

# **STATUS OF STRUCTURAL ENGINEERING**

**Qualifications, Exams, Licensing, Comity**

**Gregg E. Brandow, Ph.D., S.E.**

**STRUCTURAL  
ENGINEERING  
EXAMINATION/  
RECOGNITION  
TASK FORCE**

*Gregg Brandow, P.E.*

# CHARGE

**Develop and propose to UPLG  
a definition for a Model Law  
Structural Engineer.**

# Model Law - Structural Engineering

A licensed engineer who:

Is a graduate of an engineering program accredited by EAC/ABET

Has passed at least 18 hours of structural analysis and design courses, 9 of which must be structural design courses

# Model Law - Structural Engineering

A licensed engineer who:

- Has passed the 8-hour FE exam

- Has passed 16 hours of structural exams:

  - NCEES structural exams, 8 hours of which are Structural II (SE II)

  - 16-hour state written structural exams taken before 2004

  - NCEES Structural II plus 8-hour state written examination taken before 2006

# Model Law - Structural Engineering

Completes 4 years of acceptable structural engineering experience after confirmation of a BS degree. A maximum of 1 year of credit may be given for graduate engineering degrees that include at least 6 semester hours of structural engineering (in addition to the 18-hour education requirement).

Has a record clear of disciplinary action.

# **NCEES**

## **Structural Exam Task Force**

*Nancy L. Gavlin, P.E., S.E., Chair*

# Charge

- Evaluate existing structural exams
- Consider modifications to NCEES SE exams
  - Can be used by all Member Boards who license structural engineers by 16 hours of examination
  - Depth and breadth
  - Psychometrically sound
  - Cost effective
- Make recommendations



# Current Structural Engineering Exams

- NCEES Examinations
  - Civil Structural exam—4 hours civil breadth plus 4 hours structural module
  - SE I—8 hours, 80 multiple choice problems
  - SE II—8 hours, 4 essay problems
- State Examinations
  - California SE III—8 hours, multiple choice and essay problems
  - Washington SE III—8 hours, essay problems

# Current Structural Engineering Exams

- NCEES Examinations
  - Civil Structural—4 hours **PE**
  - SE I—8 hours **PE, SE**
  - SE II—8 hours **SE**
- State Examinations
  - California SE III—8 hours **SE**
  - Washington SE III—8 hours **SE**

