

Members present:

Chairman Jeffrey  
Assemblyman Bremner  
Assemblyman Horn  
Assemblyman Sena

Assemblyman Rusk  
Assemblyman Tanner  
Assemblyman Weise

Members excused:

Assemblyman Bennett  
Assemblyman Chaney  
Assemblyman Robinson  
Assemblyman FitzPatrick

Chairman Jeffrey called the meeting to order at 2:12 p.m. and stated that they would first hear testimony on AB 518 and then on AB 510. He stated that consideration of SB 232 and 233 would be held until Senate Commerce and Labor could be contacted in regard to information on these bills.

AB 518: Mr. Berkeley H. Curtis, member of Society of Real Estate Appraisers, spoke in support of the bill stating that this would give their profession a legal remedy in collection of their fees through the lien process. He stated that currently those of them who wanted to collect for their fees had to go through civil collection procedures. He stated that architects have the ability to lien property upon which they have provided specific services and they wished to have the same ability.

He provided to the committee proposed amendments to the bill which are attached and marked as Exhibit "A". Also attached and marked as Exhibit "B" is a letter from Don Dunn Assistant Clark County Assessor supporting the amendments.

In answer to a question from Mr. Sena, Mr. Curtis stated that only tax assessors are certified; that regular real estate appraisers are not licensed or certified.

Mr. Bill Kimmell, appraiser, stated that he supported the bill for generally the same reasons as Mr. Curtis. He stated that he felt the reports given by appraisers on parcels of property were approximately the same type of services as plans which are supplied by architects which are currently covered under the lien laws. He stated that affording this protection would also help secure their claims in case the party for whom the service was performed went into bankruptcy.

In answer to a question from Mr. Rusk, Mr. Kimmell stated that there are possibly other professions which might want this type of protection, engineers for instance. In answer to a question from Mr. Horn, Mr. Kimmell stated that the amount of lost revenue in this area, of course, varies from area to area and from appraiser to appraiser, but that he would estimate that thousands of dollars are lost each year because people don't pay the appraisal fees.

Mr. Curtis stated to the committee that he felt he could add some information for the committee at this point and stated that generally attorney's don't want to handle collection of these accounts because the claims are not large enough to bother with due to the time involved in civil collections. He also pointed out that even if payment is provided for, for instance, in a divorce decree, often it is extremely difficult and time consuming to get a judgment against the people if they don't take care of the obligation. He stated that generally their fees vary from around \$600 to approximately \$1,200.

In answer to a question from Mr. Horn, Mr. Curtis stated that the problem is a very common one according to his experience and that of other appraisers he has spoken with in Las Vegas. In answer to a question posed by Mr. Tanner, Mr. Curtis stated that, on the average, he loses three to four fees per year. And, though they normally require a 50% deposit, sometimes they waive the deposit when they are working for clients of attorneys (in divorce or estate cases) and contractors. He stated that he would also agree that there might be other people who might want to have this benefit.

Mr. Tanner asked the gentlemen what would protect the public from being liened by an appraiser who did not do a good job. Mr. Curtis stated that these men are members of professional organizations and that if they did not do a good job, they might be subject to losing their professional designation. Mr. Kimmell also pointed out that there are already protections for the public built into the lien laws and their services would be under the same provisions of the law; the same as bad services from a contractor or mechanic. He also pointed out that their services are based upon an opinion rather than a tangible product and that that would make them comparable in this area to an architect who provides to the client what they feel is the best idea, based upon opinion. Mr. Curtis also stated that he felt there would be further protection for the public because their work is done on a contractual basis. In answer to a question from Mr. Tanner, Mr. Kimmell stated that opening this area up might lead to attorneys and accountants, for instance, wanting this same privilege, but since architects are now covered he felt their profession should be also. This concluded testimony on this bill.

AB 510: Mr. Bill Knabe, spoke in favor of the bill and his remarks are attached and marked as Exhibit "C". In answer to a question from Mr. Horn, Mr. Knabe stated that the use of the age 40 in the bill was due to its presence in model laws from other states. Mr. Knabe stated that he felt those who had been practicing this profession for a long period of time should have been grandfathered in when the law was changed. Chairman Jeffrey stated that he didn't feel it would be right to make an architect out of someone who designs houses just because of endurance in the field.

Next to speak in favor of the bill was Mr. Larry Farnsworth, residential designer with offices in Las Vegas, stated that he was in favor of the bill, but that he would suggest an amendment

on page 2, line 26, deleting the word "and" and deleting lines 27, 28 and 29 entirely and deleting on line 30 "Is under 40 years of age" and on line 31 adding after the words "residential designer and" the words "has eight years experience level". He said that he felt not allowing him additional time to meet the requirements of the existing test requirements, or not allowing those who have been practicing without complaint for years to be grandfathered in, would not be working in the best interest of the public and would be putting a hardship on those who were having difficulty in complying with, perhaps, only one section of the testing requirements.

First to speak in opposition to the bill was George Tate, architect from Las Vegas, representing the Nevada Society of Architects and American Association of Architects, stated that he was speaking for 90 regular and 30 associate architects. He stated that they opposed the bill because they did not feel it was in the best interest of the people of Nevada. He pointed out that he felt certifying or qualifying anyone for something strictly on the basis of age was an absurd criteria. He stated that the residential designer designation was set up so that the people working in that area would have a chance to work on becoming regular architects.

Mr. Tate submitted to the committee a package of letters from architects who were in opposition to the bill. Those letters are attached and marked as Exhibit "D". Chairman Jeffrey asked Mr. Tate if passage of this bill would put the residential designers out of business if they couldn't pass the requirements with the next 15 months. Mr. Tate stated he felt the Board of Architects representative could speak to that more knowledgeably.

Mr. George Enomoto, past chairman of the State Board of Architects, was next to speak. He stated that when the law was originally passed making residential designers a separate designation, it was provided that these people be given five years time in which to pass the state test and be given permanent status. He stated that he did not feel, if these people could not pass the test in that five year period, that they should be designated as architects. He stated also that he agreed age was not a sound basis for qualification as an architect. He pointed out that as a member of the National Council of Architectural Boards, he knew that those who qualified as architects under this law would not be recognized in other states as being architects and his concern about that aspect had brought him here to testify from Las Vegas.

In answer to the question posed by Chairman Jeffrey, Mr. Enomoto stated that under the 1975 law all those persons who made application for permanent status were given five years to meet the minimum qualifying exam and he felt that, for those who applied themselves, that was long enough.

In answer to another question from Mr. Jeffrey, Mr. Enomoto stated that some parts of the test given for residential designers are the same and some are different; specifically, the design portion is different because they are only asked to design a home or duplex

unit. He stated that California has a special and separate designation on their books which is referred to as a "building designer".

Mr. Enomoto submitted to the committee some statisticts from the Board of Architecture and that information is attached and marked as Exhibits "E" and "F". He further stated that the test is administered with the goal of seeing how the residential designers deal with the objectives being sought by the Board. He stated that the rests are reviewed by a panel of architects. He also pointed out that some of those taking the test voluntarily take the architectural design problem because they desire ultimately to become full fledged architects.

He stated that it was true that those who did not pass the test in the next 14 months would be put out of business, but that he did not think that was unfair because they had already had four years to comply. He also said that he didn't feel staying in business for a long period of time was, necessarily, the criteria of success.

Mr. Fred Doriot, secretary for the Board of Architecture, stated that he did not feel it was right to license or certify someone as something if they did not have the proper qualifications, and that testing to see if those qualifications were met was the only way they knew to do it.

Mr. Jeffrey asked Mr. Doriot why he felt people had so much difficulty in passing this test. Mr. Doriot stated that some people simply had difficulty in translating what is asked of them onto paper in the required format or in the time allotted. He stated that those people who have passed the test have not complained that the test was unfair or too difficult. He also pointed out that he felt five years time should be enough to allow these people to qualify.

Mr. Jay S. Wynkoop stated that he had taken the test and had not passed it, but he felt that he would try again. He pointed out that personally he did not feel that someone who could not pass the test should be qualified as an architect. He stated that he had been working in the business for 17 years and that prior to 1975 had been a residential designer.

Also attached to the minutes of this meeting are additional rebuttal remarks from Mr. William Knabe, along with a copy of the NCARB Equivalency Examination (currently called the Qualifying Examination and which, in part II, has been extended an additional hour and encompasses more theoretical and written requirements than previously required). Those items are marked as Exhibit "G" and Exhibit "H", respectively.

There being no further business to come before the committee, the meeting was adjourned at 3:30 p.m.

