2020 HSC Construction Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	A
3	C
4	B
5	D
6	B
7	C
8	C
9	D
10	C
11	D
12	A
13	A
14	B
15	D

Section II

Question 16 (a)

Criteria	Marks
• Identifies TWO pre-operational checks	2
• Identifies ONE pre-operational check	1

Sample answer:

Prior to operation, inspect the power cord and plug for visible damage. Ensure the electrical test tag is in date.

Answers could include:

- Blade secured correctly
- Blade sharp and in good working order
- Clean and safe work area.

Question 16 (b)

Criteria	Marks
• Lists TWO indicators of poor performance	2
• Lists ONE indicator of poor performance	1

Sample answer:

Two indicators are vibration of machine while cutting and excessive or unusual noise levels.

Answers could include:

- Failure to start
- Presence of smoke and odour
- Time taken to complete the job
- Quality of end product.

Question 17

Criteria	Marks
• Describes factors and provides a detailed description of how they affect clear communication	5
• Outlines factors and provides a description of how they affect clear communication	4
• Identifies factors and outlines one effect on communication	3
• Identifies factors and/or outlines one effect on communication	2
• Provides some relevant information	1

Sample answer:

Plant, tools and equipment used on a construction site can result in high levels of noise. These loud levels of noise can impede effective verbal communication. For example, loud noise can prevent effective use of phones or face-to-face communication. So you could use hand signals, signage or designated meeting times.

Distance can have a big impact on effective communication. For example, on large job sites it would not be feasible to rely on shouting across the site to communicate clearly, instead the use of walkie-talkies, hand signals, whistles and sirens would need to be used.

Answers could include:

- Bias and stereotyping
- Lack of empathy
- Negative sub text
- Gender issues
- Individual differences (cultural, social, intellectual, language, religious, gender, sexuality, age)
- Emotions
- Inconsistency
- Physical barriers
- Inattention
- Pressure of time.

Question 18

Criteria	Marks
• Demonstrates in-depth knowledge of benefits in planning and provides relevant examples	5
• Demonstrates sound knowledge of benefits in planning and provides relevant examples	4
• Shows a general understanding of planning and/or provides relevant examples	3
• Shows a basic understanding of planning	2
• Provides some relevant information	1

Sample answer:

The benefits of planning and organising work tasks could include the prevention of accidents and injuries. Thinking through the job task from start to finish will identify potential hazards, allowing for the correct tools and equipment to be located, workers to be properly trained, safety equipment such as PPE and barricades to be provided to reduce the risk of harm.

Proper planning and organising can also result in minimising or avoiding waste. Having plans, material lists and checking material quantities and orders will help to ensure correct ordering.

Answers could include:

- Increased efficiency / time saving
- Improved safety
- Prevent later problems
- Cost savings
- Reduce waste
- Materials, tools and equipment available when needed
- Provides a plan and direction.

Question 19 (a)

Criteria	Marks
• Provides TWO reasons why plans are drawn to scale	2
• Provides ONE reason why plans are drawn to scale	1

Sample answer:

Plans are drawn to scale to allow large items to fit on a piece of paper of a manageable size. Small items may be enlarged to provide details of intricate components or parts.

Answers could include:

- Ease of use / transport / printing
- To reduce all construction information onto standard sheet sizes
- To maintain proportion when reducing or enlarging
- Able to check dimensions with a scale rule.

Question 19 (b)

Criteria	Marks
• Identifies the kinds of levelling information found on a site plan	2
• Identifies a piece of levelling information found on a site plan	1

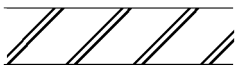
Sample answer:

- Contour lines
- Reduced levels (RL)
- Site datum
- Benchmark
- Finished floor level of proposed buildings (FFL).

Question 19 (c)

Criteria	Marks
• Sketches ALL three symbols correctly	3
• Sketches TWO symbols correctly	2
• Sketches ONE symbol correctly	1

Sample answer:

North	
Shower recess	
Brick wall	

Question 19 (d)

Criteria	Marks
• Outlines why architectural symbols and abbreviations are used in construction drawings	3
• Identifies why architectural symbols and abbreviations are used in construction drawings	2
• Lists why architectural symbols and abbreviations are used in construction drawings	1

Sample answer:

- Able to convey information more efficiently
- Materials and type of construction can be quickly identified
- Abbreviations and symbols are easier to interpret and take up less space
- Greater detail and information could be placed on each drawing sheet
- Abbreviations and symbols are standardised to ensure consistent communication among trades
- Designers, architects, engineers, builders and tradespeople are all able to communicate construction details using the same language. Universally understood by all
- Knowledge of a common technical drawing language allows for industry wide collaboration
- Standardised symbols and abbreviations can be helpful when language barriers exist.

