

DOCKETED

Docket Number:	19-BSTD-06
Project Title:	Local Ordinances Exceeding the 2019 Energy Code
TN #:	231286-5
Document Title:	Berkeley 2019 - Resolution of Findings No 69,170-NS pdf
Description:	N/A
Filer:	Danuta Drozdowicz
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/18/2019 6:00:10 PM
Docketed Date:	12/19/2019

RESOLUTION NO. 69,170-N.S.

ADOPTING FINDINGS AS TO LOCAL CLIMATIC, GEOLOGICAL, AND TOPOGRAPHICAL CONDITIONS, AND COST-EFFECTIVENESS OF LOCAL AMENDMENTS TO THE ENERGY CODE, RENDERING REASONABLY NECESSARY ENUMERATED LOCAL BUILDING STANDARDS THAT ARE MORE STRINGENT THAN THOSE MANDATED BY THE CALIFORNIA BUILDING STANDARDS CODE

BE IT RESOLVED by the City Council of the City of Berkeley as follows:

WHEREAS, the City is proposing to adopt various enumerated changes and modifications to the 2019 California Building Standards Code, California Code of Regulations, Title 24, as set forth below; and

WHEREAS, Health & Safety Code §17958 allows the City to make modifications or changes to the California Building Standards Code and other regulations adopted pursuant to Health & Safety Code §17921(a) which result in more stringent local requirements; and

WHEREAS, Health & Safety Code §17958, §17958.5 and §17958.7 require that such changes be supported by findings made by the governing body that such more stringent local requirements are necessary because of "local climatic, geological, or topographical conditions"; and

WHEREAS, Public Resources Code § 25402.1, Subdivision (h)(2), requires local energy standards to result in the diminution of energy consumption levels compared to the California Building Energy Efficiency Standards, California Code of Regulations, Title 24, Part 6 (Energy Code); and

WHEREAS, California Code of Regulations, Title 24, Part 1, §10-106 and §10-110, establish a process for local governments to apply to the California Energy Commission for a determination that a locally adopted energy standard meets the requirements of Public Resources Code § 25402.1(h)(2); and

WHEREAS, the California Statewide Codes and Standards Program, funded by California utility customers under the auspices of the California Public Utilities Commission and implemented by Pacific Gas & Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company, has provided technical support to Berkeley through identifying cost-effective opportunities for local amendments to the Energy Code (reach code) in Climate Zone 3, where Berkeley is located; and

WHEREAS, the California Statewide Codes and Standards Program, in collaboration with the Building Decarbonization Coalition, and several Community Choice Aggregations (CCAs) including East Bay Community Energy (EBCE), have developed model reach code language on which Berkeley's reach code is based; and

WHEREAS, City Council hereby makes the following additional findings with respect to cost effectiveness of any amendments to the California Building Standards Code, primarily the Energy Code, for which such findings are required:

- A. An August 1, 2019 Low Rise Residential Reach Code Cost Effectiveness Study prepared by Frontier Energy, Inc. and Misti Bruceri & Associates, LLC, for the California Statewide Codes and Standards Program (Exhibit A) used two different metrics to assess cost-effectiveness and found the proposed reach code to be cost-effective; and
- B. A July 25, 2019 Non-residential New Construction Reach Code Cost Effectiveness Study prepared by TRC Advanced Energy and Energy Soft, for the California Statewide Codes and Standards Program (Exhibit C) further documents the cost-effective combinations of measures of the proposed reach code that exceed the state’s minimum requirements and were found to be cost-effective; and
- C. The proposed amendments to the Energy Code (reach code) in the Ordinance associated with this Resolution are cost-effective; and
- D. These amendments to the Energy Code require buildings to achieve increased energy reductions; and

WHEREAS, City Council finds that the Ordinance associated with this Resolution is exempt from the California Environmental Quality Act codified in California Public Resources Code section 21000 et seq. (CEQA), pursuant to Subdivision (b)(3) of Section 15061 of the CEQA Guidelines, codified in Title 14 of the California Code of Regulations, because its standards are more stringent than the 2019 Energy Code, there are no reasonably foreseeable adverse impacts, and there is no possibility that the activity in question may have a significant impact on the environment; and

WHEREAS, pursuant to Public Resources Code § 25402.1(h)2 and California Administrative Code § 10-106, the City shall submit this Resolution and its associated Ordinance to the California Energy Commission for approval; and

