



**APPLICATION
FOR
REGISTERED WATERPROOFING CONSULTANT (RWC®)**

Dear RWC Applicant:

To become a Registered Waterproofing Consultant (RWC), 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 RWC online examinations. Those who currently hold a Registered Roof Consultant (RRC®) 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 RWC exams must be passed to earn the RWC 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 RWC application will qualify the applicant to take the general exam. A study guide for the RWC exam is included 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 \$425 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 \$75 for nonmembers),

The RWC and GCK exams are administered in computer-based testing format. The fees for each exam are \$250 for IIBEC members and \$325 for nonmembers. Once registered, the candidate will be contacted by Castle/Scantron to schedule an exam at one of the 1,000 conveniently located testing centers. Consult <http://www.castleworldwide.com/mainsite/ibtsites> 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
1500 Sunday Drive, Ste. 204 Raleigh, NC 27607
(T) 919-859-0742 or 800-828-1902 (F) 919-859-1328
www.iibec.org

APPLICATION FOR REGISTERED WATERPROOFING CONSULTANT

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INSTRUCTIONS

REGISTERED WATERPROOFING CONSULTANT APPLICATION

The candidate for the Registered Waterproofing Consultant (RWC) designation should have least 4 years of experience in the evaluation and design of waterproofing systems. The candidate should have a general knowledge of: waterproofing materials, below-grade and above-grade systems, design, industry standards, and testing and investigation.

GENERAL REQUIREMENTS

A. The successful RWC candidate must:

1. Establish that he/she has met certain minimum requirements regarding education, personal work experience, character and ethics.
2. Take and pass both the General Consultant Knowledge and RWC exams. If the candidate holds another IIBEC consultant designation, the candidate is exempt from taking the GCK exam.
3. Have at least four years of waterproofing consulting experience (as defined by the services listed on page II).

B. The applicant shall satisfy IIBEC that he/she has attained and agrees to the following minimum requirements:

1. The applicant 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, SWRI, ACI, ICRI, AIA, CSI, or other approved training and educational programs awarding educational units. IIBEC's Waterproofing course is recommended for those pursuing this designation.
3. The applicant shall have a strong moral and ethical character demonstrated by his/her references, experience and professionalism. The "Code of Ethics" for IIBEC is included in this application. It outlines the obligations of the professional consultant to the public, the client or employer, the profession, and the building industry. The Registered Waterproofing Consultant is expected to promote and conform to these "Standards."
4. The applicant shall always be totally objective, unbiased and impartial in his/her actions relating to waterproofing 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 title Registered Waterproofing Consultant, once attained, must be renewed every year. Requirements include paying a renewal fee and submitting evidence of 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. 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.

. The following assignment of points shall be implemented:

Education – 5 points shall be awarded per year of successful completion of college. You must furnish an official transcript or diploma for all educational points.

The following maximum number of points shall apply for education:

Four year degree	= 30 points (industry related*)	25 points (general)
Five year degree	= 40 points (industry related*)	30 points (general)
Masters degree	= 10 points (industry related*)	5 points (general)
Doctorate	= 10 points (industry related*)	5 points (general)
Years of College (no degree)	= 5 points/year (20 points max)	

The maximum number of points for education is 40 points.

*Architecture, engineering, construction, chemistry, waterproofing consulting, or material science

Professional Registration – 20 points shall be awarded for Registered Architects (RA) or 20 points for 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 with expiration date). Points are awarded for other certifications as noted on page 9.

NOTE: The maximum number of points for Education and Professional Registrations is 60 points.

Personal Work Experience – 1 point shall be awarded per project or task in the following categories of experience related to waterproofing as defined in deck, plaza, above-grade and below-grade waterproofing, sealants, and coatings:

Category	Service Rendered or Task Performed**	Maximum No. of Points
-----------------	---	------------------------------

1	Condition Surveys, Audits, or Investigations	20
2	Preparation or Design Review of Contract Documents	20
3	Contract Administration/Project Management	20
4	Construction Observations/Quality Assurance Observations	20
5	Forensic Investigations, Deposition, Expert Testimony	20
6	Moisture Surveys or Water Testing	5
7	Laboratory Testing: Physical/Quantitative Analysis	20
8	Research Directly Related to Waterproofing	20
9	Publications Related to Waterproofing (Articles, Books, Theses)	20
10	Lectures Presented Related to Waterproofing (Emphasizing Education)	20
11	Waterproofing Contracting Projects	20
12	Professional Association 2-year Active Participation (IIBEC, AIA, SWRI, ICRI, 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 waterproofing 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.

Waterproofing consultants shall have a relatively broad base of experience. Applicant must secure points from experience in a minimum of three categories. Each category has a maximum number of points permitted. 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 waterproofing condition survey, a moisture survey supplemented with testing, gave deposition for litigation, and wrote an article which was published in a magazine for a single project, four points could be earned: one for categories 1, 5, 6 and 9.

Projects with multiple buildings or locations with identical construction and service 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 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 (5 points, industry related) would require 95 points through experience.

Example 2: A registered engineer (20 points) with a four-year degree (30 points, industry related) would require 50 points through experience.

Example 3: A person with a four-year degree (30 points, industry related) and a master’s degree (10 points, industry related) would require 60 points through experience.

