

Small-Scale Solar Energy Systems

- Bethany Beach (Delaware), Town of. 2010. *Ordinance no. 455: An Ordinance to Add A New Chapter 484 "Solar Energy Systems" To The Town Code Of Bethany Beach.*
- Brown (Minnesota), County of. 2009. *Zoning Ordinance.* Section 4, Rules and Definitions; Part 402, Definitions. Section 7, Performance Standards; Part 702, Solar Energy Systems and Solar Structures.
- Granville (North Carolina), County of. 2010. *Code of Ordinances.* Chapter 32, Land Development Code; Article III, Use Standards; Division 3, Section 32-162(5), Accessory Uses, Residential. Section 32-166(7), Accessory Uses, Nonresidential. Article XIX, Definitions – Solar. Tallahassee, Fla.: Municipal Code Corporation.
- Hermosa Beach (California), City of. 2011. *Municipal Code.* Title 17, Zoning; Chapter 17.46, Yard, Height, and Area Restrictions; Section 17.46.220, Solar Energy Systems Can Exceed Height Limits.
- Houston (Minnesota), County of. 2011. *Zoning Ordinance.* Section 28, General Provisions; Part 0110.2808, Solar Energy Systems and Solar Structures.
- Irvine (California), City of. 2011. *Zoning Ordinance.* Division 3, General Development Standards and Land Use Regulations; Chapter 3-31, Solar Energy System Standards. Tallahassee, Fla.: Municipal Code Corporation.
- Ithaca (New York), Town of. 2011. *Town Code.* Chapter 270, Zoning; Article III, Terminology; Section 270-5, Definitions. Article XXVI, Special Regulations; Section 270-219.1, Solar Collectors and Installations.
- Minneapolis (Minneapolis), City of. 2011. *Code of Ordinances.* Title 20, Zoning Code; Chapter 535, Regulations of General Applicability; Article XII, Solar Energy Systems. Chapter 537, Accessory Uses and Structures; Section 537.110, Solar Energy System. Tallahassee, Fla.: Municipal Code Corporation.
- Portland (Oregon), City of, Bureau of Development Services. 2010. *Program Guide: Solar Water Heating and Photovoltaic Electric Generators Installed on One- or Two-Family Dwellings.* Also, *Program Guide: Solar Water Heating and Photovoltaic Electric Generators Installed on Commercial Buildings.*

- Rock Hill (South Carolina), City of. 2011. **Zoning Ordinance**. Article 4, Use Regulations; Section 4-400, Accessory Uses and Structures; Table 4-400(B), Table of Permitted Accessory Uses. Part 4-400(D)(19), Accessory Uses and Structures Allowed – Ground-Mounted Solar Installations. Article 5, Density, Intensity, and Dimensional Standards; Table 5-200(A), Allowable Yard Encroachments. Article 6, Development and Design Standards; Section 6-800(B)(2)(e), Residential Design Standards – Roof Penetrations and Equipment. Section 6-800(C)(9)(c), Commercial and Institutional Design Standards - Roof Penetrations and Equipment. Article 10, Definitions.
- Schaumburg (Illinois), Village of. 2011. **Code of Ordinances**. Title 15, Land Usage; Chapter 154, Zoning; Section 154.27, Definitions. Section 154.56, Solar Energy Systems. Section 154.58, Solar and Wind Energy System Figures. Section 154.62, Building Heights, Bulk Regulations, and Required Yards – Solar Access Protection.
- Seattle (Washington), City of. 2011. **Municipal Code**. Title 23, Land Use Code; Subtitle III, Land Use Regulations; Division 2, Authorized Uses and Development Standards; Chapter 23.42, General Use Provisions; Section 23.42.130, Nonconforming Solar Collectors. Chapter 23.44, Residential, Single-Family; Section 23.44.046, Solar Collectors. Chapter 23.45, Residential, Multi-Family; Subchapter III, Accessory Uses; Section 23.45.545, Standards for Certain Accessory Uses – Solar Greenhouses, Greenhouses and Solariums. Chapter 23.47A, Commercial; Section 23.47A.012(C), Structure Height – Rooftop Features – Solar Collectors.
- Troy (Michigan), City of. 2011. **Zoning Ordinance**. Article 2, Section 2.02, Definitions. Article 12, Sustainable Design and Development Standards; Section 12.05, Solar Structures and Easements.
- Tucson (Arizona), City of. 2011. **Land Use Code**. Article III, Development Regulations; Division 2, Development Criteria; Section 3.2.5.2(E), Accessory Structures. Section 3.2.6.6(C)(1), Exceptions to Perimeter Yards – Structures Within Perimeter Yards. Section 3.2.7.3(D), Structure Height Measurement – Exceptions. Section 3.2.9.3(A)(5), Lot Coverage – Exceptions – Buildings. Section 3.2.12, Solar Orientation. Article VI, Definitions; Division 2, Listing of Words and Terms.
- West Lake Hills (Texas), City of. 2011. **Code of Ordinances**. Chapter 22, Building Regulations; Article 22.03, Construction Code; Division 1, Generally; Section 22.03.009, Solar Energy Devices. Lubbock, Tex: Franklin Legal Publishing.

455

03/23/10

Sponsor: _____
First Reading: _____
Second Reading: _____

4-18-10
5-21-10

AN ORDINANCE TO ADD A NEW CHAPTER 484 "SOLAR ENERGY SYSTEMS" TO THE TOWN CODE OF BETHANY BEACH

Whereas, the Town Council has determined that it is desirable for the Town to permit and regulate the use of Solar Energy Systems in the Town of Bethany Beach; and

Whereas, the Town Council has determined that the use and regulation of Solar Energy Electrical Systems in the Town will reduce the need for additional electrical generation and distribution and tend to reduce atmospheric pollution that are considered harmful to the environment; and

Whereas, the Town Council recognizes that it is necessary to regulate the use and placement of Solar Energy Systems in the Town because of the impact of said Systems on both building site improvements and overall Town aesthetics;

BE IT HEREBY ENACTED by the Town Council of the Town of Bethany Beach, a majority thereof concurring in Council duly met, that the following ordinance be and hereby is enacted:

Section 1. A new Chapter 484 entitled "Solar Energy Systems" shall be added to the Bethany Beach Town Code. The Chapter shall read as follows:

Chapter 484. Solar Energy Systems.

Section 484-1. Legislative Intent. Solar Energy Electrical Systems in the Town will reduce the need for additional electrical generation and distribution and tend to reduce atmospheric pollution that is considered harmful to the environment. There is a need to recognize both the permitted use and the regulation of solar energy systems because their placement within the Town of Bethany Beach affects both building site improvements as well as overall Town aesthetics. The use of solar energy systems is encouraged in the Town of Bethany Beach.

Section 484-2. Definitions.

Accessory Structures:

All accessory structures shall be located within the rear yard space on a lot or plot on

which a principal building or structure is erected or is being erected and shall be limited to three in number, including any detached garage. Accessory structures shall comply with all safety and structural requirements set by the Bethany Beach Building Inspector. No accessory structure or projection thereof shall be less than five feet from a property line. § 425-10. Accessory buildings. [Amended 4-18-1986 by Ord. No. 169; 3-16-2007 by Ord. No. 423]

Solar Energy Systems:

An energy system which converts solar energy to usable thermal, mechanical, chemical or electrical energy to meet all or a significant part of a buildings energy requirements.

Solar Energy Equipment:

Items including but not limited to solar panels, lines, pumps, batteries, mounting brackets, framing and/or foundations used for or intended to be used for the collection of solar energy in connection with a building on residential, municipal or commercial properties. Solar energy equipment and its use is accessory to the principal use of the property.

Section 484-3. Regulations.

- A. Solar energy systems are a permitted use in all zoning districts.
- B. The placement of solar energy equipment on roofs of principal buildings is preferred and encouraged. For Town aesthetic purposes the front slope of the principal building shall not be used unless no other location of the solar energy equipment is feasible.
- C. All exterior plumbing and electrical lines must be painted and/or coated to match the color of adjacent roofing material and walls. All visible exterior plumbing and electrical lines must not be installed in any portion of the front of the property. Aluminum trim, if used and visible, should be anodized or otherwise color treated to blend into the surroundings as much as possible.
- D. Roof mounted solar energy systems on the principal building shall not be more than three (3) feet higher than the finished roof to which it is mounted. In no instance shall any part of the solar energy panels extend beyond the edge of the roof.
- E. Roof mounted solar energy equipment shall be located so as not to increase the total height of the structure above the maximum allowable height of the structure on which it is located, in accordance with the applicable zoning regulations.
- F. There is no limit to the number of modules and arrays installed on each property that comprise a solar energy system. The number of solar panels and supporting equipment shall be considered as one system.
- G. The placement of ground mounted solar energy equipment may be permitted if the solar energy equipment is unable to be located on the roof of the principal structure, but all ground mounted solar energy equipment are considered to be an accessory structures. Prepackaged UL listed solar energy based lighting systems that do not involve any installation are exempt from this provision.

- H. Solar energy commercial operations are prohibited as a principle use. These are systems whose main purpose is to generate energy for sale back into the energy grid system, rather than being consumed on the site.
- I. Only commercially made and professionally installed solar energy systems are permitted. All solar energy systems shall be installed by licensed installers that are approved as Participating Contractors by the Green Energy Fund and/or are Certified Installers by the NABCEP and/or have proof of professional training and licensure.

Section 484-4. Permitting and Enforcement. The Town, prior to the issuing a building permit for the installation of any solar energy equipment, shall be provided with any requested information in regard to proving compliance with this section of the Town Code. This information may include but shall not be limited to the following:

A. Sun and shadow diagrams specific to the installation, which would enable the Town to determine if solar access will be impaired due to the proposed location or to the location of objects which may obstruct the solar access.

- 1. Solar pathfinder results shall be provided for all cases where shading occurs between 9:00 a.m. and 3:00 p.m.
- 2. Results of the solar shade analysis must determine that seventy percent (70%) of the annual solar path's area is shade free to be considered for a solar energy grant.

B. The Town may also require submission of detailed information, including maps, plans or dimensional sketches, showing the proposed location, including setbacks from property lines or distances from structures on neighboring properties.

C. The Town may also require the submission of an as-built plan showing the actual location of any installed solar energy equipment. If the equipment is not installed as permitted, the Town may order its removal and/or its relocation as appropriate.

- 1. All solar energy systems shall meet the minimum criteria as specified in the Green Energy Fund Guidelines and shall be installed to meet all applicable local building and zoning codes. Manufacturers specifications and proof of certification shall be submitted for review and approval.

D. Any and all non-functioning and/or damaged solar panels or equipment shall be dismantled by a licensed professional as described herein and removed within three (3) months of written notification from the Building Inspector. Failure to do so will be considered a violation under the Town's Property Maintenance ordinances and will be subject to penalties and fines as referenced in Chapter 1, General Provisions, Section 1.1 Fines and Penalties.

Synopsis

This ordinance amends the Town Code to include a new Chapter 484 regulating the use of Solar Energy Systems within the Town. The ordinance addresses the purpose for this legislation, defines key terms related to Solar Energy Systems, imposes regulations for the use and installation of Solar Energy Systems, and implements a permitting and enforcement provision unique to Solar Energy Systems.

This shall certify that this is a true and correct copy of the ordinance duly adopted by the Town Council of the Town of Bethany Beach at a duly-noticed and convened meeting at which a quorum was present on 5-21th, 2010.

Attest:

Town Clerk

So Certifies:

Mayor

This shall certify that the title and synopsis of the foregoing ordinance was posted at the Town Hall on 4-23, 2010 and published in The Wave on 4-23, 2010.

So Certifies:

Date

Town Clerk

This shall certify that the title, synopsis, date of adoption, and effective date of the foregoing ordinance was published in The Wave on _____, 2010 and that a copy of the foregoing ordinance was posted at the Town Hall on _____, 2010.

So Certifies:

Date

Town Clerk

SECTION 4 RULES AND DEFINITIONS

401. Rules

401.1 Word Usage

For the purpose of this Ordinance, certain terms or words used herein shall be interpreted as follows:

The word "person" includes a firm, association, organization, partnership, trust, company or corporation as well as an individual.

The word "shall" is mandatory, and not discretionary, the word "may" is permissive.

Words used in the present tense shall include the future; and words used in the singular shall include the plural, and the plural the singular.

The word "parcel" shall include the words "piece", "lot", and "plot".

The word "building" shall include "structures" of every kind, regardless of similarity to buildings.

The masculine gender shall include the feminine and neuter.

All stated and measured distances shall be taken to the nearest integral foot. If a fraction is one-half (1/2) foot or less, the integral foot next below shall be taken.

The word "Board" includes the "county commissioners", the "Board of County Commissioners" or any other word or words meaning the "Brown County Board of Commissioners".

402. Definitions

1. **Accessory Structure** - A subordinate structure or a portion of a main structure which is located on the same lot as the main structure and the use of which is clearly incidental to the use of the main structure.
2. **Accessory Structure, Water Oriented** - A small, above ground building or other improvement, except stairways, fences, docks, and retaining walls, which, because of the relationship of its use to a surface water feature, reasonably needs to be located closer to public waters than the normal structure setback. Examples of such structures and facilities include boathouses, gazebos, screen houses, fish houses, pump houses, and detached decks.
3. **Administrator, Zoning** - The duly appointed person charged with enforcement of this Ordinance.
4. **Aggregated Project** - Projects that are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also included as part of the aggregated project.

- seats, trellises, or other features, attached or functionally related to a principal use or site and at any point extending more than three feet above ground.
40. **Design Flow** – The daily volume of discharge that a septic system is designed to treat.
 41. **Direct Sunlight** - Sunlight unobstructed by any improvement or tree within the Solar Access Space.
 42. **Drain or Drainage** – Any method for removing or diverting water from wetlands. This method shall include but is not limited to excavation of an open ditch, installation of drainage tile, filling, dikeing or pumping.
 43. **Drive-In** - Any use where products and/or services are provided to the customer under conditions where the customer does not have to leave the car or where fast service to the automobile occupants is a service offered regardless of whether service is also provided within a building.
 44. **Dwelling Site** - A designated location for residential use by one or more persons using temporary or movable shelter, including camping and recreational vehicle sites.
 45. **Dwelling Unit** - A residential building or portion thereof, frame houses, manufactured homes and earth sheltered homes, intended for occupancy by a single family but not including hotels, motels, boarding or rooming houses or tourist homes.
 46. **Dwelling Attached** - A dwelling which is joined to another dwelling at one or more sides by a party wall or walls. Two or more attached dwellings are considered a multi-family unit.
 47. **Dwelling Detached** - A dwelling which is entirely surrounded by open space on the same lot.
 48. **Easement** - A grant by a property owner for the use of a strip of land by the public or any person for any specific purpose or purposes.
 49. **Energy Storage Facility** - Equipment consisting of containers, heat, exchangers, piping, and other transfer mechanisms (including fluids, gases, or solids), controls and related structural support for transporting and storing collected energy (from solar energy systems), including structural elements designed for use in passive solar energy systems.
 50. **Equal Degree of Encroachment** - a method of determining the location of floodway boundaries so that flood plain lands on both sides of a stream are capable of conveying a proportionate share of flood flows.
 51. **Erosion Control and Wildlife Developments** - Structures, water control developments, and ponds which are installed to control soil erosion or increase the habitat for wildlife, including but not limited to: erosion control structures, dams, diversions, terraces, waterways, culverts, pits and ponds.
 52. **Essential Services** - Overhead or underground electric, gas, communication, steam or water transmission or distribution systems and structures, by public utilities or governmental departments or commissions or as are required for protection of the public health, safety, or general welfare, including towers, poles, wires, mains, drains, sewers, pipes, conduits, cables, fire alarm boxes, police call boxes, and accessories in connection therewith, but not including buildings.
 53. **Excavation** – The displacement or removal of substrate, sediment or other materials by any method.
 54. **Exterior Storage (includes open storage)** - The storage of goods, materials, equipment, manufactured products and similar items not fully enclosed by a building.
 55. **Extraction Area** - Any non-agricultural artificial excavation of earth exceeding fifty square feet of surface area of two feet in depth, excavated or made by the removal from the natural surface of earth, or sod, soil, sand, gravel, stone or

- store one standard automobile.
129. **Passive Solar Energy System** - A solar energy system that uses natural and architectural components to collect and store solar energy without using any external mechanical power.
 130. **Pedestrian Way** - A public or private right-of-way across or within a block, to be used by pedestrians.
 131. **Planned Unit Development** - A development whereby buildings are grouped or clustered in and around common open space areas in accordance with a prearranged site plan and where the common open space is owned by the homeowners and usually maintained by a homeowners association.
 132. **Planning Commission** - The Planning Commission of Brown County except when otherwise designated.
 133. **Prefabricated Home** - A non-mobile housing unit, the walls, floors and ceilings of which are constructed at a central factory and transported to a building site where final construction is completed, permanently affixing the unit to the site.
 134. **Principal Structure or Use** - One which determines the predominant use as contrasted to accessory use or structure.
 135. **Property Line** - The legal boundaries of a parcel of property which may also coincide with a right-of-way line of a road, cartway, and the like. The boundary line of the area over which the entity applying for a WECS permit has legal control for the purposes of installation of a WECS. This control may be attained through fee title ownership, easement, or other appropriate contractual relationship between the project developer and landowner.
 136. **Protective Covenant** - A contract entered into between private parties which constitutes a restriction of the use of a particular parcel of property.
 137. **Public Conservation Lands** - Land owned in fee title by Brown County, State or Federal agencies and managed specifically for grassland conservation purposes, including but not limited to State Wildlife Management Areas, State Parks, State Scientific and Natural Areas, federal Wildlife Refuges and Waterfowl Production Areas. For the purposes of this section public conservation lands will also include lands owned in fee title by non-profit conservation organizations. Public conservation lands do not include private lands upon which conservation easements have been sold to public agencies or non-profit conservation organizations.
 138. **Public Land** - Land owned or operated by municipal, school districts, county, state or other governmental units.
 139. **Public Waters** - Any waters as defined in Minnesota Statutes, section 103G.005, subdivision 14 and 15.
 140. **Qualified Employee (septic)** - An employee of the state or a local unit of government, who performs site evaluations or inspections of septic systems as part of the individual's employment duties and is registered with the Minnesota Pollution Control Agency.
 141. **Reach** - A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by a natural or man-made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most typically constitute a reach.
 142. **Recreation, Public** - Includes all uses such as tennis courts, ball fields, picnic areas, and the like that are commonly provided for the public at parks, playgrounds, community centers, and other sites owned and operated by a unit of government for the purpose of providing recreation.
 143. **Recreation, Commercial** - Includes all uses such as bowling alleys, driving ranges, and movie theaters that are privately owned and operated with the intention of earning a profit by providing entertainment for the public.
 144. **Recreation Equipment** - Play apparatus such as swing sets and slides,

pond or flowage; and (2) 300 feet from a river or stream, or the landward extent of a floodplain designated by ordinance on such a river or stream, whichever is greater. The practical limits of shorelands may be less than the statutory limits whenever the waters involved are bounded by natural topographic divides which extend landward from the water for lesser distances and when approved by the Commissioner.

160. **Shoreland Management Waters** - All public waters and other waters in Brown County, as shown on the zoning map.
161. **Sign** - A name, identification, description, display, illustration or device which is affixed to or represented directly or indirectly upon a building, structure or land in view of the general public and which directs attention to a product, place, activity, person, institution, or business.
162. **Sign, Advertising** - A sign which directs attention to a business, commodity, service, activity or entertainment not necessarily conducted, sold or offered upon the premises where such sign is located; a billboard.
163. **Sign, Business** - A sign which directs attention to a business or profession or to a commodity, service or entertainment sold or offered upon the premises where such a sign is located.
164. **Sign, Flashing** - Any illuminated sign on which illumination is not kept stationary or constant in intensity and color at all times when such sign is in use.
165. **Sign, Illuminated** - Any sign which has characters, letters, figures, designs or outlines illuminated by electric lights or luminous tubes as a part of the sign.
166. **Sign, Name Plate** - Any sign which states the name or address or both of the business or occupant of the lot where the sign is placed.
167. **Sign, Pylon** - A freestanding sign erected upon a single pylon or post, which is in excess of ten (10) feet in height with the sign mounted on the top thereof.
168. **Sign, Rotating** - A sign which revolves or rotates on its axis by mechanical means.
169. **Sign, Surface Area of** - The entire area within a single, continuous perimeter enclosing the extreme limits of the actual sign surface. It does not include any structural elements outside the limits of such sign and not forming an integral part of the display. Only one side of a double face or V-type sign structure shall be used in computing total surface area.
170. **Significant Historic Site** - Any archaeological site, standing structure, or other property that meets the criteria for eligibility to the National Register of Historic Places or is listed in the State Register of Historic Sites, or is determined to be an unplatted cemetery that falls under the provisions of Minnesota Statutes, section 307.08. A historic site meets these criteria if it is presently listed on either register or if it is determined to meet the qualifications for listing after review by the Minnesota state archaeologist or the director of the Minnesota Historical Society. All unplatted cemeteries are automatically considered to be significant historic sites.
171. **Solar Access Space** - That airspace above all lots within the district necessary to prevent any improvement, vegetation or tree located on said lots from casting a shadow upon any Solar Device located within said zone greater than the shadow cast by a hypothetical vertical wall ten (10) feet high located along the property lines of said lots between the hours of 9:30 a.m. and 2:30 p.m., Central Standard Time on December 21, PROVIDED, HOWEVER, this Ordinance shall not apply to any improvement or tree which casts a shadow upon a Solar Device at the time of installation of said device, or to vegetation existing at the time of installation of said Solar Device.
172. **Solar Collector** - A device, or combination of devices, structure, or part of a device or structure that transforms direct solar energy into thermal, chemical or electrical energy and that contributes significantly to a structure's energy supply.

173. **Solar Energy System** - A complete design or assembly consisting of a solar energy collector, an energy storage facility (where used), and components to the distribution of transformed energy (to the extent they cannot be used jointly with a conventional energy system).
174. **Solar Skyspace** - The space between a solar energy collector and the sun which must be free of obstructions that shade the collector to an extent which precludes its cost-effective operation.
175. **Solar Skyspace Easement** - A right, expressed as an easement, covenant, condition, or other property interest in any deed or other instrument executed by or on behalf of any landowner, which protects the solar skyspace of an actual, proposed, or designated solar energy collector at a described location by forbidding or limiting activities or land uses that interfere with access to solar energy. The solar skyspace must be described as the three-dimensional space in which obstruction is prohibited or limited, or as the times of day during which sunlight to the solar collector may not be obstructed, or as a combination of the two (2) methods.
176. **Solar Structure** - A structure designed to utilize solar energy as an alternate for, or supplement to, a conventional energy system.
177. **Steep Slope** - Land where agricultural activity or development is either not recommended or described as poorly suited due to slope steepness and the site's soil characteristics, as mapped and described in available county soil surveys or other technical reports, unless appropriate design and construction techniques and farming practices are used in accordance with the provisions of this ordinance. Where specific information is not available, steep slopes are lands having average slopes over 12 percent, as measured over horizontal distances of 50 feet or more, that are not bluffs.
178. **Street** - A public right-of-way which affords primary means of access to abutting property, and shall also include avenue, highway, road, or way.
179. **Street, Major or Thoroughfare** - A street which serves, or is designed to serve, heavy flows of traffic and which is used primarily as a route for traffic between communities and/or other heavy traffic generating areas.
180. **Street, Local** - A street intended to serve primarily as an access to abutting properties.
181. **Street, Pavement** - The wearing or exposed surface of the road way used by vehicular traffic.
182. **Street, Width** - The width of the right-of-way, measured at right angles to the centerline of the street.
183. **Story** - That portion of a building included between the surface of any floor and the surface of the floor next above. A basement shall be counted as a story.
184. **Structure** - Anything constructed or erected on the ground or attached to the ground or on-site utilities, including, but not limited to, buildings, factories, sheds, detached garages, cabins, manufactured homes, travel trailers/vehicles not meeting the exemption criteria specified in Section 722.26 of the ordinance and other similar items.
185. **Structural Alteration** - Any change, other than incidental repairs, which would prolong the life of the supporting members of a building, such as bearing walls, columns, beams, girders or foundations.
186. **Subdivision** - A subdivision is the dividing of any parcel of land into two or more parcels.
 - a. **Platted Subdivision** - if any resultant parcel is less than ten (10) acres in area and less than three hundred (300) feet in width and the subdividing was done for the purpose of transfer of ownership to effectuate building development if a new street or road is involved, regardless of the size of the parcel and/ or its width, subsequent

SECTION 7 PERFORMANCE STANDARDS**701. Purpose**

The performance standards established in this section are designed to encourage a high standard of development by providing assurance that neighboring land uses will be compatible. The performance standards are designed to prevent and eliminate those conditions that cause blight or are detrimental to environment. All future development in all districts shall be required to meet these standards and the standards shall also apply to existing development where so stated.

