Comment [AU1]: The comments provided in the margins indicate where changes to the February 2014 draft are proposed.

SUSTAINABILITY CODE AMENDMENTS: SOLAR DEVELOPMENT STANDARDS

Section 1: The Tucson Code, Chapter 23B, Unified Development Code, Article 3, is amended to read as follows:

ARTICLE 3, GENERAL PROCEDURES
SECTION 11, ADMINISTRATIVE MODIFICATIONS

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3.11.1 DESIGN DEVELOPMENT OPTION

A. Purpose

This section is established to provide an administrative process by which specific development and dimensional standards of the UDC may be modified under certain criteria applicable to a land use within a zone. A Design Development Option (DDO) is intended to encourage the following:

1. Flexible design solutions that are within the intent of the regulation, encourage efficient use of land, do not create a nuisance on adjacent property, and address situations where strict application of a requirement may not be practical;

2. Energy conservation through site and building design and installation of sustainable development features;

3. Innovation in site planning and architectural design; and,

4. Enhancement of community aesthetics.

B. Applicability

The following dimensional, screening, and landscaping standards may be considered for modification under this Section:

1. Setbacks;

2. Height of accessory walls and fences when the wall and fence heights do not exceed two feet above the maximum height permitted;

3. Landscaping and screening standards when the modification does not decrease the required area in square footage of landscaping or height of a screening feature; ~~and,~~

4. Structural setback and parking space length requirements for carports only in single-family and duplex development~~.~~;

5. Accessory solar collection systems serving nonresidential uses that exceed one-half the footprint of the principal structure (see Section 6.6.2.L.2.a.iii); and,

6. Locating detached accessory solar collection systems in the buildable area extending the full width of the lot between the principal structure and the front street line (see Section 6.6.2.L.2.b.i).

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D. Findings for Approval

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4. Specific Findings for Solar Collection System Modification Requests

In addition to the finding in Section 3.11.1.D.1, the PDSD Director shall find, in the case of solar collection systems, that the modification:

a. Does not create a situation where proposed development will obstruct significant views of dramatic land forms, unusual stands of vegetation, or parks from nearby properties substantially more than would occur if the development were built without the modification; and,

b. Does not create a situation where the proposed development will interfere with the optimum air temperature or solar radiation orientation of buildings on adjoining properties substantially more than would occur if the building or structures were built without the modification.

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Section 2: The Tucson Code, Chapter 23B, Unified Development Code, Article 6, is amended to read as follows:

ARTICLE 6, DIMENSIONSAL STANDARDS AND MEASUREMENTS
SECTION 4, RULES OF MEASUREMENT AND EXCEPTIONS TO DIMENSIONAL STANDARDS

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6.4.4. HEIGHT

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C. Height Exceptions

The following structural elements may extend above the maximum allowed height, subject to any limitations listed: (See Figure 6.4.4.-B, *Exceptions to Building Height*)

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4. Solar Collection Systems~~Energy Equipment~~

Solar collection systems~~energy equipment~~, provided that such elements do not exceed the allowable height limits by more than ten feet.

Comment [AU2]: Revision made to be consistent with the term used throughout the proposed revisions.

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6.4.5 PERIMETER YARDS

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D. Exceptions

Encroachment into the required perimeter yard is allowed as follows:

1. Side and Rear~~Interior~~ Property Lines

Along side and rear~~interior~~ property lines, the following may extend two feet into the required width, provided the side or rear perimeter yard is not reduced to less than three feet.

a. Chimney;

b. Roof overhang;

c. Bay window;

d. Attached awning (e.g., window shade), but not including carports or porches; or

e. Wall-mounted solar collectors.

2. Street Property Lines

Along street property lines, the following may extend into the required width as provided below.

a. Within established areas, the following may extend two feet into the required street yard.

(1) Chimney;

(2) Roof overhang;

(3) Stairs;

(4) Bay window; ~~or~~

(5) Open structures; or;

(6) Wall-mounted solar collection systems.

b. On any corner lot, no fence, structure, object, or planting shall be erected or maintained to interfere with the sight visibility triangle provisions set forth in the Technical Standards Manual.

c. An attached awning may project five feet into the street yard.

