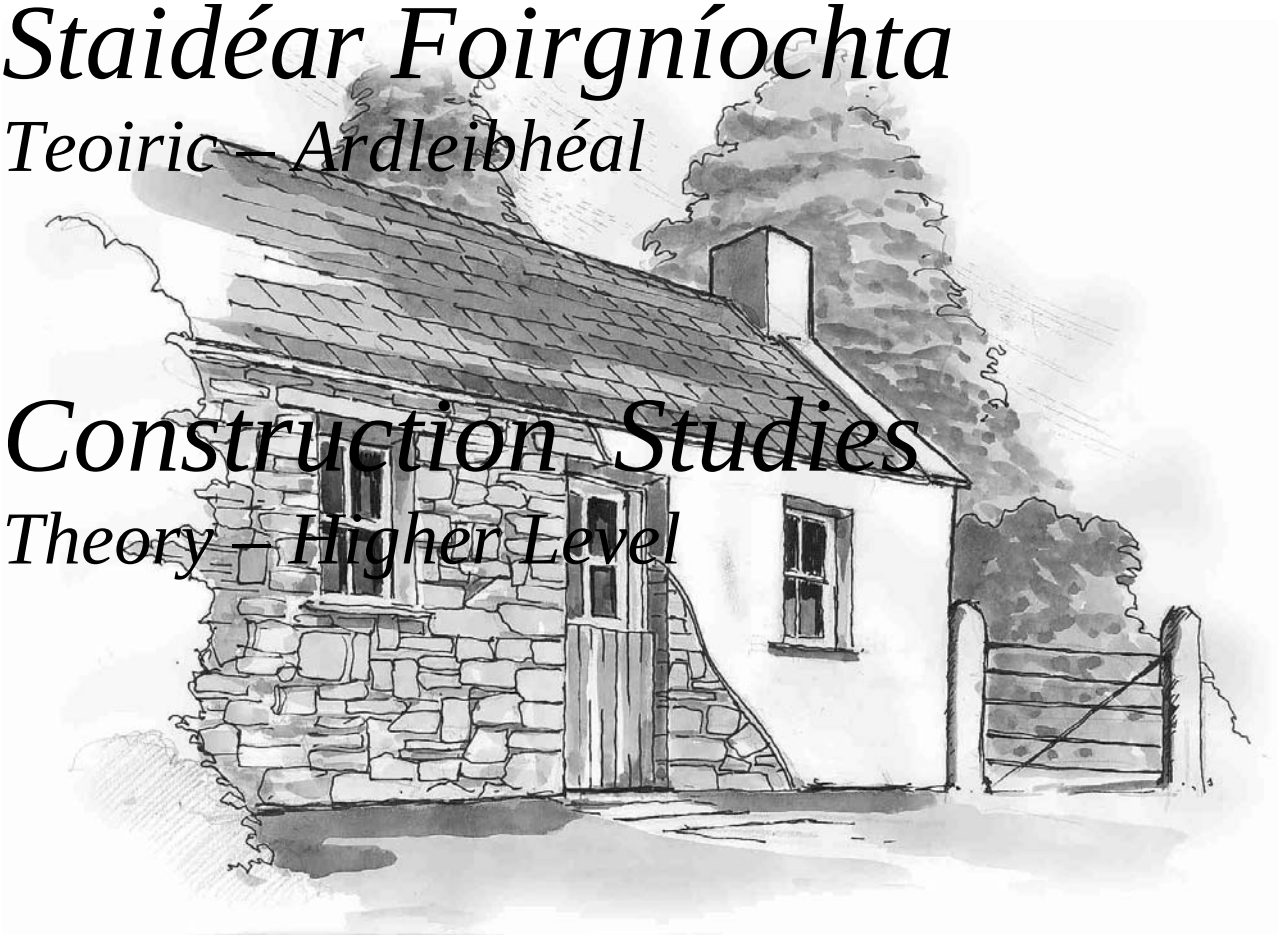
Coimisiún na Scrúduithe Stáit
State Examinations Commission

Scrúdú Ardteistiméireachta 2004

Staidéar Foirgníochta
Teoiric – Ardleibhéal



Construction Studies
Theory – Higher Level

Scéim Mharcála
Marking Scheme

CEIST 1

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Any 10 x 5 marks each ***(4 marks** for drawing and **1 mark** for drafting and annotation.)*	
300mm cavity wall, insulation and plaster	**5**
Stepped DPC or lead tray in wall and cavity	**5**
Lead roof flashing and upstand, cover flashing	**5**
112 x 50 bearer rag/rawl bolted to wall	**5**
Slates	**5**
50 x 25 slating laths on felt	**5**
112 x 50 rafters at 400 centres	**5**
112 x 50 ceiling joist / batten / hangers	**5**
112 x 50 strut and 75 x 50 runner (Purlin)	**5**
Proprietary vent slate or through ventilation space	**5**
Insulation of roof space	**5**
Wall plate on cavity closer, strapped down	**5**
Gutter	**5**
Fascia	
Soffit	
Vent	
(b)	
***5 marks** for each of **2** appropriate design details*	
Design detail 1	**5**
Design detail 2	**5**
TOTAL	**60**

CEIST 2

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
*(Correct positioning of the **5 items x 6 marks**)*	
Door	**6**
Water Closet	**6**
Bath or shower	**6**
Window	**6**
Wash hand basin	**6**
(b)	
Door: Reason 1 Reason 2	**4**
Water Closet (WC): Reason 1 Reason 2	**4**
Bath or Shower facility Reason 1 Reason 2	**4**
Window: Reason 1 Reason 2	**4**
Wash hand basin: Reason 1 Reason 2	**4**
(c)	
Note Describing Design Consideration No. 1 Sketch of Design Consideration No. 1	**5**
Note Describing Design Consideration No. 2 Sketch of Design Consideration No. 2	**5**
Total	**60**

