



R3113

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

Level 3

Thursday 22 June 2023

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

The construction of a new large slab patio and raised pond requires the removal of an old concrete slab.

Describe how **EACH** of the following can be planned for:

- i) **TWO** specialist services which may need to be involved
- ii) **ONE** method of waste management
- iii) **TWO** requirements for site security

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MARKS

b) State **TWO** problems that could occur when interpreting a key on a design plan.

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c) State **TWO** materials used for marking out irregular features on the ground.

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Q6 a) State **FOUR measures that can be taken to maintain biosecurity when handling and storing soil on a construction site.**

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b) Describe the process of reinstatement of stored soil to an area that has been previously stripped during construction.

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c) Give recommended depths of reinstated soil for **TWO** distinct horticultural situations.

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

R3113

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

Level 3

Thursday 22 June 2023

Candidates Registered	87		Total Candidates Passed	66	82%
Candidates Entered	80	92%	Passed with Commendation	37	46%
Candidates Absent/Withdrawn	6	7%	Passed	29	36%
Candidates Deferred	1	1%	Failed	14	18%

General comments

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 penalized.

Questions - It is essential to read the question carefully and to note the **key words** before starting to write to ensure answers are relevant. Candidates should take account of the command statements in the question e.g. 'list', 'describe', 'explain', together with the mark allocation, to judge the depth of the answer required. Extra information, even if it is accurate, does not gain extra marks.

Where a number of answers were specified in the question and a candidate gave a list with more than that number, **only the first answers** in the list were marked, e.g. where the question stated 'Name **TWO** locations' or 'State **TWO** ways' only the first **TWO** answers were marked even if the correct answers were given further down. It is helpful (but not essential) if the answers are numbered in the text or separate paragraphs or bullet points are used.

Plant names - Where named plant examples were asked for, **full botanical names are required** to achieve full marks: genus, species and where appropriate variety, cultivar etc. needed to be written and spelt correctly. Where genus alone was given, all species in that genus need to show the characteristic asked for to gain any credit. **Common names were NOT accepted** and misspellings were penalised. Candidates needed to use unambiguous plant examples from sources such as the RHS Plant Finder and/or the RHS A-Z Encyclopaedia of Plants together with examples given in the syllabus and avoid obscure or difficult to verify plant examples, which risked being not credited.

Labels on diagrams must be carefully and correctly positioned to avoid ambiguity. Marks can be easily lost if this is not followed. Labels must actually touch the appropriate part of the diagram and must not be left hanging in mid air. Annotations on diagrams can be accepted as an alternative to description in the text as long as these are clear and answer the question. No marks were awarded for artistic merit or for unlabelled diagrams.

Continuation sheets - Where these have been included, it is vital that the relevant question number is included in the left hand margin if information written here is to be considered. These should also be attached to the answer booklet in the appropriate place and candidates should indicate in their answer booklet that they have written part of their answer on the attached sheet/s.

Q1 The construction of a new large slab patio and raised pond requires the removal of an old concrete slab.

Describe how **EACH** of the following can be planned for:

- i) **TWO** specialist services which may need to be involved
- ii) **ONE** method of waste management
- iii) **TWO** requirements for site security

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**Q1**

- i) Candidates gaining full marks were able to name a specialist service relevant and applicable to the removal, disposal of the old concrete slab and construction of the new patio and pond. The expectation was that the candidates would have selected specialist services that included structural engineers to calculate load bearing requirements for retaining walls, electricians for installations to building regs standards, machinery operators with appropriate training and qualifications, plumbers to connect pipes, scheduling their availability and timing of need on site. However, many candidates focused on the removal of the old concrete slab.

Credited answers included:

**Removal and disposal**

- Machinery hire with operator to break up, dispose of old slab. Including equipment named; concrete breaker/ mini digger with breaker attachment/ dumper to move debris
- Hire specialist waste disposal – crushing machinery of material on site for on site re-use or to be taken away from the site by grab lorry. N.B. there was some overlap with part ii) here. If the specialist services for waste management were awarded marks in part i) no marks were given for a repeated answer in section ii)

Poor answers included reference to the machinery without the service – i.e., hire of the operator.

