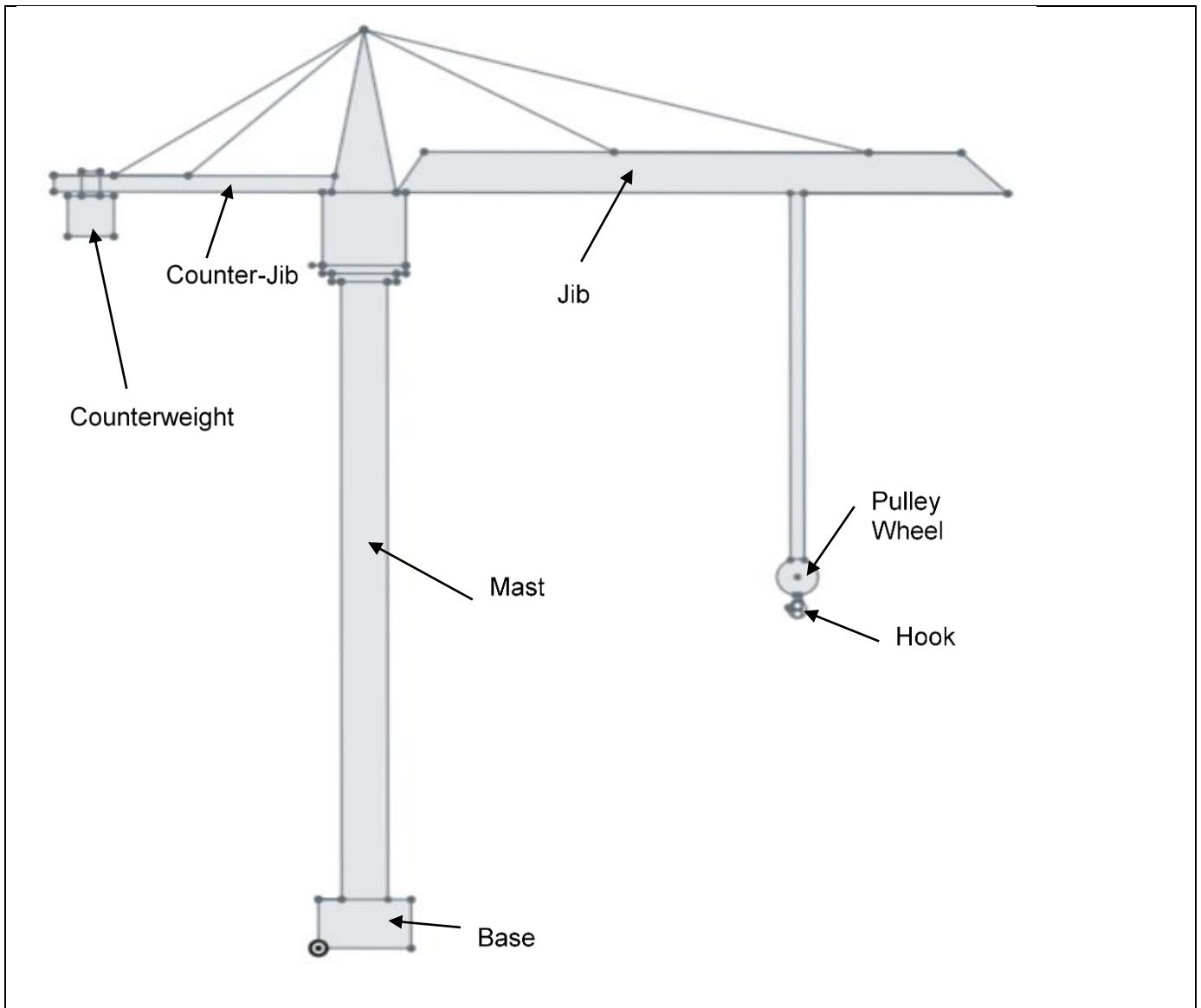
Consider the different pulley systems which could be applied to the tower crane and the appropriate dimensions required for the tower crane to remain balanced and lift the load.

Using your **engineering drawings** and **production plan**, manufacture your model tower crane to an appropriate scale of choice, selecting and using the most appropriate materials, tools and techniques.

During the manufacturing process, you should:

- demonstrate that you are able to carry out manufacturing techniques
- evidence how you demonstrated safe and correct use of a variety of tools and/or machinery throughout the manufacturing process.

You should make reference to the learner log where appropriate.



Learner log and project evaluation

As you work through the project, you are **required** to keep a learner log to record your approach. You should include:

- how you prepared
- what resources you used
- how you managed your time.

