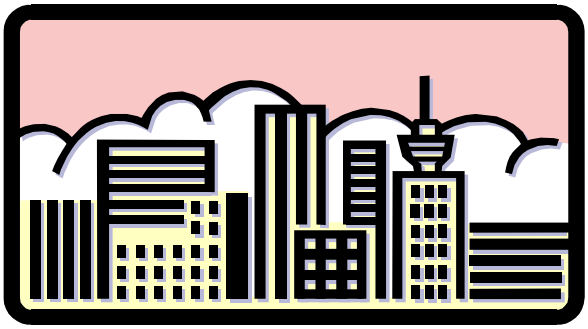
# Handbook for Building Officials

This handbook is a joint publication of the Colorado State Board of Architect Examiners and the State Board of Registration for Professional Engineers and Professional Land Surveyors. It has been prepared in the spirit of public service, and to assist building officials and the architectural and engineering communities to better understand the professional authorship requirements of our licensing and registration laws and model building codes.



# Table of Contents



## INTRODUCTION

Building codes and professional licensing laws are meant to work together. Building officials and architectural and engineering licensing boards each exist to protect the public against unsafe buildings and structures. Board staff endeavor to protect the health, safety, and welfare of the general public by ensuring that all licensed architects and engineers have the proper education and training, and pass a rigorous examination on technical and practice issues. County or local jurisdictions promulgate and adopt building codes while building officials enforce code requirements that are intended to protect the health, safety, and welfare of the general public. If building officials require all construction documents for non-exempt buildings and structures to bear the appropriate signature and seal of a licensed architect or engineer, then the registration system will share responsibility for protecting the health, safety and welfare of the public.

Colorado has limited exemptions permitting unlicensed persons to prepare architectural construction documents for single-family dwellings up to four units; or farm buildings, garages, industrial buildings and warehouses not to exceed one story or designed for occupancy by not more than ten persons. Architectural additions or alterations to exempt buildings are also permitted by unlicensed persons. However, it is clear public policy that buildings and structures of significant size or complexity must be designed by licensed architects and engineers.

In 1999, the National Council of Architectural Registration Boards (NCARB) sent questionnaires to 9,450 building officials across the country and received 2,543 responses. The questionnaires focused on the extent to which building officials view architects and engineers as performing critical services in protecting the public's safety. Ninety-five percent of the responding building officials agreed that "the expertise of licensed architects and engineers is essential to any substantial building to protect the health, safety and welfare of the public." Eighty-seven percent agreed that public safety requires architects and engineers to "conduct on-site observations of the construction of any substantial building." Finally, 86% of the respondents acknowledged that they rely on the architect and engineer who designed the project to ensure that performance standards of the building codes have been met.

This handbook is intended to be a resource to assist you in the enforcement of architectural and engineering laws as well as answer some of the questions you may have in the implementation of those laws. For your reference, you may find the Architects' laws and rules, CRS 12-4-101 et. seq., at www.dora.state.co.us/architects. Likewise, the Engineers' laws and rules, CRS 12-25-101 et. seq., can be found at www.dora.state.co.us/engineers_surveyors. **Also, please see page 7 for additional contact information.**

## I. DEFINITION OF ARCHITECTURE AND ENGINEERING

Colorado defines the practice of architecture and the practice of engineering as follows:

**Architect** means a person licensed under the provisions of the Architect Practice Act and entitled thereby to conduct a practice of architecture in the State of Colorado.

The **Practice of Architecture** means the performance of the professional services of planning and design of buildings, preparation of construction contract documents including working drawings and specifications for the construction of buildings, and the observation of construction pursuant to an agreement between an architect and any other person, but does not include the performance of the construction of buildings.

**Engineer** means a person who, by reason of intensive preparation in the use of mathematics, chemistry, physics, and engineering sciences, including the principles and methods of engineering analysis and design, is qualified to perform engineering work.

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

## II. EXEMPTIONS

The Architect Practice Act provides instances where a person who is not registered as an architect may plan, design and supervise the construction, alteration, remodeling, additions to, or repair of any of the following:

(a) One, two, three, and four unit family dwellings, including accessory buildings commonly associated with such dwellings;
(b) Garages, industrial buildings, offices, farm buildings, and buildings for the marketing, storage, or processing of farm products, and warehouses, which do not exceed one story in height, exclusive of a one-story basement, and which under applicable building code, or codes, are not designed for occupancy by more than ten persons;
(c) Additions, alterations, or repairs to the foregoing buildings which do not cause the completed buildings to exceed the applicable limitations set forth in this subsection (1);
(d) Nonstructural alterations of any nature to any building if such alterations do not affect the life safety of the occupants of the building.

