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# NL Curriculum Standard Plan of Training Concrete Finisher



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

June 2018

# PLAN OF TRAINING

## Concrete Finisher

June 2018



Government of Newfoundland and Labrador  
Department of Advanced Education, Skills and Labour  
Apprenticeship and Trades Certification Division

Approved by:

A handwritten signature in blue ink, appearing to read "Dave H.", written over a horizontal line.

Chairperson, Provincial Apprenticeship and Certification Board

Date: July 17, 2018

### Preface

This curriculum standard is aligned with the 2017 Red Seal Occupational Standard (RSOS) and National Harmonization sequencing and levels for the Concrete Finisher trade. It describes the curriculum content for the Concrete Finisher apprenticeship training program.

### Acknowledgements

Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input to the development of this curriculum standard. Without their dedication to quality training, this document could not have been produced.

We offer you a sincere thank you.

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A. RSOS Comparison Table

RSOS Sub-task		Plan of Training Unit
Task 1 – Performs Safety-related Functions		
1.01	Uses personal protective equipment (PPE) and safety equipment	FC1113 – Safety *contained in most all courses
1.02	Maintains safe work environment	
Task 2 – Uses Tools and Equipment		
2.01	Uses hand tools	FC1103 – Tools & Equipment I
2.02	Uses power tools	FC2101 – Tools & Equipment II
2.03	Uses measuring equipment	*contained in most all courses
Task 3 – Organizes Work		
3.01	Uses documentation	FC1073 – Introduction to Communication and Trade Documentation FC2260 – Communication and Trade Documentation
3.02	Determines material requirements and quantities	FC1063 – Work Scheduling and Materials I
3.03	Sequences work procedures	FC2250 – Work Scheduling and Materials II FC1003 – Formwork I FC2070 – Formwork II AM1140 – Concrete Finisher Math Fundamentals
Task 4 – Uses Communication and Mentoring Techniques		
4.01	Uses communicates techniques	FC1073 – Introduction to Communication and Trade Documentation FC2260 – Communication and Trade Documentation
4.02	Uses mentoring techniques	LT3090 – Mentoring
Task 5 – Prepares Site		
5.01	Inspects site	FC1040 – Site Preparation I
5.02	Prepares sub-grade and elevations	FC2080 – Site Preparation II

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Task 6 – Uses Formwork		
6.01	Constructs concrete formwork	FC1003 – Formwork I FC2070 – Formwork II
6.02	Installs reinforcements	
6.03	Inspects formwork and reinforcement	
6.04	Installs construction, isolation and expansion joints	FC1033 – Concrete Cutting I FC2040 – Concrete Cutting II
6.05	Removes forms	FC1003 – Formwork I FC2070 – Formwork II
Task 7 – Places Concrete		
7.01	Transports concrete on site	FC1121 – Concrete Transport & Placement I FC2010 – Concrete Transport & Placement II
7.02	Spreads concrete	
7.03	Consolidates concrete	
Task 8 – Levels Concrete		
8.01	Establishes elevation	FC1053 – Concrete Tooling by Hand FC2020 – Concrete Tooling by Machine
8.02	Screeds concrete	
8.03	Bull floats concrete	FC1053 – Concrete Tooling by Hand
Task 9 – Floats Concrete		
9.01	Floats concrete by hand	FC1053 – Concrete Tooling by Hand
9.02	Floats concrete by machine	FC2020 – Concrete Tooling by Machine
Task 10 – Hand-Tools Concrete		
10.01	Edges perimeter of slab	FC1053 – Concrete Tooling by Hand
10.02	Finishes extruded concrete surfaces	FC2030 – Extruded Concrete
10.03	Tools contraction joints	FC1053 – Concrete Tooling by Hand
Task 11 – Trowels Concrete		
11.01	Trowels concrete by hand	FC1053 – Concrete Tooling by Hand
11.02	Trowels concrete by machine	FC2020 – Concrete Tooling by Machine
Task 12 – Applies Surface Treatments to Concrete		
12.01	Applies dry-shake aggregate surface hardeners	FC2200 – Plastic Concrete - Surface Treatments
12.02	Applies exposed aggregate finish	FC2210 – Plastic Concrete - Specialty Surface Finishes
12.03	Textures concrete surface	
12.04	Applies stamped concrete surface finish	
12.05	Applies evaporation reducers	FC2200 – Plastic Concrete - Surface Treatments

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<b>Task 13 – Cures Concrete</b>		
13.01	Wet cures concrete	FC1143 – Concrete Curing
13.02	Chemical cures concrete	
<b>Task 14 – Creates Contraction Joints</b>		
14.01	Saw cuts contraction joints	FC1033 – Concrete Cutting I
14.02	Fills joints	FC2040 – Concrete Cutting II
<b>Task 15 – Protects Concrete</b>		
15.01	Protects plastic concrete	FC1010 – Concrete Protection
15.02	Protects hardened concrete	
<b>Task 16 – Repairs and Restores Concrete</b>		
16.01	Inspects concrete	FC1020 – Concrete Repairs I FC2270 – Concrete Repairs II
16.02	Removes materials	
16.03	Prepares surface for repair or restoration	
16.04	Installs repair materials	
<b>Task 17 – Applies Surface Treatments to Hardened Concrete</b>		
17.01	Prepares surface for surface treatments	FC2230 – Hardened Concrete - Surface Finishes
17.02	Abrades surface to achieve architectural finish	
17.03	Applies seamless systems	FC2240 – Application of Hardened Concrete - Surface Treatments
17.04	Applies bonded and non-bonded toppings to concrete	
17.05	Parges vertical surfaces	FC2230 – Hardened Concrete - Surface Finishes
17.06	Applies chemical surface treatment	FC2240 – Application of Hardened Concrete - Surface Treatments
<b>Task 18 – Grouts</b>		
18.01	Prepares surface for grouting	FC2280 – Grout
18.02	Mixes grout	
18.03	Installs grout	
18.04	Finishes exposed grout surfaces	
<b>Task 19 – Performs Cutting and Coring</b>		
19.01	Performs cutting	FC1033 – Concrete Cutting I FC2040 – Concrete Cutting II
19.02	Performs coring	FC2050 – Concrete Coring



## B. Program Structure

For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.

The order of course delivery within each level can be determined by the educational agency, as long as pre-requisite conditions are satisfied.

Upon completion of Level 1, individuals may be required to complete other certifications (employer or job site specific) in order to gain employment.

A Pre-employment student who becomes an apprentice will also be required to complete Level 2 in the Newfoundland and Labrador Curriculum Standard (NLCS).

<b>Level 1</b>			
<b>Course No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
FC1113	Safety	4	None
FC1103	Tools and Equipment I	8	FC1113
FC1063	Work Scheduling and Materials I	10	AM1140
FC1073	Introduction to Communication and Trade Documentation	16	None
FC1040	Site Preparation I	6	None
FC1003	Formwork I	14	FC1113, FC1103
FC1121	Concrete Transport and Placement I	36	FC1113, FC1103
FC1053	Concrete Tooling by Hand	24	FC1121
FC1143	Concrete Curing	4	FC1053
FC1010	Concrete Protection	6	None
FC1020	Concrete Repairs I	18	FC1143

<b>Level 1</b>			
<b>Course No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
FC1033	Concrete Cutting I	4	FC1143
AM1141	Concrete Finisher Math Fundamentals	42	None
<b>Total Level 1 Hours</b>		<b>192</b>	

\*A Direct Entry Concrete Finisher apprentice is **not** required to complete AM1101-Math Essentials course.

