Assessment Part 2
Building Elements
Example Load bearing Internal Wall

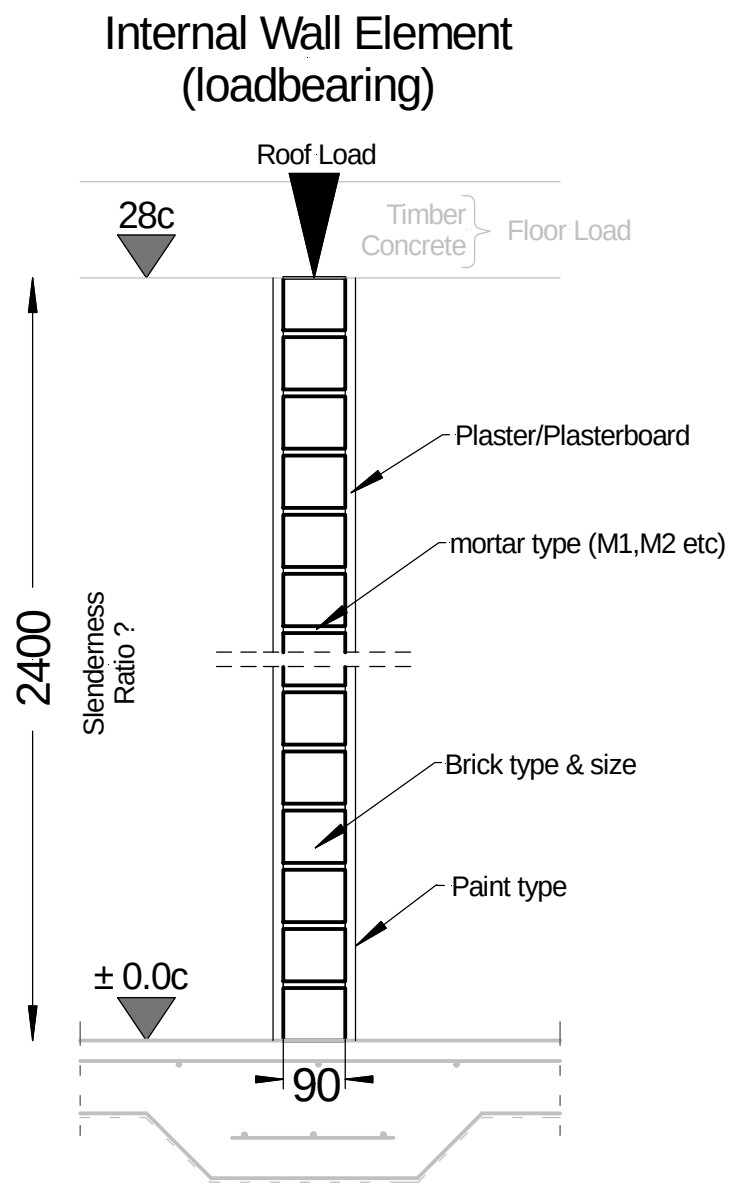
A load bearing wall carries and distributes weight from the roof and floors down to the footing. Damaging a load bearing wall can cause floors to sag, finishes to crack or in the extreme resulting in collapse of the structure.

What information is required for assignment:

- View the building plan and indentify the walls that are load bearing.
- Select one load bearing wall and determine the slenderness ratio.
- Indentify the main material that is used for the wall (eg brick; mortar; plaster/plasterboard; paint; wallpaper etc)
- If the material for the element is short of the eight (8) materials you may select material that is made up of other materials like mortar (cement, lime, sand, water).

Assignment lay out

- Approximately eight (8) pages stapled together at the upper left corner (see info below regarding the required issues to be covered)



Slenderness Ratio
The larger the slenderness ratio, the less strength there is in a column. This means the load bearing capacity decreases as the slenderness ratio increases.
Calculate the slenderness ratio (see notes, BCA &SA3700

Brick
Select a supplier, brick type & size, list all properties that are relevant of the brick (eg. strength, density, etc).

Mortar
State the type of mortar that you will use (cement, lime of compo), Classification (M2, M3, M4 etc) brick (eg. strength, suitability, density, workability etc).

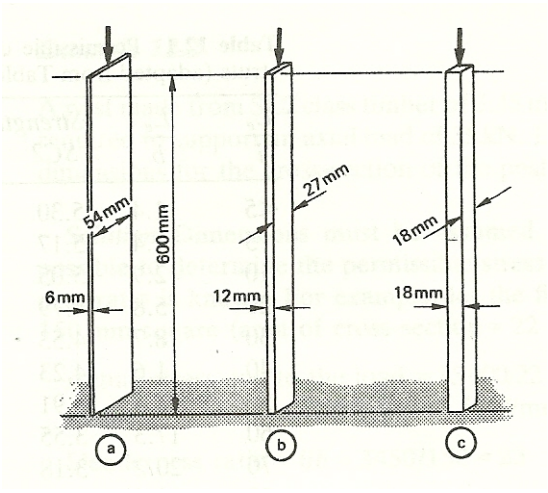
Plaster
Plaster (type, thickness, properties etc)
Plasterboard
(supplier, brand, type, thickness, properties etc)

Wall finish
Paint (supplier, brand, typ e, properties etc)
Wall paper (supplier, type, properties etc)

Optional information

Slenderness ratio ()

The S_r is not only relevant for columns but also applicable to walls. Slim or slender members tend to buckle.



