



# SAN FRANCISCO PLANNING DEPARTMENT

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## Executive Summary Planning Code Text Amendment

HEARING DATE: SEPTEMBER 15, 2016

*Project Name:* Better Roofs Ordinance  
*Case Number:* 2016-010605PCA [Board File No. 1700122]  
*Initiated by:* Supervisor Wiener / Introduced September 6, 2016  
*Staff Contact:* Anne Brask, Planner/Designer Citywide Division  
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*Reviewed by:* Jeff Joslin, Director of Current Planning  
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*Recommendation:* **Recommend Approval**

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### PLANNING CODE AMENDMENT

The proposed Ordinance amends the Planning Code to establish standards for new building construction facilitating development of renewable energy facilities and living roofs.

#### The Way It Is Now:

Under existing state law, California's Title 24 Energy Standards require 15% of roof area on new small and mid-sized buildings to be "solar ready," which means the roof is unshaded by the proposed building itself, and free of obtrusions. This state law applies to all new residential and commercial buildings of 10 floors or less. In April 2016 a unanimous vote was passed by the Board of Supervisors that builds on this state law by requiring 15% of "solar ready" roof area to have solar actually installed.

#### The Way It Would Be:

In addition to the regulations above, the Better Roof Ordinance will include a living roof alternative to the solar requirement. With this proposal, between 15% and 30% of roof space on most new construction will incorporate solar, living (green) roofs, or a combination of both. The living roof option will allow developers to replace required solar with living roof at a rate of 2 square feet of living roof for every 1 square foot of solar.

### BACKGROUND

#### A Brief History of California Title 24

The ordinance builds on existing California State building code which, since July 1, 2014, has required most new buildings to be design with a minimum area of roof space designated as "Solar Ready" if solar is not installed at the time of construction. The roof area designated as the Solar Ready zone must be designed to be free of obstructions and shading that could interfere with installation or performance of a future solar energy system.

The Better Roof ordinance requires the building designer to first calculate the Solar Ready area required under California Title 24 Part 6 Building Energy Standards. This area is equal to 15 percent of total roof

area for multifamily and non-residential buildings, and 250 square feet for single family homes. The ordinance requires that the Solar Ready zone be put to productive use by installing solar energy systems at time of construction.

### **A Brief History of San Francisco Living Roofs**

Living roofs (also known as vegetated or green roofs) have been heavily researched by the Planning Department in recent history. In 2013, San Francisco hosted the National Green Roof Conference, Cities Alive. Co-sponsored by the Planning Department and the San Francisco Public Utilities Commission (SFPUC), the conference offered three days of presentations on policy, design, and technology related to living roofs. In preparation for the 2013 conference, SPUR formed the Green Roof Task Force to produce the “Greener and Better Roofs Roadmap” report recognizing that – in addition to being a prime location for renewable energy resources – roofs can host ‘green’ or ‘living roofs’ with many additional benefits such as reducing stormwater entering the sewer, reducing energy consumption, augmenting roof life, improving city views, enhancing biodiversity and habitat, sequestering carbon, capturing pollution, and connecting citizens with nature. The SPUR Roadmap provided recommended next steps for green roof progress in San Francisco, including the introduction of legislation.

After the Cities Alive Conference, the Planning Department formed a Living (Green) Roof team to continue research on San Francisco specific rooftops. The team led tours of existing rooftops in the city, conducted interviews of designers, analyzed other city efforts, and researched San Francisco’s environmental aspects that make living roofs unique here. Our team worked with another taskforce of interested stakeholders and city agencies to understand differing priorities, roles, and best next steps for encouraging living roofs in San Francisco. The culmination of this information was crafted into a Living Roof Manual<sup>1</sup>, Living Roof webpage<sup>2</sup>, and a Living Roof map<sup>3</sup> of San Francisco. This ongoing work since 2013 led to the opportunity to work with San Francisco Department of the Environment on a holistic Better Roof Ordinance.

## **ISSUES AND CONSIDERATIONS**

### **These Technologies Are Cost Effective.**

Department of Environment has completed cost effectiveness analysis of solar photovoltaics. ARUP Engineers performed cost effectiveness analysis of living roofs on behalf of the Planning Department and Environment. Both of these cost analyzes show that solar and green roofs are indeed cost effective.

To understand the implications of solar energy as a compliance option, the cost-effectiveness of meeting the proposed Better Roof requirement entirely with photovoltaics was studied. A variety of building types and uses were modeled, from single-family homes to high-rise office. The analysis assumed the building owner paid all costs and derived all benefits from the photovoltaic system. The solar financial analysis considered costs and benefits over a 25-year period. Costs included the one-time costs to design, purchase and install the photovoltaic system, as well as the ongoing costs of financing, operation,

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<sup>1</sup> [http://default.sfplanning.org/publications\\_reports/Living\\_Roof\\_Manual\\_Web-102815.pdf](http://default.sfplanning.org/publications_reports/Living_Roof_Manual_Web-102815.pdf)

<sup>2</sup> <http://sf-planning.org/san-francisco-living-roofs>

<sup>3</sup> [http://sfgov.maps.arcgis.com/apps/OnePane/storytelling\\_basic/index.html?appid=1fe7486496ec45a397dea0254b96e546](http://sfgov.maps.arcgis.com/apps/OnePane/storytelling_basic/index.html?appid=1fe7486496ec45a397dea0254b96e546)

maintenance and insurance. Benefits included the ongoing value of solar electricity generated (it was assumed that the solar electricity directly reduced the electricity purchased from the utility by the owner), and the net reduction to the owner's federal and state taxes owed.