CEIST 3

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Materials Mix Proportions Sequence Coats Required	**5** **5** **5** **5**
(b)	
Option 1:To leave the stonework exposed *Reason in favour 1* *Reason in favour 2*	**5** **5**
Option 2:To replaster the walls *Reason in favour 1* Reason in favour 2	**5** **5**
Preferred Option Reason in support 1 Reason in support 2	**5** **5**
(c)	
Reason 1 for recommending such a mix	**5**
Reason 2 for recommending such a mix	**5**
Total	**60**

CEIST 4

PERFORMANCE CRITERIA	MAXIMUM MARK
(a) *Any 9 x 4 marks*	
Domestic Hot Water (4 x 4 marks)	
Rising main, ballcock,	**4**
Storage tank, cold feed	**4**
Overflow pipe	**4**
Indirect cylinder and expansion	**4**
Primary flow and return	
Hot water draw off	
Central heating (5 x 4 marks)	
Boiler	
Radiators	**4**
Header or expansion tank	**4**
Flow pipes to radiators	**4**
Return pipes from radiators	**4**
Regulating (thermostatic) valve	**4**
Lockshield valve, air vent	
Gate and drain valve	
(b) *2 marks for each note, 2 marks for each sketch*	
Safety Feature 1 Note Sketch	**4**
Safety Feature 2 Note Sketch	**4**
Safety Feature 3 Note Sketch	**4**
(c)	
Advantage 1	**4**
Advantage2	**4**
Advantage 3	**4**
Total	**60**

CEIST 5

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
U-value of the existing roof Total Resistance of the existing roof	5
U-value for the required roof Total Resistance for the required roof	5
Increase in Total Resistance for the required roof	5
Thickness of Glass Fibre required	5
Thickness of Rigid Urethane Board required	5
(b)	
Evaluation of Glass Fibre insulation	5
Evaluation of Rigid Urethane Board insulation	5
Preferred choice of material based on evaluation	5
(c)	
Note on Design Detail No. 1 Sketch of Design Detail No. 1	5 5
Note on Design Detail No. 2 Sketch of Design Detail No. 2	5 5
Total	60

CEIST 6

PERFORMANCE CRITERIA	MAXIMUM MARK
(a) 3 marks for each statement, 3 marks for each description	
Statement of Hazard 1 Description of Hazard 1	6
Statement of Hazard 2 Description of Hazard 2	6
Statement of Hazard 3 Description of Hazard 3	6
(b) 4 marks for each note and 4 marks for sketch	
Note on design detail to prevent Hazard 1 Sketch of design detail to prevent Hazard 1	8
Note on design detail to prevent Hazard 2 Sketch of design detail to prevent Hazard 2	8
Note on design detail to prevent Hazard 3 Sketch of design detail to prevent Hazard 3	8
(c)	
Consideration 1	6
Consideration 2	6
Consideration 3	6
Total	60

CEIST 7

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Indication of location No.1 Sketch Note	8
Indication of location No.2 Sketch Note	8
Indication of location No.3 Sketch Note	8
(b)	
Design detailing at location No.1 Sketch Note	8
Design detailing at location No.2 Sketch Note	8
Design detailing at location No.3 Sketch Note	8
(c)	
Listing of material 1 Statement of suitable location for use of material 1 Explanation of suitability of material 1 for use at stated location	6
Listing of material 2 Statement of suitable location for use of material 2 Explanation of suitability of material 2 for use at stated location	6
Total	60

CEIST 8

PERFORMANCE CRITERIA	MAXIMUM MARK
(a) 8 features x 5marks each	
1:20 scale, 7m width, 45° pitch, wall and ceiling heights	5
Rafters at 400 centres	5
Wall plates	5
Collar ties, ridge	5
Vertical studs, ceilings, runners	5
Insulation between rafters	5
Purlins, double headers, sole pieces for stud wall	5
Flooring	5
Flooring joists	5
Outer and central supporting walls	
(b)	
Argument 1 in favour of fitting dormer windows	5
Argument 2 in favour of fitting dormer windows	5
Argument 1 in favour of fitting roof light windows	5
Argument 2 in favour of fitting roof light windows	5
Total	60

CEIST 9

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Sketch of Design Detail No.1	10
Sketch of Design Detail No.2	10
(b)	
Statement of Sound Insulation Principle No.1	10
Statement of Sound Insulation Principle No.2	10
(c)	
Suggested modification No.1 Note Sketch	10
Suggested modification No.2 Note Sketch	10
Total	60

CEIST 10

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
(i) In support of the erection of the townhouses (Marks based on the relevance and cogency of the arguments)	
Point No.1	5
Point No.2	5
Point No.3	5
Point No.4	5
(ii) In support of the retention of existing house (Marks based on the relevance and cogency of the arguments)	
Point No.1	5
Point No.2	5
Point No.3	5
Point No.4	5
(b)	
Reason No.1	7
Reason No.2	7
Reason No.3	6
Total	60

CEIST 10 (ALTERNATIVE)

PERFORMANCE CRITERIA	MAXIMUM MARK
Any 6 points or other relevant points clearly stated and supported by discussion, 6 points 10 marks each.	
Point No.1	10
Point No.2	10
Point No.3	10
Point No.4	10
Point No.5	10
Point No.6	10
Total	60

