



**APPLICATION
FOR
REGISTERED ROOF CONSULTANT (RRC®)**

Dear RRC Applicant:

To become a Registered Roof Consultant (RRC), an applicant must meet specific requirements. These requirements include verifiable levels of work experience and education, high ethical standards, and a satisfactory score on both the General Consultant Knowledge (GCK) and RRC examinations. Those who currently hold a Registered Waterproofing Consultant (RWC®) and/or Registered Exterior Wall Consultant (REWC®) designation(s) are exempt from taking the GCK exam.

The General Consultant Knowledge exam tests knowledge common to all components of the building envelope (roofing, waterproofing, and exterior walls). This concept was designed to produce a more efficient testing process, eliminating common information being tested for each consultant designation.

Both the GCK and the RRC Exams must be passed to earn the RRC designation, with the exceptions mentioned above. If only one of these two exams is passed (the general or the technical), the candidate will be required to retake only the exam he or she failed. The exam that has been passed will be valid until the candidate passes the other exam and the designation is earned. Candidates who do not pass an exam will have the option to retry every four months.

There is no separate application for the GCK exam; approval of the RRC application will qualify the applicant to take the general exam. A study guide for the RRC exam is provided at the end of this application. A study guide for the GCK exam is available online or upon request at the International Institute of Building Enclosure Consultants (IIBEC).

All applicants are encouraged to use the online interactive process to complete this application. However, applications are accepted in this traditional form. **Once the application has been submitted to IIBEC (email or mail is acceptable for delivery), all required information must be provided within one year or the application will expire.**

The application fee is \$350 for IIBEC members and \$450 for nonmembers. Please allow 90 days for application processing. Applications will be processed within 60 days for an additional expediting fee (\$50 for members and \$100 for nonmembers).

The fees for each computer-based exam are \$250 for IIBEC members and \$350 for nonmembers. Once registered, the candidate will be contacted by Scantron to schedule an exam at one of the 1,000 conveniently located testing centers. Consult <https://www.scantron.com/test-site-cities/> for testing center locations.

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 IIBEC.

Sincerely,

Alec Jeffries
Senior Director of Membership & Registrations

International Institute of Building Enclosure Consultants
434 Fayetteville Street, Ste. 2400 Raleigh, NC 27601
(T) 919-859-0742 or 800-828-1902
(F) 919-859-1328

www.iibec.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. Meet certain minimum requirements regarding education, personal work experience, character and ethics.
 2. Have the knowledge, skills and abilities to properly observe, evaluate, test, recommend, design and administer roofing projects.
 3. Take and pass both the RRC and the General Consultant Knowledge Exams. If the candidate holds another IIBEC consultant designation, the candidate is exempt from taking the GCK exam.
- B.** The applicant shall satisfy IIBEC that the following minimum requirements have been attained:
1. The applicant has at least four years of roof consulting experience (as defined by the services listed on page II) 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 seminars directly related to the roofing, waterproofing, and/or exterior walls industries, e.g. IIBEC, BURSI, AIA, CSI, or other approved technical programs awarding educational units. To be acceptable, Continuing Educational Hours (CEHs) can be no older than 10 years. There is a maximum of 16 hours accepted per program.
 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 IIBEC are included in this application. They outline the obligations of the roof consultant to the public, the client, the employer, the profession, and the building industry. Conformity to IIBEC's Code of Ethics is expected of all registration holders.
 4. The applicant shall always be objective, unbiased and impartial in 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 benefit or other interest, or acceptance of any contribution or benefit that could reasonably appear that such activity, employment, interest or contribution could compromise the individual's professional judgment or prevent the individual from serving in the best interest of the client or employer.
 6. The Registered Roof Consultant designation, once attained, must be renewed every year. Requirements include paying a renewal fee and providing information regarding continuing educational hours in accordance with the registration renewal procedures established by IIBEC.
- C.** Documentation is required regarding an applicant's experience, education, professional registration, training, etc. An applicant's education and/or work experience is evaluated through 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.

The following assignment of points shall be implemented:

Education – High school education or equivalent is required. Ten points shall be awarded per year of successful completion of college. A maximum of 30 points may be received if a degree is not earned. A diploma or an official transcript must be furnished for all educational points submitted.

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)
Master's 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 – 20 points shall be awarded to registered architects (RA) and 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 with expiration date). Points are awarded for other certifications as noted on page 9.

Personal Work Experience – One 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, Depositions, Expert Testimony	30
6	Roof Moisture Surveys (Infrared, Nuclear, and/or Capacitance)	30
7	Field & Laboratory Testing: Physical/Quantitative Analyses	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 (IIBEC, CSI, ASTM, etc.)	5

** The above items refer to services rendered or tasks performed by the applicant, not by someone under the applicant's direction. The applicant's experience as a roof consultant is being evaluated, not the management ability of the applicant or the experience of the employer or subordinates. See Supplemental Sheet A for additional information regarding these items.

Roof consultants shall have a relatively broad base of experience. Applicant must earn points from experience in a minimum of three categories. To ensure that all applicants have well-rounded experience, each category is restricted in the number of points allowed. Points may be earned from more than one category for a single project. For example, if the applicant 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 for a single project, four points could be earned - one each for categories 1, 5, 6 and 9.

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

Examples of computation of points:

Example 1: A person with one year of college (10 points, industry-related) would require 90 points through experience (90 projects that qualify for one point each or other combination thereof).

Example 2: A registered engineer (20 points) with a four-year degree (40 projects that qualify for one point each or other combination thereof).

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 that qualify for one point each or other combination thereof).

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 that qualify for one point each or other combination thereof).

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 application 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 denial of application.

Make a copy of the completed application for personal records before sending it to IIBEC.

* * * *

APPLICANT PLEASE NOTE: Members and registrants of IIBEC 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. IIBEC currently has no state jurisdiction or governmental registration sanction.



APPLICATION FOR REGISTERED ROOF CONSULTANT

International Institute of Building Enclosure Consultants
 434 Fayetteville Street Ste 2400
 Raleigh, NC 27601
 (800) 828-1902 or (919) 859-0742
 Fax (919) 859-1328

Date_____

Type or Print Legibly Using Black Ink Pen

SECTION 1: PROFILE INFORMATION					
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 IIBEC Registered Roof Consultant classification before? ☐ Yes ☐ No If yes, please give date of application:					
Are you a Registered Architect? ☐ Yes ☐ No Date of first registration: State: #: Other States:					
Are you a Registered Engineer? ☐ Yes ☐ No Date of first registration: State: #: Other States:					
Are you a Contractor or employed by one? ☐ Yes ☐ No Type: ☐ General ☐ Roofing State and license number for each:					
Are you employed by or do you own a company that manufactures, distributes, or sells roofing products or materials? ☐ Yes ☐ No Identify:					
What percent of your principal income do you derive as a roof consultant? % As a waterproofing consultant? % As an exterior wall 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? ☐ Yes ☐ No					
SECTION 2: BUSINESS INFORMATION					
Employer Business Type: ☐ Other ☐ Consulting ☐ Architectural ☐ Engineering ☐ Contractor ☐ Manufacturer ☐ Distributor					
Name of business:					
Business street address: City: State: Zip: Phone & Fax:					
Organization: ☐ Individual ☐ Individual Proprietorship ☐ Partnership ☐ Corporation ☐ 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 is not required with ten or more college coursework units). A CERTIFIED COPY OF THE TRANSCRIPT(S) should be forwarded directly from the institution to IIBEC. A copy of the diploma is also acceptable. For incomplete college or university work, indicate the number of semesters completed. Attach additional sheets as required.