**The analysis shows that installing photovoltaics to comply with the proposed Better Roof ordinance is cost-effective for all building types with today's input values.** The avoided emissions resulting from the clean electricity generated by photovoltaic systems is a benefit to the broader community that was not factored into the cost-effectiveness calculation. The aggregate impact of installing photovoltaics to minimally comply with the proposed Better Roof ordinance on all 200 major new construction projects in San Francisco Planning Department's project pipeline as of third quarter 2014 would be to avoid over 26,000 metric tons of carbon dioxide emissions per year.

ARUP engineers analyzed the cost-effectiveness of meeting the Better Roofs requirement entirely with a living roof instead of solar for the alternative compliance path. The analysis was conducted with a living roof that uses 6 inches of lightweight media with native and adapted plants and two building types of similar size that are good candidates for living roofs: medium commercial and small multifamily. The costs and benefits of the living roof were compared to the costs and benefits of a baseline membrane roof with cool white coating that is a requirement for prescriptive compliance with California Title 24 for these building types. Both the living roof and baseline were modeled as part of an overall building development package required to comply with San Francisco's Stormwater Management Ordinance.

Costs and benefits of the living roof over a 25-year period are presented as those net of the costs and benefits of the baseline roof. In addition to installation costs, recurring costs of maintenance, irrigation, and reroofing were evaluated. Benefits included the avoided one-time cost of installing stormwater management equipment that would be required if not for the living roof, as well as ongoing benefits of energy savings, carbon abatement, heat island mitigation, air quality improvement, noise abatement, habitat addition, productivity increase based on biophilic effect, job creating and increased real estate value. The methodology applied by ARUP was based in large part on prior work for the US General Services Administration. Living roof data from San Francisco was used in the financial analysis, and supplemented with national data when necessary. Local data were afforded greater weight in all calculations.

**The analysis found that a living roof provides net financial benefit to the building owner, while providing significant additional benefit to the tenants, and the broader community.** The largest cost of a living roof – the one-time installation cost – is largely offset by the avoided one-time stormwater management equipment costs that would be incurred with the baseline roof. Both of these one-time costs and benefits accrue directly to the building owner.

The largest potential benefits is added real estate value, which also accrues to the building owner. Added real estate value may be realized in the form of faster tenant recruitment and longer retention, risk reduction, higher rent, and increased net operating income (NOI) due to operating expense savings. However, even in the absence of these benefits, which are well documented, the living roof was found to be cost-neutral.

The figures from the cost benefit analysis show the net costs and net benefits of the living roof compared to the baseline roof for the range of the stakeholders in development: owner, owner & occupier, tenant, and the community. Excluding benefirst to real estate value, benefit to the owner were found to offset the costs. The net impact is greater for an owner-occupied building in which the owner benefits from energy saving and biophilic effects.

Compliance with the proposed Better Roof ordinance via either a living roof or solar photovoltaics is cost-effective. The analyses showed that for both living roofs and photovoltaics, when all costs and benefits are combined and accrue over a 25-year period, the costs to the building owner are more than offset by the benefits. Cost-effectiveness can be expected to improve over time if the industry continues to trend toward lower system costs and higher energy production per unit.

**There Is Precedent For These Types Of Regulation.**

Since 2013, three California cities, Lancaster, Sebastopol, and Santa Monica, have adopted requirements to install a minimum amount of solar photovoltaic's on new buildings. These cities are each considerably less dense than San Francisco. **With this Better Roof Ordinance, San Francisco would be the first major US city to require solar on new buildings.**

**Similarly, major U.S. citis including Chicago, Washington D.C., and Portland require living roofs on certain new buildings.** Chicago had a three-year grant program that offered a subsidy of \$5,000 per project, in an effort to cool the city during the summer for urban heat island mitigation. Portland had a similar program for municipal buildings. France has also advanced a similar regulation requiring solar and/or living roofs, however it will not take effect until later in 2017.

**Roofs Are An Undervalued Opportunity.**

Rooftops are 30% of San Francisco's land area, and in a dense urban city, an untapped resource. The proposed ordinance will provide flexibility for the building designer, owner, and developer to choose the best combination of solar photovoltaic, solar water heating and living roof systems to maximize benefit based on location and building program. With the myriad of benefits that these technologies provide, the legislation would encourage a higher and better utilization of valuable rooftop space.

The Better Roofs Ordinance cumulatively mandates solar, but allows living roofs to be provided in lieu of, or in addition to, solar. The solar requirement made use of a pre-existing statutory requirement to prserve 15% of the roof for solar, requiring solar to be installed in that required area. The Better Roofs Ordinance allows 30% of the roof as a living roof to meet this requirement. A project will be able to comply by meeting one or the other, or a blend of the two.

Future research for furthering the utilization of roofs may include

- Potential of 100% utility of rooftops
- Requirements for alterations to existing building
- Better roof uses that include open space and urban agriculture

**Uses Defined in the Planning Code.**

In the Planning Code, Living Roof, Living Roof Area, and Minimum Better Roof Area are defined solely by their physical characteristics; aspects that are verifiable and have a clear and direct connection to the land use. The quality and detail of a living roof is outside of the Planning Department area of expertise. Our coordination with the San Francisco Public Utilities Commission is crucial in the success of living roofs. The Planning Department and SFPUC have created a strong foundation for continued teamwork to ensure quality review of Better Roof projects.

