

# **Interprovincial Program Guide**

## **Carpenter**

**2009**

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The CCDA Executive Committee recognizes this Interprovincial Program Guide as the national curriculum for the occupation of Carpenter.

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## Introduction

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Jurisdictions have long recognized the benefit of pooling resources in the development and maintenance of apprenticeship training standards. A successful example of this is the Interprovincial Standards (Red Seal) program itself. Essential to the establishment of standards is the development of suitable training systems and programs which enable tradespeople to acquire certification based on these standards. While certification is the responsibility of Apprenticeship administrators throughout Canada, the development and delivery of technical training is the responsibility of jurisdictions.

In 1999, work to develop common training for apprenticeship programs within the Atlantic Provinces began. To date, 22 Curriculum Standards have been developed through the Atlantic Standards Partnership (ASP) project to assist programming staff and instructors in the design and delivery of technical training. Similarly, the Canadian Council of Directors of Apprenticeship (CCDA) embarked on a process for the development of national Interprovincial Program Guides (IPGs) for the Boilermaker, Carpenter and Sprinkler System Installer trades. At its January 2005 strategic planning session, the CCDA identified developing common training standards as one of key activities in moving towards a more cohesive apprenticeship system.

With the support of Human Resources and Skills Development Canada (HRSDC), several provinces and territories have partnered to build on the ASP and the CCDA processes to further develop IPGs to be used across the country. This partnership will create efficiencies in time and resources and promote consistency in training and apprentice mobility.

## User Guide

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According to the Canadian Apprenticeship Forum, the Interprovincial Program Guide (IPG) is: "a list of validated technical training outcomes, based upon those sub-tasks identified as common core in the National Occupational Analysis, and validated by industry in the provinces and territories as incorporating the essential tasks, knowledge and skills associated with a given trade."

Learning outcomes contained in the IPG represent the minimum common core content for the development of jurisdictional training standards and outlines. IPGs are developed based on the National Occupational Analyses and extensive industry consultation. The IPG is intended to assist program development staff in the design of jurisdictional plans of training. Each jurisdiction has the flexibility to add additional content.

The IPG was deliberately constructed for ease of use and flexibility of structure in order to adapt to all delivery requirements. It details units of training, unit outcomes and objectives. It does not impose a delivery model or teaching format.

Jurisdictions and/or training providers will select and develop delivery materials and techniques that accommodate a variety of learning styles and delivery patterns. The IPG does not dictate study materials, textbooks or learning activities to be used in delivery.

The IPG document includes a recommended leveling structure to facilitate mobility for apprentices moving from one jurisdiction to another. Because of differences in jurisdictional regulations and program durations, levels are offered as suggestions only.

### Structure

The IPG is divided into units. The unit codes are used as a means of identification and are not intended to convey the order of delivery. Prerequisites have not been detailed. Each unit consists of "Learning Outcomes" and "Objectives and Content".

The "Learning Outcomes" are the specific performances that must be evaluated. Wording of the learning outcomes, "Demonstrate knowledge of...", acknowledges the broad spectrum of ways in which knowledge can be shown. It is at the discretion of each jurisdiction to determine the manner in which learning outcomes are evaluated; theoretically, practically or a combination of both.

## User Guide *(continued)*

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The "Objectives and Content" for the unit details the information to be covered in order to achieve the performances specified in the "Learning Outcomes". These objectives can be either theoretical or practical in nature, based on the requirements identified through the industry consultation process. The learning activities used to cover the objectives are at the discretion of the jurisdiction; however, practically worded objective statements have been used where industry indicated a need for the apprentices to receive exposure to performing the task or skill outlined while attending technical training. For example, this exposure could be done through instructor demonstration or individual or group performance of the skill or task. This practical training will help to reinforce the theoretical component of the technical training.

Detailed content for each objective has not been developed. Where detail is required for clarity, content has been provided. The content listed within the IPG document is **not** intended to represent an inclusive list; rather, it is included to illustrate the intended direction for the objective. Content may be added or extended in jurisdictional training plans as required.

Jurisdictions are free to deliver the IPG units one at a time or concurrently, provided that all "Learning Outcomes" are met. The IPG does not indicate the amount of time to be spent on a particular unit as the length of time required to deliver the "Learning Outcomes" successfully will depend upon the learning activities and teaching methods used.



## **IPG Glossary of Terms**

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These definitions are intended as a guide to how language is used in the IPGs.

<b>ADJUST</b>	To put in good working order; regulate; bring to a proper state or position.
<b>APPLICATION</b>	The use to which something is put and/or the circumstance in which you would use it.
<b>CHARACTERISTIC</b>	A feature that helps to identify, tell apart, or describe recognizably; a distinguishing mark or trait.
<b>COMPONENT</b>	A part that can be separated from or attached to a system; a segment or unit.
<b>DEFINE</b>	To state the meaning of (a word, phrase, etc.).
<b>DESCRIBE</b>	To give a verbal account of; tell about in detail.
<b>EXPLAIN</b>	To make plain or clear; illustrate; rationalize.
<b>IDENTIFY</b>	To point out or name objectives or types.
<b>INTERPRET</b>	To translate information from observation, charts, tables, graphs, and written material.
<b>MAINTAIN</b>	To keep in a condition of good repair or efficiency.
<b>METHOD</b>	A means or manner of doing something that has procedures attached to it.
<b>OPERATE</b>	How an object works; to control or direct the functioning of.
<b>PROCEDURE</b>	A prescribed series of steps taken to accomplish an end.

## **IPG Glossary of Terms** *(continued)*

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<b>PURPOSE</b>	The reason for which something exists or is done, made or used.
<b>TECHNIQUE</b>	Within a procedure, the manner in which technical skills are applied.
<b>TEST</b>	<p>v. To subject to a procedure that ascertains effectiveness, value, proper function, or other quality.</p> <p>n. A way of examining something to determine its characteristics or properties, or to determine whether or not it is working correctly.</p>

## **Essential Skills Profiles**

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Essential Skills are the skills needed for work, learning and life. They provide the foundation for learning all the other skills that enable people to evolve within their jobs and adapt to workplace change.

Over the past several years, the Government of Canada has conducted research examining the skills people use at work. From this research, Essential Skills Profiles have been developed for various occupations.

For more information regarding Essential Skills and to access Essential Skills Profiles for specific occupations, visit Human Resources and Skills Development Canada's Essential Skills website at:

[http://srv108.services.gc.ca/english/general/home\\_e.shtml](http://srv108.services.gc.ca/english/general/home_e.shtml)

## Profile Chart

OCCUPATIONAL SKILLS			
<b>CAR-100</b> Safety	<b>CAR-105</b> Tools and Equipment	<b>CAR-110</b> Rigging and Hoisting	<b>CAR-115</b> Fasteners, Connectors and Adhesives
<b>CAR-120</b> Communication and Trade Documentation	<b>CAR-125</b> Construction Drawings and Specifications	<b>CAR-130</b> Temporary Access Structures	<b>CAR-135</b> Hoarding
<b>CAR-200</b> Building Science Principles	<b>CAR-205</b> Building Envelope	<b>CAR-300</b> Building Science Practices	<b>CAR-140</b> Basic Site Layout
<b>CAR-210</b> Advanced Site Layout	<b>CAR-145</b> Wood Products	<b>CAR-150</b> Non-Wood Products	<b>CAR-445</b> Job Planning
CONCRETE			
<b>CAR-155</b> Concrete	<b>CAR-215</b> Footing, Slab-On-Grade and Grade Beam Forms	<b>CAR-220</b> Wall and Column Forms	<b>CAR-340</b> Stair Forms
<b>CAR-225</b> Pre-Cast Concrete	<b>CAR-335</b> Suspended Slab and Beam Forms		
FRAMING			
<b>CAR-160</b> Beams and Supports	<b>CAR-165</b> Floor Framing	<b>CAR-170</b> Wall and Partition Framing	<b>CAR-230</b> Introduction to Roof and Ceiling Framing
<b>CAR-235</b> Gable Roof Framing	<b>CAR-305</b> Hip Roof Framing	<b>CAR-310</b> Equal Slope Intersecting Roof Framing	<b>CAR-315</b> Special Roof Framing
<b>CAR-435</b> Unequal Slope Roof Framing			

