

CONTRA COSTA COUNTY
FINDINGS IN SUPPORT OF CHANGES, ADDITIONS, AND DELETIONS
TO STATEWIDE BUILDING STANDARDS CODE

The California Building Standards Commission has adopted and published the 2022 Building Standards Code, which is comprised of the 2022 California Building, Residential, Green Building Standards, Energy, Electrical, Plumbing, Mechanical, and Existing Building Codes. These codes are enforced in Contra Costa County by the Building Inspection Division of the Department of Conservation and Development.

Although these codes apply statewide, Health and Safety Code sections 17958.5 and 18941.5 authorize a local jurisdiction to modify or change these codes and establish more restrictive building standards if the jurisdiction finds that the modifications and changes are reasonably necessary because of local climatic, geological, or topographical conditions. For amendments to the California Green Building Standards Code, local climatic, geological, and topographical conditions include local environmental conditions.

Ordinance No. 2022-35 adopts the statewide codes and amends them to address local conditions. Pursuant to Health and Safety Code section 17958.7, the Contra Costa County Board of Supervisors finds that the more restrictive standards contained in Ordinance No. 2022-35 are reasonably necessary because of the local climatic, geological, and topographic conditions that are described below.

I. Local Conditions

A. Geological and Topographic

1. Seismicity

(a) Conditions

Contra Costa County is located in Seismic Design Categories D and E, which designates very high risk for earthquakes. Buildings and other structures in these zones can experience major seismic damage. Contra Costa County is near numerous earthquake faults including the San Andreas Fault, and all or portions of the Hayward, Calaveras, Concord, Antioch, Mt. Diablo, and other lesser faults. A 4.1 earthquake with its epicenter in Concord occurred in 1958, and a 5.4 earthquake with its epicenter also in Concord occurred in 1955. The Concord and Antioch faults have a potential for a Richter 6 earthquake and the Hayward and Calaveras faults have the potential for a Richter 7 earthquake. Minor tremblers from seismic activity are not uncommon in the area. A study released in 2015 by the Working Group of California Earthquake Probabilities predicts that for

the San Francisco region, the 30-year likelihood of one or more earthquake of 6.7 or larger magnitude is 72%. The purpose of this Working Group is to develop statewide, time-dependent Earthquake Rupture Forecasts for California that use best available science, and are endorsed by the United States Geological Survey, the Southern California Earthquake Center, and the California Geological Survey. Scientists, therefore, believe that an earthquake of a magnitude 6.7 or larger is now slightly more than twice as likely to occur as to not occur in, approximately, the next 30 years.

Interstates 680, 80, 580 and State Route 4 run throughout Contra Costa County. These interstates and state route divide the County into west, south, north and east areas. An overpass or undercrossing collapse would significantly alter the response route and time for responding emergency equipment.

Earthquakes of the magnitude noted above could cause major damage to electrical transmission facilities and to gas and electrical lines in buildings, causing disruption and starting fires throughout the County.

(b) Impact

A major earthquake could severely restrict the response of Contra Costa County Fire Districts and their capability to control fires. When buildings not equipped with earthquake structural support move off their foundations, gas pipes may rupture. Fires may develop from line ruptures and spread from house to house, causing an extreme demand for fire protection resources. The proximity of large areas within the County to fault traces necessitates adopting stricter structural construction standards.

2. Soils

(a) Conditions

The area is replete with various soils, many of which are expansive. Many areas have landslide prone soils and some areas are potentially liquefiable during severe seismic shaking.

Throughout Contra Costa County, the topography and development growth has created a network of older, narrow roads. These roads vary from gravel to asphalt surface and vary in percent of slope, many exceeding 20%. Several of these roads extend up through the winding passageways in the hills providing access to remote, affluent housing subdivisions. The majority of these roads are private with no established maintenance program. During inclement weather, these roads are subject to rock and mudslides, as well as downed trees, obstructing all vehicle traffic. It is anticipated

that during an earthquake, several of these roads would be unpassable preventing fire protection resources from reaching fires caused by gas line ruptures or other sources.

