



Construct brick and block structures and features

AHCLSC303

By the end of this topic, you should be able to:

- Plan and prepare work
- Set out and prepare the site
- Construct structure or feature
- Check quality of work and clean-up site

You will be directed to complete a number of activities during this presentation.
Compile your responses into one submission and email your work to training@cstc.org.au
with the subject 'AHCLSC303 Activities'

Brick/block landscape features

- There are a range of brick/block landscape features/structures that may be built, including:

Steps



Retaining walls



Fences



Ornamental garden elements

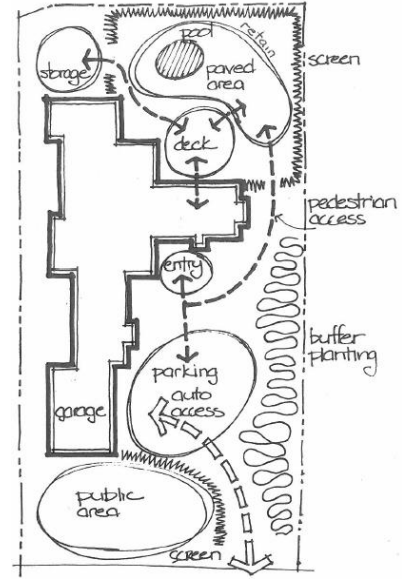


Blocks are large hollow or solid units generally made of concrete.
Bricks are smaller units – either solid or with small cores and are usually made of clay.

Plan and prepare work

- To prepare for brick/block landscape projects, you should interpret plans and specifications
 - Landscape concept plans
 - These are a visual record of ideas
 - Usually rough freehand drawings

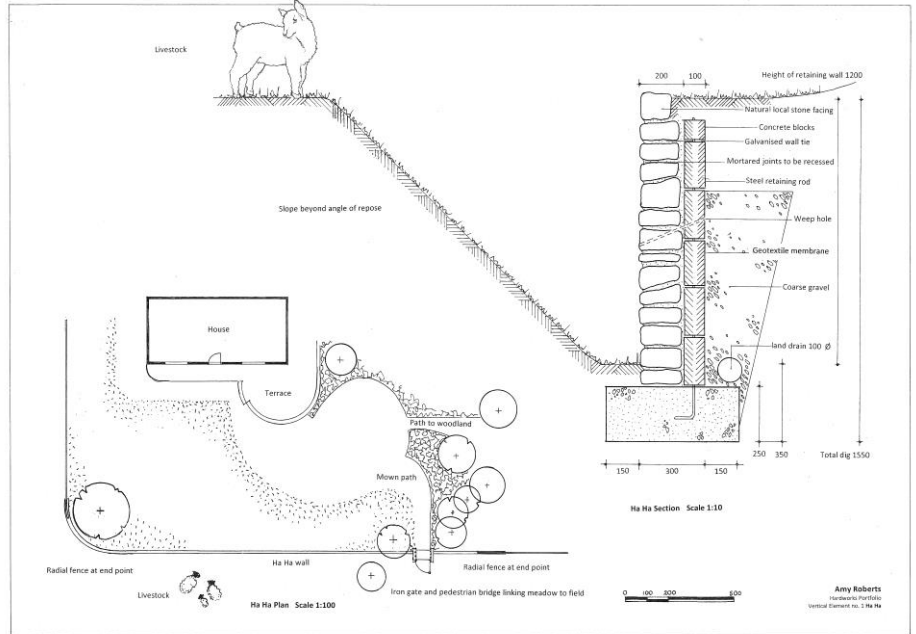
Activity 1: Draw a simple concept plan for a proposed landscape design which includes brick/block work



Plan and prepare work

- To prepare for brick/block landscape projects, you should interpret plans and specifications
 - Landscape plans

