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Colorado Department of Regulatory Agencies
Office of Policy and Research

State Board of Registration for Professional
Engineers and Professional Land Surveyors



October 15, 2003

STATE OF COLORADO

DEPARTMENT OF REGULATORY AGENCIES

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Bill Owens
Governor

October 15, 2003

Members of the Colorado General Assembly
c/o the Office of Legislative Legal Services
State Capitol Building
Denver, Colorado 80203

Dear Members of the General Assembly:

The Colorado Department of Regulatory Agencies has completed its evaluation of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. I am pleased to submit this written report, which will be the basis for my office's oral testimony before the 2004 legislative committee of reference. The report is submitted pursuant to section 24-34-104(9)(b), of the Colorado Revised Statutes (C.R.S.), which states in part:

The department of regulatory agencies shall conduct an analysis of the performance of each division, board or agency or each function scheduled for termination under this section...

The department of regulatory agencies shall submit a report and supporting materials to the office of legislative legal services no later than October 15 of the year preceding the date established for termination....

The report discusses the question of whether there is a need for the regulation provided under Article 25 of Title 12, C.R.S. The report also discusses the effectiveness of the Board and staff in carrying out the intent of the statutes and makes recommendations for statutory and administrative changes in the event this regulatory program is continued by the General Assembly.

Sincerely,

Richard F. O'Donnell
Executive Director



EXECUTIVE SUMMARY

Quick Facts

What is Regulated? Professional engineers, professional land surveyors, engineer-interns, and land-surveyor interns.

Who is Regulated? In fiscal year 01-02 there were 20,653 active licensees:

- 1,116 interns
- 766 new licensees
- 7,091 license renewals
- 721 retired licensee renewals

How is it Regulated? The State Board of Registration for Professional Engineers and Professional Land Surveyors (Board) is a Type I board housed in the Division of Registrations of the Department of Regulatory Agencies. In practice, the Board licenses professional engineers and professional land surveyors, and enrolls engineer-interns and land surveyor-interns. This involves processing and evaluating applications from prospective licensees, administering exams, enforcing minimum standards of practice as defined by law, and disciplining those in violation of the law.

What Does it Cost? The FY 2001-02 expenditure to oversee this program was \$760,000 and there were 5.7 FTE associated with this program.

In 2003, license costs were:	New	Renewal
Professional engineers	\$100.....	\$50
Professional land surveyors	\$100.....	\$50
Engineer-interns	\$25	
Land-surveyor interns	\$25	

What Disciplinary Activity is There? During the five year period FY 97-98 to FY 01-02, the Board's disciplinary proceedings consisted of:

Complaints Filed	467
Revocations	5
Suspensions	8
Letter of Admonition	112
Fines	22
Stipulated Settlements	73
Dismissed	242
Other	35

Where Do I Get the Full Report? The full sunset review can be found on the internet at: <http://www.dora.state.co.us/opr/2003EngineersandLandSurveyors.pdf>

Key Recommendations

Continue the State Board of Registration for Professional Engineers and Professional Land Surveyors (Board) until 2013

The licensing of professional engineers and professional land surveyors benefits all people in Colorado by providing a basic assurance that substandard service and potential harm to persons, property, and the environment are reduced by means of education, experience, and examination requirements. The Board performs effectively to license, discipline, and provide guidance to engineer and surveyor licensees, who in turn help to ensure healthy and safe environments, structures, and conditions for every Coloradan. Consequently, as an essential component of the existing regulatory scheme, the Board should be continued until 2013.

Alter the composition of the Board

The existing composition of the Board needs to be modified to more accurately reflect its constituencies. The number of dual licensees (in engineering and land surveying) has declined significantly in recent years as a result of developments in these professions. Moreover, nearly half of the Board's business concerns land surveying issues. Consequently, the requirement for one Board member to be a dual licensee should be changed to require an additional practicing professional land surveyor. As a result, the total number of surveyor members would increase from two to three, but the size of the Board would remain the same.

Exempt state employees who perform engineering work from the Practice Act

Employees of federal and local jurisdictions who perform engineering services are currently exempt from Colorado regulation. Many of the arguments that apply to the federal government and municipalities also extend to state government. Government agencies at all levels have similar missions, and are ultimately accountable to their citizens. By not specifically exempting state agencies from the engineering practice act, unnecessary costs are incurred by the state.

...Key Recommendations Continued

State agencies can readily assess the competency of their staff to perform any necessary tasks, and can make competent decisions as to when to use professional engineers instead of their own staff. Requiring that a professional engineer be on staff or contract raises the cost of work traditionally in the direct control of state agencies. Several other states exempt themselves from engineering regulation.

Alter the Board's name and make conforming amendments to reflect a licensure program instead of a registration program

Professional engineers and professional surveyors in Colorado must currently meet significant education, examination, and experience requirements. Therefore, the current regulation of these two groups meets all of the criteria of a licensure program. For historical and other reasons, however, the term of art used for these two professions in Colorado has been "registrants," not "licensees." These changes are proposed based on the distinction between the meaning of these words within the context of a regulatory scheme.

Increase the fining authority of the Board to a maximum of \$5,000 for each separate offense

Raising the fining authority of the Board will have a deterrent effect on undesirable conduct on the part of professional engineers and land surveyors, and in consequence, help to avert more serious standard of practice problems. The Board has used its fining authority 22 times in the last five fiscal years, which denotes both a willingness and a need for this type of enforcement action.

Authorize the Board to issue letters of concern

The Board maintains that it needs a mechanism to inform a licensee under its jurisdiction that his or her professional behavior is not deemed acceptable, but nevertheless does not warrant disciplinary action. Such a tool would allow the Board to put a licensee on notice, and consequently, afford the licensee an opportunity to take steps to correct the behavior in question. A number of other professional licensing boards have this authority and have found it useful to accomplish their regulatory mandate.

Major Contacts Made In Researching the 2003 Sunset Review of the Board

Professional Land Surveyors of Colorado (PLSC)
Professional Engineers of Colorado (PEC)
American Council of Engineering Companies of Colorado (ACEC-Colorado)
Colorado Municipal League
Colorado Counties, Inc.
Metropolitan State College Advisory Board
Engineering technical societies
Division of Registrations staff

What is a Sunset Review?

A sunset review is a periodic assessment of state boards, programs, and functions to determine whether or not they should be continued by the legislature. Sunset reviews focus on creating the least restrictive form of regulation consistent with the public interest. In formulating recommendations, sunset reviews consider the public's right to consistent, high quality professional or occupational services and the rights of businesses to exist and thrive in a highly competitive market, free from unfair, costly or unnecessary regulation.

Sunset Reviews are Prepared By:
Colorado Department of Regulatory Agencies
Office of Policy & Research
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Background

The Sunset Process

The regulatory functions of the State Board of Registration for Professional Engineers and Professional Land Surveyors (Board) in accordance with section 12-25-106(2) of the Colorado Revised Statutes (C.R.S.), shall terminate on July 1, 2004 unless continued by the General Assembly. During the year prior to this date, it is the duty of the Department of Regulatory Agencies (DORA) to conduct an analysis and evaluation of the Board pursuant to Section 24-34-104(9)(b), C.R.S.

The purpose of this review is to determine whether the Board should be continued for the protection of the public and to evaluate the performance of the program and staff of the Division of Registrations. During this review, the Board must demonstrate that there is still a need for the regulation of professional engineers and land surveyors and that the regulation is the least restrictive consistent with the public interest. DORA's findings and recommendations are submitted via this report to the legislative committee of reference of the Colorado General Assembly. Statutory criteria used in sunset reviews may be found in Appendix A.

Methodology

As part of this review, DORA staff attended Board meetings, interviewed agency staff, examined agency records, reviewed disciplinary actions online, met with officials of state professional associations, reviewed Colorado statutes and rules, and examined the laws of other states. We also reviewed the report titled *Sunset Review Committee Report* presented to us by the task force established by the Board for the purpose of making sunset recommendations.

Throughout this report we use the terms "licensee," "registrant," and their variants interchangeably.

Profile of the Professions

Profile of Professional Engineers

The following profile of professional engineers is based on the U.S. Department of Labor's *Occupational Outlook Handbook*.

Engineers apply the theories and principles of science and mathematics to research and develop economical solutions to technical problems. Their work is the link between perceived social needs and commercial applications. Engineers design products, machinery to build those products, factories in which those products are made, and the systems that ensure the quality of the products and efficiency of the workforce and manufacturing process. Engineers design, plan, and supervise the construction of buildings, highways, and transit systems. They develop and implement improved ways to extract, process, and use raw materials, such as petroleum and

natural gas. They develop new materials that both improve the performance of products and take advantage of advances in technology. They harness the power of the sun, the earth, atoms, and electricity for use in supplying the nation's power needs, and create millions of products using power. They analyze the impact of the products they develop or the systems they design on the environment and the people using them. Engineering knowledge is applied to improving many things, including the quality of health care, the safety of food products, and the efficient operation of financial systems.

Engineers consider many factors when developing a new product. For example, in developing an industrial robot, engineers determine precisely what function the robot needs to perform; design and test the robot's components; fit the components together in an integrated plan; and, evaluate the design's overall effectiveness, cost, reliability, and safety. This process applies to many different products, such as chemicals, computers, gas turbines, helicopters, and toys.

