

# Construction Studies at Coola PPS

Leaving Certificate Construction Studies provides students in the senior cycle of post-primary education with an introduction to the knowledge and skills involved in construction technology as well as construction materials and processes. Students develop their ability to communicate ideas and information and to apply accurate observation and scientific investigation through exploring materials and processes.

The subject explores the principles and practices of designing and constructing homes in the Irish context. The subject places a strong emphasis on international best practice in relation to the conservation of energy and the selection of sustainable materials when designing and building homes. Students learn about the context in which homes are built, the structure and fabric of buildings as well as the need to ensure homes are comfortable and energy efficient.



**Room 20 - Construction Studies Room**

The study of **Construction Studies** at senior cycle aims to:

- Introduce students to the knowledge and skills involved in construction technology and construction materials and practices; through theoretical study and integrated practical projects
- Develop the students ability to communicate ideas and information by appropriate methods, and to encourage them to apply accurate observation and scientific investigation through the exploration of materials and processes
- Contribute towards the general education of students
- To provide a basis for those who may wish to study construction technology at third level

## Assessment

Construction Studies is assessed at both Ordinary level and Higher level by means of a terminal examination paper (50%), a practical test (25%) and a student project (25%).

### Terminal examination paper (50%)

The terminal examination paper is assessed at both Higher and Ordinary levels in June.


Topics examined on the examination paper include:

- built heritage
- health & safety in construction
- construction materials
- urban, rural and universal design
- envelope design concepts
- site assessment & foundations
- floors, walls, roofs, windows & doors
- energy standards
- passive design
- light, heat, electrical & sound energy
- airtightness & ventilation
- water supply & drainage
- sustainability, energy and water resources

1. The external wall of a dwelling house is a 400 mm concrete block wall with a full-fill insulated cavity. The wall is plastered on both sides. A triple glazed timber casement window is fixed in the external wall, as shown. The fixed frame of the window is 150 mm x 80 mm.

(a) To a scale of 1:5, draw a vertical section through the top portion of the window. Show the wall, the concrete lintels and the fixed frame of the window. On your drawing, show the typical construction details from a level 300 mm below to a level 400 mm above the concrete lintels. Include four typical dimensions.

(b) Show clearly on your drawing the typical design detailing to ensure that the cavity is closed at the window head.

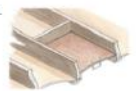


2. A young couple have bought an old, uninsulated house. They wish to improve the insulation properties of the house and have decided to start by insulating the attic space. The sketch shows the ceiling joists and the trapdoor to the attic. The ceiling joists are 200 mm x 40 mm.

(a) Draw a large freehand sketch of the triangular attic space. On your sketch show the typical design detailing necessary to highly insulate the attic at ceiling joist level. Recommend a preferred insulation type and give its typical thickness.

(b) The trapdoor is also to be insulated and well-sealed. Using notes and freehand sketches show the insulation to the trapdoor. Show also one method of sealing the trapdoor.

(c) Discuss two reasons why the couple should begin by insulating the attic space.




3. (a) A dwelling should have a clean water supply for domestic consumption. Draw a large freehand sketch of the given house and, on your sketch, show the pipework necessary to supply cold water to the kitchen sink on the ground floor and to the toilet on the first floor.

Include the following in your diagram:

- rising main
- pipework to the kitchen sink
- insulated cold water storage tank
- pipework to toilet cistern
- all necessary valves.

(b) The sketch shows a valve usually used to turn off the water supply to a toilet. Using notes and freehand sketches show the preferred location of the valve. Give one reason for choosing this location for the valve.

(c) Discuss one advantage of installing a dual-flush toilet.



Leaving Certificate Examination, 2019  
Construction Studies – Ordinary Level

### 2019 O.L. Exam Paper

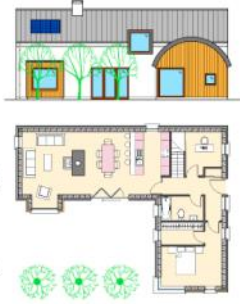
6. The elevation and ground floor plan of a house are shown. The house has two bedrooms and a bathroom upstairs. The external walls are of timber frame construction with a rendered concrete block and timber cladding finish. The house is designed to have low environmental impact.

(a) With reference to the design shown, discuss using notes and freehand sketches, three features of the design that contribute to the house having a low environmental impact.

