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DEPARTMENT OF PROFESSIONAL AND VOCATIONAL STANDARDS

State Board of Registration for Civil and
Professional Engineers



A BRIEF HISTORY OF ENGINEERING REGISTRATION

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BOARD OF REGISTRATION FOR CIVIL AND PROFESSIONAL ENGINEERS

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Introduction

Slightly more than three decades have elapsed since 1929 when the State Legislature enacted into law provisions for creating the first Engineers' Registration Board in California. Many of the political, social and economic conditions of the last thirty-odd years which were significant in shaping the course of world history were also responsible for influencing developments in the field of engineering registration here in California. The great depression of the Thirties saw the number of registered civil engineers decline from its peak of 5,035 on June 30, 1930, to 4,281 on June 30, 1940. Thus, the State experienced a loss of 15% in the number of registered engineers while the population increased 21.7% during the same period. The effect of this inverse relationship was to reduce the ratio of civil engineers per thousand population by 30% (from 0.88 to 0.62).

The remarkable technological advances made during World War II, the urgency of reconstruction for a war-torn world, and the advent of the atomic age were a few of the more obvious factors of the Forties which emphasized the role of the engineer in society and brought him universal recognition. This new position of prominence, which enhanced his prestige and gave him greater stature, revived interest of the engineer in registration. As a result, registration for Professional Engineers in the branches of Chemical, Electrical, Mechanical and Petroleum Engineering was enacted into law by the 1947 Session of the State Legislature. By 1950 the total number of registrants in the five branches of engineering had reached 24,578, and the population of California grew to 10,586,223, an increase of 53.3% over the preceding decade. The new ratio of registered engineers per thousand of population was established at 2.3 as of June 30, 1950.

There were many influences of varying importance during the last decade which contributed, directly or indirectly, to the rapid advance of engineering registration in California. Some of the more noteworthy ones were the Korean War, the struggle for missile supremacy, the race for exploration and control of space, and the much publicized "population explosion". The latter three factors are influences not easily limited to an arbitrary period of time such as a decade; they are by nature more characteristic of an age or era. However, it was during this decade (June 30, 1950 to June 30, 1960) that the effects of their influence became significant. The population of California was reported by the Bureau of Census as having increased 48.5% over the preceding decade and that it was now 15,717,204 which ranked this State second in order of population. The total number of professional engineers with registration in effect as of June 30, 1960, was 28,748 which reflected a net gain of 4,170 registrants for this ten-year period. However,

there were a total number of 7,397 new registrations granted for the identical period, but 3,227 of these were offset by the expiration of this same number of registrations due to death, retirement, transfer, etc.

From the end of World War II to the present time, engineering registration in California has experienced a rate of growth which is unmatched by any other state. More than one-eighth of the total number of engineers registered in the United States and its territories hold registration here. In only the last decade, for example, the percentage increase in the number of applications processed was 320%, while the number of candidates examined experienced a slightly greater increase of 335%. These percentages are based on 2,318 applications received and 1,700 examinations conducted for the year ending June 30, 1950, as opposed to 7,439 applications received and 5,666 examinations conducted for the year ending June 30, 1960.

A review of the history of the Board over these past years is necessary before the real significance of this growth and its impact on the operations of the Board can be fully appreciated. For more than twenty-five years the Board conducted its examinations on a semi-annual basis, usually in June and December. By 1955, however, the steadily increasing number of candidates for examination exceeded the staff's ability to handle so great a volume. To avert a crisis, the Board adopted, as an emergency measure, the policy of denying those applicants who failed the December 1955, examination the opportunity of applying for the June, 1956, examination. The Board adopted this policy at a meeting in San Francisco on December 6, 1955. It did so only after thorough consideration of the many factors involved. The urgency of the situation, however, required an immediate solution and the Board was compelled to adopt the most expedient means of containing the work load at a level commensurate with its limited staff. This action was a temporary one and it was intended to provide time only, pending a more realistic solution of the problem.

Increasing the staff in proportion to the volume of work appeared to be the most obvious solution, if not the least drastic of the other alternatives; but the Board was unsuccessful in this approach. Consequently, the responsibility of meeting an increased work load without a corresponding increase in its staff left the Board with no alternative but that of reducing the level of service which it had maintained for more than twenty-five years. It did so by extending the examination interval from six to eight months, effective January 1, 1957. The effect of this action was twofold — first, it reduced the work load by 25% and, secondly, extended the interval between examinations by 33 1/3%. This reduction in the level of service to the engineering profession, to industry, and to the general public occurred at a time when the emphasis

was on the need for engineers and at a time when a shortage of qualified engineers was being proclaimed throughout the entire country. Because the Board had no other recourse, it was again compelled to adopt a policy not in the public interest, and over the strenuous objections of the various professional groups and associations.

