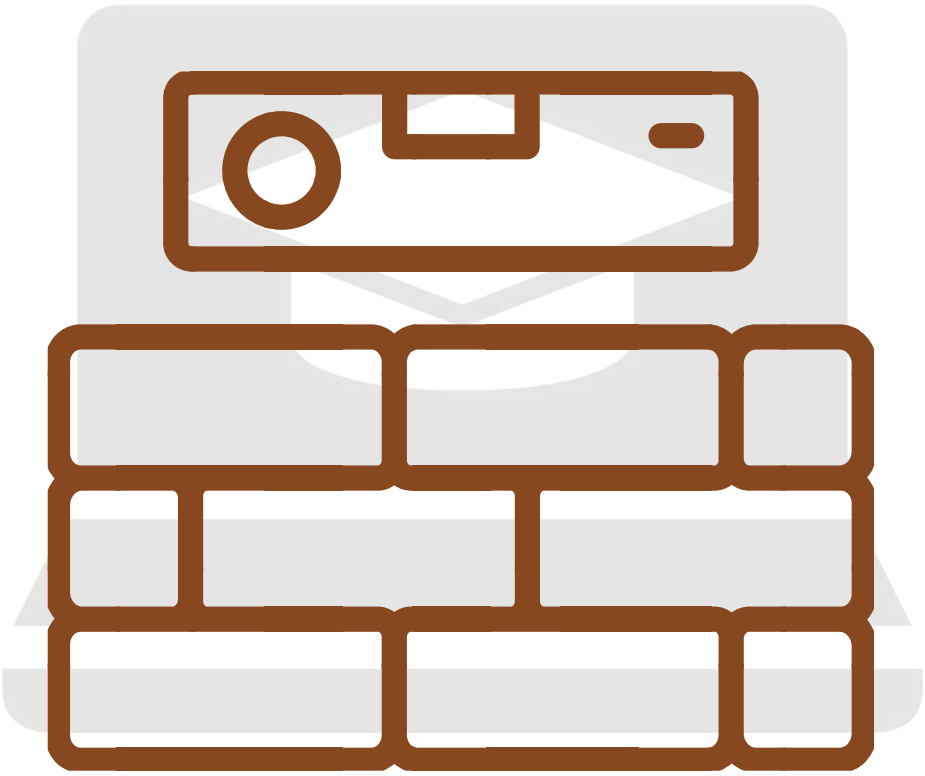
BCATS

BUILDING, CONSTRUCTION AND ALLIED TRADE SKILLS

Retaining wall

Teacher/Tutor resource



Unit Standard 12939 (v5), **Level 2**

Construct a basic retaining wall as a BCATS project. 4 CREDITS

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Teaching and assessment tips

Purpose

This unit standard credits a learner who is able to construct a basic retaining wall to an acceptable standard off given plans and specifications. Evidence must be gathered for a retaining wall with a height between 350mm and 1m, and a total perimeter of not less than 1.2m.

The examples provided in the student resource are of various material and construction methods used to build retaining walls. Providing the retaining wall meets the unit standard's minimum criteria and legal requirements you may choose to use a different design and/or support your students to modify a different design. There are different processes and tools that could achieve the same or similar outcome to the examples provided and they are to take your guidance on these.

Students need to:

- calculate the quantities of materials needed correctly
- prepare an order for materials
- set out and excavate the retaining wall foundation
- construct and finish the retaining wall to an acceptable standard
- complete everything safely
- keep your work area clean and tidy
- clean and store tools, plant and equipment correctly.

Unit Interpretation

A retaining wall between 350mm and 1m high with a perimeter of no less than 1.2m must be constructed according to the plans and specifications. Please see the assessment schedule on the last page of this resource for more-detailed requirements.

A template for creating an order is available in the resource file for student use but you are welcome to use a different one that includes all the requirements as written in the student resource. The completed order, together with any of the learner's calculations must be attached to the Assessor Observation Sheet.

Photographic or other evidence to show that the retaining wall has been completed must be attached to the Assessor Observation Sheet.

Assessment

Information to support assessment decisions should, wherever possible, be collected naturally as the BCATS project progresses.

Assessment of this unit standard consists of:

- **calculate materials required and prepare an order and**
- **completion of a basic retaining wall and**
- **completion of the Assessor Observation Sheet.**

Alignment with other unit standards

Developing programmes that integrate teaching and learning helps to provide students with meaningful and manageable learning opportunities. The following unit standards are not an exhaustive list of which you could include in your programme and nor should one feel obligated to offer all as linked units. Other unit standards you include will depend on your overall programme of study and what best meets your learners' needs.

Constructing a retaining wall can contribute to shared, complementary, or partial assessment of other standards; such as 24350, 24351, and 12927.

