

SKILLED**TRADES**^{BC}

PROGRAM OUTLINE

CARPENTER

Implementation date: April 1, 2023

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CARPENTER PROGRAM OUTLINE

**APPROVED BY INDUSTRY
JUNE 2022**

**IMPLEMENTATION DATE
APRIL 1, 2023**

THIS BC PROGRAM HAS BEEN HARMONIZED AND IS BASED ON RSOS 2021

**Developed by
SkilledTradesBC
Province of British Columbia**

TABLE OF CONTENTS

Section 1 INTRODUCTION..... 3

 Foreword 4

 Acknowledgements 5

 How to Use this Document..... 6

Section 2 PROGRAM OVERVIEW 8

 Program Credentialing Model..... 9

 Occupational Analysis Chart10

 Training Topics and Suggested Time Allocation – Level 113

 Training Topics and Suggested Time Allocation – Level 215

 Training Topics and Suggested Time Allocation – Level 316

 Training Topics and Suggested Time Allocation – Level 417

Section 3 PROGRAM CONTENT..... 18

 Level 1 Carpenter19

 Level 2 Carpenter62

 Level 3 Carpenter88

 Level 4 Carpenter117

Section 4 ASSESSMENT GUIDELINES..... 142

 Assessment Guidelines – Level 1143

 Assessment Guidelines – Level 2144

 Assessment Guidelines – Level 3145

 Assessment Guidelines – Level 4146

Section 5 TRAINING PROVIDER STANDARDS..... 147

 Facility Requirements148

 Tools and Equipment.....149

 Reference Materials.....153

 Instructor Requirements.....157

Appendices 158

 Appendix A Acronyms159

 Appendix B Previous Contributors160

 Appendix C Summary of Achievement Criteria161

Section 1
INTRODUCTION
Carpenter

Foreword

This revised 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 2022 Red Seal Occupational Standard (RSOS). It was developed by 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.

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 Section 4 for more details.

Achievement Criteria are included for those competencies that require a practical assessment. 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 measurable and that they reflect the skills spelled out in the competency. 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 WorkSafe BC 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

Industry and Instructor Subject Matter Experts retained to assist in the development and review of the Program Outline:

- Erik Hardin
- Geoff Murray
- Don Naidesh
- Aaron Van Peteghen

Industry Subject Matter Experts retained as outline reviewers:

- Randy Callaghan, PCL Construction
- Robert Dolman, BC Regional Council of Carpenters

SkilledTradesBC would like to acknowledge the dedication and hard work of all the industry representatives appointed to identify the training requirements of the Carpenter occupation.

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.

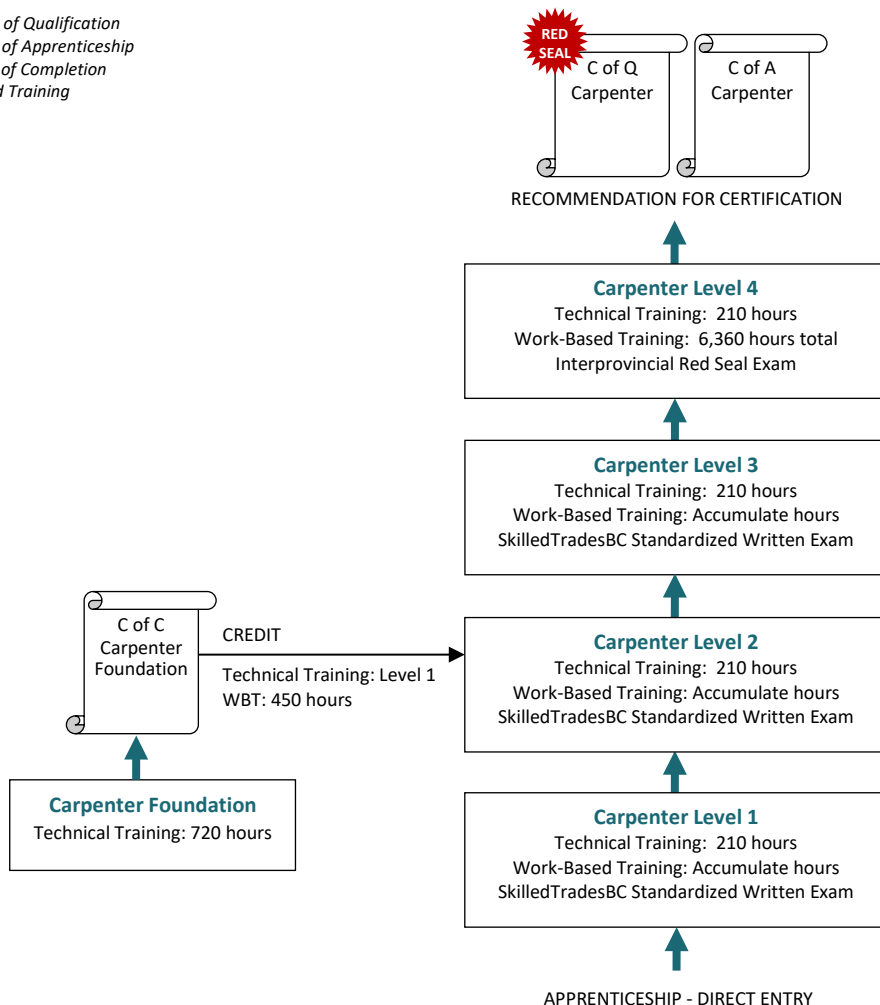
Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Program Credentialing Model	Communicates program length and structure, and all pathways to completion	Illustrates the length and structure of the program	Illustrates the length and structure of the program, and pathway to completion	Illustrates the challenger pathway to Certificate of Qualification
OAC	Communicates the competencies that industry has defined as representing the scope of the occupation	Displays the competencies that an apprentice is expected to demonstrate in order to achieve certification	Displays the competencies apprentices will achieve as a result of program completion	Displays the competencies challengers must demonstrate in order to challenge the program
Training Topics and Suggested Time Allocation	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	Shows 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	Shows 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	Shows the relative weightings of various competencies of the occupation on which assessment is based
Program Content	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	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	Provides detailed information on program content and performance expectations for demonstrating competency	Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels
Assessment Guidelines	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the general areas of competency covered in the technical training, the grading weight for each GAC, and the percentage of that time spent on theory versus practical application	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the relative weightings of various general areas of competency within the occupation on which assessment is based

Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Training Provider Standards	Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program	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	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	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
Appendix – Glossary of Acronyms			Defines program specific acronyms	

Section 2
PROGRAM OVERVIEW
Carpenter

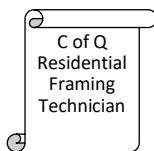
Program Credentialing Model

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

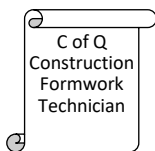


CROSS-PROGRAM CREDITS

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



Technical Training: Level 1
 WBT: 500 hours



Technical Training: Level 2
 WBT: 2,500 hours

Occupational Analysis Chart

CARPENTER

Occupation Description: Carpenters construct, install, renovate, maintain, and repair residential, civil, industrial, commercial, and institutional (ICI) structures made of wood, steel, concrete, composite, and other materials. While the scope of the carpenter trade includes many aspects of building construction, a growing number of carpenters work for contractors in such areas of trade practice as concrete forming, framing, finishing, interior systems, renovations, and surveying. Carpenters are employed in a variety of project environments, including houses under construction or renovation, ICI, civil and infrastructure projects, and plants that pre-fabricate buildings. Carpenters are found working in a variety of sectors such as construction, manufacturing, service, mining, agricultural, institutional, commercial, forestry, and transit and transportation. Due to their involvement in most aspects of building construction, experienced carpenters may advance to supervisory positions or become independent contractors.

SAFE WORK PRACTICES A	Apply shop and site safety practices A1	Apply personal safety practices A2					
	1						
DOCUMENTATION AND ORGANIZATIONAL SKILLS B	Use construction drawings and specifications B1	Interpret building codes and bylaws B2	Plan and organize work B3	Perform trade math B4	Use communication and mentorship techniques B5		
	1	2	3			1	2
TOOLS AND EQUIPMENT C	Use hand tools C1	Use portable power tools C2	Use stationary power tools C3				
	1		3			1	2
SURVEY INSTRUMENTS AND EQUIPMENT D	Use levelling instruments and equipment D1	Use site layout equipment D2					
	1					2	4

Program Overview

**ACCESS, RIGGING, AND
HOISTING EQUIPMENT**
E

Use ladders, scaffolds, and access equipment				
E1				
1				

Use rigging and hoisting equipment				
E2				
1		3		

SITE LAYOUT
F

Lay out building locations				
F1				
1				

Prepare building site				
F2				
			4	

Apply excavation and shoring practices				
F3				
		3		

**CONCRETE
FORMWORK**
G

Use concrete types, materials, additives, and treatments				
G1				
1		3		

Select concrete forming systems				
G2				
1		3		

Build footing and vertical formwork				
G3				
1		3		

Build slab-on-grade forms and suspended slab forms				
G4				
1	2	3		

Install reinforcement and embedded items				
G5				
1		3		

Build concrete stair forms				
G6				
		3		

Place and finish concrete				
G7				
1	2			

Install specialized formwork				
G8				
		3		

**WOOD FRAME
CONSTRUCTION**
H

Describe wood frame construction				
H1				
1				

Select framing materials				
H2				
1				

Build floor systems				
H3				
1				

Build wall systems				
H4				
1	2			

Build stair systems				
H5				
1	2		4	

Build roof systems				
H6				
	2	3	4	

Build specialized framing systems				
H7				
			4	

Perform renovations and additions				
H8				
			4	

Build timber and engineered wood construction				
H9				
			4	

Build decks and exterior structures				
H10				
			4	

Program Overview

FINISHING MATERIALS I	Describe roofing materials I1	Install doors and hardware I2	Install windows and hardware I3	Install exterior finishes I4	Install interior finishes I5	Install cabinets I6
	2	2 3	2	2	3 4	3
	Install interior floor, ceiling, and wall systems I7					
	3 4					
BUILDING SCIENCE J	Control the forces acting on a building J1	Control the forces acting on a building as a system J2				
	1 4	2 4				

Training Topics and Suggested Time Allocation

CARPENTER – LEVEL 1

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line A	SAFE WORK PRACTICES	6%	50%	50%	100%
A1	Apply shop and site safety practices		✓	✓	
A2	Apply personal safety practices		✓	✓	
Line B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	14%	50%	50%	100%
B1	Use construction drawings and specifications		✓	✓	
B2	Interpret building codes and bylaws		✓	✓	
B3	Plan and organize work		✓		
B4	Perform trade math		✓		
B5	Use communication and mentorship techniques		✓		
Line C	TOOLS AND EQUIPMENT	15%	50%	50%	100%
C1	Use hand tools		✓	✓	
C2	Use portable power tools		✓	✓	
C3	Use stationary power tools		✓	✓	
Line D	SURVEY INSTRUMENTS AND EQUIPMENT	8%	50%	50%	100%
D1	Use levelling instruments and equipment		✓	✓	
Line E	ACCESS, RIGGING, AND HOISTING EQUIPMENT	9%	40%	60%	100%
E1	Use ladders, scaffolds, and access equipment		✓	✓	
E2	Use rigging and hoisting equipment		✓	✓	
Line F	SITE LAYOUT	5%	30%	70%	100%
F1	Lay out building locations		✓	✓	
Line G	CONCRETE FORMWORK	20%	50%	50%	100%
G1	Use concrete types, materials, additives, and treatments		✓		
G2	Select concrete forming systems		✓		
G3	Build footing and vertical formwork		✓	✓	
G4	Build slab-on-grade forms and suspended slab forms		✓		
G5	Install reinforcement and embedded items		✓		
G7	Place and finish concrete		✓		
Line H	WOOD FRAME CONSTRUCTION	20%	60%	40%	100%
H1	Describe wood frame construction		✓		
H2	Select framing materials		✓		
H3	Build floor systems		✓	✓	
H4	Build wall systems		✓		
H5	Build stair systems		✓	✓	

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line J J1	BUILDING SCIENCE Control the forces acting on a building	3%	100% ✓	0%	100%
Total Percentage for Carpenter Level 1		100%			

