Plan of Training

Ironworker - Generalist

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

March 2012

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Approved by:

Chairperson, Provincial Apprenticeship and Certification Board

Date: March 13, 2012

Preface

This Apprenticeship Standard is based on the 2010 edition of the National Occupational Analysis for the Iron Worker (Generalist) trade.

This document describes the curriculum content for the Iron Worker (Generalist) apprenticeship training program and outlines each of the technical training units necessary for the completion of apprenticeship.

Acknowledgements

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We offer you a sincere thank you.

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A. Profile Chart

OCCUPATIONAL SKILLS			
RK1100 Safety	RK1110 Tools and Equipment	RK1120 Blueprint Reading 1 (Principles)	RK1130 Blueprint Reading 2 (Structural)
RK2340 Blueprint Reading 3 (Rebar)	RK1270 Work Planning	RK1151 Oxy-fuel Cutting	RK1161 Introduction to Welding
RK2231 Access Equipment	RK2300 Welding II	RK1220 Plasma Arc Cutting	
RIGGING AND HOISTING			
RK1230 Rigging for Ironworkers			
CRANES			
RK1240 Introduction to Cranes	RK1200 Conventional and Hydraulic Cranes	RK2190 Tower Cranes	RK2202 Electric Overhead Travelling Cranes
REINFORCING			
RK1290 Reinforcing for Ironworkers	RK2320 Reinforcing II		
PRE-STRESSES/POST-TENSIONS			
RK1280 Pre-Stressed/Post Tensioning Systems			
ERECTION, ASSEMBLY AND INSTALLATION			
RK1250 Structural Components	RK1260 Structural Steel Erection and Dismantling	RK2252 Pre-Engineered Structures	RK2181 Pre-Cast Concrete Erection and Dismantling
RK2271 Miscellaneous Ironwork	RK2310 Ornamental Ironwork	RK2241 Machinery and Equipment	RK2291 Curtain Walls

B. NOA Comparison Table

NOA 2010 Tasks		2012 POT	
Task 1 – Interprets occupational documentation.			
1.01	Interprets drawings and specifications.	RK1120	Blueprint Reading 1 (Principles)
1.02	Interprets standards, regulations and procedures.	RK1130	Blueprint Reading 2 (Structural)
		RK2340	Blueprint Reading 3 (Rebar)
Task 2 – Communicates in the workplace.			
2.01	Communicates with co-workers.	CM2160	Communication Essentials
2.02	Communicates with other disciplines.	CM2160	Communication Essentials
2.03	Communicates with apprentices.	CM2160	Communication Essentials
2.04	Uses hand signals.	RK1230	Rigging for Ironworkers
2.05	Communicates electronically.	RK1230	Rigging for Ironworkers
Task 3 – Uses and maintains tools and equipment.			
3.01	Uses hand tools.	RK1110	Tools and Equipment
3.02	Uses power tools.	RK1110	Tools and Equipment
3.03	Uses bending tools and equipment.	RK1110	Tools and Equipment
		RK1230	Reinforcing for Ironworkers
3.04	Uses powder-actuated tools.	RK1110	Tools and Equipment
3.05	Uses aerial work platforms.	RK2231	Access Equipment
3.06	Uses ladders.	RK2231	Access Equipment
3.07	Uses scaffolding.	RK2231	Access Equipment
3.08	Uses personal protective equipment (PPE).	RK1100	Safety
3.09	Uses surveying equipment.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork
3.10	Uses welding equipment.	RK1110	Tools and Equipment
		RK1161	Introduction to Welding
3.11	Uses thermal and oxy-fuel cutting equipment.	RK1151	Oxy-fuel Cutting
Task 4 – Organizes work.			

NOA 2010 Tasks		2012 POT	
4.01	Organizes materials and supplies.	RK1270	Work Planning
4.02	Marks layouts.	RK1250	Structural Components
		RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK1260	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork
4.03	Maintains safe work environment.	RK1100	Safety
4.04	Assesses site hazards.	RK1100	Safety
4.05	Plans work tasks.	RK1270	Work Planning
Task 5 – Selects rigging equipment.			
5.01	Matches load to lift capability.	RK1230	Rigging for Ironworkers
5.02	Inspects rigging equipment.	RK1230	Rigging for Ironworkers
5.03	Maintains rigging equipment.	RK1230	Rigging for Ironworkers
Task 6 – Uses hoisting and lifting equipment.			
6.01	Uses hoisting equipment.	RK1230	Rigging for Ironworkers
6.02	Uses lifting equipment.	RK1230	Rigging for Ironworkers
6.03	Attaches rigging to load.	RK1230	Rigging for Ironworkers
Task 7 – Assembles and erects cranes.			
7.01	Assesses site hazards.	RK1240	Introduction to Cranes
7.02	Determines crane position.	RK1240	Introduction to Cranes
		RK1200	Conventional and Hydraulic Cranes
		RK2190	Tower Cranes
		RK2202	Electric Overhead Travelling Cranes
7.03	Prepares bases.	RK1240	Introduction to Cranes
		RK1200	Conventional and Hydraulic Cranes
		RK2190	Tower Cranes
7.04	Erects cranes.	RK1240	Introduction to Cranes
		RK1200	Conventional and Hydraulic Cranes
		RK2190	Tower Cranes
		RK2202	Electric Overhead Travelling Cranes

NOA 2010 Tasks		2012 POT	
Task 8 – Disassembles cranes.			
8.01	Disassembles crane components.	RK1240	Introduction to Cranes
		RK1200	Conventional and Hydraulic Cranes
		RK2190	Tower Cranes
		RK2202	Electric Overhead Travelling Cranes
8.02	Prepares crane for transport.	RK1240	Introduction to Cranes
		RK1200	Conventional and Hydraulic Cranes
		RK2190	Tower Cranes
Task 9 – Fabricates on-site.			
9.01	Cuts material.	RK1290	Reinforcing for Ironworkers
		RK2320	Reinforcing II
9.02	Bends material.	RK1290	Reinforcing for Ironworkers
		RK2320	Reinforcing II
Task 10 – Installs reinforcing material.			
10.01	Places reinforcing material.	RK1290	Reinforcing for Ironworkers
		RK2320	Reinforcing II
10.02	Ties material.	RK1290	Reinforcing for Ironworkers
		RK2320	Reinforcing II
10.03	Joins material.	RK1290	Reinforcing for Ironworkers
		RK2320	Reinforcing II
Task 11 – Places pre-stressed/post-tensioning systems.			
11.01	Lays out profile.	RK1280	Pre-Stressed/Post-Tensioning Systems
11.02	Places tendons and accessories.	RK1280	Pre-Stressed/Post-Tensioning Systems
11.03	Installs bursting steel and anchorages.	RK1280	Pre-Stressed/Post-Tensioning Systems
11.04	Connects tendons to anchors.	RK1280	Pre-Stressed/Post-Tensioning Systems
11.05	Protects exposed tendons.	RK1280	Pre-Stressed/Post-Tensioning Systems
Task 12 – Stresses tendons.			
12.01	Sets up stressing equipment.	RK1280	Pre-Stressed/Post-Tensioning Systems

NOA 2010 Tasks		2012 POT	
12.02	Tensions tendons.	RK1280	Pre-Stressed/Post-Tensioning Systems
12.03	Cuts and caps tendons.	RK1280	Pre-Stressed/Post-Tensioning Systems
12.04	Removes stressing equipment.	RK1280	Pre-Stressed/Post-Tensioning Systems
12.05	De-stresses tendons.	RK1280	Pre-Stressed/Post-Tensioning Systems
Task 13 – Grouts tendons.			
13.01	Sets up grouting equipment.	RK1280	Pre-Stressed/Post-Tensioning Systems
13.02	Installs grouts.	RK1280	Pre-Stressed/Post-Tensioning Systems
Task 14 – Installs primary and secondary structural members.			
14.01	Erects falsework.	RK1250	Structural Components
14.02	Attaches structural members.	RK1250	Structural Components
		RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
14.03	Levels, plumbs and aligns structural members.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
14.04	Completes installation of structural members.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
Task 15 – Installs ornamental components and systems.			
15.01	Installs curtain walls.	RK2310	Ornamental Ironwork
		RK2291	Curtain Walls
15.02	Installs miscellaneous components.	RK2271	Miscellaneous Ironwork
Task 16 – Installs conveyors, machinery and equipment.			
16.01	Installs material handling systems.	RK2241	Machinery and Equipment
16.02	Aligns material handling systems.	RK2241	Machinery and Equipment