**Working with the Stormwater Management Ordinance.**

Review will remain the same for the Public Utilities Commission where responsibility and process will not change. The PUC will continue reviewing projects which are required to meet the Stormwater Management Ordinance (SMO). Living roofs are one of the Best Management Practices (BMPs) that is reviewed for compliance with the ordinance. SFPUC is not responsible for verifying the amount and location of Better Roof Area.

**REQUIRED COMMISSION ACTION**

The proposed Ordinance is before the Commission so that it may recommend adoption, rejection, or adoption with modifications to the Board of Supervisors.

**RECOMMENDATION**

The Department recommends that the Commission recommend *approval* of the proposed Ordinance and adopt the attached Draft Resolution to that effect.

**BASIS FOR RECOMMENDATION**

The Planning Department's strongly supports the Better Roofs requirements and Living Roof alternative as a way to enhance the utility of roofs in our city. San Francisco is known for its innovative stewardship and strong reputation for being a green, healthy, and sustainable city. The Planning Department has been at the forefront of living roof research specific to San Francisco for the past four years and we continue to update and track new technologies within this sector. By providing options for a Better Roof, the designer, developer, or owner is not forced into one use that may not be appropriate for their site or design.

As we know, in a dense urban environment, the roof becomes a valuable resource for land use opportunities and sustainable technology. The proposed Ordinance is a great place to start in thinking about how our rooftops can provide more for our neighborhoods. Future research may include the potential for urban agriculture, the inclusion of open space, and a combination of each of these uses to allow for a holistic better rooftop. Other options for the Ordinance could apply an iteration of the requirements to existing buildings undergoing alterations.

The Planning Department has worked very closely with our colleagues at the Department of the Environment and San Francisco Public Utilities Commission to ensure a successful implementation of the ordinance and will continue to look for areas to improve.

## **IMPLEMENTATION**

The Department determined that this Ordinance will impact our current implementation procedures; however the proposed changes can be implemented without increasing permit costs or review time. The ordinance will impact our current implementation procedures in the following ways:

- The Better Roofs Ordinance will require planners to review the proposed plans for compliance with the rooftop area requirements. The applicant can choose to provide solar power on 15% of their rooftop space, living roof on 30% of their rooftop space, or a combination of the two to meet the Planning Code.
- Several SOP documents would have to be amended including additional language for PPAs.
- Planning would also take the lead in producing the Better Roof Project Guide and a ZA Bulletin for assistance with implementation.
  - The Better Roof Project Guide will include: Living Roof Definition & Living Roof Manual reference; Review process; SMO and Non-Potable references; Roof definition; Roof design scenarios.

## **ENVIRONMENTAL REVIEW**

The proposed amendments are not defined as a project under CEQA Guidelines Section 15060(c) and 15378 because they do not result in a physical change in the environment.

## **PUBLIC COMMENT**

As of date of this report, the Department has received no public comment on the Better Roof legislation but has participated with a working group of interested stakeholders and city agencies, as well as outreach to building owners and developers on the legislation.

<b>RECOMMENDATION:</b>	<b>Recommendation of Approval</b>
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### **Attachments:**

Exhibit A: Draft Planning Commission Resolution

Exhibit B: Board of Supervisors File No. 1700122



# SAN FRANCISCO PLANNING DEPARTMENT

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## Planning Commission Draft Resolution HEARING DATE SEPTEMBER 15, 2016

*Project Name:* **Amendments Relating to Better Roof Requirements**  
*Case Number:* 2016-010605PCA [Board File No. 1700122]  
*Initiated by:* Supervisor Wiener / Introduced September 6, 2015  
*Staff Contact:* Anne Brask, Citywide Planning Division  
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*Recommendation:* **Recommend Approval**

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**RECOMMENDING THAT THE BOARD OF SUPERVISORS ADOPT A PROPOSED ORDINANCE THAT WOULD AMEND PLANNING CODE SECTION 149 TO ESTABLISH REQUIREMENTS FOR CERTAIN NEW BUILDING CONSTRUCTION FACILITATING DEVELOPMENT OF RENEWABLE ENERGY FACILITIES AND LIVING ROOFS; SETTING AN OPERATIVE DATE OF JANUARY 1, 2017; PROVIDING FINDINGS AS LOCAL CONDITIONS PURSUANT TO THE CALIFORNIA HEALTH AND SAFETY CODE; AFFIRMING THE PLANNING DEPARTMENT'S DETERMINATION UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT; AND MAKING FINDINGS OF CONSISTENCY WITH THE GENERAL PLAN AND THE EIGHT PRIORITY POLICIES OF PLANNING CODE SECTION 101.1.**

WHEREAS, on September 6, 2016, Supervisors Wiener introduced a proposed Ordinance under Board of Supervisors (hereinafter "Board") File Number 1700122, which would amend Sections 149 of the Planning Code to establish requirements for certain new building construction facilitating development of renewable energy facilities and living roofs;

WHEREAS, The Planning Commission (hereinafter "Commission") conducted a duly noticed public hearing at a regularly scheduled meeting to consider the proposed Ordinance on September 15, 2016; and,

WHEREAS, the proposed Ordinance has been determined to be categorically exempt from environmental review under the California Environmental Quality Act Section 15060(c); and

WHEREAS, the Planning Commission has heard and considered the testimony presented to it at the public hearing and has further considered written materials and oral testimony presented on behalf of Department staff and other interested parties; and

WHEREAS, all pertinent documents may be found in the files of the Department, as the custodian of records, at 1650 Mission Street, Suite 400, San Francisco; and

WHEREAS, the Planning Commission has reviewed the proposed Ordinance; and

MOVED, that the Planning Commission hereby recommends that the Board of Supervisors **approve** the proposed ordinance.

