SKILLED TRADES BC

PROGRAM OUTLINE

Carpenter

Implementation date: April 1, 2024

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SKILLED TRADES BC

CARPENTER

PROGRAM OUTLINE

APPROVED BY INDUSTRY

JUNE 2022

IMPLEMENTATION DATE

APRIL 1, 2024

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

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

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- 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	

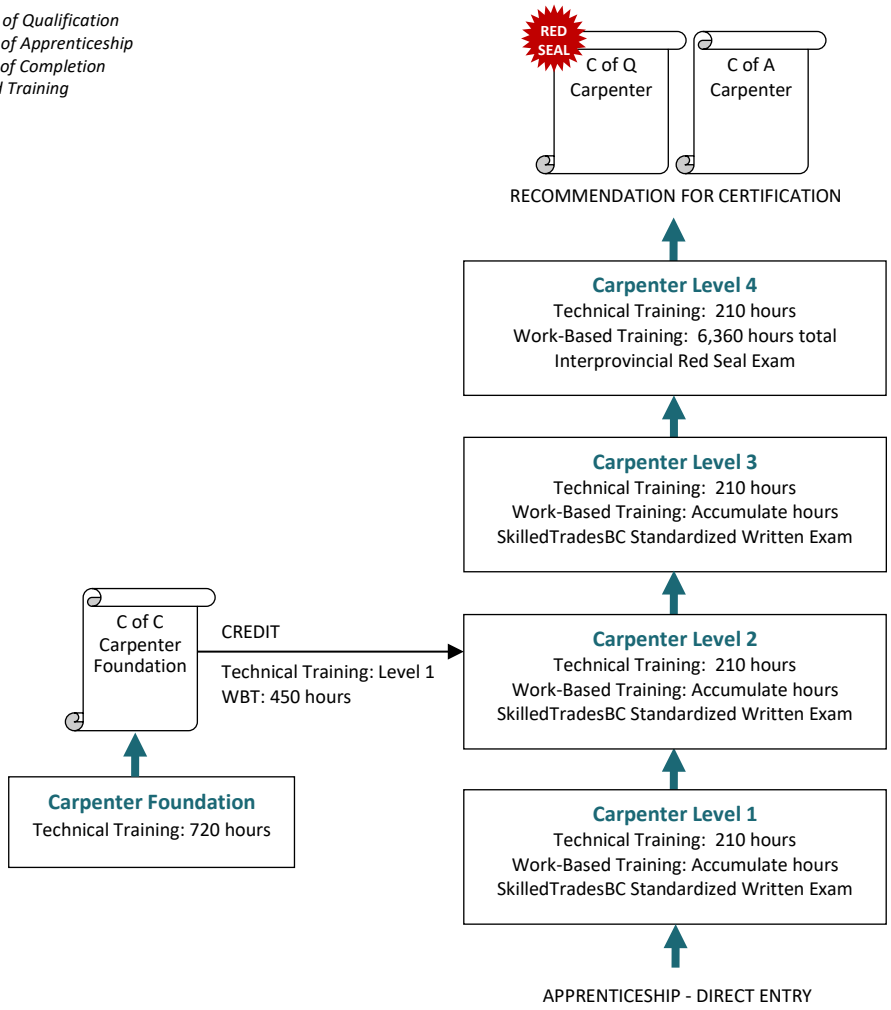
Section 2

PROGRAM OVERVIEW

Carpenter

Program Credentialing Model

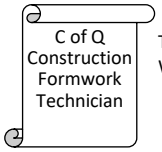
C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship
C of C = Certificate of Completion
WBT = Work-Based Training



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

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	

FINISHING MATERIALS	Describe roofing materials	Install doors and hardware	Install windows and hardware	Install exterior finishes	Install interior finishes	Install cabinets
I	I1	I2	I3	I4	I5	I6
	2	2 3	2	2	3 4	3

Install interior floor, ceiling, and wall systems
I7
3 4

BUILDING SCIENCE	Control the forces acting on a building	Control the forces acting on a building as a system
J	J1	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	**BUILDING SCIENCE**	**3%**	**100%**	**0%**	**100%**
J1	Control the forces acting on a building		✓		
	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 Allocated to:		
		% of Time	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

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

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

3. Describe safe work practices	• 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
	• Lockout procedures • Housekeeping • Using compressed air • Sound and light signals • Entering confined spaces
4. Apply safe work practices	• 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 ○ Field level risk assessment (FLRA) • Personal protective equipment (PPE) • Temporary lighting • Construction procedures • Woodworking machinery and processing

5. Describe fire safety procedures	• Components and causes of fire
	  ○ Fuel
	  ○ Heat
	  ○ Oxygen
	• Solvent flammability
	  ○ Flash points
	• Types of fires
	  ○ Class A, B, C, and D fires
	• Use of fire extinguishers
	• Fire prevention equipment
	  ○ Welding blanket
	  ○ Emergency fire blanket
	• Precautions when working with flammable substances
	• Safe use of temporary heating

6. Use Workplace Hazardous Materials Information System (WHMIS)	• WHMIS • Labelling • Safety data sheets (SDS) • Symbols • Storage

Achievement Criteria

Performance	The learner will interpret information from OHS Regulation.
Conditions	The learner will be given: • Assignment sheet
Criteria	The learner will be evaluated on: • Accuracy • Interpretation