# NCEES Model Law Engineer— Structural Engineering (2004)

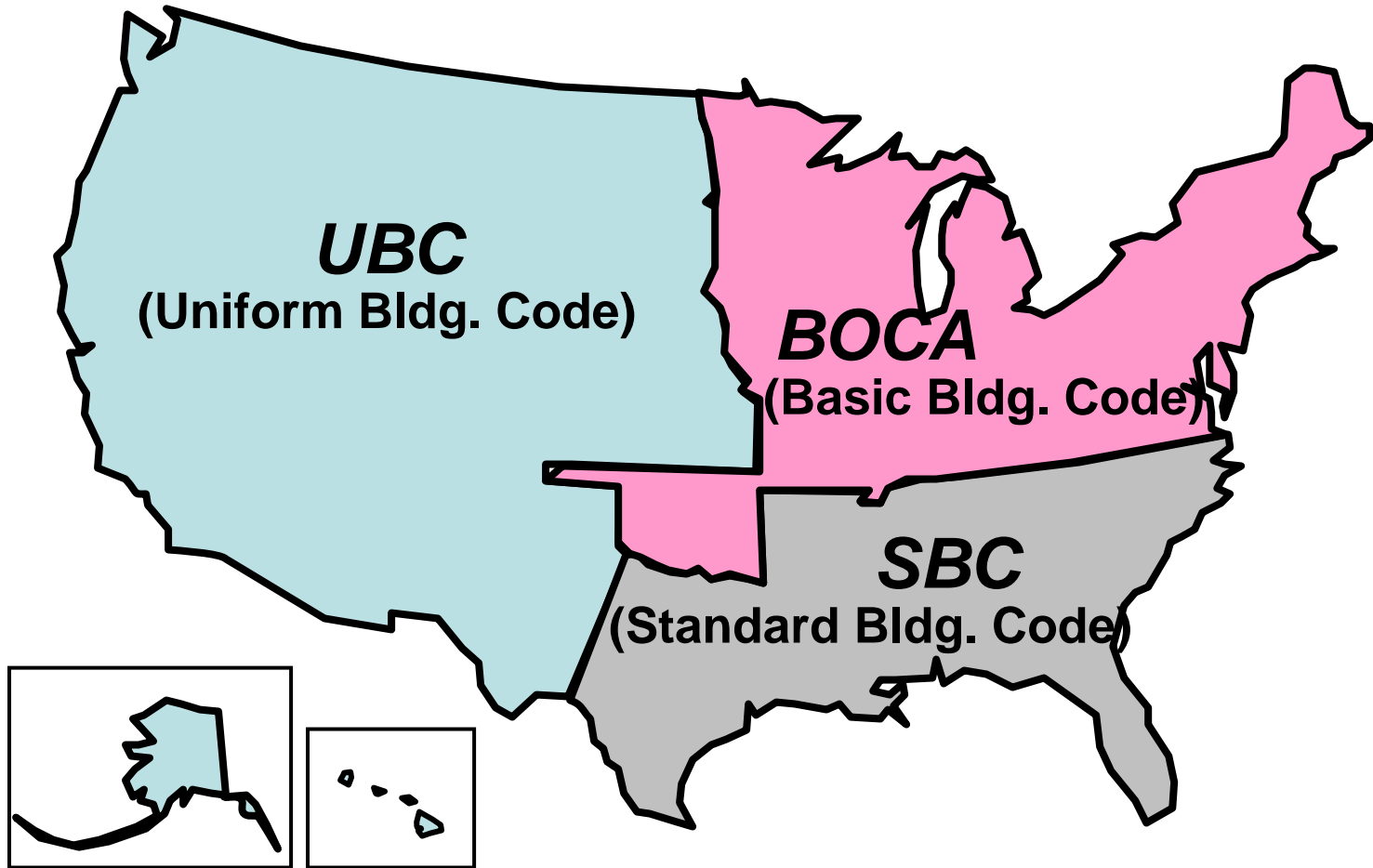
## Examination Requirements

- SE I + SE II, or
- SE II + SE III (8-hour state-written exam), or
- 16-hour state-written exam taken prior to 2004

