INCLUDING EXAMINERS COMMENTS

RHS

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R3113

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

Level 3

Thursday 14 February 2019

13:40 – 15:05

Written Examination

Candidate Number: .....

Candidate Name: .....

Centre Number/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 may be used for drawing purposes only;

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.

Ofqual Unit Code F/507/5865

Please turn over/…..

ANSWER ALL QUESTIONS

		MARKS
Q1	Describe timber decking under **EACH** of the following headings:	
	i) **ONE** type of timber;	**2**
	ii) dimensions of the boards;	**2**
	iii) surface finish;	**1**
	iv) fixing specifications;	**2**
	v) maintenance requirements.	**3**

Please see over/…..

MARKS

Total Mark

Please turn over/…..

MARKS

Q2 a) Define the term ‘rigid’ in relation to the construction of a paved seating area. **2**

b) Describe a bedding method suitable for rigid slab paving. **3**

Please see over/…..

MARKS

c) State **FOUR** pieces of information included in a specification for **ONE NAMED** type of natural stone paving. **5**

Total Mark

Please turn over/…..

MARKS

Q3 Foundations for a low wall 5m long are to be set out at right angles to an existing building. **10**

Describe how to set out these foundations using appropriate equipment.

NOT TO INCLUDE CONSTRUCTION TECHNIQUES

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MARKS

Total Mark

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MARKS

Q4 Describe the groundwork procedures prior to the installation of a permeable car parking surface under the following headings:

i) ground preparation; **3**
ii) appropriate foundations; **3**
iii) installation of **ONE NAMED** edging material. **4**

NOT TO INCLUDE SETTING OUT OR INSTALLATION OF THE SURFACE MATERIAL

Please see over/…..

MARKS

Total Mark

Please turn over/…..

MARKS

Q5 a) Give specifications for **ONE** type of modular trellis panel suitable as a screen. **4**

Please see over/…..

MARKS

b) State the sequence of construction of the trellis panels in a) to form a screen 5 panels long on a level site. **6**

Total Mark

Please turn over/…..

MARKS

Q6 For a piped water drainage system:

i) give the specifications for ONE type of pipe; **2**

ii) state **TWO** situations where it is necessary to include an inspection chamber/access point; **2**

iii) distinguish between an inspection chamber/access point and a trap in a drainage system; **2**

Please see over/…..

	MARKS
iv) Describe, with the aid of cross sectional diagram, the design of a trap in a piped drainage system.	**4**

SPACE FOR DIAGRAM

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Total Mark

Please Turn Over/…..

MARKS

Q7 A rock garden is to be constructed in a new garden:

i) state **SIX** factors to be considered when carrying out the site assessment prior to construction of a rock garden; **6**

ii) state **FOUR** hazards to be noted in a risk assessment for its construction. **4**

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MARKS

Total Mark

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MARKS

Q8 For a one brick thick garden wall:

i) state **TWO** purposes of the bond; **2**
ii) state the **NAMED** ingredients and the mix ratio for a suitable mortar; **4**
iii) state the function of **FOUR NAMED** tools used in the laying of bricks. **4**

Please see over/…..

MARKS

Total Mark

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Charity Registration Number: 222879/SC038262

R3113

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

Level 3
Thursday 14 February 2019

Candidates Registered	**88**	**Total Candidates Passed**	**81%**
Candidates Entered	**77**	Passed with Commendation	26%
Candidates Absent/Withdrawn	8	Passed	55%
Candidates Deferred	3	Failed	19%

Senior Examiner's Comments

On the whole this paper was well answered with the majority of candidates attempting and completing all the questions. The following guidelines should be of help to future candidates.

1. Where named plant examples are asked for, full botanical names (genus and species) are required to achieve full marks. Common names will not be given a mark.

2. Use the command statements e.g. list or name (single words only), state (a few sentences), describe or explain (a fuller answer) together with the mark allocation, to judge the depth of the answer. Half marks are often allocated where the basic information given is correct but needs further qualification to gain the full mark.

