



NRCA
PROCertification™

ROOF SYSTEM INSTALLER



NATIONAL ROOFING CONTRACTORS ASSOCIATION



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NRCA ProCertification™ is a certification program for roofing workers. Its goal is to build the roofing and waterproofing industry workforce. It is targeted at people who have some roofing experience. It includes experience requirements, employer verification of skills and testing.

This handbook explains how to become an NRCA ProCertified™ Roof System Installer. It also presents other aspects of the certification. This includes how the certification was developed and how it is governed. It reflects the policies of NRCA ProCertification™ at the time the handbook was published.

The Quick Start Guide for Roof System Installers also explains certifications for roof system installers. That guide focuses on the key parts of the program.

NRCA ProCertification Certifications

NRCA is creating 18 certifications. Each certification has its own requirements, and each certification must be earned separately. Following are the planned certifications.

- One for foremen
- 15 for installers: separate certifications for seven low-slope and eight steep-slope systems (see Table A)
- Two for service and maintenance personnel

Table A: Certifications for Roof System Installers	
Low-slope Systems	Steep-slope Systems
• Thermoplastic (TPO/PVC)	• Asphalt shingles
• Thermoset (EPDM)	• Clay and concrete tile
• Bituminous systems (polymer-modified bitumen and built-up)	• Wood shakes and shingles
• Liquid-applied systems and coatings	• Metal shingles
• Metal panel systems	• Slate
• Metal flashing and accessories	• Metal panel systems
• Roof-mounted photovoltaic (PV) systems	• Metal flashing and accessories
	• Roof-mounted photovoltaic systems

Certification Availability

Beginning December 2018, applications will be accepted for the NRCA ProCertified Thermoplastic Systems Installer certification and the NRCA ProCertified Asphalt Shingles Installer certification. The other certifications will be available during the next few years. NRCA will create master-level certifications in the near future. Contact certification@nrca.net for more information about the development schedule.

Certification Development

NRCA followed professional standards set by several organizations to create NRCA ProCertification. These standards guided the policies, administrative procedures and exams. Together, the professional standards require NRCA to:

- Conduct a job study, called a Job Task Analysis (JTA), for every certification it offers
- Set up a governance structure that is representative, fair and nondiscriminatory
- Define what is required to be eligible for the certifications
- Require applicants to pass an exam
- Require certificants to maintain their certification

The standards NRCA used to guide developing NRCA ProCertification are shown later in the handbook.

Job Task Analysis

Valid certifications must be based on a Job Task Analysis (JTA). A JTA is a formal study done to identify the tasks that make up a job and the skills and knowledge required to perform those tasks. The JTA for each NRCA ProCertified Roof System Installer certification comes from input from the people who do this type of work. This includes contractors and experienced installers. Each JTA describes the key knowledge, skills and abilities required to install roofing materials. The JTA for each available certification is in Appendix A.

Nondiscrimination Policy

NRCA does not discriminate and prohibits discrimination against its applicants, candidates and certificants based on race, color, ethnicity, religion, national origin, age, gender, sexual orientation, disability, marital status, or personal or business relationships. Membership in any voluntary association or trade organization is not required.

Overview of the Roof System Installer Certification

Becoming an NRCA ProCertified Roof System Installer requires the following:

1. Meeting the eligibility requirements and applying for the certification. The eligibility requirements are in the section named Eligibility Requirements.

2. Passing a proctored online exam offered at secure computer testing centers approved by NRCA and located throughout the U.S. There are more details about the exam in the section named Certification Exam.
 - a. The exam questions are multiple-choice, and some include audio, videos and images.
 - b. A candidate who fails the exam will be allowed to reschedule taking the exam two times. Each attempt will require an additional fee.
 - c. After three failed attempts at the exam, an individual must reapply.
3. Passing a hands-on skills test called a performance exam.
4. Renewing the certification. Renewal requirements are in the section named Renewal Requirements.

Note: Training is not required to become certified. However, NRCA offers a variety of training programs for roofing workers.

Eligibility Requirements

To earn a certification, a person first must be eligible to get certified. Eligibility is different for each roof system certification. They all require safety knowledge and experience in roofing. Table B shows the eligibility requirements for the asphalt shingles and thermoplastic systems certifications.

Table B: Eligibility Requirements	
Asphalt Shingles	Thermoplastic Systems
<ul style="list-style-type: none"> You must have at least 18 months experience installing asphalt shingle roof systems. 	<ul style="list-style-type: none"> You must have at least 24 months experience installing thermoplastic roof systems.
<ul style="list-style-type: none"> Your most recent experience must be within the past 12 months. 	<ul style="list-style-type: none"> Your most recent experience must be within the past 12 months.
<ul style="list-style-type: none"> Your experience must include installing flashings, valleys and various shingle types. 	<ul style="list-style-type: none"> Your experience must include flashings, sheet layout and attachment.

A supervisor must also complete an Employer Verification form. In this form, a supervisor confirms in writing the applicant has certain skills.

Steps to Becoming a ProCertified Roof System Installer

Applying for Certification

The first step to becoming certified is to submit an application and payment online.

- **Complete the online application.** The online application is found on NRCA's website, www.nrca.net. Candidates must follow the directions carefully when filling in the required information. Incomplete applications will delay processing.
- **Employer verification of skills.** To confirm that a candidate is qualified to successfully complete the certification process, a candidate must have his or her employer complete and submit the "Employer Verification" form to NRCA.
 - The candidate must provide his or her supervisor's name and contact information on the application form.
 - After the application is submitted online, NRCA will email a link to the supervisor to access and complete the Employer Verification form online.
 - The supervisor must indicate the candidate has certain skills.
- **Application approval.** The candidate will be notified whether his or her application is approved within 10 days of NRCA receiving a complete application, including a completed Employer Verification form.

Verification of Information by NRCA

NRCA reserves the right to contact building owners/operators and responsible contractors to verify an applicant's work experience.

Confidentiality

An applicant's personal information and materials for any NRCA ProCertification credential will be kept confidential unless authorized by other NRCA policies or practices or otherwise directed in writing by the applicant. Only members of NRCA ProCertification committees, staff and designated individuals acting on behalf of NRCA's board of directors will have access to these documents. NRCA will take all reasonable precautions to ensure an applicant's personal information will not be released to third parties.

