Apprenticeship and Certification Study Guide

Sprinkler Fitter

RSOS 2017

Newfoundland & Labrador

Table of Contents

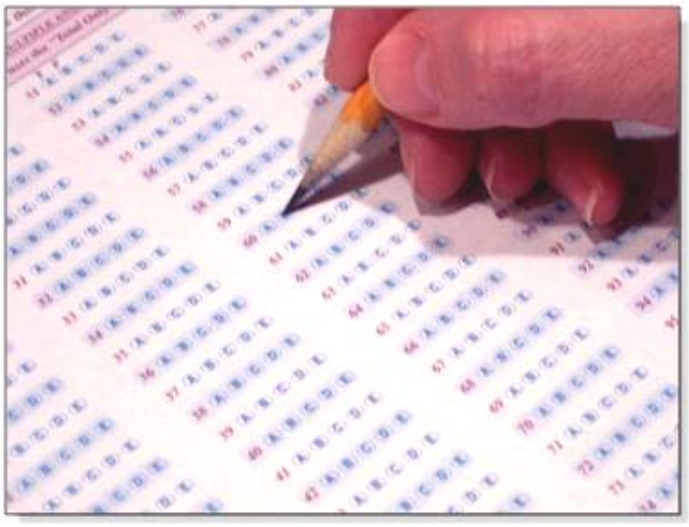
Introduction

This Study Guide has been developed by the Newfoundland and Labrador Department of Education and Early Childhood Development, Apprenticeship and Trades Certification Division, to assist apprentices and trade qualifiers as they prepare to write the Red Seal Exam. Red Seal exams are available for all Red Seal trades. For a list of Red Seal trades please refer to the Department of Education and Early Childhood Development website: https://www.gov.nl.ca/atcd/designated-trades/list-of-designated-trades/

Some of the specific goals of this guide are:

- ⇨ to help you understand the skills and knowledge that might be covered on the exam
- ⇨ to help you identify your strengths and weaknesses
- ⇨ to provide organization and structure for a course of study
- ⇨ to provide a list of resources to help you with your study plan
- ⇨ to support and supplement the teaching and learning process

This study guide outlines the theoretical portion of the program. The intent is not to replace technical training provided under the guidance of instructors. Rather, it is a tool to be used in conjunction with formal training.



Exam Process

Before the Exam

You must contact the nearest Apprenticeship and Trades Certification Divisional office to make request to write the Red Seal exam (*See Appendix A for a list of regional offices*). Upon approval, the Apprenticeship Program Officer (APO) will notify you of your eligibility to write the exam, and provide you with scheduling information. If you require special accommodations due to a disability or language barrier, please contact your regional office for information on applying for this service.

During the Exam

You must bring:

- ☐ personal identification such as a photo or signature ID or valid Newfoundland and Labrador driver's license
- ☐ your notification letter

The following will be provided:

- ☐ a calculator (*see Appendix B for calculator information*)
- ☐ all other items required such as pencils, scrap paper, etc.

Important Note:

Personal cell phones, calculators, or other electronic equipment are NOT allowed into the exam room. If you do bring them, they will be stored away and returned to you when you have completed the exam.

After the Exam

Results will be mailed to you approximately seven to ten days after completion of the exam. All necessary instructions and information will be provided in the results letter.

The percentage mark you obtained will be provided. You will also be given a section by section breakdown, showing how many questions were in each section, as well as the number of questions in each section you completed successfully.

If you are successful in obtaining a 70% or more on your exam, you will be issued a Newfoundland and Labrador Certificate of Qualification with a Red Seal endorsement.

Exam Format

All Red Seal exams are written in multiple-choice format. Each exam has between 100 and 150 questions. A multiple choice question consists of a stem (a complete question) followed by four options (A, B, C, D). The stem contains all the information necessary to answer the question. The options consist of the one correct answer and three "distracters." Distracters are incorrect. (*See Appendix C for a sample answer sheet*).

Red Seal exams contain three types of questions:

Level 1 Knowledge and Recall

Questions at this level test your ability to recall and understand definitions, facts, and principles.

Level 2 Procedural and Application

Questions at this level test your ability to apply your knowledge of procedures to a new situation.

Level 3 Critical Thinking

Questions at this level test your ability to interpret data, solve problems and arrive at valid conclusions.

On the following pages, examples of each of the three types of questions are provided.

Level 1 Examples:

1. Why is a dielectric fitting used to connect copper piping to black steel piping?

   A. To prevent friction loss.
   B. To allow expansion between joints.
   C. To provide a tight joint.
   D. To prevent electrolysis.

2. What will cause a single interlocked pre-action system to trip during a fire?

   A. Loss of air in sprinkler piping branch lines.
   B. Activation of sprinkler on branch line.
   C. Activation of low pressure alarm.
   D. Activation of fire detection system.

