PROGRAM OUTLINE

Carpenter
CARPENTER
HARMONIZED PROGRAM OUTLINE

APPROVED BY INDUSTRY
2016

BASED ON
NOA 2014
AND
CCDA HARMONIZATION
RECOMMENDATIONS 2015

Developed by
Industry Training Authority
Province of British Columbia
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Introduction

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Section 1
INTRODUCTION
Carpenter
Foreword

This revised Carpenter Program Outline is intended as a guide for instructors, apprentices, and employers of apprentices as well as for the use of industry organizations, regulatory bodies, and provincial and federal governments. It reflects updated standards based on the new Carpenter Occupational Analysis (2014) and British Columbia industry and instructor subject matter experts.

Practical instruction by demonstration and student participation should be integrated with classroom sessions. Safe working practices, even though not always specified in each operation or topic, are an implied part of the program and should be stressed throughout the apprenticeship.

This Program Outline includes a list of recommended reference textbooks that are available to support the learning objectives and the minimum shop requirements needed to support instruction.

The Program Outline was prepared with the advice and assistance of the Carpenter Review Committee and will form the basis for further updating of the British Columbia Carpenter Program and learning resources by the Construction Industry Training Organization on behalf of the Industry Training Authority (ITA).

Competencies are to be evaluated through written exams and practical assessments. A passing grade is achieved by getting an overall mark of 70%. See the Assessment Guidelines in the Appendix for more details. The types of questions used on these exams must reflect the cognitive level indicated by the learning objectives and the learning tasks listed in the related competencies.

Achievement Criteria are included for those competencies that require a practical component. The intent of including Achievement Criteria in the Program Outline is to ensure consistency in training across the many training institutions in British Columbia. Their purpose is to reinforce the theory and to provide a mechanism for evaluation of the learner’s ability to apply the theory to practice. It is important that these performances be observable and measureable and that they reflect the skills spelled out in the competency as those required of a competent journeyperson. The conditions under which these performances will be observed and measured must be clear to the learner as well as the criteria by which the learner will be evaluated. The learner must also be given the evaluation criteria.

The performance spelled out in the Achievement Criteria is a suggested performance and is not meant to stifle flexibility of delivery. Training providers are welcome to substitute other practical performances that measure similar skills and attainment of the competency. Multiple performances may also be used to replace individual performances where appropriate.

SAFETY ADVISORY

Be advised that references to the WorkSafeBC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com. Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.
Acknowledgements

Subject Matter Experts retained to assist with the review and update of the Program Outline (2016):

- Chris Backman
  Kingston Construction Ltd.
- Hank Bangma
  Thompson Rivers University
- Randy Callaghan
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- Tim Dorn
  Okanagan College
- Craig McCallum
  Selkirk College
- Matt Melgaard
  Vancouver Island University
- Geoff Murray
  Camosun College
- Don Naidesh
  British Columbia Institute of Technology
- Hamish Stewart
  British Columbia Regional Council of Carpenters
How to Use this Document

This Program Outline has been developed for the use of individuals from several different audiences. The table below describes how each section can be used by each intended audience.

<table>
<thead>
<tr>
<th>Section</th>
<th>Training Providers</th>
<th>Employers/ Sponsors</th>
<th>Apprentices</th>
<th>Challengers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Credentialing Model</strong></td>
<td>Communicate program length and structure, and all pathways to completion</td>
<td>Understand the length and structure of the program</td>
<td>Understand the length and structure of the program, and pathway to completion</td>
<td>Understand challenger pathway to Certificate of Qualification</td>
</tr>
<tr>
<td><strong>OAC</strong></td>
<td>Communicate the competencies that industry has defined as representing the scope of the occupation</td>
<td>Understand the competencies that an apprentice is expected to demonstrate in order to achieve certification</td>
<td>View the competencies they will achieve as a result of program completion</td>
<td>Understand the competencies they must demonstrate in order to challenge the program</td>
</tr>
<tr>
<td><strong>Training Topics and Suggested Time Allocation</strong></td>
<td>Shows proportionate representation of general areas of competency (GACs) at each program level, the suggested proportion of time spent on each GAC, and percentage of time spent on theory versus practical application</td>
<td>Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application</td>
<td>Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application</td>
<td>Understand the relative weightings of various competencies of the occupation on which assessment is based</td>
</tr>
<tr>
<td><strong>Program Content</strong></td>
<td>Defines the objectives, learning tasks, high level content that must be covered for each competency, as well as defining observable, measurable achievement criteria for objectives with a practical component</td>
<td>Identifies detailed program content and performance expectations for competencies with a practical component; may be used as a checklist prior to signing a recommendation for certification (RFC) for an apprentice</td>
<td>Provides detailed information on program content and performance expectations for demonstrating competency</td>
<td>Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels</td>
</tr>
<tr>
<td>Section</td>
<td>Training Providers</td>
<td>Employers/ Sponsors</td>
<td>Apprentices</td>
<td>Challengers</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Training Provider Standards</td>
<td>Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program</td>
<td>Identifies the tools and equipment an apprentice is expected to have access to; which are supplied by the training provider and which the student is expected to own</td>
<td>Provides information on the training facility, tools and equipment provided by the school and the student, reference materials they may be expected to acquire, and minimum qualification levels of program instructors</td>
<td>Identifies the tools and equipment a tradesperson is expected to be competent in using or operating; which may be used or provided in a practical assessment</td>
</tr>
</tbody>
</table>
Section 2

PROGRAM OVERVIEW

Carpenter
Program Credentialing Model

Apprenticeship Pathway

This graphic provides an overview of the Carpenter apprenticeship pathway.

C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship
C of C = Certificate of Completion
WBT = Work-Based Training

Carpenter Foundation
Technical Training: 24 Weeks*

C of Q Carpenter
Technical Training: Level 1
WBT: 500 hours

C of A Carpenter
Technical Training: Accumulate hours
ITA Standardized Written Exam

Carpenter Level 4
Technical Training: 210 hours (7 weeks*)
Work-Based Training: 6,360 hours total
Interprovincial Red Seal Exam

Carpenter Level 3
Technical Training: 210 hours (7 weeks*)
Work-Based Training: Accumulate hours
ITA Standardized Written Exam

Carpenter Level 2
Technical Training: 210 hours (7 weeks*)
Work-Based Training: Accumulate hours
ITA Standardized Written Exam

Carpenter Level 1
Technical Training: 210 hours (7 weeks*)
Work-Based Training: Accumulate hours
ITA Standardized Written Exam

RECOMMENDATION FOR CERTIFICATION

CROSS-PROGRAM CREDITS

Individuals who hold the credentials listed below are entitled to receive partial credit toward the completion requirements of this program

C of Q Residential Framing Technician
Technical Training: Level 1
WBT: 500 hours

C of Q Construction Formwork Technician
Technical Training: Level 2
WBT: 2,500 hours

* Suggested duration based on a 30-hour week
**Occupational Analysis Chart**

**CARPENTER**

**Occupation Description:** “Carpenter” means a person who performs all work in connection with the assembly and erection of false work and forms for concrete, wood and metal frame construction, and installs interior and exterior finishing metals for residential, commercial, and industrial projects, while conforming to plans and specifications and local building codes. Other trade skills include layout, rigging/signalling, cutting/welding and the erection and dismantling of scaffolding.

<table>
<thead>
<tr>
<th>SAFE WORK PRACTICES</th>
<th>DOCUMENTATION AND ORGANIZATIONAL SKILLS</th>
<th>TOOLS AND EQUIPMENT</th>
<th>SURVEY INSTRUMENTS AND EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply Shop and Site Safety Practices</td>
<td>Use Construction Drawings and Specifications</td>
<td>Use Hand Tools</td>
<td>Use Levelling Instruments and Equipment</td>
</tr>
<tr>
<td>Apply Personal Safety Practices</td>
<td>Interpret Building Codes and Bylaws</td>
<td>Use Portable Power Tools</td>
<td>Use Site Layout Equipment</td>
</tr>
<tr>
<td>A1</td>
<td>B1</td>
<td>C1</td>
<td>D1</td>
</tr>
<tr>
<td>A2</td>
<td>B2</td>
<td>C2</td>
<td>D2</td>
</tr>
<tr>
<td>1 1</td>
<td>1 2 3 4</td>
<td>1 2 3</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Plan and Organize Work</th>
<th>Perform Trade Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3</td>
<td>B4</td>
<td></td>
</tr>
<tr>
<td>1 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SAFE WORK PRACTICES**

**DOCUMENTATION AND ORGANIZATIONAL SKILLS**

**TOOLS AND EQUIPMENT**

**SURVEY INSTRUMENTS AND EQUIPMENT**
# HARMONIZED PROGRAM OUTLINE

## Program Overview

<table>
<thead>
<tr>
<th>FINISHING MATERIALS</th>
<th>Install Doors and Hardware</th>
<th>Install Windows and Hardware</th>
<th>Install Exterior Finishes</th>
<th>Install Interior Finishes</th>
<th>Install Cabinets</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>I1</td>
<td>I2</td>
<td>I3</td>
<td>I4</td>
<td>I5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install Interior Floor, Ceiling and Wall Systems</td>
<td>I7</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUILDING SCIENCE</th>
<th>Control the Forces Acting on a Building</th>
<th>Control Heat and Sound Transmission</th>
<th>Control Air and Moisture Movement in Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>J1</td>
<td>J2</td>
<td>J3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
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</tr>
</tbody>
</table>
## Training Topics and Suggested Time Allocation

### Carpenter – Level 1

<table>
<thead>
<tr>
<th>Line</th>
<th>Topic</th>
<th>% of Time Allocated to:</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>silence</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Safe Work Practices</td>
<td>6%</td>
<td>70%</td>
<td>30%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Apply Shop and Site Safety Practices</td>
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<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Apply Personal Safety Practices</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>Documentation and Organizational Skills</td>
<td>16%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Use Construction Drawings and Specifications</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Interpret Building Codes and Bylaws</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Plan and Organize Work</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Perform Trade Math</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>C</td>
<td>Tools and Equipment</td>
<td>20%</td>
<td>60%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Use Hand Tools</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Use Portable Power Tools</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Use Stationary Power Tools</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>D</td>
<td>Survey Instruments and Equipment</td>
<td>6%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Use Levelling Instruments and Equipment</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>E</td>
<td>Access, Rigging and Hoisting Equipment</td>
<td>12%</td>
<td>60%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Use Ladders, Scaffolds and Access Equipment</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Use Rigging and Hoisting Equipment</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>F</td>
<td>Site Layout</td>
<td>2%</td>
<td>30%</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Lay Out Building Locations</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>G</td>
<td>Concrete Formwork</td>
<td>20%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Use Concrete Types, Materials, Additives and Treatments</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select Concrete Forming Systems</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Build Footing and Vertical Formwork</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Build Slab-On-Grade Forms and Suspended Slab Forms</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install Reinforcement and Embedded Items</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Place and Finish Concrete</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>H</td>
<td>Wood Frame Construction</td>
<td>16%</td>
<td>60%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Describe Wood Frame Construction</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Select Framing Materials</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Build Floor Systems</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Build Stair Systems</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Build Decks and Exterior Structures</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>J</td>
<td>Building Science</td>
<td>2%</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Control the Forces Acting on a Building</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>silence</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Total Percentage for Carpenter Level 1</td>
<td>100%</td>
<td></td>
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</tr>
</tbody>
</table>
# Training Topics and Suggested Time Allocation

## Carpenter – Level 2

<table>
<thead>
<tr>
<th>Line</th>
<th>Training Area</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line B</td>
<td>Documentation and Organizational Skills</td>
<td>13%</td>
<td>60%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>B1</td>
<td>Use Construction Drawings and Specifications</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>Interpret Building Codes and Bylaws</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line C</td>
<td>Tools and Equipment</td>
<td>10%</td>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>C2</td>
<td>Use Portable Power Tools</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>Use Stationary Power Tools</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td>Use Oxy-Fuel Equipment</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Line D</td>
<td>Survey Instruments and Equipment</td>
<td>6%</td>
<td>70%</td>
<td>30%</td>
<td>100%</td>
</tr>
<tr>
<td>D2</td>
<td>Use Site Layout Equipment</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line F</td>
<td>Site Layout</td>
<td>4%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>F1</td>
<td>Lay Out Building Locations</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line G</td>
<td>Concrete Formwork</td>
<td>10%</td>
<td>30%</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td>G4</td>
<td>Build Slab-On-Grade Forms and Suspended Slab Forms</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G7</td>
<td>Place and Finish Concrete</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line H</td>
<td>Wood Frame Construction</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>H2</td>
<td>Select Framing Materials</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4</td>
<td>Build Wall Systems</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5</td>
<td>Build Stair Systems</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H6</td>
<td>Build Roof Systems</td>
<td></td>
<td>✔</td>
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<td>Line I</td>
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<tr>
<td>I1</td>
<td>Describe Roofing Materials</td>
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<td>✔</td>
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</tr>
<tr>
<td>I2</td>
<td>Install Doors and Hardware</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I3</td>
<td>Install Windows and Hardware</td>
<td></td>
<td>✔</td>
<td></td>
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**Total Percentage for Carpenter Level 2** 100%
## HARMONIZED PROGRAM OUTLINE
### Program Overview

### Training Topics and Suggested Time Allocation

#### Carpenter – Level 3

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**Total Percentage for Carpenter Level 3**: 100%
## Training Topics and Suggested Time Allocation

### Carpenter – Level 4

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Section 3

PROGRAM CONTENT

Carpenter
Level 1

Carpenter
HARMONIZED PROGRAM OUTLINE
Program Overview
Level 1

Line (GAC): A SAFE WORK PRACTICES
Competency: A1 Apply Shop and Site Safety Practices

Objectives
To be competent in this area, the individual must be able to:

- Describe safe work practices used in a shop and on a construction site.
- Apply safe work practices used in a shop and on a construction site.

LEARNING TASKS

1. Describe Occupational Health and Safety (OHS) Regulation and related materials
   - OHS Regulation and WorkSafeBC Standards
   - Legal responsibilities
     - Education and training
     - Orientation processes
     - Toolbox meetings
   - Inspections and investigations
   - WorkSafeBC assessment and penalty costs affecting employers

2. Use OHS Regulation and related materials
   - Safety committees
     - Purpose
     - Membership
     - Role of members
     - Meetings and minutes
   - Conduct site inspections
   - Conduct toolbox meetings
     - Purpose
     - Content
     - Timing
   - Conduct site inspections
     - Identification of hazards
     - Recommendations
     - Remedies

3. Describe safe work practices
   - Safety gear
   - Inspect condition of tools
   - Use proper tools
   - Guards and barriers
   - Operating hazardous equipment
   - Using hazardous materials and harmful substances
   - Flammable, explosion, and electrical hazards
   - Grounding of tools and equipment
   - Lockout procedures
   - Housekeeping
   - Using compressed air
4. Apply safe work practices

- Use OHS Regulation and WorkSafeBC Standards
- Site-specific
- Harmful substances
- Health hazards and work environment controls
- Personal protective equipment
- Powder-actuated tools
- Electrical systems
- Temporary lighting
- Ladders
- Scaffolds, swing stages and miscellaneous stages
- Construction procedures
- Excavation
- Demolition
- Rigging
- Woodworking machinery and processing

5. Describe fire safety procedures

- Component and causes of fire
  - Fuel
  - Heat
  - Oxygen
- Solvent flammability
  - Flash points
- Types of fires
  - Class A, B, C and D fires
- Use of fire extinguishers
- Fire prevention equipment
  - Welding blanket
  - Emergency fire blanket
- Precautions when working with flammable substances
- Safe use of temporary heating

6. Use Workplace Hazardous Materials Information System (WHMIS)

- WHMIS
- Labelling
- MSDS
- Symbols
- Storage
Achievement Criteria

Performance  The learner will interpret information from OHS Regulation.

Conditions   The learner will be given:
               • Assignment sheet

Criteria      The individual will be evaluated on:
               • Interpretation of OHS Regulation
Line (GAC): A  SAFE WORK PRACTICES
Competency: A2  Apply Personal Safety Practices

Objectives
To be competent in this area, the individual must be able to:

- Control the stresses on the body caused by physical work.
- List the hazards associated with working in confined spaces.
- Select and use fall protection as outlined by the OHS Regulation and WorkSafeBC Standards.
- Select and use personal protective equipment.
- Apply the concepts of personal safety awareness and practices.