Example 4: A person with a high school diploma (0 points) and projects as a waterproofing contractor (20 points earned) would require 80 points from the categories of experience.

The “PROJECT REGISTER” forms are to be completed for each category 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 denial of application.

For your own protection, make a copy of your completed application 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 WATERPROOFING CONSULTANT



International Institute of Building Enclosure Consultants
 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

SECTION 1: PROFILE INFORMATION						
Full Name	Last	First	Middle	Nickname		
Home Address	Number and Street	Apt.	Box	Road/Rural Route		
	City	Country	State	Zip	Phone	E-mail
Birth	Date	City	State	Citizenship		
Have you ever applied for IIBEC Registered Waterproofing 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 Registered Roof Consultant? () Yes () No Date of registration: #:						
Are you a Registered Exterior Wall Consultant? () Yes () No Date of registration: #:						
Are you a Contractor or employed by one? () Yes () No Type: () General () Waterproofing () Roofing State and license number for each:						
Are you employed by or own a company that manufactures, distributes, or sells waterproofing/roofing products or materials? () Yes () No Identify:						
What percent of your principal income do you derive as a waterproofing consultant: % As a roof 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/Technical Course	Degree
High School						
Junior College						
College						
Other						
Other						

Record Educational Points on Attachment Sheet 3

SECTION 4: PROFESSIONAL HISTORY AND EMPLOYMENT

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

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 contact information may be requested during the application approval process. Additional copies may be attached as necessary. 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 waterproofing consultant is being evaluated, not the applicant's management ability or the experience of the applicant's employer or subordinates. See Supplemental 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 waterproofing. Points must be earned in a minimum of three categories.

Category	Service Rendered or Task Performed	Maximum Number of Points
1	Condition Surveys, Audits or Investigations	20
2	Preparations or Design Review of Contract Documents	20
3	Contract Administration/Project Management	20
4	Construction Observation/Quality Assurance Observations	20
5	Forensic Investigations, Deposition, Expert Testimony	20
6	Moisture Surveys or Water Testing	5
7	Laboratory Testing: Physical/Quantitative Analysis	20
8	Research Directly Related to Waterproofing	20
9	Publications Related to Waterproofing (Articles, Books, Thesis)	20
10	Lectures Presented Related to Waterproofing	20
11	Waterproofing Contracting Projects	20
12	Professional Association 2-year Active Participation (IIBEC, AIA, SWRI, ICRI, CSI, ASTM, etc.)	5

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 (CEHs) by attendance at seminars directly related to the building envelope. A minimum of three seminars (i.e. - IIBEC, AIA, SCWI, ICRI, CSI, ASTM or other educational programs) dealing with waterproofing, exterior walls and/or roofing technology 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 CEHs is required (these can be no older than 10 years.) There is a maximum of 16 hours accepted per program.

SECTION 7: REFERENCES

On attachment Sheet 5, provide names and addresses of five references. **Three** must know the applicant professionally and be an RA, PE, RRC, RWC or REWC. 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 this 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 completed and returned directly to IIBEC from the references.

SECTION 8: CODE OF ETHICS

The "Code of Ethics" for IIBEC (Attachment Sheet 7) outlines the obligations of the consultant to the public, the client, the employer, the profession, and the building industry. The Registered Waterproofing 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 IIBEC with the application.

SECTION 4: PROFESSIONAL HISTORY & EMPLOYMENT

Name _____

Date _____

() New

() Update

() Continuation Sheet

List in order, beginning with the first employer, applicant’s work history directly related to waterproofing. 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. Condition Surveys, Audits or Investigations

This category applies to the scope of work in which a consultant assesses the condition of a waterproofing installation. This would be performed in general accordance with the recommended procedures of IIBEC, AIA, SWRI, ICRI, CSI, ASTM and/or other organizations in which the condition of waterproofing 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.

2. Preparation or Design Review of Contract Documents

This category may include the preparation of a complete set of documents including the bidding documents, general conditions, technical specifications, plans, sections and details, as they relate specifically to waterproofing. 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 waterproofing systems, is acceptable.

3. Contract Administration/Project Management

This category applies to the administration of a waterproofing contracting project (waterproofing replacement, repairs, and/or new construction) and would include the following duties: review of waterproofing-related submittals, coordination and oversight of field leak testing (if any), 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

This category includes observations performed by the applicant 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 waterproofing consultant. In some cases, the waterproofing 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 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, Deposition, 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 waterproofing 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; 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. Moisture Surveys or Water Testing

One point shall be awarded in this category for each project in which the applicant performs water testing or non-destructive moisture surveys. Multiple points are not awarded for each individual project even if moisture scan 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 moisture survey or water test is performed.

SECTION 5: PERSONAL WORK EXPERIENCE

Description of Service Categories (Continued)

Moisture surveys or water testing may 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. For example, on a building with seven additions involving seven different 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, then multiple points may be claimed.

7. Laboratory Testing: Physical/Quantitative Analysis

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

8. Research Directly Related to Waterproofing

This category would generally relate to research performed on waterproofing projects and materials in which technology is developed or utilized. Research, referred to herein, does not refer to procedures customarily implemented or used by 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 Waterproofing (Articles, Books, and Theses)

This category includes articles, books, theses, etc. related to waterproofing 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 Waterproofing (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. 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. Waterproofing Contracting Projects

This category includes projects in which the applicant was directly in a position of management, supervision, or installation of a waterproofing project. Merely being on a project site does not constitute the kind of experience for which this item 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 two-year Active Participation (IIBEC, AIA, SWRI, ICRI, CSI, ASTM, etc.)