Respectfully submitted,

(Committee Minutes)

*Linda D. Chandler*  
Linda D. Chandler

1077

ASSEMBLY COMMERCE COMMITTEE

ROLL CALL:

Hearing date: 3/29/ , 1979

CHAIRMAN JEFFREY  
VICE CHAIRMAN ROBINSON  
MR. BENNETT  
MR. BREMNER  
MR. CHANEY  
MR. HORN  
MR. SENA  
MR. FITZPATRICK  
MR. RUSK  
MR. TANNER  
MR. WEISE

Present	Absent	Excused
x		
		x
		x
x		
		x
x		
x		
		x
x		
x		
x		

Date of Hearing Mar 29, 1975

ASSEMBLY COMMERCE COMMITTEE

GUEST LIST

NAME (Please print)	REPRESENTING (organization)	WISH TO SPEAK	
		Yes	No.
George G. Tate	Nevada Society of Architects	X	
Jay S. Winkler	PERSONAL	X	
BENJAMIN H. CURTIS	SELF	X	
Wm. Kimmel	SELF	X	
Larry Jannotti	Self	X	
W.F. KNABE	SELF	X	
FRED DORIOT	NEVADA BOARD OF ARCHITECTURE	X	
ED. EDOMOTO	" " "	X	

SENIOR REAL PROPERTY APPRAISER  
MEMBER OF THE SOCIETY OF  
REAL ESTATE APPRAISERS

BERKELEY H. CURTIS, S.R.P.A.  
REAL ESTATE APPRAISER & CONSULTANT  
2915 WEST CHARLESTON BLVD., SUITE 3A  
LAS VEGAS, NEVADA 89102  
(702) 878-6224

March 26, 1979

To: Assembly Commerce Committee  
Nevada State Legislature  
State Capitol  
Carson City, Nevada

From: Berkeley H. Curtis, S.R.P.A.

The following ammendments are recommended:

Section 1, Subsection 2: For the purpose of this section, "appraiser" means a person who has a professional real estate appraiser's designation from a recognized national real estate appraisal organization.

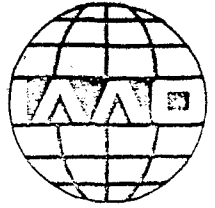
Section 3, Subsection 4C: The name of the person by whom [he] the claimant was employed or to whom he furnished the material, or for whom the service was performed.

EXHIBIT "A"



# clark county assessor's office

CLARK COUNTY COURTHOUSE  
200 EAST CARSON AVENUE • LAS VEGAS, NEVADA 89101  
(702) 386-4011



JEAN E. DUTTON, *County Assessor*

K. DON DUNN, CAE, *Assistant County Assessor*

March 16, 1979

Assemblyman Jack Jeffries  
Chairman, Committee on Commerce  
Legislative Building  
Carson City, Nevada 89710 RE: AB 518

Dear Mr. Jeffries:

As Chairman of the State Appraiser Certification Board I feel it is necessary to write you concerning the Commerce Committee Bill AB 518.

It would appear the intent of the bill is to allow private "fee" appraisers to attach a mechanic's lein on property they performed an appraisal on and did not receive their fee from property owner. While I have no opposition to the intent of the bill, I do oppose the definition of appraisers as being ones who are certified by the Board. The Appraiser Certification Board created by NRS 361:221 is for the Certification of appraisers for property tax purposes. The only private "fee" appraisers certified by the Board are those which are working as a consultant to County Assessor's Offices. At the present time there is only one "fee" appraiser certified as a consultant.

While NRS 361:221 does allow the Board to exempt individuals from taking the certification examination if they hold a recognized professional designation, the criteria we use in determining if a professional designation is recognized is that the individual has had to exhibit knowledge in the same areas in achieving the designation as are required on the exam. For example, the certification exam requires knowledge of income valuation and personal property valuation, whereas there are some very good professional appraisal designations which do not require knowledge in these areas.

EXHIBIT "B"



Page 2

In order to define appraiser to include those fee appraisers, this bill should include it would appear your committee might look into the area of those holding professional real estate appraisal designations.

Sincerely yours,



K. Don Dunn  
Assistant County Assessor

KDD/ksa

JUSTIFICATION AB 510

In the last four years, I and others have had many attorneys review NRS 623, pertaining to the residential designer, and they have said that it is a clear denial of livelihood and that at the time of passing NRS 623.193, the designers should have been made architects. Most states, they said, recognize a waiver for men who are already in business at the time statutes are up-graded.

The residential designers are not now allowed to design commercial buildings, unless under the supervision of an architect. Yet a contractor can design any building he would like, yet, the test or exam he takes, has not one thing to do with building design or architecture.

Residential designers were known as building designers before October 31, 1975. They designed many of the commercial buildings in this state from motels to churches.

All residential designers were independent business men in the field of building design before October 31, 1975, NRS 623.193.

They have but only (5) five years to pass an exam that was designed for (5) five year architectural school graduates. When they complete the exam, they also must have worked under the supervision of an architect for (3) three years, before taking the professional exam to be able to design the building they were designing before October 31, 1975.

EXHIBIT "C"

3-28-79

1083

W. F. KNABE • DESIGNER • P.O. BOX 1805 • CARSON CITY, NV. 89701



GEORGE G. TATE  
A.I.A. ARCHITECTURE

March 27, 1979

Dear Assemblyman Jeffrey:

Re: Assembly Bill #510

AB510 which was introduced by Assemblyman Glover on March 6, 1979 provides for the registration as Architects or Residential Designers of certain persons based on a minimum of prior experience as draftsman without taking the State Board Examination. This bill is terribly ill conceived and if passed could have tragic consequences in the public interest.

The present law NRS623 establishes certain requirements for study and experience to qualify a candidate to take the State Board of Architecture examination for licensing either as a Residential Designer or an Architect. The examination tests the applicant in all areas to insure that he is qualified to design buildings which are safe, functional, and protect the health and welfare of the public. This would be completely circumvented by AB510 which reads in part:

"any Residential Designer may apply for the annual examination for Architects if he qualified under NRS 623.190 and:

- a. if 40 years of age or over he must be issued a certificate of registration as an architect whether or not he has passed the examination for such registration.
- b. If under 40 years of age he must be issued a certificate as a Residential Designer and is entitled to take the examination to qualify as a registered architect."

This means that any amateur or junior draftsman upon reaching 40 years of age must be issued a license to practice Architecture regardless of how many times he has taken and failed the examination. This can perhaps be understood better by using the professions of medicine or law to draw a parallel. It is like saying that when a person reaches age 40 that he must be issued a license to practice medicine or a license to practice law regardless of how many times he has taken and failed the examinations. Obviously this is a special interest type of legislation aimed at giving a license to someone who has repeatedly failed the examination. It makes no sense whatsoever.

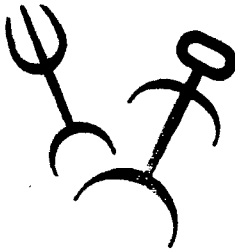
With all of the important legislation which needs to be considered, I hope that you will save your time and that of the rest of the legislature by simply killing this bill at the earliest possible moment.

Thank you.

George G. Tate, Architect

EXHIBIT "D"

1515 East Tropicana Avenue / Suite 320 / Las Vegas, Nevada 89109 / 702-736-3623



RAYMOND HELLMANN  
ARCHITECT

March 28, 1979

Ed Delorenzo, AIA, President  
Nevada Society of Architects  
3101 S. Maryland Pkwy., #112  
Las Vegas, Nevada 89109

Dear Ed,

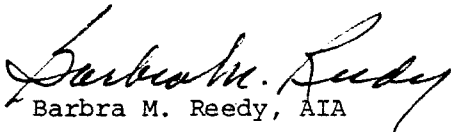
This is to express my concern regarding the practical consequences of the passage of AB510. Presuming that age alone insures competency is absurd.

Criteria for architectural licensing which includes some manner of examination procedure is the most widely accepted manner in the U. S. for establishing a registrant's competence.

Proof of competence is in the best interest of Nevada residents considering that lives may be lost as a result of improper decisions in the design and construction of a building, not to mention potential financial losses.

I, therefore, urge N.S.A. to oppose the passage of this legislation.

Sincerely,

  
Barbra M. Reedy, AIA

BMR/lm

EXHIBIT D



DAVID K. HAASE

ARCHITECT

28 March 1979

Committee on Commerce  
Nevada State Assembly  
Legislative Building  
Carson City, Nevada

Re: Assembly Bill No. 510  
(Assemblyman Glover)

Gentlemen:

As an Architect Registered in this State since 1972, I am appalled at the possibility of a bill such as Assembly Bill No. 510 becoming law.

It is obvious that Assemblyman Glover is oblivious to the primary reason for requiring Architects to be registered; that is, to determine the competency of a candidate to practice in the State of Nevada. It is essential that professionals in the State be of the highest caliber in order to maintain the general public's life and safety. It is absolutely irrational to assume an individual is qualified solely on age and experience.

I therefore urge you to defeat Assembly Bill No. 510.

Very truly yours,

David K. Haase, A.I.A.