Once again the Board was forced to revise its examination schedule to meet the needs of an increasing work load. Effective January 1, 1959, the examination in engineering fundamentals and the professional examination, theretofore held on successive Saturdays at eight month intervals, were conducted alternately at intervals of approximately four months. This had the effect of reducing the number of candidates for the professional examination by requiring them to take and pass the examination in engineering fundamentals before being eligible for assignment to the professional examination. Prior to this time the professional applicant was eligible for assignment to both examinations if he had not already passed the examination in fundamentals. As a result, another reduction in the level of service was brought about through lack of an adequate staff to meet the unprecedented volume experienced over these past years. During the 1959-60 fiscal year the Board further curtailed the examination work load by extending the interval of the Land Surveyor examination from eight to twelve months.

The foregoing outlines the growth of engineering registration in California since its beginning in 1929, in addition to highlighting some of the attendant problems of that growth experienced by the Board in recent years. The following pages tell the story of those events which led to the enactment of engineering registration in California:

Historical Summary Of Engineering

Engineering was generally considered a military function until late in the Eighteenth Century. It was primarily the art of making military machines, the construction of fortifications and the erection of offensive and defensive military works. But the requirements of an urban society, brought about by the industrial revolution, created a demand for engineering works of a nature other than military. Streets, highways, railroads, tunnels and bridges were needed for transportation and communication, as well as docks, harbors and canals.

The War of 1812 had the same effect as the War of Independence. American production was stimulated by being thrown on its own resources. It was further stimulated after the war by foreign competition. So the transition to an industrialized society brought with it the opportunity for construction of non-military or public works -- in other words, civil as opposed to military engineering. The term "Civil Engineering", it is

reported, appeared for the first time in a school catalogue published by Rensselaer Polytechnic Institute in 1828. This same Institute was the first in the United States to award the Degree of Civil Engineer to its graduates. Records indicate that four members of its graduating class of 1835 were the first to receive such a degree.

The awakening of a professional consciousness among Civil Engineers was clearly established in the United States as early as 1839. With completion of the Erie Canal in 1825, the first great achievement of American engineering became reality. The work was performed by three self-trained Americans, James Geddes, Benjamin Wright and Charles Brodhead. The pride of accomplishment and the challenge of meeting the need for future projects of equal or greater magnitude provided a basis for Civil Engineers to associate together through the medium of a formal organization. The first effort in this direction was made in 1839 when a national society of civil engineers was organized. This attempt at organization was apparently premature because it soon failed. A subsequent attempt, thirteen years later, was more successful. The American Society of Civil Engineers became the first engineering society in the United States to be organized on a national scale. This society was to represent all facets of non-military engineering for almost twenty years before the first movement for a separate identity was to occur.

The rapid advance of scientific method during the Nineteenth Century and the remarkable inventions of the same period provided impetus to a westward movement of the population. Improvements in steam locomotion and development of machine tools and farm machinery speeded this westerly expansion at an even greater rate. The increasing importance of mineral resources to an industrial economy was soon apparent. Huge quantities of coal and iron were necessary for manufacturing. And in the far West vast deposits of gold and silver were being mined. The importance of this contribution of the mining industry to the industrialization of the United States encouraged mining engineers to seek an organization representative of their specific interests. The American Institute of Mining Engineers was founded for this purpose in 1871.

The obvious benefits of mechanization increased the type and complexity of machinery required for American industry, and the designers of such machinery were soon to add another area of specialized engineering. In 1880 The American Society of Mechanical Engineers was founded. About this same time Thomas Edison developed the incandescent lamp and successfully demonstrated the practical application of electrical energy for commercial use. It then only became a question of time for the next specialty of engineering to formally organize. It did so in 1884 when The American Institute of Electrical Engineers was founded.

The fragmentation process creating the five basic branches of engineering was completed shortly after the turn of the Twentieth Century when The American Institute of Chemical Engineers was organized. Since that time additional splintering of engineering groups has increased the number of engineering organizations in the United States to well over one hundred. One exception to this trend was The American Institute of Mining Engineers. In 1919 it became The American Institute of Mining and Metallurgical Engineers, and only just recently it became the American Institute of Mining, Metallurgical and Petroleum Engineers.