## Profile Chart *(continued)*

EXTERIOR FINISH			
<b>CAR-320</b> Windows	<b>CAR-325</b> Exterior Doors	<b>CAR-240</b> Roof Coverings	<b>CAR-330</b> Exterior Wall Coverings and Trim
INTERIOR FINISH			
<b>CAR-400</b> Flooring	<b>CAR-405</b> Interior Wall Systems	<b>CAR-410</b> Ceilings	<b>CAR-415</b> Interior Doors
<b>CAR-245</b> Straight Stairs	<b>CAR-440</b> Geometric Stairs	<b>CAR-420</b> Cabinets, Countertops and Built-in Units	<b>CAR-425</b> Interior Trim Work
<b>CAR-430</b> Fixtures and Hardware			

## Recommended Level Structure

Level 1			Level 2		
Unit Code	Title	Page	Unit Code	Title	Page
CAR-100	Safety	18	CAR-200	Building Science Principles	42
CAR-105	Tools and Equipment	19	CAR-205	Building Envelope	43
CAR-110	Rigging and Hoisting	21	CAR-210	Advanced Site Layout	45
CAR-115	Fasteners, Connectors and Adhesives	23	CAR-215	Footing, Slab-on-Grade and Grade Beam Forms	46
CAR-120	Communication and Trade Documentation	24	CAR-220	Wall and Column Forms	48
CAR-125	Construction Drawings and Specifications	25	CAR-225	Pre-Cast Concrete	50
CAR-130	Temporary Access Structures	27	CAR-230	Introduction to Roof and Ceiling Framing	51
CAR-135	Hoarding	28	CAR-235	Gable Roof Framing	52
CAR-140	Basic Site Layout	30	CAR-240	Roof Coverings	54
CAR-145	Wood and Wood Products	31	CAR-245	Straight Stairs	56
CAR-150	Non-Wood Products	32			
CAR-155	Concrete	33			
CAR-160	Beams and Supports	35			
CAR-165	Floor Framing	37			
CAR-170	Wall and Partition Framing	39			
Level 3			Level 4		
Unit Code	Title	Page	Unit Code	Title	Page
CAR-300	Building Science Practices	58	CAR-400	Flooring	74
CAR-305	Hip Roof Framing	59	CAR-405	Interior Wall Systems	76
CAR-310	Equal Slope Intersecting Roof Framing	60	CAR-410	Ceilings	78
CAR-315	Special Roof Framing	63	CAR-415	Interior Doors	80
CAR-320	Windows	65	CAR-420	Cabinets, Countertops and Built-in Units	82
CAR-325	Exterior Doors	66	CAR-425	Interior Trim Work	84
CAR-330	Exterior Wall Coverings and Trim	67	CAR-430	Fixtures and Hardware	85
CAR-335	Suspended Slab and Beam Forms	69	CAR-435	Unequal Slope Roof Framing	86
CAR-340	Stair Forms	70	CAR-440	Geometric Stairs	87
			CAR-445	Job Planning	88

## 2005 NOA Sub-Task to IPG Unit Comparison

NOA Sub-task		IPG Unit	
Task 1 - Uses tools and equipment.			
1.01	Uses hand tools.	CAR-105	Tools and Equipment
1.02	Uses portable power tools.	CAR-105	Tools and Equipment
1.03	Uses stationary power tools.	CAR-105	Tools and Equipment
1.04	Uses powder actuated tools.	CAR-105	Tools and Equipment
1.05	Uses pneumatic tools.	CAR-105	Tools and Equipment
1.06	Uses rigging and hoisting equipment.	CAR-110	Rigging and Hoisting
1.07	Uses layout instruments.	CAR-105	Tools and Equipment
1.08	Uses tack welding equipment. (NOT COMMON CORE)		
1.09	Uses torch cutting equipment. (NOT COMMON CORE)		
1.10	Uses personal protective equipment (PPE).	CAR-100	Safety
Task 2 - Uses building materials.			
2.01	Selects materials.	CAR-145	Wood Products
		CAR-150	Non-Wood Products
2.02	Handles materials.	CAR-145	Wood Products
		CAR-150	Non-Wood Products
2.03	Installs fasteners, adhesives and connectors.	CAR-115	Fasteners, Connectors and Adhesives
2.04	Installs membranes and sealants.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-205	Building Envelope
2.05	Installs foundation protection.	CAR-200	Building Science Principles
		CAR-300	Building Science Practices
2.06	Installs insulating materials	CAR-205	Building Envelope
Task 3 - Interprets documentation.			
3.01	Interprets blueprints.	CAR-125	Construction Drawings and Specifications
3.02	Interprets specifications.	CAR-120	Communication and Trade Documentation
3.03	Applies building codes.	CAR-120	Communication and Trade Documentation
3.04	Interprets safety and workplace documentation.	CAR-100	Safety

NOA Sub-task		IPG Unit	
Task 4 - Organizes work.			
4.01	Performs site layout.	CAR-140	Basic Site Layout
		CAR-210	Advanced Site Layout
4.02	Estimates materials.	CAR-125	Construction Drawings and Specifications
		CAR-445	Job Planning
4.03	Communicates with others.	CAR-120	Communication and Trade Documentation
4.04	Schedules work sequence.	CAR-445	Job Planning
4.05	Maintains safe work environment.	CAR-100	Safety
		CAR-140	Basic Site Layout
4.06	Performs site preparation.	CAR-210	Advanced Site Layout
Task 5 - Constructs temporary access structures.			
5.01	Installs scaffolding.	CAR-130	Temporary Access Structures
5.02	Builds ladders, ramps and temporary stairs.	CAR-130	Temporary Access Structures
Task 6 - Constructs formwork.			
6.01	Erects shoring.	CAR-335	Suspended Slab and Beam Forms
6.02	Constructs footing forms.	CAR-215	Footing, Slab-On-Grade and Grade Beam Forms
6.03	Constructs wall and grade beam formwork.	CAR-215	Footing, Slab-On-Grade and Grade Beam Forms
		CAR-220	Wall and Column Forms
6.04	Constructs slab formwork.	CAR-215	Footing, Slab-On-Grade and Grade Beam Forms
		CAR-335	Suspended Slab and Beam Forms
6.05	Constructs column formwork.	CAR-220	Wall and Column Forms
6.06	Constructs stair formwork.	CAR-340	Stair Forms
6.07	Installs embedded steel.	CAR-215	Footing, Slab-On-Grade and Grade Beam Forms
		CAR-220	Wall and Column Forms
		CAR-340	Stair Forms
		CAR-335	Suspended Slab and Beam Forms
6.08	Dismantles/maintains formwork.	CAR-215	Footing, Slab-On-Grade and Grade Beam Forms
		CAR-220	Wall and Column Forms
		CAR-340	Stair Forms
		CAR-335	Suspended Slab and Beam Forms
Task 7 - Places and cures concrete.			
7.01	Places concrete.	CAR-155	Concrete



