2008 Building Construction

Higher

Finalised Marking Instructions

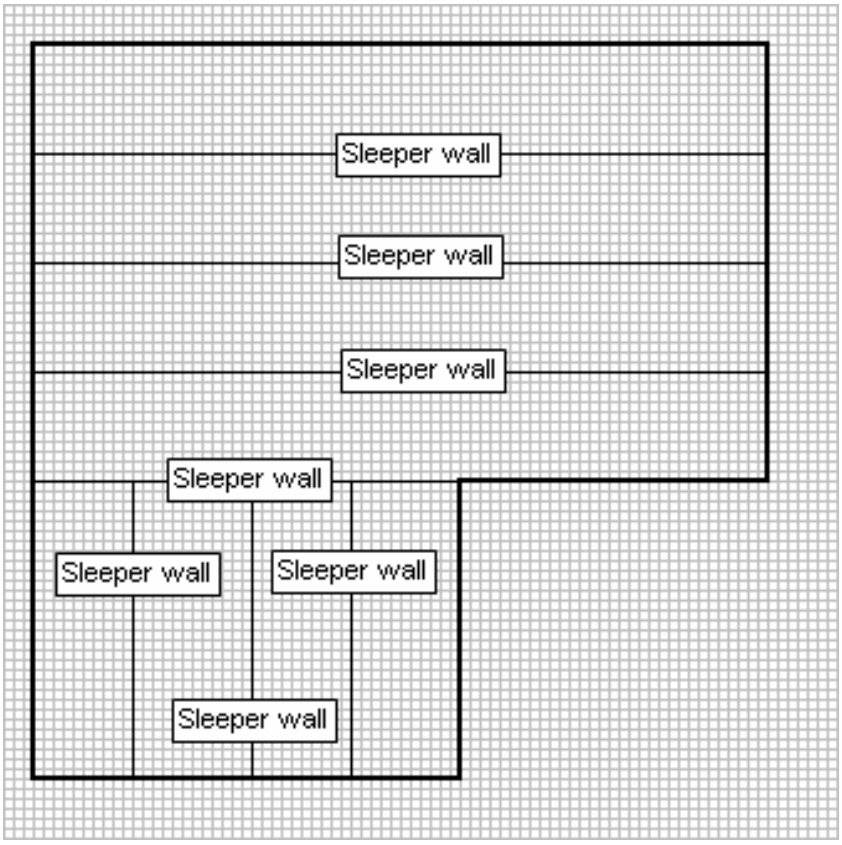
SECTION A

Marks

Attempt all the questions in this Section (total 40 marks)

1. (*a*) ***Worksheet Q1(a)*** *shows a foundation plan for a new dwelling.*

Using the ***Worksheet****, identify all the sleeper (dwarf) walls.*



2

(*b*) *Briefly explain the purpose of a sleeper wall.*

Sleeper walls are low walls which offer support to a raised floor. **2**

(*c*) *Briefly explain why large openings are provided in sleeper wall construction.*

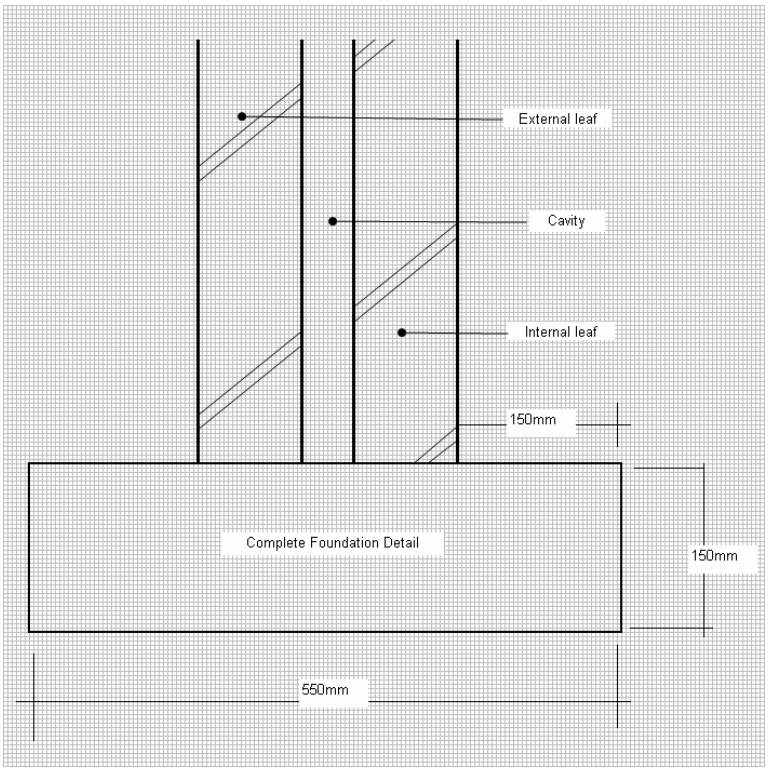
Large openings have two purposes:

