



## APPLICATION FOR REGISTERED ROOF CONSULTANT (RRC®)

Dear RRC Applicant:

All those who desire to become Registered Roof Consultants (RRC) must substantiate to RCI, Inc. that certain requirements have been met. These requirements include verifiable levels of work experience and education, high ethical standards, and a satisfactory score on a written examination.

Applications must be received, along with the appropriate fee, at RCI ninety days prior to an exam. **The application fee is \$225 for RCI members and \$300 for non-members.** Applications received between sixty and eighty-nine days prior to an exam will be accepted with a late fee of \$50 for members and \$75 for non-members. Applications will not be accepted after sixty days prior to an exam.

After this completed application has been returned to RCI and approved, a registration form must be submitted for a specific location to take the exam (this form will be provided with the approval notification letter). Registration for a specific exam should be received at RCI no later than three weeks prior to that exam. **The cost of the exam is \$175 for RCI members and \$225 for non-members** and should be submitted with the registration form. An authorization letter and exam site regulations will then be sent shortly before the exam. The applicant is responsible for arranging to take this exam. A study guide is included with this application. One must have an approved application on file at RCI to be eligible to sit for any exam.

Approved applications are valid for **two** years and reapplication is required if the applicant does not earn the RRC title within that time period.

To maintain registration, a renewal fee will be charged and evidence of continuing educational hours must be provided. Registration must be renewed every year by December 31.

As an organization focused on advancing the roofing, waterproofing and exterior wall professions, we look forward to receiving your application and encourage your active involvement in RCI.

Sincerely,

A handwritten signature in black ink that reads "Micki Kamszik". The signature is written in a cursive, flowing style.

Micki Kamszik  
Associate Director

RCI, Inc.  
1500 Sunday Drive, Ste 204 Raleigh, NC 27607  
(T) 919-859-0742 (F) 919-859-1328  
[www.rci-online.org](http://www.rci-online.org)

# APPLICATION FOR REGISTERED ROOF CONSULTANT

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# INSTRUCTIONS

## REGISTERED ROOF CONSULTANT APPLICATION

### General Requirements

- A. The successful RRC candidate must accomplish the following:
1. Establish that he/she has met certain minimum requirements regarding education, personal work experience, character and ethics.
  2. Take and pass a two part written examination. The examination will be offered each year at the annual national convention and at other times throughout the year as defined by RCI.
- B. The applicant shall satisfy RCI that he/she has attained and agrees to the following minimum requirements:
1. The applicant has at least 4 years of roof consulting experience and has attained a minimum of 100 points for education, professional registration and/or work experience.
  2. The applicant has secured a minimum of 70 hours of continuing education through attendance at a minimum of three (3) seminars directly related to the roofing, waterproofing, and/or exterior walls industries, e.g. RCI, BURSI, AIA, CSI, or other approved training and educational programs awarding educational units.
  3. The applicant shall have a strong moral and ethical character demonstrated by his/her references, experience and professionalism. The "Standards of Ethical Practice" for RCI are included in this application. They outline the obligations of the roof consultant to the public, the client or employer, and to the profession and the building industry. RCI will promote and conform to these "Standards."
  4. The applicant shall always be totally objective, unbiased and impartial in his/her actions relating to roof consulting.
  5. The applicant shall never have a conflict of interest or permit him/her to be placed in a position that would allow for a potential conflict of interest. Conflict of interest shall be defined as any activity or employment in which the applicant has any significant financial or other interest, or acceptance of any contribution if it would reasonably appear that such activity, employment, interest or contribution could compromise the Registered Roof Consultant's professional judgment or prevent the Registered Roof Consultant from serving in the best interest of the client or employer.
  6. The title Registered Roof Consultant, once attained, must be renewed every year. Requirements include submitting evidence of continuing educational hours in accordance with the registration renewal procedures established by RCI.

Documentation is required regarding an applicant's experience, education, professional registration, training, etc. Verification of an applicant's education and/or work experience shall be on a point system. A minimum of 100 points is required and may be obtained in one of the following ways: experience only; experience and education; experience, education, and professional registration.

**EXPERIENCE IS MANDATORY FOR REGISTRATION – EDUCATION ALONE WILL NOT SUFFICE.**

C. The following assignment of points shall be implemented:

**Education** – High School education, or equivalent, is required. Ten (10) points shall be awarded per year of successful completion of college. A maximum of 30 points may be received if you did not earn a degree. You must furnish a transcript or diploma for all educational points.

The following maximum number of points shall apply for education:

Four year curriculum	= 40 points (industry related*)	32 points (general)
Five year curriculum	= 50 points (industry related*)	40 points (general)
Masters degree	= 10 points (industry related*)	8 points (general)
Doctorate	= 10 points (industry related*)	8 points (general)

The maximum number of points for education is 50 points.

\*Architecture, engineering, construction, chemistry, roof consulting, or roof technology

**Professional Registration** – Twenty (20) points shall be awarded to Registered Architects (RA) and 20 points to Registered Professional Engineers (PE). Persons with dual (RA and PE) or multiple (2 RA's or 2 PE's) registrations shall receive a maximum of 20 points. (Include copy of license or registration)

**Personal Work Experience** – One (1) point shall be awarded per project or task in the following categories of experience related to roofing:

**Category Service Rendered or Task Performed\*\* Maximum No. of points**

1	Roof Condition Surveys, Audits, or Investigations	30
2	Preparation or Design Review of Contract Documents (Drawings, Specs, etc)	30
3	Contract Administration/Project Management	30
4	Construction Observations/Quality Assurance Observations	30
5	Legal: Forensic Investigations, Deposition, Expert Testimony	30
6	Roof Moisture Surveys (Infrared, Nuclear, and/or Capacitance)	30
7	Laboratory Testing: Physical/Quantitative Analysis	30
8	Research Directly Related to Roofing	30
9	Publications Related to Roofing (Articles, Books, Theses)	30
10	Lectures Presented Related to Roofing (Emphasizing Education)	20
11	Roof Contracting Projects	10
12	Professional Association Active Participation (RCI, CSI, ASTM, etc.)	5

\*\* The above items refer to services rendered or tasks performed by YOU, not by someone under your direction. Your experience as a roof consultant is being evaluated, not your management ability or the experience of your company or subordinates. See Supplement Sheet A for additional information regarding these items.

Roof consultants shall have a relatively broad base of experience. Applicant must secure points from experience in a minimum of three (3) categories. You will note that each category has a maximum number of points permitted. This is to prevent an applicant from being certified with experience in only a limited area of expertise. You may earn points from more than one category for a single project. For example, on a building on which: you performed a roof condition survey and an infrared roof moisture survey; supplemented with a nuclear gauge; gave deposition for litigation; and wrote an article which was published in a magazine – you could earn four (4) points: one for categories 1, 4, 5, and 8.

Projects with multiple buildings or locations with identical construction and service rendered shall receive a maximum of five (5) points per category, regardless of the number of buildings involved. If separate reports, specifications, etc. are provided for each building on a “stand-alone” project basis, each building then qualifies for points.

#### Examples of Computation of Points

Example 1: A person with 1 year of college (10 points, industry related) would require 90 points through experience (90 projects at 1 point each).

Example 2: A registered engineer (20 points) with a four-year degree (40 points, industry related) would require 40 points through experience (40 projects at 1 point each).

Example 3: A person with a four -year degree (40 points, industry related) and a one-year master’s degree (10 points, industry related) would require 50 points through experience (50 projects at 1 point each).

Example 4: A person with a high school diploma (0 points) and 40 projects as a roof contractor (10 points maximum) would require 90 points from the other categories of experience (90 projects at 1 point each).