**Construction and planning**

- Structural engineer to calculate load bearing for pond retaining wall and weight
- Use of specialist contractors to set out and pour concrete, construct retaining wall of the pond or other specialist construction relevant to the feature.

- ii) The majority of candidates described ordering a skip of the correct size to remove waste to an approved waste site for recycling or landfill. Good answers also included;
  - the consideration of placement on site for efficient filling giving access for pedestrian or driven machinery and removal by lorry.
  - the need for permits if the skip was stored on a road and the need for a waste movement certificate.
  - Other candidates described the use of a specialist service to crush on site and re-use as hardcore for subbase to reduce the need for landfill, or to take away as per skip or grab lorry.

- iii) This was generally well answered by candidates who gave two specific requirements for site security during construction with detail as to the method or effect of the security measure.
- Fence with locked gate to prevent access or theft
  - Fence with CCTV or warning signage to deter vandalism or theft
  - Locking tools, equipment and machinery in a secure container on site overnight and weekends

Candidates gaining low marks often named the security feature but did not describe how it was used, i.e., a fence, without describing what was enclosed or how it could be secured.

- Q2** a) State the information which is provided on a setting out plan for a **NAMED** hard landscape feature.
- b) State **TWO** problems that could occur when interpreting a key on a design plan.
- c) State **TWO** materials used for marking out irregular features on the ground.

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- Q2** a) The majority of candidates were able to state a relevant hard landscape feature and a further five pieces of information required on a setting out plan relevant to the named feature.

Relevant features included:

Paving Slab Patio; Retaining wall; Timber pergola; Flight of steps

Candidates providing poor answers did not name a feature, gave answers which lacked detail or gave information points which were not distinct. Good answers included

- 1) Benchmark location for setting out levels.
- 2) The dimensions of the feature as relevant, e.g., steps-would require dimensions of treads and riser.
- 3) Specifications of materials used as per the feature named, e.g., for a patio - Purbeck limestone 300mm x 300mm x 26mm - grey - riven finish
- 4) The scale used on the drawing
- 5) The name and address of the customer, designer and site

Other good answers included:

- The location of the feature in relation to other site features
- Details of foundations relevant to the feature – e.g., depth and materials.
- The date of the drawing and any revisions with a drawing reference number.

- b) Candidates stating two realistic relevant problems encountered when interpreting a key could be awarded marks.

Some candidates stated answers relevant to problems occurring while setting out, e.g., rain or bad weather, which are not related to the key specifically and could not be awarded marks.

Good answers included:

- Similar symbols within the key can be hard to distinguish from one another.
- If symbols in the key are coloured, but the copy is in black and white, or the colours are not true to the plan.
- The use of non-standard symbols with poor labelling can be mis-interpreted.

- c) The majority of candidates stated the use of materials that could be manipulated to form and irregular line on the ground and were awarded marks. The most popular answers included

- Dry sand
- Spray line marking spray paint
- A flexible hosepipe
- A string line and pins

Q3 Describe a pipe drain system to lower the water table on a site with a clay soil under the following headings:

- i) specification of pipe
- ii) pattern
- iii) spacing
- iv) depth
- v) backfill

Q3

- i) Most candidates gave enough details to gain high marks with three distinct specification points described; their specification included material (i.e., clay, plastic), diameter (i.e., 100mm) description (i.e., perforated/ flexible for plastic); or for clay 300mm long “tiles”, rigid, butted, etc

Generally well answered with 3 distinct specification points described.

Plastic pipes were most commonly described: 100mm diameter, flexible with perforations

Very few candidates described clay pipes.

- ii) Most candidates gave Herringbone as their drainage pattern with many of those answering on paper scripts providing a diagram; it would have been helpful to clearly label the main drain and laterals. Some candidates put in arrows going against the flow of the system.

Online candidates were not able to draw and relied on a written description.

