Illinois Solar For All

~~02.19~~05.07.2019

Site Suitability Guidelines.

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Contents

Introduction

These Site Suitability Guidelines identify site conditions that are considered barriers to the installation of both rooftop distributed generation and ground-mounted photovoltaic (PV) systems participating in the Illinois Solar for All program. These guidelines also prescribe minimum siting requirements that must be met at Part I project approval. Improper siting on properties where roofing, electrical, structural or other issues exist can create or exacerbate maintenance and repair issues, create unexpected maintenance or improvement costs and impact the performance of the system, potentially causing financial or legal burdens on property owners. These guidelines address common barriers for installing solar on existing structures in four category areas: Roofing and Structural, Electrical, Space and Accessibility, and Health and Safety. Barriers in each of these categories may be found more commonly in low-income communities, where housing stock may be older and deferred maintenance issues more acute. Ground mounted siting requirements represent site assessment requirements that are industry best practices in most jurisdictions across Illinois.

While these barriers represent the most common issues found in low-income communities related to suitability for rooftop solar photovoltaic installations, as well as industry best practices for common ground mounted siting, this list is not exhaustive. Judgment, training, and experience should be used in assessing the feasibility of installations for all Illinois Solar for All ~~("~~(ILSFA~~")~~) projects. Approved Vendors, as well as their Designees, installers, and subcontractors, will follow these assessment protocols and ensure all requirements are met before contracting with participants. Should a project move forward to the installation phase, the ILSFA program requires that all applicable local building and electrical codes, standards, permitting and zoning requirements are followed, and that sites meet the minimum suitability requirements detailed in each section below. Approved Vendors, as well as their agents, subcontractors, and Designees, will be required to attest that each installation meets these minimum requirements and will submit a completed Site Suitability Report found at the end of this document with each PV project application.

Most sites and existing structures have some limitations for installing a PV system. This document identifies barriers that represent an unacceptable safety hazard, property maintenance risk or production risk if not mitigated prior to installation. These conditions may also create an unnecessary financial burden for the property owner if installation moves forward and repairs are deferred. For example, installing a PV system on a roof with only eight years of remaining life will incur removal and reinstallation costs before the end of system life is reached and before the system, if approved, delivers 15 years of RECs. To ensure high quality PV installations that are safe and productive for the project lifespan, conditions that do not meet these minimum requirements at the time of Part I project application will not be approved~~.~~ unless the Approved Vendor develops a mitigation plan that addresses the barrier, as discussed

further below. While Illinois Solar for All does not offer funding to address such barriers, the Program Administrator will maintain a list of resources that may be useful in identifying resources to help property owners resolve these and other building or site deficiencies, like other energy and housing related program incentives or other available grants or financing options. In cases where critical onsite barriers cannot be resolved, these projects will not be approved by Illinois Solar for All.

Required Inspections

Illinois Solar for All requires review of photographic documentation, as well as onsite inspections for installed projects. Part I photo review includes a review of photographs submitted with the Part I project application, along with the Site Suitability Report, to specifically validate the site suitability findings. Part II photo review documents the installed system, equipment, compliance with program and local code requirements, and general quality of workmanship. Onsite inspections will validate site suitability findings, as well as a more detailed inspection of system quality, safety, and performance. All requirements of the Site Suitability Guidelines are validated for every ILSFA installation. Remedial processes associated with inspection findings are detailed in the Inspections section of the Approved Vendor Manual.

If sites do not meet the requirements presented in this document at the time of Part I project application, the Approved Vendor must provide an appropriate mitigation plan as part of the Site Suitability Report provided at the end of this section. Projects submitted that do not meet these requirements and have not submitted a completed mitigation plan will not be approved. If mitigation plans do not adequately demonstrate that all site suitability requirements will be meet prior to installation, the Program Administrator will work with the Approved Vendor to develop a mitigation plan on a case by case basis. Where Approved Vendors dispute the findings of the Program Administrator, either as part of a review of mitigation plans, photo documentation or onsite inspection, an appeal may be submitted in writing to the Program Administrator.