Development Of Registration Movement

There is in the nature of man an instinct to advance mutual interests among those of his own kind, and it was probably this one factor which was most instrumental in making these societies centers of exchange for technical data and know-how, and depositories for literature of the same nature. Over a period of time a vast body of specialized knowledge was accumulated; thus serving the concept of professionalism which was to emerge in later years by furnishing it an authoritative source of reference material for developing essential definitions and standards of practice.

These were the contributions of organized engineering groups which so effectively increased the technical proficiency of the individual practitioner and developed in him an attitude of professionalism. But unfortunately these influences did not extend themselves with any degree of success beyond the members of the organized group. Hence there was no effective means of preventing the unqualified and the incompetent, most of whom were not members of the organized group, from practicing engineering. To fill this void, it became necessary for the state to exercise its police powers and establish minimum standards of competence for protection of the public. So it was in 1907 when Wyoming became the first state to give legal recognition to the engineering profession.

On July 10, 1890, the territory of Wyoming became the 44th State of the United States, and like most arid regions of the West it needed to develop its water resources for irrigation and reclamation projects. It was during the administration of President Theodore Roosevelt, as a part of his conservation program, that federal assistance for financing construction of these projects was provided through enactment of the Newlands Act in 1902, which earmarked for this express purpose funds received from the sale of public lands improved by such projects. By 1907 twenty-eight projects of this nature were under way in fourteen western states. Wyoming was over-run, as a result, with unqualified opportunists and dishonest promoters who proposed numerous impractical schemes for development of its water resources. Whenever

an application for permit to use the waters of the state was submitted, it was required to be accompanied by a survey and map of the area. It soon became apparent to the State Engineer that the reliability and accuracy of such surveys and maps left much to be desired, and in many cases constituted outright fraud or incompetency. The need to regulate and control those preparing such maps and surveys became obvious, and in January 1907, a bill to license surveyors and engineers was introduced at the ninth session of the State Legislature. This bill was enacted and became law shortly thereafter. It required all engineers or surveyors who performed field work or engineering services in connection with the utilization or use of water to qualify before a Board of Engineers as a Land Surveyor or as a Topographic, Hydraulic or Hydrographic Engineer. Wyoming, thus, became the first state to exercise its police powers in this direction and establish an Engineer's Registration Board.

In 1908 Louisiana became the second state to adopt legislation establishing an engineering registration board, but it was 1915 before the next state was to enact similar legislation. The outbreak of World War I and the role of the engineer in meeting the technological requirements of modern warfare gave impetus to the registration movement; and by 1920, ten more states had adopted engineering registration laws. During the next five years, twelve more states enacted provisions for registering engineers, so that by 1925, a total of 24 states had provided for registration of engineers through legislative action.

Model Law

The subject of regulating the practice of civil engineering became one of major importance to the membership of The American Society of Civil Engineers, particularly after the enactment of such regulations by Wyoming and Louisiana. In 1911, the Society published its draft of an "act to provide for licensing of civil engineers" which was intended to serve as a model law for securing uniform legislation throughout the United States.

The Society, through its Board of Direction, was generally opposed to the principle of licensing. But as a compromise, which reflected a division of feelings among the membership, it offered the model law as a means of attaining uniformity in those states where such legislation was contemplated. In 1915, when the trend toward engineering registration was firmly established, a joint committee of a number of the national engineering societies prepared a draft of a new model law which provided for registration of all major branches of Engineering.

Since then the model law has been revised periodically down

through the years by various groups and committees until recent years when the National Council of State Boards of Engineering Examiners (founded 1920) emerged as the logical organization to carry on this function on behalf of the engineering profession.

Registration Movement In California

After the first model law appeared in 1911, the subject of licensing became of general interest to engineers throughout the nation, including those in California. Committees of the various local and national societies conducted studies, made reports and drafted tentative legislation. However, no unanimity of opinion concerning the principal provisions of such legislation could be reached by the engineering profession in California until 1923 when an attempt was made in the closing days of the 45th session of the Legislature to introduce a bill for registering professional engineers. It was impractical for the Legislature to consider such a bill in the time remaining before adjournment, and so the introduction of legislation for registering engineers was postponed until the next regular session of the Legislature in 1925.