DKH/vaj

EXHIBIT 0



Northern Nevada Chapter

THE AMERICAN INSTITUTE OF ARCHITECTS

March 28, 1979

Committee on Commerce  
Nevada State Assembly  
Legislative Building  
Carson City, Nevada

Re: Assembly Bill No. 510  
(Assemblyman Glover)

Gentlemen:

The primary purpose of requiring Architects to be licensed by the State is to protect the general public's life and safety by requiring adequate education and experience of those who plan and design our buildings.

NRS 623 Currently provides the citizens of Nevada with that protection by establishing those educational and experience qualifications necessary to be licensed as an Architect. The requirements are fair and in general conformance with the requirements of the other 49 states. The tests that are required can be passed by those persons properly qualified.

Attainment of any particular age or amount of experience in Architecture does not necessarily qualify an individual with the required knowledge to adequately protect the public's safety. Licensing persons as Architects without their having passed the necessary examinations to prove their qualifications is hazardous to the public's health and safety.

Therefore as an individual citizen of Nevada, and as President of the Northern Nevada Chapter of the American Institute of Architects, I strongly recommend that you vote to defeat Assembly Bill No. 510.

Very truly yours,

Richard S. Knapp, A.I.A.  
President

RSK/dls

OFFICERS — 1979

RICHARD S. KNAPP	.....	PRESIDENT
1755 East Plumb Lane, Suite 251, Reno, Nevada 89502	.....	329-2552
BARBRA M. REEDY	.....	VICE PRESIDENT
137 Vassar Street, Reno, Nevada 89502	.....	329-4641
RICHARD SCHROEDER	.....	SECRETARY
970 Arleen Way, Sparks, Nevada 89431	.....	784-6514
RAYMOND HELLMANN	.....	TREASURER
137 Vassar Street, Reno, Nevada 89502	.....	329-4641

DIRECTORS — 1979

WILSON G. DANIELS
DAVID K. HAASE
M. BOONE HELLMANN
JAMES O. HUBBARD
RICHARD S. KNAPP
DELBERT RAGLAND
RICHARD SCHROEDER
CLAY CARPENTER, Ex-Officio

EXHIBIT D



FROM THE OFFICES OF

**WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS - ENGINEERS, INC.**

2616 STATE STREET, LAS VEGAS, NEVADA 89109

702 / 734-1464

March 28, 1979

Mr. Jeffrey, Chairman  
Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

RE: BILL AB 510

Dear Mr. Jeffrey:

It has come to my attention that a hearing has been set to consider AB 510.

As an educated, trained, and licensed professional in the field of Architecture and Engineering, I am opposed to any act that will license unqualified people into our profession without proving their competency by examination. The people of Nevada have to be protected by knowing that licensed professionals are qualified by examination and not by virtue of being over 40 years of age.

Very truly yours,

WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS-ENGINEERS, INC.



HARRIS P. SHARP

HPS/kah

cc: Robert Robinson  
Senator Keith Ashworth  
Senator Norman Glazer

EXHIBIT 0 J 1088



FROM THE OFFICES OF

**WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS - ENGINEERS, INC.**

2616 STATE STREET, LAS VEGAS, NEVADA 89109

702 / 734-1464

March 28, 1979

Mr. Jeffrey, Chairman  
Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

RE: BILL AB 510

Dear Mr. Jeffrey:

I, the undersigned, wish to protest strongly the proposed Bill AB 510 proposed by an inexperienced group attempting to qualify for an Architects license without the benefit of formal higher education or, the necessary experience to assure the safety of life, health and property of the public.

Thank you for your consideration of this request.

Sincerely yours,

WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS-ENGINEERS, INC.


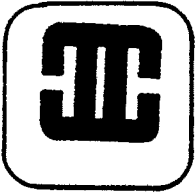
  
WALTER ZICK  
WZ/kh

EXHIBIT D

1089





March 27, 1979

CHAIRMAN  
COMMITTEE ON COMMERCE  
NEVADA ASSEMBLY  
CARSON CITY, NEVADA

REF.: ASSEMBLY BILL NO. 510 (Glover)

Gentlemen:

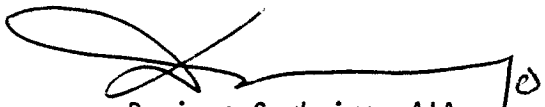
The undersigned, as a bona fide registered Architect in the State of Nevada, No. 631, wish to register my opposition to Assembly Bill No. 510, as the changes proposed to NRS 623 is intended only to benefit a limited number of individuals who have not been able to qualify as Architects by satisfactorily passing the annual examinations given by the Nevada State Board of Architecture; these proposed changes are contrary to the intent and purpose of NRS 623 Chapter, which is to safeguard life, health and property and to promote the public welfare and that of the consumer when only certified Architects who have proved to the Board they can practice Architecture and can provide services embracing the scientific structural, esthetics and orderly coordination of all the processes which enter into the production of a completed building.

Assembly Bill No. 510 would only serve to circumvent the necessary requirements and qualifications needed under NRS 623 by "grandfathering" in individuals over 40 years of age whether or not they have passed the examination for registration as Architects.

Since when has age anything to do with capabilities to perform a profession, should a nurse 40 years old be given automatically a registration to practice medicine merely because he or she reached the lucky 40. It is absurd!

Nobody in their full mental capabilities could approve this, I rest assured you will defeat this bill in its entirety.

Sincerely,

  
Domingo Cambeiro, AIA  
Nevada Registered Architect No. 631

DC/kr

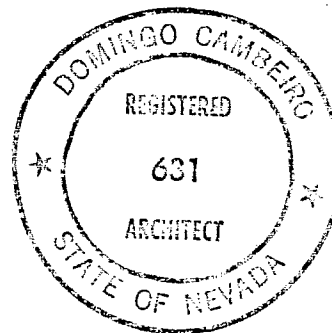


EXHIBIT D 1090



FROM THE OFFICES OF

**WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS - ENGINEERS, INC.**

2616 STATE STREET, LAS VEGAS, NEVADA 89109

702 / 734-1464

March 28, 1979

Mr. Jeffrey, Chairman  
Commerce Committee  
Nevada State Legislature  
Carson City, Nevada 89701

Dear Mr. Jeffrey:

It has come to my attention that Assembly Bill 510 will soon be brought up for consideration. As a practicing Architect, in the state of Nevada, I would like to express my opposition to this bill.

Architecture is an intricate, complicated, highly technical profession. The components of construction become increasingly complicated with each passing year. The environmental concerns of the State, Federal, and Local Governments are becoming increasingly important and require more knowledge of not only the physical environment, but the legal environment as well. Knowledge and experience should be the prime determinants of your ability to practice Architecture, not age. Do we allow physicians or lawyers to become licensed because of their age?

In our increasingly technical society, opening the door for the less than qualified people to practice Architecture would be a severe disregard of the public safety and well being.

Very truly yours,

  
DAVID DAILED A, A.I.A.

DD/je

EXHIBIT D J

1091



FROM THE OFFICES OF

**WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS - ENGINEERS, INC.**

2616 STATE STREET, LAS VEGAS, NEVADA 89109

702 / 734-1464

March 28, 1979

Mr. Jeffrey, Chairman  
Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

RE: BILL AB 510

Dear Mr. Jeffrey:

As a licensed Architect in the State of Nevada, I am profoundly concerned that the person or persons who drafted this bill do not know that the purpose of NRS Chapter 623 is to safeguard life, health and property. The passage of this bill would permit inexperienced persons to qualify for a certificate.

NRS 623 presently requires the State Board of Architecture to establish standards for examinations which are consistent with other States and the National Council of Architectural Registration Boards. I feel very strongly that the State of Nevada should not allow inexperienced persons to suddenly become professionally qualified.

Sincerely,

WALTER F. ZICK & HARRIS P. SHARP, ARCHITECTS-ENGINEERS, INC.

GERALD R. STREHLOW  
State of Nevada  
Registered Architect #717

GRS/kah



EXHIBIT D

1092

March 28, 1979

Mr. John E. Jeffrey, Chairman  
Assembly Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

Re: Assembly Bill 510

Dear Assemblyman Jeffrey:

As a resident architect in private practice in Nevada, holding multiple state architectural registration, an engineering degree from the University of Illinois and almost twenty years of responsible architectural experience, I oppose Assembly Bill 510.

With few exceptions, a draftsman is no more capable of treating the problems of our sensitive built environment than are medical technicians capable of surgery; and seniority is certainly no criteria for professional registration.

Assembly Bill 510 would permit the practice of architecture by unqualified persons.

The best interests of the State of Nevada are not served by diluting the requirements for professional registration. I respectfully request that Assembly Bill 510 be defeated in Committee.



Sincerely,

*Edward P. DeLorenzo*  
Edward P. DeLorenzo AIA

edward p delorenzo  
architect  
3101 maryland parkway  
suite 112  
las vegas nevada 89109  
(702) 731/3030

EPD/ad

EXHIBIT D 1093

March 28, 1979

Mr. John E. Jeffrey, Chairman  
Assembly Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

Re: Assembly Bill 510

Dear Assemblyman Jeffrey:

As President of the Nevada Society of Architects and on behalf of some 100 resident American Institute of Architect members in Nevada, I strongly oppose Assembly Bill 510.