You **must** use your completed learner log to carry out an evaluation of the project.

Evidence

You are required to submit the following for assessment:

- your portfolio of evidence
- your model of the tower crane
- your learner log, including your evaluation.

Types of evidence

Below is a list of suggested types of evidence that you could include:

- written/word-processed documents
- presentations
- diagrams
- annotated evidence to include photographs, images and diagrams
- technical drawings
- video/audio evidence
- witness statements (as supporting evidence)
- learner observation records (as supporting evidence).

During the project, you will need to refer to the 'Project Brief' to obtain information.

Assessment objectives

The internal synoptic project is a formal assessment that will contribute 60% towards your overall qualification grade and therefore it is important that you produce work to the highest standard that you can.

You will be assessed on your ability to independently select, apply and bring together the appropriate knowledge, understanding, skills and techniques you have learnt throughout your course of study, in response to a brief set in a real-world situation.

The internal synoptic project will be assessed holistically against five integrated assessment objectives. These assessment objectives and their weightings are shown below.

Assessment Objective	% weighting
AO1 – Recall knowledge and show understanding The emphasis here is for learners to recall and communicate the fundamental elements of knowledge and understanding.	10%
AO2 – Apply knowledge and understanding The emphasis here is for learners to apply their knowledge and understanding to real-world contexts and novel situations, including finding creative solutions.	15%
AO3 – Analyse and evaluate knowledge and understanding The emphasis here is for learners to develop analytical thinking skills to make reasoned judgements and reach conclusions.	20%
AO4 – Demonstrate and apply technical skills and processes The emphasis here is for learners to demonstrate the essential technical skills relevant to the vocational sector, by applying the appropriate processes, tools and techniques.	45%
AO5 – Manage and evaluate the project The emphasis here is for learners to develop the necessary skills of forethought, time management, self-reliance and self-reflection.	10%

Please turn over for the grading descriptors.

Grading descriptors

The assessment for each AO is broken down into bands, with each band having an associated descriptor indicating performance at that band.

Assessors must make a judgement using all of the evidence you produce to determine the assessment decisions for the internal synoptic project.

The internal synoptic project requires effective use of integrated knowledge, understanding and skills from across the full breadth of the qualification content.

AO1 Recall knowledge and show understanding	
Band	Descriptors
3	Learners recall and communicate a wide range of comprehensive engineering knowledge and understanding. Subject-specific terminology is used accurately and consistently throughout the project.
2	Learners recall and communicate a range of engineering knowledge and understanding. Subject-specific terminology is used appropriately on occasion .
1	Learners recall and communicate basic engineering knowledge and understanding. Subject-specific terminology is basic and inconsistent .
NYA	No rewardable material.

AO2 Apply knowledge and understanding	
Band	Descriptors
3	Learners accurately apply knowledge and understanding of maths, science and engineering theory, which is relevant to the context and situation.
2	Learners' application of knowledge and understanding of maths, science and engineering theory is mostly accurate and has some relevance to the context and situation.
1	Learners' application of knowledge and understanding of maths, science and engineering theory is of limited accuracy and relevance to the context and situation.
NYA	No rewardable material.

AO3 Analyse and evaluate knowledge and understanding	
Band	Descriptors
3	Learners critically analyse and evaluate engineering information, systematically judging and reaching reasoned and valid conclusions.
2	Learners appropriately analyse and evaluate engineering information, judging and reaching suitable conclusions.
1	Learners respond simply to engineering information and provide comments .
NYA	No rewardable material.

AO4 Demonstrate and apply technical skills and processes	
Band	Descriptors
3	Learners demonstrate and apply relevant engineering technical skills effectively , by applying and using appropriate engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a complete and effective solution/outcome.
2	Learners demonstrate and apply mostly relevant engineering technical skills by applying and using mostly appropriate engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a mostly complete and working solution/outcome.
1	Learners demonstrate and apply basic engineering technical skills by applying and using, in a limited way engineering processes, tools and techniques. Learners demonstrate and apply engineering technical skills to develop a partially complete solution/outcome.
NYA	No rewardable material.

AO5 Manage and evaluate the project	
Band	Descriptors
3	Learners manage the project, including preparation and planning of a wide range of project stages, time frames and resources. Learners evaluate a range of their approaches, skills and accomplishments.
2	Learners manage the project, including preparation and planning of a range of project stages, time frames and resources. Learners evaluate some of their approaches, skills and accomplishments.
1	Learners manage the project, including preparation and planning of a limited range of project stages, time frames and resources. Learners provide comments on some of their approaches, skills and accomplishments.
NYA	No rewardable material.

This is the end of the internal synoptic project.

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