The first attempt to have specific legislation enacted for registration of professional engineers came during the 46th session of the State Legislature. Assemblyman Robert B. McPherson, a Consulting Electrical Engineer from Vallejo, introduced Assembly Bill 333 on January 20, 1925. This measure was intended to regulate the practice of professional engineering within the state through a Professional Engineers Registration Board. It contained the principal provisions of a model law previously adopted by The American Association of Engineers and The American Society of Civil Engineers. After the bill was amended several times by the Assembly, it was given a "do pass" and sent to the Senate where it was amended several times more and returned to the Assembly. On April 24, 1925, the Assembly concurred with the Senate amendments, clearing the bill of its last legislative hurdle. Approval of the Governor became the one remaining obstacle to enactment of an engineering registration law in California.

Governor Friend W. Richardson apparently believed the best form of government was the least amount of government. If he did not openly advocate this policy, appearances are that he practiced it. Of 998 bills enacted by the 46th session of the State Legislature, only 480 of them received his approval. The remaining 518 were vetoed, directly or indirectly, including the measure regulating the practice of professional engineering. Although this fact has not been extensively researched, it appears that Governor Richardson exercised his right of veto during the 46th session of the State Legislature to a degree never equaled before

or since. His pocket veto of Assembly Bill 333, effective May 19, 1925, apparently discouraged proponents of engineering registration from attempting legislative action during the 1927 session because it was 1929 before another effort was made to secure such legislation.

The tragic collapse of St. Francis Dam about midnight March 12, 1928, and the violent destruction which followed the sudden release of its impounded waters dramatically emphasized the need for the State to regulate the design, construction and maintenance of such structures. The dam was located on San Francisquito Creek and was of the solid gravity type. It measured 700 feet along the centerline of the 16-foot, curved crest, with a maximum section of 205 feet in height and a thickness of 175 feet at the base. Design and construction was by The Los Angeles Bureau of Water Works and Supply, under the direction of William Mulholland, Chief Engineer. It was planned and built without any check or supervision by the State, as were more than half of the dams built in California at that time. Construction began in April 1924, and the structure was completed May 4, 1926. The reservoir was primarily for terminal storage near the end of the Los Angeles Aquaduct which conveyed water from the Owens River region. It had a maximum capacity of 38,000 acre feet and was at capacity for ten days prior to failure of the dam.

It is hard to visualize the explosive nature of the dam's failure and the destructive force it released. A wall of water, which later measurements indicated to be in excess of 125 feet in height for the first mile and a half, swept downstream along the channel of the Creek. Great blocks of concrete, some 10,000 tons in weight, were impelled downstream for more than several thousand feet. The surging waters carried down San Francisquito Creek 9 miles to the Santa Clara River and continued on its course of destruction 43 miles to the Pacific Ocean. Almost 450 persons lost their lives to the shattering violence of the flood wave as it smashed its way a total of 52 miles to the sea. Small towns were obliterated, orchards were completely leveled, farms destroyed, and highways, railroads, utilities, and other property losses ran into untold millions of dollars.

Governor C. C. Young immediately appointed a commission to investigate and report to him the causes leading to failure of the dam. The report of this commission attributed failure of the dam structure to defective foundations and recommended that the state exercise its police powers to regulate and control all dams in California, except those under Federal jurisdiction.

Perhaps an editorial of The Engineering News Record, which appeared in the February 7, 1929 issue, summarizes most effectively the temper of the times: "The St. Francis Dam failure did more than cause

widespread destruction of life and property in the valley below; it started the machinery for new laws on dam supervision, aroused the public to a state of apprehension about the safety of all dams and gave to engineers and laymen alike an impressive object lesson in the potential danger in stored water".

As a result of this failure, legislation was introduced during the 1929 session of the State Legislature which vested in the Department of Public Works, through the State Engineer, authority to regulate and control the construction of all dams in the State, with the exception of those owned by the Federal Government. It was subsequently enacted into law and became effective August 14, 1929 (Chapter 766, Statutes of 1929).

In his second biennial message to the 1931 session of the Legislature, Governor C. C. Young listed among the accomplishments of his administration, ".....one more new governmental activity to which I should like to call attention. I refer to the supervision of dams on the part of the State, which is designed to prevent any such disaster as the failure of the St. Francis Dam, which destroyed a vast amount of property and took a toll of more than four hundred lives some two or three years ago. This new activity of the Department of Public Works had scarcely commenced to function before it was called upon to examine the San Gabriel Dam, in which Los Angeles County had already spent several millions of dollars, but which was at once shown to be on so insecure a foundation that public safety demanded a discontinuance of the work".