WHEREAS, such findings must be made available as a public record and a copy thereof with each such modification or change shall be filed with the California Building Standards Commission:

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that it finds that each of the various proposed changes or modifications to the California Building Standards Code which are listed enumerated below are reasonably necessary because of local conditions in the area encompassed by the City of Berkeley, as set forth below:

A. LOCAL CONDITIONS

1. Climatic Conditions

a. Discussion

The City of Berkeley is located at the geographic center of the Bay Area. The western limits are defined by the Bay at near sea level and the eastern limits by the abruptly rising Berkeley Hills to 1,200 feet. The eastern limit faces open parklands and open space (covered with vegetative fuel loading) to the east and is exposed to a unique danger from wild land fires during periods of hot, dry weather in the summer months. Many of the Berkeley homes in this area have wood shake and shingle roofs and are surrounded by brush type vegetation. The situation is made even worse by the negative effects of high wind conditions during the fire season. During May to October, critical climatic fire conditions occur where the temperature is greater than 80°F, the wind speed is greater than 15 mph, fuel moisture is less than or equal to 10.0 percent, wind direction is from north to the east-southeast and the ignition component is 65 or greater. These conditions occur more frequently during the fire season but this does not preclude the possibility that a serious fire could occur during other months of the year. The critical climate fire conditions create a situation conducive to rapidly moving, high intensity fires. Fires starting in the wild land areas along the easterly border are likely to move rapidly westward into Berkeley's urban areas.

In September 1923, critical climatic fire conditions were in effect and Berkeley sustained one of the most devastating fires in California's history. A fire swept over the range of the hills to the northeast of Berkeley and within two hours was attacking houses within the City limits. A total of 130 acres of built-up territory burned. 584 Berkeley buildings were wholly destroyed and about 30 others seriously damaged. By far the greater portion were single-family dwellings, but among the number were 63 apartments, 13 fraternity, sorority and students' house clubs and 6 hotels and boarding houses.

In December of 1980, during critical climatic fire conditions, a small fire started at Berkeley's northeast limits and within minutes five homes were totally destroyed by fire.

On October 20, 1991, a disastrous firestorm swept down from the Oakland hills. Within the first few hours, thousands of people were evacuated. Ultimately over 3,000 dwelling units were destroyed, of which more than 70 were in Berkeley. This fire matched the pattern established by the fires of 1923 and 1980. Additionally, the conditions that led to it were the same as the conditions that led to a 1970 fire that destroyed 70 homes in Oakland.

Berkeley frequently experiences cold winter days with accompanying temperature inversions which trap wood smoke near the ground and increase air pollution. These stagnant air days are marked by increased acute respiratory disease, including asthma, and a small but consistent increase in deaths from heart and lung disease. During these periods the usual onshore flow of clean marine air ceases and wood smoke air pollution becomes an area-wide phenomena. Studies by the Bay Area Air Quality Management District suggest that between 20 and 50% of air polluting small particles come from residential wood burning.

In addition, local surface winds frequently transport moisture laden air from the surface of the Bay waters into the City. Larger scale prevailing weather patterns and winds created by the jet stream from the west also transport highly humid air and storms across the Pacific Ocean through the strait between the San Francisco peninsula and the Marin Headlands straddled by Golden Gate Bridge and into the City. The moderating effect of

the Bay waters on local temperatures tends to reduce local temperature extremes, even during periods of high inland temperatures. The combination of moist air from adjacent waters and the associated mild temperatures means that it is common for local weather conditions to hover near the dew point. This can result in the formation of fog associated with local and regional marine weather layers, which commonly cover the City for hours or even days at a time with an average morning relative humidity of 82 percent.

Much of Northern California is considered to possess a predominantly Mediterranean climate. At times Berkeley does experience periods of high temperature and/or low humidity particularly between mid-July and mid-October, when the danger of hillside fires is greatest. Throughout the rest of the year, the marine weather environment is characterized by higher humidity and lower overall prevailing temperatures, resulting in a higher overall moisture content in building construction materials and slower drying of building materials and assemblies once wet or humidified.

