NOVA SCOTIA
APPRENTICESHIP
CURRICULUM
STANDARD
for the
Occupation of
Roofer
Levels 1, 2 and 3 in September 2014
See Page 9 for NS Program Structure
Based on a New Brunswick | Nova Scotia Collaboration
pg. 9 for Program Structure
Preface

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

This document contains all the technical training elements required to complete the Roofer apprenticeship program and has been developed based on the 2012 National Occupational Analysis (NOA). The NOA can be found on the Red Seal website (www.red-seal.ca).

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

Nova Scotia Apprenticeship Agency
1256 Barrington Street, 3rd Floor
PO Box 578
Halifax, NS   B3J 2S9
P: 902-424-5651
www.nsapprenticeship.ca
Acknowledgements

The Province wishes to acknowledge the contributions of the following industry and instructional representatives who participated in the development of this document:

Wayne Skinner  New Brunswick
Gerald Phillippo  Nova Scotia

In addition to the individuals noted above, various government and industry representatives contributed to the development of this document.
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## Program Content

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# Glossary of Terms

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADJUST</strong></td>
<td>To put in good working order; regulate; bring to a proper state or position.</td>
</tr>
<tr>
<td><strong>APPLICATION</strong></td>
<td>The use to which something is put and/or the circumstance in which you would use it.</td>
</tr>
<tr>
<td><strong>CHARACTERISTIC</strong></td>
<td>A feature that helps to identify, tell apart, or describe recognizably; a distinguishing mark or trait.</td>
</tr>
<tr>
<td><strong>COMPONENT</strong></td>
<td>A part that can be separated from or attached to a system; a segment or unit.</td>
</tr>
<tr>
<td><strong>DEFINE</strong></td>
<td>To state the meaning of (a word, phrase, etc.).</td>
</tr>
<tr>
<td><strong>DESCRIBE</strong></td>
<td>To give a verbal account of; tell about in detail.</td>
</tr>
<tr>
<td><strong>DIAGNOSE</strong></td>
<td>To analyze or identify a problem or malfunction.</td>
</tr>
<tr>
<td><strong>EXPLAIN</strong></td>
<td>To make plain or clear; illustrate; rationalize.</td>
</tr>
<tr>
<td><strong>IDENTIFY</strong></td>
<td>To point out or name objectives or types.</td>
</tr>
<tr>
<td><strong>INTERPRET</strong></td>
<td>To translate information from observation, charts, tables, graphs, and written material.</td>
</tr>
<tr>
<td><strong>MAINTAIN</strong></td>
<td>To keep in a condition of good repair or efficiency.</td>
</tr>
<tr>
<td><strong>METHOD</strong></td>
<td>A means or manner of doing something that has procedures attached to it.</td>
</tr>
<tr>
<td><strong>OPERATE</strong></td>
<td>How an object works; to control or direct the functioning of.</td>
</tr>
<tr>
<td><strong>PROCEDURE</strong></td>
<td>A prescribed series of steps taken to accomplish an end.</td>
</tr>
</tbody>
</table>
## Glossary of Terms (continued)

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PURPOSE</strong></td>
<td>The reason for which something exists or is done, made or used.</td>
</tr>
<tr>
<td><strong>SERVICE</strong></td>
<td>Routine inspection and replacement of worn or deteriorating parts. An act or business function provided to a customer in the course of one’s profession. (e.g., haircut).</td>
</tr>
<tr>
<td><strong>TECHNIQUE</strong></td>
<td>Within a procedure, the manner in which technical skills are applied.</td>
</tr>
<tr>
<td><strong>TEST</strong></td>
<td>v. To subject to a procedure that ascertains effectiveness, value, proper function, or other quality.</td>
</tr>
<tr>
<td></td>
<td>n. A way of examining something to determine its characteristics or properties, or to determine whether or not it is working correctly.</td>
</tr>
<tr>
<td><strong>TROUBLESHOOT</strong></td>
<td>To follow a systematic procedure to identify and locate a problem or malfunction and its cause.</td>
</tr>
</tbody>
</table>
Essential Skills Profiles

Human Resources and Skills Development Canada (HRSDC) defines Essential Skills as “The skills needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.”

HRSDC has developed Essential Skills profiles which describe how each of the nine Essential Skills are used by workers in an occupation.

These profiles include:
- A brief description of the occupation;
- A list of the most important Essential Skills;
- Examples of tasks that illustrate how each Essential Skill is applied;
- Complexity ratings that indicate the level of difficulty;
- The physical aspects of performing the job and the attitudes that workers feel are needed to do the job well;
- Future trends affecting Essential Skills.


The development and improvement of these Essential Skills is inherent throughout the apprenticeship training program as apprentices work towards achieving journeyperson status.
### Profile Chart

#### COMMON OCCUPATIONAL SKILLS

<table>
<thead>
<tr>
<th>RFG-100</th>
<th>RFG-105</th>
<th>RFG-110</th>
<th>RFG-115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Tools and Equipment</td>
<td>Kettles and Burners</td>
<td>Drawings</td>
</tr>
<tr>
<td>RFG-120</td>
<td>RFG-125</td>
<td>RFG-130</td>
<td>RFG-145</td>
</tr>
<tr>
<td>Communication and Trade Documentation</td>
<td>Hoisting, Lifting and Rigging</td>
<td>Access Equipment</td>
<td>Planning and Estimating</td>
</tr>
<tr>
<td>RFG-205</td>
<td>RFG-325</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Roofing Equipment</td>
<td>Job Planning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### ROOF PREPARATION

<table>
<thead>
<tr>
<th>RFG-140</th>
<th>RFG-210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Roof Structures</td>
<td>Roof Deck Preparation</td>
</tr>
</tbody>
</table>

#### LOW SLOPE AND FLAT ROOFING

<table>
<thead>
<tr>
<th>RFG-220</th>
<th>RFG-200</th>
<th>RFG-215</th>
<th>RFG-300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Slope and Flat Roofs</td>
<td>Fasteners, Adhesives, and Sealants</td>
<td>Roof Membrane Systems I</td>
<td>Roof Membrane Systems II</td>
</tr>
</tbody>
</table>

#### SHINGLES, TILES, AND PRE-FORMED METAL ROOFING

<table>
<thead>
<tr>
<th>RFG-135</th>
<th>RFG-305</th>
<th>RFG-315</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofing Materials</td>
<td>Steep Roofs</td>
<td>Metal Flashings</td>
</tr>
</tbody>
</table>

#### WATERPROOFING AND DAMP-PROOFING

<table>
<thead>
<tr>
<th>RFG-310</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterproofing and Damp-proofing</td>
</tr>
</tbody>
</table>

#### ROOF MAINTENANCE AND REPAIR

<table>
<thead>
<tr>
<th>RFG-320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof Maintenance and Repair</td>
</tr>
</tbody>
</table>
**Program Structure – Nova Scotia Apprenticeship Program**

The courses listed below are required technical training in the Nova Scotia Roofer Apprenticeship Program.

