



Office of the City Manager

CONSENT CALENDAR  
September 16, 2025

To: Honorable Mayor and Members of the City Council  
From: Paul Buddenhagen, City Manager  
Submitted by: David Sprague, Fire Chief  
Subject: Updated Findings of Facts Associated with Berkeley Fire Code

RECOMMENDATION

Adopt a Resolution revised with updated Findings of Facts associated with the Council's June 17, 2025, adoption of the Fire Code, and rescind Resolution No. 71,710-N.S.

FISCAL IMPACTS OF RECOMMENDATION

There is no fiscal impact of passing this resolution.

CURRENT SITUATION AND ITS EFFECTS

The Berkeley Fire Department filed the Berkeley Fire Code, Ordinance No. 7,959-N.S. after it was adopted by City Council on June 17, 2025, with the California Building Standards Commission.

The California Building Standards Commission has requested several minor alterations to the Findings of Fact that is associated with the adoption of the code that occurred on June 17, 2025. These minor administrative alterations do not change the interpretation of the fire code as adopted by Council.

BACKGROUND

The California Building Standards Commission reviews municipally adopted fire codes to ensure they align with the state's comprehensive building standards and maintain uniformity across jurisdictions. While cities and counties in California are permitted to adopt more restrictive local amendments to the California Fire Code, those amendments must be based on specific local climatic, geological, or topographical conditions that create unique fire safety risks. The California Building Standards Commission's review process helps verify that these local codes do not conflict with state laws, exceed legal authority, or create unnecessary inconsistencies that could hinder statewide enforcement and compliance.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

No impact.

RATIONALE FOR RECOMMENDATION

The California Building Standards Commission (CBSC) requires these modifications.

ALTERNATIVE ACTIONS CONSIDERED

None.

CONTACT PERSON

David Sprague, Fire Chief, (510) 981-3473

Attachments:

- 1: Findings as to Local Climatic, Geological and Topographical Conditions (Tracked Changes)
- 2: Findings as to Local Climatic, Geological and Topographical Conditions (Final Document with Accepted Changes)

RESOLUTION NO. ##,#### - N.S.

ADOPTING FINDINGS AS TO LOCAL CLIMATIC, GEOLOGICAL AND TOPOGRAPHICAL CONDITIONS RENDERING REASONABLY NECESSARY VARIOUS ENUMERATED LOCAL FIRE STANDARDS THAT ARE MORE STRINGENT THAN THOSE MANDATED BY THE CALIFORNIA FIRE CODE AND ~~RESCINDING~~ AMENDING RESOLUTION NO. ~~71,71070,611~~—N.S.

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

WHEREAS, the City is proposing to adopt various enumerated changes and modifications to the California Fire Code, as set forth below; and

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

WHEREAS, Health & Safety Code §17925, §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 or factors”; 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 City Council that it finds that each of the various proposed changes or modifications to the California Fire Code which are enumerated below are reasonably necessary because of local conditions in the area encompassed by the City of Berkeley, as set forth below:

**1. LOCAL CONDITIONS**

a. Climatic Conditions

i. 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 wildland 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, wind speed is greater than 15 mph, fuel moisture is less than or equal to 10 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 wildland 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 September 1970, during critical climatic fire conditions characterized by hot, dry winds out of the northeast, a fire started along Fish Ranch Road and Grizzly Peak. This fire rapidly spread into the surrounding neighborhoods of Oakland and Berkeley, burning 400 acres and destroying 37 homes. An additional 18 homes were badly damaged before the fire was brought under control.
- 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 37 homes in Berkeley and Oakland.

ii. Summary.

Local climatic conditions of limited rainfall, low humidity, high temperatures and high winds along with existing building construction create 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 protect against and control such a situation.

b. Geological Conditions.

i. 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 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. The replacement of Summit Reservoir at the Kensington border in Berkeley was completed in December 2018. Berryman Reservoir North has been demolished and replaced by a steel tank in 2012. Berryman Reservoir South has received a seismic upgrade. Additional potential situations following an earthquake include broken natural gas mains and ensuing fires in the streets; building fires, as the result of broken service connections; trapped occupants in collapsed structures; and rendering of first aid and other medical attention to a large number of people.