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FREAGRAÍ
SOLUTION

CEIST 1

(a)

Lead upstand and roof flashing

Lead cover flashing
Lead upstand

Design Details:

- Cavity stepped DPC
- Lead cover flashing laps over upstand
- Lead upstand and roof flashing
- Felt turned up inside lead upstand

CEIST 2

(a)

(b)

Reasons for positioning each item listed to include

Bath

- Ease of access allowing turning circle of 1500 mm diameter
- Located in corner to give ease of fitting
- Long horizontal grab rail fitted to inside wall
- Vertical grab rail fitted to wall
- Provision of tiled ledge for easy storage
- Taps in either of two locations (1, 1) for easy access from wheelchair
- 1600 mm long bath for easy access having a height of 450 mm

WC

- Within the 1500 mm turning circle for ease of access
- Fold-up grab rail 400 mm from WC centreline (3) in conjunction with horizontal grab rail to allow firm grip facilitating independence and privacy to user
- Wall space to rear and side of WC to facilitate fixing of grab rails (4)

Wash hand basin

- Situate within easy reach of WC
- Provide grab rails for assistance
- Ease of access for doorway, with adequate space to close door
- Shortest distance between bath, WC and WHB
- Wall space to sides for long mirror to enable use from seated position
- Wall space behind WHB for mirror and fittings

Door

- 800mm clear opening width (10) for ease of access
- Lever type door handles for easy use
- Unimpeded line of access from door (9)
- Door fitted flush with floor - no saddle

Window

- Direct unimpeded access to window to facilitate ease of opening/closing
- Low cill height to allow opening and closing of seated position
- Lever handles for ease of use

Shower

- Shower 1000mm x 1000mm for ease of access
- Flush finish shower tray for ease of entry
- Fabric shower curtain (6) easily opened and closed and allowing maximum space for chair
- Non-slip finish to tray

(c)

Two other design considerations to make space user friendly for wheelchair user to include

Floor

- Slip resistant floor covering
- Drainage to internal gulley with floor gently sloped to gulley
- Gulley situated for easy access
- Stainless steel grid to gulley

Wash hand basin

- Wall mounted WHB - no pedestal - to allow close access
- Provide 700mm clear knee space beneath WHB
- Lever taps fitted

WC

- Spatula type lever handle fitted to transfer side of cistern to obviate reaching over to flush
- WC seat to finish 450 - 460mm above floor
- Vertical, horizontal and fold up grab rails as shown (3 and 4) all grab rails to be 35mm diameter

Grab rails

- Horizontal grab rails (4) 700mm above floor, 600mm long and fitted 200mm form any corner
- Vertical grab rails starting 700mm above floor, 600mm long and of 35mm diameter
- Pull handle fitted to inside of door

Shower

- Lever controls on shower for temperature and flow
- Flip-up seat (8) fitted 450 above tray
- Shower head adjustable in height 1200 to 2200mm above tray
- Vertical and horizontal grab rails in cubicle

CEIST 3

(a)

The application of an external render to a block wall.

Any external render should be

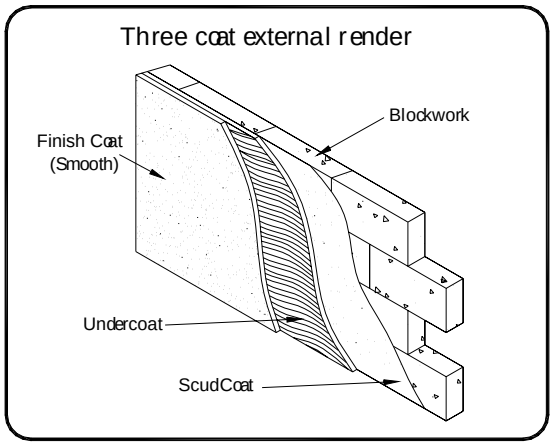
- Durable
- Resistant to moisture penetration
- Designed to weather uniformly
- In harmony with surrounding buildings

Materials required:

- Clean sand Cement Lime or plasticiser

Series of coats required

1. Scud coat
2. First undercoat – scratch coat
3. Second undercoat – final coat
4. Special finishes - if required
   - Plain finish or Textured finish
   - Thrown Finishes - Roughcast or Dry dash



1. Scud coat

Block work should be scudded with a 1:2 or 1:3 cement:sand mix. Clean water is added and the sand and cement and is mixed to the consistency of a paste. This mixture is applied to the wall by throwing with a hand scoop to a thickness of 3 to 5 mm. The rough textured surface so formed provides a mechanical bond or key for the next coat of plaster. The surface should be dampened periodically to prevent rapid drying out. The scud coat should be allowed to dry before the application of the next coat.

2. First undercoat – Scratch coat

Apply a scratch coat to a depth of 8-12 mm using a 1:1:6 or 1:2:2 cement:lime:sand mix. If a plasticiser is used to replace the lime a 1:6 or 1:4 cement:sand mix is used with plasticiser added in accordance with the manufacturer's instructions. This coat is levelled with a straight edge and is then scratched to form a mechanical key for the following coat. The scratched marks should be sufficiently deep to form a key but should not cut through the undercoat. Allow this coat to harden and dry out sufficiently before the application of the next coat.