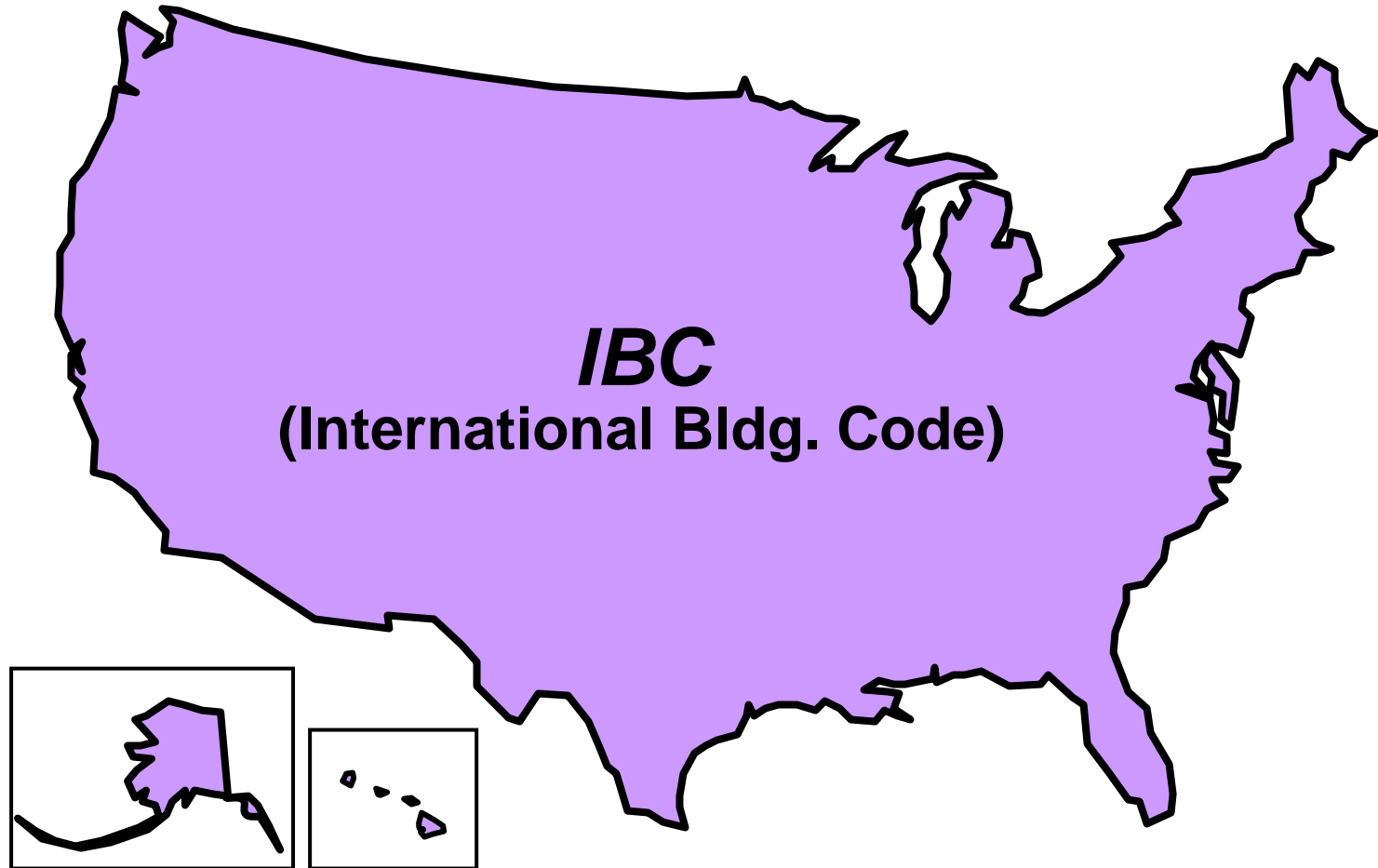
# Structural Engineering Exam Background

- Illinois SE Exam—1915
- California SE Exam—1931
- Washington SE Exam—1963
- NCEES SE I—1985
- Western States Exam—1985
- NCEES SE II—1987
- Washington SE III—1998
- California SE III—2004

# Approximate Code Usage Prior to 2001



# Expected Approximate Basis of Code Usage—2007+



# Task Force Recommendations

- There can and should be one 16-hour structural engineering exam that can be used by all jurisdictions that license S.E.'s by 16 hours of examination.
- The exam should be a breadth and depth exam with integrated design, analysis and detailing items.
- The Structural Exam should be modernized to bring it into step with the current building and bridge codes.
- The exam should be composed of two 8-hour components that can be passed individually but that are not sufficient individually.

Arizona  
Arkansas  
California  
Colorado  
Connecticut  
Delaware  
District of Columbia  
Florida  
Georgia  
Guam  
Hawaii  
Idaho  
Indiana  
Kansas  
Kentucky  
Louisiana  
Maryland  
Massachusetts  
Michigan  
Minnesota  
Mississippi  
Missouri  
Montana

