



# San Francisco's Streamlined Solar Permitting

## OVERVIEW

San Francisco's solar permitting process—which allows permits for systems 4 kW and under to be applied for, approved, paid for, and issued online or in person over-the-counter—is one of the most efficient in the nation. This paper describes the process by which the City and County of San Francisco developed and implemented its streamlined solar permitting process, provides an update on San Francisco's current e-permitting system, and outlines relevant lessons for other jurisdictions undertaking such work. This paper is structured as a resource for other jurisdictions to access best practices in streamlined permitting and learn from San Francisco's experience.

This material was prepared by San Francisco's Department of the Environment (SF Environment) and is based upon work powered by the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge managed by SolarTech.<sup>1</sup>

## SAN FRANCISCO'S EXPERIENCE

### Gathering Input & Gaining Comfort

Implementing an efficient and streamlined permitting system for San Francisco has been a multi-step process. Starting in 2002, SF Environment held a series of consultations with solar installers and customers that revealed several barriers to solarpermitting in the city, including lengthy permit reviews, high permit costs, and inconsistency between inspectors regarding permitting procedures and installation requirements. SF Environment presented these findings to the San Francisco Department of Building Inspection (DBI), and one result was that SF Environment partnered with DBI to organize trainings for DBI code officials. The trainings, which included site visits to a commercial and residential property with installed solar, improved DBI staff's comfort with and understanding of solar technologies and installations, fire safety, and other important safety and compliance issues. A second result was that DBI issued a memorandum in 2004 outlining the process for priority solar PV permitting. The new process essentially only required an electrical



<sup>1</sup> SolarTech is a non-profit solar PV industry association chartered to streamline industry business practices that hinder the market growth and adoption of solar PV through hidden costs and delays. SolarTech is one of 22 awardees of the DOE SunShot Rooftop Solar Challenge leading a team comprised of City & County of San Francisco, Solar Sonoma County, East Bay Green Corridor and Clean Coalition. This team is focused on lowering the costs and burdens of permitting, inspection, interconnection and finance for solar systems in the greater Bay Area. Visit [www.solartech.org](http://www.solartech.org) to learn more about SolarTech.

permit (as opposed to an electrical and building permit) IF they filled out the requisite forms, which included planning and zoning verifications. This priority permitting process resulted in an application package that, while considerably improved, still required the submission of a roof plan, single line diagram, photos of the proposed site, and an eight–page application.

## Convening Stakeholders & Making the Case

In order to continue the dialogue between stakeholders and the City, SF Environment and the Assessor-Recorder's office convened the San Francisco Solar Task Force. The Task Force brought together representatives from the local solar industry, environmental organizations, workforce development advocates, community stakeholders, the local utility, state energy agencies, and City departments. Conversations with stakeholders revealed that, despite improvements, the time and expense of the San Francisco permitting process was resulting in higher installation costs in San Francisco than surrounding jurisdictions, slowing the uptake of solar in the city relative to the rest of the region, and hampering the growth of a strong local solar industry.

Building off the early efforts toward improved permitting outlined above, the Solar Task Force and the City of San Francisco worked together to develop and implement a streamlined solar permitting process for residential and small commercial solar PV. The result has been a much more efficient and lower cost solar permitting processes for San Francisco.

## Streamlining the Solar Permitting Process

The Solar Task Force identified key aspects of the permitting process that needed improvement, including but not limited to:

- 1) Streamlining the number of departments that needed to review plans (Building Inspection, Planning, Fire) and ensuring that only an electrical permit was needed for a solar system (rather than an electrical permit and a building permit);
- 2) Reducing the cost of pulling a permit, including direct permit fees as well as indirect transaction costs, such as time preparing application documents, travelling to DBI and waiting in line, and even parking costs;
- 3) Maintaining safety and quality standards while improving efficiency and turnaround time.



