

**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Leaving Certificate 2020**

**Marking Scheme**

**Construction Studies**

**Ordinary Level**

## **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

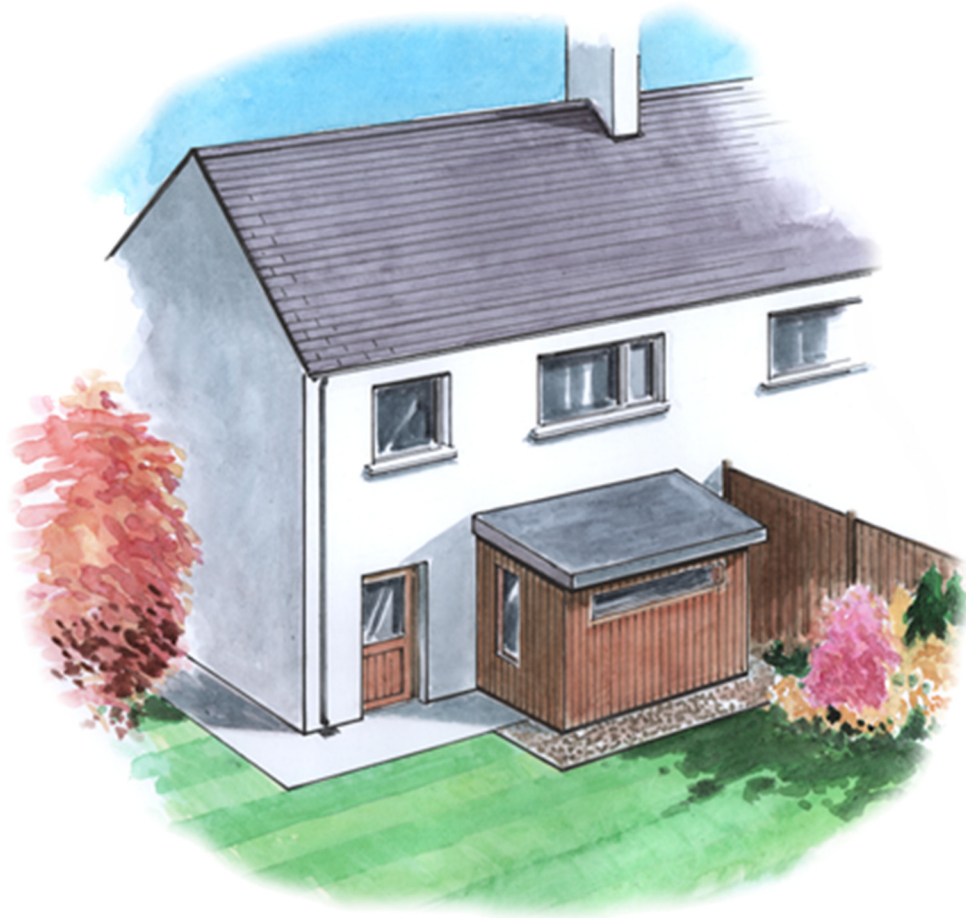
## **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



**Coimisiún na Scrúduithe Stáit**  
*State Examinations Commission*

*Leaving Certificate Examination, 2020*



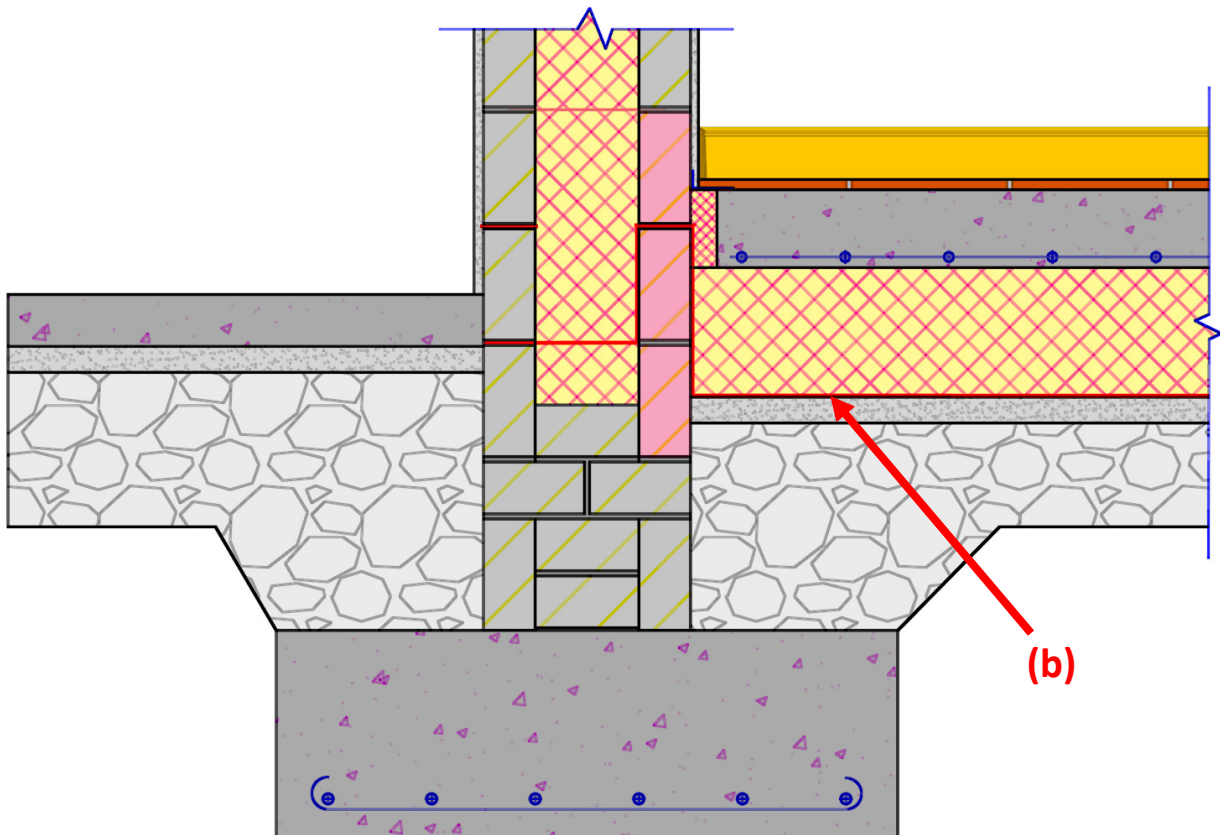
# ***Construction Studies***

## ***Theory – Ordinary Level***

**Note:** *Notes and graphics are for illustration and are not exclusive or exhaustive, other relevant notes and graphics are acceptable as responses and will be credited accordingly.*

### Question 1.

(a) Vertical section through strip foundation, external wall and ground floor.



Specification – typical detail

- Reinforced concrete foundation
- Concrete fill/ footings
- 300 mm Hardcore
- 50 mm Sand blinding
- Radon barrier or damp proof membrane
- 200 – 300 mm rigid floor insulation
- Reinforced concrete slab
- Quarry tiles
- Skirting board
- 15 mm internal plaster
- Airtight tape
- 100 mm concrete block inner leaf
- 100mm thermal blocks
- 200 mm full-fill insulated cavity
- Wall tie
- Damp proof course
- 100 mm concrete block outer leaf
- 18 mm external render.

*N.B. Any alternative detailing which complies with current Building Regulations is acceptable.*

(b) Show on your drawing the typical design detailing to prevent dampness entering the building through the floor.