***States that accept the  
SE-I Examination  
for initial PE Licensing***

***States that do NOT accept  
the  
SE-I Examination  
for initial PE Licensing***

**Alabama**

**Alaska**

**Iowa**

**Illinois**

**Maine**

**Minnesota**

**New Mexico**

**Oregon**

Nebraska  
Nevada  
New Hampshire  
New Jersey  
New York  
North Carolina  
North Dakota  
Ohio  
Oklahoma  
Pennsylvania  
Rhode Island  
South Carolina  
South Dakota  
Tennessee  
Texas  
Utah  
Vermont  
Virginia  
Washington  
West Virginia  
Wisconsin  
Wyoming



Alabama  
Alaska  
Arizona  
Arkansas  
California  
Colorado  
Connecticut  
Delaware  
District of Columbia  
Florida  
Georgia  
Guam  
Hawaii  
Idaho  
Illinois  
Indiana  
Iowa  
Kansas  
Kentucky  
Louisiana  
Maine  
Maryland  
Massachusetts  
Michigan  
Minnesota  
Mississippi  
Missouri

## **States that license by Discipline**

**Alaska**  
**Arizona**  
**California**  
**District of Columbia**  
**Guam**  
**Hawaii**  
**Idaho\*\***  
**Illinois\*\***  
**Iowa**  
**Louisiana**  
**Massachusetts**  
**Nebraska**  
**Nevada**  
**New Mexico**  
**Oregon**  
**Rhode Island**  
**Utah**  
**Vermont**  
**Washington\*\***  
**Wyoming**

Montana  
Nebraska  
Nevada  
New Hampshire  
New Jersey  
New Mexico  
New York  
North Carolina  
North Dakota  
Ohio  
Oklahoma  
Oregon  
Pennsylvania  
Rhode Island  
South Carolina  
South Dakota  
Tennessee  
Texas  
Utah  
Vermont  
Virginia  
Washington  
West Virginia  
Wisconsin  
Wyoming

\*\*Washington, Illinois and Idaho do not register by discipline but are included in this list because they require 16 hours of structural examination to have a structural engineering specialty

**States that license  
by Discipline**

Alaska  
 Arizona  
 California  
 District of Columbia  
 Guam  
 Hawaii  
 Idaho\*\*  
 Illinois\*\*  
 Iowa  
 Louisiana  
 Massachusetts  
 Nebraska  
 Nevada  
 New Mexico  
 Oregon  
 Rhode Island  
 Utah  
 Vermont  
 Washington\*\*  
 Wyoming

**States that require  
16 hrs of SE  
Examination**

Arizona  
 California  
 Guam  
 Hawaii  
 Idaho  
 Illinois  
 Louisiana  
 Nebraska  
 Nevada  
 Oregon  
 Utah  
 Washington

**SE-I & SE-II  
Examinations**

Arizona  
 Guam  
 Hawaii  
 Idaho  
 Illinois  
 Louisiana  
 Nebraska  
 Nevada  
 Utah