This category includes active two-year participation in professional associations such as IIBEC, the Construction Specification Institute, ASTM International, 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. One point is awarded per association.

Name _____ Date _____

SECTION 5: PERSONAL WORK EXPERIENCE

CATEGORIES

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

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. Additional contact information may be requested. *Duplicate sheet as needed

Name _____

Date _____

SECTION 5: SUMMARY OF POINTS

PERSONAL WORK EXPERIENCE POINTS

Category	Services Rendered or Task Performed	Max. # of points	Points/Project	Number of Projects	Total Points
1.	Condition Surveys, Audits, or Investigations	20	1		
2.	Preparation or Peer Review of Contract Documents	20	1		
3.	Contract Administration/Project Management	20	1		
4.	Construction Observations/Quality Assurance Observations	20	1		
5.	Legal: Expert Testimony, Deposition, Forensic Investigations	20	1		
6.	Moisture Surveys or Water Testing	5	1		
7.	Laboratory Testing: Physical/Quantitative Analysis	20	1		
8.	Research Directly Related to Waterproofing	20	1		
9.	Publications Related to Waterproofing (Articles, Books, Theses)	20	1		
10.	Lectures Presented Related to Waterproofing (Emphasizing Education)	20	1		
11.	Waterproofing Contracting Projects	20	1		
12.	Professional Association 2-year Active Participation (IIBEC, AIA, SCWI, ICRI, CSI, ASTM, etc.)	5	1		
TOTAL Number of Points Claimed for Personal Work Experience (Max = 100)					

EDUCATIONAL POINTS

Four-year Degree (Industry /General)	30/25			
Five-year Degree (Industry/General)	40/30			
Years of College (no degree)	5/Yr.	20 max		
Masters Degree (Industry/General)	10/5			
Doctorate (Industry/General)	10/5			
TOTAL Number of Points Claimed for Education (Max. 40)				

PROFESSIONAL REGISTRATIONS/LICENSES POINTS

Registered Architect*	20			
Licensed/Registered Engineer*	20			
Registered Roof Consultant	10			
Registered Exterior Wall Consultant	10			
Registered Roof Observer	5			
Registered Exterior Wall Observer	5			
Other*#	5			
TOTAL Number of Points Claimed for Professional Registrations (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. Refer to Page II for point limitations placed on multiple building projects.
4. Maximum number of points for education is 40 points
5. Maximum number of points for Registration is 20 points.
6. Official transcript or diploma must accompany application to substantiate all education points.
7. Minimum of 10 projects from 3 separate service categories must include a contact & phone number
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 that 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. Acceptable programs must be technical in nature (not sales or product oriented) and industry related. 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.



SECTION 7: REFERENCE FORM

Date _____

Dear _____:
(Name of reference)

An application for Registered Waterproofing 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.

Both the applicant and IIBEC 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 waterproofing work? _____
5. In your opinion, is the applicant competent as a waterproofing consultant? _____

Remarks:

Signed _____
 Name (Print) _____
 Title _____
 Company _____
 City/State _____
 Date _____
 Are you related to the applicant? _____
 If yes, how related _____
 Are you a Licensed/ Registered Engineer? _____
 Are you a Registered Architect? _____
 Are you a Registered Roof Consultant? _____
 Are you a Registered Exterior Wall Consultant? _____
 Are you a Registered Waterproofing 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, fax or email directly to:

International Institute of Building Enclosure Consultants
 1500 Sunday Drive Ste 204
 Raleigh, NC 27606
 (T) 800/828-1902 or 919/859-0742 (F) 919/859-1328
 Email: clewis@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, or performance;
 - 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.

SECTION 9:AFFIDAVIT CERTIFICATION, AUTHORIZATION AND RELEASE

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 Code of Ethics 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 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 Waterproofing 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 Waterproofing Consultant which they have on record or otherwise, and do hereby release the individual, company or institution 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 Waterproofing Consultant
Payment Form**



Enclosed is a check in the amount of: \$350 member fee \$425 non-member fee

Please accept a late fee: \$50 member fee \$75 non-member

Charge my VISA MasterCard American Express Discover for:

\$350 member fee \$425 non-member fee

\$50 expediting fee \$75 late 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 U.S. dollars to:

**International Institute of Building Enclosure Consultants
1500 Sunday Drive, Suite 204
Raleigh, NC 27607
(T) 919-859-0742 or 800-828-1902 (F) 919-859-1328
Email: clewis@iibec.org**