- Placing a continuous layer of Damp Proof Membrane (DPM)/radon barrier, an impervious material, underneath the floor
- Place a damp proof course (DPC) stopping all rising dampness, due to capillary action in the sub-walls.

## Question 2.

**(a) Show how to insulate the cavity wall.**

**Method**

- Builders install rigid insulation boards as the blockwork is being erected
- The insulation boards are tongued and grooved so fit tightly together horizontally and vertically
- A cavity wall tie is used to keep the insulation boards in place and tight against the internal block wall.

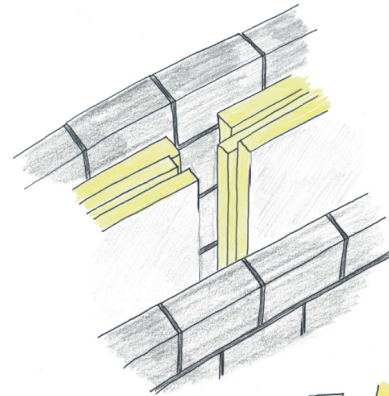
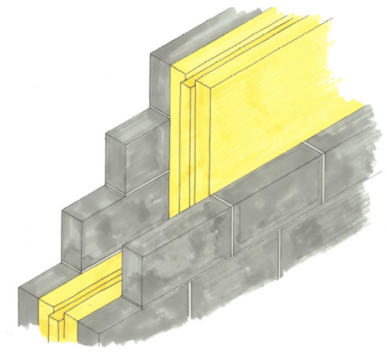
**Type of insulation**

- Expanded Polystyrene foam boards (EPS)
- Polyurethane insulation boards
- Polyisocyanurate foam panels.

**Thickness of insulation**

- Full-filled cavity insulation - 200 mm insulation
- Partial filled cavity - 150 mm insulation boards.

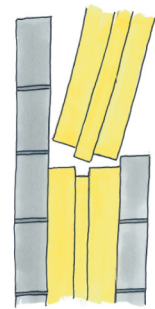
*Any other suitable method will be accepted*



**(b) Two advantages of installing cavity wall insulation.**

- Insulation reduces the heat loss in the building
- Increased thermal comfort for occupants
- Energy bills are reduced
- It is better for the environment with less use of fossil fuels
- It improves the Building Energy Rating (BER).

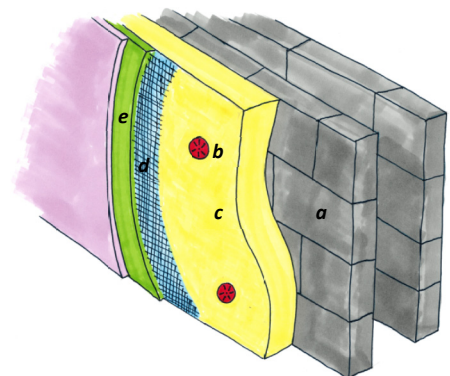
*Any other suitable reason will be accepted*



**(c) Show one method of applying additional insulation to exterior wall.**

**External solution**

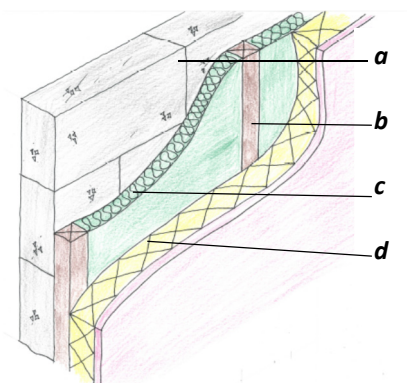
- External insulation panels are attached to the exterior walls (a) using fixings (b) and adhesive
- A minimum thickness of 200 mm insulation (c) is attached to the wall
- Surface finish is completed with a base and finish coat of acrylic (e), strengthened with a mesh reinforcement (d).



**Internal solution**

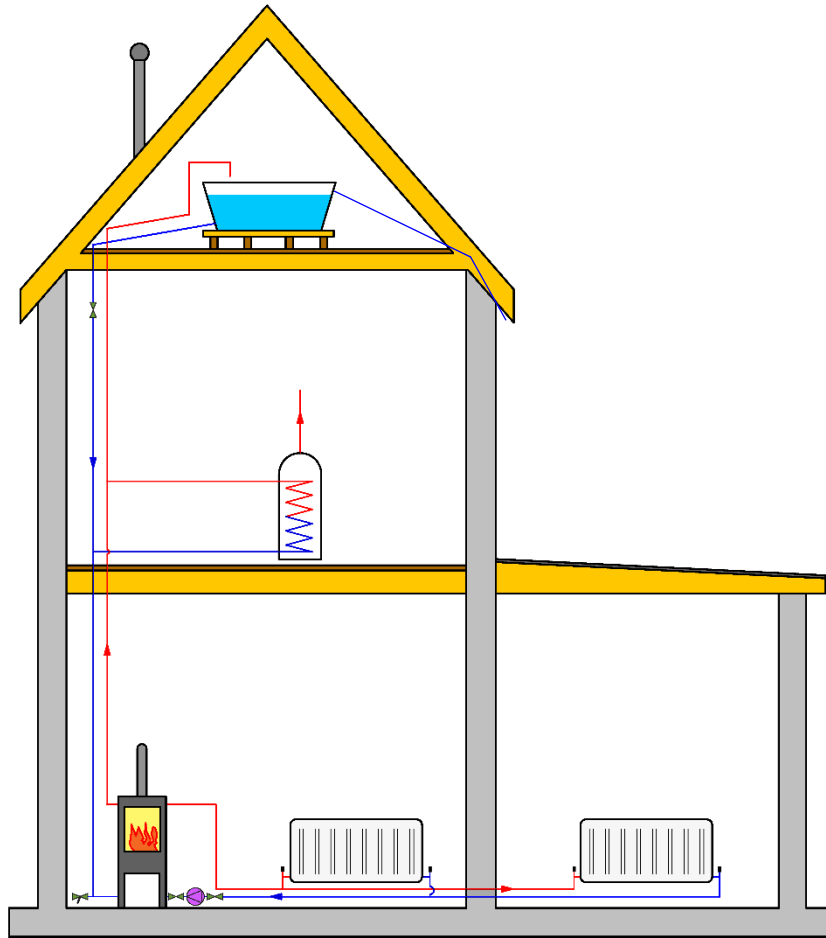
- 50 mm x 50 mm battens (b) spaced at 400 mm centres are fixed to the inside surface of the cavity wall (a)
- Sheep wool, woodfibre, cork board or rockwool insulation (c) is placed in between the battens
- Vapour barrier must be included to prevent dampness reaching the insulation
- Plasterboard of 12mm thickness or insulated plasterboard (d) is fitted to the battens, finished with a skim coat of plaster.

*Any other suitable method will be accepted*



### Question 3.

(a) Pipework required to supply hot water to the radiators and hot water cylinder.



#### Typical details:

- 15 mm cold feed to stove
- Gate valves
- 22 mm flow to radiators
- 22 mm return from radiators
- Pump and isolator
- Radiators valves
- 22 mm primary flow to cylinder
- Drain off valve
- 22 mm primary return to burner
- 22 mm overflow pipe.

*N.B. Any alternative detailing which complies with current Building Regulations is acceptable.*

(b) **One advantage of installing an underfloor heating system.**

- It distributes heat evenly and consistently around each room
- A suitably sized system can heat a larger room than an individual radiator
- It works at a lower temperature, so it can reduce your heating bills
- It is under the floor so more space in rooms and allows for easier decoration and painting of walls.