The “PROJECT REGISTER” forms are to be completed for each project an applicant claims for experience points. Two blank sheets are provided. The applicant may attach additional copies as needed. Check multiple categories if applicable.

This is an application that is intended for completion by honorable professionals. Each application will be reviewed and evaluated. References will be checked as well. False or misleading information will result in severe penalties, including revocation of registration.

For your own protection, make a copy of your completed application before sending it to RCI.

\* \* \* \*

**APPLICANT PLEASE NOTE:** The Engineer’s and Architect’s Professional Registration Boards of some states include the roof consulting profession under the jurisdiction of the Professional Registration Statutes. You are responsible to meet those requirements. RCI currently has no state jurisdiction or governmental registration sanction.



# APPLICATION FOR REGISTERED ROOF CONSULTANT

RCI, Inc.  
1500 Sunday Dr Ste 204  
Raleigh, NC 27607  
(800) 828-1902 or (919) 859-0742  
Fax (919) 859-1328

Date \_\_\_\_\_

**Type or Print Legibly Using Black Ink Pen**

<b>SECTION 1: PROFILE INFORMATION</b>					
Full Name	Last	First	Middle	Nickname	
Home Address	Number and Street	Apt.	Box	Road/Rural Route	
	City	Country	State	Zip	E-mail
Birth	Date	City	State	Citizenship	
Have you ever applied for RCI Registered Roof Consultant classification before? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please give date of application:					
Are you a Registered Architect? <input type="checkbox"/> Yes <input type="checkbox"/> No Date of first registration: State: #: Other States:					
Are you a Registered Engineer? <input type="checkbox"/> Yes <input type="checkbox"/> No Date of first registration: State: #: Other States:					
Are you a Contractor or employed by one? <input type="checkbox"/> Yes <input type="checkbox"/> No Type: <input type="checkbox"/> General <input type="checkbox"/> Roofing State and license number for each:					
Are you employed by or own a company that manufactures, distributes, or sells roofing products or materials? <input type="checkbox"/> Yes <input type="checkbox"/> No Identify:					
What percent of your principal income do you derive as a roof consultant: %					
Do you have any conflict of interest (see page I, paragraph B-5 for definition), or do you work for, own, or have interest in any company having such conflicts? <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>SECTION 2: BUSINESS INFORMATION</b>					
Employer Business Type: <input type="checkbox"/> Consulting <input type="checkbox"/> Architectural <input type="checkbox"/> Engineering <input type="checkbox"/> Contractor <input type="checkbox"/> Manufacturer <input type="checkbox"/> Distributor					
Name of business:					
Business street address: City: State: Zip: Phone & Fax:					
Organization: <input type="checkbox"/> Individual <input type="checkbox"/> Individual Proprietorship <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation <input type="checkbox"/> Other [please specify]:					

Name \_\_\_\_\_

Date \_\_\_\_\_

**SECTION 3: EDUCATION**

State in chronological order the name and location of each high or preparatory school, college, university or technical school attended (a high school diploma not required with 10 or more college coursework units). Also list graduate work, evening school, correspondence school, research work, apprenticeship program, etc. For college or university attendance, ask the institution to forward a CERTIFIED COPY OF YOUR TRANSCRIPT(S) to RCI. For incomplete college or university work, indicate the number of semesters completed. Attach additional sheets as required; place name in upper right margin.

CIRCLE LAST YEAR COMPLETED: Grade School: 1 2 3 4 5 6 7 8 High School: 9 10 11 12 College: 1 2 3 4 5 6 7 8

School	Name and Address of Institution	Dates Attended Mo/Yr to Mo/Yr	Did you Graduate?	Semesters Completed	Major/Technical Course	Degree
High School						
Junior College						
College						
Other						
Other						

**SECTION 4: PROFESSIONAL HISTORY AND EMPLOYMENT**

On Attachment Sheet 1, provide information regarding your personal work history, background, and experience directly related to roofing. Do not include employment in non-related fields.

## SECTION 5: PERSONAL WORK EXPERIENCE

On Attachment Sheet 2 ("PROJECT REGISTER") list projects for which you claim personal work experience. A minimum of ten (10) projects from three (3) separate service categories must include a project contact and telephone number. You may be asked to provide additional project contact information during the application approval process. The items below refer to services rendered or tasks performed by you, not by someone under your direction. Your experience as a roof consultant is being evaluated, not your management ability or the experience of your company or of your subordinates. See Supplement Sheet A for additional information regarding the categories listed below.

One (1) point shall be awarded per project or task in the following categories of experience related to roofing. You must earn points in a minimum of three (3) categories.

Category	Service Rendered or Task Performed	Maximum Number of Points
1.....	Roof Condition Surveys, Audits or Investigations.....	30
2.....	Preparations or Design Review of Contract Documents (Drawings, Specifications, etc.).....	30
3.....	Contract Administration/Project Management.....	30
4.....	Construction Observations/Quality Assurance Observations.....	30
5.....	Legal: Forensic Investigations, Deposition, Expert Testimony .....	30
6.....	Roof Moisture Surveys (Infrared, Nuclear, and/or Capacitance).....	30
7.....	Laboratory Testing: Physical/Quantitative Analysis.....	30
8.....	Research Directly Related to Roofing .....	30
9.....	Publications Related to Roofing (Articles, Books, Thesis).....	30
10.....	Lectures Presented Related to Roofing (Emphasizing Education).....	20
11.....	Roof Contracting Projects.....	10
12.....	Professional Association Active Participation (RCI, CSI, ASTM, etc.) .....	05

On Attachment Sheet 3 you are to summarize your personal work experience, education and professional registration. A minimum of 100 points is required for registration.

## SECTION 6: CONTINUING EDUCATIONAL HOURS EARNED

On Attachment Sheet 4, provide information regarding your receipt of continuing educational hours through your attendance at seminars, training courses, etc. directly related to the industry. You are required to have attended a minimum of three (3) roofing, waterproofing and/or exterior walls related seminars (i.e. RCI, AIA, BURS, or other approved training and education programs) and shall have documentation of such attendance. Documentation should be in the form of a certificate or letter from the sponsoring organization stating the name of the course, date course was held, and number of hours awarded. Minimum of 70 credit hours required.

## SECTION 7: REFERENCES

On Attachment Sheet 5, give names and addresses of five references. **Three** must know you professionally and be a Registered Architect, Registered Engineer, or Registered Roof Consultant. References may **not** be a relative of yours, a present employer, or fellow employee from your current firm. Each reference listed must have direct personal knowledge of your character, ethics and professional competence. Return this summary sheet to RCI. **Make five copies** of Attachment Sheet 6 and complete the top portion of the REFERENCE FORM for each reference listed. Please mail these forms directly to the individuals you have selected.

## SECTION 8: STANDARDS OF ETHICAL PRACTICE

The "Standards of Ethical Practice" for RCI (Attachment Sheet 7) outline the obligations of the roof consultant to the public, the client, the employer, the profession, and the building industry. The Registered Roof Consultant must promote and conform to these Standards.

## SECTION 9: AFFIDAVIT CERTIFICATION, AUTORIZATION AND RELEASE

Please complete Attachment Sheet 8 in the presence of a notary and submit to RCI with your application.

**SECTION 4: PROFESSIONAL HISTORY**

Name \_\_\_\_\_

Date \_\_\_\_\_

New

Update

Continuation Sheet

List in order, beginning with the first employer, your work history directly related to roofing. Do not include employment in non-related fields or employment. Add additional sheets as necessary.

