Atlantic Workforce Partnership

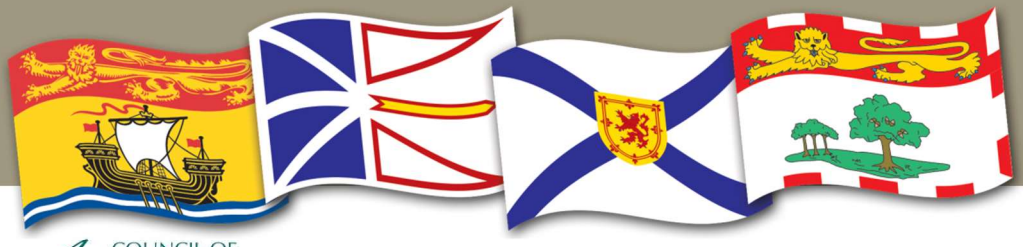
Curriculum Standard

CARPENTER

Version: 2024

Revised: N/A

Atlantic Apprenticeship



COUNCIL OF ATLANTIC PREMIERS
CONSEIL DES PREMIERS MINISTRES DE L'ATLANTIQUE

Employment and Social Development Canada
Emploi et Développement social Canada

PLAN OF TRAINING

Atlantic Apprenticeship Curriculum Standard

Carpenter

December 2024

Government of Newfoundland and Labrador
Department of Jobs, Immigration and Growth
Apprenticeship and Trades Certification Division

Approved by:

Chairperson, Provincial Apprenticeship and Certification Board

Date: Dec. 16, 2024

Atlantic Apprenticeship Curriculum Standard

Carpenter

Preface

This Atlantic Apprenticeship Curriculum Standard is intended to assist instructional staff in the design and delivery of technical, in-class training in support of the Carpenter.

This document contains all the technical training elements required to complete the Carpenter apprenticeship program and has been developed based on the Red Seal Occupational Standard (RSOS). The RSOS can be found on the Red Seal website (www.red-seal.ca).

Implementation of this AACS for Apprenticeship training is outlined in the following table.

Level	Implementation Effective
Level 1	2025-2026
Level 2	2026-2027
Level 3	2027-2028
Level 4	2028-2029

The above implementation schedule was current at time of printing. Please confirm with Apprenticeship Staff prior to commencing training.

Granting of credit or permission to challenge level examinations for pre-employment or pre-apprenticeship training for the Carpenter will be based on the content outlined in this standard. Training providers must contact their provincial apprenticeship authority for more information on the process and requirements for determining eligibility for credit towards an apprenticeship program.

Acknowledgements

The development of the Atlantic Apprenticeship Curriculum Standard (AACS) is an initiative of the Atlantic Apprenticeship Council's Atlantic Apprenticeship Harmonization Partnership (AAHP) through the Atlantic Workforce Partnership.

The AAHP was created in 2014 and funded through contributions from Employment and Social Development Canada (ESDC) and the four Atlantic Provinces. In 2023, Phase III of the AAHP concluded and the AAHP transitioned to a maintenance office supported by the four Atlantic Provinces. The Atlantic Apprenticeship Council would like to thank ESDC for the financial support provided to harmonize the 23 trades in Phase I, II and III of the AAHP.

Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input to the development of the trade Atlantic Apprenticeship Curriculum Standard (AACS) in 2016 and updating of the trade AACS in 2024. Without their dedication to quality apprenticeship training, this document could not have been produced. The Atlantic Apprenticeship Council wishes to acknowledge the contributions of the industry and instructional representatives who participated in the development of this document.

Table of Contents

User Guide

Atlantic Apprenticeship Curriculum Standards (AACS) are developed based on trade-specific national occupational standards, such as the Red Seal Occupational Standard (RSOS), and industry consultation. This document represents the minimum content to be delivered as part of the harmonized Atlantic program for the Carpenter trade.

The AACSs are deliberately constructed for ease of use and flexibility of structure to adapt to all delivery requirements. They detail units of training, unit outcomes and objectives. They do 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 AACS does not dictate study materials, textbooks or learning activities to be used in delivery.

The document includes a Level Structure to facilitate mobility for apprentices moving from one jurisdiction to another.

Structure

The content of the AACS is divided into units. Unit codes are used as a means of identification and are not intended to convey the order of delivery. It is at the discretion of the training provider to deliver the content in the required logical sequence of delivery within the level. Jurisdictions are free to deliver units one at a time or concurrently within a level, provided all outcomes are met.

The Learning Outcomes describe what the apprentice should know or be able to do at the end of training. Wording of the Learning Outcomes, "Demonstrate knowledge of…" acknowledges the broad spectrum of ways in which knowledge can be assessed (i.e., practical projects, multiple choice testing, presentations, etc.) by instructional staff within the training.

Summative evaluation will be through a multiple-choice level exam administered through the jurisdictional Apprenticeship Authority.

The Red Seal Occupational Standard (RSOS) to AACS comparison chart outlines the relation between each RSOS sub-task and the AACS units. RSOS references have also been detailed in each unit to highlight the direct link between the unit and relevant sub-tasks in the RSOS.

In the Level Structure section, the document identifies suggested hours to provide an indication of the time it should take to cover the material in the unit and is provided as a guide only. Adjustments to the suggested hours for each unit may be required to account for rate of apprentice learning, statutory holidays, storm days, registration, and examinations. These suggested hours detailed for each unit will represent both theory and practical training (if relevant) and for consistency will be based on a standard of 30 hours per week of training. The true length of time required to deliver an outcome successfully will depend upon the learning activities and teaching methods used.

There are two types of objectives found in the AACS document: theoretical and practical.

The theoretical objectives represent the material that is to be covered during the technical training to convey the required knowledge to the apprentice.

The practical objectives represent the tasks or skills that have been deemed by the Atlantic Trade Advisory Committee as critical for the apprentices to receive exposure to while attending technical training. For example, exposure could be done through instructor demonstration or individual or group performance of the skill or task. Training providers are encouraged to use practical demonstration and opportunities for hands-on learning whenever possible. Practical objectives are not intended to replace the on-the-job training component of the apprentice's program or to mirror or replace the logbook skills that are to be taught and evaluated in the workplace.

Detailed content for each objective has not been developed. Where detail is required for clarity, content has been provided. The AACS should be used in conjunction with the national standard for the trade – the Red Seal Occupational Standard (RSOS).

Glossary of Terms

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

Adjust	To put in good working order; regulate; bring to a proper state or position.
Application	The use to which something is put and/or the circumstance in which an individual would use it.
Characteristic	A feature that helps to identify, tell apart or describe recognizably, a distinguishing mark or trait.
Component	A part that can be separated from or attached to a system, a segment or unit.
Define	To state the meaning of (a word, phrase, etc.).
Describe	To give a verbal account of; talk about in detail.
Explain	To make plain or clear; illustrate; rationalize.
Identify	To point out or name objectives or types.
Interpret	To translate information from observation, charts, tables, graphs, and written material.
Maintain	To keep in a condition of good repair or efficiency.
Method	A means or manner of doing something that has procedures attached to it.
Operate	How an object works; to control or direct the functioning of.
Procedure	A prescribed series of steps taken to accomplish an end.
Purpose	The reason for which something exists or is done, made or used.

Glossary of Terms (continued)

Service	Routine inspection and replacement of worn or deteriorating parts. An act or business function provided to a customer during an individual's profession (e.g., haircut).
Technique	Within a procedure, the way technical skills are applied.
Test	v. To subject to a procedure that ascertains effectiveness, value, proper function, or other quality. n. A way of examining something to determine its characteristics or properties, or to determine whether it is working correctly.

Essential Skills / Skills for Success

Through extensive research, the Government of Canada and other national and international agencies have identified and validated key essential skills for the workplace. These skills are used in every job and at different levels of complexity. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change. In response to the evolving labour market and changing skill needs, in 2021 the Government of Canada launched a new **Skills for Success** model: QR code #1 or web link below.

https://www.canada.ca/en/services/jobs/training/initiatives/skills-success/new-model.html

The Employment and Social Development Canada (ESDC) website provides information about the Skills for Success, including:

- a brief description of the skill.
- why the skill is important.
- tools to help you improve on each of the skills, and
- videos to help you improve on each of the skills.

This information can be found at: QR code #2 or web link below.
https://www.jobbank.gc.ca/essentialskills

Skills for Success training tools can be found at: QR code #3 or web link below.
https://www.canada.ca/en/services/jobs/training/initiatives/skills-success/tools.html

The development and improvement of these Skills for Success is inherent throughout the apprenticeship training program as apprentices work towards achieving journeyperson status.

#1 The new Skills for Success model – Canada.ca

#2 Explore careers by essential skills – Job Bank

#3 Assessment and training tools – Canada.ca

Level Structure

Level 1 – 8 Weeks

Unit Code	Unit Title	Suggested Hours	Page Number
CAR-100	Safety	12	22
MENT-700	Mentoring I	6	24
CAR-105	Tools and Equipment	12	26
CAR-110	Lifting, Rigging and Hoisting	9	28
CAR-115	Fasteners, Connectors and Adhesives	6	30
CAR-120	Communication and Trade Documentation	3	32
CAR-125	Project Drawings and Specifications	21	34
CAR-130	Temporary Access Equipment and Structures	9	36
CAR-135	Hoarding	3	38
CAR-140	Basic Site Layout	27	39
CAR-145	Wood and Wood Products	9	41
CAR-150	Non-Wood Products	6	43
CAR-155	Concrete	12	45
CAR-160	Beams and Supports	18	47
CAR-165	Floor Systems	24	49
CAR-175	Introduction to Framing Systems	6	51
CAR-180	Introduction to Footings and Slab Forms	24	53
CAR-185	Decks	9	55
CAR-190	Wall Forms	24	57

Level 2 – 8 Weeks

Unit Code	Unit Title	Suggested Hours	Page Number
CAR-200	Building Science Principles	9	60
CAR-202	Exterior Walls and Partitions	36	62
CAR-205	Building Envelope	6	64
CAR-210	Advanced Site Layout	24	66
CAR-230	Introduction to Roof and Ceiling Layout and Framing	6	68
CAR-235	Gable Roofs	30	70
CAR-240	Roof Coverings	24	72
CAR-245	Straight Stairs	30	74
CAR-250	Preserved Wood Foundations	3	76
CAR-260	Exterior Doors	18	78
CAR-265	Exterior Wall Covering Systems	36	80
CAR-270	Exterior Windows	18	82

Level Structure (continued)

Level 3 – 7 Weeks

Unit Code	Unit Title	Suggested Hours	Page Number
CAR-305	Hip Roofs	30	86
CAR-310	Equal Slope Intersecting Roofs	30	88
CAR-315	Fixtures and Hardware	3	90
CAR-340	Interior Trim	18	92
CAR-345	Cabinets, Countertops and Built-in Units	12	94
CAR-355	Stair Forms	21	96
CAR-360	Interior Wall Systems	15	98
CAR-365	Ceilings	15	100
CAR-370	Pre-Cast Concrete	6	102
CAR-375	Suspended Slab and Beam Forms	21	104
CAR-380	Excavation, Shoring and Underpinning	3	106
CAR-385	Column and Vertical Forms	21	108
CAR-390	Interior Doors and Windows	15	110

Level 4 – 7 Weeks

Unit Code	Unit Title	Suggested Hours	Page Number
MENT-701	Mentoring II	6	114
CAR-401	Building Science and Sustainability	15	115
CAR-406	Flooring and Floor Coverings	15	117
CAR-425	Advanced Roofs	24	119
CAR-435	Unequal Slope Roofs	33	121
CAR-445	Project Planning	24	123
CAR-450	Renovation	15	125
CAR-455	Advanced Stairs	42	128
CAR-460	Panels, Tiles and Solid Wood Finishes	6	130
CAR-465	Program Review	30	132

2022 RSOS Sub-Task to AACS Unit Comparison

RSOS Sub-Task		AACS Unit	
Task 1 – Uses and maintains tools and equipment.			
1.01	Uses hand, power, and pneumatic tools.	CAR-105	Tools and Equipment
1.02	Uses stationary tools.	CAR-105	Tools and Equipment
1.03	Uses powder-actuated tools.	CAR-105	Tools and Equipment
1.04	Uses lifting, rigging and hoisting equipment.	CAR-110	Lifting, Rigging and Hoisting
1.05	Uses layout instruments and equipment.	CAR-105	Tools and Equipment
		CAR-140	Basic Site Layout
		CAR-210	Advanced Site Layout
1.06	Uses tack welding equipment. (NOT COMMON CORE)		N/A
1.07	Uses torch cutting equipment. (NOT COMMON CORE)		
Task 2 – Performs safety-related activities.			
2.01	Uses personal protective equipment (PPE) and safety equipment.	CAR-100	Safety
2.02	Maintains safe work environment.	CAR-100	Safety
		CAR-135	Hoarding
Task 3 – Builds and uses temporary access structures.			
3.01	Uses stationary access equipment.	CAR-130	Temporary Access Equipment and Structures
3.02	Uses mobile access equipment.	CAR-130	Temporary Access Equipment and Structures
3.03	Erects/dismantles scaffolding.	CAR-130	Temporary Access Equipment and Structures
3.04	Modifies scaffolding.	CAR-130	Temporary Access Equipment and Structures
Task 4 – Uses communication and mentoring techniques.			
4.01	Uses communication techniques.	CAR-120	Communication and Trade Documentation
		MENT-700	Mentoring I
		MENT-701	Mentoring II
4.02	Uses mentoring techniques.	MENT-700	Mentoring I
		MENT-701	Mentoring II
Task 5 – Interprets documentation.			
5.01	Interprets project drawings.	CAR-125	Projects Drawings and Specifications
			Integrated throughout document