3. Topographic

(a) Conditions

i) Vegetation

Highly combustible dry grass, weeds, and brush are common in the hilly and open space areas adjacent to built-up locations 6 to 8 months of each year. Many of these areas frequently experience wildland fires, which threaten nearby buildings, particularly those with wood roofs, or sidings. This condition can be found throughout Contra Costa County, especially in those developed and developing areas of the County. Earthquake gas fires due to gas line ruptures can ignite grasslands and stress fire district resources.

ii) Surface Features

The arrangement and location of natural and manmade surface features, including hills, creeks, canals, freeways, housing tracts, commercial development, fire stations, streets, and roads, combine to limit feasible response routes for Fire District resources in and to District areas.

iii) Buildings, Landscaping, and Terrain

Many of the newer large buildings and building complexes have building access and landscaping features and designs, which preclude or greatly limit any approach or operational access to them by Fire District vehicles. In addition, the presence of security gates and roads of inadequate width and grades that are too steep for Fire District vehicles adversely affect fire suppression efforts.

When Fire District vehicles cannot gain access to buildings involved with fire, the potential for complete loss is realized. Difficulty reaching a fire site often requires that fire personnel both in numbers and in stamina. Access problems often result in severely delaying, misdirecting or making impossible fire and smoke control efforts. In existing structures where pitched roofs have been built over an existing roof, smoke detectors should be required to warn residents of smoke and fire before the arrival of fire personnel.

(b) Impact

The above local geological and topographical conditions increase the magnitude, exposure, accessibility problems, and fire hazards presented to the County fire resources. Fire following an earthquake has the potential of causing greater loss of life

and damage than the earthquake itself. Most earthquake fires are caused by natural gas line ruptures. Hazardous materials, particularly toxic gases, could pose the greatest threat to the largest number, should a significant seismic event occur. Public safety resources would have to be prioritized to mitigate the greatest threat and may be unavailable for smaller single dwellings that affected or threatened by broken gas lines.

Other variables may intensify the situation:

1. The extent of damage to the water system
2. The extent of isolation due to bridge and/or freeway overpass collapse.
3. The extent of roadway damage and/or amount of debris blocking the roadways.
4. Climatic condition (hot, dry weather with high winds).
5. Time of day will influence the amount of traffic on roadways and could intensify the risk to life during normal business hours.
6. The availability of timely mutual aid or military assistance.
7. The large portion of dwellings with wood shake or shingle coverings (both on the roof diaphragm and sides of the dwellings) could result in conflagrations.
8. The large number of dwellings that slip off their foundations and rupture gas lines and electrical systems resulting in further conflagrations.

More restrictive electric vehicle charging standards, construction and demolition waste recovery requirements, and building electrification requirements would not impact the availability of the County's fire or public safety resources.

B. Climatic

1. Precipitation and Relative Humidity

(a) Conditions

Precipitation ranges from 15 to 24 inches per year with an average of approximately 20 inches per year. 96% of precipitation falls during the months of October through April, and 4% from May through September. May through September is a dry 5-month period each year. Additionally, the area is subject to occasional drought. Relative humidity remains in the middle range most of the time. It ranges from 45 to 65% during spring, summer, and fall, and from 60 to 90% in the winter. It occasionally falls as low as 15%.

(b) Impact

Locally experienced dry periods cause extreme dryness of untreated wood shakes and shingles on buildings and non-irrigated grass, brush and weeds, which are often near buildings with wood roofs and sidings. Such dryness causes these materials to ignite very readily and burn rapidly and intensely. Gas fires due to gas line ruptures can also spark and engulf a single-family residence during these dry periods.

Because of dryness, a rapidly burning gas fire or exterior building fire can quickly transfer to other buildings by means of radiation or flying brands, sparks or embers. A small fire can rapidly grow to a magnitude beyond the control capabilities of the Fire District resulting in an excessive fire loss.

2. Greenhouse Gas Emissions

(a) Conditions

The California Air Resources Board has collected information on emissions from air pollution sources since 1969. This information is periodically compiled by State and local air pollution control agencies to create regional and statewide greenhouse gas emissions inventories. The California greenhouse gas emissions inventory maintains information on various air pollution sources and identifies “transportation” (all on-road vehicles such as automobiles and trucks, and off-road vehicles such as trains, ships, aircraft, and farm equipment) as a primary pollution source. According to the 2019 statewide inventory, the transportation sector remains the largest source of greenhouse gas emissions, accounting for 39.7% of the total greenhouse gas emissions. Emissions from recycling and waste, comprising 2% of the total greenhouse gas emissions, have grown by 20% since 2000, and 96% of that amount is landfill emissions. California adopted land use and transportation policies and mandatory recycling laws to help reduce greenhouse gas emissions by promoting the use of renewable energy sources and reducing landfill disposal.