*Any other suitable reason will be accepted*

### Question 4.

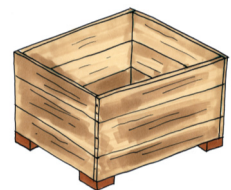
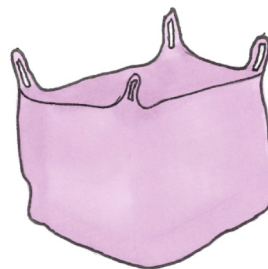
**(a) Two reasons for a waste management plan their site.**

- To prevent and minimise the quantity of waste of building sites
- To develop a culture of reusing and recycling material instead of dumping it
- To reduce the energy production in the manufacture of new material
- To keep the building site area clean and clear to prevent accidents occurring
- To prevent hazardous waste for contaminating local natural resources and water supplies
- Landfill site are becoming full and are scarce
- It reduces the overall cost of the building.

*Any other suitable reason will be accepted.*

**(b) Two construction materials that could be recycled and re-used on-site. One suitable re-use of each.**

- Bedrock, Blocks and Concrete
- Bricks
- Soil/Subsoil
- Timber
- Slates/Tiles
- Plasterboard
- Metal.



**Suitable re-use for each material.**

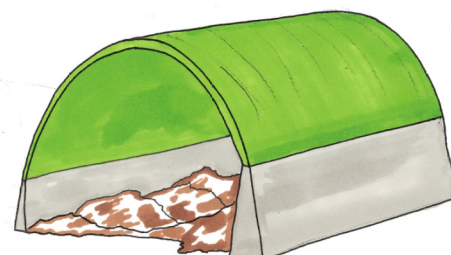
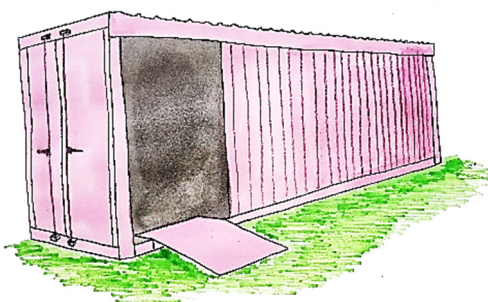
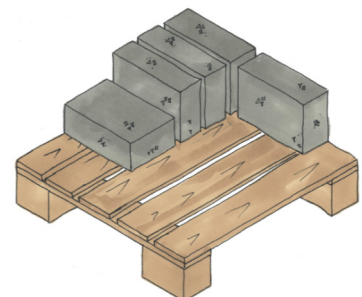
- Used for infill during construction
- Restoration heritage building projects
- Use as fill on site or for replanting of green areas
- Manufacture of wood products or for landscaping woodchips
- Reused on the building to keep the existing character of the building
- Waste gypsum can be recycled into new plasterboard
- Recycled and processing into new metal products.



*Any other valid material and reuse will be accepted*

**(c) Show one other method to sort and store waste materials on a construction site.**

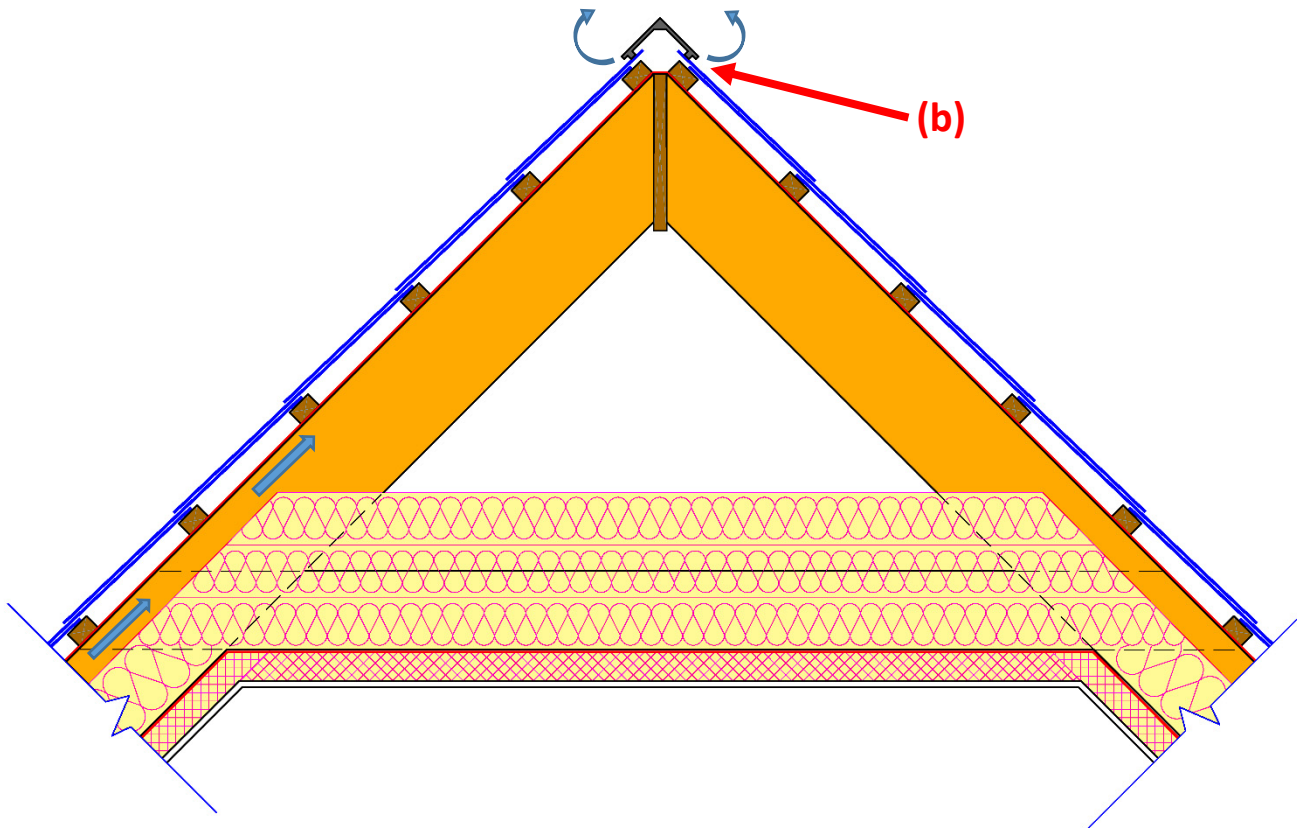
- Containers - used to protect metal from weather and other valuable waste materials
- Pallets – store and sort bricks/blocks that can be easily lifted and transported.
- Barrels – store and sort lengths of waste timber and metal.
- Trailers – store soil and bedrock for transport at a later stage.
- Boxes – Sort and store small items for transport.
- Bulk bags – store soil and gravel for later transport or reuse on site.



*Any other suitable detail will be accepted*

## Question 5.

(a) Draw a vertical section through the portion of the roof at the ridge – typical details.



Specifications – typical detail

- Ridge tile
- Ridge vent
- Slates
- 50 mm x 35 mm Battens
- Breather membrane
- 275 mm x 32 mm Ridge board
- 200 mm x 50 mm Rafter
- 200 mm x 50 mm Collar tie
- Insulation between rafters
- Airtight membrane
- Insulated plasterboard
- Plaster skim.