RSOS Sub-Task		AACS Unit	
5.02	Interprets specifications.	CAR-125	Projects Drawings and Specifications
			Throughout applicable units.
5.03	Interprets safety documentation.	CAR-120	Communication and Trade Documentation
5.04	Interprets workplace documentation.	CAR-120	Communication and Trade Documentation
			Integrated throughout document
Task 6 – Organizes work.			
6.01	Schedules work sequence.	CAR-445	Project Planning
6.02	Performs site preparation.	CAR-135	Hoarding
		CAR-445	Project Planning
6.03	Performs quantity take-off.	CAR-125	Projects Drawings and Specifications
		CAR-445	Project Planning
6.04	Organizes material.	CAR-445	Project Planning
Task 7 – Performs layout.			
7.01	Performs site layout.	CAR-140	Basic Site Layout
		CAR-210	Advanced Site Layout
7.02	Lays out concrete formwork.	CAR-180	Introduction to Footings and Slab Forms
7.03	Lays out floors.	CAR-145	Wood and Wood Products
		CAR-160	Beams and Supports
		CAR-165	Floor Systems
7.04	Lays out decks.	CAR-150	Non-Wood Products
		CAR-185	Decks
		CAR-200	Building Science Principles
		CAR-205	Building Envelope
7.05	Lays out walls.	CAR-145	Wood and Wood Products
		CAR-150	Non-Wood Products
		CAR-202	Exterior Walls and Partitions
7.06	Lays out ceilings.	CAR-150	Non-Wood Products
		CAR-160	Beams and Supports
		CAR-230	Introduction Roof and Ceiling Layout and Framing
7.07	Lays out roofs.	CAR-150	Non-Wood Products
		CAR-230	Introduction Roof and Ceiling Layout and Framing
		CAR-235	Gable Roofs
		CAR-305	Hip Roofs
		CAR-310	Equal Slope Intersecting Roofs

RSOS Sub-Task		AACS Unit	
		CAR-425	Advanced Roofs
		CAR-435	Unequal Slope Roofs
7.08	Lays out stairs.	CAR-245	Straight Stairs
		CAR-455	Advanced Stairs
7.09	Lays out balustrades.	CAR-245	Straight Stairs
		CAR-455	Advanced Stairs
Task 8 – Constructs formwork.			
8.01	Erects excavation shoring and underpinning.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-380	Excavation, Shoring and Underpinning
8.02	Erects concrete falsework.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-375	Suspended Slab and Beam Forms
8.03	Constructs footing forms.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-180	Introduction to Footings and Slab Forms
8.04	Constructs wall form systems and grade beam formwork.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-190	Wall Forms
		CAR-375	Suspended Slab and Beam Forms
8.05	Constructs slab formwork.	CAR-150	Non-Wood Products
		CAR-180	Introduction to Footings and Slab Forms
		CAR-205	Building Envelope
		CAR-375	Suspended Slab and Beam Forms
8.06	Constructs column formwork.	CAR-150	Non-Wood Products
		CAR-385	Column and Vertical Forms
8.07	Constructs stair formwork.	CAR-150	Non-Wood Products
		CAR-355	Stair Forms
8.08	Installs embedded reinforcements.	CAR-180	Introduction to Footings and Slab Forms
		CAR-190	Wall Forms
		CAR-355	Stair Forms
		CAR-375	Suspended Slab and Beam Forms
		CAR-385	Column and Vertical Forms
8.09	Dismantles formwork.	CAR-115	Fasteners, connectors, and Adhesives
		CAR-150	Non-Wood Products

RSOS Sub-Task		AACS Unit	
		CAR-180	Introduction to Footings and Slab Forms
		CAR-190	Wall Forms
		CAR-355	Stair Forms
		CAR-375	Suspended Slab and Beam Forms
		CAR-385	Column and Vertical Forms
Task 9 – Installs concrete, cement-based and epoxy products.			
9.01	Places concrete.	CAR-155	Concrete
9.02	Facilitates curing of concrete.	CAR-155	Concrete
		CAR-205	Building Envelope
9.03	Performs basic concrete finishing.	CAR-155	Concrete
9.04	Installs pre-cast components.	CAR-370	Pre-Cast Concrete
9.05	Installs grout.	CAR-370	Pre-Cast Concrete
Task 10 – Constructs floor systems.			
10.01	Installs engineered floor systems.	CAR-160	Beams and Supports
10.02	Constructs dimensional lumber floor framing.	CAR-145	Wood and Wood Products
		CAR-160	Beams and Supports
		CAR-250	Preserved Wood Foundations
Task 11 – Constructs deck systems.			
11.01	Constructs decks.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-145	Wood and Wood Products
		CAR-150	Non-Wood Products
		CAR-185	Decks
		CAR-205	Building Envelope
11.02	Installs deck components.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-185	Decks
Task 12 – Constructs wall systems.			
12.01	Installs engineered wall systems.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-145	Wood and Wood Products
		CAR-160	Beams and Supports
		CAR-175	Introduction to Framing Systems
		CAR-202	Exterior Walls and Partitions
		CAR-205	Building Envelope
		CAR-401	Building Science and Sustainability

RSOS Sub-Task		AACS Unit	
12.02	Constructs dimensional lumber wall framing.	CAR-145	Wood and Wood Products
		CAR-160	Beams and Supports
		CAR-175	Introduction to Framing Systems
		CAR-202	Exterior Walls and Partitions
		CAR-250	Preserved Wood Foundations
		CAR-401	Building Science and Sustainability
Task 13 - Constructs roof and ceiling systems.			
13.01	Installs engineered trusses.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-230	Introduction to Roof and Ceiling Layout and Framing
		CAR-235	Gable Roofs
		CAR-305	Hip Roofs
		CAR-425	Advanced Roofs
		CAR-435	Unequal Slope Roofs
13.02	Constructs roof and ceiling framing.	CAR-145	Wood and Wood Products
		CAR-230	Introduction to Roof and Ceiling Layout and Framing
		CAR-235	Gable Roofs
		CAR-305	Hip Roofs
		CAR-310	Equal Slope Intersecting Roofs
		CAR-425	Advanced Roofs
		CAR-435	Unequal Slope Roofs
Task 14 - Installs exterior doors and windows.			
14.01	Installs exterior jambs/frames.	CAR-150	Non-Wood Products
		CAR-205	Building Envelope
		CAR-260	Exterior Doors
		CAR-270	Exterior Windows
14.02	Installs exterior doors.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-205	Building Envelope
		CAR-260	Exterior Doors
14.03	Installs exterior windows.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-200	Exterior Walls and Partitions
		CAR-205	Building Envelope
		CAR-270	Exterior Windows
14.04	Installs exterior door and window hardware.	CAR-200	Exterior Walls and Partitions
		CAR-260	Exterior Doors
		CAR-270	Exterior Windows

Task 15 - Installs roofing.			
15.01	Installs roofing components.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-200	Exterior Walls and Partitions
		CAR-205	Building Envelope
		CAR-240	Roof Coverings
		CAR-401	Building Science and Sustainability
15.02	Installs roofing coverings.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-240	Roof Coverings
Task 16 - Installs exterior finishes.			
16.01	Installs exterior wall components.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-205	Building Envelope
		CAR-265	Exterior Wall Covering Systems
		CAR-401	Building Science and Sustainability
16.02	Installs exterior wall coverings.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-265	Exterior Wall Covering Systems
Task 17 - Applies wall and ceiling finishes.			
17.01	Installs wallboard.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-200	Building Science Principles
		CAR-360	Interior Wall Systems
		CAR-365	Ceilings
17.02	Applies compound to walls and ceilings.	CAR-360	Interior Wall Systems
		CAR-365	Ceilings
17.03	Installs panels, tiles, and solid wood finishes.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-145	Wood and Wood Products
		CAR-150	Non-Wood Products
		CAR-200	Building Science Principles
		CAR-360	Interior Wall Systems
		CAR-365	Ceilings
		CAR-460	Panels, Tiles and Solid Wood Finishes

17.04	Installs suspended ceilings.	CAR-145	Wood and Wood Products
		CAR-200	Building Science Principles
		CAR-365	Ceilings
17.05	Installs demountable wall systems.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-200	Building Science Principles
		CAR-360	Interior Wall Systems
Task 18 - Installs flooring.			
18.01	Installs underlayment.	CAR-150	Non-Wood Products
		CAR-406	Flooring and Floor Coverings
18.02	Installs floor coverings.	CAR-406	Flooring and Floor Coverings
18.03	Installs access flooring.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-406	Flooring and Floor Coverings
Task 19 - Installs interior doors and windows.			
19.01	Installs interior jambs/frames.	CAR-390	Interior Doors and Windows
19.02	Installs interior doors.	CAR-390	Interior Doors and Windows
19.03	Installs interior windows.	CAR-390	Interior Doors and Windows
19.04	Installs interior door and window hardware.	CAR-200	Building Science Principles
		CAR-390	Interior Doors and Windows
Task 20 - Constructs and installs finish components and stairs.			
20.01	Fabricates finish components.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-150	Non-Wood Products
		CAR-340	Interior Trim
		CAR-345	Cabinets, Countertops and Built-in Units
		CAR-455	Advanced Stairs
20.02	Installs finish components and accessories.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-315	Fixtures and Hardware
		CAR-340	Interior Trim
		CAR-345	Cabinets, Countertops and Built-in Units
		CAR-455	Advanced Stairs
20.03	Constructs stairs.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-245	Straight Stairs
		CAR-455	Advanced Stairs
Task 21 – Performs renovation-specific support activities.			
21.01	Removes existing material.	CAR-135	Hoarding
		CAR-150	Non-Wood Products
		CAR-450	Renovation

21.02	Protects structure during renovations.	CAR-135	Hoarding
		CAR-205	Building Envelope
		CAR-450	Renovation
Task 22 – Performs renovation-specific construction activities.			
22.01	Joins new to existing construction.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-200	Building Science Principles
		CAR-205	Building Envelope
		CAR-450	Renovation
22.02	Changes existing structure during renovations.	CAR-115	Fasteners, Connectors and Adhesives
		CAR-205	Building Envelope
		CAR-450	Renovation

Level 1

CAR-100 Safety

Learning Outcomes:

- Demonstrate knowledge of personal protective equipment (PPE) and safety equipment, their applications, maintenance, and procedures for use.
- Demonstrate knowledge of regulatory requirements pertaining to safety, PPE, and safety equipment.
- Demonstrate knowledge of safe work practices.

2022 Red Seal Occupational Standard Reference:

2.01 Uses personal protective equipment (PPE) and safety equipment.
2.02 Maintains safe work environment.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with workplace hazards and safe work practices.

2. Identify workplace hazards and describe safe work practices and equipment.
    i) personal
        - lifting
        - fall protection
    ii) workplace
        - electrical
        - utilities
            - underground
            - overhead
        - confined space (awareness of)
        - fall protection
        - fire
        - trenching and excavation
        - product off gassing
        - air quality
        - lock out/tag out
        - access and egress
    iii) environmental
        - site conditions
            - runoff/silting
            - below grade soil

- radon gases
- asbestos
- lead
- mercury
- animal excrements
- pests
  - ticks
- molds and mildew
- WHMIS regulated hazardous materials

3. Interpret regulations and standards.
   i) federal
      - Workplace Hazardous Material Information System (WHMIS)
      - Canadian Standards Association (CSA)
   ii) provincial/territorial
      - Occupational Health and Safety (OH&S)
      - First Aid
   iii) municipal
   iv) workplace
      - workplace orientation
      - hazard assessment

4. Identify types of PPE and describe their applications and procedures for use.
   i) clothing
   ii) equipment
   iii) products
      - sunscreen
      - sanitizers

5. Identify types of safety equipment and describe their applications and procedures for use.

6. Describe the procedures used to care for, locate, maintain, and store PPE and safety equipment.

7. Describe the procedures used to lock out and tag out equipment.

8. Describe the procedures used to store, transport, and dispose of materials.

9. Describe the procedures used to maintain a safe work environment and to remediate potential dangers related to workplace hazards.

Practical Objectives:

N/A

MENT-700 Mentoring I

Learning Outcomes:

- Demonstrate knowledge of effective communication practices as a learner.
- Demonstrate knowledge of strategies for learning skills in the workplace.

2022 Red Seal Occupational Standard Reference:

4.01 Uses communications techniques.
4.02 Uses mentoring techniques.

Suggested Hours:

6 Hours

Learning Objectives:

1. Describe the importance of one's own individual experiences.

2. Identify behaviours that demonstrate positive learning experiences.

3. Identify the benefits of workplace mentoring for the apprentice, mentor, and employer.

4. Identify the partners involved in apprenticeship training.

5. Describe the shared responsibilities for workplace learning in apprenticeship.

6. Identify different learning needs and strategies to address challenges or barriers in the workplace.
   i) learning disabilities
   ii) language
   iii) underrepresentation

7. Identify the components that create a positive and inclusive workplace culture.
   i) workplace characteristics
   ii) individual behaviours

8. Identify various learning styles and determine one’s own learning preferences.

9. Explain how learning preferences impact learning new skills.

10. Identify different learning strategies to meet individual learning needs.

11. Describe the importance of adapting to a variety of teaching and learning methods in the workplace.

12. Identify techniques for effective communication as a learner.
    i) verbal and non-verbal
    ii) active listening

13. Identify and describe personal responsibilities and attitudes that contribute to on-the-job success.
    i) self advocating
    ii) asking questions
    iii) accepting constructive feedback
    iv) working safely
    v) employing time management techniques and being punctual

Practical Objectives:

N/A

CAR-105 Tools and Equipment

Learning Outcomes:

- Demonstrate knowledge of hand, powered, gas and pneumatic tools, their applications, maintenance, and procedures for use.
- Demonstrate knowledge of stationary tools, their applications, maintenance, and procedures for use.
- Demonstrate knowledge of powder-actuated tools, their applications, maintenance, and procedures for use.
- Demonstrate knowledge of measuring and layout tools and equipment, their applications, maintenance, and procedures for use.
- Demonstrate knowledge of material handling equipment, their applications, maintenance, and procedures for use.

