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# Pre-Employment Plan of Training Sprinkler Fitter



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

March 2019

# PLAN OF TRAINING

## Sprinkler Fitter

March, 2019



**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 "David Li".

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Chairperson, Provincial Apprenticeship and Certification Board

Date: March 20, 2019

### Preface

This curriculum standard is aligned with the 2019 Level 1 Atlantic Apprenticeship Curriculum Standard (AACS) and the 2017 Red Seal Occupational Standard (RSOS) for the Sprinkler Fitter trade. It describes the curriculum content for the Sprinkler Fitter Pre-employment training program.

### Acknowledgements

The Provincial Trade Advisory Committee (PTAC), industry representatives, instructors and apprenticeship staff provided valuable input to the development of this provincial plan of training. Without their dedication to quality apprenticeship training, this document could not have been produced.

We offer a sincere thank you.

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A. RSOS Comparison Chart

A Red Seal Occupation Standard (RSOS) comparison chart is located in the Atlantic Apprenticeship Curriculum Standard (AACS).

## 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 training institution, as long as pre-requisite conditions are satisfied.

Upon completion of a Pre-employment program, 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 and 3 in the Atlantic Apprenticeship Curriculum Standard (AACCS).

<b>Pre-Employment</b>				
<b>Course No.</b>	<b>AACS No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
TS1520	---	WHMIS	6	None
TS1530	---	Standard First Aid	14	None
LA1110	---	Fall Protection Awareness	6	None
LA1100	SSI-100	Confined Space Awareness	6	None
SK1100		Personal and Work Site Safety	18	None
SK1110	SSI-105 SSI-110	Tools and Work Site Equipment	12	SK1100
SK1221	SSI-115	Rigging and Hoisting	21	SK1100
SK1290	SSI-120	Blueprint Reading and Sketching	30	None

<b>Pre-Employment</b>				
<b>Course No.</b>	<b>AACS No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
STM235	SSI-600	Electrical Principles	6	None
SK1140	SSI-135	Steel Pipe and Fittings	30	SK1100 SK1110
SK1145	SSI-140	Plastic Pipe and Fittings	15	SK1100 SK1110
SK1150	SSI-145	Copper Pipe and Tubing	15	SK1100 SK1110
SK1155	SSI-155	Supports and Hangers	9	SK1140
SK1160	SSI-160	Pipe Design and Installation I	18	SK1155 SSI-165 SK1145
SSI-165	SSI-165	Soldering, Brazing and Oxy-Acetylene Cutting	9	SK1150
SK1170	SSI-150	Sprinkler Heads and Nozzles	30	SK1160
SK1175	SSI-170	Wet Pipe Sprinkler Systems	21	SK1160
SK1180	SSI-175	Dry Pipe Sprinkler Systems	20	SK1160
SK1185	SSI-180	Antifreeze Sprinkler Systems	6	SK1175 SK1180
SSI-185	SSI-185	Pre-Action Systems I	9	SK1175 SK1180
SSI-190	SSI-190	Deluge Systems I	9	SK1175 SK1180
SK1300	SSI-195	System Drainage I	6	SK1175 SK1180



<b>Pre-Employment</b>				
<b>Course No.</b>	<b>AACS No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisite(s)</b>
AM1000	---	Introduction to Essential Skills	9	None
AP1102	---	Introduction to Apprenticeship	12	None
MC1062	---	Computer Essentials	15	None
AM1101*	---	Math Essentials	42	None
AM1311	---	Sprinkler Fitter Math Fundamentals	42	AM1101
CM2161	SSI-130	Communication Essentials	36	None
SD1761		Workplace Essentials	24	None
SK1130		Mentoring I	6	None
SK1120	SSI-125	Job Planning	8	None
<b>Total Pre-Employment Hours</b>			<b>510</b>	

\*A student who can meet the mathematics requirement through an ACUPLACER® test may be exempted from AM1101 - Math Essentials. Please check with your training institution.

<b>Required Work Experience</b>
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## Pre-Employment

### TS1520 Workplace Hazardous Materials Information System (WHMIS)

#### Learning Outcomes:

- Demonstrate knowledge of interpreting and applying the Workplace Hazardous Materials Information System (WHMIS) regulation under the Occupational Health and Safety Act.

**Duration:** 6 Hours

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

#### Objectives and Content:

1. Define WHMIS safety.
  - i. rationale and key elements
  - ii. history and development of WHMIS
  - iii. WHMIS legislation
  - iv. WHMIS implementation program
  - v. definitions of legal and technical terms
  
2. Examine hazard identification and ingredient disclosure.
  - i. prohibited, restricted and controlled products
  - ii. classification and the application of WHMIS information requirements
  - iii. responsibilities for classification
    - the supplier
    - the employer
    - the worker - Classification: rules and criteria
    - information on classification
    - classes, divisions and subdivision in WHMIS
    - general rules for classification
    - Class A - compressed gases
    - Class B - flammable and combustible materials
    - Class C - oxidizing material
    - Class D - poisonous and infectious material
    - Class E - corrosive material
    - Class F - dangerously reactive material
  - iv. products excluded from the application of WHMIS legislation
    - consumer products
    - explosives
    - cosmetics, drugs, foods and devices
    - pest control products

- radioactive prescribed substances
  - wood or products made of wood
  - manufactured articles
  - tobacco or products of tobacco
  - hazardous wastes
  - products handled or transported pursuant to the Transportation of Dangerous Goods (TDG) Act
  - v. comparison of classification systems – WHMIS and TDG
  - vi. general comparison of classification categories
  - vii. detailed comparison of classified criteria
3. Explain labeling and other forms of warning.
- i. definition of a WHMIS label
    - supplier label
    - workplace label
    - other means of identification
  - ii. responsibility for labels
    - supplier responsibility
    - employer responsibility
    - worker responsibility
  - iii. introduce label content, design and location
    - supplier labels
    - workplace labels
    - other means of identification
4. Introduce material safety data sheets (MSDS).
- i. definition of a material safety data sheet
  - ii. purpose of the data sheet
  - iii. responsibility for the production and availability of data sheets
    - supplier responsibility
    - employer responsibility
    - workers responsibility

**Practical Requirements:**

1. Locate WHMIS label and interpret the information displayed.
2. Locate a MSDS sheet for a product used in the workplace and determine what personal protective equipment and other precautions are required when handling this product.

TS1530 Standard First Aid

**Learning Outcomes:**

- Demonstrate knowledge of recognizing situations requiring emergency action.
- Demonstrate knowledge of making appropriate decisions concerning first aid.

**Duration:** 14 Hours

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

**Objectives and Content:**

1. Complete a **St. John Ambulance or Canadian Red Cross** Standard First Aid Certificate course.

## LA1110 Fall Protection Awareness

### Learning Outcomes:

- Demonstrate knowledge of various types of fall protection and their components.
- Demonstrate knowledge of the proper use of fall protection equipment and personal fall arrest systems.
- Demonstrate knowledge of fall hazards in the workplace and how to take corrective measures to eliminate them through the selection of appropriate fall protection systems.

**Duration:** 6 Hours

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

### Objectives and Content:

1. Define the term fall protection.
2. Explain why fall protection is important in the workplace.
3. Determine when to use fall protection.
4. List the A, B, C, D=s of a complete fall protection system.
5. Describe the basic function of a travel restrict system.
  - i. permanent and temporary guard rails
  - ii. personal travel restrict systems
6. Describe the basic function of a fall arrest system.
  - i. identify the components of a personal fall arrest system
    - full body harness
    - shock absorbers
    - lanyards
    - lifelines
    - vertical
    - horizontal
    - rope grabs
    - anchors
  - ii. explain how to put on a full body harness
7. Describe the basic function of a work positioning system.
  - i. list the components of a personal work positioning system

8. Explain when inspections on equipment must be conducted and what action must be taken if defects or damage is discovered.
  - i. list components of equipment that require inspection

**Practical Requirements:**

None.

## LA1100 Confined Space Awareness

### Learning Outcomes:

- Demonstrate knowledge of applications and procedures for working in confined spaces.
- Demonstrate knowledge of how to properly prepare a confined space for entry.
- Demonstrate knowledge of how to enter a confined space safely.
- Demonstrate knowledge of how to perform the duties of an attendant.
- Demonstrate knowledge of how to deal with an emergency.