DATE		(1) Company Name (2) Address (3) City, State, Zip (4) Title/Position	Description of Experience (Briefly in space provided)
From	To*		
		(1) (2) (3) (4)	
		(1) (2) (3) (4)	
		(1) (2) (3) (4)	
		(1) (2) (3) (4)	

\*Type "Present" in this column to indicate your current employer.

## **SECTION 5: PERSONAL WORK EXPERIENCE**

### **Description of Service Categories**

#### **1. Roof Condition Surveys, Audits or Investigations**

This applies to the scope of work in which a consultant visually assesses the condition of a roof. This would be performed in general accordance with the recommended procedures of RCI, BURSI and/or other organizations in which the condition of the roof is observed, identified and documented. Reporting could be through a standard checklist format or through a narrative type report. The report may include, but is not required to include, photographs and/or video documentation. A drawing will generally be prepared to present the layout of the roof penetrations and findings.

#### **2. Preparation or Design Review of Contract Documents (Drawing, Specifications, etc.)**

This may be a complete set of documents including the bidding documents, general conditions, technical specifications, roof plans, sections and details, as they relate specifically to roof consulting. On some projects, however, only the technical specification must be prepared by the consultant for implementation within another design professional's contract documents. The contract documents, in any event, would be complete. Design review of construction documents, specifically roofing systems, is acceptable.

#### **3. Contract Administration/Project Management**

This applies to the administration of a roof contracting project (re-roofing, repairs, and/or new construction) and would include the following duties: review of roofing-related submittals, oversight of quality assurance personnel, administration of pre-bid, pre-construction and progress meetings, evaluation of applications for payment, change orders and Requests for Information (RFIs), communication with owner with respect to work progress, provision of supplemental sketches and other contract administration activities as defined in the *CSI Manual of Practice*.

#### **4. Construction Observations/Quality Assurance Observations**

The scope of work under this task would be your personal observations during the construction for the assurance of quality of another's work. In most cases, the person who performs these services would be under the direction or control of a superior, preferably an experienced roof consultant. In some cases, the roof consultant may provide these services directly. Written documentation is required for this scope of work in the form of narrative reports or checklist reports. The applicant should be aware that points can't be gained by a consultant for a technician under his control who performs these services. Points gained in this item must be the direct on-site experience of the applicant.

#### **5. Legal: Forensic Investigations, Deposition, and Expert Testimony**

Experience gained through the legal arena is applicable even if the case does not go to trial. The forensic investigation may include site observations, field tests, laboratory tests and analysis, video and photographic documentation, and other procedures implemented in a standard investigation of a project that may go to litigation. The project may or may not include depositions, and may or may not include expert testimony. You may only receive one point for each legal case; multiple points are not allowed where both deposition and court testimony are provided.

#### **6. Roof Moisture Surveys (Infrared Nuclear and/or Capacitance)**

One point shall be awarded for each project in which the applicant performs an infrared, nuclear, and/or capacitance survey. Multiple points are not awarded for each individual project even if all three techniques are utilized unless each technique is reported completely independent of other techniques, e.g. separate surveys are issued.

One point is awarded for each project on which a roof moisture survey is performed, not each roof. Roof Moisture Surveys should be supplemented with destructive testing to confirm the non-destructive test. This shall not be mandatory in cases where a warranty would be violated or the client decides that a destructive test should not be performed.

Roof Moisture Surveys shall be presented in a written report including information regarding the procedures utilized, the findings, and conclusions from the observations. Recommendations may be presented but are not mandatory.

A drawing generally accompanies the report. Photographic and video documentation may or may not be presented, depending upon the project. One point shall be awarded for each project, even though several roofs may be involved in the project. For example, on a building with seven additions involving seven different roof levels and seven different constructions, only one point shall be awarded if a single report is presented. If separate reports are presented for separate buildings or different services and these are stand-alone reports,

#### **7. Laboratory Testing: Physical/Quantitative Analysis**

This item refers to ASTM testing for physical and/or quantitative analysis of roof materials. This could include test cut analysis, material testing, forensic testing, and other procedures utilizing scientific methods, and procedures. Gravimetric testing of roof core samples is not considered laboratory testing, but a supplement required in roof condition surveys and/or moisture condition surveys, etc.

#### **8. Research Directly Related to Roofing**

This would generally relate to research performed on roofing projects in which new technology is developed or utilized. Research, referred to herein, does not refer to procedures customarily implemented or used by roof consultants. This relates or refers to new innovative thinking. Written documentation must accompany this research to be valid and it must be substantiated by a second party.

#### **9. Publications Related to Roofing (Articles, Books, Theses)**

These include articles, books, theses, etc. related to roofing that have been published-- not those in revision or in draft form. The publishing may not be in an in-house or interagency type publication. These publications also shall not be solely directed to marketing, or the promotion of one's experience or ability. The intention of the publications earning credit in this item must have a fundamental basis that is educational or newsworthy.

#### **10. Lectures Presented Relating to Roofing (Emphasizing Education)**

Lectures receiving points under this item shall not be solely of a marketing nature. Credit shall not be awarded to lectures in which the primary purpose of the presentation was to promote one's company or abilities. Lectures that earn points must emphasize the educational nature of the presentation. That is not to say that a marketing lecture cannot present educational information, but the primary purpose must not be to only promote one's company or self.

#### **11. Roof Contracting Projects**

Points shall be awarded for projects in which the applicant was directly in a position of management or supervision. Merely being on a project site, such as running a kettle or gluing seams, does not constitute the kind of experience for which this item was intended. Persons receiving points for this task must have been in a position of responsible authority and management control. The same criteria regarding multiple building locations, etc., pertinent to other categories apply here as well.

#### **12. Professional Association Active Participation**

Credit shall be awarded for active participation in professional associations such as RCI, Inc., The Construction Specification Institute, The American Society of Testing and Materials, The American Society of Civil Engineering, The American Institute of Architecture, etc. Active participation is mandatory; merely being a card-carrying member is not sufficient.

Name \_\_\_\_\_ Date \_\_\_\_\_

**SECTION 5: PERSONAL WORK EXPERIENCE**

**CATEGORIES**

(Check multiple categories per project, if applicable – see pages 5 and 6 for descriptions)

Revised July 2008

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PROJECT REGISTER*		1	2	3	4	5	6	7	8	9	10	11	12
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												

**A minimum of ten (10) projects from 3 separate service categories must include a project contact and telephone number. Additional contact information may be requested.**

\*Duplicate sheet as needed

Name \_\_\_\_\_ Date \_\_\_\_\_

**SECTION 5: PERSONAL WORK EXPERIENCE**

**CATEGORIES**

(Check multiple categories per project, if applicable – see pages 5 and 6 for descriptions)

Revised July 2008

8

PROJECT REGISTER*		1	2	3	4	5	6	7	8	9	10	11	12
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												
#	Project Name: _____ Project Location: _____ Project Contact: _____ Telephone: _____ Project Date _____												

**A minimum of ten (10) projects from 3 separate service categories must include a project contact and telephone number. Additional contact information may be requested.**

\* Duplicate sheet as needed

Name \_\_\_\_\_ Date \_\_\_\_\_

**SECTION 5: SUMMARY OF POINTS FOR REGISTRATION**

**PERSONAL WORK EXPERIENCE POINTS**

Category	Services Rendered or Task Performed	Max. # of points	Points/Project	Number of Projects	Total Points
1.	Roof Condition Surveys, Audits, or Investigations	30	1		
2.	Preparation or Design Review of Contract Documents (Drawings, Specifications, etc.)	30	1		
3.	Contract Administration/Project Management	30	1		
4.	Construction Observations/Quality Assurance Observations	30	1		
5.	Legal: Expert Testimony, Deposition, Forensic Investigations	30	1		
6.	Roof Moisture Surveys (Infrared, Nuclear, and/or Capacitance)	30	1		
7.	Laboratory Testing: Physical/Quantitative Analysis	30	1		
8.	Research Directly Related to Roofing	30	1		
9.	Publications Related to Roofing (Articles, Books, Theses)	30	1		
10.	Lectures Presented Related to Roofing (Emphasizing Education)	20	1		
11.	Roof Contracting Projects	10	1		
12.	Professional Association Active Participation (RCI, CSI, ASTM, etc.)	05	1		
<b>Total Number of Points Claimed for Personal Work Experience (Max = 100)</b>					