Architectural qualifications cannot be judged merely by drafting experience or seniority.

One's qualifications to practice architecture must be judged on responsible, professional experience obtained under specific guidelines. In fact, the current trend nationally is a requirement for graduation from an accredited school of architecture prior to issuing a license to practice architecture.

On the basis of the foregoing and in the best interest of the State of Nevada I respectfully request that this Bill not be recommended to the floor.

Sincerely,



*Edward P. DeLorenzo*  
Edward P. DeLorenzo AIA

edward p delorenzo  
architect  
3101 maryland parkway  
suite 112  
las vegas nevada 89109  
(702) 731/3030

EPD/ad

cc: Harry Campbell, President Las Vegas Chapter AIA  
Dick Knapp, President Reno Chapter AIA

EXHIBIT D

1094

March 28, 1979

Mr. John E. Jeffrey, Chairman  
Assembly Commerce Committee  
Nevada State Legislator  
Carson City, Nevada 89701

Re: Assembly Bill 510

Dear Assemblyman Jeffrey:

As a resident architect of Nevada, I definitely oppose  
Assembly Bill 510.

I feel that in order to design buildings one has to have  
a very comprehensive knowledge of architecture. This  
knowledge cannot be obtained by just exposure to the  
building process, and it is not obtained at any given age.

For the safety of the general public and to protect the  
quality of the environment we create, I urge you to not  
recommend this Bill to the floor.

Respectfully,



*Rodney L. Wiedenkiller*

Rodney L. Wiedenkiller AIA

edward p delorenzo  
architect  
101 maryland parkway  
suite 112  
las vegas nevada 89109  
(702) 731/3030

RLW/ad



NEVADA STATE BOARD OF ARCHITECTURE  
880 E. SAHARA AVE. SUITE 2. LAS VEGAS, NEVADA. 89104 702/732-2431

D A T A

Temporary R.D. Licenses issues in 1975 . . . . .	39
Number of Permanent R.D. Licenses Issued Since 1975 . . .	15
Number of Temporary R.D. Licenses Lapsed Since 1975 . . .	7
Number of Active Temporary R.D. Licenses. . . . .	15
Percentage Of Active Temporary R.D.s over 40 . . . . .	86%
Percentage of Active Temporary R.D.s under 40 . . . . .	14%
Number of Active Permanent R.D. Licenses . . . . .	11
Percentage of Active Permanent R.D.s over 40 . . . . .	27%
Percentage of Active Permanent R.D.s under 40 . . . . .	73%
Number of Persons Re-Writing June Exam . . . . .	50
Percentage of Persons Re-Writing June Exam over 40 . . .	32%
Percentage of Persons Re-Writing June Exam under 40 . . .	68%
Number of New Applicants for June Exam for 1979 . . . . .	29
Percentage of New Applicants Over 40 . . . . .	0%
Percentage of New Applicants Under 40 . . . . .	100%

EXHIBIT "E"

Temporary Residential Designers Licenses issued in 1975 . . .	39
Number of Permanent R.D. Licenses issued since 1975 . . .	15
Number of Temporary R.D. Licenses lapsed since 1975 . . .	7
Number of active Temporary R.D. Licenses . . . . .	15
Number of active Permanent R.D. Licenses . . . . .	11

ACTIVE TEMPORARY RESIDENTIAL DESIGNER LICENSEES:

AGE

Joseph Bartelheim . . . . .	54
John Cooper . . . . .	60
Wallace C. Corey . . . . .	56
Robert Dennis . . . . .	64
Larry Farnsworth . . . . .	44
Jacob W. Garehime . . . . .	56
Faradg Gilan-Farr . . . . .	55
William G. Hamilton . . . . .	33
Edward J. Kenney . . . . .	63
William F. Knabe . . . . .	47
Virgil M. Larsen . . . . .	59
Lloyd Quinan . . . . .	49
Dean D. Railton . . . . .	47
Dennis E. Rusk . . . . .	30
J. John Sherman . . . . .	
Percentage of Active Temporary R.D.s over 40 . . .	86%
Percentage of Active Temporary R.D.s under 40 . . .	14%

ACTIVE PERMANENT R.D. LICENSES:

AGE

Ray D. Ballew . . . . .	34
John D. Ganthner . . . . .	31
David L. Harris . . . . .	32
John M. McCammant . . . . .	44
Philip Mitchell . . . . .	47
Kenneth Pettitt . . . . .	27
Steve Small . . . . .	35
Joseph Snider . . . . .	29
J.T. Stanford . . . . .	58
Robert Walker . . . . .	35
Timothy Wissenback . . . . .	30
Percentage of Active Permanent R.D.s over 40 . . .	27%
Percentage of Active Permanent R.D.s under 40 . . .	73%



W. F. KNABE • DESIGNER • P.O. BOX 1805 • CARSON CITY, NV. 89701

John E. Jeffrey, Chairman  
Commerce Committee

REBUTTAL-HEARING AB510 29 March 1979

I should have known better, having served on the Board myself for one year; and worked with the two men that appeared for the Board. Their facts were bent badly.

Facts -

1. In 1975, designers were listed under NRS 623.330 "exemptions", so we were not working in this state outside of the law, and that is why the architects push for NRS 623.190, so that control would be in their hands.

2. We went along with NRS 623.190 as follows:

- a. To be called residential designer, because the architects did not like the word building designer, \*A name used in California for a person who can do the same as an architect under the law.
- b. To be able to design commercial buildings under the supervision of an architect or engineer.
- c. To be grandfather as residential designers and be allowed to take the test or exam for architect.

3. But when NRS 623.190 was passed, we could not work with an engineer and we would have to take the new NCARB equivalency exam and would be allowed to take a design problem of a house instead of the NCARB design problem, and do this in (5) years or lose our registration.

Note, the NCARB exam is taken by (5) five year graduates as soon as they get out of school in June. Most designers like myself, have passed this exam, except for the design problem; and it might be noted, that most of the designers who take both design problems get higher grades on the NCARB problem, not the house problem, which is graded here in the state by architects and the Board last year, the only Board in the fifty states who asked that NCARB regrade the design problem, as they thought that the grades were too high.

EXHIBIT "G"

W.F. KNABE • DESIGNER • P.O. BOX 1805 • CARSON CITY, NV. 89701

4. The men of the state board said that (5) five years should be sufficient to pass this exam, then how come both of them took over seven years to pass the old seven part exam (both men said in front of you, that it only took them four years to pass, not true), which most architects say is not as hard as this new NCARB Exam.

If you as a designer, fail the design problem, you can ask for a review. At this review, they tell you what you did wrong and when you question them, you are told not to question them, as they are The Board; and if you don't like it, you can sue them.

5. The men from the Board said that Nevada was the only state to allow persons to be registered residential designers, this is true, because in all other states, all you need to do this type of work, is a business license.

6. They also said that 39 men started out as designers, not true, 29 started.

7. They also said that there were 700 architects in this state, not true, only 113 and almost all of them from the seven part exam and a few who were grandfathered when NRS 623 was put on the books.

8. One thing that was not brought up, was that the Board last year made a change in the regulations, stating that if a designer passes the exam, he shall work under the supervision of an architect for three years before being allowed to take the architect exam. Just another road-block.

9. I still think AB 510 is valid if the age were removed, but we could just make the designer permanent and allow him to work with an architect or engineer. We could also take out the three year regulations so that the designer could go on and take the professional exam.

Note, this would only be for the designers that made applications before October 31, 1975, as they have now reached the eight year experience level.

SUBJECT MATTER  
OUTLINE:  
NCARB EQUIVALENCY  
EXAMINATION

**TABLE OF CONTENTS**

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and Environmental Planning..... 1

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**III** Construction Theory  
and Practice..... 4

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## INTRODUCTION

The NCARB Equivalency Examination is administered to individuals applying for architectural registration or licensure who do not hold a degree in architecture from a school accredited by the National Architectural Accrediting Board (NAAB). The purpose of this examination is to determine that candidates without such a degree have the knowledge and skill normally acquired by graduates of an accredited school of architecture. After passing this examination, the candidate will be admitted to the final registration examination—The Professional Examination.

The Equivalency Examination consists of three parts:

**Part I** History and Theory of Architecture and Environmental Planning

**Part II** Design

**Part III** Construction Theory and Practice

**Part I** and **Part III** are machine-graded. One grade, Pass-Fail, will be given in each multiple choice section of the examination. **Part II**, the Design examination, is a graphic problem and will be graded by the State Board who administers this examination.