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	Degree
High School						
Junior College						
College						
Other						
Other						

Record Educational Points on Attachment Sheet 3

SECTION 4: PROFESSIONAL EMPLOYMENT HISTORY

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 personal work experience is claimed. A minimum of ten projects from three separate service categories must include a project contact and telephone number. Additional project/project contact information may be requested during the application approval process. The categories listed below refer to services rendered or tasks performed by the applicant, not by someone under the direction of the applicant. The experience of the applicant as a roof consultant is being evaluated, not the applicant's management ability or the experience of the applicant's employer or subordinates. See Supplement Sheet A for additional information regarding the categories listed below.

One point shall be awarded per project or task in the following categories of experience related to roofing. Points must be earned in a minimum of three 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, Depositions, Expert Testimony.....	30
6.....	Roof Moisture Surveys (Infrared, Nuclear, and/or Capacitance)	30
7.....	Field & Laboratory Testing: Physical/Quantitative Analyses.....	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 (IIBEC, CSI, ASTM, etc.)	05

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

SECTION 6: CONTINUING EDUCATIONAL HOURS EARNED

On Attachment Sheet 4, provide information regarding your receipt of continuing educational hours through your attendance at programs directly related to the industry. Attendance at a minimum of three roofing, waterproofing and/or exterior walls related programs (i.e. IIBEC, AIA, BURS, or other approved educational programs) is required and documentation of such attendance must be provided. Programs must be technical in nature (not sales or product oriented). Online programs meeting these requirements are acceptable. 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. A minimum of 70 credit hours is required. Continuing Educational Hours (CEHs) can be no older than 10 years.

SECTION 7: REFERENCES
On Attachment Sheet 5, provide names and addresses of five references. Three references must know the applicant professionally and be a Registered Architect, Registered Engineer or Registered Roof Consultant. References may not be related. In addition, only one reference may be from a current employer or fellow employee. Each reference listed must have direct personal knowledge of the applicant's character, ethics and professional competence. Return the summary sheet to IIBEC. Make five copies of Attachment Sheet 6 and complete the top portion of the Reference Form for each reference listed. Please send these forms to the individuals selected. Forms should be returned directly to IIBEC from the references.
SECTION 8: STANDARDS OF ETHICAL PRACTICE
The "Standards of Ethical Practice" for IIBEC (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 REGISTRATION, AUTHORIZATION AND RELEASE
Please complete Attachment Sheet 8 in the presence of a Notary and submit to IIBEC with the application.

SECTION 4: PROFESSIONAL EMPLOYMENT HISTORY

Name _____

Date _____

☐ New☐ Update☐ Continuation Sheet

List in chronological order, beginning with the first employer, applicant's 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 current employer.

SECTION 5: PERSONAL WORK EXPERIENCE

Description of Service Categories

1. Roof Condition Surveys, Audits or Investigations

This category applies to the scope of work in which an individual performs a visual condition assessment of a roof. The assessment would be performed in general accordance with the recommended procedures of IIBEC, 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 category may include the preparation of a complete set of documents including the bidding documents, general conditions, technical specifications, roof plans, sections and details, as they relate specifically to roofing. On some projects, however, only the technical specification must be prepared by the individual for implementation within another design professional's contract documents. The contract documents, in any event, would be complete. Design review of construction documents, specifically related to roofing materials and systems, is acceptable.

3. Contract Administration/Project Management

This category applies to the administration of a roof construction project (reroofing, repairs, and/or new construction) and may include some or all of 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, CPRs, CCDs; 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

This category includes observations performed by the applicant during construction for the assurance of the 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 individual 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 earned by an individual supervising a technician performing these services. Points earned in this category must be the direct on-site experience of the applicant.

5. Legal: Forensic Investigations, Depositions, and Expert Testimony

This category includes forensic investigation that 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. Only one point may be claimed for each legal case for this category; multiple points are not allowed where both deposition and court testimony are provided. Experience in this category is applicable even if the case does not go to trial.

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

This category includes performance of 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 survey reports are issued.

One point is awarded for each project on which a roof moisture survey is performed, not each roof. Roof moisture surveys may be supplemented with destructive testing to confirm the nondestructive 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, or a project including surveys on seven buildings, 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, then multiple points may be claimed.

7. Field & Laboratory Testing: Physical/Quantitative Analyses

This category refers to ASTM testing for physical, qualitative, 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 that may be performed in roof condition surveys, moisture condition surveys, or other services.

8. Research Directly Related to Roofing

This category 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)

This category includes 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)

This category includes lectures that emphasize the educational or technical nature of the presentation. Credit shall not be awarded to lectures in which the primary purpose of the presentation was to promote one's company or abilities. 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

This category includes 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 service was intended. Persons receiving points for this category 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

This category includes active two-year participation in professional associations such as IIBEC, NRCA, SWRI, CSI, ASTM, ASCE, AIA, etc. Active participation is mandatory; merely being a card-carrying member is not sufficient. One point is awarded per association.

Name _____ Date _____

SECTION 5: PERSONAL WORK EXPERIENCE**CATEGORIES**

(Check multiple categories per project, if applicable – see pages 6 and 7 for descriptions.)

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 _____												
Total for Each Column:													

A minimum of ten projects from three separate service categories *must include* a project contact and telephone number.
****Include month(s) and year(s) of each project (include on both sheets). Additional projects and/or 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 6 and 7 for descriptions.)

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 _____												
Total for Each Column:													

A minimum of ten projects from three separate service categories *must include* a project contact and telephone number.****Include month(s) and year(s) of each project (Include on both sheets). Additional contact information may be requested and duplicate sheet as needed.**

Name _____

Date _____

SUMMARY OF POINTS**SECTION 5: 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.	Field & 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 (IIBEC, CSI, ASTM, etc.)	05	1		
Total Number of Points Claimed for Personal Work Experience (Max = 100)					

SECTION 3: EDUCATIONAL POINTS

Four-Year Curriculum (Industry/General)	40/32	10/8/Yr.		
Five-Year Curriculum (Industry/General)	50/40	10/8/Yr.		
Master's Degree (Industry/General)	10/8			
Doctorate (Industry/General)	10/8			
Total Number of Points Claimed for Education (Max. 50)				

PROFESSIONAL REGISTRATION POINTS

Registered Architect*	20	20		
Registered Engineer*	20	20		
Registered Waterproofing Consultant	10	10		
Registered Exterior Wall Consultant	10	10		
Registered Roof Observer	5	5		
Registered Exterior Wall Observer	5			
Other*#	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 three categories.
2. A project register must be completed for each project. Some may include more than one service category.
3. A minimum of ten projects from three separate service categories must include a contact and 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. *Provide Copy of current license or registration certificate, which indicates current expiration date.
9. # Current license or registration must be recognized by a government agency or jurisdiction and require a minimum of a two-year industry-related degree from an accredited institution, and successful completion of an examination..