3. Second coat - Final coat

This coat is thinner than the previous coat and should be between 6-10 mm thick. In two coat applications the overall thickness of the renders should not be less than 20 mm. The undercoat should be dampened to prevent the absorption of moisture from the final coat. The render is applied with a steel trowel, straightened with a straight edge and, if no other finish is to be applied, it is finished with a wooden float to give a smooth finish. A steel trowel should never be used to for finishing external render. A high level of skill is required to achieve a smooth finish and to minimise the risk of crazing and irregular discoloration.
Renders should have lower strength than that of background material to which they are applied, otherwise differential shrinkage occurs resulting in cracking and separation of plaster layer from background. Also, successive renders should be no stronger than the previous coat.

Note:
Other finishes may be applied such as Tyrolean, roughcast (wet dash) and dry dash as deemed desirable.

(b)

Reasons in favour of removing the external render – such as

- Current render has aged, is cracked, flaking and is falling off and no longer offers protection
- The existing render looks worn and shabby and does not enhance the appearance of the house
- If the existing random rubble is of good quality, it is cheaper and quicker not to replaster the walls

- Less materials are needed if walls left unrendered, thus an economy of materials is achieved
- The original stone looks good and is visually more attractive than old plasterwork
- Unrendered walls display the beauty and character of the original stone
- Exposing the stonework showcases the skills of traditional stone masons and provides an example of good practice for young masons
- Unrendered walls highlight the age of the house – the stonework is obviously old, whereas replastering would give a modern appearance to an old house
- Stone marks out the house as different in age from newer houses of block and plaster construction

Reasons in favour of replastering the house – such as

- Houses of this age have a particular vernacular simplicity – a key characteristic being the strong contract between whitewashed plastered walls and natural dark slate roof – exposing the stonework fractures this simplicity in the traditional relationship between wall and roof.
- Vernacular architecture is unconsciously simple and honest, exposing the random rubble stonework makes the house look fussy and out of character
- The original plastered walls places this house in harmony with houses of the same age and construction, resulting in a regional uniformity and coherence – replastering respects this sense of coherence
- Hacking off the plaster suggests a disrespect for building traditions of the time in which the house was built and imposes a modern fashion on an old building
- An external render is the overcoat of the building, protecting the stonework from the penetration of driving rain. Discarding this overcoat exposes the house to the degradation by the elements, causing heat loss, deterioration of timber lintels, internal plasterwork and paint
- The original stonework was intended to be plastered, when exposed the walls may not be water and weather proof and may need further pointing, waterproofing and repairs which disrespect the character of the original house
- The random rubble was never intended to be seen and may be of poor quality in both materials and workmanship.
- The random rubble may be in need repair, resulting in a visually unsatisfactory mix of the old and the new, brick quoins, concrete lintels, and a loss of the sense of charm and character of the original building
- Traditionally, the dwelling house received more attention than other buildings such as farm buildings and outhouses. Although all built of stone, the house was plastered making it distinct from surrounding farm buildings. This tradition provides an attractive clarity in the hierarchy of rural building types. This maintains the traditional character of the house. By using the traditional renders one is restoring rather than renovating the house. Restoring implies restoring it as it was originally, renovating implies making it look new.

(c)

Lime as external render

- Lime uses less energy to produce than cement, therefore more environmentally friendly.
- Produces less CO_2 during the firing process than cement.
- Lime reabsorbs some CO_2 from the atmosphere as it sets.
- Enables low energy, sustainable materials to be used
- Can be easier removed and house re-rendered when the render comes to the end of its life
- Lime renders expand and contract easily reducing the need for expansion/movement joints
- Lime renders absorb and release moisture, facilitating a breathing wall structure
- Lime renders have a distinctive aesthetic quality
- Lime renders can be easily moulded to follow the contours of the walls to give a sculpted effect.
- A lime render would be sympathetic to the renovation of the house
- Lime renders absorb moisture and release second moisture with varying weather conditions.

CEIST 4

(a)

(b)

- Pressure Release Valve
- Boiler Cut-Out Thermostat
- Output Control Thermostat
- Boiler Control Timer Switch
- Vent Valve to Boiler
- Fire Valve on Fuel Supply
- Frost Thermostat

(c)

ƒ Sustainability	Reduces use of oil; conserves scarce resources for use of future generations
ƒ Comfort:	Allows for different ideal temperatures to be maintained in different zones of dwelling
ƒ Timing	Allows for varying ambient temperatures in specific zones at different times of the day/night and days of the week
ƒ Maintenance	Allows isolation of zones for periodic maintenance
ƒ Control	Confers more control of the domestic heating system on the householder
ƒ Interfacing	Allows the heating system to interface with sophisticated digital control technology
ƒ Remote Setting	With suitable digital interface the heating system can be set remotely even when the householder is away.

CEIST 5

(a)

Conductivity of Glass Fibre Quilt (k), k_{GF} = 0.04 W m °C

Conductivity of Urethane Board (k), k_{RU} = 0.023 W m °C

Existing U-Value of the roof = 0.35 W m² °C

Existing total resistance of the roof, R_T = 1 / U
= 1 / 0.35
= 2.86 m² °C/W

Required U-value for the roof = 0.16 W m² °C

Required total resistance for the roof, R_{TR} = 1 / U
= 6.25 m² °C/W

Required increase in resistance for the roof, R_T = R_{TR} - R_T
= 6.25 – 2.89
= 3.39 m² °C /W

i. Thickness of Glass Fibre Quilt, T_{GF} = R_T + x k_{GF} x 1000
= 3.39 x 0.04 x 1000
= 135.71 mm

ii. Thickness of Urethane Board required, T_{RU} = R_T + x k_{RU} x 1000 x
= 3.39 x 0.023 x 1000
= 78.04 mm

(b)