**Required Work Experience**

<b>Level 2</b>			
<b>Course No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
FC2101	Tools and Equipment II	6	Level 1
FC2250	Work Scheduling and Materials II	12	Level 1
FC2260	Communication and Trade Documentation	8	Level 1
FC2080	Site Preparation II	12	Level 1
FC2070	Formwork II	18	FC2080
FC2010	Concrete Transport and Placement II	12	FC2070
FC2020	Concrete Tooling by Machine	18	FC2010
FC2030	Extruded Concrete	18	Level 1
FC2200	Plastic Concrete – Surface Treatments	12	Level 1
FC2210	Plastic Concrete – Specialty Surface Finishes	18	FC2200
FC2230	Hardened Concrete - Surface Finishes	18	Level 1
FC2240	Application of Hardened Concrete - Surface Treatments	18	FC2230
FC2270	Concrete Repairs II	10	Level 1
FC2280	Grout	18	Level 1
FC2040	Concrete Cutting II	18	Level 1
FC2050	Concrete Coring	18	Level 1
LT3090	Mentoring	6	Level 1
<b>Total Level 2 Hours</b>		<b>240</b>	
<b>Total Course Credit Hours</b>		<b>432</b>	

## LEVEL 1

### FC1113 Safety

#### Learning Outcomes:

- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of maintaining a safe work environment.
- Demonstrate knowledge of regulatory requirements pertaining to safety.
- Demonstrate knowledge of PPE and safety equipment, their applications and procedures for use.

**Duration:** 4 Hours

**Pre-Requisite(s):** None

#### Objectives and Content:

1. Identify hazards and describe safe work practices related to the use and maintenance of PPE and safety equipment.
  - i. personal
  - ii. workplace
    - power hazards
    - tag out/lockout
    - confined space
    - fire
    - heights
    - chemical/gas
    - temperature extremes
    - high pressure
    - fire and gas equipment
    - machinery
  - iii. environmental
    - discharge/spills
2. Describe the potential effects of exposure to concrete material.
3. Identify and describe workplace safety and health regulations.
  - i. federal
    - Material Safety Data Sheets (MSDS)
    - Workplace Hazardous Material Information System (WHMIS)
  - ii. provincial/territorial
    - Occupational Health and Safety (OH&S)
  - iii. municipal

- iv. company safety policies and procedures
4. Identify types of personal protective equipment (PPE) and clothing and describe their applications and limitations.
5. Identify types of safety equipment and their location on-site.
  - i. fire extinguishers
  - ii. first aid kits
  - iii. eye wash stations
  - iv. spill kits
  - v. gas sensors
6. Describe the procedures for use of PPE and safety equipment.
7. Describe specific training requirements for use of PPE and safety equipment.
8. Identify safe transportation, storage and disposal procedures for hazardous materials.

**Practical Requirements:**

1. Perform a field level assessment of the work site.

## FC1103 Tools and Equipment I

### **Learning Outcomes:**

- Demonstrate knowledge of hand tools, their procedures for use, cleaning, maintenance and storage.
- Demonstrate knowledge of standard measuring equipment, their procedures for use, applications, maintenance and storage.

**Duration:** 8 Hours

**Pre-Requisite(s):** FC1113

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to hand tools and basic measuring equipment.
2. Identify types of hand tools, and describe their applications and procedures for use.
3. Describe the procedures used to clean, maintain and store hand tools.
4. Identify basic types of measuring equipment, and describe their applications and features.
  - i. measuring tapes
  - ii. hand levels
  - iii. measuring vessels
  - iv. builder's level
5. Describe the procedures used to operate, test, maintain and store basic measuring equipment.
6. Describe the procedures used to replace basic measuring equipment.

### **Practical Requirements:**

None.

## FC1063 Work Scheduling and Materials I

### Learning Outcomes:

- Demonstrate knowledge of the procedures used to schedule basic work procedures.
- Demonstrate knowledge of the procedures used to determine types and quantities of basic materials, their applications and procedures for use.
- Demonstrate knowledge of simple calculations relating to material selection (estimating).

**Duration:** 10 Hours

**Pre-Requisite(s):** AM1140

### Objectives and Content:

1. Identify the factors that affect the scheduling of work procedures and the impact on timing and work sequence.
  - i. weather conditions
  - ii. environmental conditions
2. Identify hazards and safe work practices pertaining to the use of basic materials.
3. Identify the codes and national standards pertaining to basic concrete materials.
  - i. CSA A23.1
4. Identify types of basic concrete materials, their application and procedures for use.
5. Identify types of basic reinforcement materials, their application and procedures for use.
  - i. rebar
  - ii. welded wire mesh
6. Identify basic concrete mix designs.

7. Identify types of basic grout, their properties and application.
  - i. cementitious
  
8. Describe basic calculations pertaining to material selection.
  - i. perimeters
  - ii. circumferences
  - iii. volumes

**Practical Requirements:**

None.



## FC1073 Introduction to Communication and Trade Documentation

### Learning Outcomes:

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

**Duration:** 16 Hours

**Pre-Requisite(s):** None

### Objectives and Content:

1. Identify types of trade related documentation and describe their purpose, application and procedures for use.
  - i. manufacturers' specifications
  - ii. standards documentation
    - Canadian Standards Association (CSA)
    - American Concrete Institute (ACI)
    - International Concrete Repair Institute (ICRI)
  - iii. safety documentation
2. Identify and interpret a set of residential blueprints.
  - i. foundation plan
  - ii. floor plan
  - iii. elevations
  - iv. sections and details
  - v. other trade information
3. Describe scale rules and legends and their application for residential use.
4. Describe the importance of using effective verbal and non-verbal communication with tradespeople and non-tradespeople.
  - i. co-workers
  - ii. tradespeople in other trades
  - iii. supervisors
  - iv. safety
5. Identify sources of information to consult for effective communicate.
  - i. OH&S requirements
  - ii. company and client documentation
  - iii. experienced journeypersons
6. Identify different communication and learning styles.

**Practical Requirements:**

None.

## FC1040 Site Preparation I

### **Learning Outcomes:**

- Demonstrate knowledge of site inspection procedures and factors that impact site preparation.
- Demonstrate knowledge of sub-grade preparation procedures and requirements.

**Duration:** 6 Hours

**Pre-Requisite(s):** None

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to site preparation.
2. Identify basic tools and equipment used in site preparation and describe their applications and procedures for use.
3. Describe site conditions required for site preparation.
  - i. access
  - ii. weather exposure
  - iii. moisture
  - iv. temperature
4. Identify basic equipment used to compact base materials for sub-grade and elevations.
5. Describe procedures used to compact simple base materials for sub-grade and elevations.

### **Practical Requirements:**

None.

## FC1003 Formwork I

### Learning Outcomes:

- Demonstrate knowledge of basic formwork and its application.
- Demonstrate knowledge of procedures used to layout and construct basic formwork.
- Demonstrate knowledge of basic reinforcement installation.
- Demonstrate knowledge of basic formwork inspection procedures.
- Demonstrate knowledge of procedures used to remove basic forms.

**Duration:** 14 Hours

**Pre-Requisite(s):** FC1113, FC1103

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to basic formwork.
2. Identify tools and equipment used with basic formwork, and describe their applications and procedures for use.
3. Identify basic formwork components and release agents.
  - i. reinforcement steel
  - ii. bulkheads
  - iii. screed level pegs
4. Describe the basic types of forces transmitted during placement of concrete.
5. Describe procedures used to layout and install basic formwork and embeds.
  - i. squaring
  - ii. setting grades
  - iii. establishing and transferring of elevations
  - iv. setting perimeters
6. Describe basic bracing, shoring and supporting used in constructing formwork.
7. Explain the building and removal sequence of basic formwork.
8. Describe types of basic reinforcement and their procedures for installation.
9. Identify basic equipment required for the installation of reinforcement.

10. Explain camber, deflection and shrinkage as they pertain to the construction of formwork.
11. Explain procedures used to install basic formwork to finish grade.
12. Describe basic form and bracing removal practices.
13. Describe basic form removal requirements.

**Practical Requirements:**

None.

## FC1121 Concrete Transport and Placement I

### Learning Outcomes:

- Demonstrate knowledge of the tools and equipment and the procedures used to transport concrete.
- Demonstrate knowledge of the procedures used to place concrete.
- Demonstrate knowledge of the tools and equipment, and basic procedures used to consolidate concrete.
- Demonstrate knowledge of the basic effects and outcomes of consolidating procedures.

