ATRF-1040: STEEP SLOPE ROOFING II

Cuyahoga Community College

Viewing: ATRF-1040 : Steep Slope Roofing II

Board of Trustees:
January 2025

Academic Term:
Spring 2025

Subject Code
ATRF - Applied Industrial Technology - Roofing

Course Number:
1040

Title:
Steep Slope Roofing II

Catalog Description:
Covers installation techniques for residential and small commercial roofing. Includes deck inspection and preparation, ventilation, underlayment application, flashing installation, and shingle installation.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Departmental approval: admission to Roofer's Apprenticeship program.

Outcomes

Course Outcome(s):
Prepare job site for installation of a steep slope roof.

Objective(s):
1. Determine what weather conditions in job site area affect the steep slope roof system.
2. Describe what condensation is, explain why it is a problem, and take measures to prevent condensation on a steep slope roof.
3. Describe what an ice dam is, the problems caused by ice dams, and how to prevent them.
4. Describe what electrolysis, the problems caused by electrolysis, and how to prevent them.
5. Determine if a deck is ready for steep slope roofing.
6. Identify the different types of vents used in steep slope roofing.
7. Discuss why different types of vents are used and the advantages of each.
8. Identify materials used for underlayment on a steep slope roof.
9. Discuss the purpose of underlayment steep slope roof.
10. Discuss the consequences of installing a steep slope roof without underlayment.
11. Explain how ice and water membrane work.
12. Explain need for double layer of underlayment at the valley.
13. Explain why end laps would be 6 inches while other laps may be 2 inches.

Course Outcome(s):
Install various types of underlayment in accordance with job site specifications.

Objective(s):

1. .Explain the proper steps to installation of underlayment.
2. Demonstrate various methods of installing underlayment.
3. Select appropriate materials for underlayment based on job site specifications.
4. Fasten underlayment according to job specifications (nail vs. staple)
5. Determine if underlayment will be exposed and the need to secure.
6. Determine why a double of underlayment may be required and what type of joints should be used.
7. Discuss proper storage methods for underlayment materials.
8. Discuss adjustments needed when installing underlayment to accommodate gutters.

Course Outcome(s):

Install flashings in accordance with job site specifications.

Objective(s):

1. Identify the various flashing materials and discuss when they would be used.
2. Determine proper lap of underlayment at the drip edge of the flashing.
3. Demonstrate the proper installation of various types of flashing materials.
4. Describe results of electrolysis and how to prevent it.

Course Outcome(s):

Install shingles in accordance with job site specifications.

Objective(s):

1. Determine proper type of fastener for material being used.
2. Identify the parts of shingle.
3. Differentiate between a 3 tab, random tab, laminating shingles, and interlocking shingles.
4. Determine amount of exposure depending on type of shingle used.
5. Locate the label on a bundle of shingles and identify the fire protection and wind resistance used on the shingles being installed for specified project.
6. Inspect and identify any potential problems on the roof deck and repair or replace decking as needed for preparation of installation of shingles.
7. Determine the proper amount of nails to be used for specified shingles.
8. Layout a chalkline in preparation for installation.
9. Determine shingle spacing based on job specifications.
10. Demonstrate installing shingles using half spacing and diagonal space shingle spacing.
11. Demonstrate how to start a course (line of shingles).
12. Demonstrate how to space a course using half spacing or diagonal spacing.
13. install singles in accordance with roof specifications.
14. Discuss the different types of valleys and most common valleys of used in our geographical area.
15. Discuss the advantages and disadvantages of the valley.
16. Identify appropriate fasteners for valleys.
17. Demonstrate how to install valley underlayment and valley flashing with clips (Week 4 – next class).
18. Demonstrate how to install drip edge, starter strip, and courses.

Methods of Evaluation:

1. Quizzes from Roofer’s International raining Resource center
2. Exams from Roofer's International Training Resource Center
3. Hands on projects
4. Participation

Course Content Outline:

1. Decking
   a. Types
      i. Plywood
      ii. Concrete
      iii. Cement wood fiber
      iv. Metal
   b. Inspection
      i. Proper nailing
      ii. Defects
         1. Warped boards
         2. Loosened layers of plywood
         3. Rotten wood
2. Ventilation
   a. Soffit vents under the eaves
   b. Louvered vents in the gabvles
   c. Standard roof vents
   d. Ridge cap vents
   e. Turbine Vents
3. Underlayment
   a. Materials
   b. Why
   c. Consequences of roof without underlayment
   d. Ice and water membranes
   e. Underlayment at the valley
   f. End laps vs. other laps
   g. Installation techniques
4. Flashings
   a. Materials
   b. Electrolysis
      i. When it occurs
      ii. Protection techniques
   c. Types
5. Fasteners
   a. Shingles
   b. Underlayment
   c. Proper driven nails
6. Shingles
   a. Asphalt
      i. Types
         1. Fiberglass shingles
         2. Organic
      ii. Parts of a shingle
      iii. Slots/cutouts
      iv. Tab
      v. Sealant strip
      vi. Tick marks
      vii. Design
      viii. Exposure
         1. Headlap
         2. Fire protection
         3. Wind resistance
      ix. Spacing
         1. Half spacing
         2. Diagonal spacing
   b. Wood
   c. Wood Shakes

Resources

Roofers' and Waterproofers' Research and Education Joint Trust Fund. *Steep Slope Roofing*. Roofers' and Waterproofers' Research and Education Joint Trust Fund, 2020.

Roofers' and Waterproofers' Research and Education Joint Trust Fund. *Roofers' Safety and Health Manual*. Roofers' and Waterproofers' Research and Education Joint Trust Fund, 2018.

Roofers' and Waterproofers' Research and Education Joint Trust Fund. *Fall Prevention and Protection for Residential Roofing*. Roofers' and Waterproofers' Research and Education Joint Trust Fund, 2021.

National Roofing Contractors' Association. *Roofing Materials Guide - Residential Steep Slope*. National Roofing Contractors' Association, 2021.

Resources Other

1. *Roofer's Training Resource Center*. Rooferstrc.com (http://catalog.tri-c.eduRooferstrc.com). 2024
2. *Master Shingle Applicator.* Certain Teed Corporation. www.certainteed.com/products/documents (http://catalog.tri-c.eduwww.certainteed.com/products/documents/)
3. How to Roof with Asphalt shingles. Asphalt Roofing Manufacturer's Association. (Video)
4. *Residential Roofing and Introduction.* Owens Corning. (Video)

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