Before any building permit is approved, the Zoning Administrator shall determine whether the proposed use will conform to the performance standards. The developer or landowners shall supply data necessary to demonstrate such conformance. Such data may include a description of equipment to be used, hours of operation, method of refuse disposal, and type and location of exterior storage.

702. Solar Energy Systems and Solar Structures

- (1) Solar energy systems and solar structures shall be a permitted accessory use in all districts provided the system is in compliance with minimum lot requirements and setbacks.
- (2) Solar energy systems and solar structures may be exempted from setback, height, and lot coverage restrictions in all districts by variance.
- (3) In a residential, zone no owner, occupier, or person in control of property shall allow vegetation or structures to be placed or grow so as to cast a shadow on a solar energy system which is greater than the shadow cast by a hypothetical wall ten (10) feet high located along the boundary line of said property between the hours of 9:30 a.m. and 2:30 p.m. Central Standard Time on December 21 provided, however, this standard shall not apply to vegetation or structures which casts a shadow upon the solar energy system at the time of installation of said solar energy system or to vegetation existing at the time of installation of said solar energy system.
- (4) As a means of evidencing existing conditions, the owner of a solar energy system may file notarized photographs of the effected area with the County prior to installation of said system.

Violation of this standard shall constitute a private nuisance, and any owner or occupant whose solar energy system is shaded because of such violation, so that performance of the system is impaired, may have in tort for the damages sustained thereby and may have such nuisance abated.

**Granville County, North Carolina
Code of Ordinances (2010)
Chapter 32, Land Development Code**

**ARTICLE III, USE STANDARDS
DIVISION 3. INDIVIDUAL USE STANDARDS**

Sec. 32-162. Accessory uses, residential.

Residential uses may have accessory buildings provided they conform to the following standards:

(1) Generally. Accessory structures shall meet the following standards:

a. Freestanding structures shall be located in the side or rear yard of all lots, except that accessory structures shall only be permitted in the rear yard of corner lots. On parcels containing ten or more acres, the accessory structure may be placed in the front yard provided that it is located a minimum of 100 feet from any street right-of-way and minimum of 25 feet from any side property line. Accessory structures on property that borders Kerr Lake Reservoir shall be allowed in the front, side or rear yard.

* * *

(5) An application for a proposed solar collector/energy system located at a residence must meet the following standards as a limited accessory use:

a. Solar collector. All solar energy collectors, whether ground mounted or mounted on an existing structure, shall meet the minimum accessory structure zoning setbacks for the zoning district in which located. The height of the structure shall not be taller than the maximum allowed height of a structure in the zoning district in which located. A ground-mounted solar collector shall meet the location standard in subsection (1)a. (Ord. of 7-12-1999, § 03.210; Amend. of 11-17-2008, § 2; Amd. of 8-3-2009, §§ 2, 6, 9; Amd. of 8-2-2010, § 1)

Sec. 32-163. Accessory uses, nonresidential.

Nonresidential uses may have a variety of accessory uses within the principal structure or in separate structures, provided they meet the following standards:

* * *

(7) Active solar energy systems shall be allowed as an accessory limited use in all commercial or industrial zoning districts under the following standards:

a. Roof-mounted solar systems. In addition to the building setback, the collector surface and mounting devices for roof-mounted solar systems shall not extend beyond the exterior perimeter of the building on which the system is mounted or built.

1. Pitched roof mounted solar systems. For all roof-mounted systems other than a flat roof the elevation must show the highest finished slope of the solar collector and the slope of the finished roof surface on which it is mounted.

2. Flat roof mounted solar systems. For flat roof applications a drawing shall be submitted showing the distance to the roof edge and any parapets on the building.

3. The underlying zoning district maximum height for these systems shall be complied with.
 - b. Ground-mounted solar systems. Ground-mounted solar energy systems shall meet the minimum zoning setback for the zoning district in which located, or 25 feet, whichever is strictest. The height of the structure(s) shall not be taller than 25 feet in height.
 - c. Visibility. Active solar systems shall be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways or adjacent residentially-zoned property using the standards found in section 32-264.
 - d. Approved solar components. Electric solar system components must have a UL listing.
 - e. Plan approval required. All solar systems shall require a limited use approval by the planning department.
 1. Plan applications. Plan applications for solar systems shall be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground mount system, including the property lines.
 2. Plan approvals. Applications that meet the design requirements of this section shall be granted administrative approval by the planning department.
 - f. Compliance with building code. All active solar systems shall meet approval of local building code officials, consistent with the North Carolina Building Code.
 - g. Compliance with electric code. All photovoltaic systems shall comply with the National Electrical Code, current edition.
 - h. No grid-intertie photovoltaic system shall be installed until evidence has been given to the planning department that the owner has been approved by the utility company to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.
- (Ord. of 7-12-1999, § 03.211; Amd. of 8-3-2009, §§ 8, 10)

ARTICLE XIX. DEFINITIONS

DIVISION 4. GENERAL DEFINITIONS

Sec. 32-1331. Definitions.

Solar.

Active solar system means a solar energy system that transforms solar energy into another form of energy or transfers heat from a collector to another medium using mechanical, electrical, or chemical means.

Building-integrated solar systems means an active solar system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to photovoltaic or hot water solar systems that are contained within roofing materials, windows, skylights, and awnings.

Grid-intertie solar system means a photovoltaic solar system that is connected to an electric circuit served by an electric utility company.

Off-grid solar system means a photovoltaic solar system in which the circuits energized by the solar system are not electrically connected in any way to electric circuits that are served by an electric utility company.

Photovoltaic system means an active solar energy system that converts solar energy directly into electricity.

Roof pitch means the final exterior slope of a building roof calculated by the rise over the run, typically but not exclusively expressed in twelfths such as 3/12, 9/12, 12/12.

Solar collector means a device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.

Solar collector surface means any part of a solar collector that absorbs solar energy for use in the collector's energy transformation process. Collector surface does not include frames, supports and mounting hardware.

Solar energy means radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar energy system means a device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generating, or water heating.

Solar farm means a use w[h]ere a series of solar collectors are placed in a[n] area for the purpose of generating photovoltaic power for an area greater than the principal use on the site. Also referred to as solar power plant and solar photovoltaic farm.

Solar mounting devices means devices that allow the mounting of a solar collector onto a roof surface or the ground.

**City of Hermosa Beach, California
Municipal Code (2011)**

**Title 17, Zoning
Chapter 17.46, Yard, Height, and Area Restrictions**

Section 17.46.010. Height of roof structures.

* * *

E. For the development standards for solar energy systems refer to Section 17.46.220.

Section 17.46.220 Solar energy systems can exceed height limits.

Solar energy systems shall be installed and constructed in conformance with the following:

A. Purpose:

To promote the use of solar energy systems in accordance with State law while protecting the public health and safety.

B. Definitions:

1. "Ancillary solar equipment" means any accessory part or device of a solar energy system that does not require direct access to sunlight, such as batteries, electric meters, AC/DC converters or water heater tanks.
2. "Solar collector" means any part or device of a solar energy system that requires direct access to sunlight and is typically located on the roof top, such as solar panels and solar hot water or swimming pool heaters.
3. "Solar energy system" means an accessory to the main structure and/or use which comprises of a combination of solar collector(s) and ancillary solar equipment used to generate electricity primarily for consumption on the property on which the system is located, or where multiple consumers or exceptional circumstances exist, on an adjoining property.

C. Development Standards:

1. Solar collectors and solar energy systems may exceed the height limits mandated by this Code to the minimum extent necessary for their safe and efficient operation in accordance with the California Building Code and other applicable provisions of state law.
2. Where feasible, solar energy systems shall be integrated into the design of the structure as an architectural element.
3. Where feasible, roof-mounted solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide areas for smoke ventilation opportunities and provide emergency egress from the roof.
4. Where feasible, ancillary solar equipment shall be located inside the building or be screened from public view.

5. Solar energy systems shall be erected in a secure, wind resistant manner and be maintained in good condition.

6. Other applicable development standards in this Code may be modified by the Director in the case where compliance would demonstrably reduce the operating efficiency or performance of a solar energy system and compliance will not adversely impact public health and safety.

(Ord. 08-1295 §2, Oct. 2008)

**Houston County, Minnesota
Zoning Ordinance (2011)**

**Section 28, General Provisions
0110.2808 Solar Energy Systems and Solar Structures**

Subdivision 1. Permitted by District. Solar energy systems and solar structures shall be a permitted use in all districts except the flood plain districts provided the system is in compliance with minimum lot requirements and setbacks. Within the flood plain district, solar structures shall be a conditional use.

Subd. 2. Setback Exemptions. Solar energy systems and solar structures may be exempted from setback, height, and lot coverage restrictions in all districts by variance.

Subd. 3. Access to Sun Light. In a residential zone, no owner, occupier, or person in control of property shall allow vegetation or structures to be placed or grow so as to cast a shadow on a solar energy system which is greater than the shadow cast by a hypothetical wall ten (10) feet high located along the boundary line of the property between the hours of 9:30 a.m. and 2:30 p.m. Central Standard Time on December 21 provided, however, this standard shall not apply to vegetation or structures which cast a shadow upon the solar energy system at the time of installation of the system.

Subd. 4. Establishment of Right to Sun Light. As a means of evidencing existing conditions, the owner of a solar energy system may file notarized photographs of the area with the County prior to installation of the system.

Subd. 5. Violation Constitutes a Private Nuisance. Violation of this standard shall constitute a private nuisance, and any owner or occupant whose solar energy system is shaded because of such violation, so that performance of the system is impaired, may have in tort for the damages sustained thereby and may have such nuisance abated.

**City of Irvine, California
Zoning Ordinance (2011)**

**Division 3 - General Development Standards and Land Use Regulations
Chapter 3-31. - Solar Energy System Standards**

Sec. 3-31-1. - Applicability.

Sec. 3-31-2. - Approvals required.

Sec. 3-31-3. - Residential standards.

Sec. 3-31-4. - Commercial/industrial/institutional/multi-use/office standards.

Sec. 3-31-1. - Applicability.

The purpose of the solar energy system standards is to encourage investment in solar energy systems on all parcels in the city, both residential and non-residential, while providing guidelines for the installation of those systems that are consistent with the architectural and building standards of the City. All solar energy systems shall comply with all applicable provisions of the City of Irvine Codes and the standards of this chapter.

(Code 1976, § V.E-321.1; Ord. No. 92-3, 4-14-92; Ord. No. 94-7, § 3, 6-14-94; Ord. No. 09-02, § 3, 3-24-09)

Sec. 3-31-2. - Approvals required.

The applicant shall submit for and receive approval of a building permit prior to installation of any solar energy system.

(Code 1976, § V.E-321.2; Ord. No. 92-3, 4-14-92; Ord. No. 94-7, § 3, 6-14-94; Ord. No. 09-02, § 3, 3-24-09)

Sec. 3-31-3. - Residential standards.

A. Ground-mounted solar energy systems

1. All ground-mounted solar energy systems shall not be located within the front, side, or rear building setbacks, or front yard area, and shall comply with all applicable height restrictions.

2. To the extent possible, without compromising the solar energy system's access to the sun, ground-mounted solar energy systems shall be screened from view at-grade from all adjacent streets and adjacent properties.

B. Roof-mounted solar energy systems.

1. All solar energy system appurtenances such as, but not limited to, water tanks, supports, and plumbing shall be screened to the maximum extent possible without compromising the effectiveness of the solar collectors, and shall be painted a color similar to the color of the surface upon which they are mounted. Solar collectors are exempt from the screening and color provisions of this subsection.

2. All roof-mounted solar collectors can be mounted at an optimum angle to the sun for maximum energy production. The maximum height of a solar collector shall be two feet, measured perpendicular to the roof surface, and may not exceed the maximum

overall building height. The remainder of the solar energy system shall be below the level of the solar collector(s).

(Code 1976, § V.E-321.3; Ord. No. 92-3, 4-14-92; Ord. No. 94-7, § 3, 6-14-94; Ord. No. 09-02, § 3, 3-24-09)

Sec. 3-31-4. - Commercial/industrial/institutional/multi-use/office standards.

A. Covered parking solar energy systems.

1. Covered parking solar energy systems shall not be located within any required building setback but may encroach into a landscaping setback a maximum of 3 feet.
2. Covered parking solar energy systems shall not result in a net loss of any required parking.

B. Roof-mounted solar energy systems

1. All solar energy system appurtenances such as, but not limited to, plumbing, water tanks, and support equipment shall be screened to the maximum extent possible without compromising the effectiveness of the solar collectors and shall be painted a color similar to the color of the surface upon which they are mounted. If panels are used as screening, they shall contain a finish and color consistent with the building's exterior walls. Solar collectors are exempt from the screening and color provisions of this subsection.

(Code 1976, § V.E-321.4; Ord. No. 92-3, 4-14-92; Ord. No. 94-7, § 3, 6-14-94; Ord. No. 09-02, § 3, 3-24-09)

*Town of Ithaca
PC/CodeBook for Windows*

CODE OF THE TOWN OF ITHACA, NEW YORK, v20 Updated 06-01-2010 / PART II, GENERAL LEGISLATION / Chapter 270, ZONING / ARTICLE XXVI, Special Regulations / § 270-219.1. Solar collectors and installations. [Added 10-16-2006 by L.L. No. 11-2006]

§ 270-219.1. Solar collectors and installations. [Added 10-16-2006 by L.L. No. 11-2006]

- A. Rooftop and building-mounted solar collectors are permitted in all zoning districts in the Town. Building permits shall be required for installation of rooftop and building-mounted solar collectors.
- B. Ground-mounted and freestanding solar collectors are permitted as accessory structures in all zoning districts of the Town, subject to the following requirements:
 - (1) The location of the solar collector meets all applicable setback requirements of the zone in which it is located.
 - (2) The height of the solar collector and any mounts shall not exceed 20 feet when oriented at maximum tilt.
 - (3) The total surface area of all ground-mounted and freestanding solar collectors on the lot shall not exceed 1,000 square feet.
 - (4) A building permit has been obtained for the solar collector.
 - (5) The solar collector is located in a side or rear yard.
- C. Where site plan approval is required elsewhere in this chapter for a development or activity, the site plan review shall include review of the adequacy, location, arrangement, size, design, and general site compatibility of proposed solar collectors. Where a site plan exists, an approved modified site plan shall be required if any of the thresholds specified in § 270-191 of this chapter are met, including but not limited to proposed changes to or additions of solar collectors where such changes or additions meet a § 270-191 threshold.
- D. All solar collector installations must be performed by a qualified solar installer, and prior to operation, the electrical connections must be inspected by a Town Code Enforcement Officer and by an appropriate electrical inspection person or agency, as determined by the Town. In addition, any connection to the public utility grid must be inspected by the appropriate public utility. [Amended 4-12-2010 by L.L. No. 3-2010]
- E. When solar storage batteries are included as part of the solar collector system, they must be placed in a secure container or enclosure meeting the requirements of the New York State Building Code when in use and when no longer used shall be disposed of in accordance with

Town of Ithaca
PC/CodeBook for Windows

the laws and regulations of Tompkins County and other applicable laws and regulations.

- F. If a solar collector ceases to perform its originally intended function for more than 12 consecutive months, the property owner shall remove the collector, mount and associated equipment and facilities by no later than 90 days after the end of the twelve-month period.



TOWN OF ITHACA

215 N. Tioga Street, ITHACA, N.Y. 14850

607.273.1783

FAX 607. 273.1704



FREESTANDING PHOTOVOLTAIC SYSTEMS

Building Permit Application Checklist

Please initial that each of the following is attached as part of your application package. (Write N/A for any lines that do not apply.) Checklist must accompany all applications. Incomplete packages will not be accepted.

- _____ 1) completed application form (please put N/A to any questions that do not apply)
- _____ 2) workers' comp, general liability, and NYS disability insurance
- _____ 3) fee
- _____ 4) 2 copies of all drawings and specifications (see attached list)
- _____ 5) survey map or plot plan
- _____ 6) attached PV worksheet
- _____ 7) outdoor lighting details
- _____ 8) statement of special inspections

Completed application packets may be submitted to the Town of Ithaca Town Hall at 215 N. Tioga Street Monday thru Friday 8:00 - 4:00. Please do not mail the application packet.



TOWN OF ITHACA

215 N. Tioga Street, ITHACA, N.Y. 14850

607.273.1783

FAX 607. 273.1704



Fee Information

The fee is based on the value of improvement. This value must include materials and a fair labor price (even if the work is done by the homeowner with no actual labor fee). Please make checks payable to TOWN OF ITHACA.

<u>Value of Improvement</u>	<u>Fee</u>
\$1 - \$2,500.99	\$25.00
\$2,501 - \$5,000.99	\$35.00
\$5,001 - \$10,000.99	\$45.00
\$10,001 - \$20,000.99	\$60.00
\$20,001 - \$30,000.99	\$70.00
\$30,001 - \$50,000.99	\$100.00
\$50,001 - \$100,000.99	\$200.00
\$100,001 - \$150,000.99	\$350.00
\$150,001 - \$250,000.99	\$550.00
\$250,001 - \$350,000.99	\$700.00
\$350,001 - \$500,000.99	\$850.00
\$500,001 - \$750,000.99	\$1,000.00
\$750,001 - \$1,000,000.99	\$1,500.00
\$1,000,001 - \$2,500,000.99	\$2,000.00
\$2,500,001 - \$5,000,000.99	\$4,000.00
\$5,000,001 - \$10,000,000.99	\$6,000.00
\$10,000,001 - \$20,000,000.99	\$8,000.00
Over \$20,000,000.99	\$.50 for each \$1,000 of improvement value, minimum fee \$10,000



TOWN OF ITHACA

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Worksheet for Photovoltaic System Installation

Supplied Diagrams

- _____ Is a basic site diagram supplied with the permit package?
Location of major equipment identified on plan.
- _____ Is a one-line diagram supplied with the permit package?
- _____ Array configuration shown
- _____ Array wiring identified
- _____ Combiner/junction box identified
- _____ Conduit from Array to PV Power Source Disconnect identified
- _____ Equipment grounding specified
- _____ Disconnect specified
- _____ Conduit from disconnect to inverter identified
- _____ Inverter specified
- _____ Conduit from inverter to disconnect to panel identified
- _____ System grounding specified
- _____ Point of connection attachment method identified

Inverter Information

- _____ Are cut sheets provided for inverter?
- _____ Inverter model number
- _____ Is inverter listed for utility interactivity (see CED list of Eligible Inverters)
- _____ Maximum continuous output power at 40°C
- _____ Input voltage range of inverter

PV Module Information

- _____ Are cut sheets provided for PV modules?
- _____ Are the modules listed? (see CEC list of Eligible PV Modules)
- _____ Open-circuit voltage (Voc) from listing label
- _____ Maximum permissible system voltage from listing label
- _____ Short-circuit current (Isc) from listing label



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_____ Maximum series fuse rating from listing label

_____ Maximum power at Standard Test Conditions (Pmax on Label)

_____ Voltage at Pmax from listing label

_____ Current at Pmax from listing label

Array Information

_____ Number of modules in series

_____ Number of parallel source circuits

_____ Total number of modules

_____ Operating voltage
(number of modules in series x module voltage at Pmax)

_____ Operating current
(number of parallel source circuits x module current at Pmax)

_____ Maximum system voltage (690.7)

_____ Short-circuit current (690.8)

Wiring and Overcurrent Protection

_____ Wire type is 90°C wet rated

_____ Conductor ampacities are sufficient

_____ Maximum PV source circuit current

_____ Minimum PV source circuit conductor ampacity

_____ Minimum PV output circuit conductor ampacity

_____ Minimum inverter output circuit conductor ampacity

_____ Source circuit overcurrent protection is sufficient

_____ If inverter is not listed for no backfeed current, does each source circuit have overcurrent protection in compliance with the listed maximum series fuse?

_____ If inverter is listed for no backfeed current, overcurrent protection is not necessary if only two parallel strings are connected to the inverter.

_____ Overcurrent protection on Inverter Output Circuit is sufficient



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_____ Point of connection meets provisions of NEC 690.64

_____ Point of connection panel busbar rating

Roof Information (for rooftop systems)

_____ Are the conductors from the PV Array run through the house?
If yes, what method will be used to address the protection issues?

_____ Weight of array for rooftop systems
(pounds per square foot—include mounting hardware)

_____ Age of building (roof structure)

_____ Describe roof structural elements
Rafters:

_____ Size of rafters (e.g. 2" x 6")

_____ Span of rafters (e.g. 14')

_____ Spacing of rafters (e.g. 24")

_____ Engineer statement that equipment load will not adversely affect roof

_____ Identify roofing type (e.g. comp shingle, masonry tile, shake, etc...)

_____ Is the detail of PV panel mounting attachment to the roof-framing
members provided?

_____ Identify method of sealing roof penetrations
(e.g. flashing, sealed with urethane caulk, etc...)

Ground Mounting Structure (for ground-mounted structures)

_____ Weight of array
(pounds per square foot—include mounting hardware)

_____ Are the details of the array supports, framing members, and foundation
posts and footings provided?

_____ Is the information on mounting structure(s) construction provided?
(requires engineering calculations)

_____ Is the detail on module attachment method to mounting structure
provided?



TOWN OF ITHACA

215 N. Tioga Street, ITHACA, N.Y. 14850
607.273.1783 FAX 607. 273.1704

Date Received	_____
Fee Paid	_____
Check No.	_____

Permit Number	_____
Date of Permit	_____
Zoning District	_____

SHORT FORM APPLICATION FOR BUILDING PERMIT

This application may be used for only for the projects listed below. All other projects require use of the full building permit application form.

Application is hereby made to:

- _____ install or alter a pool
- _____ construct or alter a fence or wall
- _____ replace roof covering or siding with like materials (any work beyond replacing sheathing requires full application)
- _____ Site work, including parking lots
- _____ freestanding photovoltaic installation
- _____ wood stove and chimney
- _____ Construct or alter an agricultural building/structure determined to be exempt from NYS Building Code (call Code Enforcement Officer to verify)
- _____ other minor accessory structure as allowed by the code enforcement officer (does not include any structures with roofs)
- _____ demolition of building or structure

Brief Description of Work _____ Value of Improvement \$ _____

Property Information:

Street Address _____

Tax Parcel Number _____

Property Owner:

Name _____ Daytime Telephone _____ Cell Number _____

Mailing Address _____

If owner is a corporation, names and addresses of responsible officers must be included.