CHECKLIST TO ACCOMPANY REGISTERED WATERPROOFING CONSULTANT APPLICATION

Applicant's Name _____

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 (\$350 members/\$425 nonmembers)
2. Completed Sections 1 and 2 of the application
3. Section 3 of application:
 - a. High School Diploma enclosed (if b or c below is not provided)
 - b. College transcript(s) have been requested (if diploma not available).....
 - c. College Diploma has been enclosed
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 Sheets 2:
 - a. List each project for which experience is included on Attachment Sheet 3
 - b. All names, locations and dates of projects listed
 - c. All projects registered represent my experience (not someone under my direction)
 - d. At least ten contact names and phone numbers are listed from 3 separate categories
 - 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. Educational points are substantiated by a transcript or copy of my diploma (enclosed).....
 - c. Points have been obtained 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 listed.....
 - b. Attended minimum of 3 seminars (70 hours) dealing with building envelope technology.....
8. Section 7 of application:
 - a. Listed on Attachment Sheet 5 are five references, three of whom are an RA, PE, RRC, RWC or REWC.....
 - b. None of the references are 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 to each reference
9. Section 8 of application: Attachment Sheet 7
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 complete and all spaces are checked, sign below and send the completed application form to IIBEC. If mailed, do not fold or double-side. Allow 90 days for processing. **MAKE A COPY OF YOUR COMPLETED APPLICATION BEFORE SENDING TO RCI** for your records.

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

Signature of Applicant: _____



STUDY GUIDE

For the

REGISTERED WATERPROOFING CONSULTANT (RWC®) EXAM

Prepared By
RWC Exam Development Task Force

International Institute of Building Enclosure Consultants
1500 Sunday Drive, Suite 204
Raleigh, NC 27607
800-828-1902 919-859-0742

RWC EXAM STUDY GUIDE

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STUDY GUIDE RWC® EXAMINATION

International Institute of Building Enclosure Consultants (IIBEC)

INTRODUCTION

One early goal of IIBEC was to develop a highly recognized registration program. The Registered Waterproofing Consultant (RWC) Program was developed in 2004. The primary beneficiaries of this registration program are the public, the waterproofing industry, and those individuals who become registered.

Registration is a two-part process. The comprehensive application allows IIBEC to verify certain aspects of education and waterproofing experience. The examination confirms these qualifications by testing one's knowledge of above and below-grade waterproofing and the applicant's 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. This document is strictly a guide. The examination is not tailored to any one particular area of building envelope waterproofing or to the design and construction practices unique to any one geographic area. It deals with waterproofing consulting in general. It may include all phases of waterproofing consulting such as: evaluation, design, testing, materials, and all waterproofing 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 waterproofing issues. This includes knowledge of different waterproofing materials, systems, and installations when reviewing, specifying and inspecting construction projects. Qualified applicants must be aware of applicable building codes and standards. Education and training is extremely important. 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 for a broad variety of responsibilities. It pulls everything together. The weakness most often identified with exam failure is a narrow focus in the industry.

The RWC exam is offered by Castle/Scantron, a computer-based testing company which has over 1,000 conveniently located testing centers. Approved applicants will be sent exam registration forms. After these are processed at IIBEC, candidate information will be conveyed to Castle/Scantron and the candidates will be contacted 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 waterproofing areas: materials, systems, design, industry standards, and testing and investigations. 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 within the exam.

To earn the RWC designation, both the General Knowledge Consultant (GCK) and Registered Waterproofing Consultant exams must be taken and passed. There is no separate application for the general exam; approval of the RWC application will qualify the candidate to take this 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 should there be interest in

other IIBEC consultant designations (Registered Roof Consultant and Registered Exterior Wall Consultant).

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

Although not required, IIBEC's Waterproofing course may be useful for anyone pursuing this designation. A sample of references which were used to develop the RWC exam is as follows:

References*

	Title	Author	Publication Date
1	<i>ASTM International Standard Guide 5898 Details for Adhered Waterproofing</i>	Committee D08.22	2006
2	<i>Construction Waterproofing Handbook 2nd Edition</i>	Michael T. Kubal	2008
3	<i>Manual of Low-Slope Roof Systems Fourth Edition</i>	C.W. Griffin and R.L. Fricklas	2006
4	<i>NRCA Waterproofing Manual</i>	NRCA	2005
5	<i>Principles of Design and Installation of Below-Grade and Building Deck Waterproofing in 2010</i>	Rutila, Klein, Normandeau	October 2011-Online
6	<i>RCI Manual of Practice</i>	RCI, Inc. (now IIBEC)	2010
7	<i>RCI Waterproofing Course Manual</i>	RCI, Inc. (now IIBEC)	2018
8	<i>RCIF Roof Drainage</i>	Stephen Patterson, Madan Metha, J. Richard Wagner	2003
9	<i>SWR Institute Below-Grade Waterproofing Manual</i>	Sealant, Waterproofing & Restoration Institute	1999
10	<i>The Manual of Below-Grade Waterproofing Systems 2nd Edition</i>	Justin Henshell	2016