- The large openings are left in each sleeper wall to allow ventilation across the complete solum.
- To allow access openings. **2**

Marks

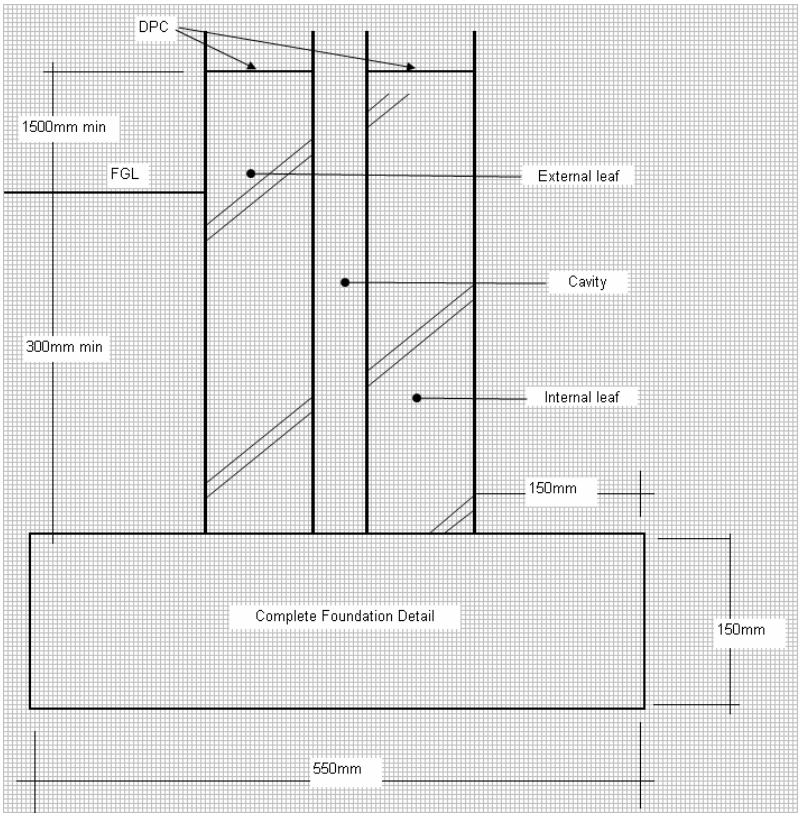
2. (*a*) ***Worksheet Q2*** *shows a partially complete foundation detail for a cavity wall.*

Using ***Worksheet Q2****, complete the detail to show a width and depth for a normal strip foundation.*



4

(*b*) *Using* ***Worksheet Q2*** *show a suitable position for ground level and damp proof course. Indicate the height of the damp proof course above ground level and the depth of the foundation below ground.*

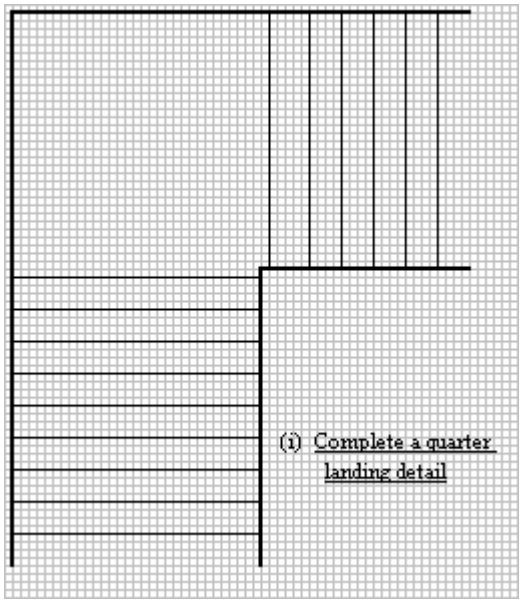


Marks

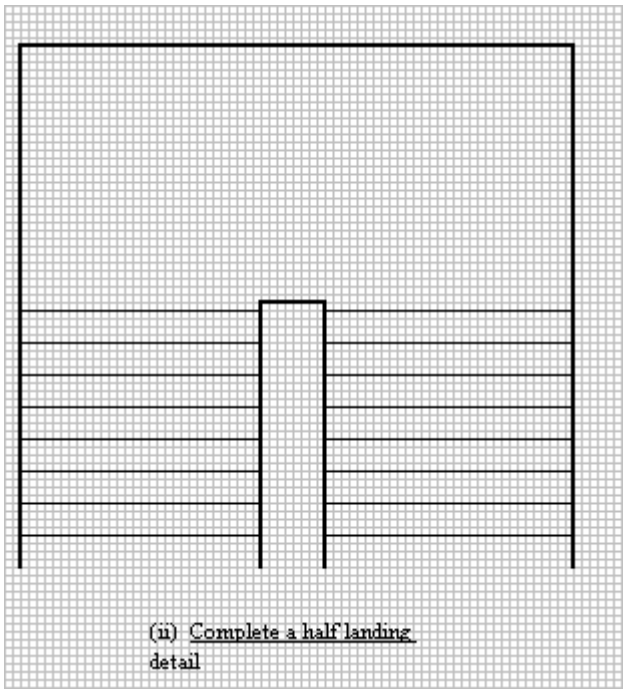
3. *Briefly describe, with the aid of an annotated sketch, each of the following types of stair:*