Question 20 (a)

Criteria	Marks
• Correctly calculates perimeter of the paved area	1

Sample answer:

$13\,200 + 3600 + 8400 + 1600 + 4800 + 5200 =$ **36 800 mm**

Question 20 (b)

Criteria	Marks
• Correctly calculates the number of pavers required	3
• Provides one or more calculation(s) of area and paver	2
• Provides some relevant calculation	1

Sample answer:

$13.2 \times 3.6 = 47.52\text{m}^2$
$4.8 \times 1.6 = 7.68\text{m}^2$
$47.52\text{m}^2 + 7.68\text{m}^2 = 55.2\text{m}^2$

$0.4 \times 0.4 = 0.16\text{m}^2$

$55.2\text{m}^2 \div 0.16\text{m}^2 = 345$ pavers

Question 20 (c)

Criteria	Marks
• Correctly calculates the total labour cost	3
• Calculates the labour cost with some errors	2
• Provides some relevant calculation	1

Sample answer:

$\$75.00 \times 30 \text{ hours} = \$2250.00$

$\$22.50 \times 24 \text{ hours} = \$540.00$

$\$2250.00 + \$540.00 = \$2790.00$

$\$2790.00 \times 1.1 = \$3069.00$ total labour cost

Question 21

Criteria	Marks
• Correctly calculates total linear metres needed	4
• Correctly calculates the total linear metres needed for three parts with some errors	3
• Correctly calculates the total linear metres needed for two parts	2
• Demonstrates some relevant calculation	1

Sample answer:

Part Name	*Length*	*Quantity*	*Total*
Wall plates	**3.615**	**2**	**7.230**
Wall studs	**2.310**	**7**	**16.170**
Noggings	**0.550**	**6**	**3.300**
		Total linear metres	**26.700**

Wall plates $3.615 \times 2 = 7.230$

Wall studs $(2.400 - 0.045 - 0.045) = 2.310 \times 7 = 16.170$

Noggings $3.615 - (7 \times 0.045 = 0.315) = 3.300$ (total length of noggings)
$3.300 \div 6 = 0.550$ (individual nogging)

$7.230 + 16.170 + 3.300 = 26.700$ linear metres

Section III

Question 22

Criteria	Marks
• Shows comprehensive knowledge and understanding of how hazardous materials can affect workers and employers • Uses relevant industry terminology • Provides relevant industry examples	13–15
• Shows sound knowledge and understanding of how hazardous materials can affect workers and employers • Uses some relevant industry terminology • Provides industry examples	10–12
• Shows general understanding of how hazardous materials can affect workers and/or employers	7–9
• Shows basic understanding of how hazardous materials can affect workers **or** employers	4–6
• Shows some awareness of how hazardous materials can affect workers or employers	1–3

Answers could include:

- Effect on workers
  - Short-term exposure (acute): skin irritation from chemicals such as cement products, light-headedness or headaches from fumes, asthma or respiratory distress from dust
  - Long-term exposure (chronic illness): examples such as asbestos-containing materials (ACMs) resulting in asbestosis, mesothelioma, other respiratory disease. Nasal cancer from MDF
  - Injury or illness due to exposure to hazardous materials can result in time off work, medical treatment and expenses, potential loss of income
  - Mental health – stress associated with working with hazardous materials
  - Workers requiring additional or specialised training to increase awareness of potential risks associated with hazardous materials

- Effect on employers
  - Increased cost for training employees
  - Cost of PPE (initial capital cost and maintenance)
  - Cost of manual handling equipment
  - Adherence to relevant codes of practice
  - Correct disposal of waste products / added costs associated with disposal of hazardous materials
  - Higher skill / qualification in handling hazardous materials can result in increased profit (able to charge more for hazardous work)
  - Must have first aid and emergency procedures and protocols in place for dealing with incidents
  - Must be licensed to work with some hazardous materials (eg asbestos).

Hazardous materials could include:

- MDF
- Asbestos
- Silica
- Solvents / paints / finishes
- Treated timber
- Flammable liquids
- Fuel
- Acids for cleaning brickwork
- Fibreglass insulation
- Compressed gases
- Sealants.

Section IV

Question 23 (a)

Criteria	Marks
• Demonstrates extensive knowledge of the considerations needed when handling a variety of materials • Uses relevant industry terminology • Provides relevant industry examples	6
• Demonstrates sound knowledge of the considerations needed when handling a variety of materials • Uses relevant industry terminology • Provides relevant industry examples	4–5
• Demonstrates basic knowledge of the considerations needed when handling a variety of materials	2–3
• Provides some relevant information	1

Answers could include:

- Size and weight of material being moved
- Distance to move
- Access – best line of approach / clear access
- Storage location of materials at the BBQ site. Stacking / storing materials according to sequence of use. Gluts to keep materials off the ground, tarps to cover materials to protect from weather
- Time required to move the materials
- Number of workers available
- Tools and equipment needed (mechanical aids, materials handling equipment, wheel/barrows, brick grabs, shovels)
- Possible gradient of the land
- PPE and safety equipment needed (gloves, safety boots, safety glasses, dust mask)
- Barricade the delivery site.