Similarly, the Engineering Practice Act does not apply in the performance of the following activities:

(a) Individuals who normally operate and maintain machinery or equipment;
(b) Individuals who perform engineering services for themselves;
(c) Partnerships, professional associations, joint stock companies, limited liability companies, or corporations, or the employees of any such organizations, who perform engineering services for themselves or their affiliates;
(d) Individuals who perform engineering services under the responsible control of a registrant;
(e) Work of a strictly agricultural nature which is not required to be of public record;
(f) Professional land surveying as defined in section 12-25-202 (6), C.R.S.

(g) Individuals who practice architecture.
(h) Utilities or their employees or contractors when performing services for another utility during times of natural disasters or emergency situations;
(i) Individuals who are employed by and perform engineering services solely for a county, city and county, or municipality;
(j) Individuals who are employed by and perform engineering services solely for the federal government.

## III. SEALING PROFESSIONAL WORK

Registered architects and professional engineers are, and should be, responsible for their professional services in their respective areas of expertise. The public, as well as building officials, rely on their professional expertise. As a result, professional submissions such as construction documents should clearly show the identity of the licensed architect and engineer who prepared them by having affixed a seal and signature and otherwise complying with the requirements of state law. Without proper identification, ultimate responsibility for any deficiencies may not be clear.

The law and applicable building codes in Colorado require that professional submissions be signed and sealed by the licensed architect or engineer who prepared them or has taken responsible control for them. Please refer to the Architects' statute Section 12-2-116, CRS (www.dora.state.co.us/Architects/arcstatute.pdf) and Rule 100.704 (www.dora.state.co.us/Architects/Rules), and the Engineers' statute Section 12-25-117, CRS (www.dora.state.co.us/engineers_surveyors/EngLaws) and Rule 5.1 (www.dora.state.co.us/engineers_surveyors/BoardRules). Also refer to the County Building Inspector statute, Section 30-28-205 (3), CRS:

> The county building inspector shall not issue any permit unless the plans and specifications for such proposed erection, construction, reconstruction, alteration, or remodeling conform to the regulations and restrictions in said building code. All such proposed erection, construction, reconstruction, alteration, or remodeling shall bear the seal of an architect or engineer licensed by the state of Colorado, unless the preparation of plans and specification is exempted by section 12-4-112, C.R.S. Such plans and specifications prepared by architectural or engineering sub-disciplines shall be so designated and shall bear the seal and signature of the architect or engineer for that sub-discipline.

The Uniform Building Code (UBC) or International Building Code (IBC) is the most common throughout Colorado. The UBC states:

"When such plans are not prepared by an architect or engineer, the building official may require the applicant submitting such plans or other data to demonstrate that state law does not require that the plans be prepared by a licensed architect or engineer."

The IBC states:
"The construction documents shall be prepared by a registered (licensed) design professional where required by the statutes of the jurisdiction in which the project is to be constructed."

As a general rule, building officials should require that all construction documents for commercial properties have the seal and signature of either a licensed architect or engineer as appropriate, or have a notation on the construction documents or building permit application stating that the plans are exempt from the general rule requiring them to be prepared by licensed architects or engineers in that jurisdiction. Building officials facing litigation or defending their actions in other arenas should not have to explain why they could have required construction documents to be prepared, signed and sealed by an architect or engineer, but chose to accept construction documents from an unlicensed individual when the law or building codes may not have allowed that unlicensed individual to prepare the construction documents in the first place.

## IV. COMMON QUESTIONS AND ANSWERS

*I have a set of construction documents signed and sealed by an architect registered in a state other than Colorado. Do the submittal documents meet the requirements in Colorado?*

No. Only architects and engineers currently licensed with the appropriate Colorado board have the authority to practice in Colorado. Professionals licensed in other states must obtain registration in Colorado in order to practice here.

*Can a Colorado licensed architect or engineer "overstamp" construction documents prepared and stamped by an architect or engineer who is licensed in another state?*

No. Overstamping is not appropriate. A Colorado Architect or Engineer may review and modify plans prepared elsewhere but by stamping and signing the plans the Architect or Engineer is taking responsible charge for them and in effect stating that the documents were prepared by him or her or under his or her responsible control.