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Unit Name</th>
<th>Prerequisites</th>
<th>Sugg. Hrs</th>
<th>Pg #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1 (6 Weeks)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MENT-1801</td>
<td>Workplace Mentoring I (<em>NS Specific</em>)</td>
<td></td>
<td>Through-out 15</td>
<td></td>
</tr>
<tr>
<td>RFG-100</td>
<td>Safety</td>
<td>None</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>RFG-105</td>
<td>Tools and Equipment</td>
<td>25</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>RFG-110</td>
<td>Kettles and Burners</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>RFG-115</td>
<td>Drawings</td>
<td>20</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>RFG-120</td>
<td>Communication and Trade Documentation</td>
<td>10</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>RFG-125</td>
<td>Hoisting, Lifting and Rigging</td>
<td>15</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>RFG-130</td>
<td>Access Equipment</td>
<td>10</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>RFG-135</td>
<td>Roofing Materials</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>RFG-140</td>
<td>Introduction to Roof Structures</td>
<td>15</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>RFG-145</td>
<td>Planning and Estimating</td>
<td>30</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td><strong>Level 2 (6 Weeks)</strong></td>
<td></td>
<td>Level 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFG-200</td>
<td>Fasteners, Adhesives and Sealants</td>
<td>30</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>RFG-205</td>
<td>Mechanical Roofing Equipment</td>
<td>Level 1</td>
<td>15</td>
<td>39</td>
</tr>
<tr>
<td>RFG-210</td>
<td>Roof Deck Preparation</td>
<td>60</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>RFG-215</td>
<td>Roof Membrane Systems I</td>
<td>30</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>RFG-220</td>
<td>Low Slope and Flat Roofs</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td><strong>Level 3 (6 Weeks)</strong></td>
<td></td>
<td>Level 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MENT-1802</td>
<td>Workplace Mentoring II (<em>NS Specific</em>)</td>
<td>Through-out   49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFG-300</td>
<td>Roof Membrane Systems II</td>
<td>30</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>RFG-305</td>
<td>Steep Roofs</td>
<td>30</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>RFG-310</td>
<td>Waterproofing and Damp-Proofing</td>
<td>15</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>RFG-315</td>
<td>Metal Flashings</td>
<td>15</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>RFG-320</td>
<td>Roof Maintenance and Repair</td>
<td>30</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>RFG-325</td>
<td>Job Planning</td>
<td>15</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>RFG-1830</td>
<td>Program Review</td>
<td>30</td>
<td>62</td>
<td></td>
</tr>
</tbody>
</table>

**Nova Scotia Roofer Apprenticeship Program**: All units must be covered within the Level training.
## 2012 NOA Sub-task to Curriculum Standard Unit Comparison