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Section 3: The Tucson Code, Chapter 23B, Unified Development Code, Article 6, is amended to read as follows:

ARTICLE 6, DIMENSIONSAL STANDARDS AND MEASUREMENTS
SECTION 6, ACCESSORY USE, BUILDINGS, AND STRUCTURES

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6.6.2 ACCESSORY BUILDINGS AND STRUCTURES

In all zones, the buildings used for accessory uses shall comply with the following:

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~~F. The use of solar energy collectors for the purpose of providing energy for heating or cooling shall be permitted in all zones, whether as part of a principal building or as an accessory building. Such solar collection devices shall not be included in computing lot coverage;~~

Comment [AU3]: This standard has been consolidated into proposed Sec. 6.6.2.L.

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L. Solar Collection Systems

1. General Standards

The following standards apply to ground-, roof-, and wall-mounted solar collection systems:

a. Solar collection systems are permitted in all zones as an accessory use in accordance with this Section 6.6.2.L.1 and 6.6.2.L.2, .3, or .4, whichever is applicable;

Comment [AU4]: Section references added for clarification purposes.

b. Solar collections systems shall not be included in computing lot coverage;

c. Solar collection systems shall be located such that prolonged and/or substantial concentrated solar radiation or glare shall not be directed onto abutting properties or roadways;

d. Solar collection systems shall comply with all applicable building and electrical standards of the adopted building codes;

e. A property owner who has installed a solar collection system shall be protected from shadowing of surrounding structures according to the requirements of Sec. 7.3.2, Shadows from Multistory Structures and Sec. 7.3.3, Shadows from Trees; and,

Comment [AU5]: Comment from Chuck Martin: This section potentially takes away the adjacent owners' property rights. This section, 7.3.2, and 7.3.3 should be deleted.

f. Where the standards of this Section 6.6.2.L conflict with other sections of the UDC, the standards of this section shall control except as follows. Solar collection systems installed on structures subject to historic preservation commission review shall comply the applicable historic preservation standards.

Comment [AU6]: Revised to be consistent with similar clauses used elsewhere in the UDC.

2. Ground-mounted Solar Collection System

a. General

The following standards apply to ground-mounted solar collections systems in residential and nonresidential zones:

i. Ground-mounted solar collection systems are permitted in accordance with the standards in this Section 6.6.2.L.2.a and the general standards provided in Section 6.6.2.L.1 and Section 6.6.2.L.2.b or .c, whichever is applicable.;

Comment [AU7]: Section references added for clarification purposes.

ii. A ground-mounted solar collection system may also serve as the roof of a carport or shade structure, such as a patio, ramada, or gazebo, without requiring separate roof framing or paneling underneath the system; and,

iii. An accessory ground-mounted solar collection system in any district shall not be any larger in area than ~~exceed the greater of~~ one-half the footprint of the principal structure~~ or 1,000 square feet, whichever is greater~~. Ground-mounted solar collection systems serving nonresidential uses may exceed this in accordance with Section 3.11.1, *Design Development Option.*

Comment [AU8]: Revise to allow commercial projects to exceed 50% - perhaps through a DDO.

b. Residential Zones

i. Ground-mounted solar collection systems in RH, SR, SH, RX-1, RX-2, R-1, R-2, R-3, MH-1, and MH-2 zones are exempt from Section 6.6.3, *Specifically Within Residential Zones;*

ii. Ground-mounted solar collection systems are permitted in residential zones in accordance with the standards in this

Section 6.6.2.L.2.b and Sections 6.6.2.L.1 and 6.6.2.L.2.a;

Comment [AU9]: Section added to clarify all of the applicable standards.

iii. ~~When accessory to a residential use, a~~ Detached ground-mounted solar collection systems are prohibited~~shall not be located~~ in the buildable area extending the full width of the lot– between the principal structure and the front street line~~public right-of-way~~, unless permitted in accordance with Section 3.11.1, *Design Development Option (DDO)*;

