CITY OF MILPITAS
Building & Safety Department
455 E. Calaveras Blvd.
Milpitas, CA 95035
408-586-3240
www.ci.milpitas.ca.gov

RESIDENTIAL BATHROOM REMODEL

1. PERMIT INFORMATION:

- ❑ The remodeling of an existing bathroom requires a Permit. A Combination permit can be obtained that includes building, electrical, mechanical and plumbing permits all in one.
- ❑ A Building Permit may be issued only to a State of California Licensed Contractor or the Homeowner.
- ❑ If the work is performed by the Homeowner personally or by his/her workers, and an inspection indicates the work cannot be completed satisfactorily, then a licensed contractor must perform the work.
- ❑ If the Homeowner hires workers, State Law requires the Homeowner to obtain Worker's Compensation Insurance. Proof of this insurance is required prior to inspection.

2. INSTALLATION REQUIREMENTS:

- ❑ **Building Codes:** All work must comply with the 2010 California Building Code (CBC), 2010 California Residential Code (CRC), 2010 California Mechanical Code (CMC), 2010 California Electrical Code (CEC), 2010 California Plumbing Code (CPC), 2010 California Energy Code based upon 2008 Building Energy Efficiency Standards (CEnC) and 2011 Milpitas Municipal Code (MMC).
- ❑ **On-line permits can only be obtained for bathroom remodels that do not include any modifications to the existing wall and/or ceiling framing, or the relocation of any fixtures.**
- ❑ If any changes will be made to the existing framing, or if any fixtures will be relocated, drawings must be submitted and approved and the permit obtained in person from the Permit Center, Building & Safety Department, 455 E. Calaveras Blvd. The drawings required may include:
  - Floor plan: Indicate walls, windows (size and type), and door sizes. Show adjoining rooms and label the use of each room. Show location of all cabinets (upper and lower) and plumbing fixtures and show their dimensions.
  - Ceiling plan: If needed to show ceiling heights, electrical and mechanical installed in the ceiling.
  - Structural: If any walls are being removed or relocated, show existing framing that shows the walls were not bearing, or if they were, how the support is being replaced.
  - Electrical, mechanical & plumbing: Show electrical receptacles, electrical fixtures with switching, and ventilation. May be included on the floor plan.
  - Details and Notes: Provide all details and notes required to explain the work.
  - All drawings must be signed by the person preparing them.

3. ROOM REQUIREMENTS:

- ❑ **Ceilings:** Bathrooms and toilet rooms must have a ceiling height of not less than 7 feet (CRC R305.1).
- ❑ **Safety glazing:** Glazing in doors and enclosures for bathtubs and showers shall be safety glazing (CRC R308.4.5).

- ❑ **Shower & tub walls:** Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet above the floor. (CRC R307.2).

- ❑ **Water-resistant gypsum backing board:** Gypsum board used as the base or backer for adhesive application of ceramic tile or other required nonabsorbent finish material shall conform to ASTM C 1396, C 1178 or C1278. Use of water-resistant gypsum backing board shall be permitted on ceilings where framing spacing does not exceed 12 inches on center for 1/2-inch-thick or 16 inches for 5/8-inch-thick gypsum board. Water-resistant gypsum board shall not be installed over a Class I or II vapor retarder in a shower or tub compartment. Cut or exposed edges, including those at wall intersections, shall be sealed as recommended by the manufacturer. (CRC R702.3.8)
    - Limitations: Water resistant gypsum backing board shall not be used where there will be direct exposure to water, or in areas subject to continuous high humidity. (CRC R702.3.8.1)

4. <u>ELECTRICAL REQUIREMENTS</u> – Installation of any new or replacement of any existing electrical shall comply with the following**. NOTE: All bathroom remodels must include upgrading the existing receptacles to have GFCI protection if not already existing.**

- ❑ Listed or labeled equipment shall be installed in accordance with the manufacturer's requirements (CEC 110.3(B)).

- ❑ New lighting or receptacles added may not overload existing circuits or panels (CEC 210.23).

- ❑ Ground-fault circuit-interrupter protection for personnel shall be provided for cables installed in electrically heated floors of bathrooms and in hydromassage bathtub locations (CEC 424.44(G)).