*Note: Any alternative detailing which complies with current Building Regulations is acceptable*







(b) Show one method of ventilating the roof.

- Ridge vent installed at the ridge
- Fitting vent slates in roof near the ridge.



**Question 6.**

(a) Show three safety signs that highlight the use of personal protection equipment (PPE). State how the safety equipment protects the workers from injury.

Safety Sign	How it protects worker
	<p><b>Steel toe cap boots</b></p> <ul style="list-style-type: none"> <li>• Protects workers from heavy materials being dropped and damaging their foot.</li> </ul>
	<p><b>Hi Viz clothing</b></p> <ul style="list-style-type: none"> <li>• Allows workers to be visible on a site</li> <li>• Allows machine operators see construction workers and avoid accidents.</li> </ul>
	<p><b>Hard hat</b></p> <ul style="list-style-type: none"> <li>• Protects workers from falling building material</li> <li>• Protects workers head from injury.</li> </ul>
	<p><b>Protective eye wear</b></p> <ul style="list-style-type: none"> <li>• Protects the workers eyes from flying debris and dust</li> <li>• Protects the worker when working with power tools.</li> </ul>
	<p><b>Ear protection</b></p> <ul style="list-style-type: none"> <li>• Protects the worker where noise is continuous at a level of 85 - 90 decibels or greater</li> <li>• Protects the worker when working near or with any machine creating a continuous noise.</li> </ul>
	<p><b>Hand protection</b></p> <ul style="list-style-type: none"> <li>• Protects the workers hands when carrying or working with sharp equipment</li> <li>• Protects the worker when working with corrosive, toxic or irritant skin substances.</li> </ul>

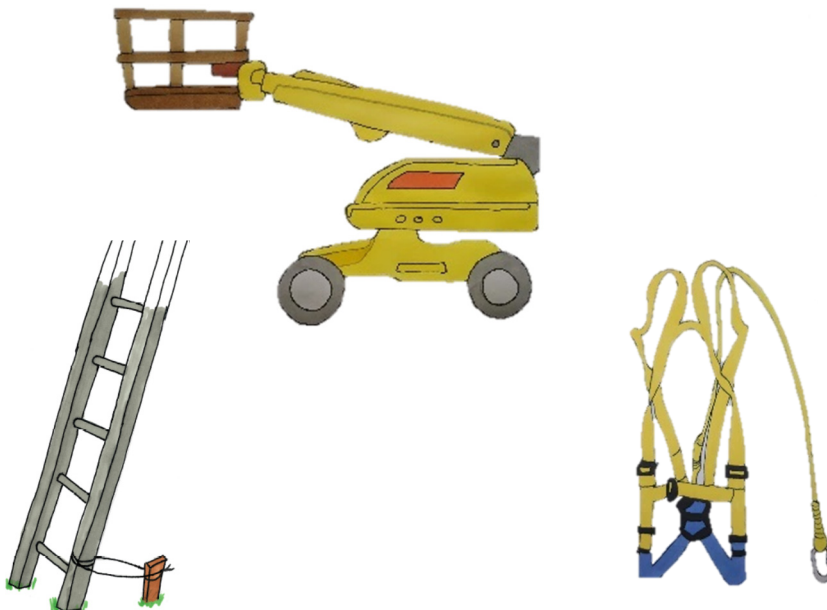
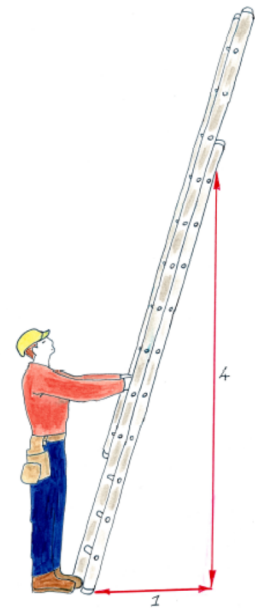
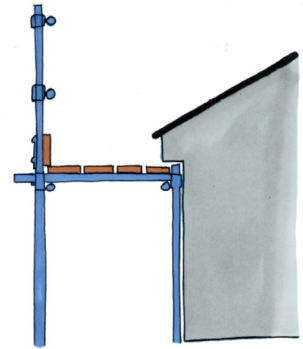
*Any other suitable sign will be accepted*

**(b) Two safety precautions that workers must follow when working safely at heights on a construction site.**

**Safety precautions:**

- Use scaffolding when working at heights above 1.5 metres
- Ensure the scaffolding is level, supported and properly erected
- Ensure a guard rail and working platforms are positioned at eaves level
- Carefully plan the use of ladders
- Limit the time workers are on the ladder
- Properly secure ladders at the top and bottom
- Position ladders at a slope of 1:4
- Workers to use safety harness and other fall protection devices as necessary to provide additional fall protection
- Use a lifting system such as a cherry picker/teleporter to reach high areas or areas that need to be worked on for an extended time period
- Work in pairs to ensure each worker has a co-worker/buddy to help with any task that has a risk.

*Any other suitable precaution will be accepted*



**(c) Two reasons why all construction workers must undertake a safety training prior to working on a construction site.**

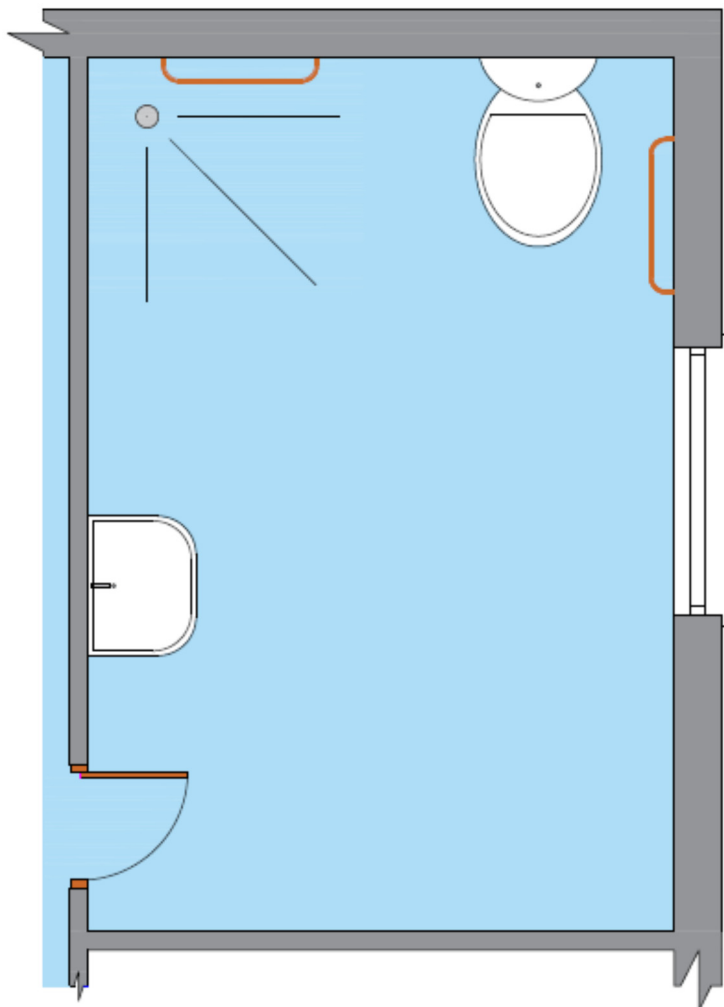
**Possible Reasons:**

- Legal requirement to comply with Health and Safety regulations for all construction workers
- Raise the standard of safety awareness on site
- Ensure that all workers undergo basic health and safety awareness training to prevent accidents and avoid health hazards
- Educates workers to assess risks and identify dangers on site
- It promotes a safety culture for all construction workers.