Activity 2:
Identify/list the detail
on the landscape
plan shown

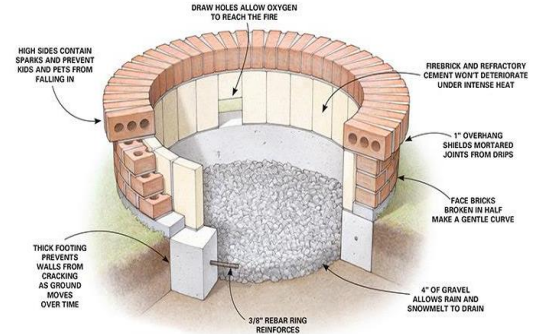
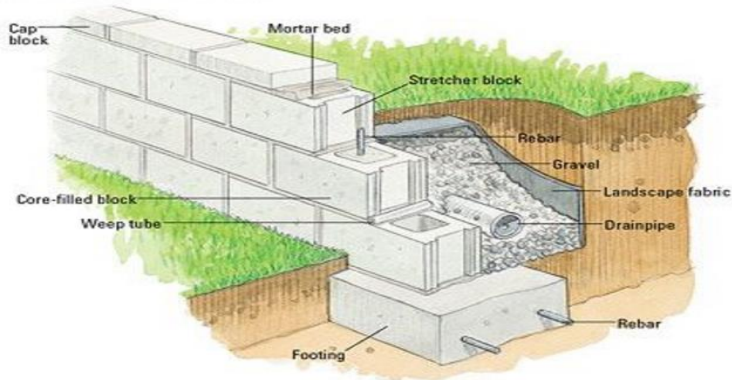


Amy Roberts
Hardworks Portfolio
Vertical Element no. 1 Ha Ha

Plan and prepare work

- To prepare for brick/block landscape projects, you should interpret construction details
 - Details the components of a structure and how they fit together
 - Provides material symbols

TYPICAL CONCRETE-BLOCK RETAINING WALL



Activity 3: List the materials required for the concrete block retaining wall construction plan shown

- To prepare for brick/block landscape projects, you should familiarise yourself with the task requirements
 - Location of services
 - Required materials, tools and equipment
 - Proposed site of brick/block structure/feature
 - Measurements (including depths)
 - Drainage requirements

Plan and prepare work

- The materials to be used for concrete landscaping projects will differ depending on the work to be completed
- However, some common materials include:
 - Bedding materials, such as

Crusher dust



Coarse sand



Decomposed granite



It is your responsibility to check the quantities and quality of materials matches the specifications

Plan and prepare work

- The materials to be used for brick/block landscaping projects will differ depending on the work to be completed.
- However, some common materials include:
 - Bricks and blocks
 - Mortar (i.e. cement and sand)
 - Additives include bonding and colour agents
 - Other admixes may be required in the specifications
 - Drainage system components
 - Damp proofing materials

Activity 4: Research and identify the standard dimensions of brick and concrete blocks

It is your responsibility to check the quantities and quality of materials matches the specifications

Plan and prepare work

- To prepare for brick/block landscaping projects, you should familiarise yourself with the work area
 - Identify any WHS hazards and assess risks (e.g. unauthorised persons in work area, underground services)
 - Consider the environmental impacts of the proposed works (e.g. erosion, redirection of water flow, runoff into stormwater drains)
- Report hazards to your supervisor within a timely fashion – especially emergency situations

Workplace risk assessment

- Risk is measured in terms of the seriousness of the possible **consequences** of the hazard and the **likelihood** that those consequences will occur, as in the matrix shown below:

Likelihood

- 1: Very Likely
- 2: Likely
- 3: Possible
- 4: Unlikely
- 5: Very Unlikely

Consequences

- A: Death or Permanent Disability
- B: Serious Injury
- C: Lost Time Injury
- D: Casualty Treatment
- E: First Aid

