



# CSD LIWP STANDARDS

FOR

## CARBON MONOXIDE ALARM - DRAFT

Category	Criteria
<b>1. MEASURE</b>	1.1. Carbon monoxide alarm is a device that detects the presence of carbon monoxide gas in order to prevent CO poisoning. 1.2. This measure is conditional and shall only be installed when required by the local jurisdiction in order to close out a permit obtained for the installation of an energy efficiency measure. 1.3. Costs for installed CO alarms shall be included within the costs for the permitted energy efficiency measure. 1.4. The following requirements are in addition to all applicable requirements found in the General Installation Guidelines.
<b>2. LICENSING</b>	2.1. This measure requires a Class B General Building Contractor license for purposes of the LIWP program.
<b>3. FEASIBILITY CRITERIA</b>	3.1. Install this measure when one of the following two conditions exist: a. Required permit is obtained for installation of an energy efficiency measure; <u>OR</u> b. Infiltration reduction measures were installed. c. <u>AND</u> one of the following conditions apply: - No alarm and/or insufficient number of alarms are present to meet minimum protection requirement; <u>OR</u> - Existing CO alarm does not function properly; <u>OR</u> - Existing CO alarm is more than 2 years old based on the date of manufacture; <u>OR</u> - Date of manufacture cannot be determined. 3.2. Do <u>NOT</u> install this measure when: a. There is no permitted work being performed. b. Infiltration reduction measures are not installed. 3.3. If client refuses the alarm, the permitted measure shall <u>not</u> be installed.
<b>4. ADDITIONAL ASSESSMENT CRITERIA</b>	4.1. Existing Alarm in a Required Location a. Assessor shall check for date of manufacture and proper operation. 4.2. Existing Alarm <u>not</u> in a Required Location a. Existing alarm in a non-compliant location shall <u>not</u> be tested or replaced. 4.3. Alarm Maximum Quantity a. CO alarm quantity shall be limited to the minimum number required to protect all areas in accordance with local code.
<b>5. MINIMUM INSTALLATION GUIDELINES</b>	5.1. Measure shall be installed in accordance with manufacturer's instructions and specifications and local building code. 5.2. Installation Requirements a. Alarm manufacturer's original mounting system, battery compartment, and all other alarm components shall <u>not</u> be modified. b. Date of installation shall be written in permanent ink in the space provided on the alarm. c. The alarm manufacturer's original battery shall be used, and the battery compartment shall <u>not</u> be modified.

	<p>d. Alarms shall be secured so they cannot be detached without removing one or more screws.</p> <p>5.3. Prohibited Locations</p> <p>a. All locations specified by the manufacturer.</p>
<b>6. POST-INSTALLATION GUIDELINES</b>	<p>6.1. Operational Checks</p> <p>a. Alarm shall be tested after installation. Alarm shall function properly in accordance with manufacturer's specifications.</p> <p>6.2. Rental Property CO Alarms</p> <p>a. The landlord or property owner shall be given a wrench that will remove the tamper-resistant installation screws.</p>
<b>7. MATERIAL SPECIFICATIONS</b>	<p>7.1. Standard residential CO Alarms shall be:</p> <p>a. Low-level display CO alarm that displays levels as low as 10 PPM.</p> <p>b. UL tested and Listed to latest ANSI/UL 2034 standard.</p> <p>c. Manufactured after August 2009 and on the State Fire Marshal's list of approved products.</p> <p>d. Single-purpose (CO only), battery-powered alarm.</p> <p>e. Electrochemical sensor.</p> <p>f. Audibly alarmed to demonstrate: 1) electrical short or failure, 2) end of sensor life, and 3) low battery life.</p> <p>7.2. Alarm Battery shall be:</p> <p>a. Non-rechargeable, long-life lithium type.</p> <p>b. Non-removable (i.e., Factory installed behind a door secured with tamper-resistant screw OR factory-sealed with soldered connections).</p> <p>7.3. Mounting System: Alarm shall secure to a mounting plate with 1 or more standard screws that extend through the alarm cover and into the mounting plate or wall.</p> <p>7.4. Hardwired-CO Alarms, when required by local code, shall be interconnected to the existing hardwired system.</p>
<b>8. WARRANTY</b>	<p>8.1. Manufacturer Warranty – 5 years</p>