- ❑ If new circuits or additional loads are being added, including adding new outlets, and the service is less than 100 amps, the service panel must be upgraded to a minimum 100 amps (CEC 230.79(C).

- ❑ **Lighting:**

    - At least one wall switch-controlled (or motion-on occupancy sensor controlled) lighting outlet shall be installed in every bathroom (CEC 210.70(A)(1)).

    - Fixtures installed in wet or damp locations shall be installed so that water cannot enter or accumulate in wiring compartments, lamp holders, or other electrical parts. All fixtures installed in wet locations shall be marked, “Suitable for Wet Locations”. [CEC Section 410.10(D)].

    - Cord-connected fixtures, chain, cable or cord-suspended fixtures, lighting track, pendants, or ceiling-suspended (paddle) fans shall not be located within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim or shower stall threshold. This zone is all encompassing and includes the zone directly over the tub or shower stall. Other fixtures located in this zone shall be listed for damp locations, or wet locations if subject to shower spray. [CEC 410.4(D)]

    - Switches shall not be installed within wet locations in tub or shower spaces unless installed as part of listed tub or shower assembly (CEC 404.4).

    - See also requirements under Energy below.

- ❑ **Branch Circuits:** At least one 20-ampere branch circuit shall be provided to supply bathroom receptacle outlet(s) (CEC 210.11(C)(3)). Such circuits shall have no other outlets, except where the circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with CEC 210.23(A)(1) and (A)(2).

- ❑ **Receptacles:**

  - At least one (1) wall receptacle outlet shall be installed in each bathroom within 36 inches of the outside edge of each basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop. [CEC Section 210.52(D)]

  - All 125 volt, 15 and 20 ampere receptacles installed in bathrooms shall be protected with GFCI(s) [CEC 210.8(A)(1)].

  - Receptacles shall not be installed within or directly over a bathtub or shower stall [CEC406.8(C)].

- ❑ **Hydromassage Bathtubs:**

  - Hydromassage bathtubs and their associated electrical components shall be on an individual branch circuit and protected by a readily accessible ground-fault circuit interrupter. All 125-volt, single-phase receptacles not exceeding 30 amperes and located within 6 feet measured horizontally of the inside walls of a hydromassage tub shall be protected by a ground-fault circuit interrupter. (CEC 680.71).

  - Hydromassage bathtub electrical equipment shall be accessible without damaging the building structure or building finish (CEC 680.73).

  - All metal piping systems and all grounded metal parts in contact with the circulating water shall be bonded together using a copper bonding jumper, insulated, covered, or bare, not smaller than 8 AWG solid (CEC 680.74).

5. PLUMBING REQUIREMENTS:

- ❑ **Approvals:** All pipe, fittings, traps, fixtures, materials and devices used in a plumbing system shall be listed or labeled (third-party certified) by a listing agency and shall be free of defects (CPC 310.1.1).

- ❑ **Workmanship:** Plumbing systems shall be installed in a manner conforming to the CPC, applicable standards, and the manufacturer's installation instructions. Burred ends of all pipe and tubing shall be reamed to the full bore of the pipe or tube, and all chips shall be removed. (CPC 310.0).

- ❑ **Fixtures:** Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet shall be set closer than fifteen (15) inches from its center to any side wall or obstruction (cabinet, bathtub, shower) nor closer than thirty (30) inches center to center to any similar fixture. The clear space in front of any water closet shall not less than 24 inches. (CPC 407.5).

- ❑ **Water closets:** Fixtures shall use a maximum average consumption of not more than 1.6 gallons per flush. Flanges must be installed above floor level and secured with corrosion-resistant fasteners. (CPC 402.2).

- ❑ **Shower size:** The shower compartment shall have a minimum finished interior of 1024 square inches and shall also be capable of encompassing a 30 inch diameter circle. The required area and dimensions shall be measured at a height equal to the top of the threshold and at a point tangent to its centerline. The minimum area and dimensions shall be maintained to a point 70 inches above the shower drain outlet with no protrusions other than the fixture valve or valves, shower head, soap dishes, shelves, and safety grab bars or rails. Fold-down seats in accessible shower stalls shall be permitted to protrude into the 30 inch circle. Where an existing bathtub is replaced by a shower receptor, it may have minimum overall dimensions of 30 inches in width and 60 inches in length. (CPC 411.7).