Online Certification Exam

After an application is approved, the applicant can take the online exam. The online exam must be passed before the hands-on performance exam can be taken.

Online Exam Content

The online test asks questions about safety and roof system installation. Table C lists examples of topics that could be on the online test.

Table C: What Might Be on the Online Test	
Asphalt Shingles	Thermoplastic Systems
<ul style="list-style-type: none">• Pick the answer that shows or describes:<ul style="list-style-type: none">– Safety gear or harness is unsafe– Safety gear is not used correctly or incorrectly– Sealants are applied correctly or incorrectly– Shingles are cut correctly or incorrectly– Shingle lines are straight or not straight– Safety equipment is safe or unsafe to use– Flashing is done right and done wrong– Nailing is done right and done wrong	<ul style="list-style-type: none">• Pick the answer that shows or describes:<ul style="list-style-type: none">– Safety done right or wrong– Safety gear is used correctly or incorrectly– The fastening pattern is right or wrong– The membrane is terminated correctly or incorrectly– Tools are not in good shape
<ul style="list-style-type: none">• Pick the answer that shows or describes the best way to:<ul style="list-style-type: none">– Apply sealant– Stagger shingles– Install underlayment– Install a valley– Trim shingle corners and valley– Set up safety equipment– Remove debris from a roof	<ul style="list-style-type: none">• Pick the answer that shows or describes the best way to:<ul style="list-style-type: none">– Lay a sheet without wrinkles, voids or fishmouths– Fasten the membrane– Use a hot air welder correctly or incorrectly– Roll seams with a roller– Score and remove release film– Use tools correctly or incorrectly

Online Exam Format

The online test has about 50 multiple-choice questions. It should take no more than one hour to complete. But test takers will be given up to two hours to complete the test.

Some questions or answers will include a photo or image. The test can be taken in English or Spanish. Test takers can choose to listen to the instructions, questions and answers using earphones.

Online Exam Sites

The proctored exam is given at authorized testing centers. There are about 250 Prometric Test Centers throughout the U.S. Tests must be scheduled in advance. To find the nearest center visit www.prometric.com.

Performance Exam

Performance Exam Content

After a certification candidate passes the online exam, he or she can complete a performance exam. The hands-on performance exam has two parts:

- Part 1: Demonstrate using a personal fall-arrest (PFA) system. This part of the test does not have a time limit.
- Part 2: Install a portion of roof system correctly and safely. Instructions are given in a performance assignment. This part of the test has a time limit.

There are different assignments that can be given for a performance exam. A sample performance assignment is in Appendix B. It is an assignment for a performance exam for the thermoplastic systems certification.

Table D lists examples of the tasks that could be part of a performance assignment. This is not a complete list of all possible tasks. Also, a performance assignment does not require a certification candidate to do all possible tasks.

Table D: Examples of What Could be Covered on the Hands-on Test	
Asphalt Shingles	Thermoplastic Systems
<ul style="list-style-type: none">• Follow directions	<ul style="list-style-type: none">• Follow directions
<ul style="list-style-type: none">• Check a PFA harness, lifeline, hooks and anchors	<ul style="list-style-type: none">• Check a PFA harness, lifeline, hooks and anchors

<ul style="list-style-type: none"> • Demonstrate wearing a PFA and explain the purpose of each part 	<ul style="list-style-type: none"> • Demonstrate wearing a PFA and explain the purpose of each part
<ul style="list-style-type: none"> • Install: <ul style="list-style-type: none"> – Underlayment – Different shingle types – Flashings – Valleys – Hip and ridge – Vents 	<ul style="list-style-type: none"> • Follow correct fastening patterns
<ul style="list-style-type: none"> • Trim corners 	<ul style="list-style-type: none"> • Correctly terminate the membrane
<ul style="list-style-type: none"> • Lay shingles 	<ul style="list-style-type: none"> • Inspect the tools
<ul style="list-style-type: none"> • Stagger shingles 	<ul style="list-style-type: none"> • Properly: <ul style="list-style-type: none"> – Lay sheets without wrinkles, voids, or fishmouths – Lay sheets around penetrations – Use a hot air welder – Roll seams with a roller – Attach membrane sheets – Score and remove release film – Use the tools
<ul style="list-style-type: none"> • Apply sealant 	
<ul style="list-style-type: none"> • Clean up 	

Scheduling and Completing a Performance Exam

Following are policies and procedures for scheduling and completing an NRCA ProCertification performance exam.

1. Roof system installers seeking an NRCA ProCertification installer certification will schedule their performance exams directly with a Qualified Assessor. A directory of NRCA ProCertification Qualified Assessors will be available. NRCA is not involved in scheduling performance exams.
2. Qualified Assessors can charge a fee. If they charge for testing services, NRCA does not tell them how much to charge. However, everyone must be charged similarly for similar services. NRCA does not receive any part of fees Qualified Assessors are paid.

3. Candidates may request to have their performance exams conducted at a job site or in an authorized testing location (ATL). ATLs may be located within a roofing contractor's facility, a local union or manufacturer's training center, a local material distributor, vocational school or a community college.
4. After agreeing to conduct a performance exam, the Qualified Assessor coordinates scheduling with an ATL. If a job-site exam is requested, the Qualified Assessor will schedule it with the candidate's employer.
5. Candidates will select a group of hands-on performance assignments from which they will be tested. For example, there are two groups of assignments for the thermoplastic systems certification. The candidate will choose which group they want to be tested from. For example:
 - Group A: Mechanically attached thermoplastic systems; OR
 - Group B: Fully adhered thermoplastic systems
6. The exact performance exam assignment will be chosen by the Qualified Assessor or NRCA ProCertification staff.
 - If the performance exam will be done at a job site, the Qualified Assessor selects the assignment based on the work progress at the time of the scheduled exam.
 - If the performance exam will be done at an ATL, assignments will be randomly chosen by NRCA ProCertification staff.
7. Candidates who require exam materials in Spanish must have their performance exam conducted by a Qualified Assessor who speaks Spanish conversationally.
8. In the performance exam, participants will be instructed which tasks they must complete to show their installations skills. This includes working safely.
9. A Qualified Assessor observes and scores the performance exam. Qualified Assessors cannot test their co-workers or subcontracted workers.
10. Qualified Assessors cannot provide any coaching, guidance or direction during the assessment unless there is imminent danger to the candidate or others.
11. Certification candidates will be given the opportunity to evaluate the Qualified Assessor and the testing site. They also have the opportunity to appeal the results of the performance exam.