3. On which type of sprinkler system is a detector wire installed as a system activation device?

   A. Dry.
   B. Wet.
   C. Antifreeze.
   D. Pre-action.

Level 2 Examples:

1. When installing a 1000 gpm fire pump, how many 2 ½ in. hose valves would be installed on the test header?

   A. 2.
   B. 3.
   C. 4.
   D. 6.

2. When installing restraint devices, what size of rod is installed on an 8 in. underground pipe?

   A. 7/8 in.
   B. 3/4 in.
   C. 5/8 in.
   D. 1/2 in.

3. How are cast fittings attached to threaded steel pipe?

   A. Apply thread compound to female thread and tighten with spanner wrench.
   B. Apply thread compound to male thread and tighten with pipe wrench.
   C. Apply Teflon tape to female thread and tighten with pipe wrench.
   D. Apply Teflon tape to male thread and tighten with spanner wrench.

Level 3 Examples:

1. When determining friction loss in a bulk main, how many feet of schedule #40 pipe is equivalent to using two standard 6 in., 40° elbows?

   A. 10.
   B. 14.
   C. 18.
   D. 22.

2. What is the size of the bolts used with standard 8 in. x 13 ½ in. flanges?

   A. 9/16 in. x 3 in.
   B. 5/8 in. x 3 1/2 in.
   C. 3/4 in. x 3 1/2 in.
   D. 7/8 in. x 4 in.

3. When installing the main for a dry pipe system, what is the required minimum grade?

   A. 1/4 in. per 10 ft.
   B. 1/2 in. per 10 ft.
   C. 1/4 in. per 12 ft.
   D. 1/2 in. per 12 ft.

Source of Questions*:*
http://www.red-seal.ca/s.1mpl.2.2x.1mQ.5.2st.3.4ns-eng.html?tid=221

Exam Content

Understanding the *Red Seal Occupational Standard* (RSOS

The Red Seal model has historically been based on the development of the National Occupational Analysis (NOA) which supports the development of multiple-choice format examinations.

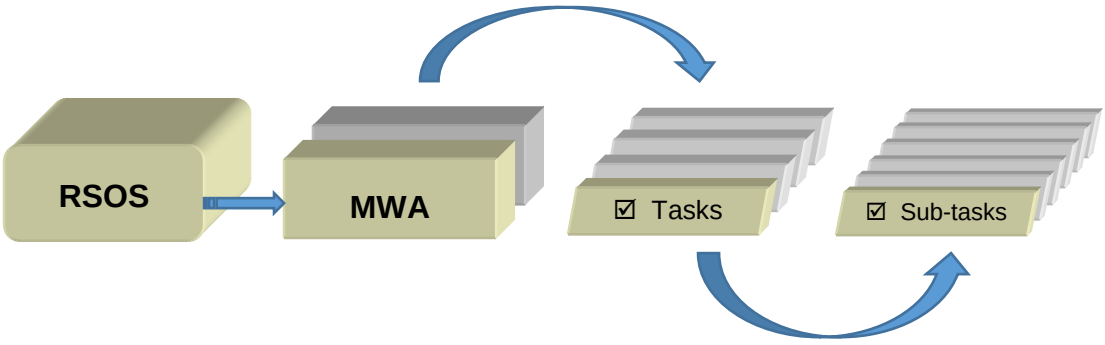
The RSOS was introduced in 2015 and is now taking the place of the NOA. Each RSOS or NOA sets the standard for a Red Seal trade. The Red Seal examination is based on the Red Seal Standard.

The new standards provide greater consistency in learning resources and allow for increased industry involvement in the development of these standards. This new model places increases emphasis on apprenticeship training and assessing skills with industry learning objectives, outcomes and performance criteria.

The RSOS for each trade describes the tasks and sub-tasks; skills and knowledge requirements; summary of essential skills; safety information; trends affecting the trade; technical terms; names of tools and equipment; acronyms; learning objectives and outcomes; industry expected performance and essential skills related to each sub-task.

The RSOS is an excellent tool to use as you study for the Red Seal exam. RSOSs can be found at http://www.red-seal.ca/resources/n.4.1-eng.html

RSOS material is organized into the following categories: **MWA (***Major Working Activity.* The MWAs are further broken down into **TASKS** (*describes activities within an MWA*) and **SUB-TASKS (***describe activities within a task – This is what the exam is based on.*