In March 1928 an organization, known as the California Engineers' Registration Association was formed. Its purpose was to secure the enactment of a law requiring the registration of professional engineers. Officers of the Association were Donald M. Baker, President; Frank H. Olmsted, C. L. Kaupe, Walter R. Fleming, E. Earl Glass, Philip Schuyler and E. N. Bryan, Vice Presidents; and Pecos H. Calahan, Secretary-Treasurer. The Association attained a membership of approximately 1,000 engineers who were interested in advancing this cause, and a bill similar in most respects to the one introduced at the 1925 session was introduced at the 1929 session of the Legislature on January 11th by Assemblyman A. E. Brock. It was known as Assembly Bill 174.

When Committee hearings of the bill were held, a difference of opinion developed between proponents of registration by branch and those who favored registration in the category of professional engineer only. Opposition also developed from those engineers who were against the philosophy of licensing in general. The mining engineers strongly objected to any regulation of their activities, as did some representatives of the mechanical and electrical engineering groups. Because the principal

opposition came from groups who practiced in branches other than civil engineering, the bill was amended to exclude them and require registration of civil engineers only. It was in this form that Assembly Bill 174 was finally adopted by the Legislature on May 15, 1929. It was approved by Governor C. C. Young on June 14th and became law on August 14, 1929 (Chapter 801, Statutes of 1929).

A similar bill was introduced in the Senate on January 14, 1929 by Senator Frank F. Merriam, who later became Governor of California in 1934. His bill received a "do pass" from the committee on May 3, 1929. But when it became apparent that Assembly Bill 174 was in the process of enactment, proponents withdrew their support of Senate Bill 263 and it was permitted to die.

Members of the first registration Board appointed by Governor Young on October 12, 1929, were Donald M. Baker, a Consulting Engineer of Los Angeles who was appointed for a two year term; Albert Givan, Chief Engineer and General Manager of the Sacramento Municipal Utility District who was appointed for a three year term; and H. J. Brunnier, a Structural Engineer of San Francisco who was appointed for a four year term. The organization meeting of the Board was held October 28 and 29, 1929, in Sacramento. Mr. Baker was elected President, Mr. Brunnier, Vice-President, and Mr. Givan, Secretary. Mr. Pecos H. Calahan was appointed Assistant-Secretary to serve at the pleasure of the Board.

The Structural Engineer And Architecture

On December 6, 1929, several months after the effective date of the first engineering registration law in California, Dean Charles Derleth, Jr., College of Civil Engineering, University of California, wrote, "I have the belief that much of the pressure which has brought about the present registration law has been due to a desire to regulate Structural Engineers who build buildings in cities. This question is wrapped up with the rights of Architecture". The story of the structural engineer and architecture, as Dean Derleth, Jr. summed it so succinctly, are "wrapped up" together and both, therefore, must be "unwrapped" simultaneously for a better understanding of their relationship.

It was architectural custom and practice before 1880 - the approximate date when skeleton construction made its first appearance - to use bearing walls of masonry to carry building loads. The principle was entirely one of inert resistance, the mass of masonry providing the required stability through its cohesive dead weight. After 1880 the design and construction of large buildings underwent many radical changes, principally through the introduction of steel framework. As one critic summarized it: "Architects partially atoned for their sins

at the close of the Nineteenth Century. After the grotesque imitations of French chateaux and Persian villas, which characterized domestic architecture, and the massive ugliness of many public buildings, the original conceptions of H. H. Richardson, Louis H. Sullivan, and John Rocbling were an earnest expression of the best that later American architects were to achieve". An editorial appearing in the February 1914 issue of the National Architect best explains the transition of American architecture during this period when the specialty of structural engineering emerged to play such a prominent role in the American architectural scene: "The advent of the modern 'skyscraper' in the United States marked the beginning of this revolution in design, and the departure from the older methods of construction, in which the outer walls carried the loading, to the 'framework' building in which all the loads are carried by beams and stanchions, the walls merely forming an outer shell. Its adoption in America has proved its stability, rapidity of erection and economy in first cost, and now most large buildings in this country are designed on these lines".