The Task Force met regularly and built a consensus on these issues before sending a formal letter to the Director of DBI, which initiated the collaboration process to implement streamlined permitting. Among its most significant accomplishments, the Task Force helped to develop a new solar PV electrical permit application. The new two-page form allows installers to check boxes indicating the size and type of installations, while requiring that installers attest—under penalty of perjury—that their installation will be installed according to relevant codes and in line with existing plans on file or standard mounting practices.

In addition, the new permitting process no longer requires systems 4kW or less to submit a roof plan or single-line diagram. Local solar installers on the Task Force worked with DBI staff to provide model solar single-line diagrams and roof plans, which DBI officials keep on file and use as reference points when reviewing solar permit applications. Systems larger than 4kW still must submit those documents for review by DBI. In comparison, the previous permitting process required a contractor to submit a single-line diagram, roof plan and eight-page permit application regardless of the system size.

A DBI plan checkers still review for fire code compliance and structural security. San Francisco's fire code requires at least a three-foot setback from the array to the street and an 18-inch to three-foot pathway from the front to the back of the roof, depending on the pitch of the roof. The system must be installed in accordance with DBI's pre-approved structural mounting guidelines and not cover more than 80% of a roof greater than 5,000 square feet. (See full list of requirements in Appendix I.)

In summary, the Task Force and DBI staff felt confident that the City could maintain public safety while still creating significant streamlining for systems under 4kW. Meanwhile, larger systems will appropriately receive more thorough review, including review of compliance with fire code, electrical regulations, and sound structural engineering. The Task Force worked with DBI and SF Environment to fully implement the new streamlined permitting process, and continues to meet on a regular basis to receive updates and provide feedback on the City's solar policies, rebate program, and other solar market development initiatives.

## **Transitioning to Electronic Permitting**

Starting in 2012, San Francisco began offering electronic submission of solar permits, expanding on its online permitting system for mechanical, electrical, and plumbing permits. Solar permit applications for systems 4 kW and under can now be submitted online, paid for online and, once approved, printed remotely. These online services are expected to save installers time and money. Payments are currently made through a third party vendor, LinktoGov.

DBI also maintains a database of existing permits searchable by address, permit number, keyword (e.g. "solar"), or applicant name. The current e-permitting system was developed in-house by DBI and the San Francisco Department of Technology, and DBI has recently finalized a \$4.5 million contract with Accela, a government software company, to completely overhaul their online permitting infrastructure to allow for, among other features, uploading and sharing plans and other large files and collaborating more efficiently across departments. This system will be online by the end of 2013.

## San Francisco’s Solar Permitting Evolution for Systems 4 kW or Less

Steps	Before Streamlining	After Streamlining	
		Over-The-Counter ( $\leq$ 4kw)	E-Permitting
Application and Submission by Contractor	Paper Permit Application Submitted by mail or in person Plans Required	Only 2-page application in which contractors verify the use of approved structural systems and sign off that all fire setbacks were met	Under 4kW: Application is completed and paid for online  Over 4kW: Beginning in 2013, application and supporting documents to be submitted online
Department of Building Inspection Review	DBI, reviews plans for fire code violations, structural soundness, and electrical code requirements	DBI reviews streamlined 2-page application	Under 4kW: DBI reviews streamlined application  Over 4kW: DBI will review streamlined application and supporting documents
Other Department Review	Permit reviewed by Planning Dept to ensure that the system is not on a historic site and the array does not exceed bldg height limit	No outside departmental review required if system meets all requirements	No outside departmental review required if system meets all requirements
Approval and Issuance	If it meets requirements, permit approved and issued	Immediate issuance over-the-counter	Existing and pending permits are available online and can be searched for by address, application number, etc.
Inspection and Compliance	Post-construction inspection	Post-construction inspection  Successful inspection necessary for SF solar rebate  Re-inspection fee (\$170/hr) if necessary	Post-construction inspection  Successful inspection necessary for SF solar rebate  Re-inspection fee (\$170/hr) if necessary

## BEST PRACTICES FOR IMPLEMENTATION

### Develop regular opportunities for broad input and collaboration.

The Solar Task Force was a setting in which insights and feedback was shared between diverse stakeholders. The group met on a regular basis, allowing for continued feedback and input into city programs and processes. Including representatives from active local solar companies, community stakeholders, key officials and relevant

City departments help ensure policies are designed well from the start, and have buy in from all involved. Such working groups benefit all stakeholders, serving as a forum to share ideas, voice concerns, and ultimately lower costs and increase solar adoption.