**Duration:** 36 Hours

**Pre-Requisite(s):** FC1113, FC1103

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to concrete transport and placement.
2. Describe conveying equipment, their application and procedures for use.
  - i. tele-belt trucks
  - ii. ready-mix truck mounted conveyor
  - iii. trailers
3. Identify transportation methods for moving and placing concrete.
4. Identify tools for placing concrete and describe their procedures for use.
5. Identify types of embedded reinforcement, their applications and procedures for use.
6. Identify the effects of embedded reinforcement on handling of concrete.
7. Explain the concept of distributing concrete starting from the nearest known level of elevation.
8. Identify basic tools and equipment used to consolidate concrete.
9. Identify basic consolidation techniques, their applications and procedures.
  - i. internal vibration
  - ii. external vibration

10. Describe the effect of vibration on forms.
11. Describe basic concrete defects, their cause and prevention techniques.
  - i. segregation
  - ii. honeycombs
  - iii. pin holes
  - iv. delamination

**Practical Requirements:**

1. Prepare site from transport to placement.

## FC1053 Concrete Tooling by Hand

### **Learning Outcomes:**

- Demonstrate knowledge of the tools and equipment and the procedures used to establish elevations.
- Demonstrate knowledge of the tools and equipment, and the techniques used to screed, bull float and float concrete by hand.
- Demonstrate knowledge of techniques used to apply a hand trowel to concrete without surface imperfections.
- Demonstrate knowledge of the effects of various factors when troweling concrete by hand.
- Demonstrate knowledge of tools and equipment used to edge concrete, their application and procedures for use.
- Demonstrate knowledge of the tools and techniques used to tool contraction joints.

**Duration:** 24 Hours

**Pre-Requisite(s):** FC1121

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to tooling concrete by hand.
2. Describe the procedures for establishing basic elevation.
3. Describe the placement of screed guides when leveling concrete.
4. Identify manual screeds and their applications.
5. Describe techniques for screeding concrete by hand.
6. Explain the purpose of screeding concrete.
7. Explain tolerances and describe their purpose as it pertains to levelling concrete.
8. Identify the tools used to bull float concrete.
9. Explain when to begin bull floating.
10. Describe the procedure of bull floating the concrete and its purpose.



11. Identify tools and equipment used to float concrete by hand.
12. Identify floating techniques used to float concrete by hand.
  - i. pressure application
  - ii. angle of float
  - iii. pattern of floating
13. Identify surface conditions and describe their effects on timing and the floating process.
  - i. firmness
  - ii. presence of bleed water
  - iii. setting of concrete materials
14. Explain the effect of weather conditions during floating of concrete by hand.
15. Explain the effect of admixtures in the concrete.
16. Identify tools and their procedure for use when troweling concrete by hand.
17. Identify surface imperfections, their causes and techniques for correction.
  - i. pin holes
  - ii. ridges
  - iii. chatter marks
  - iv. wash-boarding
  - v. blisters
18. Describe the effects of trowel pitch and force.
19. Describe the procedures used to trowel concrete by hand.

20. Identify types of edgers, their application and procedures for use.
  - i. tread
  - ii. safety
  - iii. walk-along
  - iv. curb
  - v. bullnose
21. Identify surface conditions that affect edging.
22. Identify tools required for tooling contraction joints.
23. Explain depth and spacing as it pertains to hand-tooling concrete.
24. Describe tooling techniques and their application as it pertains to hand-tooling concrete.

**Practical Requirements:**

None.

## FC1143 Concrete Curing

### Learning Outcomes:

- Demonstrate knowledge of the processes, requirements and techniques used in wet-curing concrete.
- Demonstrate knowledge of applications and procedures used in chemical curing.

**Duration:** 4 Hours

**Pre-Requisite(s):** FC1053

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to wet and chemical curing concrete.
2. Identify the tools, equipment and materials used in the process of wet-curing concrete.
3. Explain the requirements for proper hydration and temperature of concrete during the wet-curing process.
4. Describe the process and techniques of wet-curing concrete.
5. Identify types of cement and the timings related to wet-curing.
6. Explain the consequences of improper wet-curing.
7. Identify types of curing compounds in chemical-curing.
  - i. clear membrane
  - ii. fugitive dye
  - iii. dissipating curing compound
  - iv. water-based
  - v. solvent-based
8. Identify types of cement and timings related to chemical-curing.
9. Describe the effects of curing compounds on the chemical-curing process.
10. Describe the application procedure of chemical-curing compounds.
11. Identify timing for the application of chemical-curing compounds.

**Practical Requirements:**

None.

## FC1010 Concrete Protection

### **Learning Outcomes:**

- Demonstrate knowledge of how temperature affects plastic concrete.
- Demonstrate knowledge of how temperature affects hardened concrete.

**Duration:** 6 Hours

**Pre-Requisite(s):** None

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to protecting concrete.
2. Describe the effects of ground and air temperature on plastic concrete.
3. Identify the temperature of plastic concrete and its effect on set.
4. Identify temperature ranges for plastic concrete curing processes.
5. Identify methods to control weather variables for plastic concrete.
6. Identify the effects of water, ice and warm water on a plastic concrete mix.
7. Describe the effects of ground and air temperature on hardened concrete.
8. Identify temperature ranges for hardened concrete curing processes.
9. Identify methods to control weather variables for hardened concrete.

### **Practical Requirements:**

None.

## FC1020 Concrete Repairs I

### Learning Outcomes:

- Demonstrate knowledge of basic concrete defects and their causes.
- Demonstrate knowledge of material removal equipment and procedures for use.
- Demonstrate knowledge of procedures and materials used for preparing the surface for repair or restoration.
- Demonstrate knowledge of basic repair materials and procedures used for basic repair and restoration of concrete.

**Duration:** 18 Hours

**Pre-Requisite(s):** FC1143

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to repairing concrete.
2. Identify the types of basic defects that require repair.
3. Identify the causes of basic defects that require repair.
  - i. stress
  - ii. efflorescence
  - iii. improper placing or finishing
4. Identify the tools and equipment used to test concrete.
5. Identify hazards and safe work practices pertaining to the removal of materials.
6. Identify types of removal equipment and the procedures used for the removal of materials.
7. Describe basic surface preparation procedures and material.
8. Identify profiling equipment, their applications and the procedure for use.
9. Identify basic bonding agents, their application and the procedure for use.
  - i. latex modified
  - ii. slurry mix
10. Describe the saturated surface-dry (SSD) requirements for concrete.

11. Identify pre-soak methods.
12. Identify hazards and safe work practices pertaining to repairing and restoring concrete.
13. Identify basic repair materials and their applications.
14. Describe procedures used for basic repairing and restoring of concrete.
  - i. dry packing
  - ii. hand patching

**Practical Requirements:**

1. Perform dry packing procedures on damaged concrete.
2. Perform layered procedures on damaged concrete.
3. Perform patch and repair on damaged concrete.

## FC1033 Concrete Cutting I

### Learning Outcomes:

- Demonstrate knowledge of isolation, construction and expansion joints and their application.
- Demonstrate knowledge of installation procedures for isolation, construction and expansion joints.
- Demonstrate knowledge of tools and equipment and procedures to fill contraction joints.

**Duration:** 4 Hours

**Pre-Requisite(s):** FC1143

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to cutting joints.
2. Describe the types of joints and their applications.
3. Describe the types of joint components, their applications and installation procedures.
  - i. dowels
  - ii. keyways
  - iii. expansion materials
4. Describe the installation procedures for isolation, construction and expansion joints.
5. Identify tools and equipment required for wet and early entry cutting.
6. Identify tools and equipment required for filling joints.
7. Describe procedures for filling contraction joints.

### Practical Requirements:

None.