Worker Safety Best Practices

Solar projects expose workers to jobsite hazards that can be minimized by following workplace safety requirements and standards such as OSHA and NFPA 70E. These common safety issues are not covered in the Site Suitability Guidelines or in ILSFA inspections. It is expected that Approved Vendors and their installer representatives will take precautions to minimize risk exposure by following these standards, as well as through the appropriate use of fall protection, scaffolds, ladders, lifts, personal protective equipment, power tools, electrical safety protocols and other safe work practices.

Site Suitability Screening

A comprehensive solar site analysis helps ensure a safe, well-performing, and well-maintained solar-electric system. Desktop tools have made great strides in bringing detailed analytical capabilities within the reach of a mouse click, but there is no substitute for a thorough in-person assessment of a proposed site – especially where deferred maintenance issues are more prevalent. This document provides guidance and specific requirements for assessing a site's suitability for solar installation including:

1) Roofing and structural evaluation
2) Electrical evaluation
3) Space and accessibility
4) Health and safety considerations
5) Site assessment for ground mounted systems

The Approved Vendor will document site suitability screening notes in the Site Suitability Report and share it with the Program Administrator and the property owner or manager. Available resources to help mitigate any deficiencies should be presented to the property owner or manager at this time.

Roofing and Structural Evaluation

ROOFING

It is critical to assess the roof covering and underlying structural support. The primary concern of the roof covering is its weather-sealing ability. Identifying potential roof degradation early reduces the chance of leak repairs and roof replacement later, and costly removal and re-installation of PV equipment. PV installers should inspect for the following problems with roofing materials:

- Asphalt Shingles – brittleness, loss of granular coating, warping, curling and moss growth where the roof is shaded or covered by foliage.
- Slate, clay or concrete tiles – cracks, misalignment, chips, missing tiles, and flaking.
- Metal roofing – rusting, corrosion, and pitting.
- Built-up, membrane, and gravel roofs – membrane brittleness, cracking, bubbling, evidence of water penetration.

Requirements:

- Roof must have at least 15 years of expected life remaining and be weather-sealed.
- Roof must comply with all local building codes.

- If any of the conditions above are identified, they must be addressed through roof covering repair or replacement by a licensed, bonded and insured roofer prior to or in conjunction with the installation of a PV system.
- Repairs must not void existing warranties.
- If it is determined that the site will need a new roof before the end of the 15-year REC period, the installation cannot proceed without a mitigation plan. The minimum requirements of the mitigation plan are:
    - The roof will be repaired or reroofed by a licensed contractor with a warranty of at least 15 years or provisions will be made for the removal and reinstallation of the PV system to allow for the reroofing on a future date.
        - The expense of the repairs, a new roof, or future reroofing cannot be supplied by ILSFA funding,
        - The expense of the PV mounting system and flashing are part of the PV system and can be supplied by ILSFA (as part of the REC or Participant payments).
        - The expense of the removal and reinstallation of the system cannot be supplied by ILSFA funding.
- Any roof repair or replacement must not place an unsustainable financial burden on the building owner; that is, the payments must be affordable to the owner. Specifically, financing amounts, terms, and conditions must be based on an assessment of the program participant's ability to repay the debt, as defined by Regulation Z, which is a federal rule that implements aspects of the Truth in Lending Act and the Dodd-Frank Act. See ILSFA Consumer Protections for Low-income Distributed Generation for more information.

Note: Where it is difficult to determine the age or condition of a roof, a licensed, bonded, and insured roofer should be consulted.

