



# City of Chicago Solar Zoning Policy



DEPARTMENT OF PLANNING & DEVELOPMENT  
CITY OF CHICAGO

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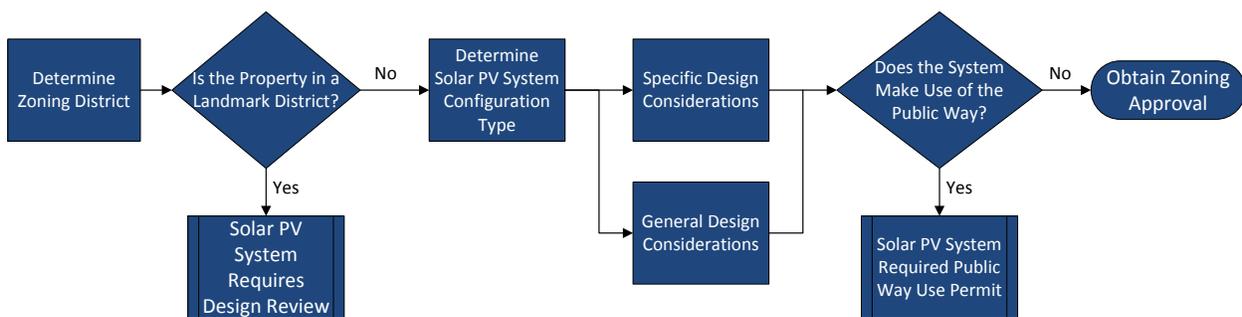
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## I. DOCUMENT OVERVIEW

The purpose of this policy is to provide guidance strictly for the zoning review of solar photovoltaic (PV) projects in the City of Chicago. The goal of this policy document is to make zoning design requirements transparent for solar PV system applicants. This policy does not provide specific guidance for the zoning review of solar thermal systems.

The framework of this policy document is to (1.) identify the major zoning districts and (2.) establish the solar PV system configuration types. The zoning district will have major impacts on a solar PV project and may limit major design features of the system, such as the size and location of the installation. The configuration type for the solar PV system will have specific design requirements. Using the zoning district and system configuration type, the City of Chicago has established design considerations required of the solar PV system in order to obtain zoning approval. See Figure 1 to illustrate the zoning review process:



**Figure 1:** Flow Diagram illustrating zoning review process

**Disclaimer:** All solar PV systems are subject to review by the City. If the solar PV system is found not to be in accordance with this policy, or violates City of Chicago Ordinance, the City of Chicago reserves the right to mandate the Owner of the property to modify or remove the system, at the Owner’s expense, as deemed appropriate.

Further, this document serves as a policy of the City of Chicago, and is not an Ordinance. As such, the requirements provided by this document are merely guidelines, and the City of Chicago withholds the right to deny Zoning Approval for any solar PV system, even if it is found to be in accordance with this policy.

## A. DEFINITIONS

**Accessory Structure:** A structure that is subordinate in area, extent and purpose to the principal use and building on the zoning lot and that is customarily used in conjunction with a permitted accessory use. (17-17-0205)

**Accessory Use:** A use that is subordinate in area, extent and purpose to the principal use on the zoning lot and that is customarily found in conjunction with a permitted principal use. (17-17-0206)

**Engineered Mounting Structure:** A structure on which solar PV system components are mounted. The structure shall be made of pre-fabricated materials and designed using industry standards. The sole purpose of the structure is to support components in a solar PV system. No unfinished materials shall be used in an engineered mounting structure.

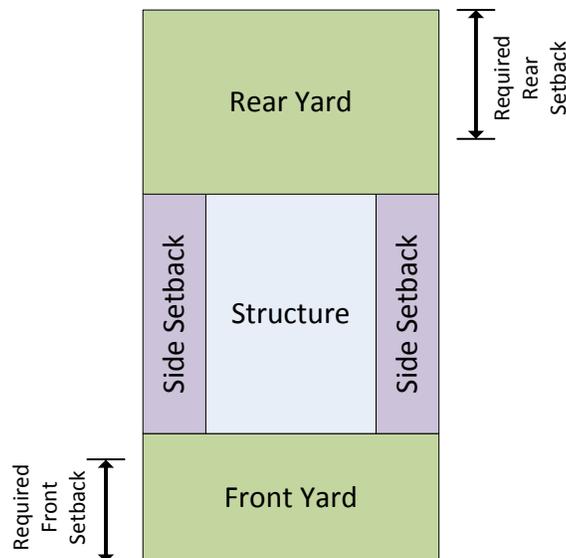
**Principal Use:** An activity or combination of activities of chief importance on the lot. One of the main purposes for which the land, buildings or structures are intended, designed, or ordinarily used. (17-17-02126)