**Duration:** 6 Hours

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

### Objectives and Content:

1. Identify situations that require specialty safety equipment.
2. Identify safety procedures associated with confined spaces.
3. Recognize confined space hazards.
  - i. define a confined space
  - ii. identify types of hazards in confined spaces
4. Describe procedures for verification of entry permit and identify proper controls for confined space entries.
  - i. list steps to protect yourself from confined space hazards
  - ii. define an entry permit
  - iii. list information included on a confined space entry permit
  - iv. explain what action must be taken if a permit expires before work is completed
5. Prepare for confined space entry.
  - i. state the first step in entry preparation
  - ii. list examples of proper entry preparation
  - iii. list types of personal protective equipment used in confined spaces
6. Determine testing techniques for confined spaces.
  - i. list the necessary steps of air testing
  - ii. state the correct order for testing gases

7. Identify confined space entry procedures.
  - i. identify the attendants responsibilities
  - ii. identify the area where the attendant should be stationed
  - iii. identify the entrants responsibilities
  
8. Explain confined space rescue techniques.
  - i. list three types of confined space rescues
  - ii. explain non-entry rescue
  - iii. list the requirements of an on-site rescue team

**Practical Requirements:**

None.



## SK1100 Personal and Work Site Safety

### Learning Outcomes:

- Demonstrate knowledge of safe work-practices and procedures.
- Demonstrate knowledge of PPE and safety equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of applications and procedures for locking out/tagging out equipment and de-energizing procedures to electrical, mechanical, hydraulic and pneumatic equipment according to all applicable acts, codes, policies, procedures, and standards.
- Demonstrate knowledge of regulatory requirements pertaining to safety.

**Duration:** 18 Hours

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

### Objectives and Content:

1. Define terminology associated with safe work practices.
2. Identify workplace hazards and describe safe work practices and safety equipment.
  - i. workplace hazards
    - personal
      - confined space
      - working at heights
      - lifting and ergonomics
      - trenches
    - workplace
      - hot work
      - lock-out/tag-out
      - high voltage
      - rotating equipment
      - barricades and flagging
      - radiation
      - extreme temperatures
      - noise
    - environmental
      - hazardous materials
      - quality of air
      - system drainage and disposal requirements
  - ii. safe work practices
    - fall protection

- hot work
  - confined space
  - travel restraint
  - using personal protective equipment (PPE)
  - following site-specific requirements
3. Identify applicable acts, codes, regulations and company/customer standards associated with personal and worksite safety.
    - i. Occupational Health and Safety Act (OHSA)
    - ii. Workplace Safety Insurance (WHSCC)
    - iii. National Building Code Canada (NBCC)
    - iv. National Fire Prevention Association (NFPA)
  4. Explain the difference between the “Act” and the “Regulations.”
  5. Identify and interpret workplace safety and health regulations.
    - i. federal (WHMIS, Transportation of Dangerous Goods [TDG])
    - ii. provincial/territorial (OH&S)
    - iii. municipal
  6. Define terminology associated with personal protective equipment and safety equipment.
  7. Identify types of PPE and describe their applications and procedures for use.
    - i. safety boots
    - ii. hard hats
    - iii. gloves
    - iv. safety glasses, goggles
    - v. masks
    - vi. coveralls
    - vii. safety harness
    - viii. respirators
    - ix. hearing protection
    - x. high visibility vests
    - xi. specialized (site-specific PPE)
    - xii. fall protection/travel restraints
  8. Identify types and location of site safety equipment, and describe their applications and procedures for use.
    - i. fire extinguishers
    - ii. eye wash stations
    - iii. first aid kits
    - iv. spill kits
    - v. air-monitoring devices

9. Describe the procedures used to inspect, maintain and store PPE and safety equipment.
10. Identify the location of first aid equipment and supplies, fire extinguishers and fire alarms.
11. Identify job conditions that require heating, ventilation and lighting.
12. Explain the purpose of storing material and equipment in designated areas.
13. Identify when to erect protective barriers.
14. Explain the importance of recycling material.
15. Identify the location of fire hazardous areas.
16. Describe a fire evacuation plan.
17. Describe safe physical limits using correct body mechanics when bending lifting, transporting or climbing with heavy loads.
18. Describe which condition(s) causes personal injury.
19. Describe the procedures to follow when unsafe worksite conditions are encountered.
  - i. problems with equipment that may endanger the worker or other workers
  - ii. contravention of acts, codes, policies , procedures or standards
  - iii. work site hazards
20. Identify the types of inappropriate behaviour that endangers workers on the worksite or damages equipment.
21. Identify situations that require lock-out/tag-out.
22. Describe procedures for locking out/tagging out equipment and piping.
23. Describe the procedure to remove locked out electrical, mechanical, hydraulic and pneumatic equipment.

**Practical Requirements:**

None.

## SK1110 Tools and Work Site Equipment

### Learning Outcomes:

- Demonstrate knowledge of hand tools, their applications, maintenance and procedures for use.
- Demonstrate knowledge of portable and stationary power tools, their applications, maintenance and procedures for use.
- Demonstrate knowledge of measuring and testing equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of the selection, assembly and procedures for using access equipment.
- Demonstrate knowledge of the identification, selection, use and maintenance of various ladders.
- Demonstrate knowledge of the procedures for selecting, erecting, dismantling and maintaining scaffolding.

**Duration:** 12 Hours

**Pre-Requisite(s):** SK1100

### Objectives and Content:

1. Define terminology associated with hand tools.
2. Identify types of hand tools and measuring devices, and describe their applications and procedures for use.
  - i. measuring tape
  - ii. torpedo level
  - iii. screwdrivers
  - iv. pliers
  - v. nut drivers
  - vi. wrenches
  - vii. vises and clamps
  - viii. hammers
  - ix. saws
  - x. files
  - xi. drills
  - xii. punches
  - xiii. chisels
  - xiv. cutters
  - xv. reamers
  - xvi. threaders
3. Define terminology associated with portable and stationary power tools.

4. Identify types of portable and stationary power tools and accessories, and describe their applications and procedures for use.
  - i. drills
    - impact
    - cordless
  - ii. pipe cutters
  - iii. welding machine
    - portable
  - iv. grooving machines
  - v. saws
    - chop
    - gas-powered
    - reciprocating
    - circular
    - cut-off
    - band
  - vi. threading machines
  - vii. grinders
  - viii. drill press
5. Identify hazards and describe safe work practices related to the use of hand tools, portable and stationary power tools and accessories.
6. Define terminology associated with measuring and testing equipment.
7. Identify types of measuring and testing equipment, and describe their applications and procedures for use.
8. Define terminology associated with access equipment.
9. Identify hazards and describe the safe work practices pertaining to the use of access equipment.
  - i. ladder
  - ii. scaffolding
10. Interpret codes and regulations pertaining to the use of access equipment.
  - i. jurisdictional limitations
  - ii. certification requirements
11. Identify types of access equipment and describe their applications.
12. Describe the procedures used to inspect and maintain ladders and scaffolding.

13. Describe the procedures used to erect level and dismantle scaffolding.
  - i. determine required system
  - ii. precautions
  - iii. erect and dismantle scaffolding
14. Describe the procedures used to store and secure access equipment.
15. Identify the various types of aerial platforms.
  - i. scissors lift
  - ii. articulating boom
  - iii. straight boom
  - iv. battery, gas and propane platforms
16. Describe the operation, application and basic safety procedures for aerial platforms.

**Practical Requirements:**

1. Select and use hand and power tools.

## SK1221 Rigging and Hoisting

### Learning Outcomes:

- Demonstrate knowledge of rigging, hoisting and lifting equipment, their applications, limitations and procedures for use.
- Demonstrate knowledge of loading and unloading equipment and materials according to all applicable acts, codes, policies, procedures, and standards.
- Demonstrate knowledge of calculations required to perform rigging, hoisting and lifting operations.
- Demonstrate knowledge of knots, bends and hitches, their applications and procedures for tying.
- Demonstrate knowledge of communication methods used for hoisting and lifting.
- Demonstrate knowledge of the procedures used to plan and perform rigging, hoisting and lifting operations.

**Duration:** 21 Hours

**Pre-Requisite(s):** SK1100

### Objectives and Content:

1. Define terminology associated with rigging, hoisting and lifting equipment.
2. Identify hazards and describe safe work practices pertaining to rigging, hoisting and lifting equipment.
  - i. hazards
    - overhead obstructions
    - excavations
    - excessive loads
3. Identify documentation and regulations pertaining to rigging, hoisting and lifting equipment.
4. Identify types of rigging, hoisting, and lifting equipment, and describe their applications, limitations, safe working loads and procedures for use.
  - i. cable clamps
  - ii. chain block hoist (single and double)
  - iii. chains
  - iv. choker
  - v. come-alongs (cable or chain)
  - vi. jacks
  - vii. overhead hoist
  - viii. pipe buggy
  - ix. pipe stand

- x. shackles
  - xi. slings
  - xii. spreader bar
  - xiii. tugger
  - xiv. ratchet lever hoist
  - xv. hand hoist
5. Identify the factors to consider for selecting rigging equipment.
- i. load characteristics
  - ii. environment
  - iii. safety factors
6. Describe types of ropes and slings, their characteristics, safe working loads and applications.
- i. natural
  - ii. synthetic
  - iii. wire
7. Describe the procedures used for attaching rigging equipment to the load.
8. Describe sling angle when preparing for hoisting and lifting operations.
9. Describe the factors to consider, and the procedures used to perform calculations related to rigging, hoisting and lifting operations.
10. Identify types of knots, bends and hitches used on ropes, and describe the safety factors, the applications and procedures to tie them.
11. Explain the purpose and procedures for using equipment when hoisting loads.
- i. chain falls
  - ii. come-along
  - iii. jacks
  - iv. trolleys
  - v. slings
  - vi. shackles
  - vii. power lifts
  - viii. leveling equipment
  - ix. fastening equipment
12. Identify and interpret hand signals used for hoisting and lifting.
13. Describe the communication methods used during hoisting, lifting and rigging operations.