#### ii. 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 life safety hazards and property damage as a result of a seismic activity.

#### c. Topographical Conditions.

##### i. 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 Highway, 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.

d. 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.

**2. REASONABLE NECESSITY**

The proposed changes and modifications to the California Fire Code are reasonably necessary due to the local climatic, geological and topographical conditions set forth above. They are further justified for the reasons set forth below.

In adopting the California Fire Code as the Berkeley Fire Code, the City proposes to make certain substantive modifications whose effect is to impose more stringent requirements locally than are mandated by the California Fire Code. These are specifically listed below, but may be generally characterized as relating to: the preservation of building and roof accessibility and emergency egress; maintenance of building compartmentation using fusible links; amendment of automatic sprinkler requirements; amendment of fire alarm system requirements; amendment of fire flow requirements; requirements for high-rise air supply and the regulation of hazards including hazardous materials, Wildland-Urban Interface management, temporary assembly attractions, fireworks and explosives. These more stringent local requirements are reasonably necessary to address risks created by local conditions set forth above for the following reasons:

1. Section 105.6.26 (Window bars, operational constraints and opening control devices) is a local amendment which regulates window bars or other opening control devices that impose operational constraints on emergency escape and rescue openings. This amendment does not impose more stringent requirements on the devices or equipment than is set forth in Section 1031.2.1 of this code, but it does impose the requirement that a fire department permit be obtained prior to the installation of such

equipment. Section 1031.2.1 of this code contains detailed requirements for the installation conditions of this equipment yet the California Fire Code provides no mechanism to verify that the code requirements are being met. This provision is adopted due to Berkeley's increased local geological risk of earthquakes and the likelihood that exterior escape and rescue openings may be needed by occupants to evacuate buildings.

2. Section 503 (Fire apparatus access roads) and Appendix D (Fire apparatus access roads) are adopted in their entirety as local code amendments. They are adopted due to: local geological conditions of severe earthquake potential which may result in landslides and the collapse of "built-environment" features which may block access roads; local topographical conditions including narrow streets and steep hills which slow and hinder emergency response and evacuation; and local climatic conditions including the need for rapid, unhindered citizen evacuation from and emergency responder access into wildfire prone areas of the City.
3. Section 504.1.1 (Marking of Exterior Building Openings) is added due to local topographical conditions which promote multi-story and on-slope construction to maximize buildable space within the City. The limited space available for development encourages developers and designers to crowd exterior openings into limited available space, often resulting in groups of building openings without any obvious cues for firefighters as to the area(s) served within the building or the purpose of the openings. This amendment is intended to inform firefighters as to the area served and/or purpose of an exterior opening and therefore reduce the amount of time firefighters may spend searching for or forcing entry into otherwise unmarked doorways.
4. Section 705.2.5 (Smoke- and heat-activated doors) is amended due to the increased risks caused by fires resulting from earthquakes and proximity to the wildland-interface. These risks, which are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. This amendment will maintain the fire and smoke separation requirements and prevent spread of smoke and fire in apartments, boarding houses, and congregate living spaces.
5. Sections 903.2.10.1, 903.2.11.1, 903.2.11.2, 903.2.22, 903.2.23, 903.3.1.2, 903.3.9 and 1103.5, 1103.5.6, 1103.5.6.1, 1103.5.6.2, 1103.5.6.3 (Fire Sprinkler Systems) are amended due to the increased risks caused by fires resulting from earthquakes and proximity to the wildland-interface. These risks, which are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. Automatic fire sprinkler systems significantly reduce the loss of life and fire spread with early suppression and control of a fire. Additionally, these amendments will maintain the standards established in 1992 after the 1990 fraternity fire and 1991 Berkeley Oakland firestorm.
6. Amendments and additions to Sections 907.2, 907.2.1, 907.2.2, 907.2.4, 907.2.7, 907.2.8.1, 907.2.8.2, 907.2.9.1 and 1103.7, 1103.7.5.1, 1103.7.6, and 1103.7.10 (Fire Alarm Systems) are amended due to the increased risks caused by fires