Comment [AU10]: This section has been revised to: 1) require a DDO to place a system in the front yard; 2) clarify that is for systems that are detached; 3) revise the "buildable area" phrase to be consistent with wording used elsewhere in the accessory use section of the code.

iv. A ground-mounted solar collection system shall comply with the perimeter yard width standards of the principal structure;~~.~~

v. Except as provided in 6.6.2.L.2.b.iv below, the system shall not exceed 10 feet in height when the ground-mounted solar collection system is a detached accessory structure. An additional 3 feet in height is allowed to accommodate the movement of pole-mounted trackers. If the system is attached to the principal structure, the maximum height permitted shall be the same as for the principal structure;~~.~~ And,

vi. When located on an Agricultural, Civic, or Recreation use and is a detached accessory structure, the ground-mounted solar collection system shall not exceed 10 feet in height, except as provided below. An additional 3 feet in height is allowed to accommodate the movement of pole-mounted trackers. Exception: when the detached ground-mounted solar collection system also serves as the roof of a carport or a shade structure, the maximum height permitted is 22 feet. If the system is attached to the principal structure, the maximum height permitted shall be the same as for the principal structure.

Comment [AU11]: Revised to add shade structures as an exception to accommodate solar collection systems that double as shade structures over picnic tables, playgrounds, basketball courts.

c. Nonresidential Zones

i. Ground-mounted solar collection systems are permitted in residential zones in accordance with the standards in this Section 6.6.2.L.2.c and Sections 6.6.2.L.1 and 6.6.2.L.2.a; and,

Comment [AU12]: Section added to clarify all of the applicable standards.

ii. When located in a nonresidential zone and is a detached accessory structure, the ground-mounted solar collection

system shall not exceed 16 feet except as provided below. An additional 3 feet in height is permitted to accommodate the movement of pole-mounted trackers. Exception: When the detached ground-mounted solar collection system also serves as a carport, the maximum height permitted is 22 feet. If the system is attached to the principal structure, the maximum height permitted shall be the same as for the principal structure.

3. Roof-mounted Solar Collection System

Roof-mounted Solar Collection Systems are permitted in accordance with the standards in this Section 6.6.2.L.3 and the general standards provided in Section 6.6.2.L.1.

a. Setbacks

A roof-mounted solar collection system shall comply with the perimeter yard standards of the principal structure.

b. Location

A roof-mounted solar collection system is permitted on the roof of a principal or accessory structure or building.

c. Height

Consistent with Sec. 6.4.4.C.4, roof-mounted solar collection systems may exceed the allowable height limit by no more than ten feet. On accessory structures in residential zones, roof-mounted solar collection systems may use this ten foot height exception to ~~either 1)~~ add an additional ten feet of solar equipment to the roof of the accessory structure ~~or 2) add ten feet of structure height to the accessory structure itself — for a structure height of 22 feet — if the solar equipment is fully integrated into the roof of the accessory structure and adds no additional height to the structure.~~ In addition, the required height of a primary structure may be raised three feet to accommodate a solar-tracking roof deck that moves vertically to maximize sun exposure provided the solar equipment is integrated into the roof and adds no additional height to the structure.

Comment [AU13]: With the distinction made between ground- and roof-mounted solar collection systems in a previous draft, this provision is no longer necessary.

4. Wall-mounted Solar Collection Systems

a. Wall-mounted solar collection systems are permitted in accordance with the standards in this Section 6.6.2.L.4 and the general standards provided in Section 6.6.2.L.1;

b. Wall-mounted solar collection systems may encroach into the required perimeter yard in accordance with 6.4.5.D, Exceptions to Perimeter Yards; and,

c. A wall-mounted solar collection system may also serve as the roof of a carport or shade structure, such as a patio, ramada, or gazebo, without requiring separate roof framing or paneling underneath the system.