# CSD LIWP STANDARDS FOR HIGH-EFFICIENCY TOILET - DRAFT

Category	Criteria
<b>1. MEASURE</b>	<p>1.1. Installation of a high efficiency toilet replaces existing toilets with a flush volume greater than 1.6 gallons per flush (gpf) to save water when required by the local jurisdiction.</p> <p>1.2. This measure is conditional and shall only be installed when required by the local jurisdiction in order to close out a permit obtained for the installation of an energy efficiency measure.</p> <p>1.3. Costs for installed high-efficiency toilets shall be included within the costs for the permitted energy efficiency measure.</p> <p>1.4. The following requirements are in addition to all applicable requirements found in the General Installation Guidelines.</p>
<b>2. LICENSING</b>	<p>2.1. This measure requires a Class B General Building Contractor or a C-36 Plumbing Contractor license for purposes of the LIWP program.</p>
<b>3. FEASIBILITY CRITERIA</b>	<p>3.1. Install this measure when:</p> <ul style="list-style-type: none"> <li>a. Required permit is obtained for other installation work, <u>AND</u></li> <li>b. The toilet was manufactured prior to 1990, <u>OR</u></li> <li>c. The existing toilet has a flush rate of &gt;1.6 gpf.</li> </ul> <p>3.2. Do <u>NOT</u> install this measure when:</p> <ul style="list-style-type: none"> <li>a. The home was built on or after January 1, 1994, <u>and</u> all toilets in the dwelling have a flush volume ≤1.6 gpf.</li> <li>b. The home is a registered historic site.</li> <li>c. A licensed plumber has certified that, due to the age, unsuitable location, or configuration of the property or its plumbing, toilet replacement with water-conserving plumbing fixtures is not feasible.</li> <li>d. Uneven floor, unstable toilet, or significant damage to/or degraded flooring.</li> </ul> <p>3.3. If client refuses the high-efficiency toilet or toilet replacement is not feasible, the permitted measure shall <u>not</u> be installed.</p>
<b>4. ADDITIONAL ASSESSMENT CRITERIA</b>	<p>4.1. Flush Volume of Existing Toilets</p> <ul style="list-style-type: none"> <li>a. Determine by obtaining visual information from the toilet (stamped gallons-per-flush [gpf] or date/vintage shall be assumed to be correct). <ul style="list-style-type: none"> <li>- Newer, low-volume toilets usually have gpf written on the bowl rim.</li> <li>- Older toilets may have a manufacturing date or gpf stamped inside the tank or on the underside of the lid.</li> </ul> </li> <li>b. Toilets manufactured between 1990 and 1994 typically were between 3.5 to 1.6 gpf rates. <ul style="list-style-type: none"> <li>- For toilets manufactured during this time frame, it is required to measure the actual volume of the tank using the method below.</li> </ul> </li> <li>c. If flush volume cannot be determined by visual inspection, calculate the volume using the method below.</li> <li>d. If the toilet's label is written in liters, convert the liter amount to gallons using this equation: <p style="text-align: center;"><b>Liters x 0.2642 = Gallons</b></p> </li> </ul>