As seen in the opposite sketch there are three different members shown which have to carry a load. Which of the 3 members would carry the greatest load?
(The cross-sectional area of all members is 324 mm².)

The slenderness ratio can be defined as the effective length divided by the least dimension of a column or wall.

Slenderness ratio of
column a = 600/6 = 100
column a = 600/12 = 50
column a = 600/18 = 33.3
in our example 2400/90=26.7 see sketch above.
The higher the S_r the lower is the load bearing capacity.

Mortar

Mortar classification is listed in Table 1 in AS 3700. Mortar mixes are designated by the proportion of their ingredients 1 cement, 0.5 lime, 4.5 sand eg. C1:L0.5:S4.5. Mortar types are M1, M2, M3 and M4. As a general rule M1 is the weakest and M4 the strongest mortar.
The characteristic strength of the brick combined with mortar result in a lesser strength of the brick wall. The strength of mortar is a great deal less than the strength of bricks.

Element Information

You need to write a paragraph for the element covering the following issues:

- references to the Australian standard and the BCA

- properties of the element
  eg. the load bearing capacity
  acoustic properties (R_w rating or STCratings)
  the fire resistant level etc .

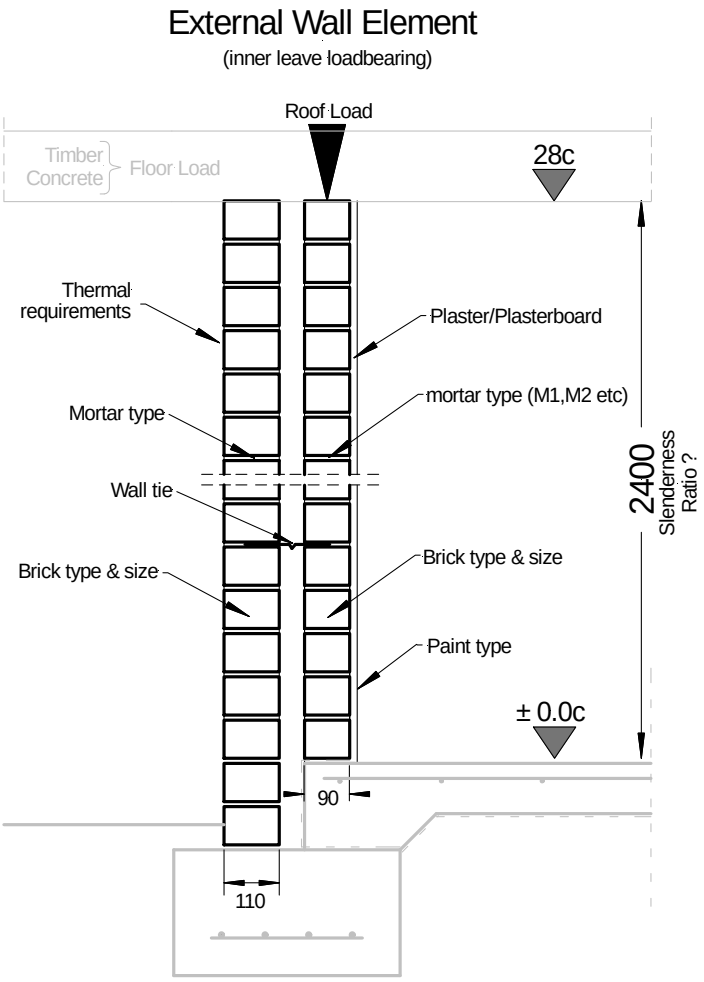
(use visual aids (sketches, photos and diagrams) to your advantage!)

Assignment out lay

The assignment must consist of a cover page, content page and the body (approx. 8 pages). If appropriate you may include a conclusion or recommendation. If you are not familiar with assignment writing and presenting contact your lecturer.
Titles, subtitles, headings and subheadings are commonly deployed to keep track of the composition structure. Use the following make up:

- title and title page (out lay)
- table of contents
- section headings
- figures and diagrams
- lists (simple, bulleted, ordered)
- references (get info from library)
- appendices (attached to the end)

Example Cavity Wall



Address the issues similar requirements as for the Internal wall Element

Additional information:

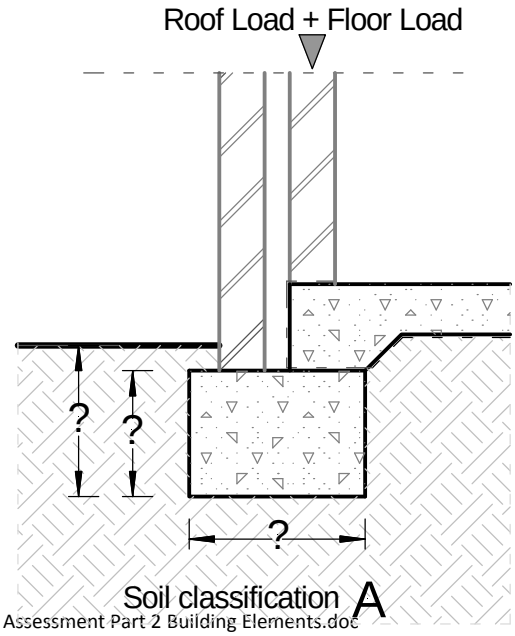
- Thermal requirements
- Wall ties

Not required

- acoustic properties (R_w rating or STCratings)
- fire resistant level

(use visual aids (sketches and diagrams) to your advantage!)

