



Including Examiner Comments

R3113

**UNDERSTANDING THE SETTING OUT & CONSTRUCTION OF LANDSCAPING
ELEMENTS IN THE GARDEN**

Level 3

Thursday 20 June 2024

13:30 – 14:55

Written Examination

Candidate Number:

Candidate Name:

Centre Name:

IMPORTANT – Please read carefully before commencing:

- i) The duration of this paper is **85** minutes;
- ii) **ALL** questions should be attempted;
- iii) **EACH** question carries **10 marks**;
- iv) Write your answers legibly in the spaces provided. It is **NOT** necessary that all lined space is used in answering the questions;
- v) Use **METRIC** measurements only;
- vi) Use black or blue ink only. Pencil can be used for drawing purposes only. Ensure that all diagrams are labelled accurately with the line touching the named object;
- vii) Where plant names are required, they should include genus, species and where appropriate, cultivar;
- viii) Where a question requires a specific number of answers; only the first answers given that meet the question requirement will be accepted, regardless of the number of answers offered;
- ix) Please note, when the word '**distinct**' is used within a question, it means that the items have different characteristics or features.

ANSWER ALL QUESTIONS

MARKS

Q1 Describe the construction of an in-situ concrete path 1m wide by 10m long on a prepared foundation under the following headings:

- i) shuttering
- ii) movement joints
- iii) concrete specifications
- iv) surface finish
- v) curing

2
2
2
2
2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Please see over/.....

MARKS

Dotted lines for writing.

Total Mark

Please turn over/.....

MARKS

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Please turn over/.....

Total Mark

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

b) Specify the materials and mix ratio for the mortar when building a garden wall with concrete blocks.

2

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Total Mark

--

Please turn over/.....

Q8 a) State the purpose of a gravel board for **ONE** named type of fence.

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

b) Name **ONE** type of fence with posts made from **EACH** of the following materials and give appropriate specifications for **EACH** post:

- i) metal
- ii) concrete

3

3

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Please see over/.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

c) State how the fence is attached to the posts for **EACH** type stated in in b).

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Total Mark

DO NOT USE THIS PAGE

DO NOT USE THIS PAGE

**©These questions are the property of the Royal Horticultural Society.
They must not be reproduced or sold.**

**The Royal Horticultural Society, Wisley, Woking, Surrey GU23 6QB.
Charity Registration Number: 222879/SC038262**

R3113 Examiners Report June 2024

General points:

Where a plant example is chosen, it is important to write the *FULL* botanic name and not just a partial name, following the correct naming protocols.

Where named plant examples are required, **common names are not credited** at level 3. Spellings of scientific terms and botanic plant names need to be full and accurate - poor spellings may be penalised.

Where a number of answers are asked for e.g. **THREE** environmental conditions, only the first three in a list will be marked.

Question 1

Describe the construction of an *in-situ* concrete path 1m wide by 10m long on a prepared foundation under the following headings:

Apart from part iii. which is purely specification, marks were awarded: 1 x mark for description/definition/purpose of the stage **and** 1 x mark for the specification.

i. shuttering

Candidates who were able to describe both the purpose of shuttering (to contain the concrete, form the shape of the path or provide a neat/clean edge) along with a suitable specification (type of timber, dimensions and method of fixing) gained full marks.

An example of a good answer was:

“Drive in wooden pegs in at the corners and along the sides, in line with marking out strings, and with the tops at the required level, as previously specified above, and set out, equal to 100mm to 150mm depth of concrete for a path.

Use shuttering boards at both ends of the path and down the sides, with the top level with the pegs so that they can be used as the guide for levelling using a length of timber to contain the concrete and form the path shape.”

ii. movement joints

Candidates who described the purpose to allow for expansion or prevent cracking under varying weather conditions gained a mark. Those who describe the joint spacing as minimum 3m intervals across the path or a method to achieve this gained the 2nd mark.

Good answers included:

“Movement joints or expansion joint, every 3 metres, a gap of approximately 5mm will be left that allows for to allow for contraction and expansion once the concrete has set.”

Methods to create the joint could be the use of timber board or specific foam product.

iii. concrete specifications

Candidates who named 1 x part Ordinary Portland Cement (OPC) and 4, 5 or 6 parts ballast gained marks. Many candidates missed marks by suggesting a different ratio or naming just sharps sand with no aggregate.

iv. surface finish

The best answers described both the method or finished effect and the reason for it.

Reasons most often included safety/non-slip for rough/ribbed finishes. Imprinted effects for aesthetic decorative purposes were also accepted.

Good answers included:

“Tamped finish once the concrete has been poured and levelled will smooth out inconsistencies and create a ribbed surface to provide a non-slip abrasive surface, alternatively you may allow for the concrete to half cure after levelling and brush the surface off with a yard brush to expose the aggregate under the top surface of cement.”

v. *curing*

Many candidates did not show an understanding of the curing process which ensures a strong bond. Many answers mentioned the need to “allow the concrete to dry fully”.

The best answers included a time frame of several days, 48hrs plus.