3. Where a number of answers are specified in the question, the examiner will not select correct answers from a list e.g. if the question states 'State' **TWO** plant names', only the first two names given will be marked.

4. Labels on diagrams should be correctly positioned to avoid ambiguity and diagrams should be clearly drawn and annotated. No marks will be awarded for artistic merit.

5. Candidates should use unambiguous plant examples as reference sources from, for example, the RHS Find a Plant Service available on the RHS Website.

ANSWER ALL QUESTIONS

		MARKS
Q1	Describe timber decking under **EACH** of the following headings:	
	i) **ONE** type of timber;	**2**
	ii) dimensions of the boards;	**2**
	iii) surface finish;	**1**
	iv) fixing specifications;	**2**
	v) maintenance requirements.	**3**

Q1 This question was answered very well by the majority of candidates with many gaining high marks. A description was asked for and in some cases more information was required to gain full marks. Marks were awarded in each section for suitable descriptions including:

i) The most common type of timber given for decking was tanalised or pressure treated softwood, but some candidates correctly quoted hardwoods, usually oak, with very few mentions of tropical hardwoods, which are also widely available.

ii) Most candidates gave an appropriate size of boards for softwood decking as 100-150mm X 20-35mm, but some candidates quoted boards that were either too thin or excessively thick or wide. Tropical hardwoods can be considerably smaller than this but few answers indicated this. Some candidates' answers also included correct commercially available lengths.

iii) Candidates usually described some kind of grooved or ribbed surface but some gave examples of non-slip finishes such as carborundum strips

iv) Screws or nails could have been given but the former was more common. To gain full marks further information was required; such as length, thickness, anti-corrosion treatment such as sheradised/galvanised, countersunk, crosshead etc. Some candidates described the actual construction procedure for the decking which was not asked for. In some answers the screws specified were not long enough to actually pass through the boards. Invisible fixing clips were mentioned but not described well.

v) This was generally well answered with examples including: pressure washing, scrubbing, application of oil, application of colour, application of non-slip paint, application of algicide, replacement of damaged boards.

			MARKS
Q2	a)	Define the term ‘rigid’ in relation to the construction of a paved seating area.	**2**
	b)	Describe a bedding method suitable for rigid slab paving.	**3**
	c)	State **FOUR** pieces of information included in a specification for **ONE NAMED** type of natural stone paving.	**5**

Q2 The aim of this question was to assess the candidate’s knowledge of surface materials and their construction techniques for a specified area in a garden.

a) There was some confusion as to the meaning of the term ‘rigid’ and few candidates were able to give a comprehensive definition. This should have stated that it consists of a solid surface which does not “bend, flex or give” over a large area and which involves the use of cement/mortar/concrete in its construction. This could be made up of a continuous material such as in situ concrete or individual units, such as slabs laid on a bed of mortar. Some candidates confused this with its permeability; rigid paving can be permeable providing it has been constructed to allow water to pass through the surface, as is the case with no fines concrete.

b) Many candidates described the construction of the entire paved area, in some cases right back to ground preparation, whereas it was only the bedding immediately under the slabs which was asked for. This needed to be a continuous mortar bed with an appropriate cement/sand mix ratio given (e.g. 1:4/1:5), with a minimum thickness of 25mm. Many candidates incorrectly specified laying the slabs on a sand bed, which would not then be rigid. Five spot bedding is not recommended for rigid paving and some candidates pointed out this fact.

c) Examples of named stone could be limestone, sandstone, slate etc, this should have been further qualified to be more specific, usually by its “provenance” or type e.g. Purbeck (limestone), York or Indian (sandstone), Welsh (slate) etc. Then there are several pieces of information that could be given, including:

- “brand” name given by the supplier e.g. “Trustone”, “Fellstone” etc.
- colour e.g. buff, black, charcoal etc.
- dimensions e.g. 300mm X 300mm (should be a commercially available size).
- thickness e.g. 25mm, 37mm, and could state that it is “calibrated”.
- edge treatment e.g. hand cut, sawn, tumbled.
- surface e.g. smooth, riven.
- weight (possibly per m2).
- new or reclaimed.