resulting from earthquakes and proximity to the wildland-interface. These risks, which are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. Automatic fire alarm systems significantly reduce the loss of life and fire spread with early detection and notification of firefighting personnel. Additionally, these amendments will maintain the standards adopted in 1998 as part of the Berkeley Fire Code.

7. Section 914.3.9 ["Fire Fighter Air Replenishment Systems"], Appendix Chapter L ["Requirements for Fire Fighter Air Replenishment Systems" in its entirety as amended), Section L104.5.1 ["Stored pressure air supply" as amended], Section 105.5.57 [operational permit to maintain a "firefighter air replenishment system (FARS)"] and Section 105.6.25 [construction permit to install or modify "Firefighter air replenishment system(FARS)"] are added due to the local geological condition of severe risk of earthquake and ensuing fires. Fire Fighter Air Replenishment Systems are intended to maximize the operational efficiency of available firefighting forces, and to reduce the impacts of high-rise fire incidents on limited firefighting forces that may already be challenged by the aftermath of a major seismic event. Additionally, these amendments will maintain the standards adopted in 2002 as part of the Berkeley Fire Code to require air supply systems for firefighting operations. The proposed code adoption recognizes Appendix Chapter L of the International Fire Code as the standard for the design, installation, testing and maintenance of such a system. It provides potential owners, designers and installers with a standard that they may refer to in order to better understand a type of system that many may not be familiar with.
8. Section ~~49124914~~.12 (Incinerators and Fireplaces), is created which mandates that certain potential ignition sources within Wildland-Urban Interface (WUI) fire areas such as incinerators, outdoor fireplaces, fire pits, permanent barbecues and grills shall not be constructed without prior approval of the fire code official. Also, continued use of such constructed equipment (termed 'maintained' in the fire code ordinance) is prohibited unless the equipment is maintained in good repair and safe condition at all times. This section and Section 4912.5 (Spark Arresters) also ~~require~~requires that such equipment be provided with appropriate spark arrestors, similar to the requirements in the Berkeley Building Code for fixed mechanical equipment associated with structures and regulated under the Berkeley Building Code. This added section requires fire department approval, spark arresters and maintenance of this equipment due to steep topography and Mediterranean climatic conditions. These conditions result in a large wildland-interface fire area which has a history of large, catastrophic fires.
9. Section 5704.2.11.1.1 (Restrictions on underground storage tanks), Section 5704.2.13.1.4 (Tanks abandoned in place), Section 5704.2.14 (Removal and disposal of tanks) and section 6104.1.12 (Restrictions on storage of LP-gas containers) of the Berkeley Fire Code are local amendments to the California Fire Code. These subsections are necessitated by local topographical conditions including the dense population of residential dwellings throughout the City; the narrow winding streets of the hazardous hill area; and the presence of a major

transportation system underground (BART with its surge chambers and other openings at the street level in various areas of the city). These factors make it very important for purposes of fire safety to regulate hazardous material storage to ensure that it does not intrude in these areas.