## FINDINGS

Having reviewed the materials identified in the preamble above, and having heard all testimony and arguments, this Commission finds, concludes, and determines as follows:

1. The proposed Ordinance will amend the Planning Code to include Better Roof Requirements for some new construction buildings.
2. **General Plan Compliance.** The proposed amendments to the Planning Code are not addressed in the General Plan; the Commission finds that the proposed Ordinance is not inconsistent with the Objectives and Policies of the General Plan.
3. **Planning Code Section 101 Findings.** The proposed amendments to the Planning Code are consistent with the eight Priority Policies set forth in Section 101.1(b) of the Planning Code in that:

1. That existing neighborhood-serving retail uses be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses enhanced;

*The proposed Ordinance would not have a negative impact on neighborhood serving retail uses and will not impact opportunities for resident employment in and ownership of neighborhood-serving retail.*

2. That existing housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of our neighborhoods;

*The proposed Ordinance would not have a negative effect on housing or neighborhood character.*

3. That the City's supply of affordable housing be preserved and enhanced;

*The proposed Ordinance would not have an adverse effect on the City's supply of affordable housing.*

4. That commuter traffic not impede MUNI transit service or overburden our streets or neighborhood parking;

*The proposed Ordinance would not result in commuter traffic impeding MUNI transit service or overburdening the streets or neighborhood parking.*

5. That a diverse economic base be maintained by protecting our industrial and service sectors from displacement due to commercial office development, and that future opportunities for

resident employment and ownership in these sectors be enhanced;

*The proposed Ordinance would not cause displacement of the industrial or service sectors due to office development, and future opportunities for resident employment or ownership in these sectors would not be impaired.*

6. That the City achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake;

*The proposed Ordinance would not have an impact on City's preparedness against injury and loss of life in an earthquake.*

7. That the landmarks and historic buildings be preserved;

*The proposed Ordinance would not have an impact on the City's Landmarks and historic buildings.*

8. That our parks and open space and their access to sunlight and vistas be protected from development;

*The proposed Ordinance would not have an impact on the City's parks and open space and their access to sunlight and vistas.*

- 8. Planning Code Section 302 Findings.** The Planning Commission finds from the facts presented that the public necessity, convenience and general welfare require the proposed amendments to the Planning Code as set forth in Section 302.

NOW THEREFORE BE IT RESOLVED that the Commission hereby recommends that the Board ADOPT the proposed Ordinance as described in this Resolution.

I hereby certify that the foregoing Resolution was adopted by the Commission at its meeting on September 15, 2016.

Jonas Ionin  
Commission Secretary

AYES:

NOES:

ABSENT:

ADOPTED: September 15, 2016

1 [Planning, Green Building Codes - Better Roof Requirements, Including Living Roofs]

2

3 **Ordinance amending the Planning Code and Green Building Code to establish**  
 4 **requirements for certain new building construction facilitating development of**  
 5 **renewable energy facilities and living roofs; setting an operative date of January 1,**  
 6 **2017; providing findings as to local conditions pursuant to the California Health and**  
 7 **Safety Code; affirming the Planning Department’s determination under the California**  
 8 **Environmental Quality Act; and making findings of consistency with the General Plan**  
 9 **and the eight priority policies of Planning Code Section 101.1.**

10 NOTE: **Unchanged Code text and uncodified text** are in plain Arial font.  
 11 **Additions to Codes** are in *single-underline italics Times New Roman font*.  
 12 **Deletions to Codes** are in *strikethrough italics Times New Roman font*.  
 13 **Board amendment additions** are in double-underlined Arial font.  
 14 **Board amendment deletions** are in ~~strikethrough Arial font~~.  
 15 **Asterisks (\* \* \* \*)** indicate the omission of unchanged Code  
 16 subsections or parts of tables.

17 Be it ordained by the People of the City and County of San Francisco:

18 Section 1. CEQA Findings and General Plan Consistency Findings.

19 (a) The Planning Department has determined that the actions contemplated in this  
 20 ordinance comply with the California Environmental Quality Act (California Public Resources  
 21 Code Sections 21000 et seq.). Said determination is on file with the Clerk of the Board of  
 22 Supervisors in File No. \_\_\_\_ and is incorporated herein by reference. The Board affirms this  
 23 determination.

24 (b) On \_\_\_\_\_, the Planning Commission, in Resolution No. \_\_\_\_\_,  
 25 adopted findings that the actions contemplated in this ordinance are consistent, on balance,  
 with the City’s General Plan and eight priority policies of Planning Code Section 101.1. The

1 Board adopts these findings as its own. A copy of said Resolution is on file with the Clerk of  
2 the Board of Supervisors in File No. \_\_\_\_\_, and is incorporated herein by reference.

3 (c) Pursuant to Planning Code Section 302, this Board finds that this Planning Code  
4 Amendment will serve the public necessity, convenience, and welfare for the reasons set forth  
5 in Planning Commission Resolution No. \_\_\_\_\_ and the Board incorporates such reasons  
6 herein by reference.

7  
8 Section 2. General Findings.