(i) Glass Fibre

FOR
- x Cost of material
- x Ease of placing
- x No disruption to the existing ceiling
- x Environmentally friendlier – inert
- x Ease of transportation
- x Lightweight - handling

AGAINST
- x Reduces roof space
- x Possible hazards when being installed
- x Reduces access to move around in attic without compromising insulation by compressing quilt.
- x Reduced access to electrical, heating and other installations
- x Possible reduced ventilation

(ii) Urethane

FOR
- x Ventilation of roof space
- x Less hazardous when being installed
- x May allow easier access to roof space
- x Possible access to electrical wiring
- x Ease of installation
- x Ease of handling and transport

AGAINST
- x Release of toxins to environment
- x Cost of material
- x May result in redecorating ceiling
- x May lower ceiling
- x May require skilled workers to install below existing ceiling

Recommendation: Any recommendation is acceptable provided it is supported by references to cogent points stated in the evaluation

(c)

Extra thickness of glass fibre quilt placed over existing attic insulation as shown in Figure 5.1.

- Eaves ventilator extended to maintain ventilation past the added glass fibre.

Figure 5.1

A vent slate or vent tile incorporated into the roof covering as shown in Figure 5.2. This compensates for the ventilation closed off by the added thickness of glass fibre quilt.

- Similar vent can be added near the ridge of the roof to increase air circulation.

Figure 5.2

Rigid urethane board sandwiched between new plasterboard and existing ceiling, Figure 5.3

- Screwed to joists
- Finished with hardwall skim or taped and filled
- Existing ventilation is not compromised.

Figure 5.3

Rigid urethane board placed over existing ceiling joists as shown in Figure 5.4

- Urethane board carefully trimmed and positioned to allow ventilation space.

Figure 5.4

CEIST 6

(a)

Three hazards that could occur in a sewage treatment and disposal system of an individual house, situated in a rural area, if the system is no properly designed:

(i) Water pollution of nearby wells, streams, rivers, lakes and watercourses causing a health hazard to humans, animal, fish and wildlife. This can occur if the treatment system is not working properly, has insufficient capacity for the inhabitants, is overflowing or leaking.

(ii) Air pollution is caused by a malfunctioning of the micro-organisms that breakdown the sewage in the unit and the partially treated sewage becomes very unpleasant, causing smells/odours. This can become a health hazard not only for the householder, but also for the neighbours and the public.

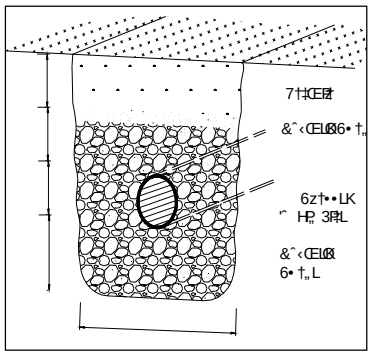
(iii) Discharges from treatment systems cause ponding in percolation area in poorly absorbent soils. This can be very unpleasant, causing a health hazard, with effluent flowing on to entrances and adjoining properties. In the summertime it attracts flies and insects and can lead to the spread of disease.

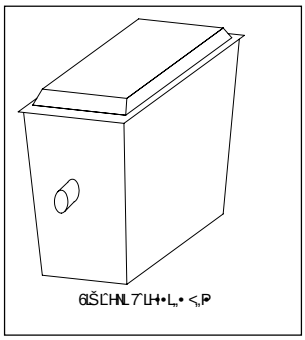
(iv) The run-off or discharge from the treatment system will cause problems if directed to a watercourse or drain

(b)

Show how proper design detailing would prevent the hazards above:

1. Ventilation through septic tank or treatment system and up to vent above eaves
2. Pipes to be watertight between house and manhole and tank and distribution box.
3. Access junctions for rodding to be installed
4. 100mm dia. uPVC soil pipe, gradient not less than 1:60.
5. Prefabricated concrete, uPVC, fibre-glass or built in-situ septic tank or sewerage treatment plant.





- 100mm dia. Slotted drainage percolation pipes in trenches 450 wide as shown.
- The distribution pipes should be connected at the ends and have air vents above ground level.
- Geotextile permeable material is laid over the stone and backfilled with topsoil.
- Only properly constructed septic tanks or agreement certified sewage treatment systems to be used.
- Soil percolation test results must show that the soil is satisfactory for the installation of a sewage treatment system or septic tank.

(c)

Three considerations for site in rural area, suitable for proper treatment and disposal of sewage:

i. The soil type and its absorption qualities. Percolation tests would have to be carried out to determine if it would be suitable and if there is sufficient area to accommodate the percolation area and a reserve percolation areas.

ii. The topography (contour and levels of the site) of the area. It is preferable to have a fall away from the dwelling, a slope leading to the position of the sewage treatment unit and the percolation area.

iii. An overall assessment of the immediate surrounding area to find out if there are any nearby streams, rivers or wells. Its proximity to other houses, buildings and other sewage treatment units.

iv. The most appropriate type of treatment system, whether a pre-cast concrete, fibre glass, PVC, mechanical pumped aerated, wetland reed bed permaculture system, etc. to suit the particular situation or site.

Ceist 7 (a). Three areas where moisture can penetrate:

Locations where moisture may penetrate mainly due to absence of D.P.C. or poor workmanship.

(b)

Designs detailing the prevention of moisture from reaching the inner leaf:

(c)

Materials used to prevent the penetration of dampness in buildings such as:

Materials used to prevent the penetration of dampness in buildings;

* Plastic D.P.C: Suitable in many areas due to its resistance to the passage of water, its flexibility and available in many widths.
* Lead: Used mainly for flashing details at abutments, valleys and chimneys. Suitable due to its resistance to the passage of water, flexibility and available in many widths and thicknesses.