Matrix	A	B	C	D	E
1	E	E	H	H	M
2	E	H	H	M	M
3	H	H	M	M	L
4	H	M	M	L	L
5	M	M	L	L	L

Plan and prepare work

- To prepare for brick/block work projects, you should organise required PPE, machinery, tools and equipment
 - **PPE may include:** Face mask, gloves, goggles, long pants, sleeved clothing, wide brimmed hat, work boots
 - **Machinery may include:** Bobcat or excavator, brick saw, cement mixer
 - **Safety equipment may include:**
 - Bunting and barricades to reduce risks to personnel on site (e.g. marking exclusion zones)
 - Signage to convey safety messages – placed visibly in the relevant work area, at eye height
 - **Tools and equipment may include:** Stringlines, Levels (line, spirit), line blocks, profiles, clamps, hammer, bolster, bricklayer's trowel, tape measure, electric grinder, masonry cutting tools, wheelbarrows, mortar boards, buckets, sponges, brushes, pointing tools, raking tools, water hose and water drum



Ensure they are appropriately selected, prepared and used for the task, following manufacturer recommendations

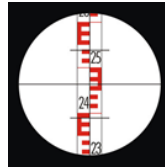
Set out and prepare site

- Follow the steps outlined below when setting up the site:
 - Locate services (e.g. telephone, gas, electricity, water, cable, sewerage)
 - Contact Dial Before You Dig to check the location of such services
 - Mark out the position of the brick/block landscape structure or feature
 - Locate existing elements/structures to take measurements from
 - Mark out the construction area
 - Use chalk on hard paved surfaces
 - Use stringlines and pegs over soil or turf
 - Marking Paint
 - A long garden hose may also be useful for marking out shapes on both hard and soft surfaces



Set out and prepare site

- Follow the steps outlined below when setting out the site:
 - Establish survey benchmarks
 - Benchmarks are based on established datum points
 - A datum is a level surface above or below which all heights are measured – think of it as a ‘starting point’



- The position of the job datum should be clearly marked on site plans
- Benchmarks are fixed points of known height to which other points can be referred
- Benchmarks should be established on positions or structures where they cannot be disturbed by construction activity

Set out and prepare site

- Follow the steps outlined below when setting up the site:
 - **Determine the location and depth of excavations**
 - Peg the reduced levels of the proposed area from the survey benchmark using the rise and fall method in a closed level run
 - Remove any roots, soft earth or debris from the subsoil/subgrade
 - Compact the base of the trench to provide a solid foundation for concrete
 - **Spread and compact the subbase/bedding material**
 - Spread bedding material loosely over the area