SECTION 6: CONTINUING EDUCATIONAL HOURS EARNED

Name _____

Date _____

☐ New☐ Update☐ Continuation

Course Name	Presented By	Dates	Hours
		Total #	

Include documentation of attendance 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. Acceptable programs must be technical in nature (not sales or product oriented) and industry related. To be acceptable, Continuing Educational Hours (CEHs) can be no older than 10 years. There is a maximum of 16 credit hours accepted per program.

A minimum of 70 credit hours is required. Please list your continuing educational courses in chronological order!

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. Send directly to each reference, who should then send the form directly back to IIBEC.



REFERENCE FORM

(Top portion to be completed by applicant)

Date _____

Dear _____:
(Name of reference)

An application for Registered Roof Consultant has been filed with the International Institute of Building Enclosure Consultants (IIBEC) by

_____ Of _____, _____.
(Name of applicant) (Company) (City/state)

Please provide the information requested below, if known, and make any comments that may be of value to IIBEC 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 IIBEC appreciate your cooperation in promptly furnishing the information requested.

GENERAL INFORMATION

(Bottom portion to be completed by reference)

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 _____
Email _____
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, email or fax directly to:

International Institute of Building Enclosure Consultants
434 Fayetteville Street Ste. 2400
Raleigh, NC 27601
(T) 800-828-1902 or 919-859-0742 (F) 919-859-1328
Email: spatterson@iibec.org

CODE OF ETHICS
International Institute of Building Enclosure Consultants

Adopted July 17, 2001

Revised March 28, 2006

Revised September 19, 2015

Introduction: The International Institute of Building Enclosure Consultants (IIBEC) is dedicated to the highest standards of professionalism, integrity, and competence. The standards contained in this Code of Ethics (Code) are statements of ethical principles by which the professional conduct and obligations of all IIBEC members and registrants shall be guided.

Under the IIBEC Bylaws, all IIBEC members and registrants are required to comply with the Code of Ethics and to report any observed violations. Adherence to this Code must be above reproach and beyond the influence of competing interests. Even the appearance of a conflict of interest shall be avoided.

The standards contained in this Code of Ethics are statements of ethical principles having broad applicability to members and registrants of IIBEC.

Members and registrants of IIBEC shall 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 in which they practice, and shall maintain the highest possible standard of professional judgment and conduct. Members and registrants shall conduct their practice honestly and impartially, serving with integrity their clients, employers, and/or the public. Learned and uncompromised professional judgment should take precedence over any other motive.

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

Fundamental Canons

Members and registrants of IIBEC, in the performance of their duties, shall:

1. Hold paramount the safety, health, and welfare of the public;
2. Uphold the letter and spirit of the ethical standards governing their professional affairs, considering the full impact of their actions on the community at large and conducting themselves in a fashion that brings credit to themselves, their employers, their peers, and their profession; and
3. Recognize the value and contributions of others engaged in all aspects of consultation, design, and construction.

Rules of Practice

1. Members and registrants shall hold paramount the safety, health, and welfare of the public in the performance of their duties.
 - a. If a member's or registrant's judgment is overruled under circumstances that, in the opinion and best professional judgment of the member or registrant, endanger life or property, the member or registrant shall:
 - i. Advise his or her employer and/or client about the decision,
 - ii. Refuse to consent to the decision, and
 - iii. Notify the appropriate building authority charged with the enforcement of the applicable laws or regulations.
 - b. Members or registrants who have knowledge of any alleged violations of this Code shall report them to the appropriate public authorities and IIBEC, and shall cooperate with appropriate public authorities and IIBEC in providing such information as may be applicable.
2. Members and registrants shall not permit the use of their names or firms nor associate in business ventures with any person or firm that they have reason to believe is engaged in fraudulent or dishonest business or professional practices.
3. Members and registrants shall uphold the letter and spirit of the ethical standards governing their professional affairs, consider the full impact of their actions on the community at large, and conduct themselves in a fashion that brings credit to themselves, their employers, and their profession by:
 - a. Engaging only in accurate, appropriate, and truthful promotion of their practice;
 - b. Being respectful of the rights of others in obtaining work or employment;
 - c. Making only accurate, truthful, and appropriate statements or claims about their qualifications, experiences,

- d. Being objective and truthful in reports, statements, testimony, and on social media;
 - e. Preserving the confidentiality of their clients and employers and serving each in a professional and competent manner;
 - f. Exercising unprejudiced and unbiased judgment and conduct when performing all services;
 - g. Undertaking assignments only when qualified by education and experience in the specific technical fields involved;
 - h. Declining any activity or employment, avoiding any financial or other interest, and refusing any contribution if it would reasonably appear that such activity, employment, interest, or contribution could compromise their judgment or conduct or prevent them from serving the best interests of their clients or employers, without making full disclosure to the client and obtaining the client's consent thereto; and
 - i. Neither offering nor making 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.
4. Members and registrants shall recognize the value and contributions of others engaged in all aspects of consultation, design, and construction. This means they shall:
- a. 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;
 - b. Encourage professional education and research, as well as the development and dissemination of information related to all aspects of consultation, design, and construction of roofing, waterproofing, and exterior wall systems; and
 - c. Take into account applicable laws and regulations and may rely on the advice of other competent and qualified persons as to the intent and meaning of such applicable laws and regulations.
5. Members and registrants shall not accept compensation—financial or otherwise—from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed.
6. Members and registrants shall not intentionally or recklessly mislead existing or prospective clients about the results that can be achieved through the use of the members' or registrants' services or products, nor shall the members or registrants state that they can achieve results by means that violate applicable law or the Code.
7. Members and registrants having substantial information leading to a reasonable belief that another member or registrant has committed a violation of this Code that raises a serious question as to the honesty, trustworthiness, or fitness of the other member or registrant shall file a complaint with the IIBEC Ethics Committee.
8. Members and registrants shall maintain and further their knowledge of the science, principles, and ethics of their profession.
9. Members and registrants shall be scrupulously honest in their control and spending of monies, and promote effective use of resources through open, honest, and impartial service with fidelity to the public, employers, associates, and clients.
10. Members and registrants shall approve or issue only those documents reviewed or prepared under their direct control and supervision that are determined to be safe for public health and welfare, in conformity with accepted industry standards and applicable laws.
11. Certain practices are not in themselves unethical, unprofessional, or contrary to any policy of IIBEC, and IIBEC members and registrants are free to decide for themselves whether to engage in any of these practices, unless in violation of an applicable law. These may include the following:
- a. Contributing his/her services or anything of value to those endeavors that the member deems worthy;
 - b. Participating in the political process and contributing time and money to political campaigns;
 - c. Submitting competitive bids or price quotations, including in circumstances where price is the sole or principal consideration in the selection of a consultant;
 - d. Providing discounts; or Providing pro bono services.

