COSCSMO07 SQA Unit Code H99P 04

Assess and evaluate the sustainability and environmental impact of developments in construction management

Overview

This unit is about managing the impact of the built environment on the natural environment. You will need to investigate requirements for assessing the environmental impact of proposals. You will also need to select the factors and the criteria used to assess the impact and assess their significance.

You will need to investigate and evaluate the best balance between the potential asset value and sustainability and project design, function, performance and return on investment. You will then need to present you development strategies to decision makers.

Finally, you will need to investigate the factors which impact on the utilisation and sustainability of resources and identify potential alternatives. You will need to carry out investigations and assessments of alternative resources to identify technical and environmental advantages. You will also need to present your recommendations for suitable strategies for using alternative resources to decision makers.

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Performance criteria

You must be able to:

Assess the environmental impact of development proposals

P1 investigate the requirements for assessing the environmental impact of proposals by examining policy documents, consulting stakeholders and experts

P2 select the factors which will be included in the assessment and the criteria to be used for assessing the impact

P3 collate relevant data and examine the proposal in its context

P4 identify and review alternative solutions which will improve environmental quality and increase sustainability

P5 analyse and forecast the environmental impact of the selected factors, both individually and in combination

P6 assess, quantify and report on the significance of each factor and suggest measures which will reduce the environmental impact

Evaluate and present sustainable requirements

You must be able to:

P7 identify goals and priorities for potential development, both currently and in the future

P8 investigate and identify the design, function and performance requirements of the potential project

P9 investigate economic factors and resources, environmental and ecological factors, and social views that affect the future asset value and sustainability of potential development and consider alternatives

P10 evaluate the best balance between the potential asset value and sustainability and project design, function, performance and return on investment

P11 present development strategies in a suitable format and justify them to decision makers

P12 decide whether and how to implement potential sustainable development projects to achieve key requirements

Identify and evaluate sustainable resources

You must be able to:

P13 investigate, from appropriate information sources, the factors which impact on the utilisation and sustainability of renewable resources

P14 assess accurately the costs and implications of the management and replacement of renewable resources

P15 identify and summarise appropriate and valid information sources and identify potential alternative resources

P16 compare the technical performance and environmental implications of alternative resources with the performance of existing finite resources with a similar function and calculate any variances

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Performance criteria

P17 investigate, assess and recommend suitable strategies for developing alternative resources, which indicate positive technical and environmental advantages

P18 present strategies in a suitable format and justify them to stakeholders

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Knowledge and understanding

You need to know and understand:

Assess the environmental impact of development proposals

K1 how and why to investigate the requirements for assessing the environmental impact of proposals by examining policy documents, consulting stakeholders and experts (analysis)

K2 how and why to select the factors which will be included in the assessment and the criteria to be used for assessing the impact (evaluation)

K3 how to collate relevant data (application)

K4 how and why to examine the proposal in its context (analysis)

K5 what to identify as alternative solutions which will improve environmental quality and increase sustainability (understanding)

K6 how and why to review alternative solutions which will improve environmental quality and increase sustainability (analysis)

K7 how and why to analyse the environmental impact of the selected factors, both individually and in combination (analysis)

K8 how and why to forecast the environmental impact of the selected factors, both individually and in combination (analysis)

K9 how and why to assess and quantify the significance of each factor (analysis)

K10 how to report on the significance of each factor (application)

K11 how and why to suggest measures which will reduce the environmental impact (synthesis)

Evaluate and present sustainable requirements

You need to know and understand:

K12 what to identify as the goals and priorities for potential development, both currently and in the future (understanding)

K13 how and why to investigate the design, function and performance requirements of the potential project (analysis)

K14 what to identify as the design, function and performance requirements of the potential project (understanding)

K15 how and why to investigate economic factors and resources, environmental and ecological factors, and social views that affect the future asset value and sustainability of potential development and consider alternatives (analysis)

K16 how and why to evaluate the best balance between the potential asset value and sustainability and project design, function, performance and return on investment (evaluation)

K17 how to present development strategies in a suitable format (application)

K18 how and why to justify development strategies to decision makers (synthesis)

K19 how and why to decide whether and how to implement potential sustainable development projects to achieve key requirements (evaluation)

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Knowledge and understanding

You need to know and understand:

Identify and evaluate sustainable resources

K20 how and why to investigate, from appropriate information sources, the factors which impact on the utilisation and sustainability of renewable resources (analysis)

K21 how and why to assess accurately the costs and implications of the management and replacement of renewable resources (analysis)

K22 what to identify as appropriate and valid information sources (understanding)

K23 how to summarise appropriate and valid information sources (application)

K24 what to identify as potential alternative resources (understanding)

K25 how and why to compare the technical performance and environmental implications of alternative resources with the performance of existing finite resources with a similar function and calculate any variances (synthesis)

K26 how and why to investigate and assess suitable strategies for developing alternative resources, which indicate positive technical and environmental advantages (analysis)