- *quarter landing*
- *half landing*
- *quarter turn with winders.*

Quarter Landing

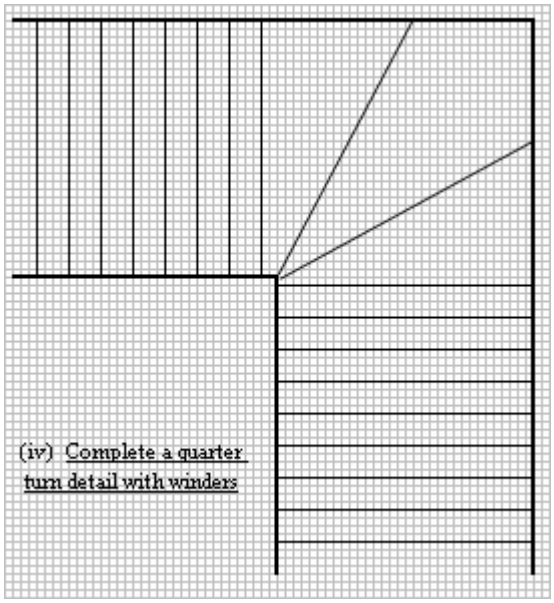


Half Landing



Marks

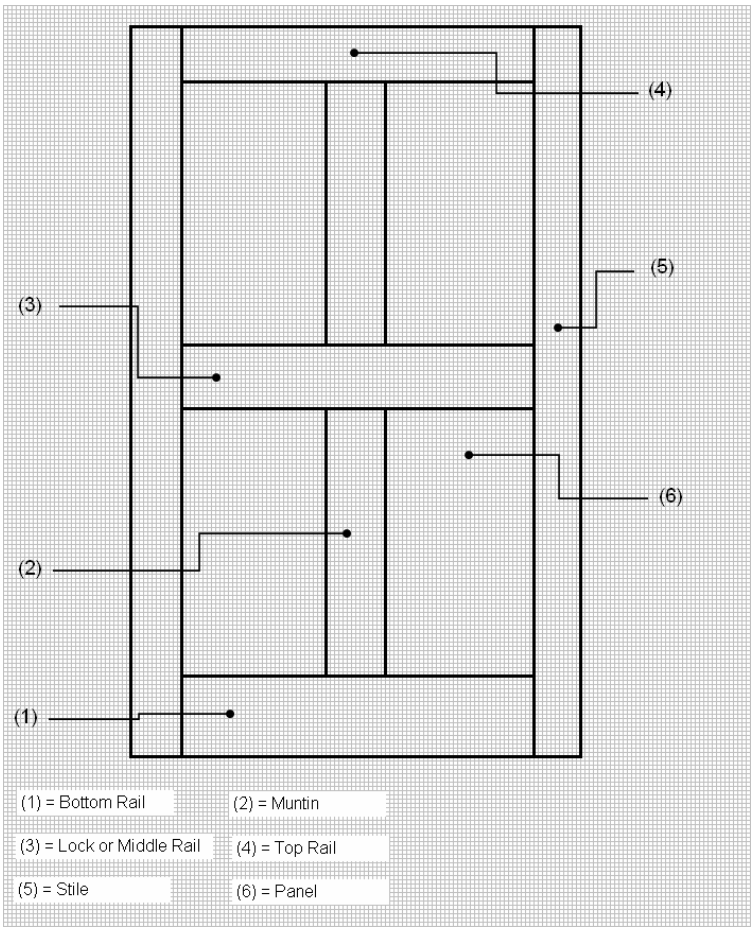
Quarter turn with winders



6

4. (*a*) ***Worksheet Q4(a)*** *shows a Victorian four panel door.*

Using the ***Worksheet****, name each of the component parts.*



3

(*b*) *State **three** functional requirements of a door.*

Three functional requirements of a door can be taken from the following list, this list is not exhaustive.