Enforcement and Amendment

- 1. Enforcement of the Code of Ethics is administered through the IIBEC Ethics Committee, appointed by the IIBEC Board of Directors, and as set forth in the *IIBEC Ethics Administrative Procedures*.
- 2. The IIBEC Code of Ethics may be amended by the IIBEC Board of Directors upon a two-thirds vote of the Board

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 the International Institute of Building Enclosure Consultants (IIBEC). 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 benefit 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 IIBEC 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: ☐ \$350.00 member fee ☐ \$450.00 nonmember fee

Expediting fee: ☐ \$50.00 member fee ☐ \$100.00 nonmember

Charge my ☐ VISA ☐ MasterCard ☐ American Express ☐ Discover for:

☐ \$350.00 member fee ☐ \$450.00 nonmember fee

☐ \$50.00 member expediting fee ☐ \$100.00 nonmember expediting fee

Name on the card _____ Telephone _____

Account Number _____ Expiration Date _____

3- or 4-Digit Verification Value Code _____

Signature _____ Date _____

Telephone _____ Cell phone _____

Bill to Address: (If different from what is listed on page 1 of the application)

Address: _____

City: _____ State: _____ Zip code: _____

Please return the completed single-sided application along with payment in US dollars to: (email delivery is preferred). *Please allow 90 days for application processing. Applications will be processed within 60 days for the expediting fee listed above. **Once the application is submitted, all outstanding information must be received within 1 year or the application will become null and void.**

International Institute of Building Enclosure Consultants
434 Fayetteville Street, Suite 2400
Raleigh, NC 27601
(T) 919-859-0742 or 800-828-1902 (F) 919-859-1328
Email: spatterson@iibec.org

CHECKLIST TO ACCOMPANY REGISTERED ROOF CONSULTANT APPLICATION

Applicant's Name _____ Date _____

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

1. Application fee enclosed (\$350.00 members/\$450.00 nonmembers)..... ☐
2. Completed Sections 1 and 2 of the application..... ☐
3. Section 3 of application:
 - a. High school or college 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 experience is included on Attachment Sheet 3..... ☐
 - b. At least ten contact names and phone numbers are listed from three 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. Points have been attained in a minimum of three 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 three 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 is a relative..... ☐
 - c. No more than one of these references is a present employer or fellow employee from current firm ☐
 - d. Made copies of Attachment Sheet 6 for EACH reference. Completed top part only for each..... ☐
 - e. Reference forms sent 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 IIBEC. (Attachment Sheet 7)..... ☐
10. Section 9 of application: Attachment Sheet 8
 - a. Affidavit has been executed and notarized..... ☐
11. Once an application has been submitted to IIBEC the time limit to provide all outstanding information is one year. ☐

When completed and all spaces are checked, sign below and send the completed application form to RCI. If mailing, **do not fold or double-side**. Allow 90 days for processing. **MAKE A COPY OF YOUR COMPLETED APPLICATION BEFORE SENDING TO IIBEC** for your records.

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 IIBEC and successful completion of the required examinations.

Signature of Applicant _____



STUDY GUIDE

For the

REGISTERED ROOF CONSULTANT (RRC®) EXAM

Prepared By
RRC Examination Development Task Force

International Institute of Building Enclosure Consultants
434 Fayetteville Street, Suite 2400
Raleigh, NC 27601
800-828-1902 919-859-0742
FAX 919-859-1328

RRC EXAM STUDY GUIDE

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STUDY GUIDE RRC® EXAMINATION

INTRODUCTION

The Registered Roof Consultant (RRC) Program has been in existence since 1987. The demand for the RRC title by private clients and public agencies continues to grow rapidly as the industry recognizes the value of the RRC's quantified skill-set. The primary beneficiaries of this program are the public, the roofing industry, and those individuals who become registered.

Registration is a two-part program. The comprehensive application allows IIBEC to verify certain aspects of education, ethics and roofing experience. The online 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 computer-based examination; however, it is not intended to be an inclusive listing of every topic addressed on the test. This document is strictly a guide. A sample of references used in the development of this exam are provided.

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, the candidate must be thoroughly familiar with a broad spectrum of principles related to roof system design, testing and construction. 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 RRC exam is offered by Scantron, a computer-based testing company, which has over 1,000 conveniently locating testing centers. Approved applicants will be sent exam registration forms. Upon receipt, candidate information will be conveyed to Scantron. Scantron will then contact the candidate to schedule a testing session.

The examination is up to four hours in length and consists of 60 multiple-choice questions that will test knowledge in the following roofing areas: codes and standards, materials and properties, assemblies, analysis and design, and evaluation and testing. Some problems may involve mathematical computations that require familiarity with basic algebra, geometry and trigonometry. Reference materials, charts and/or tables needed for the solution of problems will be provided online within the exam.

To earn the RRC designation, both the General Knowledge Consultant (GCK) and Registered Roof Consultant Exams must be taken and passed. There is no separate application for the general exam; approval of the RRC application will qualify the candidate to take the GCK Exam. If only one of these two exams is passed, the candidate is required to retake only the exam he or she failed. The exam that has been passed will be valid until the candidate passes the other exam and the designation is earned. Candidates who do not initially pass an exam will have the option to retry every four months. Once an

applicant has passed the GCK Exam, it will not need to be retaken for other RCI consultant designations (Registered Waterproofing Consultant and Registered Exterior Wall Consultant).

Approved applications have a two-year shelf life; and once the application has expired, reapplication will be required.

