AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

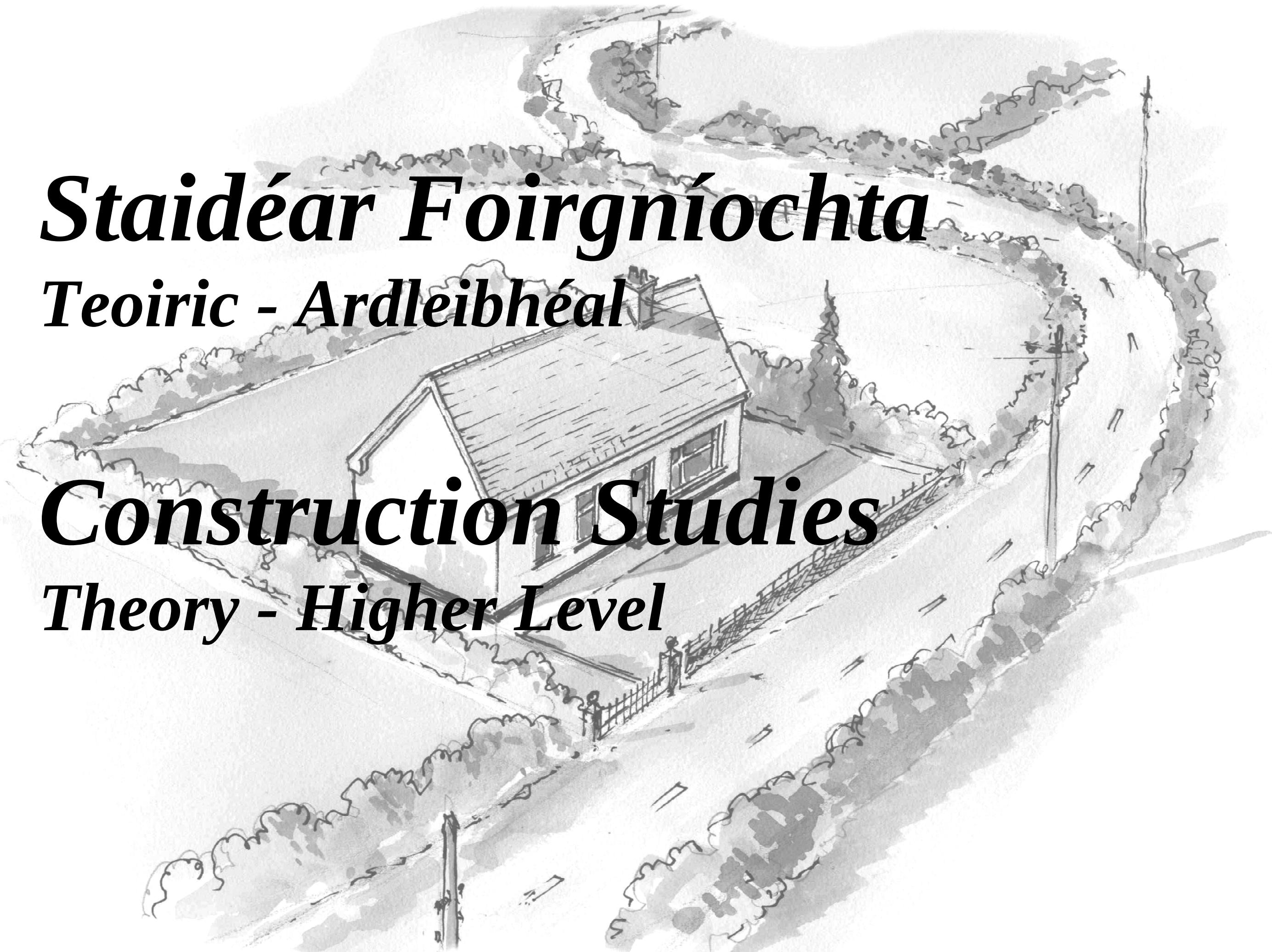
LEAVING CERTIFICATE EXAMINATION, 2002

Staidéar Foirgníochta

Teoiric - Ardleibhéal

Construction Studies

Theory - Higher Level



SCÉIM MHARCÁLA

MARKING SCHEME

CEIST 1

PERFORMANCE CRITERIA	MAXIMUM MARK
Reinforced concrete strip foundation correctly shown	**6**
Correct depth of trench correctly shown (graphically or otherwise)	**6**
Cavity wall, cavity fill correctly shown	**6**
Cavity insulation correctly shown	**6**
DPC in cavity wall correctly shown	**6**
Fireback correctly shown	**6**
Fireplace lintel correctly shown	**6**
Flue gathering correctly shown	**6**
Flue liner correctly shown	**6**
Fill to flue liner & fireback correctly shown	**6**
Hardcore & deadwork for chimney breast correctly shown	**6**
DPM & underfloor insulation correctly shown	**6**
Concrete floor correctly shown	**6**
External rendering and internal plastering to wall correctly shown	**6**
Design detail No. 1 correctly shown	**6**
Design detail No. 2 correctly shown	**6**
TOTAL *Maximum of 8* ***x 6marks*** *each out of first 14,* ***5 marks for drawing + 1 for annotation*** *in each case.* *Maximum of 6* ***marks for each of 2 applicable design details*** *correctly and accurately indicated on drawing.*	**60**

CEIST 2

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Citing of inadequate insulation/ Description of Cold Bridge	**6**
Sketch of Cold Bridge or Note describing insulation of head, jamb and cill	**6**
Sketch of insulation (at head or jamb or cill)	**6**
(b)	
Reason 1	**7**
Reason 2	**7**
Note on Method No. 1 Sketch of Method No. 1	**7** **7**
Note on Method No. 2 Sketch of Method No. 2	**7** **7**
TOTAL	**60**

CEIST 3

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Strength Property No. 1	**6**
Strength Property No. 2	**6**
Design consideration 1, to prevent deterioration over time	**6**
Design consideration 2, to prevent deterioration over time	**6**
(b)	
Note Describing Method No. 1 Sketch of Method No. 1	**6** **6**
Note describing Method No. 2 Sketch of Method No. 2	**6** **6**
(c)	
*(**2** advantages x 6 **marks** each)*	
Advantage, Method 1 (Relevance and clarity)	**6**
Advantage, Method 2 (Relevance and clarity)	**6**
TOTAL	**60**

CEIST 4

PERFORMANCE CRITERIA	**MAXIMUM MARK**
(a)	
Correct Tabulation	**3**
Ext. Surface Resistance + Int. Surface Resistance + Cavity	**3**
6 lines of calculations **x 3 marks**	**3**
	3
	3
	3
	3
	3
(b)	
*(**4 lines** of calculations **x 3 marks**)*	
Proposed extension Wall	**3**
Additional Resistance	**3**
Resistance of Exp. Stated formula	**3**
T (thickness of insulation required)	**3**
(c)	
Note describing Method No. 1	**6**
Sketch of Method No. 1	**6**
Note describing Method No. 2	**6**
Sketch of Method No. 2	**6**
TOTAL	**60**

CEIST 5

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Detailed discussion of consideration No. 1	**6**
Detailed discussion of consideration No. 2	**6**
Detailed discussion of consideration No. 3	**6**
(b)	
Dimensioned Sketch 1 Relevant Notes	**8** **8**
Dimensioned Sketch 2 Relevant Notes	**8** **8**
(c)	
Reason 1	**5**
Reason 2	**5**
TOTAL	**60**

CEIST 6

PERFORMANCE CRITERIA		MAXIMUM MARK
(a)		
(i)	Definition of Mass	**6**
	Discussion of Mass	**6**
(ii)	Definition of Completeness	**6**
	Discussion of Completeness	**6**
(iii)	Definition of Isolation	**6**
	Discussion of Isolation	**6**
(b)		
	Note of Detail No. 1	**6**
	Sketch of Detail No. 1	**6**
	Note of Detail No. 2	**6**
	Sketch of Detail No. 2	**6**
TOTAL		**60**

CEIST 7

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Environmental Consideration 1 Statement / Discussion	**10**
Environmental Consideration 2 Statement / Discussion	**10**
Environmental Consideration 3 Statement / Discussion	**10**
(b)	
Explanation No. 1 Sketch No. 1	**5** **5**
Explanation No. 2 Sketch No. 2	**5** **5**
Explanation No. 3 Sketch No. 3	**5** **5**
(or other relevant points)	
TOTAL	**60**

CEIST 8

PERFORMANCE CRITERIA		MAXIMUM MARK
(a)		
(i)	***5 marks** each for all **4** of the following correctly shown:*	
	Decking, Counter battens, drip batten/aluminium	**5**
	Fascia, Soffit, Gutter, Ventilation	**5**
	Wall Plate, D.P.C, Tie Down Straps, Wall Ties	**5**
	300 Cavity wall, Insulation, Rendering, Plastering	**5**
(ii)	***5 marks** each for **4** of the following correctly shown:*	
	Lead Flashing, Fillet, Solar Reflective Coating/Chips	**5**
	Covering Felt/Butyl Rubber, Firring Piece, Overhang	**5**
	225x50 Joists, @ 400 c/c, Steel Straps Hangers/Timber bolted to wall/built-in	**5**
	Vapour Barrier, Plaster Board, Skim, Insulation	**5**
(b)		
(i)	Condensation – Ventilation Accept sketch of design detail	**5** **5**
(ii)	Decay, note & sketch Sketch of design detail	**5** **5**
TOTAL		**60**

