

# Mark Scheme (Results)

## Summer 2010

Principal Learning

Construction  
CB304 Create the Built Environment:  
Health, Safety and Environmental Influences

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

## SECTION A

Question Number	Answer	Mark
1	<p>Benefits include:</p> <ul style="list-style-type: none"> <li>• Free source of energy</li> <li>• No greenhouse gases</li> <li>• No CO<sub>2</sub> emissions</li> <li>• Renewable energy</li> <li>• Friendly to surrounding environment</li> <li>• Relatively low maintenance</li> <li>• Can share the land with other activities eg farming</li> <li>• High initial costs but very low maintenance costs resulting in low lifecycle costs</li> <li>• Low capital investment due to availability of grants</li> <li>• Sell surplus electricity to national grid</li> <li>• Reduces the dependence on fossil fuels</li> <li>• Provides energy sources to remote areas</li> <li>• Provides energy when the grid is down ie when the mains power is cut</li> <li>• Contributes to the energy efficiency of the project and minimises the carbon footprint possibly linked to BREEAM etc</li> <li>• Can produce power 24hours a day</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two descriptions.</b></p> <p>1 mark for a simple description 2 marks for more detailed description. No mark for identification only.</p>	(4)

Question Number	Answer	Mark
2	<p>Hazards include:</p> <ul style="list-style-type: none"> <li>• Serious risk of fire or explosion from flammable substances, explosive gasses/dust, oxygen enrichment.</li> <li>• Loss of consciousness from asphyxiation arising from gas, fumes, vapour or lack of oxygen.</li> <li>• Increased concentration of dust</li> <li>• Drowning arising from increased water level or other liquids.</li> <li>• Loss of consciousness arising from an increase in body temperature.</li> <li>• Asphyxiation/suffocation arising from a free flowing solid.</li> <li>• Entrapment eg trench/tunnel collapse</li> <li>• Lack of manoeuvrability to work safely</li> <li>• Light levels inappropriate for safe working</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two descriptions.</b></p> <p>1 mark for a simple description 2 marks for more detailed description. No mark for identification only.</p>	(4)

Question Number	Answer	Mark
3	<p>Requirements:</p> <ul style="list-style-type: none"> <li>• Assess the risks to health from hazardous substances.</li> <li>• Decide what precautions are needed.</li> <li>• Prevent or adequately control exposure.</li> <li>• Ensure that control measures are used and maintained.</li> <li>• Monitor exposure of the employees.</li> <li>• Carry out appropriate health surveillance.</li> <li>• Prepare plans and procedures to deal with accidents, incidents and emergencies.</li> <li>• Ensure that employees are properly informed, trained and supervised.</li> <li>• COSHH safety file containing manufacturer's data sheet</li> <li>• Provide appropriate PPE as required</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two descriptions.</b></p> <p>1 mark for a simple description 2 marks for more detailed description. No mark for identification only.</p>	(4)

Question Number	Answer	Mark
4	<p>Impact:</p> <ul style="list-style-type: none"> <li>• In terms of distance travelled.</li> <li>• Emissions from transport.</li> <li>• Deforestation of the rainforest</li> <li>• Global warming</li> <li>• Lack of effective environmental control due to unregulated nature of overseas sourcing</li> <li>• Erosion of soil</li> <li>• Destruction of natural habitat</li> <li>• Displacement of indigenous species</li> <li>• The provision of infrastructure</li> <li>• Manufacturing processing plant</li> <li>• Marine pollution</li> <li>• Embodied energy and energy usage in terms of transport</li> <li>• Environmental effectiveness of method of transport</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two explanations.</b></p> <p>1 mark for a simple explanation  2 marks for more detailed explanation.  <b>No mark for identification only.</b></p>	(4)

## SECTION B

Question Number	Answer	Mark
5	<p>Includes:</p> <ul style="list-style-type: none"> <li>• Orientation.</li> <li>• Layout of space.</li> <li>• Energy use.</li> <li>• Materials specification.</li> <li>• Modern methods of construction.</li> <li>• Factory produced modules for site assembly eg volumetric</li> <li>• Locally sourced materials/components.</li> <li>• Low maintenance materials/components.</li> <li>• Sustainable urban drainage systems (SUDS).</li> <li>• Designing to reduce waste</li> <li>• Adaptability.</li> <li>• Water usage.</li> <li>• Alternative energy sources.</li> <li>• Design considers ease of demolition and recycling at the end of the building's intended life</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any three descriptions.</b></p> <p><b>1 mark for a simple description</b>  <b>2 marks for more detailed description.</b>  <b>No mark for identification only.</b></p>	(6)

Question Number	Answer	Mark
6(a)	<ul style="list-style-type: none"> <li>• Underpinning involves extending the existing foundation to the level of the new foundation, in order to support the existing structure.</li> </ul> <p>Any other appropriate response.</p> <p><b>1 mark for a simple description</b>  <b>2 marks for more detailed description.</b></p>	(2)

Question Number	Answer	Mark
6(b)	<p>Drawing must show</p> <ul style="list-style-type: none"> <li>• Method of transferring load to lower level</li> <li>• Connection between new and existing foundation</li> <li>• Materials used</li> <li>• Correct rendering and fill patterns</li> </ul> <p>1 mark for a simple cross-section with no annotation  2 marks for a more detailed cross-section with basic annotation  3 marks for a detailed cross-section with most annotation  4 marks for a detailed cross-section with full annotation</p>	(4)