14. Describe the procedures used to inspect, maintain and store hoisting, lifting and rigging equipment.
15. Describe the procedures used to ensure the work area is safe for lifting.
  - i. supervision of lift
  - ii. securing work area
  - iii. communication
16. Describe the procedure used to secure and barricade an area for rigging and hoisting operations.
17. Describe the procedures used to plan and perform a lift.
  - i. determine weight of the load
  - ii. select equipment
  - iii. determine set-up of equipment
  - iv. determine communication methods
  - v. set up hoisting/lifting equipment
  - vi. rig material/equipment to be lifted
  - vii. attach tag line
  - viii. perform pre-lift checks
  - ix. lift and place load
  - x. perform post-lift inspection of the load
  - xi. disconnect the load
18. Explain how to coordinate with other trades when preparing for rigging and hoisting operations.
19. Identify when special rigging or hoisting may be required for materials for pieces of equipment.

**Practical Requirements:**

1. Demonstrate the ability to tie approved knots, bends and hitches.
2. Demonstrate the use of international hand signals.
3. Demonstrate the use of standard weight tables to determine the weight of a given load.
4. Rig and move a load.

## SK1290 Blueprint Reading and Sketching

### Learning Outcomes:

- Demonstrate knowledge of the procedures to read and interpret sprinkler system drawings and on-site drawings.
- Demonstrate knowledge to produce basic sketches.
- Demonstrate knowledge of the procedures to draw and label orthographic and isometric drawings.

**Duration:** 30 Hours

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

### Objectives and Content:

1. Define terminology associated with reading and sketching drawings.
2. Identify types of lines found on sprinkler system drawings.
  - i. object (visible) line
  - ii. hidden line
  - iii. central line
  - iv. dimension line
  - v. extension line
  - vi. cutting plane line
3. Explain the fundamentals of orthographic projection and isometric projections.
4. Describe the procedures used to interpret dimensions on drawings.
5. Describe the procedures used to prepare orthographic and isometric sketches.
6. Identify drafting tools and drawing equipment, and describe their applications and procedures for use.
7. Describe views of a building with the aid of an installation drawing.
  - i. plan
  - ii. elevation

8. Identify and interpret architectural dimension and scaling.
  - i. S.I. scale rule
  - ii. architect scale rule (Imperial)
  - iii. engineer scale rule
  - iv. typical scales
  - v. floor plans
  - vi. elevations
  - vii. sections
  - viii. details
9. Identify and interpret symbols found on sprinkler system drawings.
10. Interpret specifications.
11. Describe the procedures used to prepare single line pipe drawings such as orthographic and isometric.
12. Describe the procedures used to interpret a site plan in both metric and imperial units.
13. Describe the procedures used to interpret metric and imperial scaling.
14. Identify divisions of drawings and describe their purpose.
  - i. architectural
  - ii. structural
  - iii. mechanical
  - iv. electrical
  - v. plot
  - vi. specifications
  - vii. schedules
15. Identify types of views found on sprinkler system drawings.
  - i. plan
  - ii. elevation
  - iii. sections
  - iv. details
16. Identify views and drawings of a building and describe their purpose.
  - i. isometric
  - ii. orthographic
  - iii. 3-D

17. Identify and interpret sprinkler systems information found on drawings.
  - i. grades
  - ii. dimensioning and scaling
  - iii. cutting plane lines
  - iv. extension lines
  - v. symbols and abbreviations
  - vi. single line pipe drawings

**Practical Requirements:**

1. Draw and label three basic views of an object.
2. Draw and label single line pipe drawings.
  - i. orthographic
    - 45° fittings
    - 90° fittings
    - tees
  - ii. detail drawings with north arrow indicators
    - Orthographic North to Isometric North
    - Isometric North to Orthographic North
    - North orientation

## STM235 Electrical Principles

### Learning Outcomes:

- Demonstrate knowledge of the basic concepts of electricity.

**Duration:** 6 Hours

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

### Objectives and Content:

1. Define terminology associated with electricity as related to the trade.
2. Identify hazards and describe safe work practices pertaining to electricity.
3. Identify electrical-related information found on drawings and specifications.
4. Identify tools and equipment used to test electrical circuits and describe their applications and procedures for use.
5. Identify and explain Ohm's law.
6. Identify types of current and describe their characteristics and applications.
  - i. direct current (DC)
  - ii. alternating current (AC)
7. Identify types of electrical circuits and describe their characteristics, operation and applications.
  - i. series
  - ii. parallel
  - iii. series-parallel
8. Identify types of related electrical equipment and components and describe their characteristics, operation and applications.

### Practical Requirements:

1. Use a multi-meter.

## SK1140 Steel Pipe and Fittings

### Learning Outcomes:

- Demonstrate knowledge of steel pipe, tube and fittings.
- Demonstrate knowledge of the procedures used to install steel pipe, tube and fittings.
- Demonstrate knowledge of the tools, materials and procedures used to prepare ferrous pipe fittings.
- Demonstrate knowledge of the tools, equipment, and materials used to cut, grind, groove, thread, drill, bend, paint and label steel pipe and tube.
- Demonstrate knowledge of the procedures used to cut, grind, groove, thread, bend, paint and label steel pipe and tube.

**Duration:** 30 Hours

**Pre-Requisite(s):** SK1100, SK1110

### Objectives and Content:

1. Define terminology associated with steel pipe, tube and fittings.
  - i. cutting pipe and tube
  - ii. grinding pipe
  - iii. grooving pipe
  - iv. threading pipe
  - v. drilling pipe and tube
  - vi. bending pipe and tube
  - vii. painting and labeling pipe and tube
2. Identify hazards and describe safe work practices related to installing steel pipe, tube and fittings.
3. Identify codes, standards and regulations pertaining to steel pipe, tube and fittings.
4. Identify information pertaining to steel pipe and tube installation found on drawings and specifications.
5. Identify tools and equipment for installing steel pipe, tube and fittings, and describe their applications and procedures for use.
  - i. wrenches
  - ii. levels
  - iii. sockets
  - iv. chain vices

6. Identify types of steel pipe and tube.
  - i. stainless
  - ii. galvanized
  - iii. carbon
  
7. Identify piping components and describe their purpose and relationships.
  - i. system riser
  - ii. riser
  - iii. feed mains
  - iv. cross mains
  - v. branch lines
  - vi. header
  
8. Describe the criteria for selection of steel pipe.
  - i. schedule numbers and grades
  - ii. pressure ratings
  - iii. pipe sizes and lengths
  - iv. end finishes
  - v. protective coatings and linings
  - vi. codes
  - vii. manufacturers' specifications
  - viii. manufacturing techniques
  
9. Identify types of threads.
  - i. National Pipe Thread (NPT)
  - ii. National Standard Thread
  
10. Identify the types of threaded pipe fittings and their applications.
  - i. malleable
  - ii. cast iron
  - iii. steel
  - iv. galvanized
  - v. non-ferrous
  - vi. stainless
  
11. Identify the types of flanges and their associated fittings and gaskets.
  - i. types of flanges / fittings
    - uni-flange
    - grooved
    - welded
    - companion

- ii. selection criteria
    - materials
    - flange markings
    - gasket specifications
    - manufacturers' specifications
  - iii. installation a grooved flange
  - iv. codes and regulations pertaining to flanged pipe fittings and gasket materials
12. Identify grooved and grip style pipe fittings and gaskets.
- i. types of fittings / gaskets
    - grooved flange
    - slip fitting
    - flexible coupling
  - ii. selection criteria
    - materials and types
    - markings
    - pressure and temperature ratings
    - color coding of gaskets
    - joining techniques
  - iii. tools and equipment used for preparing and joining grooved pipe
    - hand tools
    - power tools (cut grooves, roll grooves)
    - machines
  - iv. joining grooved and grip style fittings to pipe
  - v. joining techniques
  - vi. codes, regulations and manufacturers' specifications pertaining to gasket selection assembly of grooved and grip style fittings on pipe
13. Describe the procedures used to install steel pipe, tube and fittings.
14. Describe connection types related to steel pipe and tube.
15. Describe the procedures used to cut steel pipe and tube to required dimensions.
16. Describe the procedures used to grind steel pipe.
17. Describe the procedures used to groove steel pipe.
18. Describe the procedures used to thread steel pipe.
19. Describe the procedures used to drill steel pipe and tube.
20. Describe the procedures used to bend steel pipe and tube to required dimensions.