Comment [AU14]:

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Section 4: The Tucson Code, Chapter 23B, Unified Development Code, Article 7, is amended to read as follows:

ARTICLE 7, DEVELOPMENT STANDARDS
SECTION 3, SOLAR ~~CONSIDERATIONS~~DEVELOPMENT STANDARDS

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7.3. SOLAR ~~CONSIDERATIONS~~ DEVELOPMENT STANDARDS

7.3.1. SOLAR ~~ENERGY~~ COLLECTIONS~~ORS~~ SYSTEMS ALLOWED

The use of solar ~~energy~~ collection~~ors~~ systems for the purpose of providing collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating~~energy for heating or cooling~~ is permitted in all zones in accordance with all applicable zoning regulations, whether as part of a principal structure or as an accessory structure.

7.3.2. SHADOWS FROM MULTISTORY STRUCTURES

~~Shadows cast from any proposed multistory structure shall minimize shading on existing solar energy collectors of be taken into consideration as to their effect on adjacent properties to the extent possible. Where such shadows adversely affect solar energy systems between the hours of 9:00 a.m. and 3:00 p.m., a plot plan shall show that the multistory structure has been reoriented on the site to mitigate this effect or that other measures have been taken to minimize the adverse effects of the shading. The development potential of any property shall not be reduced by compliance with this section.~~

For any site where the dimensional standards for a multi-story structure have been modified to decrease the width of a perimeter yard through a Design Development Option or variance or to increase the allowable height of the multi-story structure, the plot plan must show the shadows for the proposed multistory structure between the hours of 9:00 a.m. and 3:00 p.m. on December 21st.

Comment [AU15]: Added to clarify which processes trigger compliance with this standard.

The multistory structure should be oriented or other measures taken to minimize the adverse effects of shading on the adjacent properties. (See Figure 7.3.2-A: Solar Considerations)

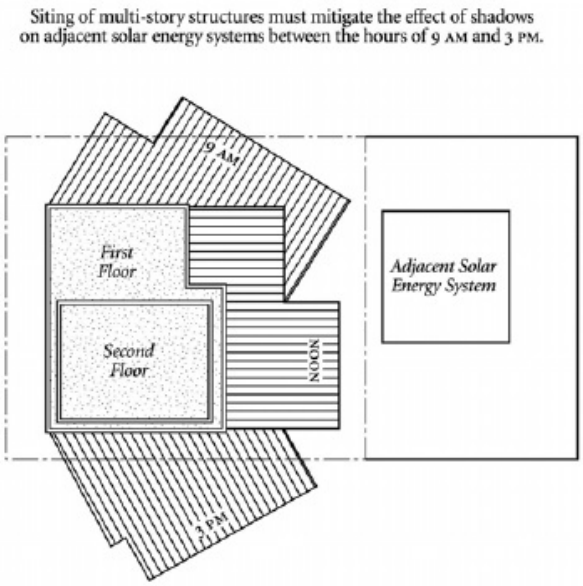

Figure 7.3.2-A: Solar Considerations

7.3.3. SHADOWS FROM TREES

~~Trees and shrubs shall be selected and located so that, at maturity, they do not interfere with existing solar , as defined in Sec 11.4, to an adjacent property. Vegetation found in violation of this requirement shall be trimmed or removed at landowner's expense to restore required solar access.~~

For any site where a landscape plan is required, trees and shrubs must be selected and located per the requirements of Technical Standards Manual Sec. 5-01.5.11, so that they do not interfere with the solar access of adjacent properties. For Flexible Lot Development (FLD) projects, this provision applies to those lots and areas along the perimeter of the FLD project site boundaries only.

Comment [AU16]: At the January 15th SCC meeting, Chuck Martin prepared shadow analyses for two scenarios: 1) multi-story residential built to the maximum height permitted adjacent to single story residential; and 2) multi-story commercial adjacent to single story residential. Both analyses showed that the City's perimeter yard requirements provide sufficient solar access for the single-story residential (i.e. the multi-story structure would not cast shadows that would obscure or block solar collection systems on the adjacent property). Based on these findings, Mr. Martin proposed this. Most of the committee supported Mr. Martin's proposal. Bruce Plenk argued that the section should be expanded to include all types of development, not just those requesting decreases in perimeter yards.