Training Topics and Suggested Time Allocation

CARPENTER – LEVEL 2

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	13%	60%	40%	100%
B1	Use construction drawings and specifications		✓	✓	
B2	Interpret building codes and bylaws		✓		
Line C	TOOLS AND EQUIPMENT	10%	40%	60%	100%
C2	Use portable power tools		✓	✓	
C3	Use stationary power tools		✓	✓	
Line D	SURVEY INSTRUMENTS AND EQUIPMENT	10%	70%	30%	100%
D2	Use site layout equipment		✓	✓	
Line G	CONCRETE FORMWORK	5%	50%	50%	100%
G4	Build slab-on-grade forms and suspended slab forms		✓	✓	
G7	Place and finish concrete		✓		
Line H	WOOD FRAME CONSTRUCTION	28%	40%	60%	100%
H4	Build wall systems		✓	✓	
H5	Build stair systems		✓	✓	
H6	Build roof systems		✓	✓	
Line I	FINISHING MATERIALS	29%	40%	60%	100%
I1	Describe roofing materials		✓		
I2	Install doors and hardware		✓	✓	
I3	Install windows and hardware		✓	✓	
I4	Install exterior finishes		✓	✓	
Line J	BUILDING SCIENCE	5%	50%	50%	100%
J2	Control forces acting on a building as a system		✓	✓	
Total Percentage for Carpenter Level 2		100%			

Training Topics and Suggested Time Allocation

CARPENTER – LEVEL 3

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	13%	50%	50%	100%
B1	Use construction drawings and specifications		✓	✓	
B2	Interpret building codes and bylaws		✓	✓	
Line C	TOOLS AND EQUIPMENT	5%	30%	70%	100%
C1	Use hand tools		✓	✓	
C3	Use stationary power tools		✓	✓	
Line E	ACCESS, RIGGING, AND HOISTING EQUIPMENT	3%	60%	40%	100%
E2	Use rigging and hoisting equipment		✓	✓	
Line F	SITE LAYOUT	3%	100%	0%	100%
F3	Apply excavation and shoring practices		✓		
Line G	CONCRETE FORMWORK	32%	50%	50%	100%
G1	Use concrete types, materials, additives, and treatments		✓		
G2	Select concrete forming systems		✓		
G3	Build footing and vertical formwork		✓	✓	
G4	Build slab-on-grade forms and suspended slab forms		✓	✓	
G5	Install reinforcement and embedded items		✓	✓	
G6	Build concrete stair forms		✓	✓	
G8	Install specialized formwork		✓	✓	
Line H	WOOD FRAME CONSTRUCTION	20%	50%	50%	100%
H6	Build roof systems		✓	✓	
Line I	FINISHING MATERIALS	24%	30%	70%	100%
I2	Install doors and hardware		✓	✓	
I5	Install interior finishes		✓		
I6	Install cabinets		✓	✓	
I7	Install interior floor, ceiling, and wall systems		✓	✓	
Total Percentage for Carpenter Level 3		100%			

Training Topics and Suggested Time Allocation

CARPENTER – LEVEL 4

		% of Time	% of Time Allocated to:		
			Theory	Practical	Total
Line B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	15%	40%	60%	100%
B2	Interpret building codes and bylaws		✓		
B3	Plan and organize work		✓	✓	
B5	Use communication and mentorship techniques		✓		
Line D	SURVEY INSTRUMENTS AND EQUIPMENT	10%	50%	50%	100%
D2	Use site layout equipment		✓	✓	
Line F	SITE LAYOUT	3%	100%	0%	100%
F2	Prepare building site		✓		
Line H	WOOD FRAME CONSTRUCTION	46%	40%	60%	100%
H5	Build stair systems		✓	✓	
H6	Build roof systems		✓	✓	
H7	Build specialized framing systems		✓		
H8	Perform renovations and additions		✓		
H9	Build timber and engineered wood construction		✓		
H10	Build decks and exterior structures		✓		
Line I	FINISHING MATERIALS	20%	50%	50%	100%
I5	Install interior finishes		✓	✓	
I7	Install interior floor, ceiling, and wall systems		✓		
Line J	BUILDING SCIENCE	6%	100%	0%	100%
J1	Control the forces acting on a building		✓		
J2	Control the forces acting on a building as a system		✓		
Total Percentage for Carpenter Level 4		100%			

Section 3
PROGRAM CONTENT
CARPENTER

Level 1 Carpenter

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:

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

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <p>1. Describe Occupational Health and Safety (OHS) Regulation and related materials</p> | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Legal responsibilities <ul style="list-style-type: none"> ○ Education and training ○ Orientation processes ○ Toolbox meetings • Inspections and investigations • WorkSafeBC assessment and penalty costs affecting employers |
| <p>2. Use OHS Regulation and related materials</p> | <ul style="list-style-type: none"> • Safety committees <ul style="list-style-type: none"> ○ Purpose ○ Membership ○ Role of members ○ Meetings and minutes • Conducting toolbox meetings <ul style="list-style-type: none"> ○ Purpose ○ Content ○ Timing • Conducting site inspections <ul style="list-style-type: none"> ○ Identification of hazards ○ Recommendations • Remedies |
| <p>3. Describe safe work practices</p> | <ul style="list-style-type: none"> • Safety gear • Inspecting condition of tools • Using proper tools • Guards and barriers • Operating hazardous equipment • Using hazardous materials and harmful substances • Flammable, explosion, and electrical hazards • Grounding of tools and equipment |

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <p>4. Apply safe work practices</p> | <ul style="list-style-type: none"> • Lockout procedures • Housekeeping • Using compressed air • Sound and light signals • Entering confined spaces |
| <p>5. Describe fire safety procedures</p> | <ul style="list-style-type: none"> • Using OHS Regulation and WorkSafeBC Standards • Site-specific • Health hazards and work environment controls • Job hazard analysis (JHA) • Pre-task safety instructions and hazard assessments <ul style="list-style-type: none"> ○ Field level risk assessment (FLRA) • Personal protective equipment (PPE) • Temporary lighting • Construction procedures • Woodworking machinery and processing |
| <p>6. Use Workplace Hazardous Materials Information System (WHMIS)</p> | <ul style="list-style-type: none"> • Components and causes of fire <ul style="list-style-type: none"> ○ Fuel ○ Heat ○ Oxygen • Solvent flammability <ul style="list-style-type: none"> ○ Flash points • Types of fires <ul style="list-style-type: none"> ○ Class A, B, C, and D fires • Use of fire extinguishers • Fire prevention equipment <ul style="list-style-type: none"> ○ Welding blanket ○ Emergency fire blanket • Precautions when working with flammable substances • Safe use of temporary heating |
| | <ul style="list-style-type: none"> • WHMIS • Labelling • Safety data sheets (SDS) • Symbols • Storage |

Achievement Criteria

Performance	The learner will interpret information from OHS Regulation.
Conditions	The learner will be given: <ul style="list-style-type: none">• Assignment sheet
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy• Interpretation

LEARNING TASKS

4. Apply ergonomic practices

5. Use fall protection systems

CONTENT

- Ear protection
- Respiratory protection
- Personal apparel
- Precautions for weather

- Musculoskeletal Injuries (MSI)
- Procedures for operating, lifting, and carrying objects and tools

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

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 drawings
- Use drafting tools and materials
- Use construction drawings

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <p>1. Describe drawings</p> | <ul style="list-style-type: none"> • Views • Types of drawings |
| <p>2. Describe the parts of drawings</p> | <ul style="list-style-type: none"> • Line types • Symbols • Abbreviations • Title block • Borders • Revisions • Legends • Notes • Scale <ul style="list-style-type: none"> ○ Ratio and proportion |
| <p>3. Describe construction documents</p> | <ul style="list-style-type: none"> • Plot plan • Foundation plan • Floor plans • Survey plans • Subdivision plans • Elevations • Sections • Details • Schedules • Legal descriptions • Surveyor’s Certificate • Terms |
| <p>4. Use drafting tools and materials</p> | <ul style="list-style-type: none"> • Drafting board • Drafting table • T-square |

LEARNING TASKS

CONTENT

5. Use construction drawings

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

- 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 learner will be evaluated on:
- Accuracy
 - Procedure

Achievement Criteria 2

- Performance** The learner will interpret information from construction drawings.
- Conditions** The learner will be given:
- Drawings and specifications
 - Assignment sheet
- Criteria** The learner will be evaluated on:
- Accuracy

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 and bylaws
- Describe the types and purposes of inspections

LEARNING TASKS

1. Describe building codes and bylaws

2. Use building codes and bylaws

3. Describe the types and purposes of inspections

CONTENT

- National Building Code
- BC Building Code
- Municipal zone bylaws
- Vancouver Building Code
- National Fire Code

- BC Building Code

- 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
 - Fire suppression
 - Chimney and fireplace
 - Framing
 - Insulation and vapour barrier
 - Building envelope
 - Energy efficiency
 - Final inspections

Achievement Criteria

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:

- Accuracy

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 the construction planning process
- Describe manufacturer and supplier documentation
- Describe material handling plan

LEARNING TASKS

CONTENT

- | | |
|--|--|
| <p>1. Describe the construction planning process</p> | <ul style="list-style-type: none"> • Overviewing sequence of a build <ul style="list-style-type: none"> ○ Pre-build <ul style="list-style-type: none"> ▪ Consulting ▪ Budgeting ▪ Designing ▪ Permits and applications ▪ Scheduling project |
| <p>2. Describe manufacturer and supplier documentation</p> | <ul style="list-style-type: none"> • Types • Uses • Formats • How to access • Storing and record keeping |
| <p>3. Describe material handling plan</p> | <ul style="list-style-type: none"> • Handling • Storage • Protection • Receiving |

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

LEARNING TASKS

1. Describe trade mathematic concepts

2. Use trade mathematics

CONTENT

- Mathematic concepts
- Application in carpentry trade
- Converting between metric and imperial measurements
- Using calculators

- Fractions
- Ratio/proportion
- Percentage
- Order of operations/BEDMAS
- Geometry
 - Circle math
 - Pythagorean theorem
 - Area and volume calculations
- Algebra

Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS

Competency: B5 Use communication and mentorship techniques

Objectives

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

- Describe effective communication skills
- Describe communication expectations
- Describe the role of the protégé

LEARNING TASKS

1. Describe effective communication skills

2. Describe communication expectations

CONTENT

- Verbal and written instructions
- Professionalism
 - Participation
 - Responsibilities
 - Conflict resolution
 - Punctuality
 - Respect
 - Social responsibility
- Trade terminology
- Harassment and discrimination
- Constructive feedback
- Safety and information meetings

- Purpose
 - Safety
 - Project coordination
 - Instructions
 - Procedures
- Networking
- Digital/social media
 - Etiquette
- Open communication
- Interfacing with public
- Methods and equipment
 - Phone
 - Digital
 - Written
- Teamwork
- Delegation
- Empowerment

LEARNING TASKS

3. Describe the role of the protégé

CONTENT

- Valuing mentor
- Accepting feedback
- Respect
- Personal responsibility of apprenticeship
- Goals

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 hand tools
- Use hand tools

LEARNING TASKS

1. Describe hand tools

2. Use measuring and layout tools

3. Use cutting, boring, and shaping tools

CONTENT

- Purpose
- Measuring and layout
- Cutting, boring, and shaping
- Fastening
- Finishing

- Safety
- Types
 - Squares
 - Rulers
 - Tape measures
 - Levels
 - Plumb bobs
 - String lines/chalk lines
 - Marking tools
- Parts
- Operation
- Adjustment
- Maintenance
- Storage

- Safety
- Types
 - Hand saws
 - Planes
 - Chisels
 - Knives
 - Drill bits
 - Files
 - Rasps
 - Sandpaper
- Parts

LEARNING TASKS

4. Use fastening tools

CONTENT

- Operation
- Adjustment
- Maintenance
- Storage

- Safety
- Types
 - Hammers
 - Screwdrivers
 - Bars
 - Pliers and cutters
 - Wrenches
- Parts
- Operation
- 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

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

CONTENT

- | | |
|---|---|
| 1. Describe portable power tools | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Cutting ○ Boring ○ Shaping ○ Fastening |
| 2. Describe the use of portable power tools | <ul style="list-style-type: none"> • Safety • Electric • Pneumatic • Mechanical • Operating procedures • Following manufacturers' documentation • Condition of equipment • Power supply • Storage of tools • Battery disposal |
| 3. Use portable circular saws | <ul style="list-style-type: none"> • Purpose • Safety • Types and sizes <ul style="list-style-type: none"> ○ Corded ○ Cordless • Parts • Blade types • Operations • Accessories • Adjustments • Maintenance |
| 4. Use portable mitre saws | <ul style="list-style-type: none"> • Purpose • Safety |

LEARNING TASKS

CONTENT

5. Use portable drills and drivers

- Types, sizes, and capacities
 - Mitre saws
 - Compound mitre saws
- Parts
- Operations
- Accessories
- Adjustments
- Maintenance

6. Use portable pneumatic tools

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

7. Use jigsaws and reciprocating saws

- Supply system
- Purpose
- Safety
- Types and sizes
 - Nail guns
 - Staplers
 - Impact wrenches
- Parts
- Fastener types
- Operations
- Accessories
- Adjustments
- Maintenance

- Purpose
- Safety
- Types, sizes, and speeds
 - Jigsaws

LEARNING TASKS**CONTENT**

- 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: <ul style="list-style-type: none">● Drawings and specifications● Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">● 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:

- Use table saws
- Use bench grinders

LEARNING TASKS

1. Use table saws

CONTENT

- Safety
- Purpose
- Types and sizes
- Parts
- Blade types and purpose
- Accessories
- Operations
- Types of cuts
- Adjustments
- Maintenance
- Following manufacturers' documentation

2. Use bench grinders

- Safety
- Purpose
- Wheel types, sizes, and speed
- Parts
- Fastener types
- Operations
- Accessories
- Adjustments
- Maintenance
- Following manufacturers' documentation

Achievement Criteria 1

Performance The learner will perform rip and cross cuts on a table saw.