9 (a) The California Building Standards Code is contained in Title 24 of the California  
10 Code of Regulations, and consists of several parts that are based upon model codes with  
11 amendments made by various State agencies. The California Green Building Standards  
12 Code, also known as the CALGreen Code, is Part 11 of Title 24 of the California Code of  
13 Regulations, and San Francisco has enacted the San Francisco Green Building Code as  
14 amendments to the California Green Building Standards Code.

15 (b) Local jurisdictions are required to enforce the California Green Building Standards  
16 Code, but they may also enact more stringent standards when reasonably necessary because  
17 of local conditions caused by climate, geology, or topography.

18 (c) The Building Inspection Commission considered the applicable sections of this  
19 ordinance at a duly noticed public hearing on \_\_\_\_\_. The Commission on the  
20 Environment considered the applicable sections of this ordinance at a duly noticed public  
21 hearing on \_\_\_\_\_.

22  
23 Section 3. Findings Regarding Local Conditions Required by the California Health and  
24 Safety Code.

1 (a) California Health & Safety Code Section 17958.7 provides that before making any  
2 changes or modifications to the California Green Building Standards Code and any other  
3 applicable provisions published by the State Building Standards Commission, the governing  
4 body must make an express finding that each such change or modification is reasonably  
5 necessary because of specified local conditions, and the findings must be filed with the State  
6 Building Standards Commission before the local changes or modifications go into effect.

7 (b) The Board of Supervisors expressly declares that the following amendments to the  
8 San Francisco Green Building Code are reasonably necessary because of local climatic,  
9 topological, and geological conditions as listed below.

10 (1) As a coastal city located on the tip of a peninsula, San Francisco is  
11 vulnerable to sea level rise, and human activities releasing greenhouse gases into the  
12 atmosphere cause increases in worldwide average temperature, which contribute to melting of  
13 glaciers and thermal expansion of ocean water – resulting in rising sea levels.

14 (2) San Francisco is already experiencing the repercussions of excessive CO<sub>2</sub>  
15 emissions as rising sea levels threaten the City’s shoreline and infrastructure, have caused  
16 significant erosion, increased impacts to infrastructure during extreme tides, and have caused  
17 the City to expend funds to modify the sewer system.

18 (3) Some people in San Francisco, such as the elderly, may be particularly  
19 vulnerable to higher temperatures resulting from climate changes.

20 (4) Installing solar photovoltaic and thermal facilities will help San Francisco  
21 meet its goals under Board of Supervisors Ordinance No. 81-08 to have a greenhouse  
22 gas-free electric system by 2030 and to reduce greenhouse gas emissions Citywide to 40%  
23 below 1990 levels by 2025 and 80% below 1990 levels below by 2050.

24 (5) Living roofs mitigate urban heat islands, improve building insulation, and  
25 moderate temperature near ventilation intake vents, each result contributing to reductions in

1 building energy use and corresponding greenhouse gas emissions. Living roofs also reduce  
2 stormwater entering the sewer system, provide habitat supporting ecological systems, and  
3 enhance urban connections between humans and nature.

4 (6) Living roofs and solar energy systems are compatible uses that can be  
5 combined on the same rooftop; the combination of the two systems can be complementary,  
6 improving the environmental benefits of each.

7 (7) It is reasonably necessary to require building owners to take steps to reduce  
8 the energy consumed by inefficient building operations and produce renewable, low-carbon  
9 electricity, capture solar heat, or develop living roofs in order to reduce pollution, benefit  
10 biodiversity, improve resilience to climate change by reducing localized heat islands, and  
11 reduce the global warming effects of energy consumption.

12 (6) Installing solar heating or solar energy systems benefits the health, welfare,  
13 and resiliency of San Francisco and its residents.

14 (c) Requiring solar water heating, solar photovoltaics, and living roofs at the time of  
15 new construction is more cost-effective than installing the equipment after construction  
16 because workers are already on-site, permitting and administrative costs are lower, and it is  
17 more cost-effective to include such systems in existing construction financing. Based upon  
18 the findings of a cost-effectiveness study performed on the more stringent local standards  
19 contained in Board of Supervisors Ordinance No. 71-16, which established rooftop renewable  
20 energy requirements for certain new buildings, the Board of Supervisors determined that  
21 installing on-site renewable energy systems is cost-effective based on the analysis contained  
22 in Board of Supervisors File No. 160154, and saves more energy than the standards  
23 contained in the 2016 California Green Building Standards (CALGreen) Code (CCR Title 24,  
24 Part 11) and the 2016 California Energy Standards (CCR Title 24, Part 6). The proposed  
25 amendments to the 2016 San Francisco Green Building Code in this ordinance provide for

1 living roofs as an additional option for compliance, and do not constitute an additional energy  
2 requirement beyond Board of Supervisors Ordinance No. 71-16.