- Allow access to a building.
- External doors keep the external climate out of the internal environment.
- Security.
- Privacy.
- Insulation.
- Means of egress and escape in case of fire.
- Internal doors can control internal temperature.
- Restrict the passage of sound between rooms. **3**

(*c*) *Flush doors can have a variety of finishes.*

*State **two** suitable finishes for a flush panel door.*

Two suitable finishes for a flush door could be:

- Plywood
- Hardboard **2**

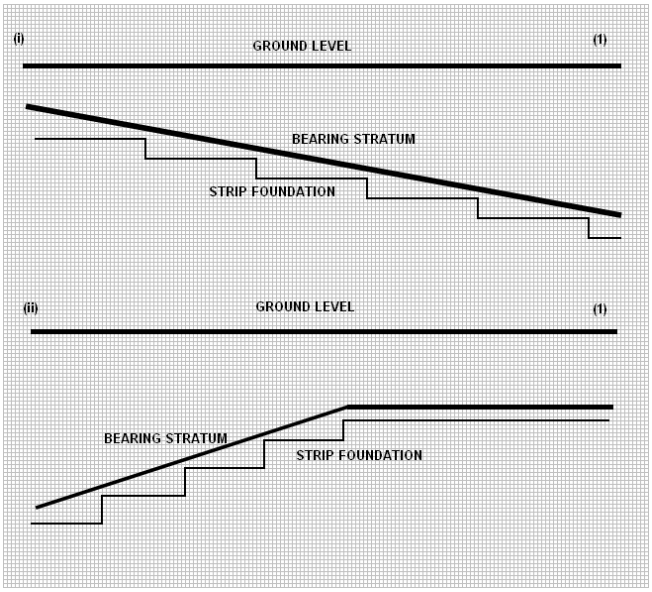
5. (*a*) *State **two** factors which must be taken into consideration when deciding the depth of a foundation.*

Any two factors from the following list would be considered when deciding the depth of a foundation:

- the need for frost cover
- the need to avoid heave
- the need for the foundation to be in the bearing stratum. **2**

(*b*) ***Worksheet Q5(b)** shows the longitudinal section through the ground level and bearing strata for two different ground conditions.*

*Using the **Worksheet** for each situation, sketch a longitudinal section through a strip foundation to show its correct relationship with the bearing stratum.*