NOA 2010 Tasks		2012 POT	
16.03	Places machinery and equipment.	RK2241	Machinery and Equipment
Task 17 – Repairs components.			
17.01	Assesses current condition of components.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
17.02	Field-fabricates components.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
17.03	Replaces components.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
17.04	Performs preventative maintenance.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork
Task 18 – Dismantles and removes structural, mechanical and miscellaneous components.			
18.01	Ensures decommissioning of structure or components.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork
18.02	Plans sequence of disassembly.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures

NOA 2010 Tasks		2012 POT	
		RK2181	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork
18.03	Removes components.	RK1260	Structural Steel Erection and Dismantling
		RK2252	Pre-Engineered Structures
		RK2181	Pre-Cast Concrete Erection and Dismantling
		RK2241	Machinery and Equipment
		RK2310	Ornamental Ironwork
		RK2271	Miscellaneous Ironwork

C. 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.

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

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

Block I				
Course No.	**IPG No.**	**Course Name**	**Hours**	**Pre-Requisite(s)**
TS1510	-	Occupational Health and Safety	6	None
TS1520	-	WHMIS	6	None
TS1530	-	Standard First Aid	14	None
LA1100	-	Confined Space Awareness	6	None
RK1100	IRW-100	Safety	30	None
RK1110	IRW-105	Tools and Equipment	60	RK1100
RK1120	IRW-115	Blue Print Reading 1 (Principles)	30	None
RK1130	IRW-110	Blue Print Reading 2 (Structural)	60	RK1120
RK1151	IRW-125	Oxy-fuel Cutting	30	RK1110
RK1161	IRW-130	Introduction to Welding	45	RK1110
RK1230	IRW-140	Rigging for Ironworkers	90	RK1110
RK1240	IRW-145	Introduction to Cranes	12	RK1230
RK1200	IRS-205	Conventional and Hydraulic Cranes	60	RK1230
RK1250	IRW-150	Structural Components	45	RK1110 RK1130 RK1200 RK1270

Block I				
Course No.	**IPG No.**	**Course Name**	**Hours**	**Pre-Requisite(s)**
RK1260	IRS-215	Structural Steel Erection and Dismantling	180	RK1120 RK1130 RK1200 RK1250
RK1270	IRS-120	Work Planning	30	RK1110 RK1120 RK1200
RK1280	IRR-230	Pre-Stressed/Post Tensioning Systems	45	RK1230
RK1290	IRW-155	Reinforcing for Ironworkers	60	RK1230 RK1270
RK2190	IRS-210	Tower Cranes	30	RK1200
AP1101	-	Introduction to Apprenticeship	15	None
*AM1100	-	Math Essentials	30	None
AM1350	-	Ironworker Math Fundamentals	30	AM1100
CM2160	-	Communication Essentials	45	None
SD1760	-	Workplace Essentials	45	None
MC1060	-	Computer Essentials	15	None

Total Hours	**1019**

***A student who can meet the mathematics requirement through an ACUPLACER® test may be exempted from AM1100-Math Essentials. Please check with your training institution.**

Required Work Experience

Block II				
Course No.	**IPG No.**	**Course Name**	**Hours**	**Pre-Requisite(s)**
RK2202	IRS-300	Electric Overhead Travelling Cranes	15	Block I
RK2181	IRS-310	Pre-Cast Concrete Erection and Dismantling	30	Block I
RK1220	IRW-160	Plasma Arc Cutting	15	RK1110
RK2271	IRS-320	Miscellaneous Ironwork	60	Block I
RK2320	IRR-225	Reinforcing II	90	Block I
RK2340	IRW-110	Blueprint Reading 3 (Rebar)	30	Block I

Total Hours	**240**

Required Work Experience

Block III				
Course No.	**IPG No.**	**Course Name**	**Hours**	**Pre-Requisite(s)**
RK2310	IRS-325	Ornamental Ironwork	30	Block II
RK2300	IRS-200	Welding II	45	RK1110
RK2231	IRW-135	Access Equipment	60	Block II
RK2252	IRS-305	Pre-Engineered Structures	45	Block II
RK2291	-	Curtain Walls	30	Block II
RK2241	IRS-315	Machinery and Equipment	30	Block II

Total Hours	**240**

Total Course Credit Hours	**1499**

BLOCK I

TS1510 Occupational Health and Safety

Learning Outcomes:

- Demonstrate knowledge of how to prevent accidents and illnesses.
- Demonstrate knowledge of how to improve health and safety conditions in the
- workplace.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Interpret the Occupational Health and Safety Act laws and regulations.
    i. explain the scope of the act
        - application of the Act
        - Federal/Provincial jurisdictions
        - Canada Labour Code
        - rules and regulations
        - private home application
        - conformity of the Crown by the Act

2. Explain responsibilities under the Act and Regulations.
    i. duties of employer, owner, contractors, sub-contractors, employees, and suppliers

3. Explain the purpose of joint health and safety committees.
    i. formation of committee
    ii. functions of committee
    iii. legislated rights
    iv. health and safety representation
    v. reporting endangerment to health
    vi. appropriate remedial action
    vii. investigation of endangerment

viii. committee recommendation
ix. employer's responsibility in taking remedial action

4. Examine right to refuse dangerous work.
   i. reasonable grounds for refusal
   ii. reporting endangerment to health
   iii. appropriate remedial action
   iv. investigation of endangerment
   v. committee recommendation
   vi. employer's responsibility to take appropriate remedial action
   vii. action taken when employee does not have reasonable grounds for refusing dangerous work
   viii. employee's rights
   ix. assigning another employee to perform duties
   x. temporary reassignment of employee to perform other duties
   xi. collective agreement influences
   xii. wages and benefits

5. State examples of work situations where one might refuse work.

6. Describe discriminatory action.
   i. definition
   ii. filing a complaint procedure
   iii. allocated period of time a complaint can be filed with the Commission
   iv. duties of an arbitrator under the Labour Relations Act
   v. order in writing inclusion
   vi. report to commission allocated period of time to request arbitrator to deal with the matter of the request
   vii. notice of application
   viii. failure to comply with the terms of an order
   ix. order filed in the court

7. Explain duties of commission officers.
   i. powers and duties of officers
   ii. procedure for examinations and inspections
   iii. orders given by officers orally or in writing
   iv. specifications of an order given by an officer to owner of the place of employment, employer, contractor, sub-contractor, employee, or supplier
   v. service of an order

vi. prohibition of persons towards an officer in the exercise of his/her power or duties
vii. rescinding of an order
viii. posting a copy of the order
ix. illegal removal of an order

8. Interpret appeals of others.
   i. allocated period of time for appeal of an order
   ii. person who may appeal order
   iii. action taken by commission when person involved does not comply with the order
   iv. enforcement of the order
   v. notice of application
   vi. rules of court

9. Explain the process for reporting of accidents.
   i. application of act
   ii. report procedure
   iii. reporting notification of injury
   iv. reporting accidental explosion or exposure
   v. posting of act and regulations

Practical Requirements:

1. Conduct an interview with someone in your occupation on two or more aspects of the act and report results.

2. Conduct a safety inspection of shop area.

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. rational 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.

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

Duration: 14 Hours

Pre-Requisite(s): None

LA1100 Confined Space Awareness

Learning Outcomes:

- Demonstrate knowledge of procedures to prepare a confined space for entry.
- Demonstrate knowledge of procedures to enter a confined space safely.
- Demonstrate knowledge of confined space rescue techniques.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Recognize confined space hazards.
   i. define a confined space
   ii. identify types of hazards in confined spaces

2. 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

3. 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

4. Determine testing techniques for confined spaces.
   i. list the necessary steps of air testing
   ii. state the correct order for testing gases

5. Identify confined space entry procedures.
   i. identify the attendants responsibilities
   ii. identify the area where the attendant should be stationed

iii. identify the entrant's responsibilities

6. 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.

RK1100 Safety

Learning Outcomes:

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

Duration: 30 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify types of personal protective equipment (PPE) and clothing and describe their applications and limitations.

2. Describe the procedures used to care for and maintain PPE.

3. Identify hazards and describe safe work practices.
   i. personal
   ii. workplace
      - lockout / tag out
      - confined space awareness
      - trenches and excavations
      - fire
      - heights (fall arrest and protection)
      - marine
   iii. environmental

4. Identify and describe workplace safety and health regulations.
   i. federal
      - Workplace Hazardous Material Information System (WHMIS)
   ii. provincial/territorial
      - occupational health and safety
      - training and certification requirements

iii. worksite specific requirements

Practical Requirements:

None.