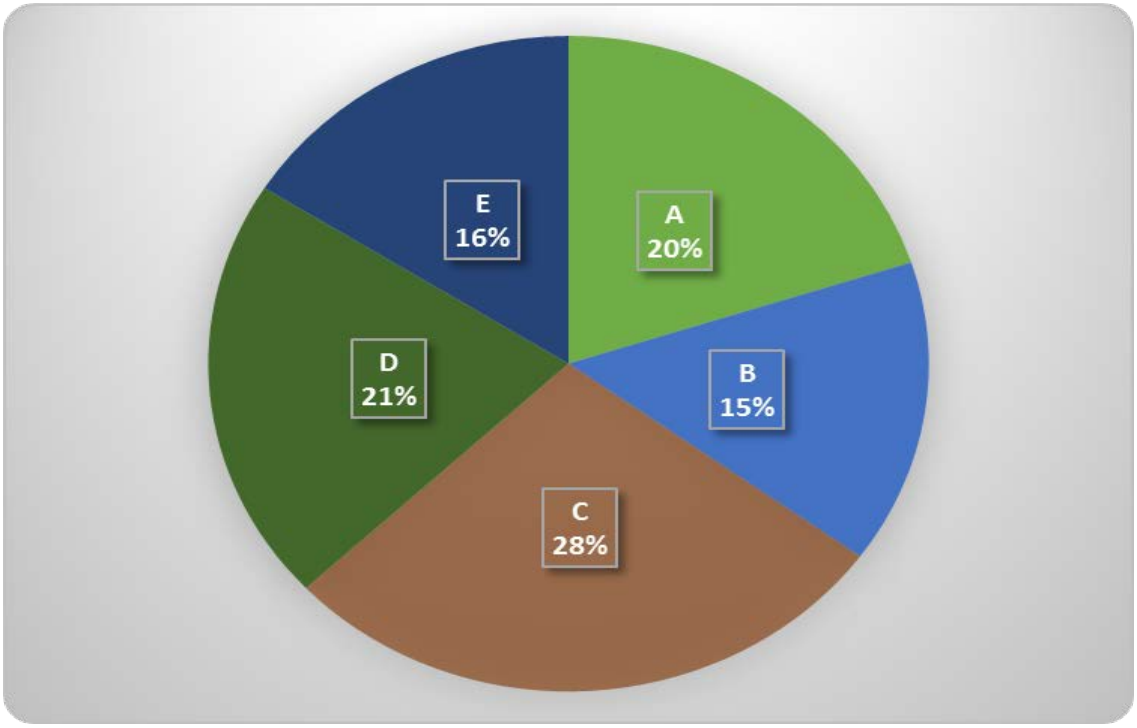


The NOA will continue to be used as the occupational standard for trades that do not yet have an RSOS developed.

RSOS Pie Chart

The RSOS Pie Chart presents the MWA percentages in the form of a pie chart which tells you the approximate number of questions from each MWA. For example, **20**% of the questions on the **Sprinkler Fitter** exam will be based on **MWA A**.

SPRINKLER FITTER



MWA Titles			
MWA A	Performs Common Occupational Skills	**MWA D**	Installs and Lays Out Fire Protection Systems and Devices
MWA B	Installs Water Supply	**MWA E**	Installs, Tests and Maintains (ITM) Fire Protection Systems
MWA C	Installs Piping		

Exam Breakdown

The **Sprinkler Fitter** exam currently has 120 questions. The following table shows a breakdown of the number of questions that come from each RSOS MWA. It is important to note that the exact number of questions can change at any time. When you are ready to write your exam, you may contact your regional office to verify the number of questions (See Appendix A).

		# of Questions
MWA A	**Performs Common Occupational Skills**	**25**
Task 1	Performs safety-related functions	
Task 2	Uses and maintains tools and equipment	
Task 3	Organizes work	
Task 4	Commissions systems	
Task 5	Uses communication and mentoring techniques	
MWA B	**Installs Water Supply**	**18**
Task 6	Installs underground water supplies	
Task 7	Installs fire pump units	
Task 8	Installs fire department connections	
Task 9	Installs private water supply systems	
MWA C	**Installs Piping**	**32**
Task 10	Prepares pipe, tube and fittings for installation	
Task 11	Installs pipe, tube and fittings	
Task 12	Installs piping components	
MWA D	**Installs and Lays Out Fire Protection Systems and Devices**	**26**
Task 13	Installs water-based systems	
Task 14	Installs specialty fire suppression systems	
Task 15	Installs detection devices	
Task 16	Installs signal-initiating devices	
MWA E	**Inspects, Tests and Maintains (ITM) Fire Protection Systems**	**19**
Task 17	Maintains and repairs fire protection systems	
Task 18	Inspects and tests fire protection systems	
	Total	**120**

RSOS Sub-tasks

The following *RSOS Task Profile Checklist* outlines the MWAs, tasks and sub-tasks for your trade. The Red Seal exam is written to test your knowledge and abilities regarding the sub-tasks in the RSOS. This chart can be used to review your current knowledge. You can review by placing a check mark (✓) next to those you understand fully.

Place your focus on those you do not understand and study them until you are comfortable with the material. Think of possible questions in that particular content area.

The RSOS also contains a list of "supporting knowledge and abilities" for each sub-task. They are the skills and knowledge you must have to perform a sub-task. The supporting knowledge and abilities identified under each sub-task will be very helpful as you review. The list can be found in the RSOS, on the Red Seal website, for your trade.

Task Profile Checklist
Based on RSOS 2017
Sprinkler Fitter

MWA A: Performs Common Occupational Skills

☐ **Task 1: Performs safety-related functions**

Sub-Tasks

- ☐ Maintains safe work environment
- ☐ Uses personal protective equipment (PPE) and safety equipment
- ☐ Performs lock-out and tag-out procedures
- ☐ Performs work in confined space

☐ **Task 2: Uses and maintains tools and equipment**

Sub-Tasks

- ☐ Uses hand tools
- ☐ Uses portable and stationary power tools
- ☐ Uses measuring and testing equipment
- ☐ Uses access equipment
- ☐ Uses rigging, hoisting and lifting equipment
- ☐ Uses soldering and brazing equipment