21. Describe the procedures and materials used to paint and label steel pipe and tube.
22. Describe the procedures used to prepare pipe fittings.
23. Describe a suitable fabrication area.
  - i. accessibility
  - ii. lighting
  - iii. traffic flow
  - iv. material, equipment handling, and storage
  - v. power supply
24. Describe the procedures used to apply mathematical concepts to steel pipe, tube and fittings.
  - i. fitting allowances
  - ii. bending allowances
  - iii. pipe layout

**Practical Requirements:**

1. Perform cutting, threading and grooving of steel pipe.

## SK1145 Plastic Pipe and Fittings

### Learning Outcomes:

- Demonstrate knowledge of plastic pipe, tube and fittings.
- Demonstrate knowledge of the procedures used to install plastic pipe, tube and fittings.
- Demonstrate knowledge of the tools, materials and procedures used to prepare non-ferrous pipe fittings.
- Demonstrate knowledge of the tools, equipment, and materials used to cut, join and label plastic pipe and tube.
- Demonstrate knowledge of the procedures used to cut, join and label plastic pipe and tube.

**Duration:** 15 Hours

**Pre-Requisite(s):** SK1100, SK1110

### Objectives and Content:

1. Define terminology associated with plastic pipe, tube and fittings.
  - i. cutting pipe and tube
  - ii. threading joining pipe
  - iii. drilling pipe and tube
  - iv. labeling pipe and tube
  - v. joining pipe and tube
2. Identify hazards and describe safe work practices related to installing plastic pipe, tube and fittings.
3. Identify codes, standards and regulations pertaining to plastic pipe, tube and fittings.
4. Identify information pertaining to plastic pipe and tube installation found on drawings and specifications.
5. Identify tools and equipment for installing plastic pipe and tube and, describe their applications and procedures for use.
6. Identify types of plastic pipe.
  - i. chlorinated polyvinyl chloride (CPVC)
  - ii. cross-linked polyethylene (PEX)
  - iii. polyvinyl chloride (PVC)

7. Identify the factors to consider for selecting plastic pipe.
  - i. types
  - ii. pressure and temperature ratings
  - iii. sizes
  - iv. manufacturers' specifications
8. Describe the types of fittings and solvents used with plastic pipe.
9. Describe the procedures used to join plastic pipe using the solvent welding process.
  - i. safety requirements
  - ii. fabrication process and materials
  - iii. cleaning, beveling and de-burring
  - iv. assembly
  - v. tools
  - vi. ventilation
  - vii. solvent cure times
  - viii. testing
10. Describe the procedures used to install plastic pipe, tube and fittings.
11. Describe connection types related to plastic pipe and tube.
12. Identify compatibility of plastic pipe and tube with site conditions and other materials.
  - i. adhere to manufactures specifications and material safety data sheets (MSDS)
13. Describe the procedures used to cut plastic pipe and tube to required dimensions.
14. Describe the procedures and materials used to label plastic pipe and tube.
15. Describe the procedures used to prepare pipe fittings.
16. Describe the procedures to apply mathematical concepts to plastic pipe, tube and fittings.
  - i. fitting allowances
  - ii. pipe layout

**Practical Requirements:**

1. Prepare, cut and assemble plastic pipe.

## SK1150 Copper Pipe and Tubing

### Learning Outcomes:

- Demonstrate knowledge of copper pipe, tubing and fittings.
- Demonstrate knowledge of the procedures used to install copper pipe, tubing and fittings.
- Demonstrate knowledge of the tools, materials and procedures used to prepare copper pipe fittings.
- Demonstrate knowledge of the tools, equipment, and materials used to cut, bend, and label copper pipe and tube.
- Demonstrate knowledge of the procedures used to cut, bend, and label copper pipe and tube.

**Duration:** 15 Hours

**Pre-Requisite(s):** SK1100, SK1110

### Objectives and Content:

1. Define terminology associated with copper pipes, tubing and fittings.
  - i. cutting pipe and tube
  - ii. grooving pipe
  - iii. drilling pipe and tube
  - iv. bending pipe and tube
  - v. labeling pipe and tube
2. Identify hazards and describe safe work practices related to installing copper pipe, tubing and fittings.
3. Identify codes, standards and regulations pertaining to copper pipe, tubing and fittings.
4. Identify information pertaining to copper pipe and tubing installation found on drawings and specifications.
5. Identify tools and equipment for installing copper pipe, tubing and fittings and describe their applications and procedures for use.
6. Identify types of copper pipe and tubing and describe their applications.

7. Identify the factors to consider for selecting copper tube.
  - i. cutting
    - grade
    - size
    - materials
  - ii. bending
    - grade
    - size
    - material
    - schedule
8. Describe the procedures used to install copper pipe, tubing and fittings.
9. Describe connection types related to copper pipe.
  - i. soldering
  - ii. brazing
  - iii. using grooved couplings
  - iv. compression type fittings
10. Explain the effect of electrolysis on piping and tubing materials.
11. Describe the procedures used to prepare and assemble flare and compression joints using hand tools.
12. Describe the procedures used to cut copper pipe and tube to required dimensions.
13. Describe the procedures used to bend copper pipe and tube to required dimensions.
14. Describe the procedures and materials used to label copper pipe and tube.
15. Describe the procedures used to prepare pipe fittings.
16. Describe the procedures to apply mathematical concepts to copper pipe, tubing and fittings.
  - i. fitting allowances
  - ii. bending allowances
  - iii. pipe layout

**Practical Requirements:**

1. Prepare, cut, bend and assemble copper pipe, tubing and fittings.

## SK1155 Supports and Hangers

### Learning Outcomes:

- Demonstrate knowledge of supports and hangers, their characteristics and applications.
- Demonstrate knowledge of the procedures used to install supports and hangers.
- Demonstrate knowledge of pipe sleeves and their installation.

**Duration:** 9 Hours

**Pre-Requisite(s):** SK1140

### Objectives and Content:

1. Define terminology associated with supports, hangers and sleeves.
2. Identify hazards and describe safe work practices pertaining to supports, hangers and sleeves.
3. Identify codes, standards and regulations pertaining to supports, hangers and sleeves.
4. Identify information pertaining to supports, hangers and sleeves found on drawings and specifications.
5. Identify the factors to consider when performing grade and hanger location calculations.
  - i. grade on pipe
  - ii. slope of ceiling
  - iii. hanger spacing
  - iv. distance from hanger to attachment points
  - v. surge restraints
6. Identify tools and equipment relating to supports, hangers and sleeves, and describe their applications and procedures for use.
  - i. hammer drills
  - ii. adjustable wrenches
  - iii. hacksaws
  - iv. pliers

7. Identify types of supports and hangers used in the installation of pipe, tube and tubing, and describe their characteristics and applications.
  - i. supports
    - ceiling flanges
    - side beam attachments
    - c-clamps
  - ii. hangers
    - riser clamps
    - pipe clamps
    - swivel rings
    - clevis
    - split rings
8. Identify types and sizes of hanger rods, and describe their characteristics and applications.
9. Identify types of protective materials applied to hangers, and describe their purpose and applications.
10. Identify types of fasteners and inserts, and describe their characteristics and applications.
11. Describe the procedures used to install supports and hangers.
12. Describe the procedures used to size and install pipe sleeves.
13. Describe the procedures used to install fasteners into structure material.
14. Identify supports and hanger requirements for various systems.
15. Describe the procedures used to install fasteners and inserts.
16. Describe the procedures used to install flexible joints.
17. Describe the procedures to apply mathematical concepts to hangers, supports, sleeves and bracing
  - i. pipe layout

**Practical Requirements:**

1. Install various supports and hangers.

## SK1160 Pipe Design and Installation I

### Learning Outcomes:

- Demonstrate knowledge of sprinkler system layout.
- Demonstrate knowledge of design considerations for steel, plastic, copper pipe, tubing and fittings.
- Demonstrate knowledge of friction loss for steel, plastic, copper pipe, tubing and fittings and hydraulically calculated systems.