**EDUCATIONAL POINTS**

Four Year Curriculum (Industry/General)	40/32	10/8/Yr.		
Five Year Curriculum (Industry/General)	50/40	10/8/Yr.		
Masters Degree (Industry/General)	10/8			
Doctorate (Industry/General)	10/8			
<b>Total Number of Points Claimed for Education (Max. 50)</b>				

**PROFESSIONAL REGISTRATION POINTS**

Registered Architect	20	20		
Registered Engineer	20	20		
Registered Waterproofing Consultant	10	10		
Registered Roof Observer	5	5		

**Total Number of Points Claimed for Registration (Max. 20)**

**GRAND TOTAL NUMBER OF POINTS CLAIMED**

**NOTES:**

1. Applicant must have points in a minimum of 3 categories.
2. A project register must be completed for each project. Some may include more than one service category.
3. A minimum of 10 projects from 3 separate service categories must include a contact & phone number.
4. Refer to Page III for point limitations placed on multiple building projects.
5. Maximum number of points for education is 50.
6. Official transcript or diploma must accompany application to substantiate all education points.
7. Maximum number of points for professional registration is 20.
8. Copy of current license or registration certificate must accompany application.

**SECTION 6: CONTINUING EDUCATIONAL HOURS EARNED**

Name \_\_\_\_\_

Date \_\_\_\_\_

- New
- Update
- Continuation

Course Name	Presented By	Dates	Hours
		<b>Total #</b>	

Please include documentation of attendance. Should be in the form of a certificate or letter from the sponsoring organization stating the name of the course, date course was held and number of hours/units awarded. **Minimum of 70 credit hours required.**

**SECTION 7: REFERENCE SUMMARY**

Name \_\_\_\_\_

Date \_\_\_\_\_

- ( ) New
- ( ) Update
- ( ) Continuation

Name & Company	Address/City, State, Zip	Telephone and Position/Title

**Note:** Please complete the top portion of the reference form (Attachment Sheet 6) for each person listed above. Mail directly to each reference, who should then mail the form directly back to RCI.

## REFERENCE FORM

Date \_\_\_\_\_

Dear \_\_\_\_\_:

An application for Registered Roof Consultant has been filed with RCI, Inc. by

\_\_\_\_\_ of \_\_\_\_\_, \_\_\_\_\_.  
(applicant) (company) (city/state)

Please provide the information requested below, if known, and make any comments that may be of value to RCI in evaluating the applicant's qualifications.

Information secured from references is for the confidential use of the organization and the source and character of the information will not be divulged, except in special cases when required by law.

The applicant and RCI, Inc. appreciate your cooperation in promptly furnishing the information requested.

### GENERAL INFORMATION

1. Applicant's present position \_\_\_\_\_
2. Number of years known \_\_\_\_\_
3. Applicant's moral character, professional ethics and personal reputation are \_\_\_\_\_
4. How long has the applicant been engaged in active roof consulting work? \_\_\_\_\_
5. In your opinion is the applicant competent as a roof consultant? \_\_\_\_\_

Remarks:

Signed \_\_\_\_\_  
 Name (Print) \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 City/State \_\_\_\_\_  
 Date \_\_\_\_\_  
 Are you related to the applicant? \_\_\_\_\_  
 If yes, how related \_\_\_\_\_  
 Are you a legally registered engineer? \_\_\_\_\_  
 Are you a legally registered architect? \_\_\_\_\_  
 Are you a Registered Roof Consultant? \_\_\_\_\_

If, for some reason, you do not desire to serve as a reference for the applicant, please return this form to us with a comment to that effect.

REFERENCE: Please return form by mail or fax to:

**RCI, Inc.**  
**1500 Sunday Drive Ste 204**  
**Raleigh, NC 27607**  
**800/828-1902 or 919/859-0742 FAX 919/859-1328**

## CODE OF ETHICS RCI, Incorporated

Adopted July 17, 2001  
Revised March 28, 2006

**Introduction:** The standards contained in this Code of Ethics are statements of ethical principles having broad applicability to members and registrants of RCI, Incorporated (RCI). However, the enumeration of particular duties and the proscription of certain conduct do not negate the existence of other obligations logically flowing from such principles. Conduct deemed unethical may be construed to include lesser offenses, such as aiding and abetting.

Members and registrants of RCI should also recognize that their profession and their practice may be governed by various laws and regulations regarding professional registration and the conduct of trade. It is their responsibility, therefore, to be familiar with those laws and regulations and to conduct themselves accordingly.

**General Obligations:** Members and registrants shall maintain and further their knowledge of the science and profession of roofing, waterproofing, and the building envelope, and shall maintain the highest possible standard of professional judgment and conduct.

**Obligation to the Public:** Members and registrants should uphold the letter and spirit of the ethical standards governing their professional affairs and should consider the full impact of their actions on the community at large.

Thus, a member or registrant shall:

- I. Engage only in accurate, appropriate and truthful promotion of his/her practice;
- II. Be respectful of the rights of others in obtaining professional work or employment; and
- III. Make only accurate, truthful and appropriate statements or claims about his/her professional qualifications, experiences or performance.

**Obligations to the Client:** Members and registrants shall conduct themselves in a fashion, which brings credit to themselves, their employers and their profession. In addition to upholding the behavioral standards described above, a member or registrant:

- I. Shall preserve the confidence of his/her client or employer and serve each in a professional and competent manner;
- II. Shall exercise unprejudiced and unbiased judgment and conduct when performing all professional services;
- III. Shall practice only in his/her area of competence;
- IV. Shall decline any activity or employment, avoid any significant financial or other interest, and decline any contribution if it would reasonably appear that such activity, employment, interest, or contribution could compromise his or her professional judgment or conduct, or prevent him/her from serving the best interest of his/her client or employer, without making full disclosure to the client and obtaining the client's consent thereto;
- V. Shall neither offer nor make any payment or gift to any public official, private client or industry representative with the intent of influencing that person's judgment or decision in connection with an existing or prospective project in which the member/registrant is interested; and
- VI. May contribute his services or anything of value to those endeavors which the member deems worthy. Further, a member or registrant has the right to participate in the political process and to contribute time and money to political campaigns.

**Obligations to the Profession and Building Industry:** Members and registrants shall:

- I. Recognize the value and contributions of others engaged in the design and construction process, and refrain from making false statements about the work of others, and shall not maliciously injure or attempt to injure the prospects, practice, or employment position of others; and
- II. Encourage professional education and research, as well as the development and dissemination of information relating to the design and construction of roofing, waterproofing, and building envelope systems.

Further, the following practices are not in themselves unethical, unprofessional, or contrary to any policy of RCI, and RCI members and registrants are free to decide for themselves whether to engage in any of these practices:

- I. Submitting competitive bids or price quotations, including in circumstances where price is the sole or principle consideration in the selection of a consultant;
- II. Providing discounts; or
- III. Providing free services.