2022 Red Seal Occupational Standard Reference:

1.01 Uses hand, power and pneumatic tools.
1.02 Uses stationary tools.
1.03 Uses powder-actuated tools.
1.05 Uses layout instruments and equipment.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with tools and equipment.

2. Identify hazards and describe safe work practices pertaining to tools and equipment.

3. Interpret regulations and specifications pertaining to tools and equipment.
   i) certification
   ii) training

4. Identify types of hand, powered, gas and pneumatic tools and accessories and describe their applications and procedures for use.

5. Identify types of stationary tools and accessories and describe their applications and procedures for use.

6. Identify types of powder-actuated tools and describe their applications and procedures for use.

7. Identify types of measuring and layout tools and equipment and describe their applications and procedures for use.

8. Identify types of material handling and describe their applications and procedures for use.
   i) aerial work platforms
   ii) forklifts
   iii) telehandlers
   iv) skid steers

9. Identify factors to consider when selecting tools and equipment.
   i) safety and training requirements
   ii) condition of tool or equipment
      - damaged
      - worn
      - defective

10. Describe the procedures used to inspect, maintain, and store hand tools, powered, gas and pneumatic tools and equipment.

11. Describe the procedures used to inspect and maintain stationary tools and guards.

12. Describe the procedures used to inspect, maintain, and store powder-actuated tools.

13. Describe the procedures used to inspect, maintain and store measuring and layout tools and equipment.

14. Describe the procedures used to inspect, maintain, and store material handling equipment.

Practical Objectives:

N/A

CAR-110 Lifting, Rigging and Hoisting

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

1.04 Uses lifting, rigging and hoisting equipment.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with lifting, rigging, and hoisting.

2. Identify hazards and describe safe work practices pertaining to lifting, rigging, and hoisting.

3. Interpret codes and regulations pertaining to lifting, rigging, and hoisting.

4. Interpret information pertaining to lifting, rigging, and hoisting found on drawings and specifications.

5. Identify types of lifting equipment and accessories, and describe their applications, limitations, and procedures for use.

6. Identify types of rigging equipment and accessories, and describe their applications, limitations, and procedures for use.

7. Identify types of hoisting equipment and accessories, and describe their applications, limitations, and procedures for use.

8. Identify types of knots, hitches and bends and describe their applications and associated procedures.

9. Identify the factors to consider when selecting lifting, rigging, and hoisting equipment.
    i) safety factor
    ii) load characteristics
    iii) environment
    iv) application
    v) hitch configuration

10. Identify factors to consider when rigging a load (material/equipment) for hoisting and lifting.
    i) load characteristics
    ii) equipment and accessories
    iii) environmental factors
    iv) anchor points/attachment locations
    v) sling angles
    vi) machine capacity/load chart
    vii) taglines

11. Explain sling angle when preparing for hoisting and lifting operations.

12. Identify methods of communication used during lifting, rigging and hoisting operations and describe their associated procedures.
    i) hand signals
    ii) electronic communications
    iii) audible/visual

13. Identify standard hand signals used for lifting, rigging and hoisting operations.

14. Describe the procedures used to inspect, maintain, and store lifting, rigging and hoisting equipment.

15. Describe the procedures used to rig and secure a load (material and/or equipment) for lifting and hoisting.

16. Describe the procedures used to perform a basic lift.

Practical Objectives:

1. Perform standard hand signals.

2. Tie various types of knots, hitches, and bends.

CAR-115 Fasteners, Connectors and Adhesives

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

8.01 Erects excavation shoring and underpinning.
8.02 Erects concrete falsework.
8.03 Constructs footing forms.
8.04 Constructs wall form systems and grade beam formwork.
8.09 Dismantles formwork.
11.01 Constructs decks.
11.02 Installs deck components.
12.01 Installs engineered wall systems.
13.01 Installs engineered trusses.
14.02 Installs exterior doors.
14.03 Installs exterior windows.
15.01 Installs roofing components.
15.02 Installs roof coverings.
16.01 Installs exterior wall components.
16.02 Installs exterior wall coverings.
17.01 Installs wallboard.
17.03 Installs panels, tiles, and solid wood finishes.
17.05 Installs demountable wall systems.
18.03 Installs access flooring.
20.01 Fabricates finish components.
20.02 Installs finish components and accessories.
20.03 Constructs stairs.
22.01 Joins new to existing construction.
22.02 Changes existing structure during renovations.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with fasteners, connectors, and adhesives.

2. Identify hazards and describe safe work practices pertaining to fasteners, connectors, and adhesives.

3. Interpret codes and specifications pertaining to fasteners, connectors, and adhesives.

4. Interpret information pertaining to fasteners, connectors and adhesives found on drawings and specifications.

5. Identify tools and equipment used with fasteners, connectors, and adhesives, and describe their applications and procedures for use.

6. Identify types and sizes of fasteners and connectors and describe their characteristics and applications.
   i) fasteners
      - threaded
      - non-threaded
   ii) anchors
      - chemical
      - mechanical
      - cast-in-place
   iii) hangers/tie downs

7. Identify factors to consider when selecting fasteners and connectors.
   i) specifications
   ii) type and condition of base material
   iii) environnemental conditions
   iv) application

8. Describe the procedures used to install and remove fasteners and connectors.

9. Identify types of adhesives and describe their characteristics and applications.

10. Identify factors to consider when selecting adhesives.
    i) specifications
    ii) type and condition of base material
    iii) environmental conditions
    iv) application

11. Describe the procedures used to apply and remove adhesives.

Practical Objectives:

N/A

CAR-120 Communication and Trade Documentation

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

4.01 Uses communications techniques.
5.03 Interprets safety documentation.
5.04 Interprets workplace documentation.

Suggested Hours:

3 Hours

Theoretical Objectives:

1. Define terminology associated with effective communication and trade-related documentation.

2. Explain the importance of effective verbal and non-verbal communication.
   - i) interpersonal interactions
     - other tradespersons
     - colleagues
     - supervisors
     - clients
   - ii) conflict resolution
   - iii) communication of work deficiencies and discrepancies

3. Explain the importance of appropriate and effective use of electronic devices and sources of information.

4. Identify types and sources of trade related documentation and describe their applications.
   - 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/instructions/signage
   - v) operating manuals
   - vi) permits

vii) drawings and specifications
viii) hazards assessment

5. Describe the procedures used to access, interpret, and apply information found on trade-related documentation.

Practical Objectives:

N/A

CAR-125 Project Drawings and Specifications

Learning Outcomes:

- Demonstrate knowledge of project drawings and specifications.
- Demonstrate knowledge of basic sketching techniques.
- Demonstrate knowledge of the procedures to interpret and extract information from drawings and specifications.

2022 Red Seal Occupational Standard Reference:

5.01 Interprets project drawings.
5.02 Interprets specifications.
6.03 Performs quantity take-off.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology associated with project drawings and specifications.

2. Interpret codes and regulations pertaining to project drawings and specifications.
   i) federal
   ii) provincial/territorial
   iii) municipal

3. Describe the metric and imperial systems of measurement and the procedures used to perform conversions.
   i) metric to imperial
   ii) imperial to metric
   iii) fractions to decimals
   iv) decimals to fractions

4. Identify types of specification documents and describe their applications.
   i) code books
   ii) contract specifications
   iii) manufacturers' specifications
   iv) client specifications
   v) change orders

5. 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

6. Identify drafting instruments and describe their applications and procedures for use.

7. Identify documentation related to modifications of drawings and specifications and describe their applications.
    i) change orders
    ii) addendums
    iii) as-builts

8. Identify drawing projections and views and describe their applications.

9. Explain resolution protocols to follow when conflict is identified within a set of project documents.
    i) precedence
    ii) communication

10. Describe the procedures used to interpret and extract information from drawings and specifications.
    i) alphabet/types of lines
    ii) symbols and abbreviations
    iii) projections
    iv) views
    v) legend
    vi) title block
    vii) general notes
    viii) schedules
    ix) scales
    x) grid lines
    xi) two-dimensional information vs. three-dimensional space
    xii) procedure to report conflict within a set of drawings

Practical Objectives:

1. Demonstrate basic sketching techniques.

2. Interpret basic project drawings.

CAR-130 Temporary Access Equipment and Structures

Learning Outcomes:

- Demonstrate knowledge of temporary access equipment and structures, their applications, and procedures for use.
- Demonstrate knowledge of procedures to construct, install, secure, and maintain stationary access equipment.
- Demonstrate knowledge of the procedures to set up, operate and maintain mobile access equipment.
- Demonstrate knowledge of the procedures to erect, dismantle and modify scaffolding.

2022 Red Seal Occupational Standard Reference:

3.01 Uses stationary access equipment.
3.02 Uses mobile access equipment.
3.03 Erects/dismantles scaffolding.
3.04 Modifies scaffolding.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with temporary access equipment and structures.

2. Identify hazards and describe safe work practices pertaining to temporary access equipment and structures.

3. Interpret codes and regulations pertaining to temporary access equipment and structures.

4. Interpret information pertaining to temporary access equipment and structures found on drawings and specifications.

5. Identify types of temporary access equipment and structures and their components and describe their applications.
   i) stationary access equipment
      - ladders
      - ramps
      - temporary stairs

ii) mobile access equipment
- aerial/elevating work platforms
- telescoping booms
- articulated booms

iii) scaffolding
- wood
- metal
  - welded frame
  - tube-and-clamp
  - systems

iv) specialty access equipment
- swing stages
- boatswain's chairs (bosun's chairs)
- pumpjack

6. Identify tools and materials used with temporary access equipment and structures.

7. Identify 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 stationary access equipment.

9. Describe the procedures used to inspect, maintain, and store stationary access equipment.

10. Describe the procedures used to set-up and operate mobile access equipment.

11. Describe the procedures used to inspect, maintain, and store mobile access equipment.

12. Describe the procedures used to erect, secure, and dismantle scaffolding.

13. Identify considerations when modifying existing scaffold structures.
   i) manufacturers' specifications
   ii) jurisdictional regulations
   iii) location and type of support systems

14. Describe the procedures used to modify existing scaffold structures.

Practical Objectives:

N/A

CAR-135 Hoarding

Learning Outcomes:

- Demonstrate knowledge of hoarding, its purpose, and applications.
- Demonstrate knowledge of the procedures to construct and dismantle hoarding.

2022 Red Seal Occupational Standard Reference:

2.02 Maintains safe work environment.
6.02 Performs site preparation.
21.01 Removes existing material.
21.02 Protects structure during renovations.

Suggested Hours:

3 Hours

Theoretical Objectives:

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) lighting
   ii) ventilation
   iii) temperature
   iv) moisture

4. Identify types of hoarding and describe their purpose and applications.
   i) environmental
   ii) containment

5. Identify equipment and materials used to construct hoarding and describe their characteristics and applications.

6. Identify materials/fasteners, adhesives and connectors used to construct hoarding, and describe their characteristics and applications.

7. Describe the procedures used to construct and dismantle hoarding.

8. Calculate the materials needed to construct hoarding.

Practical Objectives:

N/A

CAR-140 Basic Site Layout

Learning Outcomes:

- Demonstrate knowledge of site layout instruments and equipment, their applications, and procedures for use.
- Demonstrate knowledge of procedures to determine elevations using site layout equipment, and the associated calculations.

2022 Red Seal Occupational Standard Reference:

1.05 Uses layout instruments and equipment.
7.01 Performs site layout.

Suggested Hours:

27 Hours

Theoretical Objectives:

1. Define terminology associated with basic site layout.

2. Identify hazards and describe safe work practices pertaining to basic site layout.

3. Interpret codes, regulations and applicable covenants pertaining to basic site layout.

4. Interpret information pertaining to basic site layout found on drawings and specifications.

5. Identify tools and equipment used to perform basic site layout and describe their applications and procedures for use.
   i) string lines
   ii) levels
      - builders
      - laser
   iii) plumb bobs
   iv) tape measure

6. Explain basic surveying theory as it pertains to site layout.

7. Describe the procedures used to perform basic site layout.
   i) 3-4-5 method (Pythagorean Theorem)
   ii) diagonal

Practical Objectives:

1. Perform calculations pertaining to basic site layout.

2. Use site layout equipment to determine elevations.

CAR-145 Wood and Wood Products

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

7.03 Lays out floors.
7.05 Lays out walls.
10.02 Constructs dimensional lumber floor framing.
11.01 Constructs decks.
12.01 Installs engineered wall systems.
12.02 Constructs dimensional lumber wall framing.
13.02 Constructs roof and ceiling framing.
17.03 Installs panels, tiles, and solid wood finishes.
17.04 Installs suspended ceilings.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with wood and wood products.