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607.273.1783

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Builder:

Company _____ Office Telephone _____ Fax _____

Mailing Address _____

Project Manager _____ Daytime Telephone _____ Cell Number _____

Contact Person (Person listed will be the primary point of contact for all communications regarding the building permit):

Name _____ Daytime Telephone _____ Cell Phone _____

Percentage of Lot to be Occupied by All Structures _____

Is topsoil or fill material going to be moved onto or within the site in excess of 500 cubic yards? _____ yes _____ no

New York Board of Fire Underwriters Electrical Application will be applied for _____ yes _____ no

Does work involve any outdoor lighting? _____ yes _____ no

The UNDERSIGNED HEREBY APPLIES for permission to do the above in accordance with provisions of the Zoning Ordinance and other Laws and Regulations of the Town of Ithaca, or others having jurisdiction, AND AFFIRMS that all statements and information given herein are correct to the best of his/her knowledge and belief, AND FURTHER AFFIRMS that all work shall be performed in compliance with the Codes of the Town of Ithaca, the NYS Uniform Fire Prevention and Building Code, and all other applicable state and local laws, ordinances, and regulations.

I ALSO CERTIFY that the structure for which this Permit will be issued, or has been issued, will be built, or has been built, according to the latest standards of the New York State Uniform Fire Prevention and Building Code, AND FURTHER CERTIFY that the approved plans will not be deviated from without prior approval from the Architect/Engineer of record, if applicable, and the Town of Ithaca.

Signature of Property Owner or Authorized Agent

Date

Tompkins County Health Department - Approval of Septic System(s) and/or Well(s)

Date Issued _____

Insurance Certificates: NYS Workers' Compensation, Disability, Liability

On File _____

Plumbing Permit - Water & Sewer Permit Number _____

Date Issued _____

Appropriate Highway Department: Culverts, Driveway, Work in Right-of-Way

Date Issued _____

APPLICATION DENIED under Section _____

Date of ZBA Hearing _____

Date of Planning Board Approval _____

Decision _____

Type of Planning Board Approval _____

BUILDING PERMIT APPROVED BY _____

**City of Minneapolis, Minnesota
Code of Ordinances (2011)
Title 20, Zoning Code**

**Chapter 535, Regulations of General Applicability
Article XII. Solar Energy Systems**

535.820. Purpose. Regulations governing solar energy systems are established to provide for appropriate locations for solar energy systems, to ensure compatibility with surrounding uses, and to promote safe and effective use of solar energy to increase opportunities for generation of renewable energy.
(2011-Or-008, § 1, 2-11-11)

535.830. Definitions. As used in this article, the following words shall mean:

Building-integrated solar energy system. A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to active photovoltaic or hot water systems that are contained within roofing materials, windows, walls, skylights, and awnings, or passive systems that are designed to capture direct solar heat.

Building-mounted solar energy system. A solar energy system affixed to a principal or accessory building.

Freestanding solar energy system. A solar energy system with a supporting framework that is placed on, or anchored in, the ground and that is independent of any building or other structure. Garages, carports or similar structures that incorporate building-integrated or building-mounted solar energy systems shall not be classified as freestanding solar energy systems and shall instead be subject to regulations governing accessory structures.

Solar collector surface. Any part of a solar energy system that absorbs solar energy for use in the system's transformation process. The collector surface does not include frames, supports, and mounting hardware.

Solar energy. Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar energy system. A device or structural design feature intended to provide for collection, storage, and distribution of solar energy for heating or cooling, electricity generating, or water heating.
(2011-Or-008, § 1, 2-11-11)

535.840. Permitted uses and specific standards, subject to administrative review and approval.

(a) In general. Solar energy systems shall be permitted in all zoning districts, subject to the standards of this article. Solar collector surfaces and all mounting devices shall comply with the minimum yard requirements of the district in which they are located. Screening of solar collector surfaces shall not be required.

(b) Building-mounted solar energy systems.

(1) Notwithstanding the height limitations of the zoning district, building mounted solar energy systems shall not extend higher than three (3) feet above the ridge level of a roof on a structure with a gable, hip, or gambrel roof and shall not extend higher than ten (10) feet above the surface of the roof when installed on flat or shed roof.

(2) The solar collector surface and mounting devices for building-mounted solar energy systems shall be set back not less than one (1) foot from the exterior perimeter of a roof for every one (1) foot that the system extends above the parapet wall or roof surface, if no parapet wall exists, on which the system is mounted. Solar energy systems that extend less than three (3) feet above the roof surface shall be exempt from this provision.

(c) Freestanding solar energy systems.

(1) Freestanding solar energy systems, measured to the highest point of the system, shall not exceed the height of the principal structure or twenty (20) feet, whichever is less. The height of the principal structure shall be measured as provided in Chapter 520, Introductory Provisions. Freestanding solar energy systems up to sixteen (16) feet in height shall be subject to the minimum yard requirements of an accessory structure. Freestanding solar energy systems greater than sixteen (16) feet in height shall be subject to the minimum yard requirements of a principal structure. The required yard shall be measured from the property line to the closest part of the structure at minimum design tilt.

(2) In the residence and office residence districts, the area of the solar collector surface of freestanding solar energy systems shall not exceed five (5) percent of the lot area. Notwithstanding any other provision to the contrary, the maximum area of solar energy systems shall be calculated independently of the floor area of all other accessory structures on the zoning lot.

(3) The supporting framework for freestanding solar energy systems shall not include unfinished lumber.

(4) All abandoned or unused freestanding solar energy systems shall be removed within twelve (12) months of the cessation of operations.
(2011-Or-008, § 1, 2-11-11)

535.850. Administrative review process.

(a) In general. The zoning administrator, in consultation with the planning director, shall have up to fifteen (15) working days following the submittal of a complete application to approve or deny such application. The zoning administrator may impose such conditions and require such guarantees deemed reasonable and necessary to protect the public interest and to ensure compliance with the standards and purposes of this zoning ordinance and policies of the comprehensive plan.

(b) Submittal requirements. An application for a solar energy system shall be filed on a form approved by the zoning administrator, as specified in Chapter 525, Administration and Enforcement. In addition, the applicant shall submit the following:

(1) Written evidence that the electric utility service provider that serves the proposed site has been informed of the applicant's intent to install a solar energy system, unless the applicant does not plan, and so states so in the application, to connect the system to the electricity grid.

(2011-Or-008, § 1, 2-11-11)

535.860. Conditional uses. Solar energy systems that do not comply with the standards of section 535.840 above may be allowed by conditional use permit, subject to the provisions of Chapter 525, Administration and Enforcement, provided that requests to reduce minimum yard requirements shall be by variance.

(2011-Or-008, § 1, 2-11-11)

535.870. Solar access. Solar access easements may be filed consistent with Minn. Statute Section 500.30. Any property owner may purchase an easement across nearby properties to protect access to sunlight. The easement is purchased or granted by owners of nearby properties and can apply to buildings, trees, or other structures that would diminish solar access.

(2011-Or-008, § 1, 2-11-11)

Chapter 537, Accessory Uses and Structures

537.110. Allowed accessory uses and structures. The following accessory uses and structures shall be allowed, subject to the following development standards:

* * *

Solar energy system. Solar energy systems shall be allowed as an accessory use, subject to the applicable zoning district regulations and the regulations contained in Chapter 535, Regulations of General Applicability.



Solar Water Heating and Photovoltaic Electric Generators Installed on One or Two Family Dwellings

Category: Residential Construction

Revised: December 1, 2010 [Paul L. Scarlett], Director

Responsible Bureau Section: Development Services Center
1900 SW Fourth Avenue
Portland, OR 97201
503-823-7310

I. BACKGROUND

As awareness of renewable energy and green building options increases, solar energy systems are becoming a more common energy choice for Oregon homeowners. Energy from the sun can be harnessed using a solar water heating or solar electric system.

This program guide outlines the application and review procedures for obtaining the necessary permit(s) to install a solar energy system for a new or existing residential building. The guide also describes what system siting or design elements may trigger the need for additional plan review.

II. SOLAR ENERGY SYSTEM DESCRIPTION

A solar energy system is defined, for the purpose of this program guide, as a solar water heating or solar electric (also known as a photovoltaic or PV) system.

A. Solar Water Heating

A solar water heating system reduces household energy consumption by preheating water so that the residence's water heater does less work. It consists of two, primary components:

1. Solar collectors, which are commonly installed on the roof; and
2. A storage tank, which is typically co-located with the residence's water heater and in which potable water is preheated by the solar collectors via a heat exchanger.

**Bureau of Development Services
Program Guide – Solar Water Heating and Photovoltaic Electric Generators
Installed on One or Two Family Dwellings
Page 2 of 14
December 1, 2010**

B. Solar Electric

A solar electric system produces electricity that is distributed to the home via the residence's main electrical panel, offsetting electric energy that would otherwise be purchased from the utility. It consists of two, primary components:

1. Photovoltaic panels, which are commonly installed on the roof; and
2. An inverter, which converts direct current electricity produced by the panels into alternating current electricity that can be used by the home.

C. Residential Solar Pool Heating

A residential solar pool heating system consists of light-weight unglazed polymer (plastic) solar collectors, typically mounted on a roof, through which swimming pool water is circulated during the summer months to capture the sun's heat. This type of system is not subject to the requirements of this program guide, and may be installed by obtaining a mechanical permit. In some cases an electrical permit may also be necessary to install the control system for the solar collectors.

III. SCOPE

This Program Guide is designed to provide guidelines and permitting requirements to those interested in solar hot water heaters or photovoltaic solar electric panels on residential construction. This may include adding a solar system on to an existing structure as an addition or an alteration, or incorporating a solar system into a new building. The intent of these guidelines is to streamline the permitting process for solar energy systems. The Bureau of Development Services (BDS) may require additional information be submitted to ensure proper compliance with code requirements.

IV. INSTALLATION REQUIREMENTS

For a typical residential installation the following rules apply. For installations not complying with this guide contact BDS for installation requirements.

A. Land Use

Solar installations must comply with the Zoning Code. Specific Zoning information regarding a site can be obtained from the BDS Planning and Zoning Section by calling 503-823-7526.

1. Height

In all instances, installations of solar equipment, including the rails and panels, are subject to the height limitations of the specific zone where they are being installed.

Roof-mounted solar panels are not included in height calculations, and may exceed the maximum height of the zone if the following are met:

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- a. For flat roofs or the horizontal portion of mansard roofs, the panels may extend up to 5 feet above the highest point of the roof.
- b. For pitched, hipped, or gambrel roofs, the panels must be mounted no more than 12 inches from the surface of the roof at any point, and may not extend above the ridgeline of the roof. The 12 inches is measured from the upper side of the solar panel.

2. Setbacks

Installations that are 6 feet or less in height are allowed to be placed in the setbacks of the individual lot. Installations taller than 6 feet are not allowed in this area unless they are placed on the roof of a building or approved through a land use review adjustment process.

3. Design and Historic Review

- a. **General** Design review analyzes the aesthetics of a project, in order to conserve or enhance special scenic, architectural or cultural areas of the City. Projects in design overlay zones, historic districts, conservation districts, or individual historic or conservation landmarks may require design review. In some design overlay zones or historic districts a design review may not be required if the project is eligible to use the Community Design Standards.

In the Central City and Gateway plan districts, roof-mounted solar panels on existing buildings are exempt from Design Review if specified standards are met (see Zoning Code Section 33.420.045.Y). Roof-mounted solar panels are also exempt from Historic Design Review in historic design districts if specified standards are met (see Zoning Code Section 33.445.320.B.8).

Please contact BDS Planning and Zoning Section at 503-823-7526 if you are unsure if the project is located in a design or historic zone or is eligible to use the Community Design Standards.

- b. **Notice requirements** Design review is a discretionary review that requires a public notice and generally takes about 8 weeks to complete.
- c. **Fees** The Design Review fee for a solar installation will be based on the current Land Use Services Fee Schedule for a 'Minor C' review.

B. Structural

The solar collectors and underlying substructure (mounts, rails, etc.) must be designed and installed in accordance with the requirements of the latest version

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of the Oregon Solar Installation Specialty Code (OSISC). The prescriptive requirements as described in section 305.4 of OSISC are assumed to meet the residential code requirements and therefore will not require the system be designed by a registered Oregon engineer. Use the checklist attached to the back of this code guide to determine if your system would qualify for the prescriptive path. All other systems that do not meet the prescriptive requirements are required to be designed by an engineer registered in Oregon.

C. Plumbing and Electrical

All portions of the installation of solar systems governed by the plumbing or electrical portions of the residential code shall comply with the respective requirements of each code section at the time of completion of the project. In general, plumbing or electrical plan review is not required for the installation of residential solar systems, but electrical and plumbing permits must be obtained either as separate permits, or combined with the residential building permit. In all instances, field inspection is required to verify code compliance.

V. PERMITS

A. General Requirements

1. Alterations

When a solar system is added to an existing one or two family dwelling, the installation is considered an “alteration”. Under the provisions of the residential code, all alterations must meet the code requirements for new construction. Permits for solar installations qualifying as alterations may be processed in one of two ways:

- a. Through the traditional permitting system; or
- b. Through the Field Issuance Remodel (FIR) program.

The specific requirements of each of these two processes are described in detail under B. Application Process.

2. New Construction

Solar panels that are included in the construction of a new one or two family dwelling will be processed in conjunction with the new construction permit.

In all instances, the type of solar system to be installed shall be clearly indicated with the application documents and all necessary permits shall be obtained before installation of the system.

B. Application Process

All solar installations shall be submitted for permit review.

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1. Traditional Permitting System: For New Construction and Alterations

All permits for new construction and alterations are required to be processed through the Development Services Center (DSC) located at 1900 SW 4th Avenue, Portland Oregon on the first floor. All solar panels that are installed as a part of a new construction project will be processed in conjunction with the other work being permitted.

A building permit and any necessary plumbing and electrical permits will be created at the Second Screen station at the time of visit. A permit technician will evaluate the plans for completeness, and if complete, a building permit folder will be created to document all necessary reviews and approvals. An applicant may choose to combine the building permit and the plumbing/electrical permit into a single permit application, called a combination residential permit, or may apply for each of the permits separately. However, if the plumbing or electrical permits are obtained separately they will not be issued to the applicant until the associated building permit has been approved.

After the initial permits have been created, the applicant will proceed through the various review stations (Planning & Zoning and Plan Review) to verify that the design meets all of the necessary requirements. If the project is shown to comply with all requirements, and all permit fees are paid, the permit will be issued to the applicant the same day.

In some cases, depending upon the complexity of the project, it may be necessary for a particular project to be reviewed more closely and the permit will be taken in for review. In these instances, the necessary reviews will be completed within 7 days. The applicant will be notified of any additional questions via a "checksheet", or the reviews will be approved. After all necessary reviews have been completed the applicant will be notified when the permit is "Approved to Issue". The permit will be issued after all permit fees have been paid.

2. Field Issuance Remodel (FIR) Program: (Available only for Alterations)

The FIR program application process differs from the traditional application process and requires contractor registration. After the registration process is completed, the designated FIR inspector works with the contractor in the field to issue all necessary permits and advise the contractor potential issues associated with the project, such as Planning and Zoning issues. The FIR inspector will also conduct all necessary inspections for the project. All solar system permits that are processed through the FIR program will be subject to FIR registration and inspection fees. For additional information on the FIR program, consult the BDS FIR Program Guide available online at

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<http://www.portlandoregon.gov/bds> or contact the FIR program directly at 503-823-7784.

C. Permit Submittal Requirements

Regardless of the permit application process, the following information shall be submitted for each permit.

1. Site Plan

A site plan is required showing building footprints, property lines, location and dimensions of solar collectors, ridgeline of roof, fire fighter access and a description of the solar system. The system must be shown in sufficient detail to assess whether requirements of section 304.9 or one of the exceptions of OSISC have been met. See attached Figure #4.

2. Elevation Drawings

A simple building elevation will be required to measure the height of the installation above the roof. The elevation must show the height of the building, and the height of the solar installation, but does not need to show other building details, unless a Design Review is required. See attached Figure #3.

3. Structural Plans

a. Prescriptive system If the system meets all the prescriptive requirements of the OSISC, no structural calculations will be required. However, a simple structural plan showing the roof framing and system racking attachment details are required. See figures 1 through 4 for sample drawings. In addition, complete and attach the checklist for prescriptive installations found at the end of this document.

b. Designed system

- 1)** If the system does not qualify for the prescriptive path, then structural calculations prepared by an Oregon registered engineer are required. At a minimum, structural calculations verifying adequacy of the structure's roof framing, strut or frame supporting the rails (where used), attachment of the rail to the support /strut frame and the attachment to the building's roof framing are required. Calculations must be based on the latest version of the Oregon Structural Specialty Code. In some cases, manufacturer's information and installation details may be substituted for required calculations and details
- 2)** Drawings shall include a roof framing plan (member size, type, span and spacing) and any additional framing required to reinforce the existing framing. The plans should include the layout of the module system and its mounting points. Drawings should also provide

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information on any support strut or frame that supports the rails including frame member sizes, lateral bracing where required and their attachments. Details and information on the attachment of the system to the building structure are also required.

- 3)** When S5 clips or similar clips are used at standing seam metal roof decks, the following guidelines shall be followed:

Allowable Loads

Subject to the limitations noted below, the allowable uplift design loads for S-5-U Mini Clips shall not be taken greater than:

- (i) 75 lbs per clip when the clips are spaced at 24"o.c. or more but less than 48"o.c. along the seam of the standing seam deck OR
- (ii) 115 lbs per clip when the spacing along the seam of the deck is 48"o.c. or more.

Limitations:

- 1. The S-5-U Mini Clips shall be spaced a minimum of 24" o.c.
- 2. The minimum roof framing size shall be 2x4 (nominal). Maximum framing spacing shall be 24 inches. Roof sheathing shall be a minimum of ½" nominal plywood with minimum prescriptive nailing (8d at 6" o.c. edge nailing, 12" o.c. field nailing).
- 3. The standing seam metal roofing shall be one of the following types (or similar):
 - Bruce & Dana – Snap-Lock (12-inch panel width, 24 gage)
 - Taylor Metal Products – Easy Lock (12-inch panel width, 24 gage)
 - ASC Metal Products – Skyline Roofing (16-inch panel width, 26 gage)
 - AEP Span – Design Span HP (18-inch panel width, 24 gage)
 - AEP Span – Span-Lok HP (16-inch panel width, 24 gage)
- 4. Metal roofing shall be fastened to the roof framing per the manufacturer's instructions and at 24"o.c. maximum with a minimum of #10 pancake head screws. For roofing systems installed with clips (AEP span systems) clip spacing shall be 24" o.c. maximum and clips shall be installed with a minimum of two #10 pan head screws.

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Submittal Requirements

In addition to requirements for standard installations, solar installation permits utilizing S-5-U Mini Clips shall contain the following additional information:

1. Roof framing plan indicating framing member size and spacing, type of roofing, roofing attachment of metal roofing to framing, location and spacing of S-5-U Mini Clips.
2. Structural calculations demonstrating that uplift demand on the S-5-U Mini Clip is less than allowable uplift load.

VI. INSPECTIONS

The following inspections will be required for the installation of the solar system:

A. Building

Building inspections are required to verify that the solar support system is properly installed. For alterations, two building inspections, listed in order, are required to verify that the system has been installed properly:

1. IVR Code 299: Final Structural
2. IVR Code 999: Final Building.

For new construction or for permits that include additional work beyond the installation of the solar system additional inspections may be required.

B. Plumbing

A plumbing inspection is required where the solar apparatus attaches to the potable water system, usually a water heater. The inspection will verify that the collection system is properly attached so that no contamination of the potable system can occur. Two plumbing inspections, listed in order, are required to verify that the system has been installed properly:

1. IVR Code 340: Water Heater
2. IVR Code 399: Final Plumbing.

C. Electrical

An electrical inspection is required in all instances where the solar system provides power to the dwelling electrical system. The inspection will verify that the circuits and feeders have been installed properly and the system has been connected properly. Three electrical inspections, listed in order, are required to verify that the system has been installed properly:

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1. IVR Code 145: Circuits/Feeders
2. IVR Code 120: Permanent Electrical Service/Reconnect
3. IVR Code 199: Final Electrical.

VII. FEES

Fees for all required building, plumbing or electrical permits will be calculated using the current and applicable BDS fee schedule available online at <http://www.portlandoregon.gov/bds> or in the BDS Development Services Center at 1900 SW 4th Avenue, Portland Oregon.

In general, building permit fees will be based on the valuation of the structural elements for the solar panels, including the mounting brackets and rails and the cost of labor to install them. Excluded from the permit valuation is the cost of the solar equipment, including the solar collector panels, inverters and preheat tanks.

Valuation of Project = Total Project Price – Solar Equipment Value

If a Design Review is required, the fee will be for a 'Minor C' Design Review, based on the current Land Use Services Fee Schedule.

VIII. ENFORCEMENT

All code requirements shall be in accordance with the applicable permitting and inspection procedures.