Comment [AU17]: Chuck Martin proposed replacing the language in the January 3rd draft with this on the grounds that the January 3rd proposal is unenforceable. The committee discussed the types of projects that would be subject to Mr. Martin's proposal. The committee concluded that nonresidential and residential projects of 3 or more units only should be subject to the proposal. Most of the committee supported Mr. Martin's proposal. Bruce Plenk questioned if more couldn't be done to protect the solar access of solar collection systems installed in the future.

Comment [AU18]: Without this exception, there could be a conflict with the FLD standard requiring a tree every 40' of pedestrian circulation systems.

Section 5: The Tucson Code, Chapter 23B, Unified Development Code, Article 7, is amended to read as follows:

ARTICLE 7, DEVELOPMENT STANDARDS
SECTION 6, LANDSCAPING AND SCREENING

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7.6.4 LANDSCAPE STANDARDS

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B. Vehicular Use Areas

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1. Canopy Trees in Vehicular Use Areas

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b. Alternative Standard
In lieu of the number of canopy trees required by subsection a. above, the applicant may provide the number of canopy trees needed to create a shade pattern caused by the trees at maturity and buildings that covers 50% of the paved area within the vehicular use area from 9:00~~20~~ a.m. to 3:00~~20~~ p.m. Mountain Standard Time on June 21st.

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c. Exemptions

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(8) In those areas that are ~~S~~structurally covered, such as with ground-mounted solar collection systems, carports, or other types of shade structures, or in underground garages;

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Comment [AU19]: Added to clarify that trees are not required in those areas of a parking lot not covered by a solar collection system.

Section 6: The Tucson Code, Chapter 23B, Unified Development Code, Article 11, is amended to read as follows:

ARTICLE 11, DEFINITIONS AND RULES OF CONSTRUCTION
SECTION 4, OTHER TERMS DEFINED

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11.4.8 DEFINITIONS – G

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Ground-mounted Solar Collection System

A linked series of photovoltaic modules, including pole-mounted and tracker systems, or one or more solar hot water collectors that are mounted on or to the ground. The primary purpose of these systems is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating. A solar collection system that doubles as the roof of an attached or detached carport, attached porch, gazebo, ramada, or similar type of shade structure such that there is no separate roof framing or paneling underneath the solar collection system and is mounted to the ground is considered a ground-mounted solar collection system. A solar collection system that has roof framing or substrate under it or is not mounted directly to the ground or vertical wall is considered a roof-mounted solar collection system. See the definitions for roof- and wall-mounted solar collection systems for comparative purposes.

Comment [AU20]: Revised to clarify that this applies to framing and decking associated with a separate roof and not the solar collection system itself.

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11.4.19 DEFINITIONS – R

Roof-mounted Solar Collection System

A linked series of photovoltaic modules, including skin-integrated systems (Building Integrated Photovoltaic-BIPV), or one or more solar hot water collectors that are mounted on a roof. The primary purpose of these systems is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating. See the definitions for ground- and wall-mounted solar collection systems for comparative purposes.

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11.4.20 DEFINITIONS – S

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Solar Access

Access to sunlight to protect active or passive solar collection~~energy~~ systems from shadows blocking exposure to the sun during hours of high insolation, from 9:00~~20~~ a.m. to 3:00~~20~~ p.m. local time.

~~**Solar Energy System**~~

~~Either or some combination of (1) a design using natural and architectural features to cool or heat a structure or (2) a mechanical assembly that may include a solar collector, storage facility, and any other components needed to cool or heat a structure.~~

Comment [AU21]: Definition to be replaced by "ground-, roof-, and wall-mounted solar collection system" definitions

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11.4.24 DEFINITIONS – W

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Wall-mounted Solar Collection System

A linked series of photovoltaic modules, including skin-integrated systems (Building Integrated Photovoltaic-BIPV), or one or more solar hot water collectors that are mounted to a wall. The primary purpose of these systems is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating. See the definitions for ground- and roof-mounted solar collection systems for comparative purposes.

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