In addition to design and development, many engineers work in testing, production, or maintenance. These engineers supervise production in factories, determine the causes of breakdowns, and test manufactured products to maintain quality. They also estimate the time and cost to complete projects. Some move into engineering management or into sales. In sales, an engineering background enables them to discuss technical aspects and assist in product planning, installation, and use.

Most engineers specialize. More than 25 major specialties are recognized by professional societies, which in turn consist of several subdivisions. Some examples include structural, environmental, and transportation engineering, which are subdivisions of civil engineering. Ceramic, metallurgical, and polymer engineering are subdivisions of materials engineering. Engineers also may specialize in one industry, such as motor vehicles, or in one field of technology, such as turbines or semiconductor materials.

A bachelor's degree in engineering is required for almost all entry-level engineering jobs. Most engineering programs involve a concentration of study in an engineering specialty, along with courses in both mathematics and science. Most programs include a design course, sometimes accompanied by a computer or laboratory class or both.

Engineers use computers to produce and analyze designs; to simulate and test how a machine, structure, or system operates; and, to generate specifications for parts. New communications technologies using computers are changing the way engineers work on designs. Engineers can collaborate on designs with other engineers around the country or even abroad, using the Internet or related communications systems. Many engineers also use computers to monitor product quality and control process efficiency. They spend a great deal of time writing reports and consulting with other engineers, as complex projects often require an interdisciplinary team of engineers. Supervisory engineers are responsible for major components or entire projects.

In addition to the standard engineering degree, many colleges offer two or four-year degree programs in engineering technology. These programs, which usually include various hands-on laboratory classes that focus on current issues, prepare students for practical design and production work, rather than for jobs which require more theoretical and scientific knowledge. Graduates of four-year technology programs may get jobs similar to those obtained by graduates with a bachelor's degree in engineering. Engineering technology graduates, however, are not qualified to register as professional engineers under the same terms as graduates with degrees in engineering. Some employers regard technology program graduates as having skills between those of a technician and an engineer.

Nationally, about 330 colleges and universities offer bachelor's degree programs in engineering that are accredited by the Accreditation Board for Engineering and Technology (ABET), and about 250 colleges offer accredited bachelor's degree programs in engineering technology. ABET accreditation is based on an examination of an engineering program's student achievement, program improvement, faculty, curricular content, facilities, and institutional commitment. Admissions requirements for undergraduate engineering schools include a solid background in mathematics (algebra, geometry, trigonometry, and calculus) and sciences (biology, chemistry, and physics), and courses in English, social studies, humanities, and computers. Bachelor's degree programs in engineering typically are designed to last four years. Some programs offer a general engineering curriculum; students then specialize in graduate school or on the job.

All 50 states and the District of Columbia usually require licensure for engineers who offer their services directly to the public. Engineers who are licensed are called Professional Engineers (PE). This licensure generally requires a degree from an ABET-accredited engineering program, four years of relevant work experience, and successful completion of a state examination. Recent graduates can start the licensing process by taking the examination in two stages. The initial Fundamentals of Engineering (FE) examination can be taken upon graduation. Engineers who pass this examination commonly are called Engineers in Training or Engineer Interns (EI).

The EI certification usually is valid for ten years or more. After acquiring suitable work experience, EIs can take the second examination, the Principles and Practice of Engineering Exam. Several states have imposed mandatory continuing education requirements for relicensure. Most states recognize licensure from other states. Many civil, electrical, mechanical, and chemical engineers are licensed as PEs.

It is important for engineers, like those working in other technical occupations, to continue their education throughout their careers because much of their value to their employer depends on their knowledge of the latest technology. Although the pace of technological change varies by engineering specialty and industry, advances in technology have significantly affected every engineering discipline.

Profile of Professional Surveyors

The following profile of professional land surveyors is based on the U.S. Department of Labor's *Occupational Outlook Handbook*.

Traditional land surveyors establish official land, air space, and water boundaries. They write descriptions of land for deeds, leases, and other legal documents; define air space for airports; and, measure construction and mineral sites. Other surveyors provide data relevant to the shape, contour, location, elevation, or dimension of land or land features. Surveying technicians assist land surveyors by operating survey instruments and collecting information in the field, and by performing computations and computer-aided drafting in offices.

Land surveyors manage survey parties who measure distances, directions, and angles between points and elevations of points, lines, and contours on, above, and below the earth's surface. They plan the fieldwork, select known survey reference points, and determine the precise location of important features in the survey area. Surveyors research legal records, look for evidence of previous boundaries, and analyze the data to determine the location of boundary lines. They also record the results of the survey, verify the accuracy of data, and prepare plots, maps, and reports. Surveyors who establish boundaries must be licensed by the state in which they work, and are known as Professional Land Surveyors.

Some surveyors perform specialized functions that are closer to those of a cartographer than to those of a traditional surveyor. For example, geodetic surveyors use high-accuracy techniques, including satellite observations (remote sensing), to measure large areas of the earth's surface. Geophysical prospecting surveyors mark sites for subsurface exploration, usually petroleum related. Marine or hydrographic surveyors survey harbors, rivers, and other bodies of water to determine shorelines, topography of the bottom, water depth, and other features.

All 50 states license land surveyors. For licensure, most state licensing boards require that individuals pass a written examination given by the National Council of Examiners for Engineering and Surveying. Most states also require that surveyors pass a written examination prepared by the state licensing board. In addition, they must meet varying standards of formal education and work experience in the field. Because of advancing technology and rising licensing standards, formal education requirements are increasing. At present, most states require some formal post-high school coursework and 10 to 12 years of surveying experience to gain licensure. Generally, the quickest route to licensure is a combination of four years of college, two to four years of experience (a few states do not require any), and passing the licensing examinations. An increasing number of states require a bachelor's degree in surveying or in a closely related field, such as civil engineering or forestry (with courses in surveying), regardless of the number of years of experience.

Most candidates prepare for a career as a licensed surveyor by combining postsecondary school courses in surveying with extensive on-the-job training. However, as technology advances, a four-year college degree is becoming more of a prerequisite. Nationally, about 25 universities now offer four-year programs leading to a Bachelor of Science degree in surveying. Junior and community colleges, technical institutes, and vocational schools offer one, two, and three-year programs in both surveying and surveying technology.

History of Regulation

By 1947, all 50 states had laws regulating the practice of engineering. Colorado has regulated engineers since 1919 and land surveyors since 1921. The link between the two professions is a historic one, as years ago both engineers and land surveyors could practice as land surveyors. Today, public land surveying has been removed from most engineering academic programs, so engineers may practice as land surveyors only if they have been licensed as a professional land surveyor. Presently, the State Board of Registration of Professional Engineers and Professional Land Surveyors regulates the two professions.

The Colorado State Board of Engineer Examiners was first created in 1919, consisting of four members appointed by the Governor. Two years later, that law was repealed and the State Board of Examiners for Engineers and Land Surveyors was created, consisting of five engineers. Both licensed engineers and licensed land surveyors were authorized to practice land surveying. At that time, exemptions to the law were granted to employees of the federal government and any political subdivisions.

In 1927, the terms "licensed engineer" and "licensed land surveyor" were changed to "registered engineer" and "registered land surveyor." It was made a misdemeanor to use the term "engineer" or "engineering" preceded by "chemical," "civil," "consulting," "electrical," "heating," "mechanical," "mining," "sanitary," "structural," "ventilating," or other prefix in attempting to mislead or deceive the public as to the nature of the service offered.

The law was repealed and reenacted in 1951 with substantial changes. "Engineer" became "professional engineer" (PE). Exemptions to the registration law were added for persons who operated or maintained machinery or equipment, who performed engineering services for themselves, who performed engineering services under the control and direction of a registrant, or whose work was strictly agricultural and was not required to be of public record. The reenacted law also initiated the certification of engineers-in-training (EIT) and mandated that only registered land surveyors, not professional engineers, could practice land surveying.

In 1953, the name of the board was changed to the State Board of Registration for Professional Engineers. The experience requirement for engineering applicants was amended and registered engineers could now be disciplined for conviction of a felony based upon a plea of guilty or *nolo contendere*.

County surveyors were required to be registered in 1963. The amended law in 1963 also required registered land surveyors to be high school graduates with six years of experience and to pass a written examination on specified subjects with a score of at least 70 percent. At this time land surveying was redefined.

The 1965 revision of the Engineering Practice Act further expanded the grounds for disciplinary action, increased the number of board members to seven engineers and amended the requirements for certification of EITs and registration of PEs.

In 1967, a number of land surveyor provisions were amended to expand the definition of the practice and the governing board became the State Board of Registration for Professional Engineers and Land Surveyors. In addition, the composition of the board was changed to require that two board members have both engineering and land surveying licenses. Three new articles were enacted regarding minimum standards for land surveys and plats, a "Colorado coordinate system," and perpetuation of land survey monuments.

The definition of the practice of engineering was amended in 1975 to exclude superintendence of any contractor's or subcontractor's processes, equipment or personnel for the purpose of maintaining a safe work place, unless that responsibility was specifically assumed by contract. In addition, the three land surveying articles added in 1967 were amended.

Both the engineer and land surveyor practice acts were repealed and reenacted in 1981. The board's name was changed to the State Board of Registration for Professional Engineers and Professional Land Surveyors and its composition was changed to its current status. The surveyor quorum of the board was also created to administer the land surveyor statute and was composed of at least two land surveyor members of the board and one PE board member. In addition to other grounds for disciplinary action, the Board was authorized to take action for any crime deemed by it to render a registrant unfit to practice. The registration and certification requirements for PEs, EITs, and PLSs were changed, certification for surveyors-in-training was initiated, and minimum age requirements were eliminated for all applicants.