Updates April 26, 2010 edition
Updates April 24, 2009 edition
New May 1, 2008

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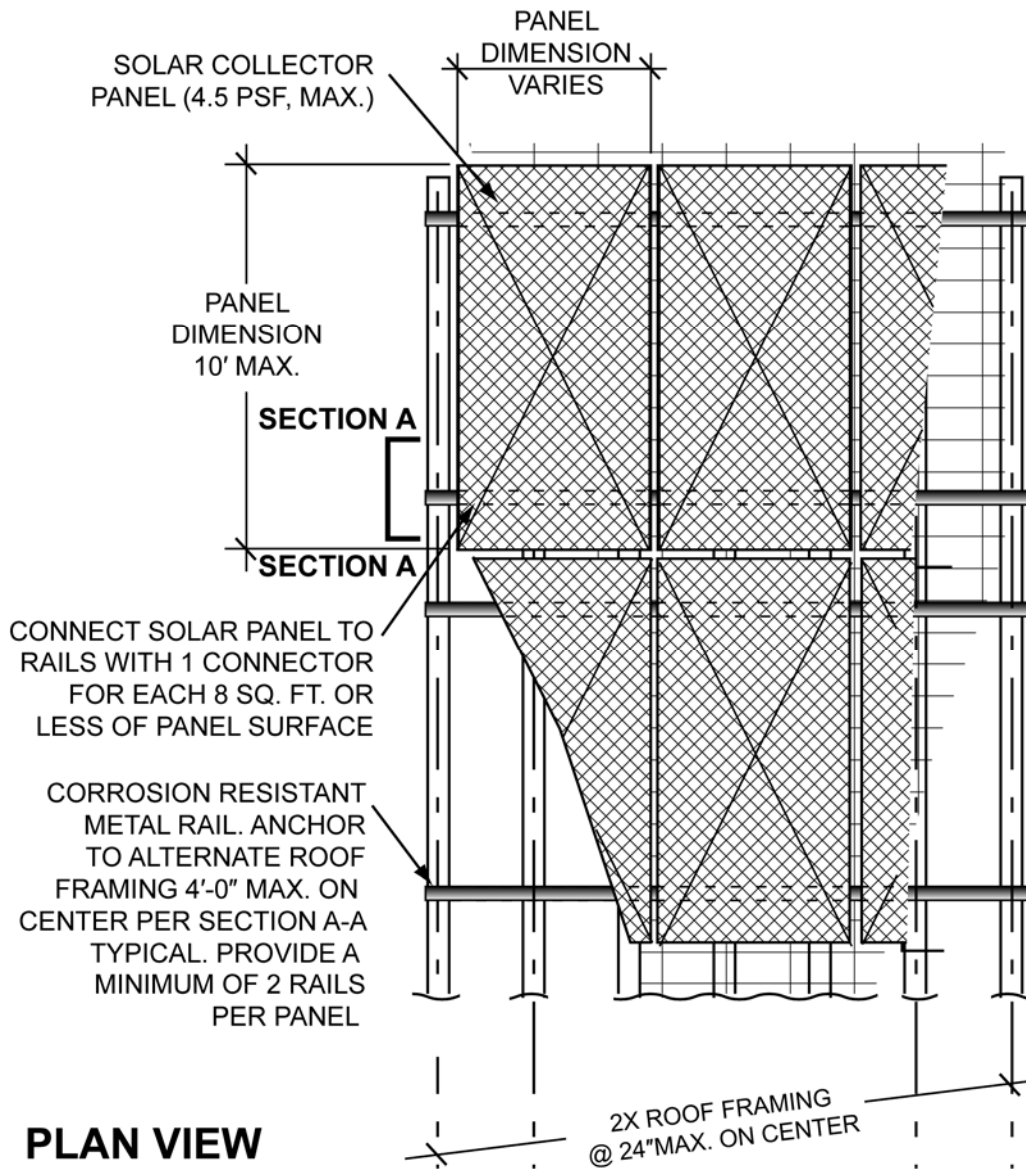
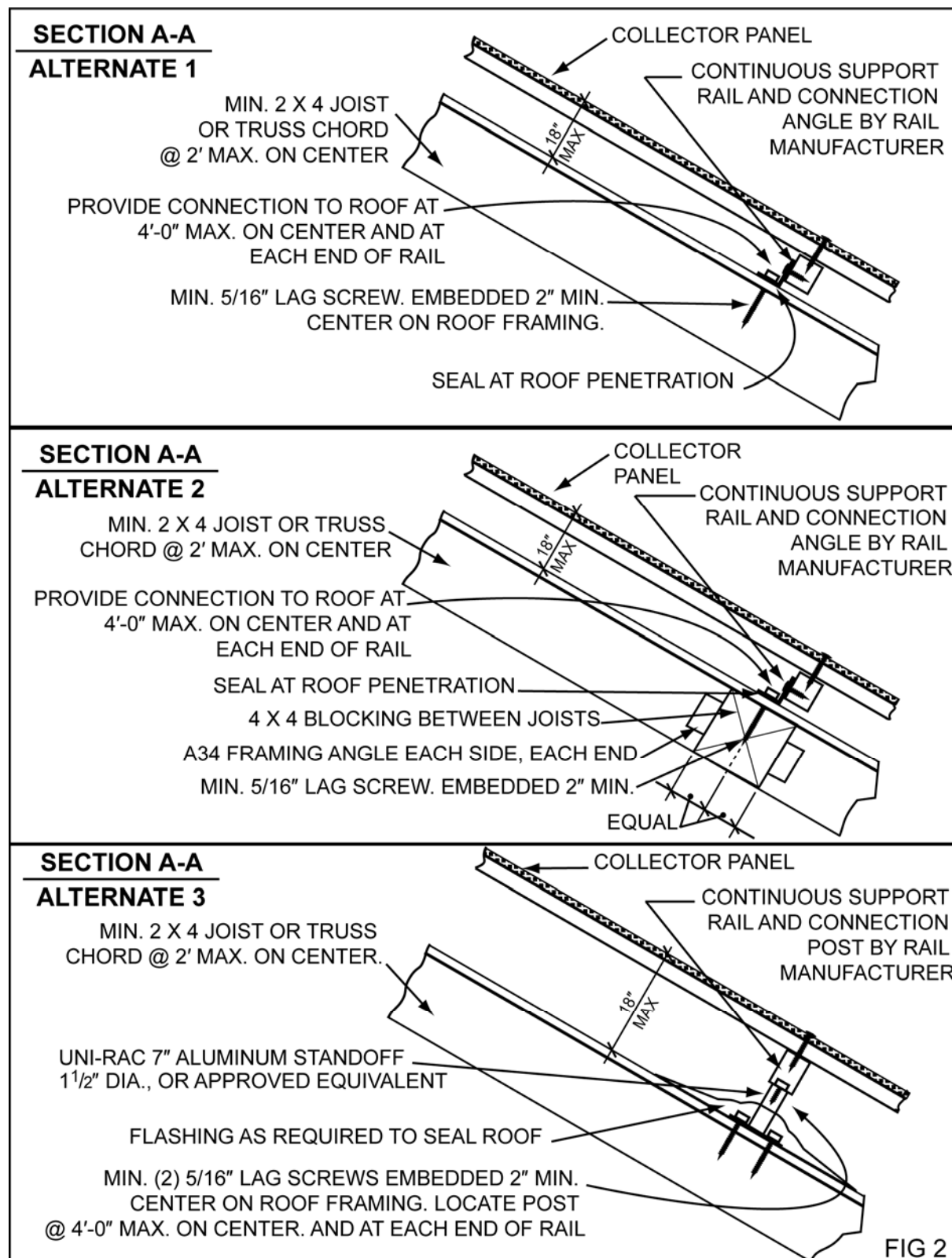
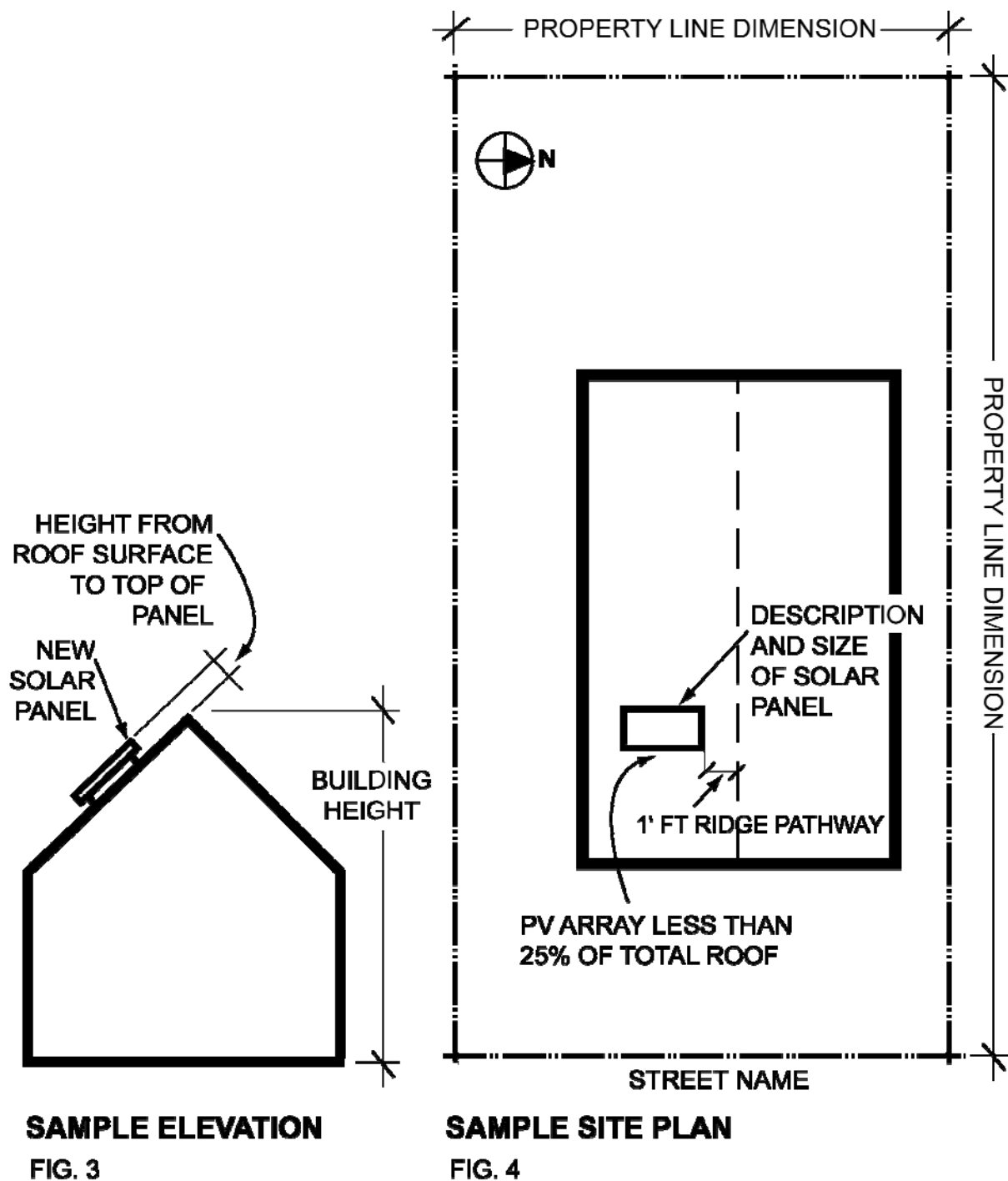


FIG. 1

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City of Portland, Oregon - Bureau of Development Services

1900 SW Fourth Avenue • Portland, Oregon 97201 • 503-823-7300 • www.portlandoregon.gov/bds



**Checklist and Submittal Requirements for Prescriptive Installations
of Solar Photovoltaic and Solar Water Heating Systems in accordance
with Oregon Solar Installation Specialty Code (OSISC)**

Instructions

Complete the following with all the information requested. This form must be submitted along with the application for installation.

Property Owner Information

Property Owner Name: _____ Installation Address: _____

Day Phone: _____ Evening Phone: _____ Email: _____

Contractor: _____ CCB#: _____

Day Phone: _____ Evening Phone: _____ Email: _____

PV Modules or Solar Water Heating Collectors

Manufacturer: _____ Model Number: _____ Listing Agency: _____

Site Plan and Structural Plan

- Attach a simple site plan showing the location of the PV or solar water heating system in relation to buildings, structures, property lines, and, as applicable, flood hazard areas.
- Attach a simple structural plan showing the roof framing (rafter size, type and spacing) and PV module system racking attachment. Plans must be shown in sufficient detail to assess whether the requirements of section 304.9 of OSISC or one of the exceptions have been met.
- Attach simple building elevation.
- The plans must be on 8.5 x 11 or larger paper.

Structural Information

Roof Design and Attachment

- Roof rafter size: ____ x ____ inches OR Manufactured Trusses
- Rafter or manufactured roof truss spacing ____ inches o.c.
- For roof rafters, maximum rafter span allowed per table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC) (www.oregonbcd.org/programs/solar/solar_code/100110_OSISC.pdf) for the size and spacing of roof rafters is ____ ft ____ inches.

Checklist to determine if your installation qualifies for prescriptive path

☐ Yes ☐ No Is this conventional light framed wood construction?

☐ Yes ☐ No Does the structure have pre-engineered trusses?

OR

Does structure have roof framing members spaced at 24" o.c. maximum AND comply with the applicable allowable span in table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC)?

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-
- ☐ Yes ☐ No Is the roofing material metal, single layer wood shingle, or not more than two layers of composition shingle?
- ☐ Yes ☐ No Is the weight of the modules and racking less than 4.5 pounds per square foot?
- ☐ Yes ☐ No Is the module height less than 18 inches above the roof in accordance with section 305.4?
- For Standing Seam Metal Roofs Only (If not applicable please skip this section)**
- ☐ Yes ☐ No Is the metal gauge 26 or heavier?
- ☐ Yes ☐ No Clamp design: Are clamps designed to withstand uplift of at least 115 pounds for clamps spaced at 60 inches on center or less or at least 75 pounds for clamps spaced at 48 inches on center or less?
- ☐ Yes ☐ No Is the spacing of the clamps as measured along the seam greater than or equal to 24" o.c. and less than 60" o.c. AND the spacing perpendicular to the seam not greater than 24" o.c.?
- ☐ Yes ☐ No Is the roofing panel width 18-inches or greater?
- ☐ Yes ☐ No Is the roofing panel attached with at least #10 screws at 24" o.c.?
- ☐ Yes ☐ No Is the roofing panels installed over minimum 1/2-inch nominal wood structural panels attached to framing with 8d nails at 6" o.c. at panel edges and 12" o.c. field nailing?

If you have indicated "No" on any of these requirements above, the project may not be submitted using the prescriptive path.

Fire Fighter Access and Escape

Access and escape pathways are not required when the array is located on a non-occupied accessory structures that is separated from occupied structures by a 6 foot minimum separation distance or by a minimum two-hour fire rated assembly.

General Requirements: For all other roof mounted systems, a minimum 36" wide pathway is required along three sides of the solar roof, located over a structurally supported area. Any roof with a slope greater than 2:12 can not use the bottom roof edge as a pathway. Pathways and solar panels shall be located outside 12" of the low point of a valley.

If the array is greater than 150 feet in length or width, additional 36" wide intermediate pathways and cutouts are required. See code for details.

If the roof has smoke and/or heat vents, a 36" pathway shall be provided to and around each vent.

Exceptions to General Requirements:

- ☐ Yes ☐ No Is the roof slope greater than 2:12?
- ☐ Yes ☐ No Is the array area 1,000 sq ft or less?
- ☐ Yes ☐ No Is the array 150 feet or less in length or width?

If you have indicated "No" to any of the items above, exceptions do not apply, provide a simple plan conforming with the general requirements.

If you have indicated "Yes" to all of the items above, see below for reduced access and escape pathway requirements.

Is the array 25% or less of the roof area? ☐ Yes ☐ No

- If Yes, a 12" pathway along each side of any horizontal ridge is required.
- If No, a 12" pathway along each side of any horizontal ridge is required and a minimum of one 36" pathway is required from ridge to eave over a structurally supported area.

Provide a simple plan showing conformance to the reduced access pathway requirements.

As the property owner or authorized representative of the above listed property, I certify that I have verified the information provided above and that the roof rafters (if applicable to the project), meet the span requirements of Table 305.4.1 (Appendix B) of the Oregon Solar Installation Specialty Code.

Applicant name (please print) _____ **Signature** _____ **Date** _____



Solar Water Heating and Photovoltaic Electric Generators Installed on Commercial Buildings

Category: Commercial Construction

Revised: December 1, 2010 [Paul L. Scarlett], Director

Responsible Bureau Section: Development Services Center
1900 SW Fourth Avenue
Portland, OR 97201
503-823-7310

I. BACKGROUND

Incorporating solar energy into commercial buildings is an increasingly common way for businesses to display environmental stewardship. With large financial incentives available at the local, state and federal level, it can be a sound business investment.

This program guide outlines the application and review procedures for obtaining the necessary permits to install a solar energy system on a new or existing commercial building.

II. SOLAR ENERGY SYSTEM DESCRIPTION

For the purpose of this program guide a solar energy system is defined as a solar water heating or solar electric (also known as a photovoltaic or PV) system.

A. Solar Water Heating

A solar water heating system reduces a business' energy consumption by preheating water so that the water heater or boiler does less work. The system consists of two primary components:

1. Solar collectors, which are commonly installed on the roof; and
2. A storage tank, which is typically co-located with the water heater and in which potable water is preheated by the solar collectors via a heat exchanger.

B. Solar Electric

A solar electric system produces electricity that is distributed to the building via an electrical panel, offsetting electric energy that would otherwise be purchased from the utility. It consists of two primary components:

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1. Photovoltaic panels, which are commonly installed on the roof; and
2. One or more inverters, which convert the direct current electricity produced by the panels into alternating current electricity that can be used by the building.

C. Commercial Solar Pool Heating

A commercial solar pool heating system consists of light-weight unglazed polymer (plastic) solar collectors, typically mounted on a roof, through which swimming pool water is circulated during the summer months to capture the sun's heat. This type of system is not subject to the requirements of this Program Guide, and may be installed by obtaining a mechanical permit. In some cases an electrical permit may also be necessary to install the control system for the solar collectors.

III. SCOPE

This program guide is designed to provide guidelines and permitting requirements to those interested in solar hot water heaters or photovoltaic solar electric panels on commercial construction. This may include adding a solar system on to an existing structure by addition or alteration, or incorporating a solar system into new building construction. The intent of these guidelines is to streamline the permitting process for solar energy systems. The Bureau of Development Services (BDS) may require additional information be submitted to ensure proper compliance with code requirements.

IV. INSTALLATION REQUIREMENTS

A. Land Use

Solar installations must comply with the Zoning Code. Specific zoning information regarding a site can be obtained from the BDS Planning and Zoning Section by calling 503-823-7526.

1. Height

In all instances, installations of solar equipment, including the rails and panels, are subject to the height limitations of the specific zone where they are being installed.

Roof-mounted solar panels are not included in height calculations, and may exceed the maximum height of the zone if the following are met:

- a. For flat roofs or the horizontal portion of mansard roofs, the panels may extend up to 5 feet above the highest point of the roof.
- b. For pitched, hipped, or gambrel roofs, the panels must be mounted no more than 12 inches from the surface of the roof at any point, and may not

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extend above the ridgeline of the roof. The 12 inches is measured from the upper side of the solar panel.

2. Setbacks

Installations that are 6 feet or less in height are allowed to be placed in the setbacks of the individual lot. Installations taller than 6 feet are not allowed in this area unless they are placed on the roof of a building or approved through a land use review adjustment process.

3. Design and Historic Review

Projects in design overlay zones, historic districts, conservation districts, or individual historic or conservation landmarks may require Design Review. Design Review analyzes the aesthetics of a project, in order to conserve or enhance special scenic, architectural or cultural areas of the City. It is a discretionary review that requires a public notice and generally takes about 8 weeks to complete. The design review fee for a solar installation will be based on the current Land Use Services Fee Schedule for a 'Minor C' review. In some design overlay zones or historic districts, design review may not be required if the project is eligible to use the Community Design Standards.

In the Central City and Gateway plan districts, roof-mounted solar panels on existing buildings are exempt from Design Review if specified standards are met (see Zoning Code Section 33.420.045.Y). Roof-mounted solar panels are also exempt from Historic Design Review in historic design districts if specified standards are met (see Zoning Code Section 33.445.320.B.8).

Please contact BDS Planning and Zoning Section at 503-823-7526, if you are unsure if the project is located in a design or historic zone or is eligible to use the Community Design Standards.

4. Upgrades to Non-conforming Development

Upgrades to non-conforming development will only be required as part of the solar installation when other modifications to the building are made (such as increasing the structural capacity of the roof system), and the valuation of the building permit for those modifications excluding the valuation of the solar system exceeds the dollar threshold of Section 33.258.070.D.2.a of the Zoning Code.

B. Structural

The solar collectors and underlying substructure (mounts, rails, etc.) must be designed and installed in accordance with the requirements of the latest version of the Oregon Solar Installation Specialty Code (OSISC). The prescriptive requirements as described in section 305.4 of OSISC are assumed to meet the

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requirements of the Oregon Structural Specialty Code and therefore will not require the system be designed by a registered Oregon engineer. Use the checklist attached to the back of this code guide to determine if your system would qualify for the prescriptive path. All other systems that do not meet the prescriptive requirements are required to be designed by an engineer registered in Oregon.

C. Plumbing and Electrical

1. General

All portions of the installation of solar systems governed by the plumbing or electrical code shall comply with the respective requirements of each code at the time of completion of the project.

2. Plan review

In general, plumbing or electrical plan review is not required for the installation of solar systems in commercial buildings. Plumbing and electrical plan review is only required for those solar systems that are being added to complex systems as defined by the State of Oregon in Administrative Rules OAR 918-780-0040 and OAR 918-311-0040 (1), cert ef. 10-01-06. In all instances, field inspection is required to verify code compliance.

V. PERMITS

A. General

When a solar system is added to an existing building, the installation is considered an “alteration”. Solar panels that are part of new construction will be processed in conjunction with the new commercial construction permit. Under the provisions of the Oregon Structural Specialty Code, all alterations must meet the requirements for new construction. All necessary permits shall be obtained prior to installation of the system. Where plumbing and electrical permits are required as noted below, they must be obtained as separate permits.

B. Specific Permits required

- 1. Building Permits** A building permit is required for all solar systems including support structures and collector panels.
- 2. Electric Permits** A separate electrical permit is required for the connection of a photovoltaic system to the building’s electrical system.
- 3. Plumbing Permits** A separate plumbing permit is required for all systems that exchange energy with and are attached to the building’s potable water system.

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C. Application Process

All permit applications for solar installations shall be submitted for review at the BDS Development Services Center (DSC) located at 1900 SW 4th Avenue, Portland, Oregon on the first floor. At that time, DSC staff will determine if the project needs to be taken in for review or if the solar system can be reviewed over the counter.

Where a solar system is installed under another program such as the Facility Permit Program (FPP), the application process for that program shall be followed.

D. Permit Submittal Requirements

1. General

In all cases, solar systems being installed in commercial buildings need the following reviews:

- a. Planning and Zoning; and
- b. Structural.

In addition, all permit applications shall clearly indicate the type of solar system to be installed. The information noted in items 2 through 4 shall be submitted for each permit.

2. Construction Drawings

Construction drawings are required as indicated below. Structural drawings and calculations may be required to bear the stamp and signature of an Oregon registered engineer.

a. Structural

- 1) Prescriptive system** If the system meets all the prescriptive requirements of the OSISC, no structural calculations will be required. However, a simple structural plan showing the roof framing and system racking attachment details are required. See figures 1 through 4 for sample drawings. In addition, complete and attach the checklist for prescriptive installations found at the end of this document

2) Designed system

- (a)** If the system does not qualify for the prescriptive path, then structural calculations prepared by an Oregon registered engineer are required. At a minimum, structural calculations verifying adequacy of the structure's roof framing, strut or frame supporting the rails (where used), attachment of the rail to the support /strut frame and the attachment to the building's roof

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framing are required. Calculations must be based on the latest version of the Oregon Structural Specialty Code. In some cases, manufacturer's information and installation details may be substituted for required calculations and details.

- (b) Drawings shall include a roof framing plan (member size, type, span and spacing) and any additional framing required to reinforce the existing framing. The plans should include the layout of the module system and its mounting points. Drawings should also provide information on any support strut or frame that supports the rails including frame member sizes, lateral bracing where required and their attachments. Details and information on the attachment of the system to the building structure are also required.
- (c) When S5 clips or similar clips are used at standing seam metal roof decks, the following guidelines shall be followed :

Allowable Loads

Subject to the limitations noted below, the allowable uplift design loads for S-5-U Mini Clips shall not be taken greater than:

- (i) 75 lbs per clip when the clips are spaced at 24"o.c. or more but less than 48"o.c. along the seam of the standing seam deck OR
- (ii) 115 lbs per clip when the spacing along the seam of the deck is 48"o.c. or more.

Limitations

1. The S-5-U Mini Clips shall be spaced a minimum of 24" o.c.
2. The minimum roof framing size shall be 2x4 (nominal). Maximum framing spacing shall be 24 inches. Roof sheathing shall be a minimum of ½" nominal plywood with minimum prescriptive nailing (8d at 6" o.c. edge nailing, 12" o.c. field nailing)
3. The standing seam metal roofing shall be one of the following types (or similar)
 - Bruce & Dana – Snap-Lock (12-inch panel width, 24 gage)
 - Taylor Metal Products – Easy Lock (12-inch panel width, 24 gage)

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- ASC Metal Products – Skyline Roofing (16-inch panel width, 26 gage)
 - AEP Span – Design Span HP (18-inch panel width, 24 gage)
 - AEP Span – Span-Lok HP (16-inch panel width, 24 gage)
4. Metal roofing shall be fastened to the roof framing per the manufacturer's instructions and at 24"o.c. maximum with a minimum of #10 pancake head screws. For roofing systems installed with clips (AEP span systems) clip spacing shall be 24-inches maximum and clips shall be installed with a minimum of two #10 pan head screws.