LEARNING TASKS

1. Describe roles and responsibilities related to workplace safety
   - Personal safety rules
   - Responsibilities affecting you and others

2. Describes hazard identification in the workplace
   - Hazardous materials
   - Falls
   - Working at heights
   - Overhead dangers
   - Confined spaces
   - Excavations
   - Working around equipment
   - Uneven ground
   - Changes in conditions

3. Use personal protective equipment and clothing
   - Inspect
   - Adjust
   - Maintain
   - Store
   - Hand protection
   - Leg and foot protection
   - Headgear
   - Eye protection
   - Ear protection
   - Lung protection
   - Personal apparel
   - Precautions for weather

4. Apply personal safe work practices
   - Musculoskeletal Injuries (MSI)
   - Procedures for using, lifting and carrying objects
LEARNING TASKS

5. Use fall protection systems

CONTENT

- Fall protection systems
  - Guardrails
  - Fall restraint
  - Fall arrest
- Rope grabs and shock-limiting devices
- Using safety harness, lanyard, and lifeline
- Safety equipment inspection

Achievement Criteria

Performance  The learner will apply personal safety practices during all shop activities.

Conditions  The learner will be given:

- Workplace orientation
- Access to personal safety equipment
- Clear expectations
- Access to OHS Regulation and WorkSafeBC Standards

Criteria  The learner will start with 100% and a demerit system will deduct a given percentage for safety infractions. A weighting system will be applied to individual safety infractions.
Line (GAC): B  DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B1  Use Construction Drawings and Specifications

Objectives:
To be competent in this area, the individual must be able to:
• Describe types of drawings.
• Interpret and extract information from a set of construction drawings.
• Use drawing instruments to create working drawings.

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<thead>
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<th>LEARNING TASKS</th>
<th>CONTENT</th>
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<td>1. Describe drawings</td>
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LEARNING TASKS

5. Use drafting tools and materials

CONTENT
- Drafting board
- Drafting table
- T-square
- Set squares
- Scales
- Drawing pencils
- Templates
- Compasses
- Erasers
- Dusting cloth or brush
- Drawing paper
- Tracing paper
- Drafting or masking tape
- Computer-Aided Drafting and Design (CADD)

6. Use architectural drawings

CONTENT
- Building dimensions
- Construction type
- Room layout
- Fixture locations
- Finish details

Achievement Criteria 1
Performance
The learner will use drafting tools to draw a project.

Conditions
The learner will be given:
- Specifications
- Assignment sheet

Criteria
The individual will be evaluated on:
- Drafting procedures

Achievement Criteria 2
Performance
The learner will interpret information from a set of building plans.

Conditions
The learner will be given:
- Drawings and specifications
- Assignment sheet

Criteria
The individual will be evaluated on:
- Interpretation of plans
Objectives
To be competent in this area, the individual must be able to:
- Identify building codes and bylaws for residential applications.
- Use building codes.
- Describe warranties and the Homeowners’ Protection Office.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Describe building codes and bylaws | • National Building Code  
• BC Building Code  
• Municipal zone bylaws  
• Vancouver Building Code  
• National Fire Code |
| 2. Use building codes and bylaws | • BC Building Code |
| 3. Describe the types and purposes of inspections | • Purpose of inspections  
• Sequence of inspections  
• Work that requires inspections  
  - Foundation and forms  
  - Perimeter drain, rain water leaders and sumps  
  - Rough in plumbing  
  - Foundation insulation and ground seal  
  - Subtrades (gas, electrical, security, sprinkler, etc.)  
  - Chimney and fireplace  
  - Framing  
  - Insulation and vapour barrier  
  - Building envelope  
  - Final inspections |

Achievement Criteria
Performance: The learner will interpret information from the building code.
Conditions: The learner will be given:
- Assignment sheet
Criteria: The individual will be evaluated on:
- Interpretation of building code
Line (GAC): B  DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B3  Plan and Organize Work

Objectives
To be competent in this area, the individual must be able to:
- Plan and organize a project.
- Handle and store construction materials.

LEARNING TASKS

1. Describe the construction planning process
   - Steps required to construct a building
   - Consult
   - Budget
   - Design
   - Permits and applications
   - Schedule project
   - Build

2. Describe manufacturer and supplier documentation
   - Types
   - Uses
   - Formats
   - How to access
   - Storing and record keeping

3. Prepare work plan for a project
   - Time
   - Materials
   - Tools

4. Store framing materials properly
   - Handling
   - Storage
   - Protecting

Achievement Criteria

Performance  The learner will prepare a work plan for a content-related practical project.

Conditions  The learner will be given:
- Drawings

Criteria  The individual will be evaluated based on:
- Completeness of work plan
### Line (GAC): B  Documentation and Organizational Skills  
#### Competency: B4  Perform Trade Math

**Objectives**

To be competent in this area, the individual must be able to:

- Use trade mathematics.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
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</table>
| 1. Describe trade math concepts |  - Mathematical concepts  
  - Application in carpentry trade  
  - Converting between metric and imperial measurements  
  - Use of calculators |
| 2. Use trade math |  - Fractions  
  - Ratio/proportion  
  - Percentage  
  - Order of operations (BEDMAS)  
  - Geometry  
    - Circle math  
    - Pythagorean theorem  
    - Area and volume calculations  
  - Algebra  
  - Trigonometry |
Line (GAC): C  TOOLS AND EQUIPMENT
Competency: C1  Use Hand Tools

Objectives
To be competent in this area, the individual must be able to:
• Describe the use of hand tools.
• Use hand tools.

LEARNING TASKS

1. Describe hand tools
   - Measuring and layout
   - Cutting, boring and shaping
   - Fastening
   - Finishing

2. Use measuring and layout tools
   - Purpose
   - Types
     - Squares
     - Rulers
     - Tape measures
     - Levels
     - Plumb bobs
     - String lines/chalk lines
     - Marking tools
   - Parts
   - Operation
   - Safety
   - Adjustment
   - Maintenance
   - Storage
LEARNING TASKS

3. Use cutting, boring and shaping tools

- Purpose
- Types
  - Hand saws
  - Planes
  - Chisels
  - Knives
  - Drill bits
  - Files
  - Rasps
  - Sandpaper
- Parts
- Operation
- Safety
- Adjustment
- Maintenance
- Storage

4. Use fastening tools

- Purpose
- Types
  - Hammers
  - Screwdrivers
  - Bars
  - Pliers and cutters
  - Wrenches
- Parts
- Operation
- Safety
- Adjustment
- Maintenance
- Storage

Achievement Criteria

Performance The learner will lay out and build a hand tool project.

Conditions The learner will be given:
- Drawings and specifications
- Tools

Criteria The learner will be evaluated on:
- Safety
- Tool use
- Calculations
- Accuracy of layout and cuts
- Quality of finished product
HARMONIZED PROGRAM OUTLINE
Program Overview
Level 1

Line (GAC): C TOOLS AND EQUIPMENT
Competency: C2 Use Portable Power Tools

Objectives
To be competent in this area, the individual must be able to:

- Describe portable power tools.
- Use portable power tools.

LEARNING TASKS

1. Describe portable power tools
   - Cutting
   - Boring
   - Shaping
   - Fastening

2. Describe the use of portable power tools
   - PPE
     - Electric
     - Pneumatic
     - Mechanical
   - Operating procedures
   - Following manufacturers’ documentation
   - Power supply
     - Disconnect while assembling
     - Check cord
   - Grounding
   - Condition of equipment
     - Guards in place
     - Attachments secure
     - Sharp blades
     - Batteries charged
   - Storage of tools
   - Battery disposal

3. Use portable circular saws
   - Purpose
   - Safety
   - Types and sizes
     - Corded
     - Cordless
   - Parts
   - Blade types
   - Operations
   - Accessories
   - Adjustments
   - Maintenance
LEARNING TASKS

4. Use portable mitre saws

   CONTENT
   • Purpose
   • Safety
   • Types, sizes and capacities
     o Mitre saws
     o Compound mitre saws
   • Parts
   • Operations
   • Accessories
   • Adjustments
   • Maintenance

5. Use portable drills and drivers

   CONTENT
   • Purpose
   • Safety
   • Types, sizes and speeds
     o Corded
     o Cordless
   • Parts
   • Bit types
   • Fastener types
   • Operations
   • Accessories
   • Adjustments
   • Maintenance

6. Use portable pneumatic tools

   CONTENT
   • Supply system
   • Purpose
   • Safety
   • Types and sizes
     o Nail guns
     o Staplers
     o Impact wrenches
   • Parts
   • Fastener types
   • Operations
   • Accessories
   • Adjustments
   • Maintenance
LEARNING TASKS

7. Use jigsaws and reciprocating saws

CONTENT

- Purpose
- Safety
- Types, sizes and speeds
  - Jigsaws
  - Reciprocating saws
  - Multi tools
  - Corded/cordless
- Parts
- Blade types
- Operations
- Accessories
- Adjustments
- Maintenance

Achievement Criteria

Performance  The learner will lay out and build a project that includes cross, mitre and bevel cuts and ripping with a circular saw.

Conditions  The learner will be given:
- Drawings and specifications
- Tools

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Accuracy of layout and cuts
- Quality of finished project
Line (GAC): C TOOLS AND EQUIPMENT
Competency: C3 Use Stationary Power Tools

Objectives
To be competent in this area, the individual must be able to:
- Describe stationary power tools.
- Use a table saw and bench grinder.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Describe stationary power tools | - Table saws  
  - Band saws  
  - Jointers  
  - Drill presses  
  - Thickness planers  
  - Sanding machines  
  - Bench grinders |
| 2. Use table saws | - Purpose  
  - Types and sizes  
  - Parts  
  - Blade types and purpose  
  - Accessories  
  - Operations  
  - Types of cuts  
  - Safety  
  - Adjustments  
  - Maintenance  
  - Following manufacturers' documentation |
| 3. Use bench grinders | - Purpose  
  - Wheel types, sizes and speed  
  - Parts  
  - Fastener types  
  - Operations  
  - Accessories  
  - Safety  
  - Adjustments  
  - Maintenance  
  - Following manufacturers' documentation |
Achievement Criteria 1

Performance  The learner will perform procedures on a table saw including ripping cuts and cross cuts.

Conditions  The learner will be given:
- Table saw

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Accuracy of dimensions

Achievement Criteria 2

Performance  The learner will use a bench grinder to sharpen a chisel or plane iron.

Conditions  The learner will be given:
- A chisel or plane iron
- Bench grinder
- Sharpening stones

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Grinding procedure
- Whetting procedure
- Sharpness of finished edge
Line (GAC): D SURVEY INSTRUMENTS AND EQUIPMENT
Competency: D1 Use Levelling Instruments and Equipment

Objectives
To be competent in this area, the individual must be able to:
• Use optical levels.

LEARNING TASKS

1. Describe levelling equipment
   • Purpose
   • Types of levelling instruments
   • Builder’s levels
   • Electronic levels
   • Parts
   • Types of equipment

2. Use levelling equipment
   • Instrument set-up
   • Testing level
   • Levelling rods
     o Parts
     o Scales
     o Rod types
     o Hand signals
   • Electronic and laser levels
     o Parts
     o Setting up procedures
     o Target use
     o Setting elevations
     o Measuring elevations
   • Record elevations
   • Common errors

3. Maintain levelling equipment
   • Storage
   • Transporting
   • Protection from elements
   • Cleaning and checking condition of parts
Achievement Criteria 1
Performance  The learner will complete a survey circuit identifying elevations at various locations including a turning point.
Conditions  The learner will be given:
- Site plan including survey points
- Field book
Criteria  The learner will be evaluated on:
- Safety
- Accuracy of rod readings
- Field book recordings
- Instrument set up

Achievement Criteria 2
Performance  The learner will transfer elevations.
Conditions  The learner will be given:
- Electronic or optical level, receiver and rod
- Survey points
Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Accuracy of elevations
Line (GAC): E ACCESS, RIGGING, AND HOISTING EQUIPMENT
Competency: E1 Use Ladders, Scaffolds and Access Equipment

Objectives
To be competent in this area, the individual must be able to:
• Describe ladders.
• Use a ladder.
• Describe scaffolds and temporary access structures.
• Use scaffolds and temporary access structures.

LEARNING TASKS

1. Describe ladders
   • OHS Regulation and WorkSafeBC Standards
   • Ladder ratings
   • Portable ladder safety
   • Ladder types
     o Access ladder
     o Performance ladder
     o Job built ladder
   • Accessories

2. Use ladders
   • Safety
   • Procedure for use
   • Maintenance
   • Storage

3. Use scaffolds and temporary access structures
   • OHS Regulation and WorkSafeBC Standards
   • General requirements
   • Construction and use
   • Scaffold types
   • Assembly procedures
   • Dismantling procedures
   • Temporary ramps, walkways and stairs
     o Slope regulations
     o Guards

4. Describe access equipment
   • OHS Regulation and WorkSafeBC Standards
   • Swing stages
   • Suspended power platform
   • Scissor lifts
   • Aerial lift
Achievement Criteria

Performance    The learner will set up a scaffold system with an access ladder.

Conditions    The learner will be given:
    • A scaffold system
    • A ladder

Criteria        The learner will be evaluated on:
    • Safety
    • Tool use
    • Assembly and disassembly of the scaffold system
    • Use of an access ladder
Objectives
To be competent in this area, the individual must be able to:
- Describe the safe use and maintenance of hoisting equipment.
- Use hoisting equipment.
- Use hand signals to communicate with the hoist operator.

LEARNING TASKS

1. Describe ropes
   - Purpose
   - Rope types
     - Fibre
     - Wire
     - Stranding
   - Use of ropes
   - Rope terms
     - Breaking strength
     - Working Load Limits (WLL)
   - Knots, bends and hitches
     - Bowline
     - Figure eight
     - Reef or square knot
     - Sheet bend
     - Round turn and two half-hitches
     - Clove hitch
     - Timber hitch
     - Trucker's knot
   - General rules for tying knots, bends and hitches

2. Describe rigging equipment
   - Slings
   - Web slings
   - Turnbuckles
   - Eyes
   - Shackles
   - Cable clips and thimbles
   - Hooks
   - Spreader bars
   - Tag lines
LEARNING TASKS

3. Describe cranes and hoists

   • Purpose
   • Use
   • Types of cranes
     o Tower
     o Self erect
     o Mobile
     o Boom truck
     o Overhead gantry
   • Types of hoists
     o Forklifts
     o Telehandler
     o Power ladder
     o Come-along
     o Wire rope winch
     o Rollers

4. Describe safe methods of lifting loads with cranes and hoists

   • OHS Regulation and WorkSafeBC Standards
   • Certification
   • Training
   • Lift plan
   • High voltage line clearance
   • Overhead hazards
   • Load stability
   • Centre of gravity
   • Sling locations
   • Use of tag lines
     o OHS Regulation and WorkSafeBC Standards
     o Rope for tag lines
     o Length of rope
     o Use of two tag lines
     o Location of attachment for tag lines
   • Use of hand signals
   • Other means of communication
     o Sound signals
     o Radio communication
     o Video systems

5. Use rigging equipment

   • OHS Regulation and WorkSafeBC Standards
   • Safe rigging practices
   • Unsafe practices
   • Calculate weight of load
LEARNING TASKS

CONTENT

- Calculate sling angle and working load limit
- Rigging structural shapes
- Rigging complex shapes
- Blocking and stacking

6. Use hoisting equipment

- OHS Regulation and WorkSafeBC Standards
- Follow lift plan
- Ground stability
- Move and place load

7. Maintain and store rigging and hoisting equipment

- OHS Regulation and WorkSafeBC Standards
- Care of slings and wire rope
- Wire rope safety
- Damages in wire rope
- Hook safety
- Safety of other hardware
- Rings, links and swivels
- Eye bolts and ring bolts
- Turnbuckles
- Shackles
- Synthetic web slings
- Inspection

Achievement Criteria 1

Performance
The learner will use hand signals for communication with a Mobile Crane Operator.

Conditions
The learner will be given:
- A series of crane operations to be signaled

Criteria
The learner will be evaluated on:
- Safety
- Hand signalling

Achievement Criteria 2

Performance
The learner will select and tie knots, bends and/or hitches.

Conditions
The learner will be given:
- Rope

Criteria
The learner will be evaluated on:
- Safety
- Tying techniques
Line (GAC): F  SITE LAYOUT
Competency: F1 Lay Out Building Locations

Objectives
To be competent in this area, the individual must be able to:
• Describe layout, excavation and grading procedures.
• Build batter boards.