2. Identify hazards and describe safe work practices pertaining to handling wood and wood products.

3. Interpret codes and regulations pertaining to wood and wood products.

4. Interpret information pertaining to wood and wood products found on drawings and specifications.

5. Identify tools and equipment used with wood and wood products and describe their applications and procedures for use.

6. Identify types of wood and describe their characteristics and applications.
   i) hardwoods
   ii) softwoods

7. Identify types of wood products and describe their characteristics and applications.
    i) lumber
    ii) panels
    iii) engineered products
        - lumber
        - structural insulated panels (SIP)

8. Identify wood defects.

9. Describe wood processing.
    i) sawing
    ii) seasoning/drying
    iii) dressing/planing
    iv) grading
    v) treating

10. Describe the procedures used to select, handle and store wood and wood products.

Practical Objectives:

N/A

CAR-150 Non-Wood Products

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

7.04 Lays out decks.
7.05 Lays out walls.
7.06 Lays out ceilings.
7.07 Lays out roofs.
8.03 Constructs footing forms.
8.04 Constructs wall form systems and grade beam formwork.
8.05 Constructs slab formwork.
8.06 Constructs column formwork.
8.07 Constructs stair formwork.
8.09 Dismantles formwork.
11.01 Constructs decks.
11.02 Installs deck components.
14.01 Installs exterior jambs/frames.
15.02 Installs roof coverings.
16.01 Installs exterior wall components.
16.02 Installs exterior wall coverings.
17.01 Installs wallboard.
17.03 Installs panels, tiles, and solid wood finishes.
18.01 Installs underlayment.
20.01 Fabricates finish components.
21.01 Removes existing material.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with non-wood products.

2. Identify hazards and describe safe work practices pertaining to handling non-wood products.

3. Interpret codes and regulations pertaining to non-wood products.

4. Interpret information pertaining to non-wood products found on drawings and specifications.

5. Identify tools and equipment used with non-wood products and describe their applications and procedures for use.

6. Identify types of non-wood products and describe their characteristics and applications.
   - i) composite
   - ii) metal
   - iii) plastic
   - iv) glass
   - v) foam
   - vi) ceramic
   - vii) cementitious board
   - viii) masonry
   - ix) gypsum

7. Describe the procedures used to select, handle and store non-wood products.

Practical Objectives:

N/A

CAR-155 Concrete

Learning Outcomes:

- Demonstrate knowledge of concrete, its characteristics, and applications.
- Demonstrate knowledge of concrete reinforcement and embedded materials and their applications.
- Demonstrate knowledge of concrete tests and their associated procedures.
- Demonstrate knowledge of procedures to place, finish and cure concrete.

2022 Red Seal Occupational Standard Reference:

9.01 Places concrete.
9.02 Facilitates curing of concrete.
9.03 Performs basic concrete finishing.

Suggested Hours:

12 Hours

Theoretical Objectives:

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, consolidate, 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
   ii) pre-cast

7. Identify types of concrete reinforcement and describe their applications.
   i) rebar and accessories
   ii) stirrups
   iii) collars
   iv) fiber
   v) mesh
   vi) dowels

8. Identify types of embedded materials and describe their applications.
    i) anchor bolts
    ii) inserts
    iii) weld plates
    iv) angle iron
    v) temperature bars
    vi) water stop
    vii) form voids
    viii) sleeves
    ix) stud welding fasteners
    x) conduit
    xi) isolation joint

9. Describe the effects of water/cement ratio on concrete.

10. Describe the effects of aggregate size on concrete.

11. Identify additives/admixtures used in concrete and describe their purpose and applications.

12. Identify types of concrete tests and describe their associated procedures.
    i) slump
    ii) air entrainment
    iii) compression
    iv) temperature

13. Identify types of joints and describe their applications.
    i) isolation
    ii) expansion
    iii) control
    iv) construction

14. Describe the procedures used to place, consolidate, and finish concrete.

15. Describe the procedures used to facilitate the curing of concrete.

Practical Objectives:

N/A

CAR-160 Beams and Supports

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

7.03 Lays out floors.
7.06 Lays out ceilings.
10.01 Installs engineered floor systems.
10.02 Constructs dimensional lumber floor framing.
12.01 Installs engineered wall systems.
12.02 Constructs dimensional lumber wall framing.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with beams and supports.

2. Identify hazards and describe safe work practices pertaining to beams and supports.

3. Interpret codes and regulations pertaining to the construction and installation of beams and supports.

4. Interpret information pertaining to beams and supports found on drawings and specifications.

5. Identify tools and equipment used to construct and install beams and supports and describe their applications and procedures for use.

6. Identify types of beams and describe their characteristics and applications.
   i) built-up
   ii) mass timber
   iii) steel
   iv) concrete

7. Identify types of beams supports and describe their characteristics and applications.

8. Identify fastening methods used to install beams and supports and describe their associated procedures.
   i) grout
   ii) pockets

9. Describe the forces acting on beams.

10. Identify factors to consider when determining beam and support systems.

11. Identify construction techniques pertaining to beam and support systems.

12. Describe the procedures used to construct built-up beams.

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

14. Identify materials/fasteners, adhesives and connectors used to construct beams and supports and describe their characteristics and applications.

Practical Objectives:

1. Lay out a built-up beam identifying quarter points.

CAR-165 Floor Systems

Learning Outcomes:

- Demonstrate knowledge of floor systems and their applications.
- Demonstrate knowledge of floor components, accessories and materials and their applications.
- Demonstrate knowledge of the procedures to lay out and frame floor systems with openings.

2022 Red Seal Occupational Standard Reference:

7.03 Lays out floors.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with the layout and framing of floor systems.

2. Identify hazards and describe safe work practices pertaining to the layout and framing of floor systems.

3. Interpret codes and regulations pertaining to the layout and framing of floor systems.

4. Interpret information pertaining to floors found on drawings and specifications.
   i) mechanical/ electrical penetrations

5. Identify tools and equipment used to lay out and frame floor systems and describe their applications and procedures for use.

6. Identify types of floor systems and describe their applications.
   i) dimensional lumber
   ii) engineered

7. Identify floor system components, accessories, and materials, and describe their purpose and applications.
   i) sub-floors
   ii) bridging/solid blocking
   iii) strapping
   iv) sills

8. Identify factors to consider when selecting floor framing systems.

9. Identify construction techniques pertaining to floor framing.
   i) leveling
   ii) squaring

10. Describe the procedures used to lay out and frame floor systems.
   i) openings

11. Describe the procedures used to connect, anchor and/or fasten floor systems.

12. Calculate materials needed to construct a floor system.

Practical Objectives:

1. Lay out a floor system with an opening.

CAR-175 Introduction to Framing Systems

Learning Outcomes:

- Demonstrate knowledge of framing systems, their characteristics, and applications.

2022 Red Seal Occupational Standard Reference:

12.01 Installs engineered wall systems.
12.02 Constructs dimensional lumber wall framing.

Suggested Hours:

6 Hours

Theoretical Objectives*:*

1. Define terminology associated with framing systems.

2. Identify hazards and describe safe work practices pertaining to framing systems.

3. Interpret codes and regulations pertaining to framing systems.

4. Identify types of framing systems and describe their characteristics and applications.
    - i) balloon
    - ii) platform
    - iii) steel
    - iv) timber
    - v) energy-efficient/engineered/manufactured
        - insulated concrete forms (ICF)
        - structural insulated panels (SIP)
        - truss wall system
        - mass timber
            - cross laminated timber (CLT)
            - nail laminated timber (NLT)
            - glue laminated timber (GLT)
    - vi) preserved wood foundations
    - vii) post and beam

5. Identify methods used to connect, fasten, and anchor framing systems.

6. Identify factors to consider when determining framing systems.
    - i) barrier-free/accessibility
    - ii) sound transmission class (STC)
    - iii) fire-ratings

iv) energy efficiency
v) occupancy

7. Explain the importance of fire stopping, fire blocking and accessory blocking.

8. Identify construction techniques pertaining to framing systems.

9. Describe blocking, backing and back framing requirements.

10. Identify load bearing wall requirements.

11. Describe load transfer and point loading.

Practical Objectives:

N/A

CAR-180 Introduction to Footings and Slab Forms

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

7.02 Lays out concrete formwork.
8.03 Constructs footing forms.
8.05 Constructs slab formwork.
8.08 Installs embedded reinforcements.
8.09 Dismantles formwork.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with footings and slab forms.

2. Identify hazards and describe safe work practices pertaining to footings and slab forms.

3. Interpret codes and regulations pertaining to the construction of footings, slab forms.

4. Interpret information pertaining to footings, slab forms found on drawings and specifications.

5. Identify tools and equipment used to construct footings and slab forms and describe their applications and procedures for use.

6. Identify types of footings and slab forms and describe their characteristics and applications.
   i) piles
   ii) piers
   iii) grade beams
   iv) strip footing
   v) pad footing

7. Identify form materials and accessories used to construct footings and slab forms.

8. Identify the steps involved in the preparation of a site for construction of footings and slab forms.

9 Identify factors to consider when constructing footings and slab forms.

10. Describe the procedures used to construct footings and slab forms.
    i) insulation

11. Identify types of embedded materials and describe their characteristics and applications.
    i) rebar
    ii) anchor bolts
    iii) mesh

12. Describe the procedures used to place embedded materials.

13. Describe the procedures and products used to dismantle and recondition forms.

14. Calculate materials needed to construct footings and slab forms and calculate the volume of concrete required.

15. Identify materials/fasteners, adhesives and connectors used to construct footings, slab forms, and describe their characteristics and applications.

Practical Objectives:

1. Lay out and construct footing forms.

CAR-185 Decks

Learning Outcomes:

- Demonstrate knowledge of decks, their characteristics, and applications.
- Demonstrate knowledge of deck components, accessories and materials, their characteristics, and applications.
- Demonstrate knowledge of procedures to lay out and construct decks.

2022 Red Seal Occupational Standard Reference:

7.04 Lays out decks.
11.01 Constructs decks.
11.02 Installs deck components.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with decks.

2. Identify hazards and describe safe work practices pertaining to decks.

3. Interpret codes and regulations pertaining to decks.

4. Interpret information pertaining to decks found on drawings and specifications.

5. Identify tools and equipment used to lay out and construct decks and describe their applications and procedures for use.

6. Identify types of decks and describe their characteristics and applications.

7. Identify deck components, accessories, and materials, and describe their purpose and applications.
   i) footings
   ii) columns
   iii) helical piles
   iv) beams
   v) joists
   vi) stairs
   vii) ramps
   viii) guards/rails
   ix) glass railings

x) pre-cast steps
xi) composite decking and components
xii) pre-engineered and prefabricated systems

8. Identify factors to consider when determining deck systems.

9. Identify considerations for barrier-free/accessible decks.
   i) ramps
   ii) guards/rails
   iii) landings

10. Identify construction techniques pertaining to deck framing.

11. Describe the procedures used to lay out and construct decks.

12. Describe methods used to attach decks to existing structures.

13. Describe methods used to construct free standing/stand-alone decks.

14. Calculate dimensions for ramps and landings.

15. Calculate materials needed to construct a deck.

16. Identify materials/fasteners, adhesives and connectors used to construct decks and describe their characteristics and applications.

17. Describe importance of maintaining building envelope.

Practical Objectives:

N/A

CAR-190 Wall Forms

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

8.04 Constructs wall form systems and grade beam formwork.
8.08 Installs embedded reinforcements.
8.09 Dismantles formwork.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with wall forms.

2. Identify hazards and describe safe work practices pertaining to wall forms.

3. Interpret codes and regulations pertaining to wall forms.

4. Interpret information pertaining to wall forms found on drawings and specifications.

5. Identify tools and equipment used with wall forms and describe their applications and procedures for use.

6. Identify types of wall form systems and describe their characteristics and applications.
   i) loose forming/panel forming
   ii) proprietary forming
   iii) insulated concrete forms (ICF)
   iv) slip forms/self-jacking forms
   v) gang forms
   vi) tilt up framework

7. Identify types of wall form system components, accessories, and materials, and describe their purpose and applications.

8. Describe the procedures used to construct wall forms.

9. Identify types of embedded materials and describe their characteristics and applications.

10. Describe the procedures used to place embedded materials.

11. Describe the procedures and products used to dismantle and recondition forms.

12. Calculate materials needed to construct wall forms and calculate the volume of concrete required.

13. Identify materials/fasteners, adhesives and connectors used to construct wall forms and describe their characteristics and applications.

Practical Objectives:

1. Lay out and construct a wall form.

Level 2

CAR-200 Building Science Principles

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

7.04 Lays out decks.
14.03 Installs exterior windows.
14.04 Installs exterior door and window hardware.
15.01 Installs roofing components.
17.01 Installs wallboard.
17.03 Installs panels, tiles, and solid wood finishes.
17.04 Installs suspended ceilings.
17.05 Installs demountable wall systems.
19.04 Installs interior door and window hardware.
22.01 Performs renovation-specific construction activities.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with building science principles.

2. Identify building science principles affecting the surrounding environment.
   i) wind effects/air flow patterns
   ii) drainage patterns
   iii) solar gain
   iv) shading
   v) sound transmission

3. Explain heat transfer principles and their impact on buildings.
   i) conduction
   ii) convection
   iii) radiation

4. Explain potential impacts of air leakage and inadequate insulation in buildings.
   i) ice dams
   ii) energy inefficiency
   iii) inclement environment
   iv) condensation, ice, and frost build-up

v) structural and cosmetic damage

5. Explain the principles of airflow and their impact on buildings.
   i) natural
   ii) mechanical

6. Explain the principles of moisture flow and its impact on buildings.
   i) moisture movement
      - gravity
      - capillary action
      - airflow
      - diffusion
      - pressure differences
      - hydrostatic pressure
   ii) sources of moisture
      - dew point and relative humidity
      - leaks
      - occupation (people, plants, and pets)
      - building use
      - environmental
   iii) effects of moisture
      - deterioration (rot, rust)
      - mold/mildew
      - air quality

7. Explain the principles of sound transmission and its impact on buildings.
   i) sound management mechanisms
   ii) potential sources of noise

8. Explain the principles of solar gain and its impact on buildings.
   i) building orientation
   ii) shading strategies
   iii) glazing

Practical Objectives:

N/A

CAR-202 Exterior Walls and Partitions

Learning Outcomes:

- Demonstrate knowledge of walls and partitions, their characteristics, and applications.
- Demonstrate knowledge of wall and partition components, accessories and materials and their applications.
- Demonstrate knowledge of procedures to lay out and frame walls and partitions.