Line (GAC): A SAFE WORK PRACTICES

Competency: A2 Apply personal safety practices

Objectives

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

- Describe roles and responsibilities related to workplace safety
- Describes hazard identification in the workplace
- Use PPE
- Apply ergonomic practices
- Use fall protection systems

LEARNING TASKS	CONTENT

1. Describe roles and responsibilities related to workplace safety	• Personal safety
	• Responsibilities
	  ○ Employers
	  ○ Employees

2. Describe hazard identification in the workplace	• Hazardous materials
	• Slips and trips
	• Working at height
	  ○ Fall protection
	  ○ Tethering tools
	  ○ Control zones
	• Overhead dangers
	• Confined spaces
	  ○ Certification
	• Excavations
	• Working around equipment
	• Uneven ground
	• Changes in conditions

3. Use personal protective equipment and clothing	• Inspecting
	  ○ Tagging out worn and defective PPE
	  ○ Frequency of inspection
	• Adjusting
	• Maintaining
	• Storing
	• Hand protection
	• Leg and foot protection
	• Headgear
	• Eye protection

LEARNING TASKS	CONTENT
	• Ear protection • Respiratory protection • Personal apparel • Precautions for weather
4. Apply ergonomic practices	• Musculoskeletal Injuries (MSI) • Procedures for operating, lifting, and carrying objects and tools

5. Use fall protection systems	• 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
1. Describe drawings	• Views • Types of drawings
2. Describe the parts of drawings	• Line types • Symbols • Abbreviations • Title block • Borders • Revisions • Legends • Notes • Scale ○ Ratio and proportion
3. Describe construction documents	• Plot plan • Foundation plan • Floor plans • Survey plans • Subdivision plans • Elevations • Sections • Details • Schedules • Legal descriptions • Surveyor's Certificate • Terms
4. Use drafting tools and materials	• Drafting board • Drafting table • T-square

LEARNING TASKS	CONTENT
	• 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)
5. Use construction drawings	• 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	CONTENT
1. Describe building codes and bylaws	• National Building Code • BC Building Code • Municipal zone bylaws • Vancouver Building Code • National Fire Code
2. Use building codes and bylaws	• BC Building Code

3. Describe the types and purposes of inspections	• Purpose of inspections
	• Sequence of inspections
	• Work that requires inspections
	  ○ Foundation and forms
	  ○ Perimeter drain, rain water leaders, and sumps
	  ○ Rough in plumbing
	  ○ Foundation insulation and ground seal
	  ○ Subtrades
	  ▪ Gas
	  ▪ Electrical
	  ▪ Security
	  ▪ 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

1. Describe the construction planning process	• Overviewing sequence of a build
	  ○ Pre-build
	  ▪ Consulting
	  ▪ Budgeting
	  ▪ Designing
	  ▪ Permits and applications
	  ▪ Scheduling project

2. Describe manufacturer and supplier documentation	• Types • Uses • Formats • How to access • Storing and record keeping
3. Describe material handling plan	• 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	CONTENT
1. Describe trade mathematic concepts	• Mathematic concepts • Application in carpentry trade • Converting between metric and imperial measurements • Using calculators

2. Use trade mathematics	• 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	CONTENT

1. Describe effective communication skills	• Verbal and written instructions
	• Professionalism
	  ○ Participation
	  ○ Responsibilites
	  ○ Conflict resolution
	  ○ Punctuality
	  ○ Respect
	  ○ Social responsibility
	• Trade terminology
	• Harrassment and discrimination
	• Constructive feedback
	• Safety and information meetings

2. Describe communication expectations	• Purpose
	  ○ Safety
	  ○ Project coordination
	  ○ Instructions
	  ○ Procedures
	• Networking
	• Digital/social media
	  ○ Etiquette
	• Open communciation
	• Interfacing with public
	• Methods and equipment
	  ○ Phone
	  ○ Digital
	  ○ Written
	• Teamwork
	• Delegation
	• Empowerment

LEARNING TASKS	CONTENT
3. Describe the role of the protégé	• 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	CONTENT
1. Describe hand tools	• Purpose • Measuring and layout • Cutting, boring, and shaping • Fastening • Finishing

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

3. Use cutting, boring, and shaping tools	• Safety
	• Types
	  ○ Hand saws
	  ○ Planes
	  ○ Chisels
	  ○ Knives
	  ○ Drill bits
	  ○ Files
	  ○ Rasps
	  ○ Sandpaper
	• Parts

LEARNING TASKS	CONTENT
	• Operation • Adjustment • Maintenance • Storage

4. Use fastening tools	• 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	• Types
	  ○ Cutting
	  ○ Boring
	  ○ Shaping
	  ○ Fastening

2. Describe the use of portable power tools	• Safety • Electric • Pneumatic • Mechanical • Operating procedures • Following manufacturers' documentation • Condition of equipment • Power supply • Storage of tools • Battery disposal

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

4. Use portable mitre saws	• Purpose • Safety

LEARNING TASKS	CONTENT

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

5. Use portable drills and drivers	• Purpose
	• Safety
	• Types, sizes, and speeds
	  ○ Corded
	  ○ Cordless
	• Parts
	• Bit types
	• Fastener types
	• Operations
	• Accessories
	• Adjustments
	• Maintenance

6. Use portable pneumatic tools	• Supply system
	• Purpose
	• Safety
	• Types and sizes
	  ○ Nail guns
	  ○ Staplers
	  ○ Impact wrenches
	• Parts
	• Fastener types
	• Operations
	• Accessories
	• Adjustments
	• Maintenance