LEARNING TASKS

<table>
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<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe excavation and grading procedures</td>
</tr>
<tr>
<td>• Clearing the site</td>
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<tr>
<td>• Excavate</td>
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<td>• Cut and fill</td>
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<tr>
<td>• Contour lines</td>
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<tr>
<td>• Grades</td>
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<tr>
<td>• Grade line and grade stakes</td>
</tr>
<tr>
<td>2. Build batter boards</td>
</tr>
<tr>
<td>• Location</td>
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<tr>
<td>• Construction</td>
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<tr>
<td>• Locating lines</td>
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<td>• Tying lines</td>
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<td>• Plumbing down from lines</td>
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<tr>
<td>• Lay out square corners</td>
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<tr>
<td>o Measuring diagonals</td>
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<tr>
<td>o 3-4-5 Method</td>
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<tr>
<td>3. Describe survey markers</td>
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<tr>
<td>• Iron pin</td>
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<tr>
<td>• Lead plug</td>
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<tr>
<td>• Survey point</td>
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<tr>
<td>• Hub</td>
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<tr>
<td>• Corner stake</td>
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<td>• Witness stake</td>
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<tr>
<td>• Benchmark</td>
</tr>
<tr>
<td>• Datum point</td>
</tr>
<tr>
<td>• Monument</td>
</tr>
<tr>
<td>• Locate correct plot plans</td>
</tr>
</tbody>
</table>

Carpenter
Harmonized Program Outline
01/19
Achievement Criteria

Performance  The learner will set up batter boards and string lines for a foundation project.

Conditions  The learner will be given:
- A foundation plan
- Reference points
- Tools

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Setting of string lines
- Dimensioning
- Construction procedures
Line (GAC): G CONCRETE FORMWORK
Competency: G1 Use Concrete Types, Materials, Additives and Treatments

Objectives
To be competent in this area, the individual must be able to:
• Describe concrete and its uses.

LEARNING TASKS
1. Describe concrete

CONTENT
• Safety
• Purpose
• Uses
• Materials
  o Portland cement
  o Water
  o Aggregates
  o Reinforcing steel
  o Embedded materials
• Handling
  o Transport
  o Placement
  o Finishing
  o Curing
# HARMONIZED PROGRAM OUTLINE

## Program Overview

### Level 1

**Line (GAC):** G  
**Competency:** G2 Select Concrete Forming Systems

## Objectives

To be competent in this area, the individual must be able to:

- Describe the construction of concrete formwork systems.

## LEARNING TASKS

<table>
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<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>1. Describe concrete formwork and falsework</strong></td>
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<tr>
<td>- Safety</td>
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<tr>
<td>- Efficiency</td>
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<tr>
<td>- Architectural considerations</td>
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<tr>
<td>- Glossary of terms</td>
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<tr>
<td>- Interpret WorkSafeBC regulations and standards for concrete formwork</td>
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<tr>
<td>- Definitions</td>
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<td>- Responsibility of employer</td>
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<td>- Responsibility of formwork designer</td>
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<td>- Construction requirements</td>
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<tr>
<td>- Inspection requirements</td>
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<tr>
<td>- Concrete pre-stressing</td>
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<tr>
<td><strong>2. Describe formwork material and hardware</strong></td>
</tr>
<tr>
<td>- Lumber</td>
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<td>- Plywood</td>
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<tr>
<td>- Metal forms</td>
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<tr>
<td>- Plywood forms</td>
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<td>- Ties</td>
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<td>- Wedges and brackets</td>
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<td>- Walers, strong backs and bracing</td>
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<td>- Reglets and inserts</td>
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<td><strong>3. Describe concrete joints</strong></td>
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<tr>
<td>- Types</td>
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<td>- Contraction</td>
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<td>- Control</td>
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<td>- Expansion</td>
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<td>- Isolation</td>
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<tr>
<td>- Construction</td>
</tr>
<tr>
<td>- Cold</td>
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<tr>
<td>- Methods of construction</td>
</tr>
</tbody>
</table>
Line (GAC): G CONCRETE FORMWORK
Competency: G3 Build Footing and Vertical Formwork

Objectives
To be competent in this area, the individual must be able to:
• Describe the construction of footing, wall and column forms.
• Construct footing, wall and column forms.

LEARNING TASKS

1. Describe footing forms
   • Strip footings
   • Stepped footings
   • Column footings
   • Grade beams

2. Describe wall forms
   • Built-in-place forms
     o Easy-strip forms
     o Snap tie forms
     o Insulated concrete forming (ICF)
   • Form panels
   • Form ties (wedges)
   • Walers
   • Strong backs
   • Bracing
   • Corner construction
   • Pour strip
   • Chamfer strip
   • Bulkheads and door bucks
   • Corbels
   • Pilasters
   • Methods of construction

3. Describe column forms
   • Types
     o Fibre tubes
     o Engineered column
     o Job built
     o Capital
   • Assembly of forms

4. Plan footing, wall and column forms
   • Safety
   • Code
   • Select materials
   • Material handling and storage
LEARNING TASKS

5. Calculate concrete volumes
   - Schedule
   - Footings
   - Walls
   - Columns
   - Center line

6. Build footing, wall and column forms
   - Layout
   - Assemble
   - Support
   - Align
   - Brace

7. Describe removal of concrete forms
   - Safety
   - Concrete design strength
   - OHS and WorkSafeBC regulations
   - Form removal
     - Tool selection
     - Edge protector
     - Re-shoring

---

Achievement Criteria 1
Performance  The learner will build footing and wall forms using quick strip tie system.
Conditions  The learner will be given:
   - A foundation plan which includes bucks, blockouts and pour strip
   - Tools
Criteria  The learner will be evaluated on:
   - Safety
   - Tool use
   - Use of material and hardware
   - Plumb and level
   - Dimensionally accurate, straight and square
   - Construction techniques

Achievement Criteria 2
Performance  The learner will build footing, wall and column forms using snap tie system.
Conditions  The learner will be given:
   - A foundation plan which includes chamfer strip
   - Forming material and hardware
   - Tools
Criteria  The learner will be evaluated on:
   - Use of material and hardware
   - Plumb and level
   Dimensionally accurate, straight and square
Line (GAC): G  CONCRETE FORMWORK
Competency:  G4  Build Slab-On-Grade Forms and Suspended Slab Forms

Objectives
To be competent in this area, the individual must be able to:
• Describe slabs-on-grade.

LEARNING TASKS
1. Describe slabs-on-grade

CONTENT
• Types of slabs
• Ground preparation
• Strength and durability
• Reinforcement
• Form system
Line (GAC): G  CONCRETE FORMWORK
Competency: G5  Install Reinforcement and Embedded Items

Objectives
To be competent in this area, the individual must be able to:
• Describe the installation of reinforcing bar in concrete.

LEARNING TASKS
1. Describe reinforcing for concrete

CONTENT
• Purpose
• Deformed bar
• Smooth bar
• Sheet or rolled mesh
• Size and spacing
• Cutting
• Splicing
• Tying
• Anchor bolts
Objectives
To be competent in this area, the individual must be able to:
- Describe methods of placing concrete.

LEARNING TASKS
1. Describe the delivery and placement of concrete

CONTENT
- Safety
- Manufacture and delivery
- Placement methods
  - Concrete pumps
  - Chutes
  - Buggies
  - Wheelbarrow
  - Concrete bucket
  - Placement boom
  - Underwater placement
- Guidelines for placing concrete
  - Consolidation
  - Discharge
  - Weather considerations
  - Segregation
  - Rate of pour
  - Environmental considerations
- Screed
- Tools and equipment
  - Power trowels
Line (GAC): H  WOOD FRAME CONSTRUCTION
Competency: H1 Describe Wood Frame Construction

Objectives
To be competent in this area, the individual must be able to:
• Describe the systems and terminology in wood frame construction.

LEARNING TASKS

1. Describe framing systems
   • Platform or Western frame construction
   • Balloon frame construction
   • Post beam and plank construction
   • Heavy timber construction
   • Preserved wood foundations
   • Energy efficient framing

2. Describe the terms used in wood frame construction
   • Structural terms
   • Architectural terms

3. Describe framing members
   • Floors and ceilings
   • Walls and partitions
   • Roofs
   • Trusses
   • Bracing and blocking
   • Sheathing

4. Describe roof styles
   • Flat
   • Shed
   • Gable
   • Hip
   • Intersecting
   • Mansard
   • Gambrel
   • Butterfly
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H2 Select Framing Materials

Objectives
To be competent in this area, the individual must be able to:
- Describe standard sizes, species and grades of wood for framing.
- Describe fasteners and hardware for wood framing.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>1. Describe characteristics of wood</td>
<td>- Structural</td>
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<td>- Aesthetic</td>
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<tr>
<td></td>
<td>- Softwood species</td>
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<td>o Douglas fir</td>
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<td>o Fir</td>
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<td>o Larch</td>
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<td>o Pine</td>
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<td>o Cedar</td>
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<td>- Hard wood species</td>
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<td>o Maple</td>
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<td>o Cherry</td>
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<td>o Birch</td>
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<td>- Tropical hardwoods</td>
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<td>2. Describe wood production</td>
<td>- Production methods</td>
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<td>o Light framing</td>
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<td>o Joists and planks</td>
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<td>o Posts and timbers</td>
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<td>o Siding</td>
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<td>LEARNING TASKS</td>
<td>CONTENT</td>
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<tr>
<td>---------------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| 3. Describe common defects in wood | • Warp  
• Compression wood  
• Mechanical defects  
• Split, check, shake  
• Knots  
• Wane  
• Pitch, streaks, stained wood  
• Decay  
• Insect damage  
• Manufacturing imperfections |
| 4. Describe manufactured products | • Veneers  
• Cross-banding  
• Cores  
• Adhesives  
• Softwood plywood grades  
• Plywood veneers and cores  
• Faces, backs and cores  
• Standard sizes and thicknesses |
| 5. Describe fasteners used in wood frame construction | • Nails  
• Threaded fasteners  
• Adhesives  
• Treated wood fasteners |
| 6. Describe hardware used in wood frame construction | • Framing connectors  
• Treated wood connectors  
• Seismic connectors |
Line (GAC): H | WOOD FRAME CONSTRUCTION
Competency: H3 | Build Floor Systems

Objectives
To be competent in this area, the individual must be able to:
- Describe the construction of floors and support systems.
- Build floors and support systems.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Describe floor systems | - Purposes  
- Uses  
- Types of floor systems  
  - Lumber  
  - Engineered  
- Components of a floor system  
  - Pony walls  
  - Posts/columns  
  - Beams  
  - Joists  
  - Sheathing  
  - Bridging |
| 2. Plan floor systems | - Safety  
- Code requirements  
- Determine materials and sizes  
- Spacing  
- Spans  
- Construction drawings  
- Interpret engineering documents  
  - Layout  
  - Drilling holes  
  - Blocking  
  - Fastener selection  
  - Temporary bracing  
- Construction sequence  
  - Stairwell openings |
| 3. Calculate floor systems | - Spans  
- Material quantities  
- Components |
| 4. Build pony walls | - Pony wall construction |
## LEARNING TASKS

### 5. Build posts/columns and beams
- Post/column anchorage
- Installing posts/columns and beams

### 6. Build floors
- Layout and installation of sill plates
- Layout and installation of joists
  - Stairwell openings
- Nailing requirements
- Joists supported by steel beams
- Layout and installation of bridging or blocking
- Installation of sheathing

## Achievement Criteria

**Performance**
The learner will plan, lay out and build a floor system with a stairwell opening.

**Conditions**
The learner will be given:
- Drawings that include openings and provisions for mechanical services

**Criteria**
The learner will be evaluated on:
- Safety
- Tool use
- Joist layout reflecting needs of services
- Sequencing of joists around openings
- Compliance with building code
- Dimensionally accurate
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H5 Build Stair Systems

Objectives
To be competent in this area, the individual must be able to:
• Describe the construction of straight stairs and handrail.
• Build stairs and handrail.

LEARNING TASKS

1. Describe stair systems
   • Purpose
   • Stair terms

2. Plan straight stairs
   • Safety
   • Code requirements for stairs and handrails
   • Construction drawings
   • Construction sequence

3. Calculate straight stairs
   • Calculate stair dimensions

4. Build straight stairs
   • Layout
   • Cut
   • Assemble

Achievement Criteria
Performance
The learner will plan and build straight stairs with a handrail.

Conditions
The learner will be given:
• Specifications

Criteria
The learner will be evaluated on:
• Safety
• Tool use
• Compliance with Building Code
• Correct calculations, layout and cuts
• Dimensionally accurate, straight, square and plumb
• Quality of finished project
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H10 Build Decks and Exterior Structures

Objectives
To be competent in this area, the individual must be able to:

- Describe deck systems.

### LEARNING TASKS

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Describe deck systems | • Purpose  
• Types  
• Components  
• Methods |
| 2. Plan deck systems | • Safety  
• Code requirements  
• Construction drawings  
• Construction sequence |
Line (GAC): J  BUILDING SCIENCE
Competency: J1  Control the Forces Acting on a Building

Objectives
To be competent in this area, the individual must be able to:
• Describe the forces acting on a building.

LEARNING TASKS
1. Describe forces acting on the building structure

CONTENT
• Dead and live loads
• Compression, tension, torsion and shear
• Uplift
• Gravity
Level 2
Carpenter
Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B1 Use Construction Drawings and Specifications

Objectives
To be competent in this area, the individual must be able to:
• Describe architectural drawings.
• Describe schedules, details and shop drawings.
• Use schedules, details and shop drawings.
• Draw finishing components.

LEARNING TASKS

1. Describe architectural drawings
   • Residential
   • Industrial, Commercial and Institutional (ICI)
   • Plans
   • Sections
   • Elevations
   • Shop drawings
   • As built drawings

2. Use architectural drawings
   • Residential
   • Industrial, Commercial and Institutional (ICI)
   • Plans
   • Sections
   • Elevations
   • Shop drawings
   • As built drawings

3. Describe schedules
   • Door schedules
   • Window schedules
   • Hardware schedules

4. Draw finishing details
   • Plan
   • Section
   • Elevation
   • Component identification
Achievement Criteria 1

Performance  The learner will interpret information from a set of construction drawings.

Conditions  The learner will be given:
- Drawings and specifications
- Assignment sheet

Criteria  The individual will be evaluated on:
- Interpretation of plans

Achievement Criteria 2

Performance  The learner will draw plans for a project such as a door or exterior finish detail.

Conditions  The learner will be given:
- Project specifications

Criteria  The learner will be evaluated on:
- Use of standard construction drawing standards and techniques
- Complete and correct content
Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B2 Interpret Building Codes and Bylaws

Objectives
To be competent in this area, the individual must be able to:
- Describe permits, inspections and warranties.

**LEARNING TASKS**

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<td>• Research</td>
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</table>
Line (GAC): C  TOOLS AND EQUIPMENT
Competency: C2  Use Portable Power Tools

Objectives
To be competent in this area, the individual must be able to:
- Describe portable power tools.
- Use portable power tools.

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<tr>
<th>LEARNING TASKS</th>
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</table>
| 1. Describe powder-actuated tools | • Purpose  
• Safety  
• OHS Regulation and WorkSafeBC Standards  
• Types and sizes  
• Hazard recognition |
| 2. Describe chain saws | • Purpose  
• Safety  
• OHS Regulation and WorkSafeBC Standards  
• Types, sizes  
• Hazard recognition  
• Protective clothing and equipment |
| 3. Describe hammer drills, rotary hammers and demolition hammers | • Purpose  
• Safety  
• Types and sizes  
• Parts  
• Operations  
• Accessories  
• Bit types  
• Adjustments  
• Maintenance |
| 4. Describe cut-off saws | • Purpose  
• Safety  
• Types and sizes  
• Parts  
• Operations  
• Accessories  
• Adjustment  
• Maintenance |
5. Describe portable grinders
   - Safety
   - Types and sizes
   - Parts
   - Operations
   - Accessories
   - Abrasive types and speeds
   - Adjustment
   - Maintenance

6. Use portable routers
   - Purpose
   - Types
   - Parts
   - Bit types
   - Tables
   - Safety
   - Operation
   - Maintenance
   - Storage

7. Use portable sanders
   - Purpose
   - Types
   - Parts
   - Abrasive types
   - Safety
   - Operation
   - Maintenance
   - Storage

8. Use portable power planes
   - Purpose
   - Types
   - Parts
   - Blades
   - Safety
   - Operation
   - Maintenance
   - Storage

9. Use portable biscuit (plate) joiners
   - Purpose
   - Types
   - Parts
   - Biscuits
   - Safety
   - Operation
Achievement Criteria

Performance  The learner will use portable power tools.

