Including Examiners Comments

Royal Horticultural Society

Sharing the best in Gardening

R3113

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

Level 3

Thursday 28 June 2012

13:30 – 14:45

Written Examination

Candidate Number:…….

Candidate Name:……

Centre Number/Name:……...

IMPORTANT – Please read carefully before commencing.

i) The duration of this paper is **75** minutes.

ii) **ALL** questions should be attempted.

iii) **EACH** question carries **10 marks**.

iv) Write your answers legibly in the spaces provided.

v) Use **METRIC** measurements only.

vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

vii) Please note, sufficient lined space is provided. It is **NOT** necessary that all lined space is used in answering the questions.

Ofqual Unit Code D/601/3836

ANSWER ALL QUESTIONS

MARKS

Q1 a) State the information that needs to be included on a setting out plan. **4**

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b) Describe **TWO** other types of scale drawings used to set out vertical elements in the realisation of a design. **6**

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MARKS

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MARKS

Q2 a) i) State **FOUR** differences between topsoil and subsoil. **4**

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ii) Explain why it is important to keep them separated during storage. **2**

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MARKS

b) i) State what is meant by 'angle of repose' giving suitable examples for different soil types. **2**

ii) Explain why the 'angle of repose' is important in the storage of soil. **2**

Total Mark

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MARKS

Q3 a) Compare the use of block paving with in-situ concrete for the construction of a domestic driveway. **7**

MARKS

b) State **THREE** methods of draining surface water from an in-situ concrete driveway for disposal on site. **3**

Total Mark

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MARKS

Q4 a) Specify **TWO** materials suitable for the construction of a short ramp in a domestic garden. **2**

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b) Describe the construction of a ramp using **ONE** of the materials specified in a). **4**

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c) State **FOUR** safety features that should be included in the construction detail of a ramp. **4**

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Q5 a) i) Specify **THREE** distinctly different materials suitable for the construction of a low wall for a raised bed. **3**

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ii) Describe the procedure using **ONE** of the materials in a) to construct a low raised bed, including the foundations. **7**

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MARKS

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MARKS

Q6 a) Compare the use of **TWO NAMED** materials used to line a large informal pond. **6**

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MARKS

b) Identify the hazards associated with the mechanical excavation of a large informal pond. 4

Total Mark

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MARKS

Q7 a) Evaluate **THREE NAMED** types of natural stone used in the construction of a traditional rock garden. **6**

MARKS

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b) State **TWO** methods of manually moving large rocks safely when there is no access for machinery. 4

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MARKS

Q8 a) State the difference between a modular fence and a non-modular fence. **2**

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b) Describe the procedure to construct a **NAMED** fence. **8**

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MARKS

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

Level 3

Thursday 28 June 2012

Candidates Registered	**155**		**Total Candidates Passed**	**94**	**70.68%**
Candidates Entered	133	85.81%	Passed with Commendation	25	18.80%
Candidates Absent	13	8.39%	Passed	69	51.88%
Candidates Deferred	3	1.94%	Failed	39	29.32%
Candidates Withdrawn	6	3.87%			

Q1 a) State the information that needs to be included on a setting out plan.

b) Describe **TWO** other types of scale drawings used to set out vertical elements in the realisation of a design.

The aim of this question was to assess the candidate's knowledge of different drawing types and their interpretation to accurately setting out features on site.

Most candidates included information which is generic to all scale plan drawings such as a North point, scale and general title information, but only a few answers included further information specifically required for setting out purposes as would be necessary on a setting out plan. Subsequently higher marks were awarded to those that included reference lines and points from which triangulation, offsets and radius positions can be located. All dimensions from these points and of the features themselves are also necessary. Site level datum positions (temporary or ordnance bench marks) should also be included along with existing and proposed spot levels.

In the second part of the question many answers didn't address the setting out requirement of the question and gave examples of planting plans or artistic design drawings which aid the visualisation of a finished project. Higher marks were awarded to answers which described section and elevation drawings of proposed vertical elements as construction details. Contour or Levels plans could also give the required information for setting out such features.

Q2 a) i) State **FOUR** differences between topsoil and subsoil.

ii) Explain why it is important to keep them separated during storage.

b) i) State what is meant by 'angle of repose' giving suitable examples for different soil types.

ii) Explain why it is important to keep them separated during storage.

The aim of this question was to assess the candidate's knowledge of the properties of soil and the safe handling and storage of it on site. This question also required some explanation of more general site management procedures relative to soil handling.