Scientific evidence has established that natural gas combustion, procurement and transportation produce significant greenhouse gas emissions that contribute to global warming and climate change. Human activities releasing greenhouse gases into the atmosphere cause increases in worldwide average temperature; which contribute to melting of glaciers and thermal expansion of ocean water, drought conditions, increase in vegetative fuel, and length of fire seasons. As a coastal city located on the San Francisco Bay, Berkeley is experiencing the repercussions of climate change due excessive greenhouse gas emissions. Rising sea levels have caused significant coastal erosion and have increased impacts to infrastructure during extreme tides.

Scientific evidence also suggests storms are growing with higher intensity due to climate change and will be followed by an increased frequency of dry periods. By 2100, average temperatures in the San Francisco Bay Area is expected to increase up to 11°, bringing 6-10 additional heat waves to Berkeley each year. According to historical records, Bay Area sea level has risen 8 inches over the last century and the pace of sea level rise has increased since 2011. While regional variability exists, the median increase for San Francisco Bay is expected to reach almost 1 ft by 2050¹ under a low risk model, while 2.7 ft is projected under an extreme risk scenario Such climate change events are expected to increase the risk of flooding in low-lying areas of Berkeley, while hillside communities face increased risk of wildfires.

b. Summary

Local climatic conditions of periods of limited rainfall, high temperature and/or low humidity particularly between mid-July and mid-October, and high winds along with existing building construction create periodic extremely hazardous fire conditions that adversely affect the acceleration intensity and size of fires in the City. The same climatic conditions may result in the concurrent occurrence of one or more fires, which may spread in the more populated areas of the City without adequate fire department personnel to

¹ Griggs, G., Cayan, D., Tebaldi, C., Fricker, H., & Árvai, J. (2017). Rising Seas in California. California Ocean Science Trust, (April), 71. Retrieved from <http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf>

protect against and control such a situation. Throughout the rest of the year, the marine weather environment is characterized by higher humidity and lower overall prevailing temperatures, resulting in a higher overall moisture content in building construction materials and slower drying of building materials and assemblies once wet or humidified. Berkeley is susceptible to the impacts of climate change, including sea level rise, increased average temperatures, and reduced air quality.

2. Geological Conditions.

a. Discussion

The City of Berkeley is in a region of high seismic activity and is traversed by the Hayward fault. It has the San Andreas earthquake fault to the west and the Calaveras earthquake fault to the east. All three faults are known to be active as evidenced by the damaging earthquakes they have produced in the last 100 years and can, therefore, be expected to do the same in the future. Of primary concern to Berkeley is the Hayward Fault, which has been estimated to be capable of earthquakes exceeding a magnitude of 7.0 on the Richter scale. It extends through many residential areas and passes through a small business district and the University of California. A large number of underground utilities cross the fault, including major water supply and natural gas lines. Intensified damage during an earthquake may be expected in those areas of poorer ground along the Bay, west of Interstate 80 and in known slide areas, as well as hillside areas (occupied mainly by dwellings) located within or near the fault zone; some areas are steep and have been subjected to slides.

The waterfront areas and areas in the Berkeley flatlands immediately adjacent to creeks and water streams present a major potential for soil liquefaction hazard. The Eastshore Freeway may liquefy and fail under heavy shaking or it may be inundated by a tsunami. The north hill area is most susceptible to landslides because of the presence of soft and unconsolidated sediments, extensive water content in the ground and the steepness of slopes.

Great potential damage can be related to the likely collapse of freeway overpasses. In the event of a major earthquake, Berkeley's firefighting capability could be greatly affected by loss of its main water supply. There is also the strong possibility of inundation due to failure of water reservoirs in the hill area. Summit Reservoir at the Kensington border in Berkeley and Berryman Reservoir North have recently been replaced by steel tanks. Berryman Reservoir South has received a seismic upgrade. Additional potential situations following an earthquake include broken natural gas mains and ensuing fire in the streets, building fires, as the result of broken service connections, the need for rescues for collapsed structures, and the rendering of first aid and other medical attention to a large number of people.

b. Summary

Local geological conditions include high seismic activity and large concentrations of residential type buildings as well as a major freeway. Since the City of Berkeley is located in a densely populated area having buildings and structures constructed over

and near a vast array of fault systems capable of producing major earthquakes, the modifications cited herein are intended to better limit property damage as a result of a seismic activity and to establish criteria for repair of damaged properties following a local emergency.

3. Topographical Conditions.

a. Discussion

The City of Berkeley has many homes built throughout the urban portion of the Berkeley Hills that are reached by narrow and often winding paved streets which hamper access for fire apparatus and escape routes for residents. In addition, many of the hillside homes are on the extreme eastern edge of the City and require longer response times for the total required firefighting force. Panoramic Way and other hill areas with narrow and winding streets may face the problem of isolation from the rest of the City.