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
- 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 levelling equipment
- Maintain levelling equipment

LEARNING TASKS

1. Describe levelling equipment

2. Use levelling equipment

3. Maintain levelling equipment

CONTENT

- Purpose
- Types of levelling instruments
 - Builder’s levels
 - Electronic levels
- Parts
- Components
 - Tripod
 - Surveyor’s rod
- Instrument set-up
- Testing level
- Levelling rods
 - Parts
 - Scales
 - Rod types
 - Hand signals
- Electronic and laser levels
 - Parts
 - Setting up procedures
 - Target use
 - Setting elevations
- Measuring elevations
- Recording elevations
- Common errors
- Storage
- Transporting
- Protection from elements
- Cleaning and maintenance of parts

Achievement Criteria 1

Performance	The learner will complete a survey circuit to identify elevations at various locations, including a turning point.
Conditions	The learner will be given: <ul style="list-style-type: none">• Site plan including survey points• Field book
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• Electronic or optical level, receiver, and rod• Survey points
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• 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:

- Use ladders
- Describe access equipment
- Use scaffolds and temporary access structures

LEARNING TASKS

1. Describe ladders

2. Use ladders

3. Describe access equipment

4. Describe use of scaffolds and temporary access structures

CONTENT

- OHS Regulation and WorkSafeBC Standards
- Ladder ratings
- Portable ladder safety
- Ladder types
 - Access ladder
 - Performance ladder
 - Job built ladder
- Accessories

- Safety
- Procedure for use
- Maintenance
- Storage

- OHS Regulation and WorkSafeBC Standards
- Swing stages
- Suspended power platform
- Scissor lifts
- Aerial lifts

- OHS Regulation and WorkSafeBC Standards
- Scaffold types
- General requirements
- Fall protection requirements
- Temporary ramps, walkways, and stairs
 - Slope regulations
 - Guards
- Work platforms

LEARNING TASKS

5. Use scaffolds and temporary access structures

CONTENT

- Assembly procedures
- Dismantling procedures
- Construction and use

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
- Accuracy
- Tool use
- Assembly and disassembly of the scaffold system

Line (GAC): E ACCESS, RIGGING, AND HOISTING EQUIPMENT
Competency: E2 Use rigging and hoisting equipment

Objectives

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

- Use ropes
- Describe rigging equipment
- Describe hoists and cranes
- Use communication methods for lifting loads with cranes and hoists

LEARNING TASKS

1. Use ropes

CONTENT

- Safety
- Purpose
- Rope types
 - Fibre
 - Wire
 - Stranding
- Terminology
 - 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

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

4. Use communication methods for lifting loads with cranes and hoists

CONTENT

- Purpose
- Types of cranes
- Types of hoists
- Rollers

- Hand signals
- Radio communication
- Video systems

Achievement Criteria 1

- Performance The learner will use hand signals for communication.
- Conditions The learner will be given:
- A series of crane operations to be signaled
- Criteria The learner will be evaluated on:
- Safety
 - Accuracy

Achievement Criteria 2

- Performance The learner will tie knots, bends, and/or hitches.
- Conditions The learner will be given:
- Rope
- Criteria The learner will be evaluated on:
- Safety
 - Accuracy

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 survey markers
- Build batter boards
- Describe excavation and grading procedures

LEARNING TASKS**CONTENT**

1. Describe survey markers	<ul style="list-style-type: none">• Iron pin• Lead plug• Survey point• Hub• Corner stake• Witness stake• Benchmark• Datum point• Monument• Locate correct plot plans
2. Build batter boards	<ul style="list-style-type: none">• Location• Construction• Locating lines• Tying lines• Plumbing down from lines• Laying out square corners<ul style="list-style-type: none">○ Measuring diagonals• 3-4-5 Method
3. Describe excavation and grading procedures	<ul style="list-style-type: none">• Clearing the site• Excavating• Cutting and filling• Contour lines• Grades• Grade line and grade stakes

Achievement Criteria

Performance	The learner will set up batter boards and string lines for a foundation project.
Conditions	The learner will be given: <ul style="list-style-type: none">• A foundation plan• Reference points• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• 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

LEARNING TASKS

1. Describe concrete

CONTENT

- Safety
- Purpose
- Uses
- Materials
 - Portland cement
 - Water
 - Aggregates
 - Reinforcing steel
 - Embedded materials
- Handling
 - Transport
 - Placement
 - Finishing
 - Curing

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 the construction of concrete formwork and falsework systems
- Describe formwork material and hardware
- Describe concrete joints

LEARNING TASKS

1. Describe concrete formwork and falsework systems

2. Describe formwork material and hardware

3. Describe concrete joints

CONTENT

- WorkSafeBC regulations and standards
- Safety
- Efficiency
- Architectural considerations
- Terminology
- Definitions
 - Responsibility of employer
 - Responsibility of formwork designer
 - Construction requirements
 - Inspection requirements
- Concrete pre-stressing

- Lumber
- Plywood
- Metal forms
- Plywood forms
- Ties
- Wedges and brackets
- Walers, strong backs, and bracing
- Reglets and inserts

- Types
 - Contraction
 - Control
 - Expansion
 - Isolation
 - Construction
 - Cold
- Methods of construction

LEARNING TASKS

CONTENT

- | | | |
|----|---|---|
| 4. | Calculate concrete volumes | <ul style="list-style-type: none"> • Access |
| 5. | Build footing, wall, and vertical forms | <ul style="list-style-type: none"> • Footings • Walls • Columns • Centreline • Layout • Assembling • Supporting • Aligning • Bracing |
| 6. | Describe removal of concrete forms | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Safety • Concrete design strength • Form removal <ul style="list-style-type: none"> ○ Tool selection ○ Edge protector |

Achievement Criteria 1

- | | |
|-------------|--|
| Performance | The learner will build footing and wall forms using a strip easy tie system. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • A foundation plan which includes bucks, blockouts, and pour strip • Tools |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Use of material and hardware • Plumb and level • Construction techniques |

Achievement Criteria 2

- | | |
|-------------|---|
| Performance | The learner will build footing and vertical forms using snap tie system. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • A foundation plan which includes chamfer strip • Forming material and hardware • Tools |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Use of material and hardware • Accuracy • Plumb and level |

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
- Ground seal

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 reinforcing for 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

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 the delivery and placement of concrete

LEARNING TASKS

1. Describe the delivery and placement of concrete

CONTENT

- Safety
- Tools and equipment
 - Power trowels
 - Power screed
- Manufacturing and delivery
- Placement methods
 - Concrete pumps
 - Boom pumps
 - Line pumps
 - Priming concrete line
 - Chutes
 - Buggies
 - Wheelbarrow
 - Concrete bucket
 - Placement boom
 - Rate of pour
- Underwater placement
- Consolidation
- Weather considerations
- Environmental considerations
- Segregation
- Screed

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 framing systems
- Describe the terms used in wood frame construction
- Describe framing members
- Describe roof styles

LEARNING TASKS

CONTENT

1. Describe framing systems

- Platform
- Balloon frame
- Engineered
 - Timber frame
 - Post and beam
- Mass timber
 - Cross-laminated timber (CLT)
 - Dowel-laminated timber (DLT)
 - Nail-laminated timber (NLT)

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

LEARNING TASKS

CONTENT

4. Describe manufactured products

- Pitched, streaked, and stained wood
- Mould and decay
- Insect damage
- Manufacturing imperfections

5. Describe fasteners used in wood frame construction

- Veneers
- Composite materials
- Pressure-treated
- Cross-banding
- Adhesives
- Softwood plywood grades
- Plywood veneers and cores
- Faces, backs, and cores
- Standard sizes and thicknesses

6. Describe hardware used in wood frame construction

- Applications
- Nails
- Adhesives
- Threaded
- Treated wood
- Powder-actuated

- 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:

- Plan floor systems
- Calculate floor systems
- Build pony walls
- Build posts/columns and beams
- Build floors
- Describe deck systems

LEARNING TASKS

1. Describe floor systems

2. Plan floor systems

CONTENT

- Purposes
- Uses
- Types of floor systems
 - Lumber
 - Engineered
- Components of a floor system
 - Pony walls
 - Posts/columns
 - Beams
 - Joists
 - Sheathing
- Bridging
- Critical barriers

- Safety
- Code requirements
- Determining materials and sizes
- Spacing
- Spans
- Construction drawings
- Interpreting manufacturers' documentation
 - Layout
 - Drilling holes
 - Blocking
 - Fastener selection
 - Temporary bracing
- Construction sequence
- Stairwell openings

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>3. Calculate floor systems</p> <p>4. Build pony walls</p> <p>5. Build posts/columns and beams</p> <p>6. Build floors</p> <p>7. Describe deck systems</p> | <ul style="list-style-type: none"> • Spans • Material quantities <ul style="list-style-type: none"> • Components • Pony wall construction • Post/column anchorage • Installing posts/columns and beams • Layout and installation of <ul style="list-style-type: none"> ○ Sill plates ○ Joists ○ Bridging or blocking • Openings • Nailing requirements • Joists supported by steel beams • Installation of sheathing • Safety • Purpose • Components • Types <ul style="list-style-type: none"> ○ Deck with spaced boards ○ Deck over living space • Methods • Code requirements • Construction drawings • Construction sequence |
|---|---|

Achievement Criteria

- | | |
|--|---|
| <p>Performance</p> <p>Conditions</p> <p>Criteria</p> | <p>The learner will plan, layout, and build a floor system with an opening.</p> <p>The learner will be given:</p> <ul style="list-style-type: none"> • Drawings that include openings and provisions for mechanical services • Tools • Materials <p>The learner will be evaluated on:</p> <ul style="list-style-type: none"> • Safety • Accuracy • Joist layout reflecting needs of services • Sequencing of joists around openings • Compliance with codes • Dimensional accuracy |
|--|---|

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 wall systems

LEARNING TASKS

1. Describe wall systems

CONTENT

- Purpose
- Use
- Type of systems
 - Pre-fabricated
 - Structural panels
 - Traditional wall framing
 - Exterior
 - Interior
 - Load bearing
 - Non-load bearing
 - Shear wall
 - Party wall

Line (GAC): **H** **WOOD FRAME CONSTRUCTION**
Competency: **H5** **Build stair systems**

Objectives

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

- Plan straight stairs
- Calculate straight stairs
- Build stairs and a handrail

LEARNING TASKS

1. Describe stair systems

2. Plan straight stairs

3. Calculate straight stairs

4. Build straight stairs and handrails

CONTENT

- Purpose
- Stair terms

- Safety
- Code requirements
 - Stairs
 - Handrails
- Construction drawings
- Construction sequence