- ❑ **Shower door:** Shower doors must not encroach into the required thirty (30) inch circle. Shower doors shall open so as to maintain a minimum twenty-two (22) inch unobstructed opening for egress. (CPC 411.6).

- ❑ **Shower receptor:** Shower receptors shall be constructed of vitrified china or earthenware, ceramic tile, porcelain-enameled metal, fiberglass, resin, or of such other material that conforms to acceptable standards as referenced in CPC Table 14-1. Each shower receptor shall be an approved type and be so constructed as to have a

finished dam, curb or threshold that is at least one (1) inch lower than the sides and back of such receptor. In no case shall any dam or threshold be less than two (2) inches or more than nine (9) inches in depth when measured from the top of the dam or threshold to the top of the drain. Each such receptor shall be provided with an integral nailing flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment. The flange shall be watertight and extend vertically a minimum of one (1) inch above the top of the sides of the receptor. The finished floor of the receptor shall slope uniformly from the sides toward the drain not less than one-quarter (1/4) inch per foot nor more than one-half (1/2) inch per foot. Thresholds shall be of sufficient width to accommodate a minimum twenty-two (22) inch door. Shower doors shall open so as to maintain a minimum twenty-two (22) inch unobstructed opening for egress. (CPC 411.5 & 411.6).

- ❑ **On-site built-up shower receptors** shall be constructed as follows (CPC 411.8):

  - Shower receptors built directly on the ground shall be watertight and shall be constructed from approved-type dense, nonabsorbent and non-corrosive materials. Each such receptor shall be adequately reinforced, shall be provided with an approved flanged floor drain designed to make a watertight joint in the floor, and shall have smooth, impervious, and durable surfaces.
  - When shower receptors are built above-ground, the subfloor and rough side of walls to a height of not less than three (3) inches above the top of the finished dam or threshold shall be first lined with sheet plastic*, lead*, or copper*, or shall be lined with other durable and watertight materials.

    *Lead and copper subpans or linings shall be insulated from all conducting substances other than their connecting drain by fifteen (at) pound asphalt felt or its equivalent, and no lead pan or liner shall be constructed of material weighting less than four (4) pounds per square foot. Copper pans or liners shall be at least No. 24 B & S Gauge (0.02 inches). Joints in lead pans or liners shall be burned. Joints in copper pans or liners shall be soldered or brazed. Plastic pans shall not be coated with asphalt-based materials.
  - All lining materials shall be pitched one-quarter (1/4) inch per foot to weep holes in the subdrain of a smooth and solidly formed subbase. All such lining materials shall extend upward on the rough jambs of the shower opening to a point no less than three (3) inches above the top of the finished dam or threshold and shall extend outward over the top of the rough threshold and be turned over and fastened on the outside face of both the rough threshold and the jambs.
  - Nonmetallic shower subpans or linings may be built up on the job site of not less than three (3) layers of standard, grade fifteen (15) pound asphalt-impregnated roofing felt. The bottom layer shall be fitted to the formed subbase and each succeeding layer thoroughly hot-mopped to that below. All corners shall be carefully fitted and shall be made strong and watertight by folding or lapping, and each corner shall be reinforced with suitable webbing hot-mopped in place. All folds, laps, and reinforcing webbing shall extend at least four (4) inches in all directions from the corner, and all webbing shall be of approved type and mesh, producing a tensile strength of not less than fifty (50) psi in either direction. Nonmetallic shower subpans or linings may also consist of multilayers of other approved equivalent materials suitably reinforced and carefully fitted in place on the job site as elsewhere required in this section.
  - Linings shall be properly recessed and fastened to approved backing so as not to occupy the space required for the wall covering and shall not be nailed or perforated at any point that may be less than one (1) inch above the finished dam or threshold. An approved-type subdrain shall be installed with every shower subpan or lining. Each such sub-drain shall be of the type that sets flush with the subbase and shall be equipped with a clamping ring or other device3 to make a tight connection between the lining and the drain. The subdrain shall have weep holes into the waste line. The weep holes located in the subdrain clamping ring shall be protected from clogging.
  - All shower lining materials shall conform to approved standards acceptable to the Building Official.