	<p>4.2. Method to Measure Flush Volume</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Tools needed:</b></p> <p>a. A plastic measuring jug with markings to show tenths of a gallon.</p> <p><b>Steps to measure toilet gpf:</b></p> <p>a. Stop water from entering the toilet by turning off the water supply valve <u>or</u> manually securing the filling mechanism in the full-off position.</p> <p>b. Remove from the tank any water-saving device (brick, bag, etc.).</p> <p>c. Mark the water level inside the tank <i>and</i> in the bowl.</p> <p>d. Flush the toilet completely, and ensure no water is entering the tank.</p> <p>e. Measure volume of water required to refill the <u>tank</u>.</p> <ul style="list-style-type: none"> <li>o Use the measuring jug to fill the tank to the pencil mark.</li> <li>o Note how much water was used to refill the tank (Volume A).</li> </ul> <p>f. Measure volume of water required to refill the <u>bowl</u>:</p> <ul style="list-style-type: none"> <li>o Use the measuring jug to fill the bowl to the pencil mark.</li> <li>o Note how much water was used to refill the bowl (Volume B).</li> </ul> <p>g. Add together volumes A and B to calculate toilet flush volume in gpf.</p> <p><b>Return the toilet to normal operation.</b> Refill the tank and confirming flapper is seated properly.</p> </div> <p>4.3. Location Suitability: Check location for conditions that might make the measure <u>not</u> feasible:</p> <p>a. Inadequate anchor bolt distance from rear wall (rough-in).</p> <p>b. Inadequate clearance on sides, above the tank, and to the front.</p> <p>4.4. Mobile Home Installations</p> <p>a. When the waste line is older plastic piping (e.g., polybutylene), it should be evaluated by an experienced plumber to determine if toilet replacement is feasible.</p> <p>b. When existing old plastic piping can safely be used, a transition shall be installed as needed to properly join the new pipe to the old plastic pipe.</p>
<p><b>5. MINIMUM INSTALLATION GUIDELINES</b></p>	<p>5.1. Measure shall be installed in accordance with manufacturer's instructions and specifications and local building code.</p> <p>5.2. Pre-Installation</p> <p>a. Toilet Removal and Preparation</p> <ul style="list-style-type: none"> <li>- Toilet flange and footprint for new toilet shall be cleaned of wax and debris and checked for damage/deterioration that requires repair/replacement.</li> <li>- If toilet flange is too low (per toilet manufacturer's specification), it shall be determined whether a flange extension is needed.</li> </ul> <p>5.3. Flange Replacement</p> <p>a. If toilet flange is damaged /deteriorated too much to secure the toilet properly, it shall be repaired or replaced.</p> <ul style="list-style-type: none"> <li>- When waste pipe is cast iron, remove accessible cast iron and replace with plastic parts.</li> </ul> <p>b. Flange Extension Installation</p> <ul style="list-style-type: none"> <li>- Height of the toilet flange shall be in accord with toilet manufacturer's instructions (typically 1/4-inch above the floor).</li> <li>- A flange extension shall be: <ul style="list-style-type: none"> <li>• Utilized when necessary to achieve the required height.</li> <li>• Properly installed, sealed, and secured.</li> </ul> </li> </ul> <p>5.4. Toilet Installation</p> <p>a. New toilet anchor bolts, washers, nuts, and caps shall be installed.</p> <ul style="list-style-type: none"> <li>- Bolts too long for caps to fit shall be cut to proper length.</li> </ul>