(b) Using notes and freehand sketches, discuss in detail each of the following renewable energy technologies and identify how each contributes to making a home more eco-friendly:

- evacuated tubes
- wind turbines
- photovoltaic panels.


(c) Discuss in detail two advantages of using local craft skills when building the house shown.



7. The main hall of a two-storey dwelling has a closed riser wooden stairs. The bottom of the stairs has a bullnose step as shown. The newel post is 120 mm x 120 mm and the rise of a step should not exceed 175 mm.

(a) To a scale of 1:5, draw a vertical section through the centre of the stairs. The section should show the typical construction detail through the bottom three steps of the stairs, showing the newel post, string, balusters and handrail. Include the typical dimensions of three structural members of the stairs.

(b) Indicate on your drawing three design features that ensure the stairs is safe for users.

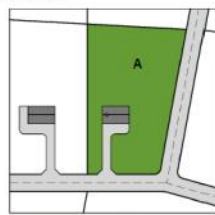


Leaving Certificate Examination, 2019  
Construction Studies – Higher Level

8. (a) Discuss three considerations to ensure the proper treatment and disposal of sewage when selecting a site for a house in a rural location.

(b) The drawing shows a site layout map. The outline of a new house and driveway is shown on site A. Using notes and freehand sketches, show the design layout necessary for a typical wastewater treatment system and percolation area on this site. Include typical dimensions for the system.

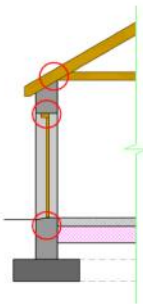
(c) Using notes and freehand sketches, discuss an alternative method, other than a typical percolation area to ensure the safe treatment of wastewater from a dwelling house.



9. Thermal envelope continuity is essential to ensure a dwelling house is thermal bridge free. The drawing shows an outline section through the external door of a single-storey house having a 450 mm external concrete block wall with a 250 mm full-fill insulated cavity. The house has a traditional cut roof with an insulated solid concrete ground floor. The external door and frame are thermally broken.

(a) Using notes and freehand sketches, show best practice design detailing that will prevent the formation of a thermal bridge at each location circled on the drawing.

(b) Discuss two negative impacts of thermal bridging as a result of poor design detailing.

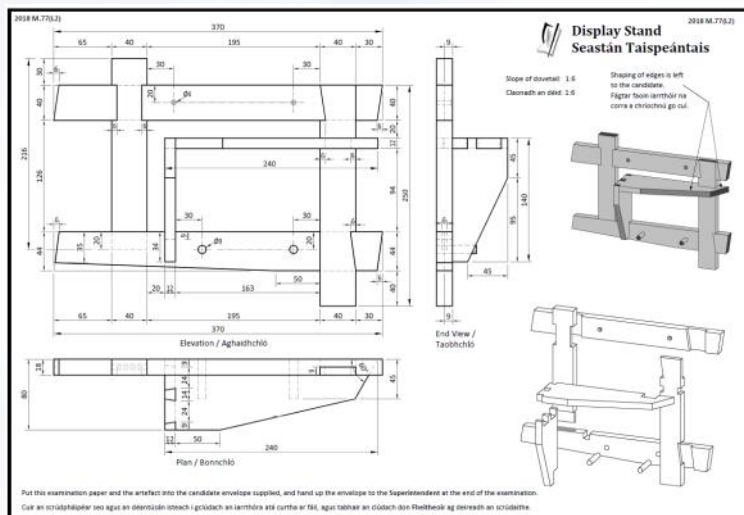


Leaving Certificate Examination, 2019  
Construction Studies – Higher Level

### 2019 H.L. Exam Paper

## Practical Test (25%)

The skills test is assessed at common level and comprises of a four hour exam that tests the student's ability to read a given drawing and to precisely manufacture an artefact using a given set of components. To do this the student must correctly identify each piece and mark and process all of the joints and decorative features.



## 2018 Practical Test



## Student Project (25%)

There are four main types of project which students can choose to design and make:

- Furniture project
- Construction detail (scaled model)
- Built heritage (scaled model)
- New/modern technology project

The project is assessed at common level and is marked out of 150 marks (there are 5 sections – each worth 30 marks).

Each project must be supported by a written report which includes three experiments.







Some examples of past Leaving Certificate Construction Studies projects at Coola PPS