For more information about NRCA ProCertification performance exams, email certification@nrca.net or call (847) 299-9070.

Policies Applying to Online Exams and Performance Exams

Failing the Exams

Candidates who fail the online exam or performance exam can take it two more times. There is a cost for retaking the online exams. Fees for performance exams are negotiated with Qualified Assessors. More information about the grievance process is in the section named Grievance/Appeals Process.

Testing Accommodations

Arrangements for people with disabilities will be provided upon request in conformance with the Americans with Disabilities Act (ADA). Professional documentation supporting a request for accommodation must be submitted to NRCA no later than four weeks before the scheduled test date. For more information about testing accommodations, contact certification@nrca.net

Confidentiality of Individual Exam Scores

Individual exam scores are reported only to the candidate in a pass/fail format unless a participant agrees in writing to release their score to specific parties.

Renewal Requirements

The NRCA ProCertified Roof System Installer certifications must be renewed every three years. Certifications must be time-limited with a specific beginning and end date so the skills of those certified don't become outdated. As a result, certification programs must require periodic renewal. Renewal requirements have not been determined. They may include:

- Paying a fee
- Continuing to work as a roof system installer during the renewal period
- Completing a certain number of hours training in topics related to a certification's JTA

Certification Awards

Participants who pass the online exam and the performance exam will earn the credential. Once certified, roof system installers get:

- A digital badge that can be put on a website or be printed on a decal or business card.
- A laminated photo ID wallet card that contains a QR code that can be used to electronically verify the credential.

Cost of the Roof System Installer Certification

Who	What	NRCA Member Fee	Nonmember Fee
Installer	Certification fee (This fee includes one attempt at the online exam.)	\$799	\$1,599
	Test retake fee	\$199	\$399
	Hands-on test Qualified Assessor's fee	Negotiable	Negotiable
	Three-year renewal fee	\$199	\$399

If an applicant does not meet the eligibility requirements, the certification fee will be refunded minus a \$249 administrative fee.

Additional Policies

Change of Addresses

Certificants who change their mailing address or email address must notify NRCA as soon as possible. Failure to do so may cause important updates on NRCA's programs to be missed that could affect a certificant's status. Change of address notices should be sent by email to certification@nrca.net.

Grievance/Appeals Process

NRCA ProCertification includes a strong grievance/appeals process to independently evaluate facts and circumstances when credentials or renewals have been denied. Individuals may choose to file under the following circumstances:

- The initial certification/credential application or renewal has been denied or revoked because the eligibility requirements were not met.
- The initial certification/credential application or renewal has been denied or revoked because not all steps of the application, renewal, training and/or examination process were completed.
- The initial certification/credential application or renewal has been denied or revoked because qualifications were misrepresented, or for presenting false information or cheating of any type.
- A certification candidate disputes pass/fail of the online knowledge exam.

Individuals may file a grievance/appeal within 30 days of receiving notice of the adverse decision. The individual must send written notice of the request for an appeal and the reason for that request.

The written grievance/request for appeal must be mailed to NRCA ProCertification program administrator:

National Roofing Contractors Association
Attn.: NRCA ProCertification Program Administrator
10255 W. Higgins Road, Suite 600
Rosemont, IL 60018-5607

The grievance/request for appeal must contain the following information:

- The name, mailing address, email address and telephone number of the individual who is appealing the decision.
- A concise statement indicating the grounds for the appeal, including all evidence, facts and supporting documentation upon which the appeal is based.
- A statement of the specific ruling or relief requested.
- Signature of the appellant or an authorized agent of the appellant.

All grounds must be specifically stated in the appeal to be considered. Appeals received after the 30-day deadline will not be considered.

Upon receipt, the grievance/request for appeal will be independently evaluated by designated, qualified members of the NRCA Certification Exams Committee Appeals Subcommittee. This committee will determine the merits of the grievance/appeal within 60 days of the initial receipt and notify the individual in writing of the committee's decision. NRCA reserves the right to request additional information or documentation from the appellant to aid the committee in its evaluation of the grievance/appeal. The committee's decision will be based on the appellant's written submissions and documentation.

If an appellant is dissatisfied with the determination of the Certification Exams Committee Appeals Subcommittee, that person may submit a request for second-tier review, in writing, to the NRCA ProCertification program administrator within 30 days of receiving notice of the Certification Exams Committee Appeals Subcommittee's decision.

Determinations made by the Certification Exams Committee are final and subject to appeal by appropriate court action or arbitration in accordance with applicable law. The proper venue for any legal proceeding arising out of or relating to NCRA ProCertification shall be Cook County, Illinois, and each party waives any defense, whether asserted by motion or pleading, that Cook County, Illinois, is an improper or inconvenient venue.

Denial and Revocation of Credential

An NRCA ProCertified Roofing Foreman credential will be denied or revoked if there is evidence that qualifications were misrepresented, or for false information or cheating of any type. Failure to meet annual maintenance requirements for the credential also will cause the credential to be revoked.

Prohibited Use of Credential

If a certification has expired or has been suspended or revoked, the individual may not claim to have an active ProCertification credential. That individual may not use an NRCA ProCertification designation until NRCA acknowledges the relevant renewal or recertification requirements have been satisfied or active status has been reinstated.

Ownership of NRCA ProCertification Program Materials

NRCA owns and will continue to own all rights, copyrights, title and interest to NRCA ProCertification courses, course materials, handbooks, manuals and assessment materials. These are protected by U.S. and international copyright laws. The NRCA ProCertified Roof System Installer agrees not to use, copy, distribute, modify, or make derivative works of any courses, course materials, educational content, information, resources, documents, materials, agreements, and assessments. Doing so may result in severe civil and criminal penalties.