Conditions  The learner will be given:
  • Drawings and specifications
  • Portable power tools

Criteria  The learner will be evaluated on:
  • Safety
  • Use of portable power tools
Line (GAC): C  TOOLS AND EQUIPMENT
Competency: C3  Use Stationary Power Tools

Objectives
To be competent in this area, the individual must be able to:
• Describe stationary power tools for finishing.
• Use stationary power tools for finishing.

LEARNING TASKS

1. Use a jointer
   • Purpose
   • Types
   • Parts
   • Accessories
   • Knives
   • Safety
   • Adjustments
   • Operations
   • Maintenance

2. Use a thickness planer
   • Purpose
   • Types
   • Parts
   • Accessories
   • Knives
   • Safety
   • Operations
   • Adjustments
   • Maintenance

3. Use sanding machines
   • Purpose
   • Types
   • Parts
   • Abrasive types
   • Accessories
   • Safety
   • Operations
   • Adjustments
   • Maintenance
Achievement Criteria

Performance  The learner will use shop equipment.

Conditions  The learner will be given:
  • Drawings and specifications
  • Shop equipment

Criteria  The learner will be evaluated on:
  • Safety
  • Use of shop equipment
  • Selection of proper cutting blades, bits and abrasives
  • Use of jigs and accessories
Objectives
To be competent in this area, the individual must be able to:

- Describe oxy-fuel equipment.
- Use oxy-fuel equipment.

LEARNING TASKS

1. Describe oxy-fuel equipment
   - PPE
   - Operating procedures
   - Following manufacturers’ documentation
   - Fuel supply
   - Condition of equipment
   - Storage

2. Use oxy-fuel equipment
   - Purpose
   - Safety
   - Parts
   - Assembly
   - Operations
   - Accessories
   - Adjustments
   - Maintenance

Achievement Criteria

Performance
The learner will perform basic cutting operations with oxy-fuel equipment.

Conditions
The learner will be given:
- Drawings and specifications

Criteria
The learner will be evaluated on:
- Safety
- Use of equipment
Line (GAC): D  SURVEY INSTRUMENTS AND EQUIPMENT
Competency: D2  Use Site Layout Equipment

Objectives
To be competent in this area, the individual must be able to:
• Describe electronic layout instruments.
• Use theodolites.

**LEARNING TASKS**

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<td>• Parts</td>
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</table>

2. Use layout equipment

| • Calculations              | 2. Use layout equipment                 |
| • Introduction to trigonometry |                                      |
| • Angles                    |                                       |
| • Site plans                |                                       |
| • Building plans            |                                       |
| • Storage                   |                                       |
| • Transporting              |                                       |
| • Protection from elements  |                                       |
| • Cleaning and checking condition of parts |   |

**Achievement Criteria**

| Performance | The learner will lay out building corners using a theodolite. |
| Conditions   | The learner will be given:                                   |
|             | • Construction drawings                                     |
|             | • Theodolite                                               |
| Criteria     | The learner will be evaluated on:                          |
|             | • Safety                                                  |
|             | • Use of instrument                                       |
|             | • Calculation of angles and lengths to locate corners      |
|             | • Accuracy of location of corner stakes                    |
Line (GAC): F  SITE LAYOUT
Competency: F1  Lay Out Building Locations

Objectives
To be competent in this area, the individual must be able to:
• Describe site layout.
• Lay out building locations and grades.

LEARNING TASKS
1. Lay out building locations
   • Square corners
   • Trigonometry
   • Grade stakes
   • Screed stakes
   • Gridlines
   • Slope

Achievement Criteria
Performance  The learner will set a series of screed stakes for a sloping slab-on-grade.
Conditions    The learner will be given:
   • Site plan
   • Bench mark elevation
Criteria      The learner will be evaluated on:
   • Safety
   • Tool use
   • Accuracy of stake location and elevations
Line (GAC): G CONCRETE FORMWORK
Competency: G4 Build Slab-On-Grade Forms and Suspended Slab Forms

Objectives
To be competent in this area, the individual must be able to:
• Build slabs-on-grade.
• Build slab tables.

LEARNING TASKS

1. Build slabs-on-grade
   • Ground preparation
   • Form system
   • Reinforcement
   • Establishing elevations

2. Build slab tables
   • Layout
   • Assemble
   • Support system

Achievement Criteria 1
Performance The learner will build the formwork for a reinforced, sloping slab-on-grade.
Conditions The learner will be given:
• Drawings and specifications
Criteria The learner will be evaluated on:
• Safety
• Tool use
• Correct installation as per drawings

Achievement Criteria 2
Performance The learner will build the formwork and falsework for a slab table.
Conditions The learner will be given:
• Drawings and specifications
Criteria The learner will be evaluated on:
• Safety
• Tool use
• Correct installation as per drawings
Line (GAC): G  CONCRETE FORMWORK
Competency: G7  Place and Finish Concrete

Objectives
To be competent in this area, the individual must be able to:
• Describe methods of placing, finishing and curing concrete.
• Describe concrete treatments and sealers.

LEARNING TASKS

1. Describe concrete finishing
   • Safety
   • Tools and equipment
   • Walls
   • Flatwork
   • Procedures
   • Surface treatments

2. Describe the process of concrete curing
   • Hydration
   • Curing
   • Sealers and hardeners
   • Environmental conditions

3. Describe concrete defects
   • Types
   • Causes
   • Repairs
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H2 Select Framing Materials

Objectives
To be competent in this area, the individual must be able to:
• Select framing materials.

LEARNING TASKS
1. Select framing materials

CONTENT
• Building code requirements
• Considerations of specific job
  o Materials
  o Cost
  o Environmental conditions
  o Availability
Line (GAC): H  WOOD FRAME CONSTRUCTION
Competency: H4  Build Wall Systems

Objectives
To be competent in this area, the individual must be able to:

- Describe wood frame walls.
- Build wood frame walls.

LEARNING TASKS

1. Describe wall systems

   - Purpose
   - Uses
   - Types of wall systems
     - Exterior
     - Interior
     - Load bearing
     - Point load
     - Non-load bearing
     - Party wall
     - Shear wall

2. Plan wall systems

   - Safety
   - Code requirements
     - Determine materials and sizes
     - Spacing
     - Spans
   - Construction drawings
   - Construction sequence
   - Temporary bracing

3. Calculate wall systems

   - Spans
   - Framing materials
   - Components

4. Build wall systems

   - Build exterior walls
     - Layout
     - Assemble
     - Squaring walls
     - Sheathing
     - Standing walls
     - Straightening and bracing walls
   - Build interior walls
     - Layout
     - Assemble
Standing walls
- Straightening and bracing walls
- Air/vapour barrier continuity
- Fire stops
- Backframing

Achievement Criteria

Performance: The learner will build walls and partitions.

Conditions: The learner will be given:
- Drawings

Criteria: The learner will be evaluated on:
- Safety
- Tool use
- Stud layout
- Framing around openings
- Compliance with code
- Dimensionally accurate, square, plumb and level
**Line (GAC):** H  **WOOD FRAME CONSTRUCTION**  
**Competency:** H5  **Build Stair Systems**

### Objectives
To be competent in this area, the individual must be able to:
- Describe straight stairs and balustrade.
- Build straight stairs and balustrade.
- Describe finished staircases.

### LEARNING TASKS

<table>
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<th>CONTENT</th>
<th>LEARNING TASK</th>
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</table>
| **1. Describe stairs and balustrade** | • Purpose  
• Uses  
• Types  
  o Straight  
  o Multi-flight  
  o Geometric  
• Stair terms  
• Stair components  
• Balustrade components |
| **2. Plan stairs and balustrade** | • Safety  
• Code requirements for stairs and balustrades  
• Construction drawings  
  o Design considerations  
• Construction sequence |
| **3. Calculate stairs and balustrade** | • Proportioning rules  
• Rise and run  
• Stairwell openings  
• Stair dimensions  
• Materials |
| **4. Build stairs and balustrade** | • Layout  
• Cut  
• Assemble |
Achievement Criteria

Performance  The learner will plan and build straight stairs with a balustrade.

Conditions  The learner will be given:
- Drawings and specifications

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Compliance with code
- Calculations, layout and cuts
- Dimensionally accurate, straight, square and plumb
- Quality of finished project
**Line (GAC):** H  **WOOD FRAME CONSTRUCTION**  
**Competency:** H6  **Build Roof Systems**

**Objectives**
To be competent in this area, the individual must be able to:
- Describe the construction of gable roofs.
- Frame gable roofs.
- Describe truss roofs.

**LEARNING TASKS**

<table>
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<th>Learning Task</th>
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</table>
| 1. Describe gable roof systems | - Purpose  
- Uses  
- Types  
- Components |
| 2. Plan gable roof systems | - Safety  
- Code requirements  
- Construction drawings  
- Construction sequence |
| 3. Calculate gable roof systems | - Calculate theoretical lengths  
- Calculate quantities of ceiling and roof framing materials |
| 4. Build gable roof systems | - Lay out roof members  
- Lay out plate  
- Cut members  
- Assemble |
| 5. Describe truss roofs | - Safety  
- Interpret manufacturers’ documentation  
- Layout of trusses  
- Handling and installation of trusses  
- Fastening trusses  
- Bracing requirements |
Achievement Criteria

Performance  The learner will build a gable roof with ceiling joists.

Conditions  The learner will be given:
   - Drawings and specifications

Criteria  The learner will be evaluated on:
   - Safety
   - Tool use
   - Calculation and layout of ceiling joists, rafters and other roof framing members
   - Dimensionally accurate, straight and square
   - Accuracy of cuts
**Line (GAC):** I  **FINISHING MATERIALS**

**Competency:** I1 Describe Roofing Materials

**Objectives**

To be competent in this area, the individual must be able to:
- Describe roofing materials.
- Describe the installation of roofing materials.

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</table>
Line (GAC):  I  FINISHING MATERIALS
Competency:  I2  Install Doors and Hardware

Objectives
To be competent in this area, the individual must be able to:
- Describe exterior doors.
- Install exterior doors.

LEARNING TASKS

1. Describe exterior doors
   - Common types
   - Special types
   - Construction
   - Purpose
   - Terminology
   - Code and security requirements
   - Weather and air sealing
   - Storage during construction
   - Swing/hand of door

2. Describe specialty exterior doors
   - Types
   - Purpose
   - Installation

3. Describe exterior door jambs
   - Types
   - Purpose
   - Construction

4. Describe exterior door hardware
   - Types
   - Purpose
   - Storage
   - Labelling

5. Install exterior doors
   - Rough openings
   - Hanging and fitting

6. Install exterior door hardware
   - Types
   - Operation
   - Fitting
   - Templates
Achievement Criteria

Performance  The learner will hang and install an exterior door.

Conditions

- Drawings and specifications

Criteria

- Safety
- Tool use
- Compliance with Code
- Installation of door to specified tolerances
- Installation of hardware
Line (GAC): I FINISHING MATERIALS
Competency: I3 Install Windows and Hardware

Objectives
To be competent in this area, the individual must be able to:
- Describe windows.
- Install windows.

LEARNING TASKS

1. Describe windows and hardware
   - Purpose
   - Code requirements
   - Types
   - Components
   - Construction
   - Energy efficiency
   - Storage
   - Operation

2. Plan window installation
   - Drawings and specifications
   - Manufacturers’ specifications
   - Delivery
   - Storage
   - Access
   - Installation
   - Protection

3. Install windows
   - Fitting
   - Plumb
   - Level
   - Shimming
   - Fastening
   - Sealing
   - Accessories
Achievement Criteria

Performance  The learner will install a window with flashing.

Conditions  The learner will be given:
- A rough opening
- A window
- Weather proofing material

Criteria  The learner will be evaluated on:
- Safety
- Tool use
- Compliance with Code and jurisdictional regulations
- Compliance with manufacturers’ specifications
- Preparation of opening
- Positioning of window in rough opening
- Installation of flashing and membranes
### Objectives

To be competent in this area, the individual must be able to:
- Describe building envelope requirements.
- Describe exterior finishing materials.
- Install exterior finishing materials.

### LEARNING TASKS

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• Terminology  
• Types of barriers  
• Rainscreen  
• Energy efficiency |
| 2. Describe exterior finish materials | • Code requirements  
• Purpose  
• Types of cladding  
• Trim and accessories  
• Types  
• Fasteners |
| 3. Plan exterior finish installation | • Safety  
• Code requirements  
• Drawings and specifications  
• Sequence of installation  
• Delivery  
• Storage  
• Access  
• Installation  
• Protection |
| 4. Calculate exterior finish materials | • Materials  
• Components  
• Accessories |
| 5. Install exterior finishes | • Layout  
• Installation |
Achievement Criteria

Performance  The learner will install exterior siding materials including flashing.

Conditions  The learner will be given:
  • Framed wall with building envelope penetrations and cornice
  • Siding and soffit material
  • Flashing and barrier material

Criteria  The learner will be evaluated on:
  • Safety
  • Tool use
  • Compliance with Code
  • Compliance with manufacturers’ specifications
  • Properly installed details for building envelope penetrations
  • Installation of flashing and siding
Line (GAC): J  BUILDING SCIENCE
Competency: J1  Control the Forces Acting on a Building

Objectives
To be competent in this area, the individual must be able to:
• Describe the forces acting on a building.
• Describe the construction details for wood frame seismic applications.

LEARNING TASKS
1. Describe seismic applications

CONTENT
• Purpose
• Types
• Describe seismic hardware
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<td>Competency:</td>
<td>J2</td>
<td>Control Heat and Sound Transmission</td>
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</table>

**Objectives**
To be competent in this area, the individual must be able to:
- Describe methods of controlling heat and sound transmission.
- Describe energy efficient framing.
- Control heat and sound transmission.

**LEARNING TASKS**

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<td>Increase energy efficiency</td>
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</table>
Line (GAC): J BUILDING SCIENCE
Competency: J3 Control Air and Moisture Movement in Buildings

Objectives
To be competent in this area, the individual must be able to:
- Describe methods of controlling air, moisture and vapour movement.
- Install air, moisture and vapour control products.

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<td>3. Describe vapour movement</td>
<td>• Purpose</td>
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<td>• Methods of controlling</td>
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<td>4. Install air, moisture and vapour control products</td>
<td>• Drawings and specifications</td>
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<td>• Manufacturers’ specifications</td>
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<td></td>
<td>• Materials</td>
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<td></td>
<td>• Methods</td>
</tr>
</tbody>
</table>

Achievement Criteria
Performance The learner will install rainscreen for exterior cladding.
Conditions The learner will be given:
- Framed wall section with a window
Criteria The learner will be evaluated on:
- Safety
- Tool use
- Accurate detailing
Level 3
Carpenter
Line (GAC): B  DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B1  Use Construction Drawings and Specifications

Objectives
To be competent in this area, the individual must be able to:
• Describe structural drawings and specifications.
• Use schedules, details and shop drawings.
• Interpret reflected ceiling plans.

LEARNING TASKS

1. Describe structural drawings and specifications
   • Types of drawings
   • Schedules
   • Specifications
   • Gridlines
   • Millwork drawings

2. Describe schedules
   • Door schedules
   • Window schedules
   • Room finish schedules
   • Hardware schedules

3. Describe shop drawings
   • Interior elevations
   • Millwork drawings

4. Use structural drawings
   • Specifications
   • Schedules
   • Building dimensions
   • Construction type
   • Mechanical and electrical systems

5. Interpret reflected ceiling plans
   • Reflected ceiling plans
   • Specialties
   • Hardware

6. Draw formwork details
   • Plan view
   • Section view
Achievement Criteria 1
Performance  The learner will interpret information from a set of structural drawings.
Conditions   The learner will be given:
              • Drawings and specifications
              • Question sheet
Criteria     The individual will be evaluated on:
              • Interpretation of plans

Achievement Criteria 2
Performance  The learner will draw formwork details, including plan and section views.
Conditions   The learner will be given:
              • Specifications
Criteria     The learner will be evaluated on:
              • Required construction details as per drawings
              • Proper drawing technique

Achievement Criteria 3
Performance  The learner will estimate a reflected ceiling plan, including items such as lighting fixtures
              and bulkheads.
Conditions   The learner will be given:
              • Drawings and specifications
Criteria     The learner will be evaluated on:
              • Accuracy of materials take off
Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B2 Interpret Building Codes and Bylaws

Objectives
To be competent in this area, the individual must be able to:
• Use building codes.

