

Mark Scheme (Results)

Summer 2012

Principal Learning

Construction and the Built
Environment (CB307/01)

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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.

Question Number	Answer	Mark
1	<p>Types of building services that will require maintenance include:</p> <ul style="list-style-type: none"> • Electrical – cables, fittings and fixtures • Plumbing – pipes, fittings, valves, etc • Sanitation – fittings, inspection chambers • Heating and hot water – boiler, fittings, power supply • Water treatment – filters, fittings etc • Air conditioning – filters, fittings, ducts etc • Ventilation – filters, fittings, ducts etc • Lift installation – cables. Plant room, doors etc • Mechanical • Fire and emergency – sprinklers, alarms, etc • Refrigeration - plant, fitting, pipes etc • Security – alarm, detectors sensors, wiring, • Computer – systems, cabling etc • Telecommunications – cabling, systems etc • Heat pumps <p>Any other appropriate response</p> <p>Max 2 marks for each of any four descriptions.</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only.</p>	(8)

Question Number	Answer	Mark
2	<p>Benefits of using light railway developments include:</p> <ul style="list-style-type: none"> • Removal of vehicles from roads • Reduced emissions from vehicles • Reduced congestion • Easy access to the heart of the city • Regular and reliable journey times • Reduction in noise levels • Improved air quality • Reduction in greenhouse gasses • Encourages walking and cycling to stations • Can use 'traffic cells' to restrict vehicle access • Integration of cycles – cycle and ride/rent schemes • Reduction in car use infrastructure – roads/garages 	(8)

	<ul style="list-style-type: none"> • Safe transport system • Reduced carbon emissions • Improved access to city facilities • More socially inclusive society <p>Any other appropriate response</p> <p>Max 2 marks for each of any four descriptions</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only</p>	
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Question Number	Answer	Mark
3	<p>Items to be included within an access audit under DDA include:</p> <ul style="list-style-type: none"> • Car parking facilities • Access and egress routes • Internal and external doors – width and opening • Horizontal circulation spaces and facilities • Vertical circulation – spaces and facilities • Toilet and washroom facilities – door width, space, facilities • Signage – specialist facilities, safe refuge areas • Alarms and security systems – method of evacuation • Floor Surfaces –uneven, split level, ramps • Lighting – safe exit • Refuge areas – for safe emergency evacuation • Level access/egress <p>Any other appropriate response</p> <p>Max 2 marks for each of any four descriptions.</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only.</p>	(8)

Question Number	Answer	Mark
4	<p>Benefits of using ground source heat pumps include:</p> <ul style="list-style-type: none"> • Uses a renewable energy source • Do not burn fuels for example gas • Reduced running costs in comparison with traditional fuel types • Increased SAP ratings – Building Regulation Requirements • Improved Eco Homes rating – environmental rating schemes for homes in the UK • Low environmental impact • Reduced carbon footprint – in comparison with traditional fuel sources • Provision of zero carbon energy • Zero visual impact • Easy interface with building systems <p>Any other appropriate response</p> <p>Max 2 marks for each of any three descriptions.</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only.</p>	(6)

Question Number	Answer	Mark
5	<p>Categories used within a BREEAM assessment include:</p> <ul style="list-style-type: none"> • Management – policy, commissioning and procedural issues • Health and Wellbeing – indoor and external issues affecting health and wellbeing • Energy –related to operational energy use and CO₂ issues • Transport – related to CO₂ and location related factors • Water – related to consumption and water efficiency • Material and waste – related to environmental impact of building materials • Ecology – related to ecological value of the site • Land use - related to greenfield and brownfield sites • Pollution – related to air and water pollution <p>Any other appropriate response</p> <p>Max 2 marks for each of any three descriptions.</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only.</p>	(6)