Example Footing



Select all material that is required for the construction of the footing and slab on ground.

The foundation material is classified as **S**

The internal wall load on the edge slab and footing consist of the weight of the roof load, suspended concrete floor slab (172 mm thick) and the brickwork.
List the properties and the testing of the material that is needed and reference the BCA (DTS) and Australian standards for the selected material

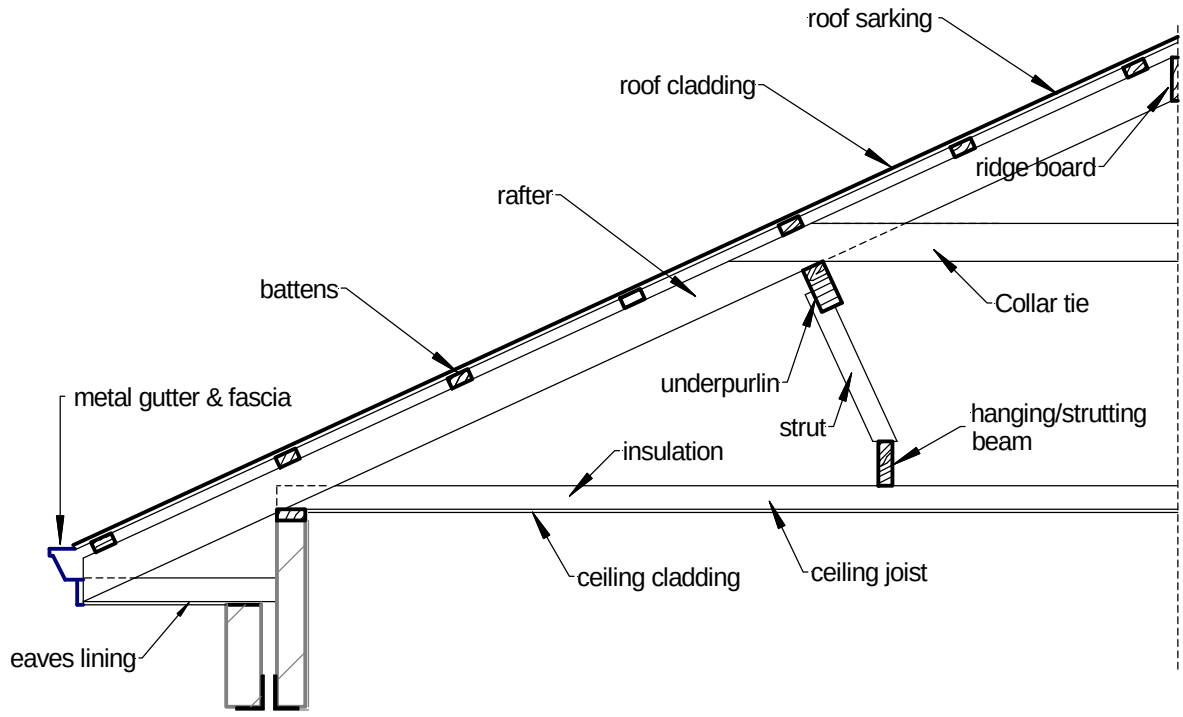
Foundation material
Properties Strength, Density (soil standards and test required) etc.

Concrete Footings & slab-on-ground
Properties strength, density durability (relevant standards and test) etc. List the requirement of ordering concrete and name a supplier.

Reinforcement

Properties strength, density (relevant standards and test) etc. List the requirement of ordering the required reinforcement and name a supplier
Draw a fully labelled sketch (scale 1:10)of the footing and show all dimensions and the placement of the reinforcement.
Write a short paragraph on the changes of the footing system if the soil is classified as class **S**
(what effect will it have on the footing system if there is a characteristic soil movement (y_s) ?)

Example Roof Structure



If you select the roof as element the largest part will be timber with some other materials that's shown in the above sketch. Specify the timber that you will use (stress grade, sizes etc.) and name a supplier for the timber and the accessories (nails, bolts, galvanised straps & brackets etc.)
You must cover all the labelled material and discuss briefly their properties and function.
Select the type of roof cladding and the spacing of battens and type of sarking etc. insulation thickness including R or U value.

http://www.efunda.com/formulae/solid_mechanics/columns/intro.cfm

Read more: How to Identify a Load Bearing Wall | eHow.com
http://www.ehow.com/how_2074043_identify-load-bearing-wall.html#ixzz13dCAi7c0

.Before beginning a home remodeling project, learn to identify a load bearing wall.