Name \_\_\_\_\_

Date \_\_\_\_\_

**AFFIDAVIT REGISTRATION AUTHORIZATION AND RELEASE (to be notarized)**

State (Province) of \_\_\_\_\_

County of \_\_\_\_\_

\_\_\_\_\_, being first duly sworn, deposes and says:  
(Applicant's Name)

I, the Applicant named above, have read the contents hereof, and to the best of my knowledge and belief the statements contained in this application are true in substance and effect and are made in good faith. I hereby subscribe to and agree to conform to the Standards of Ethical Practice for RCI, Inc. I shall endeavor never to place myself in a conflict of interest or permit myself to be placed in a position that would allow for a potential conflict of interest. Conflict of interest shall be defined as any activity or employment having any significant financial or other interest, or acceptance of any contribution if it would reasonably appear that such activity, employment, interest or contribution could compromise my professional and objective judgment as a roof consultant or prevent me from serving the best interest of my client.

I also hereby authorize any individual, company or institution with whom I have been associated to furnish RCI, Inc. with any information concerning my qualifications for Registered Roof Consultant which they have on record or otherwise, and do hereby release the individual, company or organization and all individuals connected therewith from all liability for any damage whatsoever incurred by me as a result of their furnishing such information.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

\_\_\_\_\_  
(Signature of Applicant)

(SEAL)  
My Commission expires \_\_\_\_\_

\_\_\_\_\_  
(Signature of Notary Public)



## Application for Registered Roof Consultant Payment Form

Enclosed is a check in the amount of:  \$225.00 member fee       \$300.00 non-member fee

Please accept a late fee:                       \$50.00 member fee       \$75.00 non-member

Charge my  VISA    MasterCard    American Express    Discover for:

\$225.00 member fee       \$300.00 non-member fee

\$50.00 late member fee       \$75.00 late non-member fee

Name on the card \_\_\_\_\_

Account Number \_\_\_\_\_      Expiration Date \_\_\_\_\_

3- or 4-Digit Verification Value Code \_\_\_\_\_

Signature \_\_\_\_\_      Date \_\_\_\_\_

Telephone \_\_\_\_\_      Cell phone \_\_\_\_\_

Please return the completed application along with payment in US dollars to:

**RCI, Inc.**  
**1500 Sunday Drive Ste 204**  
**Raleigh, NC 27607**  
**(T) 919-859-0742 (F) 919-859-1328**

## CHECKLIST TO ACCOMPANY REGISTERED ROOF CONSULTANT APPLICATION

Applicant's Name \_\_\_\_\_ Social Security Number \_\_\_\_\_ Date \_\_\_\_\_

A check or initial in the block at the right indicates that you have completed that requirement of the application.

1. Application fee enclosed (\$225.00 members/\$300.00 nonmembers).....
2. Completed Sections 1 and 2 of the application.....
3. Section 3 of the application:
  - a. High School Diploma enclosed.....
  - b. College transcript(s) have been requested.....
4. Section 4 of application:
  - a. All dates are listed.....
  - b. All employers' names and addresses are listed.....
  - c. Brief description of experience under each employer is listed.....
5. Section 5 of application - Attachment Sheet 2:
  - a. Each project for which I claim experience is registered on Attachment Sheet 2.....
  - b. At least 10 contact names and phone numbers are listed from 3 separate categories.....
  - c. All names, locations and dates of projects are listed.....
  - d. All projects registered represent my experience (not someone under my direction).....
  - e. All projects claimed truly reflect worthy experience under the appropriate heading.....
6. Section 5 of application - Attachment Sheet 3:
  - a. All points claimed are summarized by category.....
  - b. Education points are substantiated by a transcript or copy of my diploma (enclosed).....
  - c. I have attained points in a minimum of 3 categories.....
  - d. Points claimed for professional registration are substantiated by a copy of my Registration Certificate or License (enclosed).....
7. Section 6 of application - Attachment Sheet 4:
  - a. All course names, sponsoring organization, dates and credit hours claimed are listed.....
  - b. I have attended a minimum of 3 industry related seminars (70 hours) .....
8. Section 7 of application:
  - a. Listed on Attachment Sheet 5 are five references, three of whom are a Registered Architect, Professional Engineer or Registered Roof Consultant.....
  - b. None of the references are a relative, a present employer or fellow employee from current firm.....
  - c. Made copies of Attachment Sheet 6 for EACH reference. Completed top part only for each.....
  - d. Reference forms mailed directly to each reference.....
9. Section 8 of application: Attachment Sheet 7
  - a. I have read and agree to abide by the Standards of Ethical Practice for RCI, Inc. (Attachment Sheet 7).....
10. Section 9 of application: Attachment Sheet 8
  - a. Affidavit has been executed and notarized .....

When complete and all spaces are checked, sign below, enclose this checklist, and mail the completed application form unfolded in a large envelope to RCI. Allow 90 days for processing. **MAKE A COPY OF YOUR COMPLETED APPLICATION BEFORE SENDING TO RCI** for your own protection.

This is to certify that I have completed the application as required by the association, I have checked all details and entries, and herewith submit said application for registration. I understand that registration is contingent upon meeting the requirements of RCI and successful completion of the required examinations.

\_\_\_\_\_  
Signature of Applicant



## STUDY GUIDE

### REGISTERED ROOF CONSULTANT EXAM

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Prepared By

RRC Examination Development Committee

RCI, Inc  
1500 Sunday Drive, Suite 204  
Raleigh, NC 27607  
800-828-1902 919-859-0742  
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# RRC® STUDY GUIDE

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**STUDY GUIDE**  
**RRC<sup>®</sup> EXAMINATION**  
**RCI, Inc.**  
Revised January, 2009

## INTRODUCTION

One early goal of RCI was to develop a nationally recognized registration program. The Registered Roof Consultant (RRC) Program has been in existence since 1987, has gained recognition by many organizations, and has been established as a minimum standard of practice by some. RCI is working toward national recognition of its registration program and hopes to achieve this goal in the future. The primary beneficiaries of this program are the public, the roofing industry, and those individuals who become registered.

Registration is a two-part program based on verifiable minimum levels of education, ethics, experience, and satisfactory performance on a comprehensive written examination.

The application for registration allows RCI to verify certain aspects of education and roofing experience. The written examination confirms these qualifications by testing one's knowledge of roofing and the ability to use this knowledge in practical applications.

This study guide outlines subjects that are addressed in the written examination; however, it is not intended to be an inclusive listing of every topic addressed on the test. This document is strictly a guide. References used in the development of this exam are provided.

Please understand that the examination is not tailored to any one particular area of roof consulting or to the design and construction practices unique to any geographic area. It deals with roof consulting in general as indicated by the references listed on the next page. It may include all phases of roof consulting (evaluation, design, testing and construction), both steep- and low-slope roofing, and all systems (e.g., shingle, tile, slate, built-up, single-ply, metal and spray applied systems).

In order to receive a passing score on the examination, you must be thoroughly familiar with a broad spectrum of principles related to roof system design, testing and construction. This spectrum of knowledge includes roof system design parameters, specification development, project management, project administration, life cycle costing, roof assets management, conflict resolution, contracts and contract documents, construction materials, non-destructive testing, and report preparation. Education and experience in these areas are extremely important. However, practical application under the guidance of a qualified mentor may be even more important because it reinforces formal education and training and provides a sound foundation over a broad spectrum. It pulls everything together. The weakness most often identified with exam failure is a narrow focus in the industry.

The Registered Roof Consultant examination is offered several times each year. The dates and locations can be obtained from RCI or from the RCI website ([rci-online.org](http://rci-online.org)).

The examination is 6 hours in length and will be delivered in two parts, each 3 hours long.

Each part of the examination carries equal weight and a passing score must be attained for the total exam. If a passing score is not achieved, the entire exam must be retaken.