CEIST 9

PERFORMANCE CRITERIA	MAXIMUM MARK
(a)	
Studs @ 400 cts, noggings Sketch, **4 marks** Note, **4 marks**	**8**
Sole pieces, DPC Sketch, **4 marks** Note, **4 marks**	**8**
Headpieces Sketch, **4 marks** Note, **4 marks**	**8**
(b)	
Studs at door Sketch, **3 marks** Note, **3 marks**	**6**
Lintel/studs over door Sketch, **3 marks** Note, **3 marks**	**6**
(c)	
Advantage No. 1 Relevance, **3 marks** Quality of discussion, **3 marks**	**6**
Advantage No. 2 Relevance, **3 marks** Quality of discussion, **3 marks**	**6**
Disadvantage No. 1 Relevance, **3 marks** Quality of discussion, **3 marks**	**6**
Disadvantage No. 2 Relevance, **3 marks** Quality of discussion, **3 marks**	**6**
TOTAL	**60**

CEIST 10

PERFORMANCE CRITERIA	MAXIMUM MARK
*Any **6 points** or other relevant points clearly stated and **supported by discussion**.* *(**5 marks** for each point stated and **5 marks** for each discussion to a maximum of 60 marks)*	
Point No. 1 (Statement **5 marks**, Discussion **5 marks**)	**10**
Point No. 2 (Statement **5 marks**, Discussion **5 marks**)	**10**
Point No. 3 (Statement **5 marks**, Discussion **5 marks**)	**10**
Point No. 4 (Statement **5 marks**, Discussion **5 marks**)	**10**
Point No. 5 (Statement **5 marks**, Discussion **5 marks**)	**10**
Point No. 6 (Statement **5 marks**, Discussion **5 marks**)	**10**
TOTAL	**60**

CEIST 10 (ALTERNATIVE)

PERFORMANCE CRITERIA	**MAXIMUM MARK**
(a)	
(i) ***3*** *well discussed* ***points in favour of building*** *(marks based on the relevance and cogency of the arguments)*	
Argument No. 1	**7**
Argument No. 2	**7**
Argument No. 3	**7**
(i) ***3*** *well discussed* ***points in opposition to building*** *(marks based on the relevance and cogency of the arguments)*	
Argument No. 1	**7**
Argument No. 2	**7**
Argument No. 3	**7**
(b)	
Planning Guideline 1	**6**
Planning Guideline 2	**6**
Planning Guideline 3	**6**
TOTAL	**60**

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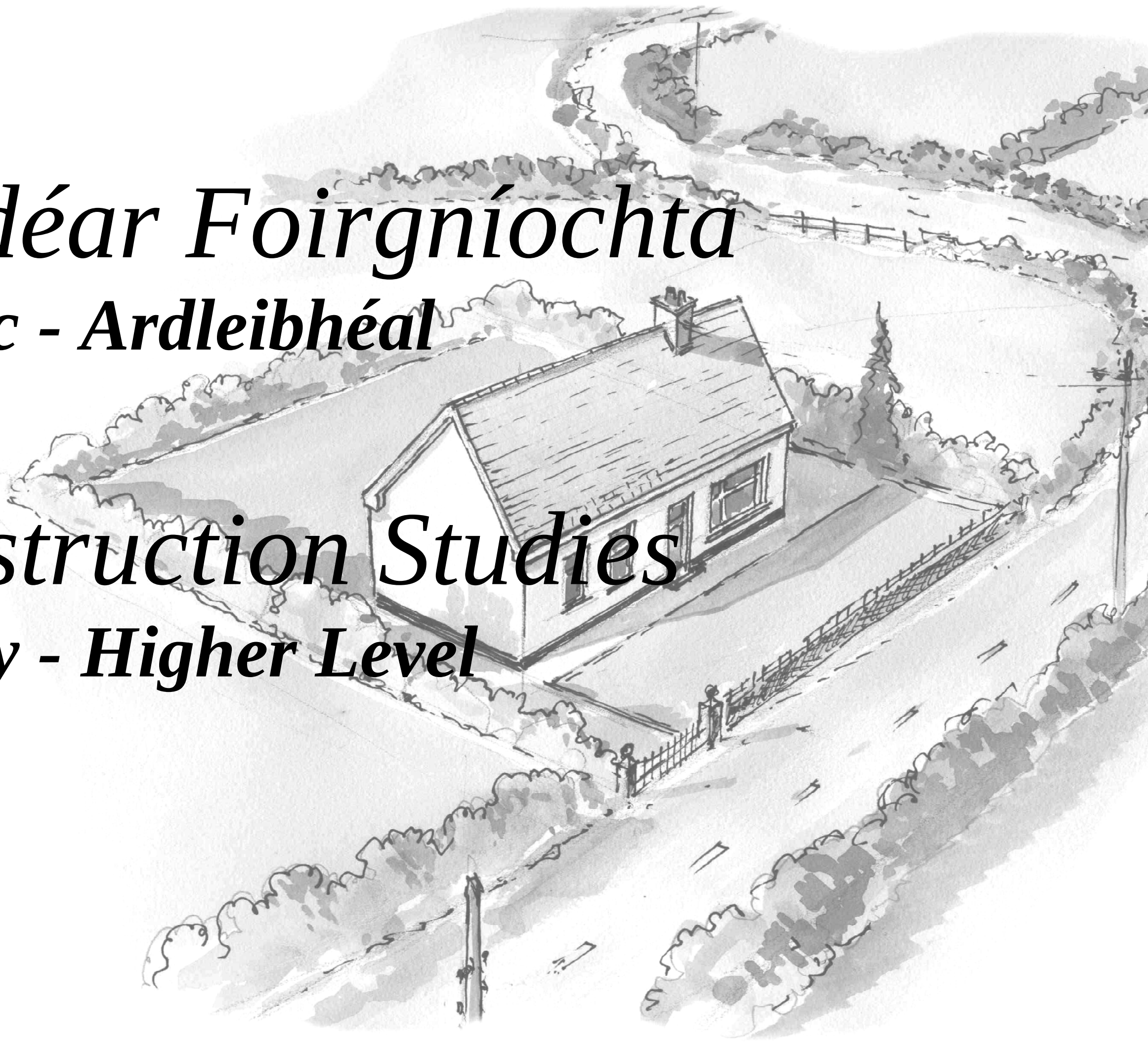
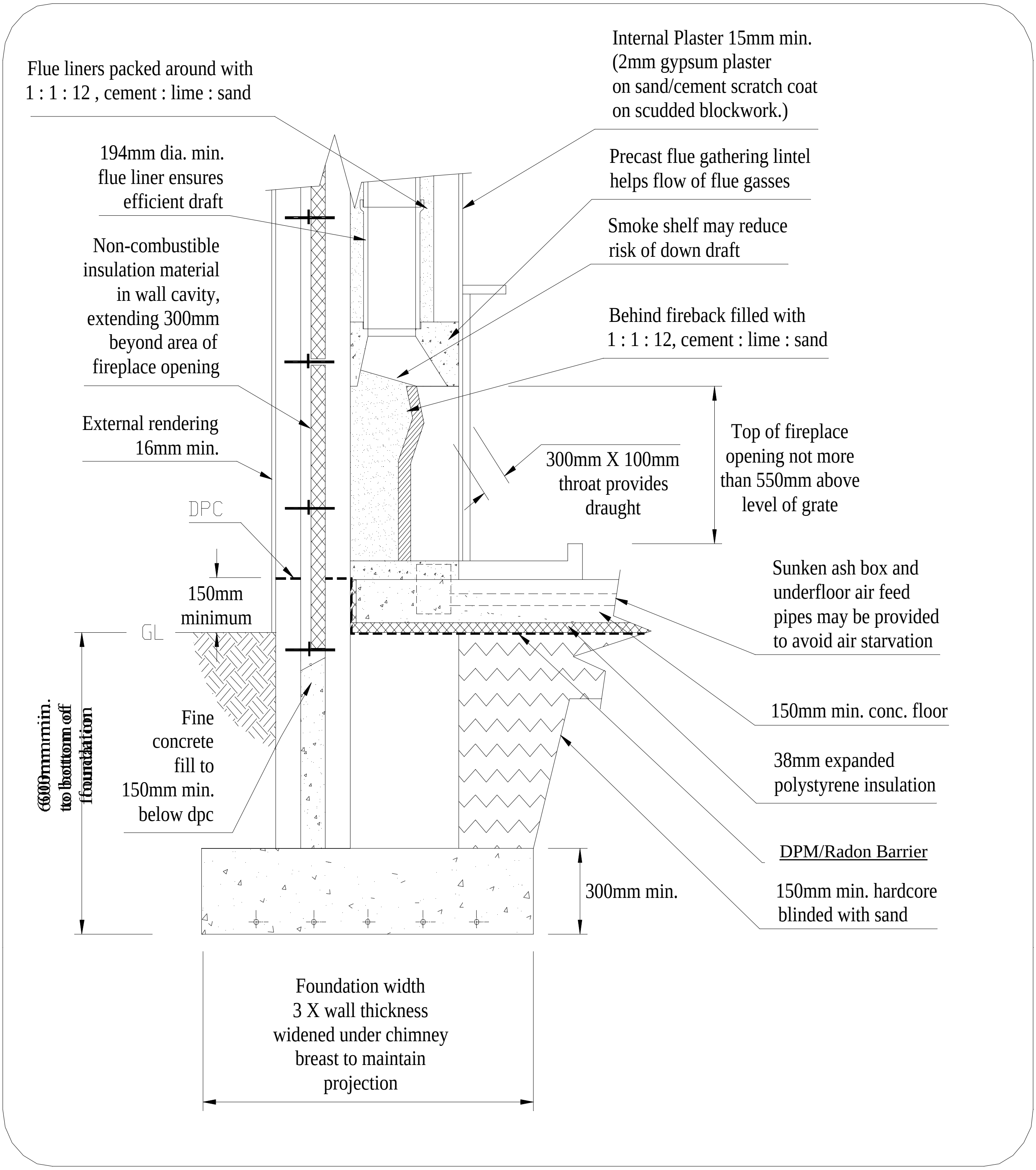


