

Theme 4 Cost management

4.1 Understand the factors influencing cost

- 4.1.1 Identify the factors influencing cost.
- 4.1.2 Explain how these factors influence cost.

4.2 Evaluate cost management

- 4.2.1 Critique the client's budget in conjunction with the program and the conditions for completing the project.
- 4.2.2 Critique the recommendations made to a client following a value analysis.

4.3 Understand the various methods of estimating cost

- 4.3.1 Describe the methods for estimating cost.

4.4 Apply estimating methods within the framework of a project

- 4.4.1 Identify the resources available to do a cost estimate.
- 4.4.2 Differentiate between the concepts of construction costs, project costs and overall costs.
- 4.4.3 Use the preferred estimating method in a given situation.

Theme 5 Code research

5.1 Understand the scope and application of the National Building Code of Canada to the design, construction and occupancy of buildings

- 5.1.1 Identify the parts of the Code which apply to specific building projects.
- 5.1.2 Interpret the Division B appendices in Volume 2 of the Code.
- 5.1.3 Identify the scope and application of referenced standards included in the Code.

5.2 Apply the minimum standards of Division B of the National Building Code to design development

- 5.2.1 Apply the classification and construction requirements to a proposed building.
- 5.2.2 Apply building fire safety requirements to a proposed building.
- 5.2.3 Apply floor area safety requirements to a proposed building.
- 5.2.4 Apply barrier free requirements to a proposed building.

5.3 Apply the minimum standards of the National Building Code to construction documents regulated by Division B Part 3

- 5.3.1 Interpret the Code requirements for fire safety.
- 5.3.2 Interpret the Code requirements for sound separations.
- 5.3.3 Interpret the Code requirements for safety in floor areas.
- 5.3.4 Interpret the Code requirements for exits.
- 5.3.5 Interpret the Code requirements for health.
- 5.3.6 Interpret the Code requirements for barrier free design.

5.4 Apply the minimum standards of the National Building Code to construction documents regulated by Division B Part 9

- 5.4.1 Apply prescriptive Code requirements for structural design.
- 5.4.2 Apply prescriptive Code requirements for safety.
- 5.4.3 Apply prescriptive Code requirements for health.
- 5.4.4 Apply prescriptive Code requirements for envelope design.

5.5 Understand the requirements for achieving design compliance using alternative solutions, as set out in Division A and Subsection 1.1.2. of Division B of the National Building Code

- 5.5.1 Identify the proper application of an alternative solution in a building design.
- 5.5.2 Identify Code objectives and their application.
- 5.5.3 Identify the functional statements associated with a Code requirement.
- 5.5.4 Identify the documents and information required to file an alternative design solution.

THEME 6 SCHEMATIC DESIGN

6.1 Understand aspects of schematic design

- 6.1.1 Identify the information required for schematic design, given specific conditions.
- 6.1.2 Categorize the engineering services required for the schematic design of a given project (program, clients and context).
- 6.1.3 Identify the documentation typically prepared for the client's approval of the schematic design.
- 6.1.4 Explain the scope of building code analysis in schematic design.
- 6.1.5 Explain the principles of sustainable design as they relate to schematic design.

THEME 7**DESIGN DEVELOPMENT****7.1 Understand aspects of design development**

- 7.1.1 Identify the information required for design development, given specific conditions.
- 7.1.2 Categorize the engineering services required for the design development of a given project (program, clients and context).
- 7.1.3 Identify the documentation typically prepared for the client's approval of the design development.
- 7.1.4 Describe the impacts of universal accessibility on design development.
- 7.1.5 Explain the principles of sustainable design as they relate to design development.

THEME 8**FINAL PROJECT****8.1 Understand the principles of construction**

- 8.1.1 Explain general structural principles.
- 8.1.2 Explain general mechanical principles (plumbing, heating, ventilation, air conditioning, fire protection, conveyance systems).
- 8.1.3 Explain the principles of soil mechanics.
- 8.1.4 Explain the principles of foundations.
- 8.1.5 Explain the principles of building envelope.
- 8.1.6 Explain the principles of acoustic design for a building.

8.2 Know construction materials and their properties

- 8.2.1 Choose the appropriate materials for a given project.
- 8.2.2 Identify the main properties of load-bearing materials (metal, wood, concrete, masonry).
- 8.2.3 Identify the properties of the types of building framework (metal, wood, concrete, masonry).
- 8.2.4 Identify the properties of the main types of insulating materials.
- 8.2.5 Identify the properties of the main types of air/vapour/water barriers.
- 8.2.6 Identify the properties of the main types of finishing materials.
- 8.2.7 Identify the impact of materials and processes on health and the environment.

8.3 Understand construction processes

- 8.3.1 Describe foundation systems as they relate to soil types and conditions.
- 8.3.2 Describe the role of components in a building envelope.
- 8.3.3 Choose construction methods that are appropriate to given criteria (cost, timing, durability, aesthetics, performance) and environmental conditions.