NOA Sub-task		IPG Unit	
7.02	Cures concrete.	CAR-155	Concrete
7.03	Installs pre-cast components.	CAR-225	Pre-Cast Concrete
7.04	Installs grout.	CAR-225	Pre-Cast Concrete
<b>Task 8 - Performs layout.</b>			
8.01	Lays out floor systems.	CAR-160	Beams and Supports
		CAR-165	Floor Framing
8.02	Lays out wall systems.	CAR-170	Wall and Partition Framing
8.03	Lays out roof and ceiling systems.	CAR-160	Beams and Supports
		CAR-230	Introduction to Roof and Ceiling Framing
		CAR-235	Gable Roof Framing
		CAR-305	Hip Roof Framing
		CAR-310	Equal Slope Intersecting Roof Framing
		CAR-435	Unequal Slope Roof Framing
		CAR-315	Special Roof Framing
<b>Task 9 - Constructs framing systems.</b>			
9.01	Constructs floor systems.	CAR-160	Beams and Supports
		CAR-165	Floor Framing
9.02	Constructs wall systems.	CAR-170	Wall and Partition Framing
9.03	Constructs roof and ceiling systems.	CAR-160	Beams and Supports
		CAR-230	Introduction to Roof and Ceiling Framing
		CAR-235	Gable Roof Framing
		CAR-305	Hip Roof Framing
		CAR-310	Equal Slope Intersecting Roof Framing
		CAR-435	Unequal Slope Roof Framing
		CAR-315	Special Roof Framing
<b>Task 10 - Installs exterior doors and windows.</b>			
10.01	Installs exterior jambs and frames.	CAR-325	Exterior Doors
10.02	Installs exterior doors.	CAR-325	Exterior Doors
10.03	Installs exterior windows.	CAR-320	Windows
10.04	Installs exterior door and window hardware.	CAR-320	Windows
10.04	Installs exterior door and window hardware.	CAR-325	Exterior Doors
<b>Task 11 - Installs roofing.</b>			
11.01	Installs roof coverings.	CAR-240	Roof Coverings
11.02	Installs roofing components.	CAR-240	Roof Coverings

NOA Sub-task		IPG Unit	
Task 12 - Finishes exterior walls and cornices.			
12.01	Installs exterior wall coverings.	CAR-330	Exterior Wall Coverings and Trim
12.02	Installs exterior wall trims.	CAR-330	Exterior Wall Coverings and Trim
Task 13 - Applies wall/ceiling finishes.			
13.01	Installs gypsum coverings.	CAR-405	Interior Wall Systems
13.02	Installs panels and tiles.	CAR-405	Interior Wall Systems
13.03	Installs solid wood finishes.	CAR-405	Interior Wall Systems
13.04	Installs suspended ceilings.	CAR-410	Ceilings
13.05	Installs demountable wall systems.	CAR-405	Interior Wall Systems
Task 14 - Installs flooring.			
14.01	Installs underlayment.	CAR-400	Flooring
14.02	Installs floor coverings.	CAR-400	Flooring
14.03	Installs access flooring.	CAR-400	Flooring
Task 15 - Installs interior doors and windows.			
15.01	Installs interior jambs/frames.	CAR-415	Interior Doors
15.02	Installs interior doors.	CAR-415	Interior Doors
15.03	Installs interior windows.	CAR-320	Windows
15.04	Installs interior door and window hardware.	CAR-320	Windows
		CAR-415	Interior Doors
Task 16 - Constructs stairs.			
16.01	Lays out stairs.	CAR-245	Straight Stairs
		CAR-440	Geometric Stairs
16.02	Constructs straight stairs.	CAR-245	Straight Stairs
16.03	Constructs geometric stairs.	CAR-440	Geometric Stairs
Task 17 - Constructs finish components.			
17.01	Fabricates finish components.	CAR-420	Cabinets, Countertops and Built-in Units
		CAR-425	Interior Trim Work
17.02	Installs finish components/accessories.	CAR-420	Cabinets, Countertops and Built-in Units
		CAR-425	Interior Trim Work
		CAR-430	Fixtures and Hardware

# **LEVEL 1**

## **CAR-100**

## **Safety**

### **Learning Outcomes:**

- Demonstrate knowledge of safety equipment, its applications and procedures for use.
- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulations pertaining to safety.

### **Objectives and Content:**

1. Identify types of personal protective equipment (PPE) and describe their applications.
  - i) clothing
  - ii) equipment
2. Describe the procedures for care and maintenance of PPE.
3. Inspect, maintain and use PPE.
4. Identify hazards and describe safe work practices and equipment.
  - i) personal
    - lifting
  - ii) workplace
    - electrical
    - confined space (awareness of)
    - fire
    - fall protection
    - trenching and excavation (awareness of)
    - hazardous materials
    - lockout/tag out
  - iii) environmental
5. Identify and interpret workplace safety and health regulations.
  - i) federal
    - WHMIS/MSDS
  - ii) provincial/territorial

## **CAR-105                      Tools and Equipment**

### **Learning Outcomes:**

- Demonstrate knowledge of hand and power tools, their applications, maintenance and procedures for use.
- Demonstrate knowledge of powder actuated tools and their applications.
- Demonstrate knowledge of measuring and layout tools and equipment, their applications, maintenance and procedures for use.

### **Objectives and Content:**

1. Interpret regulations pertaining to tools and equipment.
  - i) hand and power
  - ii) powder actuated
2. Identify types of hand tools and describe their applications and procedures for use.
3. Describe the procedures used to inspect and maintain hand tools.
4. Select, inspect, maintain and use hand tools.
5. Identify types of power tools and equipment and describe their applications and procedures for use.
  - i) electric/battery
  - ii) pneumatic
  - iii) fuel
6. Describe the procedures used to inspect and maintain power tools and equipment.
7. Select, inspect, maintain and operate power tools and equipment.
8. Identify types of powder actuated tools and describe their applications.
9. Identify types of measuring and layout tools and equipment and describe their applications and procedures for use.

10. Describe the procedures used to inspect and maintain measuring and layout tools and equipment.
11. Select, inspect, maintain and use measuring and layout tools and equipment.

## **CAR-110**

## **Rigging and Hoisting**

### **Learning Outcomes:**

- Demonstrate knowledge of rigging and hoisting equipment, their applications, limitations and procedures for use.
- Demonstrate knowledge of knots, hitches and bends.
- Demonstrate knowledge of the procedures to communicate during rigging and hoisting operations.

### **Objectives and Content:**

1. Define terminology associated with rigging and hoisting.
2. Identify hazards and describe safe work practices pertaining to rigging and hoisting.
3. Interpret regulations pertaining to rigging and hoisting.
4. Identify types of rigging equipment and accessories and describe their applications, limitations and procedures for use.
5. Identify types of hoisting equipment and accessories and describe their applications, limitations and procedures for use.
6. Describe the procedures used to inspect, maintain and store rigging and hoisting equipment.
7. Identify types of knots, hitches and bends and describe their applications and associated procedures.
8. Describe the procedures used to rig material/equipment for hoisting.
9. Identify the methods of communication used during rigging and hoisting operations and describe their associated procedures.
  - i) hand signals
  - ii) electronic communications
    - audible
    - visual

10. Perform hand signals associated with basic rigging and hoisting operations.



## **CAR-115                      Fasteners, Connectors and Adhesives**

### **Learning Outcomes:**

- Demonstrate knowledge of fasteners, connectors and adhesives, their applications and procedures for use.

### **Objectives and Content:**

1. Define terminology associated with fasteners, connectors and adhesives.
2. Identify hazards and describe safe work practices pertaining to fasteners, connectors and adhesives.
3. Identify tools and equipment used to remove and install fasteners, connectors and adhesives and describe their applications and procedures for use.
4. Interpret codes and specifications pertaining to the use of fasteners, connectors and adhesives.
5. Identify types of fasteners and connectors and describe their characteristics and applications.
  - i) threaded fasteners
  - ii) non-threaded fasteners
  - iii) anchors
  - iv) hangers/tie downs
6. Describe the procedures used to install and remove fasteners and connectors.
7. Install and remove fasteners and connectors.
8. Identify types of adhesives and describe their characteristics and applications.
9. Describe the procedures used to apply and remove adhesives.