RK1110 Tools and Equipment

Learning Outcomes:

- Demonstrate knowledge of tools and equipment, their applications, maintenance and procedures for use.

Duration: 60 Hours

Pre-Requisite(s): RK1100

Objectives and Content:

1. Identify types of hand tools and describe their applications and procedures for use.

2. Describe the procedures used to inspect, maintain and store hand tools.

3. Identify types of power tools and describe their applications and procedures for use
   i. electric
   ii. hydraulic
   iii. pneumatic
   iv. gas

4. Describe the procedures used to inspect, maintain and store power tools.

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

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

7. Identify types of leveling and alignment instruments and describe their applications and procedures for use.

8. Describe the procedures used to inspect, maintain and store leveling and alignment instruments.

9. Identify types of powder actuated equipment and describe their applications.
   i. certification requirements

Practical Requirements:

1. Cope and heat-bend angle-iron.

2. Lay out framework.

3. Select and use hand tools.

4. Select and use power tools.

RK1120 Blueprint Reading 1 (Principles)

Learning Outcomes:

- Demonstrate knowledge of drawings and their applications.
- Demonstrate knowledge of the procedures to interpret and extract information from drawings.

Duration: 30 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define terminology associated with drawings.

2. Identify types of drawings and describe their applications.
   i. civil/site/plot
   ii. architectural
   iii. mechanical
   iv. structural
   v. shop/detail drawings
   vi. sketches

3. Identify drawing projections and views and describe their applications.
   i. orthographic
   ii. oblique
   iii. isometric
   iv. section
   v. auxiliary

4. Interpret and extract information from drawings.
   i. lines
   ii. legend
   iii. symbols and abbreviations
   iv. title block
   v. notes and specifications

vi. tolerances/allowances
vii. bill of materials
viii. schedules
ix. metric and imperial dimensioning
x. revisions
xi. scales

Practical Requirements:

1. Construct an isometric, orthographic and multi-view drawing.

2. Take dimensions using:
   i. architects' scale rule
   ii. mathematical calculations from construction blueprints

RK1130 Blueprint Reading 2 (Structural)

Learning Outcomes:

- Demonstrate knowledge of drawings and their applications.

Duration: 60 Hours

Pre-Requisite(s): RK1120

Objectives and Content:

1. Describe the component parts of steel structures.
2. Define the terminology related to the materials and processes used.
3. Identify basic structural materials and shapes.
4. Identify and interpret the symbols used on blueprints for steel structures.
5. Describe the procedures used to compile a materials take-off.

Practical Requirements:

1. Match fabricated structural steel for layout prior to erection.
2. Match anchor bolt layout.
3. Compile a materials take-off.

RK1151 Oxy-fuel Cutting

Learning Outcomes:

- Demonstrate knowledge of oxy-fuel equipment and accessories.
- Demonstrate knowledge of the procedures used to cut with oxy-fuel equipment.

Duration: 30 Hours

Pre-Requisite(s): RK1110

Objectives and Content:

1. Define terminology associated with oxy-fuel cutting.

2. Identify hazards and describe safe work practices pertaining to oxy-fuel cutting.
   i. personal
   ii. shop/facility
   iii. equipment
   iv. ventilation
   v. storage/handling

3. Identify and interpret codes and regulations pertaining to oxy-fuel equipment.

4. Identify oxy-fuel equipment and accessories and describe their applications.

5. Identify types of fuels and gases used in oxy-fuel cutting operations and describe their characteristics and applications.

6. Identify types of cutting flames and describe their application and the procedures for flame adjustment.
   i. oxidizing
   ii. carburizing
   iii. neutral

7. Describe the procedures used to set-up, adjust and shut-down oxy-fuel equipment.

8. Describe the procedures used to inspect, maintain and store oxy-fuel equipment.

9. Describe the procedures used to cut materials using oxy-fuel equipment.

10. Identify common cutting faults and describe the procedures to prevent and correct them.

Practical Requirements:

1. Set up oxy-fuel equipment.

2. Perform free hand, track and straight edge oxy-fuel cutting.

3. Shut down and disassemble oxy-fuel equipment.

RK1161 Introduction to Welding

Learning Outcomes:

- Demonstrate knowledge of Shielded Metal Arc Welding (SMAW) equipment and accessories.
- Demonstrate knowledge of SMAW welding processes.

Duration: 45 Hours

Pre-Requisite(s): RK1110

Objectives and Content:

1. Define terminology associated with SMAW welding.

2. Interpret information pertaining to SMAW welding found on drawings.
   i. symbols
   ii. abbreviations

3. Identify hazards and describe safe work practices pertaining to SMAW welding.
   i. personal
   ii. shop/facility
   iii. equipment
   iv. ventilation
   v. storage/handling

4. Identify codes and standards pertaining to welding.
   i. Canadian Welding Bureau (CWB)

5. Identify the SMAW welding processes and describe their characteristics and basic applications.

6. Identify SMAW welding equipment, consumables and accessories and describe their application.

7. Describe the procedures used to set-up and adjust SMAW welding equipment.

8. Describe the procedures used to inspect and maintain SMAW welding equipment.

9. Identify types of welds performed using SMAW welding equipment.

10. Identify welding positions and describe their applications.

11. Describe the procedures used to weld using SMAW welding equipment.

12. Identify common weld faults and describe the procedures to prevent and correct them.

Practical Requirements:

1. Set up equipment and perform a plate weld using the SMAW process.

2. Shut down SMAW welding equipment

RK1230 Rigging for Ironworkers

Learning Outcomes:

- Demonstrate knowledge of hoisting, lifting and rigging equipment, their applications, limitations and procedures for use.
- Demonstrate knowledge of the procedures used to perform hoisting and lifting operations.
- Demonstrate knowledge of calculations required when performing hoisting and lifting operations.

Duration: 90 Hours

Pre-Requisite(s): RK1110

Objectives and Content:

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

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

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

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

5. Perform calculations pertaining to rigging equipment.
   i. safe working loads
   ii. breaking strength

6. Identify types of hoisting and lifting equipment and accessories and describe their applications and procedures for use.

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

8. Identify types of knots, hitches and bends and describe their applications and the procedures used to tie them.

9. Describe the procedures used to rig material/equipment for hoisting and lifting.

10. Describe the procedures used to ensure the work area is safe for hoisting and lifting.
    i. supervision of lift
    ii. securing work area
    iii. communication

11. Identify and describe procedures used to communicate during hoisting, lifting and rigging operations.
    i. hand signals
    ii. electronic communications
    iii. audible/visual
    iv. relay of signals

12. Calculate sling tension and sling angle when preparing for hoisting and lifting operations.

13. Describe the procedures used to determine the weight and weight distribution of loads.
    i. reference load charts
    ii. determine types of loads
    iii. engineered lifts

14. Identify the factors to consider when selecting rigging equipment.
    i. load characteristics
        - weight
        - size
        - shape
        - center of gravity
    ii. environment

15. Describe the procedures used to perform a lift.
    i. secure work area
    ii. load determination

iii. selection of rigging hardware
iv. communication methods
v. pre-lift checks
vi. placement of load
vii. post-lift inspection

Practical Requirements:

1. Rig materials using basic equipment and techniques.

2. Demonstrate placement and use of slings.

3. Inspect, measure and cut wire and fibre ropes.

4. Inspect rigging equipment.

5. Estimate weight of loads and working load limits (WLL).

6. Perform reeving and lacing of blocks.

7. Select and install turnbuckles, thimbles and cable clips.

8. Assemble and operate block and tackle.

9. Perform temporary lashing of load.

10. Plan and execute a mock lift.

RK1240 Introduction to Cranes

Learning Outcomes:

- Demonstrate knowledge of cranes, their applications and limitations.
- Demonstrate knowledge of crane lifting operations.