FREAGRAÍ

SOLUTIONS

CEIST 1



Flue liners packed around with 1 : 1 : 12 , cement : lime : sand
194mm dia. min. flue liner ensures efficient draft
Non-combustible insulation material in wall cavity, extending 300mm beyond area of fireplace opening
External rendering 16mm min.
DPC
150mm minimum
GL
600mm min. to bottom of foundation
Fine concrete fill to 150mm min. below dpc
Internal Plaster 15mm min. (2mm gypsum plaster on sand/cement scratch coat on scudded blockwork.)
Precast flue gathering lintel helps flow of flue gasses
Smoke shelf may reduce risk of down draft
Behind fireback filled with 1 : 1 : 12, cement : lime : sand
300mm X 100mm throat provides draught
Top of fireplace opening not more than 550mm above level of grate
Sunken ash box and underfloor air feed pipes may be provided to avoid air starvation
150mm min. conc. floor
38mm expanded polystyrene insulation
DPM/Radon Barrier
150mm min. hardcore blinded with sand
300mm min.
Foundation width 3 X wall thickness widened under chimney breast to maintain projection

CEIST 2

(a)

- Condensation might occur at the location indicated if thermal insulation was inadequate.
- A lack of insulation in the wall around the window opening leads to higher heat loss through the wall resulting in the cold bridge effect as shown in Figs 2.1 and 2.2.
- The cold bridge effect causes the area of the wall surrounding the window opening to be at a lower temperature than the remainder of the wall.
- When air within the building comes into contact with the cold surfaces, dew point is reached and condensation forms on the wall.

COLD BRIDGE AT HEAD AND CILL OF WINDOW OPENING

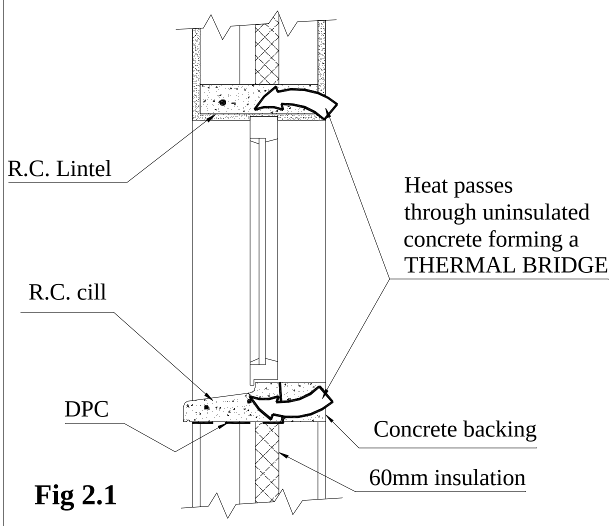


Fig 2.1

DETAIL OF UNINSULATED JAMB

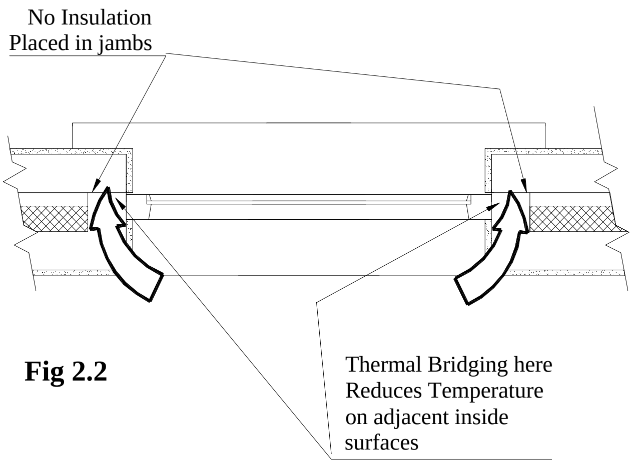


Fig 2.2

- Correct detailing around the window opening ensures that the thermal insulation in the wall is continuous at the head, jambs and cill as shown in Figs 2.3, 2.4 and 2.5.
- Prestressed or cast in-situ concrete lintels support the head of the window opening. The cavity is closed by insulation material as shown in Fig. 2.3.

DETAIL OF THERMAL INSULATION AT HEAD AND CILL OF WINDOW OPENING

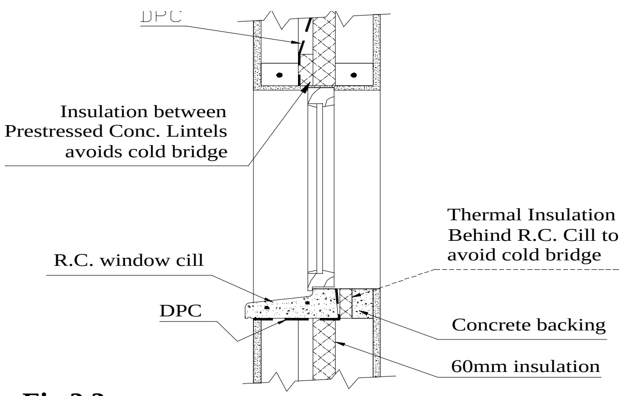


Fig 2.3

- If there is a minimum of 1m of wall exposed above the opening, a stepped dpc is provided to protect the opening from water penetration.
- Thermal insulation is placed behind the cill to avoid thermal bridging as shown in Fig 2.3.
- The cill is wrapped in dpc so that all its surfaces that are in contact with the wall are covered including the ends. This ensures that dampness does not penetrate the wall through the cill.

- If a single lintel is used then insulation is fixed to the inside surface of the lintel as shown in Fig 2.4.

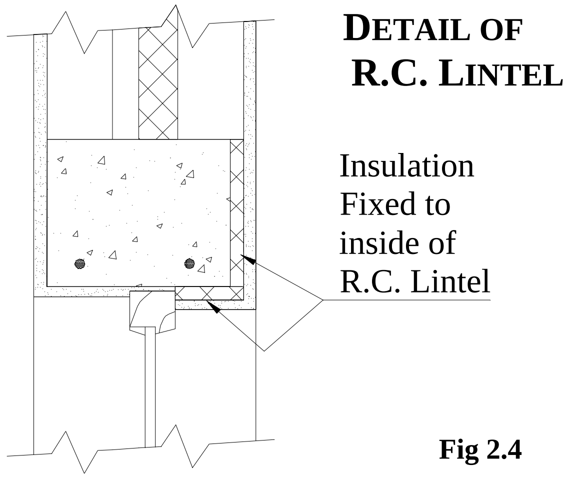


Fig 2.4

- The jambs of the opening are closed with a block cavity closer.
- Insulation is provided between the return of the cavity closer and the outer leaf of the wall as shown in Fig 2.5.
- This detailing stops any thermal bridging around the window ope and avoids the risk of condensation due to thermal bridging.

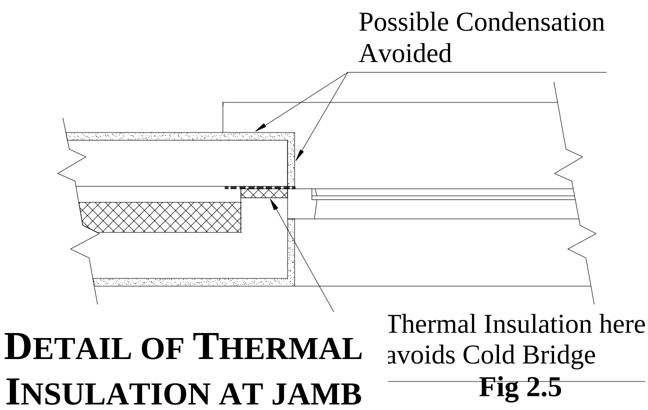


Fig 2.5

(b)

When condensation occurs on the internal surfaces of a building it may be due to moisture from the air being deposited on the surfaces when the dew point is reached. This may be due to one or more of the following factors:

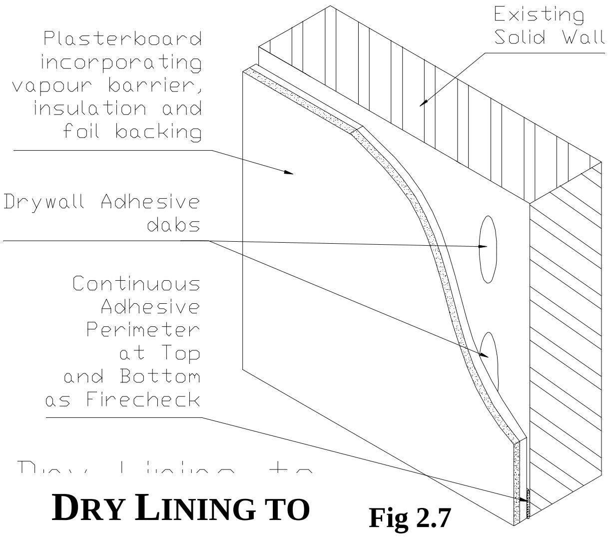
(i) the coldness of the surfaces – bad insulation,

(ii) poor ventilation

(iii) excessive humidity in the air.