2022 Red Seal Occupational Standard Reference:

7.05 Lays out walls.
12.01 Installs engineered wall systems.
12.02 Constructs dimensional lumber wall framing.

Suggested Hours:

36 Hours

Theoretical Objectives:

1. Define terminology associated with wall and partition layout and framing.

2. Identify hazards and describe safe work practices pertaining to wall and partition layout and framing.

3. Interpret codes and regulations pertaining to wall and partition layout and framing.

4. Interpret information pertaining to walls and partitions found on drawings and specifications.

5. Identify tools and equipment used with walls and partitions and describe their applications and procedures for use.

6. Identify types of walls and partitions and describe their characteristics and applications.
   i) load bearing (including point loading)
   ii) non-load bearing
   iii) timber
   iv) curtain
   v) mass timber

7. Identify types of engineered walls and partitions and describe their characteristics and applications.

8. Identify wall and partition framing components, accessories, and materials, and describe their purpose and applications.
    i) energy efficiency
    ii) sound transmission
    iii) fire rating
    iv) security/safety
    v) moisture control

9. Identify factors to consider when selecting wall and partition systems.

10. Identify construction techniques pertaining to walls and partitions.

11. Describe the procedures used to layout and frame walls and partitions.
    i) wood
    ii) steel

12. Describe the procedures used to erect walls and partitions.

13. Calculate materials needed to construct walls and partitions.

14. Identify materials/fasteners, adhesives and connectors used to construct walls and partitions and describe their characteristics and applications.

15. Identify load bearing wall requirements.

16. Describe load transfer and point loading.

Practical Objectives:

1. Lay out and frame a dimensional lumber load bearing wall with an opening.

CAR-205 Building Envelope

Learning Outcomes:

- Demonstrate knowledge of the building envelope and its components.
- Demonstrate knowledge of procedures to install membranes, sealants, and insulating materials.

2022 Red Seal Occupational Standard Reference:

7.04 Lays out decks.
8.05 Constructs slab formwork.
9.02 Facilitates curing of concrete.
11.01 Constructs deck systems.
12.01 Installs engineered wall systems.
14.01 Installs exterior jambs/frames.
14.02 Installs exterior doors.
14.03 Installs exterior windows.
15.01 Installs roofing components.
16.01 Installs exterior wall components.
21.02 Protects structure during renovations.
22.01 Joins new to existing construction.
22.02 Changes existing structure during renovations.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with the building envelope.

2. Identify hazards and describe safe work practices pertaining to the building envelope.

3. Interpret codes, regulations and manufacturers' specifications pertaining to the building envelope.

4. Interpret information pertaining to the building envelope found on drawings and specifications.

5. Identify types of membranes and describe their purpose and applications.
   i) vapor barriers
   ii) waterproofing/damp-proofing barriers
   iii) air barriers

iv) weather/moisture barriers

6. Identify types of tapes and sealants and describe their characteristics and applications.

7. Identify factors to consider when selecting and installing membranes and sealants.

8. Describe the procedures used to install membranes and sealants.
   i) foundation
   ii) floors
   iii) walls
   iv) ceilings
   v) penetrations
   vi) roof

9. Identify types of insulating materials and describe their characteristics and applications.

10. Identify factors to consider when selecting and installing insulating materials.

11. Describe the procedures used to install insulating materials.

12. Calculate materials needed to create a building envelope.

13. Identify materials/fasteners, adhesives and connectors used install membranes and describe their characteristics and applications.

Practical Objectives:

1. Select and install membranes, sealants, and insulating materials.

CAR-210 Advanced Site Layout

Learning Outcomes:

- Demonstrate knowledge of site layout tools and equipment, their applications, and procedures for use.
- Demonstrate knowledge of procedures to lay out building lines and their associated calculations.

2022 Red Seal Occupational Standard Reference:

1.05 Uses layout instruments and equipment.
7.01 Performs site layout.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with the layout of building lines.

2. Identify hazards and describe safe work practices pertaining to the layout of building lines.

3. Interpret codes and regulations pertaining to the layout of building lines.

4. Interpret information pertaining to the layout of building lines found on drawings and specifications.

5. Identify tools and equipment used to lay out building lines and describe their applications and procedures for use.
   i) total stations
   ii) theodolites
   iii) transits

6. Describe the procedures used to perform advanced site layout.
   i) establish offsets
   ii) determine locations of building and other structures
   iii) layout building lines

7. Perform calculations pertaining to the layout of building lines.

Practical Objectives:

1. Use site layout equipment to lay out building lines.

CAR-230 Introduction to Roof and Ceiling Layout and Framing

Learning Outcomes:

- Demonstrate knowledge of roof framing systems, their characteristics, and applications.
- Demonstrate knowledge of roof and ceiling framing components, their purpose, and applications.

2022 Red Seal Occupational Standard Reference:

7.06 Lays out ceilings.
7.07 Lays out roofs.
13.01 Installs engineered trusses.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with roof and ceiling layout and framing.

2. Identify hazards and describe safe work practices pertaining to roof and ceiling layout and framing.

3. Interpret codes and regulations pertaining to roof and ceiling layout and framing.

4. Interpret information pertaining to roof and ceiling layout and framing found on drawings and specifications.

5. Identify tools and equipment used with roof and ceiling framing components and describe their applications and procedures for use.

6. Identify styles of roofs and describe their characteristics and applications.
    i) gable
    ii) hip
    iii) flat
    iv) intersecting
        - equal slope
        - unequal slope
    v) shed
    vi) gambrel
    vii) mansard

7. Identify types of roof framing systems and describe their characteristics and applications.
    i) wood frame
    ii) engineered trusses
    iii) engineered joists
    iv) timber frame

8. Identify types of roof and ceiling framing components and describe their purpose and applications.
    i) skylights
    ii) chimneys
    iii) curbs, parapets, and scuppers
    iv) utilities
    v) hatches
        - access
        - roof
    vi) tapered insulation
    vii) stairwells
    viii) chases
    ix) vents

9. Explain the relationship between roof slopes and ratios, and their application in determining roof dimensions.

10. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

N/A

CAR-235 Gable Roofs

Learning Outcomes:

- Demonstrate knowledge of components, accessories and materials used to lay out and frame gable roofs.
- Demonstrate knowledge of procedures to lay out and frame gable roofs.

2022 Red Seal Occupational Standard Reference:

7.07 Lays out roofs.
13.01 Installs engineered trusses.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with gable roofs.

2. Identify hazards and describe safe work practices pertaining to gable roofs.

3. Interpret codes and regulations pertaining to gable roofs.

4. Interpret information pertaining to gable roofs found on drawings and specifications.

5. Identify tools and equipment used to construct of gable roofs and describe their applications and procedures for use.

6. Identify gable roof framing components/members, accessories, and materials, and describe their purpose, characteristics, and applications.
   i) sheathing
   ii) fascia
   iii) framing members
   iv) ventilation

7. Describe the procedures used to lay out and frame gable roofs.

8. Describe the procedures used to lay out and install engineered gable roof trusses.
   i) bracing
      - temporary
      - permanent

9. Calculate dimensions associated with gable roof layout.

10. Calculate materials needed to frame a gable roof.
    i) framing components
    ii) sheathing
    iii) ventilation

11. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

1. Lay out and frame a gable roof.

CAR-240 Roof Coverings

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

15.01 Installs roofing components.
15.02 Installs roofing coverings.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with roof coverings and accessories.

2. Identify hazards and describe safe work practices pertaining to roof coverings and accessories.
   i) permanent roof anchors

3. Interpret codes, regulations and manufacturers' specifications pertaining to roof coverings and accessories.

4. Interpret information pertaining to roof coverings and accessories found on drawings and specifications.

5. Identify tools and equipment used with roof coverings and accessories and describe their applications and procedures for use.

6. Identify types of residential and commercial roof coverings and describe their characteristics and applications.
   i) sloped
   ii) flat

7. Identify roofing components and accessories and describe their characteristics and applications.
   i) flashing

8. Identify fasteners and sealants used with roof coverings and accessories.

9. Explain the importance of sloped roof eave and valley protection.

10. Identify potential roof covering problems and describe the procedures used to prevent them.

11. Describe the procedures used to remove and install roof coverings and accessories.

12. Calculate materials needed to install roof coverings and roofing accessories.

13. Identify types of roofing materials and describe their characteristics and applications.
    i) metal
    ii) wood
    iii) asphalt composite
        - shingles
        - rolled roofing
        - ballast
        - selvage
        - granular
        - smooth bitumen
        - torch down
        - fiberglass

14. Describe adhesion requirements for site conditions.

Practical Objectives:

1. Install a roof covering.

CAR-245 Straight Stairs

Learning Outcomes:

- Demonstrate knowledge of straight stairs, their characteristics, and applications.
- Demonstrate knowledge of procedure to lay out, construct and install straight stairs.

2022 Red Seal Occupational Standard Reference:

7.08 Lays out stairs.
7.09 Lays out balustrades.
20.03 Constructs stairs.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with straight stairs.

2. Identify hazards and describe safe work practices pertaining to straight stairs.

3. Interpret codes and regulations pertaining to straight stairs.

4. Interpret information pertaining to straight stairs found on drawings and specifications.

5. Identify tools and equipment used with straight stairs and describe their applications and procedures for use.

6. Describe straight stairs, their characteristics, and applications.

7. Identify components of straight stairs and guards and describe their purpose and applications.
   i) treads
   ii) risers
   iii) stringers
   iv) handrails
   v) landings
   vi) balustrades

8. Describe the procedures used to lay out, construct and install straight stairs and their components.

9. Calculate straight stair dimensions and stairwell openings.

10. Identify materials/fasteners, adhesives and connectors used to construct and install straight stairs and describe their characteristics and applications.

11. Calculate the materials needed to construct straight stairs.

Practical Objectives:

1. Lay out and construct straight stairs.

CAR-250 Preserved Wood Foundations

Learning Outcomes:

- Demonstrate knowledge of preserved wood foundations and their applications.
- Demonstrate knowledge of procedures to construct preserved wood foundations.

2022 Red Seal Occupational Standard Reference:

10.02 Constructs dimensional lumber floor framing.
12.02 Constructs dimensional lumber wall framing.

Suggested Hours:

3 Hours

Theoretical Objectives:

1. Define terminology associated with preserved wood foundations.

2. Identify hazards and describe safe work practices pertaining to preserved wood foundations.

3. Interpret codes and regulations pertaining to preserved wood foundations.

4. Interpret information pertaining to preserved wood foundations found on drawings and specifications.

5. Identify tools and equipment used with preserved wood foundations and describe their applications and procedures for use.

6. Identify types of preserved wood foundations.
   i) with concrete floor slab and wood footings
   ii) with wood sleeper floors
   iii) with framed wood floors
   iv) on concrete strip footings

7. Identify materials used to construct preserved wood foundations and describe their characteristics and applications.
   i) bracing, fasteners, adhesives
   ii) pressure-treated lumber and plywood
   iii) water-/damp-proofing
   iv) backfill

8. Identify factors to consider when constructing preserved wood foundations.
    i) vertical loads
    ii) lateral loads
    iii) size and contact grade of preserved wood material
    iv) thickness and grade of treated plywood
    v) stud spacing
    vi) blocking
    vii) soil conditions
    viii) finished grade
    ix) granular drainage layer
    x) special drainage requirements

9. Describe the procedures used to construct preserved wood foundations.

Practical Objectives:

N/A

CAR-260 Exterior Doors

Learning Outcomes:

- Demonstrate knowledge of exterior door assemblies and accessories.
- Demonstrate knowledge of procedures to lay out and install exterior door assemblies and accessories.
- Demonstrate knowledge of procedures to alter and repair exterior door assemblies and accessories.

2022 Red Seal Occupational Standard Reference:

14.01 Installs exterior jambs/frames.
14.02 Installs exterior doors.
14.04 Installs exterior door and window hardware.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with exterior doors.

2. Identify hazards and describe safe work practices pertaining to exterior doors.

3. Interpret codes, regulations and manufacturers' specifications pertaining to exterior doors.

4. Interpret information pertaining to exterior doors found on drawings and specifications.

5. Identify tools and equipment used with exterior doors and describe their applications and procedures for use.

6. Identify types of exterior doors and frames and describe their characteristics and applications.

7. Identify exterior door hardware, components, and accessories, and describe their purpose, characteristics, and applications.

8. Identify factors to consider when selecting and installing exterior doors and frames.
   i) barrier-free/accessibility
   ii) energy efficiency
   iii) sound transmission

iv) fire rating
v) egress
vi) security/safety
vii) moisture control

9. Describe the procedures used to lay out and install exterior door assemblies and accessories.
   i) flashing
   ii) sloped sills

10. Describe the procedures used to alter and repair exterior door assemblies and accessories.

11. Calculate materials needed to install an exterior door assembly.

12. Identify materials/fasteners, adhesives and connectors used to install exterior doors and describe their characteristics and applications.