**Learning Outcomes:**

- Demonstrate knowledge of effective communication practices.
- Demonstrate knowledge of trade related documentation and its use.

**Objectives and Content:**

1. Describe the importance of effective verbal and non-verbal communication.
  - i) other tradespersons
  - ii) colleagues
  - iii) supervisors
  - iv) clients
2. Identify types of trade related documentation and describe their applications and procedures for use.
  - i) manufacturers' specifications
  - ii) codes and standards
    - National Building Code (NBC)
    - provincial/municipal codes
    - Canadian Standards Association (CSA)
  - iii) energy efficiency guides
  - iv) safety manuals
  - v) permits

**Learning Outcomes:**

- Demonstrate knowledge of construction drawings and specifications.
- Demonstrate knowledge of basic sketching techniques.

**Objectives and Content:**

1. Define terminology associated with drawings and sketches.
2. Describe metric and imperial systems of measurement.
3. Perform conversions.
  - i) metric to imperial
  - ii) imperial to metric
  - iii) fractions to decimals
  - iv) decimals to fractions
4. Identify types of drawings and describe their applications.
  - i) site/plot/civil
  - ii) architectural
  - iii) mechanical
  - iv) structural
  - v) electrical
  - vi) shop drawings
  - vii) sketches
5. Identify drawing related documentation and describe their applications.
  - i) change orders
  - ii) addendums
  - iii) as-builts
  - iv) specifications
6. Identify drawing projections and views and describe their applications.
  - i) projections
    - orthographic
    - oblique
    - isometric

- ii) views
  - plan
  - section
  - detail
  - elevation
  - cross section
- 7. Interpret information on drawings.
  - i) lines
  - ii) legend
  - iii) symbols and abbreviations
  - iv) notes and specifications
  - v) schedules
  - vi) scales
- 8. Demonstrate basic sketching techniques.

**Learning Outcomes:**

- Demonstrate knowledge of temporary access structures, their applications and procedures for use.
- Demonstrate knowledge of the procedures to construct, install and secure temporary access structures.

**Objectives and Content:**

1. Define terminology associated with temporary access structures.
2. Identify hazards and describe safe work practices pertaining to temporary access structures.
3. Interpret codes and regulations pertaining to temporary access structures.
4. Identify types of temporary access structures and describe their applications.
  - i) scaffolding
  - ii) ladders
  - iii) ramps
  - iv) temporary stairs
5. Identify materials used to construct temporary access structures.
6. Describe the procedures used to construct temporary access structures.
7. Describe considerations for installing and securing temporary access structures.
  - i) code and regulatory requirements
  - ii) site conditions
  - iii) manufacturers' specifications and instructions
8. Describe the procedures used to install and secure temporary access structures.
9. Install and secure temporary access structures.
10. Describe the procedures used to inspect and maintain temporary access structures.

11. Identify methods of access control.
  - i) hand and guard rails

## **CAR-135            Hoarding**

### **Learning Outcomes:**

- Demonstrate knowledge of hoardings, their purpose and applications.
- Demonstrate knowledge of the procedures used to construct and dismantle hoardings.

### **Objectives and Content:**

1. Define terminology associated with hoarding.
2. Identify hazards and describe safe work practices pertaining to hoarding.
3. Interpret codes, regulations and specifications pertaining to hoarding.
  - i) ventilation
  - ii) temperature regulation
  - iii) moisture regulation
4. Identify types of hoarding and describe their purpose and applications.
  - i) environmental
  - ii) containment
5. Identify equipment and materials used to construct hoardings and describe their characteristics and applications.
6. Describe the procedures used to construct and dismantle hoardings.

## **CAR-140**

## **Basic Site Layout**

### **Learning Outcomes:**

- Demonstrate knowledge of site layout equipment, its applications and procedures for use.
- Demonstrate knowledge of the procedures used to determine elevations using site layout equipment.

### **Objectives and Content:**

1. Define terminology associated with site layout.
2. Identify hazards and describe safe work practices pertaining to site layout.
3. Identify tools and equipment used to perform basic site layout and describe their applications and procedures for use.
  - i) string lines
  - ii) levels
4. Interpret codes and regulations pertaining to site layout.
5. Interpret information pertaining to basic site layout found on drawings and specifications.
6. Describe the procedures used to perform basic site layout.
  - i) 3-4-5 method (Pythagorean Theorem)
  - ii) diagonal
7. Perform calculations pertaining to basic site layout.
  - i) elevations
8. Use site layout equipment to determine elevations.



**Learning Outcomes:**

- Demonstrate knowledge of wood and wood products, their characteristics and applications.
- Demonstrate knowledge of the procedures to handle and store wood and wood products.

**Objectives and Content:**

1. Define terminology associated with wood and wood products.
2. Identify hazards and describe safe work practices pertaining to handling wood products.
3. Identify types of wood and describe their characteristics and applications.
  - i) hardwoods
  - ii) softwoods
4. Describe the wood processing process.
  - i) sawing
  - ii) seasoning/drying
  - iii) dressing/planing
  - iv) grading
  - v) treating
5. Identify types of wood products and describe their characteristics and applications.
  - i) lumber
  - ii) panels
  - iii) engineered lumber
6. Describe the procedures used to select, handle and store wood products.

**Learning Outcomes:**

- Demonstrate knowledge of non-wood products, their characteristics and applications.
- Demonstrate knowledge of the procedures used to handle and store non-wood products.

**Objectives and Content:**

1. Define terminology associated with non-wood products.
2. Identify hazards and describe safe work practices pertaining handling non-wood products.
3. Identify types of non-wood products and describe their characteristics and applications.
  - i) composite
  - ii) metal
  - iii) plastic
  - iv) glass
  - v) polystyrene
  - vi) ceramic
4. Describe the procedures used to select, handle and store non-wood products.

## **CAR-155            Concrete**

### **Learning Outcomes:**

- Demonstrate knowledge of concrete products, their characteristics and applications.
- Demonstrate knowledge of concrete tests and their associated procedures.
- Demonstrate knowledge of the procedures used to place, finish and cure concrete.

### **Objectives and Content:**

1. Define terminology associated with concrete.
2. Identify hazards and describe safe work practices pertaining to concrete.
3. Interpret codes and regulations pertaining to concrete.
4. Interpret information pertaining to concrete found on drawings and specifications.
5. Identify tools and equipment used to test, place, and finish concrete and describe their applications and procedures for use.
6. Identify concrete structures and describe their characteristics and applications.
  - i) cast-in-place
    - footings
    - slabs
    - beams
    - walls and columns
    - piers
    - stairs
  - ii) pre-cast
    - piles
7. Describe the effects of water/cement ratio on concrete.
8. Describe the effects of aggregate size on concrete.

9. Identify additives/admixtures used in concrete and describe their purpose and applications.
10. Identify types of concrete tests and describe their associated procedures.
  - i) slump
  - ii) air entrainment
  - iii) compression
11. Describe the procedures used to place, consolidate and finish concrete.
12. Describe the procedures used to cure concrete.
  - i) cold weather
  - ii) hot weather

## **CAR-160                      Beams and Supports**

### **Learning Outcomes:**

- Demonstrate knowledge of beams and supports, their characteristics and applications.
- Demonstrate knowledge of the procedures used to construct and install beams and supports.