☐ **Task 3: Organizes work**

Sub-Tasks

- ☐ Interprets codes, standards, regulations and procedures
- ☐ Uses drawings and specifications
- ☐ Uses documentation and reference material
- ☐ Plans job tasks and procedures
- ☐ Prepares work site
- ☐ Performs layout of systems

☐ **Task 4: Commissions systems**

Sub-Tasks

- ☐ Commissions water supply systems
- ☐ Commissions fire protection systems

☐ **Task 5: Uses communication and mentoring techniques**

Sub-Tasks

- ☐ Uses communication techniques
- ☐ Uses mentoring techniques

MWA B: Installs Water Supply

☐ **Task 6: Installs underground water supplies**

Sub-Tasks

- ☐ Supervises trenching and backfilling (NOT COMMON CORE)
- ☐ Installs underground piping and components (NOT COMMON CORE)
- ☐ Flushes underground system

☐ **Task 7: Installs fire pump units**

Sub-Tasks

- ☐ Determines location of pumps, drivers, controllers and components
- ☐ Installs pumps, drivers, controllers and components

☐ **Task 8: Installs fire department connections**

Sub-Tasks

- ☐ Determines location, size and type of fire department connections
- ☐ Installs fire department connection piping and components

☐ **Task 9: Installs private water supply systems**

Sub-Tasks

- ☐ Installs water tanks
- ☐ Installs related equipment

MWA C: Installs Piping

☐ **Task 10: Prepares pipe, tube and fittings for installation**

Sub-Tasks

- ☐ Cuts pipe and tube
- ☐ Bends pipe and tube
- ☐ Threads pipe
- ☐ Grooves pipe
- ☐ Drills pipe and tube
- ☐ Grinds pipe
- ☐ Prepares fittings

MWA C: Installs Piping (*Cont'd)*

☐ **Task 11: Installs pipe, tube and fittings**

Sub-Tasks

- ☐ Installs steel pipe, tube and fittings
- ☐ Installs plastic pipe, tube and fittings
- ☐ Installs copper pipe, tube and fittings
- ☐ Paints and labels pipe and tube

☐ **Task 12: Installs piping components**

Sub-Tasks

- ☐ Selects sprinklers
- ☐ Installs sprinklers and nozzles
- ☐ Installs sleeves
- ☐ Installs supports and hangers
- ☐ Installs seismic-protection
- ☐ Installs cross-connection control assemblies
- ☐ Installs system drainage

MWA D: Installs and Lays Out Fire Protection Systems and Devices

☐ **Task 13: Installs water-based systems**

Sub-Tasks

- ☐ Installs wet pipe systems
- ☐ Installs dry pipe systems
- ☐ Installs antifreeze systems
- ☐ Installs preaction/deluge systems
- ☐ Installs foam systems
- ☐ Installs standpipe systems
- ☐ Installs water mist and hybrid systems

☐ **Task 14: Installs specialty fire suppression systems**

Sub-Tasks

- ☐ Installs dry and wet chemical, clean agent and carbon dioxide systems
- ☐ Installs portable extinguishers

MWA D: Installs and Lays Out Fire Protection Systems and Devices (Cont'd)

☐ **Task 15: Installs detection devices**

Sub-Tasks

- ☐ Installs wet and dry pilot lines
- ☐ Installs heat-actuated devices (HADs) (NOT COMMON CORE)
- ☐ Installs spark detection systems (NOT COMMON CORE)
- ☐ Installs air sampling systems (NOT COMMON CORE)
- ☐ Installs electrical detection systems (NOT COMMON CORE)

☐ **Task 16: Installs signal-initiating devices**

Sub-Tasks

- ☐ Installs alarm-initiating devices
- ☐ Installs supervisory-initiating devices

MWA E: Inspects, Tests and Maintains (ITM) Fire Protection Systems

☐ **Task 17: Maintains and repairs fire protection systems**

Sub-Tasks

- ☐ Troubleshoots fire protection systems
- ☐ Repairs deficiencies
- ☐ Performs scheduled maintenance

☐ **Task 18: Inspects and tests fire protection systems**

Sub-Tasks

- ☐ Performs scheduled tests
- ☐ Performs scheduled inspections
- ☐ Inspects portable fire extinguishers

Create a Study Plan

As you prepare for your exam, it is important to plan a schedule. The following two tables will help you stay on track.

The first table is a **"Weekly Study Plan."** In this table list the areas you will focus your study for each day. You should include items you need to review as well as items you need to study. Remember, more time will be needed for study in areas you find difficult, whereas you may only require review in areas you are more familiar with. As you work through the RSOS sub-task list you can start to fill in this table.

The second table is a **"Study Time Table."** It is important to create a study schedule where you determine the best days of the week and times of day for you to study.

Print several copies of these tables and fill out for each week of study. It is important to stick to your study schedule.

Weekly Study Plan for Week of: _____

	Area of Study 1	Area of Study 2	Area of Study 3	Area of Study 4	Area of Study 5	Area of Study 6
Mon.						
Tues.						
Wed.						
Thu.						
Fri.						
Sat.						
Sun.						