### **Make the economic case.**

Streamlining solar permitting processes has the potential to reduce costs both for the city, solar industry, and ultimately solar system owners, while also supporting local economic development and green job growth. The Solar Task Force, armed with California Solar Initiative statistics and the Sierra Club's Permitting Scorecard, was able to show that the longer, more expensive permitting process was hindering San Francisco's solar market development. These statistics proved a valuable leverage point with policymakers interested in increasing the adoption of renewable energy and making the city competitive with surrounding jurisdictions. Recent surveys carried out under the US DOE's Solar America Cities and SunShot Initiative can also provide useful benchmarking to identify areas for improvement going forward.

### **Draw on existing best practices and model guidelines.**

A number of reports and guidelines are now available to help cities improve their permitting processes, many of which came out of the US DOE's Solar America Cities program. The Solar America Board for Codes and Standards (Solar ABCs) has issued best practices documentation for streamlined solar permitting, which can be used as a reference point for jurisdictions. In addition, the Interstate Renewable Energy Council has issued a report<sup>2</sup> on developing efficient solar permitting, and California Governor Jerry Brown's Office of Planning and Research has published a permitting guidebook<sup>3</sup> for local jurisdictions.

### **Create specific requests and maintain working relationship with permitting authorities.**

The Task Force was able—with a single voice—to write a letter to DBI with helpful, specific, and proven recommendations for streamlining solar permitting in San Francisco. The Task Force also held in-person meetings to keep the recommendations on track. The more targeted the recommendations are, the more likely they are to be adopted. Limiting demands on the building department's staff and resources during this process is also important, particularly given the financial constraints facing many municipalities today, as is making the case for long-term time and cost savings associated with streamlined permitting.

### **Balance speed and safety.**

During the streamlining process, it is paramount to balance the desire for a more efficient solar permitting system with the need to maintain rigorous safety standards for systems. The role of DBI is to protect public safety by ensuring quality work and code compliance; the local permitting authority should be able to provide input on the permitting reforms to ensure they are comfortable with proposed changes. Contractors are, of course, ultimately responsible for completing safe installations, and the permitting system should have regular, reliable checks for quality control.

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<sup>2</sup> <http://www.irecusa.org/wp-content/uploads/Sharing-Success-final-version.pdf>

<sup>3</sup> [http://opr.ca.gov/docs/California\\_Solar\\_Permitting\\_Guidebook.pdf](http://opr.ca.gov/docs/California_Solar_Permitting_Guidebook.pdf)

## Get building officials on board.

Given the relatively recent and fast expansion of solar PV, permitting officials often need to be educated on solar technologies in order to increase their comfort with inspecting these systems, and they need to be educated through trainers and classes that they trust, such as those led by other code officials and engineers. It is also helpful to reference best practices in other cities as well as the Solar ABCs, which have been developed and vetted by experienced code officials.

## Enable tracking and data management with electronic permitting.

Efficient data management is essential to building a permitting system that is transparent, effective and responsive, and can also help the city to track installations, measure the impact of solar programs, and share information amongst city departments (including, for example, providing fire departments with up to date information on the location of solar systems and disconnect switches for use during emergency responses). One of the primary goals of San Francisco's new online permitting system is to dramatically improve the city's ability to store, search, and share permitting documentation, internally and externally. One of the most important features of the new system will be a function that will allow different departments to view and edit electronic documents by logging into a central portal. This allows departments to collaborate more quickly, and for contractors to only need to submit one set of plans. Contractors will also be able to track their application status as it moves through the review process.

