

Typical Inspections

Every permit that is issued has at least one inspection that is required to be performed in order to determine substantial compliance with the State Building Code.

In general our office will need 1-2 days advance notice for schedule inspections. On occasions the inspection may not be able to be scheduled for several days, depending on the time of year and the current work load.

Inspection	General Description
Footing	<ol style="list-style-type: none"> 1. On undisturbed soil or approved fill 2. 42" minimum frost protection 3. Forms in place – bottom surface of footings shall not have a slope exceeding 1:10 4. Rebar in place (if applicable), Developed lengths of 20 ft or more of #4 or larger rebar shall be bonded 5. Looking for the presence of ledge, water, frozen material
Deck Piers	<ol style="list-style-type: none"> 1. On undisturbed soil or approved fill 2. 42" minimum frost protection 3. Forms (tubes) in place
Backfill	<ol style="list-style-type: none"> 1. Waterproofing installed 2. Foundation drainage system installed - including discharge piping 3. Anchor bolt spacing 4. Sill plate installed, floor framing may be installed, no floor sheathing to be installed around perimeter
Underslab	<ol style="list-style-type: none"> 1. Vapor barrier installed 2. Insulation installed, if applicable.
Rough Plumbing	<ol style="list-style-type: none"> 1. All piping installed 2. Nail plates installed 3. DWV pressure test, 5 psig for air or 10 ft of water above the highest fitting connection <ol style="list-style-type: none"> a. Test gauge shall have increments of 0.10 psi or less 4. Water-system test, 50 psig air <ol style="list-style-type: none"> a. Test gauge shall have increments of 1 psi or less
Rough HVAC	<ol style="list-style-type: none"> 1. All piping and ductwork installed 2. Ductwork – All joints, seams and connections are made substantially airtight with tapes, gasketing, mastics (adhesives) or other approved closure system 3. Ductwork in unconditioned spaces or outside the building are insulated to at least R-6. 4. Ductwork in attics are insulated to at least R-8. 5. Nail plates installed. 6. Duct tightness test, refer to the Energy Efficiency Checklist
Rough Electric	<ol style="list-style-type: none"> 1. All boxes and wiring installed 2. Wire attachments 3. Nail plates installed
Underground Utilities	<ol style="list-style-type: none"> 1. All piping and conduit are installed and trench is open 2. Appropriate utility tape is ready for installation
Electrical Service	<ol style="list-style-type: none"> 1. Meter socket installed 2. Panel installed with main disconnect and ground rods installed 3. Underground Utilities inspection for the service lateral approved, if applicable
Fuel Gas Line	<ol style="list-style-type: none"> 1. All lines and valves installed 2. Nail plates installed 3. Pressure test, minimum 3 psig or 1-1/2 times the proposed maximum working pressure (G2417.4.1) <ol style="list-style-type: none"> a. Mechanical gauges used to measure test pressure shall have a range such that the highest end of the scale is not greater than five times the test pressure. (G2417.4)
Masonry Fireplace Throat & Chimney	<ol style="list-style-type: none"> 1. One flue past the smoke chamber for fireplaces 2. One flue past thimble for masonry chimneys
Fire blocking & Draft stopping	<ol style="list-style-type: none"> 1. All required penetrations sealed 2. Transitional spaces from vertical to horizontal cavities are effectively sealed
Framing	<ol style="list-style-type: none"> 1. Performed after Rough-in inspections have been approved 2. Constructed in accordance with approved plans
Insulation	<ol style="list-style-type: none"> 1. R-values installed match approved plans 2. Windows and doors match approved plans in size, quantity and U-values 3. Building envelope air tightness, refer to the Energy Efficiency Checklist
Certificate of Occupancy	<ol style="list-style-type: none"> 1. Occupiable condition, no furniture in the house, no wet paint 2. Building numbers installed per the Town Ordinance

	<ol style="list-style-type: none">3. Joints, penetrations, and all other such openings in the building envelope that are sources of air leakage are sealed.4. Energy efficiency certificate is affixed to the electrical panel5. All devices (receptacles, switches, smoke detectors, lights, etc.) and utilities installed and operational
Certificate of Approval	A certificate of approval shall be issued indicating substantial compliance for all completed work that requires a building permit but does not require a certificate of occupancy. Such work shall include, but not limited to: re-roofing; re-siding; fences over 6 feet in height; retaining walls over 3 feet in height; and electrical, plumbing and mechanical repairs or alterations performed on the absence of additional work that requires a certificate of occupancy.