7. Use jigsaws and reciprocating saws	• 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: • Drawings and specifications • Tools
Criteria	The learner will be evaluated on: • Safety • Tool use • Accuracy of layout and cuts • Quality of finished project

Line (GAC): C TOOLS AND EQUIPMENT

Competency: C3 Use stationary power tools

Objectives

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

- Use table saws
- Use bench grinders

LEARNING TASKS	CONTENT
1. Use table saws	• 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	CONTENT

1. Describe levelling equipment	• Purpose
	• Types of levelling instruments
	  ○ Builder's levels
	  ○ Electronic levels
	• Parts
	• Components
	  ○ Tripod
	  ○ Surveyor's rod

2. Use levelling equipment	• 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

3. Maintain levelling equipment	• 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: • Site plan including survey points • Field book
Criteria	The learner will be evaluated on: • Safety • Accuracy of rod readings • Field book recordings • Instrument set up

Achievement Criteria 2

Performance	The learner will transfer elevations.
Conditions	The learner will be given: • Electronic or optical level, receiver, and rod • Survey points
Criteria	The learner will be evaluated on: • Safety • Tool use • Accuracy of elevations

Line (GAC): E ACCESS, RIGGING, AND HOISTING EQUIPMENT

Competency: E1 Use ladders, scaffolds, and access equipment

Objectives

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

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

LEARNING TASKS	CONTENT

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

2. Use ladders	• Safety • Procedure for use • Maintenance • Storage
3. Describe access equipment	• OHS Regulation and WorkSafeBC Standards • Swing stages • Suspended power platform • Scissor lifts • Aerial lifts

4. Describe use of scaffolds and temporary access structures	• OHS Regulation and WorkSafeBC Standards
	• Scaffold types
	• General requirements
	• Fall protection requirements
	• Temporary ramps, walkways, and stairs
	  ○ Slope regulations
	  ○ Guards
	• Work platforms

LEARNING TASKS	CONTENT
5. Use scaffolds and temporary access structures	• 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	CONTENT

1. Use ropes	• 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	CONTENT
3. Describe cranes and hoists	• Purpose • Types of cranes • Types of hoists • Rollers
4. Use communication methods for lifting loads with cranes and hoists	• 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	• Iron pin • Lead plug • Survey point • Hub • Corner stake • Witness stake • Benchmark • Datum point • Monument • Locate correct plot plans
2. Build batter boards	• Location • Construction • Locating lines • Tying lines • Plumbing down from lines • Laying out square corners ○ Measuring diagonals • 3-4-5 Method
3. Describe excavation and grading procedures	• 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: • A foundation plan • Reference points • Tools
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe concrete	• 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	CONTENT

1. Describe concrete formwork and falsework systems	• WorkSafeBC regulations and standards
	• Safety
	• Efficiency
	• Architectural considerations
	• Terminology
	• Definitions
	  ○ Responsibility of employer
	  ○ Responsibility of formwork designer
	  ○ Construction requirements
	  ○ Inspection requirements
	• Concrete pre-stressing

2. Describe formwork material and hardware	• Lumber • Plywood • Metal forms • Plywood forms • Ties • Wedges and brackets • Walers, strong backs, and bracing • Reglets and inserts

3. Describe concrete joints	• Types
	  ○ Contraction
	  ○ Control
	  ○ Expansion
	  ○ Isolation
	  ○ Construction
	  ○ Cold
	• Methods of construction

Line (GAC): G CONCRETE FORMWORK

Competency: G3 Build footing and vertical formwork

Objectives

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

- Describe the construction of footing and vertical forms
- Plan footing, wall, and vertical forms
- Calculate concrete volumes
- Construct footing and vertical forms
- Describe removal of concrete forms

LEARNING TASKS	CONTENT

1. Describe footing forms	• Types
	  ○ Strip
	  ○ Stepped
	  ○ Column
	  ○ Grade beams

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

3. Plan footing, wall, and vertical forms	• Safety • Codes • Select materials • Material handling and storage • Schedule

LEARNING TASKS	CONTENT
	• Access
4. Calculate concrete volumes	• Footings • Walls • Columns • Centreline
5. Build footing, wall, and vertical forms	• Layout • Assembling • Supporting • Aligning • Bracing

6. Describe removal of concrete forms	• OHS Regulation and WorkSafeBC Standards
	• Safety
	• Concrete design strength
	• Form removal
	  ○ 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:
- A foundation plan which includes bucks, blockouts, and pour strip
- Tools

Criteria: The learner will be evaluated on:
- 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:
- A foundation plan which includes chamfer strip
- Forming material and hardware
- Tools

Criteria: The learner will be evaluated on:
- 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	CONTENT
1. Describe slabs-on-grade	• 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	CONTENT
1. Describe reinforcing for concrete	• 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

Line (GAC): H WOOD FRAME CONSTRUCTION

Competency: H2 Select framing materials

Objectives

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

- Describe characteristics of wood
- Describe wood production
- Describe common defects in wood
- Describe manufactured products
- Describe fasteners used in wood frame construction
- Describe hardware used in wood frame construction

LEARNING TASKS	CONTENT
1. Describe characteristics of wood	• Structural • Aesthetic • Softwood species • Hardwood species • Tropical hardwoods