Warranty Disclaimer and Limitation of Liability

All NRCA ProCertification information, documents and materials are provided “as is,” and NRCA makes no warranties, whether express, implied, statutory or otherwise, including, without limitation, warranties of merchantability or fitness for a particular purpose. In no event shall NRCA be liable for any direct, indirect, special, punitive or consequential damages of any kind or nature whatsoever, including without limitation, loss of profits or other economic loss caused by, resulting from, or otherwise arising from use of or reliance on any of the NRCA ProCertification program materials.

Governance and Oversight

Valid certifications must have a governance structure that complies with international and professional standards. NRCA ProCertification governance structure represents all major stakeholders and there is independence in decision-making across all essential certification activities. There is clear and appropriate separation between all NRCA certification and education and training functions to avoid conflicts of interest between those functions, and to protect the integrity of certification activities.

Professional Standards for Certifications

NRCA followed certification standards set by several organizations to create NRCA ProCertification. The organizations included:

- The International Standards Organization (ISO) document ISO/IEC 17024: Conformity assessment—General requirements for bodies operating certification of persons, 2012
- The Institute for Credentialing Excellence (ICE) document ICE 1100: 2010(E)- Standard for Assessment-Based Credential Programs
- The International Accreditation Service (IAS) document Accreditation Criteria for Bodies Operating Certification of Persons: AC474, June 2013

- The International Board of Standards for Training, Performance and Instruction document 2003 ibstpi® Instructor Standards: Competencies & Performance Statements

Additionally, NRCA drew on the internationally recognized standards of:

- The U.S. Department of the Army, U.S. Army Corps of Engineers document EM 385-1-1, Safety and Health Requirements, published 30 November 2014
- The Interstate Renewable Energy Council (IREC) document IREC Standard 14732: 2013 General Requirements for Renewable Energy & Energy Efficiency Credential Programs

ProCertification Program Committee

The ProCertification Program Committee's activities help ensure the certifications serve the strategic goals and needs of all stakeholders. The committee:

- Identifies strategies that advance a certification's purpose
- Regularly monitors performance data of each certification to ensure the roofing industry's needs are met

Certification Exams Committee

The Certification Exams Committee oversees development of certification exams. It consists of three subcommittees:

1. Exam Development Subcommittee
 - a. Networks with industry subject matter experts to help create exam content
 - b. Monitors pass/fail ratios as an indicator of exam efficacy
2. Eligibility Subcommittee
 - a. Develops and maintains the certification candidate eligibility criteria
 - b. Develops and maintains recertification requirements
3. Appeals Subcommittee
 - a. Evaluates appeals filed by candidates whose applications were denied; candidates who failed exam(s); or certificants whose credentials were revoked
 - b. Implements disciplinary processes

NRCA ProCertification Contacts

Applications for all NRCA ProCertification credentials are available on NRCA's website, www.nrca.net.

Mailing Address:

National Roofing Contractors Association
Attn.: ProCertification Program Administrator
10255 W. Higgins Road, Suite 600
Rosemont, IL 60018-5607

Email:

General Inquiries and Applications: certification@nrca.net

Inquiries from Qualified Assessors and Authorized Testing Locations: QAsupport@nrca.net

Phone: (847) 299-9070

Fax: (847) 299-1183

Office Hours: 8 a.m. to 4:30 p.m. CST

Appendix A: NRCA ProCertified Roof System Installer JTAs

Appendix A1: Job Task Analysis for NRCA ProCertified Asphalt Shingle Roof System Installation

Job Description	Given instructions for installing a specific asphalt shingle roof system, an NRCA ProCertified™ Asphalt Shingles Installer must be able to:	
DOMAIN 1	PROJECT SAFETY	12%
General workplace safety		
1.1	Comply with all employer’s safety instructions, policies and rules	
1.2	Participate actively in discussions with supervisors (e.g. foreman, superintendent or safety director) about specific hazards likely to be found on a job site and their controls before the start of each day’s work	
1.3	Ask supervisors to explain unclear safety instructions	
1.4	Notify supervisors and other crew members immediately of any unsafe work conditions discovered during construction and implement corrective actions, if feasible, to ensure safety of others	
1.5	Recognize the specific safety regulations published by the Occupational Safety and Health Administration (OSHA) or other organizations with jurisdiction that may apply to a given job site	
Specific workplace safety		
1.6	Confirm fall protection systems are set up during all construction phases	
1.7	Use and maintain fall-protection system(s) following manufacturer’s and employer’s policies and instructions	
1.8	Identify safety equipment and devices required to meet project requirements	
1.9	Locate safety data sheets (SDS) on job sites for all materials being used	
1.10	Review and implement the information provided in safety data sheets (SDS)	
1.11	Select and wear required personal protective equipment (PPE) when hazards are present	
1.12	Maintain personal protective equipment (PPE) following manufacturer’s and employer’s policies and instructions	
1.13	Determine safe and efficient roof access locations	
1.14	Select, set up and use ladders following manufacturer’s and employer’s policies and instructions before each day’s use	
1.15	Lift, move and set materials, tools and equipment without injuring yourself or others	
1.16	Use hand and power tools only after receiving training	
1.17	Inspect all hand and power tools and equipment for damage prior to use	
1.18	Tag and remove damaged tools or equipment from job sites and report them to supervisors and other crew members following employer’s policies and instructions	
DOMAIN 2	GENERAL WORK PRACTICES AND COMMUNICATIONS	5%
2.1	Define basic roofing terminology	