10. Section B105.2 (Appendix B, "Fire Flow Requirements for Buildings", Table B105.2, "Required Fire-Flow For Buildings Other Than One- And Two-Family Dwellings, Group R-3 And R-4 Buildings And Townhouses") is amended due to the geological conditions of the City with its proximity to major earthquake faults. Predictions by the local water utility company are that many water mains will break as the result of a magnitude 6.7 earthquake on the Hayward Fault.
11. Appendix O (Temporary haunted houses, ghost walks and similar amusement uses) is adopted as a local amendment to the California Fire Code and is adopted based on local geological conditions (the potential for severe earthquake with accompanying fire and/or structural collapse) and local topographical conditions including the need to ensure adequate separation of structures and uses in densely developed urban areas. Fire alarm systems (as required in this appendix) are shown to significantly reduce the life safety threat to occupants of structures during fire events. Regulation of these structures and activities ensures that adequate safety provisions have been made for limiting occupancy to safe numbers of guests and for the evacuation of attraction guests in crowded urban environments. Adoption of this appendix also allows for the regulation of related features such as the combustibility of decorations and the management of hazards such as temporary electrical wiring and the use of portable generators.

BE IT FURTHER RESOLVED by the Council of the City of Berkeley that certain local amendments to the codes are not building standards more stringent than the provisions of the California Fire Code but rather cover matters not addressed by those codes as building standards, or are administrative in nature, as follows:

1. Chapter 1 (as amended in Sections 101.1, 102.6, 104.13, 104.14, 105.5.18, 105.5.55, 105.5.56, 105.5.58, 105.5.59, 107.2, 107.4, 111, 111.1, 111.1.1, 111.3, 112.1, 112.4, 114.7, and 114.7.1 provides administrative provisions, an appeal process, and additional clarification and non-building standard permit requirements required to implement the fire code.
2. Chapter 2 as amended in section 202 (Definitions) provides additional definitions required to clarify and implement the local adoption of the fire code.
3. Chapter 3 (General Requirements) is adopted in its entirety. The adopted sections of this chapter impose controls on a wide range of hazards that are not building standards. Hazards addressed include asphalt kettles, combustible waste materials, control of ignition sources, open burning/recreational fires, open flames, powered industrial equipment, smoking, securing of vacant premises, vehicle impact protection, fueled equipment, general storage and hazards to firefighters.
4. Chapter 49 as amended, including Sections 4902.1, ~~Table 4902.1~~, 4903.3, ~~4904.4~~, 4905.2, 4906.5, 4906.5.1, 4906.5.2, 4906.5.2.1, 4906.5.2.2, Table 4906.5.2.2, 4906.5.2.3, Table 4906.5.2.3, 4906.5.3, 4906.5.4, 4906.5.5, 4906.6, 4906.7, 4907.4,

4907.6 provides definitions related to local Wildland-Urban Interface (WUI) fire areas, directs interested parties to appropriate BMC Chapter 19.28 sections (Berkeley Building Code) for building construction requirements in WUI areas, and imposes various non-building standard requirements for the management of vegetation. Administrative Amendments Section 4907.3 and 4907.6 and Ordinance Added Sections 4907.4, 4912, 49124911, 4911.1, 49124911.2, 49124911.3, 4911.3, 4912.3.1, 49124911.3.2, 49124911.3.3.3, 4912, 4911.4, 49124911.5, 4911.6, 49124911.7, 49124911.8, 49124911.9, 49124911.10, 49124911.11, 49124911.13, 49124911.14, 49124911.15, 49124911.16, 49124911.17, and 49124911.18 impose various non-building standard requirements for the preventionsuppression and control of fires in WUI areas.