Duration: 12 Hours

Pre-Requisite(s): RK1230

Objectives and Content:

1. Define terminology associated with cranes and crane lifting operations.

2. Identify hazards and describe safe work practices pertaining to cranes and crane lifting operations.

3. Interpret codes and regulations pertaining to cranes and crane lifting operations.

4. Interpret information pertaining to crane lifting operations found on drawings and specifications.

5. Interpret tables and charts to lift and move loads.
   i. crane limitations
      - tipping/stability failure
      - structural failure

6. Explain the principles of leverage and their application to cranes.

7. Identify types of cranes and describe their components, characteristics and applications.
   i. hydraulic
   ii. conventional
   iii. tower
   iv. electric overhead travelling (EOT)
   v. crawler

vi. carrier mounted
vii. rough terrain
viii. all terrain
ix. high capacity
x. knuckle boom
xi. derrick
xii. boom truck

8. Identify the considerations for crane assembly/installation on-site.
   i. site hazard assessment
      - overhead power lines
      - underground services
      - obstructions
      - soil/ground conditions
   ii. crane position
      - crane radius/swing area
      - headroom

Practical Requirements:

None.

RK1200 Conventional and Hydraulic Cranes

Learning Outcomes:

- Demonstrate knowledge of hydraulic and conventional cranes, their components and accessories.
- Demonstrate knowledge of the procedures used to erect, set-up and disassemble hydraulic and conventional cranes.

Duration: 60 Hours

Pre-Requisite(s): RK1230

Objectives and Content:

1. Define terminology associated with hydraulic and conventional cranes.

2. Identify and describe the procedures used to communicate during hydraulic and conventional crane operations.
   i. hand signals
   ii. electronic communications
   iii. audible/visual

3. Identify hydraulic crane components, accessories and attachments and describe their characteristics and applications.

4. Identify conventional crane components, accessories and attachments and describe their characteristics and applications.

5. Identify the considerations for hydraulic and conventional crane assembly/installation on-site.
   i. site hazard assessment
      - overhead power lines
      - underground services
      - obstructions
      - soil/ground conditions
      - environmental conditions

ii. crane position
- crane radius/swing area
- quadrants of operation
- headroom

6. Describe the procedures used to assemble and set-up hydraulic cranes.

7. Describe the procedures used to assemble and set-up conventional cranes.

8. Describe the procedures used to disassemble hydraulic cranes, their components, accessories and attachments.

9. Describe the procedures used to disassemble conventional cranes, their components, accessories and attachments.

10. Describe the procedures used to prepare hydraulic cranes for transport.

11. Describe the procedures used to prepare conventional cranes for transport.

Practical Requirements:

None.

RK1250 Structural Components

Learning Outcomes:

- Demonstrate knowledge of structural components, their characteristics and applications.
- Demonstrate knowledge of fastening methods relating to structural steel erection.
- Demonstrate knowledge of falsework, their characteristics and applications.
- Demonstrate knowledge of the procedures used to erect and dismantle falsework.

Duration: 45 Hours

Pre-Requisite(s): RK1110, RK1130, RK1200, RK1270

Objectives and Content:

1. Define terminology associated with structural components.

2. Identify hazards and describe safe work practices pertaining to structural components.

3. Interpret codes, regulations and standards pertaining to structural components.
   i. industry standards
   ii. codes of practice
   iii. government regulations

4. Interpret information pertaining to structural components found on drawings and specifications.

5. Identify types of structures and describe their characteristics.

6. Identify structural steel shapes and describe their designations, characteristics and applications.
   i. I-beam
   ii. H-beam
   iii. wide flange
   iv. welded wide flange
   v. angle
   vi. channel
   vii. tee
   viii. hollow structural steel (HSS)
   ix. miscellaneous shapes

7. Identify types of structural components and their purpose.
   i. columns
   ii. girders
   iii. beams
   iv. trusses
   v. joists
   vi. secondary steel
   vii. decking
   viii. girts
   ix. purlins
   x. sag rods
   xi. bracing
   xii. bridging
   xiii. lintels
   xiv. pre-cast
   xv. glued laminated timber products
   xvi. composite

8. Identify fastening methods associated with structural steel and describe their characteristics, applications and limitations.
   i. install fasteners/bolts
   ii. welding

9. Describe the procedures used to install fasteners for securing structural steel members.

10. Identify types of falsework and describe their characteristics and applications.

11. Describe the procedures used to erect and dismantle falsework.

Practical Requirements:

None.

RK1260 Structural Steel Erection and Dismantling

Learning Outcomes:

- Demonstrate knowledge of structural steel members, their characteristics and applications.
- Demonstrate knowledge of the procedures used to erect structural steel members and components.
- Demonstrate knowledge of the procedures used to dismantle and remove structural steel members and components.

Duration: 180 Hours

Pre-Requisite(s): RK1120, RK1130, RK1200, RK1250

Objectives and Content:

1. Define terminology associated with structural steel erection and dismantling.

2. Identify hazards and describe safe work practices pertaining to structural steel erection and dismantling.
   i. temporary bracing
   ii. environmental conditions
   iii. sequence

3. Interpret codes, regulations and standards pertaining to structural steel erection and dismantling.
   i. industry standards
   ii. codes of practice
   iii. government regulations

4. Interpret information pertaining to structural steel erection and dismantling found on drawings and specifications.

5. Identify tools and equipment relating to structural steel erection and dismantling and describe their applications and procedures for use.
   i. erection

ii. aligning
iii. fastening
iv. inspecting
v. revision/fabrication

6. Identify structural steel members and describe their characteristics and applications.
   i. columns
   ii. girders
   iii. beams
   iv. trusses
   v. joists
   vi. decking
   vii. girts
   viii. purlins
   ix. sag rods
   x. bracing
   xi. bridging
   xii. lintels

7. Describe the procedures used to erect and install structural steel members.

8. Describe the procedures used to level, plumb and align structural steel members.

9. Describe the procedures used to inspect erected structural steel to ensure conformity to standards.
   i. visual
   ii. mechanical

10. Describe the procedures used to repair and replace structural steel members and components.

11. Describe the procedures used to dismantle and remove structural steel members and components.

Practical Requirements:

1. Develop a work site plan.

2. Erect and secure structural steel members.

3. Plumb, align and secure steel structures.

4. Test and inspect steel structures.

5. Dismantle structural steel.

RK1270 Work Planning

Learning Outcomes:

- Demonstrate knowledge of the procedures used to plan and organize work tasks and handle work materials.

Duration: 30 Hours

Pre-Requisite(s): RK1110, RK1120, RK1200

Objectives and Content:

1. Identify sources of information relevant to work task planning.
   i. documentation
   ii. drawings
   iii. related professionals
   iv. clients

2. Describe the procedures used to plan work tasks.
   i. scheduling
   ii. material/equipment selection
   iii. weight calculation
   iv. bar place order/sequence

3. Describe the procedures used to organize and store tools, equipment, materials and supplies on-site.
   i. select location for material lay down
   ii. offload/unload and sort materials and supplies

Practical Requirements:

1. Set up and use site equipment.

RK1280 Pre-Stressed/Post-Tensioning Systems

Learning Outcomes:

- Demonstrate knowledge of pre-stressed/post-tensioning systems and their components.
- Demonstrate knowledge of the procedures used to place pre-stressed/post-tensioning systems.
- Demonstrate knowledge of the procedures used to stress post-tensioning systems.

Duration: 45 Hours

Pre-Requisite(s): RK1230

Objectives and Content:

1. Define terminology associated with pre-stressed/post-tensioning systems.
   i. pre-stressed
   ii. post-tensioning
   iii. pre-tensioning

2. Explain the purpose and effects of pre-stressed/post-tensioning on structures.

3. Identify types of pre-stressed/post-tensioning systems and describe their characteristics and applications.
   i. bonded
      - strand
      - wire
      - bar
   ii. unbonded
      - strand
      - wire
      - bar

4. Identify pre-stressed/post-tensioning materials, components and accessories and describe their characteristics and applications.

i. tendons
ii. bursting steel
iii. anchoring devices
iv. conduits
v. supports
vi. grout
vii. connectors

5. Identify hazards and describe safe work practices pertaining to pre-stressing/post-tensioning.

6. Interpret codes and regulations pertaining to pre-stressing/post-tensioning.

7. Interpret information pertaining to pre-stressing/post-tensioning found on drawings and specifications.

8. Identify tools and equipment relating to pre-stressing/post-tensioning and describe their applications.
   i. layout tools and equipment
   ii. stressing equipment
      - single strand jacks
      - multi-strand jacks
      - pumps
      - gauges
   iii. grouting equipment
      - mixer
      - storage hopper
      - screen
      - pump
      - pressure gauges
      - hoses
   iv. prepping equipment
      - stapler
      - pocket formers
      - wedge seating tool
      - sheath
      - stripper
   v. finishing equipment
      - pocket shear