The statute was again repealed and reenacted in 1985. One major change was that the experience requirements for PE licensure were again increased. In 1987, the section on disciplinary proceedings for both engineers and land surveyors was amended to provide for administrative hearings by administrative law judges.

Legislation enacted in 1988 was a result of the recommendations made during the sunset review process. The law was revised to include an exemption for persons employed by and performing engineering services for the federal government. Several provisions were added as grounds for discipline for both engineers and land surveyors, including the use of false, deceptive, or misleading advertising; performing services beyond one's competency, training, or education; failure to report to the Board any registered engineer known to have violated any provision of the act; excessive use of any habit-forming drug; or, failure to report to the Board any malpractice claim regarding engineering services that is settled or in which judgment is rendered. The revisions in 1988 also authorized the Board to issue letters of admonition, and eliminated "good character" requirements for licensure. At this time, the land surveying statute was amended to grant the Board the authority to enforce violations of Title 38.

Legislation introduced and defeated during the 1993 legislative session would have empowered the Board to require that professional land surveyors, through continuing education, demonstrate continuing professional competency as a condition of renewal or relicensure. In 1994 the Board was granted authority to fine unlicensed persons and issue cease and desist orders. In 1997 the definition of professional land surveying was amended to include, among other things, "other types of surveying" and section 38-51-109.3, C.R.S., was added to account for the development of geographic information system positions as they relate to land surveying.

House Bill 03-1061, which was signed into law by the Governor on April 22, 2003, repealed the requirement that the Board publish an annual roster of professional engineers. Instead, the new requirement calls for the Board to “make available through printed or electronic means” a list of the names and addresses of record, of all professional engineers, the rules of the board, the rules of professional conduct, and other pertinent information the Board deems necessary.

Legal Framework

Professional Engineers

Part 1 of Article 25 of Title 12 of the Colorado Revised Statutes (C.R.S.) is the enabling legislation concerning engineers. An “engineer” is defined in section 12-25-102(3), C.R.S., as “a person who, by reason of intensive preparation in the use of mathematics, chemistry, physics, and engineering sciences, including the principles and methods of engineering analysis and design, is qualified to perform engineering work...” The scope of practice, or what constitutes engineering, is contained in subsection (10), which defines the "practice of engineering" as:

the performance for others of any professional service or creative work requiring engineering education, training, and experience and the application of special knowledge of the mathematical and engineering sciences to such professional services or creative work, including consultation, investigation, evaluation, planning, design, surveying, and the observation of construction to evaluate compliance with plans and specifications in connection with the utilization of the forces, energies, and materials of nature in the development, production, and functioning of engineering processes, apparatus, machines, equipment, facilities, structures, buildings, works, or utilities, or any combination or aggregations thereof, employed in or devoted to public or private enterprise or uses.

There are a number of specific exemptions to the above scope of practice, including for individuals who normally operate machinery; corporations and their employees engaged in engineering for themselves; individuals who perform engineering services under the responsible charge of a registrant; professional land surveyors and architects; and for individuals who perform engineering services solely for a local jurisdiction or the federal government (§ 12-25-103, C.R.S.).

Board Creation, Composition, and Repeal

Section 12-25-106, C.R.S., establishes the nine-member State Board of Registration for Professional Engineers and Professional Land Surveyors (Board). The Board is subject to repeal on July 1, 2004, in accordance with section 24-34-104, C.R.S.

Appointment and removal of Board members is effected by the Governor based on staggered four-years terms which are limited to two full terms for each member. Four Board members must be professional engineers with no more than two members engaged in the same discipline of engineering. One Board member must be a professional engineer, as well as a professional land surveyor (PE-PLS), while two members must be practicing professional land surveyors. The remaining two members must be citizens of the United States and residents of Colorado for at least one year who have not been engaged in engineering or land surveying. In addition, each professional engineer member of the Board must be registered or licensed as a professional engineer and practicing as such for at least five years.

Powers and Duties of the Board

Section 12-25-107, C.R.S., empowers the Board to:

- adopt and promulgate rules and regulations for the enforcement of Article 25 of Title 12;
- hold at least six meetings a year;
- adopt rules of professional conduct for professional engineers;
- provide for written examinations in the "fundamentals of engineering" and the "principles and practice of engineering" and ensure that the passing score for any examination is set so as to measure the level of minimum competency;
- employ at least one investigator qualified to investigate engineering related complaints; and,
- adopt and have an official seal.

In addition, the Board may deny, suspend, revoke, or refuse to renew the license and certificate of registration, and limit the scope of practice, or place on probation, any professional engineer or engineer-intern in violation of the article (§ 12-25-108, C.R.S.).

Grounds for Discipline and Disciplinary Proceedings

Grounds for discipline under section 12-25-108, C.R.S., include:

- failing to meet the generally accepted standards of engineering practice whether through act or omission;
- performing services beyond an engineer's competency, training, or education;
- engaging in fraud, misrepresentation, or deceit in obtaining or attempting to obtain a certificate of registration or enrollment;
- using false, deceptive, or misleading advertising;
- being addicted to, or dependent upon, alcohol or habit-forming drugs or controlled substances;
- violating any law or regulation governing the practice of engineering in another state or jurisdiction;
- failing to report to the Board within 60 days any settled malpractice claim if such claim concerned engineering services performed or supervised by a registered engineer; and,
- failing to report to the Board any registered professional engineer known to have violated any provision of the practice act, or any Board order, rule, or regulation.

Section 12-25-108(2), C.R.S., authorizes the Board to issue letters of admonition for cause to a professional engineer without conducting a hearing. Such letter must be sent to the registrant by certified mail and advise him or her of the right, within 20 days after receipt of the letter, to make a written request to the Board to institute disciplinary proceedings to formally adjudicate the conduct or acts on which the letter was based. Section 12-25-109(4), C.R.S., provides for the use of administrative law judges in the manner prescribed in Article 4 of Title 24, C.R.S. All charges, unless dismissed by the Board, must be referred to an administrative hearing by the Board within five years after the date on which they were filed (§ 12-25-109(3), C.R.S.).

The Board upon its own motion may, and upon the receipt of a signed complaint in writing from any person must, investigate the activities of any professional engineer, engineer-intern, or other person who presents grounds for disciplinary action. The Board, program administrator, or administrative law judge may issue subpoenas. The Board may also impose fines for each violation according to statutory schedule.

Furthermore, the Board is authorized to apply for injunctive relief in the manner provided by the Colorado rules of civil procedure. In such proceedings, it is not necessary to allege or prove either that an adequate remedy at law does not exist, or that substantial or irreparable damage would result from the continued violation. After notice and a hearing, and if there is a finding by a majority of the Board that a violation of any provision of this article has occurred, it may issue a cease and desist order. The Colorado Court of Appeals has initial jurisdiction to review all final actions and orders that are subject to judicial review of the Board.

Qualifications for Professional Engineer

An applicant may qualify for licensing and registration as a professional engineer by endorsement if such applicant is licensed in good standing in another jurisdiction requiring qualifications substantially equivalent to those of Colorado. Upon completion of the application and approval by the Board, the applicant can be licensed and registered as a professional engineer if the applicant has documented his or her technical competence.

According to section 12-25-114(2), C.R.S., an applicant may qualify for licensing and registration as a professional engineer by graduation, experience, and examination if such applicant passes the principles and practice of engineering examination. There are several combinations of education and experience that may be utilized by applicants to gain entrance to the examination. The fundamental path includes all of the following:

- Graduation from a Board-approved engineering curriculum of four or more years;
- Eight years of progressive engineering experience, of which educational study may be a part; and,
- Enrollment as an engineer-intern in Colorado.

To be eligible for licensing and registration as a professional engineer, an applicant must provide documentation of his or her technical competence (§ 12-25-113, C.R.S.). The Board, upon acceptance of an applicant who has demonstrated competence in professional engineering and upon receipt of payment of the required fee, licenses and issues a numbered certificate of registration (§ 12-25-115(1), C.R.S.). Upon receipt of a certificate of registration, a newly registered professional engineer may obtain a seal. The seal and a signature may be used by an engineer only when the work being stamped was performed under the engineer's responsible charge (§ 12-25-117, C.R.S.).

Professional Land Surveyors

Part 2 of Article 25 of Title 12, C.R.S., is the enabling legislation concerning professional land surveyors. Section 12-25-202, C.R.S., defines "professional land surveying" as the application of special knowledge of principles of mathematics, methods of measurement, and law for the determination and preservation of land boundaries. In addition to the specific types of surveying enumerated in this section, "professional land surveying" may include other types of surveying. An individual is construed as practicing professional land surveying if such individual engages by verbal claim, sign, letterhead, or card or in any other way holds himself or herself out to be a professional land surveyor, or as being able to perform any professional land surveying service, or if such individual does perform any professional land surveying service or work.

Section 12-25-205, C.R.S., provides for enforcement, penalties, and stipulates that it is unlawful for any individual to use the words "land surveyor," "land surveying," or "professional land surveyor," or words of similar meaning, unless such individual is licensed and registered in accordance Colorado law. Subsequent to a finding by the Board that an individual has unlawfully engaged in the practice of professional land surveying, the Board may assess a fine against such unlawfully engaged individual in an amount not less than \$50 and not more than \$750.