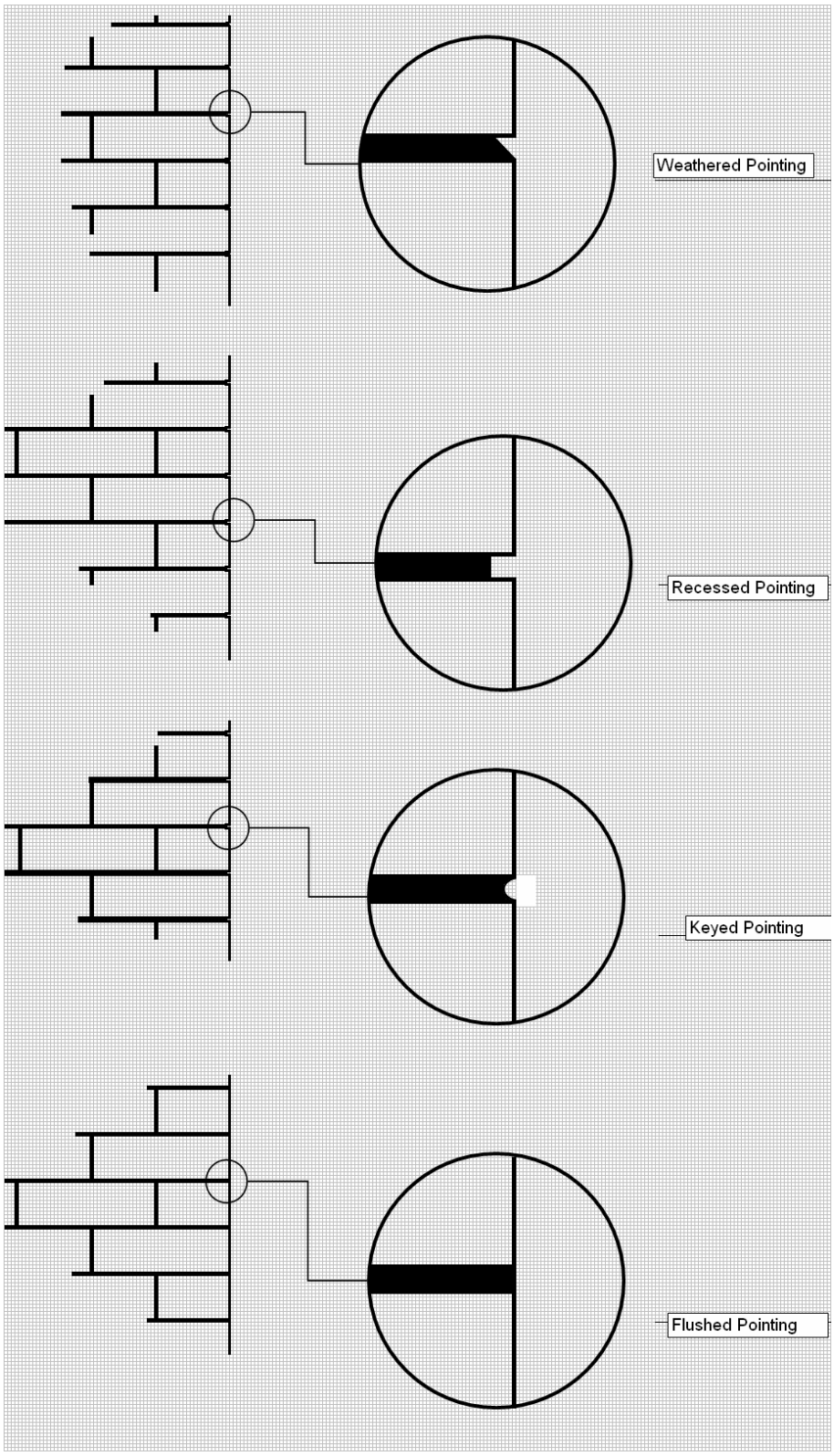


6

Marks

6. ***Worksheet Q6*** *shows four different types of pointing for facing brickwork.*

Using the ***Worksheet****, identify each type of pointing.*



4

SECTION B

Marks

Attempt any TWO questions in this Section (total 60 marks)

7. (*a*) *State **four** factors which should be taken into consideration when establishing a building site.*

- Security and safety.
- Layout.
- Services.
- Site access.
- Site activity.
- Required facilities which meet health and safety requirements.
- Movement of vehicles to and from site. **4**

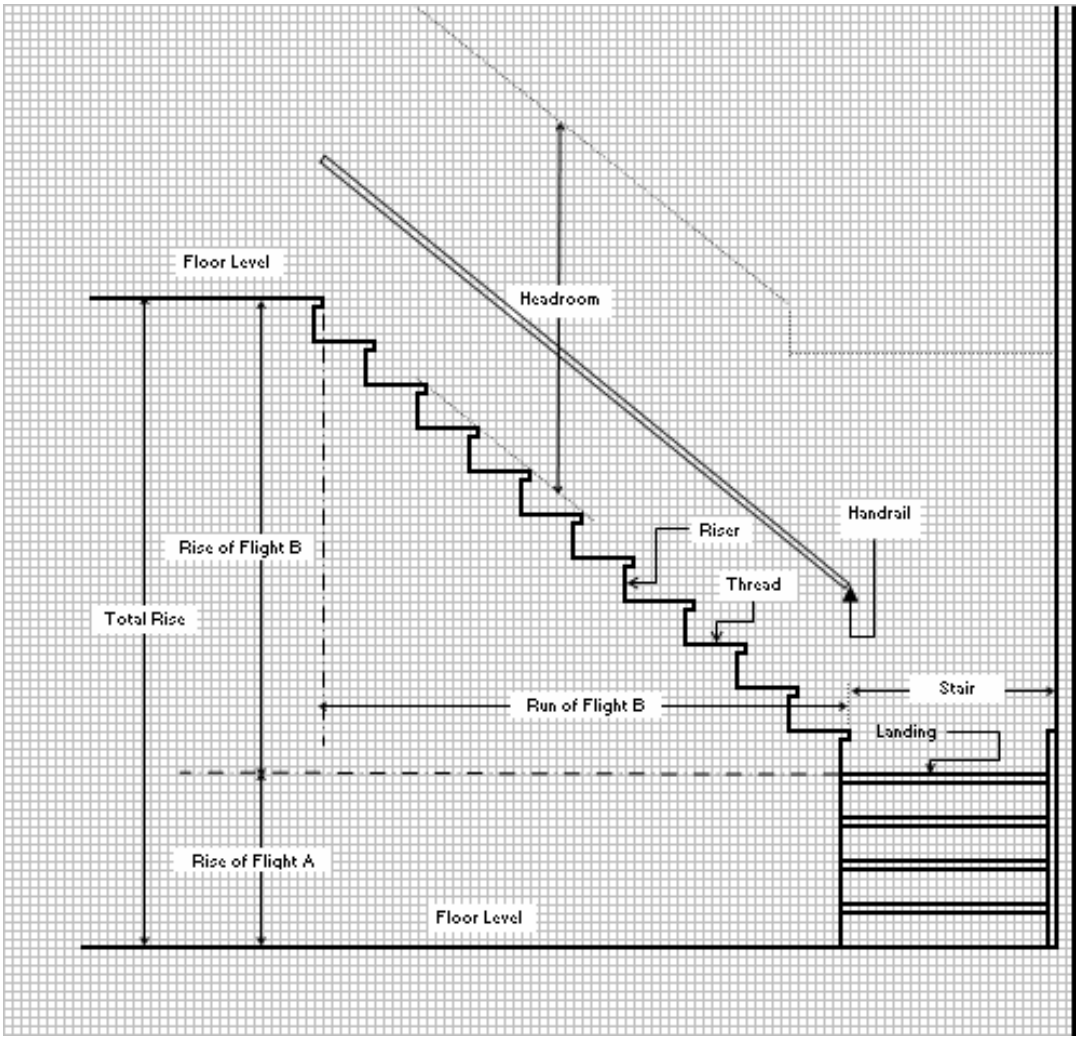
(*b*) *In site investigation, briefly explain why water percolation tests are carried out.*