Contra Costa County also completed a local greenhouse gas emissions inventory as well as a community-wide Climate Action Plan. The County’s Climate Action Plan contains measures reducing greenhouse gas emissions pertaining to renewable fuel vehicles and reducing landfill disposal for the purpose of reducing greenhouse gas emissions.

(b) Impact

More restrictive electric vehicle charging standards, construction and demolition waste recovery requirements, and building electrification requirements would be consistent with the intent of State legislation and County requirements to aggressively implement energy and waste policies designed to ensure success in meeting their greenhouse gas emission reduction and reusable energy and recycling goals.

3. Temperature

(a) Conditions

Temperatures have been recorded as high as 114° F. Average summer highs are in the 75° to 90° range, with average maximums of 105° F in some areas of unincorporated Contra Costa County.

(b) Impact

High temperatures cause rapid fatigue and heat exhaustion of firefighters, thereby reducing their effectiveness and ability to control large building, wildland fires, and fires caused by gas line ruptures.

Another impact from high temperatures is that combustible building material and non-irrigated weeds, grass and brush are preheated, thus causing these materials to ignite more readily and burn more rapidly and intensely. Additionally, the resultant higher temperature of the atmosphere surrounding the materials reduces the effectiveness of the water being applied to the burning materials. This requires that more water be applied, which in turn requires more fire resources in order to control a fire on a hot day. High temperatures directly contribute to the rapid growth of fires to an intensity and magnitude beyond the control capabilities of the Fire Districts in Contra Costa County. The change of temperatures throughout the County between very low and extreme highs contributes to a voltage drop in conductors used for power pole lines. This necessitates that voltage drops be considered.

More restrictive electric vehicle charging standards, construction and demolition waste recovery requirements, and building electrification requirements would not have a negative impact on the temperature conditions within the County.

4. Winds

(a) Conditions

Prevailing winds in many parts of Contra Costa County are from the north or northwest in the afternoons. However, winds are experienced from virtually every direction at one time or another. Velocities can reach 14 mph to 23 mph ranges, gusting to 25 to 35 mph. 40 mph winds are experienced occasionally and winds up to 55 mph have been registered locally. During the winter half of the year, strong, dry, gusty winds from the north move through the area for several days creating extremely dry conditions.

(b) Impact

Winds such as those experienced locally can and do exacerbate fires, both interior and exterior, to burn, and spread rapidly. Fires involving non-irrigated weeds, grass, brush, and fires caused by gas line ruptures can grow to a magnitude and be fanned to an intensity beyond the control capabilities of the fire services very quickly even by relatively moderate winds. When such fires are not controlled; they can extend to nearby buildings, particularly those with untreated wood shakes or shingles.

Winds of the type experienced locally also reduce the effectiveness of exterior water streams used by all Contra Costa County Fire Districts on fires involving large interior areas of buildings, fires which have vented through windows and roofs due to inadequate built-in fire protection and fires involving wood shake and shingle building exteriors. Local winds will continue to be a definite factor toward causing major fire losses to buildings not provided with fire resistive roof and siding materials and buildings with inadequately separated interior areas, or lacking automatic fire protection systems, or lacking proper gas shut-off devices to shut off gas when pipes are ruptured, or lacking proper electrical systems. National statistics frequently cite wind conditions, such as those experienced locally, as a major factor where conflagrations have occurred.

More restrictive electric vehicle charging standards, construction and demolition waste recovery requirements, and building electrification requirements, would not have a negative impact on the wind conditions within the County.

II. Necessity of More Restrictive Standards

Because of the conditions described above, the Contra Costa County Board of Supervisors finds that there are building and fire hazards unique to Contra Costa County that require the more restrictive fire protection, structural and design load requirements, and energy and waste management policies set forth in Ordinance No. 2022-35.