CEIST 8

(a)

(b)

Advantages of fitting roof light windows

- Roof lights maintain the plane of the roof, resulting in a restrained and restful roofline
- Roof lights permit the design of buildings of simplicity which complement the vernacular tradition of rural dwellings
- Roof lights, because of their orientation, provide more light than a similar size vertical window. (See sketch)
- Roof lights can be of smaller size than vertical windows and give same light, resulting in appropriate scale and less heat loss through glazing
- Roof lights are easy to install and are supplied with appropriate flashings
- Roof lights allow the use of attic space, which otherwise would be dead space,
- Attic space, fitted with roof lights becomes usable space, resulting in the economical use of building materials
- Roof lights are designed for easy and safe cleaning from within the room.

Advantages of fitting dormer windows

- Properly proportioned and sited, dormer windows permit the construction of building of restrained height, which fit easily with other building of modest scale in the landscape
- Locating simple wall plate dormer windows provide imaginative possibilities for architects in the designing of buildings of visual interest
- Box type dormer windows in the roof need careful designing to ensure that they are appropriate, but they allow the use of the roof space as an active space
- The use of dormer windows helps reduce the bulk of a building, facilitating the design of dwellings of human scale, a characteristic of vernacular architecture
- The inclusion of dormer windows allows attic spaces to become useable, live spaces.
- Internally, rooms with dormer windows have a more intimate scale than uniform height rooms of similar floor area
- Successfully integrated dormer windows relate to the scale of the house and add visual interest to the façade
- The inclusion of dormer window allow full head height to be attained, giving easy access for viewing purposes
- Dormer windows can be of the same design, style and profile as the other windows of the house giving a coherence and unity to the building facade

CEIST 9

(a)

Design details similar to those shown in Figure 9.1 and Figure 9.2 would improve the sound insulation of the stud partition with a minimum of disruption of the existing wall. These details could be combined to further increase the sound insulation properties.

Figure 9.1

Figure 9.2

The design details shown in Figure 9.2 and Figure 9.3 add the reconstruction of the stud partition but save floor area while achieving a greater increase in sound insulation.

Figure 9.3

Figure 9.4

(b)

- Heaviness: An increase in weight will improve the sound insulation properties of the partition by combating the transmission of airborne noise. The fixing of a second layer of plasterboard to the partition depends on this principle. (The Mass Law: The sound insulation of a single leaf partition is proportional to its mass per unit area.)
- Isolation The separation of the opposite surfaces of the partition by the inclusion of a cavity provides isolation, which reduces the transmission of sound through the structure of the partition.
- Flexibility The use of an absorbent quilt suspended in the cavity of the partition helps in the reduction of sound passing through the structure. This is partly due to the flexibility of the quilt. Rigidity aids the transmission of sound in a structure.
- Completeness The elimination of any small gaps in the structure, air tightness, or of any areas

of lesser sound insulation improves the overall insulation of the partition greatly. This is achieved by staggering the joints in the plasterboard and by taking great care to seal around all joints to other walls and not to bridge the cavity

(c)

Sound is reflected by hard flat surfaces in a way analogous to the reflection of light.
This may be helpful in the vicinity of the sound source, the speakers.
It is desirable to absorb the sound when it meets other surfaces.

Modifications to improve the acoustic properties of the living room:

Cover the concrete floor with sound absorbent material such as carpet;
Hang curtains, drapes or other sound absorbent materials on the walls;
Fix acoustic tiles to part of the ceiling or walls;
Fix panels to some walls with an air space or absorbent material behind;
Position speakers carefully to avoid undesirable reflection of sound

CEIST 10

(a)

i. Reasons in favour of the erection of the townhouses - such as

- x House in an urban area means less travel to city centre for work and leisure, less congestion on roads
- x Less time spent on travelling to and from work, resulting in lower demand on fossil fuel and a consequent reduction in pollution
- x An established urban area has existing amenities such as schools, churches, shopping areas, leisure facilities
- x New buildings help regenerate an established area
- x More sustainable than a new house in green field site
- x Sustainable development in that services such as electricity, phone, water, sewerage are already provided nearby and can be extended at minimum cost
- x Sustainable in that existing infrastructure is already in place such as roads, paths, green areas, hence a reduction in use of building materials such as stone, cement, sand, gravel, hardcore
- x Existing transport services such as bus routes, train lines are already developed
- x Garden is already developed, so reduced demand for building materials such as stone and ceme
- x The existing garden is already too big, easier to maintain the space if it is shared
- x New houses benefit from the trees, plants, shrubs of the existing garden
- x Easier to integrate a new house into an existing development than in green field site
- x Modern city dwelling requires a higher population density for sustainable development, these houses help achieve this goal
- x The buildings at the rear offer a new imaginative possibility for urban redevelopment, not locked in the urban paradigm of one hundred years ago
- x The buildings are smaller in scale than the original house, therefore do not fracture the sense of the existing urban space
- x Reduces traffic congestion on road, if more people can live closer to their work.
- x Security for older people as neighbours at rear – less exposed to possible vandalism
- x Shorter distances to centre of town/shops/facilities for larger number of people
- x More sustainable than dispersed dwellings for buses, transportation services
- x Services e.g. crèche, restaurants develop in proximity to centres of population
- x There is demand for urban dwellings and areas with excess space should be developed.
- x Reduces ribbon development along new roads and relieves urban sprawl.