Study Time Table for Week of: _____

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 AM - 9:00 AM							
9:00 AM - 10:00 AM							
10:00 AM - 11:00 AM							
11:00 AM - 12:00 Noon							
12:00 Noon 1:00 PM							
1:00 PM - 2:00 PM							
2:00 PM - 3:00 PM							
3:00 PM - 4:00 PM							
4:00 PM - 5:00 PM							
5:00 PM - 6:00 PM							
6:00 PM - 7:00 PM							
7:00 PM - 8:00 PM							

Resources - Websites

Study information can be drawn from a variety of sources. A sample list of study materials (websites and books) is provided below. These and other helpful resources may be found in a local college bookstore, on the internet, or at your place of employment. You may also be able to borrow them from an apprentice or journeyperson in your trade.

Study Strategies and Exam Preparation Guide

The *Study Strategies & Exam Preparation Guide* is meant to be used in conjunction with this study guide. It provides direction and information on such areas as study habits, test preparation and test taking techniques.

https://www.gov.nl.ca/atcd/files/Study-Strategies-and-Exam-Prep-Guide-November-2025.pdf

Plan of Training (POT)

A *Provincial Plan of Training* details the full scope of learning for a particular occupation, including both technical training competencies and industry experiences necessary to write a Red Seal exam (and complete the requirements for Red Seal Certification), or to write a provincial examination. The Plan of Training is based on the RSOS.

https://www.gov.nl.ca/atcd/designated-trades/pots-aacs/

Red Seal Website

Red Seal is a program that sets common standards to evaluate the skills of tradespeople across Canada. It is a partnership between the Federal Government and the provinces/territories.

The Red Seal model has been based on the National Occupational Analyses (NOA) which supports the development of multiple-choice examinations. A new Red Seal Occupational Standard (RSOS) was introduced in 2015 and is taking the place of the NOA.

http://www.red-seal.ca/

Sprinkler Fitter PRACTICE Exam

This is **NOT** a Red Seal exam. This is a practice exam provided by the Red Seal Standards program. It was developed using similar question types to that of a Red Seal exam. The exam is intended to be used for self-assessment in preparation for writing a Red Seal exam.

http://www.red-seal.ca/s.1mpl.2.2x.1mQ.5.2st.3.4ns-eng.html?tid=221

Red Seal Exam Self-Assessment Guide

Use this self-assessment tool to rate your own understanding and experience with the tasks of the trade that are on the Red Seal examination:

https://www.red-seal.ca/_conf/assets/custom/docms/sprinklersysinstal/self-assessment.pdf

Acronyms

Refer to **Appendix 'D'** (Page 28) for a Red Seal copy of the Acronyms.

Glossary of Terms

Refer to **Appendix 'E'** (Page 29) for a Red Seal copy of the Glossary.

List of Tools and Equipment

Refer to **Appendix 'F' (**Page 33**)** for a Red Seal copy of the Tools and Equipment list.

Resources – Book List

The books listed below can help you obtain information on specific topics. It is not necessary to use these books specifically, as you may find others that will be equally beneficial.

If you wish to obtain any of the resources listed, here is the reference information:

- ☐ *Alberta Modules, # 1 through #10,* Northern Alberta Institute of Technology, Alberta,
- ☐ *Use and Care of Tools,* 1st edition, 1972, United Association Education
- ☐ *Rigging*, 1972, United Association Education
- ☐ IPT's International Pipe Trades Handbook, 2006, IPT Publishing and Training Limited, Lee, Robert A., ISBN 978-0920855188

Disclaimer

Various external resources (websites, textbooks) have been listed in this study guide to assist an individual in preparing to write a Red Seal exam. This does not mean the Department of Education and Early Childhood Development, Newfoundland and Labrador endorses the material or that these are recommended as the best resources. There may be other resources of equal or greater value to an individual preparing for a Red Seal exam. The Department of Education and Early Childhood Development has no control over the content of external textbooks and websites listed, and no responsibility is assumed for the accuracy of the material.

Conclusion

We hope this guide has provided you with some useful tools as you prepare for your Red Seal exam. If you have any questions regarding your Red Seal exam please contact your regional office (*see Appendix A for a list of regional offices*).

We appreciate your comments and feedback regarding the usefulness of this study guide. If you have any comments or suggestions, we welcome your feedback. The feedback form at the end of this guide can be used for this purpose.

Appendix A: Regional Offices

If you have any questions regarding your IP Red Seal exam, please contact one of the following regional offices:

Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division
Toll Free: 1-877-771-3737
https://www.gov.nl.ca/atcd/contact-us/staff-listing-and-office-locations/