ENERGY EFFICIENCY CHECKLIST

The information within this handout are highlights from the 2009 IECC which became effective October 7, 2011 and are applicable for all projects applied for on and after October 7, 2011. All projects shall comply with the mandatory provisions and either the prescriptive provisions listed here or by the performance method addressed at the end of this handout.

Low energy buildings or portions thereof shall be exempt from the building thermal envelope provisions (101.5.2)

INSULATION & FENESTRATION REQUIREMENTS

(Prescriptive) Insulation & fenestration shall either comply with the values below or compliance with the REScheck (www.energycodes.gov)

- Fenestration U-factor 0.30 maximum
- Skylights U-factor 0.60 maximum
- Ceiling R-38 or R-30 if full height of insulation extends over the wall top plate at eaves (402.2.1)
- Wall R-20 or R-13 with R-5 insulated sheathing
- Floor R-30 or insulation sufficient to fill joist cavity, R-19 minimum
- Basement walls R-10 continuous insulated sheathing or R-13 cavity insulation
- Slab, heated R-10, extending 2 feet below grade
- Crawl space R-10 continuous insulated sheathing or R-13 cavity insulation
- Mass Wall R-13 or R-17 if more than 50% of insulation is on the interior face
- Slabs <12" below finish grade shall be insulated to R-10, extending 2 feet below grade (402.2.8)
- Glazed fenestration exemption; up to 15 sq ft of glazed fenestration may be exempt from U-factor requirements (402.3.3)
- Opaque door exemption; up to 25 sq ft may be exempt from the U-factor requirements for one side hinged opaque door (402.3.4)

AIR LEAKAGE

- (Mandatory) Joints (including rim joist junctions), attic access openings, penetrations, and all other such openings in the building envelope that are sources of air leakage are sealed with, caulk, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material. (402.4.1)
- (Mandatory) Air barrier and sealing exists on common walls between dwelling units, on exterior walls behind tubs/showers, and in openings between window/door jambs and framing (402.4.1)
- (Mandatory) Recessed lights in the building thermal envelope are (402.4.5);
 1. Type IC-rated and ASTM E283 labeled
 2. Sealed with a gasket or caulk between the housing and the interior wall or covering.
- (Prescriptive) Access doors separating conditioned from unconditioned space are weather-stripped and insulated (without insulation compression or damage) to at least the level of insulation on the surrounding surfaces. Where loose fill insulation exists, a baffle or retainer is installed to maintain insulation application (402.2.3)
- (Mandatory) Wood-burning fireplaces shall have gasketed doors and outdoor combustion air (402.4.3)

AIR SEALING AND INSULATION

- (Mandatory) Building envelope air tightness and insulation complies by either (402.4.2);
 1. Building envelope tightness and insulation tested for air leakage of less than 7 air changes per hour when tested with a blower door at a pressure of 50 pascals (1 psf). OR
 2. Visual inspection for
 - Air barriers and thermal barrier: installed on outside of air-permeable insulation and breaks or joints in the air barrier are filled or repaired
 - Ceiling/attic: air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed
 - Above-grade walls: insulation is installed in substantial contact and continuous alignment with the building envelope air barrier.