The change in American architecture from the traditional to the modern was a product of the times. It began in an era of industrial expansion and grew to maturity with big business. It was a time of the great corporations and giant combines, when American Capitalists and Financiers such as Cornelius Vanderbilt, Jay Gould, E. H. Harriman, J. P. Morgan, James J. Hill, and John D. Rockefeller struggled for control of industry, commerce and transportation. By employing such devices as Pools, Trusts, and Holding Companies, the great corporations grew even greater. It was reported, for example, that for the decade 1880-1890 there were 18 Trusts with an aggregate capital of slightly less than three hundred million dollars, while ten years later, at the turn of the century, 157 Trusts were reported with an aggregate capital in excess of three billion dollars. This phenomenal growth of Trusts during the decade 1890-1900 occurred despite the Sherman Anti-Trust Law which was enacted in 1890. This period of American History has been frequently described as the "Battle of the Titans". No wonder that this new concept of architecture flourished in such a highly competitive environment. It not only met the need of big business for concentration, by providing building space which was both functional and economical, but it offered considerable latitude for architectural treatment as well.

The period of transition from the old to the new style of architecture was not without its problems, however. It was to a great extent a time of trial and error for the architect, but it was a time of fraud and incompetence, too. Periodicals of the day are filled with accounts of the various problems besetting the architect; and oddly enough today, some sixty years later, most of these same problems still confront him. The Chicago Economist (issue of July, 1897) in an article captioned,

"Desperation of the Architects", declared the condition of the profession to be worse than the business stagnation then in progress. It quoted the evils of cutting prices among architects and the disastrous competition between architects and their own draughtsmen, who work at night and have no office expense, as contributing to the depressing state of architecture. The Architectural Annual of 1900 editorialized: "It is well known that builders, with their plan factories and their offers of high wages to good draughtsmen, have worked toward the demoralization of the profession". From 1897 to 1900 almost every issue of the Brickbuilder, a periodical of the day devoted to architecture, was replete with editorial condemnation of the prevailing practice of material suppliers making rebates to architects. Another subject receiving editorial treatment of this same periodical was incompetence. Illustrative of editorial feelings on that subject are the following extracts from an editorial appearing in the April 1897 issue: "We have in mind at this moment a 16 story office building which was constructed by a firm of architects who are acknowledged masters of their profession.....with the result that an occupancy of a little over a year the vibrations were found to be so great that it became necessary to build two heavy brick walls inside of the building from foundation to roof in order to acquire the needed stiffness. In another very prominent building, the movement of the steel frame was such....." These are only two instances of many such examples of incompetency appearing in the technical publications of that period. Steel frame construction for skyscrapers was relatively new of course, and it was to experience many problems of this nature before architects acknowledged it to be a highly technical field requiring the training, skill and experience of a specialist in structural engineering.

Since licensing of the medical and legal professions proved successful in suppressing "quacks" and "shysters", it became only a matter of time before the architectural profession attempted to have similar legislation enacted. In 1897, ten years before Wyoming became the first State to register engineers, Illinois became the first State to license architects. Four years later California became the second State when "An Act to Regulate the Practice of Architecture" was approved by Governor Henry T. Gage on March 23, 1901. This law was modeled after the one enacted in Illinois. It merely prohibited a person from using the term architect or holding himself out as one. It did not prevent an unlicensed person from preparing designs, plans and specifications for buildings whenever such person gave notice to the client that he was not a licensed architect. "The law is good as far as it goes and is on the whole a very fair beginning", commented one of the leading architectural periodicals of the day, then added, "It is a pity that it could not go a great deal further and be really mandatory instead of simply permissive". The California State Board of Architecture was composed of ten members appointed by the Governor. Five members were from northern California

the Board, may take the place of written and oral examinations in the subjects of Materials and Specifications, Strength of Materials and Structural Design, provided, however, he passes a satisfactory examination in Theory of Architecture, History of Architecture and Architectural Design". This rule was adopted by the State Board on April 10, 1924, at a joint meeting of the Northern and Southern District Boards in Los Angeles. Its purpose was to encourage architectural licensing of structural engineers and thereby eliminate the controversial area of overlap between the two fields. Under the circumstances it was a practical solution to a thorny problem, or so it seemed. But in actual practice it proved to be only partially successful.