**Duration:** 18 Hours

**Pre-Requisite(s):** SK1155, SS1-165, SK1145

### Objectives and Content:

1. Define terminology associated with pipe design and installation.
  - i. sprinkler system layout
2. Identify hazards and describe safe work practices pertaining to pipe design and installation.
3. Identify codes, standards and regulations pertaining to pipe design and installation.
4. Identify tools and equipment relating to pipe design and installation, and describe their applications and procedures for use.
5. Identify information pertaining to pipe design and installation found on drawings and specifications.
6. Identify the factors to consider for determining pipe design and installation requirements.
7. Describe the procedures used to lay out sprinkler systems and components.
8. Identify friction loss as it applies to steel pipe schedules and hydraulically calculated systems.
9. Identify the design considerations for installing steel pipe, tube and fittings.
10. Identify friction loss as it applies to plastic pipe and tube and hydraulically calculated systems.
11. Identify the design considerations for installing plastic pipe, tube and fittings.



12. Identify friction loss as it applies to copper pipe and tubing, and hydraulically calculated systems.
13. Identify the design considerations for installing copper pipe, tubing and fittings.

**Practical Requirements:**

1. Assemble and install a sprinkler system.

## SSI-165 Soldering, Brazing and Oxy-Acetylene Cutting

### Learning Outcomes:

- Demonstrate knowledge of soldering and brazing equipment, their applications and procedures for use.
- Demonstrate knowledge of the procedures used to grind pipe.
- Demonstrate knowledge of the procedures used to braze and solder joints.

**Duration:** 9 Hours

**Pre-Requisite(s):** SK1150

### Objectives and Content:

1. Define terminology associated with soldering, brazing and oxy-acetylene cutting.
2. Identify hazards and describe safe work practices pertaining to soldering, brazing and oxy-acetylene cutting.
  - i. conditions that require the disarming of detection systems prior to soldering or brazing
3. Identify codes, standards and regulations pertaining to soldering, brazing and oxy-acetylene cutting.
4. Interpret information pertaining to soldering, brazing and oxy-acetylene cutting found on drawings and specifications.
5. Identify types of soldering, brazing and oxy-acetylene equipment and consumables.
  - i. oxy-fuel and air-fuel torches
  - ii. gas cylinders
  - iii. torch heads and tips
  - iv. brazing alloy and flux
  - v. soldering alloy and flux
  - vi. sand cloth
  - vii. gases
    - oxygen
    - acetylene
    - MAPP
    - Propane
    - butane

6. Describe the selection criteria for solders and brazing alloys.
  - i. types
  - ii. pressure rating
  - iii. temperature rating
  - iv. application
7. Identify different soldering and brazing processes and applications.
8. Describe the procedures to use oxy-acetylene equipment.
9. Describe the procedures used to solder and braze joints.
10. Describe the procedures used to inspect, maintain and store soldering, brazing and oxy-acetylene equipment.

**Practical Requirements:**

1. Perform soldering and brazing on various types of pipe.

## SK1170 Sprinkler Heads and Nozzles

### Learning Outcomes:

- Demonstrate knowledge of sprinklers and nozzles and their selection for use.
- Demonstrate knowledge of the procedures used to install sprinklers and nozzles.

**Duration:** 30 Hours

**Pre-Requisite(s):** SK1160

### Objectives and Content:

1. Define terminology associated with sprinklers and nozzles.
2. Identify hazards and describe safe work practices pertaining to sprinklers and nozzles.
3. Identify codes, standards and regulations pertaining to sprinklers and nozzles.
4. Identify information pertaining to sprinklers and nozzles found on drawings, specifications and listings.
5. Identify tools and equipment relating to sprinklers and nozzles, and describe their applications and procedures for use.
6. Explain the operation of sprinklers and nozzles in systems.
7. Identify types of sprinklers and nozzles, and describe their characteristics and applications.
  - i. automatic sprinklers
    - solder
    - bulb
    - open
  - ii. standard spray sprinklers
    - upright
    - pendant
    - sidewall
  - iii. extended coverage sprinklers
    - pendant
    - upright
    - sidewall
  - iv. specialty sprinklers and nozzles
    - residential
    - institutional

- CMSA/large drop
  - ESFR, in-rack
  - attic
  - old-style/conventional
  - open sprinkler
  - window
  - dry
  - foam
  - CO<sub>2</sub>
  - clean agent
  - combustible concealed space
- v. flexible sprinkler assemblies
8. Identify conditions, hazard classification and commodity classification for selecting sprinklers.
- i. conditions
    - freezing
    - excessive heat
    - corrosive environment
  - ii. commodity classification
    - high pile storage
    - in-rack
    - solid pile
9. Explain the importance of correct positioning for sprinklers and nozzles.
10. Identify required distances between standard spray and extended coverage sprinklers based on occupancy classification, manufacturers' specifications and National Fire Protection Association (NFPA) standards.
- i. occupancy classifications
    - light hazard
    - ordinary hazard
    - extra hazard
11. Identify obstructions of sprinklers and nozzles.
12. Identify clearances required between piled storage materials and sprinkler deflectors.
13. Identify the factors that affect maximum ceiling temperature.
14. Identify temperature ratings and colour coding.
- i. ordinary
  - ii. intermediate
  - iii. high
  - iv. extra-high

15. Explain the location requirements, procedures for installing, and ceiling temperatures of standard spray sprinkler heads.
  - i. bays
  - ii. beams
  - iii. girders
  - iv. joists
  - v. open bar joists
  - vi. open ceilings
  - vii. trusses
  - viii. storage materials
  
16. Identify performance characteristics that apply to automatic sprinklers.
  - i. deflector design/spray patterns
  - ii. orifice size
  - iii. temperature rating
  - iv. temperature sensitivity
  - v. orientation
  
17. Describe the procedures used to install sprinklers and nozzles.
  
18. Describe the procedures used and the factors to consider to protect, handle and care for sprinklers and nozzles prior to and during the installation process.

**Practical Requirements:**

None.

## SK1175 Wet Pipe Sprinkler Systems

### Learning Outcomes:

- Demonstrate knowledge of wet pipe systems, and their operation and characteristics.
- Demonstrate knowledge of the procedures used to install wet pipe systems and components.

**Duration:** 21 Hours

**Pre-Requisite(s):** SK1160

### Objectives and Content:

1. Define terminology associated with wet pipe systems.
2. Identify hazards and describe safe work practices pertaining to wet pipe systems.
3. Identify codes, standards and regulations pertaining to wet pipe systems.
4. Identify information pertaining to wet pipe systems found on drawings and specifications.
5. Identify tools and equipment relating to wet pipe systems, and describe their applications and procedures for use.
6. Identify types of wet pipe systems, and describe their operating principles and characteristics.
  - i. tree
  - ii. gridded
  - iii. looped
7. Identify wet pipe system components, and describe their location, purpose and operation.
  - i. valves
    - ball
    - butterfly
    - check
    - gate
    - globe
  - ii. pressure-reducing valves
  - iii. relief valves
  - iv. control valves
  - v. alarm check valves

- vi. indicating valves
  - vii. water flow alarm devices
  - viii. fire department connection
  - ix. test connections and drains
  - x. flow switches
  - xi. riser manifolds
  - xii. air vents
  - xiii. sprinklers, alarm devices
8. Identify alarm valves to be trimmed, and describe their components and relevant design characteristics.
  9. Determine characteristics and application of sprinklers.
  10. Identify design criteria for wet pipe systems.
    - i. density
    - ii. square footage
    - iii. occupancy classifications
  11. Identify drainage requirements for each water-based system.
  12. Describe the procedures used to layout and install wet pipe systems and their components.
  13. Describe the procedures used to install alarm valve trim.
  14. Identify the factors to consider and requirements for installing auxiliary drains on wet pipe systems.
  15. Describe the preventative methods used to prevent false alarms.
  16. Identify the requirements for pressure testing of wet pipe systems and describe the associated procedures.
  17. Describe methods used to prevent freezing.
  18. Describe the advantages of a wet-pipe sprinkler system.

**Practical Requirements:**

1. Trim a wet pipe valve on a sprinkler system.



## SK1180 Dry Pipe Sprinkler Systems

### Learning Outcomes:

- Demonstrate knowledge of dry pipe systems, their operation and characteristics.
- Demonstrate knowledge of the procedures used to install dry pipe systems and their components.