**Public Way:** Any sidewalk, street, alley, highway, or other public thoroughfare. (17-17-02137)

**Setback:** An open, unobstructed area that is required by the Chicago Zoning Ordinance to be provided from the furthestmost projection of a structure to the property line of the lot on which the building is located. (17-17-02152) (See Figure 2)

**Photovoltaic (PV):** The term “photovoltaic” refers to the generation of electrical power by method of converting solar radiation into direct current electricity. Solar PV collectors consist of a number of solar cells made from photovoltaic material.

**Yard:** The actual (as opposed to “required”) open space on a zoning lot that is unoccupied and unobstructed from its lowest level to the sky. (17-17-02192) (See Figure 2)



**Figure 2:** Illustration showing location of setbacks on a property

## B. SOLAR PV SYSTEM DESCRIPTION

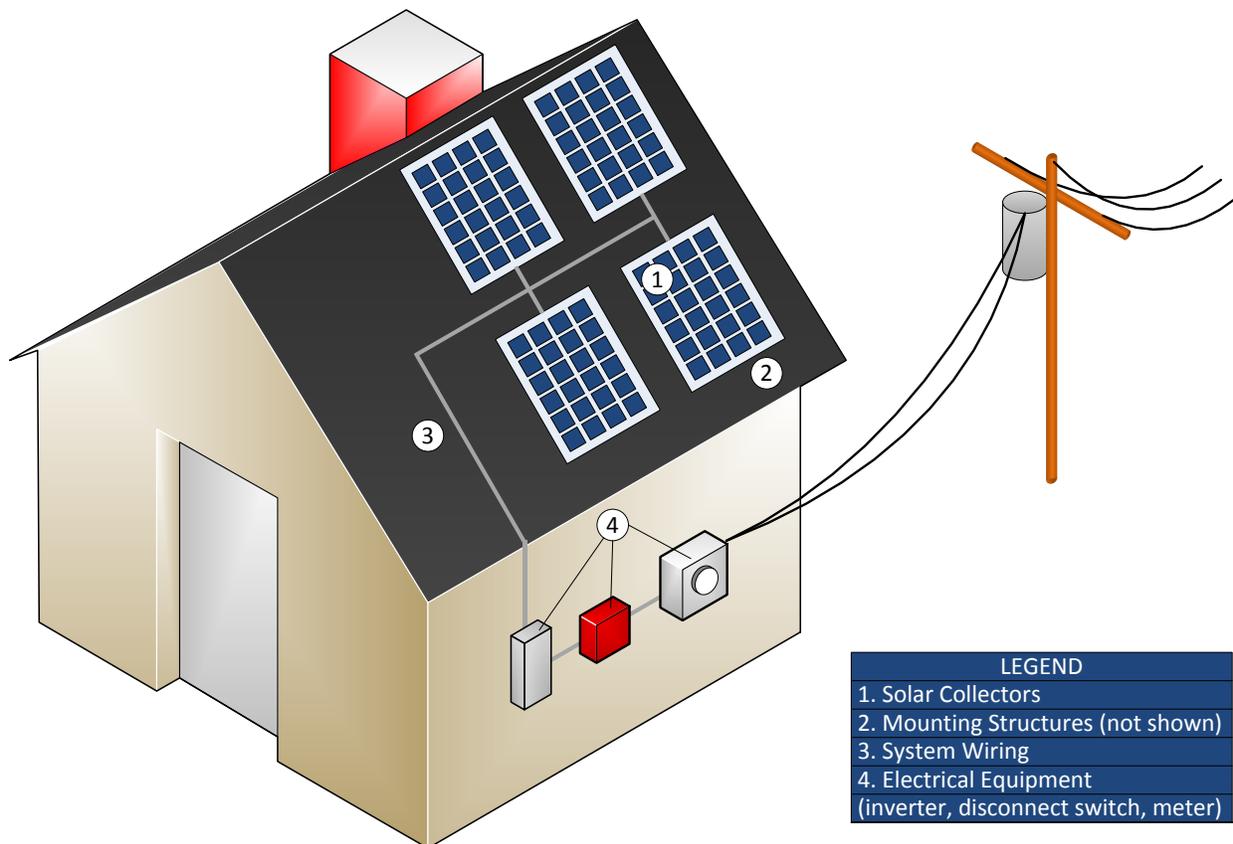
### Definition:

A solar PV system produces electricity for the principal use of the property on which the solar electric system is located. The solar PV system is considered an accessory structure to the principal structure. The components of a solar PV system that are governed by this policy are not limited to solar collector units, as this policy also governs any other component installed as part of a solar PV system.