<table>
<thead>
<tr>
<th>NOA Sub-task</th>
<th>PG Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 1 – Performs safety related functions.</strong></td>
<td></td>
</tr>
<tr>
<td>1.01 Uses personal protective equipment (PPE) and safety equipment.</td>
<td>RFG-100 Safety</td>
</tr>
<tr>
<td>1.02 Maintains safe work environment</td>
<td>RFG-100 Safety</td>
</tr>
<tr>
<td><strong>Task 2 – Maintains and uses tools and equipment.</strong></td>
<td></td>
</tr>
<tr>
<td>2.01 Maintains tools and equipment.</td>
<td>RFG-105 Tools and Equipment</td>
</tr>
<tr>
<td></td>
<td>RFG-110 Kettles and Burners</td>
</tr>
<tr>
<td>2.02 Uses hoisting, lifting and rigging equipment.</td>
<td>RFG-125 Hoisting, Lifting and Rigging</td>
</tr>
<tr>
<td>2.03 Uses motorized equipment.</td>
<td>RFG-205 Mechanical Roofing Equipment</td>
</tr>
<tr>
<td><strong>Task 3 – Perform common work practices and procedures.</strong></td>
<td></td>
</tr>
<tr>
<td>3.01 Interprets blueprints and drawings.</td>
<td>RFG-115 Drawings</td>
</tr>
<tr>
<td></td>
<td>RFG-325 Job Planning</td>
</tr>
<tr>
<td>3.02 Estimates material.</td>
<td>RFG-145 Planning and Estimating</td>
</tr>
<tr>
<td></td>
<td>RFG-325 Job Planning</td>
</tr>
<tr>
<td>3.03 Assesses worksite conditions.</td>
<td>RFG-145 Planning and Estimating</td>
</tr>
<tr>
<td></td>
<td>RFG-325 Job Planning</td>
</tr>
<tr>
<td>3.04 Communicates with others.</td>
<td>RFG-120 Communication and Trade Documentation</td>
</tr>
<tr>
<td></td>
<td>RFG-125 Hoisting, Lifting and Rigging</td>
</tr>
<tr>
<td></td>
<td>RFG-325 Job Planning</td>
</tr>
<tr>
<td>3.05 Accesses work area.</td>
<td>RFG-130 Access Equipment</td>
</tr>
<tr>
<td>3.06 Positions equipment and material on the ground and on the roof.</td>
<td>RFG-110 Kettles and Burners</td>
</tr>
<tr>
<td></td>
<td>RFG-125 Hoisting, Lifting and Rigging</td>
</tr>
<tr>
<td></td>
<td>RFG-145 Planning and Estimating</td>
</tr>
<tr>
<td></td>
<td>RFG-205 Mechanical Roofing Equipment</td>
</tr>
<tr>
<td>3.07 Prepares material disposal system.</td>
<td>RFG-145 Planning and Estimating</td>
</tr>
<tr>
<td><strong>Task 4 – Prepares roof for replacement.</strong></td>
<td></td>
</tr>
<tr>
<td>4.01 Protects surrounding area.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>4.02 Removes loose debris.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>4.03 Removes roofing and flashing.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>4.04 Prepares roof substrate.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>4.05 Performs minor adjustments to penetrations, curbs, and parapets.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>4.06 Installs water cut-offs, temporary seals, and temporary drains.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td><strong>Task 5 – Prepares deck for roof installation.</strong></td>
<td></td>
</tr>
<tr>
<td>5.01 Inspects deck.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>5.02 Cleans deck.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>5.03 Verifies placement of roof penetrations, curbs, and parapets.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td>5.04 Dries deck.</td>
<td>RFG-210 Roof Deck Preparation</td>
</tr>
<tr>
<td><strong>Task 6 – Applies roofing components</strong></td>
<td></td>
</tr>
<tr>
<td>6.01 Installs leveling surface</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>NOA Sub-task</td>
<td>PG Unit</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>6.02 Primes substrate.</td>
<td>RFG-200 Fasteners, Adhesives and Sealants</td>
</tr>
<tr>
<td>6.03 Applies vapour retarder, vapour barrier and air barrier.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>6.04 Installs insulation.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>6.05 Installs cover board.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>6.06 Installs drains, vents, curbs and penetrations.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>6.07 Applies ballast, walkways, and protective surfaces.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>6.08 Installs metal flashings.</td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td><strong>Task 7 – Applies membranes.</strong></td>
<td></td>
</tr>
<tr>
<td>7.01 Relaxes membranes.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.02 Sets membranes.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.03 Applies membranes using hot-liquid process.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.04 Applies membranes using torched-on method.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.05 Applies membranes using hot-air welding.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td></td>
<td>RFG-200 Fasteners, Adhesives and Sealants</td>
</tr>
<tr>
<td>7.06 Applies membranes using cold process.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.07 Applies membranes using mechanical fasteners.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td></td>
<td>RFG-200 Fasteners, Adhesives and Sealants</td>
</tr>
<tr>
<td>7.08 Applies loose-laid membranes.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td>7.09 Installs membrane flashings.</td>
<td>RFG-215 Roof Membrane Systems I</td>
</tr>
<tr>
<td></td>
<td>RFG-300 Roof Membrane Systems II</td>
</tr>
<tr>
<td><strong>Task 8 – Performs common steep slope practices.</strong></td>
<td></td>
</tr>
<tr>
<td>8.01 Installs steep slope underlayment.</td>
<td>RFG-305 Steep Roofs</td>
</tr>
<tr>
<td>8.02 Installs attic vent flashings.</td>
<td>RFG-305 Steep Roofs</td>
</tr>
<tr>
<td>8.03 Installs valley treatments.</td>
<td>RFG-305 Steep Roofs</td>
</tr>
<tr>
<td>8.04 Installs saddles/crickets.</td>
<td>RFG-305 Steep Roofs</td>
</tr>
<tr>
<td>8.05 Installs metal flashings for steep slope roofs.</td>
<td>RFG-305 Steep Roofs</td>
</tr>
<tr>
<td></td>
<td>RFG-315 Metal Flashings</td>
</tr>
<tr>
<td><strong>Task 9 – Applies shingles.</strong></td>
<td></td>
</tr>
<tr>
<td>9.01 Determines layout of shingles.</td>
<td>RFG-135 Roofing Materials</td>
</tr>
<tr>
<td></td>
<td>RFG-220 Low Slope and Flat Roofs</td>
</tr>
<tr>
<td>NOA Sub-task</td>
<td>PG Unit</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>RFG-305 Steep Roofs</td>
</tr>
</tbody>
</table>
| 9.02 Installs starter strips. | RFG-135 Roofing Materials  
|  | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 9.03 Fastens shingles. | RFG-135 Roofing Materials  
|  | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 9.04 Cuts shingles. | RFG-135 Roofing Materials  
|  | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 9.05 Tabs shingles. | RFG-135 Roofing Materials  
|  | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| **Task 10 – Applies roof tiles.** | |
| 10.01 Installs strapping. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 10.02 Fastens roof tiles. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 10.03 Cuts roof tiles. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 10.04 Installs closure strips. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 10.05 Seals ridge and hip caps. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| **Task 11 – Applies pre-formed metal roofing.** | |
| 11.01 Installs strapping for pre-formed metal roofing. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 11.02 Fastens pre-formed metal roofing. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 11.03 Cuts sheet metal | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 11.04 Installs closure strips for pre-formed metal roofing. | RFG-220 Low Slope and Flat Roofs  
|  | RFG-305 Steep Roofs |
| 11.05 Installs snow guards. | RFG-220 Low Slope and Flat Roofs  
<p>|  | RFG-305 Steep Roofs |
| <strong>Task 12 – Waterproofs surfaces.</strong> | |
| 12.01 Prepares waterproofing substrates | RFG-310 Waterproofing and Damp-proofing |
| 12.02 Applies waterproofing membrane. | RFG-310 Waterproofing and Damp-proofing |
| 12.03 Installs green, sustainable, vegetative and, protected membrane components. | RFG-310 Waterproofing and Damp-proofing |</p>
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MENT-1801  Workplace Mentoring I
(Nova Scotia Unit of Instruction)

Learning Outcomes:
- Identify and explain strategies for learning workplace skills.
- Demonstrate strategies to assist in learning skills in the workplace.

Objectives and Content:
1. Describe the importance of your own experiences.
2. Identify the partners involved in apprenticeship.
3. Describe the shared responsibilities for workplace learning.
4. Determine your own learning preferences and explain how these relate to learning new skills.
5. Describe the importance of different types of skills in the workplace.
6. Describe the importance of essential skills in the trade.
7. Identify different ways of learning.
8. Identify your learning preferences.
9. Identify different learning needs and strategies to meet learning needs.
10. Identify techniques for effective communication.
11. Identify strategies to assist in learning a skill.