Any of these specifications may or may not be appropriate to the named stone chosen and this was not always reflected in the answers. This part of the question was not well answered with few candidates gaining high marks due to the lack of detail given.

MARKS

Q3 Foundations for a low wall 5m long are to be set out at right angles to an existing building. **10**

Describe how to set out these foundations using appropriate equipment.

NOT TO INCLUDE CONSTRUCTION TECHNIQUES

Q3 The aim of this question was to assess the candidate's knowledge and understanding of setting out procedures / techniques.

This required a description of the procedures in the correct sequence. Marks were awarded for:

- Locating the start point of the new wall on the existing building from a plan or given specification.
- Setting out line 5m long with appropriate materials (e.g. pins and line), giving an indication whether this is the centre or one edge of the intended wall.
- Details of a method of achieving a right angle (e.g. 345 triangle using tape measures or a builder's square) and adjusting the previous line to this.
- Description of how the width of foundation is arrived at from this line.
- Method of marking out the extent of the foundation ready for excavation (e.g. the use of site rails/profile boards and/or spray paint).

Better answers approached this with a series of paragraphs outlining each stage with appropriate explanations and diagrams for each task. However, this question was not well answered with many candidates spending too much time explaining the actual excavation and construction of the foundation when it clearly stated in the question **not** to include construction techniques. There were very few good answers which explained clearly how the right angle was achieved with several candidates focusing on the explanation of 345 triangles in too much detail, or confusing the given 5m length of wall in explaining the 345 method, or attempting to work out square roots from this. Many candidates allocated a site datum but it was not clear they understood the meaning of this or the relevance to this scenario.

MARKS

Q4 Describe the groundwork procedures prior to the installation of a permeable car parking surface under the following headings:

i)	ground preparation;	**3**
ii)	appropriate foundations;	**3**
iii)	installation of **ONE NAMED** edging material.	**4**

NOT TO INCLUDE SETTING OUT OR INSTALLATION OF THE SURFACE MATERIAL

Q4 The aim of this question was to assess the candidate's knowledge of ground preparation and foundation requirements prior to the installation of surface materials appropriate to a specific use.

Most candidates had an understanding of the requirements of the tasks involved although some wasted time in describing design aspects of the choice of surface material, setting it out and its installation when the question was clearly only asking for groundwork procedures. Good answers included the following points and were rewarded appropriately:

i) Ground preparation:

- removal of debris and existing vegetation, with a suitable method and equipment (e.g. mini digger, use of herbicides etc).
- removal of topsoil and excavation to an appropriate formation level.
- consolidation of the sub-grade / subsoil and the required equipment (e.g. plate compactor).

The amount of excavation required was often confused, with excessive depths stated or the removal of all the subsoil being quoted.

ii) Foundations:

- inclusion of a geotextile membrane – permeable to allow passage of water but avoidance of migration of the sub-grade into the foundation.
- installation of a suitable permeable base material – e.g. DoT (MOT) type 3, no fines "hardcore".
- To an appropriate thickness suitable for light vehicular traffic – e.g. 150mm minimum.
- consolidation / equipment (e.g. plate compactor).

Many candidates gave unsuitable specifications for a permeable base material and didn't understand the purpose or position of the membrane.

MARKS

Q4 continued…

iii) Edging:

Almost all candidates gave a brick or precast concrete edging (kerb) as their named example with a few quoting timber.

- material – e.g. precast concrete kerbs (described with appropriate dimensions, e.g. bull nosed or round top 50mm X 150mm).
- laid in stiff concrete with correct mix ratio (e.g. 1:5).
- dimensions given and haunched/shouldering to rear (better answers had a diagram).
- laying technique to a set out line.
- joints dealt with appropriately e.g. butted.

Most answers gave vague specifications for the edging material and few candidates fully understood the laying techniques, with mortar often incorrectly being quoted as a bed. Haunching was often mentioned but it was not always clear that the candidate appreciated what its purpose was. Many candidates suggested that the edging should be installed level with a spirit level whereas in many cases (e.g. if a driveway is on a slope) this is not possible or may be undesirable for drainage reasons.