Exempt from the scope of practice of professional land surveying are employees working under the direct supervision of a professional land surveyor. In addition, employees of the federal government engaged in the practice of surveying in the course of their employment within Colorado are exempt. All other legally recognized professions are exempt as well (§ 12-25-203, C.R.S.).

The Board's composition and the powers and duties of the Board are the same as those enumerated earlier in this report with the additional provision that a surveyor quorum of the Board is charged with advising the full Board concerning issues relating to land surveyors. "Surveyor quorum of the board" means not less than the two professional land surveyor members of the Board, a professional engineer and professional land surveyor member of the Board, and one of the non-engineering, non-land surveyor members of the Board.

The Board is empowered to adopt rules of conduct for professional land surveyors and to require each applicant for licensing to demonstrate competence by means of examination and education, and may also require work examples as it deems necessary. In addition, the Board ensures that the passing score on surveying examinations is set to measure the level of minimum competency.

Grounds for Discipline and Disciplinary Proceedings

Section 12-25-208, C.R.S., sets out the grounds for surveyor discipline. The Board has the power to deny, suspend, revoke, or refuse to renew the license and certificate of registration of, or place on probation, limit the scope of practice of, or require additional training of any professional land surveyor or land surveyor-intern who is found guilty of, among other things:

- Failing to meet the generally accepted standards of the practice of land surveying through act or omission
- Performing services beyond one's competency, training, or education
- Using false, deceptive, or misleading advertising
- Violating any law or regulation governing the practice of professional land surveying in another state or jurisdiction
- Violating any rule or regulation of the Board concerning surveyors

The Board may issue a letter of admonition to a professional land surveyor or land surveyor-intern on any of the grounds for discipline without conducting a hearing. The registrant may within 20 days after receipt of the letter make a written request to the Board to institute formal disciplinary proceedings in order to formally adjudicate the conduct or acts on which the letter was based. In addition to any penalty imposed, a registrant in violation may be fined for each infraction.

The Board upon its own motion may, and upon the receipt of a signed complaint in writing from any person must, investigate the activities of any professional land surveyor, land-surveyor intern, or other person who presents grounds for disciplinary action. The Board, program administrator, or administrative law judge may issue subpoenas. The Board may also impose fines for each violation according to statutory schedule.

Furthermore, the Board is authorized to apply for injunctive relief in the manner provided by the Colorado rules of civil procedure. In such proceedings, it is not necessary to allege or prove either that an adequate remedy at law does not exist, or that substantial or irreparable damage would result from the continued violation. After notice and a hearing, and if there is a finding by a majority of the Board that a violation of any provision of this article has occurred, it may issue a cease and desist order.

Qualifications for a Professional Land Surveyor

To be eligible for licensing and registration as a professional land surveyor, an applicant must provide documentation of technical competence (§ 12-25-213, C.R.S.). Section 12-25-214, C.R.S., sets out the qualifications for a professional land surveyor. An applicant may qualify for licensing and registration as a professional land surveyor by endorsement and examination if such applicant passes the required examination or examinations. In order to be admitted to the examination, the applicant must be licensed in good standing in another jurisdiction requiring qualifications substantially equivalent to those currently required in Colorado, or had equivalency at the time of initial licensure.

For applicants not licensed in another jurisdiction, there are several combinations of education and experience that may be utilized to gain entrance to the examination. The fundamental path includes all of the following:

- Graduation from a board-approved surveying curriculum of four or more years;
- Two years of progressive land surveying experience under the supervision of a professional land surveyor; and,
- Certification as a land-surveyor intern in Colorado.

The Board, upon acceptance of an applicant who has demonstrated competence in professional land surveying and upon receipt of payment of the required fee, licenses and issues a numbered certificate of registration (§ 12-25-215(1), C.R.S.). Upon receipt of a certificate of registration, a newly registered land surveyor may obtain a seal. The seal and a signature may be used by a surveyor only when the work being stamped was performed under the land surveyor's responsible charge (§ 12-25-217, C.R.S.).

Program Description and Administration

The State Board of Registration for Professional Engineers and Professional Land Surveyors (Board) is a Type I board housed in the Division of Registrations of the Department of Regulatory Agencies. As the name of the Board denotes, it is responsible for two allied, but distinct professions: professional engineers and professional land surveyors. The mission of the Board is "public protection through effective licensure and enforcement." In practice, the Board licenses professional engineers and professional land surveyors. It also enrolls engineer-interns and land surveyor-interns. This involves processing and evaluating applications from prospective licensees, administering exams, enforcing minimum standards of practice as defined by law, and disciplining those in violation of the law.

In fiscal year 01-02 there were 20,653 licensees under the Board's jurisdiction. In this fiscal year, the Board licensed a total of 1,825 persons, of which 632 were by endorsement and the remaining 1,193 by examination. Colorado does not have reciprocity agreements with other states.

The Board accomplishes its mission with the help of 5.7 full-time equivalent employees (FTE) headed by a Program Director. The rest include 2.0 FTE at the Administrative Assistant II level, 2.0 FTE at the Administrative III level, and 1.0 FTE at the General Professional IV level. Staffing trends and program expenditures for the preceding five fiscal years is presented in Table 1.

**Table 1
Staff and Expenditures, Fiscal Year 97-98 to Fiscal Year 01-02**

Fiscal Year	Total Program Expenditure	FTE
97-98	\$695,305	6.1
98-99	\$846,566	6.1
99-00	\$727,751	6.1
00-01	\$724,526	5.7
01-02	\$760,000	5.7

Fiscal years 97-98 through 99-00 included a 0.4 FTE in charge of reviewing Monument Records. When the incumbent in that position left, the Board was unable to find a replacement and the duties were outsourced and continue to be performed by a contractor.

Licensing

An applicant may qualify for licensing and registration as a professional engineer by graduation, experience, and examination if such applicant passes the principles and practice of engineering examination. There are several combinations of education and experience that may be utilized by applicants to gain entrance to the examination. The fundamental path includes all of the following:

- Graduation from a board-approved engineering curriculum of four or more years;
- Eight years of progressive engineering experience, of which educational study may be a part; and,
- Enrollment as an engineer-intern in Colorado.

To be eligible for licensing and registration as a professional engineer, an applicant must provide documentary evidence of his or her technical competence (§ 12-25-113, C.R.S.). The Board, upon acceptance of an applicant who has demonstrated competence in professional engineering and upon receipt of payment of the required fee, licenses and issues a numbered certificate of registration (§ 12-25-115(1), C.R.S.). Upon receipt of a certificate of registration, a newly registered professional engineer may obtain a seal. The seal and a signature may be used by an engineer only when the work being stamped was performed under the engineer's responsible charge (§ 12-25-117, C.R.S.).

For land surveyor applicants there are several combinations of education and experience that may be utilized to gain entrance to the examination. The fundamental path includes all of the following:

- Graduation from a board-approved surveying curriculum of four or more years
- Two years of progressive land surveying experience under the supervision of a professional land surveyor
- Certification as a land-surveyor intern in Colorado

The Board, upon acceptance of an applicant who has demonstrated competence in professional land surveying and upon receipt of payment of the required fee, licenses and issues a numbered certificate of registration (§12-25-215 (1), C.R.S.). Upon receipt of a certificate of registration, a newly registered land surveyor may obtain a seal. The seal and a signature may be used by a surveyor only when the work being stamped was performed under the land surveyor's responsible charge (§ 12-25-217, C.R.S.).

Table 2 below depicts the aggregate number of professional engineers and professional land surveyors for the previous five fiscal years. The second column in Table 2 is the number of new Engineer-Interns (EI) and Land Surveyor Interns (LSI) who were enrolled in that fiscal year. The third column provides the number of those who were licensed as a Professional Engineer (PE) or Professional Land Surveyor (PLS) in that year. The fourth column is the number of PEs and PLSs who were actively practicing and renewed their license that year.

The fifth column shows the number of retired PEs and PLSs who renewed their license pursuant to sections 12-25-114(4)(a) and 12-25-214(5)(a), C.R.S. The column entitled “Total Licenses” is not a total of the previous four columns. It reflects the total number of active licenses as of June 30 of that fiscal year.

Table 2
Engineers and Surveyors in Colorado, Fiscal Year 97-98 to Fiscal Year 01-02

Fiscal Year	New EI/LSI Enrollments	New PE/PLS Licensees	Active License Renewals	Retired License Renewals	Total Active Licenses
97-98	1,005	839	8,104	745	19,052
98-99	1,094	856	6,704	690	19,471
99-00	985	936	7,610	724	19,638
00-01	1,027	2,176	7,217	717	20,195
01-02	1,116	766	7,091	721	20,653

Renewals are on a two-year rolling cycle such that a new license expires two years from the end of the month in which the license was originally issued.

Examinations

The Board offers the examinations of the National Council of Examiners for Engineering and Surveying (NCEES) and the Colorado State Specific Surveying Examination. The Board contracts with NCEES to administer these examinations. NCEES is a national non-profit organization composed of engineering and land surveying licensing boards representing all U.S. states and territories.