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

A sample of documents/references that were used to develop the RRC Exam is as follows:

References*

	Title	Author	Pub. Date
1	ANSI/SPRI FX-1: Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners	ANSI/SPRI	August 11, 2011
2	ASCE 7-10: Minimum Design Loads for Buildings and Other Structures	ASCE	2010
3	FM Global Property Loss Prevention Data Sheets	Factory Mutual Insurance Company	2012
4	International Building Code 2009	International Code Council	February 2009
5	<i>The NRCA Roofing Manual: "Metal Panel and SPF Roof Systems"</i>	NRCA	2012
6	<i>The NRCA Roofing Manual: "Membrane Roof Systems"</i>	NRCA	2011
7	RCIF Publication No. 02.03, <i>Roof Drainage</i>	Patterson/Mehta/Wagner	2003
8	<i>Roof Systems Thermal & Moisture</i>	RCI (now IIBEC)	2011
9	<i>Roof Technology & Science I</i>	RCI (now IIBEC)	2014
10	<i>Roof Technology & Science II</i>	RCI (now IIBEC)	2014
11	<i>Architectural Sheet Metal Manual</i>	SMACNA	January 2012
12	<i>Wind Pressures on Low-slope Roofs</i>	Stephen Patterson and Madan Mehta	2013

* The references listed above are only some of the many that were used in the development of this exam. This is meant to serve as a guide to illustrate the types of references used; this is not a recommendation or suggestion to purchase all of the publications listed. The most useful tool in preparation for the exam is the following list of skills, knowledge and responsibilities identified by the task force as those associated with acceptable performance within the roof consulting profession. It is recommended that the applicant review this list as it relates to one's experience/skill set and then prepare accordingly with the courses and/or publications which may be helpful to the individual.

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 included below. The percentage of questions on the exam from each section is indicated.

Sections	Section/Objective Title	Percentage of questions from section on exam
Section 1	Codes and Standards	8.5%
Objective 1.1	Identify application of fire codes for roof design.	
Objective 1.2	Identify industry standards that apply to roof design.	
Objective 1.3	Describe application of building codes and standards that apply to roof design.	
Section 2	Materials and Properties	16.5%
Objective 2.1	Describe roofing component characteristics.	
Section 3	Assemblies	20%
Objective 3.1	Describe characteristics of steep-slope assemblies.	
Objective 3.2	Describe characteristics of low-slope assemblies.	
Objective 3.3	Describe characteristics of flashings and details.	
Section 4	Analysis and Design	30%
Objective 4.1	Demonstrate knowledge of wind design.	
Objective 4.2	Demonstrate knowledge of drainage design.	
Objective 4.3	Demonstrate knowledge of moisture control systems.	
Objective 4.4	Demonstrate knowledge of thermal system design.	
Section 5	Evaluation and Testing	25%
Objective 5.1	Describe quality-assurance practices.	
Objective 5.2	Describe field and laboratory testing practices.	
Objective 5.3	Demonstrate knowledge of moisture surveys.	
Objective 5.4	Demonstrate knowledge of visual roof condition assessments	
Objective 5.5	Describe roof failure modes and mechanisms.	
	Total Percentage	100%

RRC Exam Sample Questions

Sample questions are provided from each section of the exam and are indicative of the types of questions you will encounter. Exhibits and answers have been provided at the end of the study guide. Partial credit is not given for one correct answer where two are required.

Codes and Standards

1. You are asked to prepare specifications for a new 100,000-square foot [9,290-square-meters] warehouse in Kansas City, Missouri. The building will have a structural steel frame and a corrugated metal roof deck. The client has indicated they plan to be insured by FM Global and will need a Class 1-rated roof assembly. The client has also requested that the roof assembly consist of a modified bitumen roof covering with a minimum R-value of 20 [RSI = 3.52] installed over the roof deck.

Which two standards should be referenced in the performance standards of the roof specification to address the fire rating of the assembly? (Choose two.)

- A. FM 1-28
- B. FM 1-52
- C. FM 4450
- D. FM 4470

2. You are calculating the uplift for an edge metal attachment.

Which standards organization would you use for your design?

- A. SMACNA
- B. ASTM
- C. ANSI/SPRI
- D. NRCA

3. Which two components of a roof assembly are administered by requirements in ASHRAE Standard 90.1? (Choose two.)

- A. Insulation
- B. Ballast
- C. Air barrier
- D. Metal deck

Materials and Properties

4. For a gravel-surfaced built-up roof membrane, the aggregate surfacing provides which two primary functions? (Choose two.)
- A. Splitting resistance
 - B. Impact resistance
 - C. UV resistance
 - D. Water resistance

5. A tile roof is to be installed on a building located in a hot/humid climate with a plywood roof deck installed at a slope of 3 units vertical in 12 units horizontal, and the dimension of the S-shaped tile is 18 inches [450 mm] long and 18 inches [450 mm] wide with an installed weight of 10 psf [479 Pa].

According to the Tile Roof Institute, what is the recommended attachment method?

- A. One steel nail with 5/16-inch [8-mm] diameter head of length to penetrate 1/2 inch [13mm] into the deck or batten.
 - B. Two copper nails with 3/8-inch [9-mm] diameter head of length to penetrate 3/4 inch [19 mm] into or through the thickness of the deck or batten.
 - C. One hot-dipped galvanized screw with 5/16-inch [8-mm] diameter head of length to penetrate 3/4 inch [19 mm] into or through the thickness of the deck or batten.
 - D. Medium-sized patty of mortar composed of Type I Portland cement, cleaned/sieved sand, and potable water.
6. What are two purposes of gypsum cover boards? (Choose two.)
- A. To prevent crushing of roof insulation
 - B. To improve water resistance
 - C. To improve fire resistance
 - D. To reduce the number of fasteners required for attachment

7. The coating for a spray-applied polyurethane foam roof contains 69 percent solids at the time of application.

For average 15-mil [0.38-mm] dry film thickness, what is the wet mil thickness required for a single-coat application measured to the nearest mil [0.03 mm]?

- A. 10 mils [0.25 mm]
- B. 18 mils [0.46 mm]
- C. 22 mils [0.56 mm]
- D. 25 mils [0.64 mm]

Assemblies

8. A standing-seam metal roof has thermal movement caused by changes in temperature. When designing for expansion and contraction, the consultant elects to affix the panels at the ridge.

At which location should the panels be affixed?

- A. At the eave
 - B. At the hip
 - C. At the lap joints
 - D. At the valley
9. What are two ways that ANSI/SPRI/FM 4435/ES-1 is used in the design of perimeter edge systems? (Choose two.)
- A. To determine vertical and horizontal loads on sheet metal and wood nailers
 - B. To determine the type of fasteners used to attach metal edge systems
 - C. To prescribe the field test procedures for metal edge systems
 - D. To prescribe the laboratory testing procedure for metal edge systems
10. A client asks you to investigate a SPF roof system that has developed numerous blisters. Core samples reveal larger, elongated cells between two of the lifts.

What caused the blisters?

- A. Tree-bark foam texture on the lower lift
 - B. Off-ratio foam on the upper lift
 - C. Ultraviolet degraded foam of the lower lift
 - D. Popcorn foam texture on the upper lift
11. As part of a factory expansion, additional plumbing vents are being provided in the existing conventional built-up roofing system.

Which two features should be included in the flashing detail at these penetrations? (Choose two.)