Submittal Requirements

In addition to requirements for standard installations, solar installation permits utilizing S-5-U Mini Clips shall contain the following additional information:

1. Roof framing plan indicating framing member size and spacing, type of roofing, roofing attachment of metal roofing to framing, location and spacing of S-5-U Mini Clips.
2. Structural calculations demonstrating that uplift demand on the S-5-U Mini Clip is less than allowable uplift load.

3. Other Drawings

- a. **Site plan** A site plan is required showing building footprints, property lines, location and dimensions of solar collectors, ridgeline of roof, Fire fighter access and a description of the solar system. System must be shown in sufficient detail to assess whether requirements of section 304.9 or one of the exceptions of OSISC have been met.
- b. **Elevation** An elevation drawing must show the height of the building and the height of the solar installation above the roof, but does not need to show other building details, unless Design Review is required.
- c. **Details** Roof penetration detail including water proofing, curbs, flashing, etc.

4. Electrical and Plumbing Plans

Plumbing or electrical plans are only required for those installations that fall under the definition of complex structure as defined by the State of Oregon in

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OAR 918-780-0040 and OAR 918-311-0040 respectively. Plumbing or electrical plans are not required for other solar system installations.

After all plans and necessary information has been approved by all reviewers, and applicable permit fees have been paid, the permits shall be issued.

VI. INSPECTIONS

Inspections are required for all permits issued for solar systems as indicated below:

A. Building

Building inspections will be determined based upon the scope of the entire project on a project by project basis.

B. Plumbing

Plumbing inspections are required where the solar apparatus attaches to the potable water system, usually a water heater. The inspections will verify that the collection system is properly attached, so that no contamination of the potable system can occur. Two plumbing inspections, listed in order, are required to verify that the system has been installed properly:

1. IVR Code 340: Water Heater
2. IVR Code 399: Final Plumbing.

C. Electrical

Electrical inspections are required to verify the circuits and feeders have been installed properly and the system has been connected properly. Three electrical inspections, listed in order, are required to verify that the system has been installed properly:

1. IVR Code 145: Circuits/Feeders
2. IVR Code 120: Permanent Electrical Service/ Reconnect
3. IVR Code 199: Final Electrical.

VII. FEES

Fees for all required building, plumbing or electrical permits will be calculated using the current and applicable BDS fee schedules available online at <http://www.portlandoregon.gov/bds> or in the BDS Development Services Center at 1900 SW 4th Avenue, Portland, Oregon.

A. General

In general, building permit fees will be based on the valuation of the structural elements for the solar panels, including the mounting brackets and rails and the

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cost of labor to install them. Excluded from the permit valuation is the cost of the solar equipment, including the solar collector panels, inverters and preheat tanks.

Valuation of Project = Total Project Price – Solar Equipment Value

B. Design Review

Where Design Review is required, the fee will be for a 'Minor C' Design Review, based on the current Land Use Services Fee Schedule.

VIII. ENFORCEMENT

All code requirements shall be in accordance with applicable permitting and inspection procedures established by BDS.

Updates April 26, 2010 edition
Updates April 24, 2009 edition
New May 1, 2008

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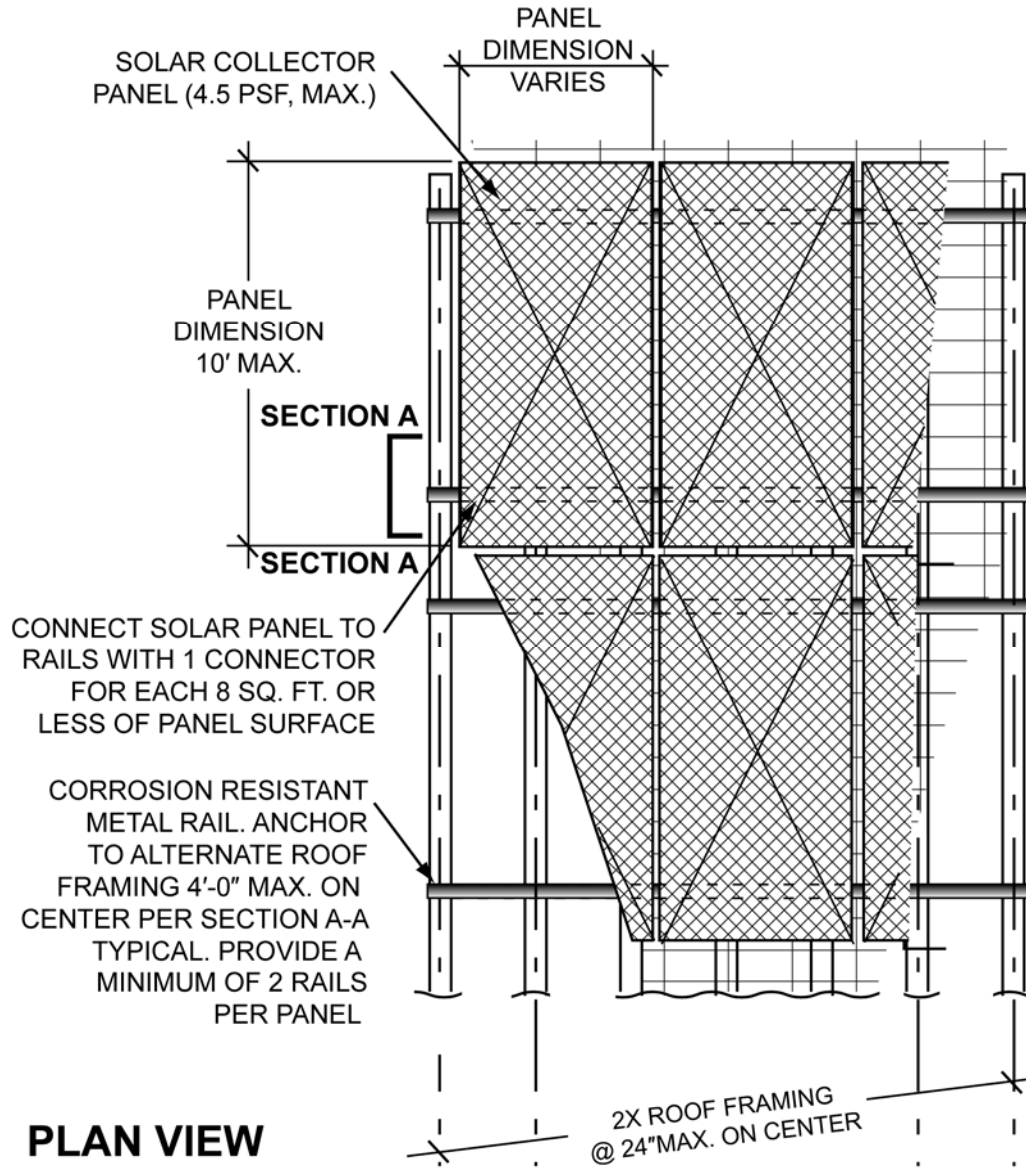
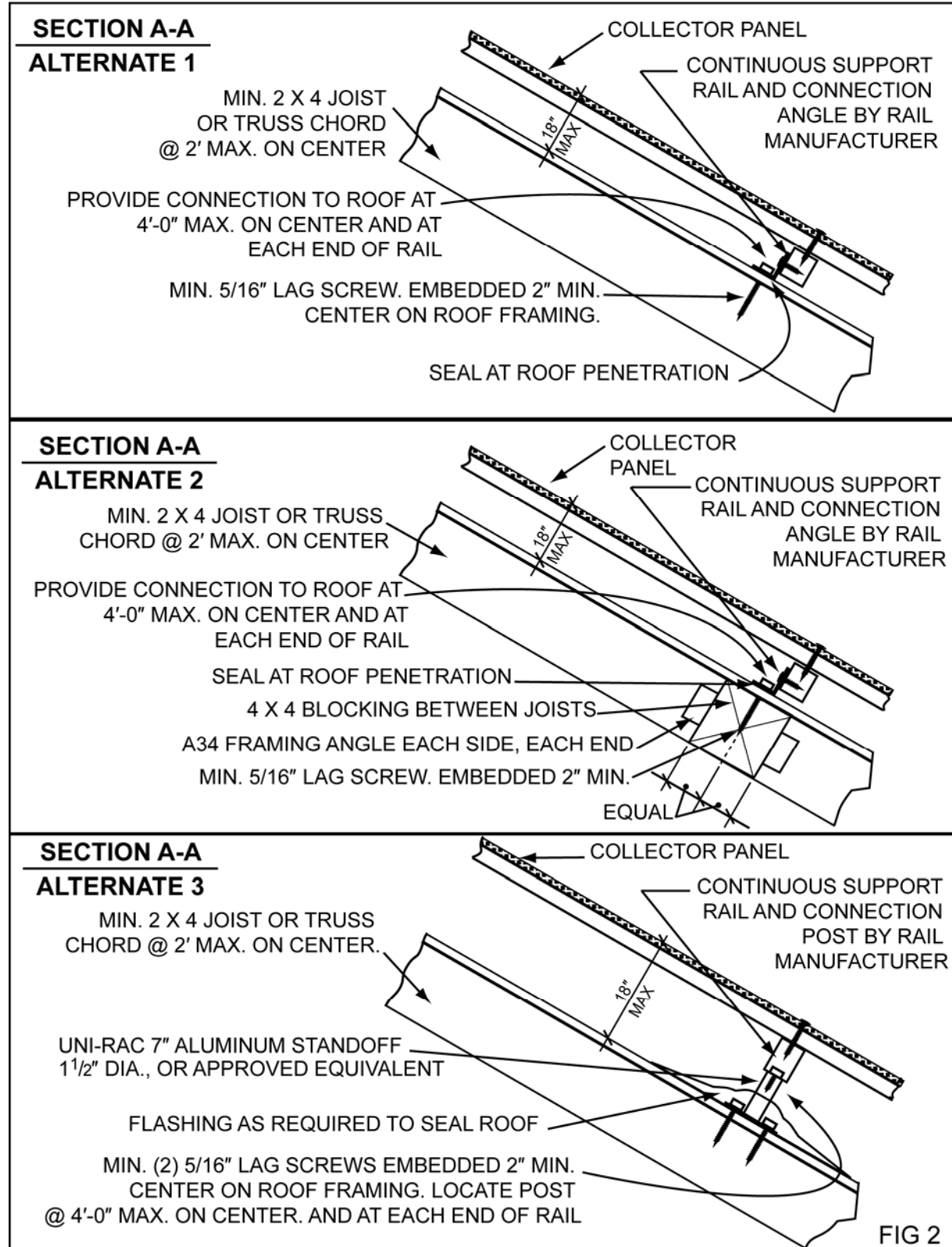
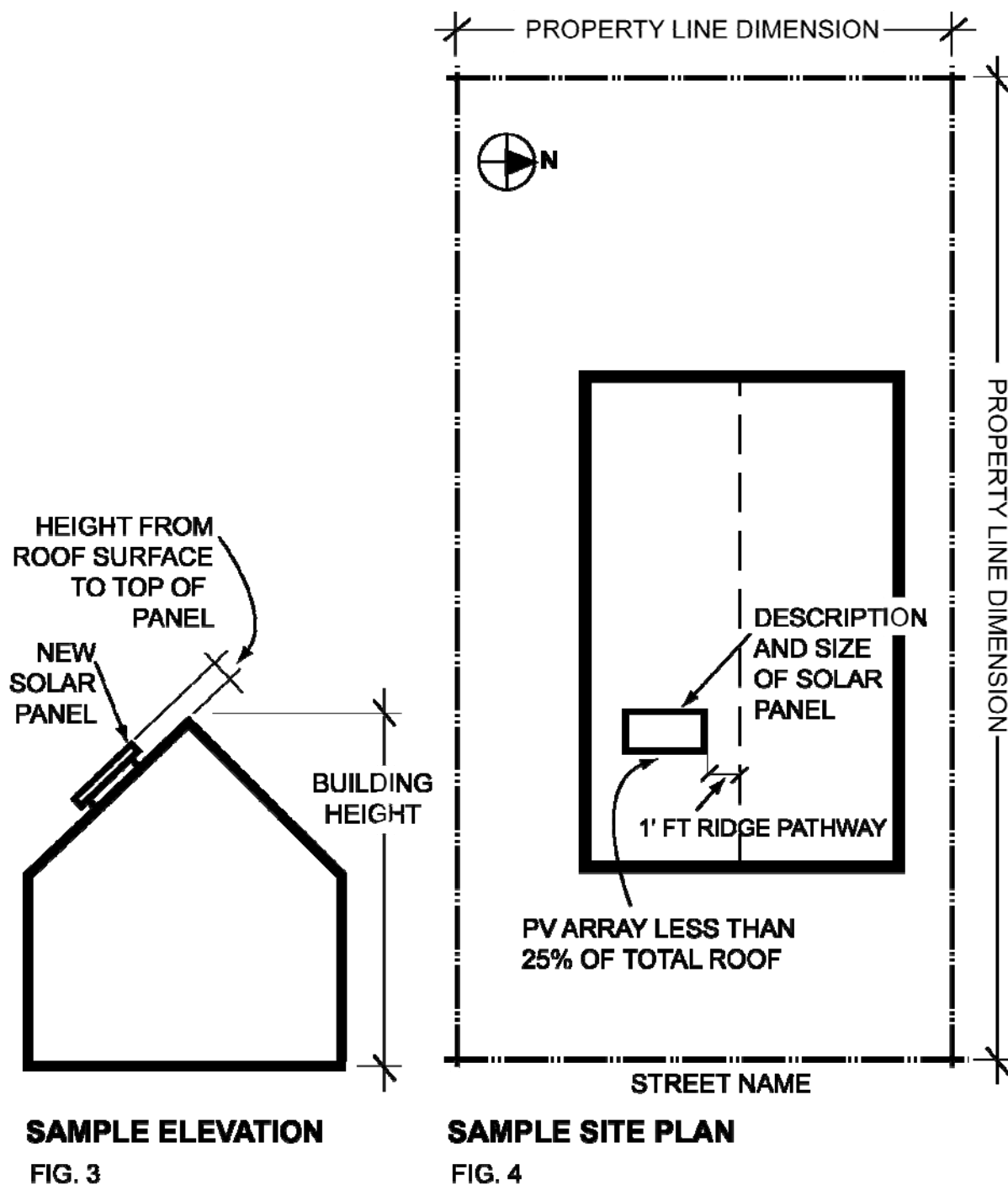


FIG. 1

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City of Portland, Oregon - Bureau of Development Services

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Checklist and Submittal Requirements for Prescriptive Installations of Solar Photovoltaic and Solar Water Heating Systems in accordance with Oregon Solar Installation Specialty Code (OSISC)

Instructions

Complete the following with all the information requested. This form must be submitted along with the application for installation.

Property Owner Information

Property Owner Name: _____ Installation Address: _____

Day Phone: _____ Evening Phone: _____ Email: _____

Contractor: _____ CCB#: _____

Day Phone: _____ Evening Phone: _____ Email: _____

PV Modules or Solar Water Heating Collectors

Manufacturer: _____ Model Number: _____ Listing Agency: _____

Site Plan and Structural Plan

- Attach a simple site plan showing the location of the PV or solar water heating system in relation to buildings, structures, property lines, and, as applicable, flood hazard areas.
- Attach a simple structural plan showing the roof framing (rafter size, type and spacing) and PV module system racking attachment. Plans must be shown in sufficient detail to assess whether the requirements of section 304.9 of OSISC or one of the exceptions have been met.
- Attach simple building elevation.
- The plans must be on 8.5 x 11 or larger paper.

Structural Information

Roof Design and Attachment

- Roof rafter size: ____ x ____ inches OR Manufactured Trusses
- Rafter or manufactured roof truss spacing ____ inches o.c.
- For roof rafters, maximum rafter span allowed per table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC) (www.oregonbcd.org/programs/solar/solar_code/100110_OSISC.pdf) for the size and spacing of roof rafters is ____ ft ____ inches.

Checklist to determine if your installation qualifies for prescriptive path

☐ Yes ☐ No Is this conventional light framed wood construction?

☐ Yes ☐ No Does the structure have pre-engineered trusses?

OR

Does structure have roof framing members spaced at 24" o.c. maximum AND comply with the applicable allowable span in table 305.4.1 (Appendix "B") of the Oregon Solar Installation Specialty Code (OSISC)?

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- ☐ Yes ☐ No Is the roofing material metal, single layer wood shingle, or not more than two layers of composition shingle?
- ☐ Yes ☐ No Is the weight of the modules and racking less than 4.5 pounds per square foot?
- ☐ Yes ☐ No Is the module height less than 18 inches above the roof in accordance with section 305.4?

For Standing Seam Metal Roofs Only (If not applicable please skip this section)

- ☐ Yes ☐ No Is the metal gauge 26 or heavier?
- ☐ Yes ☐ No Clamp design: Are clamps designed to withstand uplift of at least 115 pounds for clamps spaced at 60 inches on center or less or at least 75 pounds for clamps spaced at 48 inches on center or less?
- ☐ Yes ☐ No Is the spacing of the clamps as measured along the seam greater than or equal to 24" o.c. and less than 60" o.c. AND the spacing perpendicular to the seam not greater than 24" o.c.?
- ☐ Yes ☐ No Is the roofing panel width 18-inches or greater?
- ☐ Yes ☐ No Is the roofing panel attached with at least #10 screws at 24" o.c.?
- ☐ Yes ☐ No Is the roofing panels installed over minimum 1/2-inch nominal wood structural panels attached to framing with 8d nails at 6" o.c. at panel edges and 12" o.c. field nailing?

If you have indicated "No" on any of these requirements above, the project may not be submitted using the prescriptive path.

Fire Fighter Access and Escape

Access and escape pathways are not required when the array is located on a non-occupied accessory structures that is separated from occupied structures by a 6 foot minimum separation distance or by a minimum two-hour fire rated assembly.

General Requirements: For all other roof mounted systems, a minimum 36" wide pathway is required along three sides of the solar roof, located over a structurally supported area. Any roof with a slope greater than 2:12 can not use the bottom roof edge as a pathway. Pathways and solar panels shall be located outside 12" of the low point of a valley.

If the array is greater than 150 feet in length or width, additional 36" wide intermediate pathways and cutouts are required. See code for details.

If the roof has smoke and/or heat vents, a 36" pathway shall be provided to and around each vent.

Exceptions to General Requirements:

- ☐ Yes ☐ No Is the roof slope greater than 2:12?
- ☐ Yes ☐ No Is the array area 1,000 sq ft or less?
- ☐ Yes ☐ No Is the array 150 feet or less in length or width?

If you have indicated "No" to any of the items above, exceptions do not apply, provide a simple plan conforming with the general requirements.

If you have indicated "Yes" to all of the items above, see below for reduced access and escape pathway requirements.

Is the array 25% or less of the roof area? ☐ Yes ☐ No

- If Yes, a 12" pathway along each side of any horizontal ridge is required.
- If No, a 12" pathway along each side of any horizontal ridge is required and a minimum of one 36" pathway is required from ridge to eave over a structurally supported area.

Provide a simple plan showing conformance to the reduced access pathway requirements.

As the property owner or authorized representative of the above listed property, I certify that I have verified the information provided above and that the roof rafters (if applicable to the project), meet the span requirements of Table 305.4.1 (Appendix B) of the Oregon Solar Installation Specialty Code.

Applicant name (please print) _____ Signature _____ Date _____



ZONING ORDINANCE

Adopted: December, 2005
Effective Date: March 1, 2006
Last Updated – 15 February 2011

ARTICLE 4: USE REGULATIONS
Section 4-400: Accessory Uses and Structures

TABLE 4-400(B): TABLE OF PERMITTED ACCESSORY USES**P = PERMITTED****BLANK CELL = PROHIBITED**

ACCESSORY USE TYPE	RESIDENTIAL DISTRICTS										BUSINESS DISTRICTS										PLANNED DEVELOPMENT (PD) DISTRICT					ADD'L REQUIREMENTS	
	SF-2	SF-3	SF-4	SF-5	SF-8	MF-8	MF-15	MHP	RH	OI	NO	DTWN	NC	LC	CC	GC	MUC	NMU	IG	IH	IB	PD-R	PD-C	PD-MEC	PD-TND		PD-PED
Accessory Dwelling Unit	P	P	P	P					P		P	P						P				P			P		Section 4-400(D)(1)
Air Conditioner Compressor Unit (residential)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			P	P	P	P		Section 4-400(B)(5)(a)(3)
Automated car wash with gasoline filling station							P				P	P	P	P	P	P	P	P	P		P		P				Section 4-400(D)(2)
Automotive Repair (occurring outdoors)															P	P			P	P	P		P				Section 4-400(C)(2)(a)
Automated Teller Machine (ATM)							P			P	P	P	P	P	P	P	P	P			P	P	P	P	P		
Fences or Walls	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Section 4-400(D)(3)
Food Sales (indoor)						P	P				P	P	P	P	P	P	P	P	P	P	P		P	P	P	P	Section 4-400(D)(4)
Equine Stable	P	P	P						P																		Section 4-400(D)(17)
Ground-Mounted Solar Panels or Solar Thermal Collectors	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Section 4-400(D)(18)
Home Occupations	P	P	P	P	P	P	P		P	P	P	P	P	P	P	P	P	P				P	P		P		Section 4-400(D)(5)
Neighborhood Recreation Center	P	P	P	P	P	P	P											P				P			P		Section 4-400(D)(6)
Outdoor Display and Sales												P	P	P	P	P	P	P	P	P	P		P	P	P	P	Section 4-400(D)(7)
Outdoor Storage (as an accessory use)										P		P		P	P	P	P		P	P	P		P	P	P	P	Section 4-400(D)(8)
Parking of Oversized Vehicles									P	P	P	P	P	P	P	P	P	P	P	P	P		P	P	P	P	Section 4-400(C)(2)(b)
Produce Stand					P	P	P		P			P	P	P	P	P	P	P				P	P		P		Section 4-400(D)(9)
Recreational Facilities, Including Playground Equipment & Non-illuminated Athletic Fields	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			P	P	P	P	P		
Recycling Drop-Off Stations				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Section 4-400(D)(10)
Retail Sales of Goods as part of Permitted Warehouse Freight Movement Uses														P	P	P	P		P	P	P		P	P			Section 4-400(D)(11)
Satellite Dish Antenna (small)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Section 4-400(D)(12)
Satellite Dish Antenna (large)						P	P			P	P	P	P	P	P	P	P	P	P	P	P		P	P		P	
Security or Caretaker Quarters										P	P	P	P	P	P	P	P	P	P	P	P		P	P		P	Section 4-400(D)(13)
Storage or Parking of Major Recreational Equipment	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Section 4-400(D)(14)
Storage Building or Equipment Shed	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

ARTICLE 4: USE REGULATIONS
Section 4-400: Accessory Uses and Structures

(a) Associated with a Residence

Such stable is used for boarding only horses and/or ponies owned by residents who reside on-site;

(b) No Commercial Operation

No horses or ponies belonging to persons living off-site are boarded;

(c) Limited in Size

The size of the stable shall be limited to a maximum of twenty-five percent (25%) of the principal use;

(d) Grazing Area

A minimum of nine hundred (900) square feet of pasture is provided for each horse or pony boarded; and

(e) Minimum Separation

The stable shall not be located within three hundred (300) feet of any residential dwelling located off-site.