* 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 waterproofing 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 task force of subject matter experts systematically compiled a list of objectives that relate to the responsibilities, knowledge, and skills associated with acceptable performance within the waterproofing 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	Materials	22%
Objective 1.1	Identify different waterproofing materials	
Objective 1.2	Describe how to properly select waterproofing materials	
Objective 1.3	Demonstrate knowledge of how to properly use materials for waterproofing	
Section 2	Systems	21%
Objective 2.1	Describe the difference between waterproofing and dampproofing	
Objective 2.2	Describe waterproofing system applications	
Objective 2.3	Demonstrate knowledge of below-grade waterproofing systems	
Objective 2.4	Demonstrate knowledge of above-grade waterproofing systems	
Section 3	Design	33%
Objective 3.1	Describe how to design above-grade and below-grade waterproofing systems	
Objective 3.2	Describe the performance criteria of a waterproofing system	
Objective 3.3	Demonstrate how to perform various calculations pertaining to waterproofing	
Objective 3.4	Demonstrate knowledge of how to properly detail waterproofing systems	
Objective 3.5	Describe geotechnical conditions	
Objective 3.6	Describe various drainage systems related to waterproofing	
Section 4	Industry Standards	7%
Objective 4.1	Identify safety hazards associated with waterproofing systems	
Objective 4.2	Identify standards and codes applicable to waterproofing	
Section 5	Testing and Investigation	17%
Objective 5.1	Demonstrate knowledge of various test and investigative methods for existing waterproofing	
Objective 5.2	Describe testing methods related to new or replacement waterproofing installations	
	Total	100%

RWC 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.

Materials

1. The excavation for the basement of a new office building has been completed. It has been determined that the underslab waterproofing will be applied directly over the prepared grade prior to any preliminary working ("mud") slab being poured on-site.

Which type of waterproofing material should be installed?

- A. acrylic modified cementitious compound
- B. bentonite clay panels
- C. rubberized asphalt membrane
- D. thermoplastic CPE membrane

2. Which type of material only becomes waterproof when exposed to moisture?

- A. acrylic modified cement
- B. bentonite clay panels
- C. hot rubberized asphalt membrane
- D. thermoplastic membrane

3. A concrete structure constructed over a retail area is intended to be a pedestrian walkway to gain access to an adjacent building.

Which two systems would be used to waterproof the top surface of the concrete structure? (Choose two.)

- A. two-ply modified-bitumen membrane with an aluminum foil-faced surfacing
- B. polyurethane coating with embedded sand aggregate surfacing
- C. prefabricated cardboard bentonite panels with concrete pavers
- D. PVC single-ply membrane with metal walkway planks

4. Pavers will be installed on pedestals that are to be placed over a waterproofing membrane applied on a concrete plaza deck.

Which two materials would be installed between the pedestals and waterproofing membrane? (Choose two.)

- A. high density polyisocyanurate insulation board
- B. extruded polystyrene insulation board
- C. exterior glass mat gypsum board
- D. prefabricated drainage composite panel

5. You are retained by an architect to provide design review as a waterproofing consultant for a new project consisting of a below-grade cast-in-place concrete parking structure. The geotechnical report indicates that corrosive soils are present in the building site. The project is located in a northern climate and freeze-thaw cycling is expected over the service life of the structure. The architect has specified a crystalline coating to be applied on the interior side of the below-grade walls.

Which two considerations should your review include? (Choose two.)

- A. Negative-side waterproofing will leave the concrete structure exposed to a potentially harmful corrosive environment.
- B. Freeze-thaw cycling may cause damage to the concrete due to moisture being trapped in the concrete by the coating.
- C. Crystalline coatings typically have high vapor transmission ratings, which may cause high humidity inside the structure.
- D. The crystalline coating's effectiveness may be damaged by the carbon dioxide emissions inside the parking garage over time.

6. A contractor proposed to use a hot-applied rubberized asphalt (HARA) membrane instead of a solvent-based liquid applied membrane on a concrete deck application.

Which two application advantages does the HARA membrane provide? (Choose two.)

- A. low odor
- B. no cure time
- C. works well at lower ambient temperatures
- D. compatible with PVC flashings

7. A concrete contractor has submitted a Request for Substitution for replacing the specified PVC water stop with a hydrophilic rubber water stop in the vertical and horizontal foundation joints.

You approve this request with which condition?

- A. Make the replacement, but not in the keyway of the foundation wall or slab.
- B. Make the replacement, but not on the inboard side of the reinforcing bars.
- C. Make the replacement, but not within 1 inch [25 mm] of the concrete face.
- D. Make the replacement, but not at the top and side of the keyway.

Systems

8. While designing the connecting tunnel between an existing office building and a new parking garage, it was determined that the tunnel will need to be protected from damage due to moisture. The tunnel will be constructed using a cast-in-place concrete floor and ceiling slab with 8 inch [200 mm] thick reinforced concrete masonry unit walls. The geotechnical report indicates that the tunnel will be exposed to hydrostatic pressure on a seasonal basis.

Which material should be applied to the exterior of the tunnel construction?

- A. fiber-reinforced cement parging
 - B. self-adhered modified-bitumen membrane
 - C. siloxane compound
 - D. clay emulsified asphalt
9. For conditions where void (carton) forms are required due to expansive soils, which two waterproofing systems would you recommend for use as a positive side, underslab, waterproofing system? (Choose two.)

- A. adhesive-coated HDPE sheet waterproofing
- B. bentonite sheet waterproofing
- C. thermoplastic sheet waterproofing
- D. cementitious waterproofing

10. Chronic leaks have been occurring in a parking deck with a cast concrete slab wearing surface over the waterproofing system, which is installed on a structural concrete substrate.

Which two actions should be performed to rehabilitate the waterproofing? (Choose two.)