*Any other suitable reasons will be accepted*

## Question 7.

- (a) Draw a freehand sketch of the bathroom design and show your preferred location for the toilet, wash basin and shower area. Give one your reason for selecting each location.



### Toilet

- Located on an external wall making waste disposal easier to plumb
- It has free space on the side to allow grab rails to be fixed to the wall
- Fitted in this location to allow for a 1500 mm turning circle in bathroom
- External wall to allow toilet to be fixed securely.

### Wash basin

- There is a wall to allow it to be fixed securely
- Fitted in this location to allow for a 1500 mm turning circle
- Wall space to attach a mirror over the basin
- Adequate wall space to install grab rails if necessary.

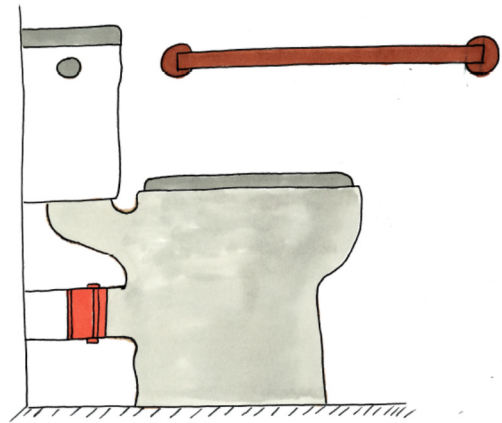
### Shower area

- It avoids the door opening and allows for moving space
- It has natural light available
- It has external walls to allow for fixtures and fittings to be attached securely
- Fitted in this location to allow for a 1500mm turning circle in bathroom.

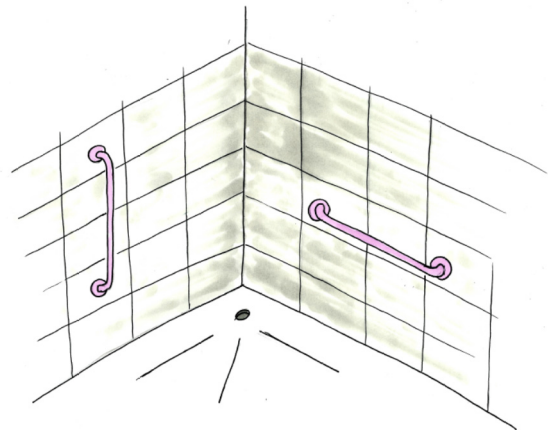
*Or any other suitable locations*

**(b) Two possible locations for the grab-rails. One reason for each position.****Toilet area**

- Grab-rail securely attached to a solid wall.
- Horizontal grab rail at a height 700 mm from the ground.
- To improve safety and mobility when using the water closet
- To provide extra support when lowering or rising from the water closet seat
- To allow people with reduced mobility to use the water closet safely.

**Shower area**

- Grab-rail securely attached to the tiles using fixings.
- Horizontal or vertical grab rails installed in the shower area
- To provide extra support when using the shower area
- To provide safety from slipping in the shower area
- Allows person with reduced mobility to use the shower area safely and independently.



*Any other suitable area and reason.*

**(c) Discuss one advantage of designing a bathroom suitable for people with reduced mobility.**

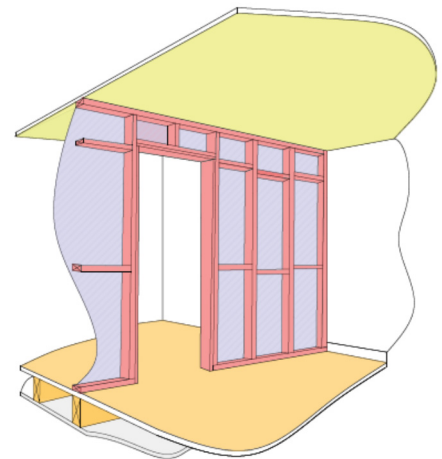
- Future proofing the home so less modifications need to be made later
- Later modifications, demolishing, and retrofitting are expensive and intrusive to the homeowners
- Allow the homeowner and family to live in their home for their entire life
- It allows the house to be used by the less mobile members of the family independently
- Allows safe access to the bathroom by all.

*Any other valid reason*

## Question 8.

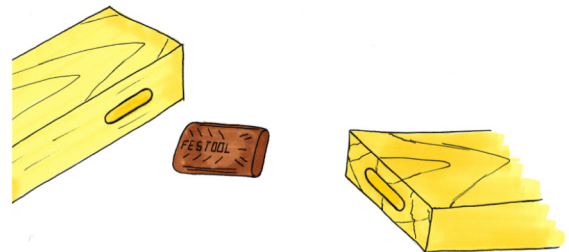
### Stud partition

- A stud wall comprises of a frame, timber, or metal studs, secured to the floor, ceiling and walls
- The partition is made with vertical studs spanning from floor to ceiling
- Horizontal members called headplates and soleplates sit at the top and bottom of the studs.
- Horizontal brace pieces between studs called noggins are used for rigidity
- Studs are spaced at 400 mm centres and are covered with plasterboard
- Stud partitions can be load bearing or non-load bearing.



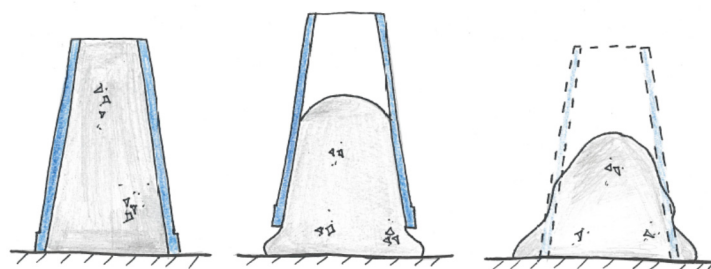
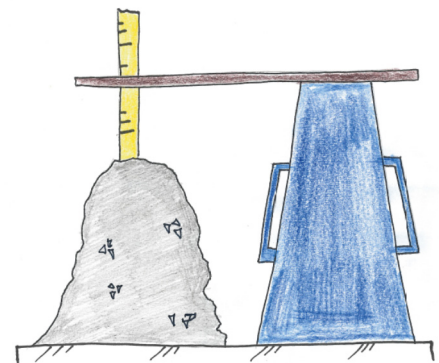
### Domino joint

- This joint is widely used in the manufacture of modern furniture
- A domino joint is woodworking joint cut with a domino joiner
- Used to quickly joint pieces of wood
- The domino joint is used to butt, edge or corner join pieces of wood
- The domino joint when used with wood adhesive produces a very strong joint.



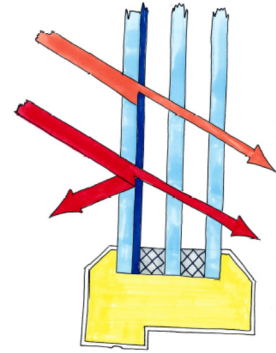
### Slump test

- The slump test is used to measure the workability of fresh concrete
- The slump test is carried out on site on each batch of concrete that is to be used to check the uniformity of the mixtures
- The slump test can be used to check that the correct amount of water has been added to the concrete mix
- The slump test is carried out with a truncated cone, tamping rod, and meter stick
- Results are recorded when the cone is removed and the sample slumps:
  - 0 - 50 mm slump = Low workability
  - 50 - 75mm slump = Medium workability.