2. Describe wood production	• Production methods
	  ○ Sawing
	  ○ Drying
	  ○ Surfacing
	• Moisture content
	• Sizes
	• Grading
	  ○ Grade stamps
	  ○ Board lumber
	  ○ Light framing
	  ○ Joists and planks
	  ○ Beams and stringers
	  ○ Posts and timbers
	  ○ Decking
	• Siding

3. Describe common defects in wood	• Warp • Compression wood • Mechanical defects • Split, check, and shake • Knots • Wane

LEARNING TASKS	CONTENT
	• Pitched, streaked, and stained wood • Mould and decay • Insect damage • Manufacturing imperfections
4. Describe manufactured products	• Veneers • Composite materials • Pressure-treated • Cross-banding • Adhesives • Softwood plywood grades • Plywood veneers and cores • Faces, backs, and cores • Standard sizes and thicknesses
5. Describe fasteners used in wood frame construction	• Applications • Nails • Adhesives • Threaded • Treated wood • Powder-actuated
6. Describe hardware used in wood frame construction	• Framing connectors • Treated wood connectors • Seismic connectors

Line (GAC): H WOOD FRAME CONSTRUCTION

Competency: H3 Build floor systems

Objectives

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

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

LEARNING TASKS	CONTENT

1. Describe floor systems	• Purposes
	• Uses
	• Types of floor systems
	  ○ Lumber
	  ○ Engineered
	• Components of a floor system
	  ○ Pony walls
	  ○ Posts/columns
	  ○ Beams
	  ○ Joists
	  ○ Sheathing
	• Bridging
	• Critical barriers

2. Plan floor systems	• 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
3. Calculate floor systems	• Spans • Material quantities • Components
4. Build pony walls	• Pony wall construction
5. Build posts/columns and beams	• Post/column anchorage • Installing posts/columns and beams

6. Build floors	• Layout and installation of
	  ○ Sill plates
	  ○ Joists
	  ○ Bridging or blocking
	• Openings
	• Nailing requirements
	• Joists supported by steel beams
	• Installation of sheathing

7. Describe deck systems	• Safety
	• Purpose
	• Components
	• Types
	  ○ Deck with spaced boards
	  ○ Deck over living space
	• Methods
	• Code requirements
	• Construction drawings
	• Construction sequence

Achievement Criteria

Performance	The learner will plan, layout, and build a floor system with an opening.
Conditions	The learner will be given: • Drawings that include openings and provisions for mechanical services • Tools • Materials
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe wall systems	• 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	CONTENT
1. Describe stair systems	• Purpose • Stair terms

2. Plan straight stairs	• Safety
	• Code requirements
	  ○ Stairs
	  ○ Handrails
	• Construction drawings
	• Construction sequence

3. Calculate straight stairs	• Dimensions

4. Build straight stairs and handrails	• 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: • Specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe the forces acting on a building structure	• 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	• Residential • Industrial, commercial, and institutional (ICI) • Plans • Sections • Elevations • Shop drawings • As built drawings
2. Use architectural drawings	• Residential • ICI • Plans • Sections • Elevations • Shop drawings • As built drawings
3. Describe schedules	• Door schedules • Window schedules • Hardware schedules
4. Draw finishing details	• Plan • Section • Elevation • Component identification

Achievement Criteria 1

Performance	The learner will interpret information from a set of construction drawings.
Conditions	The learner will be given: • Drawings and specifications • Assignment sheet
Criteria	The individual will be evaluated on: • Interpretation of plans

Achievement Criteria 2

Performance	The learner will draw plans for a project such as a door or exterior finish detail.
Conditions	The learner will be given: • Project specifications • Materials
Criteria	The learner will be evaluated on: • Use of standard construction drawing standards and techniques • Complete and correct content

Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS

Competency: B2 Interpret building codes and bylaws

Objectives

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

- Describe the use of municipal permits
- Describe warranties and inspections
- Describe the role of BC Housing in construction

LEARNING TASKS	CONTENT
1. Describe the use of municipal permits	• 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
2. Describe warranties and inspections	• Role • Warranty providers • Inspections ○ Energy advisor consultations
3. Describe the role of BC Housing in construction	• 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
1. Describe powder-actuated tools	• Safety • Purpose • OHS Regulation and WorkSafeBC Standards • Types and sizes • Hazard recognition
2. Describe chain saws	• Safety • Purpose • OHS Regulation and WorkSafeBC Standards • Types and sizes • Hazard recognition • Protective clothing and equipment
3. Describe hammer drills, rotary hammers, and demolition hammers	• Safety • Purpose • Types and sizes • Parts • Operations • Accessories • Bit types • Adjustments • Maintenance

LEARNING TASKS	CONTENT
4. Describe cut-off saws	• 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
	• Types • Parts • Blades • Operation • Maintenance • Storage
9. Use portable biscuit (plate) joiners	• 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: • Drawings and specifications • Portable power tools
Criteria	The learner will be evaluated on: • 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	CONTENT
1. Use a jointer	• 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: • Drawings and specifications • Stationary power tools • Materials
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe electronic layout instruments	• Purpose
	• Types
	  ○ Theodolites
	  ○ Total stations
	• Parts

2. Use layout equipment	• 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: • Construction drawings • Theodolite
Criteria	The learner will be evaluated on: • Safety • Use of instrument • Calculation of angles and lengths to locate corners • Accuracy of location of corner stakes