(19) Ground-Mounted Solar Installations

In instances where roof-mounting of solar panels or solar thermal collectors is not practicable due to efficiency or aesthetic considerations, ground-mounting may be necessary. Due to differences in scale between residential and commercial/institutional/industrial solar systems, separate standards apply as follows:

(a) Residential

1. Must be located to the rear of the principal structure and screened from view from public streets.
2. Must be as close to the ground as practicable and in no case higher than the principal structure.
3. The mounting framework must be neutral in color or screened from view from surrounding residential properties.

(b) Commercial/Institutional/Industrial

1. Every effort must be made to completely screen the devices from view from public streets. In instances where complete screening is not possible, the devices must be screened and/or located as to have a minimal visual impact as seen from public streets.
2. Must be as close to the ground as practicable and in no case higher than the principal structure.
3. The mounting framework must be neutral in color or screened from view from public streets.

ARTICLE 5: DENSITY, INTENSITY, & DIMENSIONAL STANDARDS
Section 5-200: Measurements and Exceptions

2. Rear Yard Depth Required

Depth of required rear yards shall be measured at right angles to a straight line joining the rearmost points of the side lot lines. The rear building setback line shall be parallel to the straight line so established.

(2) Allowable Yard Encroachments

Every part of every required yard shall be open and unobstructed from the ground to the sky except as provided in Table 5-200(A), *Allowable Yard Encroachments*, or as otherwise permitted in this Ordinance:

TABLE 5-200(A): ALLOWABLE YARD ENCROACHMENTS	
FEATURE	LIMITATION
Sills and Belt Courses	Shall not project over twelve (12) inches into a required yard
Movable awnings	Shall not project over three (3) feet into a required yard, provided that where the yard is less than five (5) feet in width, the projection shall not exceed one-half (½) of the width of the yard
Chimneys, Fireplaces, Bay Windows, or Pilasters	Shall not project more than two (2) feet into a required yard
Fire Escapes, Stairways, and Balconies(unenclosed)	Shall not project more than five (5) feet into a required yard, or more than three (3) feet into a required yard for a multiple family dwelling, hotel, or motel
Hoods, Canopies, Roof Overhangs, or Foundation Planters, or Marquees	Shall not project over three (3) feet into a required yard, and shall come no closer than one (1) foot to the lot line
Fences, Walls, and Hedges	Permitted in yards subject to the requirements of this section
Cornices, Eaves, and Gutters	Shall not project more than three (3) feet into a required yard, provided that where the yard is less than six (6) feet in width, the projection shall not exceed one-half (½) the width of the yard
Ground-Mounted Solar Panels or Solar Thermal Collectors	Installations that are six (6) feet or less in height shall not project more than two (2) feet into a required yard, based on the required yards for accessory structures. Installations taller than six (6) feet may not encroach into required yards unless approved as a variance by the Zoning Board of Appeals.

ARTICLE 6: DEVELOPMENT AND DESIGN STANDARDS
Section 6-700: Exterior Lighting Standards

Values. Cut-off lighting shall be designed to direct light downward (e.g., shoebox style).

**TABLE 6-700(D): MAXIMUM ILLUMINATION VALUES
(REGARDLESS OF LIGHT TYPE)**

USE	MAXIMUM ILLUMINATION AT PROPERTY LINE (IN FOOT-CANDLES)
RESIDENTIAL; PUBLIC AND INSTITUTIONAL	0.5
COMMERCIAL	2.5
SERVICE AND INDUSTRIAL/EDGE OF RIGHT-OF-WAY	2.5
PARKING LOTS	NO LESS THAN 0.2 AND NO GREATER THAN 2.5

(4) Uniformity Ratios

In order to maintain uniformity in light levels across a development and prevent or minimize dark areas, the ratio of maximum to minimum lighting levels on a given site or parcel of land, as measured in foot-candles at ground level, shall not exceed fifteen-to-one (15:1) in the Residential districts or ten-to-one (10:1) in the Business and Planned Development (PD) districts. Parking lots shall maintain the same uniformity ratios as the principal use served. In the cases of mixed uses, the uniformity ratios for Business and Planned Development (PD) districts shall apply.

(5) Direction of Lighting

- (a)** No light source shall be directed outward toward property boundaries or adjacent right-of-way.
- (b)** Low intensity architectural lighting may be used to illuminate individual structures or landscaping materials provided the maximum illumination values comply with the standards in Table 6-700(D), *Maximum Illumination Values*.

(6) Distance from Property Line

All exterior lighting fixtures shall be located a minimum of five (5) feet from a property line or five (5) feet from a right-of-way line, and shall not be located within a required buffer area unless the fixtures are located at the interior edge.

(7) Hue

Lighting sources shall be color neutral types, such as halogen or metal halide. Light types of limited spectral emission, such as low pressure sodium or mercury vapor lights, are prohibited.

(8) Solar Powered Lighting

Solar panels up to a maximum of twenty (20) square feet may be used as a power source for lighting fixtures when mounted on the same pole as the fixture. Solar panels larger than twenty (20) square feet must meet the standards of either Section 6-800, *Design Standards*, for roof-mounted solar installations, or Section 4-400, *Accessory Uses and Structures*, for ground-mounted solar installations.

6-700(F) Wall-Mounted Lights

Wall-mounted lights shall be fully shielded luminaries (such as shoebox or can style fixtures) to prevent the light source from being visible from any adjacent residential property or public street right-of-way. Nothing in this subsection shall prevent the use of sconces or other decorative lighting fixtures provided that the source of illumination is not visible from adjacent

ARTICLE 6: DEVELOPMENT AND DESIGN STANDARDS**Section 6-800: Design Standards**

1. Except for Assisted Living Facilities, Nursing Homes, and structures designed or intended for occupation by persons with physical disabilities, the finished floor elevation at the front façade shall be located above grade in accordance with the following standards:
 - a. For setbacks of ten (10) feet or more, the foundation supporting the floor framing on the front façade shall be a minimum of eighteen (18) inches above grade; and
 - b. For setbacks of less than ten (10) feet, the foundation supporting the floor framing on the front façade shall be a minimum of twenty-four (24) inches above grade.
2. Exposed foundation walls or piers shall be clad in face brick, stone, stucco, or some other masonry material accurately imitating these materials. Lattice-work screening shall be installed between piers on front and side building façades.
3. Nothing in this subsection shall prevent the use of slab foundations, provided the slab is clad in the materials required in subsection (2) above, and extends to the minimum height above grade specified in subsection (1) above.

(e) Roof Penetrations and Equipment

All roof vents, pipes, antennas, satellite dishes, solar installations, and other roof penetrations and equipment (except chimneys) shall be located on the rear elevations or otherwise configured to the degree practicable to have a minimal visual impact as seen from the street. Solar installations that are visible from the street must be either composed of building-integrated components (such as solar shingles) that are not readily evident, or be designed and mounted to match the shape, proportions, and slope of the roof. See below examples of acceptable and unacceptable visible residential solar installations.

Acceptable:

ARTICLE 6: DEVELOPMENT AND DESIGN STANDARDS
Section 6-800: Design Standards

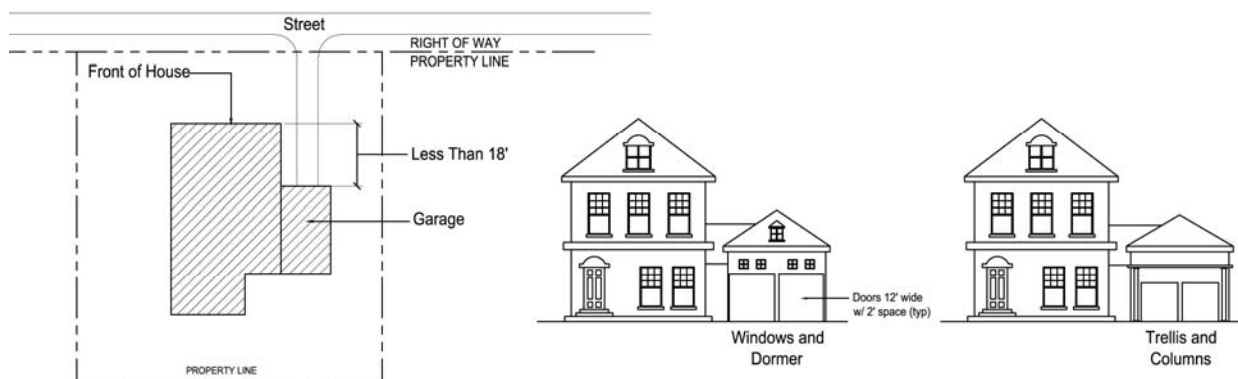
Unacceptable:



(f) **Garage Location**

Except for garages set back from the right-of-way at least fifty (50) feet, and located on lots with a minimum lot size of one (1) acre or greater, garages shall be located so as to comply with the following standards as shown in Figure 6-800(B)(3), *Street-Facing Garage Design*:

FIGURE 6-800(B)(3): STREET-FACING GARAGE DESIGN



1. **Street-Facing Garages**

- a. Except as allowed on lots with difficult topography or unique existing natural features, no street-facing garage shall be located closer than two (2) feet behind the primary front façade (conditioned space) of the single-family structure it serves;
- b. Any garage that is located less than eighteen (18) feet behind the front façade of the single-family structure it serves shall include a minimum of at least two (2) architectural features on the side including the garage

ARTICLE 6: DEVELOPMENT AND DESIGN STANDARDS
Section 6-800: Design Standards

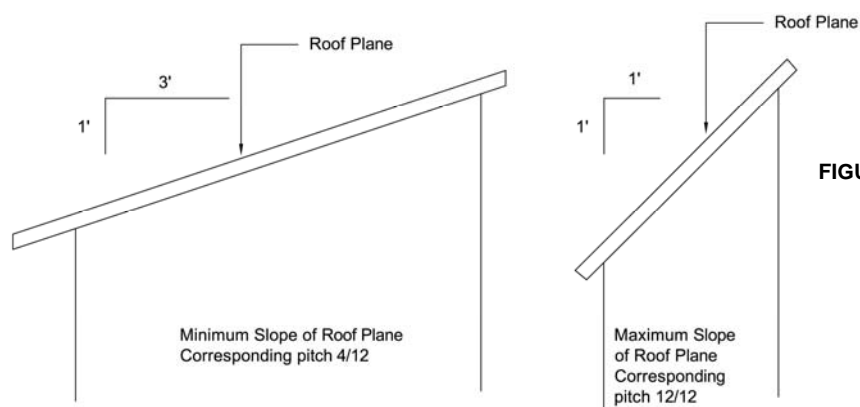


FIGURE 6-800(C)(3): ROOF PLANES

(b) Flat Roofs

When flat roofs are used, parapet walls with three-dimensional (3D) cornice treatments shall conceal these. The cornice shall include a perpendicular projection a minimum of four (4) inches from the parapet façade plane. Alternative cornice treatments may be approved as part of special architectural designs.

(c) Roof Penetrations and Equipment

All roof-based mechanical equipment, as well as vents, pipes, antennas, satellite dishes, solar installations, and other roof penetrations (with the exception of chimneys) shall be located, to the degree practicable, on the rear elevations or screened with a parapet or screen wall having a three-dimensional (3D) cornice treatment. The cornice of a parapet wall shall include a perpendicular projection a minimum of four (4) inches from the parapet façade plane. This standard is intended to minimize visual impact as seen from:

1. A public street;
2. Public areas of adjacent sites;
3. Vacant land classified as SF-2, SF-3, SF-4, SF-5, or SF-8; or
4. Lands containing single-family detached, attached, townhouse, or two- (2) to four- (4) family dwelling development.

Solar installations that are visible from the street must be either composed of building-integrated components (such as solar shingles) that are not readily evident, or designed and mounted to match the shape, proportions, and slope of the roof, or to serve as a feature of the building (such as awnings). See below examples of acceptable commercial solar installations.

ARTICLE 6: DEVELOPMENT AND DESIGN STANDARDS
Section 6-800: Design Standards

Acceptable:**(10) Off-Street Parking**

Off-street parking shall comply with the standards of Section 6-100, *Off-Street Parking and Loading*, and the following:

(a) Parking Location

1. Within the MUC, NC, NO, PD-R, and PD-TND districts, no off-street surface parking shall be located between the building and the street it fronts, except in the NC district, up to sixty (60) feet depth of parking and drive surface may be located between a building and the street it fronts if the building includes two (2) or more stories.
2. In the OI, LC, CC, GC, PD-R, PD-C, and Planned Development (PD)-MEC districts, no more than sixty (60) feet depth parking and drive surface (exclusive of internal landscaped islands) shall be located between a building and any adjacent street. This may be increased to one hundred twenty (120) feet for buildings over fifty thousand (50,000) square feet, and to one hundred eighty (180) feet for buildings over one hundred thousand (100,000) square feet.

(b) Retail Uses in Parking Garages

All parking garages zoned for commercial or mixed use and directly fronting a street shall comply with the following standards:

1. A minimum of fifty percent (50%) of the ground floor street frontage shall be constructed to accommodate retail uses; and
2. The ground floor of the portion constructed to accommodate retail uses shall have a height of at least fifteen (15) feet between the average grade level and the underside of the structure's second floor.

(11) Internal Pedestrian Walkways**(a) Continuous Pathways Required**

In addition to the standards of Section 6-800(A)(2)(f)(2), *Internal Pedestrian Access*, continuous internal pedestrian walkways shall be provided to connect off-street surface parking areas with primary building entrances and the public sidewalk system.

ARTICLE 10: DEFINITIONS AND RULES FOR INTERPRETATION
Section 10-200: Definitions**SITE LANDSCAPING**

Required vegetative material consisting of trees and shrubs that are placed on a development site to soften built edges and provide transitions (see Section 6-300(D), *Land Use Buffers*).

SITE PLAN

A permit reviewed and approved, approved with conditions, or denied by either the Planning Commission or Development Services Director in accordance with Section 2-300(H), *Site Plan*.

SITE SPECIFIC DEVELOPMENT PLAN

A set of documents comprising a complete development plan and application submitted to the City by a landowner describing the types and density or intensity of uses for specific lands for a Planned Development (PD) Master Plan (and associated documents), Site Plan (major or minor), Variance, Special Exception, Conditional Use, Preliminary Plat for Subdivision, or other similar approval.

SLOPE, NON-CRITICAL/LOW

Those areas of land characterized by a slope less than or equal to fifteen percent (15%).

SLOPE, PRECAUTIONARY/MODERATE

Those areas of land characterized by a slope of between fifteen (15%) and twenty percent (20%).

SLOPE, PROHIBITIVE/SEVERE

Those areas of land characterized by a slope greater than or equal to twenty-five percent (25%)

SMALL LOAN COMPANY

Establishments that are restricted lenders regulated under Chapter 29 to Title 34 of the South Carolina Code of Laws and supervised lenders regulated under Chapter 3 of Title 37 of the South Carolina Code of Laws; however, the term does not include deferred presentment lenders, pawn shops, or those supervised lenders primarily providing short-term vehicle loans.

SOIL AND WATER CONSERVATION DISTRICT OR CONSERVATION DISTRICT

A governmental subdivision of the State of South Carolina created pursuant to Chapter 9, Title 48, Code of Laws of South Carolina, 1976, as amended; and Soil and Water Conservation District Board means the governing body of the Soil and Water Conservation District.

SOLAR INSTALLATION

A system such as a photovoltaic or solar thermal system that uses the sun's energy to produce electricity or heat.

SOLAR PANEL

A grouping of photovoltaic cells that produce electricity from sunlight.

SOLAR THERMAL COLLECTOR

A device that collects heat from the sun and transfers the heat to another location for immediate heating or storage for use later. Solar thermal collectors are typically associated with solar water heating systems.



Proposed Text Amendment-Report to City Council

Case No. T-2010-02

Meeting Date: June 28, 2010

Staff Contact: Eric S. Hawkins, AICP, Planner III

INFORMATION

Applicable Sections: Article 4: Use Regulations; Article 5: Density, Intensity, & Dimensional Standards; Article 6: Development & Design Standards; and Article 10: Definitions & Rules for Interpretation

Application Date: April 6, 2010

Applicant: Rock Hill Planning Commission

BACKGROUND

At their meeting on March 8, City Council considered an Electric Net Metering Policy as requested by the City Utilities Department. This policy would allow for an electric utility customer to install Customer-owned Renewable Generation (CRG) facilities and sell the excess energy back to the electric utility system and receive credit for the energy delivered. During the discussions about this program, Council recognized the need to establish design standards for solar and other alternative energy facilities and devices. While the existing standards of the zoning ordinance could be applied to these facilities & devices, the unique nature of this technology presents the need for specific standards. Also, the trend toward increasing interest in alternative energy sources warrants new standards for the various types of facilities and devices that have been uncommon or non-existent in our area in the past. The proposed amendments were sponsored by the Planning Commission at their April 6, 2010, meeting.

EXPLANATION OF AMENDMENTS

In developing the proposed regulations, staff reviewed ordinances from jurisdictions across the country and researched the various alternative energy systems that area available. Based on this review and our discussions with experts in the alternative energy field, we found that solar is the only type of alternative energy system that is feasible in our area that presents design issues that should be regulated by zoning. The wind resources in our area are not sufficient to make wind power a cost-effective energy source. Any proposals for wind turbines within the City would be regulated by the standard height limitations of the zoning ordinance. Installations of other types of alternative energy systems (i.e. geothermal) are not readily evident and can be treated the same as standard mechanical equipment from a zoning perspective. Also included is a provision to allow clerestories and skylights to exceed height limits.

The rationale behind the regulations is as follows:

- The preferred location for mounting solar panels is on the roof of a structure. When the panels cannot be mounted on a roof due to efficiency or aesthetic considerations, ground-mounting may be necessary. Ground-mounted solar panels or solar thermal collectors are permitted in all zoning districts as an accessory structure and standards for their location are established. The standards are intended to minimize views of these installations from public streets and residential properties.

Proposed Text Amendment – Report to City Council

T-2010-02

Page 2

- Solar panels are an increasingly common source of power for sign and site lighting. Provisions are included to allow solar panels up to 20 square feet in size to be used for this purpose.
- Solar installations are included in the list of roof penetrations and equipment that must be located on the rear elevations or otherwise configured so views of them are minimized from the street. Provisions are included to permit installations that are visible from the street when they are designed to match the shape, proportion, and slope of the roof. Pictures are included to confirm the intent of these standards.
- Definitions are included for “Solar Thermal Collector”, “Solar Installation”, and “Solar Panel”.

Please note that some neighborhoods may have restrictive covenants that would preclude solar installations, even if the proposal is in compliance with the zoning ordinance. The City is required to inquire about the existence of restrictive covenants and is unable to approve a zoning permit for anything that is not allowed by the covenants.

PUBLIC NOTIFICATION

Staff hereby certifies that the required public notification actions have been completed as follows:

- May 2 & 16- Planning Commission public hearing advertisements published in *The Herald*.

PUBLIC HEARING

The Rock Hill Planning Commission held a public hearing on the proposed amendments at their June 1, 2010, meeting. No one from the public spoke on this item.

STAFF RECOMMENDATION

Staff recommends approval of the proposed amendments.

PLANNING COMMISSION RECOMMENDATION

Following the public hearing at their June meeting, the Planning Commission voted unanimously to recommend approval of the proposed amendments, subject to the addition of a height limit for clerestories and skylights. Staff has added a provision to Section 5-200(D)(1)(d) to limit clerestory and skylight height to 15% of building height or 10 feet, whichever is less.

ATTACHMENTS:

- Proposed Text Amendments

**Village of Schaumburg, Illinois
Code of Ordinances (2011)**

**TITLE 15: LAND USAGE
CHAPTER 154: ZONING**

§ 154.27 DEFINITIONS.

* * *

SOLAR ACCESS: A property owner's right to have sunlight shine on his land.

SOLAR COLLECTOR: An assembly, structure, or design, including passive elements, used for gathering, concentrating or absorbing direct or indirect solar energy, specifically designed for holding a substantial amount of useful thermal energy and to transfer that energy to a gas, solid or liquid or to use that energy directly; this may include, but is not limited to, a mechanism or process used for gathering solar energy through thermal gradients, or a component used to transfer thermal energy to a gas, solid or liquid or to convert into electricity.

SOLAR ENERGY: Radiant energy received from the sun at wavelengths suitable for heat transfer, photosynthetic use, or photovoltaic use.

SOLAR ENERGY SYSTEM: A system that uses the power of the sun to capture and store energy and reduce on site consumption of utility power.

SOLAR ENERGY SYSTEM, BUILDING MOUNTED: A solar energy system mounted on either the principal or accessory structure or facade.

SOLAR ENERGY SYSTEM, FREESTANDING: A solar energy system that is not attached to another structure and is ground mounted.

SOLAR ENERGY SYSTEM, JOINT: A solar energy collector or storage mechanism that supplies energy for structures or processes on more than one lot or in more than one dwelling unit or leasehold, but not to the general public and involves at least two (2) owners or users.

SOLAR SKYSPACE: The maximum three-dimensional space extending from a solar collector to all positions of the sun necessary for efficient use of the collector.

(A) Where a solar energy system is used for heating purposes only, solar skyspace shall mean the maximum three-dimensional space extending from a solar energy collector to all positions of the sun between nine o'clock (9:00) A.M. and three o'clock (3:00) P.M. local apparent time from September 22 through March 22 of each year.

(B) Where a solar energy system is used for cooling purposes only, solar skyspace shall mean the maximum three-dimensional space extending from a solar collector to all positions of the sun between eight o'clock (8:00) A.M. and four o'clock (4:00) P.M. local apparent time from March 23 through September 21 of each year.

SOLAR SKYSPACE EASEMENT: A right, expressed as an easement, covenant, condition, restriction or other property interest in any deed, will or other instrument executed by or on behalf of any landowner or in any order of taking, appropriate to protect the solar skyspace of a solar collector at a particularly described location to forbid or limit any or all of the

following where detrimental to access to solar energy: structures on or above ground; vegetation on or above ground; or other activities. Such right shall specifically describe a solar skyspace in three-dimensional terms in which the activity, structures or vegetation are forbidden or limited or in which such an easement shall set performance criteria for adequate collections of solar energy at a particular location.

SOLAR STORAGE MECHANISM: Equipment or elements such as piping and transfer mechanisms, containers, heat exchangers or controls thereof and gases, solids, liquids or combinations thereof that are utilized for storing solar energy, gathered by a solar collector, for subsequent use.

ADMINISTRATION AND ENFORCEMENT

§ 154.56 - SOLAR ENERGY SYSTEMS.

(A) Intent: The intent of these standards is to allow for the safe and effective development of solar energy systems throughout the village of Schaumburg.

(B) General Requirements:

(1) Accessory Structure: Solar energy systems are permitted as accessory structures as detailed in this section.

(2) On Site Use: Energy produced through the solar energy system shall be utilized on site.

(3) Utility Provider Notification: Written evidence must be provided at the time a building permit is requested that the utility company has been notified of the customer's intent to install a solar energy system.

(4) Special Use: Additional height may be requested through the special use process outlined in section 154.44 of this chapter.

(a) In reviewing the request for additional height, such factors as height of the system in relationship to existing and potential structures, manmade or natural, and their impact on the system's efficacy shall be considered.

(C) Freestanding Systems: Freestanding systems shall be developed according to the following parameters. Refer to section 154.59, figure 1 of this chapter.

(1) Yard Location: Permitted in the interior side yard, rear yard, and interior courts.

(2) Setback: All parts of the freestanding system shall be set back ten feet (10') from the interior side and rear property lines and shall not be located in a public utility easement.

(3) Height: Shall be a maximum of fifteen feet (15') in height, measured from the average grade at the base of the pole to the highest edge of the system.