2.2	Perform basic roof calculations and measurements	
2.3	Review project specifications and follow supervisor's instructions	
2.4	Ask questions to review and clarify instructions	
2.5	Review work goals, tasks and objectives with supervisor to start each day	
2.6	Remain flexible when work conditions unexpectedly change	
2.7	Participate in and contribute to problem-solving discussions	
2.8	Collaborate with other team members	
2.9	Share work experience and knowledge with others	
2.10	Arrive at job sites on time	
2.11	Express ideas about ways to improve work processes	
2.12	Respect everyone	
2.13	Actively seek feedback on one's performance	
2.14	Notify supervisors when resources are running low	
2.15	Perform all tasks with pride and seek to achieve high-quality standards	
2.16	Take personal responsibility for and report mistakes	
2.17	Continuously seek and actively participate in education and training opportunities that enhance and grow a professional career	
DOMAIN 3	SYSTEM MATERIALS	7%
3.1	Explain the function(s) of all asphalt shingle roof system materials and accessories	
3.2	Identify the various types of asphalt shingles	
3.3	Identify and select the materials and accessories required for a given specification	
3.4	Identify underlayment roll size, types and coverage	
3.5	Identify area of coverage provided by each shingle package	
3.6	Locate and review manufacturer's installation instructions provided on shingle packaging	
3.7	Identify incompatible materials and substrates	
3.8	Identify potential problems when handling and cutting materials	
3.9	Explain the effects different weather conditions may have on asphalt shingle installations	
3.10	Recognize and react to defective or damaged materials following employer's policies and manufacturer's recommendations	
DOMAIN 4	TOOLS AND EQUIPMENT	5%
4.1	Select the required tools and equipment for a given task	
4.2	Inspect tool and equipment condition before every use	
4.3	Use tools and equipment only for their intended purposes	
4.4	Only operate powered tools and equipment that you have been trained to use and follow manufacturer's instructions	
4.5	Maintain tools and equipment per manufacturer's instructions	
4.6	Select electrical extension cords to match the power requirement of a tool	
4.7	Confirm a safe, adequate power source for each tool before use	
4.8	Clean tools and equipment after each use	
DOMAIN 5	MATERIALS INSTALLATION	42%
General preparation		
5.1	Set up and inspect all safety-related equipment and devices	

5.2	Determine the installation sequence for all required system components
5.3	Determine fastening patterns and attachment requirements for all materials and accessories
5.4	Stage and position all required materials, tools and equipment
5.5	Inspect all materials and accessories for damage; replace as necessary
<i>Substrate preparation</i>	
5.6	Visually inspect substrate to ensure it is secure, firm, smooth, clean, frost-free and dry before installing materials
5.7	Notify supervisor and other crew members immediately of any deteriorated substrate conditions discovered during construction and implement corrective actions, if feasible, to ensure safety of others
5.8	Repair substrate defects as instructed by supervisor
<i>Re-cover preparation</i>	
5.9	Remove existing metal edge flashings, vertical surface flashings, counterflashings or accessories as specified
5.10	Identify, cut, secure or remove curled or lifted shingles
5.11	Remove existing hip and ridge shingles
5.12	Remove debris and loose material from existing roof surface
<i>Underlayment layout and attachment</i>	
5.13	Determine underlayment locations and sequencing
5.14	Move, set and align underlayment rolls into sequenced locations
5.15	Overlap adjoining underlayment materials to ensure water flows over laps, penetration flashings and accessories and not against them
5.16	Unroll, remove release film and adhere water and ice dam protection membranes without wrinkles, buckles or voids
5.17	Unroll and attach underlayment without wrinkles, buckles or voids
5.18	Set and maintain specified underlayment, sidelaps and overlaps
5.19	Ensure ventilation openings are unobstructed after underlayment installation is completed
5.20	Repair or replace damaged underlayment before covering with shingles
<i>Shingle layout and attachment</i>	
5.21	Determine shingle installation sequence following project requirements and related manufacturer's instructions
5.22	Determine and select nail types and lengths to meet project requirements and manufacturer's specification
5.23	Set, align and attach starter strip materials
5.24	Set, align and attach shingles
5.25	Set, align and attach shingles to ensure water flows over side laps, penetration flashings and accessories and not against them
5.26	Nest new shingles consistently in re-cover installations when existing shingle exposure is consistent course-to course
5.27	Maintain specified shingle overlap, exposure and alignment on all slopes
5.28	Ensure all nails are driven flush and tight against shingle surface and not under-driven or overdriven

5.29	Ensure all nails are firmly attached in specified locations and nail heads are completely covered in the finished roof system
5.30	Cut shingles without damaging underlying materials
5.31	Cut, set and attach shingles around penetrations and dormers while maintaining specified overlap, exposure and alignment
5.32	Cut, set and attach shingles in valleys
5.33	Ensure ventilation openings are unobstructed in the finished roof system
5.34	Ensure shingle self-sealing strips are not damaged or become contaminated during installation
5.35	Prepare, cut, align and attach hip and ridge shingles
5.36	Immediately replace any scuffed or damaged shingles
DOMAIN 6	FLASHINGS AND ACCESSORIES INSTALLATION 24%
6.1	Identify components of a specific flashing detail
6.2	Demonstrate knowledge of the function(s) of all flashing detail components
6.3	Stage and position all required flashing materials, tools and equipment
6.4	Determine and follow the installation sequence for all required flashing components and accessories
6.5	Determine the attachment method for each flashing component and accessory including fastener type and locations to meet project requirements and manufacturer's specifications
6.6	Install ventilation accessories including continuous ridge, static, mechanical and powered vents
6.7	Install drip edge metal flashings at perimeter rake and eave edges
6.8	Install penetration flashing components, including flanges and accessories, where asphalt shingles intersect pipes or vents
6.9	Install vertical surface flashing components and accessories where asphalt shingles intersect walls, chimneys, curbs and kick-outs including apron; step; cricket or backer; and counterflashings
6.10	Install flashing components and accessories at all roof slope transitions including steep-to-low; low-to-steep; and steep-to-steep transition areas
6.11	Install skylight flashing components and accessories
6.12	Determine locations and apply mastics and sealants at all flashing and accessory details to meet project requirements and manufacturer's specifications
DOMAIN 7	JOB SITE HOUSEKEEPING 5%
7.1	Continuously remove all kinds of construction waste and debris from all substrates, roof surfaces, curbs, chimneys, vents, skylights or other surfaces
7.2	Immediately clean spills of mastics, sealants, solvents or chemicals from roof surfaces
7.3	Continuously maintain gutters or other roof drainage systems clear of materials or debris
7.4	Maintain clean footwear on all installed shingle surfaces
7.5	Ensure sharp-edged materials, fasteners, tools and equipment do not cut, puncture or scrape installed surfaces
7.6	Protect installed shingle surfaces from damage and other construction debris