NCARB recommends that candidates taking this examination have unlimited opportunities to pass any part or the total examination. The candidate will retain credit for parts passed should he fail to pass the total examination on his first attempt. Individual State Boards may vary in their position on retakes from that of NCARB, therefore, candidates taking this examination are urged to clarify this matter with their State Board.

The outlines contained in this publication have been developed as a framework for the preparation of this examination. They suggest areas for questions and a means of classifying and distributing questions appropriately over the disciplines to be covered. The examination is available only to State Boards.

A candidate will find that these outlines and all parts of the examination are broad in scope. They have been developed to simulate academic subjects normally covered in college work.

These outlines will be most useful to a candidate as a check list and study guide. It should be understood that no single examination will include all items contained in these outlines.

## EXAMINATION: PART I

### History and Theory of Architecture and Environmental Planning

Time allotment: 2 hours

No reference material permitted.

The candidate should be capable of demonstrating a knowledge of the history and theories of architectural environmental planning and their impact on contemporary thought and practice. Theory may be defined as an attempt to establish the nature and source of forces which influence a designer as he evaluates alternatives and makes design decisions.

- I. An architect must be cognizant of the objective and subjective influences which markedly affect and often determine architectural design and environmental planning.
  - A. Material factors
    1. Geography
    2. Climate
    3. Site
    4. Orientation
    5. Natural and man-made materials
  - B. Human factors
    1. Physiology and psychology
    2. Social patterns and institutions
    3. Construction methods and systems
    4. Economics
    5. Design capabilities as affected by travel and contact with the work of others
    6. Population characteristics
    7. Political and legal systems
- II. A candidate should be able to identify the major movements in architecture and environmental planning in history and relate each to its contemporary milieu in terms of material and human factors.
- III. A candidate should be familiar with the lives and work of those who have contributed to significant environmental developments of the past and present. Among these are:

John Ruskin	Skidmore, Owings and Merrill
Viollet-le-Duc	Andrew Jackson Downing
Sigfried Giedion	Benjamin Latrobe
Lewis Mumford	John Root
Nikolaus Pevsner	Leon Baptist Alberti
Ebenezer Howard	Inigo Jones
Frederick Law Olmsted	McKim, Mead and White
Jane Jacobs	Sir Patrick Geddes

- IV. A candidate should demonstrate an understanding of environmental thought in the major periods of its development; he should be capable of relating architectural and environmental theory of the period to specific characteristics, such as:
- Refinement and perfection of the Greek temple
  - Massiveness and geographic proliferation of Roman structures
  - Evolution of Greek and Roman urban forums
  - Structural integrity of the Gothic cathedral
  - Development of design handbooks in the late Renaissance
  - Baroque influence on urban design goals
  - Dominance of structural form
  - The Industrial Revolution and the nature of the city
  - Modular design as interpreted by le Corbusier
  - Ornament of the various periods
  - Honesty in structure advocated by Louis Sullivan
  - Organic architecture of Frank Lloyd Wright
  - Teamwork of Walter Gropius

- V. A candidate should be familiar with design theories and principles arising from
- Construction materials
  - Structural systems
  - Building function and utilization
  - Community organization
  - Proportional measurement and the module
  - Human occupancy
  - Land economics
  - Allied arts
  - Urban technology
  - Changes in urban conditions

- VI. A candidate should understand the relationship of design of individual structures and building complexes to the urban setting in which they are located. Pertinent examples are
1. Roman camps
  2. Medieval cities
  3. Baroque planning as at Bath and Versailles
  4. Washington, D. C.
  5. High-rise structures in 20th Century American cities
  6. Suburban developments
    - Green belts
    - Planning in Britain
  7. Canberra
  8. Brasilia
  9. Peking
  10. Athens
  11. Rome and the Forums
  12. New England colonial towns
  13. Court House Square in Mid-West U.S.A.

- VII. A candidate should have the ability to recognize and relate environmental design principles to current projects. The following is a suggested group of sub-divisions:

- A. Modular systems
- B. Proportion and Distribution
- C. Space divisions
- D. Human and Vehicular Circulation
- E. Mass and Line
- F. Relationships of masses
- G. Relationships of masses and voids
- H. Use of materials

## EXAMINATION: PART II

### Architectural Design

Time Allotment: 10 hours

No reference material permitted.

The intent of this examination is to evaluate the candidate's ability to use his knowledge and experience to identify significant site characteristics and to develop a design concept of a building for a particular function. The candidate should be able to exhibit, through the traditional methods of architectural graphics, his ability to grasp the hypothetical client's requirements and to achieve a creative solution within its environmental context. In addition, the candidate should recognize the architect's responsibility to the community health, safety and welfare. The design examination is gauged to test the candidate's ability to solve a simple building design problem which does not require specialized knowledge. The scale of the problem is limited to that which might be encountered by a young practitioner in practice or as an employee of a medium size firm.

The program and site plan are developed to present all significant background information, and it is not intended that specialized knowledge or research be required. The solution as expressed graphically by the candidate should be a representation of his professional judgements in dealing with all stated aspects of the proposed project and site characteristics on an integrated basis. The examination allows the candidate to state his basic concept in words or other graphic form. This statement is not evaluated as a part of the solution, but is used to better understand the graphic solution.

The candidate's solution is evaluated and graded by his own State registration board according to a set of criteria established for that particular examination by its authors. The evaluation criteria and relative point values are shown on the examination and consist of areas of major, intermediate and minor value. The evaluation criteria may contain, but is not limited to, the following items:

## I. ORGANIZATION FACTORS AFFECTING THE QUALITY OF DESIGN

### A. Function

1. Relationship of building spaces and components
  - a. Logic of organization on the site.
  - b. Logic of organization relative to off-site factors and influences
    - Land use
    - Natural features
    - Traffic
  - c. Logic of open space
2. Circulation
  - a. Adequacy and clarity of systems
  - b. Differentiation of circulation systems
  - c. Adequacy of service systems.
  - d. Conformance to reasonable safety standards, codes and regulations.
3. Programming interpretation
  - a. Logic of site utilization based upon program requirements.
  - b. Satisfactory functional relationships

### B. Environmental influences

1. Site
  - a. Recognition and utilization of site characteristics
    - Topography
    - Existing vegetation
    - Special features
  - b. Recognition of adjacent or area characteristics
    - Views and vistas
    - Negative conditions
2. Climate
  - a. Analysis of climatic influences on site plan and building design
  - b. Organization of spaces or components to recognize natural climate indoor-outdoor, heat, glare.
  - c. Organization of components to recognize building requirements—
    - Air-conditioning
    - Natural light
    - Weather (sun, rain, ice, drainage)
3. Environmental Control
  - a. Drainage systems, erosion control
  - b. Plants, planting and landscaping
  - c. Lighting
  - d. Acoustics

### C. Social influences

1. Social Organization
  - a. Political

- b. Ethnic heritage
- c. National, regional, local goals

### 2. Human Values

- a. Comfort, convenience, consideration of handicapped.
  - b. Recognition of special personal needs; privacy, or community as appropriate, etc.
  - c. Protection from elements.
- ### 3. Codes and Regulations
- a. Consideration of public health, safety and welfare.
  - b. Consideration of public convenience.

### D. Building Technology

1. Structure
  - a. Validity and adequacy
  - b. Consistency
  - c. Efficiency
2. Materials
  - a. Validity and adequacy
  - b. Quality, texture and finish
  - c. Appropriateness of methods and systems
  - d. Availability
  - e. Maintenance, durability
  - f. Safety and fire protection
3. Environmental Control
  - a. Heating, ventilating and air-conditioning
  - b. Lighting—Natural and Artificial
  - c. Weather protection
  - d. Acoustics

### E. Economics

1. Efficiency of construction type, techniques, systems.
2. Efficiency of materials, methods, systems

## II. VISUAL AESTHETICS

### A. Quality of Architectural Design

1. Unity or variety of design
  - a. Consistency or variation
  - b. Emphasis, focus, dominance
  - c. Simplicity or complexity
  - d. Adapting or contrasting
  - e. Static or dynamic
2. Scale
  - a. Suitability of scale of interior spaces for intended uses.
  - b. Suitability of building mass to express function or relationships
3. Proportion and composition of open space and building elements
4. Balance of visual components, visual structure or order.

5. Movement, rhythm or sequence of spaces, interior to exterior, exterior spaces and building form.

#### B. Visual Expression

1. Of intended building function
  - a. Human occupancy
  - b. Structural awareness
  - c. Special human use
  - d. Relationship to environment.
2. Concept
  - a. Predominate basic theme
  - b. Deliberate relationship of elements
3. Appropriate use of visual design characteristics
  - a. Form
  - b. Space
  - c. Color, texture
  - d. Mass, volume, voids
  - e. Line, surface
4. Recognition of environmental influences on design
  - a. Light and shadow
  - b. Form contrast
  - c. Environmental setting, weather

#### III. CLARITY OF PRESENTATION

- A. Graphic readability, clarity completeness.