### **Objectives and Content:**

1. Define terminology associated with beams and supports.
2. Identify hazards and describe safe work practices pertaining to beams and supports.
3. Identify tools and equipment used to construct and install beams and supports and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the construction and installation of beams and supports.
5. Interpret information pertaining to beams and supports found on drawings and specifications.
6. Identify types of beams and describe their characteristics and applications.
  - i) built-up
  - ii) engineered
  - iii) steel
7. Identify types of beam supports and describe their characteristics and applications.
8. Identify fastening methods used to install beams and supports and describe their associated procedures.
9. Identify considerations for determining beam design.
10. Describe the procedures used to construct built-up beams.

11. Describe the procedures used to install beams and supports.

## **CAR-165              Floor Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of types of floor framing, their characteristics and applications.
- Demonstrate knowledge of floor framing components and materials.
- Demonstrate knowledge of the procedures used to layout and assemble floor systems.

### **Objectives and Content:**

1. Define terminology associated with floor systems and framing.
2. Identify hazards and describe safe work practices pertaining to floor systems and framing.
3. Identify tools and equipment used to frame and install floor systems and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to floor systems and framing.
5. Interpret information pertaining to floors found on drawings and specifications.
6. Identify types of floors and describe their characteristics and applications.
  - i) framed
    - balloon framing
    - platform framing
7. Identify floor components and accessories and describe their purpose and applications.
8. Identify considerations for selecting floor framing and sheathing materials.
9. Describe the procedures used to anchor floor systems.
10. Describe the procedures used to layout and assemble floor systems.
  - i) layout joist locations/openings
  - ii) select and cut floor frame members

11. Layout a floor structure.
12. Identify construction techniques pertaining to floor framing.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings
13. Calculate materials.
  - i) framing components
  - ii) sheathing



## **CAR-170**

## **Wall and Partition Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of wall and partition framing components and materials.
- Demonstrate knowledge of the procedures used to layout and frame walls and partitions.

### **Objectives and Content:**

1. Define terminology associated with wall and partition framing.
2. Identify hazards and describe safe work practices pertaining to wall and partition framing.
3. Identify tools and equipment used to frame walls and partitions and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to wall and partition framing.
5. Interpret information pertaining to walls and partitions found on drawings and specifications.
6. Identify the types of walls and partitions and describe their characteristics and applications.
  - i) load bearing
  - ii) non-load bearing
7. Identify wall and partition framing components and accessories and describe their purpose and applications.
8. Identify considerations for selecting wall and partition materials.
9. Describe the procedures used to layout and frame walls and partitions.
  - i) calculate layout dimensions
    - length
    - height
    - location of openings

- size of openings
  - ii) layout stud locations/openings
  - iii) select and cut wall/partition frame members
  - iv) assemble walls/partitions
10. Layout walls and partitions.
11. Describe the procedures used to erect walls and partitions.
12. Identify construction techniques pertaining to wall and partition framing.
- i) energy efficiency
  - ii) sound reduction
  - iii) fire rating
  - iv) structural load
13. Describe preserved wood foundations, their characteristics and applications.
14. Calculate materials.
- i) framing components
  - ii) sheathing

## **LEVEL 2**

**Learning Outcomes:**

- Demonstrate knowledge of building science principles and their impact on buildings.

**Objectives and Content:**

1. Define terminology associated with building science principles.
2. Explain heat flow principles and their impact on buildings.
  - i) conduction
  - ii) convection
  - iii) radiation
3. Explain the impact of air leakage on heat flow in buildings.
4. Explain the principles of natural and mechanical airflow and their impact on buildings.
5. Explain the principles of moisture flow and their impact on buildings.
  - i) moisture movement
    - gravity
    - capillary action
    - airflow
    - diffusion
  - ii) sources of moisture
    - relative humidity
  - iii) effects of moisture
  - iv) dew point
6. Explain the principles of sound transmission and their impact on buildings.
  - i) sound management mechanisms
  - ii) potential sources of noise
7. Identify types of foundation drainage systems and describe their characteristics and applications.

**Learning Outcomes:**

- Demonstrate knowledge of building envelopes and their applications.
- Demonstrate knowledge of the procedures used to install building envelopes.

**Objectives and Content:**

1. Define terminology associated with building envelope.
2. Identify hazards and describe safe work practices pertaining to building envelope.
  - i) personal
  - ii) site
3. Interpret codes and regulations pertaining to building envelope.
4. Interpret information pertaining to building envelope found on drawings and specifications.
5. Identify types of membranes and describe their purpose and applications.
  - i) vapour barriers
  - ii) waterproofing/damp-proofing barriers
  - iii) air/weather barriers
6. Identify types of sealants and describe their characteristics and applications.
7. Describe the procedures used to select and install membranes.
  - i) foundation
  - ii) floors
  - iii) walls
  - iv) ceilings
  - v) penetrations
8. Select and install membranes.

9. Identify types of insulating materials and describe their characteristics and applications.
  - i) batt
  - ii) rigid
  - iii) loose
  - iv) foam
  - v) foamed in place
  - vi) foil faced
10. Describe the procedures used to select and install insulating materials.
  - i) foundation
    - interior
    - exterior
  - ii) floors
  - iii) walls
  - iv) ceilings
11. Select and install insulating materials.
12. Calculate materials.

## **CAR-210            Advanced Site Layout**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to layout building lines.

### **Objectives and Content:**

1.       Perform calculations pertaining to advanced site layout.
  - i)       offsets
  - ii)      angles
  - iii)     building lines
2.       Describe the procedures used to perform advanced site layout.
  - i)       establish offsets
  - ii)      determine corners
  - iii)     layout building lines.
3.       Use site layout equipment to layout building lines.

**Learning Outcomes:**

- Demonstrate knowledge of footing, slab-on-grade and grade beam forms, their characteristics and applications.
- Demonstrate knowledge of the procedures used to construct and dismantle footing, slab-on-grade and grade beam forms.

**Objectives and Content:**

1. Define terminology associated with footing, slab-on-grade and grade beam forms.
2. Identify hazards and describe safe work practices pertaining to footing, slab-on-grade and grade beam forms.
3. Identify tools and equipment used to construct footing, slab-on-grade and grade beam forms and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the construction of footings, slab-on-grade and grade beams.
5. Interpret information pertaining to footing, slab-on-grade and grade beam forms found on drawings and specifications.
6. Identify types of footings, slab-on-grade and grade beam forms and describe their characteristics and applications.
7. Identify form materials and accessories used to construct footings, slab-on-grade and grade beam forms.
8. Describe the procedures used to prepare the site for construction of footings, slab-on-grade and grade beams.
9. Identify types of piles and describe their characteristics and applications.
10. Identify types of piers and describe their characteristics and applications.



11. Describe the procedures used to construct footing, slab-on-grade and grade beam forms.
12. Identify types of embedded materials and describe their characteristics and applications.
  - i) rebar
  - ii) anchor bolts
  - iii) mesh
13. Describe the procedures used to place embedded materials.
14. Describe the procedures and products used to dismantle and recondition forms.
15. Calculate materials.
  - i) form materials
  - ii) reinforcing materials
  - iii) concrete

**Learning Outcomes:**

- Demonstrate knowledge of wall and column forms, their characteristics and applications.
- Demonstrate knowledge of the procedures used to construct and dismantle wall and column forms.

**Objectives and Content:**

1. Define terminology associated with wall and column forms.
2. Identify hazards and describe safe work practices pertaining to wall and column forms.
3. Identify tools and equipment used to construct wall and column forms and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the construction of wall and column forms.
5. Interpret information pertaining to wall and column forms found on drawings and specifications.
6. Identify types of wall and column form systems and accessories and describe their characteristics and applications.
  - i) loose forming/panel forming
    - wood
    - steel
    - aluminum
    - fiberglass
  - ii) insulated concrete forms (ICF)
  - iii) gang forms
  - iv) slip forms/self-jacking forms
7. Describe the procedures used to construct wall and column forms.