STRUCTURAL

Roof surfaces and structures must be able to withstand the loads placed on them by PV arrays. The condition of the underlying structural members – trusses, rafters, beams – must be carefully evaluated. Additionally, the site should be assessed to determine that there has not been any significant decay of components or unaddressed fire or water damage that would impact the ability of the site to withstand loads associated with solar implementation. If the roof structure does not meet current structural code requirements and is not in generally acceptable structural condition, the site will be deemed unacceptable for solar installation. This will include checking specific components of the load as well as the solar array (overall geometry, weight limits, anchor layout and pullout strength, etc.) and compliance with support component

manufacturer's recommendations. The PV installer must also inspect the roof structure for:

- Significant decay, dry rot, insect, fire, or water damage of components.
- Significant sagging, movement, or sponginess of the roof surface.
- Added roof loads.
- Multiple-layer roof – three or more layers.
- Removed web members.
- Rafter holes, notches, and truss/roof framing modifications.

Requirements:

- If any of the conditions above are identified, they must be addressed in a manner approved by a licensed structural engineer or architect before the PV installation can proceed.
- Roof structure should meet current local structural code requirements.
- Roof structure must be evaluated to be able to support additional loading of PV system per ASCE-7 or local building code.

Electrical System

The electrical system is another key factor to be considered when determining site suitability for PV installation. Older homes often have electrical wiring that was installed according to previous versions of the NEC code and is now out of code. This can lead to electrical issues that may need to be rectified before a PV system can be installed.

The PV installer must conduct an initial visual inspection to confirm none of the following hazardous and out-of-code conditions are present:

- Uncovered electrical boxes.
- Improperly insulated or exposed wires.
- Unsecure electrical connections.
- Inadequate panelboard space for interconnection of the PV system.
- Inadequate busbar capacity to handle power back fed into the panel.
- Active knob and tube wiring.
- Fused panelboards.

Requirements:

- If any of the conditions above are identified, they must be resolved by an electrician licensed by the Authority Having Jurisdiction (AHJ) before a PV installation can proceed.

- The existing panelboard consists of circuit breakers and not Edison base fuses.
- The existing panelboard has space for adding the necessary over current protection devices for the PV System.
- The busbar of the existing panelboard has enough capacity to handle the additional back fed load from the PV system.
- The existing panelboard does not present any hazardous electrical conditions (i.e. missing dead front cover, exposed wires, loose breakers, insufficient clearances, etc.).
- The existing electrical system does not contain active knob and tube (K&T) wiring in any portion of the system.
- Electrical boxes are covered, and all wiring has proper insulation and connectors.
- The electrical system must comply with the National Electric Code (NEC) enforced by the Authority Having Jurisdiction (AHJ).

Space and Accessibility

PV systems require additional power conversion and safety equipment. The installation process will require safe access to the interconnection panel, the new equipment locations, and conduit routes. Sufficient space must be available for the planned inverter, disconnects, other balance of system (BOS) equipment, and the accessibility clearances for these components.

The PV installer must conduct an initial visual inspection to confirm:

- Work areas are clear of hazardous materials (flammable materials, paints, solvents, etc.) and clutter that could impede work.
- Electrical interconnection panel has sufficient clearances, as defined by local electrical and building codes.
- Planned equipment has sufficient mounting space and code required work clearances.

Requirements:

- Determine equipment locations with building owner.
- Ensure spaces are hazard free and have proper clearances.

Other Health and Safety Considerations

HAZARDOUS MATERIALS

Older buildings may contain potentially hazardous materials that should not be disturbed, for example, asbestos piping insulation, vermiculite, or fiberglass insulation.

Hazardous materials can be harmful to workers and if they are brought into living spaces can introduce hazards to the occupants. Where feasible, the hazardous materials should be removed by licensed remediation professionals. Where requirements cannot be met because of hazardous conditions, installation cannot be performed. Illinois Solar for All does not provide funding to remediate hazardous materials or conditions. **The PV installer should not**:

- Disturb vermiculite insulation.
- Disturb suspected asbestos containing building materials (pipe wrap, fireproofing materials, boiler insulation, etc.) or any other materials that expose others to health or safety risk.

Requirements:

- Develop installation plans that do not disturb hazardous materials.
- Do not install equipment within interior areas with exposed or damaged suspected asbestos materials.
- Do not enter roof cavities where vermiculite is suspected.