Candidates gaining marks included a description of a herringbone layout, with a central main pipe, showing the direction of water flow, with lateral pipes at 45° either side at regular intervals.

Some candidates gave the spacings of the layout which was required in part iii)

- iii) Candidates describing spacings of lateral pipes of a range 2m -5m, which is appropriate to clay soil, gained a mark.
- iv) An appropriate depth for clay soil is 450mm to 600mm. Candidates who gave depths above or below this did not gain a mark
- v) A number of candidates missed key points, most not including the size and quality of aggregate.

Those gaining 3 marks would need to address;

- the aggregate material used to back fill with detail, i.e., size and washed.
- The location of the aggregate under and around the pipe
- The use of a membrane and position around the pipe, to line the trench and between aggregate and topsoil backfill

Some candidates also described the filling of topsoil above the drainage trench to make up ground levels for planting or other landscaping.

Examples of good answers included:

- the back fill will be sat on a small bed of 10-20mm size clean gravel, 100mm of stone on top and surrounding, a geotextile membrane to stop soil particles from entering the drain and then top soil to the ground level
- The channel is backfilled with washed 10mm gravel or pea shingle both below and above the pipe before covering over with topsoil (and turf if under a lawn). A geotextile layer can also be used either around the pipe or around the gravel to keep out silt and sediment.

Q4 For the construction of a new aggregate driveway:

- i) outline the site preparation procedures following setting out
- ii) describe the installation of an appropriate foundation
- iii) give the specifications of **ONE** suitable surface material

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**Q4** A number of candidates did not present their answers to this question in a logical way for part i) and ii). Many included the instillation of foundations in part i) or included the digging out to depth in part ii) concentrating in site clearance in part i). A significant number described setting out, which is excluded in part i) and could not be awarded marks for that part.

- i) Candidates describing, with detail, 4 points within the processes of clearance and preparation gained marks. These could include: removal of vegetation and method; digging out to a depth of 200-300mm; instillation of drainage; consolidation of sub soil with method; installation of permeable geotextile membrane.

An example of a good answer included:

*“Mark out the area with pegs and string line. Strip away any vegetation; if this contains weeds then dispose of appropriately by burning or green waste. Remove the topsoil layer and store appropriately. Dig to the appropriate depth – 200-300mm to create the sub-base, and consolidate the sub soil using a plate vibrator.”*

- ii) Candidates describing, with detail, 4 points within the processes of instillation of an appropriate foundation for an aggregate drive way following preparation gained good marks. These could include: spreading and the type of sub base material (MOT/DOT types); spreading to ensure thickness and depth 150-250mm; consolidation and method; ensuring an even fall 1:60.

An example of a good answer included:

*“Lay a permeable membrane over the compacted subsoil. Fill with a permeable subgrade material for example MOT/Type 3 that has reduced fines; this will increase the permeability of the drive. Fill to a level of 150mm ensuring an even fall of 1:60 and compact using a vibrating plate compactor.”*

- iii) To achieve two marks candidates needed to name a suitable aggregate surface material and specify two other details of either size, shape or colour.

Good examples included:

- Self-binding gravel, e.g., Breedon, a mixture of limestone particles which is crushed and graded to a 12mm to dust, forming a solid layer when compacted.
- Washed and cleaned grey granite gravel angular chippings of between 6-14mm.
- Hoggin - a mixture of gravel particles, as above but has rounded pebbles as larger aggregate, ranging from approximately 40mm down to clay sized particles, which is spread in a damp condition and sets hard when compacted and dry.

**Q5** When completing a risk assessment for the construction of an in-situ concrete path using hand mixed concrete,

- i) identify **FIVE** hazards
- ii) state **ONE** way of minimising the risk for **EACH** hazard identified in i)

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Q5 The question was specifically about hand mixed concrete, candidates who described hazards related to the use of machinery could not be awarded marks. Marks were also lost by vague or non-specific answers such as 'wear PPE', 'erect signs'

Hazard related to any stage of the construction were relevant, including digging out, setting shuttering, mixing concrete and laying poured concrete.

