(2) A statement by the applicant describing provisions of Wisconsin law which govern the practice of engineering and which concern the design needs of people with physical disabilties.

Note: A copy of the form required to be completed by this rule can be obtained from the Department of Regulation and Licensing at Room 173, 1400 East Washington Avenue, Madison, Wisconsin 53702.

History: Cr. Register, April, 1981, No. 304, eff. 5-1-81.

A-E 1.15 Examinations. (1) ELIGIBILITY. An applicant to be eligible to enter a scheduled examination must file his application for registration or certification or request for re-examination together with the required fees with the secretary 2 months before the scheduled date for the examination.

(2) FORFEITURE OF FEES. In the event an applicant has been notified in writing by the office of the secretary of the board that he has been assigned to a stated examination, and he fails to appear for such examination his fee shall not be refundable unless he has been excused from such obligation 10 days prior to such examination or unless he submits to the board ample proof that he was unable to be present. Such proof must be in the office of the board at least 2 months before a future examination which he may desire to take if his former fee is to be considered for use in connection with such examination.

(3) EXAMINATION RETAKES. An applicant who upon taking any portion of the board's architectural, engineering, design of engineering systems, or land surveying examinations for the first time fails a portion or all of that examination may, upon request and payment of the re-examination fee, retake all of it, or the portions of it failed, during any 3 of the 6 semi-annual examinations next following the first examination written. If the applicant fails to complete passing the entire examination during any 3 of the 6 semi-annual examinations next following the first examination written, the applicant shall;

(a) Be ineligible to take further examinations for a period of one year.

(b) Revert to the status of a new applicant and be required to take all portions of the examination unless otherwise approved in advance by the board.

(c) Be required to furnish proof that since his last failure he has further prepared himself by education work, or practical experience before being admitted to additional examinations.

(4) EXAMINATIONS FOR ARCHITECTS. (a) *Examination required.* All applicants for registration as architects, except those applying under s. 443.10 (1), Stats., shall complete an examination consisting of sections covering: Architectural Sciences and Technology (Structure, Construction, Environmental Control), Architectural Design, Project Development, Professional Administration, and Historical and Theoretical Context.

(b) *Time and place of examinations.* Examinations will be held at sites and on dates designated by the board.

(c) *Scope of examinations.* Examinations administered to applicants seek to determine the applicant's preparedness to exercise skills likely to be needed by an architect practicing architecture at the time of the ex-

amination. Each examination, prior to being offered by the examining board, is reviewed by the architects' section to determine that the examination is reasonably related to the skills likely to be needed by a practicing architect and that the examination tests the applicant's preparedness to exercise such skills. The examination will include material relating to the practice of architecture in the state of Wisconsin, with emphasis placed on Wisconsin law, including the registration law for architects, the board's rules, natural energy design, including both active and passive natural energy design, the design needs of people with physical disabilities and relevant statutes, codes and procedures of the department of industry, labor and human relations and other state agencies relating to the practice of architecture.

(d) *Requirements for entrance to the examination.* To be eligible to enter a scheduled examination, an applicant must have 4 years of qualifying academic credit or 4 years of qualifying architectural work experience or a combination of academic credit and architectural work experience which totals 4 years.

(e) Applicants for registration as an architect who have taken any part of the architects examination before June, 1980 must complete the exam format prescribed and existing at the time the applicant first applied for registration as an architect.

(5) WRITTEN EXAMINATIONS FOR ENGINEER-IN-TRAINING AND PROFESSIONAL ENGINEER. (a) *Examinations required.* 1. For certification as engineer-in-training—fundamentals examination. Total 1 day (8 hours).

2. For registration as professional engineer.

a. If certified as engineer-in-training—principles and practice examination. Total 1 day (8 hours).

b. If not certified as engineer-in-training—fundamentals examination and principles and practice examination. Total 2 days (16 hours).

(b) *Place and time of examinations.* The examinations will be held at sites and on dates designated by the board.

(c) *Grading of written examinations, passing grades and retakes.* Experience ratings will not be weighed as a part of the examinations.

(d) *Scope of written examinations.* 1. Fundamentals examination — requires an understanding of the physical and mathematical sciences involved in the fundamentals of engineering.

2. Principles and practice examination—requires ability to apply engineering principles and judgment to problems in general engineering fields such as chemical, civil, electrical and mechanical fields. Questions involving economic analysis and the design needs of people with physical disabilities and relevant statutes and codes will be included.

(e) *Requirements for entrance to examinations.* To be eligible to take the examination sections on fundamentals of engineering and principles and practice of engineering, an applicant shall have 4 years of qualifying engineering work experience or a combination of academic credit or engineering work experience which totals 4 years. Applicants who have obtained senior standing in an educational program of study of

at least 4 years which leads to a baccalaureate degree in engineering or engineering technology are eligible to take the examination sections.