Part 1 of the examination consists of one hundred and nine multiple choice questions and will involve questions on the following topics: ethics, roof condition surveys, audits or investigations, communication, testing, codes and standards, materials, construction documents, bid phase and construction phase. Part 2 includes fifty six design questions. Some problems may involve mathematical computations which require familiarity with basic algebra, geometry and trigonometry. Charts or tables needed for the solution of problems will be provided in the examination booklet.

Although not required, the following RCI education programs may be useful for anyone pursuing this designation: Professional Roof Consulting, Roof System Thermal and Moisture Design, Roof Drain Design and Calculations, and the Wind Design courses.

Questions for the RRC Exam have been prepared based on the following documents:

	<u>Title</u>	<u>Author</u>	<u>Pub. Date</u>
1.	Annual Book of ASTM Standards, Vol. 04.04 Roofing & Waterproofing	ASTM	2009
2.	ASCE-7	ASCE-07	2006
3.	ASHRAE 90.1	ASHRAE	2007
4.	Canadian Roofing Contractors Assoc. Manual	CRCA	1997
5.	cedarbureau.org (Cedar Shake & Shingle Bureau)	CSSB	Nov 2004
6.	Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions	RTI/WSRCA	Jan 2002
7.	Construction Specification Canada (CSC)	CSC	accessed in 2008
8.	CSI Manual of Practice (Project Resource Manual)	CSI	2005
9.	Factory Mutual Research Corporation (FMRC), Approval Guide & Roof Coverings	FMRC	2005
10.	FM Global (FMLPD) Loss Prevention Data Sheets 1-28, 1-29, 1-52 (2007); 1-28R, 1-29R (1998); 1-49 (2000)	FMLPD	Various
11.	IECC		2006
12.	Industry Knowledge/Experience		
13.	International Building Code (IBC)	IBC	2003
14.	Manual of Low-slope Roof Systems, 4th Edition	Fricklas & Griffin	2006
15.	Math Calculations		
16.	Metal Roofing Design Guide	MBMA	2000

17.	National Building Code of Canada	NBCC	2005
18.	NRCA Architectural Metal Roofing Manual	NRCA	2006
19.	NRCA Commercial Low Slope Materials Roofing Guide (2 Vols.)	NRCA	Feb 2001-2002
20.	NRCA Green Roofing Manual	NRCA	2007
21.	NRCA Metal Panel and SPF Roof Systems	NRCA	2008
22.	NRCA Perimeter Details (tested in accordance with ANSI/SPRI ES-1)	NRCA	accessed in 2008
23.	NRCA Roofing and Waterproofing Manual, Fifth Edition	NRCA	2001
24.	RCI Advanced Thermal and Moisture Manual	RCI	accessed in 2008
25.	RCI Code of Ethics	RCI	Mar 28, 2006
26.	RCI Manual of Practice	RCI	2010
27.	RCI Professional Roof Consulting Manual	RCI	2007
28.	RCI Roof Technology and Science I and II	RCI	2006
29.	RCI Rooftop Quality Assurance Manual	RCI	2006
30.	RCI Wind and Drainage Manual	RCI	accessed in 2008
31.	Residential Asphalt Roofing Manual	ARMA	1989
32.	Revere Copper and Common Sense	Revere Copper Products	
33.	Roof Drainage	RCIF	2005
34.	SMACNA Architectural Sheet Metal Manual, Sixth Edition	SMACNA	2003
35.	SPRI - Flexible Membrane Roofing: A Professional's Guide to Specifications, Seventh Edition	SPRI	2003
36.	SPRI.org	SPRI	accessed in 2008
37.	The Slate Book	Stearns/Stearns & Meyer	1998
38.	Underwriters Laboratory (UL), Roofing Materials and Systems Annual Directory	UL	2005
39.	Wind Pressures on Low Slope Roofs	RCIF	2005

As part of the exam revision process, the committee of subject matter experts systematically compiled a list of objectives that relate to the responsibilities, knowledge, and skills associated with acceptable performance within the roof consulting profession. This list provided the organizational framework for the exam and is attached below. The percentage of questions on the exam from each section is indicated.

<b>Sections</b>	<b>Section/Objective Title</b>	<b>Percentage of questions from section on exam</b>
<b>Section 1</b>	<b>Ethics</b>	<b>1.8</b>
Objective 1.1	<b>Given a scenario, demonstrate knowledge of ethical conduct.</b>	
<b>Section 2</b>	<b>Roof Condition Surveys, Audits, or Investigations</b>	<b>14.5</b>
Objective 2.1	<b>Demonstrate knowledge of life cycle cost analysis</b>	
Objective 2.2	<b>Demonstrate ability to evaluate existing roof assemblies and related conditions</b>	
Objective 2.3	<b>Given a scenario, determine the potential risks related to existing design or construction</b>	
Objective 2.4	<b>Given a scenario, demonstrate knowledge of failure mechanisms of various roof systems and components</b>	
Objective 2.5	<b>Describe suitability of existing roof assembly</b>	
Objective 2.6	<b>Describe how environmental conditions deteriorate roofing materials</b>	
<b>Section 3</b>	<b>Communication</b>	<b>5.5</b>
Objective 3.1	<b>Given a scenario, demonstrate knowledge of roles and responsibilities</b>	
Objective 3.2	<b>Demonstrate the ability to prepare written communications</b>	
Objective 3.3	<b>Given a scenario, describe how to interact professionally with the client and other members of the project team</b>	
<b>Section 4</b>	<b>Testing</b>	<b>7.3</b>
Objective 4.1	<b>Describe proper sampling techniques</b>	
Objective 4.2	<b>Describe investigative procedures to analyze a roof assembly</b>	
Objective 4.3	<b>Demonstrate knowledge of industry standard test procedures</b>	
Objective 4.4	<b>Given a scenario, accurately interpret test data including anomalies</b>	
<b>Section 5</b>	<b>Design</b>	<b>34</b>
Objective 5.1	<b>Demonstrate knowledge of roofing systems and assemblies</b>	
Objective 5.2	<b>Given a scenario, demonstrate knowledge of thermal calculations</b>	
Objective 5.3	<b>Describe roof assembly design considerations</b>	
Objective 5.4	<b>Given a scenario, demonstrate knowledge of ventilation calculations</b>	
Objective 5.5	<b>Given a scenario, demonstrate the ability to perform wind uplift calculations</b>	

Objective 5.6	<b>Given a scenario, determine drainage requirements</b>	
Objective 5.7	<b>Describe how to prepare construction drawings</b>	
Objective 5.8	<b>Demonstrate knowledge of air barriers/vapor retarders</b>	
<b>Section 6</b>	<b>Codes and Standards</b>	<b>4.8</b>
Objective 6.1	<b>Identify building codes, industry standards and manufacturers' requirements</b>	
<b>Section 7</b>	<b>Materials</b>	<b>14.5</b>
Objective 7.1	<b>Identify fundamental properties of various material components</b>	
Objective 7.2	<b>Demonstrate knowledge of material interactions</b>	
<b>Section 8</b>	<b>Construction Documents</b>	<b>7.3</b>
Objective 8.1	<b>Demonstrate knowledge of contract documents</b>	
Objective 8.2	<b>Describe information to request from the client</b>	
<b>Section 9</b>	<b>Bid Phase</b>	<b>2.4</b>
Objective 9.1	<b>Demonstrate knowledge of bidding procedures</b>	
<b>Section 10</b>	<b>Construction Phase</b>	<b>7.9</b>
Objective 10.1	<b>Demonstrate knowledge of construction administration</b>	
Objective 10.2	<b>Demonstrate knowledge of roof top quality assurance procedures</b>	
Objective 10.3	<b>Demonstrate knowledge of post construction procedures</b>	

## SAMPLE QUESTIONS

Sample questions are provided from each section of the exam and are indicative of the types of questions you will encounter. Answers have been provided at the end of the study guide.