Candidates who described a non-relevant hazard could not be awarded marks for ways of minimising that hazard so lost two marks.

Good answers included;

- Hazard: Cement dust being inhaled or getting into worker's eyes
Minimise risk by: Workers wearing facemasks and goggles when opening bags and mixing.
- Hazard: Trip hazards caused by shovels and other tools being left lying around
Minimise risk by: Keeping equipment stored away from the work zone when not in use; shovels, rakes or striking off board should be stood upright.
- Hazard: Skin irritation caused by handling cement
Minimise risk by: Wearing gloves and keeping arms, torso and legs covered with long sleeves and trousers plus adequate footwear when handling cement bags
- Hazard: lifting heavy cement bags
Minimise risk by: Correct lifting technique employed, with bent knees, lifting one bag at a time or using sack-truck or wheelbarrow to move bags
- Hazard: Slip hazard caused by wet floors from spillages of water when mixing or wet concrete when pouring
Minimise risk by: Use a hose to supply water close to the mixing site to mitigate carrying water in buckets or can. Clear spillages when they occur.

Other answers included

- Hazard: Muscle sprains due to the repetition of turning the mix continuously
Minimise risk by: Mixing in small batches and take regular breaks.

- Q6** a) State **FOUR** measures that can be taken to maintain biosecurity when handling and storing soil on a construction site.
- b) Describe the process of reinstatement of stored soil to an area that has been previously stripped during construction.
- c) Give recommended depths of reinstated soil for **TWO** distinct horticultural situations.

- Q6** a) The majority of candidates answered this part well. Those that gave four distinct measures that could be taken during either handling and moving soil, or during storage, gained marks if those measure were specifically related to bio-security.

Measures to maintain biosecurity could include those to avoid contamination of soil by weed, pathogens, pollutants or water. Measures to protect the surrounding environment from contamination from the stored soil were also acceptable.

Some candidates' answers lacked detail or repeated measures and could not be awarded full marks. Numerous candidates thought bio-security would be dealt with adequately by cleaning their boots, wearing gloves, washing their vehicle and even washing their spade. Other poor answers simply described the storage of soil without reference to bio-security.

Examples of correct answers included:

- Moving and storing top-soil and sub soil separately to avoid contamination between soils, both from the same site or from different sites.
 - Avoid storing the piles near to waterways or ponds to prevent the soil from entering into watercourses, increasing algae growth.
 - Clean boots and the wheels of any machinery to prevent cross-contamination between sites.
 - Soil stored long term can be seeded with a grass and clover mix, The roots hold the topsoil together and stop it blowing away in the wind and prevent other weeds getting into the soil.
- b) The majority of candidates did not answer this part well. Many answers lacked sufficient detail. The majority of candidates answers included:

- The need to relieve compaction in sub soil before reinstating top soil
- Ensure the top soil is spread to an even depth throughout the site,

Other suitable answers could have included:

- Carry out the work on a dry day and with dry soil
 - Install topsoil in small loads, raking level in layers and consolidating between each load.
- c) Candidates who gained marks most often gave depths of reinstated topsoil of
- 150mm for the installation of a lawn
 - 350mm - 400mm for herbaceous or shrub borders.

A number of candidates did not use the unit of measure, e.g., stating 150 and 400, and could not be awarded marks.

A significant number of candidates thought that plants would need a minimum of 1 metre depth of topsoil, which is surprising for a level 3 learner.

Q7 For a one brick thick garden wall, state:

- i) suitable specifications for the bricks
- ii) **TWO** purposes of the bond
- iii) the **NAMED** ingredients and the mix ratio for a suitable mortar
- iv) the function of **FOUR NAMED** tools used in the laying of bricks