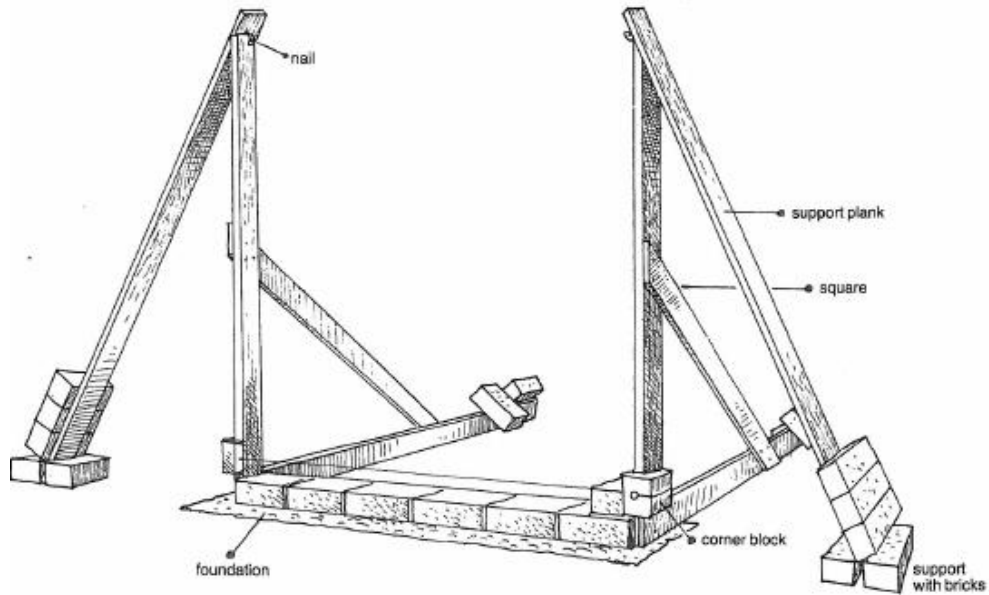


Set out and prepare site

- Follow the steps outlined below when setting out the site:
 - Establish profiles to conform to the designated tolerances
 - A profile is a temporary fixture (e.g. timber pegs with cross boards attached) which assists in determining a structure's position and intended height
 - Stringlines are positioned from profile to profile in the exact position, height and batter of the wall. By sighting through two stringlines (i.e. one at the top of the feature construction and one at the bottom), a plane or finished face can be seen
 - This is the front face to build the concrete structure/feature to

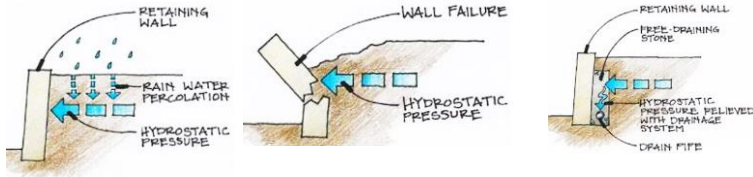


Set out and prepare site



Drainage

- A retaining wall requires drainage to be installed
 - Drainage types include surface and subsurface

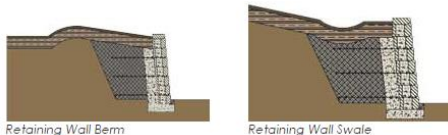


Consequences of poor drainage:

- The wall will act as a dam
- Cracks in the wall due to erosion under the base material
- Walls sinking or moving
- Blocks shifting out of alignment
- Wall failure



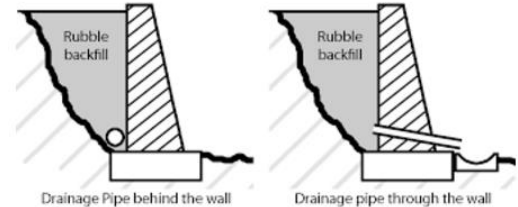
- Installing adequate drainage



Activity 5: List the components for four (4) common surface drainage systems used in landscape construction: Spoon, Channel and grate, Pit, Contour

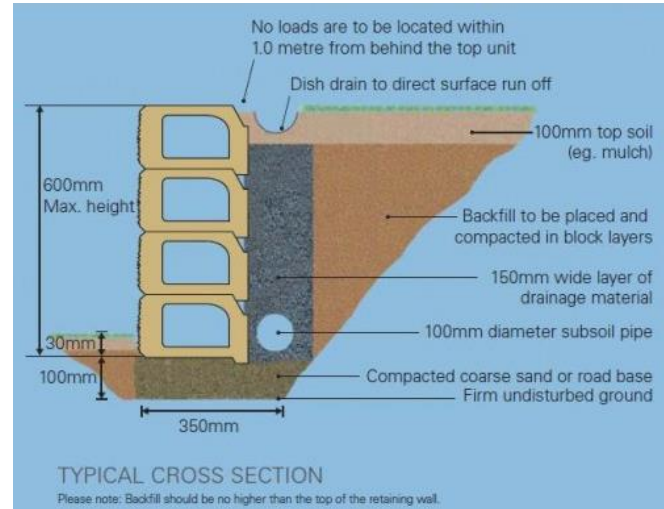
- When do I need drain pipes?
 - All walls taller than 1.2m
 - Sites with poorly draining soils
 - Alongside paved areas
 - Water lines, mains or fire hydrants
 - With slopes above the wall
 - On multi-tiered and terraced walls
 - All commercial and municipal projects