Line (GAC): 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	CONTENT
1. Build slabs-on-grade	• 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	CONTENT
1. Describe concrete finishing	• Safety • Tools and equipment • Walls • Flatwork • Procedures • Surface treatments
2. Describe the process of concrete curing	• Hydration • Curing • Sealers and hardeners • Environmental conditions
3. Describe concrete defects	• Types • Causes • Repairs

Line (GAC): H WOOD FRAME CONSTRUCTION

Competency: 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	CONTENT

1. Plan wall systems	• Safety
	• Code requirements
	  ○ Determine materials and sizes
	  ○ Spacing
	  ○ Spans
	  ○ Brace walls
	• Engineering
	  ○ Seismic hardware
	• Construction drawings
	• Construction sequence
	• Temporary bracing
	• Critical barriers

2. Calculate wall systems	• Spans • Framing materials • Components

3. Build wall systems	• Build exterior walls
	  ○ Layout
	  ○ Assemble
	  ○ Squaring walls
	  ○ Sheathing
	  ○ Standing walls
	  ○ Straightening and bracing walls
	• Build interior walls
	  ○ Layout
	  ○ Assemble
	  ○ Standing walls
	  ○ Straightening and bracing walls
	  ○ Fire stops
	  ○ Backframing

Achievement Criteria

Performance	The learner will build walls and partitions.
Conditions	The learner will be given: • Drawings • Materials • Tools
Criteria	The learner will be evaluated on: • 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	• Types
	  ○ Straight
	  ○ Multi-flight
	• Stair components
	• Balustrade components

2. Plan stairs and balustrade	• Safety • Code requirements • Construction drawings ○ Design considerations • Construction sequence
3. Calculate stairs and balustrade	• Building codes • Rise and run • Stairwell openings • Stair dimensions • Materials
4. Build stairs and balustrade	• Layout • Cut • Assemble

Achievement Criteria

Performance	The learner will plan and build straight stairs with a balustrade.
Conditions	The learner will be given: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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	• Purpose • Uses • Types • Components
2. Plan a gable roof system	• Safety • Code requirements • Construction drawings • Construction sequence
3. Calculate gable roof systems	• Theoretical lengths • Quantities of ceiling and roof framing materials
4. Build a gable roof system	• Layout roof members • Layout plate • Cut members • Assemble
5. Describe truss roofs	• Safety • Interpret manufacturers' documentation • Layout of trusses • Handling and installation of trusses • Fastening trusses • Bracing requirements

LEARNING TASKS	CONTENT
6. Calculate hip rafter systems	• Theoretical lengths • Materials • Adjustments
7. Build a hip rafter system	• 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: • Drawings and specifications
Criteria	The learner will be evaluated on: • Safety • Tool use • Calculation and layout of ceiling joists, rafters, and other roof framing members • 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: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • Safety • Accuracy • Dimensional accuracy

Line (GAC): I FINISHING MATERIALS

Competency: I1 Describe roofing materials

Objectives

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

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

LEARNING TASKS	CONTENT
1. Describe roofing materials	• Purpose • Types • Re-roofing • Flashing • Underlay • Accessories • Fasteners
2. Plan for the installation of roofing materials	• Safety • Code requirements • Tools • Protecting existing surfaces • Removing existing roofing materials • Underlay • Flashing • Accessories
3. Calculate roofing materials	• 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	• 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	• Types • Purpose • Installation
3. Describe exterior door jambs	• Types • Purpose • Construction
4. Describe exterior door hardware	• Types ○ Architectural • Purpose • Storage • Labelling
5. Install exterior doors	• 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	CONTENT
1. Describe windows and hardware	• Purpose • Code requirements • Types • Components • Construction • Energy efficiency • Storage • Operation
2. Plan window installation	• Schedule • Code requirements • Drawings and specifications • Manufacturers' specifications • Delivery • Storage • Access • Installation ○ Critical barriers • Protection
3. Install windows	• Safety • Fitting • Plumb • Level • Shimming • Fastening • Sealing • Accessories

Achievement Criteria

Performance	The learner will install a window.
Conditions	The learner will be given: • Tools • A rough opening • A window • Building envelope material
Criteria	The learner will be evaluated on: • 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	CONTENT
5. Install exterior finishing materials	• 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	• Purpose • Principles • Materials • Methods
2. Describe control of vapour	• Purpose • Principles • Materials • Methods
3. Describe control of air movement	• Purpose • Principles • Materials • Methods
4. Describe control of heat and cold	• Purpose • Principles • Materials • Methods
5. Install building envelope components	• Purpose • Building envelope control layers

Achievement Criteria

Performance	The learner will install building envelope control layers.
Conditions	The learner will be given: • Tools • Materials • Details • Drawings • Manufacturers' specifications
Criteria	The learner will be evaluated on: • 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	• Types of drawings • Schedules • Specifications • Gridlines
2. Describe schedules	• Door schedules • Window schedules • Room finish schedules • Hardware schedules
3. Describe shop drawings	• Interior elevations • Millwork drawings
4. Use structural drawings	• Specifications • Schedules • Building dimensions • Construction type • Mechanical and electrical systems
5. Interpret reflected ceiling plans	• Reflected ceiling plans • Specialties • Hardware
6. Draw formwork details	• Plan view • Section view

Achievement Criteria 1

Performance	The learner will interpret information from a set of structural drawings.
Conditions	The learner will be given: • Drawings and specifications • Question sheet
Criteria	The learner will be evaluated on: • Accuracy