3  
4 Section 4. The San Francisco Planning Code is hereby amended by adding  
5 Section 149 and revising Section 307, to read as follows:

6 **SEC. 149. BETTER ROOFS; LIVING ROOF ALTERNATIVE.**

7 *(a) Purpose. State law requires that certain new residential and nonresidential buildings set*  
8 *aside a “solar ready” portion of the roof equal to 15% of the total roof area. The solar ready area*  
9 *must be unshaded and free of obstructions, to allow that portion of the roof to be used for future*  
10 *installation of solar energy or heating systems. The San Francisco Green Building Code requires a*  
11 *building owner to actually use the solar ready area of the roof for solar energy or heating systems. The*  
12 *purpose of this Section 149 is to allow the use of “living roofs” as an additional means of meeting some*  
13 *or all of the Better Roof requirements of the Green Building Code, and thereby further promote the use*  
14 *of rooftops to increase renewable energy resources, stormwater management, and biodiversity.*

15 *(b) Definitions. As used in this Section 149, the following capitalized terms shall have the*  
16 *following meanings:*

17 *Better Roof Requirements. The requirements of San Francisco Green Building Code*  
18 *Sections 4.201.2 and 5.201.1.2, as amended.*

19 *Living Roof. The media for growing plants, as well as the set of related components installed*  
20 *exterior to a facility’s roofing membrane. “Living Roof” includes both “roof gardens” and*  
21 *“landscaped roofs” as referenced in the California Building Code.*

22 *Living Roof Area. The area of media for growing plants installed for the purposes of*  
23 *compliance with this Section, consistent with standards prepared and maintained by the Planning*  
24 *Department for planning, installation, and maintenance of Living Roofs.*

1 Minimum Better Roof Area. An equivalent area to the Solar Ready Zone, as calculated under  
2 CCR Title 24, Part 6, Section 110.10 and San Francisco Green Building Code Sections 4.201.2 and  
3 5.201.1.2, as applicable.

4 Roof. All outside coverings of a building or structure, including the structural supports,  
5 decking, and top layer exposed to the outside, at all levels of building, excluding roof area designated  
6 for skylights, vehicle traffic, or heliport.

7 Solar Ready Zone. A section of the roof designated and reserved for the installation of a solar  
8 electric or solar thermal system as required in certain new buildings by CCR Title 24, Part 6, Section  
9 110.10(b) through (e) and San Francisco Green Building Code Sections 4.201.2 and 5.201.1.2, as  
10 applicable.

11 (c) Applicability. A project sponsor may use a Living Roof as an alternative means of meeting  
12 some or all of the Better Roof requirements for any building that:

13 (1) constitutes a Large Development Project or Small Development Project under the  
14 Stormwater Management Ordinance (Public Works Code secs. 147-147.6);

15 (2) has a gross floor area of 2,000 square feet or more;

16 (3) has 10 or fewer occupied floors; and

17 (4) applies for a site permit or building permit on or after January 1, 2017.

18 (d) Living Roof Requirements. Should a project sponsor use a Living Roof as a means of  
19 meeting some or all of the Better Roof requirements, the sponsor shall submit to the Planning  
20 Department for its review and approval a Living Roof design in which the sum of the areas of the  
21 following features is equal to or greater than the Minimum Better Roof Area:

22 (1) Area of all solar photovoltaic collectors that meet the performance criteria of the  
23 San Francisco Green Building Code (secs. 4.201.2(c)(1) and 5.201.1.2(b)(1)), as appropriate;

24 (2) Area of all solar thermal collectors that meet the performance criteria of the San  
25 Francisco Green Building Code (secs. 4.201.2(c)(2) and 5.201.1.2(b)(2)), as appropriate; and

1                   (3) Area and Location of Living Roof.

2                   (A) For the purpose of this Section 149, each square foot of Living Roof shall  
3 count as 0.5 square foot towards the Minimum Better Roof Area requirements; provided, however, that  
4 the actual square footage of the Living Roof shall be used to determine compliance with the Stormwater  
5 Management Ordinance.

6                   (B) A Living Roof may be located within or outside of the Solar Ready Zone  
7 used for compliance with CCR Title 24, Part 6, Section 110.10. Where a Living Roof Area is located  
8 outside the Solar Ready Zone, the requirements of Section 110.10 for the solar zone shall otherwise still  
9 apply.

10                  (e) Waiver. If the project sponsor demonstrates to the Zoning Administrator's satisfaction that  
11 it is physically infeasible to meet the Living Roof requirements as written for the project in question, the  
12 Zoning Administrator may, in his or her sole discretion and pursuant to the procedures set forth in  
13 Planning Code Section 307(h), grant partial relief from the requirements stated in subsection (d) where  
14 the design of the Better Roof is within 10% percent of any quantitative requirements. The requirements  
15 of CCR Title 24, Part 6, Section 110.10 for the solar zone shall remain applicable.

16  
17 **SEC. 307. OTHER POWERS AND DUTIES OF THE ZONING ADMINISTRATOR.**

18                  In addition to those specified in Sections 302 through 306, and Sections 316 through  
19 316.6 of this Code, the Zoning Administrator shall have the following powers and duties in  
20 administration and enforcement of this Code.

21                  \* \* \* \*

22                  (h) Exceptions from Certain Specific Code Standards through Administrative Review.  
23 The Zoning Administrator may allow complete or partial relief from certain standards  
24 specifically identified below, in Section 161, or elsewhere in this Code when modification of  
25

1 the standard would result in a project fulfilling the criteria set forth below and in the applicable  
2 section.

3 (1) Applicability.

4 (A) Eastern Neighborhood Mixed Use Districts. For projects not subject  
5 to Section 329, relief may be provided for the following requirements: rear yard; non-  
6 residential open space; off-street loading requirements; and off-street parking limits up to the  
7 maximum quantities described in Section 151.1.