## AM1141 Concrete Finisher Math Fundamentals

### Learning Outcomes:

- Demonstrate knowledge of mathematical concepts in the performance of trade practices.
- Demonstrate knowledge of mathematics as a critical element of the trade environment.
- Solve mathematical word problems.
- Demonstrate knowledge of mathematical principles for the purposes of problem solving, job and materials estimation, measurement, calculation, system conversion, diagram interpretation and scale conversions, formulae calculations, and geometric applications.

**Duration:** 42 Hours

**Pre-Requisite(s):** AM1101

### Objectives and Content:

The instructor is required to use trade specific examples to reinforce the course objectives.

1. Describe percent/decimal/fraction conversions and comparisons in trade specific situations.
2. Describe ratios and proportions as they relate to trade specific problems.
3. Describe the use of the Imperial and Metric measurement systems in trade specific applications.
4. Describe Imperial and Metric conversions in trade specific situations.
  - i. convert between imperial and metric measurements
  - ii. convert to another unit within the same measurement system
5. Describe how to manipulate formulas using cross multiplication, dividing throughout, elimination, and substitution to solve trade specific problems.
  - i. right angle triangles
  - ii. area
  - iii. volume
  - iv. perimeter
  - v. density
6. Identify calculations involving geometry that are relevant to the trade.
  - i. angle calculations

- ii. circle calculations
7. Identify math processes used to complete administrative trade tasks.
- i. material estimation
  - ii. material costing
  - iii. time & labour estimates
  - iv. taxes & surcharges
  - v. markup & projecting revenue

**Practical Requirements:**

1. To emphasize or further develop specific knowledge objectives, students will be asked to complete practical demonstrations which confirm proper application of mathematical theory to job skills.

**Note:** This course is **Non-Transferable** to other trades programs, and **Not Eligible for Prior Learning Assessment**. Students completing training in this trade program are required to complete this math course. Apprentice transfers under Provincial / Territorial Mobility agreements may be exempt from this requirement.

## LEVEL 2

### FC2101 Tools and Equipment II

#### **Learning Outcomes:**

- Demonstrate knowledge of power tools, their procedures for use, applications, maintenance and storage.
- Demonstrate knowledge of advanced measuring equipment, their procedures for use, applications, maintenance and storage.

**Duration:** 6 Hours

**Pre-Requisite(s):** Level I

#### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to power tools and advanced measuring equipment.
2. Identify types of power tools, and describe their applications and features.
  - i. electric tools
  - ii. pneumatic tools
  - iii. hydraulic tools
  - iv. gas-powered tools
  - v. powder-actuated tools
3. Describe the procedures used to operate power tools.
4. Describe the procedures used to maintain, clean and store power tools.
5. Describe the procedures used to have power tools tagged, repaired or replaced.

6. Identify types of advanced measuring equipment, and describe their applications and features.
  - i. scales
  - ii. laser levels
  - iii. measuring vessels
7. Describe the procedures used to operate, test, maintain and store advanced measuring equipment.
8. Describe the procedures used to replace advanced measuring equipment.

**Practical Requirements:**

None.

## FC2250 Work Scheduling and Materials II

### Learning Outcomes:

- Demonstrate knowledge of the procedures used to schedule detailed work procedures.
- Demonstrate knowledge of the procedures used to determine types and quantities of multiple materials, their applications and procedures for use.
- Demonstrate knowledge of detailed calculations relating to material selection (estimating).

**Duration:** 12 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify the factors that affect the scheduling of work procedures and its impact on timing and work sequence.
  - i. material properties
  - ii. public safety
  - iii. accessibility to work site area
  - iv. work of other trades
  - v. pre-construction meetings
2. Describe the sequence of construction operations and timing of work procedures.
3. Identify hazards and safe work practices pertaining to the use of advanced materials.
4. Identify the codes and national standard pertaining to advanced concrete materials.
  - i. CSA A23.1

5. Identify types of advanced concrete materials, their application and procedures for use.
  - i. synthetic and steel fibres
  - ii. pre- and post-tensioning cables
  - iii. dowels
  
6. Identify types of base materials, their application and procedures for use.
  - i. gravel
  - ii. clay
  - iii. recycled crushed concrete
  - iv. sand
  - v. pea stone
  - vi. clear stone
  
7. Identify types of membranes, their application and procedures for use.
  - i. evaporation reducers
  - ii. polyethylene
  - iii. insulating
  - iv. water-stop
  - v. vapour retarders
  
8. Identify types of advanced reinforcement materials, their application and procedures for use.
  
9. Identify advanced concrete mix designs.
  
10. Identify types of advanced grout, their properties and application.
  - i. epoxy
  - ii. polyester
  
11. Identify air entrainment compatibility and adjustments required for placing and finishing concrete.
  
12. Describe advanced calculations pertaining to material selection.
  - i. percentages
  - ii. ratio
  - iii. proportion
  - iv. areas
  - v. Pythagorean Theorem

**Practical Requirements:**

1. Perform calculations relating to estimating concrete materials.
  - i. percentage
  - ii. ratio
  - iii. proportion
  - iv. areas
  - v. Pythagorean Theorem
  - vi. volume

## FC2260 Communication and Trade Documentation

### Learning Outcomes:

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

**Duration:** 8 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify types of trade related documentation and describe their purpose, application and procedures for use.
  - i. manufacturers' specifications
  - ii. standards documentation
    - Canadian Standards Association (CSA)
    - American Concrete Institute (ACI)
    - International Concrete Repair Institute (ICRI)
  - iii. work orders
  - iv. grade sheets
  - v. safety documentation
2. Identify and interpret a set of commercial blueprints.
  - i. floor plans and elevations
  - ii. building sections and elevations
  - iii. room finish
  - iv. wall sections
  - v. miscellaneous details
  - vi. structural details
  - vii. mechanical layout
  - viii. electrical layout
  - ix. site plan
  - x. detail drawings
3. Describe scale rules and legends and their application for commercial use.
4. Identify the material symbols used in sectional and other drawings.
5. Identify and describe alphabet of lines.



6. Describe the importance of using effective verbal and non-verbal communication with tradespeople and non-tradespeople.
  - i. consultants
  - ii. engineers and architects
  - iii. owners
  - iv. product representatives
  
7. Identify sources of information to consult for effective communicate.
  - i. codes / regulations / standards
  - ii. OH&S requirements
  - iii. drawings and specifications
  - iv. company and client documentation

**Practical Requirements:**

None.

## FC2080 Site Preparation II

### Learning Outcomes:

- Demonstrate knowledge of site inspection procedures and factors that impact site preparation.
- Demonstrate knowledge of sub-grade preparation procedures and requirements.

**Duration:** 12 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Interpret codes and regulations pertaining to site preparation.
  - i. zoning
  - ii. by-laws
  - iii. permits
2. Interpret information pertaining to site preparation found on drawings and specifications.
  - i. utilities
3. Identify advanced tools and equipment used in site preparation and describe their applications and procedures for use.
4. Describe site problems that affect site preparation.
  - i. poor drainage
  - ii. obstructions
  - iii. utilities
  - iv. rain water leaders
5. Describe site inspection procedures and the reporting process.
6. Identify types of base materials used for sub-grade and elevations.
7. Identify advanced equipment used to compact base materials for sub-grade and elevations.
8. Describe procedures used to compact advanced base materials for sub-grade and elevations.

**Practical Requirements:**

None.

## FC2070 Formwork II

### Learning Outcomes:

- Demonstrate knowledge of advanced formwork and its application.
- Demonstrate knowledge of procedures used to layout and construct advanced formwork.
- Demonstrate knowledge of advanced reinforcement installation.
- Demonstrate knowledge of advanced formwork inspection procedures.
- Demonstrate knowledge of procedures used to remove advanced forms.
- Demonstrate knowledge of procedures used for the re-use of forms.