**Duration:** 20 Hours

**Pre-Requisite(s):** SK1160

### Objectives and Content:

1. Define terminology associated with dry pipe systems.
2. Identify hazards and describe safe work practices pertaining to dry pipe systems.
3. Identify codes, standards and regulations pertaining to dry pipe systems.
4. Identify information pertaining to dry pipe systems found on drawings and specifications.
5. Identify tools and equipment relating to dry pipe systems, and describe their applications and procedures for use.
6. Identify types of dry pipe systems, and describe their operating principles and characteristics.
  - i. tree
  - ii. looped
7. Identify dry pipe system components, and describe their locations, purpose and operation.
  - i. fire department connections
  - ii. test connections and drains
  - iii. water flow alarm devices
  - iv. control valves
  - v. dry pipe valves
  - vi. regulated air supply
  - vii. regulated nitrogen supply
  - viii. valves
  - ix. quick opening devices (QODs)
  - x. anti-flooding devices
  - xi. auxiliary drains
  - xii. drum drips

- xiii. high/low supervisory devices
  - xiv. pressure gauges
8. Identify dry pipe valves to be trimmed, and describe their components and design characteristics.
  9. Identify the factors to consider and requirements for installing auxiliary drains on dry pipe systems.
  10. Identify the requirements for pressure testing dry pipe systems, and describe the associated procedures.
  11. Describe the procedures used to layout and install dry pipe systems and components.
    - i. grade pipe mains and branch lines
    - ii. low point drains
  12. Describe the procedures used to install dry pipe valve trim.
  13. Describe the preventative methods used to prevent false alarms.
    - i. air and nitrogen supply
    - ii. air dryer
    - iii. air maintenance device
  14. Identify calculations pertaining to capacity of dry pipe systems and air or nitrogen supply.

**Practical Requirements:**

1. Trim a dry pipe valve on a sprinkler system.
2. Reset a dry pipe valve (DPV).

## SK1185 Antifreeze Sprinkler Systems

### Learning Outcomes:

- Demonstrate knowledge of antifreeze systems, their operation and characteristics.
- Demonstrate knowledge of the procedures to install and maintain antifreeze systems.

**Duration:** 6 Hours

**Pre-Requisite(s):** SK1175, SK1180

### Objectives and Content:

1. Define terminology associated with antifreeze systems.
2. Identify hazards and describe safe work practices pertaining to antifreeze systems.
3. Identify codes, standards and regulations pertaining to antifreeze systems.
4. Identify information pertaining to antifreeze systems found on drawings and specifications.
5. Identify tools and equipment relating to antifreeze systems, and describe their applications and procedures for use.
6. Identify the factors to consider for determining the need for freezing protection or antifreeze systems.
  - i. location
  - ii. accessibility
  - iii. cost
7. Identify types of antifreeze systems and their components, and describe their purpose and applications.
  - i. configuration
  - ii. types of solutions
  - iii. temperature mixtures
8. Identify types and mixtures of antifreeze solutions, and describe their characteristics and applications.
  - i. used with potable water supply
  - ii. used with non-potable water supply

9. Identify the requirements and describe the procedures used to handle, store and dispose of antifreeze.
10. Identify valves required for antifreeze systems.
11. Identify installation requirements for antifreeze systems.
  - i. antifreeze loop
  - ii. cross-connection control
12. Describe the procedures used to test and maintain antifreeze systems.
13. Identify the requirements for pressure testing antifreeze systems, and describe the associated procedures.

**Practical Requirements:**

None.

## SSI-185 Pre-Action Systems I

### Learning Outcomes:

- Demonstrate knowledge of pre-action systems, their applications and operating principles.

**Duration:** 9 Hours

**Pre-Requisite(s):** SK1175, SK1180

### Objectives and Content:

1. Define terminology associated with pre-action systems.
2. Identify hazards and describe safe work practices pertaining to pre-action systems.
3. Identify codes, standards and regulations pertaining to pre-action systems.
4. Identify information pertaining to pre-action systems found on drawings and specifications.
5. Identify tools and equipment relating to pre-action systems, and describe their applications and procedures for use.
6. Identify types of pre-action systems and describe their operating principles and applications.
  - i. pre-action systems
    - non-interlock
    - single interlock
    - double interlock
  - ii. applications
    - computer rooms
    - freezers
    - aircraft hangers
    - electrical rooms
7. Identify trim components used on pre-action valves, and describe their design variations and applications.
8. Identify types of alarms that a pre-action valve will operate.
  - i. solenoid actuators
  - ii. diaphragm actuators

9. Identify supplemental fire detection systems, and describe their operating principles and applications.
  - i. electric
  - ii. pneumatic
  - iii. hydraulic
  
10. Identify the system controls required for pre-action systems.

**Practical Requirements:**

None.

## SSI-190 Deluge Systems I

### Learning Outcomes:

- Demonstrate knowledge of deluge systems, their applications and operating principles.

**Duration:** 9 Hours

**Pre-Requisite(s):** SK1175, SK1180

### Objectives and Content:

1. Define terminology associated with deluge systems.
2. Identify hazards and describe safe work practices pertaining to deluge systems.
3. Identify codes, standards and regulations pertaining to deluge systems.
4. Identify information pertaining to deluge systems found on drawings and specifications.
5. Identify tools and equipment relating to deluge systems, and describe their applications and procedures for use.
6. Identify types of deluge systems, and describe their operating principles and applications.
  - i. deluge systems
    - deluge
    - high speed deluge
  - ii. applications
    - aircraft hangers
    - petro-chemical
    - mining
    - pulp and paper
    - theatrical stages
    - marine
    - wharfs
    - transformers
7. Identify trim components used on deluge valves, and describe their design variations and applications.

8. Identify types of alarms that a deluge valve will operate.
  - i. solenoid actuators
  - ii. diaphragm actuators
  
9. Identify supplemental fire detection systems, and describe their operating principles and applications.
  - i. electric
  - ii. pneumatic
  - iii. hydraulic
  
10. Identify the system controls required for deluge systems.

**Practical Requirements:**

None.



## SK1300 System Drainage I

### Learning Outcomes:

- Demonstrate knowledge of system drainage.

**Duration:** 6 Hours

**Pre-Requisite(s):** SK1175, SK1180

### Objectives and Content:

1. Define terminology associated with system drainage.
2. Identify hazards and describe safe work practices pertaining to system drainage.
3. Interpret codes, standards and regulations pertaining to system drainage.
4. Interpret information pertaining to system drainage found on drawings and specifications.
5. Identify tools and equipment relating to system drainage, and describe their applications and procedures for use.
6. Identify types of system drainage, and describe their operating principles and characteristics.
  - i. main
  - ii. auxiliary
  - iii. sectional
7. Identify grading requirements for system drainage
8. Identify system drainage components and their applications
  - i. drain valves
  - ii. drain cups
  - iii. air gaps
  - iv. drum drip

### Practical Requirements:

None.

## SK1120 Job Planning

### **Learning Outcomes:**

- Demonstrate knowledge of trade-related codes, standards, regulations, procedures and their applications.
- Demonstrate knowledge of trade-related documentation and reference material and their application.
- Demonstrate knowledge of the procedures to plan and organize jobs.
- Demonstrate knowledge of procedures for receiving materials.
- Demonstrate knowledge of procedures used to store, secure, organize and maintain materials.
- Demonstrate knowledge of procedures used to plan for and prepare work sites.

**Duration:** 8 Hours

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

### **Objectives and Content:**

1. Define terminology associated with trade-related codes, standards, regulations, and procedures.
2. Explain responsibilities associated with completing and/or signing trade-related documents.
3. Describe the procedures used to complete trade-related documents.
4. Define terminology associated with trade-related documentation and reference material.
5. Identify types of trade related documentation and reference materials and describe their applications.
6. Define terminology associated with job planning activities.
7. Identify sources of information relevant to job planning activities.
  - i. documentation
  - ii. drawings
  - iii. related professionals
  - iv. clients

8. Identify the factors to consider for determining job requirements.
  - i. personnel
  - ii. tools and equipment
  - iii. materials
  - iv. permits
9. Describe the procedures used to plan job tasks.
10. Describe the procedures used to receive and verify delivered materials.
11. Describe the procedures used to store, secure, organize and maintain inventory.
12. Describe the procedures used to prepare work sites.
  - i. lay down
  - ii. erecting barricades and flagging
  - iii. identifying hazards
  - iv. locating service points
  - v. locating isolation points
  - vi. material take-off lists
13. Identify location and types of site safety equipment.
  - i. fire extinguishers
  - ii. eye wash stations
  - iii. first aid kits
  - iv. spill kits
  - v. air-monitoring devices

**Practical Requirements:**

None.

## SK1130 Mentoring I

### Learning Outcomes:

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

**Duration:** 6 Hours

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

### Objectives and Content:

1. Describe the importance of individual experience.
2. Describe the shared responsibilities for workplace learning.
3. Determine personal learning preferences and explain how they 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. document use
  - iii. writing
  - iv. oral communication
  - v. numeracy
  - vi. thinking
  - vii. working with others
  - viii. digital technology
  - ix. continuous learning
6. Identify different ways of learning.
7. Identify different learning needs and strategies to meet learning needs.
  - i. learning disabilities
  - ii. learning preferences
  - iii. continuous learning

8. Identify strategies to assist in learning a skill.
  - i. understanding the basic principles of instruction
  - ii. developing coaching skills
  - iii. being patient
  - iv. providing feedback

**Practical Requirements:**

None.