In the areas north and south of the University of California, there are large concentrations of apartments, rooming houses, and fraternity and sorority houses. A number of apartments in these areas are of wood frame construction and are up to five stories in height from grade level. The fire potential is moderately high due to building congestion, heights, and wood shingle roof coverings and siding. Fires can be expected to involve large groups of buildings in these areas. It is noted that Berkeley most probably has more physically impaired people per capita than any other community in the United States. It is estimated that 14% of the approximate population of 112,580 per 2010 Census in Berkeley are physically impaired. Emergency egress and rescue for these people are more difficult during a fire or other life safety emergency.

The Eastshore Freeway, running along the western edge of Berkeley, is one of the most heavily used and congested freeway sections in the state. Noted impacts have been increased rates of asthma, particularly among children. The proximity of Berkeley to this freeway and its location downwind from prevailing patterns negatively affects air quality, thus increasing the impact of wood smoke in Berkeley.

Part of the Pacific Coast Range, the Berkeley Hills, define the eastern boundary of the City and form a natural obstruction to the movement of humidified, cooler air out of the San Francisco Bay basin and the City of Berkeley into the dryer adjacent inland valleys and the interior of the State. Although these hills do not form an absolute air barrier, they do play a significant role in the creation of local microclimates. This effect is evidenced by the disparity in temperatures and relative humidity commonly experienced during periods of warm weather between communities adjacent to the San Francisco Bay / Pacific Ocean and communities in the Bay Area inland valleys only a few miles inland.

The City of Berkeley is part of a densely populated metropolitan area with limited space for landfills. It is important to preserve the limited landfill space for materials which cannot be diverted and to keep land-clearing debris out of landfills, where decomposition of such organic material would result in methane.

b. Summary

Local topographical conditions include hillside housing with many narrow and winding streets with slide potential for blockage in the abruptly rising Berkeley hills. These conditions create an extremely serious problem for the Fire Department when a major fire or earthquake occurs. Many situations will result in limiting or total blockage of fire department emergency vehicular traffic, overtaxed fire department personnel and a total lack of resources for the suppression of fire in buildings and structures in the City of Berkeley. In addition, under these local conditions, the presence of wood smoke can cause increased disease, including asthma, and increased deaths from heart and lung disease. The built environment also provides little space for landfills.

B. REASONABLE NECESSITY

The proposed changes and modifications to the California Building Standards Code are reasonably necessary due to the local conditions set forth above because they reduce the risks to life, public safety, health, welfare and property which result from the City's changing climate and location astride an active earthquake fault. They are further justified for the reasons set forth below.

In adopting the California Building Standards Code as the Berkeley Building Codes, the City proposes to make certain substantive modifications whose effect is to impose more stringent requirements locally than are mandated by the California Building Standards Code. These are:

- (1) Building standards relating to increased fire resistance in Fire Zones 2 and 3 (Berkeley Building Code Chapter 19.28 Article 2, Berkeley Residential Code Chapter 19.29 Section 19.29.050);
- (2) Standards to reduce the health risk caused by wood smoke under the climatic conditions of Berkeley (Berkeley Building Code Chapter 19.28 Article 3);
- (3) Building standards for retrofit of certain existing building types with seismic weaknesses (Berkeley Building Code Chapter 19.28 Article 5);
- (4) Standards for repair of existing buildings (Berkeley Building Code Chapter 19.28, Article 6);
- (5) Provisions requiring retrofitting of unreinforced masonry buildings (Berkeley Building Code Chapter 19.28 Article 6 and Berkeley Municipal Code Chapter 19.38);
- (6) Provisions requiring retrofitting of soft, weak, or open front buildings (Berkeley Building Code Chapter 19.28 Article 6 and Berkeley Municipal Code Chapter 19.39);
- (7) Various technical amendments to structural standards (Berkeley Building Code Chapter 19.28 Article 7, Berkeley Residential Code Chapter 19.29 Section 19.29.060);