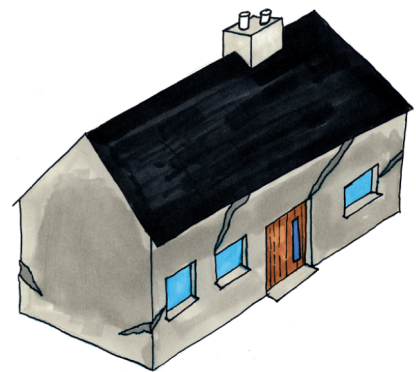
**Dynamic glass**

- This technology enables a thin coating to change from clear to tinted when a small DC voltage is applied
- Dynamic glass enables glass to change tint when necessary to reduce glare and overheating of the interior
- Provides greater levels of comfort for the occupant
- Electrochromic: metallic oxide layers fixed to the surface of glass. These are controlled when a low voltage electric current passed through layers to adjust the tint/opacity of the glass
- Thermochromic glass reacts and tints to the heat and intensity of the sun.



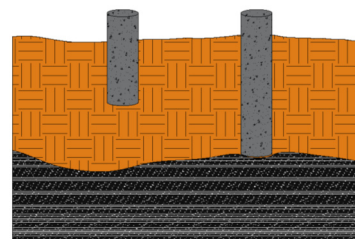
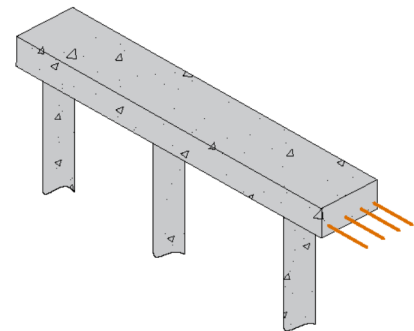
**Pyrite**

- Pyrite is form of iron sulphide
- Pyrite is a naturally occurring mineral in sedimentary rocks
- Pyrite can undergo a chemical reaction when exposed to moisture and oxygen.
- This chemical reaction can cause the pyrite to crack and expand
- When pyrite is used in the building of foundations it can cause the ground floors to heave, causing cracking and movement of walls causing cracks to appear on the wall surfaces.



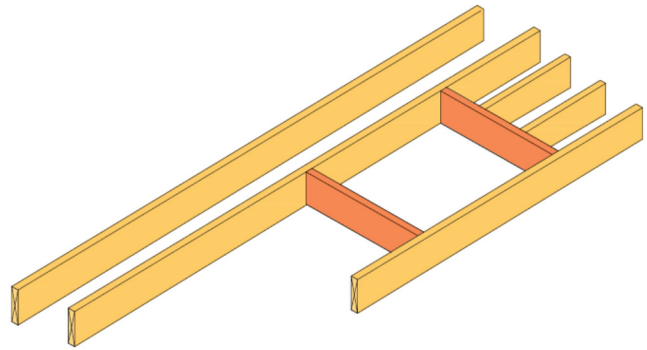
**Pile foundation**

- Pile foundations are used to support and anchor a building to the ground
- Pile foundations are used where the building is situated on Low bearing capacity soil or when good bearing capacity soil is deep underground
- There are three types of Pile foundations:
  - End-bearing, friction and short-bored
- Pile foundations can be drilled with concrete poured or be driven into the ground using a pile driver
- A ground beam sits on top of the pile foundations
- Load-bearing walls transmit their load onto the beam which in turn transmits its load onto the pile foundation.



### Trimmer

- A trimmer joist supports joists and rafters that cannot be supported at their ends
- Trimmer joists run perpendicular to rafters and common joists
- Trimmer joists support trimmed joists
- Trimming joists support a trimmer joist
- Trimmer joists are used around chimney openings and stairwells to allow sufficient clearance for the stairs or chimney to pass through the floor or roof
- Trimmer joists carry more load than common joist so are usually thicker in size
- Trimmer joists are usually 25 mm thicker than common joists.



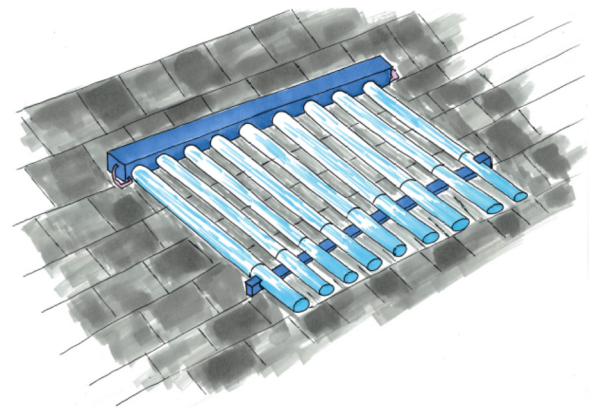
### Butt hinge

- It varies in length from 12 mm to 150 mm
- A widely used hinge
- It is made of brass, mild steel or stainless steel.
- Used for doors, windows, boxes etc
- Consists of two leaves and a central pin
- The leaves are fitted into two shallow trenches cut into the frame
- Butt hinges are secured using countersink screws.



### Solar Panel

- A solar panel may be in the form of a photovoltaic panel or evacuated tubes.
- An evacuated tube collects solar radiation and converts it into heat.
- A photovoltaic panel generate electricity by absorbing sunlight and using that light energy to create an electrical current.
- The solar panel is usually situated on a south facing roof, 45° angle is optimum to catch solar energy in Ireland
- Solar panels may also be placed at ground level but risk being damaged, or the sunlight blocked due to trees or overgrowth
- A solar panel is a sustainable energy source, environmentally friendly and helps reduce CO<sup>2</sup> emissions
- The panel can be mounted to follow the path of the sun.



## Question 9.

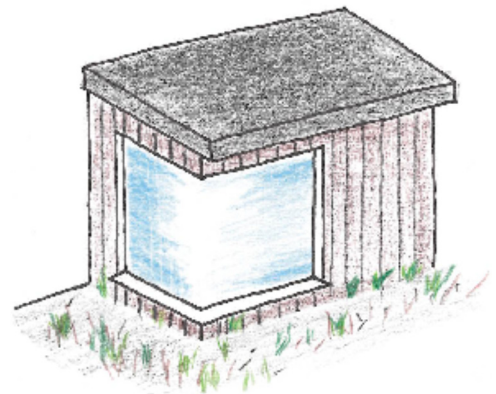
### (a) Two reasons why a homeowner would build an extension to their house.

- Increase the indoor floor area to accommodate the needs of a growing household
- To improve the level of natural lighting entering the existing building
- Increase the value of the existing building
- Cheaper to improve existing building rather than move to a new building
- Change and personalise an older designed building to new needs
- Improve the thermal performance of the existing building as new building materials will be more energy efficient.