- ❑ **Tests for Shower Receptors:** Shower receptors shall be tested for watertightness by filling with water to the level of the rough threshold. The test plug shall be so placed that both upper and under sides of the subpan shall be subjected to the test at the point where it is clamped to the drain. (CPC 411.8.1).

- ❑ **Valve location:** At showers and tub/shower combinations, valves shall be located on sidewall of shower compartment to allow bather to adjust the valves prior to stepping into the shower spray (CPC 411.10).

- ❑ **Water Supply Riser:** Every water supply riser from the shower valve to the showerhead outlet, whether exposed or not, shall be securely attached to the structure (CPC 411.11).

- **Bathtubs and Whirlpool Bathtubs:** Unless otherwise listed, all bathtubs and whirlpool bathtubs shall comply with the following (CPC 414.0):

  - A removable panel shall be provided to access and remove the pump. Whirlpool pump access located in the crawl space shall be located no more than twenty (20) feet from an access door, trap door, or crawl hole.
  - The circulation pump shall be located above the crown weir of the trap.
  - The pump and the circulation piping shall be self-draining to minimize water retention in accordance with standards referenced in CPC Table 14-1.
  - Suction fittings on whirlpool bathtubs shall comply with the listed standards.
  - The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 120^{O}F. The water heater thermostat shall not be considered a control for meeting this provision.

- **Scalding protection:** Showers and tub/shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection. These valves shall conform to ASSE 1016. (CPC 418.0).

- **Drains and vents:** Only approved pipe and fittings shall be installed. Piping shall be sized according to their Drainage Fixture Count loads and comply with the following:

  - Drain and vent materials shall be cast iron, galvanized steel, galvanized wrought iron, copper, brass, Stainless Steel 304 or 316L, Schedule 40 ABS or PVC DWV plastic pipe, or extra strength vitrified clay pipe (CPC 701.1 & 903.1).
    - No galvanized wrought-iron or steel pipe shall be used under ground and shall be kept at least six (6) inches above ground.
    - ABS and PVC DWV piping shall be installed in accordance with Installation Standard 5 & 9.
    - Vitrified clay pipe and fittings shall not be used above ground and shall be kept at least twelve (12) inches below ground.
    - Copper tube shall have a weight of not less than copper drainage tube type DWV.
    - Stainless steel 304 pipe and fittings shall not be installed under ground and shall be kept at least six (6) inches above ground.
  - Drainage piping systems shall be sized in accordance with CPC Section 703.0. Vent piping systems shall be sized in accordance with CPC Section 904.0.
    - Water closets require minimum 3" trap and drain and 1 ½" vent.
    - Bathtubs require minimum 1 ½" trap and drain and 1 ¼" vent.
    - Showers require minimum 2" trap and drain and 1 ¼" vent.
    - Lavatories require minimum 1 ¼" trap (1 ½" if set of two) and drain and 1 ¼" vent.
  - The aggregate cross-sectional area of all vents through the roof shall not be less than the building sewer (CPC 904.1).
  - Vent pipes shall extend through its flashing at the roof not less than six (6) inches above the roof and twelve (12) inches from a vertical wall, not less than ten (1) feet from or three (3) feet above any openable window, door, opening, air intake, or vent shaft, nor less than three (3) feet from a property line (CPC 906.0).
  - When joining ABS to PVC a solvent cement transition joint using listed transition solvent cement (CPC 316.1.6).
  - Must use proper fittings for changes of direction in accordance with CPC 706.0.
  - Piping shall be installed with a minimum slope ¼" per foot (CPC 708.0).
  - Where a fixture is installed on a floor level that is lower than the next upstream manhole cover of the public sewer, a backwater valve shall be installed in accordance with CPC Section 710.0.
  - Cleanouts must be accessible, located at the upper terminal of each branch or run of piping, and sized per CPC Table 7-6 (CPC 707.0).
    - Cleanouts may be omitted on a horizontal drain less than five (5) feet in length.
    - Cleanouts are not required on piping that is above the floor level of the lowest floor.
    - Cleanouts in piping two (2) inches or less shall be installed with a clearance of not less than twelve (12) inches in front of the cleanout.