The first part of this question was generally answered well with many candidates gaining high marks. Good answers compared organic matter content, colour, fertility and soil structure differences of topsoil and subsoil. There was, however, sometimes confusion as to whether there are pH, texture and drainage variations between the two layers. Most answers for part ii) included explanations of the effects on fertility, structure and workability if the two soil types are mixed, particularly in relation to potential plant growth. There was some confusion as to the effects of anaerobic or aerobic respiration if the two soils were mixed. It was often stated that topsoil is an expensive material which would need replacing if was lost in the mixing of the soil, however it was also often assumed that subsoil is rubbish which has no place in the overall scheme of things. Very few answers mentioned the structural qualities of subsoil with regard to load bearing for foundations for hard landscaping structures.

Although most candidates were obviously aware of what the angle of repose of a soil means they were often not able to describe adequately where the angle is measured. Most answers stated that it is the angle that soil is stored at but the question does not mention soil storage; better answers were suitably rewarded for stating that it is the natural angle at which a soil will come to rest. Most answers could give an average angle of repose but very few could accurately state angles for clay or sand, with the majority getting it the wrong way around. Marks were awarded in the second part for stating safety, erosion, drainage, maintenance and the size of footprint of the storage bunds as being important issues.

Q3 a) Compare the use of block paving with in-situ concrete for the construction of a domestic driveway.

b) State **THREE** methods of draining surface water from an in-situ concrete driveway for disposal on site.

The aim of this question was to assess the candidate's knowledge and understanding of specific paving types, materials and construction techniques, including surface water disposal methods.

Good answers compared the surfaces' appropriateness for fitting different shapes and the requirements for edging or formwork, maintenance issues, ease of removal and re-instatement for repairs etc., time to full load bearing, speed of installation, aesthetics and cost. This question was about comparing all the properties of the two surfaces but many candidates over-concentrated on drainage issues, particularly with regards to the permeability of block paving, SUDS and planning legislation. It was a general misconception that block paving is permeable, but this is only the case if specialised blocks are used and the sub-base is designed to allow water to pass through it. In this respect there was also often confusion as to planning legislation for hard, non-porous surfacing of driveways.

Most answers to the second part of the question gave examples of various gullies, channels, gratings and interceptor or French drains as methods of collecting the water. It was often not clear that the candidate actually knew exactly what these terms meant as it was not fully explained how the water entered them or how it was then disposed of on site. Where the destination was stated most candidates suggested a soakaway as a method of dispersal but rain gardens, bog gardens, ponds or underground storage tanks were also quoted. Worryingly a few suggested connection to the mains sewers. Surprisingly few answers included simply running the water off the edge into a suitably free-draining bed or lawn. Many answers went into details of falls and, in particular, suggested cambers which are very rarely applied to in-situ concrete driveways.

Q4 a) Specify **TWO** materials suitable for the construction of a short ramp in a domestic garden.

b) Describe the construction of a ramp using **ONE** of the materials specified in a).

c) State **FOUR** safety features that should be included in the construction detail of a ramp.

The aim of this question was to assess the candidate's knowledge of safe ramp construction in a garden situation.

All candidates gave suitable examples to the first part of the question, however higher marks were gained by those that were more explicit than quoting simply, for example, concrete. In-situ concrete would have distinctly different properties and construction specifications to pre-cast concrete slabs.

Dependant on the material chosen, marks in the second part were awarded for giving full specifications and dimensions of all the processes, including the foundations for the construction of a ramp. The majority of answers either described an in-situ concrete or timber decking ramp.

The third part of the question was generally well answered with candidates quoting variations of the following: non-slip surfaces, provision of handrails, appropriate angle, adequate lighting, side retaining edges and inclusion of landings. There was some confusion as to whether drainage should be a safety feature with many suggesting a cross fall – this would be difficult to incorporate into a ramp (how would it meet a level surface top and bottom?), it would be difficult to construct and it would not be necessary on a steep longitudinal slope anyway. Most answers assumed that the ramp was intended for use by people with disabilities, particularly wheelchair users, which was not implied in the question but these are sensible guidelines to follow anyway.

Q5 a) i) Specify **THREE** distinctly different materials suitable for the construction of a low wall for a raised bed.

ii) Describe the procedure using **ONE** of the materials in a) to construct a low raised bed, including the foundations.

The aim of this question was to assess the candidate's knowledge of wall construction materials and methods.

Most candidates could name three suitable materials; the most common being brick, stone, concrete blocks and timber – usually in the form of railway sleepers.

Marks were awarded in the second part of the question relevant to the named materials selected to include: appropriate foundation design and materials, materials for the wall with construction details (i.e. bond, mortar mix), DPC provision (horizontal and vertical tanking), coping, all with dimensions throughout. Suitable drainage techniques included: drainage provision behind wall (perforated pipe) and through wall (pipes or weep-holes). The vast majority of answers described the construction of a brick wall. There was often confusion over the specifications of the foundation to include a hard core and blinding layer under a concrete strip foundation which is not usually necessary on firm undisturbed subsoil. Also there was confusion over the provision of a damp proof course in conjunction with drainage. Many answers specified engineering bricks which would not need a horizontal DPC. Also many answers suggested a vertical membrane to line the back of the wall together with weep holes or pipes passing through the wall and it was not clear how, or if, it would involve piercing the membrane and thus defeat the object.
Apart from the above this question was answered well by many candidates, picking up most of the above points, usually aided by the inclusion of a drawing although these could have been clearer in many cases.