## AM1000 Introduction to Essential Skills

### Learning Outcomes:

- Demonstrate knowledge of the nine nationally recognized essential skills.
- Demonstrate knowledge of the essential skills levels of complexity.
- Demonstrate knowledge of the essential skills required for the learners chosen trade.
- Demonstrate an awareness of essential skills assessments.

**Duration:** 9 Hours

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

### Objectives and Content:

1. Identify and describe the essential skills recognized by the Government of Canada through the Office of Literacy and Essential Skills (OLES).
  - i. reading
  - ii. document use
  - iii. numeracy
  - iv. writing
  - v. oral communication
  - vi. working with others
  - vii. thinking
  - viii. computer use
  - ix. continuous learning
2. Describe the Levels of Complexity measurement assigned to essential skills.
3. Identify the essential skills, along with their complexity level, identified as necessary for the learner's trade.
  - i. RSOS / NOA content<sup>1</sup>
  - ii. OLES Essential Skills Profiles<sup>2</sup>
  - iii. OLES tools and support for apprentices and tradespersons<sup>3</sup>
4. Describe the nature and purpose of essential skills assessment.
  - i. self-assessment & formal assessment tools
  - ii. indicators of deficiencies
  - iii. suggestions for improvement

5. Describe the benefits of essential skills improvement.
  - i. confidence at work
  - ii. employability
  - iii. success in apprenticeship
  - iv. wage & job advancement

**Practical Requirements:**

1. Complete an essential skills self-assessment addressing numeracy, document use and reading. The online **Government of Canada Essential Skills Indicator<sup>4</sup> and Essential Skills self-assessment for the trades<sup>5</sup>** are to be used unless the instructor provides a similar assessment tool or tools.
2. Participate in a group discussion about the impact of gaps in essential skills that may be revealed by the self-assessments completed, and the value of improving essential skills.

\*Students are graded complete or incomplete on this practical work, no grade is permitted for self-assessment performance. However, completion of the practical requirements is mandatory for completion of this unit.

**Resources:**

All footnotes are in the companion document “Resources for Introduction to Essential Skills” which is available online from Apprenticeship and Trade Certification.

## AP1102 Introduction to Apprenticeship

### Learning Outcomes:

- Demonstrate knowledge of how to become a registered apprentice.
- Demonstrate knowledge of the steps to complete an apprenticeship program.
- Demonstrate knowledge of various stakeholders in the apprenticeship process.
- Demonstrate knowledge of the Red Seal Program.

**Duration:** 12 Hours

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

### Objectives and Content:

1. Define terminology associated with apprenticeship.
  - i. apprentice
  - ii. registered apprentice
  - iii. trade qualifier
  - iv. journeyperson
  - v. certified journeyperson
  - vi. Certificate of Apprenticeship
  - vii. Certificate of Qualification
  - viii. dual certification
  - ix. compulsory trades
  
2. Explain the roles and responsibilities of those involved in the apprenticeship system in Newfoundland and Labrador.
  - i. registered apprentice
  - ii. training institution
  - iii. employer
  - iv. journeyperson
  - v. mentor
  - vi. Department of Immigration, Population Growth and Skills
    - Industrial Training section
    - Standards and Curriculum section
  - vii. Provincial Trade Advisory Committees (PTAC)
  - viii. Provincial Apprenticeship and Certification Board (PACB)



3. Describe the training components of an apprenticeship.
  - i. in-school
    - Pre-employment / Level 1
    - advanced levels
  - ii. workplace experience
  
4. Explain the steps in the registered apprenticeship process.
  - i. meet entrance requirements
    - education
    - employment
    - Recognition of Prior Learning (RPL) - if applicable
  - ii. complete the registration process
    - application
    - required documents
  - iii. complete the Memorandum of Understanding (MOU)
    - contract responsibilities
    - probation period
    - cancellation
  - iv. maintain Record of Occupational Progress (Logbook)
    - sign off skills
    - record hours
    - update Apprenticeship Program Officer (APO) on progress
  - v. class calls
    - hour requirements
    - EI eligibility
    - training schedule
  - vi. level examinations - if applicable
  - vii. progression schedule
    - apprenticeship level
    - wage rates
  - viii. certification examinations
    - Provincial
    - Interprovincial
      - written
      - practical - if applicable
  - ix. certification
    - Certificate of Apprenticeship
    - Certificate of Qualification
    - Provincial journeyman - Blue Seal
    - Interprovincial journeyman - Red Seal endorsement (RSE)
  
5. Identify the Conditions Governing Apprenticeship.

6. Discuss cancellation of apprenticeship.
  - i. failure to notify of address change
  - ii. extended periods of unemployment
  - iii. lack of contact with an APO for an extended period
  - iv. failure to respond to class calls
  - v. declining of multiple class calls
  
7. Explain the Interprovincial Standards Red Seal program.
  - i. designated Red Seal trades
  - ii. the Red Seal Occupational Standard (RSOS)
  - iii. relationship of RSOS to IP examination
  - iv. national qualification recognition and mobility
  
8. Identify the current financial incentives available to apprentices.
  - i. Federal
  - ii. Provincial
  
9. Explain the Provincial / Territorial Apprentice Mobility Guidelines.
  - i. temporary mobility
  - ii. permanent mobility
  
10. Describe Atlantic and National Harmonization initiatives.

**Practical Requirements:**

1. Use the Provincial Apprenticeship and Trades Certification website at [www.gov.nl.ca/atcd](http://www.gov.nl.ca/atcd)
  - i. locate, download, and complete the Application for Apprenticeship and Memorandum of Understanding (MOU)
  - ii. locate the address of the Industrial Training office closest to this campus
  - iii. locate the training schedule and identify the start date of the next class call for this trade
  - iv. locate and review the learning resources applicable to this trade
    - Study Guide
    - Exam Preparation Guide
    - Plan of Training

2. Use the Plan of Training applicable to this trade.
  - i. locate the hours for the trade
    - total in-school
    - total required for certification
  - ii. locate the number of levels
  - iii. locate the courses in each level
  - iv. locate the hours required for progression to a Level 2 apprentice and the wage percentage of that level

## AM1101 Math Essentials

Note: It is recommended that AM1101 be delivered in the first semester of the Pre-employment program.

### Learning Outcomes:

- Demonstrate knowledge of essential numeracy skills.
- Demonstrate knowledge of mathematics as a critical element of the trade environment.
- Demonstrate knowledge of mathematical principles in trade problem solving situations.
- Demonstrate the ability to solve simple mathematical word problems.

**Duration:** 42 Hours

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

### Objectives and Content:

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Describe whole number operations.
  - i. read, write, count, round off, add, subtract, multiply and divide whole numbers.
2. Describe the application of the order of operations in math problems.
3. Describe fraction and mixed number operations.
  - i. read, write, add, subtract, multiply and divide fractions.
4. Describe decimal operations.
  - i. read, write, round off, add, subtract, multiply and divide decimals.
5. Describe percent/decimal/fraction conversion and comparison.
  - i. convert between fractions, decimals and percents.
6. Identify percentage operations.
  - i. read and write percentages
  - ii. calculate base, rates and percentages
7. Identify ratio and proportion operations.
  - i. use a ratio comparing two quantities with the same units
  - ii. use a proportion comparing two ratios

8. Describe the use of the imperial measurement system in math problems.
  - i. identify units of measurement
    - length
    - mass
    - area
    - volume
    - capacity
  
9. Describe the use of the metric measurement system in math problems.
  - i. identify units of measurement
    - length
    - mass
    - area
    - volume
    - capacity
  
10. Identify angles, lines and geometric shapes.
  - i. use a protractor to measure angles
  - ii. determine whether an angle is right, acute or obtuse
  - iii. identify parallel, perpendicular, horizontal and vertical lines
  - iv. identify types of triangles, quadrilaterals, and 3-dimensional shapes
  
11. Describe estimation strategies.
  - i. estimate a linear measure using a referent
  - ii. estimate length, area and volume of objects in metric and imperial systems
  
12. Describe problem solving that involves linear measurement using instruments such as rulers or tape measures, in the metric and imperial systems.