8 (B) Dwelling Unit Exposure for Historic Buildings. Relief may also be  
9 provided for dwelling unit exposure requirements for buildings which are designated landmark  
10 buildings or contributory buildings within designated historic districts per Article 10 of this  
11 Code, any building designated Category I-IV per Article 11 of this Code, and/or buildings  
12 recorded with the State Historic Preservation Office as eligible for the California Register,  
13 when the following criteria are met: (i) literal enforcement of Section 140 would result in the  
14 material impairment of the historic resource; and (ii) the project complies with the Secretary of  
15 the Interior's Standards, (36 C.F.R. § 67.7 (2001)) and/or Section 1006 and any related Article  
16 10 appendices of this Code. This administrative exception does not apply to new additions to  
17 historic buildings.

18 (C) Residential Open Space for Historic Buildings. For a landmark  
19 building designated per Article 10 of this Code, a contributing building located within a  
20 designated historic district per Article 10, or any building designated Category I-IV per Article  
21 11 of this Code, the provision of off-site publicly accessible open space, meeting the  
22 requirements of Section 135(h), may be credited toward the residential usable open space  
23 requirement.

24 (D) Conversion of Non-conforming Uses to Residential Uses. The Zoning  
25 Administrator may modify or waive dwelling unit exposure requirements, rear yard

1 requirements, open space requirements for inner courts, and the substitution of off-site  
2 publicly accessible open space for required residential open space, provided:

3 (i) That the residential use, whether dwelling units group housing,  
4 or SRO units, are principally permitted in the district or districts in which the project is located;

5 (ii) That the nonconforming use is eliminated by such conversion,  
6 provided further that the structure is not enlarged, extended or moved to another location; and

7 (iii) That the requirements of the Building Code, the Housing Code  
8 and other applicable portions of the Municipal Code are met.

9 (E) Better Roofs; Living Roof Alternative. For projects subject to Section 149,  
10 the Zoning Administrator may waive portions of the applicable requirements as provided in  
11 Section 149(e).

12 (2) Procedures. The review of a modification requested under this Section shall  
13 be conducted as part of, and incorporated into, a related building permit application or other  
14 required project authorizations; no additional fee shall be required. Under no circumstances  
15 shall such modification provide relief from any fee, including those related to usable open  
16 space pursuant to Sections 135(j) and 135.3(d). The provisions of this Subsection (h) shall not  
17 preclude such additional conditions as may be deemed necessary by the Zoning  
18 Administrator to further the purposes of this Section or other Sections of this Code.

19 \* \* \* \*

20  
21 Section 6. The Green Building Code is hereby amended by revising Sections 4.201.2  
22 and 5.201.1.2, to read as follows:

23 **SEC. 4.201.2. RENEWABLE ENERGY AND BETTER ROOFS**

24 (a) Newly constructed Group R occupancy buildings which are less than or equal to  
25 10 or fewer occupied floors ~~stories above grade~~ and which apply for a building permit on or after

1 January 1, 2017 shall install solar photovoltaic systems and/or solar thermal systems in the  
2 solar zone required by California Code of Regulations (CCR), Title 24, Part 6, Section 110.10.

3 (b) The minimum solar zone area for the project shall be calculated under Title 24,  
4 Part 6, Section 110.10(b) through (e), as applicable, and Residential Compliance Manual  
5 Chapter 7 or Nonresidential Compliance Manual Chapter 9, as applicable, except as provided  
6 below.

7 (1) For single family residences, Exceptions 3 and 5 to Title 24, Part 6,  
8 Section 110.10(b) 1A may be applied in the calculation of the minimum solar zone area.  
9 Exceptions 1, 2, 4, 6, and 7 may not be applied in the calculation. For single family residences  
10 subject to Planning Code Section 149, Exception 3 may be applied in the calculation of the minimum  
11 solar zone area, and Exceptions 1, 2, 4, 5, 6, and 7 may not be applied in the calculation.

12 (2) For Group R Occupancy buildings other than single family residences,  
13 Exceptions 3 and 5 to Title 24, Part 6, Section 110.10(b) 1B may be applied in the calculation  
14 of the minimum solar zone area. Exceptions 1, 2, and 4 may not be applied in the  
15 calculation. For Group R Occupancy buildings other than single family residences subject to  
16 Planning Code Section 149, Exception 5 may be applied in the calculation of the minimum solar zone  
17 area, and Exceptions 1, 2, 3, and 4 may not be applied in the calculation.

18 (3) Buildings with a calculated minimum solar zone area of less than 150  
19 contiguous square feet due to limited solar access under Exception 5 to Title 24, Part 6,  
20 Section 110.10(b)1A or Exception 3 to Title 24, Part 6, Section 110.10(b)1B are exempt from  
21 the solar energy requirements in this Section 4.201.2.

22 (c) The sum of the areas occupied by solar photovoltaic collectors and/or solar  
23 thermal collectors must be equal to or greater than the solar zone area. The solar zone shall  
24 be located on the roof or overhang of the building, or on the roof or overhang of another  
25 structure located within 250 feet of the building or on covered parking installed with the

1 building project. Solar photovoltaic systems and solar thermal systems shall be installed in  
2 accord with: all applicable State code requirements, including access, pathway, smoke  
3 ventilation, and spacing requirements specified in CCR Title 24, Part 9; all applicable local  
4 code requirements; manufacturer’s specifications; and the following performance  
5 requirements:

6 (1) Solar photovoltaic systems: The total nameplate capacity of photovoltaic  
7 collectors shall be at least 10 Watts DC per square foot of roof area allocated to the  
8 photovoltaic collectors.