8. Identify types of embedded materials and describe their characteristics and applications.
  - i) rebar
  - ii) anchor bolts
  - iii) metal inserts
9. Describe the procedures used to place embedded materials.
10. Describe the procedures and products used to dismantle and recondition forms.
11. Calculate materials.
  - i) form materials
  - ii) reinforcing materials
  - iii) concrete

**Learning Outcomes:**

- Demonstrate knowledge of pre-cast concrete components.
- Demonstrate knowledge of the procedures used to cast and install pre-cast concrete components.

**Objectives and Content:**

1. Define terminology associated with pre-cast concrete.
2. Identify hazards and describe safe work practices pertaining to pre-cast concrete
3. Identify tools and equipment used to install pre-cast concrete and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the installation of pre-cast concrete.
5. Interpret information pertaining to pre-cast concrete found on drawings and specifications.
6. Identify pre-cast concrete components and describe their characteristics and applications.
7. Describe the procedures used to cast and install pre-cast concrete components.

**Learning Outcomes:**

- Demonstrate knowledge of roof types, their characteristics and applications.
- Demonstrate knowledge of roof and ceiling framing components and materials.

**Objectives and Content:**

1. Define terminology associated with roof and ceiling framing.
2. Identify hazards and describe safe work practices pertaining to roof and ceiling framing.
3. Identify tools and equipment used to construct roof and ceiling framing and describe their applications and procedures for use.
4. Identify types of roofs and describe their characteristics and applications.
  - i) gable
  - ii) hip
  - iii) flat
  - iv) intersecting (equal and unequal slope)
  - v) shed
5. Identify roof and ceiling framing components and describe their characteristics and applications.
6. Explain the relationship between roof slope, pitch and ratio and their application in determining roof dimensions.
7. Identify construction techniques pertaining to roof and ceiling framing.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings

## **CAR-235                      Gable Roof Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to frame gable roofs.

### **Objectives and Content:**

1. Define terminology associated with gable roofs.
2. Interpret codes and regulations pertaining to gable roof framing.
3. Interpret information pertaining to gable roofs found on drawings and specifications.
4. Identify materials used in the construction of gable roofs.
5. Identify gable roof framing components/members and describe their characteristics and applications.
  - i) collar ties
  - ii) ceiling joists
  - iii) rafters
6. Identify the methods used to calculate rafter line length in gable roofs.
  - i) theoretical line length
  - ii) actual line length
7. Calculate dimensions associated with gable roof layout.
  - i) rafter length
  - ii) ridge length
  - iii) collar tie length
  - iv) rise
  - v) projection
  - vi) overhang
  - vii) cornice
8. Describe the procedures used to layout gable roofs.
9. Describe the procedures used to assemble and install gable roofs.

- i) rafter
  - ii) truss
10. Layout and assemble a gable roof.
11. Calculate materials.
- i) framing components
  - ii) sheathing

**Learning Outcomes:**

- Demonstrate knowledge of roof coverings, their characteristics and applications.
- Demonstrate knowledge of roofing accessories, their characteristics and applications.
- Demonstrate knowledge of the procedures used to remove and install roof coverings and roofing accessories.

**Objectives and Content:**

1. Define terminology associated with roof coverings.
2. Identify hazards and describe safe work practices pertaining to roof coverings.
3. Identify tools and equipment used to remove and install roof coverings and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to roof coverings.
5. Interpret information pertaining to roof coverings found on drawings and specifications.
6. Identify types of roof coverings and describe their characteristics and applications.
7. Identify roofing accessories and describe their characteristics and applications.
8. Identify types of eave protection and describe their characteristics and applications.
9. Describe the procedures used to install eave protection.
10. Describe the procedures used to remove and install roof coverings and accessories.
11. Calculate materials.
  - i) roof coverings



ii) roofing accessories

## **CAR-245              Straight Stairs**

### **Learning Outcomes:**

- Demonstrate knowledge of straight stairs, their characteristics and applications.
- Demonstrate knowledge of the procedure used to layout, construct and install straight stairs.

### **Objectives and Content:**

1. Define terminology associated with straight stairs.
2. Identify hazards and describe safe work practices pertaining to straight stairs.
3. Identify tools and equipment used to layout and construct straight stairs and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to straight stairs.
5. Interpret information pertaining to straight stairs found on drawings and specifications.
6. Identify types of straight stairs and describe their characteristics and applications.
  - i) straight stairs
  - ii) platform stairs
7. Identify straight stair components and describe their characteristics and applications.
8. Calculate straight stair dimensions.
9. Describe the procedures used to layout, construct and install straight stairs and their components.
10. Layout and construct straight stairs.

## **LEVEL 3**

## **CAR-300                      Building Science Practices**

### **Learning Outcomes:**

- Demonstrate knowledge of building science practices and their impact on buildings.

### **Objectives and Content:**

1. Interpret codes and specifications pertaining to building science principles.
2. Identify energy efficient construction techniques and considerations and describe their impact on the building as a system.
  - i) thermal mass
  - ii) building orientation
  - iii) passive solar
  - iv) framing/insulating
3. Identify the methods used to control air leakage and heat flow in buildings.
4. Identify the methods used to control airflow in buildings.
5. Identify the methods used to control moisture flow in buildings.
6. Identify the methods used to control sound transmission in buildings.
7. Identify methods, products and ideas which help to contribute to an environmentally responsible and sustainable building.
  - i) recycled/recyclable materials
  - ii) reducing carbon footprint
  - iii) water conservation
  - iv) renewable resources
8. Describe the procedures used to install foundation drainage systems.

## **CAR-305              Hip Roof Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to frame hip roofs.

### **Objectives and Content:**

1. Define terminology associated with hip roofs.
2. Interpret codes and regulations pertaining to hip roof framing.
3. Interpret information pertaining to hip roof framing found on drawings and specifications.
4. Identify materials used in the construction of hip roofs.
5. Identify hip roof framing components and describe their characteristics and applications.
  - i) ceiling joists
  - ii) collar ties
  - iii) rafters
6. Calculate dimensions associated with hip roof layout.
  - i) rafter length
  - ii) ridge length
  - iii) rise
  - iv) projection
  - v) overhang
  - vi) cornice
7. Describe the procedures used to layout hip roofs.
  - i) framing components
  - ii) sheathing
8. Describe the procedures used to assemble and install hip roofs.
  - i) rafter
  - ii) truss

9. Layout and assemble a hip roof.
10. Calculate materials.
  - i) framing components
  - ii) sheathing

## **CAR-310**

## **Equal Slope Intersecting Roof Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to frame equal slope intersecting roofs.

### **Objectives and Content:**

1. Define terminology associated with equal slope intersecting roofs.
2. Interpret codes and regulations pertaining to equal slope intersecting roof framing.
3. Interpret information pertaining to equal slope intersecting roofs found on drawings and specifications.
4. Identify materials used in the construction of equal slope intersecting roofs.
5. Identify equal slope intersecting roof framing components and describe their characteristics and applications.
  - i) ceiling joists
  - ii) collar ties
  - iii) rafters
6. Calculate dimensions associated with equal slope intersecting roof layout.
  - i) rafter length
  - ii) ridge length
  - iii) rise
  - iv) projection
  - v) overhang
  - vi) cornice
7. Describe the procedures used to layout equal slope intersecting roofs.
8. Describe the procedures used to assemble and install equal slope intersecting roofs.
9. Layout and assemble an equal slope intersecting roof.