Level 2

24358 *Plan and monitor the construction of a BCATS project and quality check the product*

To complete the retaining wall, students are required to work off a plan and specifications to calculate the materials required and prepare an order for materials. This is complementary to the requirements to plan and monitor the stages of construction and do the quality checks required for US 24358.

24360 *Demonstrate knowledge of timber and other construction materials used in BCATS projects*

Alongside the required theory component of 24360, students constructing a retaining wall will use a variety of construction materials suitable for in-ground and above ground use. The retaining wall can therefore be one of the projects contributing to the achievement of 24360.

24357 *Receive instructions and communicate information in relation to BCATS projects*

Projects where students need to work together to successfully complete them provide a lot of opportunities to demonstrate they can receive instructions and communicate well. The retaining wall can therefore be one of the projects contributing to the achievement of 24357.

24354 *Demonstrate knowledge of health and safety legislation and apply safe working practices in a BCATS environment*

Alongside the required theory component of US 24354, the construction of a retaining wall provides students with the opportunity to demonstrate safe practices.

24350 *Identify, select, maintain and use portable power tools for BCATS projects*

24351 *Demonstrate knowledge of and use specified fixed machinery in the construction of BCATS projects*

12927 *Demonstrate knowledge of, select, maintain and use hand tools used for BCATS projects*

The retaining wall can be one of the minimum of two practical projects required for each of the unit standards noted above. While students may not necessarily complete the theory aspects of the standards as part of constructing the retaining wall, they should be encouraged to document evidence of the tools and machinery they selected and used.

Examples of oral assessment questions

1. What types of retaining walls require a building consent?

   Walls over 1.5 metres high.

   Walls lower than 1.5 metres but carrying extra loading on top, such as a driveway, a building or a steeply sloping bank.

2. Retaining walls are usually best constructed with an incline towards the area to be retained. Explain why this is important and identify the ratio of the batter.

   Sloping the retaining wall towards the area to be retained assists in preventing the wall collapsing due to the pressure from the soil behind. The ratio should be no less that 1:4.

3. What drainage material should be used behind a retaining wall?

   300mm minimum clean free-draining gravel.

   Slotted drainage pipe or weep holes at the base of the wall.

4. What information does the manufacturer's instructions for precast concrete blocks provide?

   Foundation type.

   Instructions for constructing the wall.

   Maximum height.

   The amount each course is stepped back.

5. Describe the construction of a timber post and rail retaining wall.

   Poles or posts are securely embedded in the ground and inclined toward the area to be retained. Horizontal rails are then fixed to the inside of the posts.

6. Which end of a post should go in the post hole and why?

   The uncut end, as the cut end has untreated timber exposed and will rot.

7. What does the maximum height for a crib wall depend on?

Type of ground to be retained.

Type of backfill used.

Condition of site drainage.

8. Name 3 factors that affect the quality and quantities of materials required for a retaining wall.

Construction method being used.

Design drawings and specifications.

Finished height and length of the wall.

Any allowance for wastage; for example, if a material is only available in a fixed length.

Assessment Schedule

US 12939 (v5) - Construct a basic retaining wall as a BCATS project (Level 2, Credit 4)

Evidence for credit in this unit standard must be gathered for a retaining wall with a height of between 350 millimetres and 1 metre, and a total perimeter length of not less than 1.2 metres.

Outcome 1	**Calculate quantities and prepare an order for materials for a basic retaining wall.**	Assessment evidence and judgement
PC 1.1	Quantities of materials are calculated from working drawings and job specifications.	Evidence gathered from student's calculations and the assessor observation sheet showing: • quantities of materials are calculated correctly.
PC 1.2	An order for materials is prepared in accordance with workplace practice.	Evidence gathered using order list. • order is legible and correct measurement units are used.
Outcome 2	**Construct a basic retaining wall.**	**Assessment evidence and judgement (please take photos to verify)**
PC 2.1	Retaining wall foundation is set out and excavated in accordance with working drawings and job specifications.	Evidence gathered from retaining wall project and the assessor observation sheet showing: • set out and excavation is neat and accurate.
PC 2.2	Retaining wall is constructed and finished in accordance with working drawings and job specifications.	Evidence gathered from retaining wall project and the assessor observation sheet showing: • retaining wall is constructed and finished correctly.
Outcome 3	**Complete work operations.**	**Assessment evidence and judgement**
PC 3.1	All operations are safely completed in accordance with workplace practice.	Evidence gathered from retaining wall project and the assessor observation sheet showing: • appropriate PPE selected and used • tools and materials used correctly and safely • personal safety and safety of others observed.
PC 3.2	Workplace, tools, plant and equipment are cleaned, and tools, plant and equipment stored in accordance with workplace practice.	Evidence gathered from retaining wall project and the assessor observation sheet showing: • work area cleaned • waste disposed of • tools, plant and equipment cleaned and stored correctly.