7.7	Immediately correct any incidental damage to newly installed shingles following manufacturer's guidelines
7.8	Ensure every completed roofing project is left clean and free of scrap, excess fasteners, waste materials or other debris

Appendix A2: **Job Task Analysis for NRCA ProCertified Thermoplastic Single-ply Roof Membrane System Installation**

Job Description	Given instructions for installing a specific thermoplastic single-ply roof or waterproofing membrane system, an NRCA ProCertified™ Thermoplastic Systems Installer must be able to:	
DOMAIN 1	PROJECT SAFETY	13%
<i>General workplace safety</i>		
1.1	Comply with all employer’s safety instructions, policies and rules	
1.2	Recognize the specific safety regulations published by the Occupational Safety and Health Administration (OSHA) or other organizations with jurisdiction that may apply to a given job site	
1.3	Participate actively in discussions with supervisors (e.g., foreman, superintendent or safety director) about specific hazards likely to be found on a job site and their controls before the start of each day’s work	
1.4	Ask supervisors to explain unclear safety instructions	
1.5	Notify supervisors and other crew members immediately of any unsafe work conditions discovered during construction and implement corrective actions, if feasible, to ensure safety of others.	
<i>Specific workplace safety</i>		
1.6	Confirm fall-protection systems are set up during all construction phases	
1.7	Use and maintain fall-protection system(s) following manufacturer’s and employer’s policies and instructions	
1.8	Locate safety data sheets (SDS) on job sites for all materials being used	
1.9	Review and implement the information provided in safety data sheets (SDS)	
1.10	Select and wear required personal protective equipment (PPE) when hazards are present	
1.11	Maintain personal protective equipment (PPE) following manufacturer’s instructions and employer’s policies and procedures	
1.12	Lift, move and set materials without injuring yourself or others	
1.13	Inspect all hand and power tools and equipment for damage prior to use	
1.14	Use hand and power tools only after receiving training	
1.15	Tag and remove damaged tools or equipment from job sites and report them to supervisors and other crew members following employer’s policies and instructions	
1.16	Identify work processes that could generate static electricity hazards	
DOMAIN 2	GENERAL WORK PRACTICES AND COMMUNICATIONS	7%
2.1	Define basic roofing terminology	
2.2	Perform basic roof calculations and measurements	
2.3	Accurately follow all instructions given for a projects’ specification	
2.4	Ask questions to review and clarify instructions	
2.5	Review work goals, tasks and objectives with supervisor to start each day	
2.6	Remain flexible when work conditions unexpectedly change	

2.7	Participate in and contribute to problem-solving discussions	
2.8	Collaborate with other team members	
2.9	Share work experience and knowledge with others	
2.10	Arrive at job sites on time	
2.11	Express ideas about ways to improve work processes	
2.12	Respect everyone	
2.13	Actively seek feedback on one's performance	
2.14	Notify supervisors when resources are running low	
2.15	Perform all tasks with pride and seek to achieve high-quality standards	
2.16	Take personal responsibility for and report mistakes	
2.17	Continuously seek and actively participate in education and training opportunities that enhance and grow a professional career	
DOMAIN 3	SYSTEM MATERIALS	10%
3.1	Explain the function(s) of all membrane system components	
3.2	Explain the differences among types of thermoplastic membranes	
3.3	Identify and select the correct materials required for a given installation	
3.4	Identify incompatible materials and substrates	
3.5	Select and apply sealants to cut edges of reinforced membranes according to manufacturer's requirements	
3.6	Describe the effects different weather conditions may have on thermoplastic membrane installations	
3.7	Recognize and react to defective or damaged materials following employer's policies and manufacturer's recommendations	
3.8	Thoroughly mix adhesives or sealants, if applicable, following product manufacturer's instructions	
DOMAIN 4	TOOLS AND EQUIPMENT	6%
4.1	Select the required tools and equipment for a given task	
4.2	Inspect tool and equipment condition before every use	
4.3	Use tools and equipment only for their intended purposes	
4.4	Only operate powered tools and equipment that you have been trained to use and follow manufacturer's instructions	
4.5	Maintain tools and equipment per manufacturer's instructions	
4.6	Select electrical extension cords to match the power requirement of a tool	
4.7	Confirm a safe, adequate power source for each tool before use	
4.8	Clean tools and equipment after each use	
DOMAIN 5	MATERIALS INSTALLATION	27%
<i>General preparation</i>		
5.1	Set up and inspect all safety-related equipment and devices	
5.2	Determine the installation sequence for all required system components	
5.3	Stage and position all required materials, tools and equipment	
5.4	Inspect all materials and accessories for damage; replace as necessary	
<i>Substrate preparation</i>		
5.5	Visually inspect substrate to ensure it is reasonably smooth, clean, frost-free and dry before installing materials	

5.6	Notify supervisor and other crew members immediately of any deteriorated substrate conditions discovered during construction and implement corrective actions, if feasible, to ensure safety of others
5.7	Repair substrate defects as instructed by supervisor
5.8	Ensure wood nailers, curbs, drains and other penetrations are secured in place
<i>Sheet layout</i>	
5.9	Follow a sheet layout plan
5.10	Identify roll size(s) and coverage area
5.11	Determine roll installation sequencing
5.12	Determine direction(s) to unroll membranes
5.13	Move, set and align rolls into sequenced locations
5.14	Unroll and allow membranes to relax as specified
5.15	Unroll adjoining sheets to ensure water flows over side laps and not against them
5.16	Unroll membranes and maintain specified sidelap dimension
5.17	Cut membranes without damaging underlying membranes
5.18	Unroll and cut membranes around penetrations and maintain specified sidelap dimension
5.19	Unroll and cut membranes around penetrations and provide specified membrane extensions up all vertical surfaces
5.20	Set and align membrane end laps at specified dimensions
5.21	Stagger membrane roll end laps when necessary
5.22	Fold excess membrane into inside corners following manufacturer's recommendations
5.23	Apply temporary ballast to maintain sheet alignment
5.24	Install temporary night seals at all vulnerable membrane edges following manufacturer's recommendations at the end of each day's work
<i>Membrane attachment—loose-laid ballasted systems</i>	
5.25	Review and identify the ballast type(s), locations, loading, application rates and sequence with supervisor
5.26	Attach field membrane at all perimeter, penetration and slope change locations
5.27	Install membrane protection layers following manufacturer's requirements
5.28	Safely operate and use special equipment to spread ballast at the specified rate of coverage
5.29	Set and install paver pedestal systems
5.30	Safely cut and install concrete pavers
<i>Membrane attachment—mechanically attached systems</i>	
5.31	Select the specified fastener types and lengths, plates or bars and tools and equipment requirements
5.32	Inspect the underside of substrates and/or structural decks for the presence of utility piping or conduits; mark substrate surface to ensure fasteners avoid contact with them
5.33	Install all fasteners, plates and bars following the specified distances, patterns or grid instructions in the sheet or insulation layout plan