PESTS

Older buildings may have envelopes that are open to various types of pests – termites, insects, rodents, and birds. Left unchecked, pests can damage structural members and create unsafe and unhygienic work environments. Illinois Solar for All does not provide funding for pest control. The PV installer should not:

- Work in unsafe or unhygienic conditions

Requirement

- Ensure work areas are free of pests prior to the installation of a PV system.

Ground Mounted Systems

This section is relevant if any portion of the system will be ground mounted. Ground mounted solar systems must be able to withstand the loads placed on them by PV arrays. A ground mount system will need to have an appropriate foundation to support the proposed PV array. The installer will need to confirm that any flooding risks ~~have been~~can be mitigated. If the site has a wide range of elevation variations, it may require grading to level out elevation differences. The geotechnical features of the proposed site will need evaluation to confirm the type of foundation necessary. ~~Access walkways are required and needed for maintenance purposes.~~ Clearance around the PV array is required and needed for maintenance purposes. The installer must investigate the site to assure eligibility will not be affected by wetlands or protected natural resources. If

wetlands or protected natural resources are present, a mitigation plan to minimize impacts will be required.

Requirements:

~~A completed Civil Assessment must be presented, stamped and submitted by a civil engineer licensed to practice in the Authority Having Jurisdiction, including:~~

- ~~A completed Geotechnical Report~~
- ~~A completed Structural Report, including foundation requirements for proposed ballast type or tracking type system to be stamped and submitted by a structural engineer licensed to practice in the Authority Having Jurisdiction.~~

An assessment must be presented that identifies all potential barriers to the PV system installation and provides mitigation plans to address any barriers identified. The Approved Vendor will attest that the requirements for non-ministerial permits can be met. The Approved Vendor should have results from the following tools and any other tools that may apply to the site:

- Obtain the Flood Insurance Rate Map (FIRM) review through the Federal Emergency Management Agency (FEMA) to confirm lack of flooding risk for the site. If the FIRM is not available for the site, ~~provide~~obtain the flood risk report through the External Data Request report. If flood risks are present, provide the report and a mitigation plan.
- ~~Confirmation that~~Obtain the report from Fish and Wildlife Service (FWS) online mapping tool showing the ground mounted system does not intrude on protected wetlands. ~~Provide report from Fish and Wildlife Service (FWS) online mapping tool.~~If wetlands are present, provide the report and a mitigation plan.
- ~~Completed~~Obtain the report from the Ecological Compliance Technical Tool Report (EcoCAT) showing no protected resources are present. If protected resources are present, provide the report and include a mitigation plan.

~~Additional requirements for Part I project application include the full system design parameters and equipment, shading study, as well as the executed interconnection agreement and documentation of all local permitting for systems 25 kW or larger.~~

The ground mount narrative description should include a

- description and photo(s) of the site conditions where the proposed system will be installed. (i.e. notable soil conditions, flooding or marshy areas, excessive hills, old/abandoned foundations or structures, industrial waste, landfill or capped remediation site)

Summary

The conditions summarized in this document may require the intervention of a licensed professional for remediation. In no cases will Illinois Solar for All provide funding for remediation. Wherever possible, the Approved Vendor and ~~their~~its installer should provide the site owner with available resources through the ILSFA Program Resources Guide and support the property owner in mitigating these deficiencies. Resources provided in the Program Resources Guide, as well as other resources known to the Approved Vendor or installer that can be used to support the mitigation of known risks or installation barriers should be shared with property owners, including energy efficiency program details.

Finally, where repairs are made at a cost to the building owner, they should not place a financial burden on the owner and must be based on the customer's ability to pay. Specifically, financing amounts, terms, and conditions must be based on an assessment of the program participant's ability to repay the debt, as defined by Regulation Z, which is a federal rule that implements aspects of the Truth in Lending Act and the Dodd-Frank Act. See ILSFA Consumer Protections for Low-income Distributed Generation for more information.