- Windows and doors; space between window/door jambs and framing is sealed
- Floors: air barrier is installed at any exposed edge of insulation.
- Shaft penetrations are sealed
- Plumbing and wiring: insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring
- Air barrier extends behind electrical/phone boxes on exterior walls or are air sealed-type boxes
- Corners, headers, narrow framing cavities, and rim joists are insulated
- Shower/tub on exterior wall: insulation exists between showers/tubs and exterior wall
- HVAC register boots that penetrate building envelope are sealed to subfloor or drywall
- Fireplace walls include an air barrier

SUNROOMS/GREENHOUSES

- **(Prescriptive)** Conditioned sunrooms/greenhouses that are thermally isolated from the building envelope shall have a weighted U-value of 0.60. Floors and ceilings shall have minimum R-19 insulation and walls R-11 minimum. For varying R- and U-values, area weighted averages shall be used to determine compliance (402.2.11)
 1. Greenhouse that are thermally isolated and are 400 sq ft or less in area shall have a maximum area-weighted fenestration U-value of 0.60.
 2. Sunrooms that are thermally isolated and are 500 sq ft or less in area shall have a maximum area-weighted fenestration U-value of 0.50.
 3. Sunrooms that are connected with a conditioned space via a maximum area-weighted fenestration U-value of 0.45

MATERIAL IDENTIFICATION AND INSTALLATION

- **(Mandatory)** Insulation is installed in substantial contact with the surface being insulated and in a manner that achieves the rated R-value (402.4.2)
- **(Mandatory)** Materials and equipment are identified so that compliance can be determined (303.1)
- **(Mandatory)** Manufacturer manuals for all installed heating and cooling equipment and service water heating equipment have been provided (303.3)
- **(Mandatory)** Insulation R-values and glazing U-values are clearly marked or the installer shall provide certification listing the type, manufacturer and R-value of insulation installed in each element of the building thermal envelop (303.1.1)
- **(Mandatory)** Certification shall be submitted for blown or sprayed insulation stating the initial installed thickness, settled thickness, settled R-value, installed density, coverage area, and number of bags installed (303.1.1)
- **(Mandatory)** Certificate shall be submitted for sprayed polyurethane foam insulation stating the installed thickness of the areas covered and R-value of installed thickness. (303.1.1)
- **(Mandatory)** The certificate shall be posted in a conspicuous location on the jobsite and shall be signed and dated by the insulation installer (303.1.1)
- **(Mandatory)** Blown-in or sprayed roof/ceiling insulation shall be written in inches on markers that are installed at least one for every 300 sq ft throughout the attic space. The markers shall be affixed to the framing and marked with the minimum initial installed thickness with numbers a minimum of 1 inch in height and each marker shall face the attic access opening (303.1.1.1)

DUCT INSULATION

- **(Prescriptive)** Supply ducts in attics shall have an installed minimum R-value of R-8. All other ducts in unconditioned spaces or outside of the building envelope shall have an installed minimum R-value R-6. (403.2.1)

DUCT CONSTRUCTION AND TESTING

- **(Mandatory)** Building framing cavities are not used as supply or return ducts (403.2.3)
- **(Mandatory)** All joints and seams of air ducts, air handlers, filter boxes, and building cavities used as return ducts are substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other approved closure systems. Tapes, mastics, and fasteners are rated UL 181A or UL 181B and are labeled according

to the duct construction. Metal duct connections with equipment and/or fittings are mechanically fastened. Crimp joints for round metal ducts have contact lap of at least 1 ½ inches and are fastened with a minimum of three equally spaced sheet-metal screws. (403.2.2)

Exceptions:

1. Joint and seams covered with spray polyurethane foam
 2. Where a partially inaccessible duct connection exists, mechanical fasteners can be equally spaced on the exposed portion of the joint so as to prevent a hinge effect
 3. Continuously welded and locking-type longitudinal joints and seams on ducts operating at less than 2 in. w.g. (500 Pa)
- **(Mandatory)** Duct tightness test has been performed and meets one of the following test criteria (403.2.2):
 1. Post-construction leakage to outdoor test: Less than or equal to 8 cfm per 100 sq ft of conditioned floor area
 2. Post-construction total leakage test (including air handler enclosure): Less than or equal to 12 cfm per 100 sq ft pressure differential of 0.1 inches w.g.
 3. Rough-in total leakage test with air handler installed: Less than or equal to 6 cfm per 100 sq ft of conditioned floor area when tested at a pressure differential of 0.1 inches w.g.
 4. Rough-in total leakage test without air handler installed: Less than or equal to 4 cfm per 100 sq ft of conditioned floor area
 5. Exception: Duct tightness test is not required if the air handler and all ducts are located within the conditioned space.