Activity 6: List the advantages and disadvantages of drainage behind and through the build wall (as shown below)



Retaining wall drainage

- Subsurface drainage is installed usually around the first or second courses of blocks
- Conduit / ag-flow pipe / weep holes should be placed at various points in the wall to allow sub-surface water to exist
- This may not always be aesthetically pleasing, hence a rubble drain behind the wall is the most general method



Construct structure or feature

- To establish the required mortar mix, you need to determine the strength requirements for the project

APPLICATION		CEMENT	SAND	AGGREGATE	20kg BAGS OF CEMENT PER m ³
	MORTAR General purpose	1	4	–	15
	Improved workability	1	6	+1 Hydrated Lime	8

- All ingredients should be thoroughly mixed together along with required additives, such as:
 - **Bonding agents:** Increases durability of mortar, improving chemical, corrosion, moisture and salt water resistance of render
 - **Colour agents:** Customises the colour of the mortar
 - **Other admixes:** Surfactant, Methyl Cellulose

Activity 7: Research other admixes

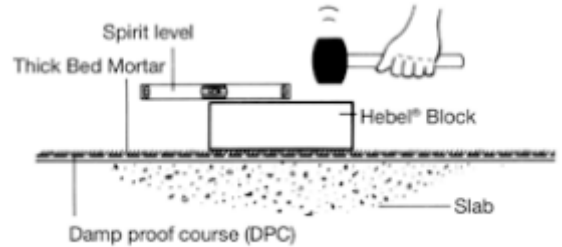
Construct structure or feature

- Often footings need to be constructed when installing brick/block structures or features
 - The footing is responsible for securing the structure/feature into the ground
- A foundation is the excavated trench or hole into which the footing is placed – it is responsible for supporting the structure/feature
 - It is necessary for the foundation to be excavated to a stable base material
 - If there are any areas that are soft fill, they should be compacted and filled with a roadbase-type material
- The concrete should be poured into the foundation continuously, rather than in small sections, to avoid cracking in the structure/feature



Construct structure or feature

- To reduce moisture and mould from passing from the ground to brick/block structures and features, it is important to install damp proofing close to ground level
- For example:
 - **Damp-proof course (DPC):** A barrier of impervious material built into brick/block work to prevent moisture from moving upward
 - Lay **base course** on damp proof course



Activity 8: Research other methods of damp proofing and the materials used

Construct structure or feature

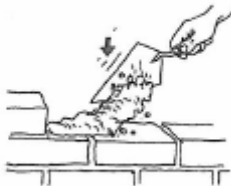
How to lay bricks



Separate a pear-shaped lump of mortar



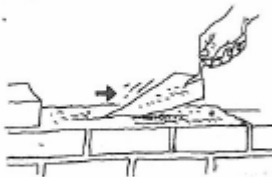
Scoop it onto the trowel



Drop the mortar onto the bricks



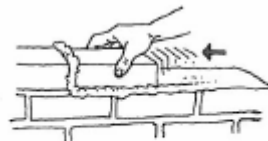
Scrape off the surplus mortar



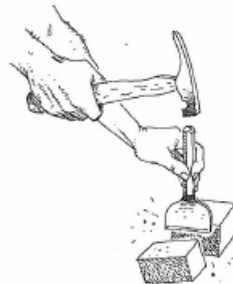
Scrape a groove in the mortar



Butter the end of the next brick



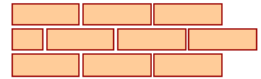
Slide the brick into position



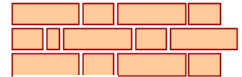
The right way to cut a brick

Place the brick on the ground and position the bolster on the cutting line. Hit the bolster just hard enough to make a mark on the brick. Turn the brick on its side and repeat the procedure. Now place the brick with its underside up and position the bolster on the cutting line again. Give the bolster a good, hard blow. The brick should break all along the cutting lines.