5.34	Ensure fasteners, plates and bars in membrane side laps are placed at specified locations within the seam
5.35	Drive all fasteners straight, true and to specified depths without overdriving or underdriving
5.36	Immediately remove, relocate and replace any faulty fastening attempts
5.37	Safely operate and use heat-induction welding equipment
5.38	Adjust heat-induction welding equipment to accommodate ambient weather conditions and roof slope
5.39	Weld membrane to coated heat-induction fastener plates fully without overheating
5.40	Frequently clean and maintain contact surface of heat-induction welding equipment
<i>Membrane attachment—adhered systems</i>	
5.41	Select the primers, adhesives, materials, tools and equipment required for the specified application method
5.42	Set, align, cut and place membranes in position and in manageable sizes before applying or activating adhesives (dry set)
5.43	Fold back dry-set membranes and secure with temporary ballast to hold in place and avoid movement and to facilitate adhesive application or removal of release films
5.44	Apply required primers to substrate surfaces following manufacturer's recommended rate of coverage
5.45	Apply membrane adhesives to substrate and/or membrane surfaces following manufacturer's recommended rate of coverage
5.46	Apply hot bitumen adhesives following manufacturer's guidelines, instructions and specified temperature
5.47	Continuously remove release film from the folded-back side of self-adhering membranes without tearing the film (this task does not apply to factory-applied sidelap adhesive release films—see <i>Membrane Seaming</i> domain)
5.48	Fold in and set membrane in place within the manufacturer's recommended adhesive set or drying times and without creases, wrinkles, voids, bubbles or blisters
5.49	Immediately broom membrane surface to smooth any creases, wrinkles, voids, bubbles or blisters
5.50	Immediately roll entire membrane surface with a roller of specified size and/or weight to help ensure full contact between membrane and adhesives
DOMAIN 6	MEMBRANE SEAMING 22%
6.1	Select, inspect and set up all tools, materials and equipment required to meet manufacturer's seaming instructions and specifications
6.2	Ensure all membrane seams remain clean, dry and free of dust, dirt or other contaminants
6.3	Trim corners of underlying membrane corner at T-joints as directed by manufacturer
6.4	Operate and use handheld hot-air welding equipment, including making adjustments that achieve appropriate welding temperatures for site conditions and result in seams welded according to manufacturer's specifications

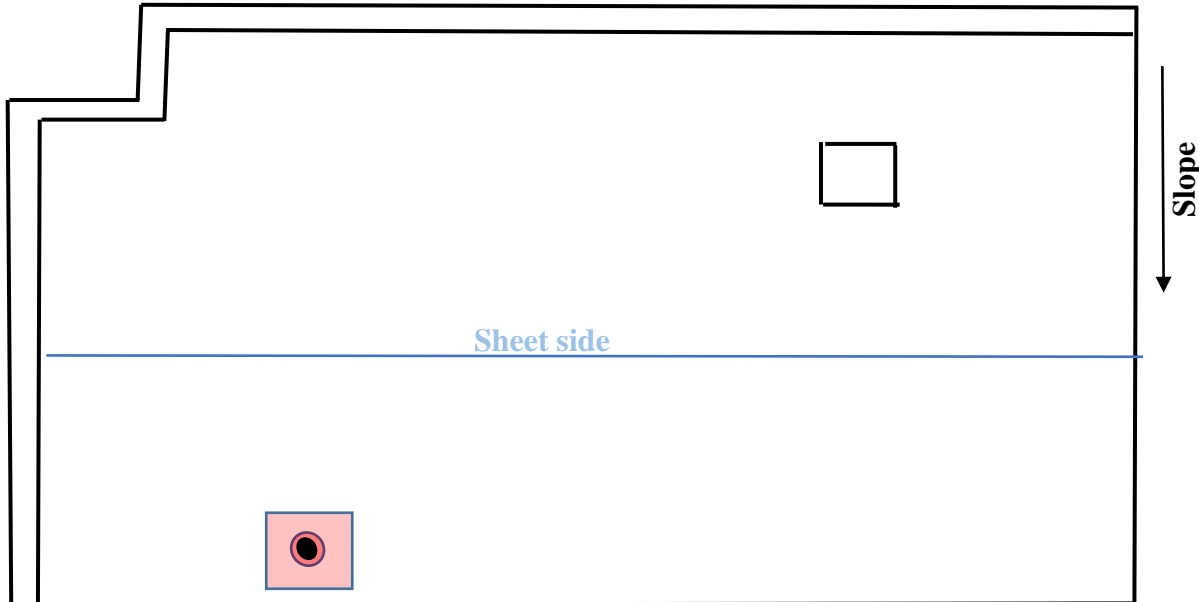
6.5	Correctly use seam rollers to eliminate buckles, ridges, bubbles or voids and ensure seams are welded according to manufacturer’s specifications	
6.6	Operate and use robotic hot-air welding equipment, including making adjustments that achieve appropriate welding speed and temperatures for membrane type and site conditions and result in seams welded according to manufacturer’s specifications	
6.7	Closely inspect hot-air welded seams for cold-weld areas, voids or gaps using a recommended seam probing tool—without scratching or scoring membranes—and immediately repair deficiencies with handheld hot-air welding equipment	
6.8	Hot-air weld T-joint cover patches where required by manufacturer	
6.9	Determine required locations for self-adhering seam cover strips and apply where required by manufacturer	
6.10	Determine required locations for seam sealants and apply where required by manufacturer	
6.11	Continuously remove release film from membrane side laps that use factory-applied seam adhesives without tearing and immediately roll seams to eliminate buckles, ridges, bubbles or voids	
DOMAIN 7	FLASHINGS AND ACCESSORIES INSTALLATION	11%
7.1	Identify all components of a specific flashing detail	
7.2	Explain the function(s) of all flashing detail components	
7.3	Stage and position all required flashing materials, tools and equipment	
7.4	Determine the installation sequence for all required flashing accessories	
7.5	Recognize inadequate distances between roof drains, curbs, parapet walls and other penetrations	
7.6	Install membrane base flashings on all vertical walls and curbs	
7.7	Install membrane flashings at raised perimeter edges	
7.8	Install membrane flashings with all embedded metal details	
7.9	Install membrane flashings with all membrane-coated edge metal details	
7.10	Install membrane flashings at all sheet metal and plumbing vent stacks	
7.11	Install membrane flashings and associated penetration pockets	
7.12	Install membrane flashings at all roof drains	
7.13	Install membrane base flashings at all through-wall and overflow scuppers	
7.14	Install all types of membrane base flashing fasteners at correct spacings	
7.15	Install all types of sealants and caulks used in flashing detail applications	
DOMAIN 8	JOB SITE HOUSEKEEPING	4%
8.1	Maintain a high level of cleanliness of substrates, membrane seams and surfaces	
8.2	Continuously remove all kinds of construction waste and debris from all rooftop surfaces, curbs, HVAC equipment, skylights or other surfaces during and after daily work	
8.3	Immediately clean spills of adhesives, solvents or chemicals from membrane surfaces	
8.4	Maintain roof drainage systems clear of any materials or debris that may block drainage	