Corner Brook

1-3 Union Street
Aylward Building, 2nd Floor
Corner Brook, NL A2H 5M7

Telephone: (709) 637-2366
Facsimile: (709) 637-2519

Grand Falls-Windsor

42 Hardy Avenue
Grand Falls-Windsor, NL
A2A 2J9

Telephone: (709) 292-4215
Facsimile: (709) 292-4502

Clarenville

45 Tilley's Road
Clarenville, NL
A5A 1Z4

Telephone: (709) 466-3982
Facsimile: (709) 466-3987

St. John's

P.O. Box 8700
1170 Topsail Road
Mount Pearl, NL A1B 4J6

Telephone: (709) 729-2729
Facsimile: (709) 729-5878

Happy Valley-Goose Bay

163 Hamilton River Road
Bursey Building
Happy Valley-Goose Bay, NL
A0P 1E0

Telephone: (709) 896-6348
Facsimile: (709) 896-3733

Wabush

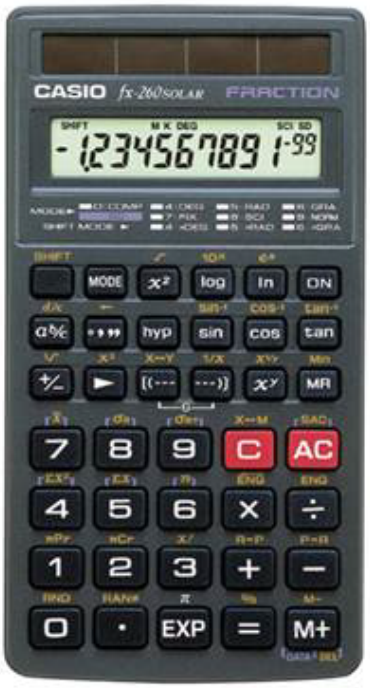
1D Grenfell Drive
P.O Box 160
Wabush, NL
A0R 1B0

Telephone: (879) 382-1920
Facsimile: (709) 282-3007

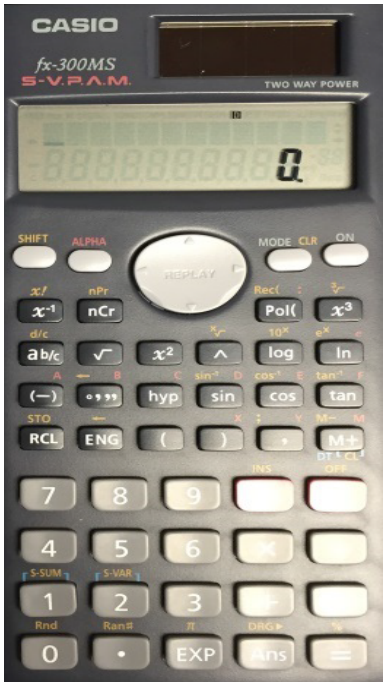
Appendix B: Calculator Use

The picture below shows a calculator with the same functions as the one you will be provided with during your exam. It is advisable to borrow or purchase one with similar functions so that you can familiarize yourself with it before you write your exam.