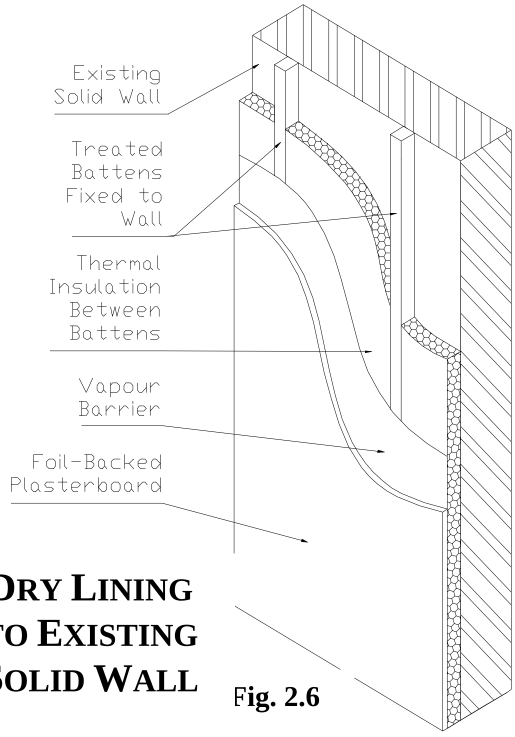
- Changes in the heating, cooking and ventilation arrangements in an old house can lead to problems with condensation arising where previously not present.
- This is particularly true when older draughty windows and doors are replaced or when an open fire with a large flue is no longer used.
- When a more efficient heating system is installed in an old house, the warm air has the capacity to hold more water vapour than cold air. The air has a higher dew point leading to more condensation when in contact with cold wall surfaces. Increasing the insulation value of the outside walls can help to eliminate this condensation.
- Dry lining the walls as shown in Fig. 2.6 can do this.
- Vertical battens treated with preservative are fixed to the wall.

- A horizontal treated batten is fixed at floor and ceiling to aid fixing of plasterboard and to act as a fire stop.
- The spaces between the battens are filled with sheets of polystyrene or other insulation material.
- A vapour barrier is placed on the warm side of the battens and insulation.
- Plasterboard is fixed to the battens and is either taped and jointed or finished with a skim of hardwall plaster.
- If foil-backed plasterboard is used, the foil backing acts as a vapour barrier.



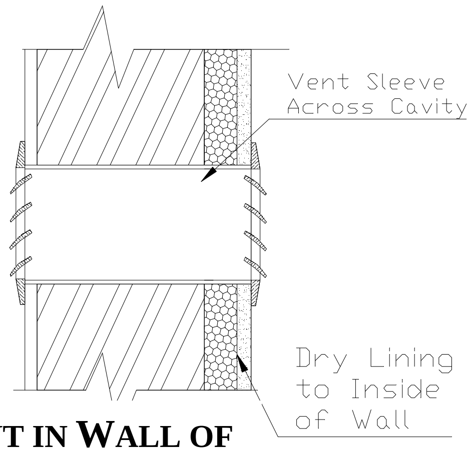
DRY LINING TO EXISTING WALL **Fig 2.7**

- If the ventilation in the old house has been reduced, perhaps by the installation of new windows and external doors and draught proofing, then new provision may be needed for ventilation.
- Ventilation can be provided by the provision of vents in outside walls as shown in Fig 2.8.
- The vents should be positioned so that draughts are avoided.
- High humidity originating in utility rooms, kitchens and bathrooms can be a cause of condensation throughout the house.
- Mechanical ventilation may be used to remove the moisture-laden air from such sources.
- Cooker hoods fitted with extractor fans and wall or window-mounted extractor fans can be installed to reduce humidity throughout the house.



DRY LINING TO EXISTING SOLID WALL **Fig. 2.6**

- A variation of this method is to fix sheets of plasterboard incorporating insulation, vapour barrier and reflective foil directly to the wall with dabs of adhesive, Fig 2.7.
- A continuous margin of adhesive is provided at floor and ceiling to act as a fire stop.



VENT IN WALL OF OLD HOUSE **Fig 2.8**

CEIST 3

(a)

(i.) Steel Reinforcing in concrete is intended to strengthen the tensile resistance. The position of the steel in the concrete is important and must be carefully considered. The steel may be any form of bar (usually mild steel). Tensile stress is a stress in the material which tends to pull the fibres apart lengthways.

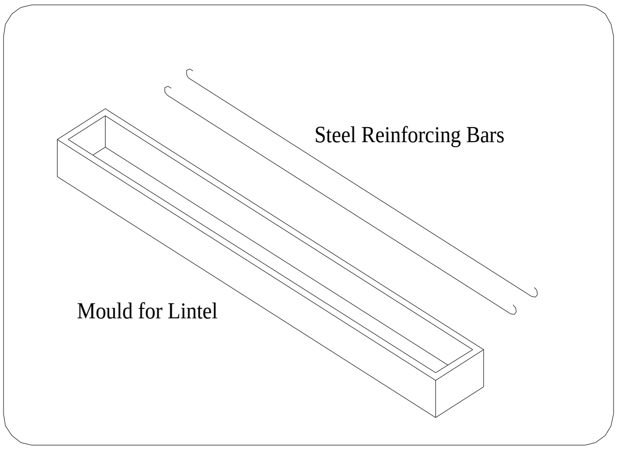
(ii.) Adequate cover of the steel bars, preventing the ingress of water, causing the steel to rust.

Positioning of steel in concrete is very important to counteract tensile stress.

Test soil for chemicals that may have an effect on the reinforced concrete over time.

Additives to concrete may react with steel causing deterioration over time.

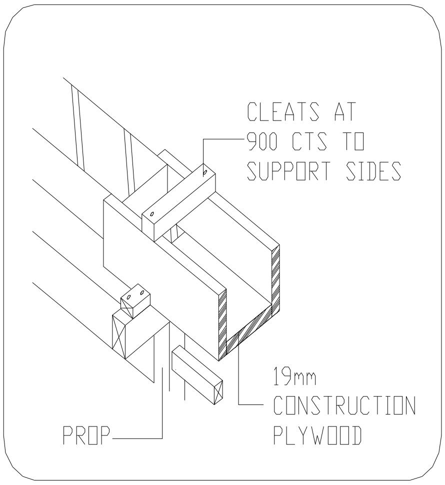
(b)



PRE-FORMED LINTEL

Pre-formed Lintel

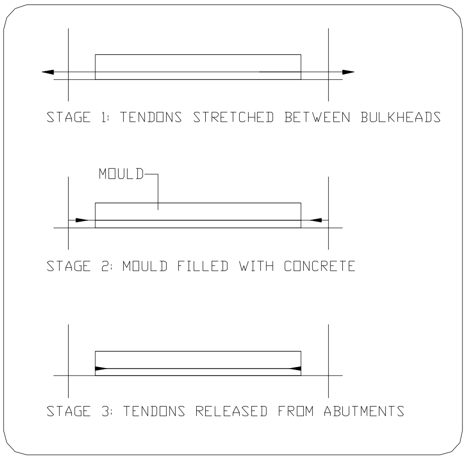
A form or mould is made on the ground into which the concrete is cast. Reinforcing bars are placed in the concrete, the ends turned to improve the tensile resistance. The formwork may be of wood or metal. When set the mould is struck and the lintel is lifted into position.



IN-SITU REINFORCED CONCRETE LINTEL

In-Situ Reinforced Concrete Lintel

Formwork is constructed so that the lintel may be cast in-situ. Major design considerations include: span, lintel depth, size and number of reinforcing bars. The constituency of the mix should be such that it can be fully compacted by the vibration techniques available.



PRE-STRESSED CONCRETE LINTEL

Pre-stressed Concrete Lintel:

Pre-stressed Concrete Lintel is a concrete beam and could be defined as pre-stressed concrete. This means that a compressive stress is put into the reinforcing before it begins its working life and is positioned to be in areas where tensile stresses will develop under working load. High tensile steel rods or tendons are incorporated permanently in the concrete member. The steel is tensioned as shown in stage 1. Concrete is poured and allowed to set.

- For pre-stressing: rods or tendons are stretched to the required tension and anchored to bulkheads.

(c)

Pre-formed Lintel:

- Can be made on site to the required size.
- Less expensive, no delay.

In-situ Lintel:

- Ease of manufacture and placement e.g. cantilever.
- Helps to bond the structure well.

Pre-stressed Concrete Lintel:

- Speeds up construction as no time is spent on site making forms.
- Light and easy to handle, and transport.