**Duration:** 18 Hours

**Pre-Requisite(s):** FC2080

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to advanced formwork.
2. Identify local codes, building codes, regulation requirements and CSA standards related to formwork.
3. Interpret information pertaining to formwork found on drawings and specifications.
4. Identify tools and equipment used with advanced formwork, and describe their applications and procedures for use.
5. Identify the types of forming systems and their applications.
  - i. snap ties
  - ii. cam lock and tie rods
  - iii. slip forms
  - iv. insulated concrete Styrofoam forms
  - v. she-bolts
  - vi. steel forms
6. Identify the types of structures that require formwork.
7. Identify advanced formwork components and release agents.
  - i. form liners
  - ii. miscellaneous inserts
  - iii. cambers

- iv. chamfer strips
  - v. keyways
  - vi. water stops
8. Describe expansion, control and isolation joint construction pertaining to formwork.
  9. Describe the advanced types of forces transmitted during placement of concrete.
  10. Identify critical form areas to prevent form failure.
  11. Identify the types of formwork required for various grout applications.
  12. Identify the types of vertical architectural finishes.
  13. Describe procedures used to layout and install advanced formwork and embeds.
    - i. squaring
    - ii. setting grades
    - iii. establishing and transferring of elevations
    - iv. setting perimeters
  14. Describe advanced bracing, shoring and supporting used in constructing formwork.
  15. Describe calculations related to constructing formwork.
    - i. rise over run
    - ii. Pythagorean Theorem formula (3-4-5 calculations)
    - iii. form estimations
  16. Explain the building and removal sequence of advanced formwork.
  17. Describe types of advanced reinforcement and their installation procedures.
  18. Identify codes, drawings and specifications related to reinforcement.
  19. Identify advanced equipment required for the installation of reinforcement.
  20. Identify use of forming systems.
  21. Explain codes, specifications and regulations pertaining to formwork.
  22. Explain procedures used to install advanced formwork to finish grade.
  23. Identify reporting procedures for the inspection of formwork.

24. Describe advanced form and bracing removal practices.
25. Describe advanced form removal requirements.
26. Explain proper form removal timing as per concrete application.
27. Describe proper cleaning, repairing and removal of foreign objects for the re-use of forms.

**Practical Requirements:**

1. Build an advanced form and install all the required components.
2. Remove advanced formwork.

## FC2010 Concrete Transport and Placement II

### Learning Outcomes:

- Demonstrate knowledge of the procedures used when transporting concrete.
- Demonstrate knowledge of the tools and equipment, and advanced procedures used to consolidate concrete.
- Demonstrate knowledge of the advanced effects and outcomes of consolidating procedures.

**Duration:** 12 Hours

**Pre-Requisite(s):** FC2070

### Objectives and Content:

1. Identify regulations pertaining to the transportation of concrete.
2. Describe time restriction and CSA A23.1 requirements for the transporting of concrete.
3. Describe slump and consistency testing methods.
4. Identify advanced tools and equipment used to consolidate concrete.
5. Identify types and sizes of vibrators, their application and procedures for use.
6. Identify advanced consolidation techniques, their applications and procedures.
  - i. vibrating screeds
7. Describe concrete defects.
  - i. segregation
  - ii. honeycombs
  - iii. pin holes
  - iv. delamination

8. Describe effects of over-vibrating on aggregate, embedded reinforcement and slump consistency.

**Practical Requirements:**

1. Place concrete into an advanced form.



## FC2020 Concrete Tooling by Machine

### **Learning Outcomes:**

- Demonstrate knowledge of the tools and equipment, and the techniques used to screed, float and trowel concrete by machine.
- Demonstrate knowledge of admixtures in concrete, their applications and effects on floating concrete by machine.
- Demonstrate knowledge of the effects of various factors when troweling concrete by machine.

**Duration:** 18 Hours

**Pre-Requisite(s):** FC2010

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to tooling concrete by machine.
2. Interpret information pertaining to tooling concrete by machine found on drawings and specifications.
3. Describe procedures for establishing advanced elevation.
4. Explain slope and fall to achieve varying elevations.
5. Describe calculations performed to establish elevation.
6. Identify mechanical screeds and their applications.
7. Describe techniques for screeding concrete by machine.
8. Describe methods used to achieve tolerances ( $F_L$  and  $F_F$ ).

9. Identify types of floating machines, their operation and procedures for use.
  - i. walk-behind single machine
  - ii. double-pan ride-on machine
  - iii. edge machine
10. Identify types of blades, their application and procedures for use.
  - i. float
  - ii. combination
  - iii. pan
11. Explain the effect of blade speed and pitch on concrete surfaces.
12. Explain the effect of admixtures in the concrete.
13. Identify types of machines used for troweling and their procedures for use.
  - i. walk-behind single machine
  - ii. double-trowel ride-on machine
14. Identify the effects of various types of blades on a concrete surface.
15. Identify troweling techniques used to trowel concrete by machine.
  - i. finishing at construction joints
  - ii. patterns for each pass of the machine (in relation to previous pass)
  - iii. adjusting blade pitch and speed
  - iv. addressing cold joints
16. Describe the effects of weather conditions on the concrete.
17. Describe the effects of admixtures in the concrete.
18. Describe the effects of poor ventilation on slab surface (for health, safety and carbonation).

**Practical Requirements:**

1. Perform laser level application to establish concrete grade / elevation.
2. Perform power screed operation on placed concrete.

## FC2030 Extruded Concrete

### Learning Outcomes:

- Demonstrate knowledge of extruded concrete surfaces and the tools and equipment and procedures used to finish them.

**Duration:** 18 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to extruded concrete surfaces.
2. Interpret information pertaining to extruded concrete surfaces found on drawings and specifications.
3. Identify specialized tools and equipment used to finish extruded surfaces.
4. Identify types of extruded surfaces and the techniques used to produce them.
  - i. curb and gutter
  - ii. sidewalk
  - iii. highway
  - iv. slip form
5. Identify the procedures used to finish extruded surfaces.
6. Describe the characteristics of extruded concrete.
  - i. slump
  - ii. air content
  - iii. mix design

### Practical Requirements:

None.

## FC2200 Plastic Concrete - Surface Treatments

### **Learning Outcomes:**

- Demonstrate knowledge of products and the techniques used to broadcast them on concrete surface.
- Demonstrate knowledge of the factors that affect dry-shake aggregate surface hardeners on concrete.
- Demonstrate knowledge of evaporation reducers and the procedures used for application.
- Demonstrate knowledge of the factors that affect applying evaporation reducers.

**Duration:** 12 Hours

**Pre-Requisite(s):** Level I

### **Objectives and Content:**

1. Identify hazards and describe safe work practices pertaining to plastic concrete surface treatments.
2. Identify types of dry-shake hardeners and their application procedures.
  - i. mineral or metallic aggregate
  - ii. natural or pigmented
3. Explain the effect of improper application and finishing of dry-shake aggregate surface hardeners.
4. Explain the effects of surface conditions on dry-shake aggregate surface hardeners.
5. Identify evaporation reducers and their applications.
6. Identify tools and equipment and the procedures used to apply evaporation reducers.
7. Explain mixing procedures for evaporation reducers.
8. Explain the effects of surface conditions on the application of evaporation reducers.

**Practical Requirements:**

1. Broadcast hardener onto a plastic concrete slab.

## FC2210 Plastic Concrete - Specialty Surface Finishes

### Learning Outcomes:

- Demonstrate knowledge of exposed aggregate finish and the procedures used for application.
- Demonstrate knowledge of the factors that affect applying retarders.
- Demonstrate knowledge of the requirements and techniques for texturing concrete surfaces.
- Demonstrate knowledge of the factors that affect texturing concrete.
- Demonstrate knowledge of stamps, patterns, designs and the procedures used to stamp concrete.
- Demonstrate knowledge of the factors that affect stamping of concrete.