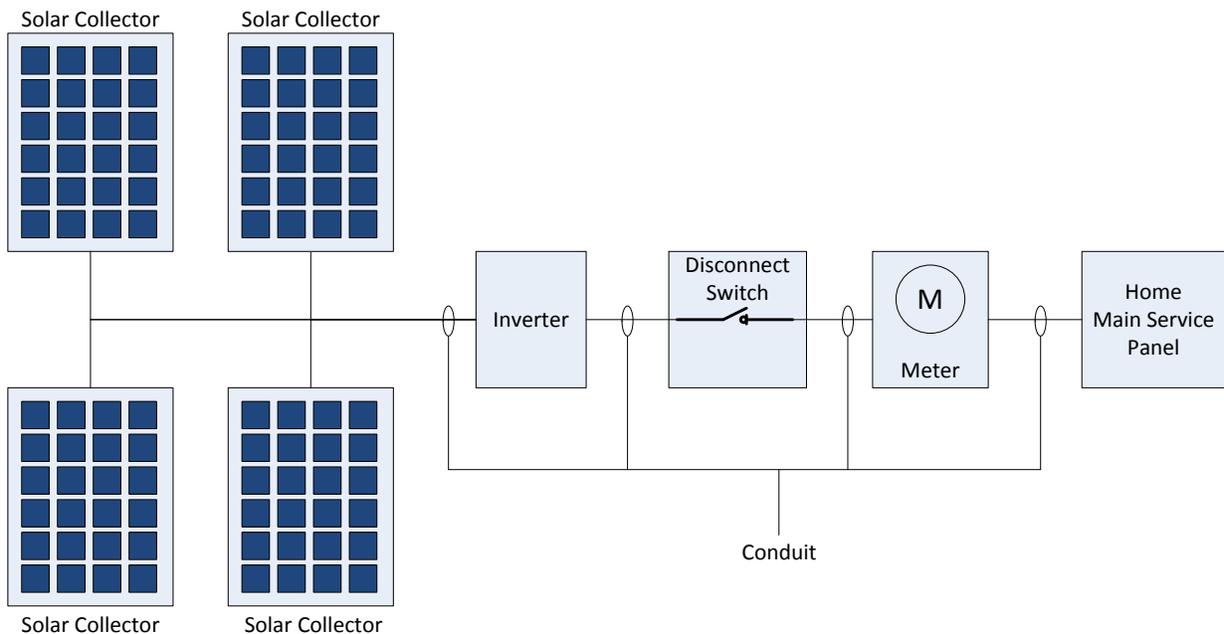
### Components:

The components of a solar electric system that are relevant to the zoning policy:

1. Solar collector units (series of photovoltaic (PV) cells, typically configured in standard panel assemblies)
2. Solar collector mounting structures (bracketing hardware, trays, ballasting, etc.)
3. System wiring (includes all cables, conduit, etc.)
4. Other electrical equipment (junction boxes, inverters, disconnect switches, meters, etc.)



**Figure 3:** Graphical Illustration of Components for a Typical Rooftop Solar PV System



**Figure 4:** Single Line Diagram of Solar PV System

### C. CONFIGURATION TYPES

The basic configuration types of solar PV systems are Roof-Mounted, Non Roof-Mounted, Freestanding, or BIPV systems. Each solar PV system configuration type has unique design considerations that will impact the zoning review. Zoning design considerations depend on the selected solar PV system configuration type.

#### 1. Accessory to a Structure

##### (a) Roof-Mounted

Roof-mounted systems are defined as solar PV systems in which all solar collector units are mounted on the roof of a structure. Roof-mounted systems can either be physically connected to the roof of a structure (penetrating, see Figure 5), or rested on top of the structure through ballasting means (non-penetrating/ballasted, see Figure 6).