CEIST 4

(a)

Component	**Conductivity**	**Resistivity**	**Thickness**	**Resistance**
	(k)	**(r = 1/k)**	**(T)**	**(R = T * r)**
External Surface				0.0550
External Rendering	0.4600	2.1739	0.0190	0.0413
Block Outer Leaf	1.4400	0.6944	0.1000	0.0694
Cavity				0.1800
Conc. Block Inner Leaf	1.4400	0.6944	0.1000	0.0694
Internal Plaster	0.4600	2.1739	0.0160	0.0348
Internal Surface				0.1230
			Total Resistance (R_T)	**0.5730**
			U Value:	**1.7453**

(b)

Existing Wall:

U value = 1.7453 $W/M^2°C$

Total Resistance, R_{T1} = 0.5730 $M^2°C/W$

Proposed Extension Wall:

U value = 0.4500 $W/M^2°C$

Total Resistance, R_{T2} = 2.2222 $M^2°C/W$

Additional Resistance Required = $R_{T2} – R_{T1}$

= 2.2222 – 0.5730

= 1.6492 $M^2°C/W$

Resistance of Expanded Polystyrene Cavity Insulation,

Thickness, T / Conductivity, k = 1.6492 $M^2°C/W$

T / 0.033 = 1.6492

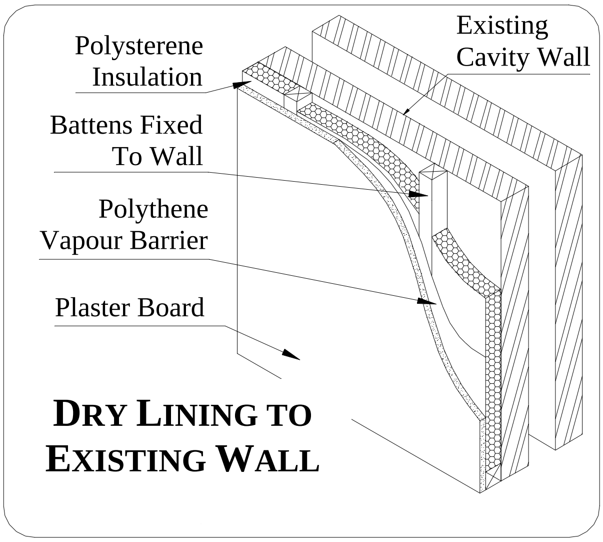
T = 1.6492 X 0.0330

= 0.0544

Thickness of Insulation Required = 55mm

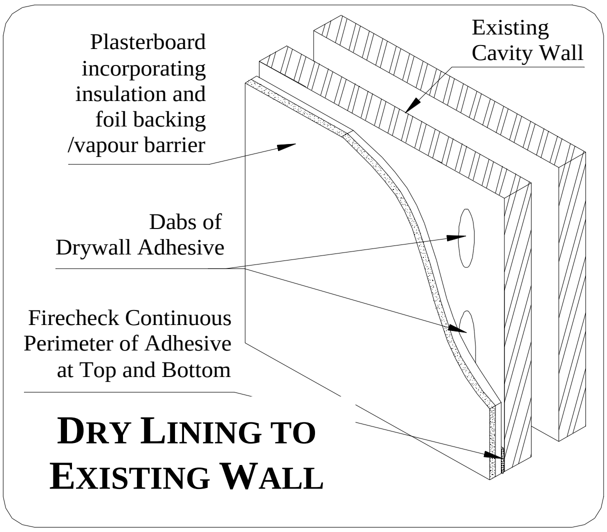
(c)

The thermal transmittance might be reduced by:



(i) Dry lining the wall

- Expanded polystyrene insulation, 60mm, is placed between battens fixed to the wall surface.
- A vapour barrier on the warm side of the insulation eliminates the possibility of condensation.
- Plasterboard is fixed to the battens.
- If foil backed plasterboard is used the foil backing acts as a barrier to radiant heat and a vapour barrier.

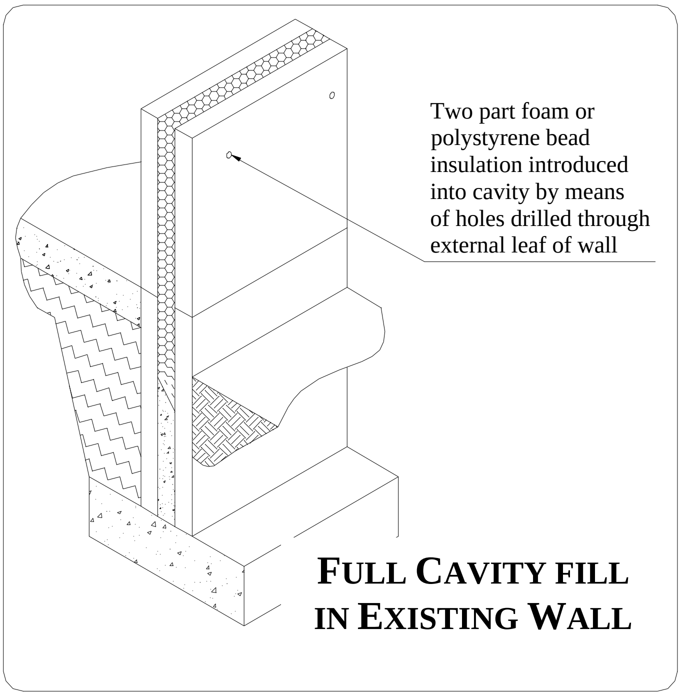


(ii) Dry lining the wall using plasterboard and adhesive

- Plasterboard incorporating insulation, vapour barrier and foil backing is fixed to the wall by means of dabs of adhesive.
- A continuous perimeter of adhesive is used at the top and bottom of the wall to provide a fire stop.

(iii) Introducing foam or bead insulation material into the cavity

- Holes are drilled into the cavity of the wall and two-part foam is injected.
- The mixed liquids foam, filling the cavity and this foam then becomes rigid.
- A variation on this method of insulation is to inject beads of polystyrene to fill the cavity.
- Because the insulation material in both of these methods bridges the cavity, there is a possibility of dampness being conducted across to the inner leaf of the wall.

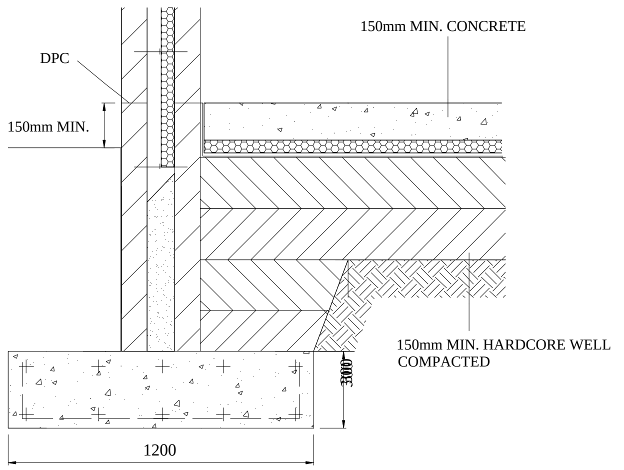


CEIST 5

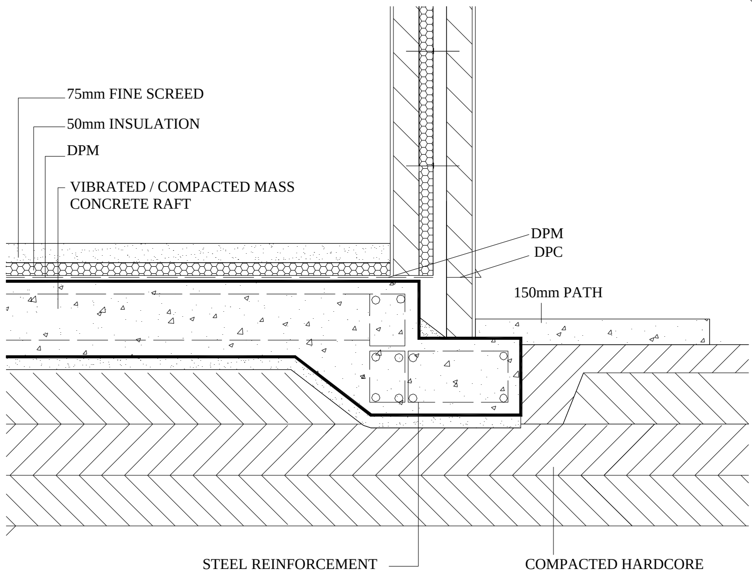
(a)

- Bearing pressure of sub-soil. The ability of the soil to support loads, measured in KN/m sq. The greater the bearing pressure, the greater the loads the soil can carry. A loose gravel sub-soil would have a low bearing pressure (approximately 200KN/m sq). Field tests can determine the bearing pressure.
- The excavations may require timbering. This type of sub-soil will require close timbering, as it is loose gravel. This will add an additional cost to the foundation.
- Height of water-table, which is the natural level of ground water on a site. This may affect the depth of excavation. The water table is highest in winter and its level varies according to the conditions such as: under-ground flow, evaporation and rainfall.

(b)



WIDE STRIP FOUNDATION



RAFT FOUNDATION

(c)

Wide Strip Foundation:

- The load is spread over a greater area.
- Suitable for soils with a relatively low bearing pressure.
- Economic in use of material.
- Minimises energy use.

Raft Foundation:

- Loads spread evenly over entire area, reduces settlement of sub-soil.
- Lesser chance of differential settlement occurring.
- Suitable for soils with poor bearing pressure.
- Minimises the amount of excavation.