(4) Quantity: Single-family residential lots twenty thousand (20,000) square feet or less in size are limited to a total of one hundred (100) square feet in area of panels.

(5) Abandonment: If a freestanding system is inoperable or abandoned for a period of twelve (12) consecutive months; the owner may be notified by the village that the energy system must either be repaired and made operable or removed within ninety (90) days.

(D) Building Mounted Systems: Building mounted systems shall be developed according to the following parameters. Refer to section 154.59, figures 2 through 4 of this chapter.

(1) Location: Building mounted systems are permitted in the following locations:

(a) Principal and accessory structures.

(b) Any roof face.

(c) Side and rear building facades.

(d) Front or corner building facades, if the following conditions are met:

1. Solar access is optimized on the front and corner facades.

2. Systems are simultaneously used to shade the structure's windows. Refer to section 154.59, figures 3 and 4 of this chapter.

(2) Orientation: Panels shall be angled to maximize solar access.

(3) Height: Height is measured from the roof surface, on which the system is mounted, to the highest edge of the system. Refer to section 154.59, figure 2 of this chapter.

(a) Shall have a maximum height of fifteen feet (15').

(b) Shall not extend more than five feet (5') above the highest peak of a pitched roof.

(4) Projection: Solar energy systems may project off a roof edge or building facade as follows. Refer to section 154.59, figure 3 of this chapter on how to measure projection.

(a) May project up to four feet (4') from a building facade or roof edge.

(b) May project into a side or rear setback, but shall be no closer than five feet (5') to the side or rear property line.

(E) Solar Access Protection:

(1) Creation Of Easements: Solar access easements across contiguous or nearby lots, tracts, or land may be created to establish a window of exposure to the sun so as to protect an existing or intended solar collector's exposure to the sun from obstruction of buildings and trees.

(a) Such easements may be purchased, reserved, granted, or otherwise obtained.

(b) Adverse possession cannot create such an easement.

(c) An easement infringed upon is a compensable property right through private remedy.

(2) Recording Of Easements: Solar access easements shall be recorded with the Cook County recorder of deeds or DuPage County recorder of deeds and filed with the community development department.

(3) Construction In Easement Areas: Any person seeking a building permit to construct or modify any structure or building so as to increase the consumption of airspace over that lot shall certify in writing that no solar access easement exists over that lot.

(4) Denial Of Permit: Should the community development department determine that the proposed construction would intrude upon the easement, no building permit shall be granted.

(Ord. 10-059, passed 6-8-2010)

§ 154.59 - SOLAR AND WIND ENERGY SYSTEM FIGURES.

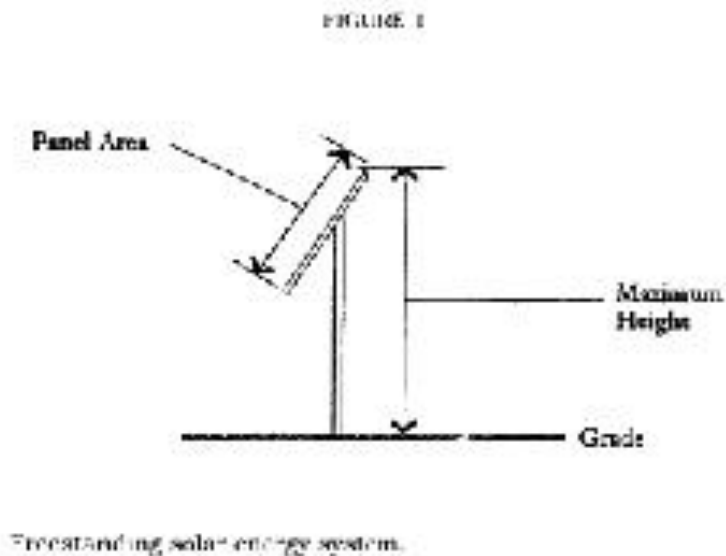
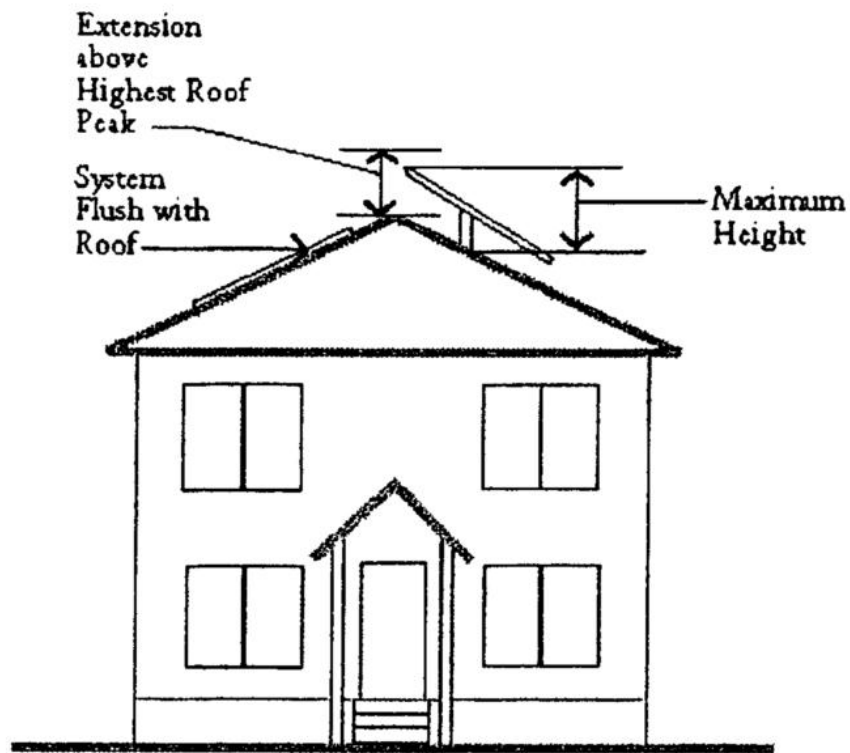
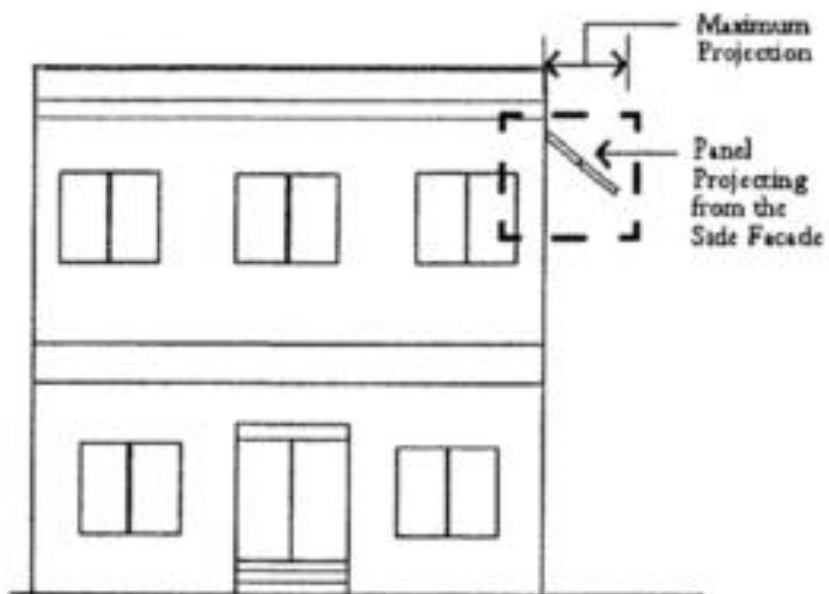


FIGURE 2



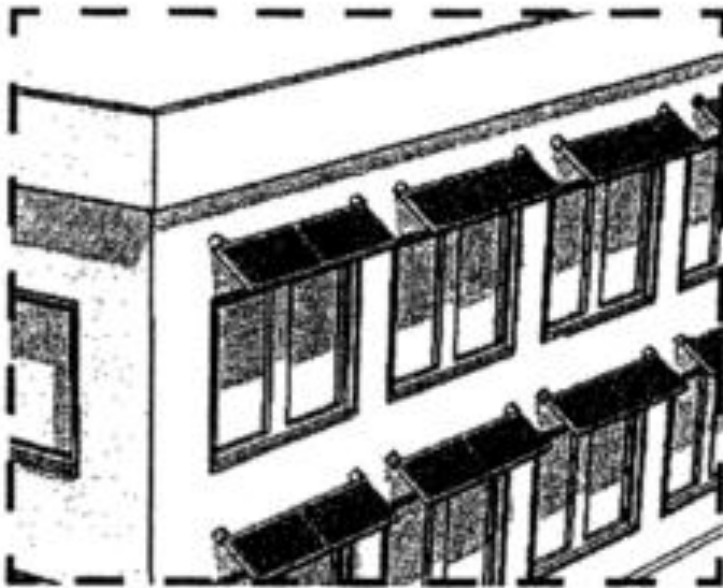
Measuring height of a building mounted solar energy system.

FIGURE 3



Permitted projection of a building mounted solar energy system.

FIGURE 4



Dual purpose. Example of facade mounted panels that are serving to also shade the windows.

(Ord. 10-059, passed 6-8-2010)

GENERAL PROVISIONS

§ 154.62 - BUILDING HEIGHTS, BULK REGULATIONS, AND REQUIRED YARDS.

* * *

(C) Solar Access Protection:

- (1) **Creation Of Easements:** Solar skyspace easements across contiguous or nearby lots, tracts, or land may be created to establish a window of exposure to the sun so as to protect an existing or intended solar collector's exposure to the sun from obstruction of buildings and trees. Such easements may be purchased, reserved, granted or otherwise obtained. Adverse possession cannot create such an easement. An easement infringed upon is a compensable property right through private remedy.
- (2) **Recording Of Easements:** A solar easement may, at the discretion of the easement owner, be recorded with the Cook County recorder of deeds, or DuPage County recorder of deeds and filed with the community development department.
- (3) **Construction In Easement Areas:** Any person seeking a building permit to construct or modify any structure or building so as to increase the consumption of airspace over that lot shall certify in writing that no solar skyspace easement exists over that lot. Where a solar skyspace easement exists, the applicant for the permit shall present a copy of the deed containing the legal description of the easement, unless the easement is already filed with the community development department. Should

the community development department determine that the proposed construction would intrude upon the easement, no building permit shall be granted.

(Ord. 163, passed 12-5-1961; Am. Ord. 95-62, passed 6-13-1995; Am. Ord. 03-37, passed 3-11-2003; Am. Ord. 07-110, passed 7-24-2007)

**City of Seattle, Washington
Seattle Municipal Code (2011)**

**Title 23 - LAND USE CODE
Subtitle III Land Use Regulations
Division 2 Authorized Uses and Development Standards**

**Chapter 23.42 - General Use Provisions
SMC 23.42.130 Nonconforming solar collectors.**

The installation of solar collectors that do not conform to development standards or that increase an existing nonconformity may be permitted as follows:

- A. In single-family zones, pursuant to subsection B of Section 23.44.046;
- B. In multifamily zones, pursuant to Section 23.45.582;
- C. In NC zones or C zones, pursuant to subsection Section 23.47A.012 E.

(Ord. No. 123209 , Section 6, 2009; Ord. 122311 , Section 29, 2006; Ord. 120293 Section 1 (part), 2001.)

**Chapter 23.44 - Residential, Single-Family
Subchapter III Accessory Uses
SMC 23.44.046 Solar collectors.**

A. Solar collectors are permitted outright as an accessory use to any principal use permitted outright or to a permitted conditional use subject to the following development standards:

1. Solar collectors, including solar greenhouses which meet minimum standards and maximum size limits as determined by the Director, shall not be counted in lot coverage.
2. Solar collectors except solar greenhouses attached to principal use structures may exceed the height limits of single-family zones by four (4) feet or extend four (4) feet above the ridge of a pitched roof. However, the total height from existing grade to the top of the solar collector may not extend more than nine (9) feet above the height limit established for the zone (see Exhibit A 23.44.046). A solar collector which exceeds the height limit for single-family zones shall be placed so as not to shade an existing solar collector or property to the north on January 21st, at noon, any more than would a structure built to the maximum permitted height and bulk.
3. Solar collectors and solar greenhouses meeting minimum written energy conservation standards administered by the Director may be located in required yards according to the following conditions:
 - a. In a side yard, no closer than three (3) feet from the side property line; or

- b. In a rear yard, no closer than fifteen (15) feet from the rear property line unless there is a dedicated alley, in which case the solar collector shall be no closer than fifteen (15) feet from the centerline of the alley; or
 - c. In a front yard, solar greenhouses which are integrated with the principal structure and have a maximum height of twelve (12) feet may extend up to six (6) feet into the front yard. In no case shall the greenhouse be located closer than five (5) feet from the front property line.
- B. Nonconforming Solar Collectors. The Director may permit the installation of solar collectors which cause an existing structure to become nonconforming, or which increase an existing nonconformity, as a special exception pursuant to Chapter 23.76, Procedures for Master Use Permits and Council Land Use Decisions. Such installation may be permitted even if it exceeds the height limit established in Section 23.44.046 A2, so long as total structure height including solar collectors does not exceed thirty-nine (39) feet above existing grade and the following conditions are met:
1. There is no feasible alternative to placing the collector(s) on the roof;
 2. Such collector(s) are located so as to minimize view blockage for surrounding properties and shading of property to the north, while still providing adequate solar access for the collectors;
 3. Such collector(s) meet minimum written energy conservation standards administered by the Director; and
 4. The collector(s) add no more than seven (7) feet of height to the existing structure. To minimize view blockage or shadow impacts, the Director shall have the authority to limit a nonconforming solar collector to less than seven (7) additional feet of height.

(Ord. 113401 Section 3, 1987; Ord. 111590 Section 1, 1984; Ord. 110793 Section 6, 1982; Ord. 110669 Sections 13(part), 32(part), 1982; Ord. 110381 Section 1(part), 1982.)

Chapter 23.45 - Residential, Multi-Family
Subchapter III Accessory Uses
SMC 23.45.545 Standards for Certain Accessory Uses

* * *

B. Solar greenhouses, greenhouses and solariums.

1. Solar greenhouses, greenhouses and solariums, in each case that are attached to and integrated with the principal structure and no more than 12 feet in height are permitted in a required rear setback, subject to subsection 23.45.545.B.3, and may extend a maximum of 6 feet into required front and side setbacks, subject to subsection 23.45.545.B.2.
2. An attached solar greenhouse, greenhouse or solarium, in a required setback, shall be no closer than 3 feet from side lot lines and 8 feet from front lot lines.

3. A solar greenhouse, greenhouse or solarium allowed pursuant to subsection 23.45.545.B.1 shall not be closer than 5 feet to the rear lot line, except that it may abut an alley if it is no taller than 10 feet along the rear lot line, is of no greater average height than 12 feet for a depth of 15 feet from the rear lot line, and is no wider than 50 percent of lot width for a depth of 15 feet from the rear lot line.

C. Solar collectors.

1. Solar collectors that meet minimum written energy conservation standards administered by the Director are permitted in required setbacks, subject to the following:

a. Detached solar collectors are permitted in required rear setbacks, no closer than 5 feet to any other principal or accessory structure.

b. Detached solar collectors are permitted in required side setbacks, no closer than 5 feet to any other principal or accessory structure, and no closer than 3 feet to the side lot line.

2. Sunshades that provide shade for solar collectors that meet minimum written energy conservation standards administered by the Director may project into southern front or rear setbacks. Those that begin at 8 feet or more above finished grade may be no closer than 3 feet from the lot line. Sunshades that are between finished grade and 8 feet above finished grade may be no closer than 5 feet to the lot line.

* * *

D. Solar Collectors on Roofs. Solar collectors that are located on a roof and meet minimum energy conservation standards administered by the Director are permitted as follows:

1. In Lowrise zones, up to 4 feet above the maximum height limit or 4 feet above the height of elevator penthouse(s), whichever is higher; and

2. In MR and HR zones, up to 10 feet above the applicable height limit or 10 feet above the height of elevator penthouse(s), whichever is higher.

E. Nonconforming Solar Collectors. The Director may permit the installation of solar collectors that meet minimum energy standards and that increase an existing nonconformity as a special exception pursuant to Chapter 23.76. Such an installation may be permitted even if it exceeds the height limits established in Sections 23.45.009 and 23.45.514 when the following conditions are met:

1. There is no feasible alternative solution to placing the collector(s) on the roof;

2. Such collector(s) are located so as to minimize view blockage from surrounding properties and the shading of property to the north, while still providing adequate solar access for the solar collectors.

Chapter 23.47A - Commercial
SMC 23.47A.012 Structure height.

C. Rooftop Features.

* * *

3. Solar Collectors.

- a. In zones with mapped height limits of 30 or 40 feet, solar collectors may extend up to 4 feet above the otherwise applicable height limit, with unlimited rooftop coverage.
 - b. In zones with height limits of 65 feet or more, solar collectors may extend up to 7 feet above the otherwise applicable height limit, with unlimited rooftop coverage.
4. Except as provided below, the following rooftop features may extend up to 15 feet above the applicable height limit, as long as the combined total coverage of all features gaining additional height listed in this subsection 23.47A.012.C.4 does not exceed 20 percent of the roof area, or 25 percent of the roof area if the total includes stair or elevator penthouses or screened mechanical equipment:

- a. Solar collectors;

* * *



Article 2 Definitions

E. PLAY HOUSE: A detached [building](#) designed and used for children's play.

ACCESSORY USE: A [use](#) which is supplemental and subordinate to the main use and used for purposes clearly incidental to those of the main use.

ACTIVE SOLAR ENERGY STRUCTURE: A [structure](#) which utilizes mechanically-operated [solar collectors](#) to collect, transfer or store [solar energy](#).

ADULT DAY CARE HOME. A private residence, in which six (6) adults or less are given care and supervision for periods of time not to exceed sixteen (16) hours in a twenty-four (24) hour period.

ADULT DAY CARE CENTERS. A center other than a private residence, in which more than six (6) adults are supervised and receive group care for periods of time not to exceed sixteen (16) hours in a twenty-four (24) hour period.

ADULT FOSTER CARE FACILITIES: A governmental or non-governmental establishment that provides foster care to adults. It include facilities and foster care family homes for adults who are aged, mentally ill, developmentally disabled, or physically handicapped who require supervision on an ongoing basis but who do not require continuous nursing care. An adult foster care facility does not include nursing homes, homes for the aged, [hospitals](#), alcohol or substance abuse rehabilitation center, residential centers for persons released from or assigned to a correctional facility, or any other facilities which have been exempted from the definition of adult foster care facility by the Adult Foster Care Facility Licensing Act, 218 of 1979, MCL 400.701, as amended. The types of licensed adult foster care facilities include the following:

- A. FOSTER CARE SMALL GROUP HOME: A facility with the approved capacity to receive twelve (12) or fewer adults who are provided supervision, personal care, and protection in addition to room and board, for twenty-four (24) hours a day, five (5) or more days a week, and for two (2) or more consecutive weeks for compensation.
- B. FOSTER CARE LARGE GROUP HOME: A facility with approved capacity to receive at least thirteen (13) but not more than twenty (20) adults to be provided supervision, personal care, and protection in addition to room and board, for twenty-four (24) hours a day, five (5) or more days a week, and for two (2) or more consecutive weeks for compensation.
- C. FOSTER CARE FAMILY HOME: A private residence with the approved capacity to receive six (6) or fewer adults to be provided with foster care for five (5) or more days a week and for two (2) or more consecutive weeks. The adult foster care family home licensee must be a member of the household and an occupant of the residence.

Authority and
Administration

Development
Regulations

Processes and
Procedures

Supplemental Design
Regulations

Nonconformity,
Appeals, Amendments



Article 2 Definitions

Authority and
Administration

PASSIVE SOLAR ENERGY STRUCTURE: A [structure](#) which uses natural and architectural components to collect and store solar energy without using external mechanical energy.

Development
Regulations

PERFORMANCE STUDIO: A [building](#) or a portion of a building where the [principal use](#) of the space is the provision of instruction in the various arts, including but not limited to dance, theater, music, and singing. This shall not preclude student performances.

PERFORMANCE THEATER: A [building](#) or portion of a building where the [principal use](#) of the space is dramatic, dance, or musical performances or similar activities, in front of an audience, including performances on film, television, music video, or multimedia. Performance theaters shall include theaters, assembly halls, concert halls or similar [places of assembly](#).

PERSON: An individual, firm, association, proprietorship, organization, partnership, trust, corporation, limited liability company, or other entity.

Processes and
Procedures

PLACES OF ASSEMBLY: Unless otherwise identified and defined by this Ordinance, "places of assembly" means any [building](#), [structure](#), and/or grounds where groups of more than twenty (20) people meet or are assembled. Places of assembly shall include, but are not limited to auditoriums, lecture halls, stadiums, sports arenas, convention spaces, and other similar facilities.

PLACES OF WORSHIP: A site used for or intended for the regular assembly of persons for the conducting of religious services and accessory uses therewith.

Supplemental Design
Regulations

PLANNED UNIT DEVELOPMENT (PUD): A development consisting of a combination of land [uses](#) in which the specific development configuration and use allocation is based upon a comprehensive physical plan meeting the requirements of this Ordinance.

PLANNING COMMISSION: The Planning Commission of the City of Troy.

PLANNING DIRECTOR: The chief administrator of the City of Troy Planning Department.

PRELIMINARY DEVELOPMENT PLAN (PDP): The second step in the review process for a [Planned Unit Development](#). The PDP includes specific information concerning the phasing and design of detailed elements within the PUD.

Nonconformity,
Appeals, Amendments

PRINCIPAL USE: The principal use to which the premises are devoted and the principal purpose for which the premises exists. Commonly referred to as "main use".

PRODUCTION FACILITY, MULTIMEDIA: A facility for creating, recording, editing, or producing multimedia content, in any digital media format, film or videotape. Such activities shall include, but not be limited to, motion pictures, television series or specials, commercials, music videos, sound recordings, digital animation, and video games.



Article 2
Definitions

streamer, or other similar object in any form whichever, which contains printed or written matter in words, symbols, or pictures, or in any combination thereof attached to or affixed to the ground or any structure, as defined and regulated by Chapter 85, Signs, of the City of Troy Code of Ordinances.

SOLAR ACCESS EASEMENT: A right, expressed as an easement, covenant, condition or other property interest in any deed or other instrument executed by or on behalf of any landowner, which protects the [solar skyspace](#) of an actual, proposed or designated [solar energy](#) collector at a described location by forbidding or limiting activities, land [uses](#), [structures](#) and/or trees that interfere with access to solar energy. The solar skyspace must be described as the three (3) dimensional spaces in which obstruction is prohibited or limited. Any property owner may give or sell his right to access to sunlight. Such Solar Access Easements shall be recorded and copies shall be kept on file with the Troy Clerk's Department.

SOLAR COLLECTOR: A device or combination of devices, structures, or parts thereof, that collects, transfers or transforms direct solar, radiant energy into thermal, chemical, or electrical energy, and that contributes significantly to a structure's energy supply. In addition to such functions, solar collectors may also serve as a part of a structure's roof, wall, window or other structural member.

SOLAR ENERGY: Radiant energy (direct, diffuse, and reflected) received from the sun.

SOLAR SKYSPACE: The space between a [solar energy collector](#) and the sun which must be free of obstructions that shade the collector to an extent which precludes its cost-effective operation.

SIGNIFICANT OR SUBSTANTIAL PORTION: Means thirty (30) percent or more of the term modified by such phrase.

STORY: That part of a [building](#), except a mezzanine, included between the surface of one (1) floor and the surface of the next floor, or if there is not a floor above, then the ceiling next above. A story thus defined shall not be counted as a story when more than fifty (50) percent by cubic content, is below the height level of the adjoining ground.

