**NZQA**

**Approved**

Achievement standard: 91356 Version 3

Standard title: Develop a conceptual design for an outcome

Level: 2

Credits: 6

Resource title: Hoof it to the shed

Resource reference: Generic Technology VP-2.3 v2

Vocational pathway: Primary Industries

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91356-02-8253 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

Achievement standard: 91356

Standard title: Develop a conceptual design for an outcome

Level: 2

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Resource title: Hoof it to the shed

Resource reference: Generic Technology VP-2.3 v2

Vocational pathway: Primary Industries

Learner instructions

# Introduction

This assessment activity requires you to develop a conceptual design for a calf rearing structure.

You are going to be assessed on how you develop a justified conceptual design for a calf rearing structure.

The following instructions provide you with a way to structure your work to demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

## Brief

Familiarise yourself with the following starting brief provided by your assessor/educator.

The calf rearing structure (technological outcome) must:

* house 500 calves
* be ventilated
* protect the calves from the chilling effects of the wind and rain
* allow the calves to get some sun
* allow access to fresh water at all times
* have flooring that facilitates easy cleaning and removal of waste
* be such that calves do not stand directly on concrete
* have at least 1.5m² of space per calf
* have no more than 12 calves per pen
* allow for milk to be brought to the calves.

You will need to refine the brief as you develop your conceptual design. (This brief refinement is not assessed.)

## Developing potential conceptual designs

* Use research, including analysing existing outcomes, to produce some design ideas for your calf rearing structure.
* Carry out ongoing exploration and evaluation of your design ideas to determine their suitability for including in your conceptual designs. Make sure you refer to your developing brief when making decisions.
* Further develop your acceptable design ideas to produce some conceptual designs that could potentially address your brief.

## Evaluating conceptual designs

Evaluate your conceptual designs by:

* gathering and considering evidence from:
	+ ongoing research
	+ ongoing functional modelling (to explore all aspects of the conceptual designs, including technical feasibility and social acceptability)
	+ ongoing stakeholder feedback (for example the farm owner/s; the farm workers).
* combining the evidence gathered to draw conclusions and make decisions (synthesising).

## Communicating the final conceptual design

Select the conceptual design that you consider best addresses your brief:

* Communicate your final conceptual design in such a way that you clearly describe your proposed structure that has the potential to address your final brief.
* You should describe in detail how the structure will look and function. To do this, you could use sketches, diagrams, technical drawings, scale models, computer simulations, written descriptions, details of materials/components and/or assembly instructions.

## Potential fitness for purpose

Substantiate the outcome’s potential fitness for purpose. That is, use your synthesised evidence to support the likelihood of your proposed calf rearing structure addressing your brief.

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This activity requires learners to develop a justified conceptual design for a calf rearing structure that has the potential to be fit for purpose. The context can be adapted to meet the needs of learners.

# Conditions

This is an individual assessment activity.

For this assessment resource, a brief has been provided. Alternatively, the brief could be developed by the learner and confirmed by the assessor/educator.

# Resource requirements

Assessors/educators must either provide a brief as a starting point or confirm that a learner has developed one that is suitable. The brief must allow for a range of designs and include the purpose and probable attributes of the outcome.

Learners will require:

* internet and library access
* access to the specified environment for the proposed technological outcome
* access to existing outcomes
* access to a camera for capturing evidence
* resources for functional modelling and the development of conceptual designs (for example Balsa wood, cardboard, glue, 3D modelling software).

The following website may be useful:

NRM Calf Rearing Guide <http://www.nrm.co.nz/uploads/pdf/NRM_Calf_Rearing_Guide_2013.pdf>.

# Additional information

Technology Online (<http://technology.tki.org.nz>) includes two explanatory papers (in the Curriculum Support section) that offer guidance that aligns with the requirements of this standard. They are:

* technological modelling (includes explanations of functional modelling)
* outcome development and evaluation.

# Assessment schedule: Generic Technology 91356 - Hoof it to the shed

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner has developed a conceptual design for an outcome by:* establishing potential conceptual designs for a calf rearing structure through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes

For example:In consideration of the brief, the learner documents their analysis of a range of existing calf rearing structures, and their internet research of structures and current developments in such things as water distribution systems. The learner uses this information to sketch a range of design ideas for a calf rearing structure that addresses the brief. From that, the learner establishes some potential conceptual designs.* using evidence from research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs

For example:The learner creates several models and uses these to talk to the farmer and the workers. As a result of feedback, the learner makes adjustments to the preferred conceptual design to allow for easier cleaning and access to stalls.* selecting and communicating the final conceptual design for a calf rearing structure

For example:The learner confirms the conceptual design. It is presented to the main stakeholders through 3D computer modelling and photos of the site. * explaining the calf rearing structure’s potential fitness for purpose

For example:The learner explains how the conceptual design has the potential to address the conceptual statement and specifications as defined in the brief.*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner has developed a refined conceptual design for an outcome by:* establishing potential conceptual designs for a calf rearing structure through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes
* ongoing exploration and evaluation of design ideas to determine their suitability for inclusion in conceptual designs

For example:In consideration of the brief, the learner documents their analysis of a range of existing calf rearing structures, and their internet research of structures and current developments in such things as water distribution systems. The learner uses this information to sketch a range of design ideas for a calf rearing structure that addresses the brief. These are shown to a builder, and as a result of that feedback, and relooking at a range of different structures, a different water distribution system and more efficient use of spaces is included in the conceptual designs.* using evidence from ongoing research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs

For example:* + the learner creates several models and uses these to talk to a builder, the farmer and the farm workers. As a result of feedback, they undertake more internet research, use functional modelling to test ventilation and water catching ideas and modify the preferred conceptual design
	+ the learner takes their developments back to stakeholders on several occasions and makes more adjustments.
* selecting and communicating the final conceptual design for a calf rearing structure

For example:The learner confirms the conceptual design. It is presented to the main stakeholders through 3D computer modelling and photos of the site.* explaining the calf rearing structure’s potential fitness for purpose

For example:The learner explains how the conceptual design has the potential to address the conceptual statement and specifications as defined in the brief.*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner has developed a justified conceptual design for an outcome by:* establishing potential conceptual designs for a calf rearing structure through generating and evaluating design ideas that are informed by research, including the analysis of existing outcomes
* ongoing exploration and evaluation of design ideas to determine their suitability for inclusion in conceptual designs

For example:In consideration of the brief, the learner documents their analysis of a range of existing structures, and their internet research of structures and current developments. The learner uses this information to sketch a range of design ideas for a calf rearing structure that addresses the brief. These are shown to a builder, and as a result of that feedback, and relooking at a range of different structures, a different water distribution system and more efficient use of spaces is included in the conceptual designs.* synthesising evidence from ongoing research and functional modelling, including feedback from stakeholders, to evaluate conceptual designs

For example:* + the learner creates several models and uses these to talk to a builder, the farmer and the farm workers. As a result of feedback, they undertake more internet research, use functional modelling to test ventilation and water catching ideas. This combined evidence leads to a decision being made to modify the preferred conceptual design
	+ the learner takes their developments back to stakeholders on several occasions and makes more adjustments.
* selecting and communicating the final conceptual design for a calf rearing structure

For example:The learner confirms the conceptual design. It is presented to the main stakeholders through 3D computer modelling and photos of the site.* substantiating the calf rearing structure’s potential fitness for purpose

For example:The learner justifies such things as the need for a particular ventilation and watering system. The learner explains why the chosen design features are best in comparison to alternatives.*The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.