- Cleanouts in piping larger than two (2) inches shall be installed with a clearance of not less than eighteen (18) inches in front of the cleanout.
- Cleanouts in under floor piping shall be extended to or above the finished floor or shall be extended outside the building when there is less than eighteen (18) inches of vertical overall clearance or when there is less than thirty (30) inches horizontal clearance from the means of access to the cleanout. No cleanout shall be located more than twenty (20) feet from the access door, trap door, or crawl hole.

- Testing: The piping of the plumbing, drainage and venting systems shall be tested with water or air (except plastic shall only be by water). Water test shall be done with a ten (10) foot head of water. Air shall be done with five (5) pounds per square inch. The water or air must be held in the system for a minimum of fifteen (15) minutes prior to inspection. (CPC 712.0).

❑ **Supports:** All piping shall be supported at intervals not to exceed those shown in CPC Table 3-2.

❑ **Pipe:** Joints and connections shall be in accordance with CPC 316.0. Water piping shall also comply with CPC 606.0.

❑ **Water supply and distribution:** Water supply and distribution piping shall be in accordance with CPC Chapter 6. Water piping materials may be brass, copper, cast iron, galvanized iron, galvanized steel, CPVC, or PEX-AL-PE. CPVC piping must be installed in accordance with Section 604.1.1. PEX and PEX-AL-PEX piping is prohibited. Piping systems shall be sized in accordance with CPC 610.0. The minimum size of any branch shall be ½".

6. MECHANICAL REQUIREMENTS:

❑ **Mechanical ventilation:** Bathrooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with the California Mechanical Code (CBC 1203.4.2.1).

❑ **Ventilation:** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet , one-half of which must be openable. (CRC R303.3)

Exception: The glazed areas shall not be required where artificial light and a mechanical ventilation system are provided. The minimum ventilation rates shall be 50 cubic feet per minute for intermittent ventilation or 25 cubic feet per II minute for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside.

❑ **Fan exhaust termination:** Exhaust ducts shall terminate outside the building and be equipped with back-draft dampers (CMC 504.1) and shall terminate a minimum of 3 feet from property line and building openings (CMC 504.5). Provide an exhaust fan in bathrooms containing a bathtub and/or shower per CBC Section 1203.4.2.1. Indicate fan location. Size fan a minimum of 25 cfm per CMC Table 4-4 for continuous system operation with a maximum of 1 sone per CEnC. For intermittent bath fan operation, provide minimum ventilation airflow of 50 cfm per CMC Table 4-4 and maximum of 3.0 sone rating per CEnC.

7. ENERGY REQUIREMENTS:

❑ All new lighting must comply with all applicable mandatory measures of the California Energy Code. Refer to the attached form MF-1R for a list of the mandatory requirements.

❑ If adding or replacing lighting, it shall be high efficacy fixtures (e.g. fluorescent) or be controlled by a manual-on occupant sensor (CEnC Section 150(k)10) complying with CEnC Section 119(j). Such sensor shall not have a control that allows the luminaire to be turned on automatically or that has an override allowing the luminaire to be always on.

❑ Recessed lighting in insulated ceilings must be rated for direct insulation contact (IC), certified as airtight construction (AT), and must have a sealed gasket or caulking between the housing and ceiling to prevent the flow of heated or cooled air out of the living areas and into the ceiling cavity (CEnC 150(k)12).

- ❑ **Title 24 Energy Compliance Reports:** The following forms must be filled out and attached to the permit prior to inspection:

  - Mandatory Measures form MF-1R.
  - Installation Certificate CF-6R-LTG-01.