#### IV. NARRATIVE DESCRIPTION

May not carry evaluation value, can be optional expression of candidate's solution.

#### V. COMPLIANCE WITH PROGRAM

Minor omissions may cause negative points, major omissions affecting organization may prohibit evaluation of solution.

### EXAMINATION: PART III

---

#### Construction Theory and Practice

Time allotment: 8 hours

Reference material permitted:

- Structural reference handbooks as outlined in Appendix A
- College texts and personal notes on structural design.
- Slide rule (no other mechanical calculators of any type are permitted).

#### STRUCTURAL TECHNOLOGY

##### I. SELECTION OF STRUCTURAL FORMS

- A. The sizing of structural units in a variety of materials and forms.
  1. Selection of a truss or truss type
  2. Recognition of situations requiring use of plate girder

3. Selection of a steel beam vs. a truss or concrete beam
4. Selection of a prestressed concrete beam vs. a steel beam
5. Establishing beam size in relation to its span
6. Establishing slab thickness in relation to its span
7. Establishing optimum bay size for concrete slab reinforced in two directions
8. Establishing optimum bay size for concrete slab using beams and joists
9. Establishing maximum length of cantilever outside a given span
10. Establishing maximum span using laminated wood beams.
11. Establishing maximum span using open web joists
12. Establishing maximum spans using T and G wood decking of different thicknesses
13. Selection of structural roof member in wood, steel and concrete
14. Selection of column size to properly support a load in wood, steel or concrete. Effect of column section conformation.

- B. Recognition of the inclusion in proper manner of all elements necessary to the proper functioning of a structural unit.

1. Adequate and proper bracing for a simple structural frame
2. Adequate reinforcement for shear in a concrete beam
3. Sufficient reinforcement for a concrete beam as related to its size and span
4. Placement of reinforcement with respect to faces of beam and clearances to permit placement of concrete
5. Omission or inclusion of web stiffeners in a plate girder
6. Need for bridging in a floor structural system
7. Identifying possibility of serious horizontal shear in a wood member
8. Recognition of need for shear walls in a structure
9. Difficulties involved in a concrete member so heavily reinforced that aggregates cannot flow between the bars
10. Identifying mis-designed members of a truss
11. A masonry wall with insufficient lateral strength or bracing



12. Recognition of plastic flow
  13. A retaining wall of stable design
  14. Floor systems sufficiently strong but too light for vibrating loads
  15. Adequate tying of reinforcement to maintain bar positions during pouring
- C. Recognition of potential difficulty in joining of structural members
1. Provision of joint systems between members of different materials (wood to concrete; concrete to steel)
  2. Provision of adequate bracing
  3. Provision for transmission of horizontal stresses
  4. Joints designed for rigidity
  5. Joints designed for expansion movement
- D. Interpretation of evidences of potential or partial failure in structural members or systems
1. Excessive deflection (visually observable)
  2. Cracking in masonry materials resulting from:
    - a. Material shrinkage
    - b. Expansion of materials
    - c. Building settlement
    - d. Shear in concrete beam
    - e. Movement in structural frame
    - f. Plastic flow in concrete
  3. Improper joint construction
  4. Inadequate bracing

## II. FORCES ACTING ON STRUCTURES

- A. Wind
1. Wind velocities in terms of pressures
  2. Single story warehouse – open, long
  3. Multi-story building
  4. Maximums which may be anticipated (may vary by locality)
  5. Open sided shed-like structure
  6. High single structures such as chimneys, signs, pylon signs, light standards
  7. Effect on window mullions
  8. Flexibility vs. rigidity
- B. Gravity and Vertical Load
1. Dead load and live load relationship
    - a. Variations arising from multiple story application
    - b. Effect on percentage of dead to live loads
- C. Gravity soils resistance
1. Varieties of soils conditions
  2. Compaction

3. Vocabulary of soil analysis
  4. Relationship of water in soil to foundation stability
  5. Variation in soil character within the lines of a single building
  6. Types of footing design – continuous, isolated, piles, floating slab
  7. Test borings and their analysis
  8. Piling in extremely wet conditions (swamp, shore or riverbank conditions)
- D. Seismic Forces
1. Recognition of a lateral (horizontal) force
  2. Nature of induced stresses in buildings
  3. Identification of seismic zones – characteristics
  4. Knowledge of seismic scale
  5. The character of soil and its reaction to seismic forces
  6. Seismic joints
  7. Vocabulary of structural forms necessary to resist horizontal forces
  8. Mass and rigidity regarding above grade floors
  9. Roof diaphragm and shear walls in resisting horizontal forces
  10. Effect of building shapes
  11. Joints and joint design to resist horizontal forces
  12. Roof and foundation connections
  13. Bracing
  14. Racking
  15. Prevention of glass breakage
- E. Retaining Walls
1. Horizontal earth and water forces
  2. Resistance to overturning
  3. Resistance to sliding
- F. Expansion of Materials
1. Wood subjected to wetting subsequent to placement in structure
  2. Concrete slabs subjected to wide temperature variations
  3. Steel beams set into masonry work
  4. Steel frames, free standing
  5. Steel framework jointed with masonry construction
- G. Temperature stresses, e.g. columns exposed to exterior
- H. Impact
1. Elevators
  2. Truck docks

### III. THEORY OF STRUCTURAL DESIGN

- A. Demonstration of a knowledge of the basic principles of theoretical mechanics upon which structural design is based.
1. System of forces and its resultants
  2. General condition of equilibrium of a system of forces
  3. Polygon of forces - graphic equilibrium
  4. Moment
  5. Couples
  6. Stress
  7. Gravity
  8. Center of gravity
  9. Moment of inertia
  10. Strain
  11. Elastic limits
  12. Moduli of Elasticity
  13. Stress and strain resulting from temperature change
  14. Stress above elastic limits
  15. Resilience
  16. Working strength - factors of safety
  17. Axial tension
  18. Axial compression
  19. Shearing stress
  20. Bearing pressure
  21. Simple bending in beams
  22. Bending moment and moment of resistance
  23. Modulus of rupture
  24. Longitudinal shear
  25. Deflection
  26. Axial loading of columns
  27. Eccentric loading of columns
  28. Bond in concrete structures
  29. Theory of flexure applied to concrete members
  30. Plastic flow in concrete
  31. Specific applications to concrete
    - a. Rectangular beam reinforced
    - b. Rectangular beam reinforced for tension and compression
    - c. Tee beam design
    - d. Web reinforcement
    - e. Deflection in concrete beams and slabs
  32. Loading analysis
    - a. Establishment of reactions to given loadings
    - b. Shear diagrams
    - c. Moment diagrams
    - d. Truss analysis - stress diagrams

- B. Demonstration of a familiarity with the more frequently used structural design formula.

1. Moments of Inertia

$$I = \frac{bh^3}{12} \quad I = \frac{\pi r^4}{4}$$

2. Bending Moments

$$M = \frac{wL^2}{8} \quad M = \frac{wL^2}{10} \quad M = \frac{wL^2}{12} \quad M = \frac{wL^2}{16}$$

$$M = \frac{Pl}{4} \quad f = \frac{Mc}{I} \quad S = \frac{I}{c} \quad bh^2 = \frac{6M}{f}$$

3. Shear and Diagonal Tension

$$v = \frac{V}{bd} \quad s = \frac{SQ}{bl} \quad v = \frac{VQ}{bl}$$

4. Bond and Anchorage (Concrete)

$$u = \frac{V}{\sum ojd} \quad u = \frac{8V}{7\sum od}$$

5. Deflection

$$\Delta = \frac{Pl^3}{48EI} \quad \Delta = \frac{5wL^4}{384EI}$$

6. Columns

$$\frac{P}{A} = \frac{0.30E}{(l/d)^2} \quad F_a = \frac{149,000,000}{(Kl/r)^2}$$

$$F = \frac{\left[1 - \frac{(Kl/r)^2}{2C^2}\right] F_y}{\text{Factor of Safety}}$$

$$P = A_g (0.25f'_c + f_{s,pg})$$

7. Combined Stresses

$$f = \frac{P}{A} \pm \frac{My}{I} \quad \frac{f_a}{F_a} + \frac{f_b}{F_b} \leq 1.0$$

$$f_a/F_a + f_{bx}/F_b + f_{by}/F_b \leq 1.0$$

8. Concrete Beams

- a. Identification of typical diagrammatic section and standard beam element notations
- b. Reinforced for tension only

$$bd^2 = \frac{M}{f_s p_j} \quad A_s = \frac{M}{f_s jd}$$

### IV. COMPUTATIONS

- A. Footings

1. Design of continuous footings under walls or columns
2. Design of isolated footings
3. Design of piling and piling structures
4. Combination footings
5. Concrete pad
6. Footings to resist seismic forces