HEATING AND COOLING EQUIPMENT

- **(Mandatory)** HVAC equipment shall be sized in accordance with ACCA Manual S-04 based on building loads calculated in accordance with ACCA Manual J-02, eighth edition or other approved HVAC calculation methodologies (403.6)
- **(Mandatory)** Interior design temperatures used for heating shall be 72 degrees F maximum for heating and minimum of 75 degree F for cooling. (302.1)
- **(Mandatory)** For systems serving multiple dwelling units documentation has been submitted demonstrating compliance with 2009 IECC sections 503 and 504 (403.7)
- **(Mandatory)** Forced air furnaces shall be provided with a programmable thermostat (403.1.1)
- **(Mandatory)** Service hot water piping shall be insulated to a minimum R-2 within 10 ft of the service water heating equipment. (403.4.1)
- **(Mandatory)** Cold water piping serving service water heating equipment shall be insulated to a minimum R-2 for the first 5 ft of piping (403.4.1)

CIRCULATING SERVICE HOT WATER SYSTEMS

- **(Mandatory)** Circulating service hot water pipes are insulated to R-2 (403.4)
- **(Mandatory)** Circulating service hot water systems include an automatic or accessible manual switch to turn off the circulating pump when the system is not in use (403.4)

HEATING AND COOLING PIPING INSULATION

- **(Mandatory)** HVAC piping conveying fluids above 105 degrees F or chilled fluids below 55 degrees F are insulated to R-3 (403.3)

SWIMMING POOLS

- **(Mandatory)** Heated swimming pools have an on/off heater switch (403.9.1)
- **(Mandatory)** All pool heaters shall be equipped with a readily-accessible on-off switch without adjusting the thermostat setting. Pool heaters that are natural gas or LPG shall not have continuously burning pilot lights. (403.9.1)
- **(Mandatory)** Timer switches on pool heaters and pumps, except where pumps operate within solar- and/or waste-heat-recovery systems (403.9.2)
- **(Mandatory)** Heated swimming pools have a cover on or at the water surface. For pools heated over 90 degrees F the cover shall have a minimum insulation value of R-12. Covers are not required when 60% of the heating energy is from site-recovered energy or solar energy source (403.9.3)

LIGHTING REQUIREMENTS

- **(Prescriptive)** A minimum of 50% of the lamps in permanently installed lighting fixtures can be categorized as one of the following (404.1)
 1. Compact fluorescent
 2. T-8 or smaller diameter linear fluorescent
 3. 40 lumens per watt for lamp wattage ≤ 15
 4. 50 lumens per watt for lamp wattage > 15 and ≤ 40
 5. 60 lumens per watt for lamp wattage > 40

OTHER REQUIREMENTS

- **(Mandatory)** Snow- and ice-melting systems with energy supplied from the service to a building shall include automatic controls capable of shutting off the system when (403.8);
 1. The pavement temperature is above 50 degrees F, and
 2. No precipitation is falling, and
 3. The outdoor temperature is above 40 degrees F (manual shutoff is permitted)
- **(Prescriptive)** Window replacements shall have a maximum U-factor of 0.35 (402.3.6)

CERTIFICATE

- **(Mandatory)** A permanent certificate shall be placed on or in the electrical distribution panel listing the predominant insulation R-values; window U-factors; type of efficiency of space conditioning and water heating equipment. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels (401.3)

PERFORMANCE PROVISIONS

- Compliance shall be based on simulated energy performance requires that a proposed residence be shown to have an annual energy cost less than or equal to the annual energy cost of the standard reference design (405.3)