

Construction Plan Requirements

From the 2006 Uniform Statewide Building Code (USBC) **Section 109: Construction Documents.** Construction documents shall be submitted with the application for a permit. The number of sets of such documents to be submitted shall be determined by the locality. Construction documents for one-and-two family dwellings may have floor plans reversed provided an accompanying site plan is approved.

Exception: Construction documents do not need to be submitted when the building official determines the proposed work is of a minor nature.

The following outline is for new houses, and for additions and renovations to existing houses. Each project is unique and this outline cannot cover every possibility. A general rule when preparing plans is that the plans should show the complete scope of the work, so that anyone who reads the plans can fully understand the materials, dimensions, sizes, colors, building processes, location, etc. of the project. The plans are an integral part of the construction contract between the owner and the contractor. They express the desires of the owner and the responsibilities of the contractor. If a dispute ends up in court, the plans will be a vital piece of evidence to support claims. **More importantly, good plans can prevent disputes and assure a successful project for both the owner and contractor.**

FOR ONE AND TWO FAMILY RESIDENTIAL CONSTRUCTION: Any new construction or renovations to the structure must include drawings which show the proposed work to be done. The plans and elevations must be drawn to scale and be dimensioned and must include (but not limited to) the following:

- ◆ Foundation details, showing the depth, spacing, sizes, location, materials, reinforcement, connections, drainage, waterproofing, and other relative information.
- ◆ Framing details, showing the size, material and spacing of joists, studs, beams, rafters, headers, collar ties, band boards, ridge boards, reinforcing, sheathing, wall bracing, fireblocking, stair construction, connectors, columns and all other structural details.
- ◆ A floor plan showing the dimensions of the building and rooms in the building, the use of the spaces, size and location of doors and windows, bathroom and kitchen details, stair details, handrail and guardrail details, dimensions of hallways and closets; wall, floor and ceiling finishes, and all other architectural details.
- ◆ Elevation and sectional details, showing typical foundation, wall, floor and roof details, insulation R-values, exterior siding, interior finishes, ceiling heights, platforms and landings, stair profiles, roof and soffit venting, vaulted or tray ceilings, attic and crawl space access, etc.
- ◆ Electrical details which show the location of the electrical meter, voltage and ampacity of the service, service grounding, disconnects, overcurrent devices, conductor sizes, power and lighting receptacles, number of circuits, GFCI protected outlets, main and sub-panels, ceiling fans, lighting, smoke detectors, etc.
- ◆ Plumbing details which show the size of the water service to the house, the materials and size of the water service piping to the house, main cut-off valve and other valves, pressure regulator, water distribution piping material and size; location and type of fixtures to include but not limited to a water heater, water closets, bathtubs, showers, sinks, lavatories, bidets, whirlpool tubs, hot tubs/spas, pools, ice makers, dishwasher, fountains, irrigation system, backflow prevention and other water using fixtures. The sanitary

drainage details shall include the material, size and location of drain pipes, vents, traps, cleanouts, floor drains, laundry drains, building drain and sewer line, and other details of the drainage system.

- ◆ Mechanical details which show the location of the furnace/heat pump/boiler, condenser, air handling unit, circulating pumps, hydronic piping; vent material, type, location, length, and termination; energy input rating, energy output rating, efficiency; duct materials, size, insulation values, lengths, size, and location of supply and return air registers; exhaust fans, humidifiers, filters; fireplaces and chimneys, gas line materials, sizes, lengths, valves; appliance clearances, thermostats, location of air for combustion and ventilation, clothes dryers and other equipment, and other details.

ADDITIONAL REQUIRED DETAILS

USBC Section 109.2 Site plan: When determined necessary by the code official, a site plan shall be submitted with the application for a permit. The site plan shall show to scale the size and location of all proposed construction, including any associated wells, septic tanks or drain fields. The site plan shall also show to scale the size and location of all existing structures on the site, the distances from lot lines to all proposed construction, the established street grades and the proposed finished grades. When determined necessary by the building official, the site plan shall contain the elevation of the lowest floor of any proposed buildings. The site plan shall also be drawn in accordance with an accurate boundary line survey. When the application for a permit is for demolition, the site plan shall show all construction to be demolished and the location and size of all existing structures that are to remain on the site.

USBC Section 109.3 Engineering details: When determined necessary by the code official, construction documents shall include adequate detail of the structural, mechanical, plumbing or electrical components. Adequate detail may include computations, stress diagrams or other essential technical data and when proposed buildings are more than two stories in height, adequate detail may specifically be required to include where floor penetrations will be made for pipes, wires, conduits, and other components of the electrical, mechanical and plumbing systems and how such floor penetrations will be protected to maintain the required structural integrity or fire-resistance rating, or both. All engineered documents, including relevant computations, shall be sealed by the RDP responsible for the design.

It is incumbent upon the applicant to provide the necessary drawings and specifications which describe the work to be performed. There are usually different methods and materials which can be used to construct any given project. The Code Administration Department can inform the applicant of the minimum code requirements, and offer advice of typical construction methods. "Typical details" are available in the Code Administration office for decks, finished basements, sheds, and other projects. The methods and materials are the applicant's choice however, and must conform to the minimum building code standards.

Please note that it is not sufficient for the applicant to indicate on the plans, wording such as "all construction to meet applicable building codes", or "structure to comply with section abc.xyz of the building code", or other similar wording. The plans must show the details of

construction. It is far easier and less expensive to change plans in the design stage, that to remove and reconstruct portions of a structure.

Following is a list of plan requirements. Not all of these requirements apply to all plans; if you have any questions, please contact the Code Administration Office.