ii. Reasons against the erection of townhouses – such as

- x Increased congestion in an area designed for a particular population density
- x Roads at rear of houses were not designed for vehicular access, too narrow for motor cars thus causing congestion
- x Increased density, resulting in a fracturing of the existing urban space
- x If planning permission is granted for these houses at rear, then a precedent is set for all other houses to build two houses, resulting in a congestion not planned for
- x Danger to pedestrians using this narrow road, especially young and old
- x Exiting sewage services not designed for this volume
- x Fire hydrants not usually provided at rear, expensive to fit in established area
- x Road may have to be widened to facilitate entry of facilities such as fire brigade, changing the intimacy and charm of this area
- x New houses will overlook existing established houses, resulting in a loss of privacy

- The houses will be smaller and of contemporary design, resulting in a break with the traditional character of the area
- If planning is allowed for two such houses, then others will get the same permission resulting in a whole plethora of such dwellings, forever changing the character of this mature and settled area.
- Sustainable living - medium density creates sense of shared community
- People have a valid expectation to maintain existing space and character of their area
- High density puts pressure on existing services, resulting in greater congestion on existing roads
- Different expectations of young and old, peace and quiet versus noise, energy, music

(b)

Recommendation to the planning authority

Three reasons supported by cogent argument.

CEIST 10 (ALTERNATIVE)

Suburban settlement -- wasteful in terms of its impact on towns and erosion of the landscape, wasteful of resources…

Points may include

- Building along existing roadways, one house deep, each detached house facing on to the roadway is wasteful of space, materials and services
- Ribbon development fractures sense of separateness of town and countryside
- Erosion of landscape - the sense of the countryside being distinct is blurred by the continuation of lines of houses along roadways leading to the sub-urbanisation of the countryside
- Separate roads, sewerage phone electricity to each individual dwelling wastes resources
- Unsustainable development - this model of urban sprawl does not consider the energy needs of future generations
- A paradigm of rural dwelling - a detached one-off house on its own site - being imported into the town without proper planning, the lost art of town planning
- Where we live as important as how we live – a properly functioning community has a sense of place, community and friends, linear development along busy roadways militates against the development of a community spirit, difficult to identify a shared space
- Proper transport systems need a population density, scattered one off dwellings do not provide this critical mass
- This linear development along roadways leads to the loss of the traditional character of towns as contained spaces, built in the form of streets, terraces, squares and open areas
- Traditional town development was laid out differently, town development has its own configuration of interconnecting streets and lanes as well as public areas such as parks and squares, giving continuity, directness and safety

Reversing the trend …….If this trend is to be reversed, the built fabric of towns will have to renewed

- The challenge is to develop a deep cultural change to break our dependence on the car, to transform the way we live and to revitalise the decline of towns and villages
- A change of mindset, breaking the separateness mindset, to learn to live again in connectedness with others
- Learn from the past, towns and villages that developed between 1750 and 1850 concentrated on the street layout, providing a mixture of ground floor trading spaces and residential spaces, giving a living community, close to facilities such as schools, churches playing areas
- A need to rediscover and develop the charm of urban living
- Depletion of the fossils fuels and consequent rise in price challenges us to re-envision the way we structure our dwellings and communities
- Humans exist in relationships, town dwelling helps break down the separateness of isolated single dwellings - especially for young and old
- Families will attracted back to towns and villages when we consciously plan for this end
- We will have to plan for more intentional lifestyles, close to amenities such as schools, churches, libraries, leisure centres, playing fields
- Plan for communities, providing active social areas such as dedicated safe play areas for children… active social/play areas integral to the streetscape so that children can be unobtrusively supervised – social areas encircled and protected by surrounding houses
- Urban living provides a critical mass required to provide adequate public transport, dispersed dwellings do not, ease of travel will attract people back from the congestion of the roads
- Limit the effect of the motor car on urban communities by providing dedicated parking areas, pedestrianised streets, dedicated areas for family relaxation
- Provide walk and cycle lanes especially to schools for safety of children and teenagers
- Plan mixed dwellings for old, middle age and young, break the age segregation through thoughtful, purposeful planning - many old people return to the security of planned urban living and proximity to facilities
- Urban living increase the opportunities for positive social interactions and thus build a community sense
- Provide incentives for people who buy houses in urban areas, such as for first time buyers
- Plan for apartments of adequate floor area and facilities e.g. storage to accommodate families
- Provide incentive for smaller trading outlets, family businesses, mixed living and trading
- Develop model urban areas, where a new model of urban living can be observed and appreciated
- Raise awareness of the need to limit waste and rediscover the advantages of urban living
- Educate next generation to be more thoughtful, less wasteful and more respectful of people and the diminishing resources of the planet and other valid, well presented and argued reasons

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Scrúdú Ardteistiméireachta 2004
Leaving Certificate Examination 2004

Scéim Mharcála
Marking Scheme

(150 marc)

Staidéar Foirgníochta
Triail Phraticiúil

Construction Studies
Practical Test

Construction Studies 2004

Marking Scheme - Practical Test

Note to Examiners
The artefact is to be hand produced by candidates without the assistance of machinery.
However the use of a battery powered screwdriver is allowed.
Where there is evidence of the use of machinery for a particular procedure a penalty applies.
Mark out of 50% of the marks available for that procedure.