- plasma cutter
- oxy-fuel torch

9. Describe the procedures used to set-up, operate and dismantle pre-stressing/post-tensioning equipment.

10. Describe the procedures used to inspect, maintain and store pre-stressing/post-tensioning equipment.

11. Describe the procedures used to place pre-stressed/post-tensioning systems.
    i. layout profile
    ii. place tendons and accessories
    iii. install bursting steel and anchorage
    iv. connect tendons to anchors
    v. protect exposed tendons

12. Describe the procedures used to stress tendons.
    i. tension tendons
    ii. short tail tendon stressing
    iii. document elongation and gauge pressure
    iv. de-pressurize and remove equipment

13. Explain the de-stressing process and its associated requirements and hazards.
    i. requirements
        - engineered procedures and specifications
        - restricted work zone access
    ii. hazards
        - danger zones
        - structural failure
        - equipment failure

14. Describe procedures used to finish tendons.
    i. bonded
    ii. unbonded

15. Describe the procedures used to grout tendons in bonded systems.
    i. verifying post-tensioning duct system
    ii. batching and mixing grout
    iii. testing grout

iv. injecting grout
v. releasing trapped air
vi. post-grouting inspection
vii. sealing of grout inlets and outlets

Practical Requirements:

None.

RK1290 Reinforcing for Ironworkers

Learning Outcomes:

- Demonstrate knowledge of reinforcing materials and accessories.
- Demonstrate knowledge of the procedures to prepare for reinforcing concrete.

Duration: 60 Hours

Pre-Requisite(s): RK1230, RK1270

Objectives and Content:

1. Explain the purpose of reinforcing concrete.

2. Define terminology associated with reinforced concrete.

3. Explain the forces and stresses associated with reinforced concrete.
   i. compression
   ii. tension
   iii. shear
   iv. live and dead loads

4. Identify hazards and describe safe work practices pertaining to reinforcing.
   i. fall arrest and protection
   ii. dowel protection
   iii. work positioning (belly hook)
   iv. repetitive strain injuries
   v. proper packing/carrying techniques

5. Interpret codes and regulations pertaining to reinforcing.

6. Interpret information pertaining to reinforcing found on drawings and specifications.

7. Identify standards and identification systems relating to reinforcing steel.

i. grades and diameters
ii. mill standards
iii. Concrete Reinforcing Steel Institute (CRSI)
iv. colour codes and tags

Practical Requirements:

1. Tie reinforcing steel.

RK2190 Tower Cranes

Learning Outcomes:

- Demonstrate knowledge of tower cranes, their components and accessories.
- Demonstrate knowledge of the procedures used to erect, set-up and disassemble tower cranes.

Duration: 30 Hours

Pre-Requisite(s): RK1200

Objectives and Content:

1. Define terminology associated with tower cranes.

2. Identify and describe the procedures used to communicate during tower crane operations.
   i. hand signals
   ii. electronic communications
   iii. audible/visual

3. Identify types of tower cranes and describe their characteristics and applications.
   i. stationary
      - fixed
      - slewing
   ii. mobile

4. Identify tower crane components, accessories and attachments and describe their characteristics and applications.

5. Identify the considerations for tower crane assembly/installation on-site.
   i. site hazard assessment
      - overhead power lines
      - obstructions
   ii. crane position

- crane radius/swing area

6. Describe the procedures used to erect, set-up and climb/jump tower cranes.

7. Describe the procedures used to disassemble tower cranes, their components, accessories and attachments.

8. Describe the procedures used to prepare tower cranes for transport.

Practical Requirements:

None.

AP1101 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: 15 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define the following terms:
   i. apprenticeship
   ii. apprentice vs. registered apprentice
   iii. Journeyperson vs. Certified Journeyperson
   iv. Certificate of Apprenticeship
   v. Certificate of Qualification
   vi. Recognition of Prior Learning
   vii. dual certification

2. Explain the apprenticeship system in Newfoundland and Labrador and the roles and responsibilities of those involved.
   i. registered apprentice
   ii. training institution
   iii. employer
   iv. Journeyperson
   v. Department of Advanced Education and Skills
      - Industrial Training Section
      - Standards and Curriculum Section
   vi. Provincial Trade Advisory Committees
   vii. Provincial Apprenticeship and Certification Board

3. Identify the Conditions Governing Apprenticeship.

4. Describe the training and educational requirements.
   i. pre-employment (entry level) training
   ii. block release
   iii. on-the-job

5. Explain the steps in the registered apprenticeship process.
   i. criteria for eligibility
      - entrance requirements as per Conditions of Apprenticeship
      - employment
   ii. registration process
      - application requirements
   iii. Memorandum of Understanding
      - probation period
      - cancellation
   iv. Record of Occupational Progress (Logbook)
      - signing off skills
      - recording hours
      - updating PDO on progress
   v. class calls
      - schedule
      - EI Eligibility
      - Direct Entry
      - advanced level
   vi. Block Exams
   vii. progression
      - schedule
      - wage rates
   viii. cancellation of apprenticeship
   ix. Practical Examinations
   x. Provincial and Interprovincial examinations
   xi. certification
      - Certification of Apprenticeship
      - Certification of Qualification
      - Provincial certification
      - Interprovincial Red Seal Endorsement

6. Explain the Interprovincial Standards Red Seal Program.
    i. designated Red Seal trade
    ii. the National Occupational Analysis (NOA)
    iii. Interprovincial (IP) Red Seal Endorsement Examination
    iv. relationship of NOA to IP Examination
    v. qualification recognition and mobility

7. Identify the current financial incentives available to apprentices.

8. Explain the NL apprenticeship and trades certification division's out-of- province apprenticeship policy.

Practical Requirements:

1. Use the Provincial Apprenticeship and Trades Certification web site at www.gov.nl.ca/app to:
    i. locate, download, and complete the Application for Apprenticeship and Memorandum of Understanding (MOU)
    ii. locate, download, and complete the Out of Province registration forms
        - Application for Apprenticeship (out of province)
        - Letter of Understanding (LOU)
        - Acceptance of Conditions Letter
    iii. locate, download, and complete the Work Experience Credits form
    iv. identify the locations of all Industrial Training offices
    v. locate and review the following learning resources relevant to the trade:
        - Study Guide
        - Exam Preparation Guide
        - Plan of Training

2. Use a logbook for this trade to:
    i. identify the hours for the trade (in-school and on-the-job)
    ii. identify the number of blocks
    iii. identify the courses in each block
    iv. identify the workplace skills to be completed and verified

3. Use the Red Seal Web site, http://www.red-seal.ca to retrieve the National Occupational Analyses (NOA) for this trade.
   i. identify the following components of the NOA:
      - Trends
      - Scope
      - Key Competencies
      - Blocks
      - Tasks
      - Subtasks
      - Pie Charts
      - Table of Specifications

AM1100 Math Essentials

Note: It is recommended that AM1100 be delivered in the first semester of the Entry Level training program.

Learning Outcomes:

- Demonstrate knowledge of the numeracy skills required to begin the 2nd level math course.
- 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: 30 Hours

Pre-Requisite(s): None

Objectives and Content:

Wherever possible, the instructor should use trade specific examples to reinforce the course objectives

1. Use multiplication tables from memory.

2. Perform whole number operations.
   i. read, write, count, round off, add, subtract, multiply and divide whole numbers

3. Apply the order of operations in math problems.

4. Perform fraction and mixed number operations.
   i. read, write, add, subtract, multiply and divide fractions

5. Perform decimal operations.
   i. read, write, round off, add, subtract, multiply and divide decimals

6. Perform percent/decimal/fraction conversion and comparison.
   i. convert between fractions, decimals and percents

7. Perform percentage operations.
   i. read and write percentages
   ii. calculate base, rates and percentages

8. Perform ratio and proportion operations.
   i. use a ratio comparing two quantities with the same units
   ii. use a proportion comparing two ratios

9. Use the imperial measurement system in math problems.
   i. identify units of measurement for:
      - length
      - mass
      - area
      - volume
      - capacity

10. Use the metric measurement system in math problems.
    i. identify units of measurement for:
       - length
       - mass
       - area
       - volume
       - capacity

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.