K27 how and why to recommend suitable strategies for developing alternative resources, which indicate positive technical and environmental advantages (synthesis)

K28 how to present strategies in a suitable format to stakeholders (application)

K29 how and why to justify strategies to stakeholders (evaluation)

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Scope/range

Assess the environmental impact of development proposals

1 Requirements:
- 1.1 social and community obligations
- 1.2 legal obligations
- 1.3 current codes of practice
- 1.4 feasibility
- 1.5 conditions to be applied to the proposal
- 1.6 significant environmental issues and effects
- 1.7 examining alternatives
- 1.8 proposing appropriate mitigation measures

2 Proposals:
- 2.1 individual projects
- 2.2 strategic policies, plans and proposals

3 Factors:
- 3.1 environmental impact and sustainability
- 3.2 quantity
- 3.3 quality (including design)
- 3.4 cost (including whole life costs/return on investment)
- 3.5 time
- 3.6 social (community use and adaptability)
- 3.7 programme
- 3.8 transport impact minimisation

4 Criteria:
- 4.1 primary and secondary effects
- 4.2 positive and negative
- 4.3 risk and opportunity
- 4.4 construction, operation and decommissioning stages
- 4.5 temporary, cumulative and permanent
- 4.6 short and long term

5 Relevant data:
- 5.1 project baseline information
- 5.2 survey information
- 5.3 relevant standards

Scope/range

5.4 relevant legal, regulatory and policy requirements

5.5 historical

5.6 project

6 Alternative solutions:

6.1 different locations

6.2 different sites

6.3 brownfield development

6.4 different layouts

6.5 extending the use of existing resources

6.6 renewable energy technology

6.7 use of alternative resources

6.8 changes to implementation and phasing

6.9 not carrying out the proposal

Evaluate and present sustainable requirements

7 Goals and priorities:

7.1 quantity

7.2 cost (including whole life costs)

7.3 time

7.4 development

7.5 improvement

7.6 use

7.7 maintenance

7.8 low carbon design

7.9 environmental impact and sustainability

7.10 security

7.11 health and safety

7.12 logistics

8 Investigate:

8.1 use of benchmarking tools

8.2 insurance risk

8.3 research

8.4 consultancy advice

Scope/range

8.5 regulatory advice

9 Economic factors and resources:

9.1 finance

9.2 fiscal policy (including carbon tax/incentives)

9.3 water demand/supply/use minimisation

9.4 payback/return on investment

9.5 carbon trading schemes/carbon reduction credits

9.6 climate change levy agreements

9.7 workforce (skills)

9.8 raw materials

9.9 manufactured systems and component/modular systems

9.10 energy use/demand minimisation

9.11 water demand/supply/use minimisation

9.12 brownfield development

9.13 land use

9.14 resource efficient low carbon urban design

9.15 market demands and social factors

10 Environmental and ecological factors:

10.1 natural resources

10.2 emissions (air, land, water)

10.3 waste and recycling

10.4 effluent

10.5 access to environmentally sensitive areas

10.6 effects of climate change

10.7 land use contamination

10.8 carbon use minimisation

10.9 water use

10.10 biodiversity

10.11 renewable energy technology

10.12 protect archaeological and historically valuable resources

10.13 transport impact minimisation

11 Social views:

11.1 client

Scope/range

11.2 funders/investors

11.3 workforce

11.4 suppliers

11.5 users

11.6 community (including public and private space)

12 Asset value and sustainability:

12.1 provide capital growth

12.2 location in relation to a stable economy and community

12.3 saleable revenue

12.4 minimising running costs (environmental and economic)

12.5 minimising maintenance

12.6 location in relation to flooding/ground conditions

12.7 energy use/demand minimisation

12.8 district heating

Identify and evaluate sustainable resources

13 Information sources:

13.1 desk research of published literature

13.2 commissioned research

13.3 consultation with appropriate authorities

13.4 consultation with colleagues

14 Factors:

14.1 nature

14.2 location

14.3 continued availability

14.4 energy use/demand/storage capacity

14.5 climate change impact

14.6 carbon use

14.7 waste

14.8 water use

14.9 biodiversity

15 Utilisation:

15.1 historic use

Scope/range

15.2 current use

15.3 anticipated future use

16 Resources:

16.1 alternative power generation schemes and implications on design and master planning

16.2 solar, wind, biomass, CHP, photovoltaic, ground source heat pump, air source heat pump, hydrogen; fuel cell)

16.3 hydro, wave and tidal power

17 Environmental implications:

17.1 social

17.2 cultural

17.3 technical

17.4 economic (including funding/tax incentives)

17.5 visual

17.6 political

17.7 legal

18 Present:

18.1 oral written

18.2 graphically

18.3 electronically

18.4

19 Stakeholders:

19.1 immediate superiors and managers

19.2 elected representatives

19.3 public servants

19.4 shareholders

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