Too many structural engineers were opposed to the principle of licensing in general, and licensing by the State Board of Architecture in particular. Some opposed it as a needless formality because licensing was not a legal requirement for designing buildings. Others advocated recognition through an engineering registration law. In 1925 the latter group played an active part in the campaign to pass an engineering registration law through the California Legislature, only to have it receive a pocket-veto. Professional pride and fear of losing his identity prompted the structural engineer to continue his struggle for recognition. Failure to accomplish this end meant oblivion for his profession, such as it was at the time. An Opinion of the Attorney General of California, dated July 20, 1927, made it clear that a person who was not licensed as an architect was prohibited from holding himself out as an architect, as engaged in architecture, as an architectural designer, as an architectural engineer, and as a designer, among other terms, when used in connection with architectural work. The Opinion obviously strengthened the position of the architect while it weakened the position of those who were not licensed, including structural engineers specializing in building design. The antagonism created by vigorous enforcement of the Opinion served to unify opposition of structural engineers; and a subsequent modification by the State Board of Architecture of the rule liberalizing examination requirements for license for applicants who were structural engineers, which eased these requirements still further, apparently failed to accomplish the purpose intended. Although this rule was adopted by the State Board of Architecture on April 11, 1928, one month after the St. Francis Dam tragedy, within the next year structural engineers received legal recognition as such when legislation was enacted during the 1929 Session of the Legislature which specifically exempted them from applicable provisions of the Architectural Practice Act.

Other than for one minor technical amendment in 1903 which provided for an annual renewal fee, the act regulating the practice of architecture was not amended from its adoption in 1901 until 1929. Attempts were made during these years at almost every session of the

Legislature to have the act amended, but these efforts never met with success until 1929 when two bills were introduced in the Senate. Senator J. C. Garrison, a vineyardist and farmer, introduced Senate Bill 45 on January 8, 1929, and Senator Frank C. Weller, attorney from Los Angeles, introduced Senate Bill 177 on January 10, 1929. Both Bills made extensive changes in the act regulating the practice of architecture, including the notice in writing provision which is in effect today. Senate Bill 177 passed through the Senate without incident on March 6, 1929, but when it was considered by the Assembly on March 22, 1929, during the second reading of the bill, several amendments were made from the floor which were adopted unanimously. One such amendment expressly exempted the structural engineer from giving notice in writing to a client that he was not an architect; and another defined the term "structural engineer" as (1) one who passes an examination given by three persons selected by the State Board of Architectural Examiners from a list of five submitted by the American Society of Civil Engineers, or other similar organization, or (2) one who holds a license to practice structural engineering in California by authority of state law. Since an engineering registration law was also under consideration at the time by the Legislature, the latter definition anticipated its enactment evidently while the former definition was intended only in the event such legislation was not enacted. The Assembly passed the amended version of Senate Bill 177 on March 28, 1929, and the Senate, concurring with the Assembly amendments, passed it on April 1, 1929. It was signed into law by Governor C. C. Young on April 6, 1929 and became effective August 14, 1929, Chapter 68, Statutes of 1929. When it became obvious that Senate Bill 177 was to become law, no effort was made to enact Senate Bill 45 and it was permitted to die.

It was several months after the Governor appointed its membership before the first Civil Engineers' Registration Board was adequately organized and staffed to administer provisions of the registration law. By the close of 1929 the Board had formulated and adopted those rules and regulations which it considered necessary for purposes of administration, including a rule defining the term of civil engineering. The controversy between architects and civil engineers over the area of overlap subsided somewhat during the legislative session of 1929 only to flare anew when the Board included the design of buildings among the activities it defined as comprising the practice of civil engineering. Two subsequent meetings between committees of the Board of Architectural Examiners and the Civil Engineers' Registration Board, which were held in Los Angeles on March 31st and April 8, 1930, adjourned "sine die". Neither committee was able to report progress toward resolving their differences. One of those participating in the first meeting between the boards, as a representative of the Structural Engineers Association of Southern California, was Mark M. Falk, its president, who in the following decade was appointed to the Civil Engineers' Registration Board and subsequently was also to serve