An example of a good answer included:

Chemical process in which concrete hardens by hydration over several days. Water content must be kept constant during this time. The concrete may need misting with water or covering with damp hessian sacking to prevent water loss.

Question 2

Describe for a new parking area in a front garden:

i) *implications of ONE NAMED piece of planning legislation in relation to drainage (5)*

The majority of candidates were able to name SUDs (sustainable drainage systems legislation), very few went onto describe the need to apply for planning permission **only** if the driveway was more than 5m² in area.

May candidates were vague about the implications of the legislation, they most often described the use of non-permeable surfaces, few described the impact of water runoff.

An example of a good answer was:

“2008 SUDS (sustainable urban drainage system) legislation requires that any area of impermeable surfacing above 5 metres squared must be given planning permission. SUDS requires run off water to be dealt with onsite rather than overwhelming public drainage”

ii) **ONE** *method for collecting and recycling the water drained from the area (5)*

Any method candidates could have described needed to include a method for collecting the water from the drive, a method for moving and storing the water along with a way to use the recycled water.

Poor answers tended to describe the movement of water into a channel or gully to drain into a planted area. This is not collection.

The best answers included a storage tank or system along with a method to pump or move the water out for use for irrigation in the garden.

A good example is:

“Rainwater can be collected and recycled by ensuring that the fall directs any water into a collecting drain or gully which is sized to take the expected rainfall plus 30% for climate change. The drain or gully takes the water to an underground tank, which could be under the drive, or under an adjacent area of garden.

The tank stores the water for later use in irrigation or other uses.

To retrieve the water there will need to be a pump or a dipping chamber.”

Question 3

a) State **THREE** methods of controlling weeds while soil is being stored giving **ONE** limitation of **EACH**. (6)

This part question was well answered by many candidates who gave examples such as

- hand weeding – limitations: labour intensive, ineffective with deep/fragile roots, could break up roots and cause further infestation
- chemical control using herbicide such as glyphosate- limitations: professional expertise/certification required, effects on the environment, timing/seasonal issues with systemic herbicides
- covering with sheet material – limitations: not practical and expensive over large area, degradation of plastics, wind, possible exclusion of water and run-off problems, unsightly
- growing temporary cover crop such as clover– limitations: maintenance issues whilst in storage long term only, reliant on season, re-instatement issues (spreading seeds)

Poor answers included those who repeated coverings with different materials.

b) Explain why sub-soiling may be necessary prior to reinstating top soil on a site. (4)

This part question was not answered to the same standard as part a) but was generally well answered with candidates describing the need to relieve sub soil compaction on construction sites.

The best answers described both the causes of compaction and reasons why it should be carried out.

A good example is:

“The subsoil may have become compacted by being travelled over by site vehicles and staff during the construction and hard landscaping phases of the project.

There could also already have been an impervious pan caused by previous site cultivation practices such as repeated ploughing to the same depth.

The subsoil will need to be broken up to improve the drainage and to increase the root growing space for plants growing in the topsoil above and allow deeper rooting plants to establish.”

Question 4

a) *Describe how to set out an irregular island bed from a scale plan. (7)*

Very few candidates gained all 7 marks, often omitting the initial stage of taking measurements from the scale plan and the final stage of marking out the island bed.

Most candidates described the use of offsets to set out the bed on the ground.

Those that included the establishment of reference points to position a fixed base line, or multiple base lines to increase accuracy, on plan and transfer these to the ground around the location of the bed, taking measurements along the base line to known points, and measuring out at a right angle to the known distance for several points on all sides of the bed, gained good marks.

These points could then be joined to form the outline of the bed, using string or spray paint.

Better candidates realised that two or three baselines would increase accuracy.

b) *State THREE problems that could be encountered in the interpretation of a scale planting plan when setting out plants on the ground. (3)*

A well answered question, the most often given problems were:

- Colour plan reproduced in black and white
- Symbols not clearly differentiated
- Plan has been photocopied to a different scale
- Spacings shown not appropriate to plants supplied
- Plan becomes indecipherable due to wet weather

Question 5

*Describe the construction of a flight of three steps using **NAMED** materials. (10)*

NOT TO INCLUDE SETTING OUT

Many candidates struggled with this question.

Some candidates read the NAMED materials part of the question and named a very large list of materials, giving multiple different ones which could be used for the same function, such as the riser. There was an expectation that to describe the construction of a flight of steps that candidates would include a tread and a riser, but some did not give both.

Again, some candidates gave a comprehensive answer as to the initial preparation, excavation and numerous details as to the sub-base, but failed to include more than a few points as to the step construction.

Some candidates described the whole process as if it was to be carried out on flat ground.

A correct answer could describe the construction procedure to include:

- Excavate and form slope / formation level as required and consolidate
- Install a foundation for the risers – 100-150mm depth, concrete.
- Construct the first riser to a maximum of 150mm height - options here could be laying engineering bricks with mortar, or installing a soft wood sleeper.
- Backfill behind riser with hardcore/concrete or Dtp1
- Lay the first tread onto the riser (concrete of stone slab, max 350mm depth, for brick riser, with small overhang and slight fall towards the front.)
- Construct the second riser
- Backfill as before and repeat procedure for three steps

Question 6

For the construction of a timber pergola;

i) Describe the foundations (3)

Foundations could be either concrete or steel socket; most candidates described a concrete foundation. Marks were awarded for the dimensions of the hole, width and depth, for a 100mm x100mm post a width of 300mm square and depth of 600mm was correct.