	A	OVERALL ASSEMBLY	Marks
	1	Overall quality of assembled artefact	10
	2	Dowels located and fitted correctly (2 x 2 marks)	4
	3	Edge of base – (i) design and (ii) shaping (2 x 3 marks)	6
		Total	20

	B	MARKING OUT	Marks
	1	Base (4 x 2 marks)	8
	2	Plaque Sloping sides (3 x 1 marks) Chamfers 3 marks Base mortice 2 marks	8
	3	Left side	6
	4	Right side	6
	5	Back rail	6
	6	Support to plaque	2
		Total	36

BASE	C	PROCESSING	Marks
	1	Four end mortices - each mortice 4 marks (4 x 4 marks)	16
	2	Centre mortice	4
	3	Stopped trench	4
		Total	24

TWO SIDES	D	PROCESSING	Marks
	1	Four tenons - each tenon 4 marks (4 x 4 marks)	16
	2	Two dovetail pins – each pin 4 marks (2 x 4 marks)	8
	3	Cutting of two sloping tops (2 x 1 marks) Finishing of two sloping tops (2 x 1 marks)	4
	4	Cutting of two sloping fronts (2 x 1 marks) Finishing of two sloping fronts (2 x 1 marks)	4
		Total	32

BACK RAIL	E	PROCESSING	Marks
	1	Two dovetails – each tail 5 marks (2 x 5 marks)	10
		Total	10

PLAQUE	F	PROCESSING	Marks
	1	Forming tenon at base	6
	2	Shaping of three sloping edges (3 x 2 marks)	6
	3	Forming four chamfers (4 x 2 marks)	8
	4	Drilling hole	2
		Total	22

SUPPORT	G	PROCESSING	Marks
	1	Shaping sloping side	2
	2	Drilling for two screws (2 x 1 marks)	2
	3	Countersinking for two screws (2 x 1 mark)	2
		Total	6

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2004

ConstructionStudies

Ordinary Level and Higher Level

Marking Scheme

Practical Coursework

(150 Marks)

Form A

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Certificate Examination 2004

Construction Studies

School Assessment of Candidates' Practical Coursework

Name of Candidate:……Examination Number:

Type of Project:

☐ Practical Craft ☐ Building Science

☐ Written/Drawn with Scale Model ☐ Composite

	Marking Scheme		Maximum Marks	Marks Awarded
A	**Planning of Project** x Ability to design an appropriate plan or procedure x Evidence of research x Preparation of working drawings/use of models as graphic aids			
		Subtotal	30	
B	**Report Writing** x Design folio detailing planning, execution and evaluation of project x Critical appraisal of project for quality, function and finish x Conclusions from practical experience of project work			
		Subtotal	30	
C	**Manipulative Skills** x Skills in preparation and finishing of materials x Safe use of tools and machines - Hand /Power/CNC x Skills in assembly of materials			
		Subtotal	30	
D	**Presentation of Project** x Task completed to acceptable standard x Appropriate use of materials x Satisfactory knowledge of construction technology			
		Subtotal	30	
E	**Experiments** x Evidence of ability to plan and carry out three experiments. Experiments should be related to the project work or selected from the suggested experiments outlined in the syllabus for Construction Studies.	Experiment 1 Experiment 2 Experiment 3		
		Subtotal	30	
		TOTAL:	150	

Signature of Teacher:…… Date: ……

Coimisiún na Scrúduithe Stáit

Scrúdú Ardteistiméireachta 2004

Staidéar Foirgníochta

Gnáthleibhéal agus Ardleibhéal

Scéim Mharcála

Obair Chúrsa Phraiticiúil

(150 Marc)

Foirm A

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Scrúdú Ardteistiméireachta 2004

Staidéar Foirgníochta

Breithmheas na Scoile ar Obair Chúrsa Phraiticiúil na nIarrthóirí

Ainm an Iarrthóra: …….. Scrúduimhir:

An Sórt Tionscadail:

- ☐ Cleachtas Ceardaíochta
- ☐ Eolaíocht Tógála
- ☐ Scríofa/Tarraingthe le Mionsonraí de réir Scála
- ☐ Ilchodach

	Scéim Mharcála	Uasmhéid Marcanna	Marcanna a Bhronntar
A	Pleanáil an Tionscnaimh x Cumas chun plean cuí don nós imeachta a dhearadh x Fianaise faoi thaighde a thaispeáint x Ullumhú líníochtaí oibre/úsáid ionsamhalacha nó áiseanna don ghrafaic Fo-iomlán	30	
B	Tuairisc a Scríobh x Fóilió dearaidh le sonraí ar phleanáil, ar fheidhmiú agus ar mheastoireacht an tionscnaimh x Measúnú criticiúil ar an tionscnamh i gcoinne aidir le caighdeán, feidhm agus críochnúlacht x Tátail ó thaithí phraticiúil na hoibre tionscadail Fo-iomlán	30	
C	Scileanna Lámhsiúcháin x Scileanna in ullmhú agus i mbailchríoch ábhar x Úsáid shábhálta uirlisí agus innealra - Láimhe/Cumhachta/CNC x Scileanna i gcóimeáil ábhar Fo-iomlán	30	
D	Léiriú an Tionscnaimh x Tascanna a críochnú de réir caighdeáin chuí x Úsáid chuí ábhar x Eolas sásúil ar theicneolaíocht tógála Fo-iomlán	30	
E	Turgnaimh x Léiriú ar chumas arthrí thurgnamh a phleanáil agus a chur i gcrích Ba cheart go mbeadh baint ag na turgnaimh leis an obair thionscadail nó go roghnófaí iad ó liosta na dturgnamh a leirítear sa siollabas Staidéir Fhoirgníochta. Turgnamh 1 Turgnamh 2 Turgnamh 3 Fo-iomlán	30	
	MÓR-IOMLÁN:	150	

Siniú an Mhúinteora: …… Dáta ……