Factors to consider when moving the materials are the distance that materials are to be moved and the weights of the individual materials. Suitable mechanical lifting aids eg hand trolley may be used or an appropriate number of workers to lift the given weight.

The order in which the materials are moved and then positioned near the BBQ should reflect the sequence in which they will be used where possible. The placement should permit safe access to the area and permit good housekeeping practices.

Question 23 (b)

Criteria	Marks
• Shows in-depth knowledge and understanding of a range of environmental issues • Accurately addresses all aspects of the question • Uses relevant industry terminology • Provides relevant industry examples	9
• Shows sound knowledge and understanding of a range of environmental issues • Addresses all aspects of the question • Uses relevant industry terminology • Provides relevant industry examples	7–8
• Shows general understanding of a range of environmental issues • Uses some relevant industry terminology • Includes some industry examples	5–6
• Shows basic understanding of environmental issues	3–4
• Provides some relevant information on environmental issues	1–2

Answers could include:

- Site preparation
  - Erect barricades and signage to protect the site
  - Erect sediment barriers to prevent run off onto neighbouring properties or into drains and waterways

- Construction
  - Secure materials, protect from wind, protect from rain eg cover to prevent from washing away
  - Minimise water usage / wastage. Tank water
  - Potentially use recycled materials eg bricks, formwork
  - Restrict work to nominated council hours to minimise noise and traffic impact on neighbours
  - Impact on workers from being exposed to extreme temperatures (hot and cold), sunscreen, hat, rest breaks, water, rain protection
  - Don’t leave equipment running unnecessarily, to reduce energy consumption`

- Clean up
  - Establish a wash-out area for tools and equipment
  - Sort all waste materials for correct disposal or recycling
  - Restore site to as good or better than original condition.

2020 HSC Construction
Mapping Grid

Section I

Question	Marks	Unit of competency / Element of competency	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
1	1	Plan and organise work 1.1 – page 31, 2.2 – page 33	X		X					
2	1	Apply OHS requirements, policies and procedures in the construction industry 1.4 – page 96 & 98	X				X			
3	1	Work effectively and sustainably in the construction industry 1.4 – page 15	X	X		X		X		
4	1	Use construction tools and equipment 4.1 – page 72, 5.2 – page 74			X		X			X
5	1	Use construction tools and equipment 2.2 – page 71	X				X			X
6	1	Prepare to work safely in the construction industry 2.2 – page 82	X		X		X		X	
7	1	Read and interpret plans and specifications 1.2 – page 57	X		X		X		X	
8	1	Use construction tools and equipment 2.1 – page 70	X				X			
9	1	Read and interpret plans and specifications 1.2 – page 58	X			X	X			
10	1	Conduct workplace communication 1.1 – page 38	X	X			X		X	
11	1	Prepare to work safely in the construction industry 3.4 – page 85	X		X				X	
12	1	Prepare to work safely in the construction industry 2.1 – page 81			X				X	
13	1	Use construction tools and equipment 2.1 – page 70					X			X
14	1	Carry out measurements and calculations 2.3, 3.1 – page 52			X		X			X
15	1	Carry out measurements and calculations 3.1 – page 52			X					X

Section II

Question	Marks	Unit of competency / Element of competency	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
16 (a)	2	Use construction tools and equipment 4.2 – page 67	X				X			
16 (b)	2	Use construction tools and equipment 1.4 – page 67	X						X	
17	5	Conduct workplace communication 1.1, 2.2 – page 39	X						X	
18	5	Plan and organise work 1.1 – page 34		X	X		X			
19 (a)	2	Read and interpret plans and specifications 3.1 – page 59		X	X		X			
19 (b)	2	Read and interpret plans and specifications 4.2, 4.3 – page 60		X	X		X		X	
19 (c)	3	Read and interpret plans and specifications 1.1, 3.1 – page 60		X	X		X			
19 (d)	3	Read and interpret plans and specifications 3.1 – page 61		X	X				X	
20 (a)	1	Carry out measurements and calculations 2.3 – page 52			X	X	X			
20 (b)	3	Carry out measurements and calculations 2.3 – page 52			X	X	X			
20 (c)	3	Carry out measurements and calculations 3.1 – page 53			X	X	X			
21	4	Carry out measurements and calculations 3.2 – page 52			X	X	X			

Section III

Question	Marks	Unit of competency / Element of competency	Employability skills (Please put an X where appropriate)							
			Communica-tion	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
22	15	Prepare to work safely in the construction industry Apply OHS requirements, policies and procedures in the construction industry Risk management – page 3 Safe work procedures and practices – page 4	X	X	X	X	X	X	X	X

Section IV

Question	Marks	Unit of competency / Element of competency	Employability skills (Please put an X where appropriate)							
			Communica-tion	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
23 (a)	6	Plan and organise work 1.1, 3.1 – page31–34	X	X	X	X	X	X	X	X
23 (b)	9	Work effectively and sustainably in the construction industry 5.1, 5.2, 5.3 – page 22–27	X	X	X	X	X	X	X	X