- Dimensions

- Stairs
 - Layout
 - Cut
 - Assemble
- Handrails
 - Layout
 - Cut
 - Assemble

Achievement Criteria

Performance	The learner will plan and build straight stairs with a handrail.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Specifications • Tools • Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Compliance with building codes • Correct calculations, layout, and cuts • Dimensional accuracy: straight, square, and plumb • Quality of finished project

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 the forces acting on a building structure

CONTENT

- Dead and live loads
- Stresses
 - Compression
 - Tension
 - Torsion
 - 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:

- Use architectural drawings
- Describe schedules
- Draw finishing details

LEARNING TASKS

CONTENT

- | | |
|------------------------------------|---|
| 1. Describe architectural drawings | <ul style="list-style-type: none"> • Residential • Industrial, commercial, and institutional (ICI) • Plans • Sections • Elevations • Shop drawings • As built drawings |
| 2. Use architectural drawings | <ul style="list-style-type: none"> • Residential • ICI • Plans • Sections • Elevations • Shop drawings • As built drawings |
| 3. Describe schedules | <ul style="list-style-type: none"> • Door schedules • Window schedules • Hardware schedules |
| 4. Draw finishing details | <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none">• Drawings and specifications• Assignment sheet
Criteria	The individual will be evaluated on: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• Project specifications• Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• 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 the use of municipal permits
- Describe warranties and inspections
- Describe the role of BC Housing in construction

LEARNING TASKS

CONTENT

- | | |
|---|--|
| <p>1. Describe the use of municipal permits</p> | <ul style="list-style-type: none"> • Development of permit application • Building permit application • Demolition permit • Hoarding permit • Gas fitting permit • Plumbing permit • Electrical permit • Fuel tank permit • Sign permit • Water connection permit • Sewer connection permit • Health permit • Occupancy permit |
| <p>2. Describe warranties and inspections</p> | <ul style="list-style-type: none"> • Role • Warranty providers • Inspections <ul style="list-style-type: none"> ○ Energy advisor consultations |
| <p>3. Describe the role of BC Housing in construction</p> | <ul style="list-style-type: none"> • Definition • Purpose • Licencing/warranty • Research |

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 powder-actuated tools
- Describe chain saws
- Describe hammer drills, rotary hammers, and demolition hammers
- Describe cut-off saws
- Describe portable grinders
- Use portable routers
- Use portable sanders
- Use portable power planes
- Use portable biscuit (plate) joiners

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <p>1. Describe powder-actuated tools</p> | <ul style="list-style-type: none"> • Safety • Purpose • OHS Regulation and WorkSafeBC Standards • Types and sizes • Hazard recognition |
| <p>2. Describe chain saws</p> | <ul style="list-style-type: none"> • Safety • Purpose • OHS Regulation and WorkSafeBC Standards • Types and sizes • Hazard recognition • Protective clothing and equipment |
| <p>3. Describe hammer drills, rotary hammers, and demolition hammers</p> | <ul style="list-style-type: none"> • Safety • Purpose • Types and sizes • Parts • Operations • Accessories • Bit types • Adjustments • Maintenance |

LEARNING TASKS

4. Describe cut-off saws

CONTENT

- Safety
- Purpose
- 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

- Safety
- Purpose
- Types
- Parts
- Bit types
- Tables
- Operation
- Maintenance
- Storage

7. Use portable sanders

- Safety
- Purpose
- Types
- Parts
- Abrasive types
- Operation
- Maintenance
- Storage

8. Use portable power planes

- Safety
- Purpose

LEARNING TASKS

CONTENT

9. Use portable biscuit (plate) joiners

- Types
- Parts
- Blades
- Operation
- Maintenance
- Storage

- Safety
- Purpose
- Types
- Parts
- Biscuits
- Operation
- Maintenance
- Storage

Achievement Criteria

Performance	The learner will use portable power tools to complete a project.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Portable power tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy

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:

- Use a jointer
- Use a thickness planer
- Use sanding machines

LEARNING TASKS

1. Use a jointer

CONTENT

- Safety
- Purpose
- Types
- Parts
- Accessories
- Knives
- Adjustments
- Operations
- Maintenance

2. Use a thickness planer

- Safety
- Purpose
- Types
- Parts
- Accessories
- Knives
- Operations
- Adjustments
- Maintenance

3. Use sanding machines

- Safety
- Purpose
- Types
- Parts
- Abrasive types
- Accessories
- Operations
- Adjustments
- Maintenance

Achievement Criteria

Performance	The learner will use stationary power tools to finish a project.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings and specifications• Stationary power tools• Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Selection of cutting blades, bits, and abrasives• Use of jigs and accessories

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

1. Describe electronic layout instruments

2. Use layout equipment

CONTENT

- Purpose
- Types
 - Theodolites
 - Total stations
- Parts

- Calculations
- Introduction to trigonometry
- Square corners
- Angles
- Site plans
- Building plans
- Storage
- Transporting
- Protection from elements
- Cleaning and maintenance of parts

Achievement Criteria

Performance	The learner will lay out building corners using a theodolite.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Construction drawings • Theodolite
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Use of instrument • Calculation of angles and lengths to locate corners • Accuracy of location of corner stakes

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

LEARNING TASKS

1. Build slabs-on-grade

CONTENT

- Ground preparation
- Form system
- Reinforcement
- Establishing elevations

Achievement Criteria

Performance The learner will build the formwork for a sloping slab-on-grade.

Conditions The learner will be given:

- Drawings and specifications
- Tools
- Equipment

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- 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 concrete finishing
- Describe the process of concrete curing
- Describe concrete defects

LEARNING TASKS

1. Describe concrete finishing

2. Describe the process of concrete curing

3. Describe concrete defects

CONTENT

- Safety
- Tools and equipment
- Walls
- Flatwork
- Procedures
- Surface treatments

- Hydration
- Curing
- Sealers and hardeners
- Environmental conditions

- Types
- Causes
- Repairs

Line (GAC): H WOOD FRAME CONSTRUCTION

Competency: H4 Build wall systems

Objectives

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

- Plan wall systems
- Build wood frame walls

LEARNING TASKS

1. Plan wall systems

2. Calculate wall systems

3. Build wall systems

CONTENT

- Safety
- Code requirements
 - Determine materials and sizes
 - Spacing
 - Spans
 - Brace walls
- Engineering
 - Seismic hardware
- Construction drawings
- Construction sequence
- Temporary bracing
- Critical barriers

- Spans
- Framing materials
- Components

- 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
 - Fire stops
 - Backframing

Achievement Criteria

Performance	The learner will build walls and partitions.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings• Materials• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Stud layout• Framing around openings• Compliance with code• Dimensional accuracy: 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:

- Plan straight stairs and balustrade
- Build straight stairs and balustrade

LEARNING TASKS

CONTENT

- | | |
|------------------------------------|--|
| 1. Describe stairs and balustrade | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Straight ○ Multi-flight • Stair components • Balustrade components |
| 2. Plan stairs and balustrade | <ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings <ul style="list-style-type: none"> ○ Design considerations • Construction sequence |
| 3. Calculate stairs and balustrade | <ul style="list-style-type: none"> • Building codes • Rise and run • Stairwell openings • Stair dimensions • Materials |
| 4. Build stairs and balustrade | <ul style="list-style-type: none"> • Layout • Cut • Assemble |

Achievement Criteria

- | | |
|-------------|--|
| Performance | The learner will plan and build straight stairs with a balustrade. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Tools • Materials |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Compliance with building codes • Calculations, layout, and cuts • Dimensional accuracy: 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 roof systems
- Describe truss roofs
- Plan a gable roof system
- Build a gable roof
- Build a hip rafter

LEARNING TASKS

CONTENT

- | | |
|---------------------------------|--|
| 1. Describe roof systems | <ul style="list-style-type: none"> • Purpose • Uses • Types • Components |
| 2. Plan a gable roof system | <ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings • Construction sequence |
| 3. Calculate gable roof systems | <ul style="list-style-type: none"> • Theoretical lengths • Quantities of ceiling and roof framing materials |
| 4. Build a gable roof system | <ul style="list-style-type: none"> • Layout roof members • Layout plate • Cut members • Assemble |
| 5. Describe truss roofs | <ul style="list-style-type: none"> • Safety • Interpret manufacturers' documentation • Layout of trusses • Handling and installation of trusses • Fastening trusses • Bracing requirements |

LEARNING TASKS

6. Calculate hip rafter systems

7. Build a hip rafter system

CONTENT

- Theoretical lengths
- Materials
- Adjustments

- Safety
- Code requirements
- Construction drawings
- Construction sequence

Achievement Criteria 1

- | | |
|-------------|--|
| Performance | The learner will build a gable roof with ceiling joists. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Tool use • Calculation and layout of ceiling joists, rafters, and other roof framing members • Dimensional accuracy: straight and square • Accuracy of cuts |

Achievement Criteria 2

- | | |
|-------------|--|
| Performance | The learner will layout and install a hip rafter. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Tools • Materials |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Dimensional accuracy |

Line (GAC):	I	FINISHING MATERIALS
Competency:	II	Describe roofing materials

Objectives

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

- Describe roofing materials
- Plan for the installation of roofing materials
- Calculate roofing materials

LEARNING TASKS

CONTENT

1. Describe roofing materials	<ul style="list-style-type: none"> • Purpose • Types • Re-roofing • Flashing • Underlay • Accessories • Fasteners
2. Plan for the installation of roofing materials	<ul style="list-style-type: none"> • Safety • Code requirements • Tools • Protecting existing surfaces • Removing existing roofing materials • Underlay • Flashing • Accessories
3. Calculate roofing materials	<ul style="list-style-type: none"> • Coverage • Waste factors • Accessories

Line (GAC):	I	FINISHING MATERIALS
Competency:	I2	Install doors and hardware

Objectives

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

- Install exterior doors

LEARNING TASKS

CONTENT

1. Describe exterior doors	<ul style="list-style-type: none"> • Purpose • Schedule • Code requirements • Security requirements • Common types • Construction • Terminology • Weather and air sealing • Storage during construction • Swing/hand of door
2. Describe specialty exterior doors	<ul style="list-style-type: none"> • Types • Purpose • Installation
3. Describe exterior door jambs	<ul style="list-style-type: none"> • Types • Purpose • Construction
4. Describe exterior door hardware	<ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Architectural • Purpose • Storage • Labelling
5. Install exterior doors	<ul style="list-style-type: none"> • Types • Operation • Fitting • Templates

Achievement Criteria

Performance The learner will install an exterior door with hardware.

Conditions The learner will be given:

- Drawings and specifications
- Materials
- Tools

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Compliance with building 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:

- Plan window installation
- Install windows

LEARNING TASKS

1. Describe windows and hardware

2. Plan window installation

3. Install windows

CONTENT

- Purpose
- Code requirements
- Types
- Components
- Construction
- Energy efficiency
- Storage
- Operation

- Schedule
- Code requirements
- Drawings and specifications
- Manufacturers' specifications
- Delivery
- Storage
- Access
- Installation
 - Critical barriers
- Protection

- Safety
- Fitting
- Plumb
- Level
- Shimming
- Fastening
- Sealing
- Accessories

Achievement Criteria

Performance	The learner will install a window.
Conditions	The learner will be given: <ul style="list-style-type: none">• Tools• A rough opening• A window• Building envelope material
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Compliance with manufacturers' specifications• Preparation of opening• Positioning of window in rough opening• Installation of flashing and membranes

Line (GAC):	I	FINISHING MATERIALS
Competency:	I4	Install exterior finishes

Objectives

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

- Describe building envelope
- Plan exterior finish installation
- Install exterior finishing materials

LEARNING TASKS

CONTENT

1. Describe building envelope

- Code requirements
- Purpose
- Terminology
- Critical barriers
 - Air
 - Vapour
 - Moisture
 - Thermal
- Rainscreen systems
- Energy efficiency

2. Describe exterior finish materials

- Code requirements
- Purpose
- Types of finish materials
- Types of cladding
- Trim and accessories
- 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

LEARNING TASKS

5. Install exterior finishing materials

CONTENT

- Accessories
- Layout
- Installation

Achievement Criteria

Performance The learner will install exterior cladding materials including flashing.