LEARNING TASKS
1. Interpret building codes and bylaws

CONTENT
• Guards
• Ramps
• Egress
• Area of refuge
• Hoarding
• Demolition
• Concrete mixes
• Accessibility
• Fire separation
• Fire rating

Achievement Criteria
Performance The learner will interpret information from the building code.
Conditions The learner will be given:
• Question sheet
Criteria The individual will be evaluated on:
• Interpretation of building code
Line (GAC): C  TOOLS AND EQUIPMENT
Competency: C1  Use Hand Tools

Objectives
To be competent in this area, the individual must be able to:

- Describe finishing tools.
- Use hand tools for finishing work.

LEARNING TASKS

1. Describe finishing tools
   • Purpose
   • Types
     o Marking tools
     o Squares
     o Chisels
     o Smoothing tools
     o Scrapers
     o Clamps
     o Coping saws

2. Use finishing tools
   • Safety
   • Adjustment
   • Operation
   • Maintenance
   • Storage

Achievement Criteria

Performance  The learner will use and maintain hand tools.
Conditions  The learner will be given:

- Drawings and specifications

Criteria  The learner will be evaluated on:

- Safety
- Tool use and maintenance
Line (GAC): C  TOOLS AND EQUIPMENT

Competency: C3  Use Stationary Power Tools

Objectives
To be competent in this area, the individual must be able to:
- Describe stationary power tools.
- Use shop equipment.

LEARNING TASKS

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<td>1. Use band saws</td>
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<td>2. Use a drill press</td>
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</tbody>
</table>

Achievement Criteria

| Performance | The learner will use shop equipment. |
| Conditions  | The learner will be given: |
| Criteria    | The learner will be evaluated on: |
|             | Drawings and specifications |
|             | Safety |
|             | Selection, use and maintenance shop equipment |
|             | Selection of cutting blades, bits and abrasives |
|             | Use of jigs and accessories |
**Line (GAC):** F  **SITE LAYOUT**  
**Competency:** F3  **Apply Excavation and Shoring Practices**

**Objectives**
To be competent in this area, the individual must be able to:
- Describe excavations and shoring.
- Plan excavations and shoring.
- Calculate excavation volumes.

**LEARNING TASKS**

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<td>• Soil conditions</td>
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<td>• Site survey</td>
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<td>• Grading</td>
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<td>• Grid lines and grade stakes</td>
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<td>• Excavation planning</td>
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<td>• Describe backfilling</td>
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<td>4. Calculate excavations</td>
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<tr>
<td>• Estimate volume of excavated material</td>
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</table>
Line (GAC): G  CONCRETE FORMWORK
Competency: G1  Use Concrete Types, Materials, Additives and Treatments

Objectives
To be competent in this area, the individual must be able to:
• Describe concrete types, materials and admixtures.

LEARNING TASKS

CONTENT

1. Describe the uses for concrete
• Structural
• Architectural
• Fire proofing
• Insulating
• Conduits
• Pavements

2. Describe concrete mix designs
• Strength
• Durability
• Water tightness
• Finishing ability

3. Describe the types of admixtures and treatments for concrete
• Air-entraining
• Water-reducing
• Plasticizers
• Retardants
• Accelerators
• Colours
• Dampproofing and permeability-reducing agents
• Bonding agents
• Release agents
• Gas-forming agents
• Pozzolans

4. Describe structural grout
• Purpose
• Types
• Procedures
Line (GAC): G CONCRETE FORMWORK
Competency: G2 Select Concrete Forming Systems

Objectives
To be competent in this area, the individual must be able to:
- Describe concrete forming systems.
- Select concrete forming systems.

LEARNING TASKS

1. Describe the factors affecting form design
   - Safety
   - Architectural design
   - Concrete members
   - Efficiency
   - Environmental conditions
   - Form pressures
   - Slump
   - Temperature
   - Vibration
   - Placement method
   - Form size
   - Cantilever formwork
   - Concrete design mix

2. Describe specialized formwork
   - Specialized formwork
   - Sandblasted and tooled concrete
   - Rustication and form liners
   - Architectural
   - Engineered systems
   - Describe manufactured wall form panels
HARMONIZED PROGRAM OUTLINE
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Line (GAC):  G  CONCRETE FORMWORK
Competency:  G3  Build Footing and Vertical Formwork

Objectives
To be competent in this area, the individual must be able to:
• Describe concrete forming systems.
• Construct concrete forming systems.

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<thead>
<tr>
<th>LEARNING TASKS</th>
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<td>• Designs</td>
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<td>3. Describe wall forms</td>
<td>• Engineered wall system</td>
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<td>• Gang forms</td>
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<td>• Construction procedures</td>
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<td>• Form details</td>
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<td>4. Describe insulated concrete forms (ICF)</td>
<td>• Components and hardware</td>
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<td>• Contract drawings</td>
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<td>• Engineered drawings</td>
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<td>• Form system</td>
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<td>• Lift plan</td>
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<td>• Concrete placement</td>
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<td>• Material handling and storage</td>
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<td></td>
<td>• Schedule</td>
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<td></td>
<td>• Access</td>
</tr>
</tbody>
</table>
LEARNING TASKS

6. Calculate forming materials and concrete volumes

   • Contact area
   • Concrete wall volume
     o Battered
     o Circular
     o Polygon
   • Components

7. Construct vertical formwork

   • Layout
   • Assembly
   • Alignment
   • Form removal

Achievement Criteria

Performance  The learner will build a gang form.

Conditions  The learner will be given:
   • Specifications
   • Construction drawings

Criteria  The learner will be evaluated on:
   • Safety
   • Tool use
   • Use of forms and hardware
   • Plumb and level
   • Dimensionally accurate, straight and square
Line (GAC): G CONCRETE FORMWORK
Competency: G4 Build Slab-On-Grade Forms and Suspended Slab Forms

Objectives
To be competent in this area, the individual must be able to:
• Describe suspended slab construction.
• Build suspended slabs.

LEARNING TASKS

1. Describe suspended slabs
   • Types of slabs
   • Slab components
   • Suspended slab forming products
   • Specifications

2. Describe shoring and re-shoring for falsework systems
   • Safety
   • Installation drawings
   • Re-shoring requirements
   • Re-shoring systems

3. Plan suspended slab formwork
   • Safety
   • Construction drawings
   • Procedures
     o Form system
     o Lift plan
     o Concrete placement
     o Form removal
   • Material handling and storage
   • Schedule
     o Sub-trades

4. Calculate forming materials and concrete volumes
   • Concrete volume
   • Components

5. Construct suspended slabs
   • Layout
   • Assembly
   • Alignment
   • Form removal
Achievement Criteria 1

Performance  The learner will install chamfer strips including mitres and 3-way corners.

Conditions  The learner will be given:
  • Specifications

Criteria  The learner will be evaluated on:
  • Safety
  • Tool use
  • Correct installation
  • Fit

Achievement Criteria 2

Performance  The learner will build suspended slab forms including a beam or a girder.

Conditions  The learner will be given:
  • Construction drawings and specifications

Criteria  The learner will be evaluated on:
  • Safety
  • Tool use
  • Use of forms and hardware
  • Plumb and level
  • Dimensionally accurate, straight and square
Line (GAC): G  CONCRETE FORMWORK
Competency: G5  Install Reinforcement and Embedded Items

Objectives
To be competent in this area, the individual must be able to:
- Describe concrete reinforcement.
- Describe embedded metals and plastics.
- Install anchor bolt templates.

### LEARNING TASKS

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<th>Learning Task</th>
<th>Content</th>
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<tbody>
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<td>- Machine base bolts</td>
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<td>- Sleeves</td>
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<td>- Reglets</td>
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<td>- Dowels</td>
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<tr>
<td></td>
<td>- Manhole cover frames</td>
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<tr>
<td></td>
<td>- Grates, catch basins and drain troughs or trenches</td>
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<td>- Dock levellers</td>
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<td>- Water stops</td>
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<td>- Specialty items</td>
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<td>3. Describe concrete fastening systems</td>
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<td>- Metal anchors</td>
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<td></td>
<td>- Chemical anchors</td>
</tr>
<tr>
<td></td>
<td>- Mechanical anchors</td>
</tr>
<tr>
<td></td>
<td>- Powder actuated fasteners</td>
</tr>
</tbody>
</table>
Achievement Criteria

Performance  The learner will lay out and install an anchor bolt template.

Conditions    The learner will be given:
                • Construction drawings and specifications

Criteria      The learner will be evaluated on:
                • Safety
                • Tool use
                • Accuracy
                • Installation
HARMONIZED PROGRAM OUTLINE
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Line (GAC): G CONCRETE FORMWORK
Competency: G6 Build Concrete Stair Forms

Objectives
To be competent in this area, the individual must be able to:
- Describe concrete stair construction.
- Build concrete stair forms.

LEARNING TASKS

1. Describe concrete stairs
   - Cast-in-place stairs
   - Pre-cast stairs
   - Concrete finishes and nosings
   - Components

2. Plan concrete stair form
   - Safety
   - Code requirements
   - Construction drawings
   - Procedures
     - Form system
     - Concrete placement
     - Temporary tread protection
   - Schedule
     - Sub-trades

3. Calculate concrete stairs
   - Rise and run
   - Stairwell opening
   - Concrete volume
   - Components

4. Construct concrete stairs
   - Layout
   - Assembly
   - Alignment
   - Form removal

Achievement Criteria
Performance The learner will build multi-flight concrete stair forms.
Conditions The learner will be given:
- Drawings and specifications
Criteria The learner will be evaluated on:
- Safety
- Tool use
- Compliance with Code
- Layout
- Use of forms and hardware
- Plumb and level
- Dimensionally accurate, straight and square
Line (GAC): G  CONCRETE FORMWORK
Competency: G8  Install Specialized Formwork

Objectives
To be competent in this area, the individual must be able to:

- Describe pre-cast concrete.
- Describe tilt-up construction.
- Describe pre-stressed concrete.
- Describe slip-forming.
- Describe mass concrete.
- Describe architectural formwork.
- Lay out for the installation of pre-cast, concrete components.

LEARNING TASKS

1. Describe tilt-up construction
   - Safety
   - Uses
   - Drawings
   - Formwork
   - Lifting sequence
   - Lifting and bracing procedures

2. Describe pre-cast concrete
   - Purpose
   - Types
   - Order of assembly
   - Handling and storage
   - Construction methods

3. Describe pre-stressed concrete
   - Pre-tensioning
   - Post-tensioning

4. Describe slip-form construction
   - Planning
   - Types
   - Construction procedures
   - Jacks and yokes
   - Concrete placement
   - Concrete finishing
   - Dismantling procedures

5. Describe mass concrete
   - Heat of hydration
   - Types
   - Placement methods
## Learning Tasks

6. Describe architectural formwork

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<tr>
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<td>o Landscape features</td>
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7. Describe sealing joints

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<td>• Sealers and primers</td>
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8. Lay out tilt-up construction

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</thead>
<tbody>
<tr>
<td>• Construction drawings</td>
</tr>
<tr>
<td>• Locations of hardware and accessories</td>
</tr>
</tbody>
</table>

### Achievement Criteria

**Performance**  The learner will lay out for the installation of pre-cast, concrete components.

**Conditions**  The learner will be given:

- Drawings and specifications

**Criteria**  The learner will be evaluated on:

- Safety
- Tool use
- Location of components
Line (GAC): H  WOOD FRAME CONSTRUCTION
Competency: H6  Build Roof Systems

Objectives
To be competent in this area, the individual must be able to:
- Describe hip roofs.
- Build a hip roof.
- Describe intersecting roofs.
- Build an intersecting roof.
LEARNING TASKS

1. Describe hip roof systems
   • Purpose
   • Uses
   • Types
   • Components

2. Plan hip roof systems
   • Safety
   • Code requirements
   • Construction drawings
   • Construction sequence

3. Calculate hip roof systems
   • Theoretical lengths
   • Materials

4. Build hip roof systems
   • Lay out
   • Cut
   • Assemble

5. Describe an intersecting roof
   • Purpose
   • Uses
   • Types
   • Components

6. Plan an intersecting roof
   • Safety
   • Code requirements
   • Drawings and specifications
   • Construction sequence

7. Calculate an intersecting roof
   • Theoretical lengths
   • Materials

8. Build an intersecting roof
   • Lay out
   • Cut
   • Assemble

Achievement Criteria

Performance The learner will build an intersecting hip roof.

Conditions The learner will be given:
   • Drawings and specifications

Criteria The learner will be evaluated on:
   • Safety
   • Tool use
   • Compliance with Code
   • Calculation, layout and spacing of rafters and roof framing members
   • Dimensionally accurate, straight and square
   • Accuracy of cuts
Line (GAC):  I  FINISHING MATERIALS
Competency:  I2  Install Doors and Hardware

Objectives
To be competent in this area, the individual must be able to:
- Describe interior doors.
- Install interior doors.

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<td>• Purpose</td>
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<td>• Templates</td>
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</table>
Achievement Criteria 1
Performance The learner will hang and install an interior door.
Conditions The learner will be given:
• Construction drawings and specifications
Criteria The learner will be evaluated on:
• Safety
• Adherence to Code
• Installation of door to specified tolerances
• Installation of hardware

Achievement Criteria 2
Performance The learner will use templates to layout door closers and panic hardware.
Conditions The learner will be given:
• Manufacturers’ specifications
• Materials
Criteria The learner will be evaluated on:
• Proper layout of hardware
Line (GAC): I FINISHING MATERIALS
Competency: I5 Install Interior Finishes

Objectives
To be competent in this area, the individual must be able to:
- Describe gypsum wallboard installation.

### LEARNING TASKS

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<td>• Purpose</td>
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<td>3. Calculate materials</td>
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<td></td>
<td>• Components</td>
</tr>
</tbody>
</table>
Objectives
To be competent in this area, the individual must be able to:
- Describe the construction and installation of cabinets, countertops and hardware.
- Construct cabinets.

LEARNING TASKS

1. Describe cabinets
   - Types
   - Components
   - Construction methods
   - Finishes

2. Describe countertops
   - Types
   - Construction methods

3. Plan the building of cabinets and countertops
   - Safety
   - Drawings and specifications
     - Shop drawings
   - Calculation of materials
   - Fixture locations
   - Sequence of installation
   - Temporary protection
   - Delivery
   - Storage

4. Build cabinets
   - Material breakout
   - Layout
   - Cut
   - Assembly

5. Plan the installation of prefinished cabinets and countertops
   - Safety
   - Code requirements
   - Installation methods
   - Components
   - Temporary protection

6. Install countertops
   - Techniques
Achievement Criteria

Performance: The learner will build a cabinet.

Conditions: The learner will be given:
- Drawings and specifications

Criteria: The learner will be evaluated on:
- Safety
- Tool and equipment use
- Dimensioning
- Fit and finish
- Installation of hardware
Line (GAC): I  FINISHING MATERIALS
Competency: I7  Install Interior Floor, Ceiling and Wall Systems

Objectives
To be competent in this area, the individual must be able to:
• Describe interior systems.
• Install steel stud walls and partitions.
• Install suspended ceilings.