**Duration:** 18 Hours

**Pre-Requisite(s):** FC2200

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to plastic concrete surface finishes.
2. Identify tools and equipment used to apply surface retarder.
3. Identify the types of exposed aggregate finish and the procedures used to expose the aggregate.
  - i. ready-mix
  - ii. broadcast
4. Explain how to broadcast aggregate uniformly or in desired pattern.
5. Explain the saturated surface-dry (SSD) requirements for aggregate.
6. Explain the effect of surface conditions on the application of surface retarders.

7. Identify types of textured surfaces and the techniques required to achieve them.
  - i. broomed
  - ii. tine finish
  - iii. swirl
  - iv. herringbone
8. Identify tools and equipment used for texturing surfaces.
9. Explain the effect of surface conditions on the texturing process.
10. Identify various types of patterns used for stamping concrete surfaces and their procedures for use.
  - i. grouted (cobblestone, random stone, barn board)
  - ii. seamless
11. Identify various types of stamping tools used for stamping concrete surfaces.
12. Identify the mix design required to accommodate a pattern.
13. Identify stamp compositions.
  - i. flexible urethane
  - ii. paper
  - iii. metal
14. Describe the effects of broadcast products on setting time, prior to stamping.
15. Describe the effects of weather conditions on stamping procedures.
16. Identify the use of evaporation reducers prior to stamping concrete surfaces.

**Practical Requirements:**

1. Perform a stamp finish on plastic concrete.

## FC2230 Hardened Concrete Surface Finishes

### Learning Outcomes:

- Demonstrate knowledge of equipment and the procedures used to prepare surfaces.
- Demonstrate knowledge of products used to prepare surfaces.
- Demonstrate knowledge of the equipment and procedures used to abrade concrete surfaces.
- Demonstrate knowledge of the effects of abrading concrete.
- Demonstrate knowledge of parging, the materials, application and procedures used.

**Duration:** 18 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to hardened concrete surface finishes.
2. Identify types of profiling equipment, their application and procedures for use.
  - i. sand / shot blasters
  - ii. power grinders
  - iii. concrete shavers
3. Identify surface cleaning equipment and describe surface cleaning procedures.
  - i. acid washing
  - ii. pressure washing
4. Describe the effects of products on the preparation of surfaces.
5. Identify degreasing agents and describe their application.
  - i. caustic soda
  - ii. citrus-based cleaners
  - iii. chemical strippers
6. Identify types of profiling equipment, their application and procedure for use.
7. Identify types of architectural finishes.
  - i. textured
  - ii. polished
  - iii. wash-coated



- iv. exposed aggregate
  - v. bush hammered
  - vi. antiquing
8. Identify methods used to achieve architectural finishes.
- i. sand blasting
  - ii. grinding
  - iii. bush hammering
  - iv. wash-coating
  - v. form treatments
9. Describe regulations pertaining to the disposal of dispelled material.
10. Identify safe work practices related to abrading concrete.
11. Describe the environmental impact of abrading concrete.
12. Identify types of parging materials.
13. Explain the mixing methods for parging materials.
14. Describe parging procedures on vertical surfaces.
15. Identify finishing and texturing methods for parging on vertical surfaces.
- i. troweling
  - ii. stenciling
  - iii. combing
  - iv. sponging
  - v. grinding
  - vi. dry sacking
  - vii. adding colour
  - viii. darbying
16. Describe the use of colours, their application and procedures for use when parging on vertical surfaces.

**Practical Requirements:**

1. Perform bush-hammering on hardened concrete to achieve an architectural finish.

## FC2240 Application of Hardened Concrete Surface Treatments

### Learning Outcomes:

- Demonstrate knowledge of the application of seamless systems.
- Demonstrate knowledge of the epoxy tools and the procedures used to apply seamless systems.
- Demonstrate knowledge of various factors that affect the application of seamless systems.
- Demonstrate knowledge of bonded and non-bonded toppings, their applications and procedures for use.
- Demonstrate knowledge of the application and procedure used to apply bonded and non-bonded toppings.
- Demonstrate knowledge of the application of chemical surface treatment to hardened concrete.
- Demonstrate knowledge of the various factors that affect the use of chemical surface treatments to hardened concrete.

**Duration:** 18 Hours

**Pre-Requisite(s):** FC2230

### Objectives and Content:

1. Describe safe work practices pertaining to the use of seamless systems.
2. Identify types of seamless systems, mixing techniques and their application.
  - i. coating
  - ii. broadcast systems
  - iii. trowel-down systems
  - iv. epoxy
  - v. non-static floor coating
  - vi. terrazzo

3. Identify epoxy tools, their application and procedures for use.
  - i. trowels
  - ii. spiked rollers
  - iii. gauged squeegees
  - iv. screed boxes
  - v. mixing equipment
4. Describe the procedures used to apply seamless systems.
5. Explain moisture content of substrate and how it affects seamless systems.
6. Identify types of toppings for concrete.
  - i. pre-mixed topping
  - ii. modified concrete
  - iii. grout
7. Identify bonding agents, their application and procedures for use.
  - i. latex modified
  - ii. cement slurry mix
  - iii. epoxy (high and low viscosity)
8. Identify topping reinforcements and describe their application.
  - i. synthetic or steel fibre
  - ii. rebar
  - iii. welded wire mesh
9. Identify bonding methods.
  - i. installing studs
  - ii. installing rebar
  - iii. applying latex
  - iv. scrubbing slurry into surface
10. Describe curing methods for bonded and non-bonded toppings.
11. Describe hazards and safe work practices pertaining to the use of bonded and non-bonded toppings and chemical surface treatments.

12. Identify types of chemical surface treatment, their mixing techniques and procedures for use.
  - i. dyes
  - ii. acid stains
  - iii. silane
  - iv. siloxane
  - v. oxides
  - vi. silicate densifiers
  
13. Identify types of protective coatings and procedure for their application.
  - i. epoxies
  - ii. urethanes
  - iii. acrylics
  
14. Explain moisture content of substrate and how it affects chemical surface treatments.
  
15. Identify the application time and drying time requirements for chemical surface treatments.
  
16. Describe the effects of temperature on chemical surface treatments.
  
17. Describe the effects of the concrete mix design on chemical surface treatments.

**Practical Requirements:**

1. Prepare a bonding slurry for a hardened concrete topping.

## FC2270 Concrete Repairs II

### Learning Outcomes:

- Demonstrate knowledge of concrete defects and their causes.
- Demonstrate knowledge of testing tools and equipment, and procedures used to inspect concrete.
- Demonstrate knowledge of disposal methods.
- Demonstrate knowledge of procedures and materials used for preparing the surface for repair or restoration.
- Demonstrate knowledge of complex repair materials and procedures used for complex repair and restoration of concrete.

**Duration:** 10 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify the types of complex defects that require repair.
2. Identify the causes of complex defects that require repair.
  - i. environmental (acid rain, carbonation)
  - ii. corrosion
3. Identify the requirements for non-destructive and destructive testing.
4. Describe procedures used to inspect concrete.
  - i. visual
  - ii. chain dragging
  - iii. hammer sounding
  - iv. copper-copper sulfate test
  - v. core sample
5. Identify regulations and safe work practices pertaining to disposal of materials.
6. Identify methods used to dispose of materials.
7. Describe complex surface preparation procedures and material.
8. Identify complex bonding agents, their application and the procedure for use.
9. Identify complex repair materials and their applications.

10. Describe procedures used for complex repairing and restoring concrete.
  - i. pouring back
  - ii. injecting
  - iii. shot-creting

**Practical Requirements:**

1. Perform pour-back of concrete to a damaged concrete surface.

## FC2280 Grout

### Learning Outcomes:

- Demonstrate knowledge of grouts, surface preparation and application methods.
- Demonstrate knowledge of application and procedures for mixing grout.
- Demonstrate knowledge of grout and installation methods used.
- Demonstrate knowledge of grout and procedures to finish exposed surfaces.