##### (b) Non Roof-Mounted

Non roof-mounted systems are defined as solar PV systems in which the solar collector units are attached to the exterior of a structure at a location other than the roof. Such solar PV systems can be attached to the exterior walls of a structure, or other features such as awnings (see Figure 7).



**Figure 5 (Above Left):** An example of a roof-mounted (penetrating) solar PV system  
(Source: <http://www.solarserviceinc.com>)



**Figure 6 (Above Right):** An example of a ballasted (non-penetrating) solar PV system. Here, the PV panels are not physically connected to the roof. Cinderblocks are used as ballasting means to secure the system to the roof. (Source: <http://www.solarserviceinc.com>)



**Figure 7:** At the Chicago Center for Green Technology, solar panels serve a dual purpose, as they are used to generate electricity and are used as awnings above windows. This is an example of a non roof-mounted system. (Source: <http://news.medill.northwestern.edu>)

## 2. Freestanding

Freestanding systems are defined as solar PV systems in which the solar collector units are mounted independently of the principal structure or any other accessory structure. The most common types of freestanding solar PV systems are ground-mounted and pole-mounted systems.



**Figure 8:** Dual purpose ground-mounted solar PV system located on a parking shading structure. (Source: <http://climateinc.org>)



**Figure 9:** Single purpose pole-mounted solar PV system. (Source: <http://www.mlive.com>)

### 3. Building Integrated Photovoltaics (BIPV)

A BIPV system is defined as a solar PV system where the solar collector units are integrated into the principal structure, rather than considered an accessory to the structure. The BIPV system typically replaces or substitutes an architectural or structural element of the structure. Examples of BIPV electric systems are those where solar collector units are built into roofing materials, skylights, windows, and awnings.



**Figure 10:** BIPV system, solar PV panels are built into the shingles of a roof (<http://solarenergyfactsblog.com>)



**Figure 11:** BIPV system, as a window of a structure (<http://inhabitat.com>)



## **D. ZONING DISTRICT**

Solar PV systems are subject to different design considerations based on their zoning district. For the purpose of this policy, there are four distinct zoning district categories that determine zoning approval.

The location and boundaries of zoning districts in the City of Chicago can be found using the following link:

<https://gisapps.cityofchicago.org/zoning/>

### **Residential Districts (Type 'R' and 'DR'):**

The Residential Districts include all districts with a classification that begin with 'R'. In addition, this category also includes the Downtown Residential Districts, for which the district classification begins with 'DR'. The residential districts are intended to create, maintain and promote a variety of housing opportunities for individual households and to maintain the desired physical character of the city's existing neighborhoods. While the districts primarily accommodate residential use types, nonresidential uses that are compatible with residential neighborhoods are also allowed. (17-2-0101)

### **Business and Commercial Districts (Type 'B' and 'C')**

The 'B' and 'C' (Business and Commercial) districts are intended to accommodate retail, service and commercial uses and to ensure that business and commercial-zoned areas are compatible with the character of existing neighborhoods. (17-3-0101)

### **Manufacturing Districts (Type 'M')**

The 'M' and Planned Manufacturing Districts "PMD" are intended to accommodate manufacturing, warehousing, wholesale and industrial uses outside the Central Area. (17-5-0101)

### **Downtown Districts (Type 'D')**

'D' zoning districts are intended solely for application within the downtown area (17-4-0101). The downtown districts exclude the downtown residential districts (type 'DR'), as these are grouped with the residential districts.

## II. DESIGN CONSIDERATIONS

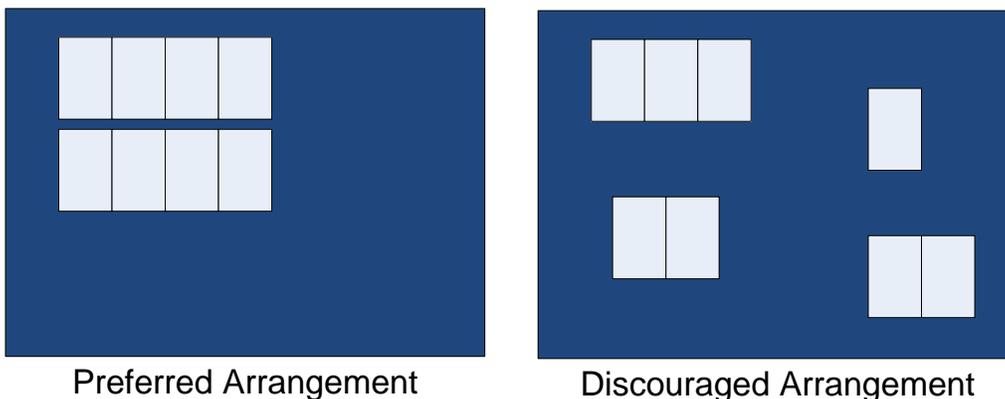
Once the zoning district and solar PV system configuration type have been determined (from Section I: 'Document Overview', above), the City of Chicago reviews solar PV system applications using various design considerations.