Site Suitability Report

Project Information

Site Address _____

(City, State, Zip Code): _____

_____

Project Type (select one):	Installation type (select one):
☐ 1-4 unit	☐ Rooftop
☐ 5+ unit	☐ Ground Mounted
☐ Non-Profit/Public Facility	☐ Other (describe)
☐ Community Solar	

Proposed Project Size~~:~~ (kW AC):

_____

Building Owner Name: _____

Approved Vendor/Designee: _____

ILSFA Approved Vendor ID#: _____

Date: _____

For Designees: Aggregator _____

associated with this project

Approved Vendor Site Assessment Statement

Select the applicable statement.

☐ This building/site meets all Site Suitability requirements in its current condition.

☐ This building/site will meet Site Suitability requirements prior to or coinciding with PV installation. The plan for these proposed remedial measures is detailed in the report below. The cost of repair will not place an unsustainable financial burden on the owner, as defined in the Site Suitability Guidelines.

☐ This building/site CANNOT meet the site suitability requirements without an unsustainable financial burden on the owner. The owner has been given the ILSFA Program Resources Guide to pursue assistance in mitigating problems outlined in this report. Upon successful mitigation, the owner is eligible to continue the process with the Approved Vendor or to contact the ILSFA Program.

Site Conditions

Instructions: Complete each of the following sections and check the appropriate box. Please provide additional information and details in the notes section.

ROOF ASSESSMENT

The Approved Vendor/Designee uploads roof photos showing overall roof condition and area where PV system will be located, according to Part I project application requirements.

☐ The roof is in good, very good, or excellent condition and ~~has greater than 15 years' expected life remaining and~~ is suitable for PV installation. A PV system installed here will not require removal for re-roofing within the required 15-year REC contract period. No repairs or upgrades needed. Please describe:

☐ Minor repairs or upgrades needed. Please describe:

☐ Major repairs or upgrades needed. Please describe:

ROOF MITIGATION PLAN, IF APPLICABLE

☐ Roof deficiencies will be resolved by a licensed, bonded and insured roofer prior to or in conjunction with installation of a PV system, provided that the repairs or replacement do not create an unsustainable financial burden on the building owner. The plan of action must describe the scope of work, ~~who will complete it,~~the potential contractor(s), and how the work will be paid for.

Mitigation Plan:

☐ Owner has selected not to proceed with roof repairs ~~and~~. The owner will not proceed with the PV installation at this time.

Notes:

Structural Assessment

The Approved Vendor/Designee uploads photo(s) showing supporting structure, according to Part I project application requirements.

SELECT THE APPLICABLE OPTION:

☐ The supporting structure is suitable for PV installation in its current condition. No upgrades needed. Please describe:

☐ Minor repairs or upgrades needed. Please describe:

~~☐~~☐ Major repairs or upgrades needed. Please describe:

STRUCTURAL REPAIR PLAN, IF APPLICABLE

☐ Structural deficiencies will be resolved using a plan submitted by a licensed architect or structural engineer and approved by the local Authority Having Jurisdiction prior to or in conjunction with installation of a PV system, provided that the repairs or replacement do not create an unsustainable financial burden on the building owner. The plan of action must describe the scope of work, ~~who will complete it,~~the potential contractor(s), and how the work will be paid for.

Mitigation Plan:

☐ Owner has selected not to proceed with structural repairs ~~and~~. The owner will not proceed with the PV installation at this time.

Notes:

Electrical Assessment

The Approved Vendor/Designee uploads photos showing the electrical system tie-in location and overcurrent protection, according to Part I project application requirements.

SELECT THE APPLICABLE OPTION:

☐ The electrical system is suitable for PV installation. No upgrades needed.
Please describe:

☐ Minor repairs or upgrades needed. Please describe:

☐ Major repairs or upgrades needed. Please describe:

ELECTRICAL SYSTEM MITIGATION PLAN, IF APPLICABLE

☐ Electrical deficiencies will be resolved by licensed, bonded, and insured electricians with the approval of the local Authority Having Jurisdiction prior to or in conjunction with installation of a PV system, provided that the repairs or replacement do not create an unsustainable financial burden on the building owner. The plan of action must describe the scope of work, ~~who will complete it,~~the potential contractor(s), and how the work will be paid for.