The following information provides a brief description of the various examinations administered by the Board:

- *Engineer-Intern (EI) or Fundamentals of Engineering Exam (FE): NCEES Examination.* This exam is a closed book eight-hour, multiple-choice, supplied reference examination that is administered in two four-hour sessions. On the day of the examination, examinees are provided with a reference handbook.
- *Professional Engineer (PE) or Principles and Practice of Engineering Examination: NCEES Exam.* This examination is an eight-hour, open book exam that is administered in two four-hour sessions. The examination is offered in a variety of engineering disciplines. All of the examinations are in a multiple-choice response format.
- *Land Surveyor-Intern (LSI) or Fundamentals of Land Surveying (FLS) Exam: NCEES Exam.* This examination is a closed book eight-hour, multiple-choice examination that is administered in two four-hour sessions.

- *Professional Land Surveyor (PLS) or Principles and Practice of Surveying Exam.* This examination consists of two components: The “NCEES Principles and Practice of Land Surveying” examination, which is an open book, six-hour, multiple-choice examination, and the “Colorado State Specific Surveying Examination”, which is a closed book, one and one half-hour, multiple-choice exam. Each of these two sections is scored separately.

Examination pass rates for the five types of examinations are provided in Table 3 below.

Table 3
Examination Pass Rates by Type of Exam, FY 96-97 through FY 01-02

Pass Rates	FY 96-97	FY 97-98	FY98-99	FY 99-00	FY 00-01	FY 01-02
EI						
OCT	81.47%	75.55%	76.82%	77.03%	75.58%	73.33%
APR	82.62%	77.02%	74.96%	71.69%	71.33%	72.81%
PE						
OCT	46.48%	51.01%	45.99%	40.31%	55.06%	51.99%
APR	58.36%	42.23%	55.22%	43.28%	55.23%	53.83%
LSI						
OCT	41.67%	42.50%	63.27%	52.94%	45.16%	31.43%
APR	65.91%	61.54%	59.46%	34.38%	52.78%	46.67%
PLS						
OCT	81.82%	65.00%	69.57%	61.11%	69.57%	76.67%
APR	68.75%	76.47%	68.18%	56.67%	69.70%	78.95%
CO1.5 HR						
OCT	51.72%	70.97%	60.00%	63.64%	73.53%	57.41%
APR	76.47%	57.58%	60.00%	65.00%	59.57%	44.90%

Engineer-Intern (EI); Professional Engineer (PE); Land Surveyor-Intern (LSI); Professional Land Surveyor (PLS); Colorado State Specific Surveying Exam (CO1.5 HR)

Examinations are given twice each year in April and October. The examination administration was recently outsourced to NCEES, the vendor which also prepares the exams. The purpose for outsourcing was two-fold: to implement an efficient examination process in light of the loss of a long-time employee that handled all aspects of the examinations administration and to eliminate the examination security concerns of the Board.

Complaints/Disciplinary Actions

The procedure of processing complaints involves a number of standard steps. First, Board staff must determine whether the subject of the complaint is within the Board's jurisdiction. Only rarely are complaints not within the Board's jurisdiction. For example, a complaint solely involving contractual matters, without any indication of accompanying unethical behavior, would be deemed to be outside of the Board's jurisdiction and the complainant would be so informed. Second, Board staff must determine if there is enough information provided in the complaint to proceed. If information is lacking, such as land survey plats, the chronology of events, and so on, additional information is requested from the complainant.

Once Board staff determines that the complaint is within the Board's jurisdiction and there is enough information, a letter is sent to the respondent requesting a response to the allegations within 20 days. A letter is also sent to the complainant as notification that the Board received the complaint. Once the response to the complaint is received, both the complaint and the response are put on the next Board agenda for review and determination as to whether there is probable cause of a license law violation. If that determination of probable cause is not made, the Board dismisses the complaint and both the respondent and the complainant are notified. If the Board decides that there is probable cause that a violation occurred, they have several options:

- If the Board needs additional information to make a final determination, the complaint is referred to the Division of Registrations' Office of Investigations;
- If the Board believes that it has sufficient information and is clear in its determination of a violation, the Board may refer the complaint to the Office of the Attorney General for prosecution; or,
- Issue a Letter of Admonition to the respondent.

Upon review of a Report of Investigation from the Office of Investigations, the Board has similar options to dismiss, refer to the Office of the Attorney General, or issue a Letter of Admonition.

Oftentimes, information is received that concerns a possible violation but is not presented as a complaint. If information and evidence is presented that represents action or behavior that is a possible statutory violation, a complaint is initiated by Board staff on behalf of the Board, which the Board has delegated to it. In this case, the same procedures are followed as outlined above. If the information does not clearly represent a possible violation, an inquiry is initiated and the same due process procedures are followed that ask for a response from the respondent.

The number and types of complaints for the preceding five fiscal years is shown in Table 4. The two largest categories of complaints involve practicing without a license and violation of the standards of practice.

Table 4
Type and Number of Complaints, Fiscal Year 97-98 through Fiscal Year 01-02

Nature of Complaints	FY 97-98	FY 98-99	FY 99-00	FY 00-01	FY 01-02
Practicing w/o a License	35	22	20	22	11
Standard of Practice	57	41	28	21	25
Fee Dispute	0	0	0	0	1
Scope of Practice	2	3	0	0	1
Unethical Conduct	14	11	6	5	3
Unprofessional Conduct	0	1	0	1	1
Fraudulent Use of Seal	0	1	1	2	3
Violation Based on Another State's Action	15	10	12	7	5
Practice w/ Lapsed Licensed	9	16	16	15	11
Violation of Stipulation	6	2	0	2	3
Total	138	107	83	75	64

The resolution of legitimate complaints is an important performance measure for an agency under sunset review. DORA is charged with assessing “whether complaint, investigation and disciplinary procedures adequately protect the public and whether final dispositions of complaints are in the public interest or self-serving to the profession” (§ 24-34-104(9)(b)(VII), C.R.S.).

Disciplinary actions provide a solid indication of the overall enforcement activities of the Board. Table 5 below depicts final agency actions by category for the period under review. The largest category in Table 5 is dismissed complaints. Across the review period, more than 40 percent of charges were dismissed. In general, letters of admonition are the least severe form of discipline in the regulated professions. Taken together, letters of admonition and dismissals accounted for more than 60 percent of all Board actions in each year under consideration. On the other side of the coin, revocation, the most severe form of discipline, was utilized a total of five times in five years.

It is also important to note that the number of final agency actions depicted in Table 5 and the frequency of complaints depicted in Table 4 do not correspond on a one to one basis for each of the fiscal years under review. This is because a complaint may take more than one year to resolve and consequently may appear across fiscal years, while final agency actions are reflected only once in the year in which they occur.

Table 5
Final Agency Actions, Fiscal Year 97-98 through Fiscal Year 00-01

Type of Action	FY 97-98	FY 98-99	FY 99-00	FY 00-01	FY 01-02
Revocation	1	2	0	0	2
Surrender of License	1	3	2	0	1
Suspension	1	2	2	0	3
Letter of Admonition	18	29	24	21	20
License Denied after Hearing	0	0	0	0	0
Injunction	1	1	0	0	0
Fine	N/A	6	8	3	5
Stipulated Settlement	20	11	21	10	11
Dismiss	49	76	43	39	35
Cease & Desist Stipulations & Orders	8	3	5	7	3
Total	99	133	105	80	80

According to section 12-25-108(1), C.R.S. and section 12-25-208(1), C.R.S., the Board has, the power to, among other things, place on probation any professional engineer, engineer-intern, professional land surveyor, or land surveyor-intern who is in violation of the practice act. Probation, however, is not tracked separately from stipulated settlements. Consequently, this type of final agency action is not reflected in Table 5, and was not used by the Board as a stand alone enforcement tool. Similarly, practice limitations were not utilized outside of stipulated settlements.

In the next section of this report we discuss specific recommendations for program improvement.

Analysis and Recommendations

During the course of this sunset review, the Department of Regulatory Agencies (DORA) solicited input from a variety of sources. A number of significant issues were presented and considered including:

- Elimination of several of the currently exempted categories in the engineering statute, including the municipal exemption;
- The definition of the practice of engineering, that is, the scope of practice of professional engineers; and,
- Revision of education and experience requirements for enrollment and licensure of engineers and land surveyors.

The proposals that were not incorporated in this report were primarily set aside because there was insufficient justification for the requested changes. First, we rejected the “municipal exemption” proposal on the grounds that municipalities can readily assess the competencies of their staff to perform any necessary engineering tasks, and can make competent decisions as to when to use professional engineers instead of their own staff. Requiring that a professional engineer be on staff or contract raises the cost of work traditionally in the direct control of local jurisdictions, such as curb, sidewalk, and street projects. In addition, it is the duty of local officials to consider factors beyond standard engineering, such as the preservation of a community’s character, and in the case of Colorado’s gambling towns, historic preservation mandated by law. We discuss these matters in more detail in Recommendation 4 below.

Second, we saw no need to amend the definition of the practice of engineering. One aspect of this proposal entailed changing the definition to include “expert engineering testimony and reports.” The main arguments advanced for the change in the definition of the practice of engineering are that it clarifies for the public what engineers do, and further, that the proposed changes are based on the Model Law of the National Council of Examiners for Engineering and Surveying. We note, however, that the expansion of a statutory definition does not necessarily equate with clarification. More importantly, it is inconsistent to base a proposal on a national model law when one of the suggestions for the change included that, currently, expert witnesses may not be familiar with local conditions, such as soil composition. Finally, we note that courts have their own witness vetting processes by which to assess the level of expertise that may be necessary to resolve a controversy. Consequently, a change of the definition of the practice of engineering is neither necessary nor desirable.