Resource:
- Recommended resource to use in the delivery of this unit: www.apprenticeship.nscc.ca/mentoring/apprentice.htm
RFG-100        Safety

Learning Outcomes:

- Demonstrate knowledge of safety and personal protective equipment, their applications and procedures for use.
- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulations pertaining to safety.

National Occupational Analysis Reference:

1.01 Uses personal protective equipment (PPE) and safety equipment.
1.02 Maintains safe work environment.

Suggested Hours

20 hours

Objectives and Content:

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

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

3. Identify types of safety equipment and describe their applications.
   i) warning lines
   ii) guard rails
   iii) fire extinguishers
   iv) first aid kits

4. Describe the procedures used to operate safety equipment.

5. Identify hazards and describe safe work practices and equipment.
   i) personal
      - falls
      - personal apparel
      - disease
      - burns
- lacerations
- weather
- lifting

ii) workplace
- fire
- electrical
- confined space (awareness of)
- lockout/tag out
- heights
- spills
- faulty equipment
- debris
- obstructions
- hazardous/flammable material
- weather
- asbestos

iii) environmental

6. Identify classes of fire and describe fire control equipment and procedures.

7. Identify and interpret workplace safety and health regulations.
   i) federal
      - Occupational Health and Safety Regulations
      - Workplace Hazardous Material Information System (WHMIS)
   ii) provincial
   iii) municipal

8. Describe the procedures used to protect the public and work areas.
   i) warning lines and barricades
   ii) signage
   iii) tarps and protective coverings

9. Describe the importance of good housekeeping practices.
RFG-105  Tools and Equipment

Learning Outcomes:

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

National Occupational Analysis Reference:

2.01 Maintains tools and equipment.

Suggested Hours:

25 hours

Objectives and Content:

1. Define terminology associated with roofing tools and equipment.

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

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

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

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

6. Identify types of power tools and equipment and describe their applications and procedures for use.
   i) electric/battery
   ii) pneumatic
   iii) stationary
7. Describe the procedures used to inspect, maintain and store power tools and equipment.

8. Identify types of powder-actuated tools and equipment and describe their applications.

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

10. Describe the procedures used to inspect, maintain and store measuring and layout tools and equipment.
RFG-110    Kettles and Burners

Learning Outcomes:

- Demonstrate knowledge of kettles and burners and their applications.
- Demonstrate knowledge of the procedures to set up and operate kettles and burners.
- Demonstrate knowledge of fire and torch safety.

National Occupational Analysis Reference:

1.02 Maintains safe work environment.
2.01 Maintains tools and equipment.
3.06 Positions equipment and material on the ground and on roof.

Suggested Hours:

20 hours

Objectives and Content:

1. Define terminology associated with kettles and burners.

2. Identify hazards and describe safe working practices pertaining to kettles and burners.

3. Identify regulations and standards pertaining to kettles and burners.
   i) training and certification
   ii) handling and storage

4. Identify types of tools and equipment related to kettles and burners and describe their applications and procedures for use.

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

6. Describe the procedures used to set-up and operate kettles.

7. Describe the procedures used to inspect, maintain and store kettles.
8. Identify types of propane and describe their applications.
   i) liquid
   ii) vapour

9. Describe the procedures used to connect and disconnect burner.

10. Describe the procedures used to monitor propane pressure and adjust burner flame.

11. Describe the procedures used to inspect, maintain and store propane.

12. Identify types of burners and describe their applications and procedures for use.

13. Identify the components of a torch assembly.

14. Describe the procedures used to set-up and operate burners.

15. Describe the procedures used to inspect, maintain and store burners.

16. Identify the elements of a comprehensive pre-job inspection.

17. Identify safe torching techniques and describe their associated procedures.

18. Describe the procedures used to perform a post-job fire watch.
RFG-115  Drawings

Learning Outcomes:
- Demonstrate knowledge of drawings and their use.
- Demonstrate knowledge of the procedures to interpret and extract information from drawings.
- Demonstrate knowledge of basic mathematical calculations.
- Demonstrate knowledge of basic sketching techniques.

National Occupational Analysis Reference:
3.01 Interprets blueprints and drawings.

Suggested Hours:
20 hours

Objectives and Content:
1. Define terminology associated with drawings.
2. Describe metric and imperial systems of measurement.
3. Perform basic mathematical calculations.
   i) whole numbers
   ii) decimals
   iii) fractions
   iv) ratios
4. Perform conversions.
   i) metric to imperial
   ii) imperial to metric
   iii) fractions to decimals
   iv) decimals to fractions
5. Identify types of drawings and describe their applications.
   i) architectural
   ii) mechanical
   iii) structural
   iv) electrical
v) shop/detail drawings
vi) sketches

6. Identify drawing related documentation and describe their applications.
i) change orders
ii) addendums
iii) as-builts
iv) specifications

7. Identify drawing projections and views and describe their applications.
i) projections
   - orthographic
   - oblique
   - isometric
ii) views
   - elevation
   - cross section
   - plan
   - detail

8. Interpret information found on drawings.
i) lines
ii) legend
iii) symbols and abbreviations
iv) notes and specifications
v) schedules
vi) scales

9. Demonstrate basic sketching techniques.
RFG-120 Communication and Trade Documentation

Learning Outcomes:

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

National Occupational Analysis Reference:

3.04 Communicates with others.

Suggested Hours:

10 hours

Objectives and Content:

1. Describe the importance of effective verbal and non-verbal communication on the job.
   i) other tradespersons
   ii) colleagues
   iii) supervisors
   iv) clients
   v) general public

2. Explain the coaching and mentoring relationship between journeyperson and apprentice.

3. Identify methods and tools used for communication on the job.

4. Identify types of trade related documentation and describe their applications and procedures for use.
   i) manufacturers’ specifications
   ii) codes and standards
      - National Building Code (NBC)
      - provincial/municipal codes
      - Canadian Standards Association (CSA)
   iii) environmental protection regulations and guidelines
   iv) energy efficiency guides
   v) safety manuals
   vi) written emergency procedures
vii) permits
ix) technical and advisory bulletins
x) work orders
Learning Outcomes:

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

National Occupational Analysis Reference:

2.02 Uses hoisting, lifting and rigging equipment.
3.04 Communicates with others.
3.06 Positions equipment and material on the ground and on the roof.