Question Number	Answer	Mark
6	<p>Impacts of the Environmental Protection Act include:</p> <ul style="list-style-type: none"> • Control of emissions - fumes, smoke, dust etc • Control of radioactive substances • Control of noise - caused by a vehicle, machinery or equipment on a highway, road, footway, square or court open to the public. • Control of smoke – fires, not prejudicial to health • Control of gasses - arising on industrial, trade or business premises, not prejudicial to health • Control of steam - not prejudicial to health • Control of smells - not prejudicial to health • Control of dust - arising on industrial, trade or business premises prejudicial to health • Control of hazardous substances – e.g. chemicals prejudicial to health • Control of litter - nature conservation • Control of asbestos - prejudicial to health • Biodiversity Control of pollutants, eg polluting water courses • Control of waste - management • Control of litter – throwing, dropping, depositing <p>Any other appropriate response</p> <p>Max 2 marks for each of any three descriptions.</p> <p>1 mark for a simple description. 2 marks for a more detailed description. No mark for identification only</p>	(6)

Question Number		Indicative Content
7		<p>Items included within a feasibility study could include:</p> <ul style="list-style-type: none"> • Financial implications of the project • The timescale involved in throughout the project through to completion • Energy analysis of future requirements • Building condition analysis including problems related to asbestos, to determine refurbishment requirements • Building services analysis including fire, drainage, sanitation • Legal implications including Equality Act, DDA, Building Regulations • Energy conservation opportunities • Renewable technologies opportunities that could be considered or implemented • Refurbishment requirements for the full structure • Future maintenance requirements for both internal and external elements and services • Sources of finance/grants for completion of the proposed work <p>Any other appropriate response</p>
Level	Mark	Descriptor
	0	No rewardable material / No marks for identification only
1	1-2	Limited understanding of feasibility study demonstrated with one or two items briefly described and no application to the scenario
2	3-4	Clear understanding of feasibility study demonstrated with some items described in more detail and increasing application to the project scenario
3	5-6	Sound understanding of feasibility study demonstrated with a range of items fully described specifically focussed on the project scenario

Question Number		Indicative Content
8		<p>Explanation of how some of the following materials improve the sustainability of the project:</p> <ul style="list-style-type: none"> • Fine aggregate (sand) – minimum processing – low embodied energy, from quarries, river bed • Coarse aggregate (gravel), minimum processing – low embodied energy, from quarries, river bed • Locally sourced wood – managed forests, minimal transportation • Calcium – silicate (sand-lime) bricks • Locally sourced natural stone, minimal transportation • Sheep’s wool insulation, minimal processing • Cellulose (wastepaper) insulation • Hemp concrete products • Hemp plaster • Lime based mortar used for masonry – aids future re-use • Earth blocks – minimal processing, low embodied energy • Dried clay block and bricks, minimal processing, low embodied energy • Hemp blocks • Wood fibre insulation products - minimal processing, low embodied energy • Recycled materials – concrete, steel, glass, copper, zinc • Re-used materials – bricks, timber, clay products, stone • Natural paints • Water-based paints <p>Any other appropriate response</p>
Level	Mark	Descriptor
	0	No rewardable material / No marks for identification only
1	1-2	Limited understanding of sustainable materials demonstrated with one or two materials briefly described and no application to the scenario
2	3-4	Clear understanding of sustainable materials demonstrated with some materials described in more detail and increasing application to the project scenario
3	5-6	Sound understanding of sustainable materials demonstrated with a range of materials fully described specifically focussed on the project scenario.

Question Number		Indicative Content
9		<p>Requirements of Part L of the Building Regulations Include:</p> <ul style="list-style-type: none"> • Increased standard of thermal insulation to external elements for example walls, floors, roof • Energy efficient heating, lighting, services and control systems • Control of excessive solar gain by shading etc • Control of heat gains and losses from pipes, ducts and vessels • Meeting carbon targets • Energy efficient operation of plant, boilers etc • Whole building carbon improvement - building geometry, construction, use, HVAC and lighting equipment • Improved air tightness – openings in the external fabric, windows, doors etc • Energy Performance Certificates –rating of energy efficiency • Design limits - thermal performance of the building fabric and building services <p>Any other appropriate response</p>
Level	Mark	Descriptor
	0	No rewardable material / No marks for identification only
1	1-2	Limited understanding of Part L (Conservation of Fuel and Power) demonstrated with one or two requirements briefly described and no application to the scenario
2	3-4	Clear understanding of Part L (Conservation of Fuel and Power) demonstrated with some requirements described in more detail and increasing application to the project scenario
3	5-6	Sound understanding of Part L (Conservation of Fuel and Power) demonstrated with a range of requirements fully described specifically focussed on the project scenario.

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