as its president. Almost seven months passed before representatives of the two professions formally met again. Committees of each board, as well as representatives of the Structural Engineers Association and State Architects Association, assembled on November 3, 1930, in an effort to effect a settlement of the dispute. If credit for resumption of meetings between the two professions belongs to any one person, it most probably belongs with the Director of the Department of Professional and Vocational Standards, James Collins. It was his suggestion that the boards meet to iron out conflicting provisions of the two laws and prepare appropriate amendments for submission to the Legislature at its next session in 1931. A second meeting was held on December 2, 1930, with the full membership of both boards in attendance, at which time agreement was reached to the extent that neither side "would submit any amendments to the Acts without first discussing the matter with the other group". The possibility of further progress toward better relations between the two groups ended abruptly when the Board of Architectural Examiners announced that it intended to take action against any engineer attempting to practice architecture without an architect's license. The announcement appeared in an article of the December 1930 issue of the California Architect and Engineer. It quoted A. M. Edelman, Secretary-Treasurer of the Architects' Board, as making the following statement: "Regarding the eligibility of civil engineers to practice architecture, please be advised that where a person has been licensed as a civil engineer, he is not entitled to practice architecture under the provisions of the State Act Regulating the Practice of Architecture, or of the State Act Regulating the Practice of Civil Engineering, and any one doing so, is subject to the penalties prescribed under the Architect's Act if found guilty".

When the Forty Ninth Session of the Legislature convened in January, 1931, civil engineers of the state were ready with drafts of proposed legislation to amend the law regulating the practice of civil engineering. Assemblyman Roy J. Nielsen, an insurance man of Sacramento, introduced these drafts in the form of two Assembly Bills. One of them, Assembly Bill 616, added section 1(a) to the act. It incorporated into law the definition of civil engineering previously adopted by the board under its rule making authority. The other, Assembly Bill 615, contained various technical amendments until March 16, 1931 when it was amended to provide, by adding section 1(b): "No person shall use the title "structural engineer" unless he is a registered civil engineer in this state and furthermore unless he has been found qualified as such structural engineer according to the rules and regulations established therefor by the board of registration for civil engineers. Anyone who violates the provisions of this section is guilty of a misdemeanor". Assembly Bill 615 passed the Assembly March 27th and the Senate on April 14th. It was signed by the Governor on April 30th, Chapter 254, and effective August 14, 1931.

Assembly Bill 616 was amended three times in the Assembly and twice in the Senate before being signed by the Governor on June 15th, Chapter 891, effective August 14, 1931. Shortly after both Bills were approved the Civil Engineers' Registration Board wrote a letter to the Board of Architectural Examiners thanking them for their cooperation in aiding amendments AB 615 and 616 to the Civil Engineers Act. The long and oftentimes bitter struggle for recognition by structural engineers specializing in building design ended with adjournment of the 49th Session of the Legislature. But it was not quite the end of the story for the structural engineer and architecture.

As a result of the new legislation the Board added Rule XVIII to its rules and regulations. The new rule outlined the requirements and procedures for those wishing to qualify for the right to use the title of structural engineer. It was adopted at a meeting in July at Sacramento, effective August 14, 1931. Under provisions of this rule the Board interpreted as qualifying experience, responsible charge of structural engineering work only in connection with the investigation, design and construction of buildings. This apparent concession to architects was soon challenged by other structural engineers who did not specialize in designing buildings. And an Opinion of Frank J. Barry, Chief Counsel of the Department of Professional and Vocational Standards, held that Rule XVIII was "unconstitutional and void because it unreasonably restricts the use of the title "structural engineer" to a particular class of structural engineer". He further stated: "The rule in question is intended to limit the use of the title "Structural Engineer" to those civil engineers who have certain designated experience in the construction and design of buildings while excluding all civil engineers who may have the highest qualifications and ample experience in the construction of dams, bridges, tunnels and other like structures". Consequently Rule XVIII was amended by the Board, effective August 16, 1932, to define Structural engineering as "the investigation of, the design of, and the selection of, the force-resisting and load supporting members of structures; such as foundations, walls, columns, beams, girders, slabs, trusses, and similar members".

Under Board Rules, registered civil engineers who furnished satisfactory evidence of five years or more of acceptable structural engineering experience were granted use of the title without an examination. Those with less than five years but more than three years of experience were assigned to the written examination. Grandfathering of those with more than five years of experience was discontinued by the Board on August 1, 1935. In its place, the Board required the applicant to pass an examination, either the regular written or an oral, before it granted the title "structural engineer". Only those who achieved an outstanding reputation in structural engineering were considered eligible

for an oral examination; all others were assigned to the regular written examination. The eminence clause as an exception to the written examination for structural authority was removed entirely from the rules on September 19, 1939. Since then, all applicants have been required to take and pass the regular written examination before authority to use the title "structural engineer" is granted by the Board.

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