LEARNING TASKS

1. Describe steel stud systems
   • Types
   • Purpose
   • Tools
   • Components

2. Plan installation of steel stud systems
   • Safety
   • Code requirements
   • Construction drawings

3. Install steel studs
   • Lay out
   • Cut
   • Assemble

4. Describe demountable partitions
   • Types
   • Components
   • Tamper-resistant fasteners
   • Installation

5. Describe interior ceiling systems
   • Purpose
   • Types
   • Components
   • Methods

6. Plan installation of interior ceiling systems
   • Safety
   • Code requirements
   • Construction drawings
   • Reflected ceiling plans

7. Calculate materials
   • Wall systems
   • Ceiling systems
8. Install interior ceiling systems
   • Lay out
   • Cut
   • Assembly

Achievement Criteria 1
Performance  The learner will build steel stud walls with openings.
Conditions   The learner will be given:
              • Drawings and specifications
Criteria     The learner will be evaluated on:
              • Safety
              • Tool use
              • Plumb and square
              • Cutting and fastening technique
              • Dimensional accuracy

Achievement Criteria 2
Performance  The learner will build a suspended ceiling.
Conditions   The learner will be given:
              • Reflected ceiling plan
Criteria     The learner will be evaluated on:
              • Safety
              • Tool use
              • Layout
              • Level and square
              • Accurate dimensioning
              • Installation technique
Level 4
Carpenter
Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B2 Interpret Building Codes and Bylaws

Objectives
To be competent in this area, the individual must be able to:
• Interpret building codes and bylaws.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interpret building codes and bylaws</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Geometric stairs</td>
</tr>
<tr>
<td>• Wall systems</td>
</tr>
<tr>
<td>• Sound transmission classification</td>
</tr>
<tr>
<td>• Fire separations</td>
</tr>
<tr>
<td>• Air, vapour and insulated assemblies</td>
</tr>
</tbody>
</table>

Achievement Criteria 1
Performance The learner will interpret information from the building code.
Conditions The learner will be given:
• Assignment sheet
Criteria The learner will be evaluated on:
• Interpretation of building code

Achievement Criteria 2
Performance The learner will complete documents for a building permit application.
Conditions The learner will be given:
• Municipal bylaws and regulations
• Construction drawings and specifications
Criteria The learner will be evaluated on:
• Interpretation of bylaws, regulations, and permit processes
Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS
Competency: B3 Plan and Organize Work

Objectives
To be competent in this area, the individual must be able to:
- Describe contract documents.
- Use construction specifications.
- Use plans and drawings.
- Estimate costs from construction drawings.

LEARNING TASKS
1. Describe contract documents
   - Types
   - Articles of agreement
   - Definitions
   - General conditions
   - Supplementary conditions
   - General requirements
   - Specifications
   - Drawings
   - Addenda

2. Describe the bidding process
   - Invitation to tender
   - Instruction to bidders
   - Tender form

3. Describe estimating
   - Rough estimate
   - Detailed estimate
   - Partial estimate
   - Sub trades
   - Quote pricing
   - Target pricing
   - Cost plus pricing
   - Unit pricing
   - Change orders
   - Allowances
4. Describe financial considerations
   - Payment schedule
   - Bonds
   - Liens
   - Penalties/bonuses
   - Contingency funds

5. Plan work sequence
   - Construction sequence
   - Material delivery sequence
   - Coordination with sub-trades
   - Time estimates

6. Estimate the cost of a job
   - Labour
   - Material
   - Equipment
   - Subtrades
   - Overheads
   - Profit margin

7. Describe inspections for engineered applications
   - Architectural
     - Work completed
     - Quality of work
   - Engineering
     - Geotechnical
     - Formwork
     - Reinforcing steel
     - Embedded materials
     - Concrete
   - Municipal/Provincial
     - Plumbing
     - Electrical
     - Fire
     - Gas
     - Final/occupancy
     - Elevator
     - Health
Achievement Criteria

**Performance**  The learner will estimate and schedule a project.

**Conditions**  The learner will be given:
- Drawings and specifications
- Cost guides

**Criteria**  The learner will be evaluated on:
- Project schedule
- Documentation
- Accuracy
Line (GAC): D SURVEY INSTRUMENTS AND EQUIPMENT
Competency: D2 Use Site Layout Equipment

Objectives
To be competent in this area, the individual must be able to:

- Describe total stations.

LEARNING TASKS

1. Describe total stations
   - Calculations
   - Set-up
   - Adjustment
   - Readings
   - Layout
   - Maintenance
   - Storage

2. Calculate layout of curves
   - Types
   - Chord lengths
   - Arc lengths
   - Offsets

Achievement Criteria

Performance The learner will lay out curved shapes.
Conditions The learner will be given:
   - Drawings and specifications
Criteria The learner will be evaluated on:
   - Safety
   - Tool use
   - Calculations and layout
   - Accuracy
Line (GAC): F SITE LAYOUT
Competency: F2 Prepare Building Site

Objectives
To be competent in this area, the individual must be able to:
- Describe site considerations.
- Describe site preparation.
- Describe hoarding.
- Describe pre-excavation preparation.
- Describe drainage systems.
- Describe backfilling.

LEARNING TASKS

1. Describe site considerations

CONTENT
- Building location
- Temporary facilities
  - First Aid
  - Tool storage
  - Site offices
  - Fuel storage
  - Muster station
  - Parking
  - Wheel wash
  - Sediment control
- Temporary services
- Water
- Gas
- Electrical
- Material lay down services
- Delivery areas
- Temporary road ways
- Demobilization
LEARNING TASKS

2. Describe site and project preparation
   • Site layout
   • Permits
   • Environmental plan
   • Clearing the site
   • Tree protection
   • Sediment and erosion control
   • Geotechnical reports
   • BC One Call
   • Weather considerations
   • Identify and remove hazardous materials
   • Site services
   • Dump site

3. Describe hoardings
   • Building codes and bylaws
   • Methods of construction
   • Types
   • Access lighting and signage

4. Describe site drainage systems
   • Types
     o Dewatering system
     o Perimeter draining systems
     o Granular drainage layer systems
     o Drainage disposal
     o Sumps

5. Describe pre-excavation preparation
   • Environmental impact assessment
   • Planning
   • Locate services
   • Disconnect services
   • Building elevations
   • Demolition
   • Access to site
   • Location of temporary buildings
   • Location of excavated materials
   • Build hoardings and barricades
   • Location of building materials
LEARNING TASKS

6. Describe sumps, catch basins and septic tanks

- Code regulations
- De-watering systems
- Sumps
- Trapping hoods
- Storm drains
- Sanitary sewer
- Catch basins
- Backwater valves
- Septic tanks
- Perimeter drains

7. Describe backfilling

- Safety
- Code requirements
- Procedures
  - Backfilling concrete foundations
  - Backfilling preserved wood foundations
  - Backfilling service trenches
- Foundation protection
- Water/damp proofing
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H5 Build Stair Systems

Objectives
To be competent in this area, the individual must be able to:
- Describe geometric stairs.
- Build geometric stairs.
- Build balustrades.

LEARNING TASKS

1. Describe stairs with winders
   - Stringer types
   - Tread shapes

2. Plan stairs with winders
   - Safety
   - Code requirements
   - Stringer types

3. Calculate stairs with winders
   - Rise and run
   - Stairwell openings
   - Stair dimensions
   - Materials

4. Build stairs with winders
   - Layout
   - Cut
   - Assembly

5. Describe circular stairs
   - Purpose
   - Types
   - Components

6. Plan circular stairs
   - Safety
   - Code requirements
   - Stringer types

7. Calculate circular stairs
   - Rise and run
   - Stairwell openings
   - Stair dimensions
   - Materials
8. Build circular stairs

- Layout
- Cut
- Assembly

Achievement Criteria 1

Performance: The learner will build winder stairs.
Conditions: The learner will be given:
- Drawings and specifications
Criteria: The learner will be evaluated on:
- Safety
- Tool use
- Compliance with Code
- Calculations, layout and cuts
- Dimensionally accurate, straight, square and plumb
- Fit and finish

Achievement Criteria 2

Performance: The learner will build circular stairs.
Conditions: The learner will be given:
- Drawings and specifications
Criteria: The learner will be evaluated on:
- Safety
- Tool use
- Compliance with Code
- Calculations, layout and cuts
- Dimensionally accurate, straight, square and plumb
- Use of templates and jigs
- Assembly techniques
- Fit and finish

Achievement Criteria 3

Performance: The learner will build a balustrade.
Conditions: The learner will be given:
- Drawings and specifications
Criteria: The learner will be evaluated on:
- Safety
- Tool use
- Compliance with Code
- Calculations, layout and cuts
- Dimensionally accurate, straight, square and plumb
- Fit and finish
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H6 Build Roof Systems

Objectives
To be competent in this area, the individual must be able to:
  • Describe the construction methods for unequal slope intersecting roofs.
  • Build unequal slope intersecting roofs.

LEARNING TASKS

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe an unequal slope intersecting roof</td>
</tr>
<tr>
<td>2. Plan an unequal slope intersecting roof</td>
</tr>
<tr>
<td>3. Calculate an unequal slope intersecting roof</td>
</tr>
<tr>
<td>4. Build an unequal slope intersecting roof</td>
</tr>
</tbody>
</table>

Achievement Criteria

Performance The learner will build an unequal slope intersecting roof.
Conditions The learner will be given:
  • Drawings and specifications
Criteria The learner will be evaluated on:
  • Safety
  • Tool use
  • Compliance with Code
  • Drawing for adjustments
  • Accuracy
Line (GAC): H WOOD FRAME CONSTRUCTION
Competency: H7 Build Specialized Framing Systems

Objectives
To be competent in this area, the individual must be able to:
• Describe specialized framing systems.
• Build specialized framing systems.

LEARNING TASKS

1. Describe specialized framing systems

   • Types
   • Bay windows
   • Bow windows
   • Window boxes
   • Drop ceiling
   • Valences
   • Pony walls
   • Bulkheads
   • Cornices
   • Access floors
   • Purpose
   • Styles

2. Describe specialized roof systems

   • Types
     - Polygon roofs
     - Gambrel
     - Mansard
     - Flat
     - Dormer
     - Cupola
     - Turret
     - Canopy
     - Spire
     - Saw tooth
     - Butterfly roof
   • Components
     - False gable
     - Cricket/saddle
     - Parapet
     - Cant strip
     - Hidden gutters
HARMONIZED PROGRAM OUTLINE
Program Content
Level 4

- Methods of construction
  - Openings
  - Wall frame
  - Roof frame
  - Curbs
  - Vaulted ceilings

3. Plan specialized framing systems
   - Safety
   - Code requirements
   - Scale drawing
   - Construction sequence

4. Calculate specialized framing systems
   - Theoretical lengths
   - Materials

5. Build specialized framing systems
   - Layout
   - Cut
   - Assembly

Achievement Criteria

Performance The learner will build a specialized framing, such as polygon roofs, bay windows, or dormers.

Conditions The learner will be given:
   - Drawings and specifications

Criteria The learner will be evaluated on:
   - Safety
   - Tool use
   - Accuracy
   - Framing technique
Line (GAC): H     WOOD FRAME CONSTRUCTION
Competency: H8   Perform Renovations and Additions

Objectives
To be competent in this area, the individual must be able to:
• Describe renovations and additions.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe renovations and additions</td>
<td>• Purpose</td>
</tr>
<tr>
<td></td>
<td>• Types</td>
</tr>
<tr>
<td></td>
<td>• Design considerations</td>
</tr>
<tr>
<td>2. Plan renovations and additions</td>
<td>• Safety</td>
</tr>
<tr>
<td></td>
<td>• Code requirements</td>
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<tr>
<td></td>
<td>• Permits</td>
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<tr>
<td></td>
<td>• Hoarding</td>
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<td></td>
<td>• Drawings and specifications</td>
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<td>• Sequence</td>
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<tr>
<td></td>
<td>• Demolition</td>
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<td>• Temporary support</td>
</tr>
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<td>• Services</td>
</tr>
<tr>
<td></td>
<td>• Protect finishes</td>
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<tr>
<td></td>
<td>• Housekeeping</td>
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<td></td>
<td>• Disposal</td>
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<td>• Hazardous materials</td>
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<td>• Asbestos</td>
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<td>• Mold</td>
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<td>• Lead</td>
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<td>• Mercury</td>
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<td>• PCB</td>
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<td>• Infestation</td>
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<tr>
<td></td>
<td>• Biohazards</td>
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<tr>
<td></td>
<td>• Silica</td>
</tr>
<tr>
<td></td>
<td>• Dust</td>
</tr>
<tr>
<td></td>
<td>• Reclaim material</td>
</tr>
<tr>
<td>3. Describe methods of renovations and</td>
<td>• Select materials</td>
</tr>
<tr>
<td>additions</td>
<td>• Support existing structure</td>
</tr>
<tr>
<td></td>
<td>• Connecting structural components</td>
</tr>
<tr>
<td></td>
<td>• Concrete-to-concrete</td>
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<tr>
<td></td>
<td>• Wood-to-wood</td>
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<tr>
<td></td>
<td>• Wood-to-steel</td>
</tr>
<tr>
<td></td>
<td>• Removal of temporary supports and hoardings</td>
</tr>
<tr>
<td></td>
<td>• Install finishes</td>
</tr>
</tbody>
</table>
Objectives
To be competent in this area, the individual must be able to:

- Describe timber and engineered wood construction.

LEARNING TASKS

1. Describe timber construction

CONTENT

- Purpose
- Types
  - Traditional post and beam
  - Heavy timber
  - Engineered
  - Logs
  - Cross-laminated timber (CLT)
- Uses
- Hardware
- Tools
- Connections
### Line (GAC):

**H**  
**WOOD FRAME CONSTRUCTION**

**Competency:**  
**H10**  
**Build Decks and Exterior Structures**

#### Objectives

To be competent in this area, the individual must be able to:

- Describe exterior structures.
- Plan exterior structures.

#### LEARNING TASKS

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Describe exterior structures</strong></td>
</tr>
<tr>
<td>• Purpose</td>
</tr>
<tr>
<td>• Types</td>
</tr>
<tr>
<td>o Fences</td>
</tr>
<tr>
<td>o Pergola</td>
</tr>
<tr>
<td>o Gazebos</td>
</tr>
<tr>
<td>o Privacy screens</td>
</tr>
<tr>
<td>o Accessory buildings</td>
</tr>
<tr>
<td>• Components</td>
</tr>
<tr>
<td>• Methods</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2. Plan exterior structures</strong></td>
</tr>
<tr>
<td>• Safety</td>
</tr>
<tr>
<td>• Code requirements</td>
</tr>
<tr>
<td>• Drawings and specifications</td>
</tr>
<tr>
<td>• Sequence</td>
</tr>
</tbody>
</table>
Line (GAC): I  FINISHING MATERIALS
Competency: I5 Install Interior Finishes

Objectives
To be competent in this area, the individual must be able to:
- Describe finished floors.
- Describe interior wall finishes and trims.
- Install interior wall finishes and trims.

LEARNING TASKS

1. Describe finished floors
2. Plan the installation of finished floors
3. Describe interior finishes
4. Plan interior finishes
5. Install interior finishes

CONTENT
- Types
- Safety
- Code requirements
- Code requirements
- Material calculations
- Storage and handling
- Acclimatization
- Subfloor preparation
- Installation of sleepers
- Layout procedures
- Fasteners
- Adhesives
- Sanding/finishing
- Layout
- Cut
- Assembly
Achievement Criteria 1

Performance  The learner will scribe fit paneling.
Conditions   The learner will be given:
              • Specifications
Criteria     The learner will be evaluated on:
              • Safety
              • Tool use
              • Fit

Achievement Criteria 2

Performance  The learner will install casing and crown moulding.
Conditions   The learner will be given:
              • Specifications
Criteria     The learner will be evaluated on:
              • Safety
              • Tool use
              • Fit and finish
Line (GAC): I FINISHING MATERIALS
Competency: I7 Install Interior Floor, Ceiling and Wall Systems

Objectives
To be competent in this area, the individual must be able to:
• Describe specialized floor systems.