8. SMOKE ALARMS, CARBON MONOXIDE ALARMS & SPARK ARRESTER:

- ❑ In single family residences and multi-family (townhomes, condominiums, and apartments), installation of smoke detectors, carbon dioxide alarms and spark arrestors on all chimneys is required prior to the final inspection as follows:

  - **Smoke Alarms:** When the value of the work exceeds $1,000, smoke alarms approved and listed by the State Fire Marshal must be installed if they do not already exist in each sleeping room, outside each separate sleeping area in the immediate vicinity of the bedrooms, and on each additional story of the dwelling. In existing buildings, alarms may be solely battery operated where alterations or repairs do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes. Where more than one smoke alarm is required to be installed, the alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit, except where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Refer to CRC Section R314 and the *"Smoke Alarms"* handout for more additional information.

  - **Carbon Monoxide Alarms:** When the value of the work exceeds $1,000, an approved and listed carbon monoxide alarm shall be installed if they do not already exist in existing dwellings or sleeping units that have attached garages or fuel-burning appliances as follows: outside each separate dwelling unit sleeping area in the immediate vicinity of bedrooms and on every level of dwelling unit. In existing dwelling units a carbon monoxide alarm is permitted to be solely battery operated where repairs or alterations do not result in the removal of wall and ceiling finishes or there is no access by means of attic, basement or crawl space. Where more than one carbon monoxide alarm is required to be installed, the alarms shall be interconnected in a manner that activation of one alarm shall activate all of the alarms in the individual unit, except where repairs do not result in the removal of wall and ceiling finishes, there is no access by means of attic, basement or crawl space, and no previous method for interconnection existed. See CRC Section R315 for additional information.

  - **Spark arrester:** When the value of the work exceeds $1,000, a spark arrester must be installed on fireplace chimneys if one does not already exist per MMC Section II-3-2.06. Spark arresters shall be constructed in conformance with CRC Section 1003.9.1.

9. INSPECTIONS:

- ❑ The number of inspections required depends on the type of shower receptor installed and the overall scope of the work. A rough plumbing and electrical inspection should be scheduled for any work installed in the framing, and a shower pan test scheduled, prior to installation of any wallboard. Additional inspections may be needed based on extent of the project. Review with your inspector during the first inspection the requirements for your project. The final inspection should be scheduled after all the work is completed. For each inspection, the Permit Card with the Energy Compliance Report forms completely filled and out attached, and the Approved Job Copy of the Drawings (if any) must be presented to the inspector. Permits expire 180 days after the last passed inspection.

10. QUESTIONS:

- ❑ If you have any questions regarding your project contact the Building & Safety Department at (408) 586-3240.

Mandatory Measures Summary MF-1R

Residential

Site Address:	Enforcement Agency:	Date:

NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

DESCRIPTION

Building Envelope Measures:

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

Fireplaces, Decorative Gas Appliances and Gas Log Measures:

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

Space Conditioning, Water Heating and Plumbing System Measures:

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines),and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

Site Address:	Enforcement Agency:	Date:

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

Ducts and Fans Measures:

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

Pool and Spa Heating Systems and Equipment Measures:

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

Residential Lighting Measures:

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy.

EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft^2 or 100 watts for dwelling units larger than 2,500 ft^2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119. EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupant sensor.
§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luimnaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.
§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the lumiunaire is airtight with air leakage less then 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.
§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.
§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).
§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146
§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

INSTALLATION CERTIFICATE		CF-6R-LTG-01
Residential Lighting		**(Page 1 of 3)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

1. Kitchen Lighting

Does project include kitchen lighting?

☐ Yes, complete section 1 ☐ No, go on to section 2
☐ Yes §150(k)3: The wattage of permanently installed luminaires (lighting fixtures) has been determined as specified by §130(d).
☐ Yes ☐ No §150(k)3: In the kitchen, are there electrical boxes finished with a blank cover or where no electrical equipment has been installed, and where the electrical box can be used for a luminaire or a surface mounted ceiling fan? If yes, the following row must also be yes:
☐ Yes ☐ NA Wattage has been calculated as 180 watts of low efficacy lighting per blank electrical box.