			MARKS
Q5	a)	Give specifications for **ONE** type of modular trellis panel suitable as a screen.	**4**
	b)	State the sequence of construction of the trellis panels in a) to form a screen 5 panels long on a level site.	**6**

Q5 The aim of this question was to assess the candidate's understanding of the installation sequence of the various components and techniques employed in the construction of screening in a garden.

Candidates in general understood the concept of a screen made up of modular trellis panels. Marks were awarded in each section for:

a) Specifications:

- suitable type of timber e.g. tanalised softwood.
- configuration e.g. square grid or diagonal, size of grid e.g.150mm.
- dimensions of the individual battens e.g. 25X25mm.
- size of panel e.g. 1.8m.X.1.8m (ideally a standard commercially available size, but could be bespoke).
- surface finish (e.g. planed) and colour.
- profile of top of panel and/or capping strip.
- FSC certification.

Many answers were somewhat vague and didn't provide sufficient detail for higher marks. Some candidates quoted sizes of timber that were either too flimsy or too big. Some included specifications for the posts where the question only asks for the panels.

b) Sequence

- Determine line of screen and setting up string line.
- Excavation and insertion of first post to appropriate depth and secure in ground (concrete and/or rammed hardcore/soil), ensuring it is upright.
- Attachment of first panel using a method appropriate for the type of post e.g. nails, clips or slotted, ensuring that it is level.
- Insertion of second post, securing as with the first, and attachment of first panel to it.
- Attachment of second panel ensuring it is level and in line with the previous one.
- Continuing with the remaining posts and panels in the same manner until complete.
- Attachment of capping/finials etc as appropriate.

Most candidates understood the basic principles of erecting a modular panel type of fence but many did not give an appropriate sequence. It would be very difficult with this type of construction to set all the posts securely before attaching the panels as even a slight inaccuracy would lead to the panels not fitting. Some candidates wasted time by describing the fixing method of panel to post in too much detail.

MARKS

Q6 For a piped water drainage system:

i) give the specifications for ONE type of pipe; **2**

ii) state **TWO** situations where it is necessary to include an inspection chamber/access point; **2**

iii) distinguish between an inspection chamber/access point and a trap in a drainage system; **2**

iv) Describe, with the aid of cross sectional diagram, the design of a trap in a piped drainage system. **4**

Q6 The aim of this question was to assess the candidate's knowledge of the principles and components of a specified drainage system.

i) Specifications of drainage pipes was generally well-answered. Candidates who gained highest marks specified the material the pipe was made from with a description of its format and appropriate dimensions. Most commonly this was flexible, perforated plastic, typically with a diameter of 100mm, but could have been glazed or unglazed clay, concrete or pitch fibre, with suitable descriptions

ii) The next two parts of the question were not well answered. Most candidates did not understand the purpose of an inspection chamber/access point and so could not give examples of where one may be positioned in the system. Typically, this could have been at the head of a surface water system, where there is a junction of two pipes, where there is a major change in direction or where there is an excessive length of run; these being places vulnerable to blockage and are points that allow the insertion and use of drainage rods or high pressure jetting. An inspection chamber is not, as was suggested in some cases, somewhere the pipes can be inspected for damage and repaired.

iii) The difference between inspection chambers and traps was not well understood by many candidates.

A simple trap differs from an inspection chamber/access point in that its purpose is to trap silt and debris and prevent it from entering the system or progressing further. It may or may not allow access for rodding, but there will be some way in which the silt etc can be removed from the trap itself. It would not be necessary in a land drainage system to prevent the escape of gases; this would only apply in a sewage or foul water system. A few answers incorrectly stated that the trap was to catch vermin and prevent it getting in the drains.

iv) Most candidates produced a drawing showing a form of receptacle or chamber and the arrangement of an inlet and outlet but not all of them would function efficiently as a trap; in some instances the outlet was shown as being above the inlet, the water level was not indicated and/or there was insufficient depth to catch the silt. Few diagrams included appropriate dimensions. Several candidates' diagrams showed the workings of a soakaway or French drain.