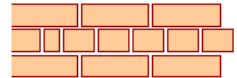
- Continue building the structure/feature
 - Consider the different types of bonds that may be used:
 - Stretcher bond
 - Flemish bond
 - English bond
 - Honeycomb bond
 - To ensure the viability and stability of the structure, apply mortar (usually around 10mm thick) to bind the building bricks/blocks together



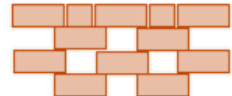
Stretcher bond



Flemish bond



English bond



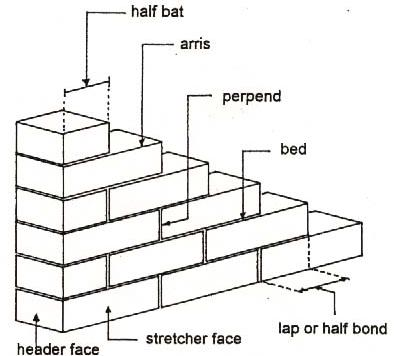
Honeycomb bond

Activity 9: Research the suitability of the different types of bonds across various brick/block work projects

Construct structure or feature

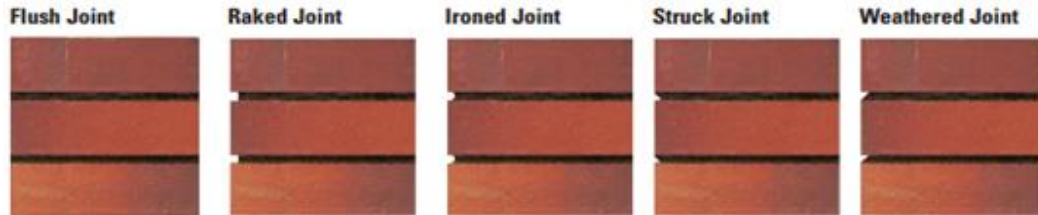
- Tips for laying bricks/blocks:

- Bricks/blocks should not touch the string line (keep 1mm away)
- Lightly tap bricks/blocks into place with the end of your trowel
- Continually check your gauges to ensure there is no 'pig in the wall'
- Work your mortar board regularly
- Use your spirit level to check the level of approximately five bricks in length
- Mortar, extruded from tapping the brick/block down to the string line, should be cut off with an upward stroke of the trowel
- Brush your work regularly
- Joints should be tooled progressively as the bricks/blocks are laid, when the mortar is firm to thumb pressure



Activity 10: Research and list the specifications for mortar beds and perpend (perps)

- Apply finishes to the brick/block work, for example:
 - Raked joints, where the mortar is recessed from the brick face by about 10mm
 - Ironed, using a rounded tool to give a concave or dished look
 - Flush with the block/brick
 - Struck back at an angle



Construct structure or feature

- At the conclusion of the construction process, be sure to clean down brick/block work surfaces

Rake



Brush



Wash



Activity 11: List environmentally safe products for cleaning

- After constructing the brick/block structure, you are required to complete the following practices:
 - Compare the quality of the finished works with the drawings and specifications standards
 - Record and/or report your work outcomes to your supervisor
 - Clean up the work area
 - Shut down, maintain, clean and store machinery, tools and equipment
 - Follow manufacturer's specifications and supervisor's instructions
 - Report faults that are discovered in logbook and/or site records

Activity 12: Have team members take photos and videos of your involvement with brick/block features. Be sure to include all stages of construction.

- After installing the brick/block feature or structure, you are required to complete the following practices:
 - **Dispose of materials that cannot be reused or recycled**
 - Separate soil and waste material (e.g. organic, inorganic and recyclable piles)
 - Ensure that you follow the enterprise guidelines (e.g. JSA and SWMS for handling and disposing of waste)
 - Follow Safety Data Sheets (SDS) and environmental plans to ensure environmentally safe practices