§150(k)8 Kitchen Lighting must comply with either method (a), (b), or (c) below:

(a) All high efficacy luminaires

☐ Yes, complies because only high efficacy luminaires have been installed in the kitchen.
☐ No, complies with method (b) or (c).

(b) ≥ 50% watts used by high efficacy luminaires

☐ Yes, complies because at least 50% of the installed watts are from permanently installed high efficacy luminaires as demonstrated in the table below: Total A ≥ Total B.
☐ No, complies with method (a) or (c).

Fill out the following table if complying with either method (b) or (c).

Table (b)

Luminaire Type	Efficacy High	Efficacy Low	Watts	x	Quantity	=	High Efficacy Watts	or	Low Efficacy Watts
	□	□		x		=		or	
	□	□		x		=		or	
	□	□		x		=		or	
	□	□		x		=		or	
	□	□		x		=		or	
Complies with method (b) if A ≥ B					Total:	A:		≥	B:

(c) Additional Kitchen Low Efficacy Lighting

☐ Yes, complies because the kitchen lighting qualifies for additional low efficacy lighting and as demonstrated in table in (b) (above) and the table in (c) (below) that (A + C) ≥ B
☐ No, complies with method (a) or (b).

Additional kitchen low efficacy lighting is available only if all of the following are true:

☐ Yes. All low efficacy luminaires in the kitchen are controlled by a vacancy sensor Dimmer energy management control system (EMCS) or a multi-scene programmable control system.
☐ Yes. Permanently installed luminaires in garages laundry rooms closets greater than 70 square feet and utility rooms are high efficacy luminaires AND are controlled by a vacancy sensor.

Table (c)

From the Table in (b)		Use 50 W for dwelling units ≤ 2,500 ft^2 Use 100 W for dwelling units > 2,500 ft^2	Add	Yes/No ?
A	B	C	A + C	Is (A+C) ≥ B ?

2. Lighting Internal to Cabinets

Does project includes lighting internal to cabinets?

☐ Yes, complete section 2 ☐ No, go on to section 3
☐ Yes, §150(k)9: Permanently installed lighting internal to cabinets uses ≤ 20 watts of power per linear foot of illuminated cabinet.

3. Installed Devices and Components Have Been Certified to the Energy Commission

Does the project include any of the devices or components listed below? ☐ **Yes, complete section 3** ☐ **No, go on to section 4**

☐ Yes

§119 and §150(k)7(F): Any of the following devices and components which have been installed have been certified to the Energy Commission according to the applicable provisions of §119: All LED lighting systems that are classified as high efficacy, ballasts used in recessed luminaires, vacancy sensors (automatic off/manual on occupant sensors), dimmers, track lighting integral current limiters, and outdoor motion sensors.

4. Lighting Controls Complete section 4

☐ Yes ☐ NA	§150(k)7A: Permanently installed low efficacy luminaires are controlled by switches separate from those controlling high efficacy luminaires.
☐ Yes ☐ NA	§150(k)7B: Exhaust fans with integral lighting systems are switched separately from lighting systems, OR have a lighting system that can be manually turned on and off while allowing the fan to continue to operate for an extended period of time.
☐ Yes ☐ NA	§150(k)7C: All permanently installed luminaires are switched with readily accessible controls that permit the luminaires to be manually switched on and off.
☐ Yes ☐ NA	§150(k)7D: All lighting controls have been installed in accordance with the manufacturer's instructions.
☐ Yes ☐ NA	§150(k)7E: All lighting circuits that are controlled by more than one switch, where a dimmer or vacancy sensor has been installed to comply with §150(k), no controls bypass the dimmer or vacancy sensor functions.

5. Luminaires (Lighting Fixtures)

Does the project include the installation of any luminaires (indoor or outdoor)?