- A. Cant strip
 - B. Metal flashing
 - C. Wood curb
 - D. Membrane stripping sheet
12. You are designing a sump for a roof drain on a low-sloped roof.
- According to NRCA guidelines, how wide should the sump be?
- A. Ten times the thickness of the insulation
 - B. The drain bowl size plus 24 inches [610 mm]
 - C. 36 inches [914mm] minimum
 - D. 48 inches [1219mm] minimum

Analysis and Design

13. Refer to Exhibit #1

A building is located on open terrain with scattered obstructions. The distance from the ground surface adjacent to the building to the roof eave varies from 54 feet [16.5 m] to 58 feet [17.7 m].

In accordance with ASCE 7-10, what is the Velocity Pressure Exposure Coefficient for this roof as shown in the exhibit?

- A. 1.106
- B. 1.114
- C. 0.834
- D. 0.842

14. A client asks you to calculate the design wind pressure for a roof on a building that meets enclosure classification requirements for both an open and partially enclosed building.

According to ASCE 7-10, which statement is true?

- A. The building should be classified as an open building.
- B. The building should be classified as an enclosed building.
- C. The building should be classified as a partially enclosed building.
- D. The building classification is not required when calculating design wind pressures.

15. Refer to Exhibit #2

You are designing the drainage for a new house, and the owner wants to have half-round gutters that are to be installed level with two downspouts. The roof has a slope of 6:12 and is located in an area where the rainfall intensity is 5.7 inches [146 mm] per hour.

Referring to the exhibit, what is the minimum diameter gutter size to be used assuming the downspouts are adequate to drain the roof?

- A. 5 inches [127 mm]
- B. 6 inches [152 mm]
- C. 7 inches [178 mm]
- D. 8 inches [203 mm]

16. Refer to Exhibit #3

You are designing the replacement for the upper roof section on a commercial building. The existing scuppers are only 4 inches [102 mm] wide and often become clogged with debris. For the building shown on the exhibit, the head of water at the scupper is 1 inch [25.4 mm] and a rainfall intensity of 2.75 inches [69.9 mm] per hour.

What is the minimum scupper length for the scupper on roof section C?

- A. 7 inches [178 mm]
- B. 8 inches [203 mm]
- C. 9 inches [229 mm]
- D. 10 inches [254 mm]

- 17.** You are asked to perform a peer review on a low-slope roof system for a new indoor pool facility.

The roof assembly contains the following:

- metal deck
- 1/2 inch [13 mm] gypsum
- 6 mil polyethylene vapor retarder
- 2 inches [50 mm] polyisocyanurate (two layers, staggered)
- 1/2 inch [13 mm] wood fiber cover board
- 4-ply BUR

The system is to be mechanically fastened to the deck through the polyisocyanurate.

Which two concerns should you bring to the attention of the architect? (Choose two.)

- A.** A hygrothermal analysis should be completed of the roof assembly.
- B.** No vapor barrier should be installed.
- C.** Consider using a different vapor barrier type.
- D.** A mechanically fastened membrane would be less prone to thermal bridging.

- 18. Refer to Exhibit #4**

Referring to the exhibit, what is the temperature between the layers of polyisocyanurate insulation to the nearest whole degree?

- A.** 49 degrees F [9.4 degrees C]
- B.** 51 degrees F [10.6 degrees C]
- C.** 53 degrees F [11.7 degrees C]
- D.** 55 degrees F [12.8 degrees C]

- 19.** Your client owns a 20,000 square foot [1,860 square meters] light-industrial warehouse near San Jose, California, which was constructed five years ago. The client is planning to re-coat the existing roof and is concerned about whether this project will need to meet the state's cool roof requirements in regards to solar reflectance.

Which consideration will affect the design of this project?

- A.** The color of the existing roof
- B.** The U-value of the existing roof assembly
- C.** The coating rating by the Cool Roof Rating Council
- D.** The height of the existing building

Evaluation and Testing

20. According to RCI (now IIBEC)'s *Rooftop Quality Assurance* manual, during the installation of a multi-ply asphalt built-up roof.

Which two statements describe quality control guidelines? (Choose two.)

- A. Bitumen is within the recommended equiviscous temperature (EVT) range at the point of felt application.
- B. Roofing plies are installed so sidelaps and endlaps are not bucking water.
- C. Insulation is loosely attached to the substrate or underlying insulation with specified securement.
- D. Substrate is 90 percent dry, clean, reasonably smooth, and suitably prepared to receive insulation and/or membrane.

21. When testing for withdrawal resistance of fasteners, which two conditions would suggest the need for additional pull tests to be performed? (Choose two.)

- A. Steel decking has multiple changes in orientation.
- B. Pullout values vary significantly
- C. Water infiltration has occurred.
- D. Roof slope changes direction.

22. You are asked to investigate possible moisture damage in an existing roofing system; however, the building owner is concerned about cutting or damaging the roof during the field test procedure.

Which two nondestructive techniques should be used? (Choose two.)

- A. Capacitance meter
- B. Core sampling
- C. Electrical resistance probe
- D. Infrared thermography

23. Your client has a series of warehouses at a single facility. You are asked to recommend a single, noninvasive, moisture survey technique to be used on all the roofs. All buildings are single-story, high-bay structures with metal decking. Some buildings feature through-fastened metal panel roofs with fiberglass batt insulation; some feature PVC roofs with foil-faced isocyanurate board insulation. The survey will be conducted during a planned week-long vacation shutdown when you will have complete access to the facility.

Which moisture survey technique should you recommend?

- A. Electrical impedance
- B. Infrared
- C. Capacitance
- D. Electric field vector mapping

- 24.** During a visual assessment survey of a conventional built-up roofing membrane with pea gravel surfacing, the asphalt flood coat of the roofing membrane has areas of displaced gravel.

What does this mean?

- A.** The roofing membrane is nearing the end of its service life.
- B.** The roofing membrane is experiencing differential movement.
- C.** The roofing membrane is experiencing creep.
- D.** The roofing membrane is experiencing wind scour.

- 25.** The construction of an existing, original roof on a 12-year-old warehouse located in Duluth, MN, consists of:

- Modified bitumen cap sheet, torch-applied
- Modified bitumen base sheet adhered with asphalt bitumen
- ½-inch [12.5-mm] wood fiberboard adhered with asphalt bitumen
- 2 inches [75 mm] polyisocyanurate insulation mechanically fastened to the roof deck
- Sloped steel deck

The building was originally used for heated dry goods handling and storage but was converted a year ago to a facility for temporary storage of finished pulp products, which is a high humidity activity. Dripping from the roof deck at the interior roof drain openings was observed during the late winter and spring. The roof has not leaked during the summer. Visual examination of the roof did not reveal any apparent damage or excessive deterioration of the roof membrane or the membrane flashings at the roof top penetrations.

What is the probable cause of the reported dripping at the roof drain openings?