CEIST 6

(a)

(i) Mass

- The Mass Law states that the sound insulation of a single leaf partition is dependent on its mass per unit area.
- The mass of a structure has an effect on the way in which it transmits sound.
- Sound waves in dense materials are of low amplitude and so the sound that is re-radiated into the air from such materials have low amplitude also.
- When structures of greater mass form a part of a building it follows that there is a greater reduction in sound.
- According to the mass law, theoretically there is a 6dB increase in sound insulation for each doubling of mass. In practice the increase is found to be about 5dB.
- Sound insulation depends on the frequency of the sound.
- The sound insulation increases by about 5dB when the frequency of the sound is doubled.
- Mass is used to increase sound insulation in wooden floors when sand pugging is used between the joists.
- Party walls often take advantage of the mass law to ensure good sound insulation between adjacent houses.

(ii) Completeness

- Small gaps in a structure will have a much greater effect on sound insulation than might be expected.
- It is essential that a structure is **airtight** if it is to effectively insulate against sound transmission.
- In practice it is essential that all gaps such as those around pipes and between doorframes and walls or in badly fitting windows be carefully sealed if they are not to result in a major reduction in the sound insulation properties of a structure.
- Particular attention should be paid to gaps that might occur at joins between floors and walls or ceilings.
- Blockwork and brickwork are best plastered to ensure completeness.
  It is important that there is **uniformity** of sound insulation in a structure. An area of poor insulation such as an unsealed door will have an effect greater than its relative area.

(iii) Isolation

- Each time sound transfers from one material to another its wave motion is changed and it loses energy.
- Advantage can be taken of isolation to improve sound insulation.
- Ensuring that there is no continuity between adjacent parts of a structure will lead to a decrease in sound transfer.
- Double windows with an airspace of at least 150mm are good sound insulators for this reason as are floating floors.
- Flanking transmission of sound through rigid links in structures can greatly reduce insulation.

(b)

The sound insulation of the partition separating the rooms may be increased by providing isolation within the partition as shown in Fig 6.1. This is achieved by providing another stud partition in front of the existing one but completely independent of it.
It is essential that careful attention be paid to completeness when constructing the plasterboard finish to the new stud partition.
In particular, attention must be paid to the joining of the new structure to the existing ceiling and floor.

INSULATION OF WALL BETWEEN LIVING ROOM AND CHILD'S ROOM

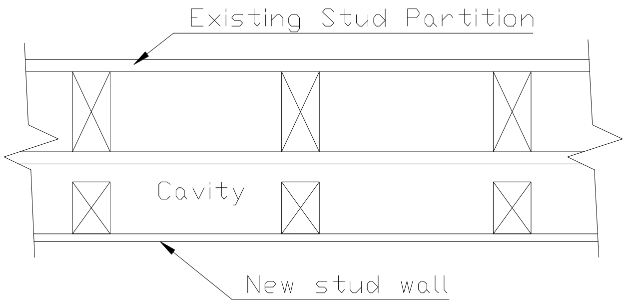


Fig 6.1

INSULATION OF LIVING ROOM FLOOR

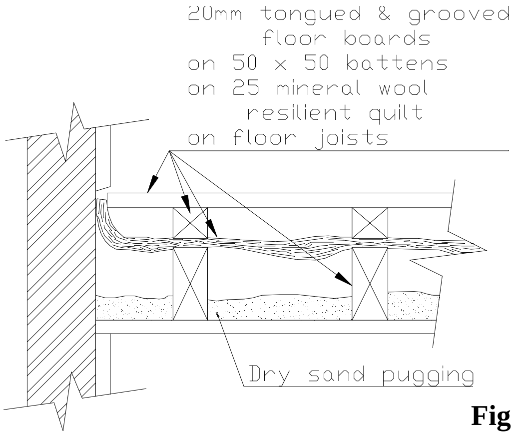


Fig 6.2

The sound insulation of the floor and ceiling that separate the living room and the downstairs bedroom can be improved by construction of a sound insulated floor.
This is done by lifting the existing floorboards and laying a floating floor on battens as shown in Fig 6.2. The battens are laid on a quilt of resilient mineral wool laid over the existing floor joists.
The battens are not nailed to the joists in order to provide isolation between them.
Dry sand pugging is placed as shown at a rate of about $90kg/m^2$ to add mass to the structure. The extra mass improves the sound insulation.

Sound could be transferred through the door of the living room to the space outside and from there through the door of the child's room. To overcome this problem both doors can be sound proofed by fitting a draught stop to the frames as shown in Fig 6.3.

SOUND PROOFED DOOR OF LIVING ROOM AND CHILD'S ROOM

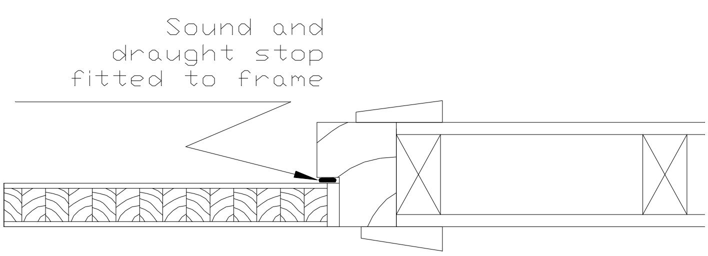


Fig 6.3

INSULATED CEILINGS OF LIVING ROOM AND CHILD'S ROOM

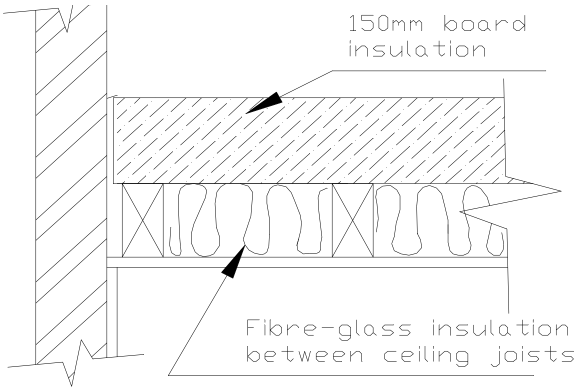


Fig 6.4

Sound is liable to be transferred through the ceiling of the living room and from there down to the child's room.
Placing 150mm thick board insulation on top of the ceiling joists of each room as shown in Fig 6.4 can guard against this.
Due care should be exercised not to leave any gaps between the boards and to ensure that all the margins of the ceiling areas are well covered.
Fibre-glass insulation placed between the ceiling joists adds further to the sound insulation of the ceilings.

CEIST 7

(a) *Soil type and Percolation*

- The ground and soil must have adequate soakage to allow the rate of flow of the untreated effluent filter through the soil.
- Percolation must not be excessive or it may contaminate the ground water.
- The ground water table must be established to make sure that it will accept effluent.
- Percolation tests must to be carried out to determine the capacity of the soil to absorb effluent and calculate the length of pipe-work required for the particular soil.
- No part of the percolation should be closer than 20m to the nearest point of the nearest habitable building.
- No part of the percolation area should be within 10m of the nearest boundary, stream or ditch or within 3m of the boundary of the adjoining site.
- The proximity of wells, rivers, streams and waterlogged areas have a big bearing on the choice of site. No water supply or under ground drainage could be within the area of the septic tank or percolation area.
- Neighbouring habitable buildings and existing septic tanks/treatment plants and their proximity would be taken into consideration in case of over saturation in the area.
- Access for empting the treatment unit has to be provided.
- The capacity and the proposed number of inhabitants of the building would also be a factor.

(b)

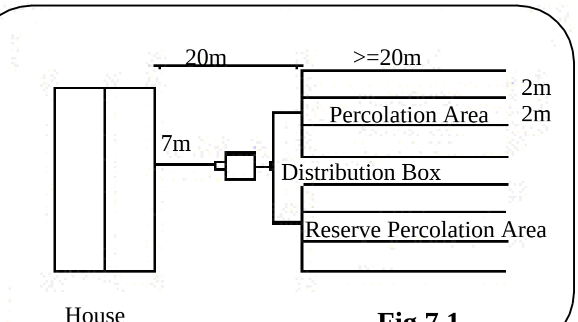


Fig 7.1

Fig.7.1:

- 100mm dia. uPVC soil pipe, gradient not less than I : 60.
- Ventilation into septic tank and up to vent at eaves.
- Prefabricated, concrete, uPVC, fibre-glass or built in-situ septic tank or sewage treatment plant.
- Pipes to be watertight between house and manhole, manhole and tank, tank and distribution box.
- Access junctions for rodding to be installed.

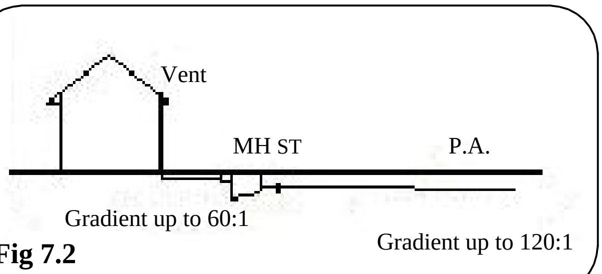


Fig 7.2

Fig. 7.2:

- Safe strong pre-cast concrete slabs on tank.
- Manhole and access junctions for cleaning/rodding.