☐ Yes, complete section 5 ☐ No, go on to section 6	
☐ Yes, high efficacy luminaire classification has been determined according to §150(k)1, and low efficacy luminaire classification has been determined according to §150(k)2.	
☐ Yes ☐ NA	§150(k)4: Fluorescent lamps rated 13 watts or greater have an electronic ballasts having an output frequency no less than 20 kHz.
☐ Yes ☐ NA	§150(k)5: Permanently installed night lights, and night lights integral to permanently installed luminaires or exhaust fans, contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and do not contain a line-voltage socket or line voltage lamp holder, OR the night light is rated to consume no more than 5 watts of power and does not contain a medium screw-base socket.
☐ Yes ☐ NA	§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, meet the applicable requirements of §150(k).
☐ Yes ☐ NA	Any electrical box finished with a blank cover or where no electrical equipment has been installed, and where the electrical box can be used for a luminaire or a surface mounted ceiling fan, has been treated as low efficacy luminaires for compliance with §150(k).

Does the project include any luminaires that are recessed into insulated ceilings?

☐ Yes, complete the rest of section 5 ☐ No, go on to section 6
☐ Yes, §150(k)12: Luminaires that are recessed into insulated ceilings meet all of the following conditions:
☐ Yes, are listed, as defined in §101, for zero clearance insulation contact (IC) by UL or other nationally recognized testing/rating laboratory, and
☐ Yes, have labels that certify the luminaires are airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283 (Exhaust fan housings are not required to be certified airtight), and
☐ Yes, are sealed with a gasket or caulk between luminaire housings and the ceiling, and all air leak paths between conditioned and unconditioned spaces have been sealed with a gasket or caulk. (including all exhaust fan housings), and
☐ Yes, allows ballast maintenance and replacement to be readily accessible to building occupants from below the ceiling without requiring the cutting of holes in the ceiling.

6. Indoor Lighting (any indoor room that is not a kitchen)

Does the project include permanently installed luminaires in any room that is not a kitchen?

☐ Yes, complete section 6 ☐ No, go on to section 7	
☐ Yes ☐ NA	§150(k)10: Permanently installed luminaires in bathrooms, garages, laundry rooms, closets > 70 ft^2, and utility rooms are high efficacy luminaires OR are controlled by a vacancy sensor.
☐ Yes ☐ NA	§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms are high efficacy luminaires, OR are controlled by a dimmer switch OR are controlled by a vacancy sensor.

7. Outdoor Lighting

Does the project include any permanently installed outdoor lighting?

☐ Yes, complete section 7 ☐ No, go on to section 8	
☐ Yes ☐ NA	§150(k)13: Luminaires providing outdoor lighting, including outdoor lighting for private patios on low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, and which are permanently mounted to a residential building or to other buildings on the same lot are high efficacy luminaires OR are controlled by a manual on/off switch, plus a motion sensor not having an override or bypass switch that disables the motion sensor, plus one of the following three additional control methods:
	a. A photocontrol that does not have an override or bypass switch that disables the photocontrol; or
	b. An astronomical time clock not having an override or bypass switch that disables the astronomical time clock; or
	c. Energy management controls systems (EMCS) not having an override or bypass switch that allows the luminaire to be always on.
☐ Yes ☐ NA	**Exception 2**: Low efficacy outdoor luminaires used to comply with Exception 1 to §150(k)13 are controlled by an override switch which temporarily bypasses the motion sensing function, and the motion sensor is automatically reactivated within six hours. The luminaire is controlled by a photocontrol, astronomical time clock, or EMCS as required by Exception 1 to §150(k)13.
☐ Yes ☐ NA	**Exception 3**: There are permanently installed luminaires in or around swimming pools, water features, or other locations subject to Article 680 of the California Electric Code which do not need to be high efficacy luminaires.
☐ Yes ☐ NA	§150(k)14: Internally illuminated address signs comply with §148, OR do not contain a screw-base socket and consume no more than 5 watts of power as determined according to §130(d).
☐ Yes ☐ NA	§150(k)15 Lighting for parking lots and carports with a total of 8 or more vehicles per site have lighting that complies with §130,132, 134, and 147. Lighting for parking garages for 8 or more vehicles comply with §130, 131, 134, and 146. If yes, the Nonresidential compliance forms must be submitted

8. Common areas of low-rise residential buildings

Does the project include the installation of any luminaires in common areas of low-rise residential buildings?

☐ Yes, complete section 8 ☐ No, go on to section 9
☐ Yes, §150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires OR are controlled by occupant sensor(s) certified to comply with §119(d).

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):