LEARNING TASKS          CONTENT
1. Describe specialized floor systems
   • Access flooring
   • Sports surfaces
Line (GAC): J  BUILDING SCIENCE  
Competency: J1  Control the Forces Acting on a Building

Objectives
To be competent in this area, the individual must be able to:
• Describe the forces acting on a building.
• Describe the construction details for wood frame seismic applications.
• Determine construction practices based on design loads and bearing capacities of soils.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Describe forces acting on the building structure | • Types of loads  
|                                         | • Types of stress  
|                                         | • Bearing capacities of soil                                 |
| 2. Describe forces acting on the building envelope | • Weather/climate  
|                                         | • Temperature  
|                                         | • Wind  
|                                         | • Water  
|                                         | • Building orientation  
|                                         | • Ultra violet radiation/sun  
|                                         | • Relative humidity  
|                                         | • Hydrostatic forces  
|                                         | • Atmospheric pressure  
|                                         | • Pressure differential                                     |
| 3. Describe seismic applications        | • Code requirements  
|                                         | o Brace wall panels  
|                                         | o Brace wall bands  
|                                         | o Sheathing types  
|                                         | o Nailing patterns  
|                                         | o Nail types  
|                                         | o Blocking and backing  
|                                         | o Bracing  
|                                         | o Floor diaphragms                                          |
| 4. Describe seismic hardware and steel frames | • Hold down anchors  
|                                         | • Straps  
|                                         | • Bolts  
|                                         | • Nails  
|                                         | • Drag struts  
|                                         | • Steel moment frames                                       |
| 5. Describe live and dead load calculation | • Tributary area                                            |
Soil bearing capacities
Footing sizes
Section 4

TRAINING PROVIDER STANDARDS
Facility Requirements

Classroom Area
- Comfortable seating and tables suitable for learning
- Compliance with the local and national fire code and occupational safety requirements
- Overhead and multimedia projectors with a projection screen
- Whiteboard with marking pens and erasers, or chalkboard with chalk and erasers
- Lighting controls to allow easy visibility of the projection screen while allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- In-room temperature control to ensure comfortable room temperature
- Acoustics in the room must allow audibility of the instructor
- Access to a computer lab complete with 16 computers and internet access
- Access to a library complete with reference material for student and instructor use

Shop Area
- 2,400 square feet of workshop space per class of 16 students with a minimum ceiling height of 16 feet
  - This includes space for a tool crib
- Adequate lighting and lighting control
- Ventilation as per WorkSafeBC Standards
- Refuse and recycling bins for used shop materials
- First-aid facilities

Lab Requirements
- N/A

Student Facilities
- Adequate lunch room as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal storage lockers

Instructor’s Office Space
- Desk and filing space
- Computer
## Tools and Equipment

### Shop Equipment

**Required**

**All Levels:**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Safety Equipment</td>
<td></td>
</tr>
<tr>
<td>Eye protection</td>
<td></td>
</tr>
<tr>
<td>Fall protection systems</td>
<td></td>
</tr>
<tr>
<td>First aid kit</td>
<td></td>
</tr>
<tr>
<td>Foot protection</td>
<td></td>
</tr>
<tr>
<td>Hand protection</td>
<td></td>
</tr>
<tr>
<td>Hard hat (head protection)</td>
<td></td>
</tr>
<tr>
<td>Hearing protection</td>
<td></td>
</tr>
<tr>
<td>Lung protection</td>
<td></td>
</tr>
<tr>
<td>Reflective vest</td>
<td></td>
</tr>
</tbody>
</table>

### Stationary Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust collection equipment</td>
<td></td>
</tr>
</tbody>
</table>

### Level-Specific:

#### Survey Instruments

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical levels</td>
<td>1</td>
</tr>
<tr>
<td>Theodolite</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Rigging and Hoisting Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chokers</td>
<td>1</td>
</tr>
<tr>
<td>Come-alongs</td>
<td>1</td>
</tr>
<tr>
<td>Eyebolts</td>
<td>1</td>
</tr>
<tr>
<td>Nylon lifting straps</td>
<td>1</td>
</tr>
<tr>
<td>Pinch bar</td>
<td>1</td>
</tr>
<tr>
<td>Ropes</td>
<td>1</td>
</tr>
<tr>
<td>Skid ramps</td>
<td>1</td>
</tr>
<tr>
<td>Tirfors</td>
<td>1</td>
</tr>
<tr>
<td>Turnbuckles</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Stationary Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band saw</td>
<td>3</td>
</tr>
<tr>
<td>Sanders</td>
<td>2</td>
</tr>
<tr>
<td>Bench grinder</td>
<td>1</td>
</tr>
<tr>
<td>Table saw</td>
<td>1</td>
</tr>
<tr>
<td>Drill press</td>
<td>3</td>
</tr>
<tr>
<td>Thickness planer</td>
<td>2</td>
</tr>
<tr>
<td>Jointer</td>
<td>2</td>
</tr>
</tbody>
</table>
Shop (Facility) Tools

Standard Tools

All Levels:

Hand tools

- Adjustable wrench
- Allen wrenches
- Chalk line
- Clamps
- Combination square
- Cordless drill
- Dry line
- Framing square
- Hammers (framing, finishing)
- Hand saws
- High speed drill set
- Knives
- Levels
- Measuring tape

- Nail puller
- Nail set
- Pencil/markign instrument
- Pliers and side cutter
- Plumb bob
- Pry bars
- Scale rulers
- Screwdrivers (Robertson, Phillips, straight)
- Sliding T-bevel square
- Speed square
- Stair gauges
- Try square
- Wrecking bar

Portable Power Tools and Portable Equipment

- Calculator
- Circular saw
- Cordless drill and bits
- Electric drill
- Extension cords
- Grinder
- Ladders

- Mitre saw
- Portable power tool accessories
- Power nailer/fastener
- Reciprocating saw
- Step ladders
- Wet/dry vacuum
- Wheelbarrow
### Level-Specific:

<table>
<thead>
<tr>
<th>Level</th>
<th>Tool Description</th>
<th>Hand tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3</td>
<td>Angle divider</td>
<td>1,3 Plane (compass)</td>
</tr>
<tr>
<td>1</td>
<td>Aviation snips</td>
<td>1,3 Plane (fore)</td>
</tr>
<tr>
<td>1</td>
<td>Back saw</td>
<td>1,3 Plane (jack)</td>
</tr>
<tr>
<td>2,3</td>
<td>Butt gauge</td>
<td>1,3 Plane (jointer)</td>
</tr>
<tr>
<td>2,3,4</td>
<td>Caulking gun</td>
<td>1,3 Plane (rabbet)</td>
</tr>
<tr>
<td>1</td>
<td>Circle cutter</td>
<td>1,3 Plane (router)</td>
</tr>
<tr>
<td>1,3</td>
<td>Concrete bits</td>
<td>1,3 Plane (smooth)</td>
</tr>
<tr>
<td>3</td>
<td>Cone/tie wrench</td>
<td>1,3 Plane (universal)</td>
</tr>
<tr>
<td>3</td>
<td>Coping saw</td>
<td>1,3 Putty knife</td>
</tr>
<tr>
<td>3</td>
<td>Dividers</td>
<td>1,3 Rasp</td>
</tr>
<tr>
<td>3</td>
<td>Drywall T-square</td>
<td>1,3 Scribe</td>
</tr>
<tr>
<td>1</td>
<td>File</td>
<td>1,3 Scribing compass</td>
</tr>
<tr>
<td>1</td>
<td>Hack saw</td>
<td>1,3 Set of chisels</td>
</tr>
<tr>
<td>2</td>
<td>Hand shears</td>
<td>1,2 Stapler</td>
</tr>
<tr>
<td>2,3</td>
<td>Hinge gain template</td>
<td>1,3 Stones (oil and water)</td>
</tr>
<tr>
<td>3</td>
<td>Hole saw</td>
<td>1,2 Tape measure 100 ft.</td>
</tr>
<tr>
<td>3</td>
<td>&quot;J&quot; rollers</td>
<td>3 Trammel points</td>
</tr>
<tr>
<td>3</td>
<td>Keyhole saw</td>
<td>1,3 Wood boring bits</td>
</tr>
<tr>
<td>3</td>
<td>Laminate knives</td>
<td>1,3 Wood chisels</td>
</tr>
<tr>
<td>1,3</td>
<td>Plane (bench)</td>
<td>1,3 Wood spade bit set</td>
</tr>
<tr>
<td>1,3</td>
<td>Plane (block)</td>
<td></td>
</tr>
</tbody>
</table>
### Portable Power Tools and Portable Equipment

<table>
<thead>
<tr>
<th></th>
<th>Portable Power Tool</th>
<th></th>
<th>Portable Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air compressor</td>
<td></td>
<td>Ladder jacks</td>
</tr>
<tr>
<td>2</td>
<td>Belt sander</td>
<td>3</td>
<td>Laminate trimmer</td>
</tr>
<tr>
<td>2</td>
<td>Biscuit joiner</td>
<td></td>
<td>Oxy-fuel outlet</td>
</tr>
<tr>
<td>3</td>
<td>Concrete cutting saw</td>
<td>2</td>
<td>Palm sander</td>
</tr>
<tr>
<td>3</td>
<td>Concrete vibrator</td>
<td>2</td>
<td>Planer</td>
</tr>
<tr>
<td>3</td>
<td>Construction heaters</td>
<td>1</td>
<td>Pneumatic tools</td>
</tr>
<tr>
<td>3</td>
<td>Cut-off saw</td>
<td>1,3</td>
<td>Powder actuated tools</td>
</tr>
<tr>
<td>3</td>
<td>Drywall gun</td>
<td>1,2</td>
<td>Roof jack</td>
</tr>
<tr>
<td>3</td>
<td>Electric chipping hammer</td>
<td>2</td>
<td>Router and bits</td>
</tr>
<tr>
<td>1</td>
<td>Generator</td>
<td>2</td>
<td>Sander</td>
</tr>
<tr>
<td>3</td>
<td>Grinder</td>
<td>1</td>
<td>Scaffold</td>
</tr>
<tr>
<td>3</td>
<td>Hammer drill</td>
<td>3</td>
<td>Stapler</td>
</tr>
<tr>
<td>3</td>
<td>Jackhammer</td>
<td>1</td>
<td>Wall jack</td>
</tr>
<tr>
<td>1</td>
<td>Jigsaw</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student Tools (supplied by student)

**Required**
- Contact training facility for required tools and equipment

**Recommended**
- Steel toed boots
- Safety glasses
- Scientific calculator with trigonometry functions
- Weather appropriate clothing
- Carpenter’s apron
- Hammer
- Metric and imperial tape measures
- Drafting supplies – drawing pencils, metric and imperial scales, T-square, set-squares, geometry set
- Squares
- Knives
- Hard Hat
- Gloves
Reference Materials

Required Reference Materials

- Contact training facility for required reference material

Level 1:
- Carpenter Apprenticeship Program: Year 1: (2 Binder Set) – BC Trade Modules (www.crownpub.bc.ca)
- Carpenter: Third Canadian Edition by Floyd Vogt and Michael Nauth
- British Columbia Building Code

Level 2:
- Carpenter Apprenticeship Program: Year 2: (2 Binder Set) – BC Trade Modules (www.crownpub.bc.ca)
- Carpenter: Third Canadian Edition by Floyd Vogt and Michael Nauth
- British Columbia Building Code

Level 3:
- Carpenter Apprenticeship Program: Year 3: (2 Binder Set) – BC Trade Modules (www.crownpub.bc.ca)
- Carpenter: Third Canadian Edition by Floyd Vogt and Michael Nauth
- British Columbia Building Code

Level 4:
- Carpenter Apprenticeship Program: Year 4: (2 Binder Set) – BC Trade Modules (www.crownpub.bc.ca)
- Carpenter: Third Canadian Edition by Floyd Vogt and Michael Nauth
- British Columbia Building Code

Recommended Resources

  All carpenters in British Columbia are required to use and adhere to this regulation. The OHS Regulation is always changing to meet the needs of the construction industry. Use the WorkSafeBC website to keep up-to-date with changes to the regulation and to be informed of new workplace hazards. www.worksafebc.com


- Principles and Practices of Commercial Concrete

- Understanding Construction Drawings Tom Stephenson


Codes

- BC Ministry of Housing [http://www.gov.bc.ca/buildingcodes](http://www.gov.bc.ca/buildingcodes) Queen's Printer for BC Code books
  - BC Building Code
  - BC Fire Code
  - BC Electrical Code
- National Fire Protection Association [www.nfpa.org](http://www.nfpa.org)
  - NFPA 80 – Standards for Fire Doors and Fire Windows

Suggested Texts

- **Building Trades Blueprint Reading** Sandberg – Copp Clark (1982)
  ISBN 0-7730-2900-1
  This text is suggested to complete the technical training component of the carpentry apprenticeship program. It describes blueprint-reading techniques for the construction of residential buildings. Available online at: [https://www.amazon.ca/Building-Trades-Blueprint-Reading-Residential/dp/0773029001](https://www.amazon.ca/Building-Trades-Blueprint-Reading-Residential/dp/0773029001)


  The Building Trades Dictionary explains the meaning of many construction terms. The text makes good use of diagrams. It is useful as an auxiliary reference text that may be available at the public library. CD Rom is available. Available online at: [http://www.atplearning.com/Building-Trades-Dictionary-P41.aspx](http://www.atplearning.com/Building-Trades-Dictionary-P41.aspx)

- **Practical Problems in Mathematics For Carpenters** Huth – Delmar (1991)
  ISBN 0-8273-4579-8
  Harry Huth, the author of this text, uses many diagrams and sample problems to lead the learner through the methods used to solve carpentry related math problems. The text is useful as an auxiliary reference text that may be available at the public library. Available online at: [http://www.amazon.com/Practical-Problems-Mathematics-Carpenters-Series/dp/1111313423](http://www.amazon.com/Practical-Problems-Mathematics-Carpenters-Series/dp/1111313423)

- **Permanent Wood Foundations** Canadian Wood Council (1992)
  The Canadian Wood Council publishes this text. It includes many diagrams and does an excellent job of describing wood foundations. It is useful as an auxiliary reference text that may be available at the public library. Available online at: [https://webstore.cwc.ca/technical-books/pwf001e-permanent-wood-foundations](https://webstore.cwc.ca/technical-books/pwf001e-permanent-wood-foundations)

- **Formwork for Concrete** Hurd – American Concrete Institute SP-4 (1989)
Formwork for Concrete, Principals and Practices of Commercial Construction is the definitive text on the construction of formwork. The explanations and diagrams are excellent. It is useful as an auxiliary reference text that may be available at the public library. Available online at: [http://www.amazon.com/Formwork-Concrete-ACI-SP4-M-K-Hurd/dp/B0034W2LVW](http://www.amazon.com/Formwork-Concrete-ACI-SP4-M-K-Hurd/dp/B0034W2LVW)

- **Concrete Technology**  
  White – Delmar (1991)  
  ISBN 0-8273-3635-7  

Concrete Technology is a simplified version of Design and Control of Concrete Mixtures. It is useful as an auxiliary reference text that may be available at the public library. Available online at: [http://www.amazon.com/Concrete-Technology-Trade-Industry/dp/0827336357](http://www.amazon.com/Concrete-Technology-Trade-Industry/dp/0827336357)

- **Hand Woodworking Tools**  
  McDonnell – Delmar (1978)  
  ISBN 0-8273-1098-6  

Hand Woodworking Tools gives a wonderful description of the traditional hand woodworking tools used in carpentry. It is an older text that may be out of print but is listed here because of the quality of the diagrams used in the text. It is useful as an auxiliary reference text that may be available at the public library. Available online at: [http://www.abebooks.com/servlet/BookDetailsPL?bi=11800428479&cm_sp=seedet--plp--bdp](http://www.abebooks.com/servlet/BookDetailsPL?bi=11800428479&cm_sp=seedet--plp--bdp)

- **Design and Control of Concrete Mixtures, 8th Canadian Edition**  


- **Understanding Wood**  
  ISBN 978-1-56158-358-4  

Understanding Wood is a very well written text on the properties of wood. It describes how the properties of wood can be predicted and controlled. It is useful as an auxiliary reference text that may be available at the public library. Available online at: [http://www.tauntonstore.com/understanding-wood-2nd-edition-r-bruce-hoadley-070490.html](http://www.tauntonstore.com/understanding-wood-2nd-edition-r-bruce-hoadley-070490.html)

- **Canadian Woodframe House Construction, CMHC, Revised 2013**  

The Central Mortgage and Housing Corporation (CMHC) publish this useful book. It describes all aspects of wood frame construction. It is useful as an auxiliary reference text that may be available at the public library and is also available on CD-ROM. It is available for free download on the CMHC website. Available online at: [https://www03.cmhc-schl.gc.ca/catalog/productDetail.cfm?cat=178&itm=1&lang=en&sid=gp9iTS](https://www03.cmhc-schl.gc.ca/catalog/productDetail.cfm?cat=178&itm=1&lang=en&sid=gp9iTS)
• **National Building Code of Canada**

The National Building Code (NBC) is the main building regulation text for Canada. Local Building Codes are based on this text. When working in British Columbia, it is useful to be aware of the difference between the BC Code and the NBC. This text is available at public libraries and at the college library and is also available on CD-ROM. Available online at: [http://www.nrc-cnrc.gc.ca/eng/solutions/advisory/codes_centre_index.html](http://www.nrc-cnrc.gc.ca/eng/solutions/advisory/codes_centre_index.html)

• **Construction Materials, Methods and Techniques**  
  William P. Spence, Eva Kultermann (2016)