5. Section 5001.7 (Hazardous Materials Transport Restrictions) is a local amendment to the California Fire Code that restricts the transportation, storage and transfer of hazardous materials but does not create or modify any building standards. It simply imposes additional requirements necessitated by local conditions. This new subsection is necessitated by the dense population of residential dwellings throughout the City; the narrow winding streets of the hazardous hill area; and the presence of a major transportation system underground (BART with its surge chambers and other openings at the street level in various areas of the city). These factors make it very important for purposes of fire safety to regulate hazardous material transportation to ensure that it does not intrude in these areas.
6. Section 5601.1.3 (Fireworks) prohibits (with suitable exceptions) the possession, manufacture, storage, sale, handling and use of fireworks within the jurisdiction (including fireworks classified by the State Fire Marshal as Safe and Sane fireworks). Section 5604.1 (“General” section of 5604, “Explosive and Fireworks”) is modified to prohibit the storage and handling of explosives within the jurisdiction. Both sections are intended to preserve the ban on storage, handling and use of these materials within City limits which have historically been deemed unsafe and inappropriate activities within the jurisdiction.
7. Section 5701.4.1 (Transfer of flammable and combustible liquids) prohibits dispensing of flammable liquids on or from a street or public way and provides administrative provisions, additional clarification and non-building standard approval or permit requirements required to implement the fire code.
8. Appendix E (Hazard Categories) and Appendix F (Hazard Ranking) are local amendments to the California Fire Code related to hazardous materials management. These chapters define the hazard categories and rankings associated with the storage, handling and use of hazardous materials, and provide the qualitative and quantitative rankings used on hazardous materials information signs posted for the benefit of firefighters and other first responders. These hazard categories and rankings are administrative in nature and do not constitute building standards.

BE IT FURTHER RESOLVED, that Resolution No. 71,71069,170–N.S is hereby rescinded.

RESOLUTION NO. ##,#### - N.S.

ADOPTING FINDINGS AS TO LOCAL CLIMATIC, GEOLOGICAL AND TOPOGRAPHICAL CONDITIONS RENDERING REASONABLY NECESSARY VARIOUS ENUMERATED LOCAL FIRE STANDARDS THAT ARE MORE STRINGENT THAN THOSE MANDATED BY THE CALIFORNIA FIRE CODE AND RESCINDING RESOLUTION NO. 71,710–N.S.

WHEREAS, the City is proposing to adopt various enumerated changes and modifications to the California Fire Code, as set forth below; and

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

WHEREAS, Health & Safety Code §17925, §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 or factors”; 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 City Council that it finds that each of the various proposed changes or modifications to the California Fire Code which are enumerated below are reasonably necessary because of local conditions in the area encompassed by the City of Berkeley, as set forth below:

**1. LOCAL CONDITIONS**

a. Climatic Conditions

i. 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 wildland 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, wind speed is greater than 15 mph, fuel moisture is less than or equal to 10 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 wildland 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 September 1970, during critical climatic fire conditions characterized by hot, dry winds out of the northeast, a fire started along Fish Ranch Road and Grizzly Peak. This fire rapidly spread into the surrounding neighborhoods of Oakland and Berkeley, burning 400 acres and destroying 37 homes. An additional 18 homes were badly damaged before the fire was brought under control.
- 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 37 homes in Berkeley and Oakland.

ii. Summary.

Local climatic conditions of limited rainfall, low humidity, high temperatures and high winds along with existing building construction create 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 protect against and control such a situation.

b. Geological Conditions.

i. 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 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. The replacement of Summit Reservoir at the Kensington border in Berkeley was completed in December 2018. Berryman Reservoir North has been demolished and replaced by a steel tank in 2012. Berryman Reservoir South has received a seismic upgrade. Additional potential situations following an earthquake include broken natural gas mains and ensuing fires in the streets; building fires, as the result of broken service connections; trapped occupants in collapsed structures; and rendering of first aid and other medical attention to a large number of people.

#### ii. 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 life safety hazards and property damage as a result of a seismic activity.

#### c. Topographical Conditions.

##### i. 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.

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d. 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.

**2. REASONABLE NECESSITY**

The proposed changes and modifications to the California Fire Code are reasonably necessary due to the local climatic, geological and topographical conditions set forth above. They are further justified for the reasons set forth below.