**SE-II & SE-III  
Examinations**

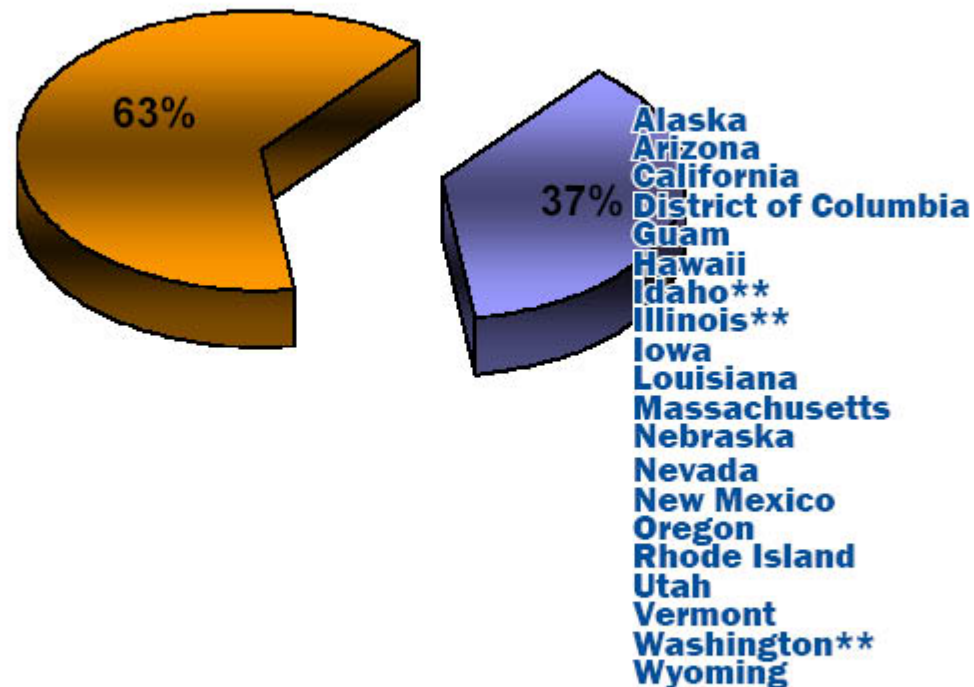
Oregon  
 California  
 Washington

**States that require  
CE / PE License  
& 16 hrs of SE  
Examination**

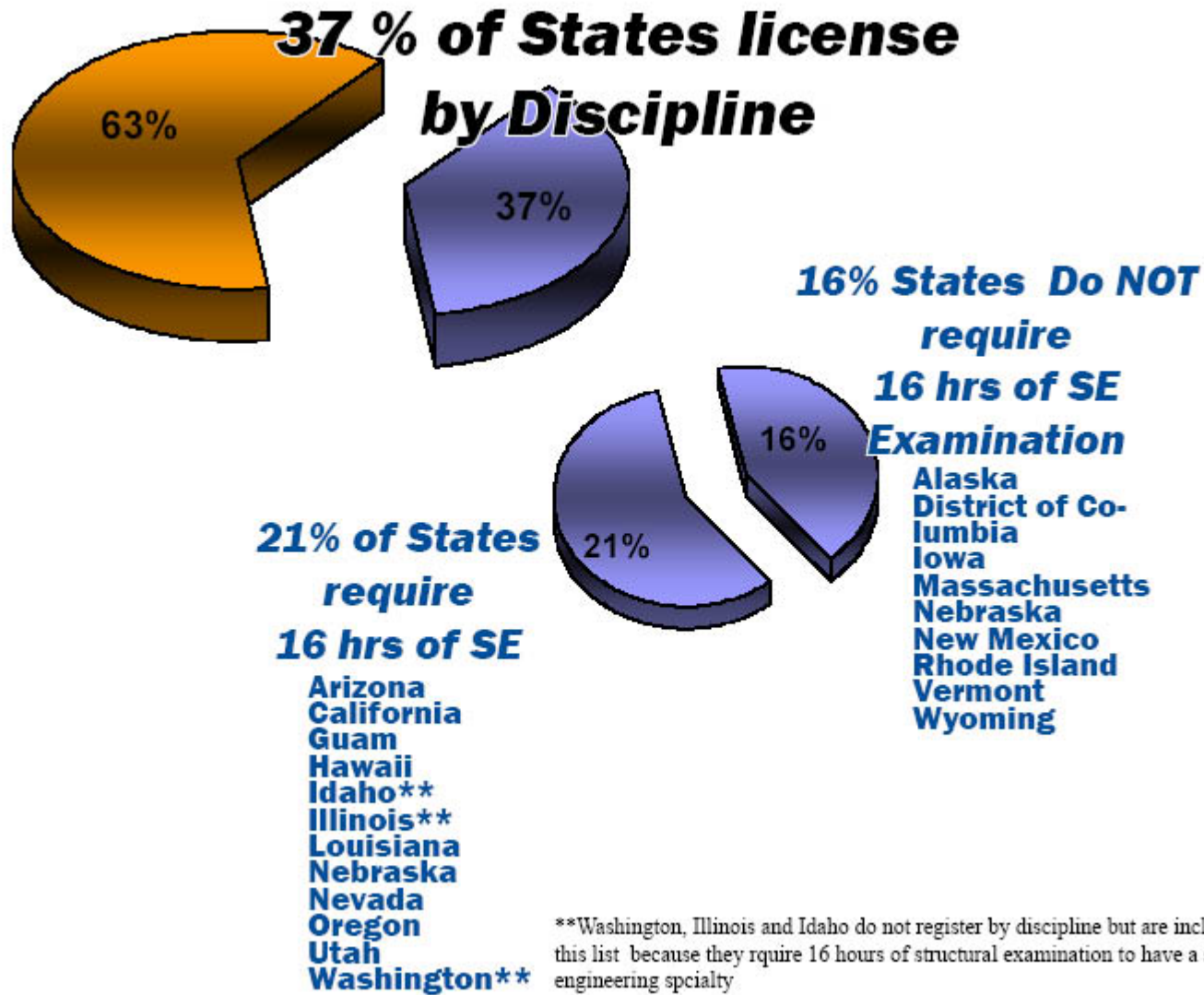
California  
 Guam  
 Idaho  
 Nevada  
 Utah  
 Washington