Achievement Criteria 2

Performance	The learner will draw formwork details, including plan and section views.
Conditions	The learner will be given: • Specifications
Criteria	The learner will be evaluated on: • 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: • Drawings and specifications
Criteria	The learner will be evaluated on: • 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	CONTENT
1. Interpret building codes and bylaws related to public spaces	• 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: • Question sheet
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe finishing tools	• 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	CONTENT
1. Use band saws	• 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

1. Describe lifting loads with cranes and hoists	• OHS Regulation and WorkSafeBC Standards
	• Considerations
	  ○ High voltage line clearance
	  ○ Overhead hazards
	  ○ Load stability
	  ○ Centre of gravity
	  ○ Sling locations

2. Use rigging equipment	• OHS Regulation and WorkSafeBC Standards
	• Safe rigging practices
	  ○ Lift plan
	• Calculations
	  ○ Weight of load
	  ○ Sling angle
	  ○ Working load limit
	• Rigging structural shapes
	• Rigging complex shapes
	• Blocking and stacking

3. Use hoisting equipment	• OHS Regulation and WorkSafeBC Standards • Hand signals • Follow lift plan • Ground stability • Move and place load
4. Maintain and store rigging and hoisting equipment	• OHS Regulation and WorkSafeBC Standards • Safe storage and maintaintence

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 • Instructions • Materials
Criteria	The learner will be evaluated on • 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	CONTENT

1. Describe excavations	• Safety
	• Purpose
	• Bulk excavations
	• Trench excavations
	• Deep excavations
	• Soil
	  ○ Conditions
	  ○ Types
	  ○ Bearing capacities/allowable bearing pressure
	• Underpinning

2. Describe shoring	• Types • Slope stabilization
3. Plan excavations and shoring	• Safety • Weather conditions • Site survey • Grading • Grid lines and grade stakes • Excavation planning • Describe backfilling
4. Calculate excavations	• 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	• Structural • Architectural • Fire proofing • Insulating • Conduits • Pavements

2. Describe concrete mix designs	• Strength
	• Durability
	• Water tightness
	• Finishing ability
	• Specialty concrete
	  ○ Exposed aggregate
	  ○ Self-consolidating

3. Describe the types of admixtures and treatments for concrete	• 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	• 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	CONTENT
1. Describe the factors affecting form design	• Safety • Architectural design • Concrete members • Efficiency • Environmental conditions • Form pressures • Slump • Temperature • Vibration • Placement method • Form size • Cantilever formwork • Concrete design mix
2. Describe 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	• Raft slabs • Mass pad • Pile cap • Caissons • Piles
2. Describe pile foundations	• Types • Parts • Grade beams • Uses • Designs

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

4. Describe wall forms	• Engineered wall system • Gang forms • Construction procedures • Form details • Double walers systems
5. Describe insulated concrete forms (ICF)	• Components and hardware • ICF foundation walls • Above ground flat ICF walls

LEARNING TASKS	CONTENT

6. Plan footing and vertical formwork	• 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	• Types of slabs • Slab components • Suspended slab forming products • Specifications
2. Describe fly table forms	• Safety • Layout ○ Crane pick points • Assembly • Support system
3. Describe shoring and re-shoring	• Safety • Installation drawings • Re-shoring requirements • Re-shoring systems

4. Plan suspended slab formwork	• Safety
	• Construction drawings
	• Procedures
	  ○ Form system
	  ○ Lift plan
	  ○ Concrete placement
	  ○ Curing
	  ○ Form removal
	• Material handling and storage
	• Scheduling
	• Sub-trades

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

LEARNING TASKS	CONTENT
6. Construct suspended slabs	• Layout • Assembly • Alignment • Form removal

Achievement Criteria 1

Performance	The learner will install chamfer strips including mitres and 3-way corners.
Conditions	The learner will be given: • Specifications • 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	• 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	• Anchor bolts • Weld plates • Lifting anchors • Plastics
3. Describe door frames used in concrete and masonry walls	• Types of frames • Methods of installation
4. Describe concrete fastening systems	• 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: • Construction drawings and specifications • Tools
Criteria	The learner will be evaluated on: • 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	• Cast-in-place stairs • Pre-cast stairs • Concrete finishes and nosings • Components

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

3. Calculate concrete stairs	• Rise and run • Stairwell opening • Concrete volume • Components
4. Construct concrete stairs	• Layout • Assembly • Alignment • Bracing • Form removal

Achievement Criteria

Performance	The learner will build multi-flight concrete stair forms.
Conditions	The learner will be given: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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	CONTENT
1. Describe tilt-up construction	• Safety • Uses • Drawings • Formwork • Lifting sequence • Lifting and bracing procedures
2. Describe pre-cast concrete	• Purpose • Types • Order of assembly • Handling and storage • Construction methods
3. Describe pre-stressed concrete	• Pre-tensioning • Post-tensioning
4. Describe slip-form construction	• Planning • Types • Concrete mix design • Construction procedures • Jacks and yokes • Concrete placement • Concrete finishing • Dismantling procedures

LEARNING TASKS	CONTENT
5. Describe mass concrete	• Heat of hydration • Types • Placement methods

6. Describe architectural formwork	• Purpose
	• Types
	  ○ Curved walls
	  ○ Arches
	  ○ Floors
	  ○ Walls
	  ○ Ceilings
	  ○ Landscape features
	• Rustications
	• Sandblasted and tooled concrete
	• Exposed aggregate
	• Form liners
	• Stamped and coloured