Marks also awarded for the specification of the concrete, ratio 1:4/5/6 OPC to ballast.

A few candidates used set in steel socket which also gained marks. Method of fixing, i.e. set in concrete, driven into ground or bolted down with description of steel socket (i.e. galvanised / painted, clamp or bolt post fixing, dimensions, e.g. 100X100mm), depth e.g. 600mm

ii) Give the specifications for the uprights (3)

Generally well answered by candidates who were able to describe the dimensions, source and type of specific timber, finish, shape and size.

Good examples included

- Oak hardwood, from FSC source, square beam, 150mm x 100mm planed finish
- Soft wood *Pinus* species, Round 100mm, Tanalised, rough sawn finish.
- BUT numerous candidates did not take into consideration that the posts were being put into a hole 600mm deep. They therefore recommended a post 2.4m tall, which after being sunk into hole would only be 1.8m above ground. **The specification should therefore be given as length e.g. 3000mm OR Finished height above ground of minimum 2.4m**

*iii) Describe **ONE** method of attachment of the beams to the uprights (4)*

Generally poorly answered, with some candidates describing notched timber upright and post. The most commonly given methods for attachment were

- Drilling into the posts to attach with bolts or screws, this method gained least marks
- Attaching hanging brackets to the posts, along with dimensions and specification of the bracket and the fixing bolts.
- Chiselling a notch into the post into which the beam sits, along with dimensions and specification of the fixing bolts.
- Cutting a half lap joint into the post and beam, along with dimensions and specification of the fixing bolts.

An example of a good answer was:

“Cut a slot into the top of the post. The slot will be the width and depth of the beam and go through the post from one side to the other, leaving sufficient wood on each side for support for the beam when it is inserted into the groove e.g. 75mm deep x 25mm wide. Pre-drill the holes to bolt the beam to the post using 2 x stainless steel coach bolts 10mm x 150mm”

Question 7

a) Describe **FOUR** distinct methods of reducing damp penetration into a garden wall. (8)

Candidates who named and then went on to describe 4 different methods to prevent water/damp penetrating a garden wall from the base or the top, gained marks.

A large number of candidates also described methods of drainage for retaining walls and could not be awarded marks.

Suitable answers could have included:

- Non permeable sheet material (i.e. plastic, bitumen felt) as damp proof course at base of wall, laid into the base course of brick.
- Engineering bricks, slate or tiles as damp proof course at base of wall.
- Slate or stone coping at top of wall which overhangs and with a drip groove, directing water away from the wall
- Rendering or tanking of the wall sides, using concrete render.
- Angled or weather struck pointing, angled into the recess, sloping away from the joint

b) Specify the materials and mix ratio for the mortar when building a garden wall with concrete blocks. (2)

Candidates who named 1 x part Ordinary Portland Cement (OPC) and 5 x parts builder's sand gained full marks. Answers in the range 1:4 -1:6 were accepted.

Many candidates missed marks by suggesting a different ratio or not naming a specific sand as builders. Candidates suggesting the use of sharp sand and ballast did not gain full marks.

Question 8

a) *State the purpose of a gravel board for **ONE NAMED** type of fence. (2)*

Candidates must first name a type of fence which could incorporate a gravel board. Named fences could be: Post and panel or Featherboard / Close board.

The correct purpose of a gravel board most often given was to hold a timber fence away from damp soil/ground to prevent water ingress into timber, preventing rotting. The purpose could also be to retain soil on sites with small level changes on the boundary/fence line.

Candidates who simply said the purpose was to “stop timber rotting” did not gain full marks.

b) *Name **ONE** type of fence with posts made from **EACH** of the following materials and give appropriate specifications for **EACH** post:*

Candidates who named a suitable fence with posts made from each material gained a mark, those who were able to describe the specifications of detail of type of metal, dimensions, surface finish, or shape of these gained a further 2 marks

Suitable answers included:

i) *metal (3)*

Chain link fence, specification of posts to include type of metal, dimensions, finish or preservative, configuration, e.g. are made with galvanised angle iron, approximately 1.4m tall

ii) *concrete (3)*

modular panel fencing using 100 x 100 x 2400 mm concrete post with slots on opposite sides to slot the panels into place. Post with rounded, domed top.

c) *State how the fence is attached to the posts for **EACH** type stated in b). (2)*

Candidates who did not name suitable fence types in part b) did not achieve marks for part c).

Those gaining marks included some detail on the way the substance of the fence is attached to the posts described in b).

Examples of good answers for the above examples are:

- (i) The chain fence is attached to the main post, rolled out along the intermediary posts until the next braced post. It is then attached using eyebolts and a stretcher bar is used to tighten. It is then secured into place with cleats.
- (ii) panels are slotted into grooves on opposite sides of the concrete post.