### Ethics

1. You send a box of golf balls to the director of construction of an organization that outsources roof consulting services.

According to the RCI Code of Ethics, under which two of these circumstances would this be unethical? (Choose two.)

- A. if you paid for the outing with personal funds
- B. if your spouse worked for the same company as the director of construction
- C. if the recipient worked for a public entity and such gifts were prohibited by law
- D. if you were attempting to influence that person's judgment in connection with an existing or prospective project for which your firm was seeking an assignment

### Roof Condition Surveys, Audits, or Investigations

2. The reflectivity of the roof surfacing is important to the life-cycle cost of the roof assembly.

Which surfacing has the highest initial reflectivity?

- A. white coatings
- B. asphalt emulsion
- C. aluminum coating
- D. white mineral granules

3. Which two deficiencies should a consultant inspect for on a gravel built-up roof membrane system? (Choose two.)

- A. holes
- B. pipes
- C. wind scour
- D. surface crazing

4. While investigating a roof, you observe large icicles forming at the eave of a sloped shingled roof system. The roof is covered with a large quantity of snow.

Which two should you do immediately? (Choose two.)

- A. Check the conditions in the attic space.
  - B. Check to determine adhesion between shingles.
  - C. Assess the surface condition of the shingles on all sides of the building.
  - D. Advise the owner to have traffic areas directly below the icicles barricaded and have the icicles removed.
5. According to the *Manual of Low-Slope Roof Systems, 4th Edition*, what is the most reliable method for judging roof component reliability?

- A. controlled laboratory tests
- B. roof consultant advisory panels
- C. long term field service performance
- D. interpolation of material performance in other applications

6. One of the challenges of completing a corporate roof review is describing the suitability of the existing roof assembly. The RRC is conducting a roof survey of a metal standing seam hydrokinetic roof system. It is a light gauge metal with a high gloss finish with no stiffening ribs in the pan.

Which statement should be included in the report?

- A. The contractor should have made certain that the rolling mill was well-tuned during installation.
  - B. Oil canning is a frequent phenomenon; there are inherent risks as the oil canning could result in a leak.
  - C. The metal pans should have been greater in width, heavier in gauge, finished with a flat texture with stiffening ribs.
  - D. Oil canning is likely due to the gauge, finish and profile of the panel's pan. The client should be aware of the visual effects which can be exacerbated by varying light conditions.
7. You are asked to investigate a situation where the roof membrane has pulled away from the parapet walls. The building is located in Boston, MA. The roof consists of a stone-ballasted EPDM membrane, foam plastic insulation, and a steel roof deck.

What is the likely cause?

- A. Shrinkage of the EPDM membrane has occurred due to loss of processing oils.
- B. The adhesive used to glue the EPDM base flashings to the parapet walls has failed.
- C. A hydrocarbon based solvent has attacked the exposed material, while the roofing under the stone ballast was protected.
- D. Contamination from a local airport has penetrated the exposed EPDM membrane flashings and caused swelling of the EPDM.

## Communication

8. A reroof project has been undertaken using the *RCI Manual of Practice* documents under which the owner has roles and responsibilities.

Which statement describes the owner?

- A. The owner is the prime consultant's design team lead.
  - B. The owner is the person(s) who has title of the building.
  - C. The owner is the person(s) who is responsible for certifying payment for the work.
  - D. The owner is the entity with whom the contractor has entered into a contractual agreement.
9. According to RCI's *Rooftop Quality Assurance Manual*, daily reports should address which two items? (Choose two.)
- A. visitors
  - B. weather conditions
  - C. equipment requirements
  - D. payment request reviews
10. The owner has requested the services of an RRO to observe and report on the progress of a new roof installation.

According to the RCI *Rooftop Quality Assurance Manual*, when should the reports be distributed to the general contractor, roof contractor, consultant, and owner?

- A. 3 days
- B. 7 days
- C. same day
- D. with close out documents

## Testing

11. You are using the ASTM D 3617 – 07, "Standard Practice for Sampling and Analysis of Built-Up Roof System during Application" on a project.

Unless otherwise specified, how many samples should be taken?

- A. Take at least one specimen for each separate roof.
- B. Take at least one specimen for each separate roof, plus one for each 4,300 sq. ft. (400 sq. m).
- C. Take at least one specimen for each separate roof, plus one for each 10,000 sq. ft. (929 sq. m).
- D. Take at least one specimen for each separate roof, plus two for each 10,000 sq. ft. (929 sq. m).

12. You are asked to investigate roof leaks at the lower roof area of a large supermarket in Los Angeles covered by an exposed PVC membrane. A roofer has already been on site to perform repairs and reported that 115 individual patches were applied to the membrane all over the lower roof surface. However, the building staff had only reported leakage near the junction with the higher roof.

When investigating the leaks, which initial course of action is appropriate?

- A. Have the roofer cut open some patches to demonstrate the types of faults the roofer found. Then perform a flood test on the upper roof to confirm that the leaks are eliminated.
  - B. Perform a detailed visual review of the membrane and have the roofer patch any further defects found. Then wait for the next rain to determine the success of the repairs.
  - C. Conduct a roof moisture survey, core cuts, and a visual survey at the lower roof area, and compare the results with the patch locations. Inspect the details at the high/low roof junction.
  - D. Perform a flood test on the lower roof to a depth of 6 inches (150 mm) to confirm that the leaks are eliminated, and then use electronic field vector mapping to locate and repair any remaining faults.
13. The UL 1256 "Fire Test of Roof Deck Constructions" measures which fire performance characteristic of the roof assembly?
- A. fire penetration and structural integrity
  - B. flame spread below the roof deck within defined time limits
  - C. fire spread on the top surface of the roof assembly under high wind conditions
  - D. flame spread on the top surface of the roof assembly within defined time limits
14. You have taken a test cut of an existing BUR where a blister has formed. The asphalt in the blister is on the lower ply and has a cratered surface.

What could be the cause for this condition?

- A. Water was present during application.
- B. There is a depression in the substrate.
- C. The asphalt was cold during application.
- D. The insulation cover board was wood fiber.

### Design

15. Specific to the application of sprayed in place polyurethane foam roofing, what is the minimum dry-film thickness (DFT) range for the entire coating system?
- A. 0.008" to 0.015" (0.20 mm to 0.38 mm)
  - B. 0.010" to 0.018" (0.25 mm to 0.46 mm)
  - C. 0.010" to 0.020" (0.25 mm to 0.51mm)
  - D. 0.020" to 0.040" (0.51 mm to 1.02 mm)

16. Refer to Exhibit #1.

A conventional roof assembly includes a vapor retarder/temporary roof installed over insulation and a steel deck. You are provided with:

The sum of the R values ( $\sum R_{vr}$ ) below the underside of the vapor retarder

The Inside Design Temperature ( $T_i$ )

The Outside Design Temperature ( $T_o$ )

The Design Dew Point temperature (which you are to assume is the temperature at the underside of the vapor retarder/temporary roof)

Assume that the temperature at the underside of the vapor retarder is equal to the Design Dew Point temperature.

Irrespective of building code requirements and based on the formula provided in the exhibit, which formula will accurately determine the total needed for the entire assembly ( $\sum R_m$ ) to prevent condensation underneath the vapor during the winter?