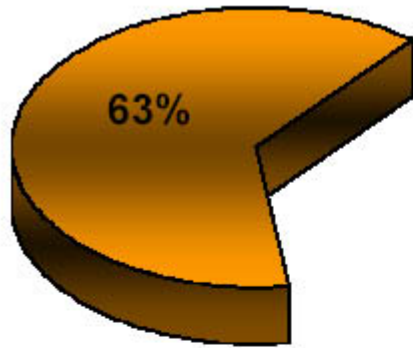
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## **37% of States that license by Discipline**

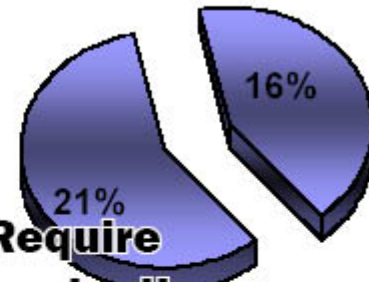


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**37% of States License by Discipline**



**21% Of States Require 16 hrs of SE Examination**

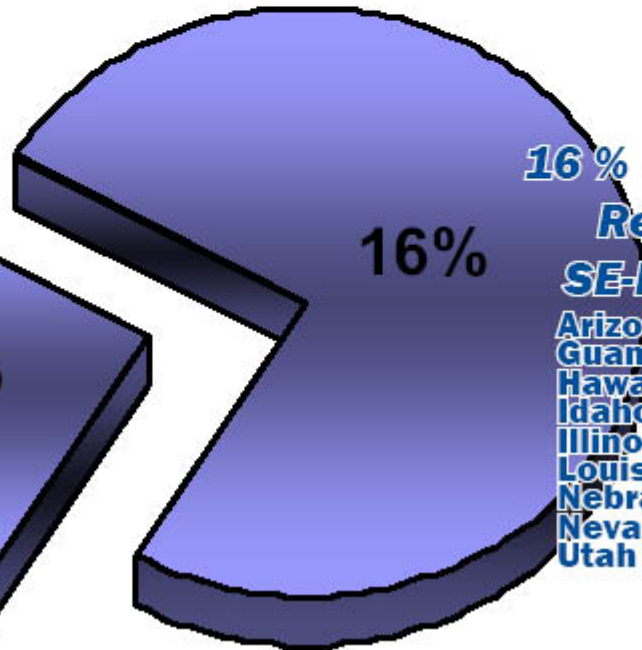
**5% of the States Require SE-II & SE-III Examinations**