Suggested Hours:

15 hours

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. Interpret regulations pertaining to hoisting, lifting and rigging.

4. Identify types of hoisting and lifting equipment and accessories, and describe their applications, limitations and procedures for use.
   i) A-frame (swing boom hoist)
   ii) monorail (trolley track hoist)
   iii) hand hoist
   iv) ladder
      a. hydraulic

5. Describe the procedures used to assemble and disassemble hoist frames and their components.
6. Identify types of rigging equipment and accessories, and describe their applications, limitations and procedures for use.
   i) slings
   ii) cables
   iii) hooks
   iv) shackles
   v) spreader bars
   vi) chain hoists
   vii) pins
   viii) chokers
   ix) block and tackle
   x) come-alongs
   xi) ropes

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 associated procedures.

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

10. Identify the methods of communication used during hoisting, lifting and rigging operations and describe their associated procedures.
    i) hand signals
    ii) electronic communications

11. Perform hand signals associated with basic hoisting, lifting and rigging operations.
RFG-130 Access Equipment

Learning Outcomes:

- Demonstrate knowledge of access equipment, their applications and procedures for use.
- Demonstrate knowledge of the procedures used to erect and secure temporary access structures.

National Occupational Analysis Reference:

3.05 Accesses work area.

Suggested Hours

10 hours

Objectives and Content:

1. Define terminology associated with access equipment.

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

3. Interpret codes and regulations pertaining to access equipment.
   i) heights
   ii) weights
   iii) distances
   iv) sizes

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

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

6. Identify types of access equipment and describe their characteristics and applications.
   i) Scaffolds
   ii) Ladders
   iii) Work platforms
iv) Hydraulic lifts  
   - Scissor lifts  
   - Man lifts  

7. Describe considerations for installing and securing access equipment.  
   i) codes and regulations  
   ii) site conditions  
   iii) manufacturers’ specifications and instructions  

8. Describe the procedures used to erect, secure and dismantle temporary access structures.  

9. Describe the procedures used to inspect, maintain and store access equipment.
RFG-135  Roofing Materials

Learning Outcomes:

- Demonstrate knowledge of roofing materials, their characteristics and applications.

National Occupational Analysis Reference:

Refers to many sub-tasks throughout the NOA.

Suggested Hours

30 hours

Objectives and Content:

1. Define terminology associated with roofing materials.

2. Identify hazards and describe safe work practices pertaining to roofing materials.

3. Interpret codes and regulations pertaining to roofing materials.

4. Interpret information pertaining to roofing materials found on drawings and specifications.

5. Identify types of low slope/flat roofing materials and describe their characteristics and applications.
   i) asphalt
      - # 1
      - # 2
      - # 3
   ii) felts
       - Organic
       - Inorganic
   iii) coal tar saturated

6. Identify types of insulation and describe their characteristics and applications.
   i) fibreboard
ii) fibreglass
iii) close cell extruded (polystyrene)
iv) expanded polystyrene (bead board)
v) polyisocyanurate

7. Identify types of cold process materials and describe their characteristics and applications.
i) mastics
ii) asphalt
   - primer
   - emulsions
   - cut backs
iii) roof coatings

8. Identify types of steep-roof materials and describe their characteristics and applications.
i) asphalt shingles
   - three-tab self-sealing
   - interlocking
   - architectural shingles
ii) split-wood shakes
   - hand split re-sawn
   - straight split
   - taper split
iii) clay tiles
   - spanish
   - mission
iv) concrete tiles
v) slate
vi) metal tiles
vii) metal shingles

9. Identify types of single-ply materials and describe their characteristics and applications.
i) Ethylene propylene diene monomer (EPDM)
ii) Polyvinyl chloride (PVC) systems
iii) modified bitumen membranes
   - hot mopped
   - torch applied
   - self-adhered
iv) Thermoplastic polyolefin (TPO)

10. Identify types of roof coatings and describe their characteristics and applications.
i) fibrated
ii) non-fibrated
iii) rubberized
RFG-140  Introduction to Roof Structures

Learning Outcomes:

- Demonstrate knowledge of roof structures and designs.
- Demonstrate knowledge of basic roof slope calculations.

National Occupational Analysis Reference:

Refers to many sub-tasks throughout the NOA.

Suggested Hours

15 hours

Objectives and Content:

1. Define terminology associated with roof structures.

2. Identify types of roof structures and designs.
   i) low slope / flat
   ii) steep

3. Describe roof structural components and accessories and describe their characteristics and applications.
   i) trusses and rafters
   ii) beams
   iii) ridges
   iv) valleys
   v) eaves
   vi) edges
   vii) decking
   viii) insulation
   ix) flashing
   x) crickets

4. Describe roof slopes.
   i) ratio/pitch
   ii) rise to run
   iii) slope percentage
RFG-145 Planning and Estimating

Learning Outcomes:

- Demonstrate knowledge of planning requirements and procedures.
- Demonstrate knowledge of estimating quantities of material.
- Demonstrate knowledge of job-site preparation.

National Occupational Analysis Reference:

3.01 Interprets blueprints and drawings
3.02 Estimates materials.
3.03 Assesses worksite conditions
3.06 Positions equipment and material on the ground and on the roof.
3.07 Prepares material disposal systems.

Suggested Hours

30 hours

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) assess worksite conditions and safety
   ii) select tools, equipment and materials for task
   iii) identify accessibility to onsite utilities
   iv) identify waste management procedures

3. Estimate material requirements.
   i) convert between metric and imperial measurements
   ii) calculate area and lineal measurements
   iii) calculate material coverage to manufacturers’ specifications
   iv) calculate volume and weight of old materials for disposal
4. Describe the procedures used to receive and document receipt of materials and supplies on-site.

5. Describe the procedures used to organize and store tools, equipment and materials on-site.
   i) load/unload truck and sort materials and supplies
   ii) position equipment and materials on roof
       - weight distribution
       - strategic sequence
   iii) secure and cover equipment and materials on roof and ground
Level 2
RFG-200  Fasteners, Adhesives and Sealants

Learning Outcomes:

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

National Occupational Analysis Reference:

Refers to many sub-tasks throughout the NOA.