MARKS

Q7 A rock garden is to be constructed in a new garden:

i) state **SIX** factors to be considered when carrying out the site assessment prior to construction of a rock garden; **4**

ii) state **FOUR** hazards to be noted in a risk assessment for its construction. **6**

Q7 The aim of this question was to assess the candidate's understanding of the necessity to plan a landscape construction project. The second part required a knowledge of risk assessment and the identification of potential hazards when carrying out a specific construction project.

This question was answered well by most candidates with many gaining high marks. A few candidates incorrectly included design criteria for the rock garden, such as aspect, or planting considerations rather than the site assessment for construction. Good answers also provided some explanation as to the kind of details that would be recorded and the importance of noting them. In the second part of the question most candidates gave hazards specifically related to rock garden construction but some listed problems regarding damage to the environment which would not be considered hazards in a risk assessment.

Examples of answers that marks were awarded to in each section included:

i) Possible factors

- access to site for materials/ machinery, e.g. width, weight restrictions, overhead obstructions.
- access around the site to move rocks, soil and waste /condition of surfaces (e.g. lawns) /slopes etc.
- underground services/obstructions.
- soil depth/type etc and any requirement for regarding.
- drainage issues/requirements.
- vegetation (shrubs/trees/roots near site to be avoided).
- vegetation (weeds and how to remove/eradicate).
- storage considerations, materials/tools and machinery, security.
- removal of waste.
- availability of water.
- safety of owners/public/visitors.
- workers' welfare, toilets, first aid etc.

ii) Typical hazards:

- heavy lifting / manual handling causing back injuries.
- trapping fingers and limbs, crush injuries.
- sharp tools/rocks causing cuts and abrasions.
- working on slope and/or slippery ground, trips and falls, broken limbs hitting underground utilities (electrocution, explosion).

MARKS

Q8 For a one brick thick garden wall:

i) state **TWO** purposes of the bond; **2**
ii) state the **NAMED** ingredients and the mix ratio for a suitable mortar; **4**
iii) state the function of **FOUR NAMED** tools used in the laying of bricks. **4**

Q8 The aim of this question was to assess the candidate's knowledge of materials and techniques used in the construction of garden walls.

i) The purpose of the bond is to give strength to the structure by interlocking the bricks and thus spreading the load, and also to provide an attractive finish/pattern. Relatively few candidates gave two good explanations with many being vague in trying to explain the strength aspect and the appearance was often overlooked entirely.

ii) Marks were awarded for stating Portland cement (OPC) and soft/building sand at a ratio of 1:4 or 5, mixed with clean (potable) water. Some candidates indicated that a mortar plasticiser or lime could also be incorporated, but not at the expense of the major ingredients (cement/sand). Many candidates gained full marks for the specification of a suitable mortar mix. Common errors were not fully specifying Portland cement, specifying sharp instead of soft/builders' sand, and specifying a mix which would be too strong or weak.

iii) Marks in this section were only awarded for tools directly involved with the actual laying of the bricks so naming equipment used for peripheral activities such as those involving the use of concrete mixers and wheel barrows was not acceptable.

Examples of possible tools and their functions include:

- brick laying trowel – for spreading the mortar and tapping the bricks into place.
- pointing trowel – for filling and finishing the joints.
- string line and pins – for ensuring the bricks are laid in a straight line and level.
- club (lump) hammer, in conjunction with a brick bolster – for cutting the bricks.
- spirit level for ensuring that the courses are laid level and the wall is vertical.
- pointing tool/iron/bucket handle – for smoothing off the joints.
- spot/mortar board – for holding the mortar ready for use.
- gauge rod – for ensuring the bricks and courses are consistently spaced.
- tape measure – for setting out and ensuring the brick work is within given tolerances.
- soft hand brush – for dusting down and brushing off excess mortar following pointing.
- set square – for ensuring corners are square.

A bricklayer would not use any kind of hammer to knock the bricks down as was suggested by several candidates.