This text does an excellent job of describing the properties of construction materials. It is useful as an auxiliary reference text that may be available at the public library or at the college library. Available online at: [https://www.amazon.ca/Construction-Materials-Methods-Techniques-Sustainable/dp/1435481089](https://www.amazon.ca/Construction-Materials-Methods-Techniques-Sustainable/dp/1435481089)

• **Why Buildings Stand Up**  
  ISBN 978-0-393-30676-7

Why Buildings Stand Up does a great job of describing the physics of building construction. It uses many historical references and truly simplifies the forces acting on a building. It is useful as an auxiliary reference text that may be available at the public library or at the college library. Available online at: [http://books.wwnorton.com/books/978-0-393-30676-7/](http://books.wwnorton.com/books/978-0-393-30676-7/)

• **Architectural and Graphic Standards, Student Edition**  
  Charles George Ramsey, Harold, Reeve, Sleeper, Bruce Bassler (Editor)  
  American Institute of Architects (2008)  

The construction details shown in this text are wonderful. Both residential and commercial construction details are shown. It is useful as an auxiliary reference text that may be available at the public library or at the college library. Available online at: [https://www.amazon.ca/Architectural-Graphic-Standards-Student-Edition/dp/0470085460](https://www.amazon.ca/Architectural-Graphic-Standards-Student-Edition/dp/0470085460)

• **Hoisting and Rigging Safety Manual**

The Ontario Safety Association published this manual. It provides a good description of safe rigging practices. It is useful as an auxiliary reference text that may be available at the public library or at the college library. Available online at: [http://www.oetio.com/Hoisting_and_Rigging_Safety_Manual.aspx](http://www.oetio.com/Hoisting_and_Rigging_Safety_Manual.aspx)

• **De Walt Carpentry and Framing**  
  ISBN 13:978-1-111361-3-0

De Walt Carpentry and Framing handbook spells out, through pictures, the step-by-step procedures associated with key carpentry concepts. The accompanying text is clear, straightforward, and accessible, clarifying and elaborating on the visuals. Coverage begins with a discussion of house types and foundations, gradually progressing to more complex areas, such as wall and floor framing. Available online at: [http://www.amazon.com/gp/product/1111136130/ref=pd_lpo_sbs_dp_ss_1?pf_rd_p=1944687522&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=1111313423&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=1XXKK46T155ATRSSY32](http://www.amazon.com/gp/product/1111136130/ref=pd_lpo_sbs_dp_ss_1?pf_rd_p=1944687522&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=1111313423&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=1XXKK46T155ATRSSY32)

**NOTE:**

This list of Reference Materials is for training providers. Apprentices should contact their preferred training provider for a list of recommended or required texts for this program.
Instructor Requirements

Occupation Qualification
The instructor must possess one of the following:

- Carpenter Certificate of Qualification from British Columbia, preferably with an Interprovincial Red Seal Endorsement
- Carpenter Certificate of Qualification from another Canadian jurisdiction, complete with the Interprovincial Red Seal Endorsement

Work Experience

- A minimum of 5 years’ experience working in the industry as a journeyperson.

Instructional Experience and Education
It is preferred that the instructor also possesses one of the following:

- An Instructors Diploma or equivalent
- A Bachelor’s Degree in Education
- A Master’s Degree in Education
Appendices
Appendix A

Assessment Guidelines
Program: Carpenter

Training providers delivering Carpenter apprenticeship in-school technical training are required to enter the following information in ITA Direct Access (ITADA) for each apprentice:

- An in-school mark in the form of a percentage

Training Provider Component: In-School Technical Training

The in-school mark for each level is derived from a combination of theory and practical assessments. This mark is then combined with the ITA Standard Level Examination to determine a final mark for the level.

Calculation tables showing the subject competencies, level percentage weightings and level examination weightings are shown in the Grading Sheet: “Subject Competencies and Weightings” section of this document.

Carpenter Level 1, 2 & 3 in-school marks are calculated by:

- Totaling the level theory competency results as noted in the competencies and weightings tables and multiplying the total by 50% for Level 1, 2 & 3 to produce a weighted theory result;
- Totaling the level practical competency results as noted in the competencies and weightings tables and multiplying the total by 50% for Level 1, 2 & 3 to produce a weighted practical result;
- Adding the theory and practical competency results together to determine the final in-school result.

Successful completion of the in-school training for each level is defined as an in-school mark of 70% or greater.

ITA Component: ITA Standardized Level Examinations - Level 1, 2 & 3

ITA Direct Access (ITADA) automatically calculates the final mark for a level once the in-school training and standard level exam marks are entered into the system. This mark is calculated by blending the standardized exam percentage score and the in-school technical training percentage score to determine the final mark for the level.

In-school technical training (combined theory & practical) is weighted at 80% and the ITA standardized level exam is weighted at 20%. These two scores are combined to determine the final level mark. This result is the final mark that is recorded in ITA Direct Access.

- A mark of 70% or greater is required to pass the level when combining the final in-school percentage score and the final ITA standardized level exam percentage score.
Component: Level 4 - Proprietary Examinations

Until further notice, Training Providers delivering the Carpenter program will continue using their institution's proprietary examination in the calculation of the apprentices' achievement for Level 4. The percentage weighting of this exam is 30% of the final in-school technical training mark.

Refer to the Grading Sheet Subject Competencies and Weightings Table to determine the calculation process for completing a final Level 4 percentage. The final blended mark for Level 4 is to be reported to ITA and must be 70% or greater to pass the level.

Interprovincial Red Seal Exam

In order to achieve certification, Carpenter apprentices are required to write the Carpenter Interprovincial Red Seal exam after completing all levels of in-school technical training. Apprentices must have passed all levels of in-school technical training or be approved challengers to sit the exam. A score of 70% or greater is required for a pass.

Interprovincial Red Seal exams should be requested by training providers via the usual ITA procedure. The ITA will administer and invigilate Interprovincial Red Seal exams and score and record exam results in ITA Direct Access.
### Grading Sheet: Subject Competency and Weightings

**PROGRAM:**

**IN-SCHOOL TRAINING:**

**ITA DIRECT ACCESS CODE:**

**CARPENTER LEVEL 1**

<table>
<thead>
<tr>
<th>LINE</th>
<th>SUBJECT COMPETENCIES</th>
<th>THEORY WEIGHTING</th>
<th>PRACTICAL WEIGHTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SAFE WORK PRACTICES</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>B</td>
<td>DOCUMENTATION AND ORGANIZATIONAL SKILLS</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>C</td>
<td>TOOLS AND EQUIPMENT</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>D</td>
<td>SURVEY INSTRUMENTS AND EQUIPMENT</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>E</td>
<td>ACCESS, RIGGING AND HOISTING EQUIPMENT</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>F</td>
<td>SITE LAYOUT</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>G</td>
<td>CONCRETE FORMWORK</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>H</td>
<td>WOOD FRAME CONSTRUCTION</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>J</td>
<td>BUILDING SCIENCE</td>
<td>2%</td>
<td>0%</td>
</tr>
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</table>

**Total**

<table>
<thead>
<tr>
<th>Theory</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Calculated by the Training Provider**

(Carpenter in-school theory & practical subject competency weighting)

50% 50%

**Training Provider enters final in-school mark into ITA Direct Access**

IN-SCHOOL %

**Calculated by ITA:**

**In-school Mark**

ITA Direct Access calculates the percentage weighting once the in-school mark is entered. Combined theory and practical subject competency multiplied by 80%

**Standard Level Exam Mark**

ITA Direct Access will calculate the percentage weighting once the standard level exam marks have been entered. The exam score is multiplied by 20%

**Final Mark**

The final mark for determining credit is calculated by ITA Direct Access. FINAL%
## HARMONIZED PROGRAM OUTLINE
### Appendix A
### Assessment Guidelines

**PROGRAM:**
**IN-SCHOOL TRAINING:**
**ITA DIRECT ACCESS CODE:**

<table>
<thead>
<tr>
<th>LINE</th>
<th>SUBJECT COMPETENCIES</th>
<th>THEORY WEIGHTING</th>
<th>PRACTICAL WEIGHTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>DOCUMENTATION AND ORGANIZATIONAL SKILLS</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>C</td>
<td>TOOLS AND EQUIPMENT</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>D</td>
<td>SURVEY INSTRUMENTS AND EQUIPMENT</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>F</td>
<td>SITE LAYOUT</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>G</td>
<td>CONCRETE FORMWORK</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>H</td>
<td>WOOD FRAME CONSTRUCTION</td>
<td>20%</td>
<td>22%</td>
</tr>
<tr>
<td>I</td>
<td>FINISHING MATERIALS</td>
<td>25%</td>
<td>22%</td>
</tr>
<tr>
<td>J</td>
<td>BUILDING SCIENCE</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

**Total**

100% 100%

### Calculated by the Training Provider
(Carpenter in-school theory & practical subject competency weighting)

50% 50%

### Training Provider enters final in-school mark into ITA Direct Access

IN-SCHOOL %

### Calculated by ITA:
**In-school Mark**
ITA Direct Access calculates the percentage weighting once the in-school mark is entered. Combined theory and practical subject competency multiplied by

80%

### Calculated by ITA:
**Standard Level Exam Mark**
ITA Direct Access will calculate the percentage weighting once the standard level exam marks have been entered. The exam score is multiplied by

20%

### Calculated by ITA:
**Final Mark**
The final mark for determining credit is calculated by ITA Direct Access.

FINAL%
<table>
<thead>
<tr>
<th>LINE</th>
<th>SUBJECT COMPETENCIES</th>
<th>THEORY WEIGHTING</th>
<th>PRACTICAL WEIGHTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>DOCUMENTATION AND ORGANIZATIONAL SKILLS</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>C</td>
<td>TOOLS AND EQUIPMENT</td>
<td>3%</td>
<td>8%</td>
</tr>
<tr>
<td>F</td>
<td>SITE LAYOUT</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>G</td>
<td>CONCRETE FORMWORK</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>H</td>
<td>WOOD FRAME CONSTRUCTION</td>
<td>20%</td>
<td>18%</td>
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<tr>
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<td>FINISHING MATERIALS</td>
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<td>30%</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
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</table>

Calculated by the Training Provider
(Carpenter in-school theory & practical subject competency weighting) 50% 50%

Training Provider enters final in-school mark into ITA Direct Access  
IN-SCHOOL %

Calculated by ITA: **In-school Mark**
ITA Direct Access calculates the percentage weighting once the in-school mark is entered. Combined theory and practical subject competency multiplied by 80%

Calculated by ITA: **Standard Level Exam Mark**
ITA Direct Access will calculate the percentage weighting once the standard level exam marks have been entered. The exam score is multiplied by 20%

Calculated by ITA: **Final Mark**
The final mark for determining credit is calculated by ITA Direct Access. FINAL%
## PROGRAM: CARPENTER
### IN-SCHOOL TRAINING:
#### ITA DIRECT ACCESS CODE: 0004CA04

<table>
<thead>
<tr>
<th>LINE</th>
<th>SUBJECT COMPETENCIES</th>
<th>THEORY WEIGHTING</th>
<th>PRACTICAL WEIGHTING</th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>DOCUMENTATION AND ORGANIZATIONAL SKILLS</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>D</td>
<td>SURVEY INSTRUMENTS AND EQUIPMENT</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>F</td>
<td>SITE LAYOUT</td>
<td>8%</td>
<td>5%</td>
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<tr>
<td>H</td>
<td>WOOD FRAME CONSTRUCTION</td>
<td>55%</td>
<td>55%</td>
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<tr>
<td>I</td>
<td>FINISHING MATERIALS</td>
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<td>9%</td>
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<tr>
<td>J</td>
<td>BUILDING SCIENCE</td>
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<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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**Calculated by the Training Provider:**

<table>
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<tr>
<th>Description</th>
<th>Theory</th>
<th>Practical</th>
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<tbody>
<tr>
<td>Carpenter in-school theory &amp; practical subject competency weighting</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>In-school Mark</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined theory and practical subject competency multiplied by</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proprietary Exam Mark</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The exam score is multiplied by</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Training Provider enters final in-school mark into ITA Direct Access</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A score of 70% or greater is required for a pass.</td>
<td></td>
<td>Final %</td>
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</table>

All apprentices who complete Level 4 of the Carpenter program with a FINAL level mark of 70% or greater will write the Interprovincial Red Seal examination as their final assessment.

ITA will enter the apprentices’ Carpenter Interprovincial examination mark in ITADA. A minimum mark of 70% on the examination is required for a pass.
Appendix B
Glossary
Appendix B Glossary

Adjust
To change something in a minor way so that it works better, such as changing the mitre angle on a compound mitre saw.

Build
To make something by putting together parts or materials; construct; erect. This includes layout and assembly techniques; cutting, fitting, fastening, and joinery.

Calculate
Determine the amount or number of something mathematically. Calculating includes all aspects of estimating labour and materials (where there is some overlap with planning), calculation of volumes, theory, lengths of rafters, rise and run of stairs, board foot measure, etc.

Consult
To ask for the professional opinion of someone or to talk with someone, or look up information in a document, in order to make a decision.

Construction Drawings and Specifications
Blueprints, plans, instructions, information

Correct
Having no errors or mistakes. Calculations should be done correctly.

Describe
To explain or give an account of an item or concept. This means an introduction to a topic area that will include terminology, safety as it pertains to the topic, types and uses of the item. For example, describing roofs will include terminology such as rise and run, slope, rafter, fascia; discussion regarding working at heights; types of roofs such as gable and hip.

Identify
Establish or indicate what something is. This is the most basic level of learning and typically precedes all others. In the case of a lengthy learning period (such as an apprenticeship), it is often adequate to identify a tool or procedure well in advance of actually describing and using the tool.

Install
To make ready to be used in a certain place, such as installing a door or window hardware.

Interpret
To explain or understand the meaning of something. This primarily means using construction drawings. Given the alphabet of lines and numerous symbols and formats, construction drawings are a language of their own. The carpenter must interpret two dimensional drawings to build three dimensional objects.

Layout
The way in which the parts of something are arranged or laid out. This is a fundamental aspect of a carpenter's role in the construction process and includes everything from use of surveying equipment to locate buildings on sites, to making scale drawings of complex joinery details such as intersecting unequal slope roof framing members. It is included in the Learning Tasks entitled 'Build' because it is often the first step in putting things together, but in some cases 'Layout' could be a separate Learning Task. A procedure or group of components must be correctly laid out in order for construction to proceed.
**Maintain**
To keep a tool in good condition by performing regular maintenance such as lubrication or cleaning, as well as making repairs and correcting problems.

**Plan**
An intention or decision about what one is going to do; to decide on and arrange in advance.
Planning includes all aspects of reading and interpreting construction drawings and documentation; any reference to WorkSafeBC, building codes and bylaws; consultation with architects, engineers, sub trades, and owners occurs as part of planning. There is an overlap between planning and calculating, primarily in terms of estimating time and materials.

**Prepare**
To work out the details of or plan in advance; to make something ready for some activity or purpose, such as preparing the site for construction activities.

**Proper**
In a thorough manner; suitable for some purpose or situation. Tools are used properly.

**Systems**
A set of detailed methods, procedures and routines created to carry out a specific activity, perform a duty, or solve a problem. Typically, the use of the term systems refers to ICI construction. It is used to differentiate between ICI systems, such as proprietary forms or interior finishes, and common residential construction techniques.

**Use**
The act of using something. This typically involves the safe and proper operation of a tool or construction system. In the case of formwork systems, safe, proper and efficient use includes the ease of stripping the formwork.
Appendix C
Previous Contributors
Previous Contributors

Subject Matter Experts retained to assist with the review and update of the Program Outline (2014):

- Chris Backman  
  Kingston Construction
- Randy Callaghan  
  PCL
- Geoff Murray  
  Camosun College
- Don Naidesh  
  BCIT
- Stephen Pelley  
  Vancouver Island University

Subject Matter Experts retained to assist in the development of Program Outline (2013):

- Will Benson
- Yves Blaison
- Syd Lenton
- Geoff Murray
- Chris Paton
- Stephen Pelley

The Program Outline was prepared with the advice and direction of an industry steering committee convened initially by the Construction Industry Training Organization (CITO) Members included:

- Chris Backman
- Yves Blaison
- Elmer Eidse
- Mark Konrad
- Brian Lee
- Carrol Watamaniuk
- Alf Wiens