## Create incentives to promote compliance with regulations and safe installations.

In San Francisco, receiving the local GoSolar SF incentive is contingent upon a successful permit inspection. There is also a significant re-inspection fee (\$170/hr), which the contractor must pay if the first inspection fails. These provide a financial incentive for contractors to perform a quality, code-compliant installation the first time, thereby increasing efficiency and lowering costs for the City. Other methods for achieving these results include a probationary process that includes more checks for new contractors and contractors with a history of repeated code violations. Such actions reward quality installations, allow the City to identify sources of repeated inspection failures, and help new contractors understand permitting requirements.

***For more information, please contact the San Francisco Department of Environment:***



**Telephone: (415) 355-3700**

**Fax: (415) 554-6393**

**11 Grove Street San Francisco, CA 94102**

**[www.sfenvironment.com](http://www.sfenvironment.com)**

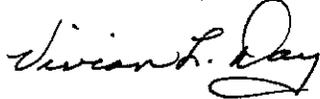
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# Appendix I: San Francisco Solar Photovoltaic Permitting Procedures



## MEMORANDUM

**TO** : All Interested Parties

**FROM** : Vivian L. Day, C.B.O.   
Director

**DATE** : February 10, 2009 (supersedes memo dated January 9, 2008)

**SUBJECT** : **San Francisco Solar Photovoltaic Permitting Procedures**

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The following interim procedures apply to solar photovoltaic permitting and inspection activities in San Francisco until superseded:

1. **No Planning Department review is typically required; *except*,**
  - Where the installation of the solar photovoltaic systems creates or is part of a vertical or horizontal addition to a building, such as a new roof structure or carport extending beyond the surface on which the photovoltaic system could be directly mounted.
2. **Electrical permits only are required for photovoltaic systems, and no building permits, building permit fees, or building inspections are typically required; *except*,**
  - Building permits may be required for structural or electrical systems that, in the opinion of the Director of the Department of Building Inspection, require additional permit review and associated fees to assure the public health and safety.
3. **Electrical permits for photovoltaic systems shall be charged at the rates established in San Francisco Building Code.** At the date of this memorandum, the rates are:
  - Up to 10 kW \$170.00 per system
  - Each additional 10 kW \$100
  - Plan review, where required \$187 per hour
  - Re-inspections, where required \$170 per hour

Additional permit processing fees will be charged per SFBC Fee Tables.

**OFFICE OF THE DIRECTOR**  
1660 Mission Street – San Francisco CA 94103  
Office (415) 558-6131 – FAX (415) 558-6225  
Email: Vivian.Day@sfgov.org

4. **No submittal information, such as diagrams, site plans or roof layouts, is typically required; *except*,**
  - For photovoltaic systems greater than 4 kW output, the following information must be presented for over-the-counter review by Electrical Inspection Division staff:
    - a. Roof layout showing location of all equipment and required Fire Department access (see Items 6 through 10 below).
    - b. Single-line schematic diagram noting:
      - i. System grounding
      - ii. Module ratings
      - iii. Wiring methods
      - iv. Conductor size and insulation types
      - v. Over current devices
      - vi. Disconnect means
      - vii. Inverter rating(s)
    - c. Structural system details for non-standard rack installations.
5. **On a flat roof (up to 3:12) with only one street frontage, a three foot clear walkway must be provided along the roof edge of the roof facing the street and a 3-foot clear walkway, provided at any location, must allow access to the rear of the building.** On a case-by-case basis, the Fire Department will consider alternatives or exceptions to these requirements.
6. **On a flat roof (up to 3:12) on a corner lot having two street frontages, a three foot clear area must be provided along the roof edges facing both streets. No other walkway is required.** On a case-by-case basis, the Fire Department will consider alternatives or exceptions to these requirements.
7. **On a pitched roof (over 3:12) a three foot clear walkway must be provided along the roof edge facing the street and a clear area measuring at least 18 inches, measured on the roof surface, must be provided from the ridge of the roof to the edge of the photovoltaic array.** On a case-by-case basis, the Fire Department will consider alternatives or exceptions to these requirements.
8. **Clear access to fire standpipes and other emergency equipment on roofs must be maintained.**
9. **If the roof area is greater than 5000 square feet and the photovoltaic system covers more than 80% of the roof area, the photovoltaic array layout must be reviewed by the Fire Department to assure sufficient emergency access.** The Fire Department will accomplish this review over-the-counter at no fee.
10. **Solar photovoltaic panels must be supported on the roof or surface of the building that they serve.**