In adopting the California Fire Code as the Berkeley Fire Code, the City proposes to make certain substantive modifications whose effect is to impose more stringent requirements locally than are mandated by the California Fire Code. These are specifically listed below, but may be generally characterized as relating to: the preservation of building and roof accessibility and emergency egress; maintenance of building compartmentation using fusible links; amendment of automatic sprinkler requirements; amendment of fire alarm system requirements; amendment of fire flow requirements; requirements for high-rise air supply and the regulation of hazards including hazardous materials, Wildland-Urban Interface management, temporary assembly attractions, fireworks and explosives. These more stringent local requirements are reasonably necessary to address risks created by local conditions set forth above for the following reasons:

1. Section 105.6.26 (Window bars, operational constraints and opening control devices) is a local amendment which regulates window bars or other opening control devices that impose operational constraints on emergency escape and rescue openings. This amendment does not impose more stringent requirements on the devices or equipment than is set forth in Section 1031.2.1 of this code, but it does impose the requirement that a fire department permit be obtained prior to the installation of such equipment. Section 1031.2.1 of this code contains detailed requirements for the

installation conditions of this equipment yet the California Fire Code provides no mechanism to verify that the code requirements are being met. This provision is adopted due to Berkeley's increased local geological risk of earthquakes and the likelihood that exterior escape and rescue openings may be needed by occupants to evacuate buildings.

2. Section 503 (Fire apparatus access roads) and Appendix D (Fire apparatus access roads) are adopted in their entirety as local code amendments. They are adopted due to: local geological conditions of severe earthquake potential which may result in landslides and the collapse of "built-environment" features which may block access roads; local topographical conditions including narrow streets and steep hills which slow and hinder emergency response and evacuation; and local climatic conditions including the need for rapid, unhindered citizen evacuation from and emergency responder access into wildfire prone areas of the City.
3. Section 504.1.1 (Marking of Exterior Building Openings) is added due to local topographical conditions which promote multi-story and on-slope construction to maximize buildable space within the City. The limited space available for development encourages developers and designers to crowd exterior openings into limited available space, often resulting in groups of building openings without any obvious cues for firefighters as to the area(s) served within the building or the purpose of the openings. This amendment is intended to inform firefighters as to the area served and/or purpose of an exterior opening and therefore reduce the amount of time firefighters may spend searching for or forcing entry into otherwise unmarked doorways.
4. Section 705.2.5 (Smoke- and heat-activated doors) is amended due to the increased risks caused by fires resulting from earthquakes and proximity to the wildland-interface. These risks, which are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. This amendment will maintain the fire and smoke separation requirements and prevent spread of smoke and fire in apartments, boarding houses, and congregate living spaces.
5. Sections 903.2.10.1, 903.2.11.1, 903.2.11.2, 903.2.22, 903.2.23, 903.3.1.2, 903.3.9 and 1103.5, 1103.5.6, 1103.5.6.1, 1103.5.6.2, 1103.5.6.3 (Fire Sprinkler Systems) are amended due to the increased risks caused by fires resulting from earthquakes and proximity to the wildland-interface. These risks, which are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. Automatic fire sprinkler systems significantly reduce the loss of life and fire spread with early suppression and control of a fire. Additionally, these amendments will maintain the standards established in 1992 after the 1990 fraternity fire and 1991 Berkeley Oakland firestorm.
6. Amendments and additions to Sections 907.2, 907.2.1, 907.2.2, 907.2.4, 907.2.7, 907.2.8.1, 907.2.8.2, 907.2.9.1 and 1103.7, 1103.7.5.1, 1103.7.6, and 1103.7.10 (Fire Alarm Systems) are amended due to the increased risks caused by fires resulting from earthquakes and proximity to the wildland-interface. These risks, which

are particularly severe in Berkeley due to its high population density, are shown by its past history of above average death and property loss due to fire in these types of occupancies. Automatic fire alarm systems significantly reduce the loss of life and fire spread with early detection and notification of firefighting personnel. Additionally, these amendments will maintain the standards adopted in 1998 as part of the Berkeley Fire Code.