13. Identify exterior door schedules and describe their characteristics and applications.

Practical Objectives:

1. Install an exterior door.

CAR-265 Exterior Wall Coverings Systems

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

16.01 Installs exterior wall components.
16.02 Installs exterior wall coverings.

Suggested Hours:

36 Hours

Theoretical Objectives:

1. Define terminology associated with exterior wall covering systems, cladding and trim.

2. Identify hazards and describe safe work practices pertaining to exterior wall covering systems, cladding and trim.

3. Interpret codes, regulations and manufacturers' specifications pertaining to exterior wall covering systems, cladding and trim.

4. Interpret information pertaining to exterior wall covering systems, cladding and trim found on drawings and specifications.

5. Identify tools and equipment used to install exterior wall covering systems, cladding and trim, and describe their applications and procedures for use.

6. Explain the effect of weather, wind load and pressure changes on exterior wall covering systems, cladding and trim.

7. Identify types of exterior wall coverings and describe their characteristics and applications.
    i) wood
    ii) vinyl
    iii) composite products
    iv) masonry
    v) stucco
    vi) steel

8. Identify types of exterior wall cladding, trim and accessories, and describe their characteristics and applications.

9. Identify factors to consider when selecting and installing wall covering systems~~,~~ cladding and trim.
    i) energy efficiency
    ii) sound transmission
    iii) fire rating
    iv) safety/security
    v) moisture control

10. Identify methods used to protect against water penetration and describe their associated procedures.
    i) rain screens

11. Describe the procedures used to remove and install exterior wall coverings systems.

12. Describe the procedures used to remove and install exterior wall cladding and trim.

13. Calculate materials needed to install exterior wall coverings systems, cladding and trim.

14. Identify materials/fasteners, adhesives and connectors used to construct wall covering systems and describe their characteristics and applications.

Practical Objectives:

1. Install exterior wall coverings, trim and accessories to manufacturers' specifications.

CAR-270 Exterior Windows

Learning Outcomes:

- Demonstrate knowledge of exterior window assemblies and accessories.
- Demonstrate knowledge of procedures to lay out and install exterior window assemblies and accessories.
- Demonstrate knowledge of procedures to alter and repair exterior window assemblies and accessories.

2022 Red Seal Occupational Standard Reference:

14.01 Installs exterior jambs/frames.
14.03 Installs exterior windows.
14.04 Installs exterior door and window hardware.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with exterior windows.

2. Identify hazards and describe safe work practices pertaining to exterior windows.

3. Interpret codes and regulations pertaining to exterior windows.

4. Interpret information pertaining to exterior windows found on drawings and specifications.

5. Identify tools and equipment used with exterior windows and describe their applications and procedures for use.

6. Identify types of exterior windows and frames and describe their characteristics and applications.

7. Identify exterior window hardware, components, and accessories, and describe their purpose, characteristics, and applications.

8. Identify factors to consider when selecting and installing exterior windows.
    i) energy efficiency
    ii) sound reduction
    iii) fire rating
    iv) egress
    v) security/safety
    vi) moisture control

9. Describe the procedures used to lay out and install exterior window assemblies and accessories.
    i) flashing
    ii) sloped sill

10. Describe the procedures used to alter and repair exterior window assemblies and accessories.

11. Identify materials/fasteners, adhesives and connectors used to install windows and describe their characteristics and applications.

12. Identify exterior window schedules and describe their characteristics and applications.

Practical Objectives:

1. Install an exterior window.

Level 3

CAR-305 Hip Roofs

Learning Outcomes:

- Demonstrate knowledge of components, accessories and materials used to lay out and frame hip roofs.
- Demonstrate knowledge of procedures to layout and frame hip roofs.

2022 Red Seal Occupational Standard Reference:

7.07 Lays out roofs.
13.01 Installs engineered trusses.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with hip roofs.

2. Identify hazards and safe work practices pertaining to hip roofs.

3. Interpret codes and regulations pertaining to hip roofs.

4. Interpret information pertaining to hip roofs found on drawings and specifications, and ventilation requirements.

5. Identify tools and equipment used in the construction of hip roofs and describe their applications and procedures for use.

6. Identify hip roof framing components/members, accessories, and materials, and describe their purpose, characteristics, and applications.
   i) sheathing
   ii) fascia
   iii) framing members

7. Describe the procedures used to lay out and frame hip roofs.

8. Describe the procedures used to lay out and install engineered hip roof trusses.

9. Calculate dimensions associated with hip roof layout.

10. Calculate materials needed to frame hip roofs.
    i) framing components
    ii) sheathing

11. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

1. Lay out and frame a hip roof.

CAR-310 Equal Slope Intersecting Roofs

Learning Outcomes:

- Demonstrate knowledge of components, accessories and materials used to layout and frame equal slope intersecting roofs.
- Demonstrate knowledge of procedures to lay out and frame equal slope intersecting roofs.

2022 Red Seal Occupational Standard Reference:

7.07 Lays out roofs.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with equal slope intersecting roofs.

2. Identify hazards and safe work practices pertaining to equal slope intersecting roofs.

3. Interpret codes and regulations pertaining to equal slope intersecting roofs.

4. Interpret information pertaining to equal slope intersecting roofs found on drawings and specifications.

5. Identify tools and equipment used in the construction of equal slope intersecting roofs and describe their applications and procedures for use.

6. Identify equal slope intersecting roof framing components/members, accessories, and materials, and describe their purpose, characteristics, and applications.
   i) sheathing
   ii) fascia

7. Describe the procedures used to lay out and frame equal slope intersecting roofs.

8. Describe the procedures used to lay out and install engineered equal slope intersecting roof trusses.

9. Calculate dimensions associated with equal slope intersecting roof layout.

10. Calculate materials needed to frame an equal slope intersecting roof.
    i) framing components
    ii) sheathing

11. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

1. Lay out and frame an equal slope intersecting roof.

CAR-315 Fixtures and Hardware

Learning Outcomes:

- Demonstrate knowledge of fixtures and hardware, their characteristics, and applications.
- Demonstrate knowledge of procedures to lay out and install fixtures and hardware.
- Demonstrate knowledge of procedures to alter and repair fixtures and hardware.

2022 Red Seal Occupational Standard Reference:

20.02 Installs finish components and accessories.

Suggested Hours:

3 Hours

Theoretical Objectives:

1. Define terminology associated with fixtures and hardware.

2. Identify hazards and describe safe work practices pertaining to fixtures and hardware.

3. Interpret codes, regulations and manufacturers' specifications pertaining to fixtures and hardware.

4. Interpret information pertaining to fixtures and hardware found on drawings and specifications.

5. Identify tools and equipment pertaining to fixtures and hardware and describe their applications and procedures for use.

6. Identify types of fixtures and hardware and describe their characteristics and applications.
   i) barrier-free/accessibility
   ii) residential
   iii) industrial, commercial, institutional (ICI)

7. Identify additional framing or blocking that may be required before installing fixtures and hardware.

8. Describe the procedures used to lay out and install fixtures and hardware.

9. Describe the procedures used to alter and repair fixtures and hardware.

10. Identify hardware schedules and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-340 Interior Trim

Learning Outcomes:

- Demonstrate knowledge of interior trim, its characteristics, and applications.
- Demonstrate knowledge of procedures to lay out and install interior trim.
- Demonstrate knowledge of procedures to alter and repair interior trim.

2022 Red Seal Occupational Standard Reference:

20.01 Fabricates finish components.
20.02 Installs finish components and accessories.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with interior trim.

2. Identify hazards and describe safe work practices pertaining to interior trim.

3. Interpret codes and manufacturers' specifications pertaining to interior trim.

4. Interpret information pertaining to interior trim work found on drawings and specifications.

5. Identify tools and equipment pertaining to interior trim and describe their applications and procedures for use.

6. Describe the importance of proper handling, storage, and preparation of interior trim materials.
   i) acclimatization of products and materials

7. Identify types of interior trim and describe their characteristics and applications.

8. Describe the procedures used to lay out and install interior trim.

9. Describe the procedures used to alter and repair interior trim.

10. Calculate materials needed to install interior trim.

11. Identify materials/fasteners, adhesives and connectors used to fasten interior trim and describe their characteristics and applications.

Practical Objectives:

1. Install interior trim.

CAR-345 Cabinets, Countertops and Built-in Units

Learning Outcomes:

- Demonstrate knowledge of cabinets, countertops and built-in units, their characteristics, and applications.
- Demonstrate knowledge of procedures to lay out, construct and install cabinets, countertops, and built-in units.
- Demonstrate knowledge of procedures to alter and repair cabinets, countertops, and built-in units.

2022 Red Seal Occupational Standard Reference:

20.01 Fabricates finish components.
20.02 Installs finish components and accessories.

Suggested Hours:

12 Hours

Theoretical Objectives:

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. Interpret codes, regulations and manufacturers' specifications pertaining to cabinets, countertops, and built-in units.

4. Interpret information pertaining to cabinets, countertops and built-in units found on drawings and specifications.

5. Identify tools and equipment pertaining to cabinets, countertops, and built-in units, and describe their applications and procedures for use.

6. Identify types of cabinets and built-in units and describe their characteristics and applications.

7. Identify cabinet and built-in unit hardware, components, and accessories, and describe their purpose, characteristics, and applications.

8. Identify types of countertops and describe their characteristics and applications.

9. Identify factors to consider when selecting and installing barrier free/accessible cabinets, built-in units, countertops, hardware, components, and accessories.

10. Describe the procedures used to layout and install cabinets.

11. Describe the procedures used to layout, construct and install built-in units.

12. Describe the procedures used to alter and repair cabinets and built-in units.

13. Describe the procedures used to construct and install countertops.

14. Describe the procedures used to alter and repair countertops.

15. Calculate dimensions associated with cabinets and built-in units' layout.

16. Calculate materials needed to install cabinets, built-in units, and countertops.

17. Identify materials/fasteners, adhesives and connectors used to install cabinets, countertops and built-in units and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-355 Stair Forms

Learning Outcomes:

- Demonstrate knowledge of stair forms, their characteristics, and applications.
- Demonstrate knowledge of procedures to lay out and construct stair forms.
- Demonstrate knowledge of procedures to dismantle and recondition stair forms.

2022 Red Seal Occupational Standard Reference:

8.07 Constructs stair formwork.
8.08 Installs embedded reinforcement.
8.09 Dismantles formwork.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology associated with stair forms.

2. Identify hazards and describe safe work practices pertaining to stair forms.

3. Interpret codes and regulations pertaining to stair forms.

4. Interpret information pertaining to stair forms found on drawings and specifications.

5. Identify tools and equipment used with stair forms and describe their applications and procedures for use.

6. Identify types of concrete stairs and describe their characteristics and applications.

7. Identify concrete stair form components and accessories and describe their purpose and applications.

8. Identify materials and accessories used to construct stair forms.

9. Describe the procedures used to lay out and construct stair forms.

10. Identify types of embedded materials and reinforcing components, and describe their purpose, characteristics, and applications.

11. Describe the procedures used to place embedded materials.

12. Describe the procedures and products used to dismantle and recondition stair forms.

13. Calculate materials required to construct concrete stairs.
    i) stair forms
    ii) concrete

14. Identify materials/fasteners, adhesives and connectors used to construct stair forms and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-360 Interior Wall Systems

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

17.01 Installs wallboard.
17.02 Applies compound to walls and ceilings.
17.03 Installs panels, tiles, and solid wood finishes.
17.05 Installs demountable wall systems.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with interior wall systems.

2. Identify hazards and describe safe work practices pertaining to interior wall systems.

3. Interpret codes, regulations and manufacturers' specifications pertaining to interior wall systems.

4. Interpret information pertaining to interior wall systems found on drawings and specifications.

5. Identify tools and equipment used with interior wall systems and describe their applications and procedures for use.

6. Identify types of interior wall systems and describe their characteristics and applications.
   i) shaft
   ii) fire-rated
   iii) STC-rated
   iv) demountable
      - office partition
   v) operable

7. Identify types of wallboard and describe their characteristics and applications.
   i) gypsum
   ii) cementitious
   iii) fiber board

8. Identify types of panels and tiles and describe their characteristics and applications.
   i) hardboard
   ii) laminate
   iii) acoustical
   iv) composites
   v) metal
   vi) wood

9. Identify interior wall system components, accessories, and materials, and describe their purpose, characteristics, and applications.
   i) hardware
   ii) trim
   iii) channels
   iv) furring
   v) blocking
   vi) sound barrier

10. Identify factors to consider when selecting and installing interior wall systems.

11. Describe the procedures used to prepare walls for finish.
   i) acclimatization of products and materials

12. Describe the procedures used to remove and install wall systems.

13. Calculate dimensions associated with interior wall system layout.

14. Calculate components, accessories and materials needed to install interior wall systems.

15. Identify materials/fasteners, adhesives, grout, and connectors used to construct interior wall systems and describe their characteristics and applications.

Practical Objectives:

1. Install interior coverings.

CAR-365 Ceilings

Learning Outcomes:

- Demonstrate knowledge of ceilings, their characteristics, and applications.
- Demonstrate knowledge of procedures to layout and install ceilings.
- Demonstrate knowledge of procedures to alter and repair ceilings.

2022 Red Seal Occupational Standard Reference:

17.01 Installs wallboard.
17.02 Applies compound to walls and ceilings.
17.03 Installs panels, tiles, and solid wood finishes.
17.04 Installs suspended ceilings.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with ceilings.