11. **Solar photovoltaic panels may be installed over only one roof covering of a flat/built up roof or over two roof coverings of a shingled roof unless otherwise approved by the Department of Building Inspection.** The Department of Building Inspection will review such requests over-the-counter at no fee. Requests should be accompanied by details of current roof assemblies and approximate weights per square foot of roofing material.
12. **Storage batteries may not be connected to the solar photovoltaic system unless a separate electrical permit is procured based on detailed plans for the system installation.** A building permit is required if such batteries contain more than 50 gallons of battery acid or are installed on a rack over five feet, nine inches high.
13. **Structural safety for photovoltaic system installations may be assured in any one of the following four ways:**
- I. Install a structural mounting system that is pre-approved by the Department of Building Inspection. Contractors must have pre-approved structural documents available on the site at the time of Electrical inspection, or
  - II. Meet the following minimum standards for fasteners of rack systems to roof:
    - a. Table of fasteners -
 

<u># modules (max size 4'x6')</u>	<u>minimum # of mounting points</u>
1	4
2	4
3	6
4	8
5	10
6	12
7	14

      - o Double number of modules for mounting points
      - o Assume two bolts per mounting point.
    - b. Lag bolts to be 1/4" if 4" embedment into wood joist material, 5/16" if 3" embedment
    - c. Use appropriate fasteners if rack supports are supported by materials other than wood joists
    - d. Maximum panel load is to be no greater than 8 pounds per square foot.
  - III. Install a standard manufactured rack and panel mounting system in accordance with manufacturer's installation instructions; or
  - IV. Have the structural mounting system approved by a Department of Building Inspection engineer on a case-by-case basis as an over-the-counter, no-fee review. Provide rack installation design drawings and related materials for review.

Since little technical review is required prior to permit issuance, permit holders must be prepared to show conformance with all technical requirements in the field at the time of inspection.

At this time, please use the form for *Electrical Permit Application for Roof-Mounted Solar Photovoltaic Systems*. This form is available on-line at the Department of Building Inspection website at [www.sfgov.org/site/dbi\\_page.asp?id=18633](http://www.sfgov.org/site/dbi_page.asp?id=18633) or at the Department of Building Inspection offices. For technical information regarding electrical permits and installations, please contact the Electrical Inspection Division at 415-558-6654.

Please note that these procedures are still under active review. Comments or questions regarding Solar PV permitting policies are appreciated; please contact Laurence Kornfield, Chief Building Inspector, at 415-558-6244 or at [Laurence.Kornfield@SFGov.org](mailto:Laurence.Kornfield@SFGov.org).

Thank you.

VLD/LK/ce

# Appendix II: Department of Building Inspection Electrical Permit Application for Roof-Mounted Solar Photovoltaic (PV) Systems



**DEPARTMENT OF BUILDING INSPECTION Electrical  
Permit Application for Roof-Mounted Solar Photovoltaic  
(PV) Systems Only**

Permit #

<b>Job Address:</b>	<b>Owner:</b>	<b>Phone:</b> (    )
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<b>Contractor License #</b>	<b>License Class:</b>	<b>Business Tax License #:</b>
<b>Contractor/Applicant Name:</b>		<b>Applicant Phone:</b> (    )
<b>Applicant Address:</b>		<b>Applicant Cell Phone:</b> (    )

Installation Description:  Residential  Non-Residential

<b>Number of Roof-mounted Solar PV Modules</b>	<b>Watts per Module</b>	<b>Valuation of Electrical Work:</b> \$
<b>Number of Interactive Inverters</b>	<b>Power ratings (each)</b>	<b>Total No. of Rating</b> <b>KW</b>
<b>Additional Comments:</b>		

