CITY OF WILLOW PARK
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SOLAR PHOTOVOLTAIC (PV) SYSTEM PERMIT APPLICATION CHECKLIST

North Central Texas Council of Governments

Solar Ready II

Powered by SunShot U.S. Department of Energy

This Permit Application Checklist is intended to be used as a best management practice when establishing local government requirements for residential and commercial solar photovoltaic (PV) system permits. Local governments may modify this checklist to accommodate their local ordinances, code requirements, and permit procedures. The following application items may, at the community's discretion, be replaced by an expedited process such as those published by the Solar America Board for Codes and Standards or referenced as examples in the Solar Ready II materials posted at www.nctcog.org/solar.

1. REQUIRED INFORMATION

Type of Application

- ☐ Residential
- ☐ Commercial (Also see Part 2: Commercial Building Requirements)

Type of Solar PV System

- ☐ Roof Top
- ☐ Ground Mount
- ☐ Other: Click here to enter text.

☐ Size of System (kW): Click here to enter text.

☐ Completed permit application(s) and supplement information sheet, if required. Select all that apply: *(Please contact Building Department for standards)*

- ☐ Roof Top: An electrical permit is required
- ☐ Ground Mount: Building and electrical permits are required
- ☐ Other: Building and/or electrical permits may be required

☐ Installed in accordance with the National Fire Protection Association National Electrical Code (NFPA 70) as adopted by the State of Texas, applicable ordinances, districts, and/or special use categories (e.g.: zoning or special use, etc.); subject to plan approval.

NOTE: The National Electrical Code (NEC) is the Texas state electrical code. The state adopts the NEC as the State Code on September 1 of any year in which the new NEC Code book is published (every three years).

NOTE: Potential impacts of solar PV projects to other development such as airports should be considered and evaluated by the local government as appropriate.

☐ **Construction Documents:** Two copies of construction documents shall include, but are not limited to, the following items:

- ☐ Site specific, stamped engineering drawings (*reviewed or designed, and sealed by a licensed professional engineer, if determined to be necessary by the building official or their appointed designee)*, assembly installation plans, manufacturer's installation instructions, and/or equipment manufacturer's data sheets.
- ☐ Make, model, and quantity of module, inverter, and racking system certified to the UL 2703, UL 62109, or UL 1741 standard by a Nationally Recognized Testing Laboratory as appropriate.

- ☐ Framing plans
- ☐ Method of sealing/flashing for roof penetrations
- ☐ Connection details to building or ground mount
- ☐ Structural calculations or load diagram (required only when the PV array weight exceeds 5 lbs./sq. ft) ☐ (*may require engineer design if deemed applicable by Building Official*)
- ☐ Data cut sheets for battery storage if applicable (including type of battery)

☐ **Site Plan:** Include the PV array layout in compliance with the local government design criteria including:

- ☐ Roof plan showing location of equipment and, if required, fire setbacks
- ☐ Existing site easements, property lines, building setback lines, zoning setbacks
- ☐ Typical side view detail of the solar PV system mount on the roof
- ☐ Location of all existing structures and proposed PV system equipment (*including modules, disconnects, inverters, panel boards, combiner boxes, storage batteries, utility meters, etc*.)
- ☐ Plumbing vent termination: Vent termination is not allowed under solar installations and must be relocated or modified, or an air admittance valve may be utilized in accordance with the International Plumbing Code (IPC) and/or the International Residential Code (IRC).

☐ **Fire Code Requirements:** Installation complies with Section 605.11 of the 2012 International Fire Code (IFC), or a more recent IFC version. (See Attachment)

☐ **Electrical Plans:** In addition to the construction documents, include a three-line diagram, or a line diagram that meets the requirements of the local government, and complies with the state NEC. The local government should determine appropriate level of professional design requirements (*e.g., preparation by a master electrician licensed byTDLR; designed and sealed by an engineer, if required by the Texas Engineering Practice Act; or PV equipment manufacturer's engineered line diagram*). A proper line diagram should include:

- ☐ AC and/or DC circuit arc fault protection as required by the NEC or ordinance (if any)
- ☐ Inverter listed to the UL 62109 or UL 1741 Safety Standard; photovoltaic module(s) listed to the UL 1703 safety standard. Listings conducted by a Nationally Recognized Testing Laboratory.
- ☐ Inverter AC output disconnect location, utility disconnect location, and AC output over-current protection device rating.
- ☐ Location of combiner box(es), disconnect switch, size of source circuit overcurrent protection, if required
- ☐ Service panel bus rating and main circuit breaker/fuse ampere rating
- ☐ Circuit diagram with conduit, wire type and sizes, and/or cable type and wire sizes
- ☐ Equipment grounding and bonding conductors and grounding electrode conductor, if applicable
- ☐ Battery disconnect and overcurrent protection, if applicable
- ☐ List of all appropriate labels and marking per NEC and IFC requirements

2. ADDITIONAL COMMERCIAL BUILDING INFORMATION

☐ Building Information: Information about the building the PV system will be attached to:

☐ Occupancy Group: _____

☐ Number of Stories: _____

☐ Year Built: _____

☐ Construction Type: _____

☐ Area (Square Feet): _____

☐ Roof Type: _____

☐ Fire Sprinkler System (for fully sprinkled building only)

WILLOW PARK SOLAR SYSTEM PERMITTING GUIDELINES:

SOLAR SYSTEM PERMITTING SUCCESS GUIDELINES:

- Complete Electrical Permit Application with completed checklist above.
- Plans must indicate compliance with roof offsets as described in the Fire Marshal section below. Roof top plan must show dimensioned offsets.
- Information warnings may be stickers with exterior rated glue, see attached signage sheet
- Master or journeyman electrician must be present at final inspection
- Must have inch pound torque wrench
- System cannot be energized until Building Inspector and Fire Mashal have performed final inspection.

THE FOLLOWING ARE REQUIRED BY THE INTERNATIONAL FIRE CODE AND WILL BE REVIEWED AND INSPECTED BY THE CITY OF WILLOW PARK FIRE MARSHAL.

2012 IFC

605.11 Solar photovoltaic power systems. Solar photovoltaic power systems shall be installed in accordance with Sections 605.11.1 through 605.11.4, the *International Building Code* and NFPA 70.

> **Exception:** Detached, nonhabitable Group U structures including, but not limited to, parking shade structures, carports, solar trellises and similar structures shall not be subject to the requirements of this section.

605.11.1 Marking. Marking is required on interior and exterior direct-current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects.

605.11.1.1 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections605.11.1.2 through 605.11.1.4 shall have all letters capitalized with a minimum height of 3/8 inch (9.5 mm) white on red background.

605.11.1.2 Marking content. The marking shall contain the words “WARNING: PHOTOVOLTAIC POWER SOURCE.”

605.11.1.3 Main service disconnect. The markings hall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.

605.11.1.4 Location of marking. Marking shall be placed on interior and exterior DC conduit, raceways, enclosures and cable assemblies every 10 feet (3048mm), within 1 foot (305 mm) of turns or bends and within 1 foot (305 mm) above and below penetrations of roof/ceiling assemblies, walls or barriers.

605.11.2 Locations of DC conductors. Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.

605.11.3 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 605.11.3.1 through 605.11.3.3.3.

> **Exceptions:** 1. Residential structures shall be designed so that each photovoltaic array is no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in either axis.
>
> 2. Panels/modules shall be permitted to be located up to the roof ridge where an alternative ventilation method approved by the fire chief has been provided or where the fire chief has determined vertical ventilation techniques will not be employed.

605.11.3.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

605.11.3.2 Residential systems for one- and two-family dwellings. Access to residential systems for one- and two-family dwellings shall be provided in accordance with Sections 605.11.3.2.1 through 605.11.3.2.4.

605.11.3.2.1 Residential buildings with hip roof layouts. Panels/modules installed on residential buildings with hip roof layouts shall be located in a manner that provides a 3-foot-wide (914 mm) clear access pathway from the eave to the ridge on each roof slope where panels/modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.2 Residential buildings with a single ridge. Panels/modules installed on residential buildings with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels/modules are located.