- A. Clean the surface of the concrete topping slab and apply crystalline waterproofing.
- B. Remove the topping slab, install hot-fluid-applied polymer modified asphalt waterproofing, and place a new 6 inch [150 mm] concrete topping slab.
- C. Remove the topping slab, install bentonite panel waterproofing, and place a new 6 inch [150 mm] concrete topping slab.
- D. Prepare the surface of the concrete topping slab and install a new hot-fluid-applied polymer modified asphalt waterproofing.

11. Refer to Exhibit #1

Which waterproofing is an acceptable material for the condition represented in the photograph shown in the exhibit?

- A. bentonite sheets
- B. butyl rubber
- C. liquid-applied membranes
- D. PVC sheets

12. A parking garage deck waterproofing system has horizontal joints that are expected to experience 50% movement.

According to ASTM C920, the horizontal joints should be treated with which sealant?

- A. Type M, Grade NS, Class 25
- B. Type M, Grade P, Class 50, Use T
- C. Type M, Grade P, Class 25, Use T
- D. Type M, Grade NS, Class 50, Use NT

Design

13. According to ASTM C981, what are the conditions related to drainage for a concrete plaza, over occupied space, with a built-up asphalt bituminous membrane for waterproofing?

- A. The deck can be level since these membranes can withstand ponding.
- B. The deck must be sloped 1/4 inch/foot [2%] to drain.
- C. The deck must be sloped 1/8 inch/foot [1%] to drain.
- D. The deck can be level only if you use a drainage board over the membrane.

14. Which waterproofing system would be applied to concrete that was placed seven days ago and may be subject to dynamic cracks?

- A. prefabricated bentonite geocomposite sheet
- B. fully adhered polymer-modified bitumen sheet
- C. crystalline cementitious waterproofing
- D. liquid-applied bitumen-extended urethane

15. Joints in a concrete substrate are to be placed at 30 feet [9 m] on-center.

What represents the joint movement and adequate joint width required with a Coefficient of Linear Expansion for concrete of 6.20×10^{-6} inch/(inch.degree F) [11.1×10^{-6} mm/(mm.degree C)], with a low temperature of 40 degrees F [4 degrees C] and a high temp of 140 degrees F [60 degrees C], sealant movement of 50%, and zero tolerances?

- A. movement = 0.2232 inch [5.6 mm]; joint size = 3/8 inch [9 mm]
- B. movement = 0.2232 inch [5.6 mm]; joint size = 1/2 inch [13 mm]
- C. movement = 0.3125 inch [7.8 mm]; joint size = 5/8 inch [16 mm]
- D. movement = 0.3125 inch [7.8mm]; joint size = 3/8 inch [9 mm]

- 16.** You are asked to specify a sealant for a parking deck expansion joint. The structural engineer has indicated the 1 inch [25 mm] wide joint will need to accommodate up to 1/2 inch [12.5 mm] movement.

Which sealant would you recommend?

- A.** Type S; Grade NS; Use T; movement up to 25%
- B.** Type M; Grade NS; Use T; movement up to 50%
- C.** Type S; Grade P; Use NT; movement up to 125%
- D.** Type M; Grade P; Use NT; movement up to 25%

- 17.** You are considering several designs for the perimeter details of a proposed vegetative waterproofing assembly.

According to the RCI (now IIBEC) Waterproofing Manual, which two advantages would a 4 foot [1.2 m] wide ballasted strip have over a monolithic concrete traffic slab in this scenario? (Choose two.)

- A.** access to repair membrane flashings
- B.** prevention of root growth towards membrane flashings
- C.** ventilation of root systems
- D.** compliance with wind uplift requirements

- 18.** What is a water table?

- A.** An underground lake which intersects the footings.
- B.** The level of water in the ground below which the soil is saturated.
- C.** Water that is retained by an impermeable clay layer.
- D.** Water that flows across the foundation from one side to the other.

- 19. Refer to Exhibit #2**

During the preliminary design of a third-floor employee terrace area for a new office building, you are asked to design the terrace drainage system. The configuration of the terrace area is shown in the exhibit. The design rainfall is 4 inches per hour. Due to available space in the ceiling plenum, the maximum roof leader pipe slope is limited to 1/4 inch per foot [2 percent].

Referring to the exhibit, what is the size and slope of the last section of horizontal roof leader piping prior to continuing down through the building?

- A.** 6 inch diameter pipe at 1/2 inch per foot slope [4 percent]
- B.** 6 inch diameter pipe at 1/4 inch per foot slope [2 percent]
- C.** 6 inch diameter pipe at 1/8 inch per foot slope [1 percent]
- D.** 8 inch diameter pipe at 1/8 inch per foot slope [1 percent]

Industry Standards

20. What describes a safe oxygen level for human occupancy in an excavation greater than four feet deep?

[What describes a safe oxygen level for human occupancy in a confined space?]

- A. an oxygen level greater than 10.5%, but less than 12.8%
- B. an oxygen level greater than 16.5%, but less than 19.5%
- C. an oxygen level greater than 19.5%, but less than 23.5%
- D. an oxygen level greater than 23.5%, but less than 33.3%

21. You are specifying a self-adhesive rubberized asphalt membrane for a below-grade foundation wall.

Which two design considerations should be included in your specifications? (Choose two.)