AM1350 Ironworker 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.
- Demonstrate knowledge of solving 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: 30 Hours

Pre-Requisite(s): AM1100

Objectives and Content:

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

1. Employ percent/decimal/fraction conversion and comparison in trade specific situations.

2. Apply ratios and proportions to trade specific problems.

3. Use the Imperial Measurement system in trade specific applications.

4. Use the Metric Measurement system in trade specific applications.

5. Complete Imperial/Metric conversions in trade specific situations.
   i. convert between imperial and metric measurements
   ii. convert to another unit within the same measurement system

6. Manipulate formulas using cross multiplication, dividing throughout, elimination, and substitution to solve trade specific problems, such as:
   i. right angle triangles
   ii. area
   iii. volume
   iv. perimeter

7. Perform calculations involving geometry that are relevant to the trade, such as:
   i. angle calculations
   ii. circle calculations

8. Use practical math skills 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 has been designated as 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.

CM2160 Communication Essentials

Learning Outcomes:

- Demonstrate knowledge of the importance of well-developed writing skills in the workplace and in career development.
- Demonstrate knowledge of the purpose of various types of workplace correspondence.
- Demonstrate knowledge of the principles of effective workplace writing.
- Demonstrate knowledge of standard formats for letters and memos.
- Demonstrate knowledge of principles related to writing effective letters and memos.
- Demonstrate the ability to prepare and deliver an oral presentation.
- Demonstrate knowledge of the importance of effective interpersonal skills in the workplace.

Duration: 45 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 the principles for writing clear, concise, complete sentences and paragraphs which adhere to the conventions of grammar, punctuation, and mechanics.

2. Identify the principles of effective workplace writing.
    i. describe the value of well-developed writing skills to career success
    ii. discuss the importance of tone, and language or word choice in workplace communication, regardless of the circumstances
    iii. demonstrate an awareness of cultural differences when preparing workplace correspondence
    iv. describe the writing process as it applies to workplace communication
        - planning
        - writing

- editing/revising

v. identify the parts of a business letter and memo, and when each should be used in the workplace

vi. identify the standard formats for business letters and memos

vii. identify guidelines for writing sample letters and memos which convey:
- acknowledgment
- routine request
- routine response
- complaint
- refusal
- persuasive request
- letters of appeal

3. Identify types of informal workplace documents.

i. identify types & purposes of reports
- incident
- process
- progress

ii. identify common trade specific forms

iii. describe primary and secondary methods used to gather information

iv. discuss the importance of accuracy and completeness in reports and forms

4. Identify the elements of presentations used in the workplace.

i. identify presentation types
- impromptu
- informative
- demonstration
- persuasive

ii. identify the components of an effective presentation
- eye contact
- body language
- vocal qualities
- audience analysis
- multimedia tools
- keeping on topic

5. Demonstrate an understanding of interpersonal communications in the workplace.
    i. identify listening techniques
    ii. demonstrate an understanding of group dynamics
    iii. describe the importance of contributing information and expertise in the workplace
    iv. describe the importance of respectful and open communication in the workplace
    v. identify methods to accept and provide feedback in a constructive and considerate manner
    vi. explain the role of conflict in a group to reach solutions

6. Identify acceptable workplace uses of communication technologies.
    i. cell / Smart Phone etiquette
    ii. voice mail
    iii. e-mail
    iv. teleconferencing / videoconferencing for meetings and interviews
    v. social networking
    vi. other emerging technologies

Practical Requirements:

1. Write well-developed, coherent, unified paragraphs.

2. Write sample letters and memos.

3. Write one short informal report.

4. Complete a selection of at least 3 trade-related forms.

5. Deliver an effective oral presentation.

SD1760 Workplace Essentials

Note: It is recommended that SD1760 be delivered in the second half of the Entry Level training program.

Learning Outcomes:

- Demonstrate knowledge of workplace essentials in the areas of meetings, unions, workers compensation, workers' rights, and human rights.
- Demonstrate knowledge of good customer service practices.
- Demonstrate knowledge of effective job search techniques.

Duration: 45 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 common practices related to workplace meetings.
    i. identify and discuss meeting format and preparation required for a meeting
    ii. explain the purpose of an agenda
    iii. explain the expected roles, responsibilities, and etiquette of meeting participants

2. Define unions and identify their role in the workplace.
    i. identify the purpose of unions
    ii. identify a common union structure
    iii. identify the function of unions in this trade

3. Demonstrate an understanding of the Worker's Compensation process.
    i. describe the aims, objectives, regulations and benefits of the Workplace Health, Safety and Compensation Commission
    ii. explain the role of the Workers Advisor
    iii. explain the internal review process

4. Demonstrate an understanding of workers' rights.
    i. define labour standards
    ii. identify 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. examine the Human Rights Code and explain the role of the Human Rights Commission
    ii. define harassment in various forms and identify strategies for prevention
        - direct
        - systemic
        - adverse effect
    iii. identify gender and stereotyping issues in the workplace
    iv. define basic concepts and terms related to workplace diversity including age, race, culture, religion, socio-economic status, and sexual orientation

6. Demonstrate an understanding of quality customer service.
    i. explain why quality service is important
    ii. identify barriers to quality customer service
    iii. identify customer needs & common methods for meeting them
    iv. identify and discuss the characteristics & importance of a positive attitude
    v. identify the importance of demonstrating good communication skills including body language, listening, questioning, and when using electronic communication devices
    vi. identify techniques for interacting with challenging customers to address complaints and resolve conflict

7. Demonstrate an understanding of effective job search techniques.
    i. identify and explain employment trends, opportunities, and sources of employment
    ii. identify and discuss essential skills for the trades as outlined by Human Resources and Skills Development Canada
    iii. review job ads and identify the importance of fitting qualifications to job requirements
    iv. identify the characteristics of effective resumes, the types of resumes, and principles of resume formatting
    v. identify the characteristics of an effective cover letter
    vi. identify the components of a portfolio, and discuss the value of establishing and maintaining a personal portfolio
    vii. identify the common characteristics of the job interview process:
        - pre-interview preparation
        - interview conduct
        - post-interview follow up

Practical Requirements:

1. Create a resume.

2. Create a cover letter.

3. Participate in a mock job interview.

MC1060 Computer Essentials

Learning Outcomes:

- Demonstrate knowledge of computer systems and their operation.
- Demonstrate knowledge of popular software packages and their applications.
- Demonstrate knowledge of security issues related to computers.

Duration: 15 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 the major external components of a microcomputer system.
   i. input devices
   ii. output devices
   iii. central control unit

2. Use operating system software.
   i. start and quit a program
   ii. use the help function
   iii. use the find function
   iv. maximize and minimize a window
   v. use the task bar
   vi. adjust desktop settings such as screen savers, screen resolution, and backgrounds
   vii. shut down a computer

3. 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

4. Use word processing software to create documents.
   i. enter text
   ii. indent and tab text
   iii. change text attributes (bold, underline, font, etc.)
   iv. change layout format (margins, alignment, line spacing)
   v. spell check and proofread
   vi. edit text
   vii. save document
   viii. print document
   ix. close document
   x. retrieve documents

5. Use spreadsheet software to create spreadsheets.
   i. enter data in cells
   ii. create formulas to add, subtract, multiply and divide
   iii. save spreadsheet
   iv. print spreadsheet
   v. close spreadsheet
   vi. retrieve spreadsheet

6. Access the Internet.
   i. access websites using the world wide web(www)
   ii. identify examples of web browsers
   iii. use search engines with common searching techniques
   iv. describe security issues

7. Use electronic mail.
   i. describe e-mail etiquette
      - grammar and punctuation
      - privacy and legal issues when sharing and forwarding e-mail
      - work appropriate content
      - awareness of employer policies
   ii. manage e-mail using the inbox, sent, and deleted folders
   iii. send an e-mail message with attachment(s)
   iv. print e-mail

Practical Requirements:

None.

BLOCK II

RK2202 Electric Overhead Travelling Cranes

Learning Outcomes:

- Demonstrate knowledge of electric overhead travelling (EOT) cranes, their components and accessories.
- Demonstrate knowledge of the procedures to assemble and install EOT cranes.

Duration: 15 Hours

Pre-Requisite(s): Block I

Objectives and Content:

1. Define terminology associated with EOT cranes.

2. Identify and describe the procedures used to communicate during EOT crane operations.
   i. hand signals
   ii. electronic communications
   iii. audible/visual

3. Identify hazards and describe safe work practices pertaining to EOT cranes and EOT crane operations.
   i. bus bar

4. Identify EOT crane components, accessories and attachments and describe their characteristics and applications.
   i. crane rails
   ii. end trucks
   iii. wheels
   iv. bridge girders
   v. hoist and trolleys
   vi. crane stop
   vii. load blocks

viii. cab
ix. bus bar

5. Identify types of EOT controls and describe their characteristics and applications.
   i. cab operated
   ii. remote operated
   iii. pendant

6. Describe the procedures used to assemble and install EOT cranes.

Practical Requirements:

None.