- B. Columns

1. Short and struts  $l/r < 120$
2. Long  $l/r > 120$

3. Eccentric loading of columns
  4. Concrete
    - a. With tied reinforcement
    - b. With spiral reinforcement
  5. Steel rolled sections
  6. Steel pipe
  7. Wood
  8. Composite (steel and concrete)
  9. Base plates
- C. Beams and Girders
1. Concrete
    - a. Simple span
    - b. Continuous span
    - c. With compressive reinforcement
    - d. T-beam
    - e. Design of stirrups
    - f. Check bond stresses
  2. Steel
    - a. I Beam
    - b. Channel
    - c. Angles
    - d. Bar Joists
  3. Wood
    - a. Rectangular
    - b. Joists
- D. Trusses
1. Stress diagram
  2. Determining stress direction
  3. Recognizing stress character from observation
  4. Design of individual members
    - a. Tension
    - b. Compression
    - c. Combined with beam loading
  5. Design of truss joints (shear and bearing)
    - a. Riveted
    - b. Bolted
    - c. Welded
    - d. Joints in wood trusses
- E. Floor Systems
1. Steel beam and joist or purlin
    - a. With steel deck
    - b. With wood deck
    - c. With concrete slab deck
    - d. With precast units
  2. Simple joists and wood floor
  3. Light section steel joists
    - a. With wood deck
    - b. With steel deck
    - c. With concrete deck
  4. Open truss joists
    - a. With wood deck
    - b. With steel deck
    - c. With concrete deck
- F. Walls
1. Unreinforced concrete
  2. Reinforced concrete
  3. Unreinforced masonry
  4. Reinforced masonry
  5. Tilt-up concrete slabs
  6. Studding
  7. Steel panelling
  8. Bearing vs. non-bearing walls
- G. Joints
1. Rivets and bolts in steel
  2. Lag screws, timber connectors and bolts in wood
  3. Welding in steel
  4. Wire nails in wood structure
  5. Glued joints (metal and wood)
  6. Shear on anchor bolts in masonry
- V. EFFECT OF STRUCTURE ON DESIGN
- A. This should include early relationship of system to the anticipated finished appearance
1. Exposed concrete using various textures
  2. Steel, exposed or encased in various ways
  3. Wood—solid or laminated
- B. This should also include relating the structural system to the building function, particularly as this function demands specific spatial subdivisions.
1. Related to building types
    - a. Office buildings
    - b. Schools
    - c. Hospitals
    - d. Large garages
    - e. Churches
  2. The implications of complete plan flexibility
- C. It should include screening the economic implications of specific structural systems
1. The use of excessively long spans
  2. The use of materials difficult to obtain or construct
  3. The use of construction methods not in common use in a particular area

4. The utilization of a system not readily adaptable to existing site, bearing soil, or available labor market
5. Precast vs. poured-in-place concrete
6. Consideration of wall bearing structure, even for multi-story use.
7. The use of extremely long floor slabs utilizing added depth for utilities
8. Implication of resting the structure upon a very few supports
9. Implication of completely modular structural organization

D. Sufficient familiarity with more complex forms to be able to consider their use with confidence, although their detailed design may not be required in this examination

1. These may include:
  - a. Systems requiring an analysis by moment distribution
  - b. Rigid frames
  - c. Folded plate
  - d. Thin shell
  - e. Stress skin
  - f. Lamella arches
  - g. Irregularly curved shapes
  - h. Catenary suspension
  - i. Geodesic domes
  - j. Structure employing tension in steel as a major element in design.
  - k. Pre-stressed concrete members either pre-tensioned or post-tensioned
  - l. Hyperbolic paraboloid
  - m. Lift slab systems

## CONSTRUCTION TECHNOLOGY

### I. SITE WORK

- A. Bracing and shoring
- B. Building moving
- C. Caissons
- D. Clearing and grubbing
- E. Demolition
- F. Dewatering
- G. Drainage
- H. Excavation
- I. Fences
- J. Grading
- K. Landscaping
- L. Paving
- M. Piling
- N. Recreation areas
- O. Soil treatment
- P. Underpinning
- Q. Other site work

## II. CONCRETE

- A. Architectural or structural cast-in-place
  1. Mixes
  2. Control joints
  3. Finishes
  4. Forms
  5. Foundations
  6. Lift slabs
  7. Lightweight concrete
  8. Placement
  9. Prestressed concrete
  10. Reinforcing
  11. Tilt-up walls
  12. Waterstops
- B. Insulating concrete
- C. Gypsum decks
- D. Precast concrete
  1. Architectural units
  2. Curtain wall panels
  3. Gaskets and sealants
  4. Prestressed concrete
  5. Roof slabs
- E. Other concrete work

## III. MASONRY

- A. Calking
- B. Expansion joints and control joints
- C. Insulation of masonry construction
- D. Mortars
- E. Prefabricated masonry
- F. Reinforced masonry
- G. Reinforcing and ties
- H. Retaining walls
- I. Stone work
- J. Unit masonry
  1. Brick
  2. Clay tile
  3. Ceramic veneer
  4. Concrete block
  5. Glass block
  6. Gypsum partition tile
  7. Prefaced units
  8. Stone
- K. Other masonry work

## IV. METALS: STRUCTURAL AND MISC.

- A. Architectural metals, ferrous and non-ferrous
- B. Gratings
- C. Handrails
- D. Miscellaneous iron
- E. Ornamental metal work
- F. Structural metals
- G. Wire-mesh partitions
- H. Other metal work

## V. CARPENTRY

- A. Cabinet work
- B. Carpentry, rough and finish
- C. Cement-and-wood-fiber plank
- D. Cement-asbestos work
- E. Drywall construction
- F. Flooring
- G. Furring
- H. Insulation
- I. Laminated timber
- J. Millwork
- K. Paneling
- L. Timber poles
- M. Wood preservatives

## VI. MOISTURE PROTECTION

- A. Dampproofing
- B. Flashing
- C. Insulation, roof
- D. Roofing, all types
- E. Sealants
- F. Sheet-metal work
- G. Sheet roofing and siding
  - 1. Cement-asbestos
  - 2. Metal
  - 3. Plastic
  - 4. Protected-metal
- H. Shingles
- I. Skylights and roof scuttles
- J. Waterproofing
- K. Weatherproofing

## VII. DOORS, WINDOWS, AND GLASS

- A. Doors and frames, metal and wood
- B. Glazing
  - 1. Glass
  - 2. Plastics
- C. Louvers
- D. Metal curtain walls
- E. Mirrors
- F. Scuttles
- G. Store fronts
- H. Window and door screens
- I. Window walls
- J. Windows and frames

## VIII. FINISHES

- A. Acoustical materials
- B. Ceramic and quarry tile
- C. Flooring, resilient
- D. Floors set in mortar
  - 1. Brick
  - 2. Marble
  - 3. Slate
  - 4. Stone
  - 5. Tile

- E. Glass mosaics
- F. Interior stone veneers
- G. Paint
- H. Plastering
- I. Plastic finishes
- J. Plastic tile
- K. Special coatings
- L. Standing Marble
- M. Terrazzo
- N. Wall coverings
  - 1. Fabrics
  - 2. Paper
  - 3. Plastics
- O. Other finishes

## IX. SPECIALTIES

- A. Bulletin boards
- B. Chalkboards
- C. Finish hardware
- D. Fire extinguishers
- E. Incinerators
- G. Lockers
- G. Partitions
  - 1. Demountable
  - 2. Movable
- H. Food service equipment
- I. School equipment

## X. CONVEYING SYSTEMS

- A. Vertical transportation (elevators, escalators, lifts, dumbwaiters, hoists, etc.)
- B. Horizontal transportation (conveyors, moving sidewalks, ramps, etc.)