- A. Treat cracks less than 1/16 inch [1.6 mm].
- B. Ensure substrate is clean, dry, and frost free.
- C. Prime the substrate.
- D. Prepare voids and honeycombs with silicone sealant.

Testing and Investigation

22. You are asked to investigate water infiltration problems on the topmost level of a below-grade parking garage. The upper surface of the garage at grade is grass covered. From inside the garage, you can see that the main garage roof structure is composed of 5 foot [1.5 m] wide single-span precast concrete double-tees. After heavy rains and snow melts, water leaks appear through the joints between the precast members in widely-dispersed areas of the garage. A recent building condition report indicates that the garage structure is about 30 years old and the original waterproofing consists of an organic felt built-up membrane. The total area of the waterproofed surface is approximately 20,000 square feet [1860 square meters].

Which two investigative procedures would be appropriate to determine remedial action? (Choose two.)

- A. Conduct a series of 25 4 inch [100 mm] diameter test cores through the full waterproofing and structural system from the top side, chosen at random, to get a number of samples of the membrane and concrete condition. Conduct moisture content testing on the membrane samples.
- B. Remove the landscaping material at the roof/wall junction at the exterior edge of the garage down to the membrane level to expose the system construction.
- C. Perform chloride ion tests on the concrete to establish the extent of corrosion. Conduct electronic leak detection tests on the membrane from the upper surface of the deck.
- D. Dig three test openings 6 feet by 6 feet [1.8 m by 1.8 m] in size, chosen over leaking areas, down to the membrane level, and investigate the condition and the construction of the waterproofing membrane.

23. Refer to Exhibit #3

You observed the crack shown in the exhibit at a below-grade parking garage.

Which repair method should you recommend?

- A.** self-adhering tape
- B.** chemical grout injection
- C.** rout and seal crack with silicone sealant
- D.** rout and seal crack with urethane sealant

24. You are asked to perform quality control testing on an extensive garden roof with a 15- degree slope. The membrane is a black, fully adhered EPDM over rigid insulation.

Which test should you use?

- A.** EFVM
- B.** nuclear
- C.** capacitance
- D.** ASTM D5957 flood test

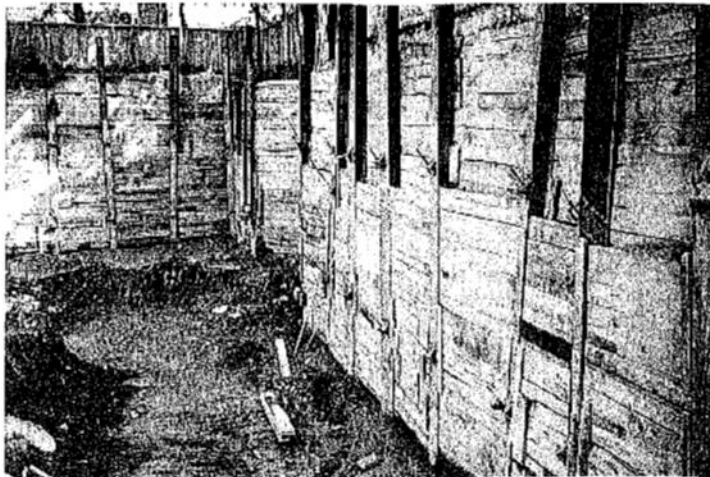
25. Refer to Exhibit #4

The exhibit shows a wet-film thickness measurement on a liquid-applied membrane with an 80% solids content based on the measured wet-film thickness shown on the exhibit.

What is the expected minimum dry-film thickness at the measured location?

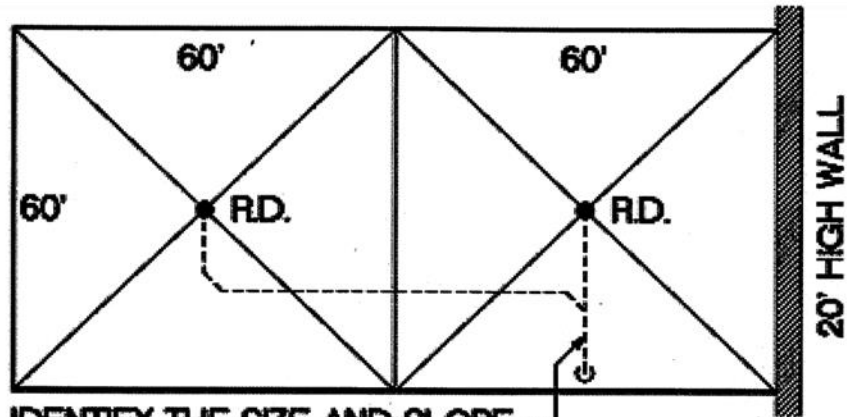
- A.** 12.5
- B.** 44
- C.** 48
- D.** 52