	<ul style="list-style-type: none"> <li>b. Brass open-cap nuts shall be installed over corrosion-resistant washers with properly-filling bolt caps placed over the nuts. A new water shutoff valve shall be installed, when the existing valve is worn, defective, or leaking.</li> <li>c. Toilet tank supply line shall be replaced and be free of leaks.</li> <li>d. The toilet seat shall be installed and secured.</li> </ul>
<b>6. POST-INSTALLATION GUIDELINES</b>	<ul style="list-style-type: none"> <li>6.1. Operational Checks <ul style="list-style-type: none"> <li>a. Tank shall be filled and flushed at least two times.</li> <li>b. All joints shall be checked for water leaks, and tightened for a proper seal.</li> <li>c. Toilet shall be level, solid, and secure.</li> </ul> </li> </ul>
<b>7. MATERIAL SPECIFICATIONS</b>	<ul style="list-style-type: none"> <li>7.1. Toilets shall be: <ul style="list-style-type: none"> <li>a. WaterSense Labeled High-Efficiency Toilet (HET) <ul style="list-style-type: none"> <li>- Single-flush HET with flush volume <math>\leq 1.28</math> gpf</li> <li>- Dual-flush HET with “effective flush volume” <math>\leq 1.28</math> gpf</li> </ul> </li> <li>b. Other Toilet Requirements <ul style="list-style-type: none"> <li>- MAP rating: <math>\geq 350</math> grams</li> <li>- Trapway: Fully glazed, 2” minimum</li> <li>- Bowl Shape: Elongated or round, per availability, client preference, and location dimensions and clearances</li> <li>- Bowl Height: 15” minimum (excluding seat) for standard toilet <ul style="list-style-type: none"> <li>• When ADA compliance is required, vertical distance from the finished floor to the top of the seat shall be a minimum 15” and maximum 19”.</li> <li>• Unit height shall be selected in accordance with client’s physical needs and wishes.</li> </ul> </li> <li>- White in color without specialty features. Client-requested color is allowed if no cost increase is created.</li> </ul> </li> </ul> </li> <li>7.2. Toilet Accessories <ul style="list-style-type: none"> <li>a. Water supply line: braided hose with brass fittings</li> <li>b. Water shutoff valve: conformance with IAPMO and CPC requirements</li> <li>c. Wax Ring with Flange <ul style="list-style-type: none"> <li>- Good quality thick or reinforced wax, with polyethylene flange. <ul style="list-style-type: none"> <li>• Flange not required on a 2<sup>nd</sup> ring placed on top for additional thickness.</li> </ul> </li> <li>- Compliance with Federal Specification TT-P-1536A</li> </ul> </li> <li>d. Replacement Toilet Anchor Bolts, Washers, Nuts <ul style="list-style-type: none"> <li>- Brass bolts: 2-1/4” length by 5/16” diameter minimum</li> <li>- Captive washer included, to secure flange bolt in upright position</li> <li>- Brass open-cap nuts</li> <li>- Corrosion-resistant washers (e.g., stainless steel)</li> </ul> </li> <li>e. Toilet Bolt Caps: plastic or ceramic, color-matched to toilet</li> <li>f. Replacement Plastic Toilet Flanges, Toilet Flange Extensions, and Spacers <ul style="list-style-type: none"> <li>- Compliance with ASME A112.4.3.</li> </ul> </li> </ul> </li> <li>7.3. Toilet Shims <ul style="list-style-type: none"> <li>a. White plastic or other waterproof material for use with toilets</li> <li>b. Snap-off or easy to trim with sharp knife</li> </ul> </li> <li>7.4. Caulk (sealant between toilet base and floor) <ul style="list-style-type: none"> <li>a. Mold-resistant, acrylic latex or equivalent</li> <li>b. Conformance with ASTM C834, C920, or C1311</li> </ul> </li> <li>7.5. Toilet Seat <ul style="list-style-type: none"> <li>a. Thermoplastic or thermoset-types</li> <li>b. No wood seats allowed.</li> </ul> </li> </ul>
<b>8. WARRANTY</b>	<ul style="list-style-type: none"> <li>8.1. Manufacturer Warranty – 3 years</li> </ul>