Minimum Plan Standards

1. **GRAPHIC REPRESENTATION.** The plans must include the following:
 - A title page which includes a description of the work, building code information relative to the project and a list of drawings.
 - All plans are drawn to an established and identifiable scale
 - Drawings are appropriately dimensioned
 - Drawings are annotated as necessary
 - Proper weight lines are used and copies are legible
 - Appropriate title blocks, scale indication, north arrow, legends, revision number, etc.
 - Drawings are assembled in a logical order
 - Architects or Engineers original seal where required

2. **SITE PLANS.** A site plan provided by others such as a surveyor, may be used. The site plan must include the following:
 - Property lines and dimensions, street names and an arrow which shows the north direction
 - The footprint of all existing structures, and the footprint of the proposed addition(s) or new structure(s)
 - Set back dimensions from property lines and existing and existing structures
 - Utility or other easements
 - Location of walkways, driveways, steps, retaining walls, and other accessory structures
 - Utility lines and connections
 - Finished floor elevations
 - Elevation contour lines
 - Significant trees, rock out-croppings, swales, streams, and other natural site conditions

3. **FLOOR PLANS.** Floor plans for the new construction must include the following:
 - All walls, braced wall panels, partitions, doors, windows, skylights, appliances, cabinets and other built-in furnishings, stairs, ladders, access openings, balconies, decks, garages, carports, fireplaces, and all other parts of the structure.
 - For renovations/remodeling, plans showing existing conditions must be provided.
 - All rooms must be labeled
 - Full dimensions
 - Size and location of all plumbing appliances

4. **EXTERIOR ELEVATIONS.** Exterior elevations must show the following:
 - Complete elevations representing all sides of the structure

- Grade lines and finish floor lines
- Door and window locations
- Finish and trim materials with adequate annotations
- Roof pitches, crickets, saddles, overhangs, eaves, rakes, roof covering materials, etc.
- Foundation and roof vents.
- Gutters/downspouts

5. SECTIONS AND DETAILS. Sections and details must show the following:

- At least one section through the structure
- Additional sections which show other critical or unusual details
- All foundations, floor framing connections to the foundation
- All wall and partition types
- Elevations with dimensions
- All beams, joists, rafters, columns, and other load bearing parts of the structure
- Stair construction including landings, showing rise and run of stairs, guardrails, handrails, headroom, materials, etc.
- Details of fire-resistant rated assemblies

6. ELECTRICAL, PLUMBING AND MECHANICAL DETAILS. The electrical, plumbing and mechanical plans may be separate or the details may be shown on other plans. The following information must be included:

- Location of all receptacles, switches, lighting fixtures, smoke detectors, disconnects, service panels, sub-panels; the location of dedicated circuits for water heaters, cooking, clothes dryers, HVAC equipment, sump pumps, motors, etc.
- The location of telephone, data, fire alarm devices, annunciators, and other special purpose outlets
- All HVAC ducts, registers and thermostats
- Details of hydronic and electric resistance heating systems
- Location of HVAC equipment and location of other fuel burning appliances
- BTU rating of all fuel burning appliances
- Size, length, material, and operating pressure of all gas lines, and location of all regulators and valves
- Location of water, gas and electrical service entrance to the building
- Location and size of the water heater
- Location of all plumbing appliances, and a riser diagram of DWV piping for the appliances
- An energy analysis showing that the proposed construction meets the minimum requirements of the Energy Conservation Code of the local jurisdiction

7. FOUNDATION PLANS. The foundations plans must show the following:

- Location and size of footings, stem walls, piers, grade beams, basement walls, retaining walls, slabs on grade, monolithic slab/footings, pilings, helix anchors, brick ledges and any other foundation features
- Soil bearing capacity, and the location of any shrink/swell soils
- Location of any fill upon which a foundation will be constructed
- Location, size and spacing of reinforcing steel to be placed in concrete or CMU

- Location, size and spacing of anchors to be placed in concrete or CMU
- Location of vents, access openings, doors, windows or other opening in concrete or CMU walls
- Details of CMU walls to include size of units, reinforcement, lintels and grouting
- Locations, size and spacing of steel or wood columns
- Details of perimeter drainage where habitable or usable space is below grade
- Details of wood foundation walls
- Special foundation walls such as insulated forms
- Construction details of masonry fireplaces, including foundation

8. FRAMING PLANS. The following information must be included on the structural framing plans:

- The size and spacing of beams, joists, rafters and trusses
- Sheathing of floor, wall and roof membranes, including blocking and clips
- Typical wall section(s) showing size and spacing of framing members, sheathing and interior finish, and location and type of braced wall panels.
- Size of window and door headers.
- For I-Joists, the location and size of squash blocks, and the material used for rim joists
- Location of interior shear walls, load bearing partitions, and any fire-resistant rated walls
- Fastening schedule for built-up beams
- Connection details for posts and beams, and special connections required for trusses
- Details of dormers, crickets, soffits, roof ventilation, and any decorative roof features
- Details of exterior architectural features such as water tables, columns, mouldings, dentals, pergolas, arches, etc.
- Details of vent enclosures for pre-fab fireplaces
- Slope of roofs and details of roof coverings
- Size, type and location and R-value of all insulation

9. SPECIFICATIONS. The drawings must contain, as a part of the general notes or in a separate format, appropriate specifications to describe the materials and/or workmanship required. The following specifications must be included:

- The building codes used to design the project
- The live and dead loads used to design structural elements
- The appropriate local design frost depth and wind speed
- Specifications for materials such as wood, steel, concrete, manufactured wood products, etc.
- Specifications for finish materials such as wall, floor and ceiling coverings, doors, cabinets and counter tops, plumbing fixtures, stairs, balustrades, interior trim, paints, etc.

10. ENERGY CODE ANALYSIS. For new spaces which will be heated and/or cooled, please provide an energy efficiency analysis which shows that the space(s) will conform to the minimum building code requirements.