- A.  $\sum R_m = - [(\sum R_{vr}) \times (T_i - T_o)] \div (T_{vr} - T_i)$
- B.  $\sum R_m = - [(\sum R_{vr}) \div [(T_i - T_o) \div (T_{vr} - T_i)]]$
- C.  $\sum R_m = [(\sum R_{vr}) \div [(T_{vr} - T_o) \times (T_i - T_o)]]$
- D.  $\sum R_m = [(\sum R_{vr}) \div [(T_{vr} - T_o) \div (T_i - T_o)]]$

17. According to the NRCA/CRCA, a properly installed base flashing for a BUR should be installed to what minimum height above the finished roof surface?

- A. 6 inches (152 mm)
- B. 8 inches (200 mm)
- C. 10 inches (254 mm)
- D. 12 inches (610 mm)

18. Refer to Exhibit #2.

A roof replacement project is being designed for a rectangular agricultural building ( $I = 0.87$ ) with numerous window and door openings (partially enclosed). The roof has an eave height of 70 feet (21 m) and the location is a relatively open terrain of a rural area with a basic wind speed of 90 mph (145 kph). Assume wind directionality factor of 1.0.

According to the RCIF *Wind Pressures on Low Slope Roofs*, and based on the velocity pressure equation, as shown in the exhibit, what is the design pressure in the field of the roof?

- A. -32.72
- B. -39.75
- C. -41.16
- D. -47.31

19. Refer to Exhibit #3.

You have been asked to size a gutter for a contractor who only has 24 gauge galvanized steel available.

Referring to the exhibit, what is the maximum width of unformed metal stock that can be used to form a rectangular gutter based on the table given?

- A. 15 inches (380 mm)
- B. 20 inches (510 mm)
- C. 25 inches (640 mm)
- D. 35 inches (890 mm)

20. Which type of drawing is used to convey the design intent for a vent stack in a built-up roof construction?

- A. detail
- B. section
- C. diagram
- D. perspective

21. Which statement is correct about vapor retarders?

- A. Vapor retarders are most effective when placed at the warm side of the assembly.
- B. Vapor retarders are primarily intended to reduce the rate of air flow through a roof assembly.
- C. A typical pattern of roof fasteners that puncture a vapor retarder can reduce its effectiveness by over 40%.
- D. Sealing of laps in a vapor retarder helps reduce vapor transmission only when there is a separate air barrier present.

### **Codes and Standards**

22. You are designing a roof replacement on a Factory Mutual Global insured building.

Which FM Global Loss Prevention Data Sheet should you consult for perimeter metal flashing attachments?

- A. FM 1-18
- B. FM 1-49
- C. FM 1-54
- D. FM 1-52

## Materials

23. Which two functions does bitumen (asphalt, coal tar, or cold adhesive) serve in built-up roof membrane systems? (Choose two.)
- A. adhesion
  - B. peel strength
  - C. UV protection
  - D. weatherproofing
24. Extruded polystyrene insulation may have chemical incompatibility with which types of roof covering?
- A. thermoset
  - B. thermoplastic
  - C. metal roof panels
  - D. modified bitumen

## Construction Documents

25. During discussions between the consultant and the owner, the consultant is to prepare a complete set of construction documents on a reroof project using an architectural-type contract. The documentation is to be quite specific regarding materials, application procedures, and cost.

Which type of contract should be used?

- A. unit price contract
- B. cost-plus fee contract
- C. combined bid contract
- D. stipulated (fixed) sum contract

## Construction Phase

26. During a roof replacement project, it is discovered that one layer of 2.5 inch (64 mm) insulation is required on 500 square feet (46.5 square meters) of roof to fill in where the roof decks are at different levels.

If the contractor indicates that there will be no impact on the contract sum and time, which form should be issued?

- A. addendum
- B. change order
- C. change directive
- D. supplemental instruction

27. Which two should be documented in the quality assurance observer's field reports? (Choose two.)
- A. safety
  - B. approval
  - C. deviations
  - D. deficiencies
28. A project is complete and the owner wants to make final acceptance (payment). A lien waiver is required by the contract documents.
- Which statement concerning lien waivers is correct?
- A. A lien waiver is a document from a subcontractor stating that the payment was received from the general contractor.
  - B. A lien waver is a security interest to protect the subcontractor from a general contractor by placing a lien on a property.
  - C. Since the subcontractor does not have a contract with the owner, the subcontractor has the right to lien the project with a lien waiver.
  - D. A lien waiver must be received by the owners project manager within in a statutory period (# of days) from the receipt of the contractor's final invoice.

## Exhibit #1.

$$T_{vr} = T_i - [(\sum R_{vr} + \sum R_m) \times (T_i - T_o)]$$

$\sum R_m$  = Minimum sum of the total R of all roof assembly components

$\sum R_{vr}$  = Sum of R values between the warm side of the assembly and underside of the vapor retarder/temporary roof

$T_i$  = Design Temperature inside the building

$T_o$  = Design Temperature outside the building

$T_{vr}$  = Temperature at the underside of the Vapor Retarder/Temporary Roof

## Exhibit #2.

### Velocity pressure equation

$$q_z = 0.00256(K_z)(K_{zt})(K_d)(V)(V)(I)$$

### Wind Uplift pressure equation

$$p = q_h[(GC_p) - (GC_{pi})]$$

### Velocity Pressure Coefficient Table

Mean Roof Height ft (m)	A	B	C	D
0-15 (0-4.6)	0.68	0.70	0.85	1.03
20 (6.1)	0.68	0.70	0.90	1.08
25 (7.6)	0.68	0.70	0.94	1.12
30 (9.1)	0.68	0.70	0.98	1.16
40 (12.2)	0.68	0.76	1.04	1.22
50 (15.2)	0.68	0.81	1.09	1.27
60 (18.0)	0.68	0.85	1.13	1.31
70 (21.3)	0.68	0.89	1.17	1.34
80 (24.4)	0.68	0.93	1.21	1.38
90 (27.4)	0.68	0.96	1.24	1.40
100 (30.5)	0.68	0.99	1.26	1.43

### External Pressure Coefficient Table

Mean Roof Height  $\leq$  60ft (18.3 m)

field	-1.0
perimeter	-1.8
corner	-2.8

Mean Roof Height  $>$  60ft (18.3 m)

field	-1.4
perimeter	-2.3
corner	-3.2

### Internal Pressure Coefficients Table

open buildings	0.00
Partially enclosed buildings	0.55
enclosed buildings	0.18

### Exhibit #3.

Girth		Galvanized Steel		Copper		Aluminum		Stainless Steel	
in.	mm	gauge	mm	oz.	mm	in.	mm	gauge	mm
up to 15	up to 380	26	0.5512	16	0.55	0.032	0.812	28	0.396
16-20	410-510	24	0.7010	16	0.55	0.040	1.016	26	0.477
21-25	530-640	22	0.8534	20	0.69	0.051	1.295	24	0.635
26-30	660-760	20	1.006	24	0.82	0.063	1.295	22	0.795
31-35	790-890	18	1.311	24	0.82			20	0.952
Over 35	Over 890	16	1.613					18	1.270

**Table 1 -5 Recommended Minimum Gauges For Gutter**

*NOTE: Girth refers to the width of the unformed metal stock.*

## SAMPLE QUESTIONS ANSWERS

Note your answers. Review the appropriate document(s) in those areas to better understand the rationale behind the indicated correct answer.

Take advantage of the programs provided by RCI, including courses on the national and regional levels.

1. C and D
2. A
3. A and C
4. A and D
5. C
6. D
7. A
8. D
9. A and B
10. C
11. C
12. C
13. B
14. A
15. D
16. A
17. B
18. C
19. B
20. A
21. A
22. B
23. A and D
24. B
25. D
26. D
27. C and D
28. A