- The ordinance amends the 2022 California Building Code by:
 - Clarifying the reference to electrical vehicle charging for new residential constructions to include both future and fully operational chargers in accordance with local amendments made to the CGBSC. (§74-4.002(b).)
 - Requiring the installation of a smoke detector in each existing flat roof building when a pitched roof is added on top of the existing flat roof, and the solid sheathing of the flat roof is not removed. (§ 74-4.002(c).)
 - Requiring most wood shakes or shingles used for exterior wall covering to be fire treated. (§ 74-4.002(d).)

- Requiring special inspections for concrete compressive strength at certain foundations to be consistent with code requirements for concrete at other locations. (§ 74-4.002(e).)
- Addressing the poor performance of plain concrete structural elements during seismic events. (§ 74-4.002(f), § 74-4.002(h), § 74-4.002(i).)
- Prohibiting placement of reinforcement while the concrete is in a semifluid condition thus increasing quality control during construction. Enhanced quality control is necessary because of seismic considerations. (§ 74-4.002(g).)
- The ordinance amends the 2022 California Residential Code by:
 - Requiring the installation of a smoke detector in each existing flat roof building when a pitched roof is added on top of the existing flat roof, and the solid sheathing of the flat roof is not removed. (§ 74-4.004(c).)
 - Prohibiting the use of gypsum wallboard as braced wall panels in single- and two-family dwellings and accessory structures, and by limiting the use of Portland Cement Plaster braced walls to only one story single- and two-family dwellings, as these materials have performed poorly during recent California seismic events. (§74-4.004(d), and §74-4.004(e).)
- The ordinance amends the 2022 California Green Building Standards Code by:
 - Imposing more restrictive electric vehicle charging standards, as follows:
 - Amending the definition of electric vehicle charging space to include both current and future installations in contrast to the statewide code that includes only future installations in the definition. (§ 74-4.006(a).)
 - For new multi-family buildings:
 - Requiring five percent of the total number of parking spaces (but not less than one space) be fully operational Electric Vehicle Charging Spaces (“EV spaces”) for all multi-family buildings irrespective of the number of units. Statewide code only requires five percent fully operational EV spaces for new multi-family developments with 20 or more units. (§ 74-4.006(d), and § 74-4.006(e).)
 - For new non-residential buildings:
 - Requiring that the number of EV spaces in new construction provide fully operational EVSE exceeding the number required by the statewide code consistent with current local amendments. (§ 74-4.006(i), and § 74-4.006(j).)
 - Imposing more restrictive construction waste reduction, disposal and recycling standards consistent with those presently enforced in the County as follows:
 - Imposing the mandatory restrictions from Chapter 4 of the 2022 CGBSC on certain projects for existing residential buildings, including:
 - Projects that increase the total combined conditioned and unconditioned building area by 5,000 square feet or more. ((§ 74-4.006(b).)
 - Projects that impact 5,000 square feet or more of the total combined conditioned and unconditioned building area. ((§ 74-4.006(b).)
 - Demolition projects when a demolition permit is required, except demolition projects that are necessary to abate a public nuisance. (§ 74-4.006(b), and § 74-

4.006(c).)

- Eliminating the exception from construction waste management requirements for projects solely based on their isolated location from diversion facilities. ((§ 74-4.006(f).)
 - Requiring measuring of all generated debris to ensure that at least 65% is diverted from landfills. (§ 74-4.006(i), and § 74-4.006(o).)
 - Requiring more comprehensive documentation for construction waste management be provided to the enforcing agency and making submittal of the same a prerequisite for scheduling final inspections. (§ 74-4.006(g), and § 74-4.006(m).)
- The amendments to the 2022 California Existing Building Code are not substantive in nature and are limited to administrative provisions for the use and enforcement of this Code, and to be consistent with the administrative provisions of the statewide codes as amended.
 - The ordinance amends the 2022 California Energy Code by:
 - Adding the definition of an all-electric building to mean a building that has no natural gas or propane plumbing within the building, and that uses electricity as its sole source of energy. (§ 74-4.010(b).)
 - Requiring that all newly constructed residential, detached accessory dwelling unit, hotel, office, and retail type buildings that do not have vested rights before June 1, 2022 be all-electric buildings. The statewide code has no mandatory building electrification requirements. (§ 74-4.010(a).)