Third, we rejected an increase in educational requirements. The task force was of the opinion that

the statutes should explicitly encourage education for engineers and land surveyors. Based on board experience in disciplinary matters and the rapid pace of change in the technology, methods, materials, and equipment in the engineering and surveying fields, it is clear that education plays an important role in an individual becoming a competent practitioner. In addition, the committee believed that current inequities in education and experience credit between the two practice acts should be resolved in the sunset process.¹

Although it is a laudable goal to encourage education, the state's role in professional and occupational regulation is to ensure minimum practitioner competence. By setting entry requirements at unnecessarily high levels, ostensibly to protect the public, a group may limit the number of individuals who can qualify. This, in turn, may create an artificial scarcity and enable those who are licensed to charge higher prices for their services than they might otherwise command.² By way of comparison, we concluded in the 1999 Sunset Review of the Colorado State Board of Accountancy that:

...the 150 credit-hour educational requirement is an overly restrictive entry barrier into the accounting profession with no demonstrable public protection function. Adoption of the 150 credit-hour requirement is likely to raise consumer costs, entrench market power in those accountants who attain the CPA designation, and restrict competition. On the other hand, keeping the educational requirement at the Bachelor's level is in line with current entry level educational trends in both the private and public sectors, and will promote the optimum utilization of personnel (p. 45).

The above referenced recommendation was favorably received by the Governor and the General Assembly. Moreover, the 1999 accountancy proposal was substantially more modest than the educational increase requests under present consideration. Proponents of the change, such as the direct and opportunity costs to licensees themselves, as well as any net benefits that might accrue to consumers. We conclude therefore that the aggregate increase in education for both professional engineers and land surveyors is unnecessary, unsupported, and does not meet the criterion that "...the existing statutes and regulations establish the least restrictive form of regulation consistent with the public interest.." (§ 24-34-104(9)(b)(II), C.R.S.).

¹ Sunset Review Committee Report, p. 4.

² The Council on Licensure, Enforcement, and Regulation (CLEAR), 1996. *Demystifying Occupational and Professional Regulation*, Lexington: CLEAR, 1996. p. 13.

Recommendation 1 – Continue the State Board of Registration for Professional Engineers and Professional Land Surveyors until 2013.

The State Board of Registration for Professional Engineers and Professional Land Surveyors (Board) is a policy autonomous board housed in the Division of Registrations of the Department of Regulatory Agencies (DORA). The mission of the Board is "public protection through effective licensure and enforcement." In practice, the Board licenses professional engineers and professional land surveyors, and enrolls engineer-interns and land surveyor-interns. This involves processing and evaluating applications from prospective licensees, administering examinations, enforcing minimum standards of practice as defined by law, and disciplining those in violation of the law. In fiscal year 01-02 there were 20,653 licensees under the Board's jurisdiction.

Professional engineers and professional land surveyors are licensed practitioners who directly shape both Colorado's physical environment and the quality of life of its citizens. According to engineers, the common link among the various types of engineering subspecialties is the scientific and technical knowledge involved in the design of everything from dams and buildings to electronic instruments. Allowing unlicensed persons to practice engineering, such as the design of structures or systems that are intended to be used by the public presents a genuine potential for both physical and economic harm to the public. Consequently, minimum competency standards that ensure the safety of structures and systems are necessary.

The licensing of professional engineers and professional land surveyors benefits all people in Colorado by providing a basic assurance that substandard service and potential harm to persons, property, and the environment are reduced by means of education, experience, and examination requirements. These requirements are established and maintained by the Board. The Board provides protection to the public; initially through the licensing process which ensures minimum competency and, after licensure in those instances when enforcement is necessary, by providing public protection to the consumer through appropriate disciplinary action. The Board performs effectively to license, discipline, and provide guidance to engineer and surveyor licensees, who in turn help to ensure healthy and safe environments, structures, and conditions for every Coloradan. Consequently, as an essential component of the existing regulatory scheme, the Board should be continued until 2013.

Recommendation 2 – Alter the composition of the State Board of Registration for Professional Engineers and Professional Land Surveyors.

Section 12-25-106(3), C.R.S., currently provides for a nine-member Board. Four members must be professional engineers with no more than two engaged in the same discipline of engineering service or practice, two must be public members, two members must be practicing professional land surveyors, and one member must be both a professional engineer and professional land surveyor.

The existing composition of the Board needs to be modified to more accurately reflect its constituencies. The number of dual licensees has declined significantly in recent years as a result of developments in these professions. Currently, the pool from which to select a Board member who is both a professional engineer and a professional land surveyor is less than 200 in comparison to the total number of licensees, which is approximately 20,000. Moreover, nearly half of the Board's business concerns land surveying matters. Consequently, the requirement for one Board member to be a dual licensee should be changed to require an additional practicing professional land surveyor. As a result, the total number of surveyor members would increase from two to three.

Recommendation 3 – Amend sections 12-25-102, and 12-25-202, C.R.S., and make conforming amendments to reflect a licensure program instead of a registration program, alter the Board's name, and repeal Bylaw 1.2.1.

In general, a regulatory scheme designed to oversee a professional or occupational group is comprised of three basic elements, or some combination of these elements. The three major components of a regulatory scheme are licensing, certification, and registration. Licensing is the most restrictive form of regulation, certification is intermediate, while registration is the least restrictive form of regulation.

In a licensing program, a licensee must meet the minimum standards of competence set out for the profession in question. This usually entails the three “Es”: education, examination, and experience requirements. Licensure laws prohibit unlicensed individuals from engaging in protected activities. These activities are generally referred to as the “scope of practice” of the profession or occupation under consideration. Licensure is most common in the medical professions given that the threat to the public health, safety, and welfare is the greatest. For example, physicians and dentists are licensed in Colorado.

The hallmark of a state certification program is title protection. Certification protects a specific occupational title, but does not preclude others from practicing a particular profession. For example, in Colorado, anyone can practice occupational therapy, but only those who meet specific qualifications may claim to be a “Certified Occupational Therapist.” In addition, private organizations may engage in certification schemes. Private certification identifies practitioners who meet the standards of a private organization or professional association, but have no relation to the police powers of the state.

A registration program usually only requires that an individual furnish his or her name, and other basic information to a government agency. A fee may be associated with such a registration program. Registration is the least intrusive level of state regulation, and is used when the threat to public health, safety or welfare is minimal. For example, in Colorado, hunting and fishing outfitters must register with the Division of Registrations. If registration is imposed, it is usually illegal to perform activities within a given jurisdiction if one is not registered, which is meant to control “fly by night” operators.

In sum, professional engineers and professional surveyors in Colorado must currently meet significant education, examination, and experience requirements. Therefore, the current regulation of these two groups meets all of the criteria of a licensure program. For historical and other reasons, however, the term of art used for these two professions in Colorado has been “registrants”, not “licensees.” The proposed changes involve replacing the words “registration,” “registrant,” and “registered” with the words “licensure,” “licensing,” “license,” and “licensee.” These changes are proposed based on the distinction between the meaning of these words within the context of a regulatory scheme.

Similarly, changing the name of the Board to the “State Board of Licensure for Professional Engineers and Professional Land Surveyors” would more accurately reflect its main function.

Finally, the bylaw concerning the Board’s name (1.2.1) is superfluous given that it is defined in statute and should therefore be repealed.

Recommendation 4 – Exempt state employees who perform engineering work from the practice act.

Statutory evaluation criteria direct DORA to assess:

if regulation is necessary, whether the existing statutes and regulations establish the least restrictive form of regulation consistent with the public interest, considering other available regulatory mechanisms and whether agency rules enhance the public interest and are within the scope of legislative intent.

One of the main proposals advanced by the Board’s sunset task force is the elimination of the municipal exemption currently permitted under Section 12-25-103(g), C.R.S. In its report, the task force notes that federal employees are currently exempted, as well as engineers who work for corporations that manufacture products covered by product liability laws. Individuals who are employed by a private company that perform engineering services under contract for a local jurisdiction are not currently exempted. Similarly, state employees are not exempted. The proposed changes are therefore designed to address those individuals who perform engineering services as part of their employment for a city, county, or other local jurisdiction. The task force also points out, however, that most of these individuals are currently licensed and therefore the proposed change would not have an adverse impact. This, of course, begs the question as why the change is needed in the first place.

We sought a response concerning the proposed repeal of the municipal exemption from *Colorado Counties, Inc.*³ (CCI) and the *Colorado Municipal League*⁴ (CML), two organizations that represent local government interests which oppose changing the current law. CML notes correctly that the municipal exemption has long been recognized in law and there has been little, if any, basis for repeal of the exemption. Further, the proposed change would not result in a net public benefit, and threatens many traditional activities that are currently and adequately performed by local jurisdiction employees who are not professional engineers. A related point concerns preserving the current definition of the practice of engineering. Any such change would only serve to complicate what local governments are able to do under the law, and create many “gray” areas. In practice, this would lead to interpretations that are sure to be challenged in court if a change in the definition of the practice of engineering is adopted.