Question Number	Answer	Mark
7	<p>Costs include:</p> <ul style="list-style-type: none"> <li>• Lost production time.</li> <li>• Fines.</li> <li>• Investigation costs.</li> <li>• Management time.</li> <li>• Legal costs.</li> <li>• Product or material damage.</li> <li>• Sick pay.</li> <li>• Failure of business.</li> <li>• Damage to reputation resulting in loss of business</li> <li>• Increased insurance premiums</li> <li>• Remedial costs to fix problems</li> </ul> <p>Any other appropriate response.</p> <p>MAX 3 marks for each of any two descriptions.</p> <p>1 mark for a simple description  2 marks for more detailed description.  3 marks for a full description.  No mark for identification only.</p>	(6)



Question Number	Answer	Mark
8(a)	<p>Sum of all costs over the full life span of a building. It includes purchase price, installation cost, operating costs, maintenance and upgrade costs.</p> <p>Any other appropriate response.</p> <p><b>1 mark for a simple explanation</b> <b>2 marks for a more detailed explanation</b></p>	(2)

Question Number	Answer	Mark
8(b)	<p>Costs include:</p> <ul style="list-style-type: none"> <li>• Acquisition costs.</li> <li>• Land costs.</li> <li>• Investment costs.</li> <li>• Design costs.</li> <li>• Construction costs.</li> <li>• Operating costs.</li> <li>• Maintenance and repair costs.</li> <li>• Energy costs.</li> <li>• Materials costs.</li> <li>• Redeveloping costs.</li> <li>• Disposal costs.</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two descriptions.</b></p> <p><b>1 mark for a simple description</b> <b>2 marks for more detailed description.</b> <b>No mark for identification only.</b></p>	(4)

## SECTION C

Question Number	Answer	Mark
9(a)	<p>Physical factors <b>must</b> relate to construction of roof and they include:</p> <ul style="list-style-type: none"> <li>• Access and egress.</li> <li>• Working platforms.</li> <li>• Manual handling.</li> <li>• Plant and mechanical lifting equipment.</li> <li>• Materials handling.</li> <li>• Vehicle and plant movement.</li> <li>• Fall arrest equipment.</li> <li>• Transportation of materials.</li> <li>• Guardrails to working platform.</li> <li>• Guardrails to roof edge.</li> <li>• Barriers.</li> <li>• Safety signage.</li> <li>• PPE</li> <li>• Fall restraint</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any two responses.</b></p> <p>1 mark for a description                  2 marks for description that includes analysis.                  No mark for identification only.</p>	(4)

Question Number	Answer	Mark
9(b)	<p>Duties include to:</p> <ul style="list-style-type: none"> <li>• Plan, manage and monitor the construction phase.</li> <li>• Co-operation and co-ordination between all persons involved on the project.</li> <li>• Liaise with the CDM Co-ordinator.</li> <li>• Ensure welfare facilities are provided throughout the construction phase.</li> <li>• Develop and provide appropriate site rules.</li> <li>• Consult with other contractors regarding the Health and safety Plan.</li> <li>• Ensure information for the Health and Safety File is identified from each contractor.</li> <li>• Prevent unauthorised access to site.</li> <li>• Provide suitable site inductions.</li> <li>• Provide Information on risks to health and safety.</li> <li>• Provide information and training.</li> </ul> <p>Any other appropriate response.</p> <p><b>MAX 2 marks for each of any three descriptions.</b></p> <p>1 mark for a simple description 2 marks for more detailed description. <b>No mark for identification only.</b></p>	(6)

Question Number	Indicative Content	
10	<p>Well presented and structured answers should contain an introduction, main content and conclusion.</p> <p><b>Introduction:</b> Should outline to the client that with the exception of the initial cost, the benefits generally outweigh the disadvantages for the office development project.</p> <p><b>Main content:</b> Should contain descriptions and analysis of a range of benefits and disadvantages.</p> <ul style="list-style-type: none"> <li>• The electricity produced is pollution free.</li> <li>• No carbon dioxide emissions or greenhouse gasses.</li> <li>• No moving parts therefore limited maintenance.</li> <li>• Decrease or remove completely the dependence on fossil fuel-generated electricity.</li> <li>• Saving on overall energy bill.</li> <li>• Electricity suppliers will pay for excess electricity.</li> <li>• Reduced whole life costs.</li> <li>• Energy is produced where it is used, so little energy is lost moving it around.</li> <li>• Light is required to generate electricity so night time and cloudy days do not produce power.</li> <li>• To use AC appliances inverters must be used.</li> <li>• Battery storage means additional maintenance and replacement.</li> <li>• Some of the materials used in photovoltaic are toxic.</li> </ul> <p><b>Conclusion:</b> Draws conclusions based on the evidence produced within the body of the report. Any other appropriate response.</p>	
	<b>Level</b>	<b>Mark</b>
		0
		No rewardable material
	1	1-4
		Poorly structured with no introduction or conclusion. Some relevant benefits and disadvantages identified but weak in description.
	2	5-8
		Structured report which attempts introduction and conclusion. Relevant benefits and disadvantages described and analysed (at least three benefits and three disadvantages to get top of band).
	3	9-10
		Well structured report with clear introduction and conclusion. Sound description and analysis of at least three benefits and three disadvantages.

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