- (8) Building standards for construction of exterior elevated elements (E3) to resist moisture intrusion (Berkeley Building Code Chapter 19.28 Article 8);
- (9) Building standards for emergency housing during the declaration of a shelter crisis (Berkeley Building Code Chapter 19.28 Article 9);
- (10) Provisions requiring range hood ventilation in residential dwelling units (Berkeley Mechanical Code Chapter 19.32 Section 19.32.040);
- (11) Provisions requiring installation of automatic gas shut-off valves (Berkeley Plumbing Code Chapter 19.34 Section 19.34.040);
- (12) Energy standards that provide all-electric and energy efficient mixed fuel pathways for new construction, require solar photovoltaics on new nonresidential buildings, and require electric readiness on mixed fuel buildings (Berkeley Energy Code Chapter 19.36 Section 19.36.040);
- (13) Provisions increasing and expanding the applicability of construction and demolition waste diversion requirements (Berkeley Green Code Chapter 19.37 Section 19.37.040);
- (14) Provisions to reduce the cement content in construction concrete mix designs (Berkeley Green Code Chapter 19.37 Section 19.37.040); and
- (15) Provisions for electric vehicle charging requirements in new residential and nonresidential buildings. (Berkeley Green Code Chapter 19.37 Section 19.37.040).

These more stringent local requirements are reasonably necessary to address risks created by local conditions set forth above for the following reasons:

- The modifications made by Chapter 19.28 Article 2, and Chapter 19.29 Section 19.29.050 reduce the risk to life and property created by wildfires in the hillside areas of the City.
- The modifications made by Chapter 19.28 Article 3, and Chapter 19.32 Section 19.32.040 reduce the risk to public safety created by air pollution throughout the City.
- The modifications made by Chapter 19.28 Article 5, Article 6, Article 7, Chapter 19.29 Section 19.29.060, Chapter 19.34 Section 19.34.040, Chapters 19.38 and 19.39 reduce the risk to life and property and hasten recovery from predictable future natural disasters.
- The modifications made by Chapter 19.28, Article 8, reduce the risk to life and property resulting from the effect of the City's climate and topography on exterior building construction features and materials.
- The modifications made by Chapter 19.36 Section 19.36.040 reduce the risk to public health and welfare resulting from the City's development and its effect on climate change by increasing decarbonization in new construction and reducing natural gas infrastructure, thus mitigating the impacts of climate change.

- The modifications made by Chapter 19.37 improve public health, safety and welfare by preserving the limited landfill space for materials which cannot be diverted resulting from the effect of local topography with limited space for landfills, and mitigating the impacts of climate change.
- The modifications made by Chapter 19.37.040 Section 19.37.040 support the City's decarbonization efforts by reducing the embodied emissions associated with the production of concrete, thus mitigating the impacts of climate change.
- The modifications made by Chapter 19.37 Section 19.37.040 support the City's decarbonization efforts by increasing electric vehicle charging infrastructure in both residential and nonresidential buildings, thus mitigating the impacts of climate change.

BE IT FURTHER RESOLVED that certain local amendments to the Codes are not more stringent than the provisions of the California Codes but rather cover matters not addressed by those Codes or are administrative in nature and do not modify building standards pursuant to Health & Safety Code §17958, §17958.5 and §17958.7. These amendments establish administrative regulations for the effective enforcement of building standards throughout the City of Berkeley as follows:

Chapter 19.28, Article 1 (Administrative provisions and definitions) and Article 4 (Construction in the Right of Way) and Administrative amendments to Chapter 19.29 (California Residential Code), to Chapter 19.30 (California Electrical Code), to Chapter 19.32 (California Mechanical Code), to Chapter 19.34 (California Plumbing Code), to Chapter 19.36 (California Energy Code) and to Chapter 19.37 (California Green Building Standards Code) are local amendments to the California Codes affecting administration provisions only.

BE IT FURTHER RESOLVED that this Resolution shall go into effect on January 1, 2020.

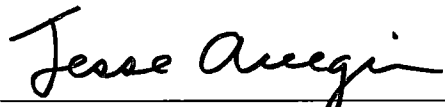
BE IT FURTHER RESOLVED that Resolution No. 67,736-N.S. is hereby rescinded effective January 1, 2020.

The foregoing Resolution was adopted by the Berkeley City Council on November 12, 2019 by the following vote:

Ayes: Bartlett, Davila, Droste, Hahn, Harrison, Kesarwani, Robinson, Wengraf, and Arreguin.

Noes: None.

Absent: None.



Jesse Arreguin, Mayor

Attest: 

Mark Numainville, City Clerk