Conditions The learner will be given:

- Tools
- Framed wall with building envelope penetrations
- Cladding and soffit material
- Flashing and barrier material

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Compliance with Code
- Compliance with manufacturers' specifications
- Properly installed details for building envelope penetrations
- Installation of flashing and cladding

Line (GAC): J **BUILDING SCIENCE**
Competency: J2 **Control forces acting on a building as a system**

Objectives

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

- Describe control of water
- Describe control of vapour
- Describe control of air movement
- Describe control of heat and cold
- Install building envelope components

LEARNING TASKS

CONTENT

1. Describe control of water	<ul style="list-style-type: none"> • Purpose • Principles • Materials • Methods
2. Describe control of vapour	<ul style="list-style-type: none"> • Purpose • Principles • Materials • Methods
3. Describe control of air movement	<ul style="list-style-type: none"> • Purpose • Principles • Materials • Methods
4. Describe control of heat and cold	<ul style="list-style-type: none"> • Purpose • Principles • Materials • Methods
5. Install building envelope components	<ul style="list-style-type: none"> • Purpose • Building envelope control layers

Achievement Criteria

Performance	The learner will install building envelope control layers.
Conditions	The learner will be given: <ul style="list-style-type: none">• Tools• Materials• Details• Drawings• Manufacturers' specifications
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Compliance with manufacturers' specifications• Installation of flashing and membranes• Sequencing

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
- Describe schedules, details, and shop drawings
- Use structural drawings
- Interpret reflected ceiling plans
- Draw formwork details

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Describe structural drawings and specifications | <ul style="list-style-type: none"> • Types of drawings • Schedules • Specifications • Gridlines |
| 2. Describe schedules | <ul style="list-style-type: none"> • Door schedules • Window schedules • Room finish schedules • Hardware schedules |
| 3. Describe shop drawings | <ul style="list-style-type: none"> • Interior elevations • Millwork drawings |
| 4. Use structural drawings | <ul style="list-style-type: none"> • Specifications • Schedules • Building dimensions • Construction type • Mechanical and electrical systems |
| 5. Interpret reflected ceiling plans | <ul style="list-style-type: none"> • Reflected ceiling plans • Specialties • Hardware |
| 6. Draw formwork details | <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none">• Drawings and specifications• Question sheet
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy

Achievement Criteria 2

Performance	The learner will draw formwork details, including plan and section views.
Conditions	The learner will be given: <ul style="list-style-type: none">• Specifications
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy• Detail

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: <ul style="list-style-type: none">• Drawings and specifications
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy• Detail

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 related to public spaces

LEARNING TASKS

1. Interpret building codes and bylaws related to public spaces

CONTENT

- Guards
- Ramps
- Egress
- Area of refuge
- Hoarding
- Demolition
- Concrete mixes
- Accessibility

Achievement Criteria

Performance	The learner will interpret information in the BC Building Code related to public spaces.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Question sheet
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Accuracy

Line (GAC): C **TOOLS AND EQUIPMENT**
Competency: C1 **Use hand tools**

Objectives

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

- Use finishing tools

LEARNING TASKS

1. Describe finishing tools

CONTENT

- Purpose
- Types
 - Marking tools
 - Squares
 - Chisels
 - Smoothing tools
 - Scrapers
 - Clamps
 - 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
- Accuracy
- 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:

- Use band saws
- Use drill press

LEARNING TASKS

1. Use band saws

CONTENT

- Safety
- Purpose
- Types
- Parts
- Blade types
- Adjustments
- Operations
- Accessories
- Maintenance

2. Use a drill press

- Safety
- Purpose
- Types
- Parts
- Bit types
- Operations
- Accessories
- Maintenance

Achievement Criteria

Performance The learner will use band saw and drill press.

Conditions The learner will be given:

- Drawings and specifications

Criteria The learner will be evaluated on:

- Safety
- Selection, use, and maintenance of shop equipment
- Selection of cutting blades and bits
- Use of jigs and accessories

Line (GAC): E **ACCESS, RIGGING, AND HOISTING EQUIPMENT**
Competency: E2 **Use rigging and hoisting equipment**

Objectives

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

- Describe lifting loads with cranes and hoists
- Use rigging equipment
- Use hoisting equipment
- Maintain and store rigging and hoisting equipment

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>1. Describe lifting loads with cranes and hoists</p> | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Considerations <ul style="list-style-type: none"> ○ High voltage line clearance ○ Overhead hazards ○ Load stability ○ Centre of gravity ○ Sling locations |
| <p>2. Use rigging equipment</p> | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Safe rigging practices <ul style="list-style-type: none"> ○ Lift plan • Calculations <ul style="list-style-type: none"> ○ Weight of load ○ Sling angle ○ Working load limit • Rigging structural shapes • Rigging complex shapes • Blocking and stacking |
| <p>3. Use hoisting equipment</p> | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Hand signals • Follow lift plan • Ground stability • Move and place load |
| <p>4. Maintain and store rigging and hoisting equipment</p> | <ul style="list-style-type: none"> • OHS Regulation and WorkSafeBC Standards • Safe storage and maintenance |

LEARNING TASKS

CONTENT

- Wire rope
- Hook
- Hardware
- Care of slings and wire rope
- Damages in wire rope
- Components
 - Rings, links, and swivels
 - Eye bolts and ring bolts
 - Turnbuckles
 - Shackles
 - Synthetic web slings
- Inspection

Achievement Criteria

- | | |
|-------------|---|
| Performance | The learner will prepare a lift plan. |
| Conditions | The learner will be given <ul style="list-style-type: none"> • Instructions • Materials |
| Criteria | The learner will be evaluated on <ul style="list-style-type: none"> • Safety • Accuracy |

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

1. Describe excavations

2. Describe shoring

3. Plan excavations and shoring

4. Calculate excavations

CONTENT

- Safety
- Purpose
- Bulk excavations
- Trench excavations
- Deep excavations
- Soil
 - Conditions
 - Types
 - Bearing capacities/allowable bearing pressure
- Underpinning

- Types
- Slope stabilization

- Safety
- Weather conditions
- Site survey
- Grading
- Grid lines and grade stakes
- Excavation planning
- Describe backfilling

- Estimate volume of excavated material

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 the uses for concrete
- Describe concrete mix designs
- Describe the types of admixtures and treatments for concrete
- Describe structural grout

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe the uses for concrete | <ul style="list-style-type: none"> • Structural • Architectural • Fire proofing • Insulating • Conduits • Pavements |
| 2. Describe concrete mix designs | <ul style="list-style-type: none"> • Strength • Durability • Water tightness • Finishing ability • Specialty concrete <ul style="list-style-type: none"> ○ Exposed aggregate ○ Self-consolidating |
| 3. Describe the types of admixtures and treatments for concrete | <ul style="list-style-type: none"> • Air-entraining • Water-reducing • Plasticizers • Retardants • Accelerators • Colours • Damp proofing and permeability-reducing agents • Bonding agents • Release agents • Gas-forming agents • Pozzolans |
| 4. Describe structural grout | <ul style="list-style-type: none"> • 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 the factors affecting form design
- Describe alternative foundation systems

LEARNING TASKS

1. Describe the factors affecting form design

CONTENT

- Safety
- Architectural design
- Concrete members
- Efficiency
- Environmental conditions
- Form pressures
- Slump
- Temperature
- Vibration
- Placement method
- Form size
- Cantilever formwork
- Concrete design mix

2. Describe alternative foundation systems

- Preserved wood foundations
- Masonry block foundations
- Insulated concrete forms (ICF)

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
- Plan footing and vertical formwork
- Construct concrete forming systems

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Describe footing forms | <ul style="list-style-type: none"> • Raft slabs • Mass pad • Pile cap • Caissons • Piles |
| 2. Describe pile foundations | <ul style="list-style-type: none"> • Types • Parts • Grade beams • Uses • Designs |
| 3. Describe column forms | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Fibre tubes ○ Engineered column ○ Job built ○ Capital • Assembly of forms |
| 4. Describe wall forms | <ul style="list-style-type: none"> • Engineered wall system • Gang forms • Construction procedures • Form details • Double walers systems |
| 5. Describe insulated concrete forms (ICF) | <ul style="list-style-type: none"> • Components and hardware • ICF foundation walls • Above ground flat ICF walls |

LEARNING TASKS

6. Plan footing and vertical formwork

CONTENT

- Safety
- Contract drawings
- Engineered drawings
- Procedures
 - Form system
 - Lift plan
 - Concrete placement
- Grade beams
- Material handling and storage
- Schedule
- Access

7. Calculate forming materials and concrete volumes

- Contact area
- Concrete wall volume
 - Battered
 - Circular
 - Polygon
- Components

8. Construct vertical formwork

- Layout
- Assembly
- Alignment
- Form removal

Achievement Criteria

Performance The learner will build a vertical formwork project.

Conditions The learner will be given:

- Specifications
- Construction drawings

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Use of forms and hardware
- Plumb and level
- Dimensional accuracy: 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
- Plan suspended slab formwork
- Construct suspended slabs

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe suspended slabs | <ul style="list-style-type: none"> • Types of slabs • Slab components • Suspended slab forming products • Specifications |
| 2. Describe fly table forms | <ul style="list-style-type: none"> • Safety • Layout <ul style="list-style-type: none"> ○ Crane pick points • Assembly • Support system |
| 3. Describe shoring and re-shoring | <ul style="list-style-type: none"> • Safety • Installation drawings • Re-shoring requirements • Re-shoring systems |
| 4. Plan suspended slab formwork | <ul style="list-style-type: none"> • Safety • Construction drawings • Procedures <ul style="list-style-type: none"> ○ Form system ○ Lift plan ○ Concrete placement ○ Curing ○ Form removal • Material handling and storage • Scheduling • Sub-trades |
| 5. Calculate forming materials and concrete volumes | <ul style="list-style-type: none"> • Concrete volume • Components |

LEARNING TASKS

6. Construct suspended slabs

CONTENT

- 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
- Tools
- Materials

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Fit

Achievement Criteria 2

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

Conditions The learner will be given:

- Construction drawings and specifications
- Tools
- Materials

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Use of forms and hardware
- Plumb and level
- Dimensional accuracy: 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:

- Install embedded materials
- Describe door frames used in concrete and masonry walls
- Describe concrete fastening systems

LEARNING TASKS

CONTENT

1. Describe embedded materials	<ul style="list-style-type: none"> • Anchor bolts • Machine base bolts • Sleeves • Reglets • Dowels • Manhole cover frames • Grates, catch basins, and drain troughs or trenches • Dock levellers • Water stops • Specialty items
2. Install embedded materials	<ul style="list-style-type: none"> • Anchor bolts • Weld plates • Lifting anchors • Plastics
3. Describe door frames used in concrete and masonry walls	<ul style="list-style-type: none"> • Types of frames • Methods of installation
4. Describe concrete fastening systems	<ul style="list-style-type: none"> • Grout • Metal anchors • Chemical anchors • Mechanical anchors • Powder-actuated fasteners

Achievement Criteria

Performance	The learner will lay out and install anchor bolt template.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Construction drawings and specifications • Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Installation

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
- Plan concrete stair form
- Construct concrete stair forms

LEARNING TASKS

CONTENT

- | | |
|------------------------------|---|
| 1. Describe concrete stairs | <ul style="list-style-type: none"> • Cast-in-place stairs • Pre-cast stairs • Concrete finishes and nosings • Components |
| 2. Plan concrete stair form | <ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings • Procedures <ul style="list-style-type: none"> ○ Form system ○ Concrete placement ○ Temporary tread protection • Schedule • Sub-trades |
| 3. Calculate concrete stairs | <ul style="list-style-type: none"> • Rise and run • Stairwell opening • Concrete volume • Components |
| 4. Construct concrete stairs | <ul style="list-style-type: none"> • Layout • Assembly • Alignment • Bracing • Form removal |

Achievement Criteria

Performance	The learner will build multi-flight concrete stair forms.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings and specifications• Tools• Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Compliance with code• Layout• Use of forms and hardware• Plumb and level• Dimensional accuracy: 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 tilt-up construction
- Describe pre-cast concrete
- Describe pre-stressed concrete
- Describe slip-forming
- Describe mass concrete
- Describe architectural formwork
- Describe sealing joints
- Lay out for pre-cast concrete components

LEARNING TASKS

1. Describe tilt-up construction

CONTENT

- 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
- Concrete mix design
- Construction procedures
- Jacks and yokes
- Concrete placement
- Concrete finishing
- Dismantling procedures

LEARNING TASKS

5. Describe mass concrete

6. Describe architectural formwork

7. Describe sealing joints

8. Lay out tilt-up construction

CONTENT

- Heat of hydration
- Types
- Placement methods

- Purpose
- Types
 - Curved walls
 - Arches
 - Floors
 - Walls
 - Ceilings
 - Landscape features
- Rustications
- Sandblasted and tooled concrete
- Exposed aggregate
- Form liners
- Stamped and coloured

- Types of caulking compounds
- Backer rods
- Sealers and primers
- Procedures

- Construction drawings
- Locations of hardware and accessories

Achievement Criteria

Performance The learner will lay out pre-cast concrete components.