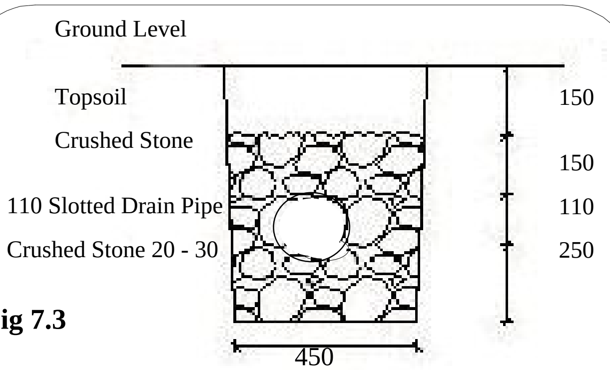


Fig 7.3

PERCOLATION PIPES AND FILL

Fig. 7.3:

- 110mm dia. Slotted drainage/percolation pipes laid in trenches 450 wide with 250mm crushed stone (20 to 30mm) underneath, along sides and 150mm on top.
- The distribution pipes should normally be interconnected at the ends and have air vents above ground level.
- Geotextiles or permeable durable material is laid over the stone and backfilled with topsoil.
- No rain, surface or storm water should be allowed into the septic tank.
- Upstand air vents at the end of each

Fig. 7.4:

- The effluent/solids enter the first chamber through the 'T' pipe sc as not to disturb the scum on the top, where aerobic action occurs. Anaerobic action occurs beneath the scum.
- The partially processed effluent flows from the second chamber through the 'T' pipe out to the distribution box and percolation area.

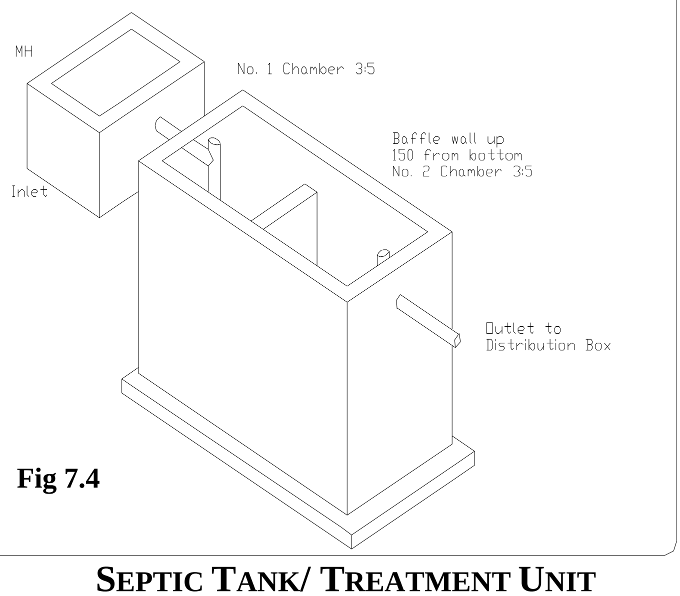


Fig 7.4

SEPTIC TANK/ TREATMENT UNIT

CEIST 8

(a)

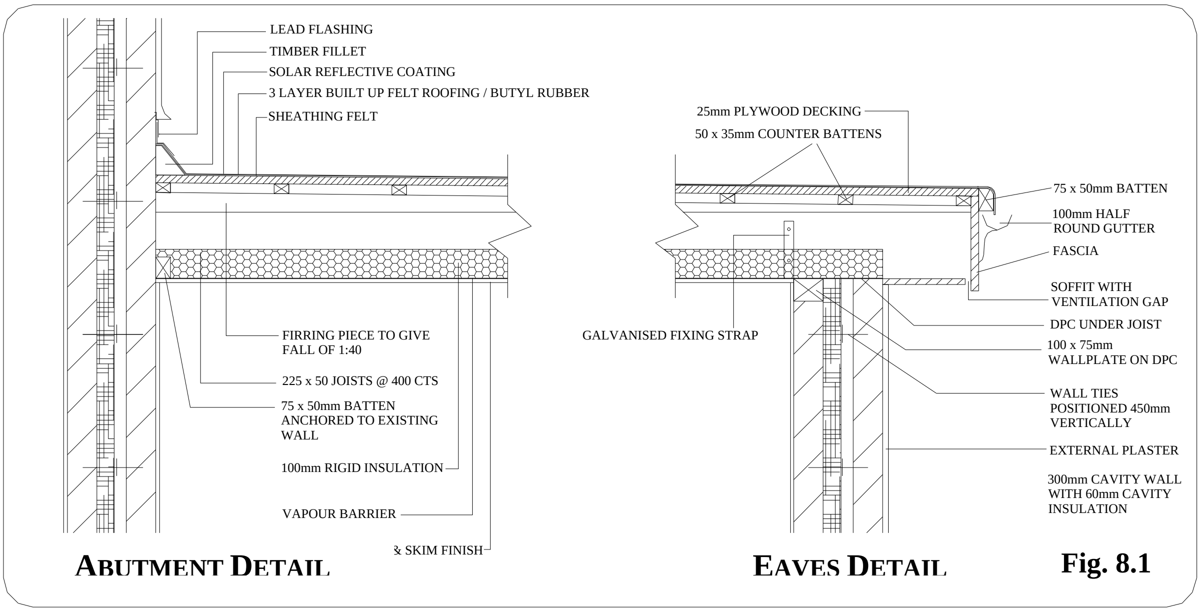


Fig. 8.1

(b)

(i)

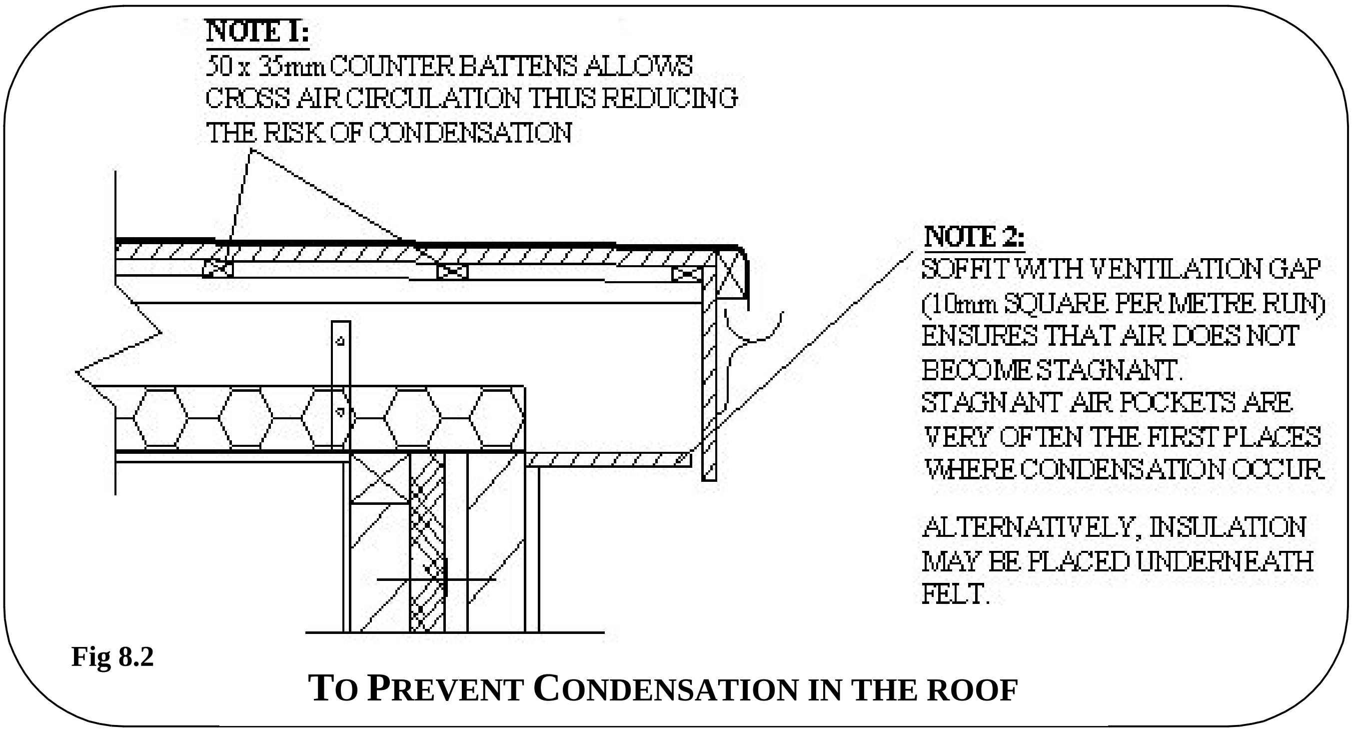


Fig 8.2

TO PREVENT CONDENSATION IN THE ROOF

(ii)

Note 1:

- Vapour barrier on warm side eliminates the risk of moisture transfering to insulation. This prevents an increase of moisture content in the wood, thus avoiding fungal growth from occuring.
- There are many different forms of fungal growth but the most destructive form is *Merulius Lachrymans* (dry rot). The rot spreads rapidly in moist stagnant conditions. Examples of vapour barriers include: 1000g Polythene, Aluminium Foil-back Plaster Slabs.

Note 2:

- Use good quality decking eg.: W.B.P. (Weather and Boil proof Plywood).
- Lay flat roofs so that the design fall at no point is less than 1 in 40. As a result there will be no ponding and the likelyhood of water entering will be reduced.
- Use well seasoned structural timber, dried to 18% Moisture Content.