DORA concurs with the view that sufficient justification for repeal of the municipal exemption has not been presented. By way of contrast, CML provided specific examples to support its position that repealing the municipal exemption would lead to increased costs without corresponding public protection benefits. Municipalities routinely make use of their own experienced personnel instead of professional engineers to safely perform such tasks as sewer system upgrades and drainage projects. In addition, it is the duty of local officials to consider factors beyond pure engineering, such as the preservation of a community’s character, and in the case of Colorado’s gambling towns, historic preservation mandated by law (see § 12-47.1-1202, C.R.S.). It would also be inconsistent to seriously consider eliminating the municipal exemption given that a similar exemption, the industrial exemption (§ 12-25-103(1)(c), C.R.S.), is not being actively proposed for repeal. Finally, we take this opportunity to point out that repeal of the municipal exemption has been rejected by the General Assembly on at least two other occasions.

Many of the arguments that apply to municipalities also extend to state government. State agencies and local municipalities have similar missions, and both are ultimately accountable to their constituents. By not specifically exempting state agencies from the engineering practice act, unnecessary costs are incurred by the state. Regarding engineering projects, state agencies can readily assess the competencies of their staff to perform any necessary tasks, and can make competent decisions as to when to use professional engineers instead of their own staff. Requiring that a professional engineer be on staff or contract raises the cost of work traditionally in the direct control of state agencies, such as the Colorado Department of Transportation. Specific projects may involve curb, sidewalk, and street projects of varying size and complexity.

³ Colorado Counties, Inc. is the professional association of county commissioners. CCI’s membership currently includes commissioners from 61 of Colorado’s 64 counties.

⁴ Founded in 1923, the CML is a non-profit, non-partisan association that represents and serves Colorado’s cities and towns. Currently 264 of the state’s 270 municipalities are members – representing over 99 percent of the state’s municipal population. CML’s mission is to “Advocate municipal interests and provide information and assistance to municipal officials.”

It is telling that several other jurisdictions exempt themselves from engineering regulation, and some exempt specific state and federal agencies. For example, South Dakota, Vermont, and the District of Columbia exempt all of their employees from their respective engineering statutes. Florida exempts all subordinate public officials of a person in responsible charge irrespective of political subdivision, as well as regular full-time employees of a public utility or other entity subject to regulation by the Florida Public Service Commission. Georgia exempts all elective officers of the political subdivision of the state while in the practice of professional engineering in the performance of their official duties, as well as officers and employees of the Department of Transportation while engaged within the state in the practice of professional engineering for the department. Illinois limits its exemption to employees of all political subdivisions performing inspection, maintenance, and service work.⁵

It is also noteworthy that federal employees are currently exempt from Colorado's practice act, but not state employees. No less than 34 other states have some sort of federal exemption. In other words, with respect to the state's engineering practice act, whether we consider the exemption of Colorado state employees from the bottom up (municipal to state) or from the top down (federal to state), there is ample evidence for eliminating this aspect of regulation so as to promote cost savings while maintaining adequate safety standards.

Recommendation 5 – Increase the fining authority of the Board to a maximum of \$5,000 for each separate offense.

The General Assembly has supported a policy of allowing boards to impose fines on licensees in non-health professions. One drawback to this policy is that small fines may be viewed by licensees as a cost of doing business, rather than a deterrent to a negligent, dangerous, or substandard practice. Generally speaking, it is preferable to impose small fines for minor violations of a practice act, as opposed to license restrictions, suspensions, or revocations for acute violations. The State Board of Registration for Professional Engineers and Professional Land Surveyors has used its fining authority 22 times in the last five fiscal years, which denotes both a willingness and a need for this type of enforcement action.

The current fining authority of the Board is insufficient to deter unlawful behavior. Section 12-25-105(9), C.R.S., allows the Board to impose a fine of between \$50 and \$750. However, given that the individuals and organizations that fall under the ambit of this practice act tend to be well established professionals and businesses, these amounts are inadequate on their face. One suggestion was to increase the Board's fining authority to a maximum of \$10,000. We compared this amount to that imposed on architects, an allied profession, and made note that on or about 1997 the American Institute of Architects also favored fines of up to \$10,000. The General Assembly, however, only increased the Examining Board of Architects fining authority to \$5,000. Consequently, the State Board of Registration for Professional Engineers and Professional Land Surveyors should be granted the authority to levy fines up to a maximum of

⁵ Compiled from *Engineering Licensure Laws: A State-by-State Summary and Analysis*. National Society of Professional Engineers, 1997 (verified by DORA either by telephone or online).

\$5,000 for each separate offense, an amount consistent with that imposed on professional architects (see § 12-4-111(5), C.R.S.). To effect this recommendation, section 12-25-105, C.R.S., should be amended accordingly, together with any necessary conforming amendments.

In conclusion, raising the fining authority of the Board will have a deterrent effect on undesirable conduct on the part of professional engineers and land surveyors, and in consequence, help to avert more serious standard of practice problems.

Recommendation 6 – Authorize the Board to issue letters of concern.

Unlike other regulatory boards of the Division of Registrations, the Board lacks the statutory authority to issue letters of concern.

The Board maintains that it needs a mechanism to inform a licensee under its jurisdiction that his or her professional behavior is not deemed acceptable, but nevertheless does not warrant disciplinary action. Such a tool would allow the Board to put a licensee on notice, and consequently, afford the licensee an opportunity to take steps to correct the behavior in question. A number of other professional licensing boards have this authority and have found it useful to accomplish their regulatory mandate. For example, the Accountancy Board has such authority at section 12-2-126(1)(b)(II), C.R.S.; the Board of Medical Examiners at section 12-36-118(4)(c)(II.5), C.R.S.; and, the Podiatry Board at section 12-32-108.3(2)(c)(V), C.R.S. In short, letters of concern are analogous to a policeman issuing a warning as opposed to ticketing an errant driver.

To effect this recommendation, a new subsection (5) should be enacted in section 12-25-108, C.R.S., and conforming amendments made for professional land surveyors as follows:

THE BOARD MAY ISSUE A LETTER OF CONCERN TO A PROFESSIONAL ENGINEER OR AN ENGINEER-INTERM BASED ON ANY OF THE GROUNDS SPECIFIED IN SUBSECTION (1) OF THIS SECTION WITHOUT CONDUCTING A HEARING AS SPECIFIED IN SECTION 12-25-109 (4) WHEN AN INSTANCE OF POTENTIALLY UNSATISFACTORY CONDUCT COMES TO THE BOARD'S ATTENTION THAT DOES NOT WARRANT FORMAL ACTION BY THE BOARD. LETTERS OF CONCERN SHALL BE CONFIDENTIAL AND SHALL NOT BE DISCLOSED TO MEMBERS OF THE PUBLIC OR IN ANY COURT ACTION UNLESS THE BOARD IS A PARTY.

In conclusion, this recommendation will enable the Board to take preventive action by informing licensees of potentially violative conduct before substantial harm occurs.

Recommendation 7 – Allow 30 days from the date of mailing to respond to a letter of admonition instead of 20 days from the date of proven receipt.

According to section 12-25-108(2), C.R.S., the Board may issue a letter of admonition to a professional engineer or an engineer-intern based on any of the specified grounds without conducting a hearing. Such letter must be sent to the registrant by certified mail advising him or her of the right to, within 20 days after receipt of the letter, make a written request to the Board to institute formal disciplinary proceedings to formally adjudicate the conduct or acts on which the letter was based. Similar provisions are addressed in section 12-25-208(2), C.R.S., for professional land surveyors.

In practice, these provisions require a letter of admonition to be mailed via certified mail, return receipt requested. This is the only verifiable way to prove the date on which such letter is received. However, letters of admonition as used by other regulatory boards have been returned as undeliverable or unclaimed. One possible explanation for this is that the respondent may have moved and not notified the relevant board of the new address. An additional consideration here is that state mail is not forwarded, it is returned to the relevant board as undeliverable.

A more pessimistic explanation is that the respondent simply refuses to sign for the letter, thus preventing the tolling period from beginning.

The Colorado Court of Appeals recently addressed this issue in *Colorado State Board of Medical Examiners v. Roberts*, 42 P.3d 70 (Colo. App. 2001). In *Roberts*, the court reviewed a provision in the Medical Practice Act that is substantially similar to the statute discussed here. The Board of Medical Examiners issued a letter of admonition to Dr. Roberts and mailed it to him at his place of business via certified mail, return receipt requested. However, Dr. Roberts and his staff refused to sign for the letter on two separate occasions. Three months later, Dr. Roberts requested that the Board of Medical Examiners vacate the letter of admonition and institute formal disciplinary proceedings against him. The Board of Medical Examiners refused, stating that two notices of attempted delivery by the U.S. Postal Service was sufficient to constitute receipt and begin the 20-day tolling period for requesting formal disciplinary proceedings.

Dr. Roberts and the Court of Appeals disagreed. In focusing on the plain language of the statute, the court held that “receipt” in the statute requires actual receipt. Since the engineering practice act contains language that is substantially similar to the statutory provision reviewed in *Roberts*, it is not unreasonable to conclude that the State Board of Registration for Professional Engineers and Professional Land Surveyors will encounter a similar problem in the future. By requiring the letter of admonition to be mailed by certified mail, the Board will be able to establish the date on which it is mailed. To allow for delivery time, and to be consistent with other appeals timelines, the time in which registrants may request formal disciplinary proceedings should be extended from 20 days to 30 days.