8.5	Wear and maintain clean footwear on all membrane surfaces
8.6	Ensure sharp-edged materials, fasteners, tools and equipment do not cut, puncture or scrape finished membrane surfaces
8.7	Ensure every completed roofing project is left clean and free of scrap, waste materials or other debris
8.8	Protect all finished membrane surfaces from damage, dirt and other construction debris throughout a project's duration
8.9	Immediately mark and repair any physical damage that may occur to newly installed membranes following manufacturer's guidelines

Appendix B: Sample Performance Exam Assignment

TP-SA1: NRCA PROCERTIFICATION MECHANICALLY-ATTACHED THERMOPLASTIC SYSTEM VENT PIPE FLASHING

Candidate Performance Assignment and Instructions



The Qualified Assessor will read the instructions to the candidate. The candidate will also have a copy of the assignment he or she can keep during the performance exam.

You are here to complete a performance exam to earn your certification. I am going to test your ability to install a mechanically attached thermoplastic roof system. I have given you everything you need to do this job. I will show you where all the materials, tools and equipment that you need are located.

PART ONE: SETUP AND SAFETY TASKS

This is Part One of your exam. Your performance in this part is not timed.

There are certain safety behaviors during this exam that, if at any time I observe you doing, can cause you to automatically fail. There are no exceptions to this policy. The behaviors that can cause you to automatically fail include:

- A. You expose yourself to a fall hazard without a fall-protection system in place
- B. You improperly use fall-protection equipment while exposed to a fall hazard
- C. You unsafely use a ladder
- D. Any other behavior I see you do that, in my judgement, creates imminent danger of serious injury or death to the you or others

You CANNOT ask anyone questions about:

- How to set up or use any tools, equipment or materials
- How to wear or use a personal-fall arrest (PFA) system
- Correct or incorrect procedures, steps or techniques to help you do any task

First, you must demonstrate and explain to your assessor how to use a personal fall-arrest (PFA) system, including:

- Putting on a harness
- Connecting a lifeline to an anchor. I will show you the anchor.
- Connecting a lanyard to the harness and to the life line
- Explaining all PFA system components and how they work
- Demonstrating how to use a rope grab device and lifeline to prevent you from hitting the ground or striking an object should you fall

You do not need to stay tied-off during your exam unless I tell you, but you must continue wearing the harness.

You must set up all tools, equipment and materials on the mockup without help from your assessor or anybody.

I will show you where the PFA anchor device is located. When you are ready, you can begin the demonstration and explain how to use a PFA. Tell me when you finish the PFA demonstration. I will finish reading your assignment instructions, and you can finish setting up materials, tools and equipment.

PART TWO: INSTALLATION TASKS INSTRUCTIONS

This is Part Two of your exam. Your performance in this part of the exam will be timed. The timer starts when you tell me you are ready.

You must use personal protective equipment (PPE) for all work. If you do something unsafe, I will stop your work. You must correct the safety error before proceeding. You do not get extra time when you are stopped for a safety issue.

I will tell you when you have 10-minutes remaining on the timer. When the time has ended, you must stop working.

I will read you the tasks. You cannot ask any questions about how to do any part of the work or what you need to get the assignment done.

- Install two 12-foot-long rows of thermoplastic membrane sheets and maintain a minimum 6-inch sidelap in all areas
- Extend sheets a minimum of 4 inches up parapet walls and curbs
- Set and align field sheets into the parapet wall inside and outside corners and secure sheets

- Mechanically attach field sheets with fastener plates spaced a maximum of 6 inches on center in seams and within 1 inch from the sheet edge
- Mechanically attach field sheets with fasteners placed a maximum of 6 inches on center around penetrations with a minimum of four fasteners per penetration
- Mechanically attach field sheets using cap nails spaced 12 inches on center and a minimum of 1 inch above the membrane surface at perimeter walls
- Completely hot-air weld a minimum of 12 lineal feet of membrane sheet side lap seams and maintain a minimum 2-inch weld width
- Hot-air weld a minimum 6-inch-wide cover strip over a cut field sheet
- Install a minimum 24-inch square target sheet around the vent pipe with a minimum 2-inch-wide weld around its perimeter
- Install a prefabricated boot flashing on the pipe penetration, including draw band and sealant

When you are ready, tell me and I will start the timer.