Casio FX-260

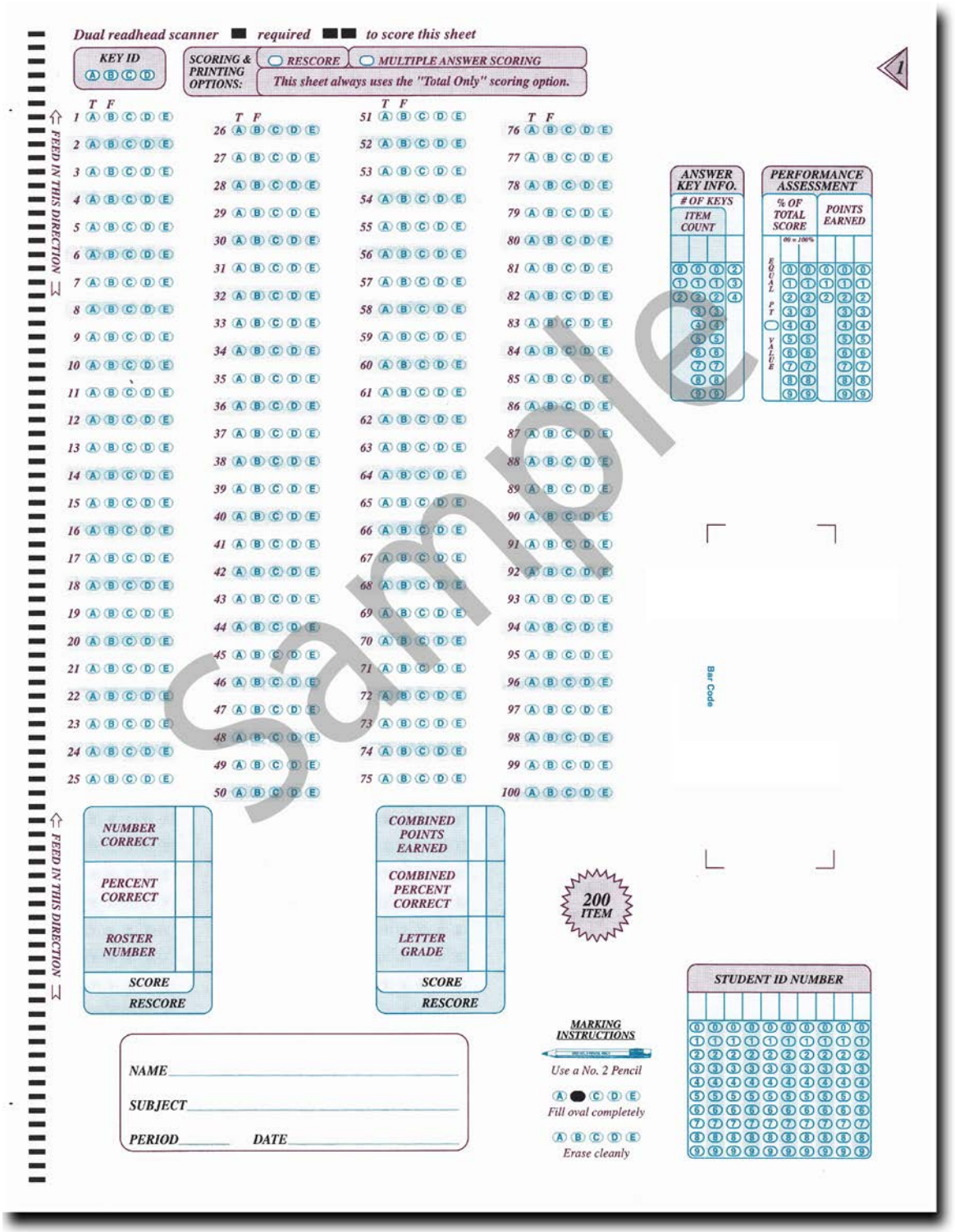


Casio FX-300 MS



Appendix C: Answer Sheet Example

With your exam you will be given an answer sheet similar to the one below. When answering multiple choice questions be sure to fill the circle completely and fill the circle that corresponds to the question on the exam.



Feedback Form
Study Guide – Sprinkler Fitter

Please answer the following:

(1) This Study Guide is a useful tool for exam preparation.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

(2) The topics contained in the guide are arranged in a logical order.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

(3) The design and format of the guide caught my attention.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

(4) The instructions throughout the guide are clear and to the point.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

(5) The resources listed in this guide are suitable and valuable.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

(6) The guide should contain more information.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

Suggested information/resources to include:

Additional Comments:

Please complete this form and return via fax or mail to the following:

Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division
Standards and Curriculum Unit
45 Tilley's Road, Clarenville, NL A5A 1Z4
Fax: (709) 466-3987

RED SEAL DOCUMENT

APPENDIX D: Acronyms

AHJ	Authority Having Jurisdiction
ANSI	American National Standards Institute Canadian
CAN/ULC	ULC Standard
CMSA	Control Mode Specific Application
CPVC	Chlorinated Poly Vinyl Chloride
CSA	Canadian Standards Association
DCVA	Double Check Valve Assembly
ESFR	Early Suppression Fast Response
FM	Factory Mutual
HAD	Heat-Actuated Device
ITM	Inspection, Testing and Maintenance
MAPP	Methylacetylene-Propadiene Propane
NBC	National Building Code
NFPA	National Fire Protection Association
NPT	National Pipe Thread
NST	National Standard Thread
OH&S	Occupational Health and Safety
OS&Y	Outside Stem & Yoke
PIV	Post Indicator Valve
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QOD	Quick Opening Device
RP (RPBA)	Reduced Pressure Backflow Assembly
SOS	Safety Data Sheets
TOG	Transportation of Dangerous Goods
ULC	Underwriters Laboratories of Canada
WHMIS	Workplace Hazardous Materials Information System

APPENDIX E: Glossary

accelerators	quick opening device that speeds up the trip action of a dry pipe valve
air dryer	any one of several types of air dryers, such as refrigerated air dryers and desiccant air dryers
backfill	earth, soil or gravel (aggregate) used in proper placement to bury underground piping
cathodic protection	a method of grounding used primarily on steel water tanks and underground piping to prevent electrolysis
combined dry pipe/preaction system	dry pipe system that employs a supplemental detection system
cross-connection control	assemblies that prevent potentially contaminated water from flowing back into the water supply
deluge system	a system with open sprinkler heads, set up so that when the system is tripped all heads spray simultaneously
dies	equipment used to cut extremal threads in rod or pipe
dry pipe system	a sprinkler system charged with air, primarily used to prevent freezing in a cold environment
escutcheon (plate)	aesthetic or cosmetic plates through which sprinkler heads enter the building space (sometimes called escutcheon plates)

excess pressure pump	water pump that boosts pressure to prevent false alarms
fire pump assembly	water pump designed to supply or supplement flow and pressure dedicated to fire protection
flow switch	a device that monitors water flow and initiates an alarm signal to a fire alarm panel or equivalent
flushing connection	a connection used to flush water from piping and components; for example, at the end of a water main or hydrant
grade	the slope of a pipe or trench, usually expressed as a ratio of rise (change in elevation) to run (change in distance)
grooving (of pipe)	a process of mechanically joining pipe in which a groove is cut or pressed (rolled) around a pipe to accommodate a coupling
hangers	components installed to allow pipes to be attached overhead or to other support structures
heat-actuated detectors (HAD)	heat-activated device, triggered when a specified temperature or rate of increasing temperature is detected
laydown	a pre-determined area where material is stored
mark-ups/asbullt drawing	a revised set of drawings submitted by a contractor upon completion of a project that reflect all changes made in the specifications and shop drawings during the construction process