Design considerations are broken into two separate areas:

- **General Design Considerations** are guiding design principles that apply to **all** solar PV systems, regardless of configuration and zoning district type.
- **Specific Design Considerations** are design principles that apply based on the system configuration type and zoning district.

### A. GENERAL DESIGN CONSIDERATIONS

1. Solar collectors shall be located such that any solar glare is not directed onto nearby properties or roadways. To limit solar glare, the face of the collectors can be configured as to not face a Public Way or neighboring property. Solar collectors must be made of a non-reflective surface. If the solar PV installation creates an adverse impact to the public or neighboring properties, the property owner will be required to take measures to mitigate the impact. Such measures may include screening provisions, such as vegetation, to block the glare, or to remove the solar collectors entirely.
2. A solar PV system shall not be used to display any advertising or signage, including streamers, pennants, spinners, flags, reflectors, ribbons, balloons, banners, or other similar materials.
3. All solar PV systems shall be installed using an engineered mounting structure.
4. All solar PV system wiring shall be neatly grouped, routed and continuously supported.
5. Where feasible, solar collector units shall be consolidated into array groupings, rather than situated in a disjointed manner. (See Figure 12, below)



**Figure 12:** Arrangement solar collectors should be consolidated as much as possible.

## **B. SPECIFIC DESIGN CONSIDERATIONS**

The specific design considerations contained in this section are not applicable to every solar PV system. They are applied only once the zoning district of the property is known and the configuration type of the solar PV system has been determined.

### **1. Roof-Mounted Systems**

Roof-mounted solar PV systems are considered accessory to structures in all zoning districts. The requirements for roof-mounted solar PV systems are the same in all zoning districts.

#### **(a) Allowed Structures**

##### **i. Residential Districts**

No part of the solar PV system may extend beyond the exterior perimeter of the principal or accessory structure.

##### **ii. All Other Districts**

Solar PV systems can be mounted on accessory structures, such that no part of the system extends beyond the exterior perimeter of the building on which the system is mounted.

#### **(b) Height**

##### **Flat Roof**

Any part of the solar PV system shall not exceed 9 feet in overall height, or extend more than 5 feet above the building parapet, whichever results in less height. (17-17-0311-B)

##### **Pitched Roof**

Solar PV collectors must be mounted flush with the roof, and the surface of the collector shall not extend any further than 12 inches from the roof surface at any point<sup>1</sup>. No portion of the solar collectors shall extend beyond the ridgeline of the roof at any point.

#### **(c) Placement**

Solar PV systems shall be designed and configured to blend into the architecture of the building to the greatest extent possible, or shall be screened from the view from the public way.

Solar collector units shall be consolidated to one area on the roof to the greatest extent possible, and shall not be scattered in multiple groups on the roof.

In any district, if the principal structure is located within a required setback, then the solar PV system may be located within that same setback.

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<sup>1</sup> This requirement only applies to solar PV systems, and does not apply to solar thermal systems. Zoning requirements for solar thermal installations are outside the scope of this policy.

**TABLE 1: ROOF-MOUNTED SOLAR PV SYSTEMS DESIGN MATRIX**

Roof Type	District	Allowed Structure	Setback	Height	Aesthetic
Flat	Residential	Principal & Accessory Structures	No portion of the system shall extend beyond the edge of the roof.	Max Height: 9 feet or 5 feet above parapet, whichever is less	Blend into the architecture of the building.  Consolidated to one area of the roof, not scattered.  Engineered mounting structures required.
	All Other Districts	Principal & Accessory Structures			
Pitched	Residential	Principal & Accessory Structures	No portion of the system shall extend beyond the ridgeline or the edge of the roof.	Surface of the panel shall not extend any further than 12 inches from the roof surface, at any point.	
	All Other Districts	Principal & Accessory Structures			

**Note:** Requirements are provided only for solar PV systems, and do not apply to solar thermal systems.

**2. Non Roof-Mounted Systems**

**(a) Residential Districts**

Solar PV systems shall not be mounted to any façade facing the front of the property.