A percolation test is a method of assessing how much water can drain away through your plot's subsoil (a subsoil porosity test). It is performed by excavating a small area and monitoring the time taken for the water to drop. Normally measured in minutes per inch. **2**

Marks

(*c*) ***Worksheet Q7(c)*** *shows an architects detail of a new timber private stair.*

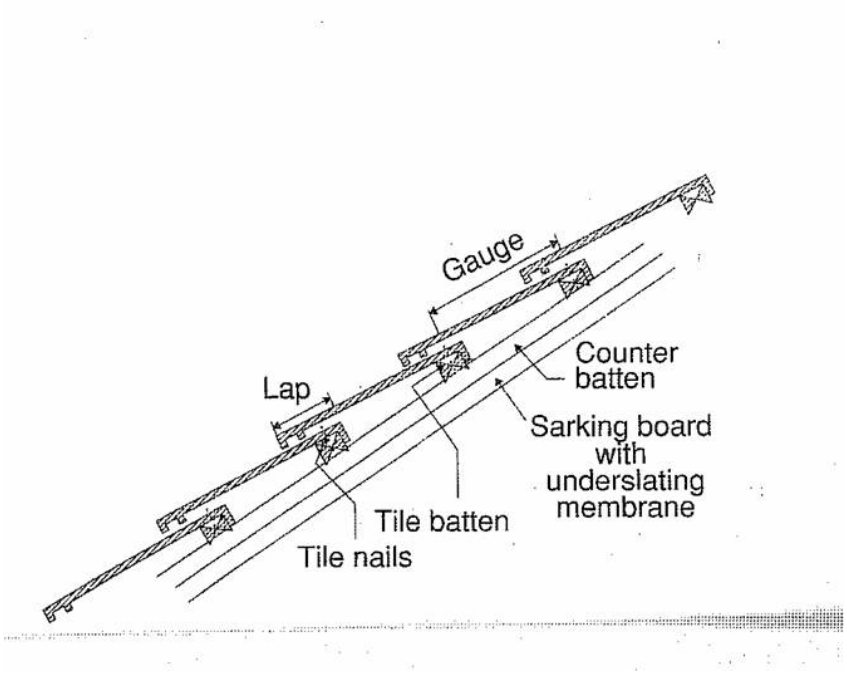
Using the ***Worksheet****, state the name of the parts of the stair numbered 1-12.*



6

Marks

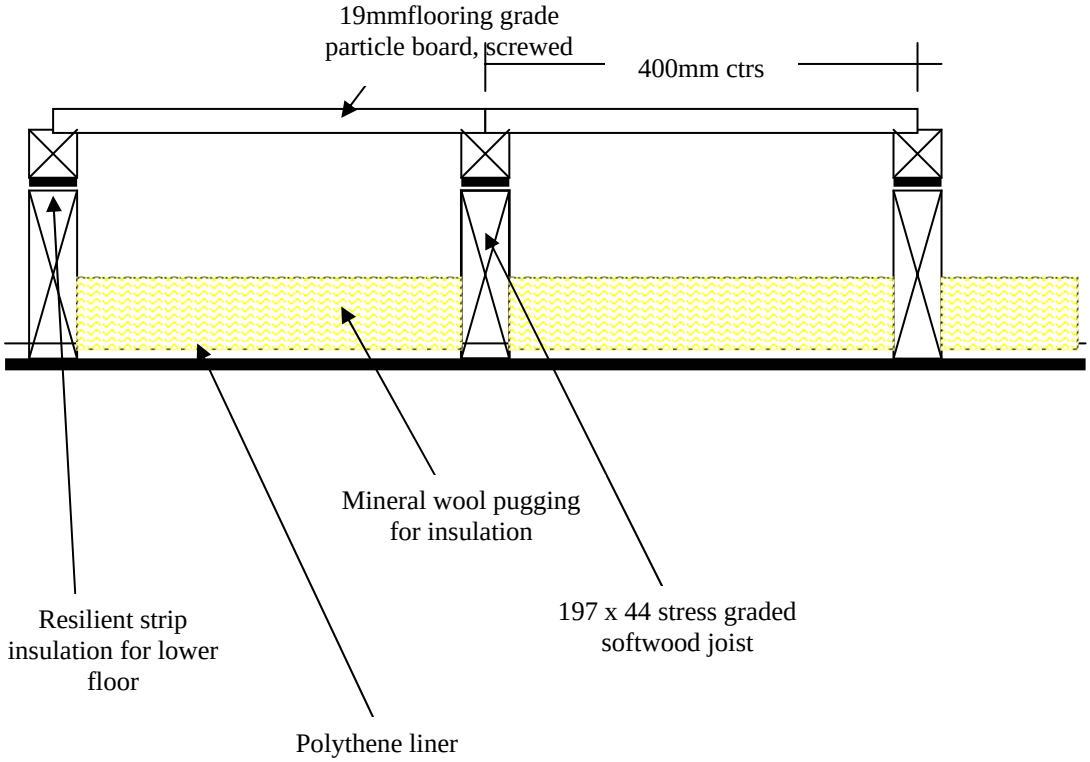
(*d*) *Prepare an annotated sketch to show a typical cross-sectional roofing detail for interlocking concrete tiles on battens and counter battens.*