7. Section 914.3.9 ["Fire Fighter Air Replenishment Systems"], Appendix Chapter L ["Requirements for Fire Fighter Air Replenishment Systems" in its entirety as amended), Section L104.5.1 ["Stored pressure air supply" as amended], Section 105.5.57 [operational permit to maintain a "firefighter air replenishment system (FARS)"] and Section 105.6.25 [construction permit to install or modify "Firefighter air replenishment system(FARS)"] are added due to the local geological condition of severe risk of earthquake and ensuing fires. Fire Fighter Air Replenishment Systems are intended to maximize the operational efficiency of available firefighting forces, and to reduce the impacts of high-rise fire incidents on limited firefighting forces that may already be challenged by the aftermath of a major seismic event. Additionally, these amendments will maintain the standards adopted in 2002 as part of the Berkeley Fire Code to require air supply systems for firefighting operations. The proposed code adoption recognizes Appendix Chapter L of the International Fire Code as the standard for the design, installation, testing and maintenance of such a system. It provides potential owners, designers and installers with a standard that they may refer to in order to better understand a type of system that many may not be familiar with.
8. Section 4912.12 (Incinerators and Fireplaces), is created which mandates that certain potential ignition sources within Wildland-Urban Interface (WUI) fire areas such as incinerators, outdoor fireplaces, fire pits, permanent barbecues and grills shall not be constructed without prior approval of the fire code official. Also, continued use of such constructed equipment (termed 'maintained' in the fire code ordinance) is prohibited unless the equipment is maintained in good repair and safe condition at all times. This section and Section 4912.5 (Spark Arresters) also require that such equipment be provided with appropriate spark arrestors, similar to the requirements in the Berkeley Building Code for fixed mechanical equipment associated with structures and regulated under the Berkeley Building Code. This added section requires fire department approval, spark arresters and maintenance of this equipment due to steep topography and Mediterranean climatic conditions. These conditions result in a large wildland-interface fire area which has a history of large, catastrophic fires.
9. Section 5704.2.11.1.1 (Restrictions on underground storage tanks), Section 5704.2.13.1.4 (Tanks abandoned in place), Section 5704.2.14 (Removal and disposal of tanks) and section 6104.1.1 (Restrictions on storage of LP-gas containers) of the Berkeley Fire Code are local amendments to the California Fire Code. These subsections are necessitated by local topographical conditions including the dense population of residential dwellings throughout the City; the narrow winding streets of the hazardous hill area; and the presence of a major transportation system underground (BART with its surge chambers and other

openings at the street level in various areas of the city). These factors make it very important for purposes of fire safety to regulate hazardous material storage to ensure that it does not intrude in these areas.

10. Section B105.2 (Appendix B, “Fire Flow Requirements for Buildings”, Table B105.2, “Required Fire-Flow For Buildings Other Than One- And Two-Family Dwellings, Group R-3 And R-4 Buildings And Townhouses”) is amended due to the geological conditions of the City with its proximity to major earthquake faults. Predictions by the local water utility company are that many water mains will break as the result of a magnitude 6.7 earthquake on the Hayward Fault.
11. Appendix O (Temporary haunted houses, ghost walks and similar amusement uses) is adopted as a local amendment to the California Fire Code and is adopted based on local geological conditions (the potential for severe earthquake with accompanying fire and/or structural collapse) and local topographical conditions including the need to ensure adequate separation of structures and uses in densely developed urban areas. Fire alarm systems (as required in this appendix) are shown to significantly reduce the life safety threat to occupants of structures during fire events. Regulation of these structures and activities ensures that adequate safety provisions have been made for limiting occupancy to safe numbers of guests and for the evacuation of attraction guests in crowded urban environments. Adoption of this appendix also allows for the regulation of related features such as the combustibility of decorations and the management of hazards such as temporary electrical wiring and the use of portable generators.