preactlon systems	a system that may or may not contain supervisory air or nitrogen that can be operated through detection or sprinkler activation
pressure switch	a device used for monitoring high or low pressure in piping system
pump room	also called pump house. A designated area or room in a building or outside a building that contains a fire pump and its components
reaming	a process to restore the pipe to Its original inside diameter, usually by removing the internal burr or flare formed when the pipe was cut
seismic/sway bracing	pipe restraint system
shop drawings	a drawing or set of drawings produced by the contractor, supplier, manufacturer or subcontractor for the purpose of Installing, fabricating and bidding
sleeve	installed before or after concrete or other structural placement to enable pipes to pass from one area of a structure to another
sling	any metal or synthetic flexible device used to cradle or support a load. Slings are attached to the hoist llne of the lifting device to complete the lift
sprinkler guards	devices used to protect heads from damage
standpipe system	a system to which firefighting hoses may be attached

suppression systems	types include weVdry chemical, gas, clean agent, mist, hybrid
tamper switch	device which monitors the opening or closing of a valve by sounding a signal In fire alarm panel
thrust block	concrete restraint cast In place at critical point in underground piping installations, in order to prevent hydraulic pressure from moving or separating pipe joints
trim	smaller or auxiliary piping attached to installed devices such as valves and pumps. Often supplied as a 1rim package"
valves	device placed in a pressurized piping system In order to control, direct or prevent the movement of chemicals, gases, liquids or other substances
water motor gong	a water-operated local audible alarm
wet pipe system	sprinkler system charged with water

APPENDIX E: TOOLS AND EQUIPMENT

Hand Tools

adjustable wrenches (various sizes)
benders (pipe and tube)
caulking gun
centre finder/contour marker
centre punch
cold chisels (various sizes)
combination wrenches (metric and imperial) crimping tools
cutters (pipe and tube)
die and chasers
drop-in anchor setting tool
drywall saw
extension cord
files (flat, half-round, rat-tail, bastard)
fitting brushes
flaring tool
flashlight
gasket cutter
grease gun
hacksaw
hammers (ball-peen, claw, sledge)
hand saw
head wrench
hex wrenches (metric and imperial)
hose wrench
in-air groovers
levels
line-up bars
markers
nipple chuck
oilers
paint brushes
pick
pipe stand
pipe wrench

pliers (needle nose, locking, slip joint, side cutting)
plumb bob
pry bar (goose neck, wrecking, pinch) ratchet cutters
rod cutters
rod dies
scissors
scrapers (various sizes)
screwdrivers (flat, Phillips, Robertson, various sizes)
snips (heavy duty sheet metal cutting) socket sets (metric and imperial)
strap/chain wrench
tripod vice
trowels (concrete and pointer)
utility knives
vice bench vice
wire brush
wire cutter

Portable and Stationary Power Tools

air monitoring device
chop saw
compressor
concrete cutting machine
coring machine core driller
die equipment
electric drills (portable magnetic base, drill press, cordless, hammer, t-drill) flushing machine (hydraulic and hydrophneumatic)
fusion welding machine
grinders (wire brush, angle grinders)
groover (hydraulic, cut, press and roll)
hand-held electronic tape
heating torch
hole saw
hydraulic bender
hydraulic cutter
impact wrenches (electric, pneumatic and wireless)

oxy-fuel brazing torch
oxy-fuelcutting torch
pipe cutter
pipe threaders/groovers
plasma cutter
powder actuated tools
power vice
reamer (hand-held or mounted on power threader)
reciprocating saw
tamper
tapping machine and attachments
testing pump
threading machine
vacuum cleaner (wet/dry)
water pump
wire wheel (body grinder or angle grinder with wire brush)

Measuring and Testing Equipment

amp/volt meter
back flow test kit
battery load tester
builder's level
calibrating gauge
calipers
dial indicator
differential pressure gauge
diffuser
drafting equipment (scale ruler, compass)
feeler gauge
flow meter
heat lamp
hoses
hydrometer
laser level
laser plumb
liquid measuring containers
magnetic level
manometer
multimeter
pipe diameter tape

Pitot tubes
play pipes
pressure gauge kit
refractometer
sight tube
spirit level
square
stop watch
straightedge
tachometer
tape measure
temperature gauge
test hoses and securement
testing pump, excess, hydrostatic test pump
thread depth gauge(ring/plug)
torque wrench
transit
vernier calliper

Hoisting, Lifting and Access

beam clamps
cable clamps
chain block hoist
chains
come-alongs (cable or chain) fork-lift
grip hoist
jack
ladder
overhead hoist
pipe buggy (pipe cannon)
pipe dolly (grass hopper)
portable booms
power-elevated work platform
rope
scaffolding
shackles
sling
snatch blocks
spreader bar
stand
support
tugger

Electronic Equipment (General)

digital camera
calculator
cellular phone
computer
hand-held and stationary
radios

Personal Protective Equipment (PPE) and Safety Equipment

air hood
air monitoring device
apron
boots
confined space entry equipment
coveralls
earplugs and earmuffs
eye wash stations
face shield
fall protection equipment
fire blanket
fire extinguisher
fire hoses
fire-retardant clothing
first aid kit
gloves
goggles
hard hat
high voltage rubber insulating blankets and gloves
knee pads
reflector vest
respirators (particle, vapor)
safety glasses
self-contained breathing apparatus (SCBA)
spill kit
tag- and lock-out devices
welding partition screen

Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division

Version 17 Revised: April 2026