This recommendation neither restricts nor expands the powers of the boards or the rights of professional engineers and professional land surveyors. It attempts to expedite the disciplinary process while protecting the rights of registrants. Consequently, the General Assembly should change the timelines for appealing a letter of admonition to 30 days from the date of mailing, rather than 20 days from the date of proven receipt.

Recommendation 8 – Enhance the preservation of land survey monuments.

The original intent of section 38-51-107, C.R.S., was to give professional land surveyors reliable historical information to be able to follow in the footsteps of previous land surveyors. July 1, 1975, is the date when professional land surveyors were first required to place a durable cap bearing their registration number on monuments that they set. "Monument" means the object or physical structure that marks the corner point, that is, the point of reference determined by the surveying process. It was probably assumed in July of 1975 that monuments set in a recently platted subdivision would be in existence and available for future location and reference. However, some of the plastic caps that were used deteriorate when exposed to sunlight, and aluminum caps corrode in certain soils. Monuments are also frequently destroyed by construction or landscaping.

As time passes, even monuments set after July 1, 1975, will be lost through attrition. When Section 38-51-107, C.R.S., was enacted, professional land surveyors had a 15-year window within which surveyors did not have to file land survey plats. Now that window has nearly doubled and will continue to grow.

By changing the date from July 1, 1975, to a date within the last 20 years, professional land surveyors will have more reliable information to conduct land surveys and land survey monuments will be maintained in an identifiable state. This benefits the public by keeping the costs of conducting land surveys within reason.

To effect this recommendation, section 38-51-107, C.R.S., should be amended to read:

(1) Every professional land surveyor who accepts a monument while performing a monumented land survey shall prepare a plat if such monument is not of record either in the clerk and recorder's office of the county in which the monument lies or in the public office designated by the county commissioners pursuant to section 38-50-101 (2) or if such monument is set pursuant to section 38-51-104.

(2) No plat shall be required to be prepared OR DEPOSITED if the monuments accepted or set are within a platted subdivision which was filed ~~after July 1, 1975~~ IN THE CLERK AND RECORDER'S OFFICE WITHIN THE TWENTY (20) YEARS PRIOR TO ACCEPTING OR SETTING MONUMENTS IN THE PLATTED SUBDIVISION.

In short, this recommendation updates Colorado law in accordance with professional developments in surveying.

Recommendation 9 – Housekeeping Changes.

The following recommended changes (CAPITALS for proposed new language and ~~strikeouts~~ for proposed deletions) either clarify the intent of the original legislation, or serve to update the practice act of professional engineers and professional land surveyors in accordance with developments in these professions. Conforming amendments may be needed, especially to address the statutory provisions in both professions when only one profession is specifically referred to below.

- According to section 12-25-106(7), C.R.S., “The director of the division of registrations shall appoint a program ~~administrator~~ DIRECTOR for the board and such other personnel as are deemed necessary for the board to perform its statutory duties, pursuant to section 13 of article XII of the state constitution.”

The title of this position has been changed and should be accurately reflected in the statute.

- According to section 12-25-105(6), C.R.S., “the practice of PROFESSIONAL engineering in violation of any of the provisions of this part 1 shall be deemed a class 3 misdemeanor and shall be EITHER:”

This language clarifies that it concerns professional engineers only, and the “either” conforms to the “or” that follows between the subsequent paragraphs (a) and (b).

Section 12-25-108, C.R.S., concerns grounds for discipline and provides in part that “a felony THAT IS RELATED TO THE ABILITY TO PRACTICE ENGINEERING; except that the board shall be governed by the provisions of section 24-5-101, C.R.S., in considering such conviction or plea.”

- It is in keeping with the intent of the act to clarify section 12-25-105(4), C.R.S., as follows: “it is unlawful for any individual to use in any manner an expired, suspended, or revoked license, certificate, or seal, OR TO PRACTICE OR OFFER TO PRACTICE WHEN NOT QUALIFIED, OR TO FALSELY CLAIM THAT SUCH INDIVIDUAL IS LICENSED.”
- It is in keeping with the intent of the act to refine section 12-25-107(1)(g), C.R.S., as follows: “provide for written examinations in the fundamentals of engineering and the principles and practice of engineering. Examinations shall be given at ~~such times~~ LEAST TWICE ANNUALLY AT SUCH locations as the board shall determine.
- It is in keeping with the intent of the act to refine section 12-25-110(5), C.R.S., as follows: “no individual whose license or enrollment has been revoked shall be allowed to reapply for licensure OR ENROLLMENT earlier than two years after the effective date of the revocation.”

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- It is in keeping with the intent of the act to refine section 12-25-117(1), C.R.S., as follows: “upon receipt of a certificate of registration LICENSURE, the newly registered LICENSED professional engineer may obtain a seal. A crimp type seal, or a rubber stamp facsimile type seal, or both AN ELECTRONIC TYPE SEAL may be used. The seal shall be of a design approved by the board and shall contain the professional engineer's name and registration LICENSE number and the designation ‘Colorado registered LICENSED professional engineer.’ Colorado professional engineers registered licensed before July 1, 1984 2004, may continue to use their prior existing seals.”

The term “facsimile” is now associated with the product of fax machines and needs to be removed from the statute. In accordance with other state laws, this statute needs to be modified to allow the use of electronic seals.

Administrative Recommendation 1 – Repeal Board Rules 2-2; 3-1-5; 3-3-2; 3-3-4; 3-4-2; 3.5.3; and 1.2.2.

Although the Board is empowered to adopt rules and regulations under section 12-25-107(1)(a), C.R.S., the Board exceeds its general powers and duties in the following instances:

- In Definition 2.2, the Board interprets sections 12-25-104, and 12-25-204, C.R.S., to mean that “the same structure and supervision requirements are required of all organizations offering and/or providing engineering or land surveying services for others whether they are organized as sole proprietorships, firms, partnerships, joint stock associations, corporations or another legally constituted entity.” But neither of these terms, nor any provisions concerning “sole proprietorships” or “another legally constituted entity” may be found in these two sections of the law.
- Under section 12-25-107(1)(b), C.R.S., the Board may adopt rules of professional conduct. Rule 3.1.5, however, concerns the “caliber of association” of registrants, and is on its face beyond the scope of the practice act. In short, the conduct of professional engineers and surveyors is within the purview of the Board, not any of their associations. Similarly, Rule 3.4.2 concerning the appearance of impropriety is not within the mandate of the Board.
- When registrants serve as expert or technical witness in court or other official proceedings, their testimony is governed by court rules and other vetting mechanisms. The Board has no cause or grounds to intervene in these matters as Rule 3.3.2 clearly does.
- Rule 3.3.4 concerning statements beyond engineering and land surveying holds that “registrants shall not issue a professional statement in a field of expertise outside of the practice of engineering and/or land surveying unless they hold a proper registration from the lawful authority that issues such registration.” Clearly, in the scenario envisioned by this Rule, the registrant would be subject to the practice act of the profession in question, and therefore there is no need for the Board to promulgate a rule in an attempt to control this type of conduct.

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- Rule 3.5.3 holds that “registrants or their associates shall not publicize or promote themselves for the purpose of securing or retaining employment by the use of a professional engineer seal or professional land surveyor seal or any reproduction thereof.” But it is precisely this confirmation of competency that prospective business clients and consumers seek to aid them in their decision making. Not only have individual engineers and surveyors worked hard to attain this benefit, it is counterproductive to these professions to prevent them from engaging in legitimate and truthful advertising.
 - Rule 1.2.2 holds that “the board shall hold at least 6 regular meetings a year as required by law. Notice of regular meetings shall be given as required by Section 24-6-402(2), Colorado Revised Statutes. All meetings of the board are open to the public except when the board meets in executive session as allowed by Section 24-6-402, Colorado Revised Statutes.” But it is self-evident that law, including section 12-25-107, C.R.S., governs the conduct of the Board’s meetings, therefore this Rule is redundant.

In conclusion, the Board Rules outlined above represent instances of overly zealous regulation, rules that are at times redundant or beyond legislative intent, and which constitute precedents that should not be pursued by other policy autonomous boards.

Appendix A – Sunset Statutory Evaluation Criteria

- (I) Whether regulation by the agency is necessary to protect the public health, safety and welfare; whether the conditions which led to the initial regulation have changed; and whether other conditions have arisen which would warrant more, less or the same degree of regulation;
- (II) If regulation is necessary, whether the existing statutes and regulations establish the least restrictive form of regulation consistent with the public interest, considering other available regulatory mechanisms and whether agency rules enhance the public interest and are within the scope of legislative intent;
- (III) Whether the agency operates in the public interest and whether its operation is impeded or enhanced by existing statutes, rules, procedures and practices and any other circumstances, including budgetary, resource and personnel matters;
- (IV) Whether an analysis of agency operations indicates that the agency performs its statutory duties efficiently and effectively;
- (V) Whether the composition of the agency's Board or commission adequately represents the public interest and whether the agency encourages public participation in its decisions rather than participation only by the people it regulates;
- (VI) The economic impact of regulation and, if national economic information is not available, whether the agency stimulates or restricts competition;
- (VII) Whether complaint, investigation and disciplinary procedures adequately protect the public and whether final dispositions of complaints are in the public interest or self-serving to the profession;
- (VIII) Whether the scope of practice of the regulated occupation contributes to the optimum utilization of personnel and whether entry requirements encourage affirmative action;
- (IX) Whether administrative and statutory changes are necessary to improve agency operations to enhance the public interest.