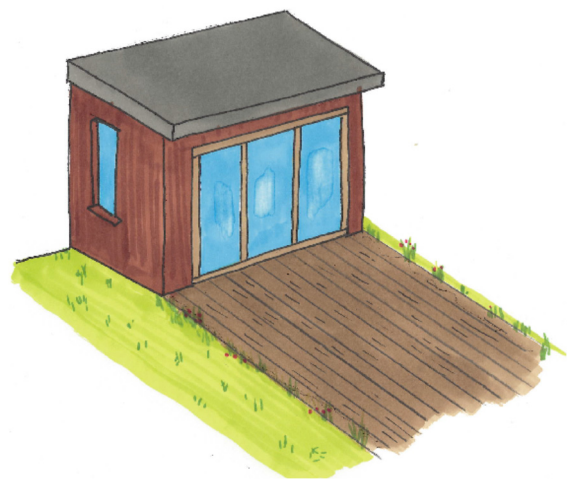
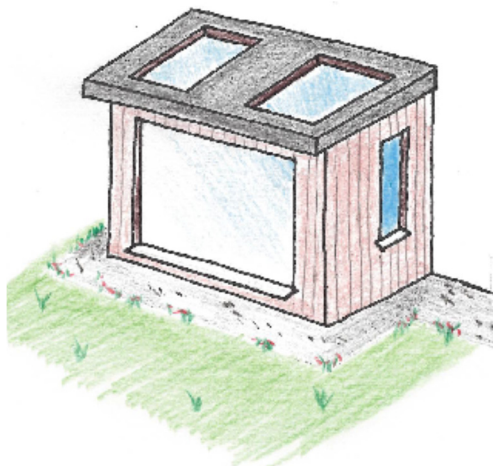
*Any other valid reason*

### (b) Two modifications to the rear of the building that would allow more natural light enter the house and extension.

- Remove internal walls to allow light to penetrate through to the internal rooms
- Replace existing door with a sliding door or bi-fold doors to increase the light entering
- Increase the size of the existing windows
- Install floor to ceiling glazing walls to replace existing walls
- The existing window could be replaced with larger taller unit
- Install roof lights on the sloped roof of the extension
- Install solar-tubes/sky tunnels in the roof.



*Any other suitable modification(s)*



### (c) Two advantages for increasing the natural light entering a house for the home occupants.

#### Advantages:

- Reduced energy costs for lighting and heating
- Less reliance on fossil fuels for lighting
- Regulates Seasonal Affective Disorder (SAD)
- Reduces eye strain and improves quality of illumination
- Improves exposure to sunlight, hence improves Vitamin D levels
- Increases the aesthetics of interior space.

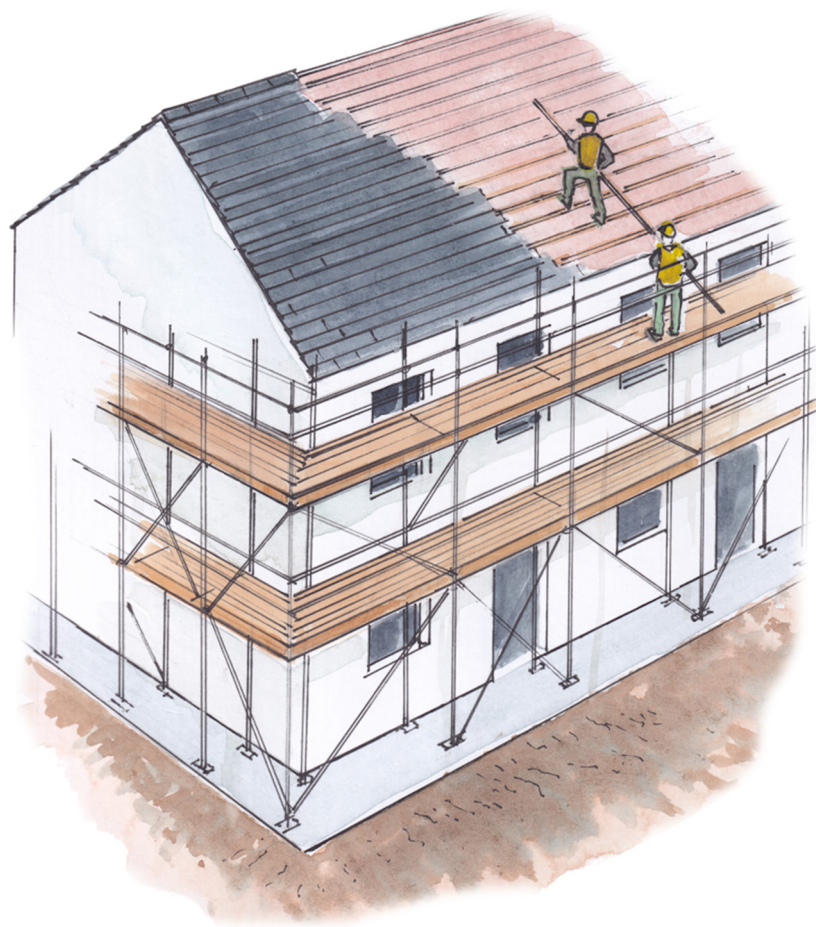
*Any other valid reason*





**Coimisiún na Scrúduithe Stáit**  
*State Examinations Commission*

*Leaving Certificate Examination, 2020*



***Construction Studies***  
*Theory – Ordinary Level*

***Marking Scheme***

**Question 1.**

<b>Vertical section through foundation, external wall and ground floor</b>	
<b>DETAILS - typical sizes</b>	<b>MARKS</b>
<b>Part (a)</b>	
Reinforced strip foundation 1200 mm x 400 mm	<b>5</b>
Concrete fill / foundation blocks	
Hardcore and sand blinding	
1200-gauge damp proof course/radon barrier	<b>5</b>
200 - 300 mm Floor insulation	<b>5</b>
150 mm Concrete floor slab taped and sealed at junction of wall and floor	<b>5</b>
Floor tiles 20 mm	<b>5</b>
Skirting board	<b>5</b>
Concrete block inner leaf with 13 mm internal plaster	<b>5</b>
200 mm Full fill cavity insulation	<b>5</b>
Wall ties	
Concrete block outer leaf with 19 mm render	
<b>Any 7 x 5 marks</b>	<b>Sub-total</b>
	<b>35</b>
Any 4 typical dimensions	<b>4</b>
<b>Draughting, accuracy and scale</b>	<b>8</b>
	<i>(excellent, good, fair)</i> <b>8      6      4</b>
	<b>Sub-total</b>
	<b>12</b>
<b>Part (b)</b>	
Design detailing to prevent dampness entering the building through the floor.	
Damp proof membrane/Radon Barrier	<b>3</b>
	<b>Sub-total</b>
	<b>3</b>
	<b>Total</b>
	<b>50 marks</b>

**Question 2.**

<b>Insulating cavity walls</b>			
<b>DETAILS</b>			<b>MARKS</b>
<b>Part (a)</b>			
Show how to insulate the cavity wall			
Method of insulating wall	<i>note + sketch</i>	(8 + 8 marks)	<b>16</b>
Preferred insulation type for cavity wall			<b>5</b>
Thickness of insulation			<b>5</b>
<b>Sub-total</b>			<b>26</b>
<b>Part (b)</b>			
<b>Two</b> advantages of installing cavity wall insulation.			
Advantage 1			<b>4</b>
Advantage 2			<b>4</b>
<b>Sub-total</b>			<b>8</b>
<b>Part (c)</b>			
Show <b>one</b> additional method of applying wall insulation			
Additional Insulating the wall detail	<i>note + sketch</i>	(8 + 8 marks)	<b>16</b>
<b>Sub-total</b>			<b>16</b>
<b>Total</b>			<b>50 marks</b>