Suggested Hours:

30 hours

Objectives and Content:

1. Define terminology associated with fasteners, adhesives and sealants.
2. Identify hazards and describe safe work practices pertaining to fasteners, adhesives and sealants.
3. Interpret codes and specifications pertaining to the use of fasteners, adhesives and sealants.
4. Identify tools and equipment relating to fasteners, adhesives and sealants and describe their applications and procedures for use.
   i) powder-actuated
5. Identify types of fasteners and describe their characteristics and applications.
   i) nails
      - screws
      - bolts
      - clips
      - plates
      - anchors
6. Describe the procedures used to install and remove fasteners.

7. Identify types of adhesives and describe their characteristics and applications.
   i) contact cement
   ii) seam tape
   iii) primer
   iv) two-part
   v) solvent
   vi) water-based

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

9. Identify types of sealants and describe their characteristics and applications.
   i) mastic
   ii) caulking

10. Describe the procedures used to apply and remove sealants.
RFG-205  Mechanical Roofing Equipment

Learning Outcomes:

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

National Occupational Analysis Reference:

2.03 Uses motorized equipment.
3.06 Positions equipment and material on the ground and on the roof.

Suggested Hours

15 hours

Objectives and Content:

1. Define terminology associated with mechanical roofing equipment.

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

3. Interpret regulations pertaining to mechanical roofing equipment.

4. Identify types of mechanical equipment and describe their applications and procedures for use.
   i) skid steer loader
   ii) sweepers
   iii) spreaders
       - asphalt
       - gravel
   iv) roof cutters
   v) roof rippers
   vi) roof planers
   vii) power buggies
   viii) mini mopper
   ix) spudders
   x) automated seamer
   xi) felt layers
5. Describe the procedures used to inspect, maintain and store mechanical equipment.
RFG-210       Roof Deck Preparation

Learning Outcomes:

- Demonstrate knowledge of roof deck components and their applications.
- Demonstrate knowledge of the procedures used to prepare a roof deck for replacement.
- Demonstrate knowledge of the procedures used to prepare a roof deck for new installation.

National Occupational Analysis Reference:

4.01 Protects surrounding area.
4.02 Remove loose debris.
4.03 Remove roofing and flashings.
4.04 Prepares roof substrate.
4.05 Performs minor adjustments to penetrations, curbs and parapets.
4.06 Installs water cut-offs, temporary seals and temporary drains.
5.01 Inspects deck.
5.02 Cleans deck.
5.03 Verifies placement of roof penetrations, curbs and parapets.
5.04 Dries deck.

Suggested Hours:

60 hours

Objectives and Content:

1. Define terminology associated with roof deck preparation.

2. Identify hazards and describe safe work practices pertaining to roof deck preparation.

3. Interpret codes and regulations pertaining to roof deck preparation.

4. Interpret information pertaining to roof deck preparation found on drawings and specifications.

5. Identify tools and equipment relating to roof deck preparation and describe their applications and procedures for use.
6. Identify types of roof decks and describe their characteristics and applications.
   i) wood
      - sawed lumber
      - planks
      - plywood/oriented strand board (OSB) sheathing
      - wood tongue and groove
   ii) steel
      - corrugated metal
      - cold-rolled
   iii) concrete
      - precast
      - pre-stressed
      - poured in place
      - light weight concrete fill

7. Identify types of roof deck components and describe their purpose and applications.
   i) leveling surface
   ii) vapour barrier
   iii) insulation
   iv) cover board

8. Identify types of water cut-offs and describe their applications.
   i) temporary
   ii) permanent

9. Describe the procedures used to prepare a roof for replacement.
   i) assess and protect surrounding area
   ii) remove loose debris
   iii) remove damaged or deteriorated roofing
   iv) remove flashings
   v) prepare roof substrate
   vi) perform minor adjustments to height of penetrations and parapets
   vii) install water cut-offs, temporary seals and temporary drains
   viii) clean up and dispose of waste

10. Describe the procedures used to prepare a deck for new roof installation.
    i. inspect deck
    ii. clean deck
    iii. verify placement of roof penetrations, curbs and parapets

11. Describe factors to be considered when preparing a deck in the winter.
RFG-215  Roof Membrane Systems I

Learning Outcomes:

- Demonstrate knowledge of roof membranes and their applications.
- Demonstrate knowledge of the procedures to install BUR roof membrane systems.
- Demonstrate knowledge of the procedures used to install cold process roof membranes.
- Demonstrate knowledge of the procedures used to install hot rubberized roof membranes.
- Demonstrate knowledge of the procedures to install membrane flashings.

National Occupational Analysis Reference:

7.01  Relaxes membranes.
7.02  Sets membranes.
7.03  Applies membranes using hot-liquid process.
7.04  Applies membranes using torched-on method.
7.05  Applies membranes using hot-air welding.
7.06  Applies membranes using cold process.
7.07  Applies membranes using mechanical fasteners.
7.09  Applies membrane flashings.

Suggested Hours

30 hours

Objectives and Content:

1. Define terminology associated with roof membranes.
2. Identify hazards and describe safe work practices pertaining to roof membranes.
3. Interpret codes and regulations pertaining to roof membranes.
4. Interpret information pertaining to roof membranes found on drawings and specifications.
5. Identify tools and equipment relating to roof membranes and describe their applications and procedures for use.

6. Identify roof membrane systems and describe their applications.
   i) built up roof (BUR)
   ii) cold process roof
   iii) hot rubberized roofing

7. Describe procedures used to install roof membrane systems.
   i) cold process
   ii) hot liquid process

8. Describe the procedures used to install membrane flashings.
RFG-220   Low Slope and Flat Roofs

Learning Outcomes:

- Demonstrate knowledge of low slope and flat roofs and their components.
- Demonstrate knowledge of the procedures to install low slope and flat roof components.