Q6 a) Compare the use of **TWO NAMED** materials used to line a large informal pond.

b) Identify the hazards associated with the mechanical excavation of a large informal pond.

The aim of this question was to assess the candidate's knowledge of pond construction materials and methods.

Really the only two suitable methods are butyl liner and puddled clay and many candidates took these materials to compare. However three other methods were suggested; concrete, fibreglass (or similar) preformed shells, and plastic or polythene liners. The significant points in the question are 'large' and 'informal' so these last three materials could be used but would be considered unsuitable. Concrete would involve strong complex, curved formwork and elaborate reinforcement to produce such a pond, which, although not impossible, would make it very expensive. Preformed shells just would not be available in a size probably bigger than about 2.5 metres because of access and transport restrictions so would not be big enough to be 'large'. Plastic liners again would not be available in a large enough size and would be difficult to join successfully, and with a short life expectancy would not be considered for a large project if they were liable to need replacement in a short time. Marks were awarded to candidates who took these alternatives but only if they highlighted the problems above in their comparison which, in effect, made them unsuitable materials.

Those who chose butyl liner and puddled clay described the properties of the two materials, with butyl usually being the more familiar. There was often some confusion as to whether suitable clay needs to be present on site or if it is imported. The problems with folds and disguising the edge of liners was often omitted. Many answers were just descriptions and evaluations of each material rather than direct comparisons. Some answers described the construction processes which were not required.

Many candidates failed to recognise a hazard as being something that has the potential to cause injury. Examples of typical hazards in this case would be:

- the use of the machinery on sloping and slippery ground with the possibility of it overturning,
- open excavations – falling in, collapse and entrapment,
- the machine striking a bystander,
- striking underground services etc.

Many answers suggested precautions to reduce risk such as the wearing of high visibility clothing, signage, fencing the area and training of staff. Also many answers included damage to the environment and soil conditions which are not hazards in the health and safety sense as required here.

Q7 a) Evaluate **THREE NAMED** types of natural stone used in the construction of a traditional rock garden.

b) State **TWO** methods of manually moving large rocks safely when there is no access for machinery.

The aim of this question was to assess the candidate's knowledge of rock garden materials and construction.

Most candidates were able to name three types of stone. These included sandstone, limestone, granite and slate. Unfortunately most answers didn't expand on this to include examples of provenance of each type. Most answers who quoted just 'limestone' went on to describe the characteristics and environmental issues of the use of Westmorland limestone which don't necessarily apply to Purbeck limestone. Likewise sandstone from Yorkshire has different characteristics and properties to that from Sussex. Many candidates quoted limestone and tufa, which is also a limestone, as two different rock types. Most answers included something on environmental issues and in particular sustainability; no rock extraction is sustainable, although some did advocate its reclamation and re-use.

Examples of methods of manually moving large rocks included mechanisms made up of rollers, levers, pulleys, winches, trollies, sack barrows, A-frame tripods, tarpaulins etc. Better answers described the use of the equipment but it often was not clear how the rocks were manoeuvred in a safe way to take advantage of the techniques. By far the most common answer involved the use of rollers and this was often accompanied by a drawing. It was considered that 'large rocks' in the question implied they could not be safely lifted so 'using safe manual handling practices', or 'putting in a wheelbarrow' were not acceptable as answers.

Q8 a) State the difference between a modular fence and a non-modular fence.

b) Describe the procedure to construct a **NAMED** fence.

The aim of this question was to assess the candidate's knowledge of fencing materials and specifications, and their understanding of appropriate construction methods.

Answers to the first part of the question should have stated that a modular fence is pre-built in sections and erected on site, and a non-modular fence is constructed with individual components from scratch on site. This question was generally well answered, with most candidates giving a suitable example of each type as well.

There were a variety of fence types chosen in the second part but generally marks were awarded for the following significant points: marking out and method of ensuring line and level, excavation, material specifications, dimensions, method of securing posts, sequence of post insertion, methods and sequence of fixing of panels/rails, palings, caps and capping.

These were often further explained by the addition of a drawing, but these were sometimes not very clear. Most candidates answered this well but there was often confusion as to the sequence of inserting the infill and securing the posts – in most cases it would be very difficult to get the spacing and levels right by putting in all the posts before the panels or rails are inserted and attached.