RK2181 Pre-Cast Concrete Erection and Dismantling

Learning Outcomes:

- Demonstrate knowledge of pre-cast concrete members and their components.
- Demonstrate knowledge of the procedures used to erect pre-cast concrete.
- Demonstrate knowledge of the procedures to dismantle pre-cast concrete.

Duration: 30 Hours

Pre-Requisite(s): Block I

Objectives and Content:

1. Define terminology associated with pre-cast concrete erection and dismantling.

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

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

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

5. Identify tools and equipment relating to pre-cast concrete erection and dismantling and describe their applications and procedures for use.

6. Identify types of pre-cast concrete members and components and describe their characteristics and applications.
   i. panels
      - horizontal
      - vertical
   ii. beams
   iii. joists
   iv. columns

v. single tees
vi. twin tees

7. Describe the procedures used to prepare for the erection of pre-cast concrete members and components.
   i. site preparation
   ii. equipment set-up
   iii. determine weight
   iv. rigging procedures
   v. material handling
   vi. layout

8. Describe the procedures used for the erection of pre-cast concrete members and components.
   i. attaching to support clips
   ii. aligning, leveling and plumbing
   iii. fastening
      - welding
      - bolting
   iv. grouting

9. Describe the procedures used to finish pre-cast concrete.
   i. removing lugs
   ii. grinding
   iii. painting
   iv. packing
   v. caulking
   vi. installing gaskets
   vii. air sealing
   viii. grouting

10. Describe the procedures used to dismantle and remove pre-cast concrete members.

Practical Requirements:

1. Develop a work site plan.

RK1220 Plasma Arc Cutting

Learning Outcomes:

- Demonstrate knowledge of plasma arc cutting equipment and accessories.
- Demonstrate knowledge of procedures used to cut with plasma arc cutting equipment.

Duration: 15 Hours

Pre-Requisite(s): RK1110

Objectives and Content:

1. Define terminology associated with plasma arc cutting.

2. Identify hazards and describe safe work practices pertaining to plasma arc cutting.
   i. personal
   ii. shop/facility
   iii. equipment
   iv. ventilation
   v. storage/handling

3. Describe the plasma arc cutting process and its applications.

4. Identify plasma arc cutting equipment and accessories and describe their applications.

5. Describe the procedures used to set-up, adjust and shut-down plasma arc cutting equipment.

6. Describe the procedures used to inspect, maintain and store plasma arc cutting equipment.

7. Describe the procedures used to cut using plasma arc cutting equipment.
   i. free hand
   ii. straight edge

8. Identify common cutting faults and describe the procedures used to prevent and correct them.

Practical Requirements:

1. Set up plasma arc cutting equipment.

2. Perform free hand and straight edge plasma arc cutting.

3. Shut down and disassemble plasma arc cutting equipment.

RK2271 Miscellaneous Ironwork

Learning Outcomes:

- Demonstrate knowledge of miscellaneous ironwork.
- Demonstrate knowledge of the procedures used to fabricate and install miscellaneous ironwork.

Duration: 60 Hours

Pre-Requisite(s): Block I

Objectives and Content:

1. Define terminology associated with miscellaneous ironwork.

2. Identify hazards and describe safe work practices pertaining to miscellaneous ironwork.

3. Interpret codes and regulations pertaining to miscellaneous ironwork.

4. Interpret information pertaining to miscellaneous ironwork found on drawings and specifications.

5. Identify tools and equipment relating to miscellaneous ironwork and describe their applications and procedures for use.

6. Identify types of miscellaneous ironwork and describe their components, characteristics and applications.
   i. stairways
   ii. ladders and platforms
   iii. railings
   iv. catwalks
   v. fences

7. Describe the procedures used to fabricate miscellaneous ironwork.
   i. shop

ii. field

8. Describe the procedures used to install miscellaneous ironwork.
   i. site preparation
   ii. material handling and movement

Practical Requirements:

1. Fabricate and install:
   i. handrails
   ii. stairways
   iii. door frames
   iv. roof opening

RK2320 Reinforcing II

Learning Outcomes:

- Demonstrate knowledge of the procedures used to fabricate reinforcing material.
- Demonstrate knowledge of the procedures used to install reinforcing material.

Duration: 90 Hours

Pre-Requisite(s): Block I

Objectives and Content:

1. Interpret standards relating to reinforcing materials fabrication and placing/installation.
   i. Concrete Reinforcing Steel Institute (CRSI)
   ii. American Concrete Institute (ACI)

2. Perform calculations relating to reinforcing concrete.
   i. lengths
   ii. cover
   iii. splices
   iv. weights
   v. quantities
   vi. bar spacing

3. Describe the procedures used to fabricate reinforcing materials.
   i. layout materials
   ii. cut, bend, tie and splice materials

4. Describe the procedures used to assemble reinforced members.

5. Describe the procedures used to install reinforcing materials.
   i. place materials
   ii. secure materials

6. Describe the procedures used to ensure reinforcing materials remain stable during pouring operations.

Practical Requirements:

1. Install and tie rebar.

2. Cut and bend materials according to specifications.

3. Perform splicing procedures.

4. Fabricate slab and beam.

5. Fabricate double wall.

6. Fabricate two columns.

RK2340 Blueprint Reading 3 (Rebar)

Learning Outcomes:

- Demonstrate knowledge of rebar drawings and their use.

Duration: 30 Hours

Pre-Requisite(s): Block I

Objectives and Content:

1. Define the terminology and symbols related to the materials and processes used with reinforcing steel.

2. List the component parts of reinforced concrete and identify their associated symbols and abbreviations.

3. Identify basic reinforced materials and shapes.

4. Describe the procedures used to compile a materials take-off for reinforcing steel.

Practical Requirements:

1. Compile a materials take-off.

BLOCK III

RK2310 Ornamental Ironwork

Learning Outcomes:

- Demonstrate knowledge of ornamental ironwork.
- Demonstrate knowledge of the procedures used to fabricate and install ornamental ironwork.

Duration: 30 Hours

Pre-Requisite(s): Block II

Objectives and Content:

1. Define terminology associated with ornamental ironwork.

2. Identify hazards and describe safe work practices pertaining to ornamental ironwork.

3. Interpret codes and regulations pertaining to ornamental ironwork.

4. Interpret information pertaining to ornamental ironwork found on drawings and specifications.

5. Identify tools and equipment relating to ornamental ironwork and describe their applications and procedures for use.

6. Identify types of ornamental ironwork and describe their components, characteristics and applications.
   i. stairways
   ii. railings
   iii. curtain walls

7. Describe the procedures used to fabricate ornamental ironwork.
   i. shop

ii. field

8. Describe the procedures used to install ornamental ironwork.
   i. site preparation
   ii. material handling and movement
   iii. layout
   iv. install and secure items

9. Describe the procedures used for finishing ornamental ironwork.
   i. grinding
   ii. painting
   iii. filling procedures
   iv. polishing

10. Describe the procedures used to repair ornamental ironwork.

11. Describe the procedures used to remove ornamental ironwork.

Practical Requirements:

None.

RK2300 Welding II

Learning Outcomes:

- Demonstrate knowledge of welding and gouging equipment and accessories.
- Demonstrate knowledge of welding processes and procedures.