Oregon  
California  
Washington

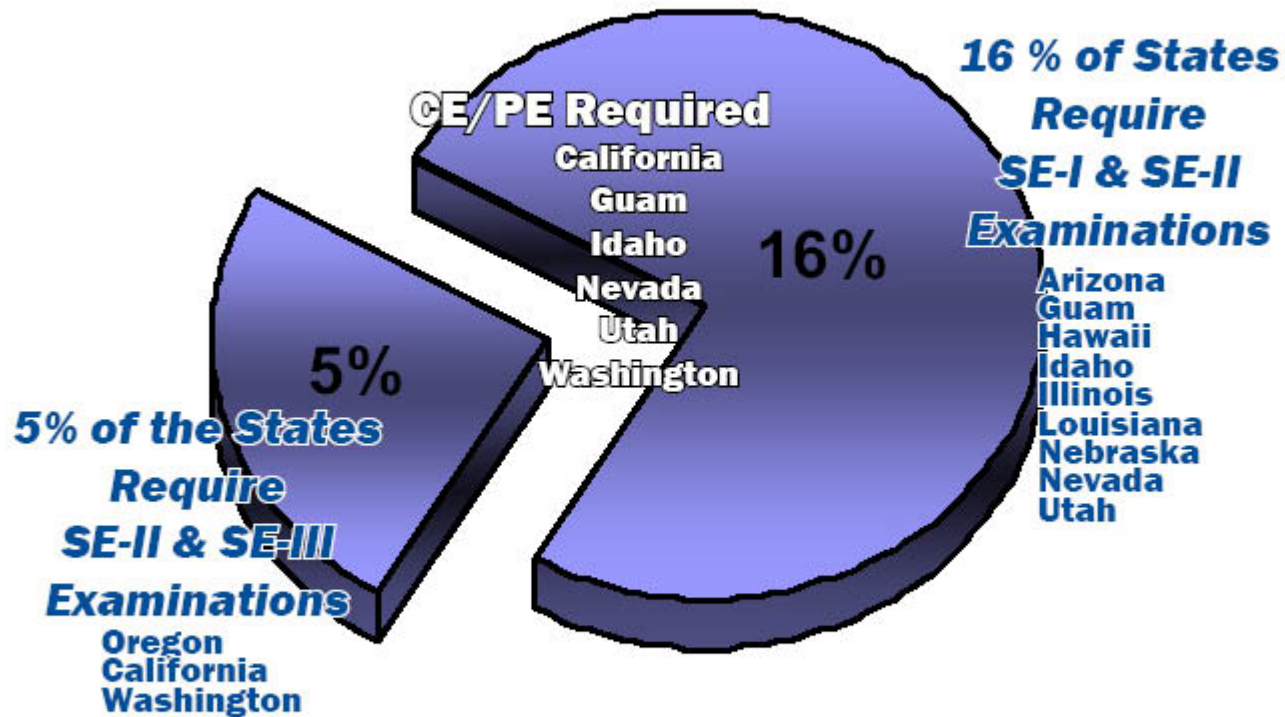


**16% of States Require SE-I & SE-II**

Arizona  
Guam  
Hawaii  
Idaho  
Illinois  
Louisiana  
Nebraska  
Nevada  
Utah



# 21% Of States Require 16 hrs of SE Examination



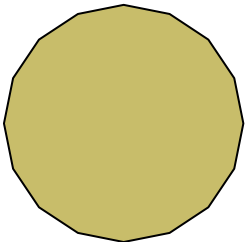
# **The National Council of Examiners for Engineering and Surveying**

has issued  
this **Certificate** to

***Very Good Engineer, P.E.***

In fulfillment of the education, experience, and examination  
requirements of a

**Model Law Engineer - Structural Engineering**



**President**

**Executive Director**

# **GOALS**

**One Exam for all SE's (NCEES Task Force)**

**Uniformity in Qualifications, Exams, &  
Experience Requirements (NCEES Model Law SE)**

**Encourage States for Practice Acts (SE or CE+SE) or Title Acts**

**Comity between states that recognize Structural Engineers (NCEES Records  
Program for SE's)**