Mitigation Plan:

☐ Owner has selected not to proceed with electrical repairs ~~and~~. The owner will not proceed with the PV installation at this time.

Notes:

Space, Accessibility, Health and Safety Assessment

The Approved Vendor/Designee uploads photos showing there is ample space and clearances for PV system components, according to Part I project application requirements. Work areas must be clear of hazardous materials, pests, and other site hazards.

SELECT THE APPLICABLE OPTION:

☐ The site meets space, accessibility, health, and safety requirements. Please describe:

☐ Minor site changes are needed. Please describe:

☐ Major site changes are needed. Please describe:

SPACE, ACCESSIBILITY, PESTS, AND HAZARDOUS MITIGATION PLAN, IF APPLICABLE

☐ Site deficiencies will be resolved by licensed, bonded, and insured professionals as applicable (e.g., asbestos remediation contractor) and in accordance with local codes prior to or in conjunction with installation of a PV system, provided that the site mitigations do not create an unsustainable financial burden on the building owner. The plan of action must describe the scope of work, ~~who will complete it,~~the potential contractor(s), and how the work will be paid for.

Mitigation Plan:

☐ Owner has selected not to proceed with making site free and clear of site space, accessibility, or health and safety deficiencies. The owner will not proceed with the PV installation at this time.

~~Mitigation Plan~~Notes:

Ground Mount Siting Assessment

The Approved Vendor/Designee uploads ~~required documentation,~~photos and completes the following form including ~~the completed Geotechnical Report, Structural Report,~~a narrative description of the site, according to Part I project application requirements. The approved vendor shall look up site location in the Flood Insurance Rate Map or External Data Request report, obtain the Fish and Wildlife Service wetlands report, and obtain the Ecological Compliance Technical tool report. If any of the documents show deficiencies requiring mitigation, include the document(s) with this report.

The Approved Vendor/Designee will attest that all requirements for non-ministerial permits will be met as part of the construction of the ground mount system. (Please check the box on the attestation page.)

SELECT THE APPLICABLE OPTION:

☐ ~~The completed Civil Plan **does not** require flooding, drainage or environmental mitigation:~~

☐ The site is suitable for ground mount PV installation. No upgrades needed. Please provide a summary description of the conditions at the site:

☐ The completed Civil Plan **does** require flooding, drainage or environmental mitigation:

☐ Minor repairs or upgrades needed. Please provide a summary description of the conditions at the site and the specific item(s) to be remediated:

SUMMARY DESCRIPTION OF CIVIL PLAN FOR GROUND MOUNTED INSTALLATION:

☐ Major repairs or upgrades needed. Please provide a summary description of the Civil Plan for installationconditions at thisthe site, including the mitigation required as determined from investigation and engineering assessments. Please include the structural requirements for system installation, including racking type and foundation requirements.

~~Civil Plan Summary~~specific item(s) to be remediated:

☐ ~~GROUND MOUNT MITIGATION PLAN, IF APPLICABLE~~

☐ Barriers to ground mounting will be resolved to the satisfaction of the local Authority Having Jurisdiction prior to or in conjunction with installation of a PV system. The mitigation plan will not create an unsustainable financial burden on the building owner. The plan of action must describe the scope of work, the potential contractor(s), and how the work will be paid for.

Mitigation Plan:

☐ Owner has selected not to proceed with remediation of barriers to the ground mounted array. The owner will not proceed with the PV installation at this time.

Notes:

Attestation:

☐ I verify that the information on this form is true, complete, and accurate.

☐ [for ground mount systems:] I attest that all requirements for non-ministerial permits have been investigated and can be met.

_____
Name (First, Last)

_____
Title

_____
Date

_____
Company Name (Approved Vendor or Designee)

☐ Approved Vendor

☐ Approved Vendor Designee

☐ Subcontractor or Agent of Approved Vendor

_____ _____
Approved Vendor/Contractor Signature Date

_____ _____
Participant/Property Owner Signature Date