8.4 Evaluate material assemblies

- 8.4.1 Evaluate an acoustic assembly.
- 8.4.2 Evaluate a firestop assembly.
- 8.4.3 Evaluate an assembly of materials in relation to its thermal resistance.
- 8.4.4 Evaluate an assembly of materials in relation to moisture control.
- 8.4.5 Evaluate an assembly of materials in relation to its air-tightness.
- 8.4.6 Develop a structural system with a wooden frame from data provided.

8.5 Understand the components of the construction documents

- 8.5.1 Describe the contents of the specifications.
- 8.5.2 Describe the function of the specifications.
- 8.5.3 Describe the function of the working drawings.
- 8.5.4 List the main components of the working drawings.
- 8.5.5 Explain the relationships among the components of the construction documents.

8.6 Understand the principles of writing a technical specification

- 8.6.1 Explain the links between the MasterFormat and the National Master Specification (NMS).
- 8.6.2 Distinguish among the divisions of the NMS that are common or specific to each of the disciplines (architecture, structural, mechanical, electrical, etc.).
- 8.6.3 Match a construction element to the appropriate division of the MasterFormat.
- 8.6.4 Describe the components of a typical MasterFormat specification section.
- 8.6.5 List the rules related to writing a good specification.

8.7 Evaluate the components of the construction documents

- 8.7.1 Verify that products, materials and assemblies conform to standards and codes.
- 8.7.2 Check that architectural documents are coordinated and complete.

THEME 9**BIDDING AND CONTRACT NEGOTIATIONS****9.1 Understand the different methods of realizing construction projects**

9.1.1 Differentiate between the forms of project delivery.

9.2 Understand the types of construction contract

9.2.1 Identify the different types of construction contract.

9.2.2 Explain the purpose of the CCDC construction documents.

9.2.3 Describe the responsibilities of parties in a construction contract.

9.3 Understand the methods for the awarding of a construction contract

9.3.1 Describe the responsibilities of each party involved in the tendering process.

9.3.2 Describe the role of the local construction associations and bid depositories in the tendering process.

9.3.3 Describe the methods for the awarding of a construction contract.

9.3.4 Describe the stages of a standard tendering process.

9.3.5 Describe the documentation required for each phase of the tendering process.

9.4 Evaluate the bids submitted by the contractors

9.4.1 Describe architect's responsibility in making recommendations.

9.4.2 Assess bid submissions.

THEME 10**CONSTRUCTION PHASE – OFFICE****10.1 Understand the roles of the architect and other participants in the administration of the construction contract**

10.1.1 Explain the roles and responsibilities of the architect in the administration of a given construction contract.

10.1.2 Explain the roles and responsibilities of the client (owner) in the administration of a given construction contract.

10.1.3 Explain the roles and responsibilities of the contractor in the administration of a given construction contract.

10.2 Understand office administration tasks related to the different stages of a construction contract

10.2.1 Explain the tasks related to the construction phase (from the initial construction meeting, throughout construction and close-out, until the end of the warranty period).

10.2.2 Describe the documentation required of the contractor prior to commencement of construction.

10.2.3 Describe the type of documentation required to effect changes to the construction contract.

10.2.4 Explain the tasks involved in processing payment for the work.

10.2.5 Explain the tasks involved in the review of shop drawings and submittals.

10.2.6 Explain the terms of a contract related to deficiencies, take-over procedures, commissioning, indemnification and warranty.

10.3 Apply the administration forms appropriate to different aspects of construction

10.3.1 Complete a certificate for payment.

10.3.2 Complete a change order.

10.3.3 Complete relevant forms or reports (substantial completion, final inspection, field review, etc.).

THEME 11**CONSTRUCTION PHASE – SITE****11.1 Understand the roles of the architect and the other participants in the administration of a construction contract**

11.1.1 Explain the roles and responsibilities of the architect in the administration of a given construction contract.

11.1.2 Explain the roles and responsibilities of the client (owner) in the administration of a given construction contract.

11.1.3 Explain the roles and responsibilities of the contractor in the administration of a given construction contract.

11.1.4 Explain the roles and responsibilities of the architect with respect to inspection and testing firms.

11.2 Understand site tasks related to the different stages of a construction contract

11.2.1 Explain the tasks related to the construction phase on site (from the initial construction meeting, throughout construction and close-out, until the end of the warranty period).

11.2.2 Describe the procedures for monitoring construction progress.

11.2.3 Explain the terms of the construction contract related to field review.

11.2.4 Explain the terms of the construction contract related to the takeover procedures.

11.2.5 Explain the terms of the construction contract related to issues of hazardous materials and toxic substances.

11.3 Apply the administration forms appropriate to different aspects of construction

11.3.1 Complete relevant forms or reports (meeting report, field review, etc.).