Conditions The learner will be given:

- Drawings and specifications
- Tools
- Materials

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:

- Plan hip roof systems
- Build a hip roof
- Plan an intersecting roof
- Build an intersecting roof

LEARNING TASKS

CONTENT

1. Describe hip roof systems	<ul style="list-style-type: none"> • Purpose • Uses • Types • Components
2. Plan hip roof systems	<ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings • Construction sequence
3. Calculate hip roof systems	<ul style="list-style-type: none"> • Theoretical lengths • Materials • Components
4. Build hip roof systems	<ul style="list-style-type: none"> • Layout • Cutting • Assembling
5. Describe an intersecting roof	<ul style="list-style-type: none"> • Purpose • Uses • Types • Components
6. Plan an intersecting roof	<ul style="list-style-type: none"> • Safety • Code requirements • Drawings and specifications • Construction sequence

LEARNING TASKS

7. Calculate an intersecting roof

8. Build an intersecting roof

CONTENT

- Theoretical lengths
- Materials
- Components
- Layout
- Cutting
- Assembling
- Sheathing cuts

Achievement Criteria

Performance	The learner will build an intersecting hip roof.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Layout and spacing of rafters and roof framing members • Dimensional accuracy

Line (GAC):	I	FINISHING MATERIALS
Competency:	I2	Install doors and hardware

Objectives

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

- Install interior doors
- Install interior door hardware

LEARNING TASKS

CONTENT

1. Describe interior doors	<ul style="list-style-type: none"> • Purpose • Types • Schedule • Construction • Terminology • Code requirements • Security • Storage during construction • Swing/hand of door
2. Describe specialty interior doors	<ul style="list-style-type: none"> • Types • Purpose • Installation
3. Describe interior door jambs	<ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Steel frame • Purpose • Construction
4. Describe interior door hardware	<ul style="list-style-type: none"> • Types • Schedule • Purpose • Storage
5. Install interior doors	<ul style="list-style-type: none"> • Rough openings • Hanging and fitting
6. Install interior door hardware	<ul style="list-style-type: none"> • Types • Operation • Fitting • Templates

Achievement Criteria 1

Performance	The learner will install an interior door.
Conditions	The learner will be given: <ul style="list-style-type: none">• Construction drawings and specifications• Materials• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Compliance with building codes

Achievement Criteria 2

Performance	The learner will use templates to layout door closers and panic hardware.
Conditions	The learner will be given: <ul style="list-style-type: none">• Manufacturers' specifications• Materials• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy

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
- Plan installation of gypsum wallboard
- Calculate materials

LEARNING TASKS

CONTENT

1. Describe gypsum wallboard

- Types
- Purpose
- Components
- Tools
- Installation

2. Plan installation of gypsum wallboard

- Safety
- Code requirements
- Temporary protection

3. Calculate materials

- Gypsum wallboard
- Components

Line (GAC): I **FINISHING MATERIALS**
Competency: I6 **Install cabinets**

Objectives

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

- Build cabinets
- Plan installation cabinets
- Install countertops

LEARNING TASKS

CONTENT

1. Describe cabinets

- Types
- Components
- Construction methods
- Finishes

2. Describe countertops

- Types
 - Plastic laminate
 - Solid surface
 - Stone
 - Tile
 - Wood
- 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

LEARNING TASKS

CONTENT

6. Install countertops

- Installation methods
- Components
- Temporary protection

- Techniques

Achievement Criteria 1

- Performance** The learner will build a cabinet.
- Conditions** The learner will be given:
- Drawings and specifications
 - Tools
 - Materials
- Criteria** The learner will be evaluated on:
- Safety
 - Accuracy
 - Dimensioning
 - Fit and finish
 - Installation of hardware

Achievement Criteria 2

- Performance** The learner will apply plastic laminate to a project.
- Conditions** The learner will be given:
- Drawings and specifications
 - Tools
 - Materials
- Criteria** The learner will be evaluated on:
- Safety
 - Accuracy
 - Dimensioning
 - 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:

- Plan installation of steel stud systems
- Install steel stud walls and partitions
- Plan installation of interior ceiling systems
- Install interior ceiling systems

LEARNING TASKS

CONTENT

1. Describe steel stud systems	<ul style="list-style-type: none"> • Types • Purpose • Tools • Components
2. Plan installation of steel stud systems	<ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings
3. Install steel studs	<ul style="list-style-type: none"> • Layout • Cut • Assemble
4. Describe demountable partitions	<ul style="list-style-type: none"> • Types • Components • Installation
5. Describe interior ceiling systems	<ul style="list-style-type: none"> • Purpose • Types • Components • Methods
6. Plan installation of interior ceiling systems	<ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings • Reflected ceiling plans
7. Calculate materials	<ul style="list-style-type: none"> • Wall systems • Ceiling systems
8. Install interior ceiling systems	<ul style="list-style-type: none"> • Layout • Cut • Assembly

Achievement Criteria 1

Performance	The learner will build steel stud walls with openings.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings and specifications• Tools• Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Plumb and square• Cutting and fastening technique

Achievement Criteria 2

Performance	The learner will build a suspended ceiling.
Conditions	The learner will be given: <ul style="list-style-type: none">• Reflected ceiling plan• Tools• Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Layout• Level and square• 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 related to sound transmission and fire-rated assemblies

LEARNING TASKS

1. Interpret building codes related to sound transmission and fire-rated assemblies

CONTENT

- Floor, wall, and roof systems
 - Sound transmission classification
 - Fire-rated assemblies
 - Compartments
 - Separations
 - Walls
 - Penetrations

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

CONTENT

1. Describe contract documents

- Types
- Articles of agreement
- Definitions
- General conditions
- Supplementary conditions
- General requirements
- Specifications
- Drawings
 - Paper
 - Digital
- 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

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 5. Plan work sequence | <ul style="list-style-type: none"> • Liens • Penalties/bonuses • Contingency funds |
| 6. Estimate the cost of a job | <ul style="list-style-type: none"> • Construction sequence and scheduling <ul style="list-style-type: none"> ○ Gantt chart ○ Critical path • Material delivery sequence • Coordination with sub-trades • Time estimates |
| 7. Describe inspections for engineered applications | <ul style="list-style-type: none"> • Labour • Material • Equipment • Subtrades • Overheads • Profit margin |
| 8. Describe use of computers in the construction process | <ul style="list-style-type: none"> • Architectural <ul style="list-style-type: none"> ○ Work completed ○ Quality of work • Engineering <ul style="list-style-type: none"> ○ Geotechnical ○ Formwork ○ Reinforcing steel ○ Embedded materials ○ Concrete • Municipal/Provincial <ul style="list-style-type: none"> ○ Plumbing ○ Electrical ○ Fire ○ Gas ○ Final/occupancy ○ Elevator ○ Health |
| 8. Describe use of computers in the construction process | <ul style="list-style-type: none"> • Building information modelling (BIM) • Electronic plan rooms • CADD • Spreadsheets • As builts • Warranty documents |

Achievement Criteria 1

Performance	The learner will estimate and schedule a project.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings and specifications• Cost guides
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Accuracy• Project schedule• Documentation

Achievement Criteria 2

Performance	The learner will complete documents for a building permit application.
Conditions	The learner will be given: <ul style="list-style-type: none">• Municipal bylaws and regulations• Construction drawings and specifications
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Interpretation of bylaws, regulations, and permit processes

Line (GAC): **B DOCUMENTATION AND ORGANIZATIONAL SKILLS**
Competency: **B5 Use communication and mentorship techniques**

Objectives

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

- Describe the role of mentor
- Describe mentoring skills and attributes
- Describe workplace diversity and inclusion

LEARNING TASKS

CONTENT

1. Describe the role of mentor

- Valuing apprentice
- Identifying goals
- Encouraging
- Managing risk
- Providing feedback
- Developing capabilities
- Maintaining confidentiality

2. Describe mentoring skills and attributes

- Inspiration
- Active listening
- Building trust
- Encouragement
- Preparedness
- Approachability
- Objectiveness
- Fairness
- Compassion
- Leading by example

3. Describe workplace diversity and inclusion

- Codes of Conduct
 - Builder’s Code
- Fair recruiting and hiring practices
- Equity in promotion
- Acceptance
- Accommodations
- Anti-harrassment/anti-bullying policies

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
- Calculate and layout curves

LEARNING TASKS

1. Describe total stations

2. Calculate layout of curves

CONTENT

- Calculations
- Set-up
- Adjustment
- Readings
- Layout
- Maintenance
- Storage

- Types
- Chord lengths
- Arc lengths
- Offsets

Achievement Criteria

Performance	The learner will layout curved shapes.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Calculations and layout

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 site drainage systems
- Describe sumps, catch basins, and septic tanks
- Describe backfilling

LEARNING TASKS

1. Describe site considerations

2. Describe site and project preparation

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 management
 - Logistics
 - Site processes
 - Dump site
- Temporary road ways
- Demobilization

- Site layout
- Permits
- Requirements
 - Environmental plan
 - Environmental impact assessment
 - Geotechnical reports
- Clearing the site
 - BC One Call

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>3. Describe hoardings</p> <p>4. Describe site drainage systems</p> <p>5. Describe sumps, catch basins, and septic tanks</p> <p>6. Describe backfilling</p> | <ul style="list-style-type: none"> • Demolition <ul style="list-style-type: none"> ○ Identifying and removing hazardous materials • Site services <ul style="list-style-type: none"> ○ Locating ○ Disconnecting ○ Existing ○ New • Building elevations
 • Building codes and bylaws • Methods of construction • Types • Access lighting and signage
 • Types <ul style="list-style-type: none"> ○ Dewatering systems ○ Perimeter draining systems ○ Granular drainage layer systems ○ Drainage disposal • Sumps
 • Code regulations • Dewatering systems • Sumps • Trapping hoods • Storm drains • Sanitary sewers • Catch basins • Backwater valves • Septic tanks • Perimeter drains
 • Safety • Code requirements • Procedures <ul style="list-style-type: none"> ○ Concrete foundations ○ Preserved wood foundations ○ Service trenches ○ Compaction • 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

CONTENT

1. Describe stairs with winders	<ul style="list-style-type: none"> • Stringer types • Tread shapes
2. Plan stairs with winders	<ul style="list-style-type: none"> • Safety • Code requirements • Stringer types
3. Calculate stairs with winders	<ul style="list-style-type: none"> • Rise and run • Stairwell openings • Stair dimensions • Materials
4. Build stairs with winders	<ul style="list-style-type: none"> • Layout • Cutting • Assembling
5. Describe circular stairs	<ul style="list-style-type: none"> • Purpose • Types • Components
6. Plan circular stairs	<ul style="list-style-type: none"> • Safety • Code requirements • Stringer types
7. Calculate circular stairs	<ul style="list-style-type: none"> • Rise and run • Stairwell openings • Stair dimensions • Materials

LEARNING TASKS

8. Build circular stairs

9. Build balustrades

CONTENT

- Layout
- Cutting
- Assembling

- Code requirements
- Calculating
- Planning
- Layout
- Assembling

Achievement Criteria 1

Performance	The learner will build winder stairs.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Compliance with building codes • Calculations, layout, and cuts • Dimensional accuracy: straight, square, and plumb • Fit and finish