Duration: 45 Hours

Pre-Requisite(s): RK1110

Objectives and Content:

1. Define terminology associated with welding and gouging.

2. Interpret information pertaining to welding found on drawings and welding procedures.
   i. Symbols
   ii. abbreviations

3. Identify hazards and describe safe work practices pertaining to welding and gouging.
   i. personal
   ii. shop/facility
   iii. equipment
   iv. ventilation
   v. storage/handling

4. Identify and interpret codes and standards pertaining to welding and gouging.
   i. Canadian Welding Bureau (CWB)

5. Identify welding processes and describe their characteristics and applications.
   i. shielded metal arc welding (SMAW)
   ii. gas metal arc welding (GMAW)
   iii. gas tungsten arc welding (GTAW)
   iv. flux core arc welding (FCAW)

v. stud welding
vi. arc-spot welding (ASW)
vii. submerged arc welding (SAW)

6. Identify welding equipment, consumables and accessories and describe their application.
   i. FCAW
   ii. stud welding

7. Describe the procedures used to set-up and adjust welding equipment.
   i. FCAW
   ii. stud welding

8. Describe the procedures used to inspect, maintain and store welding equipment.
   i. FCAW
   ii. stud welding

9. Identify types of welds and joints performed using welding equipment.

10. Identify welding positions and describe their applications.

11. Describe the procedures used to weld using welding equipment.
   i. FCAW
   ii. stud welding

12. Identify arc-air gouging equipment, consumables and accessories and describe their applications.

13. Describe the procedures used to gouge using arc-air gouging equipment.

Practical Requirements:

1. Set up equipment and perform a plate weld using the FCAW process

2. Set up equipment and perform arc air gouging.

3. Set up equipment and perform stud welding.

RK2231 Access Equipment

Learning Outcomes:

- Demonstrate knowledge of ladders, scaffolding and aerial work platforms, their applications, limitations and procedures for use.

Duration: 60 Hours

Pre-Requisite(s): Block II

Objectives and Content:

1. Define terminology associated with ladders, scaffolding and aerial work platforms.

2. Identify hazards and describe safe work practices pertaining to ladders, scaffolding and aerial work platforms.

3. Identify codes and regulations pertaining to ladders, scaffolding and aerial work platforms.

4. Identify types of ladders, scaffolding and aerial work platforms and describe their characteristics and applications.

5. Identify types of work positioning, fall arrest and protection equipment and describe their applications and procedures for use.

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

7. Describe the procedures used to inspect and maintain ladders, scaffolding and aerial work platforms.

Practical Requirements:

1. Erect and dismantle a scaffold using tube and clamp for bracing.

2. View a demonstration of a power elevated working platform and its operation.

RK2252 Pre-Engineered Structures

Learning Outcomes:

- Demonstrate knowledge of pre-engineered structures and their components.
- Demonstrate knowledge of the procedures used to erect pre-engineered structures.

Duration: 45 Hours

Pre-Requisite(s): Block II

Objectives and Content:

1. Define terminology associated with pre-engineered structures.

2. Identify hazards and describe safe work practices pertaining to pre-engineered structures.

3. Interpret codes and regulations pertaining to pre-engineered structures.

4. Interpret information pertaining to pre-engineered structures found on drawings and specifications.

5. Identify tools and equipment relating to pre-engineered structures and describe their applications and procedures for use.

6. Identify types of pre-engineered structures and describe their characteristics and applications.
   i. tapered beam
   ii. single-span rigid frame
   iii. multi-span rigid frame
   iv. single span and continuous trusses
   v. lean-to

7. Identify pre-engineered structure components and describe their characteristics and applications.

8. Describe the procedures used to plan and prepare for erection of pre-engineered structures.

9. Describe the procedures used to erect pre-engineered structures and their components.

Practical Requirements:

None.

RK2291 Curtain Walls

Learning Outcomes:

- Demonstrate knowledge of the layout and installation of curtain and window walls.
- Demonstrate knowledge of the procedures used to glaze wall openings.

Duration: 30 Hours

Pre-Requisite(s): Block II

Objectives and Content:

1. Describe assembly and erection procedures and sequence.
   - i. determine lay-down and assembly area
   - ii. interpret drawings
   - iii. off-load materials
   - iv. identify components
   - v. select and set up equipment
   - vi. select materials
   - vii. rig loads
   - viii. handle finished materials

2. Describe the procedures used to lay-out curtain walls and window walls.

3. Identify and interpret the information provided by drawings and prints.
   - i. structural blueprint
   - ii. detail drawings
   - iii. plan sequence
   - iv. architectural drawings.

4. Describe the procedures used to verify location of embedment.

5. Describe the procedures used for installation.
   - i. interlock section with standing sections

ii. align and level assembled sections
iii. apply back-beading to curtain wall
iv. verify alignment and secure
v. install flashing

6. Identify and interpret the information provided by the structural blueprint.

7. Describe lay-out procedures.

8. Describe the procedures used to drill holes.

9. Describe the procedures used to install support clips on structures.

10. Describe the procedures used to fasten wall sections.

11. Describe the procedures used to rig assembled sections.
    i. equipment
    ii. safety
    iii. signals
    iv. sequence

12. Describe the procedures used to install and secure glass and plastic.

13. Describe the procedures used to apply sealer or sealant around glass according to specifications.

Practical Requirements:

None.

RK2241 Machinery and Equipment

Learning Outcomes:

- Demonstrate knowledge of the procedures used to install and remove machinery and equipment.

Duration: 30 Hours

Pre-Requisite(s): Block II

Objectives and Content:

1. Define terminology associated with machinery and equipment installation and removal.

2. Identify hazards and describe safe work practices pertaining to installation and removal of machinery and equipment.

3. Interpret codes and regulations pertaining to installation and removal of machinery and equipment.

4. Interpret information pertaining to installation and removal of machinery and equipment found on drawings and specifications.

5. Identify tools and equipment relating to installation and removal of machinery and equipment and describe their applications and procedures for use.

6. Identify types of machinery and equipment installed and removed by ironworkers and describe their characteristics.
   v. storage tanks
   vi. bins
   vii. hoppers
   viii. conveyors

7. Describe the procedures used to install machinery and equipment.
   i. move/transport
   ii. assemble

iii. erect
iv. level
v. align
vi. support
vii. secure

8. Describe the procedures used to remove machinery and equipment.

Practical Requirements:

None.

D. 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 inSection14.

5.0 Apprenticeship Progression Schedule, Wage Rates and Advanced Training Criteria

Progression Schedule

Ironworker (Generalist)
5400 Hours

APPRENTICESHIP LEVEL AND WAGES

Year	Wage Rate At This Level	Requirements for progression to next level of apprenticeship	When requirements are met, the apprentice will progress to…
1st	60 %	▪ Completion of Block 1 training ▪ Pass Block 1 exam ▪ Minimum 1800 hours of combined relevant work experience and training	2nd Year
2nd	75%	▪ Completion of Block 2 training ▪ Pass Block 2 exam ▪ Minimum 3600 hours of combined relevant work experience and training	3rd Year
3rd	90%	▪ Completion of Block 3 training ▪ Minimum 5400 hours of combined relevant work experience and training ▪ Sign-off of all workplace skills in apprentice logbook ▪ Pass certification exam	Journeyperson Certification

Wage Rates

- Rates are percentages of the prevailing journeyperson's wage rate in the place of employment of the apprentice.
- 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.
- Rates must not be less than the wage rate established by any collective agreement which may be in force at the apprentice's workplace.
- Employers are free to pay wage rates above the minimums specified.

Block Exams

- This program may **not** currently contain Block Exams, in which case this requirement will be waived until such time as Block Exams are available.

Ironworker (Generalist)
5400 Hours

CLASS CALLS

Call Level	Requirements for Class Call	Hours awarded for In-School Training
Direct Entry Apprentice: PLA & / or Block 1	▪ Minimum of 1000 hours of relevant work experience ▪ Prior Learning Assessment (PLA) at designated college (if applicable)	To be determined by the number of courses completed after each class call
Block 2	▪ Minimum of 3000 hours of relevant work experience and training	240
Block 3	▪ Minimum of 5200 hours of relevant work experience and training	240

Direct Entry Apprentice

- Must complete Block 1 courses through PLA and / or in-school training.
- Block 1 training is to be completed via class calls; up to 16 weeks of training per calendar year.
- Must attend in-school training until Block 1 is complete before attending Blocks 2 or higher.

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 journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or qualifying to receive a class call to training as a registered Trade Qualifier. Cancellation must be mutually agreed upon by the employer and the apprentice.

14.5 An employer shall ensure that each apprentice is under the direct supervision of an approved journeyperson supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyperson with respect to the task, activity or function that is being supervised.

14.6 Under the Plan of Training the employer is required to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give first opportunity to be hired before another is hired.

14.7 The employer will permit each apprentice to attend training programs as prescribed by the PACB.

14.8 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a PACB authorized training institution and have sign-off done by instructors to meet the requirements for certification.

15.0 Appeals to Decisions Based on Conditions Governing Apprenticeship Training

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

E. 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 5400 hours.

   Or

   A total of 7200 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.

F. 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 journeyperson.
- 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 Advanced Education 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 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.