- A.** Water penetrating at undetected flaws in the membrane seams
- B.** Snow blowing in at the mechanical units during the winter
- C.** Condensation accumulation within the roof assembly
- D.** Water seeping through the aging membrane

Exhibit #1

Velocity Pressure Exposure Coefficients, K_h and K_z

Table 28.3-1

Height above ground level, z		Exposure		
		B	C	D
ft	(m)			
0-15	(0-4.6)	0.70	0.85	1.03
20	(6.1)	0.70	0.90	1.08
25	(7.6)	0.70	0.94	1.12
30	(9.1)	0.70	0.98	1.16
40	(12.2)	0.76	1.04	1.22
50	(15.2)	0.81	1.09	1.27
60	(18)	0.85	1.13	1.31

Notes:

- 1 The velocity pressure exposure coefficient K_z may be determined from the following formula:

For $15 \text{ ft.} \leq z \leq z_g$

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

For $z < 15 \text{ ft.}$

$$K_z = 2.01 (15/z_g)^{2/\alpha}$$

Note: z shall not be taken less than 30 feet in exposure B.

2. α and z_g are tabulated in Table 26.9-1.
3. Linear interpolation for intermediate values of height z is acceptable.
4. Exposure categories are defined in Section 26.7.

Exhibit #2 (Page 1 of 2)

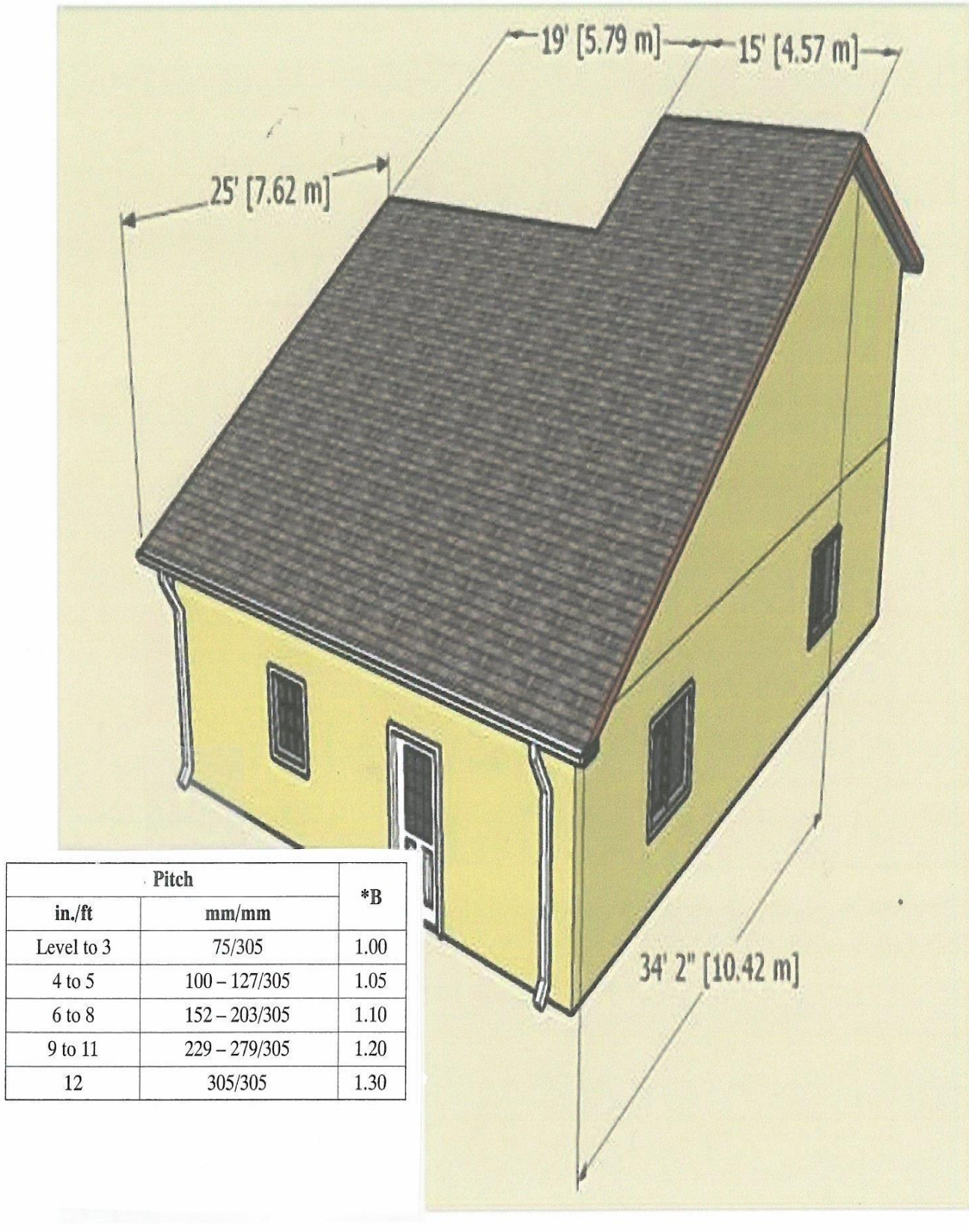


Exhibit #2 (Page 2 of 2)