**Question 3.**

<b>Hot water supply for radiators and hot water cylinder</b>	
DETAILS – typical sizes	MARKS
<b>Part (a)</b>	
Pipework required to supply hot water to radiators and hot water cylinder	
Draw given sketch	5
15 mm cold feed to burner	5
22 mm flow to radiators	5
22 mm return from radiators	5
Radiators	5
22 mm primary flow to cylinder	5
22 mm primary return to burner	5
22 mm overflow pipe	5
22 mm expansion pipe from cylinder	5
Valves / pumps	5
<b>Any 8 x 5 marks</b>	<b>Sub-total</b>
	<b>40</b>
<b>Quality of sketch</b>	<b>(excellent, good, fair)</b>
	6      4      2
	<b>Sub-total</b>
	<b>6</b>
<b>Part (b)</b>	
<b>One advantage of installing an underfloor heating system.</b>	
Advantage	4
	<b>Sub-total</b>
	<b>4</b>
	<b>Total</b>
	<b>50 marks</b>

**Question 4.**

<b>On site waste management</b>		
<b>DETAILS</b>	<b>MARKS</b>	
<b>Part (a)</b>		
<b>Two</b> reasons why a construction company should have a waste management plan for their site		
Reason 1	<b>8</b>	
Reason 2	<b>8</b>	
<b>Sub-total</b>	<b>16</b>	
<b>Part (b)</b>		
<b>Two</b> construction materials that could be recycled and re-used on-site. Give <b>one</b> suitable re-use for each material.		
Construction material 1	<b>4</b>	
Construction material 2	<b>4</b>	
Suitable re-use for material 1	<b>5</b>	
Suitable re-use for material 2	<b>5</b>	
<b>Sub-total</b>	<b>18</b>	
<b>Part (c)</b>		
<b>One</b> other method to sort and store waste materials on a construction site.		
Method	<i>note + sketch</i> (6 + 10 marks)	<b>16</b>
<b>Sub-total</b>	<b>16</b>	
<b>Total</b>	<b>50 marks</b>	

**Question 5.**

<b>Vertical section through the roof at the ridge</b>		
DETAILS - typical sizes		MARKS
<b>Part (a)</b>		
Draw a vertical section through the rafters, collar and the ridge.		
Ridge tile		<b>5</b>
Ridge vent		
Roofing slates		
Battens 50 mm x 35 mm		<b>5</b>
Breather membrane		<b>5</b>
Ridge board 275 mm x 32 mm		<b>5</b>
Rafter 200 mm x 50 mm		<b>5</b>
Collar tie 200 mm x 50 mm		<b>5</b>
Insulation between rafters		<b>5</b>
Airtight membrane		
Insulated plasterboard		
Plaster skim		
<b>Any 7 x 5 marks</b>	<b>Sub-total</b>	<b>35</b>
Any <b>three</b> typical dimensions	3 x 1 mark	<b>3</b>
<b>Draughting, accuracy and scale</b>	<i>(excellent, good, fair)</i> <b>8      6      4</b>	<b>8</b>
	<b>Sub-total</b>	<b>11</b>
<b>Part (b)</b>		
Show on your drawing one method of ventilating the roof.		
Vent at ridge or Vent slate		<b>4</b>
	<b>Sub-total</b>	<b>4</b>
	<b>Total</b>	<b>50 marks</b>

**Question 6.**

<b>Site Safety</b>		
DETAILS		MARKS
<b>Part (a)</b>		
Show <b>three</b> safety signs that highlight the use of personal protection equipment and how each protects workers.		
Safety sign <b>1</b>		<b>6</b>
Reason 1		<b>2</b>
Safety sign <b>2</b>		<b>6</b>
Reason 2		<b>2</b>
Safety sign <b>3</b>		<b>6</b>
Reason 3		<b>2</b>
<b>Sub-total</b>		<b>24</b>
<b>Part (b)</b>		
Describe <b>two</b> safety precautions that construction workers must follow when working safely at heights on a construction site.		
Precaution <b>one</b>	<i>notes + sketch</i> (5 + 4 marks)	<b>9</b>
Precaution <b>two</b>	<i>notes + sketch</i> (5 + 4 marks)	<b>9</b>
<b>Sub-total</b>		<b>18</b>
<b>Part (c)</b>		
<b>Two</b> reasons why all construction workers must undertake a safety training course		
Reason 1		<b>4</b>
Reason 2		<b>4</b>
<b>Sub-total</b>		<b>8</b>
<b>Total</b>		<b>50 marks</b>

**Question 7.**

<b>Reduced mobility bathroom area design</b>			
<b>DETAILS</b>			<b>MARKS</b>
<b>Part (a)</b>			
Draw a sketch of bathroom design and show preferred location for the toilet, WHB and shower.			
Sketch of bathroom			<b>6</b>
Location and valid reason for toilet position	<i>(3 + 3 marks)</i>		<b>6</b>
Location and valid reason for wash basin position	<i>(3 + 3 marks)</i>		<b>6</b>
Location and valid reason for shower area position	<i>(3 + 3 marks)</i>		<b>6</b>
<b>Sub-total</b>			<b>24</b>
<b>Part (b)</b>			
Two possible locations for the grab-rails and a reason for each.			
Suitable location 1	<i>note + sketch</i>	<i>(2 + 4 marks)</i>	<b>6</b>
Reason 1			<b>4</b>
Suitable location 2	<i>note + sketch</i>	<i>(2 + 4 marks)</i>	<b>6</b>
Reason 2			<b>4</b>
<b>Sub-total</b>			<b>20</b>
<b>Part (c)</b>			
One advantage of designing a bathroom suitable for people with reduced mobility.			
Advantage of designing bathroom suitable for people with reduced mobility			<b>6</b>
<b>Sub-total</b>			<b>6</b>
<b>Total</b>			<b>50 marks</b>



**Question 8.**

<b>Construction Terms</b>	
<b>DETAILS</b>	<b>MARKS</b>
<b>Item one</b>	
Primary communication of relevant information	<b>6</b>
Other communication of relevant information	<b>4</b>
<b>Item two</b>	
Primary communication of relevant information	<b>6</b>
Other communication of relevant information	<b>4</b>
<b>Item three</b>	
Primary communication of relevant information	<b>6</b>
Other communication of relevant information	<b>4</b>
<b>Item four</b>	
Primary communication of relevant information	<b>6</b>
Other communication of relevant information	<b>4</b>
<b>Item five</b>	
Primary communication of relevant information	<b>6</b>
Other communication of relevant information	<b>4</b>
<b>Total</b>	<b>50 marks</b>

**Question 9.**

<b>House extension with natural light</b>			
<b>DETAILS</b>			<b>MARKS</b>
<b>Part (a)</b>			
<b>Two</b> reasons why a homeowner would build an extension to their house			
Valid reason one			<b>6</b>
Valid reason two			<b>6</b>
<b>Sub-total</b>			<b>12</b>
<b>Part (b)</b>			
<b>Two</b> modifications to allow more natural light enter the house and extension			
Modification 1 to extension	<i>notes + sketch</i>	(4 + 9 marks)	<b>13</b>
Modification 2 to extension	<i>notes + sketch</i>	(4 + 9 marks)	<b>13</b>
<b>Sub-total</b>			<b>26</b>
<b>Part (c)</b>			
<b>Two</b> advantages for increasing the natural light entering a house for the home occupants			
Advantage 1			<b>6</b>
Advantage 2			<b>6</b>
<b>Sub-total</b>			<b>12</b>
<b>Total</b>			<b>50 marks</b>