Exhibit #1



Courtesy of Henshell & Buccellato, Consulting Architects

Exhibit #2



IDENTIFY THE SIZE AND SLOPE OF THIS SECTION OF ROOF LEADER PIPING

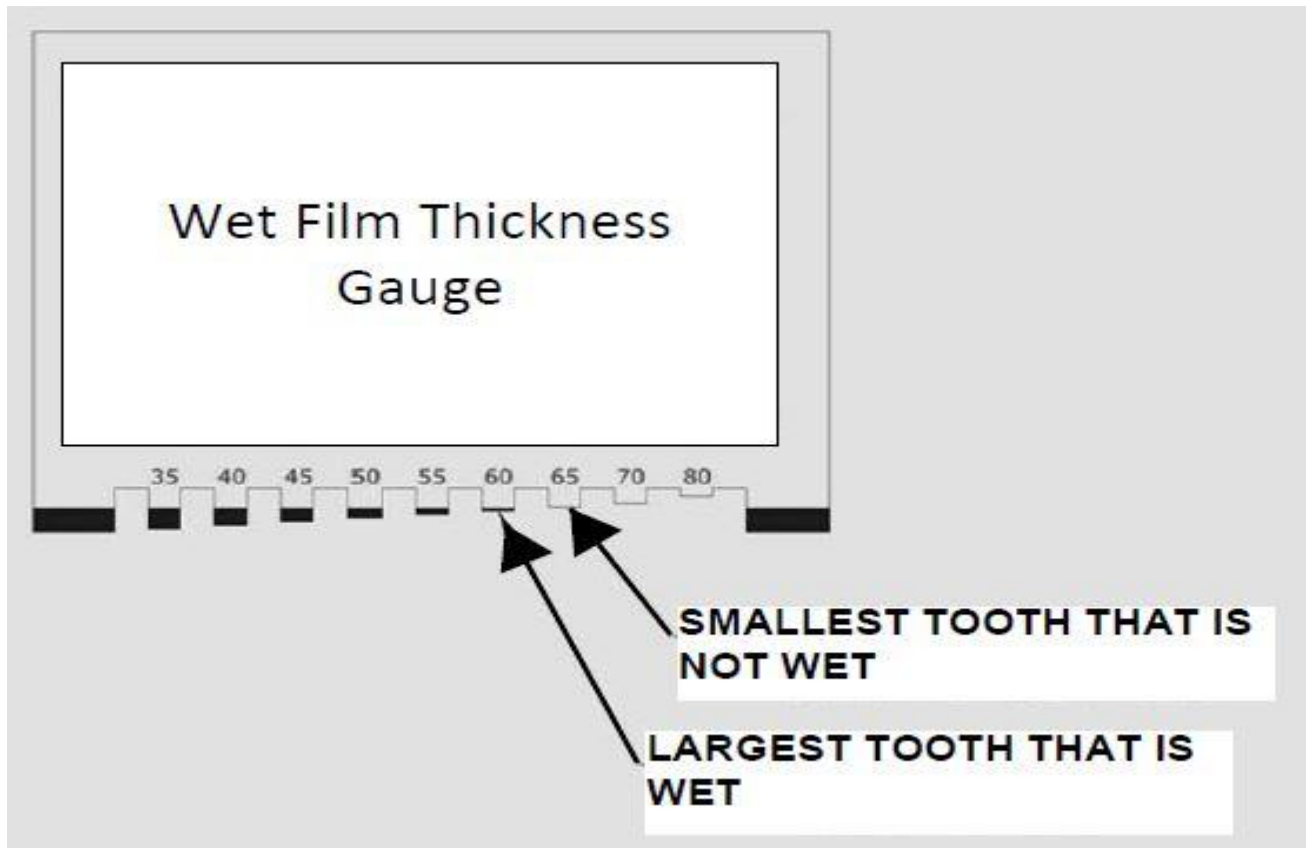
SIZE OF HORIZONTAL STORM DRAINAGE PIPING

SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
¹/₈ unit vertical in 12 units horizontal (1-percent slope)						
3	3,288	1,644	1,096	822	657	548
4	7,520	3,760	2,506	1,800	1,504	1,253
5	13,360	6,680	4,453	3,340	2,672	2,227
6	21,400	10,700	7,133	5,350	4,280	3,566
8	46,000	23,000	15,330	11,500	9,200	7,600
10	82,800	41,400	27,600	20,700	16,580	13,800
12	133,200	66,600	44,400	33,300	26,650	22,200
15	218,000	109,000	72,800	59,500	47,600	39,650
¹/₄ unit vertical in 12 units horizontal (2-percent slope)						
3	4,640	2,320	1,546	1,160	928	773
4	10,600	5,300	3,533	2,650	2,120	1,766
5	18,880	9,440	6,293	4,720	3,776	3,146
6	30,200	15,100	10,066	7,550	6,040	5,033
8	65,200	32,600	21,733	16,300	13,040	10,866
10	116,800	58,400	38,950	29,200	23,350	19,450
12	188,000	94,000	62,600	47,000	37,600	31,350
15	336,000	168,000	112,000	84,000	67,250	56,000
¹/₂ unit vertical in 12 units horizontal (4-percent slope)						
3	6,576	3,288	2,295	1,644	1,310	1,096
4	15,040	7,520	5,010	3,760	3,010	2,500
5	26,720	13,360	8,900	6,680	5,320	4,450
6	42,800	21,400	13,700	10,700	8,580	7,140
8	92,000	46,000	30,650	23,000	18,400	15,320
10	171,600	85,800	55,200	41,400	33,150	27,600
12	266,400	133,200	88,800	66,600	53,200	44,400
15	476,000	238,000	158,800	119,000	95,300	79,250

Exhibit #3



Exhibit #4



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