7. Describe sealing joints	• Types of caulking compounds • Backer rods • Sealers and primers • Procedures
8. Lay out tilt-up construction	• 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	• Purpose • Uses • Types • Components
2. Plan hip roof systems	• Safety • Code requirements • Construction drawings • Construction sequence
3. Calculate hip roof systems	• Theoretical lengths • Materials • Components
4. Build hip roof systems	• Layout • Cutting • Assembling
5. Describe an intersecting roof	• Purpose • Uses • Types • Components
6. Plan an intersecting roof	• Safety • Code requirements • Drawings and specifications • Construction sequence

LEARNING TASKS	CONTENT
7. Calculate an intersecting roof	• Theoretical lengths • Materials • Components
8. Build an intersecting roof	• Layout • Cuttting • Assembling • Sheathing cuts

Achievement Criteria

Performance	The learner will build an intersecting hip roof.
Conditions	The learner will be given: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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	• Purpose • Types • Schedule • Construction • Terminology • Code requirements • Security • Storage during construction • Swing/hand of door
2. Describe specialty interior doors	• Types • Purpose • Installation
3. Describe interior door jambs	• Types ○ Steel frame • Purpose • Construction
4. Describe interior door hardware	• Types • Schedule • Purpose • Storage
5. Install interior doors	• Rough openings • Hanging and fitting
6. Install interior door hardware	• Types • Operation • Fitting • Templates

Achievement Criteria 1

Performance	The learner will install an interior door.
Conditions	The learner will be given: • Construction drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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: • Manufacturers' specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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
	• Installation methods • Components • Temporary protection
6. Install countertops	• 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	• Types • Purpose • Tools • Components
2. Plan installation of steel stud systems	• Safety • Code requirements • Construction drawings
3. Install steel studs	• Layout • Cut • Assemble
4. Describe demountable partitions	• Types • Components • Installation
5. Describe interior ceiling systems	• Purpose • Types • Components • Methods
6. Plan installation of interior ceiling systems	• Safety • Code requirements • Construction drawings • Reflected ceiling plans
7. Calculate materials	• Wall systems • Ceiling systems
8. Install interior ceiling systems	• Layout • Cut • Assembly

Achievement Criteria 1

Performance	The learner will build steel stud walls with openings.
Conditions	The learner will be given: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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: • Reflected ceiling plan • Tools • Materials
Criteria	The learner will be evaluated on: • 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
	• Liens • Penalties/bonuses • Contingency funds

5. Plan work sequence	• Construction sequence and scheduling
	  ○ Gantt chart
	  ○ Critical path
	• Material delivery sequence
	• Coordination with sub-trades
	• Time estimates

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

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

8. Describe use of computers in the construction process	• 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: • Drawings and specifications • Cost guides
Criteria	The learner will be evaluated on: • Accuracy • Project schedule • Documentation

Achievement Criteria 2

Performance	The learner will complete documents for a building permit application.
Conditions	The learner will be given: • Municipal bylaws and regulations • Construction drawings and specifications
Criteria	The learner will be evaluated on: • Interpretation of bylaws, regulations, and permit processes

Line (GAC): B DOCUMENTATION AND ORGANIZATIONAL SKILLS

Competency: 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	CONTENT
1. Describe total stations	• Calculations • Set-up • Adjustment • Readings • Layout • Maintenance • Storage
2. Calculate layout of curves	• Types • Chord lengths • Arc lengths • Offsets

Achievement Criteria

Performance	The learner will layout curved shapes.
Conditions	The learner will be given: • Drawings and specifications • Tools • Materials
Criteria	The learner will be evaluated on: • 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	CONTENT

1. Describe site considerations	• 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

2. Describe site and project preparation	• Site layout
	• Permits
	• Requirements
	  ○ Environmental plan
	  ○ Environmental impact assessment
	  ○ Geotechnical reports
	• Clearing the site
	  ○ BC One Call

LEARNING TASKS	CONTENT

	• Demolition
	  ○ Identifying and removing hazardous materials
	• Site services
	  ○ Locating
	  ○ Disconnecting
	  ○ Existing
	  ○ New
	• Building elevations

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

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

5. Describe sumps, catch basins, and septic tanks	• Code regulations • Dewatering systems • Sumps • Trapping hoods • Storm drains • Sanitary sewers • Catch basins • Backwater valves • Septic tanks • Perimeter drains

6. Describe backfilling	• Safety
	• Code requirements
	• Procedures
	  ○ 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	• Stringer types • Tread shapes
2. Plan stairs with winders	• Safety • Code requirements • Stringer types
3. Calculate stairs with winders	• Rise and run • Stairwell openings • Stair dimensions • Materials
4. Build stairs with winders	• Layout • Cutting • Assembling
5. Describe circular stairs	• Purpose • Types • Components
6. Plan circular stairs	• Safety • Code requirements • Stringer types
7. Calculate circular stairs	• Rise and run • Stairwell openings • Stair dimensions • Materials

LEARNING TASKS	CONTENT
8. Build circular stairs	• Layout • Cutting • Assembling
9. Build balustrades	• Code requirements • Calculating • Planning • Layout • Assembling