National Occupational Analysis Reference:

6.01 Installs leveling surface.
6.02 Primes substrate.
6.03 Applies vapour retarder, vapour barrier and air barrier.
6.04 Installs insulation.
6.05 Installs cover board.
6.06 Installs drains, vents, curbs and penetrations.
6.07 Applies ballast, walkways and protective surfaces.
6.08 Installs metal flashings.

Suggested Hours

45 hours

Objectives and Content:

1. Define terminology associated with low slope and flat roofs (built-up roofing).
2. Identify hazards and describe safe work practices pertaining to low slope and flat roofs.
3. Interpret codes and regulations pertaining to low slope and flat roofs.
4. Interpret information pertaining to low slope and flat roofs found on drawings and specifications.
5. Identify tools and equipment pertaining to the installation of low slope and flat roof components and describe their applications and procedures for use.
6. Identify types of low slope and flat roofs and describe their characteristics and applications.
   i) inverted roof membrane assembly (IRMA)
   ii) smooth
   iii) cold process

7. Identify low slope and flat roof components and describe their characteristics and applications.
   i) levelling surface
      - gypsum products
      - sheeting boards
   ii) primers
      - water-based
      - solvent-based
   iii) vapour retarders, vapour barriers and air barriers
   iv) insulations
      - polystyrene (expanded and extruded)
      - polyisocyanurate
      - fibreglass
   v) cover board
      - wood fibre
      - asphalt-impregnated
      - asphalt-coated
      - plain
      - asphalt core boards
   vi) drains, vents, curbs and penetrations
   vii) ballasts, walkways and protective surfaces
   viii) flashings
      - self-adhesive
      - modified bitumen
      - felt

8. Identify materials used in low slope and flat roof installation.
   i) asphalts
   ii) hot rubberized roofing
   iii) adhesives
   iv) felts
      - organic
      - glass

8. Calculate material requirements.

10. Identify methods used to install low slope and flat roof components and describe their associated procedures.
i) cold process
   - cutbacks
   - emulsions

ii) asphalt

iii) hot rubberized
Level 3
Learning Outcomes:

- Identify and explain strategies for teaching workplace skills.
- Demonstrate strategies to assist in teaching skills in the workplace

Objectives and Content:

1. Describe the impact of your own experiences in teaching skills.
2. Identify the different roles played by a workplace mentor.
3. Describe the six-step approach to teaching skills.
4. Explain the importance of identifying the point of the lesson.
5. Identify how to choose a good time to present a lesson.
6. Explain the importance of linking the lessons.
7. Identify the components of the skill (the context).
8. Describe considerations for demonstrating a skill.
9. Identify types of skill practice.
10. Describe considerations in setting up opportunities for skill practice.
11. Explain the importance of providing feedback.
12. Identify techniques for giving effective feedback.
15. Explain how to adjust a lesson to different situations.

Resource:

- Recommended resource to use in the delivery of this unit: www.apprenticeship.nscc.ca/mentoring/apprentice.htm
RFG-300  Roof Membrane Systems II

Learning Outcomes:

- Demonstrate knowledge of the procedures to install thermoset roof membranes.
- Demonstrate knowledge of the procedures to install thermoplastic roof membranes.
- Demonstrate knowledge of the procedures to install modified bitumen roof membranes.

National Occupational Analysis Reference:

7.01 Relaxes membranes.
7.02 Sets membranes.
7.03 Applies membranes using hot-liquid process.
7.04 Applies membranes using torched-on method.
7.05 Applies membranes using hot-air welding.
7.06 Applies membranes using cold process.
7.07 Applies membranes using mechanical fasteners.
7.08 Applies loose-laid membranes.
7.09 Applies membrane flashings.

Suggested Hours

30 hours

Objectives and Content:

1. Define terminology associated with roof membranes.
2. Identify hazards and describe safe work practices pertaining to roof membranes.
3. Interpret codes and regulations pertaining to roof membranes.
4. Interpret information pertaining to roof membranes found on drawings and specifications.
5. Identify tools and equipment relating to roof membranes and describe their applications and procedures for use.
6. Identify types of roof membrane systems and describe their applications.
   i) thermoset
   ii) thermoplastic
   iii) modified bitumen

7. Describe the procedures used to install roof membrane systems.
   i) torched-on
   ii) loose-laid and ballasted
   iii) fully adhered
   iv) mechanically attached

8. Describe the procedures used to secure and seal seams.
   i) hot-air welding
   ii) adhesives
   iii) splice tape

9. Describe the procedures used to install membrane flashings.
RFG-305  Steep Roofs

Learning Outcomes:
- Demonstrate knowledge of steep roofs and their components.
- Demonstrate knowledge of the procedures to install steep roof components.
- Demonstrate knowledge of the procedures to install, repair and replace roof coverings.

National Occupational Analysis Reference:
8.01 Installs steep slope underlayment
8.02 Installs attic vent flashings
8.03 Installs valley treatments
8.04 Installs saddles/crickets
8.05 Installs metal flashings for steep slope roofs

Suggested Hours
30 hours

Objectives and Content:
1. Define terminology associated with steep roofs.
2. Identify hazards and describe safe work practices pertaining to steep roofs.
3. Interpret codes and regulations pertaining to steep roofs.
4. Interpret information pertaining to steep roofs found on drawings and specifications.
5. Identify tools and equipment relating to the installation of steep roof components and describe their applications and procedures for use.
6. Identify steep roof components and describe their characteristics and applications.
   i) underlayment
   ii) attic vent flashings
iii) valley treatments
iv) saddles/crickets
v) metal flashings

7. Identify types of roof coverings and describe their characteristics and applications.
i) shingles
   - interlocking
   - metal
   - asphalt
ii) shakes
   - cedar
   - metal
iii) tiles
   - clay
   - metal
   - concrete
   - slate
iv) pre-formed metal sheets
v) recycled products

8. Identify materials used in steep roof installation.
i) adhesives
ii) fasteners
iii) starter and closure strips
iv) ridge and hip caps
v) snow guards

9. Calculate material requirements.

10. Identify methods used to install steep roof components and describe their associated procedures.

11. Describe procedures used to install, repair and replace roof coverings.
RFG-310  

**Waterproofing and Damp-Proofing**

**Learning Outcomes:**

- Demonstrate knowledge of waterproofing and damp-proofing and their applications.
- Demonstrate knowledge of the procedures to waterproof and damp-proof.