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**Q7**

- i) Candidates gaining marks stated a minimum of 2 suitable specifications for bricks including  
Size: standard is 65mm x 102.5mm x 215mm  
Colour - Red  
Material – London Clay  
Name of brick or company – Engineering / Ibstock  
Specifications related to the strength or porosity of the bricks were rarely given but could have been awarded marks.  
A number of candidates did not give units of measurements for size or gave incorrect dimensions not suitable for bricks for a garden wall, most often the incorrect size would be for a paving block, which is thinner.
- ii) Several candidates did not fully understand the term “bond”, which is the arrangement of bricks in the wall. Some candidates described the properties of mortar holding the bricks together and could not be awarded marks.  
The purposes of the bond are to increase the strength of the wall by reducing straight joints, form a decorative pattern and tie the bricks together.  
Those who related their answer to a specific named bond appropriate for a one brick thick garden wall gained the highest marks. e.g.
  - English bond: alternate courses of stretchers and headers reduce straight joints, reducing water ingress and increasing the strength of the wall OR
  - Flemish Bond: alternating bricks with header and stretcher is decorative and adds strength, tying the bricks together across the width and length of the wall.
- iii) Candidates who named 1 x part Ordinary Portland Cement (OPC) and 3 or 4 parts Builder's sand gained full marks.  
  
Many candidates missed marks by suggesting a different ratio not suitable for mortar or not naming a specific sand such as Builders. Candidates suggesting the use of sharp sand and ballast did not gain full marks.
- iv) To gain 4 marks candidates needed to name four distinct tools used specifically in laying bricks and state their function. Candidates gained high marks in this section.  
Suitable answers included:
  - Brick layer's trowel to apply the mortar to the course and butt the brick.
  - String line and pegs to ensure the line of the wall is straight
  - Spirit level to ensure that the bricks are plumb/vertical and level horizontally
  - Pointing trowel or tool for the application and texturing of the appropriate pointing between the bricks

**Q8** Describe timber decking under **EACH** of the following headings:

- i) **ONE** type of timber
- ii) dimensions of the boards
- iii) surface finish
- iv) fixing specifications
- v) maintenance requirements

**Q8**

This question was answered with varying degrees of accuracy, with some candidates giving only vague answers to many sections. Candidates who gave specific details relevant to the headings and deck boards gained marks. For part ii) some candidates did not give units of measurements or provided dimensions which were either too narrow, wide, or thin to be used as deck boards.

- i) correct answers needed to include an element of the named timber. e.g.
  - Pressure treated and tanalised Spruce FSC certified timber.
  - Redwood cedar decking, can come tanalised but cedar is naturally rot resistant
  - Kiln dried Balau, a tropical hardwood

Candidates naming reconstituted composite deck boards could not be awarded a mark, they are not 100% timber.

- ii) Candidates naming suitable dimensions of width, thickness or length could be awarded up to 2 marks.

Standard softwood deck boards are sold in the range 100-150mm width x 20-35mm thickness in lengths of typically 1.5m, 1.8m or 2.4m.

Candidates naming dimensions outside of these ranges needed to relate them to the named timber in part i). e.g., Iroko hardwood 90mm width x 20mm thickness x 2.4m length.

- iii) Candidates most often described a ribbed finish with grooves to help reduce slipping, most relevant to softwood timbers. Candidates naming a smooth finish to tropical hardwoods also gained a mark. Some candidates gave a colour or a stain/paint as their finish.

- iv) Some candidates incorrectly described the construction of a deck frame, brackets and joist hangers; the question only asks for fixings.

Candidates who described the specifications of screws, nails or bolts used gained marks. e.g.

- 10mm galvanised steel bolts, 100mm long
- 4.5mm x 6.3mm galvanised cross head decking screws.

- v) Candidates were mainly very accurate and detailed in their description of three maintenance tasks carried out on the decking. Maintenance requirements include;
  - Pressure washing annually to remove algae and moss.
  - Re-sealing with a suitable product such as a preservative stain or decking oil to increase the longevity of the deck.
  - Check screws are still countersunk and tighten if needed.
  - Replace rotten or damaged boards. May need re-sanding to prevent splinters.
  - Any ornamental application such as a stain or paint may eventually need to be reapplied.
  - The timber will need to be stripped, power sanded and then the paint or stain reapplied.

Candidates describing three of the above gained full marks.

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