**PLEASE CHECK THE APPLICABLE BOXES:**

- Total inverter power over 4kw (If checked, DBI Electrical review and approval of electrical one-line drawing is required in signature box 1)
- Roof area is greater than 5,000 sq. feet and solar PV modules cover more than 80% of the roof area. (If checked, Fire Department review and approval of PV module layout is required in signature box 2)
- Built up roof has more than one layer, or shingled roof has more than two layers, or attachment details not pre-approved. (If checked, DBI Structural review, approval of roof load & attachment details is required in signature box 3)

**Please review your permit information for accuracy. A new permit is required to correct inaccuracies or omissions on issued permits.**

Roof-mounted solar PV installations that conform to the general requirements itemized on side 2 of this Form will not require a building permit application, Planning Department approval, plan review, or equipment submittal. Contractor shall arrange a final inspection of the completed solar photovoltaic system, telephone **(415)558-6570**.

#1 Electrical review if solar PV system(s) installation is rated over 4kw	Date:
Signed by	Print Name Phone: (    )

#2 Fire Dept. review if roof area is over 5,000 sq. ft. and solar PV modules cover more than 80% of roof area	Date:
Signed by	Print Name Phone: (    )

#3 Structural review if solar system is installed over more than one layer of built-up roof or two layers of shingled roof	Date:
Signed by	Print Name Phone: (    )

#4 The ten conditions listed on the reverse side of this form accurately represent the proposed solar photovoltaic project.	Date:
Signed by	Print Name Phone: (    )

**GENERAL REQUIREMENTS:**

1. Solar PV panel modules will be supported on the roof or surface of the building that they serve.
2. The weight of solar PV panel modules and supporting hardware will not exceed 8 pounds per square foot.
3. Solar PV panel modules may be installed over only one roof covering of a flat/built up roof, or two roof coverings of a shingled roof unless otherwise approved by the Department of Building Inspection (DBI)
4. On a flat roof (up to 3:12) with one street frontage, a 36 inch clear area will be provided along the roof edge facing the street. A 36 inch clear walkway will be provided /maintained to allow access to rear of the building.
5. On a flat roof (up to 3:12) of a corner lot building having two street frontages, a 36 inch clear area will be provided along the roof edges facing both streets. No other walkway area is required.
6. On a pitched roof (over 3:12) a 36 inch clear area will be provided along the roof edge facing the street and a clear area of at least 18 inches, measured along the roof surface, will be provided from the ridge of the roof to the edge of the solar PV modules.
7. Clear access to fire standpipes and other emergency equipment is provided /maintained.
8. Storage batteries will not be part of this solar photovoltaic system.
9. The solar PV modules will not create and/or will not be part of a vertical or horizontal addition such as, a new roof structure or carport extending beyond the existing building.
10. The solar PV modules will be fastened to the roof in accordance with either
  - manufacture’s instructions pre-approved by DBI, or
  - the support/fastening system is pre-approved by DBI, or
  - the module mounting rack and roof attachment system is designed and/or installed under the direct supervision of a California licensed engineer or architect, or
  - the modules are fastened in accordance with the following table and requirements:

<b>Number of modules (Max size 4’ by 6’)</b>	<b>Minimum Number of mounting points</b>
1	4
2	4
3	6

If more than three modules, the number of mounting points shall be doubled per module.

- Assume two bolts per mounting point
- Lag bolts in wooden members will be ¼” diameter by 4” long, or 5/16” diameter by 3” long.
- Appropriate type and size fasteners will support solar PV panel modules fastened to other materials.

**Note:**

The contractor’s representative who is familiar with the solar PV system shall be on site for the inspection and shall provide access to all areas of the installation. The contractor’s representative shall make available all documents related to the solar PV system including: technical data, structural mounting details, and other related information. Since technical review is not required prior to electrical permit issuance for systems of 4kw or less, the permit holder shall demonstrate conformance with all requirements at time of inspection.