Systems may be mounted to the sides of structures, such that no part of the system projects more than 18 inches into the side setback of the property.

Systems may be mounted to the rear of a structure, such that no part of the system projects more than 3 feet into the rear setback of the property.

**(b) All Other Districts**

Non roof-mounted solar PV systems may be mounted to the front, sides, or rear of structures. The maximum distance that a system is allowed to project from a structure is 3 feet.

If a system projects into a public way, it requires public way approval, and the application must be reviewed by the Chicago Department of Transportation (CDOT).

Solar PV systems may be mounted to awnings. The system must be mounted to the flat surface of an awning, and must not project horizontally or vertically beyond the limits of the awning.

**TABLE 2: NON-ROOF-MOUNTED SOLAR PV SYSTEMS DESIGN MATRIX**

District Type	Allowed in Setback?		Extension Length	Aesthetic
<b>Residential</b>	Front	No	N/A	<p>Blend into the architecture of the building.</p> <p>Consolidated or uniformly placed on structure, not scattered.</p> <p>Engineered mounting structure required.</p>
	Side	Yes	18 inches maximum	
	Rear	Yes	3 feet maximum	
<b>Business &amp; Commercial</b>	Front	Yes	<p>Max extension from structure: 3 feet</p> <p>Systems that extend into the Public Way require CDOT review.</p>	
	Side	Yes		
	Rear	Yes		
<b>Manufacturing</b>	Front	Yes		
	Side	Yes		
	Rear	Yes		
<b>Downtown</b>	Front	Yes		
	Rear	Yes		
	Side	Yes		

**3. Freestanding Systems**

**(a) Residential Districts**

Freestanding solar PV systems are not permitted in Residential Districts.

**(b) All Other Districts**

Freestanding solar PV systems shall not be located within any required setback of a property.

Any power transmission lines connecting a freestanding solar PV system to any other structure on the property shall be buried underground.

**TABLE 3: FREESTANDING SOLAR PV SYSTEMS DESIGN MATRIX**

District Type	Setback Requirements	Aesthetic
<b>Residential</b>	<b>NOT PERMITTED</b>	
<b>All Other Districts</b>	System shall not be located in any required setback.	Consolidated to one area of the property, not scattered. System cables between structures must be buried.

**C. ABANDONMENT**

If a solar PV system has been abandoned, meaning it has not been in operation for a period of 12 months or more, or is defective or unsafe in any manner, the solar PV system shall be required to be removed or repaired by the property owner.

If not removed within 90 days, the City of Chicago may pursue legal action to have the system removed at the property owner’s expense.

**III. OTHER CONSIDERATIONS**

**A. LANDMARK DISTRICTS**

If the proposed solar PV system is to be installed on a property that is a designated or proposed Chicago Landmark, or within a designated or proposed Chicago Landmark District, a separate design review is required by Historic Preservation Division of the Department of Planning and Development.

The purpose of this review is to determine whether the solar PV system will adversely affect any significant historical or architectural features of the property and/or district.

Typically, significant features are those aspects that are readily visible from the public way. Based on the specific landmark designation ordinance, significant features do vary from building to building and from one district to the other. Since no two situations are exactly alike, each application will be reviewed on a case-by-case basis; however the general approach for installations of solar PV systems would include the following design considerations:

- For solar panels installed on rooftops, these should be placed on the roof such that the components would not be visible from the public rights-of-way (streets and sidewalks).
- For a free-standing solar panel system, these should be located in limited or no-visibility locations in secondary areas of the property, such as in the rear yard.
- For solar panel installations on building facades, these should be located with limited visibility from the public rights-of-way, such as on a secondary elevation at the rear of a property.



The Historic Preservation Division staff encourages applicants to seek their advice and guidance before filing a permit application. A pre-permit review can clarify landmark requirements for the applicant and help expedite the review during the permit application process. For more information, please reference the City of Chicago's Landmarks Ordinance (Municipal Code of Chicago, Section 2-120-580 et seq.)

## **B. PUBLIC WAY USE**

Any solar PV system that extends into or is placed in the public way is subject to an additional review by the Department of Business Affairs and Consumer Protection (BACP) and/or the Chicago Department of Transportation (CDOT). If the solar PV system is approved by the BACP or CDOT, additional fees will be required and a Public Way Use permit will be granted.