2. Identify hazards and describe safe work practices pertaining to ceilings.

3. Interpret codes, regulations and manufacturers' specifications pertaining to ceilings.

4. Interpret information pertaining to ceilings found on drawings and specifications.
   i) reflected view

5. Identify tools and equipment pertaining to ceilings and describe their applications and procedures for use.

6. Identify types of ceilings and describe their characteristics and applications.
   i) suspended
   ii) non-suspended
   iii) drop
   iv) bulkhead

7. Identify ceiling components, accessories, and materials, and describe their purpose, characteristics, and applications.

8. Identify factors to consider when selecting and installing ceilings.
    i) STC rated
    ii) fire rated

9. Describe the procedures used to lay out and install ceilings.

10. Describe the procedures used to alter and repair ceilings.

11. Calculate dimensions associated with ceiling layout.

12. Calculate components, accessories and materials needed to install ceilings.

13. Identify materials/fasteners, adhesives and connectors used to install ceilings and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-370 Pre-Cast Concrete

Learning Outcomes:

- Demonstrate knowledge of pre-cast concrete components, their characteristics, and applications.
- Demonstrate knowledge of procedures to cast and install pre-cast concrete components.
- Demonstrate knowledge of grouts, their characteristics, and applications.
- Demonstrate knowledge of procedures to install grout.

2022 Red Seal Occupational Standard Reference:

9.04 Installs pre-cast components.
9.05 Installs grout.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with pre-cast concrete.

2. Identify hazards and describe safe work practices pertaining to pre-cast concrete.

3. Interpret codes and regulations pertaining to pre-cast concrete.

4. Interpret information pertaining to pre-cast concrete found on drawings and specifications.

5. Identify tools and equipment used with pre-cast concrete and describe their applications and procedures for use.

6. Identify pre-cast concrete components, accessories, and materials, and describe their characteristics and applications.
   i) grout
   ii) shims

7. Describe the procedures used to construct pre-cast concrete components.
   i) tilt up

8. Describe the procedures used to install pre-cast concrete components and accessories.

9. Identify types of grout and describe their characteristics and applications.

10. Describe the procedures used to install grout.

11. Describe the procedures used to reinforce pre-cast concrete components.
    i) pre-stressed
    ii) post tensioned

12. Identify materials/fasteners, adhesives and connectors used to install pre-cast concrete and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-375 Suspended Slab and Beam Forms

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

8.02 Erects concrete falsework.
8.04 Constructs wall form systems and grade beam formwork.
8.05 Constructs slab formwork.
8.08 Installs embedded reinforcements.
8.09 Dismantles formwork.

Suggested Hours:

21 Hours

Theoretical Objectives:

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. Interpret codes, regulations and manufacturers' specifications pertaining to the construction of suspended slab and beam forms.

4. Interpret information pertaining to suspended slabs and beams found on drawings, specifications, and engineers' documentation.

5. Identify tools and equipment used with suspended slab and beam forms and describe their applications and procedures for use.

6. Identify types of suspended slab and beam forms and describe their characteristics and applications.
   i) mat foundation
   ii) post tensioned
   iii) grade beams
   iv) spandrel beam

7. Identify types of piles and describe their characteristics and applications.

8. Identify types of piers and describe their characteristics and applications.

9. Identify types of form accessories and support structures and describe their characteristics and applications.
   i) falsework
   ii) pans
   iii) drop panels
   iv) shores
   v) re-shores
   vi) table forms
   vii) proprietary forms

10. Describe the procedures and products used to construct suspended slab and beam forms.
   i) joints
   ii) chase

11. Describe the procedures and products used to dismantle and recondition suspended slab and beam forms.

12. Describe the procedures used to re-shore suspended slabs and beams.

13. Calculate materials needed to construct suspended slab and beam forms and calculate the volume of concrete required.

14. Identify materials/fasteners, adhesives and connectors used to construct suspended slab and beam forms and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-380 Excavation Shoring and Underpinning

Learning Outcomes:

- Demonstrate knowledge of excavation shoring and underpinning, their characteristics and application.
- Demonstrate knowledge of procedures to erect excavation shoring and place underpinning.

2022 Red Seal Occupational Standard Reference:

8.01 Erects excavation shoring and underpinning.

Suggested Hours:

3 Hours

Theoretical Objectives

1. Define terminology associated with excavation shoring and underpinning.

2. Identify hazards and describe safe work practices pertaining to excavation shoring and underpinning.

3. Interpret codes, regulations and manufacturers specifications pertaining to excavation shoring and underpinning.

4. Interpret information pertaining to excavation shoring and underpinning found on drawings, specifications, and engineers' documentation.

5. Identify tools and equipment used for excavation shoring and underpinning and describe their applications and procedures for use.

6. Identify types of shoring and shoring materials and describe their characteristics and applications.

7. Identify types of underpinning techniques and describe their characteristics and applications.

8. Identify types of accessories and support structures used in excavation shoring and underpinning and describe their characteristics and applications.

9. Describe the procedures and products used to erect excavation shoring and place underpinning.

10. Describe the procedures used to shore suspended slabs and beams.

11. Calculate materials needed for excavation shoring and underpinning.

12. Identify materials/fasteners, adhesives and connectors used for excavation shoring and underpinning and describe their characteristics and applications.

Practical Objectives:

N/A

CAR-385 Column and Vertical Forms

Learning Outcomes:

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

2022 Red Seal Occupational Standard Reference:

8.06 Constructs column formwork.
8.08 Installs embedded reinforcements.
8.09 Dismantles formwork.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology associated with column and vertical forms.

2. Identify hazards and describe safe work practices pertaining to column and vertical forms.

3. Interpret codes and regulations pertaining to column and vertical forms.

4. Interpret information pertaining to column and vertical forms found on drawings and specifications.

5. Identify tools and equipment used with column and vertical forms and describe their applications and procedures for use.

6. Identify types of column and vertical form systems and describe their characteristics and applications.
   i) loose forming/panel forming
   ii) proprietary (patented) forming
   iii) insulated concrete forms (ICF)
   iv) slip forms/self-jacking forms
   v) fly form
   vi) gang forms
   vii) tilt form

7. Identify types of column and vertical form system components, accessories, and materials, and describe their purpose and applications.

8. Describe the procedures used to construct column and vertical forms.

9. Identify types of embedded materials and describe their characteristics and applications.

10. Describe the procedures used to place embedded materials.

11. Describe the procedures and products used to dismantle and recondition forms.

12. Calculate materials needed to construct column and vertical forms and calculate the volume of concrete required.

13. Identify materials/fasteners, adhesives and connectors used to construct column and vertical forms and describe their characteristics and applications.

Practical Objectives:

1. Demonstrate how to lay out and construct a column and/or vertical form.

CAR-390 Interior Doors and Windows

Learning Outcomes:

- Demonstrate knowledge of interior door and window assemblies and accessories, their characteristics, and applications.
- Demonstrate knowledge of procedures to lay out and install interior door and window assemblies and accessories.
- Demonstrate knowledge of procedures to alter and repair interior door and window assemblies and accessories.

2022 Red Seal Occupational Standard Reference:

19.01 Installs interior jambs/frames.
19.02 Installs interior doors.
19.03 Installs interior windows.
19.04 Installs interior door and window hardware.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with interior doors and windows.

2. Identify hazards and describe safe work practices pertaining to interior doors and windows.

3. Interpret codes, regulations and manufactures' specifications pertaining to interior doors and windows.

4. Interpret information pertaining to interior doors and windows found on drawings and specifications.

5. Identify tools and equipment pertaining to interior doors and windows and describe their applications and procedures for use.

6. Identify types of door jambs and frames and describe their characteristics and applications.

7. Identify types of interior doors and windows and describe their characteristics and applications.

8. Identify interior door and window hardware, components, and accessories, and describe their purpose, characteristics, and applications.

9. Identify factors to consider when selecting and installing interior doors and windows, their hardware, components, and accessories.
   i) barrier-free/accessibility
   ii) energy efficiency
   iii) sound reduction
   iv) fire rating
   v) egress
   vi) security/safety

10. Describe the procedures used to lay out and install interior door and window assemblies and accessories.

11. Describe the procedures used to alter and repair interior door and window assemblies and accessories.

12. Calculate materials needed to install an interior door and window assembly.

13. Identify materials/fasteners, adhesives and connectors used to install interior doors and windows and describe their characteristics and applications.

14. Identify door and window schedules and describe their characteristics and applications.

Practical Objectives:

1. Install an interior door.

Level 4

MENT-701 Mentoring II

Learning Outcomes:

- Demonstrate knowledge of effective communication practices as a mentor.
- Demonstrate knowledge of strategies for teaching workplace skills.

2022 Red Seal Occupational Standard Reference:

4.01 Uses communications techniques.
4.02 Uses mentoring techniques.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Identify the different roles played by a workplace mentor.

2. Identify strategies to create a supportive learning environment.

3. Identify techniques for effective communication as a mentor.
   i) constructive feedback
   ii) active listening
   iii) leading meetings and one-on-one sessions

4. Describe the steps in teaching a skill.
   i) identifying the point of lesson
   ii) linking the lesson
   iii) demonstrating the skill
   iv) providing practice
   v) giving feedback
   vi) assessing skill and progress

5. Identify strategies to assist in teaching a skill while meeting individual learning needs.
   i) principles of instruction
   ii) coaching skills

6. Explain how to adjust a lesson for various situations.

Practical Objectives:

N/A

CAR-401 Building Science and Sustainability

Learning Outcomes:

- Demonstrate knowledge of building science principles and techniques to plan, construct and maintain environmentally sustainable buildings.

2022 Red Seal Occupational Standard Reference:

12.01 Installs engineered wall systems.
12.02 Constructs dimensional lumber wall framing.
15.01 Installs roofing components.
16.01 Installs exterior wall components.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with building science and environmental sustainability.

1. Interpret standards and regulations pertaining to building science and environmental sustainability practices.

3. Identify green building certification systems and programs and describe their benefits and applications.
   i) Leadership in energy and environmental design (LEED)
   ii) Energy Star

4. Identify energy efficient construction techniques and considerations and describe their impact on the building as a system.
   i) net-zero energy (NZE)
   ii) passive design strategies
      - building orientation
      - shading
      - thermal mass
   iii) building envelope technology
      - framing/insulating
      - air tightness
      - vapor barriers and drainage planes
   iv) seismic considerations
   v) reclamation/management of water

5. Identify methods and products that help contribute to an environmentally responsible and sustainable building.
    i) using recycled/recyclable materials
    ii) reducing carbon footprint
    iii) conserving water
    iv) using renewable resources
    v) employing adaptable building principles
    vi) maintaining indoor air quality
        - radon gas
        - other gases
    vii) using higher efficiency and longer life expectancy materials
        - mass timber
        - engineered forming systems

6. Explain the concept of off-gassing and its effects on human health and the environment.

7. Identify types of drainage systems and describe their characteristics and applications.

8. Describe the procedures used to control air leakage and heat transfer in buildings.

9. Describe the procedures used to control airflow in buildings.

10. Describe the procedures used to control moisture flow in buildings.

11. Describe the procedures used to control sound transmission in buildings.

12. Describe the procedures used to control or eliminate off-gassing.

13. Describe the procedures used to control surface and ground water drainage systems.

Practical Objectives:

N/A

CAR-406 Flooring and Floor Coverings

Learning Outcomes:

- Demonstrate knowledge of underlayment, floor coverings, their characteristics, and applications.
- Demonstrate knowledge of procedures to remove and install underlayment and floor coverings.
- Demonstrate knowledge of procedures to install access flooring.

2022 Red Seal Occupational Standard Reference:

18.01 Installs underlayment.
18.02 Installs floor coverings.
18.03 Installs access flooring.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with flooring and floor coverings.

2. Identify hazards and describe safe work practices pertaining to flooring and floor coverings.

3. Interpret codes, regulations and manufacturers' specifications pertaining to flooring and floor coverings.

4. Interpret information pertaining to flooring and floor coverings found on drawings and specifications.

5. Identify tools and equipment used with flooring and floor coverings and describe their applications and procedures for use.

6. Identify types of flooring and describe their characteristics and applications.
   i) access flooring
   ii) specialty flooring
      - sports floors
      - terrazzo

7. Identify types of floor coverings and describe their characteristics and applications.
   i) tile
      - ceramic
      - vinyl composite tile (VCT)
      - rubber/cork
      - carpet
   ii) wood strip
   iii) laminate
   iv) sheet products
      - linoleum
      - vinyl

8. Identify flooring components, accessories, materials, grout, and coatings, and describe their purpose, characteristics, and applications.

9. Identify types of underlayment and describe their characteristics and applications.
   i) hardboard
   ii) plywood
   iii) sheathing
   iv) cement board
   v) isolation membrane

10. Explain the effect of contraction and expansion on flooring and floor coverings.

11. Describe the procedures used to prepare floor surface for the installation of floor coverings.
   i) checking moisture content of substrates
   ii) acclimatization of products and materials
   iii) applying leveling compounds

12. Describe the procedures used to remove and install flooring and floor coverings.

13. Describe the procedures used to install access floors.

14. Identify factors to consider when selecting and installing flooring and floor coverings.

15. Calculate components, accessories, materials, and coatings needed to layout and install flooring and floor coverings.

16. Identify materials/fasteners, adhesives and connectors used to install flooring and floor coverings and describe their characteristics and applications.

Practical Objectives:

1. Lay out and install flooring.

CAR-425 Advanced Roofs

Learning Outcomes:

- Demonstrate knowledge of components, accessories and materials used to lay out and frame advanced roofs.
- Demonstrate knowledge of procedures to lay out and frame advanced roofs.

2022 Red Seal Occupational Standard Reference:

7.07 Lays out roofs.
13.01 Installs engineered trusses.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with advanced roofs.