# CSD LIWP STANDARDS

FOR

## SMOKE ALARM - DRAFT

Category	Criteria
<b>1. MEASURE</b>	1.1. Smoke alarm is a device that senses smoke typically as an indicator of fire. 1.2. This measure is conditional and shall only be installed when required by the local jurisdiction in order to close out a permit obtained for the installation of an energy efficiency measure. 1.3. Costs for installed smoke alarms shall be included within the costs for the permitted energy efficiency measure. 1.4. The following requirements are in addition to all applicable requirements found in the General Installation Guidelines.
<b>2. LICENSING</b>	2.1. This measure requires a Class B General Building Contracting license for purposes of the LIWP program.
<b>3. FEASIBILITY CRITERIA</b>	3.1. Install this measure when: <ul style="list-style-type: none"> <li>a. Required permit is obtained for other installation work; <u>AND</u></li> <li>b. No alarm and/or insufficient number of alarms is present to meet minimum protection requirement; <u>OR</u></li> <li>c. Existing smoke alarm does not function properly; <u>OR</u></li> <li>d. Existing smoke alarm is more than 8 years old based on the date of manufacture; <u>OR</u></li> <li>e. A date of manufacture cannot be determined.</li> </ul> 3.2. Do <u>NOT</u> install this measure when: <ul style="list-style-type: none"> <li>a. There is no permitted work being performed.</li> </ul> 3.3. If client refuses the alarm, the permitted measure shall <u>not</u> be installed.
<b>4. ADDITIONAL ASSESSMENT CRITERIA</b>	4.1. Existing Alarm in a Required Location: <ul style="list-style-type: none"> <li>a. Assessor shall check for date of manufacture and proper operation.</li> </ul> 4.2. Existing Alarm <u>Not</u> in a Required Location: <ul style="list-style-type: none"> <li>a. Existing alarm in a non-compliant location shall <u>not</u> be tested or replaced.</li> </ul> 4.3. Alarm Maximum Quantity: <ul style="list-style-type: none"> <li>a. Smoke alarm quantity shall be limited to the minimum number required to protect all sleeping areas in accordance with by local code.</li> </ul>
<b>5. MINIMUM INSTALLATION GUIDELINES</b>	5.1. Measure shall be installed in accordance with manufacturer's instructions and specifications and local building code. 5.2. Installation Requirements <ul style="list-style-type: none"> <li>a. Alarm manufacturer's original mounting system, battery compartment, and all other alarm components shall <u>not</u> be modified.</li> <li>b. Date of installation shall be written in permanent ink in the space provided on the alarm.</li> <li>c. The alarm manufacturer's original battery shall be used, and the battery compartment shall <u>not</u> be modified.</li> <li>d. Alarms shall be secured so they cannot be detached without removing one or more screws.</li> <li>e. Hard-wired smoke alarms shall only be installed when required by the local jurisdiction, or replacing nonfunctioning existing hard-wired smoke alarms.</li> </ul>

	<p>5.3. Prohibited Locations</p> <p>a. All locations specified by the manufacturer.</p>
<p>6. POST-INSTALLATION GUIDELINES</p>	<p>6.1. Operational Checks</p> <p>a. Alarms shall be tested after installation. Alarm shall function properly in accordance with manufacturer's specifications.</p> <p>6.2. Rental Property Smoke Alarms</p> <p>a. The landlord or property owner shall be given a wrench that will remove the tamper-resistant installation screws.</p>
<p>7. MATERIAL SPECIFICATIONS</p>	<p>7.1. Standard Smoke Alarms shall be:</p> <p>a. Listed to UL 217 and single-purpose (smoke only).</p> <p>b. Photoelectric or Ionization-type.</p> <p>- <u>Note</u>: When the required 20' minimum horizontal distance from an open combustion appliance cannot be met, installation of a <i>photoelectric-type</i> alarm shall reduce the minimum distance to as little as 10'.</p> <p>c. On California State Fire Marshal's list of approved smoke alarms.</p> <p>7.2. Battery-Powered Alarm shall be:</p> <p>a. Non-rechargeable, long-life lithium type.</p> <p>b. Non-removable (i.e. factory-installed behind a door secured with tamper-resistant screw or factory sealed with soldered connections).</p> <p>7.3. Hard-Wired Alarms shall be:</p> <p>a. 120 VAC with a factory pre-installed lithium battery backup.</p> <p>b. Inter-connectable, when required as described in "Interconnected Alarms".</p> <p>7.4. Interconnected Alarms</p> <p>a. If more than one hard-wired alarm is installed, they shall be interconnected, if required by code.</p> <p>b. If multiple hard-wired smoke alarms are present and interconnected, and at least one within the group will be replaced:</p> <p>- The replaced alarm shall be compatible with the existing interconnection system, or</p> <p>- All interconnected smoke alarms shall be replaced when required by the local jurisdiction.</p>
<p>8. WARRANTY</p>	<p>8.1. Manufacturer Warranty – 10 years</p>