*Can an owner/builder/contractor make changes to a licensed architect's or engineer's construction documents?*

No. When construction documents are prepared by a licensed professional, no changes may be made except by that professional (or under certain conditions by another appropriately licensed professional).

*May a Colorado professional engineer prepare, sign, and seal architectural construction documents?*

Yes, when the engineer possesses the professional and technical qualifications to do so.

*May a Colorado registered architect prepare, sign and seal engineering construction documents?*

Yes, when the architect possesses the professional and technical qualifications to do so.

*May anyone other than a licensed architect or engineer prepare and submit construction documents to building officials?*

Yes, as previously stated in Section II, residential structures up to four units, and small farm and industrial buildings of one story with occupancy limitations of less than 10 people are permitted without the signature and seal of a registered architect or professional engineer. Building officials should document for the record, at the time a permit is granted based on unsealed and unsigned construction documents, the exception in the law that allows the design of the building or structure by an unlicensed person.

*Do shop drawings have to be signed and sealed by an architect or engineer and submitted to the building official for approval?*

Yes and no. Typically shop drawings are intended as construction or fabrication details. These are not usually part of the filed construction documents (see exceptions below). However, they should be reviewed and signed by the Architect or Engineer in charge.

*What are examples of specific component designs, (i. e. roof trusses, curtain wall design, sprinkler, pre-manufactured buildings and other pre-manufactured elements) that are required to be signed and sealed by a licensed architect or engineer when submitted to the building official for approval?*

Component, or "manufactured," buildings are treated no differently than other buildings or structures. The construction documents must be prepared (or reviewed and modified), signed, and sealed by the appropriate licensed professional registered in this state. Examples of such designs are: prefabricated metal buildings or structures, roof truss systems, post tension or pre-stress designs, and pre-cast concrete building components.

*Can a contractor sign the cover sheet of a set of construction documents prepared by an out-of-state licensed architect or engineer and comply with the law?*

No.

*Who may issue change orders and addenda to building permit construction documents, which have been filed for non-exempt buildings or structures?*

Change orders, additional construction documents and/or addenda that alter the construction documents that are required to be filed with the building department for non-exempt buildings or structures must bear the signature and seal of the licensed architect or engineer responsible for the modifications.

*Who can be the applicant for a building permit?*

The applicant can be the owner, contractor, or the registered architect or professional engineer as appropriate. However, for non-exempt buildings the name of the licensed architect or engineer shall be listed on the application. All modifications or revisions to the signed and sealed construction documents required by the building official shall be provided to the licensed architect or engineer by the building official.

*If I review plans submitted by an architect or engineer and discover significant problems with the work or I repeatedly review plans for the same architect or engineer with numerous minor problems, what can I do?*

You may provide the information and/or file a complaint with either the Architects Board or the Engineers/Surveyors Board. It is not necessary to “prove”

your case but it is important to submit examples of the kind of work that has concerned you. The Board will investigate the situation and take action as appropriate. You may be called as a witness if the case proceeds to hearing. You will be informed along the way as the case progresses through the process.

*Sometimes I face a lot of resentment from Engineers and Architects when I (or my Department) question their professional judgment during the review of their submissions. It's nothing personal, we are only exercising our responsibility to properly review work to protect the health, safety and welfare of the public. Is there anything the Board can do to intercede when these confrontations become really heated?*

Neither the Architects Board nor the Engineers/ Surveyors Board have any authority or procedure to mediate these kinds of problems. However, the Engineers/Surveyors Board, with input from county and municipal representatives, developed a brochure that looks at all sides of this difficult problem. The brochure is available in printed form from the address on page 7 or on the Internet at www.dora.state.co.us/engineers_surveyors/developguidelines. If you have encountered this problem, we encourage you to read this publication.

## V. MINIMUM STANDARDS FOR CODE SUBMISSIONS

Construction documents for most projects consist of drawings, specifications and appropriate calculations. All elements shall complement each other. Completeness and coordination of all necessary information are the responsibility of the registered architect or professional engineer. Construction documents submitted to the building official must be of sufficient nature to clearly show the project in its entirety with emphasis on the following:

1. Life safety
2. Means of egress
3. Barrier free accessibility
4. Structural integrity
5. Building code compliance
6. Definition of scope of work

The required construction documents will depend upon the size, nature and complexity of the project. The following is a suggested standard of the minimum required construction documents for review by building officials.