STORY, HALF: An uppermost [story](#) lying under a sloping roof, the usable [floor area](#) of which, at a height of four feet above the floor, does not exceed two-thirds (2/3) of the floor area in the story directly below and the height above at least two hundred (200) square feet of floor space is seven feet four inches (7'4"). When the usable floor area of such a story, at a height of four (4) feet above the floor, does exceed two-thirds (2/3) of the floor area of the story directly below, it shall be counted as a full story.

Authority and
Administration

Development
Regulations

Processes and
Procedures

Supplemental Design
Regulations

Nonconformity,
Appeals, Amendments



SECTION 12.05

SOLAR STRUCTURES AND EASEMENTS

- A. Permitted. Active and passive [solar energy devices](#), systems or structures shall be permitted in all zoning classifications by right, subject to administrative approval, except when such solar devices or architectural features project into required front or side yards, or are free-standing elements in a required front or side yard, in which case they are subject to site plan review in accordance with [Article 8](#).
- B. Maximum Height of Structures. Passive solar energy structures, such as flat plate collectors, photovoltaic cells, etc., which are roof-mounted or integrated otherwise into the roof structure shall not be included in the calculation of maximum height. Active solar energy structures, when mounted on either freestanding structural elements or integrated architecturally with a principal or accessory building shall not exceed a height of forty (40) feet.
- C. Easements. A landowner may enter into an easement, covenant, condition or other property interest in any deed or other instrument, to protect the solar skyspace of an actual, proposed or designated solar energy structure at a described location by forbidding or limiting activities, land uses, structures and/or trees that interfere with access to solar energy. The solar skyspace must be described as the three (3) dimensional space in which obstruction is prohibited or limited. Any property owner may give or sell his right to access to sunlight. Such Solar Access Easements shall be recorded and copies shall be kept on file with the Troy Building Department.

SECTION 12.06

ENVIRONMENTAL PERFORMANCE STANDARDS

- A. Intent. No use, unless otherwise allowed, shall be permitted within any district which does not conform to the following minimum requirements of use, occupancy, and operation.
- B. Airborne Emissions.
 1. Air Contaminants. All airborne emissions shall, at a minimum, comply with the applicable Federal and State standards.
 2. Smoke.
 - a. It shall be unlawful for any person, firm, or corporation to permit the emission of any smoke from any source to a density greater than that density described as No. 1 of the Ringlemann Chart; provided that the following exceptions shall be permitted: smoke, the shade or appearance of which is equal to but not darker than No. 2 of the Ringlemann Chart for a period or periods aggregating four (4) minutes in any thirty (30) minute period.

CITY OF TUCSON *LAND USE CODE*
ARTICLE III. DEVELOPMENT REGULATIONS
DIVISION 2. DEVELOPMENT CRITERIA

DIVISION 2. DEVELOPMENT CRITERIA

SECTIONS:

3.2.1	PURPOSE
3.2.2	PRINCIPAL LAND USE
3.2.3	PRINCIPAL STRUCTURE
3.2.4	SECONDARY LAND USE
3.2.5	ACCESSORY USES AND STRUCTURES
3.2.6	PERIMETER YARDS
3.2.7	STRUCTURE HEIGHT MEASUREMENT
3.2.8	ACCESS PROVISIONS
3.2.9	LOT COVERAGE
3.2.10	RESIDENTIAL DENSITY CALCULATIONS
3.2.11	FLOOR AREA RATIO (FAR) CALCULATION
3.2.12	SOLAR CONSIDERATIONS
3.2.13	STREETS
3.2.14	LOTS

- 3.2.1 PURPOSE.** This Division establishes regulations that will be applied uniformly to all uses, in all zones.
- 3.2.2 PRINCIPAL LAND USE.** A principal use is a land use which is allowed in a zone as a Permitted Land Use or as a Special Exception Land Use. The principal use is generally the primary or predominant activity conducted on a parcel; however, two (2) or more principal uses can be located on the same parcel in some zones.
- 3.2.2.1 One (1) or More Uses, Separate Projects.** One (1) or more principal uses which are conducted as separate projects on a parcel are considered individually in determining the respective Land Use Classes and development regulations.
- 3.2.2.2 Two (2) or More Uses, Same Project.** Two (2) or more principal uses conducted as a single project, which integrates elements of the various uses, such as, but not limited to, vehicular parking, vehicular and pedestrian access, refuse collection, and loading services, as common use among the various uses in the project, shall have development requirements applied as follows.
- A. *Two (2) or More Uses, Same Development Designator.* On projects with two (2) or more uses which have the same Development Designator, the Development Designator requirements shall be applied on the site as if there were only one (1) use.
- B. *Two (2) or More Uses, Different Development Designators.* On projects with two (2) or more uses which have different Development Designators, the applicable development requirements shall be based on the floor area ratio (FAR) or residential density (RAC) and the lot coverage (LC) requirements calculated separately for each use. Height and setback requirements for each use shall be in accordance with the requirements of the Development Designator assigned to each use.
1. The total land area of the project site (PS) shall be equal to or greater than the sum of the site areas required for each use. The amount of site area required for each use shall be calculated using the FAR requirement of the use. For each use, the required site area (SA) is equal to the proposed floor area (FA) divided by the FAR, as in the formula ($SA = FA \div FAR$). The total project site area is calculated using the following formula: $PS \geq (FA \div FAR) + (FA \div FAR) + (\text{repeat } FA \div FAR \text{ for each additional use})$. For additional information on FAR calculations, refer to Sec. [3.2.11](#).

- C. The use does not substantially alter the exterior appearance or character of the principal use or structure to which it is incidental.
- D. Animals may be kept for personal use in all zones subject to Tucson Code, Chapter 4, and any applicable health regulations. (Ord. No. 8808, §1, 1/27/97)

3.2.5.2

Accessory Structures. In all zones, the structures used for accessory uses shall comply with the following.

- A. An accessory structure can be built only on a lot occupied by a principal structure or use.
- B. An accessory building shall be developed in conformance with the requirements of the Development Designator of the Principal Land Use, but all other development requirements of Article III are based on the specific Accessory Land Use. (Ord. No. 8582, §1, 9/25/95)
- C. An accessory structure, which exceeds the allowable height of a wall within a perimeter yard and is detached from a principal structure, shall comply with the perimeter yard width requirements of the principal structure, except that the accessory structure may be built to a parcel line with the consent of the adjoining or, when separated by an alley, adjacent property owner(s). Accessory structures, such as light poles, flagpoles, and other tall and narrow structures that are similar, are exempt from the setback requirement. (Ord. No. 9374, §1, 4/10/00)
- D. An accessory structure, except for a stable or enclosure for animals, may be attached to a principal structure, provided that its construction complies with the development requirements of the principal structure.
- E. The use of solar energy collectors for the purpose of providing energy for heating or cooling is permitted in all zones, whether as part of a principal structure or as an accessory structure. Such solar collection devices shall not be included in computing lot coverage. (Ord. No. 9179, §1, 12/14/98)
- F. This Section is not intended to apply to buildings of five (5) feet or less in height and ten (10) square feet or less in area, such as doghouses or refuse container enclosures, nor to play equipment.
- G. All structures for animals must be set back at least fifty (50) feet from all property lines, except corrals which must be set back ten (10) feet from all property lines.
- H. The maximum height of a wall or fence within a perimeter yard is six (6) feet; however, the wall or fence may be higher than six (6) feet, but no higher than ten (10) feet, if: (*See Illustration [3.2.5.2.H.](#)*)
 - 1. At least seventy-five (75) percent of the area above six (6) feet in height is left unobstructed and open through the use of architectural elements, such as arches, columns, or wrought iron, or
 - 2. Part of, or located on top of, a retaining wall no higher than ten (10) feet measured from design grade and no higher than six (6) feet measured from the top of the retaining portion of the wall, or
 - 3. A greater height is required through the rezoning process or the Special Exception Land Use process, or
 - 4. A greater height is required by a specific regulation in the *LUC*.

(Ord. No. 8582, §1, 9/25/95; Ord. No. 9293, §1, 9/27/99)

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3. When the setback is measured from the nearest edge of sidewalk, back of sidewalk, or future sidewalk, and there is no existing or proposed sidewalk, the nearest edge of the pedestrian and utility area adjacent to the street's roadway is used as the point of measurement for the setback. The location and width requirements for pedestrian and utility areas are found in Development Standard No. 3-01.0, Street Development Standard.
4. Developing area setbacks shall not be less than the minimum width of the landscaping requirements of Sec. [3.7.2.4](#).

3.2.6.6

Exceptions to Perimeter Yards. Encroachment into the required perimeter yard is allowed as provided below.

- A. Along interior property lines, the following may extend two (2) feet into the required width, provided the yard is not reduced to less than three (3) feet.
 1. Chimney.
 2. Roof overhang.
 3. Bay windows.
- B. Along street property lines, as provided below.
 1. Within established areas, the following may extend two (2) feet into the required perimeter yard.
 - a. Chimney.
 - b. Roof overhang.
 - c. Stairs.
 - d. Bay windows.
 - e. Open structures.
 2. On any corner lot, no fence, structure, object, or planting shall be erected or maintained so as to interfere with the sight visibility triangle provisions of Development Standard 3-01.0.
- C.** Structures within perimeter yards.
 - 1.** Architectural features which are part of a solar energy system may project up to four (4) feet into required front perimeter yards. Such architectural features include, but are not limited to, overhangs, moveable insulating walls and roofs, detached solar collectors, reflectors, and piping.
 2. A wall or fence not over six (6) feet high may be erected within the limits of a perimeter yard.

3.2.7 STRUCTURE HEIGHT MEASUREMENT.

- 3.2.7.1 **Purpose.** The purpose of this Section is to establish a uniform and consistent method for measuring structure heights, which allows for changes in topography and for architectural diversity.

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3.2.7.3

Exceptions. The following structural elements may extend above the maximum allowed height, subject to any limitations listed. (*See Illustration 3.2.7.3.*)

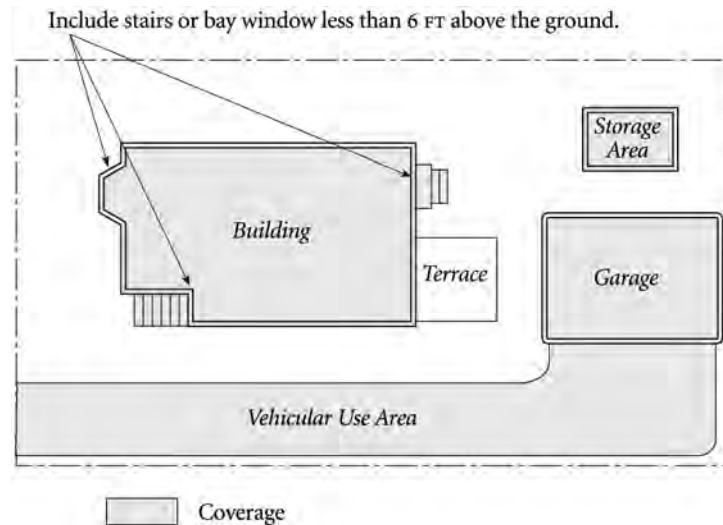
- A. Ornamental elements of the buildings and structures, such as spires, cupolas, belfries, clock towers, and domes, provided that such elements:
 - 1. Are not for human occupancy, and
 - 2. Do not exceed ten (10) feet above the allowed structure height, except as follows:
 - 3. Ornamental elements of buildings and structures proposed to exceed ten (10) feet above the allowed structure height are subject to review by the Design Review Board in accordance with Sec. [5.1.8](#) and approval as a special exception by the Zoning Examiner in accordance with procedures set forth in Sec. [5.3.9](#) and Zoning Examiner Full Notice Procedure, Sec 23A-53 and provided that:
 - a. The ornamental element is an integral part of the building's architecture, not for human occupancy.
 - b. Ornamental elements proposed to exceed ten feet (10 ft.) above the allowed structure height may not be used for commercial advertising.
 - c. The applicant must demonstrate how the proposal minimizes impacts to existing land uses by including a viewshed analysis and an analysis of the project site grades and adjacent property grades as part of their submittal.
 - d. Setbacks required for the architectural element will be one foot (1 ft.) for each additional foot in height by which it exceeds the base allowance of ten feet (10 ft.).

(Ord. No. 10166, §1, 6/21/05)

- B. Chimneys, mechanical penthouses, and bulkheads for stairwells, elevator shafts, or skylights, provided that such elements:
 - 1. Are not for human occupancy,
 - 2. Do not exceed ten (10) feet above the allowed structure height, and
 - 3. Do not exceed twenty-five (25) percent of the total roof area of the building on which they are located.
- C. Mechanical equipment, except solar energy equipment, and accessories necessary to the operation or maintenance of the building, provided that such elements:
 - 1. Do not exceed six (6) feet above the allowed structure height,
 - 2. Do not exceed twenty-five (25) percent of the total roof area of the building on which they are located,
 - 3. Are concealed by an opaque screen, and
 - 4. Are located away from the edge of the building a distance equivalent to the height of the elements.
- D.** Solar energy equipment, provided that such elements do not exceed the allowable height limits by more than ten (10) feet.
- E. Parapet walls and safety railings, provided they do not exceed the allowable height by more than four (4) feet.
- F. Communications antennae not in conjunction with a communications facility, excluding dish antennae greater than three (3) feet in diameter, provided such elements do not exceed the allowable height limits by more than five (5) feet.

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- C. Storage areas, measured from outside edge to outside edge of any area allocated to storage use. Storage areas include enclosed or open areas used for storage or display of materials, equipment, refuse, or vehicles.



3.2.9.2 Lot Coverage

3.2.9.3

Exceptions. The following are excluded from the lot coverage calculation to encourage design flexibility and provide for additional amenities.

- A. *Buildings.* Building lot coverage does not include the following areas, provided the areas are located on the ground floor.
1. Roofed areas, open on at least one (1) side, which provide shelter to exterior areas, such as balconies, entrances, stoops, and terraces, provided they are not used for utilities, maintenance, laundry, storage, or motor vehicle parking.
 2. Any part of a building used for recreational purposes provided the recreation area:
 - a. Is separated by a wall from nonrecreational areas such as laundry rooms,
 - b. Is designated for common use by tenants,
 - c. Is not used by the general public, and
 - d. Is not within a dwelling unit.
 3. Any outdoor area over an underground building which is either landscaped, used for recreation purposes, or both. The roof of the building can be a maximum of three (3) feet above design grade measured to its highest point.
 4. Roofed interior space which provides a physical connection to the outdoors and natural lighting, either directly or indirectly. In addition, the space:

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- a. Shall not, in whole or in part, be designated as tenant area;
- b. Shall not have more than fifteen (15) percent of the total area allocated toward corridor space;
- c. Shall be at least thirty (30) feet wide in any horizontal direction;
- d. Shall have a minimum floor-to-ceiling height of twenty (20) feet; and
- e. Shall not be within a dwelling unit.

5. Solar Collectors. Solar collectors, whether part of the principal structure or an accessory structure, are not included in lot coverage calculations.

B. *Vehicular Use Areas.* Within a vehicular use area, any landscaped area greater than twenty-five (25) square feet is excluded, provided the landscaped area is:

1. Larger than three (3) feet in width, and
2. Is curbed to protect it from vehicular traffic.

3.2.9.4 Lot Coverage Calculation. The amount of lot coverage per site is not to exceed the lot coverage percentage listed for the proposed land use within the zoning classification of the site.

The lot coverage percentage is determined by the total amount of land area that would fall under the lot coverage definition, divided by the total land area of the site.

3.2.10 RESIDENTIAL DENSITY CALCULATIONS.

3.2.10.1 Purpose. This Section provides uniform methods for determining residential densities on individual sites.

3.2.10.2 Applicability. Residential density for all residential projects is calculated as follows.

- A. Residential density in residential projects developed under Development Designators "A" through "I", as listed in Sec. [3.2.3.1.A](#) and Sec. [3.2.3.1.B](#), is based on one (1) dwelling unit per minimum size parcel by area, exclusive of any street and drainageway dedications or exclusive use easements. Because the acreage of a parcel used for street and drainageway purposes differs for each development project, it is difficult to provide a simple calculation that would give an exact density figure.

The following provide two (2) methods of calculating approximate density for a project. The number of units obtained through these calculations is an estimate and can only be verified by the actual design of the project. Should there be a need to express a density ratio per acre for these Development Designators, for comparison purposes only, such ratio will be calculated using the second method assuming thirty (30) percent of the site would be used for streets, drainageways, or other uses whose acreage is not included to calculate allowable density.

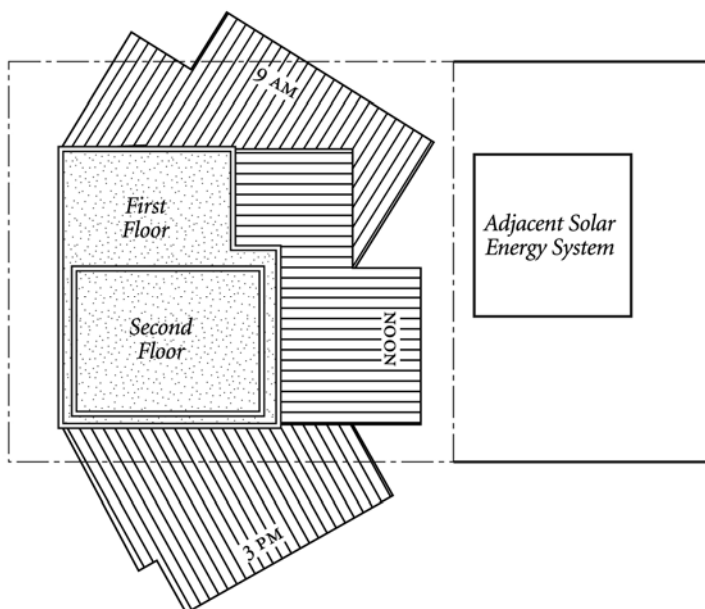
1. The first method of calculation gives the highest possible density that can be achieved on a parcel. However, to achieve this density, the following two (2) design criteria must be present. (*See Illustration 3.2.10.2. Method 1.*)
 - a. The property can be developed without additional dedications for streets, drainageways, or exclusive use easements.

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3.2.12**SOLAR CONSIDERATIONS.**

- 3.2.12.1 The use of solar energy collectors for the purpose of providing energy for heating or cooling is permitted in all zones, whether as part of a principal structure or as an accessory structure. (Ord. No. 9179, §1, 12/14/98)
- 3.2.12.2 Shadows cast from any proposed multistory structure shall be taken into consideration as to their effect on adjacent properties. Where such shadows adversely affect solar energy systems between the hours of 9:00 a.m. and 3:00 p.m., a site plan shall show that the multistory structure has been reoriented on the site to mitigate this effect or that other measures have been taken so as to minimize the adverse effects of the shading. The development potential of any property shall not be reduced by compliance with this Section. (*See Illustration 3.2.12.2.*)

Siting of multi-story structures must mitigate the effect of shadows
 on adjacent solar energy systems between the hours of 9 AM and 3 PM.



3.2.12.2 Solar Considerations

3.2.13 STREETS. Streets shall be designed in accordance with the adopted Major Streets and Routes (MS&R) Plan and Development Standard 3-01.0. The Street Development Standard provides the minimum street design and installation standards necessary to accomplish the following.

- Provide for streets of suitable location, width, and improvement to accommodate vehicular, pedestrian, and bicycle traffic.
- Afford adequate access for police, fire fighting, ambulance, paramedic, utility, sanitation, and street maintenance equipment.
- Coordinate street improvements so as to achieve a convenient system and avoid undue hardship to adjoining properties.

CITY OF TUCSON *LAND USE CODE*
 ARTICLE VI. DEFINITIONS
 DIVISION 2. LISTING OF WORDS AND TERMS

Shopping Center, Neighborhood. A shopping center which occupies up to ten (10) acres and has up to one hundred thousand (100,000) square feet of gross leasable area.

Shopping Center, Regional. Same as Regional Mall.

Short-Term Bicycle Parking Facility. A facility which provides a stationary object to which the operator can lock the bicycle frame and both wheels with a user provided U-shaped lock or a cable and lock. (Ord. No. 10886, §20, 03/22/11)

Single-Family Dwelling. A building containing one (1) dwelling unit.

Single-Family Dwelling, Attached. A dwelling unit attached on a horizontal plane to one (1) or more dwelling units by structural elements common to the attached units. Each dwelling unit is located on its own individual lot or separated by a line denoting a separate ownership of each unit. The structural elements include common wall construction, roof, or other similar improvement. Elements such as trellises, beams, and patio walls are not included.

Single-Family Dwelling, Detached. A dwelling unit which is not attached to any other dwelling unit by any structural elements, surrounded by open space and located on its own separate lot.

Site. The land area consisting of a lot or contiguous lots, not including dedicated public property, designated for development as a single entity and exclusive of any abutting public right-of-way.

Site Coverage. Same as Lot Coverage.

Site Plan. For the purposes of the *Land Use Code (LUC)*, same as Development Plan.

Site Utilization. As used in Sec. 2.8.8, Historic Preservation Zone (HPZ), the spacing between the sides of buildings.

Slope Plan. A plan which demonstrates the feasibility of complying with the site grading requirements and site cut and fill requirements of Sec. 2.8.1, Hillside Development Zone (HDZ), and further depicts the location, extent, and treatment of all cut and fill slopes.

Solar Access. Access to sunlight to protect active or passive solar energy systems from shadows blocking exposure to the sun during hours of high insolation, from 9:20 a.m. to 3:20 p.m. local time.

Solar Energy System. Includes: (1) A design using natural and architectural features to cool or heat a structure or (2) a mechanical assembly which may include a solar collector, storage facility, and any other components needed to cool or heat a structure.

Sorority. See Fraternity.

Soup Kitchen. A Food Service use which provides free meals for consumption on site.

Specific Plan. A detailed policy plan or regulation which implements the *General Plan* or any of the elements of that *Plan*. Specific plans include subregional, area, and neighborhood plans; the *Major Streets and Routes (MS&R) Plan*; the *Land Use Code (LUC)*; and any other similar plan. For more detailed information on specific plans, refer to Sec. 5.2.3. (Ord. No. 9374, §1, 4/10/00; Ord. No. 9517, §5, 2/12/01)

Specified Anatomical Areas. Is:

- A. Less than completely and opaquely covered human genitals, pubic region, buttock, anus, or female breasts below a point immediately above the top of the areola; or
- B. Human male genitals in a discernibly turgid state, even if completely and opaquely covered.

**City of West Lake Hills, Texas
Code of Ordinances (2011)**

**Chapter 22, Building Regulations
Article 22.03 Construction Code
Division 1. Generally**

Sec. 22.03.009 Solar energy devices

(a) Purpose. To help alleviate the growing energy shortage and lessen the reliance on increasingly uncertain power sources, it is the purpose of this section to encourage the use of solar energy for space heating and cooling in buildings and for heating water.

(b) Permitted uses. The use of solar energy devices for the purpose of providing energy is a permitted use within all zones, either as a part of a structure, or an independent structure. Solar energy devices shall be subject to the setback and height limitations affecting dwellings, garages, and other major improvements.

(c) Variances. Variances shall be granted from restrictions such as heights, setback and lot density where such variances are reasonable and necessary to assure unobstructed access to direct sunlight. Variances shall not be granted which would cause an unreasonable obstruction of direct sunlight to adjacent property if there is a reasonable probability of utilization of passive or active solar radiation on such adjacent property.

(1996 Code, sec. 14-79)