**National Occupational Analysis Reference:**

12.01 Prepares waterproofing substrates
12.02 Applies waterproofing membrane
12.03 Installs green, sustainable, vegetative and protected membrane components
13.01 Applies coatings
13.02 Applies protection layer

**Suggested Hours**

15 hours

**Objectives and Content:**

1. Define terminology associated with waterproofing and damp-proofing.

2. Identify hazards and describe safe work practices pertaining to waterproofing and damp-proofing.

3. Interpret codes and regulations pertaining to waterproofing and damp-proofing.

4. Interpret information pertaining to waterproofing and damp-proofing found on drawings and specifications.

5. Identify tools and equipment pertaining to waterproofing and damp-proofing, and describe their applications and procedures for use.

6. Identify types of surfaces to be waterproofed and describe their characteristics.
   i) wood
ii) concrete
iii) cinder blocks

7. Identify types of waterproofing components and describe their characteristics and applications.
i) primers
ii) insulations
iii) membranes

8. Describe the procedures used to inspect and prepare wall or deck surfaces for waterproofing.

9. Describe the procedures used to install waterproofing membrane.

10. Describe the procedures used to install protection board.

11. Identify types of damp-proof coatings and describe their applications.
i) single
ii) multi-coat

12. Identify types of primers and describe their applications.
i) water-based
ii) solvent-based

13. Describe the procedures used to apply primers.

14. Identify the methods used to apply coatings and describe their associated procedures.
i) spraying
ii) brushing
iii) rolling
iv) trowelling
RFG-315  Metal Flashings

Learning Outcomes:

- Demonstrate knowledge of metal flashings and their applications.
- Demonstrate knowledge of the procedures to fabricate and install metal flashings.

National Occupational Analysis Reference:

8.05 Installs metal flashings for steep slope roofs

Suggested Hours

15 hours

Objectives and Content:

1. Define terminology associated with metal flashings.

2. Identify hazards and describe safe work practices pertaining to metal flashings.

3. Interpret codes and regulations pertaining to metal flashings.

4. Interpret information pertaining to metal flashings found on drawings and specifications.

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

6. Explain the principles of watershed design.

7. Identify types of metal flashings and describe their characteristics and applications.
   i) aluminum
   ii) copper
   iii) stainless steel
   iv) pre-painted steel
   v) galvanized
8. Calculate flashing material requirements.

9. Describe the procedures used to fabricate and install metal flashings.
RFG-320  
**Roof Maintenance and Repair**

**Learning Outcomes:**

- Demonstrate knowledge of the procedures to inspect, maintain and repair roofs.
- Demonstrate knowledge of roof preventive maintenance procedures.

**National Occupational Analysis Reference:**

14.01 Performs roof inspections  
14.02 Performs cut test  
14.03 Determines maintenance or repair required  
15.01 Maintains drains and scuppers  
15.02 Refills penetration pockets  
15.03 Replaces deteriorated caulking  
15.04 Repairs membrane defects  
15.05 Reapplies surfacing and ballast to bare areas  
15.06 Repairs steep roofing defects  
15.07 Re-secures loose metal flashing

**Suggested Hours**

30 hours

**Objectives and Content:**

1. Define terminology associated with roof maintenance and repair.

2. Identify hazards and describe safe work practices pertaining to roof maintenance and repair.

3. Interpret codes and regulations pertaining to roof maintenance and repair.

4. Interpret information pertaining to roof maintenance and repair found on drawings and specifications.

5. Identify tools and equipment relating to the maintenance and repair of roofs and describe their applications and procedures for use.
6. Describe the procedures used to assess roof conditions and identify defects.
   i) inspection
   ii) cut test

7. Identify common defects and failures in roof membranes and decks and describe the procedures used to correct them.
   i) bleeding
   ii) deterioration
   iii) irregularities
   iv) deflection of deck
   v) uncured concrete
   vi) corrosion

8. Describe procedures used to repair roofs.
   i) BUR
   ii) cold process
   iii) modified bitumen
   iv) thermoset
   v) thermoplastic
   vi) steep roofs

RFG-325 Job Planning

Learning Outcomes:

- Demonstrate knowledge of the procedures used to plan and organize jobs.

National Occupational Analysis Reference:

3.01 Interprets blueprints and drawings
3.02 Estimates material
3.03 Assesses worksite conditions
3.04 Communicates with others
3.06 Positions equipment and materials

Suggested Hours

15 hours

Objectives and Content:

1. Compile information relevant to job planning.
   i) documentation
      - specifications
      - regulations
      - reference materials
   ii) drawings
   iii) related professionals
   iv) clients
   v) maintenance and inspection reports

2. Identify considerations for determining job requirements and describe their associated procedures.
   i) hazard and environmental assessment
   ii) personnel
   iii) tools and equipment
   iv) materials
   v) waste management
   vi) permits and documentation
3. Describe the procedures used to plan jobs.
   i) scheduling
   ii) estimating
   iii) documenting and reporting

4. Describe the procedures used to organize and store tools, equipment and materials on-site.
RFG-1830 Program Review
(Nova Scotia Unit of Instruction)

Learning Outcomes:
- Upon successful completion of this unit, the apprentice will complete a study plan based on the National Occupational Analysis.

Objectives and Content:
1. Identify areas of the program where knowledge of theory is weakest.
2. Identify areas where workplace experience is lacking or weak.
3. Identify resources necessary to address areas of shortfall.
4. Identify timelines to address areas of weakness.

Suggested Learning Activities:
1. Conduct a mock certification exam to be used for diagnostic purposes.
2. Review the National Occupational Analysis.
3. Review the Apprentice Logbook.
4. Review the Exam Preparation information found at www.nsapprenticeship.ca under Quick Links, Exam Preparation.
5. Conduct a final mock certification exam.

Resources:
These are the recommended resources to use in the delivery of this unit:
- Exam Preparation information, including videos, occupational analyses, exam counseling sheets, practice exams and sample questions, and other study materials and resources, can be found at www.nsapprenticeship.ca under Quick Links, Exam Preparation.
- Apprentice’s personal logbook
- Applicable codes and regulations
- Program texts

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