## XI. ADMINISTRATIVE RESPONSIBILITIES IN CONNECTION WITH CONSTRUCTION

- A. The architect's responsibility as related to materials used, workmanship, and final result
- B. Cost estimates
- C. Surveys, contours, soils, and drainage
- D. Subsoil tests
- E. Samples
- F. Relationships to subcontractors
- G. Shop drawings
- H. Guarantees

## ENVIRONMENT CONTROL SYSTEMS

### I. PLUMBING

- A. Piping and drainage
  - 1. Storm drainage
  - 2. Sanitary
  - 3. Domestic water
- B. Fixtures
- C. Pumps, ejectors

- D. Accessories (valves, grease traps, septic tanks, etc.)
- E. Codes; special and miscellaneous

## II. HEATING, VENTILATING, AND AIR CONDITIONING

- A. Heating
  - 1. Forced air
  - 2. Hot water
  - 3. Steam
  - 4. Electrical
  - 5. Other
- B. Ventilation
- C. Cooling
- D. Heating, ventilation, and cooling combined
- E. Miscellaneous (controls, accessory, items, etc.)
- F. Ductwork
- G. Codes; special and miscellaneous

## III. ELECTRICAL

- A. Conductors and conduit wiring
- B. Switching, switch gear, and transformers
- C. Lighting
- D. Motors and appliances
- E. Controls (low-voltage, electronic, etc.)
- F. Codes; special miscellaneous

## IV. FIRE PROTECTION

- A. Exits; stairways; corridors; aisles
- B. Extinguishing systems (wet, dry, chemical, gaseous)
- C. Safety devices
- D. Codes; tests; special and miscellaneous

## V. ARCHITECTURAL ACOUSTICS

- A. Origins of noise problems within buildings
- B. Noise transmission and noise isolation
- C. Room acoustics
  - 1. Reverberation
  - 2. Resonance
  - 3. Other factors

## APPENDIX "A"

### NCARB EQUIVALENCY EXAMINATION SELECTED REFERENCE HANDBOOKS & SELF STUDY MATERIALS

#### I. STRUCTURES

1. **Manual of Steel Construction**, 7th Ed., 1970 \$12.00 (\$10.80 to AIA members) Includes Supplements 1 & 2  
American Institute of Steel Construction, 101 Park Avenue, New York, New York 10017
2. **Reinforced Concrete Design Handbook**, 3rd Ed., 1965, \$4.50, ACI Sp-3 (Suggest copies of SP-17 and SP-17a be acquired for additional reference)  
American Concrete Institute, P.O. Box 4754, Redford Station, Detroit, Michigan 48319
3. **CRSI Design Handbook**, \$8.50  
Working Stress Design - 2nd pr., 2nd Ed., 1970 \$10.00 Ultimate Strength Design - Sept. '70 (610 pp)  
Concrete Reinforcing Steel Institute, 228 North LaSalle Street, Chicago, Illinois 60601
4. **ACI Code Handbook** ("Building Code Requirements for reinforced Concrete"), ACI 318-63, \$3.00 paper, \$4.00 hard cover. (Possible new edition available after August '71)  
**Commentary on Building Code Requirements**, ACI Committee Report, ACI Sp-10, \$2.00 paper, rev. 2nd printing, Sept. '66  
American Concrete Institute, P.O. Box 4754, Redford Station, Detroit, Michigan 48319
5. **Timber Construction Standards**, AITC 100-69, 5th Ed., 1969, \$2.00.  
American Institute of Timber Construction, 333 West Hampden Avenue, Englewood, Colorado 80110
6. **Standard Specifications and Load Tables for Open Web Steel Joists**, (Latest 1971)  
Steel Joist Institute, 2001 Jefferson Davis Highway, Suite 707, Arlington, Virginia 22202
7. **Uniform Building Code**, Vol. 1, 1970, \$10.60 soft cover, \$12.10 hard cover  
International Conference of Building Officials, 50 South Los Robles, Pasadena, California 91101
8. **Earthquake Forces on Tall Structures**, 1970  
Henry J. Degenkolb, FASCE Booklet 2717  
Available without charge from Bethlehem Steel Corporation, General Offices, Bethlehem, Pa. 18016

9. **Reinforced Brick Masonry and Lateral Force Design**, 1953 (5th printing May 1960) \$3.50 Harry C. Plummer and John A. Blume  
Published by Structural Clay Products Institute, 1750 Old Meadow Road, McLean, Va. 22101
10. **Technical Notes on Brick and Tile Construction**, Nos. 17-17M incl.  
Published by S.C.P.I., McLean, Va. Available at 25¢ per single copy or in lots of 100 or more, \$7.00
11. **Parker Handbooks**; Harry Parker  
Published by Wiley/Interscience, Div. of John Wiley and Sons, Inc. 605-3rd Avenue, New York, N.Y. 10016
  - a. **Simplified Design of Reinforced Concrete** 3rd Ed. \$9.95
  - b. **Simplified Engineering for Architects and Builders** 4th Ed. \$9.95
  - c. **Simplified Design of Structural Steel** 3rd Ed. \$9.95
  - d. **Simplified Mechanics and Strength of Materials** 2nd Ed. \$8.95
  - e. **Simplified Design of Structural Timber** 2nd Ed. \$9.95
12. **Timber Construction Manual**, 1966 \$12.50  
American Institute of Timber Construction, Englewood, Colorado 80110

#### II. HISTORY

1. **Site Planning**, MIT Press Kevin Lynch 2nd Ed.
2. **The Urban Pattern**, A.B. Gallion, Van Nostrand
3. **Architecture Through the Ages**, Talbot Hamlin, Putman
4. **American Skyline**, Tunnard & Reed, Houghton Mifflin Co.
5. **Space, Time & Architecture**, Sigfried Giedion, Harvard
6. **Town Planning in History**, Frederick Hiorns, Harrap
7. **An Outline of European Architecture**, Nicholas Pevsner, Pelican
8. **Pioneers of Modern Design**, Nicholas Pevsner, Pelican
9. **Climate and Architecture**, J.C. Aronin, Reinhold
10. **Planning the Neighborhood**, Public Administration Service
11. **Design on the Land**, Norman Newton, Bellnap/Harvard
12. **Community Builder's Handbook**, Urban Land Institute

13. **American Building**, James Marston, Fitch, 2nd Ed Vols I and II
14. **A Guide to Site and Environmental Planning**, Harvey M. Rubenstein

## CONSTRUCTION THEORY & PRACTICE

### III. CONSTRUCTION TECHNOLOGY

(Building Construction)

1. **Architectural Graphic Standards**, 6th Ed. 1970, Ramsey/Sleeper, edited by Harold Hauf, AIA. Pub by AIA \$39.50 (\$36.00 to members)
2. **Modern Architectural Detailing**, Vol 4, 1969, Konrad Gatz \$20.00  
Van Nostrand/Reinhold Co., 450 W 33rd Street, New York, N.Y. 10001
3. **Uniform Building Code**, 1970 Vol 1 \$12.00 hard cover, \$10.60 soft cover  
International Conference of Building Officials, 50 S. Los Robles, Pasadena, California 91101  
Vol II **Uniform Mechanical Code** \$4.90 soft cover
4. **National Fire Codes** \$5.00 each 1971  
National Fire Protection Association, 60 Batterymarch Street, Boston, Massachusetts 02110

Vol 4—**Building Construction and Facilities**

Vol 5—**Electrical**

Vol 6—**Sprinklers, Fire Pumps and Water Tanks**

5. **Architectural Supervision of Modern Buildings**, Martin D. Dubin, AIA pub. by Van Nostrand/Reinhold \$19.50
6. **Principles of Specification Writing**, Harold J. Rosen (Skidmore, Owings & Merrill) pub by Van Nostrand/Reinhold \$16.50
7. **Materials and Methods of Architectural Construction**, Parker, Gay, MacGuire 3rd Ed \$14.95  
Wiley/Interscience Inc., New York City, New York 10016

### IV. ENVIRONMENTAL SYSTEMS

(Building Equipment)

1. **Mechanical and Electrical Equipment for Buildings** 1971 McGuinness and Stein \$18.50  
Wiley/Interscience Inc. 605 3rd Avenue New York, New York 10016

2. **Uniform Building Code Vol II Mechanical Code** (See under III, Item 3.)
3. **NEPA Handbook of the National Electrical Code** 2nd Ed 1969 \$12.75 (See under III, Item 4. for address)
4. **National Electrical Code** 1971 (See under III, Item 4.)
5. **National Plumbing Code Illustrated**, Vincent T. Manas Pub by Manas Publications, 4513 Potomac Avenue, N.W., Wash. D.C. \$7.00  
Technical Guide Publications, 3040 N. 29th Avenue Hollywood, Florida 33020
6. **Underwriters' Laboratories Building Materials Directory** (\$1.75) and **Fire Resistance Index** (\$2.50), both January 1972  
Underwriters' Laboratories Inc., Publications Dept, 207 E Ohio Street Chicago, Illinois 60611
7. **ASHRAE Guide and Data Books**, American Society of Heating, Refrigeration and Air Conditioning Engineers
  - a. **Handbook of Fundamentals** 1971-2 Ed. \$20.00
  - b. **Equipment** 1969 Ed. \$30.00 New Ed. scheduled 1972
  - c. **Systems** 1970 Ed. \$30.00
  - d. **Applications** 1971 Ed. \$30.00

### V. PRACTICE

1. **AIA Handbook on Professional Practice** \$18.00 (AIA members \$14.50)  
AIA, 1785 Massachusetts Avenue, N.W. Washington, D.C. 20036
2. **It's the Law**, Bernard Tomson 1960 Ed.
3. **Building Contracts for Design and Construction**, Harold D. Hauf, AIA \$12.50  
Wiley/Interscience Inc., 605 3rd Avenue New York, New York 10016
4. **Construction Contracting** 2nd Ed. Clough \$12.95  
Wiley/Interscience Inc. (address above)
5. **Architectural and Engineering Law**, Bernard Tomson Reinhold Pub Co.
6. **Legal Pitfalls in Architecture, Engineering & Building Construction** Nathan Walker and Theodor Rohdenburg (available from McGraw-Hill)