**Duration:** 18 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify hazards and safe work practices pertaining to mixing and installing grouts.
2. Interpret information pertaining to mixing and installing grouts found on drawings and specifications.
3. Identify and describe surface preparation requirements and techniques for grout.
4. Identify methods for achieving saturated surface-dry (SSD) for grout.
5. Identify types of grouts, their mixing equipment, application, and properties.
  - i. cementitious
  - ii. epoxy
  - iii. polymeric
6. Explain ratios as they pertain to mixing grout.
7. Describe other additives pertaining to mixing grout.
8. Identify installation equipment used for installing grout.

9. Describe installation methods for grout.
  - i. injecting
  - ii. pouring
  - iii. strapping
  - iv. rodding
  - v. vibrating
  - vi. head boxing
  - vii. pumping
  - viii. chaining
10. Explain injection systems, their application and procedures for use when installing grout.
11. Explain pot life as it pertains to installation of grout.
12. Describe procedures used to finish and contour grout surfaces.
13. Identify the timing required for removing forms, finishing and curing exposed grout surfaces.

**Practical Requirements:**

1. Prepare grout and fill columns.



## FC2040 Concrete Cutting II

### Learning Outcomes:

- Demonstrate knowledge of cutting concrete, the equipment and procedures used.
- Demonstrate knowledge of codes pertaining to the installation of isolation, construction and expansion joints and their application.
- Demonstrate knowledge of tools and equipment and procedures to saw cut contraction joints.
- Demonstrate knowledge of procedures to fill contraction joints.

**Duration:** 18 Hours

**Pre-Requisite(s):** Level I

### Objectives and Content:

1. Identify hazards and safe work practices pertaining to cutting concrete.
2. Interpret information pertaining to cutting concrete found on drawings and specifications.
3. Identify types of cutting equipment, their applications and procedures for use.
  - i. floor saw
  - ii. cut-off saw
  - iii. chainsaw
  - iv. wire saw
4. Identify types of saw blades for cutting equipment, their applications and procedures for use.
5. Identify measuring devices used when cutting, and describe their applications and procedures for use.
6. Describe barriers used when cutting, their application and procedures for use.
7. Identify codes, specifications and regulations pertaining to the installation of construction, isolation and expansion joints.
8. Describe procedures for saw cutting contraction joints.
9. Identify timing and conditions for application of joint filling.

**Practical Requirements:**

1. Perform cutting techniques on hardened concrete using power tools / saws.

## FC2050 Concrete Coring

### **Learning Outcomes:**

- Demonstrate knowledge of coring concrete, the equipment and procedures used.

**Duration:** 18 Hours

**Pre-Requisite(s):** Level I

### **Objectives and Content:**

1. Identify hazards and safe work practices pertaining to coring concrete.
2. Identify types of coring equipment, their applications and procedures for use.
  - i. electric
  - ii. pneumatic
  - iii. hydraulic
  - iv. hammer drill
  - v. expansion anchors and eye bolts
3. Identify types of drill bits for coring equipment, their applications and procedures for use.
4. Identify measuring devices used when coring, and describe their applications and procedures for use.
5. Describe barriers used when coring, their application and procedures for use.

### **Practical Requirements:**

1. Perform coring on a concrete wall.

LT3090     Mentoring

**Learning Outcomes:**

- Demonstrate knowledge of strategies for learning skills in the workplace.
- Demonstrate knowledge of strategies for teaching workplace skills.

**Duration:**             6 Hours

**Pre-Requisite(s):**    Level I

**Objectives and Content:**

1. Describe the importance of individual experience.
2. Describe the shared responsibilities for workplace learning.
3. Determine one's own learning preferences and explain how these relate to learning new skills.
4. Describe the importance of different types of skills in the workplace.
5. Describe the importance of essential skills in the workplace.
  - i. reading
  - ii. writing
  - iii. document use
  - iv. oral communication
  - v. numeracy
  - vi. thinking skills
  - vii. working with others
  - viii. digital technology
  - ix. continuous learning
6. Identify different ways of learning.

7. Identify different learning needs and describe the strategies to meet these needs.
  - i. learning disabilities
  - ii. learning preferences
  - iii. language proficiency
8. Identify strategies to assist in learning a skill.
  - i. understanding basic principles of instruction
  - ii. developing coaching skills
  - iii. being mature and patient
  - iv. providing feedback
9. Describe personal responsibilities and attitudes that contribute to on-the-job success.
  - i. asking questions
  - ii. working safely
  - iii. accepting constructive feedback
  - iv. time management and punctuality
  - v. respect for authority
  - vi. good stewardship of materials, tools and property
  - vii. efficient work practices
10. Identify different roles played by a workplace mentor.
11. Describe teaching skills, their importance and methods of delivery.
  - i. identifying the point of a lesson
  - ii. linking the lesson
  - iii. demonstrating the lesson
  - iv. providing practice
  - v. giving effective feedback
  - vi. assessing skills and progress
12. Identify how to choose an effective time to present a lesson.
13. Identify the components of a skill (the context).
14. Describe a skills assessment.
15. Describe considerations in setting up opportunities for skill practice.
16. Explain how to adjust a lesson to different situations.
17. Identify teachable moments.

**Practical Requirements:**

None.

## C. Conditions Governing Apprenticeship Training

### 1.0 General

The following general conditions apply to all apprenticeship training programs approved by the Provincial Apprenticeship and Certification Board (PACB) in accordance with the **Apprenticeship Training and Certification Act (1999)**. If an occupation requires additional conditions, these will be noted in the specific Plan of Training for the occupation. In no case should there be a conflict between these conditions and the additional requirements specified in a certain Plan of Training. All references to Memorandum of Understanding will also apply to Letter of Understanding (LOU) agreements.

### 2.0 Entrance Requirements

#### 2.1 Entry into the occupation as an apprentice requires:

Indenturing into the occupation by an employer who agrees to provide the appropriate training and work experiences as outlined in the Plan of Training.

#### 2.2 Notwithstanding the above, each candidate must have successfully completed a high school program or equivalent, and in addition may be required to have completed certain academic subjects as specified in a particular Plan of Training. Mature students, at the discretion of the Director of Apprenticeship and Trades Certification, may be registered. A mature student is defined as one who has reached the age of 19 and who can demonstrate the ability and the interest to complete the requirements for certification.

#### 2.3 At the discretion of the Director of Apprenticeship and Trades Certification, credit toward the apprenticeship program may be awarded to an apprentice for previous work experience and/or training as validated through prior learning assessment.

- 2.4 An Application for Apprenticeship form must be duly completed along with a Memorandum of Understanding as applicable to be indentured into an Apprenticeship. The Memorandum of Understanding must contain signatures of an authorized employer representative, the apprentice and an official representing the Provincial Apprenticeship and Certification Board to be valid.
- 2.5 A new Memorandum of Understanding must be completed for each change in an employer during the apprenticeship term.

### **3.0 Probationary Period**

The probationary period for each Memorandum of Understanding will be six months or 900 employment credit hours. Within that period the memorandum may be terminated by either party upon giving the other party and the PACB one week notice in writing.

### **4.0 Termination of a Memorandum of Understanding**

After the probationary period referred to in Section 3.0, the Memorandum of Understanding may be terminated by the PACB by mutual consent of the parties involved, or cancelled by the PACB for proper and sufficient cause in the opinion of the PACB, such as that stated in Section 14.