(6) EXAMINATIONS FOR LAND SURVEYORS. (a) Satisfactory completion of 2 examinations is required for registration as a land surveyor. The 2 examinations are: "Fundamentals of Land Surveying" (1 day, 8 hours) and "Principles and Practice" (1 day, 8 hours).

(b) *Place of examinations.* The examinations will be held at sites designated by the board.

(c) *Time of examinations.* To be arranged.

(d) *Grading of written examinations, passing grades.* 1. Experience ratings will not be weighed as part of the examinations.

2. On each 8 hour examination the passing grade shall be at least 70%.

(e) *Scope of written examinations.* 1. Fundamentals of Land Surveying: Requires an understanding of mathematics, physics, surveying methods for measuring horizontal, vertical and angular values, topographic and photogrametric mapping, notekeeping, property surveys, computations, descriptions and plats.

2. Principles and Practice: Requires ability to apply principles and judgment to problems involving the U.S. System of Public Land Surveys, Wisconsin plane coordinate surveys, the relocation of lost and obliterated corners, the legal essentials of resurveys, disputed boundaries, defective deed descriptions, riparian rights, adverse possession, the Wisconsin statutes relative to land surveying including the preparation and filing of plats, the writing and interpreting of land descriptions, the technical essentials of land surveying and subdivision of lands including practical problems requiring a knowledge of the basic theory and fundamental concepts of field astronomy, geometry of curves, topography and photogrammetry.

(f) *Requirements for entrance to examinations.* 1. To be eligible to enter the "Fundamentals of Land Surveying" section of the examination, an applicant must have completed at least 2 years of a course in land surveying as defined in s. A-E 1.18, or at least 4 years of practice in land surveying, or a combination of work or training in a course in land surveying and practice in land surveying which totals at least 4 years.

2. To be eligible to enter the "Principles and Practice of Land Surveying" section of the examination, an applicant must have completed at least 2 years of an approved course in land surveying as defined in s. A-E 1.18 and at least 2 years of approved practice in land surveying, or at least 5 years of approved practice in land surveying, or a combination of at least 5 years of approved work or training in a course in land surveying and practice in land surveying.

(7) WRITTEN EXAMINATIONS FOR DESIGNER OF ENGINEERING SYSTEMS. (a) *Examinations required.* An examination is required for each field and subfield thereunder, as designated in s. A-E 1.20 (1), of these rules, in which an applicant seeks a designers' permit.

(b) *Place and time of examinations.* The examinations will be held at and on dates designated by the board.

(c) *Grading of written examinations.* Experience ratings will not be weighed as part of the examinations.

(d) *Scope of written examinations.* The examinations shall cover the application of the engineering technology related to the specific fields and subfields of engineering systems, as designated in s. A-E 1.20 (1), of these rules.

(e) *Requirements for entrance to examinations.* 1. To be eligible to enter a written examination for a permit as a designer of engineering systems, an applicant shall have 7 years of approved experience in specialized engineering design work, up to 4 years of which may be equivalent academic training or apprenticeship as provided in s. 443.07 (2), Stats.

History: 1-2-56; r. and recr. (3); am. (5) (e) 3., Register, February, 1961, No. 62, eff. 3-1-61; cr. (6), Register, August, 1965, No. 116, eff. 11-1-65; r. and recr. (3) (a), Register, November, 1966, No. 131, eff. 12-1-66; r. and recr. (4) (d), eff. 7-1-67; and r. and recr. (6), eff. 8-1-67; Register, April, 1967, No. 136; am. (5) (d) 2, (5) (f) 2 and (6) (a) 2, Register, July, 1968, No. 151, eff. 8-1-68; r. and recr. (5) (b) and (c) and (6) (b) and (c), Register, February, 1969, No. 158, eff. 3-1-69; am. (3), (6) (a) 2, and (7), Register, January, 1971, No. 181, eff. 2-1-71; r. and recr. (5), Register, September, 1971, No. 189, eff. 10-1-71; reprinted, Register, October, 1971, No. 190 to correct error; cr. (3), Register, May, 1972, No. 197, eff. 6-1-72; cr. (7), Register, December, 1972, No. 204, eff. 1-1-73; (4) (a), r. and recr. (4) (d), Register, March, 1973, No. 207, eff. 4-1-73; am. (4) (d) 1., Register, December, 1973, No. 216, eff. 1-1-74; r. and recr. (6) (a), (d) and (e), Register, July, 1974, No. 223, eff. 8-1-74; cr. (4) (e) and (f), Register, October, 1974, No. 226, eff. 11-1-74; am. (5) (d) 2, Register, November, 1975, No. 239, eff. 12-1-75; am. (4) (d) 2, Register, December, 1975, No. 240, eff. 1-1-76; emerg. r. and recr. (4), eff. 4-16-76; r. and recr. (4), Register, December, 1976, No. 252, eff. 1-1-77; am. (4) (a) and (c) 1, Register, June, 1977, No. 258, eff. 7-1-77; r. (5) (c) 2 and (7) (c) 2, Register, August, 1978, No. 272, eff. 9-1-78; r. and recr. (4) (a) to (c), cr. (5) (e), (6) (f) and (7) (e), Register, February, 1980, No. 290, eff. 3-1-80; emerg. am. (4) (c), eff. 4-19-80; suspended, 4-27-80; emerg. cr. (4) (e), eff. 7-2-80; am. (4) (c) and cr. (4) (e), Register, April, 1981, No. 304, eff. 5-1-81; reprinted to correct a printing error in (4) (d), Register, September, 1981, No. 309; am. (4) (a) and (7) (e), Register, January, 1982, No. 313, eff. 2-1-82; am. (5) (e), Register, July, 1982, No. 319, eff. 8-1-82.