Achievement Criteria 2

Performance	The learner will build circular stairs.
Conditions	The learner will be given: <ul style="list-style-type: none"> • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none"> • Safety • Accuracy • Compliance with building codes • Calculations, layout, and cuts • Dimensional accuracy: 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: <ul style="list-style-type: none">• Drawings and specifications• Materials• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Compliance with building codes• Calculations, layout and cuts• Dimensional accuracy:, 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
- Plan an unequal slope intersecting roof
- Build an unequal slope intersecting roofs
- Plan specialized roof framing systems
- Build a specialized roof framing system

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe an unequal slope intersecting roof | <ul style="list-style-type: none"> • Purpose • Uses • Types • Components |
| 2. Plan an unequal slope intersecting roof | <ul style="list-style-type: none"> • Safety • Code requirements • Construction drawings • Developed drawings • Construction sequence |
| 3. Calculate an unequal slope intersecting roof | <ul style="list-style-type: none"> • Theoretical lengths • Materials • Components |
| 4. Build an unequal slope intersecting roof | <ul style="list-style-type: none"> • Layout • Cutting • Assembling • Sheathing cuts |
| 5. Describe specialized roof framing systems | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Polygon roofs ○ Gambrel ○ Mansard ○ Flat ○ Dormer ○ Cupola ○ Turret |

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <ul style="list-style-type: none"> 6. Plan specialized roof framing systems
 7. Calculate specialized roof framing systems
 8. Build specialized roof framing systems | <ul style="list-style-type: none"> ○ Canopy ○ Spire ○ Saw tooth ○ Butterfly roof ● Components <ul style="list-style-type: none"> ○ False gable ○ Cricket/saddle ○ Parapet ○ Cant strip ○ Hidden gutters ● Methods of construction <ul style="list-style-type: none"> ○ Openings ○ Wall frame ○ Roof frame ○ Curbs ○ Critical barriers ● Vaulted ceilings
 ● Safety ● Code requirements ● Scale drawing ● Construction sequence
 ● Theoretical lengths ● Materials ● Components
 ● Layout ● Cutting ● Assembling |
|--|---|

Achievement Criteria 1

- | | |
|--------------------|--|
| <p>Performance</p> | <p>The learner will build an unequal slope intersecting roof.</p> |
| <p>Conditions</p> | <p>The learner will be given:</p> <ul style="list-style-type: none"> ● Drawings and specifications ● Materials ● Tools |
| <p>Criteria</p> | <p>The learner will be evaluated on:</p> <ul style="list-style-type: none"> ● Safety ● Accuracy ● Compliance with Code ● Drawing for adjustments |

Achievement Criteria 2

Performance	The learner will build a specialized roof framing system.
Conditions	The learner will be given: <ul style="list-style-type: none">• Drawings and specifications• Materials• Tools
Criteria	The learner will be evaluated on: <ul style="list-style-type: none">• Safety• Accuracy• Framing technique

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
- Plan exterior structures
- Plan decks

LEARNING TASKS

CONTENT

1. Describe specialized framing systems

- Purpose
- Critical barriers
- Types
 - Bay windows
 - Bow windows
 - Window boxes
 - Drop ceilings
 - Valences
 - Pony walls
 - Bulkheads
 - Cornices
 - Access floors

2. Describe exterior structures

- Purpose
- Types
 - Fences
 - Pergola
 - Gazebos
 - Privacy screens
 - Accessory buildings
- Components
- Methods

3. Plan exterior structures

- Safety
- Code requirements
- Drawings and specifications
- Sequence

4. Plan decks

- Safety
- Code requirements
- Drawings and specifications
- Sequence

LEARNING TASKS

3. Describe methods of renovations and additions

CONTENT

- Selecting materials
- Critical barriers
- Supporting existing structure
- Connecting structural components
 - Concrete-to-concrete
 - Wood-to-wood
 - Wood-to-steel
 - Wood-to-concrete
- Removal of temporary supports and hoardings
- Installing finishes

Line (GAC): H **WOOD FRAME CONSTRUCTION**
Competency: H9 **Build timber and engineered wood construction**

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
- Legislation
 - Wood First Act
- Uses
- Types
 - Heavy timber
 - Post and beam
 - Timber framing
 - Log building
 - Engineered
- Hardware
- Tools
- Connections

- Types
 - Cross-laminated timber (CLT)
 - Dowel-laminated timber (DLT)
 - Nail-laminated timber (NLT)
- Applications
- Methods
- Components

2. Describe mass timber

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:

- Plan exterior structures

LEARNING TASKS

1. Describe exterior structures

2. Plan exterior structures

CONTENT

- Purpose
- Types
 - Fences
 - Pergola
 - Gazebos
 - Privacy screens
 - Accessory buildings
- Components
- Methods

- Safety
- Code requirements
- Drawings and specifications
- Sequence

Line (GAC):	I	FINISHING MATERIALS
Competency:	I5	Install interior finishes

Objectives

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

- Plan the installation of finished floors
- Plan interior finishes
- Install interior wall finishes and trims

LEARNING TASKS

1. Describe finished floors
2. Plan the installation of finished floors

CONTENT

- Types
- Safety
- Code requirements
- Material calculations
- Storage and handling
- Acclimatization
- Subfloor preparation
- Installation of sleepers
- Layout procedures
- Fasteners
- Adhesives
- Sanding/finishing

3. Describe interior finishes

- Types
 - Wall panels
 - Wainscotting
 - Cornice moulds
 - Coffered ceilings
 - Mantles
- Components
- Materials

4. Plan interior finishes

- Safety
- Code requirements
- Drawings and specifications
- Calculations
- Sequence
- Temporary protection

LEARNING TASKS

5. Install interior finishes

CONTENT

- Layout
- Cutting
- Assembling

Achievement Criteria 1

Performance The learner will scribe fit panelling.

Conditions The learner will be given:

- Tools
- Equipment
- Specifications

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- Fit

Achievement Criteria 2

Performance The learner will install casing and crown moulding.

Conditions The learner will be given:

- Tools
- Materials
- Specifications

Criteria The learner will be evaluated on:

- Safety
- Accuracy
- 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

1. Describe specialized floor systems

CONTENT

- 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
- Describe live and dead load calculation

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe the forces acting on a building structure | <ul style="list-style-type: none"> • Types of loads • Types of stress • Bearing capacities of soil |
| 2. Describe the forces acting on a building envelope | <ul style="list-style-type: none"> • Weather/climate • Temperature • Wind • Water • Building orientation • Ultraviolet radiation/sun • Relative humidity • Hydrostatic forces • Atmospheric pressure • Pressure differential |
| 3. Describe seismic applications | <ul style="list-style-type: none"> • Code requirements <ul style="list-style-type: none"> ○ Brace wall panels ○ Brace wall bands ○ Sheathing types ○ Nailing patterns ○ Nail types ○ Blocking and backing ○ Bracing • Floor diaphragms |
| 4. Describe seismic hardware and steel frames | <ul style="list-style-type: none"> • Hold down anchors • Straps • Bolts • Nails • Drag struts • Steel moment frames |
| 5. Describe live and dead load calculation | <ul style="list-style-type: none"> • Tributary area • Soil bearing capacities • Footing sizes |

Line (GAC):	J	BUILDING SCIENCE
Competency:	J2	Control the forces acting on a building as a system

Objectives

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

- Describe energy efficient construction and sustainable building systems

LEARNING TASKS

1. Describe energy efficient construction and sustainable building systems

CONTENT

- Net zero
- Water, vapour, air, and heat
- Materials
 - R-Value/RSI calculation
- Properties
 - Compatibility
 - Permeable
 - Non-permeable
- Mechanical ventilation
- Heating and cooling

Section 4

ASSESSMENT GUIDELINES

Assessment Guidelines – Level 1

Level 1 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		CARPENTER LEVEL 1	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
A	SAFE WORK PRACTICES	6%	3%
B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	16%	12%
C	TOOLS AND EQUIPMENT	17%	16%
D	SURVEY INSTRUMENTS AND EQUIPMENT	6%	6%
E	ACCESS, RIGGING, AND HOISTING EQUIPMENT	15%	15%
F	SITE LAYOUT	2%	3%
G	CONCRETE FORMWORK	20%	30%
H	WOOD FRAME CONSTRUCTION	16%	15%
J	BUILDING SCIENCE	2%	0%
	Total	100%	100%
In-school theory/practical subject competency weighting		50%	50%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 2

Level 2 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		CARPENTER LEVEL 2	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	13%	13%
C	TOOLS AND EQUIPMENT	10%	10%
D	SURVEY INSTRUMENTS AND EQUIPMENT	12%	13%
G	CONCRETE FORMWORK	5%	5%
H	WOOD FRAME CONSTRUCTION	25%	24%
I	FINISHING MATERIALS	25%	25%
J	BUILDING SCIENCE	10%	10%
	Total	100%	100%
In-school theory/practical subject competency weighting		50%	50%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 3

Level 3 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		CARPENTER LEVEL 3	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	14%	14%
C	TOOLS AND EQUIPMENT	3%	8%
E	ACCESS, RIGGING, AND HOISTING EQUIPMENT	3%	3%
F	SITE LAYOUT	3%	0%
G	CONCRETE FORMWORK	27%	27%
H	WOOD FRAME CONSTRUCTION	20%	18%
I	FINISHING MATERIALS	30%	30%
	Total	100%	100%
In-school theory/practical subject competency weighting		50%	50%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 4

Level 4 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		CARPENTER LEVEL 4	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	DOCUMENTATION AND ORGANIZATIONAL SKILLS	15%	20%
D	SURVEY INSTRUMENTS AND EQUIPMENT	10%	13%
F	SITE LAYOUT	8%	0%
H	WOOD FRAME CONSTRUCTION	52%	55%
I	FINISHING MATERIALS	10%	12%
J	BUILDING SCIENCE	5%	0%
	Total	100%	100%
In-school theory/practical subject competency weighting		50%	50%
Final in-school percentage score Apprentices must achieve a minimum 70% as the final in-school percentage score to be eligible to write the Interprovincial Red Seal exam.		IN-SCHOOL %	

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.

SkilledTradesBC will enter the apprentices Red Seal Interprovincial examination mark in ITADA. A minimum mark of 70% on the examination is required for a pass.

Section 5

TRAINING PROVIDER STANDARDS

Facility Requirements

Classroom Area

- Compliance with all local and national fire code and occupational safety requirements
- Compliance with municipal and provincial bylaws and regulations, including WorkSafeBC requirements
- Comfortable seating and tables suitable for learning
- Overhead and multimedia projectors with a projection screen
- Whiteboard with marking pens 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 the internet for students and instructors using suitable devices
- Access to a library complete with reference material for student and instructor use

Shop Area

- Compliance with all local and national fire code and occupational safety requirements
- Compliance with municipal and provincial bylaws and regulations, including WorkSafeBC requirements
- Minimum square feet and ceiling height to safely accommodate all required equipment and tools associated with practical training components as identified in this Program Outline
- 2,400 square feet per 16 students with 16-foot ceilings is recommended
- Adequate outdoors area, fenced
- Adequate climate control and lighting
- Ventilation as per WorkSafeBC standards
- Storage area for tools, equipment, and materials
- Refuse and recycling bins for used materials
- First Aid facilities
- Posted signage for fire exits, first aid facilities, safety equipment, and hazardous materials

Lab Requirements

- N/A

Student Facilities

- Adequate lunchroom as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal storage lockers

Instructor's Office Space

- Desk and filing space
- Computer

Other

- N/A

Tools and Equipment

Required

All Levels:

Eye protection
Fall protection systems
First aid kit
Foot protection
Hand protection

Standard Safety Equipment

Hard hat (head protection)
Hearing protection
Lung protection
Reflective vest

Stationary Equipment

Dust collection equipment

Level-Specific:

Survey Instruments

1	Optical levels	2	Theodolite
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Rigging and Hoisting Equipment

1	Chokers	1	Ropes
1	Come-alongs	1	Skid ramps
1	Eyebolts	1	Tirfors
1	Nylon lifting straps	1	Turnbuckles
1	Pinch bar		

Stationary Equipment

3	Band saw	2	Sanders
1	Bench grinder	1	Table saw
3	Drill press	2	Thickness planer
2	Jointer		

Shop (Facility) Tools

Standard Tools

All Levels:

Hand tools

Adjustable wrench	Nail puller
Allen wrenches	Nail set
Chalk line	Pencil/marketing instrument
Clamps	Pliers and side cutter
Combination square	Plumb bob
Cordless drill	Pry bars
Dry line	Scale rulers
Framing square	Screwdrivers (Robertson, Phillips, straight)
Hammers (framing, finishing)	Sliding T-bevel square
Hand saws	Speed square
High speed drill set	Stair gauges
Knives	Try square
Levels	Wrecking bar
Measuring tape	

Portable Power Tools and Portable Equipment

Calculator	Mitre saw
Circular saw	Portable power tool accessories
Cordless drill and bits	Power nailer/fastener
Electric drill	Reciprocating saw
Extension cords	Step ladders
Grinder	Wet/dry vacuum
Ladders	Wheelbarrow

Level-Specific:

Hand tools

1,3	Angle divider	1,3	Plane (compass)
1	Aviation snips	1,3	Plane (fore)
1	Back saw	1,3	Plane (jack)
2,3	Butt gauge	1,3	Plane (jointer)
2,3,4	Caulking gun	1,3	Plane (rabbet)
1	Circle cutter	1,3	Plane (router)
1,3	Concrete bits	1,3	Plane (smooth)
3	Cone/tie wrench	1,3	Plane (universal)
3	Coping saw	1,3	Putty knife
3	Dividers	1,3	Rasp
3	Drywall T-square	1,3	Scriber
1	File	1,3	Scribing compass
1	Hack saw	1,3	Set of chisels
2	Hand shears	1,2	Stapler
2,3	Hinge gain template	1,3	Stones (oil and water)
3	Hole saw	1,2	Tape measure 100 ft.
3	“J” rollers	3	Trammel points
3	Keyhole saw	1,3	Wood boring bits
3	Laminate knives	1,3	Wood chisels
1,3	Plane (bench)	1,3	Wood spade bit set
1,3	Plane (block)		

Portable Power Tools and Portable Equipment

1	Air compressor	1	Ladder jacks
2	Belt sander	3	Laminate trimmer
2	Biscuit joiner	2	Oxy-fuel outlet
3	Concrete cutting saw	2	Palm sander
3	Concrete vibrator	2	Planer
3	Construction heaters	1	Pneumatic tools
3	Cut-off saw	1,3	Powder actuated tools
3	Drywall gun	1,2	Roof jack
3	Electric chipping hammer	2	Router and bits
1	Generator	2	Sander
3	Grinder	1	Scaffold
3	Hammer drill	3	Stapler
3	Jackhammer	1	Wall jack
1	Jigsaw		

Reference Materials

Required Reference Materials

- Contact training provider for required reference material

Level 1:

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

Recommended Resources

- *Occupational Health & Safety Regulation*, Worker's Compensation Board,

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 <https://worksafebc.com>

- *Concrete Formwork* by Leonard Koel, 4th Edition ISBN 9780826907103
- *Principles and Practices of Commercial Concrete*
- *Understanding Construction Drawings* Tom Stephenson
- Workplace Hazardous Materials Information System (WHMIS) and First Aid, <http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index-eng.php>
- WorkSafeBC, www.worksafebc.com

Codes

- National Fire Code of Canada <http://www.nrc-cnrc.gc.ca>
- BC Ministry of Housing <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 (NFPA) www.nfpa.org
 - NFPA 80 – Standards for Fire Doors and Fire Windows
 - NFPA 101 – Life Safety Code
- Canadian National Building Code <http://www.nrc-cnrc.gc.ca>

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.

- *Principles and Practices of Commercial Construction, 9th Edition* Smith – Prentice-Hall (2000)
ISBN 0-13-026162-9

This text is suggested to complete the technical training component of the carpentry apprenticeship program. It covers construction techniques for the construction of large buildings.

- *Building Trades Dictionary 4th Edition* Toenjes – American Technical Publishers (1989)
ISBN-13: 978-0-8269-0406-5

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.

- *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.

- *Permanent Wood Foundations* Canadian Wood Council (1992)
ISBN 0-921628-19-6

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.

- *Formwork for Concrete* Hurd – American Concrete Institute SP-4 (1989)
LCC 89-81442

Formwork for Concrete, Principles 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.

- *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.

- *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.

- *Design and Control of Concrete Mixtures, 8th Canadian Edition* ISBN-13: 978-0893122720

The Design and Control of Concrete Mixtures gives a thorough description of the components of concrete and how they work together. It is useful as an auxiliary reference text that may be available at the public library.

- *Understanding Wood* Hoadley - Taunton Press (2005)
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.

- *Canadian Wood frame 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.

- *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

- *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.

- *Why Buildings Stand Up* Salvadori, Norton Publishing (2002)
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.

- *Architectural and Graphic Standards, Student Edition* Charles George Ramsey, Harold, Reeve, Sleeper, Bruce Bassler (Editor)
American Institute of Architects (2008)
ISBN 0-471-04683-3

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.

- *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.

- *De Walt Carpentry and Framing* ISBN 13:978-1-1111361-3-0
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.

Instructor Requirements

Occupation Qualification

The instructor must possess:

- Carpenter Certificate of Qualification with an Interprovincial Red Seal Endorsement

Work Experience

The instructor must possess:

- A minimum of 5 years' experience working in the industry as a journeyperson.
- Diverse industry experience covering all the competencies in this program.

Instructional Experience and Education

It is preferred that the instructor also possesses one of the following:

- An Instructor Diploma or equivalent
- A Bachelor's Degree in Education
- A Master's Degree in Education

Appendices

**Appendix A
Acronyms**

BEDMAS	Brackets, Exponents, Division, Multiplication, Addition, and Subtraction
BIM	Building information modelling
CADD	Computer-Aided Design and Drafting
CLT	Cross-laminated timber
DLT	Dowel-laminated timber
FLRA	Field level risk assessment
ICI	Industrial, commercial, and institutional
ICF	Insulated concrete forms
JHA	Job hazard analysis
MSI	Musculoskeletal Injuries
NBC	National Building Code
NLT	Nail-laminated timber
NFPA	National Fire Protection Association
OHS	Occupational Health and Safety
PPE	Personal protective equipment
SDS	Safety data sheets
WHMIS	Workplace Hazardous Materials Information System
WLL	Working load limits

Appendix B Previous Contributors

The 2016 Program Outline was developed with the assistance of the following industry and training provider experts:

- Chris Backman Kingston Construction Ltd.
- Hank Bangma Thompson Rivers University
- Randy Callaghan PCL Constructors Ltd.
- 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

The 2014 Program Outline was developed with the assistance of the following industry and training provider experts:

- Chris Backman Kingston Construction
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- Don Naidesh BCIT
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The 2013 Program Outline was developed with the assistance of the following industry and training provider experts:

- Chris Backman
- Will Benson
- Yves Blaison
- Elmer Eidse
- Mark Konrad
- Brian Lee
- Syd Lenton
- Geoff Murray
- Chris Paton
- Stephen Pelley
- Carrol Watamaniuk
- Alf Wiens

Appendix C Summary of Achievement Criteria

Achievement Criteria are included for those competencies that require a practical assessment. 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 measurable and that they reflect the skills spelled out in the competency. 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.

The following tables summarize the practical assessments for each level. **For details, please refer to the Achievement Criteria following the particular competency in the Program Content section.**

CARPENTER – LEVEL 1 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	ACHIEVEMENT CRITERIA TASK
A1 Apply shop and site safety practices	The learner will interpret information from OHS Regulation.
B1 Use construction drawings and specifications	1. The learner will use drafting tools to draw a project.
	2. The learner will interpret information from construction drawings.
B2 Interpret building codes and bylaws	The learner will interpret information from the building code.
C1 Use hand tools	The learner will lay out and build a hand tool project.
C2 Use portable power tools	The learner will lay out and build a project that includes cross, mitre, and bevel cuts, and ripping with a circular saw.
C3 Use stationary power tools	1. The learner will perform rip and cross cuts on a table saw.
	2. The learner will use a bench grinder to sharpen a chisel or plane iron.
D1 Use levelling instruments and equipment	1. The learner will complete a survey circuit to identify elevations at various locations, including a turning point.
	2. The learner will transfer elevations.
E1 Use ladders, scaffolds, and access equipment	The learner will set up a scaffold system with an access ladder.
E2 Use rigging and hoisting equipment	1. The learner will use hand signals for communication.
	2. The learner will tie knots, bends, and/or hitches.
F1 Lay out building locations	The learner will set up batter boards and string lines for a foundation project.

G3 Build footing and vertical formwork	1. The learner will build footing and wall forms using a strip easy tie system.
	2. The learner will build footing and vertical forms using snap tie system.
H3 Build floor systems	The learner will plan, layout, and build a floor system with an opening.
H5 Build stair systems	The learner will plan and build straight stairs with a handrail.

CARPENTER – LEVEL 2 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	ACHIEVEMENT CRITERIA TASK
B1 Use construction drawings and specifications	1. The learner will interpret information from a set of construction drawings.
	2. The learner will draw plans for a project such as a door or exterior finish detail.
C2 Use portable power tools	The learner will use portable power tools to complete a project.
C3 Use stationary power tools	The learner will use stationary power tools to finish a project.
D2 Use site layout equipment	The learner will lay out building corners using a theodolite.
G4 Build slab-on-grade forms and suspended slab forms	The learner will build the formwork for a sloping slab-on-grade.
H4 Build wall systems	The learner will build walls and partitions.
H5 Build stair systems	The learner will plan and build straight stairs with a balustrade.
H6 Build roof systems	1. The learner will build a gable roof with ceiling joists.
	2. The learner will layout and install a hip rafter.
I2 Install doors and hardware	The learner will install an exterior door with hardware.
I3 Install windows and hardware	The learner will install a window.
I4 Install exterior finishes	The learner will install exterior cladding materials including flashing.
J2 Control forces acting on a building as a system	The learner will install building envelope control layers.

CARPENTER – LEVEL 3 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	ACHIEVEMENT CRITERIA TASK
B1 Use construction drawings and specifications	1. The learner will interpret information from a set of structural drawings.
	2. The learner will draw formwork details, including plan and section views.
	3. The learner will estimate a reflected ceiling plan, including items such as lighting fixtures and bulkheads.
B2 Interpret building codes and bylaws	The learner will interpret information in the BC Building Code related to public spaces.
C1 Use hand tools	The learner will use and maintain hand tools.
C3 Use stationary power tools	The learner will use band saw and drill press.
E2 Use rigging and hoisting equipment	The learner will prepare a lift plan.
G3 Build footing and vertical formwork	The learner will build a vertical formwork project.
G4 Build slab-on-grade forms and suspended slab forms	1. The learner will install chamfer strips including mitres and 3-way corners.
	2. The learner will build suspended slab forms including a beam, girder, or drop panel.
G5 Install reinforcement and embedded items	The learner will lay out and install anchor bolt template.
G6 Build concrete stair forms	The learner will build multi-flight concrete stair forms.
G8 Install specialized formwork	The learner will lay out pre-cast concrete components.
H6 Build roof systems	The learner will build an intersecting hip roof.
I2 Install doors and hardware	1. The learner will install an interior door.
	2. The learner will use templates to layout door closers and panic hardware.
I6 Install cabinets	1. The learner will build a cabinet.
	2. The learner will apply plastic laminate to a project.
I7 Install interior floor, ceiling, and wall systems	1. The learner will build steel stud walls with openings.
	2. The learner will build a suspended ceiling.

CARPENTER – LEVEL 4 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	ACHIEVEMENT CRITERIA TASK
B3 Plan and organize work	1. The learner will estimate and schedule a project.
	2. The learner will complete documents for a building permit application.
D2 Use site layout equipment	The learner will layout curved shapes.
H5 Build stair systems	1. The learner will build winder stairs.
	2. The learner will build circular stairs.
	3. The learner will build a balustrade.
H6 Build roof systems	1. The learner will build an unequal slope intersecting roof.
	2. The learner will build a specialized roof framing system.
I5 Install interior finishes	1. The learner will scribe fit paneling.
	2. The learner will install casing and crown moulding.