9 (2) Solar thermal systems: Single family residential solar domestic water  
10 heating systems shall be OG-300 System Certified by either the Solar Rating and  
11 Certification Corporation (SRCC) or the International Association of Plumbing and Mechanical  
12 Officials (IAPMO). Solar thermal systems installed in all Group R occupancy buildings other  
13 than single family residences shall use collectors with OG-100 Collector Certification by  
14 SRCC or IAPMO, shall be designed to generate annually at least 100 kBtu per square foot of  
15 roof area allocated to the solar thermal collectors. Systems with at least 500 square feet of  
16 collector area shall include a Btu meter installed on either the collector loop or potable water  
17 side of the solar thermal system.

18 (d) Approval by the Planning Department of compliance with the Better Roof requirements,  
19 including the Living Roof alternative, as provided in Planning Code Section 149, shall be accepted for  
20 compliance with San Francisco Green Building Code Section 4.201.2(a) through (c). The  
21 requirements of CCR Title 24, Part 6, Section 110.10 for the solar zone shall still apply.

22

23 **SEC. 5.201.1.2. RENEWABLE ENERGY AND BETTER ROOFS.**

24 (a) Newly constructed buildings of nonresidential occupancy which are 2000 square  
25 feet or greater in gross floor area, are of 10 or fewer occupied floors less than or equal to 10

1 ~~stories above grade~~, and apply for a building permit on or after January 1, 2017 shall install  
2 solar photovoltaic systems and/or solar thermal systems in the solar zone required by  
3 California Title 24, Part 6 Section 110.10.

4 (b) The required solar zone area for the project shall be calculated under California of  
5 Regulations (CCR), Title 24, Part 6, Section 110.10(b) through (e) and Nonresidential  
6 Compliance Manual Chapter 9, as provided below: as applicable; provided, however that

7 (1) Buildings subject to Planning Code Section 149 may apply Exception 5 ~~Exceptions~~  
8 ~~3 and 5~~ to Title 24, Part 6, Section 110.10(b)1B ~~may be applied~~ in the calculation of the  
9 minimum solar zone area and may not apply ~~and~~ Exceptions 1, 2, 3, and 4 ~~shall not be applied~~ in  
10 the calculation.

11 (2) Buildings not subject to Planning Code Section 149 may apply Exceptions 3 and 5  
12 in the calculation of the minimum solar zone area and may not apply Exceptions 1, 2, and 4 in the  
13 calculation. Such buildings ~~Buildings~~ with a calculated minimum solar zone area of less than  
14 150 contiguous square feet due to limited solar access under Exception 3 are exempt from  
15 the solar energy requirements in this Section 5.201.2.

16 (c) ~~(b)~~ The sum of the areas occupied by solar photovoltaic collectors and/or solar  
17 thermal collectors must be equal to or greater than the solar zone area. The solar zone shall  
18 be located on the roof or overhang of the building, or on the roof or overhang of another  
19 structure located within 250 feet of the building or on covered parking installed with the  
20 building project. Solar photovoltaic systems and solar thermal systems shall be installed in  
21 accord with all applicable state and local code requirements, manufacturer's specifications,  
22 and the following performance requirements:

23 (1) Solar photovoltaic systems: The total nameplate capacity of photovoltaic  
24 collectors shall be at least 10 Watts DC per square foot of roof area allocated to the  
25 photovoltaic collectors.

1                   (2) Solar thermal systems: Solar thermal systems installed to serve non-  
2 residential building occupancies shall use collectors with OG-100 Collector Certification by  
3 the Solar Rating and Certification Corporation (SRCC) or the International Association of  
4 Plumbing and Mechanical Officials (IAPMO), shall be designed to generate annually at least  
5 100 kBtu per square foot of roof area allocated to the solar thermal collectors, and, for  
6 systems with at least 500 square feet of collector area, shall include a Btu meter installed on  
7 either the collector loop or potable water side of the solar thermal system.

8                   (d) Approval by the Planning Department of compliance with the Better Roof requirements,  
9 including the Living Roof alternative, as provided in Planning Code Section 149, shall be accepted for  
10 compliance with San Francisco Green Building Code Section 5.201.1.2(a) through (c). The  
11 requirements of CCR Title 24, Part 6, Section 110.10 for the solar zone shall still apply.

12  
13                   Section 7. Effective Date; Operative Date. This ordinance shall become effective 30  
14 days after enactment. Enactment occurs when the Mayor signs the ordinance, the Mayor  
15 returns the ordinance unsigned or does not sign the ordinance within ten days of receiving it,  
16 or the Board of Supervisors overrides the Mayor’s veto of the ordinance. This ordinance shall  
17 become operative on January 1, 2017, or upon effective date, whichever is later.

18  
19                   Section 8. Transmittal to State Officials. The Clerk of the Board of Supervisors is  
20 hereby directed to transmit this ordinance, upon enactment, to the California Building  
21 Standards Commission for filing, pursuant to the applicable provisions of California law.

22  
23                   Section 9. Scope of Ordinance. In enacting this ordinance, the Board of Supervisors  
24 intends to amend only those words, phrases, paragraphs, subsections, sections, articles,  
25 numbers, punctuation marks, charts, diagrams, or any other constituent parts of the Municipal

1 Code that are explicitly shown in this ordinance as additions, deletions, Board amendment  
2 additions, and Board amendment deletions in accordance with the "Note" that appears under  
3 the official title of the ordinance.

4  
5  
6 APPROVED AS TO FORM:  
7 DENNIS J. HERRERA, City Attorney

8  
9 By: \_\_\_\_\_  
10 THOMAS J. OWEN  
11 Deputy City Attorney

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