10. Calculate materials.
- i) framing components
  - ii) sheathing



## **CAR-315              Special Roof Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to frame special roofs.

### **Objectives and Content:**

1. Define terminology associated with special roofs.
2. Interpret codes and regulations pertaining to special roof framing.
3. Interpret information pertaining to special roofs found on drawings and specifications.
4. Identify types of special roofs and describe their characteristics and applications.
  - i) gambrel
  - ii) mansard
  - iii) octagon
  - iv) flat
5. Identify materials used in the construction of special roofs.
6. Identify special roof framing components and describe their characteristics and applications.
  - i) rafter
  - ii) truss
7. Calculate dimensions associated with special roof layout.
  - i) rafter length
  - ii) ridge length
  - iii) rise
  - iv) projection
  - v) overhang
  - vi) cornice
8. Describe the procedures used to layout special roofs.
9. Describe the procedures used to assemble and install special roofs.

10. Calculate materials.
- i) framing components
  - ii) sheathing

**Learning Outcomes:**

- Demonstrate knowledge of windows and their components.
- Demonstrate knowledge of the procedures used to install windows and their components.

**Objectives and Content:**

1. Define terminology associated with windows.
2. Identify hazards and describe safe work practices pertaining to windows.
3. Identify tools and equipment used to remove and install windows and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to windows.
5. Interpret information pertaining to windows found on drawings and specifications.
6. Identify types of windows and describe their characteristics and applications.
7. Identify window components and describe their purpose.
8. Describe the procedures used to remove and install windows and their components.
9. Identify construction techniques pertaining to window installation.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings
  - iv) security/safety
10. Install a window.

**Learning Outcomes:**

- Demonstrate knowledge of exterior doors and their components.
- Demonstrate knowledge of the procedures used to install exterior doors and their components.

**Objectives and Content:**

1. Define terminology associated with exterior doors.
2. Identify hazards and describe safe work practices pertaining to exterior doors.
3. Identify tools and equipment used to remove and install exterior doors and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to exterior doors.
5. Interpret information pertaining to exterior doors found on drawings and specifications.
6. Identify types of exterior doors and frames and describe their characteristics and applications.
7. Identify exterior door hardware and components and describe their purpose.
8. Describe the procedures used to remove and install exterior doors and frames, their hardware and components.
9. Identify construction techniques pertaining to exterior door installation.
  - i) energy efficiency
  - ii) sound transmission
  - iii) fire rating
  - iv) security/safety

## **CAR-330**

## **Exterior Wall Coverings and Trim**

### **Learning Outcomes:**

- Demonstrate knowledge of exterior wall coverings and trim, their characteristics and applications.
- Demonstrate knowledge of the procedures used to remove and install exterior wall coverings and trim.

### **Objectives and Content:**

1. Define terminology associated with exterior wall coverings and trim.
2. Identify hazards and describe safe work practices pertaining to exterior wall coverings and trim.
3. Identify tools and equipment used to remove and install exterior wall coverings and trim and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to exterior wall coverings and trim.
5. Interpret information pertaining to exterior wall coverings and trim found on drawings and specifications.
6. Explain the effect of weather on exterior wall coverings and trim.
7. Identify the methods used to protect against water penetration and describe their associated procedures.
8. Install flashing.
9. Identify types of exterior wall coverings and describe their characteristics and applications.
10. Identify types of exterior trim and accessories and describe their characteristics and applications.
  - i) soffit
  - ii) fascia

11. Identify the methods of rain screening and describe their characteristics and applications.
12. Describe the procedures used to install rain screen.
13. Describe the procedures used to remove and install exterior wall coverings.
14. Describe the procedures used to remove and install exterior trim and accessories.
15. Identify construction techniques pertaining to the installation of exterior wall coverings and trim.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings
16. Calculate materials.
  - i) exterior wall coverings
  - ii) exterior trim
  - iii) accessories

**Learning Outcomes:**

- Demonstrate knowledge of suspended slab and beam forms, their characteristics and applications.
- Demonstrate knowledge of the procedures used to construct and dismantle suspended slab and beam forms.

**Objectives and Content:**

1. Define terminology associated with suspended slab and beam forms.
2. Identify hazards and describe safe work practices pertaining to suspended slab and beam forms.
3. Identify tools and equipment used to construct suspended slab and beam forms and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the construction of suspended slab and beam forms.
5. Interpret information pertaining to suspended slabs and beams found on drawings and specifications.
6. Identify types of suspended slab and beam forms and accessories and describe their characteristics and applications.
7. Describe the procedures used to construct suspended slab and beam forms.
8. Describe the procedures and products used to dismantle and recondition forms.
9. Describe the procedures used to shore suspended slabs and beams.
10. Calculate materials.
  - i) form materials
  - ii) reinforcing materials
  - iii) concrete

**Learning Outcomes:**

- Demonstrate knowledge of stair forms, their characteristics and applications.
- Demonstrate knowledge of the procedures used to construct and dismantle stair forms.

**Objectives and Content:**

1. Define terminology associated with stair forms.
2. Identify hazards and describe safe work practices pertaining to stair forms.
3. Identify tools and equipment used to construct stair forms and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to the construction of stair forms.
5. Interpret information pertaining to stair forms found on drawings and specifications.
6. Identify types of concrete stairs and describe their characteristics and applications.
7. Identify concrete stair components and accessories and describe their purpose and applications.
8. Identify form materials and accessories used to construct stair forms.
9. Describe the procedures used to construct stair forms.
10. Identify types of embedded materials and describe their characteristics and applications.
  - i) rebar
  - ii) anchor bolts
  - iii) metal inserts
11. Describe the procedures used to place embedded materials.



12. Describe the procedures and products used to dismantle and recondition forms.
13. Calculate materials.
  - i) form materials
  - ii) reinforcing materials
  - iii) concrete



## **LEVEL 4**

## **CAR-400            Flooring**

### **Learning Outcomes:**

- Demonstrate knowledge of flooring and accessories, their characteristics and applications.
- Demonstrate knowledge of the procedures used to remove and install flooring.

### **Objectives and Content:**

1. Define terminology associated with flooring.
2. Identify hazards and describe safe work practices pertaining to flooring.
3. Identify tools and equipment used to remove and install flooring and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to flooring.
5. Interpret information pertaining to flooring found on drawings and specifications.
6. Identify types of flooring and describe their characteristics and applications.
  - i) floor coverings and surfaces
  - ii) access flooring
7. Identify flooring accessories and describe their characteristics and applications.
8. Calculate dimensions associated with flooring layout.
9. Describe the procedures used to prepare floor surface for flooring installation.
10. Describe the procedures used to remove and install flooring and accessories.
11. Identify construction techniques pertaining to the installation of floor coverings.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings

12. Calculate materials.
- i) flooring materials
  - ii) accessories

## **CAR-405            Interior Wall Systems**

### **Learning Outcomes:**

- Demonstrate knowledge of interior wall systems, their characteristics and applications.
- Demonstrate knowledge of the procedures used to remove and install interior wall systems.

### **Objectives and Content:**

1. Define terminology associated with interior wall systems.
2. Identify hazards and describe safe work practices pertaining to interior wall systems.
3. Identify tools and equipment used to remove and install interior wall systems and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to interior wall systems.
5. Interpret information pertaining to interior wall systems found on drawings and specifications.
6. Identify types of interior wall systems and describe their characteristics and applications.
  - i) gypsum
  - ii) non-gypsum
  - iii) demountable
  - iv) operable
7. Identify interior wall system accessories and describe their characteristics and applications.
8. Calculate dimensions associated with interior wall system layout.
9. Describe the procedures used to remove and install gypsum wall systems.
10. Describe the procedures used to remove and install non-gypsum wall systems.