**Practical Requirements:**

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

## AM1311 Sprinkler Fitter 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.

## CM2161 Communication Essentials

### Learning Outcomes:

- Demonstrate knowledge of the importance of well-developed writing and oral communication skills in the workplace.
- Demonstrate knowledge of the principles of effective workplace writing.
- Demonstrate knowledge of the purpose of various types of workplace documentation and workplace meetings.
- Demonstrate knowledge of the importance of effective interpersonal skills in the workplace.
- Demonstrate knowledge of effective job search techniques

**Duration:** 36 Hours

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

### Objectives and Content:

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Define communications terminology used in the trade.
2. Identify the principles of effective workplace writing.
  - i. grammar, punctuation, mechanics
  - ii. sentence and paragraph construction
  - iii. tone, language, and word choice
  - iv. the writing process
    - planning
    - writing
    - editing/revising
3. Identify sources of information used to communicate in the workplace.
  - i. regulations
  - ii. codes
  - iii. OH&S requirements
  - iv. prints, drawings and specifications
  - v. company and client documentation
4. Identify types and purposes of informal workplace documents.
  - i. reports
    - incident
    - process
    - progress



- ii. common trade specific forms
  - iii. primary and secondary methods of information gathering
  - iv. accuracy and completeness in reports and forms
5. Demonstrate an understanding of interpersonal communications in the workplace.
- i. recognize group dynamics
  - ii. contribute information and expertise
  - iii. individual learning styles
    - audible
    - visual
    - experiential
    - theoretical
  - iv. recognize respectful and open communication
  - v. accept and provide feedback
  - vi. interpret non-verbal communication cues
    - body language
    - signals
6. Demonstrate an understanding of effective oral communication skills.
- i. listening
    - receiving, understanding, remembering, reflecting, evaluating, paraphrasing, and responding
  - ii. speaking
    - using clear and proper words
    - tone, style, and vocabulary
    - brevity
  - iii. common workplace oral communication situations
    - introducing self and others
    - telephone conversations
    - tool box/safety talks
    - face-to-face conversations
    - communicating with co-workers, supervisors, clients, and other trades people
7. Identify common practices related to workplace meetings.
- i. meeting formats
  - ii. meeting preparation
  - iii. agendas and minutes
  - iv. roles, responsibilities, and etiquette of meeting participants

8. Identify acceptable workplace use of communication technologies.
  - i. cell / smart phone etiquette
  - ii. voice mail
  - iii. e-mail
  - iv. texting / messaging through social media
  - v. teleconferencing / videoconferencing for meetings and interviews
  - vi. social networking
  - vii. other emerging technologies
  
9. Demonstrate an understanding of effective job search techniques.
  - i. employment trends, opportunities, and sources of employment
  - ii. job ads and the importance of fitting qualifications to job requirements
  - iii. resumes
    - characteristics of effective resumes
    - types of resumes
    - principles of resume formatting
  - iv. effective cover letters
  - v. job interview process
    - pre-interview preparation
    - interview conduct
    - post-interview follow up

**Practical Requirements:**

1. Write a well-developed, coherent, unified paragraph.
2. Complete a trade-related form.
3. Prepare an agenda for a toolbox safety talk.
4. Participate in a simulated oral workplace communication situation.
5. Prepare a resume.

## SD1761 Workplace Essentials

Note: It is recommended that SD1761 be delivered in the second half of Pre-employment training.

### **Learning Outcomes:**

- Demonstrate knowledge of workplace requirements in the areas of personal responsibility, unions, workers compensation, workers' rights, and human rights.
- Demonstrate knowledge of quality customer service.

**Duration:** 24 Hours

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

### **Objectives and Content:**

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Identify personal responsibilities and attitudes that contribute to on-the-job success.
  - i. asking questions
  - ii. working safely
  - iii. accepting constructive feedback
  - iv. time management & punctuality
  - v. respect for authority
  - vi. stewardship of materials, tools and properties
2. Define unions and identify their role in the workplace.
  - i. purpose of unions
  - ii. common union structure
  - iii. unions in this trade
3. Demonstrate an understanding of the Worker's Compensation process.
  - i. aims, objectives, and benefits of the Workplace Health, Safety and Compensation Commission
  - ii. role of the workers advisor
  - iii. internal review process

4. Demonstrate an understanding of worker's rights.
  - i. labour standards
  - ii. regulations, including:
    - hours of work & overtime
    - termination of employment
    - minimum wages & allowable deductions
    - statutory holidays, vacation time, and vacation pay
  
5. Demonstrate an understanding of human rights issues.
  - i. awareness of the Human Rights Code and the role of the Human Rights Commission
  - ii. categories of discrimination and strategies for prevention
    - direct
    - systemic
    - adverse effect
  - iii. types of discrimination
    - race
    - ethnic origin
    - colour
    - religion
    - age
    - gender identify
    - sexual orientation
    - marital status
    - family status
    - disability
    - criminal conviction that has been pardoned
  - iv. conduct that constitutes harassment and discrimination
    - objectionable conduct
    - comments or displays made either on a one-time or continuous basis that demeans, belittles, or causes personal humiliation or embarrassment to the recipient
  - v. the value of diversity in the workplace
    - culture
    - gender identify
    - sexual orientation

6. Demonstrate an understanding of quality customer service.
  - i. importance of quality service
  - ii. barriers to quality service
    - physical and physiological
    - cultural
    - technological
  - iii. customer needs & common methods for meeting them
  - iv. characteristics & importance of a positive attitude
  - v. interactions with challenging customers
  - vi. addressing complaints and resolve conflict

**Practical Requirements:**

None.

## MC1062 Computer Essentials

### Learning Outcomes:

- Demonstrate knowledge of desktop/laptop and mobile computers and their operation.
- Demonstrate knowledge of word processing and spreadsheet software, internet browsers and their applications.
- Demonstrate knowledge of e-mail applications and procedures.
- Demonstrate an awareness of security issues related to computers.
- Demonstrate an awareness of online learning using computers.

**Duration:** 15 Hours

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

### Objectives and Content:

When possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Identify computer types used in the workplace, and the characteristics of each.
  - i. desktop/laptop computers
  - ii. tablets
  - iii. smartphones
2. Identify common desktop and mobile operating systems.
  - i. Windows
  - ii. Mac OS
  - iii. iOS
  - iv. Android
3. Describe the use of Windows operating system software.
  - i. start and end a program
  - ii. use the help function
  - iii. use the find function
  - iv. maximize and minimize a window
  - v. open and scroll through multiple windows
  - vi. use the task bar
    - adjust desktop settings such as screen savers, screen resolution, and backgrounds
  - vii. shut down a computer

4. Identify the skills necessary to perform file management commands.
  - i. create folders
  - ii. copy files and folders
  - iii. move files and folders
  - iv. rename files and folders
  - v. delete files and folders
  
5. Describe the use of word processing software to create documents.
  - i. enter & edit text
  - ii. indent and tab text
  - iii. change text attributes
    - bold
    - underline
    - font
  - iv. change layout format
    - margins
    - alignment
    - line spacing
  - v. spell check and proofread
  - vi. save, close & reopen a document
  - vii. print document
  
6. Describe the use of spreadsheet software to create documents.
  - i. enter data in cells
  - ii. format data in cells
  - iii. create formulas to add, subtract, multiply and divide
  - iv. save, close & reopen a spreadsheet
  - v. print spreadsheet
  
7. Describe the use of the internet in the workplace.
  - i. web browsers
  - ii. search engines
  - iii. security issues
  - iv. personal responsibility for internet use at work
  
8. Describe the role of e-mail.
  - i. e-mail etiquette
    - grammar and punctuation
    - privacy issues when sharing and forwarding e-mail
    - work appropriate content
    - awareness of employer policies
  - ii. managing e-mail
    - using folders
    - deleting, forwarding, replying
  - iii. adding attachments to e-mail
  - iv. view e-mail attachments

- v. printing e-mail
9. Describe computer use for online learning.
- i. online training
  - ii. level exams
  - iii. study guides
  - iv. practice exams

**Practical Requirements:**

1. Create, save and print a document using word processing software.
2. Create, save and print a document using spreadsheet software.
3. Send and receive an e-mail with an attachment.



## 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

Sprinkler Fitter – 7200 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 / AACCS 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 Gap Training Year	70%	<ul style="list-style-type: none"> <li>▪ Completion of Pre-Employment / Level 1 training</li> <li>▪ Pass Level 1 exam*</li> <li>▪ Minimum 3600 hours of combined relevant work experience and training</li> </ul>	3 <sup>rd</sup> Year
3	80%	<ul style="list-style-type: none"> <li>▪ Completion of Level 2 training</li> <li>▪ Pass Level 2 exam*</li> <li>▪ Minimum 5400 hours of combined relevant work experience and training</li> </ul>	4 <sup>th</sup> Year
4	90%	<ul style="list-style-type: none"> <li>▪ Completion of Level 3 training</li> <li>▪ Pass Level 3 exam*</li> <li>▪ Minimum 7200 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><b>Wage Rates</b></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><b>Level Exams*</b></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>			

Sprinkler Fitter – 7200 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>	240
Level 2	<ul style="list-style-type: none"> <li>▪ Minimum of 4000 hours of relevant work experience and training</li> </ul>	240
Level 3	<ul style="list-style-type: none"> <li>▪ Minimum of 7000 hours of relevant work experience and training</li> </ul>	240

Class calls at Minimum Hours:

- 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.

## 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 journeyman 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 journeyman supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyman 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 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 7200 hours.

**Or**

A total of 10,800 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.