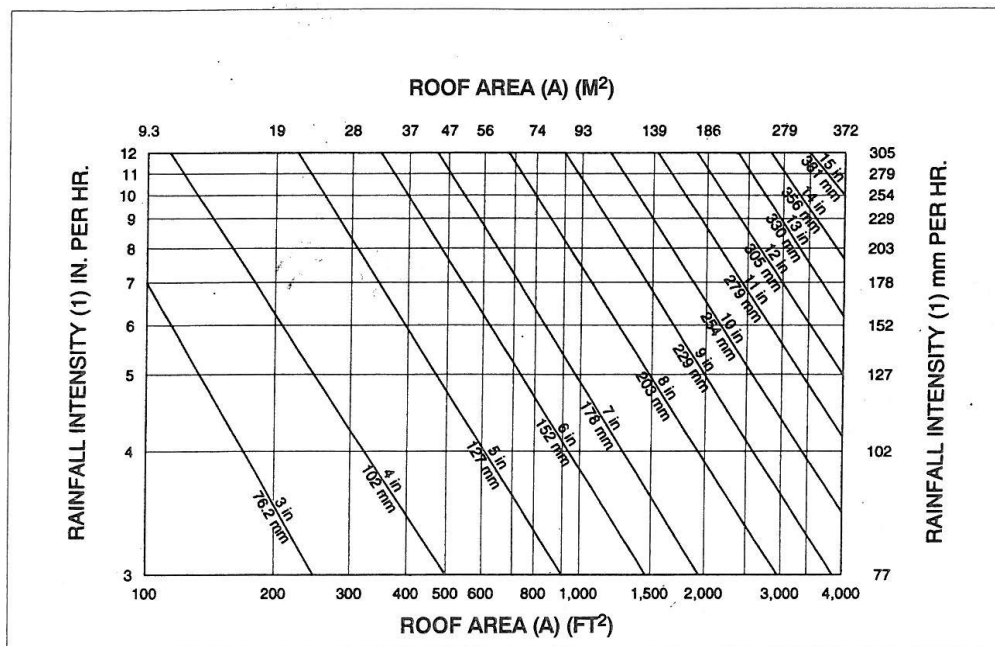


CHART 1-2 HALF ROUND GUTTER SELECTION WIDTH REQUIRED FOR GIVEN ROOF AREAS AND RAINFALL INTENSITIES

Diameters of Gutter		C.S. Area		Level		Level		$\frac{1}{8}$ in. per ft. Slope (3.2 mm/0.3 m)				$\frac{1}{4}$ in. per ft. Slope (6.4 mm/0.3 m)			
in.	mm	in. ²	mm ²	ft. ²	m ²	gpm	l/s	ft ²	m ²	gpm	l/s	ft ²	m ²	gpm	l/s
3	75	3.5	2258	680	63	7	0.44	960	89	10	0.63	1360	126	14	0.88
4	100	6.3	4064	1440	134	15	0.95	2040	190	21	1.33	2880	268	30	2.08
5	127	9.8	6321	2500	232	26	1.64	3520	327	37	2.33	5000	465	52	3.28
6	152	14.1	9095	3840	357	40	2.52	5440	505	57	3.60	7680	713	80	5.05
7	178	19.2	12390	5520	513	57	3.60	7800	725	81	5.11	11040	1030	115	7.26
8	203	25.1	16190	7960	739	83	5.24	11200	1040	116	7.32	14400	1338	165	10.4
10	254	39.1	25220	14400	1338	150	9.47	20400	1895	212	13.4	28800	2676	299	18.9

**Table 1-4 Sloped Roof Gutters
Maximum Roof Area for Gutters**

Exhibit #3

$$Q = 3.0(L - 0.2H)(H)^{1.5}$$

where:

Q = drainage capacity of scupper (gpm)
L = length of scupper (in.)
H = head of water in the scupper (in.)

$$q = 0.01039(A)I$$

where:

q = amount of water entering the scupper
A = roof area drained by the scupper (ft²)
I = rainfall intensity (in./h)

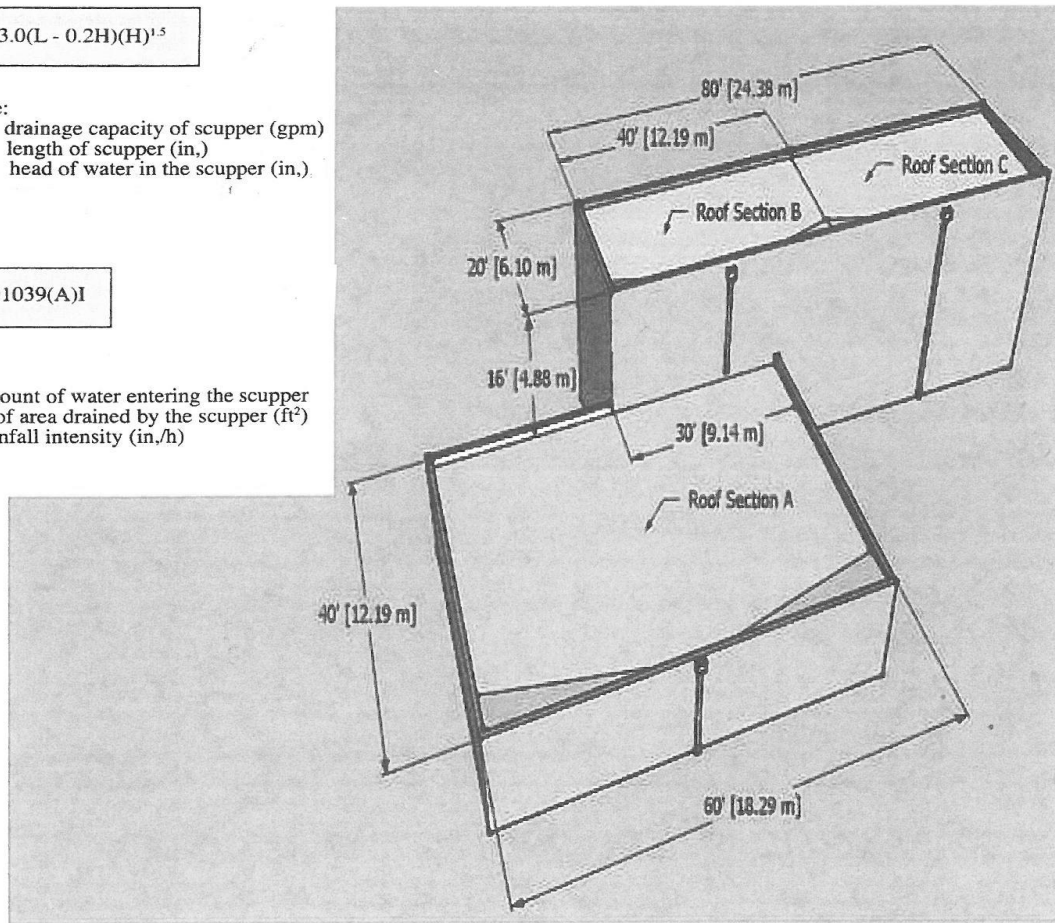
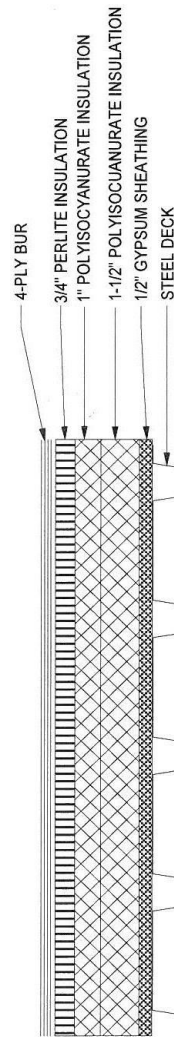


Exhibit #4

WINTER CONDITIONS

OUTSIDE TEMPERATURE = 31 DEG. F

R-VALUES	
OUTSIDE AIR	0.17
BUR	0.33
3/4" PERLITE	2.08
1" ISO	5.6
1.5" ISO	8.4
1/2" GYPSUM	0.56
STEEL DECK	—
INSIDE AIR FILM	0.61



$$T_x = T_i - \left[\left(\frac{\sum R_i}{\sum R} \right) (T_i - T_o) \right]$$

T_x = Temperature at location x

T_i = Design inside (interior side) temperature (F)

T_o = Design outside (exterior side) temperature (F)

ΣR_i = R-value (F-ft.²•h/Btu) of construction below (to the interior side) of location "x"

ΣR = R-value (F-ft.²•h/Btu) of the overall roof construction

12" AIR PLENUM

SUSPENDED CEILING

INSIDE TEMPERATURE = 70 DEG. F

Answers to Sample Questions

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 IIBEC, including courses on the national and regional levels.

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