4

(*e*) *Prepare an annotated sketch to show a typical cross-section through a plasterboard ceiling.*

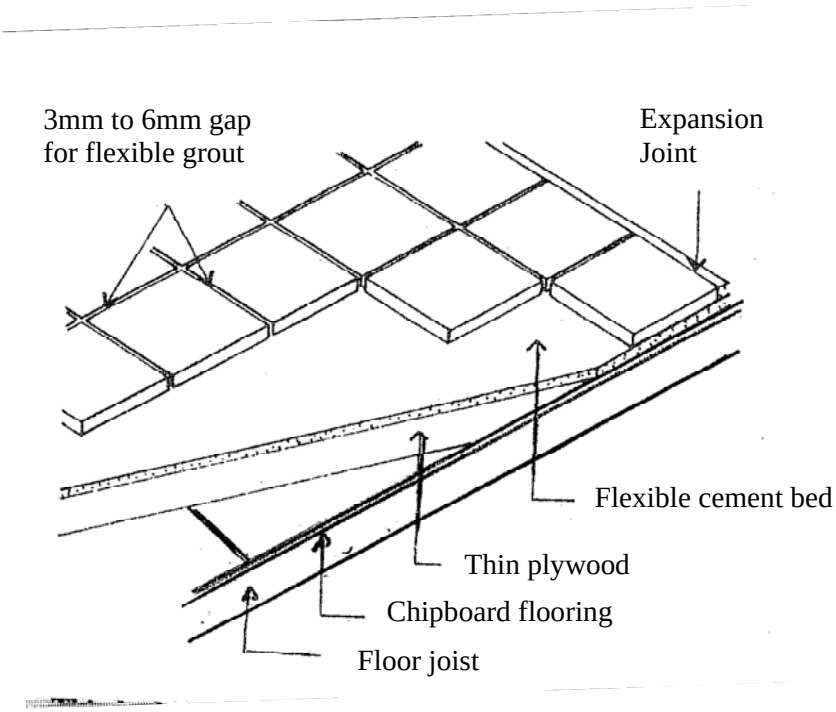
Indicate the method of fixing, finish to the plasterboard and insulation measures.



4

Marks

(*f*) *Briefly explain, with the aid of an annotated sketch, how quarry tiles may be fixed to a suspended timber floor finish.*



2

(*g*) *A building project is being planned within a suburban location.*

(i) *State what signage should be displayed on the perimeter fence.*

- Construction works in progress.
- Unauthorised access is strictly forbidden. **2**

(ii) *State what signage should be displayed at the site entrance.*

- Danger Construction works in progress.
- All visitors must report to reception.
- PPE must be worn at all times.
- No unauthorised entry. **2**

(iii) *What precautions should be taken on site at the end of the working day?*

- All buildings secured and safe.
- Scaffold access ladders removed/locked.
- All excavations should be clearly identified and properly cordoned off.
- Plant and machinery, locked and secured. **4**

Marks

8. (*a*) *Briefly describe how the following construction materials should be stored on a site:*

- *copper piping*
- *insulated plasterboard*

- copper piping – stacked in dry storage and racked
- insulated plasterboard – dry storage elevated off the floor and laid horizontally. **4**

(*b*) *Briefly describe how efficiency and site security can be achieved with regard to each of the following:*

- *handling and storage of materials*
- *items of plant*
- *temporary buildings*

In answering the following question in relation to efficiency and site security with regards to the following:

- Handling and storage of materials – materials should be ordered ensuring minimal lying time onsite, this will (1) minimise demand on premium storage space, (2) materials which are ordered too early may not be included within an interim payment and (3) high value materials should be stored in a secure compound which deters would be thieves.
- Materials compound should be strategically located where it provides direct access and minimises double handling of materials.
- Items of plant – only plant required onsite should be retained and any redundant plant should be put of hire at the earliest convenience. In relation to security, plant should be correctly disabled and left in a manner which causing no harm to others.
- Temporary buildings – when considering site setup, temporary buildings should be located in a location which causes no hindrance to the project and provides maximum security. **6**

(*c*) *Briefly explain **two** safety checks which should be undertaken before excavation commences.*

- Identify any utilities within the site by undertaking a desktop study and detailed cat scan.
- Appropriate protection is available to safeguard others.
- Area being excavated is cordoned to minimise the hazard.
- A safety buffer is put in place to safeguard against overhead cables. **4**

Marks

(*d*) *Describe the process of applying the following render finishes to a dense block background.*

- *Wet dash render*
- *Dry dash render*

Wet dash render – application

- Always ensure the surface render is being applied to is wet.
- If uneven surface a levelling coat is applied and keyed.
- A wet mix of render which includes aggregate is applied to a nominal depth of between 6 – 13mm.

Dry dash render – application

- Always ensure the surface render is being applied to is wet.
- If uneven surface a levelling coat is applied and keyed.
- A finishing cement coat with a nominal thickness of between 6 – 13mm is applied and allowed to semi harden before the pebbles are applied. **8**

(*e*) *State **four** functional requirements of a window.*

- Admission of light.
- Ventilation.
- Resistance to weather.
- Structural stability.
- Fire safety.
- Security. **4**

(*f*) (i) *List the constituent materials which form a concrete mix.*

Constituent materials of concrete mix are

- One part by volume of Ordinary Portland Cement.
- Two parts fine aggregate.
- Four parts coarse aggregate. **2**

(ii) *State **two** recognised time periods for tests to determine the strength of concrete.*

- 7 days
- 28 days **2**

Marks

9. (*a*) *A desk study is the first stage of a site investigation.*

Briefly explain the process of carrying out a desk study and identify the type of information which may be gathered.

A desk study is the first stage in a site investigation; it requires collating all published information about the site and using this information to develop a profile of the site. Once the profile is developed it normally guides future investigations, especially ground investigations. The majority of information gathered during a desk study is from maps, published reports, and photographic records.

Information which may be gathered would include:

- Ground conditions.
- Identification of any utility services on or adjacent to the site.
- Safety of any existing structures. **5**

(*b*) *State **three** main objectives of a site investigation.*

The three main objectives of a site investigation is to identify the following:

- Assess the suitability of the site for the proposed works.
- Enable an appropriate building design to be developed.
- To foresee and minimise difficulties during construction phase, namely ground conditions, etc. **3**

(*c*) (i) *List the main parts of a site investigation report.*

- Introduction
- The site
- Review of the desk top study
- Details of the ground investigation
- Foundation design
- Conclusions and recommendations **6**

(ii) *Briefly describe the content of each part of the report.*

Introduction – General outline of the proposed development and the scope of the investigation.
The site – The location, existing conditions on site and site history.
Review of the desk top study – Review of the desk top study including information from the British Geological Survey, British Coal Authority, Aerial photographs and maps.
Details of the ground investigation – Details of the ground investigation, if undertaken by bore holes, it will include the borehole logs etc.
Foundation design – A recommendation for foundation design based on the findings from the ground investigation and desk study.
Conclusions and recommendations – Based on the evidence, conclude the report and outline the recommendations for foundation design. **6**

(d) *Briefly explain the following terms used in stair construction.*

- *wall string*
- *open tread stair.*

- Wall string – a stair stringer which is against a wall is called a ‘wall string’.
- Open tread stair – open tread stair is one that is riserless. **4**

Marks

(e) *The overall rise of a stair is 2678 mm.*

Calculate a suitable rise, going and pitch of the stair to comply with current standards.

The student is expected to assume that a private stair in a dwelling may have between 12 and 14 risers. In this case if you divide the dimension given 2678 mm by 13 the answer is 206 mm. This is an acceptable dimension for the rise and should proceed to next stage. Less than the maximum 230 mm and therefore fine.

The maximum pitch of a stair is 42 degrees.

Using Trigonometry

Therefore Tan 42 degree = opp÷adj

Tan 42 degree = 206÷adj

Therefore the adj = 206÷tan 42 degrees (tan 42 = 0.90)
Adj = 206÷0.90
Adj = 228.88 mm round up to 230 mm.

One should therefore assume the going to be 230 mm.

Therefore rise = 206 mm
Going = 230 mm
Recalculate pitch to be 41 .85 degrees which is less than 42 degrees and therefore complies with current standards.

Other solutions will be acceptable if the student assumes a different number of risers. **6**

[END OF MARKING INSTRUCTIONS]