Achievement Criteria 1

Performance	The learner will build winder stairs.
Conditions	The learner will be given: • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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: • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • Safety • Accuracy • Compliance with building codes • Calculations, layout, and cuts • Dimensionall 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: • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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	• Purpose • Uses • Types • Components
2. Plan an unequal slope intersecting roof	• Safety • Code requirements • Construction drawings • Developed drawings • Construction sequence
3. Calculate an unequal slope intersecting roof	• Theoretical lengths • Materials • Components
4. Build an unequal slope intersecting roof	• Layout • Cutting • Assembling • Sheathing cuts

5. Describe specialized roof framing systems	• Types
	  ○ Polygon roofs
	  ○ Gambrel
	  ○ Mansard
	  ○ Flat
	  ○ Dormer
	  ○ Cupola
	  ○ Turret

LEARNING TASKS	CONTENT
	○ Canopy ○ Spire ○ Saw tooth ○ Butterfly roof • Components ○ False gable ○ Cricket/saddle ○ Parapet ○ Cant strip ○ Hidden gutters • Methods of construction ○ Openings ○ Wall frame ○ Roof frame ○ Curbs ○ Critical barriers • Vaulted ceilings
6. Plan specialized roof framing systems	• Safety • Code requirements • Scale drawing • Construction sequence
7. Calculate specialized roof framing systems	• Theoretical lengths • Materials • Components
8. Build specialized roof framing systems	• Layout • Cutting • Assembling

Achievement Criteria 1

Performance	The learner will build an unequal slope intersecting roof.
Conditions	The learner will be given: • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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: • Drawings and specifications • Materials • Tools
Criteria	The learner will be evaluated on: • 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

Line (GAC): H WOOD FRAME CONSTRUCTION

Competency: H8 Perform renovations and additions

Objectives

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

- Plan renovations and additions

LEARNING TASKS	CONTENT

1. Describe renovations and additions	• Purpose
	• Types
	  ○ Residential
	  ○ Industrial, commercial, and institutional (ICI)
	  ○ Leasehold improvements
	• Design considerations

2. Plan renovations and additions	• Safety
	• Code requirements
	• Drawings and specifications
	• Permits
	• Environmental assessment
	• Housekeeping
	• Remediation and abatement
	• Disposal
	• Hoarding
	• Sequence
	• Demolition
	• Temporary support
	• Services
	• Protecting finishes
	• Hazardous materials
	  ○ Asbestos
	  ○ Mould
	  ○ Lead
	  ○ Mercury
	  ○ PCB
	  ○ Infestation
	  ○ Biohazards
	  ○ Silica
	  ○ Dust
	• Reclaiming material

LEARNING TASKS	CONTENT

3. Describe methods of renovations and additions	• 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	CONTENT

1. Describe timber construction	• Purpose
	• Legislation
	  ○ Wood First Act
	• Uses
	• Types
	  ○ Heavy timber
	  ▪ Post and beam
	  ▪ Timber framing
	  ○ Log building
	  ○ Engineered
	• Hardware
	• Tools
	• Connections

2. Describe mass timber	• Types
	  ○ Cross-laminated timber (CLT)
	  ○ Dowel-laminated timber (DLT)
	  ○ Nail-laminated timber (NLT)
	• Applications
	• Methods
	• Components

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	CONTENT

1. Describe exterior structures	• Purpose
	• Types
	  ○ Fences
	  ○ Pergola
	  ○ Gazebos
	  ○ Privacy screens
	  ○ Accessory buildings
	• Components
	• Methods

2. Plan exterior structures	• 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	CONTENT
1. Describe finished floors 2. Plan the installation of finished floors	• 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	CONTENT
5. Install interior finishes	• 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	CONTENT
1. Describe specialized floor systems	• Access flooring • Sports surfaces

Line (GAC): J BUILDING SCIENCE

Competency: J1 Control the forces acting on a building

Objectives

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

- Describe the forces acting on a building
- Describe the construction details for wood frame seismic applications
- Describe live and dead load calculation

LEARNING TASKS	CONTENT
1. Describe the forces acting on a building structure	• Types of loads • Types of stress • Bearing capacities of soil
2. Describe the forces acting on a building envelope	• Weather/climate • Temperature • Wind • Water • Building orientation • Ultraviolet radiation/sun • Relative humidity • Hydrostatic forces • Atmospheric pressure • Pressure differential

3. Describe seismic applications	• Code requirements
	  ○ 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	• Hold down anchors • Straps • Bolts • Nails • Drag struts • Steel moment frames
5. Describe live and dead load calculation	• Tributary area • Soil bearing capacities • Footing sizes

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	CONTENT

1. Describe energy efficient construction and sustainable building systems	• 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 SkilledTradesBC DA. 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:

Standard Safety Equipment

Eye protection	Hard hat (head protection)
Fall protection systems	Hearing protection
First aid kit	Lung protection
Foot protection	Reflective vest
Hand protection	

Stationary Equipment

Dust collection equipment

Level-Specific:

Survey Instruments

1	Optical levels	2	Theodolite

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

Portable Power Tools and Portable Equipment

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

Level-Specific:

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, Principals and Practices of Commercial Construction is the definitive text on the construction of formwork. The explanations and diagrams are excellent. It is useful as an auxiliary reference text that may be available at the public library.

- *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 Contr*ol 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 tex*t* 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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• Geoff Murray	Camosun College
• Don Naidesh	BCIT
• Stephen Pelley	Vancouver Island University

The 2013 Program Outline was developed with the assistance of the following industry and training provider experts:

- Chris Backman
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- 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.