### **5.0 Apprenticeship Progression Schedule, Wage Rates and Advanced Training Criteria**



**Progression Schedule**

Concrete Finisher - 3600 Hours			
Apprenticeship Level And Wages			
Level	Wage Rate	Requirements for Progression to Next Level	Next Level
1	60%	<ul style="list-style-type: none"> <li>▪ Completion of Pre-Employment / Level 1 training</li> <li>▪ Registration as an apprentice</li> <li>▪ Pass Level 1 exam*</li> <li>▪ Minimum 1800 hours of combined relevant work experience and training</li> </ul>	2 <sup>nd</sup> Year
2	90%	<ul style="list-style-type: none"> <li>▪ Completion of Level 2 training</li> <li>▪ Pass Level 2 exam*</li> <li>▪ Minimum 3600 hours of combined relevant work experience and training</li> <li>▪ Sign-off of all workplace skills in apprentice logbook</li> <li>▪ Pass certification exam</li> </ul>	Journeyman Certification
<p>Wage Rates</p> <ul style="list-style-type: none"> <li>▪ Rates are percentages of the prevailing journeyman's wage rate in the place of employment of the apprentice.</li> <li>▪ Rates must not be less than the wage rate established by the Labour Standards Act (1990), as now in force or as hereafter amended, or by other order, as amended from time to time replacing the first mentioned order.</li> <li>▪ Rates must not be less than the wage rate established by any collective agreement which may be in force at the apprentice's workplace.</li> <li>▪ Employers are free to pay wage rates above the minimums specified.</li> </ul> <p>Level Exams*</p> <ul style="list-style-type: none"> <li>▪ This program may <b>not</b> currently contain level exams, in which case this requirement will be waived until such time as level exams are available.</li> </ul>			

Concrete Finisher - 3600 Hours		
Class Calls (After Apprenticeship Registration)		
Call Level	Requirements for Class Call	Hours awarded for In-School Training
Direct Entry Level 1	<ul style="list-style-type: none"> <li>▪ Minimum of 1800 hours of relevant work experience</li> <li>▪ Prior Learning Assessment (PLA) at designated college (if applicable)</li> </ul>	180
Level 2	<ul style="list-style-type: none"> <li>▪ Minimum of 3400 hours of relevant work experience and training</li> </ul>	240
<p>Class calls at Minimum Hours:</p> <ul style="list-style-type: none"> <li>▪ Class calls may not always occur at the minimum hours indicated. Some variation is permitted to allow for the availability of training resources and apprentices.</li> </ul>		

## 6.0 Tools

Apprentices shall be required to obtain their own hand tools applicable for the designated occupation of registration or tools as specified by the PACB.

## 7.0 Periodic Examinations and Evaluation

- 7.1 Every apprentice shall submit to such occupational tests and examinations as the PACB shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her apprenticeship level and rate of wage shall not be advanced as provided in Section 5 until his/her progress is satisfactory to the Director of Apprenticeship and Trades Certification and his/her date of completion shall be deferred accordingly. Persistent failure to pass required tests shall be a cause for revocation of his/her Memorandum of Understanding.
- 7.2 Upon receipt of reports of accelerated progress of the apprentice, the PACB may shorten the term of apprenticeship and advance the date of completion accordingly.
- 7.3 For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.

7.4 Course credits may be granted through the use of a PACB approved matrix which identifies course equivalencies between designated trades and between current and historical Plans of Training for the same trade.

#### **8.0 Granting of Certificates of Apprenticeship**

Upon the successful completion of apprenticeship, the PACB shall issue a Certificate of Apprenticeship.

#### **9.0 Hours of Work**

Any hours employed in the performance of duties related to the designated occupation will be credited towards the completion of the term of apprenticeship. Appropriate documentation of these hours must be provided.

#### **10.0 Copies of the Registration for Apprenticeship**

The Director of Apprenticeship and Trades Certification shall provide copies of the Registration for Apprenticeship form to all signatories to the document.

#### **11.0 Ratio of Apprentices to Journeypersons**

Under normal practice, the ratio of apprentices to journeypersons shall not exceed two apprentices to every one journeyperson employed. Other ratio arrangements would be determined and approved by the PACB.

#### **12.0 Relationship to a Collective Bargaining Agreement**

Where applicable in Section 5 of these conditions, Collective Agreements take precedence.

#### **13.0 Amendments to a Plan of Apprenticeship Training**

A Plan of Training may be amended at any time by the PACB.

#### **14.0 Employment, Re-Employment and Training Requirements**

14.1 The Plan of Training requires apprentices to regularly attend their place of employment.

14.2 The Plan of Training requires apprentices to attend training for that occupation as prescribed by the PACB.

14.3 Failure to comply with Sections 14.1 and/or 14.2 will result in cancellation of the Memorandum of Understanding. Apprentices may have their MOUs reinstated by the PACB but would be subject to a commitment to complete the entire program

as outlined in the General Conditions of Apprenticeship. Permanent cancellation in the said occupation is the result of non-compliance.

- 14.4 Cancellation of the Memorandum of Understanding to challenge journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or qualifying to receive a class call to training as a registered Trade Qualifier. Cancellation must be mutually agreed upon by the employer and the apprentice.
- 14.5 An employer shall ensure that each apprentice is under the direct supervision of an approved journeyperson supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyperson with respect to the task, activity or function that is being supervised.
- 14.6 Under the Plan of Training the employer is required to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give first opportunity to be hired before another is hired.
- 14.7 The employer will permit each apprentice to attend training programs as prescribed by the PACB.
- 14.8 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a PACB authorized training institution and have sign-off done by instructors to meet the requirements for certification.

#### **15.0 Appeals to Decisions Based on Conditions Governing Apprenticeship Training**

Persons wishing to appeal any decisions based on the above conditions must do so in writing to the Minister of Immigration, Population Growth and Skills within 30 days of the decision.

**D. Requirements for Red Seal Endorsement**

1. Evidence of the required work experiences outlined in this Plan of Training have been obtained. This evidence must be in a format clearly outlining the experiences and must be signed by an appropriate person or persons attesting that these experiences have been obtained to the level required.
2. Successful completion of all required courses in the program.
3. A combination of training from an approved training program and suitable work experience totaling 3600 hours.

**Or**

A total of 5400 hours of suitable work experience.

4. Completion of a National Red Seal examination, to be set at a place and time determined by the Apprenticeship and Trades Certification Division.

## E. Roles and Responsibilities of Stakeholders in the Apprenticeship Process

The apprenticeship process involves a number of stakeholders playing significant roles in the training of apprentices. This section outlines these roles and the responsibilities resulting from them.

### **The Apprentice:**

- completes all required technical training courses as approved by the PACB.
- finds appropriate employment.
- completes all required work experiences in combination with the required hours.
- ensures work experiences are well documented.
- approaches apprenticeship training with an attitude and commitment that fosters the qualities necessary for a successful career as a qualified journeyman.
- obtains the required hand tools as specified by the PACB for each period of training of the apprenticeship program.

### **The Employer:**

- provides high quality work experiences in an environment conducive to learning.
- remunerates apprentices as set out in the Plan of Training or Collective Agreements.
- provides feedback to training institutions, Apprenticeship and Trades Certification Division and apprentices in an effort to establish a process of continuous quality improvement.
- where appropriate, releases apprentices for the purpose of returning to a training institution to complete the necessary technical courses.
- ensures work experiences of the apprentice are documented.
- ensures a certified journeyperson is currently on staff in the same trade area as the apprentice and whose certification is recognized by the NL Department of Immigration, Population Growth and Skills.

### **The Training Institution:**

- provides a high quality learning environment.
- provides the necessary student support services that will enhance an apprentice's ability to be successful.
- participates with other stakeholders in the continual updating of programs.

### **The Apprenticeship and Trades Certification Division:**

- establishes and maintains program advisory committees under the direction of the PACB.
- promotes apprenticeship training as a viable career option to prospective apprentices and other appropriate persons involved, such as career guidance counsellors, teachers, parents, etc.
- establishes and maintains a protocol with training institutions, employers and other appropriate stakeholders to ensure the quality of apprenticeship training programs.
- ensures all apprentices are appropriately registered and records are maintained as required.
- schedules all necessary technical training periods for apprentices to complete requirements for certification.
- administers level, provincial and interprovincial examinations.

### **The Provincial Apprenticeship and Certification Board:**

- sets policies to ensure the provisions of the **Apprenticeship and Certification Act (1999)** are implemented.
- ensures advisory and examination committees are established and maintained.
- accredits institutions to deliver apprenticeship training programs.
- designates occupations for apprenticeship training and/or certification.