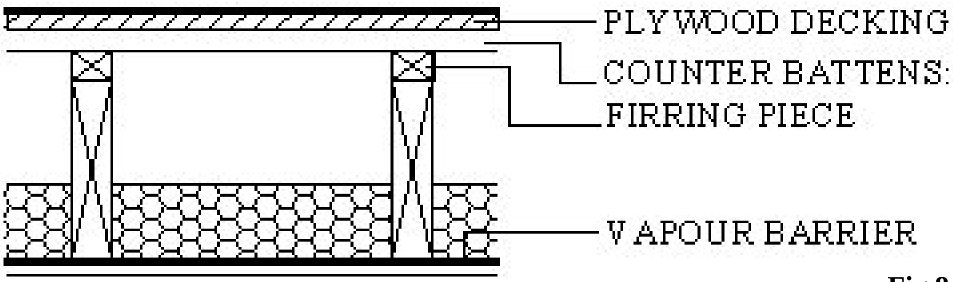
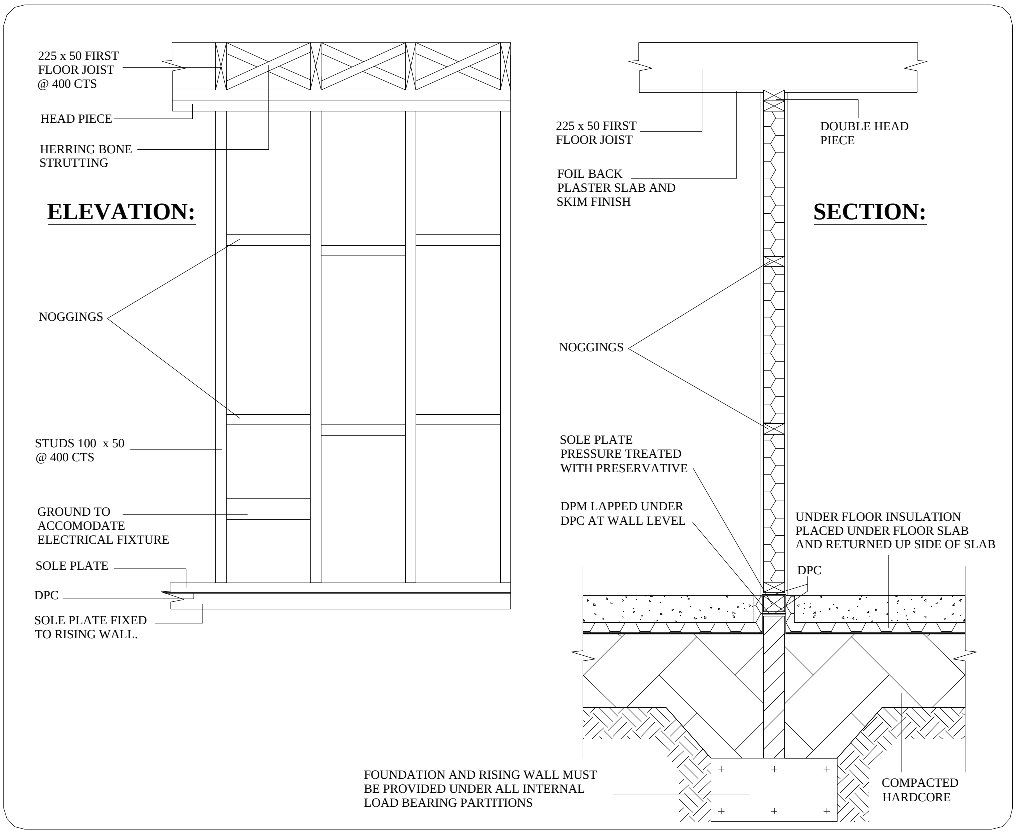


Fig 8.3

TO PREVENT DECAY IN ROOF TIMBERS

CEIST 9

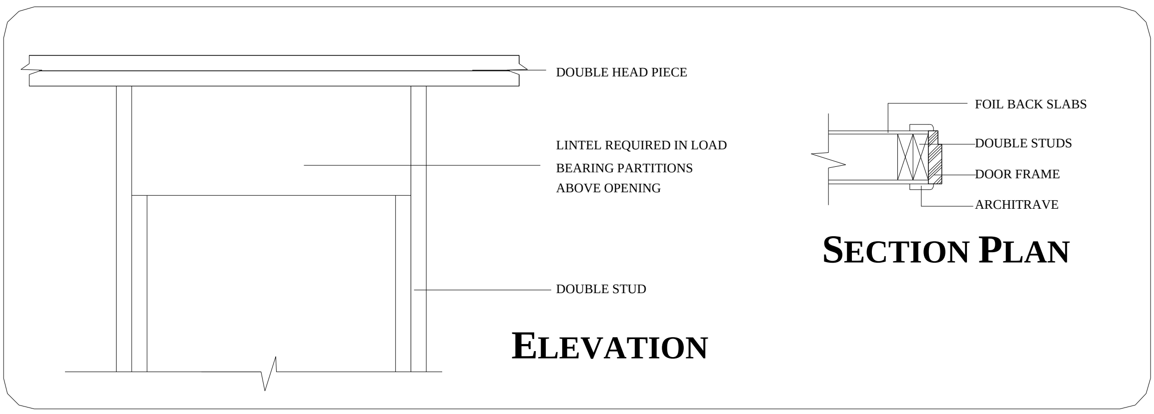
(a)



Note:

- Foundation and rising wall under all load-bearing partitions
- Herring-bone strutting used between joists
- Plaster slabs to bottom of stud for fire regulations

(b)



(c)

Advantages:

- Speed of construction: Stud partitions can be assembled on site very quickly and positioned very easily.
- As there is only a skim finish on the plasterboard, there is a very small drying out period.
- This allows second-fix joinery to be fitted faster.
- Easy to accommodate services e.g. electrical

Disadvantages:

- Expense: when the cost of all materials (kiln dried timber, foil-back plaster slabs and skimming) is added up, this proves to be an expensive option.
- Stud partitions are not as robust as a block wall.
- Do not have the mass of a block wall
- Soundproofing is less effective in a stud partition in comparison to a block wall.

CEIST 10

Traditional

- Good builders made sure that they erected buildings that were well proportioned with a modesty of scale relative to the demands of the time.
- They had a sense of belonging and permanence with a style formed through evolution over generations.
- In general they used materials that were in the area or nearby and always used the best quality available, long lasting and durable. These were stones, slates, tiles and thatch. Plaster and pebble dash were also in widespread use.
- The workmanship was generally of a very high standard as there were many highly skilled craftsmen. They took great pride and satisfaction in their work.
- Particular attention was paid to location and the positioning of the buildings taking cognisance of the surrounding area and making sure that building sat comfortably in its environment.
- Ornamentation and design were noticeable but not overdone or obtrusive, e.g. quoins on corners of buildings, reveals around windows and doors, pitched roofs, good balance, proportion and layout.

Modern

- Modern designs, practices and materials may not have the same visual coherence as traditional buildings because of the wide and varied range of materials being used today.
- The designs, shapes and proportion in many houses and adjacent houses are not related or co-ordinated. This is particularly evident in the rural countryside. In some cases designs, features and practices from other countries are to be seen. Perhaps some of these may be more acceptable in suburban areas.
- Many new materials and practices from abroad have influenced the changes in modern building in Ireland. These need to be used judiciously and with taste if they are not to detract from the environment in which they are built.
- The use of imitation stone, very large windows, inappropriate strong colours, low pitched roofs, flat roofs, non matching boundary walls and entrances are all elements of modern fashion in building over the past half century that have shocked and violated the environment and harmed the countryside.
- Unsuitable styles copied from pattern books designed for totally different landscapes and locations.
- Houses built as investments by speculators, as a second house and holiday homes. Many properties not well maintained, not having a sense of belonging.

CEIST 10 (ALTERNATIVE)

(a)

(i)

- Living and working in the countryside and want to build their own houses and live there.
- Own the land and site, parents and relations nearby, need to be close to look after their business their parents and relations.
- Born and raised in the countryside does not want to live in the town
- Rural community and countryside is being denuded of people, homesteads closed up and falling into ruins. Elderly people want to see their own people stay in the community.
- The countryside belongs to its people.
- Cannot afford a site for a house in the town. Has land that is of little use for agriculture and is best used for a site.
- Houses should be built that complement and improve the countryside.

(ii)

- Destroying the environment with urban style houses. Not the number but the scale, size and design.
- Increasing traffic dangers, new opening on to roadways causing traffic hazards.
- Increased provision of services to individual houses, e.g. electricity, water, telephone, roads, refuse collection, and the provision of sewage treatment facilities.
- Intrusion into the countryside, upsetting nature and habitat.
- Destroying areas of scenic beauty, insensitive positioning, planning and intrusion.
- Pollution of the waterways with septic tanks and run-off from entrances, yards and sites.
- Isolated buildings detract from the landscape.

(b)

- Allow people build houses where there previously was a homestead provided all the criteria regarding planning permissions are met.
- Allow people from the countryside build appropriate houses on their own land.
- That people be allowed build houses away from the main or secondary roads.
- Propose the adherence to reasonable building sight lines, restrictions of new openings, no septic tank pollution and conform to the stringent environmental constraints.
- Houses to be built into a background where it will not intrude on the skyline or panoramic view of the countryside.
- Group development of houses to be encouraged.
- That only the offspring of local residents and people in steady employment in the area be allowed to build.