2. Identify hazards and describe safe work practices pertaining to advanced roofs.

3. Interpret codes and regulations pertaining to advanced roofs.

4. Interpret information pertaining to advanced roofs found on drawings and specifications.

5. Identify tools and equipment used in the construction of advanced roofs and describe their applications and procedures for use.

6. Identify types of advanced roofs and describe their characteristics and applications.
   i) gambrel
   ii) mansard
   iii) polygon
   iv) flat
   v) deck designated as a low slope roof
   vi) dormers
   vii) crickets

7. Identify framing components/members, accessories, and materials for advanced roofs, and describe their purpose, characteristics, and applications.

8. Describe the procedures used to lay out and frame advanced roofs.

9. Calculate dimensions associated with advanced roof layout.

10. Calculate materials needed to frame an advanced roof.

11. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

1. Construct an advanced roof.

CAR-435 Unequal Slope Roofs

Learning Outcomes:

- Demonstrate knowledge of components and materials used to lay out and frame unequal slope roofs.
- Demonstrate knowledge of procedures to layout and frame unequal slope roofs.

2022 Red Seal Occupational Standard Reference:

7.07 Lays out roofs.
13.01 Installs engineered trusses.
13.02 Constructs roof and ceiling framing.

Suggested Hours:

33 Hours

Theoretical Objectives:

1. Define terminology associated with unequal slope roofs.

2. Identify hazards and describe safe work practices pertaining to unequal roofs.

3. Interpret codes and regulations pertaining to unequal slope roofs.

4. Interpret information pertaining to unequal slope roofs found on drawings and specifications.

5. Identify tools and equipment used with unequal slope roofs and describe their applications and procedures for use.

6. Identify types of unequal slope roofs and describe their characteristics and applications.
   i) gable
   ii) hip
   iii) intersecting

7. Identify unequal slope roof framing components/members and describe their purpose, characteristics, and applications.

8. Describe the procedures used to lay out and frame unequal slope roofs.

9. Describe the procedures used to lay out and install engineered unequal slope roof trusses.

10. Calculate dimensions associated with unequal slope roof layout.

11. Calculate materials needed to lay out and frame unequal slope roofs.

12. Identify materials/fasteners, adhesives and connectors used to construct roof and ceiling framing and describe their characteristics and applications.
    i) framing members
        - trusses
        - collar ties
        - purlins
        - various rafters
        - ridge boards
        - bracing
        - ceiling joists
        - webs
        - gusset plates
        - gables studs
        - beams
    ii) ventilation

Practical Objectives:

N/A

CAR-445 Project Planning

Learning Outcomes:

- Demonstrate knowledge of procedures to plan and organize projects.

2022 Red Seal Occupational Standard Reference:

6.01 Schedules work sequence.
6.02 Performs site preparation.
6.03 Performs quantity take off.
6.04 Organizes materials.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology associated with project planning.

2. Interpret information pertaining to project planning found on drawings and specifications.

3. Identify sources of information relevant to project planning.
   - i) documentation
     - specifications
     - codes and regulations
     - reference materials
     - safety manuals
   - ii) drawings
   - iii) related professionals/other trades
   - iv) clients

4. Identify considerations for project planning.
   - i) hazard and environmental assessment
   - ii) human resources
   - iii) barrier free/accessibility
   - iv) qualified tradespeople
   - v) tools and equipment
   - vi) materials
   - vii) lead times
   - viii) waste management
   - ix) permits and documentation

x) site conditions and preparation
xi) weather/seasonal conditions
xii) budget/cost control
xiii) bathrooms
xiv) signage
xv) scope of work to be completed by other trades

5. Describe the procedures used to perform quantity take-off.

6. Describe the procedures used to plan project tasks.
   i) scheduling
   ii) estimating

7. Describe the procedures used to organize and store tools, equipment, and materials on-site.

8. Explain how changes in workplace documents impact project requirements.
   i) requests for information
   ii) change orders
   iii) engineers' reports

9. Identify factors to consider when developing alternate plans to account for changes in project requirements.

Practical Objectives:

N/A

CAR-450 Renovation

Learning Outcomes:

- Demonstrate knowledge of procedures to renovate existing structures.

2022 Red Seal Occupational Standard Reference:

21.01 Removes existing material.
21.02 Protects structure during renovations.
22.01 Joins new to existing construction.
22.02 Changes existing structure during renovations.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with renovation activities.

2. Identify hazards and describe safe work practices pertaining to renovation activities.

3. Interpret codes, regulations and engineers' documents pertaining to renovation activities.

4. Interpret information pertaining to renovation activities found on drawings and specifications.

5. Identify tools and equipment used when performing renovation activities and describe their applications and procedures for use.

6. Explain the effects of adding, removing, or modifying the layout of structural components.

7. Identify the considerations when performing barrier-free/accessible renovation activities.

8. Explain the importance of conserving historical buildings.

9. Identify materials and components specific to renovation activities.
   i) hazardous
   ii) non-hazardous

10. Identify materials and components that can be reused, recycled, and reclaimed in the renovation process.

11. Identify destructive and non-destructive methods of identifying and assessing condition of existing structures.

12. Identify considerations when performing demolition and removing existing materials.

13. Describe the procedures used when performing demolition and removing existing materials.
    i) protecting structures, surfaces, and people
        - hoarding
        - shoring
        - underpinning
        - angle of repose
        - separations
        - heating/ventilation/lighting
    ii) isolating utilities
    iii) containing and abating materials
    iv) cataloguing location of materials
    v) reclaiming/reusing materials
    vi) disposing of materials

14. Identify considerations when joining new construction to existing structures.
    i) compatibility of materials
    ii) jurisdictional requirements and standards
    iii) structural integrity between new and existing
    iv) transitioning for aesthetic purposes
    v) historical building conservation requirements

15. Describe the procedures used to join new construction to existing structures.

16. Identify the considerations when making changes to existing structures.
    i) increasing energy efficiency
    ii) relocation of structural and non-structural components
    iii) condition of existing structural and non-structural support
        - rot/mold
        - damage
        - hazardous materials
        - not compliant with current codes
        - differential movement
    iv) load bearing wall requirements
    v) historical building conservation requirements

17. Describe the procedures used to make changes to existing structures.

Practical Objectives:

N/A

CAR-455 Advanced Stairs

Learning Outcomes:

- Demonstrate knowledge of advanced stairs, their characteristics and applications.
- Demonstrate knowledge of the procedures to lay out, construct and install advanced stairs.
- Demonstrate knowledge of finish components, their characteristics and applications.

2022 Red Seal Occupational Standard Reference:

7.08 Lays out stairs.
7.09 Lays out balustrades.
20.01 Fabricates finish components.
20.02 Installs finish components and accessories.
20.03 Constructs stairs.

Suggested Hours:

42 Hours

Theoretical Objectives:

1. Define terminology associated with advanced stairs.

2. Identify hazards and describe safe work practices pertaining to advanced stairs.

3. Interpret codes and regulations pertaining to advanced stairs.

4. Interpret information pertaining to advanced stairs found on drawings and specifications.

5. Identify tools and equipment pertaining advanced stairs and describe their applications and procedures for use.

6. Identify types of advanced stairs and describe their characteristics and applications.
   i) winders
   ii) curved/spiral

7. Identify types of finish materials and styles of stairs and describe their characteristics and applications.
   i) open
   ii) closed
   iii) housed
   iv) laminated

8. Identify components of advanced stairs and describe their purpose and applications.
   i) balustrades
   ii) treads
   iii) risers
   iv) stringers
   v) skirt boards
   vi) mouldings
   vii) landings

9. Describe the procedures used to lay out, construct and install advanced stairs, their components, and accessories.

10. Describe the procedures used to lay out, construct and install components of advanced stairs.

11. Calculate dimensions and materials needed to lay out, construct and install components of advanced stairs.
   i) stairs with landings
   ii) spirals
   iii) circular
   iv) manufactured

12. Identify materials/fasteners, adhesives and connectors used to construct advanced stairs and describe their characteristics and applications.

13. Identify components of advanced stairs and describe their purpose and applications.

Practical Objectives:

1. Lay out and construct advanced stairs.

CAR-460 Panels, Tiles and Solid Wood Finishes

Learning Outcomes:

- Demonstrate knowledge of panels, tiles and solid wood finishes, their characteristics, and applications.
- Demonstrate knowledge of procedures to install panels, tiles, and solid wood finishes.

2022 Red Seal Occupational Standard Reference:

17.03 Installs panels, tiles, and solid wood finishes.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with panels, tiles, and solid wood finishes.

2. Identify hazards and describe safe work practices pertaining to panels, tiles, and solid wood finishes.

3. Interpret codes, regulations and manufacturers' specifications pertaining to panels, tiles, and solid wood finishes.

4. Interpret information pertaining to panels, tiles and solid wood finishes found on drawings and specifications.

5. Identify tools and equipment used with panels, tiles, and solid wood finishes, and describe their applications and procedures for use.

6. Identify types of panels and tiles and describe their characteristics and applications.
   i) hardboard
   ii) laminate
   iii) matched veneer
   iv) beadboard
   v) wainscoting
   vi) fiberglass reinforced panels (FRP)
   vii) metal

7. Describe the procedures used to secure trim.

8. Identify panels, tiles and solid wood finish components, accessories, and materials, and describe their purpose, characteristics, and applications.
    i) sealer
    ii) applied finishes
        - stain
        - paint

9. Describe the procedures used to prepare wall or ceiling surface according to finish to be applied.

10. Identify factors to consider when installing panels, tiles, and solid wood finishes.
    i) measuring and layout
    ii) cutting
    iii) penetrations
    iv) moisture

11. Describe the procedures used to secure panels, tiles, solid wood finishes and finished trim using fasteners.
    i) manufactures specifications
    ii) site conditions

12. Describe the procedures used to remove panels, tiles, and solid wood finishes.

13. Calculate dimensions associated with panels, tiles, and solid wood finishes.

14. Calculate components, accessories and materials needed to install panels, tiles, and solid wood finishes.

Practical Objectives:

N/A

CAR-465 Program Review

Learning Outcomes:

- Demonstrate knowledge of the Red Seal Occupational Standard and its relationship to the Red Seal Examination.
- Demonstrate knowledge of overall comprehension of the trade in preparation for the Red Seal Examination.

2022 Red Seal Occupational Standard Reference:

Entire Red Seal Occupational Standard (RSOS).

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with an RSOS.
   - i) major work activities (MWA)
   - ii) tasks
   - iii) sub-tasks

2. Explain how an RSOS is developed and the link it has to the Red Seal Examination.
   - i) development
   - ii) validation
   - iii) MWA and task weighting
   - iv) examination breakdown (pie-chart)

3. Identify Red Seal products and describe their use for preparing for the Red Seal Examination.
   - i) Red Seal website
   - ii) examination preparation guide
   - iii) sample questions
   - iv) examination breakdowns
   - v) self-assessment tool

4. Explain the relationship between the RSOS and the AACS.

5. Review common occupational skills for the Carpenter trade as identified in the RSOS.
   i) tools and equipment
   ii) safety-related activities
   iii) temporary access structures
   iv) communication and mentoring techniques

6. Review process to perform planning and layout for the Carpenter trade as identified in the RSOS.
   i) documentation
   ii) organizes work
   iii) performs layout

7. Review process to perform concrete work for the Carpenter trade as identified in the RSOS.
   i) formwork
   ii) concrete, cement-based and epoxy products

8. Review process to perform framing for the Carpenter trade as identified in the RSOS.
   i) floor systems
   ii) deck systems
   iii) wall systems
   iv) roof and ceiling systems

9. Review process to perform exterior finishing for the Carpenter trade as identified in the RSOS.
   i) exterior doors and windows
   ii) roofing
   iii) exterior finishes

10. Review process to perform interior finishing for the Carpenter trade as identified in the RSOS.
   i) wall and ceiling finishes
   ii) flooring
   iii) interior doors and windows
   iv) finish components and stairs

11. Review process to perform renovations for the Carpenter trade as identified in the RSOS.
   i) renovation-specific support activities
   ii) renovation-specific construction activities

Practical Objectives:

N/A

Feedback and Revisions

This AACS will be amended periodically; comments or suggestions for improvements should be directed to:

New Brunswick:
Skilled Trades NB
Post-Secondary Education, Training and Labour
470 York St., PO Box 6000
Fredericton, NB E3B 5H1
Tel: 506-453-2260
Toll Free in NB: 1-855-453-2260
www.gnb.ca

Prince Edward Island:
Apprenticeship, Training and Certification
Workforce, Advanced Learning and Population
176 Great George St., PO Box 2000
Charlottetown, PE C1A 7N8
Tel: 902-368-4460
www.apprenticeship.pe.ca

Newfoundland and Labrador:
Apprenticeship and Trades Certification
Immigration, Population Growth and Skills
Confederation Building, West Block
Prince Philip Dr., PO Box 8700
St. John's, NL A1B 4J6
Toll Free: 877-771-3737
https://www.gov.nl.ca/atcd/

Nova Scotia:
Nova Scotia Apprenticeship Agency
1256 Barrington St.
Halifax, NS B3J 1Y6
Tel: 902-424-5651
Toll Free in NS: 1-800-494-5651
www.nsapprenticeship.ca

Any comments or suggestions received will be reviewed and considered to determine the course of action required. If the changes are deemed to be minor, they will be held for implementation during the next review cycle. If immediate change is deemed appropriate and approved by the Atlantic Trade Advisory Committee, it will result in a revision to this version of the AACS and will be detailed in the following section.

Version Changes

Revision Date	Section	Description of Change
2024	All sections	Update to align with national occupational standard