11. Install interior wall systems.
12. Identify construction techniques pertaining to the installation of interior wall systems.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire ratings
13. Calculate materials.

## **CAR-410            Ceilings**

### **Learning Outcomes:**

- Demonstrate knowledge of ceilings, their components and accessories.
- Demonstrate knowledge of the procedures used to remove and install ceilings.

### **Objectives and Content:**

1. Define terminology associated with ceilings.
2. Identify hazards and describe safe work practices pertaining to ceilings.
3. Identify tools and equipment used to remove and install ceilings and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to ceilings.
5. Interpret information pertaining to ceilings found on drawings and specifications.
6. Identify types of ceilings and describe their characteristics and applications.
  - i) suspended
  - ii) non-suspended
  - iii) drop
7. Identify ceiling components and accessories and describe their characteristics and applications.
8. Describe the characteristics and applications of bulkheads.
9. Calculate dimensions associated with ceiling layout.
10. Describe the procedures used to remove, layout and install suspended ceilings.
11. Describe the procedures used to remove, layout and install non-suspended ceilings.



12. Describe the procedures used to remove, layout and install drop ceilings and bulkheads.
13. Identify construction techniques pertaining to the installation of ceilings.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire rating
14. Calculate materials.

## **CAR-415            Interior Doors**

### **Learning Outcomes:**

- Demonstrate knowledge of interior doors and accessories, their characteristics and applications.
- Demonstrate knowledge of the procedures used to remove and install interior doors and accessories.

### **Objectives and Content:**

1. Define terminology associated with interior doors.
2. Identify hazards and describe safe work practices pertaining to interior doors.
3. Identify tools and equipment used to remove and install interior doors and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to interior doors.
5. Interpret information pertaining to interior doors found on drawings and specifications.
6. Identify types of door jambs and frames and describe their characteristics and applications.
7. Identify types of interior doors and describe their characteristics and applications.
8. Identify interior door hardware and components and describe their characteristics and applications.
9. Describe the procedures used to remove and install interior door jambs and frames.
10. Describe the procedures used to remove, install and adjust interior doors, their hardware and components.

11. Install and adjust an interior door.
12. Identify construction techniques pertaining to the installation of interior doors, their hardware and components.
  - i) energy efficiency
  - ii) sound reduction
  - iii) fire rating
  - iv) security/safety
13. Calculate materials.

## **CAR-420**

## **Cabinets, Countertops and Built-in Units**

### **Learning Outcomes:**

- Demonstrate knowledge of cabinets, countertops and built-in units, their characteristics and applications.
- Demonstrate knowledge of the procedures used to layout, construct and install cabinets, countertops and built-in units.

### **Objectives and Content:**

1. Define terminology associated with cabinets, countertops and built-in units.
2. Identify hazards and describe safe work practices pertaining to cabinets, countertops and built-in units.
3. Identify tools and equipment used to construct and install cabinets, countertops and built-in units and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to cabinets, countertops and built-in units.
5. Interpret information pertaining to cabinets, countertops and built-in units found on drawings and specifications.
6. Identify types of cabinets and built-in units and describe their characteristics and applications.
7. Identify cabinet and built-in unit hardware and components and describe their characteristics and applications.
8. Identify types of countertops and describe their characteristics and applications.
9. Calculate dimensions associated with cabinet and built-in unit layout.
10. Describe the procedures used to layout and construct cabinets and built-in units.
11. Describe the procedures used to remove and install cabinets and built-in units.

12. Construct and install cabinets and built-in units.
13. Describe the procedures used to construct countertops.
14. Describe the procedures used to remove and install countertops.
15. Construct and install countertops.
16. Calculate materials.

## **CAR-425**

## **Interior Trim Work**

### **Learning Outcomes:**

- Demonstrate knowledge of types of interior trim work, their characteristics and applications.
- Demonstrate knowledge of the procedure used to install interior trim work.

### **Objectives and Content:**

1. Define terminology associated with interior trim work.
2. Identify hazards and describe safe work practices pertaining to interior trim work.
3. Identify tools and equipment used to cut and install interior trim work and describe their applications and procedures for use.
4. Interpret information pertaining to interior trim work found on drawings and specifications.
5. Identify types of interior trim work and describe their characteristics and applications.
  - i) casings
  - ii) mouldings
  - iii) baseboard
6. Describe the procedures used to cut and install interior trim work.
7. Calculate materials.

## **CAR-430**

## **Fixtures and Hardware**

### **Learning Outcomes:**

- Demonstrate knowledge of fixtures and hardware, their characteristics and applications.
- Demonstrate knowledge of the procedures used to install fixtures and hardware.

### **Objectives and Content:**

1. Define terminology associated with fixtures and hardware.
2. Identify hazards and describe safe work practices pertaining to fixtures and hardware.
3. Identify tools and equipment used to remove and install fixtures and hardware and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to fixtures and hardware.
5. Interpret information pertaining to fixtures and hardware found on drawings and specifications.
6. Identify types of fixtures and hardware and describe their characteristics and applications.
  - i) grab bars
  - ii) closet rods
  - iii) mirrors
  - iv) hand rails
7. Describe the procedures used to remove and install fixtures and hardware.

## **CAR-435                      Unequal Slope Roof Framing**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to frame unequal slope roofs.

### **Objectives and Content:**

1. Define terminology associated with unequal slope roofs.
2. Interpret codes and regulations pertaining to unequal slope roof framing.
3. Interpret information pertaining to unequal slope roofs found on drawings and specifications.
4. Identify types of unequal slope roofs and describe their characteristics.
  - i) simple
  - ii) intersecting
5. Identify materials used in the construction of unequal slope roofs.
6. Identify unequal slope roof framing components and describe their characteristics and applications.
  - i) ceiling joists
  - ii) collar ties
  - iii) rafters
7. Calculate dimensions associated with unequal slope roof layout.
  - i) rafter length
  - ii) ridge length
8. Describe the procedures used to layout unequal slope roofs.
9. Describe the procedures used to assemble and install unequal slope roofs.
10. Calculate materials.
  - i) framing components
  - ii) sheathing



**Learning Outcomes:**

- Demonstrate knowledge of geometric stairs, their characteristics and applications.
- Demonstrate knowledge of the procedures used to layout, construct and install geometric stairs.

**Objectives and Content:**

1. Define terminology associated with geometric stairs.
2. Identify hazards and describe safe work practices pertaining to geometric stairs.
3. Identify tools and equipment used to layout and construct geometric stairs and describe their applications and procedures for use.
4. Interpret codes and regulations pertaining to geometric stairs.
5. Interpret information pertaining to geometric stairs found on drawings and specifications.
6. Identify types of geometric stairs and describe their characteristics and applications.
  - i) winders
  - ii) curved/circular
  - iii) spiral
7. Calculate geometric stair dimensions.
8. Describe the procedures used to layout, construct and install geometric stairs and their components.
9. Layout geometric stairs.

## **CAR-445              Job Planning**

### **Learning Outcomes:**

- Demonstrate knowledge of the procedures used to plan and organize jobs.

### **Objectives and Content:**

1. Identify sources of information relevant to job planning.
  - i) documentation
    - specifications
    - regulations
    - reference materials
  - ii) drawings
  - iii) related professionals
  - iv) clients
2. Identify considerations for determining job requirements and describe their associated procedures.
  - i) hazard and environmental assessment
  - ii) personnel
  - iii) tools and equipment
  - iv) materials
  - v) waste management
  - vi) permits and documentation
3. Describe the procedures used to plan job tasks.
  - i) scheduling
  - ii) estimating
4. Describe the procedures used to organize and store tools, equipment and materials on-site.
5. Extract information from drawings to produce material take-off lists.