BE IT FURTHER RESOLVED by the Council of the City of Berkeley that certain local amendments to the codes are not building standards more stringent than the provisions of the California Fire Code but rather cover matters not addressed by those codes as building standards, or are administrative in nature, as follows:

1. Chapter 1 (as amended in Sections 101.1, 102.6, 104.13, 104.14, 105.5.18, 105.5.55, 105.5.56, 105.5.58, 105.5.59, 107.2, 107.4, 111, 111.1, 111.1.1, 111.3, 112.1, 112.4, 114.7, and 114.7.1 provides administrative provisions, an appeal process, and additional clarification and non-building standard permit requirements required to implement the fire code.
2. Chapter 2 as amended in section 202 (Definitions) provides additional definitions required to clarify and implement the local adoption of the fire code.
3. Chapter 3 (General Requirements) is adopted in its entirety. The adopted sections of this chapter impose controls on a wide range of hazards that are not building standards. Hazards addressed include asphalt kettles, combustible waste materials, control of ignition sources, open burning/recreational fires, open flames, powered industrial equipment, smoking, securing of vacant premises, vehicle impact protection, fueled equipment, general storage and hazards to firefighters.
4. Chapter 49 as amended, including Sections 4902.1, 4903.3, 4905.2, 4906.5, 4906.5.1, 4906.5.2, 4906.5.2.1, 4906.5.2.2, Table 4906.5.2.2, 4906.5.2.3, Table 4906.5.2.3, 4906.5.3, 4906.5.4, 4906.5.5, 4906.6, 4906.7, 4907.4, 4907.6 provides definitions related to local Wildland-Urban Interface (WUI) fire areas, directs

interested parties to appropriate BMC Chapter 19.28 sections (Berkeley Building Code) for building construction requirements in WUI areas, and imposes various non-building standard requirements for the management of vegetation. Administrative Amendments Section 4907.3 and 4907.6 and Ordinance Sections 4907.4, 4912, 4912.1, 4912.2, 4912.3, 4912.3.1, 4912.3.2, 4912.3.3, 4912.4, 4912.6, 4912.7, 4912.8, 4912.9, 4912.10, 4912.11, 4912.13, 4912.14, 4912.15, 4912.16, 4912.17, and 4912.18 impose various non-building standard requirements for the prevention and control of fires in WUI areas.

5. Section 5001.7 (Hazardous Materials Transport Restrictions) is a local amendment to the California Fire Code that restricts the transportation, storage and transfer of hazardous materials but does not create or modify any building standards. It simply imposes additional requirements necessitated by local conditions. This new subsection is necessitated by the dense population of residential dwellings throughout the City; the narrow winding streets of the hazardous hill area; and the presence of a major transportation system underground (BART with its surge chambers and other openings at the street level in various areas of the city). These factors make it very important for purposes of fire safety to regulate hazardous material transportation to ensure that it does not intrude in these areas.
6. Section 5601.1.3 (Fireworks) prohibits (with suitable exceptions) the possession, manufacture, storage, sale, handling and use of fireworks within the jurisdiction (including fireworks classified by the State Fire Marshal as Safe and Sane fireworks). Section 5604.1 ("General" section of 5604, "Explosive and Fireworks") is modified to prohibit the storage and handling of explosives within the jurisdiction. Both sections are intended to preserve the ban on storage, handling and use of these materials within City limits which have historically been deemed unsafe and inappropriate activities within the jurisdiction.
7. Section 5701.4.1 (Transfer of flammable and combustible liquids) prohibits dispensing of flammable liquids on or from a street or public way and provides administrative provisions, additional clarification and non-building standard approval or permit requirements required to implement the fire code.
8. Appendix E (Hazard Categories) and Appendix F (Hazard Ranking) are local amendments to the California Fire Code related to hazardous materials management. These chapters define the hazard categories and rankings associated with the storage, handling and use of hazardous materials, and provide the qualitative and quantitative rankings used on hazardous materials information signs posted for the benefit of firefighters and other first responders. These hazard categories and rankings are administrative in nature and do not constitute building standards.

BE IT FURTHER RESOLVED, that Resolution No. 71,710–N.S is hereby rescinded.