**Cover Sheet**

1. Project identification
2. Project address and a location map
3. All licensed architects and engineers identified
4. The licensed architect or engineer in responsible control (the professional responsible for project coordination) shall be identified. All communications should be directed through this individual.
5. Design Criteria list:
    - I. Occupancy group
    - II. Type Construction classification
    - III. Location of property
    - IV. Seismic risk
    - V. Design loads
    - VI. Structural systems
    - VII. Square Footage/Allowable floor area
    - VIII. Fire sprinkler systems
    - IX. Height and number of stories
    - X. Occupant load
    - XI. Land use zone

**Site Plan**

Show proposed new building or structure and any existing buildings or structures, all property lines with dimensions, all streets, easements and setbacks. Show all water, sewer, communication services, natural gas, telephone, and cable TV. Electrical points of connection, proposed utility service routes and existing utilities on the site. Show all required parking, drainage and grading information. Indicate drainage inflow and outflow locations and specify areas required to be maintained for drainage purposes. A topographical survey should be provided with a benchmark elevation. Show north arrow. Show dimensions for the location and size of components delineated on the site plan.

**Geotechnical Report**

Provide a geotechnical report for the proposed structure at that site.

**Exterior Elevations**

Show each view. Show vertical dimensions and heights. Show openings and identify materials and show lateral bracing system, where applicable. Show dimensions and schedules.

**Foundation Plan**

Show all foundations and footings. Indicate size, locations, thickness, materials and strengths, and reinforcing. Show all imbedded anchoring such as anchor bolts, hold-downs, post bases, etc. Show dimensions

for the location and size of all components delineated on the foundation plan.

**Floor Plans**
Show all floors including basements. Show all rooms, with their use, overall dimensions and locations of all structural elements and openings. Show all doors and windows. Provide door and window schedules. All fire resistance rated assemblies, areas of refuge, occupancy separations, fire blocking and draft stopping shall be shown. Show dimensions for the size of all rooms and the locations of other components delineated on the floor plans.

**Framing Plans and Roof Framing Plans**
Show all structural members, their size, methods and details of attachment, connections, location and materials for floors and roofs. Show roof plan. Show dimensions for the location and size of all components delineated on the roof plan.

**Schedules**
Room finishes, doors, hardware, windows, plumbing, mechanical, electrical and structural.

**Addenda and Changes**
It shall be the responsibility of the individual identified on the cover sheet as the licensed architect or engineer in responsible control to notify the building official of any and all changes throughout the project and provide revised construction documents, calculations or other appropriate documentation prior to commencement of that portion of the construction.

**Revisions**
The party submitting changes shall be identified at the beginning of the approval process. For clarity, all revisions should be identified and clouded on the construction drawings and appropriately marked in the project manual or resubmitted as a new set of construction documents.

**Completeness of Documents**
Construction Documents for most projects consist of drawings, specifications and appropriate calculations. All elements shall complement each other. Completeness and coordination of all necessary information is the responsibility of the registered design professional(s).

**Building Sections Wall Sections**
Show materials of construction, non-rated and fire resistance rated assemblies, and fire resistance rated penetrations. Show dimensions.

**Mechanical System**
Show the mechanical system. Include all units, their sizes, mounting details, all ductwork and duct sizes. Indicate all fire dampers where required. Provide equipment schedules. Submit energy conservation calculations. Show dimensions.

**Plumbing System**
Show all fixtures, piping, slopes, materials and sizes. Show point of connections to utilities, septic tanks, pre-treatment sewer systems and water wells. Show dimensions.

**Electrical System**
Show all electrical fixtures (interior, exterior and site), wiring sizes and circuiting, grounding, panel schedules, single line diagrams, load calculations and fixture schedules. Show point of connection to utility. Show dimensions.

**Fire Sprinkler System**
Show all sprinkler heads, piping valves, alarms, tamper switches, materials, and sizes. Show point of connection to the water system and fire alarm system. Show dimensions for the size and location of components delineated on the fire sprinkler system drawings.

**Structural Systems**
Show foundation, structural members and where required provide structural calculations for the structural systems of the project. Include calculations indicating compliance with seismic, wind, snow and other design loads. Completeness of the necessary calculations is the responsibility of the registered design professional.

**Specifications**
Prepare specifications to further define the construction components, the quality of the materials, delineation of the materials and methods of construction, wall, floor and ceiling finishes, exterior finishes, and descriptions of all pertinent equipment. Schedules may be incorporated into the project manual in lieu of being delineated on the construction drawings.

If you have specific questions that were not addressed here or you need assistance, feel free to write, telephone or electronically mail either Board. The staff will be glad to help you.

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