A-E 1.16 Education as an experience equivalent for registration as a professional engineer. (1) For the purpose of meeting experience requirements for registration as a professional engineer, an applicant may claim certain education as equivalent to experience in engineering as provided in s. 443.04 (2), Stats. The engineers' section grants an experience equivalent for education according to the table shown in (2).

(2) Table of Education and Experience Equivalents.

Education	Experience Equivalent with Degree	Experience Equivalent for Each Year of Education Without Degree
B.S. Engineering (ECPD accredited)	4 years	1 year
B.S. Engineering (Not accredited by Engineers Council for Professional Development-ECPD)	3½ years	⅞ year
B.S. Engineering Technology (ECPD accredited)	3 years	¾ year
B.S. Engineering Related Sciences (e.g. Physics, Chemistry, Math, etc.)	3 years	¾ year

B.S. Engineering Technology (non-ECPD accredited)	Not more than 2½ years	⅔ year
Other B.S. Degrees	Not more than 2 years	½ year
Engineering Experience in obtaining M.S. in Engineering	1 year	N/A
Engineering Experience in obtaining Ph.D. in Engineering or Engineering Related Programs	1 year	N/A
Co-op credit shall be determined upon submission of satisfactory evidence to this board	To be determined upon submission of a record showing co-op experience.	Individual Case

History: Cr. Register, December, 1976, No. 252, eff. 1-1-77; am. (1), Register, January, 1982, No. 313, eff. 2-1-82.

A-E 1.17 Engineering experience. To qualify as satisfactory experience in engineering work for the purpose of meeting requirements of s. 443.04, Stats., an applicant's experience shall include the application of engineering principles and data and shall demonstrate an applicant's competence to do engineering work. This experience shall be acquired in the areas of engineering practice listed below or in other areas of engineering practice or academic course work which in the opinion of the board provides the applicant with a knowledge of engineering principles and data at least equivalent to that which would be acquired by experience in the areas of practice listed. An applicant need not acquire experience in all areas listed.

(1) RESEARCH AND DEVELOPMENT. (a) Problem identification, including
consideration of alternative approaches to problem solving;

(b) Planning, including selecting a theorectical or experimental approach;

(c) Execution of plan, including completing design calculations;

(d) Interpreting and reporting results, including:

1. Evaluating project feasibility studies,

2. Analyzing research and development data,

3. Producing interpretive reports,

4. Formulating conclusions and recommendations, and

5. Producing final reports.

(2) DESIGN. (a) Problem identification, including:

1. Identifying design objectives,

2. Identifying possible design concepts or methods,

3. Selecting methods to be employed in consideration of aesthetics, cost, and reliability,

4. Defining performance specifications and functional requirements, such as materials, energy balances and environmental considerations,

5. Formulating conceptual design specifications, and

6. Defining physical properties of all key materials.

(b) Planning, including defining safety health and environmental constraints.

(c) Execution of plan, including:

1. Developing design concepts,

2. Conducting feasibility studies,

3. Evaluating design and design methods,

4. Solving design problems,

5. Preparing designs, layouts and models,

6. Selecting materials and components,

7. Conducting value analysis of design,

8. Producing final designs,

9. Preparing supporting technical information,

10. Preparing detailed working drawings,

11. Preparing specifications and data sheets, and

12. Interacting with engineers from other areas of work, such as research and development and construction.

(d) Interpreting and reporting results, including:

1. Evaluating design for conformity to specifications,

2. Evaluating design solutions for efficiency, economic and technical feasibility and economic alternatives,

3. Evaluating design impact on public health, safety and welfare,

4. Evaluating design solution for adherence to laws and codes,

5. Evaluating product liability risk,

6. Reviewing designs with clients or management, and

7. Preparing final reports.

(e) Implementation of results, including interacting with engineers from other disciplines of engineering.

(3) CONSTRUCTION. (a) Problem identification, including checking working drawings and specifications; and

(b) Execution of plan, including:

1. Consulting with designers, and

2. Identifying and requesting design changes.