Exception: This requirement shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.3 Residential buildings with roof hips and valleys. Panels/modules installed on residential buildings with roof hips and valleys shall be located no closer than 18 inches (457 mm) to a hip or a valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be on only one side of a hip or valley that is the equal length, the panels shall be permitted to be placed directly adjacent to the hip or valley.

Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.4 Residential building smoke ventilation. Panels/modules installed on residential buildings shall be located not higher than 3 feet (914mm) below the ridge in order to allow for fire department smoke ventilation operations.

FOR COMMERCIAL BUILDING INSTALLATIONS

605.11.3.3 Other than residential buildings.

Access to systems for occupancies other than one- and two-family dwellings shall be provided in accordance with Sections 60511.3.1 through 60511.3.3.

Exception: Where it is determined by the *fire code official* that the roof configuration is similar to that of a one- or two-family dwelling, the residential access and ventilation requirements in Sections 605.11.3.2.1 through 605.11.3.2.4 shall be permitted to be used.

605.11.3.3.1 Access. There shall be a minimum 6-foot-wide (1892 mm) clear perimeter around the edges of the roof.

Exception: Where either axis of the building is 250 feet (76 200 mm) or less, there shall be a minimum of 4-foot-wide (1290 mm) clear perimeter around the edges of the roof.

605.11.3.3.2 Pathways. The solar installation shall be designed to provide designated pathways. The pathways shall meet the following requirements.

1. The pathway shall be over areas capable of supporting the live load of fire fighters accessing the roof.
2. The centerline axis pathways shall be provided in both axes of the roof. Centerline axis pathways shall run where the roof structure is capable of supporting firefighters accessing the roof.
3. Shall be straight line not less than 4 feet (1290 mm) clear to skylights or ventilation hatches.
4. Shall be straight line not less than 4 feet (1290 mm) clear to roof standpipes.
5. Shall provide not less than 4 feet (1290 mm) clear around roof access hatch with at least one not less than 4 feet (1290 mm) clear pathway to parapet or roof edge.

605.11.3.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

1. Arrays shall be no greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in distance in either axis in order to create opportunities for fire department smoke ventilation operations.
2. Smoke ventilation options between array sections shall be one of the following:
   2.1 A pathway 8 feet (2438 mm) or greater in width.
   2.2 A 4-foot (1290 mm) or greater in width pathway and bordering roof skylights or smoke and heat vents.
   2.3 A 4-foot (1290 mm) or greater in width pathway and bordering 4-foot by 8-foot (1290 mm by 2438 mm) “venting cutouts” every 20 feet (6096 mm) on alternation sides of the pathway.

605.11.3.3.4 Ground-mounted photovoltaic arrays. Ground-mounted photovoltaic arrays shall comply with Sections 605.11 through 605.11.2 and this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10-feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.

Willow Park
TEXAS

120 EL CHICO TRAIL, SUITE A, WILLOW PARK, TEXAS 76086

ELECTRICAL PERMIT APPLICATION

NOTE: If this work is part of a new building or remodel or other work is occurring on site, do not use this application. You must submit signed acknowledgement form as part of their issued building permit.

COMMERCIAL □ RESIDENTIAL □

(THIS APPLICATION MUST CONTAIN CONSTRUCTION DRAWINGS FOR REVIEW)

For commercial only provide contract dollar amount of all work: $_____

Applicant Name: _____

Job Address: _____

Master Electricians Name: _____

Master Electricians License Number: _____ COI Exp. Date: _____/_____/_____

Electrical Contractor Business Name: _____

Address: _____

City: _____ State: _____ Zip: _____ Phone: (_____) _____

Email Contact: _____

Complete Description of Contracted Work: _____

_____

_____

_____

This permit becomes null and void if work or construction authorized is not commenced within 180 days, or if construction or work is suspended or abandoned for a period of 180 days at any time after work is commenced.

I hereby certify that I have read and examined this application and know the same to be true and correct. All provision of Laws and Ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the State of Local Law regulating construction or the performance of construction.

_____ _____

Signature Contractor/Owner **Date**