



**AMENDED
PLANNING COMMISSION MEETING
Tuesday, October 24, 2017 7:00 p.m.
Community Recreation Center, 10640 N Clubhouse Drive**

Notice is hereby given that the Planning Commission of the City of Cedar Hills, Utah, will hold a **Planning Commission Meeting on Tuesday, October 24, 2017 beginning at 7:00 p.m.** at the Community Recreation Center, 10640 N Clubhouse Drive, Cedar Hills, Utah. This is a public meeting and anyone is invited to attend.

PLANNING COMMISSION MEETING

1. Call to Order
2. Public Comment: Time has been set aside for the public to express their ideas, concerns, and comments (comments limited to 3 minutes per person with a total of 30 minutes for this item)

PUBLIC HEARING

- Amendments to the City Code Title 10, Chapter 7, Section 2, Relating to Building Plans

SCHEDULED ITEMS

3. Approval of Minutes from the September 26, 2017 Planning Commission Meeting
4. Review/Recommendation on Amendments to the City Code Title 10, Chapter 7, Section 2, Relating to Building Plans
5. Review/Recommendation on Amendments to the City Code title 10, Chapter 5, Section 38, Relating to Ground Mounted Renewable Energy Systems
6. Review/Recommendation on Amendments to the City Code Title 10, Chapter 5, Section 27: Landscaping, Relating to Artificial Turf
7. Review/Recommendation on Walmart Signage
8. Discussion on Group Homes

ADJOURNMENT

9. Adjourn

Posted this 23rd day of October, 2017

/s/ Colleen A. Mulvey, City Recorder

- Supporting documentation for this agenda is posted on the City's Website at www.cedarhills.org.
- In accordance with the Americans with Disabilities Act, the City of Cedar Hills will make reasonable accommodations to participate in the meeting. Requests for assistance can be made by contacting the City Recorder at 801-785-9668 at least 48 hours in advance of the meeting to be held.
- The order of agenda items may change to accommodate the needs of the Planning Commission, the staff, and the public.
- This meeting may be held electronically via telephone to permit one or more of the commission members to participate.



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	10/24/2017

Planning Commission Agenda Item

SUBJECT:	Review/Recommendation on Amendments to the City Code Title 10-7-2 Relating to Building Plans
APPLICANT PRESENTATION:	n/a
STAFF PRESENTATION:	Chandler Goodwin, City Manager

BACKGROUND AND FINDINGS:

The Cedar Hills building department, currently and in the past, has required Utah registered design professionals to provide design documents for all structures being built under the I-Codes with the exception of the IRS (International Residential Code). The most recent (201) International Building Code (IBC) Section 107.1 indicates that this is required only if the statute of the jurisdiction issuing permits for construction requires it.

"IBC Section 107.1 General. Submittal documents consisting of construction documents, statement of special inspections, geotechnical report, and other data shall be submitted in two or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional. Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code."

In an effort to continue providing for the safety of individual structures and the community as a whole, the requirement to provide registered design professional plan submittals should be recognized by Cedar Hills statute.

PREVIOUS LEGISLATIVE ACTION:

10-7-2 Plans Required: All applications for building permits shall be accompanied by plans that have been drawn to scale showing the actual dimensions of the lot to built upon, the size and location of existing buildings to be erected. (ord. 6-20-78A, 6-20-1978)

FISCAL IMPACT:

N/A

SUPPORTING DOCUMENTS:

Proposed language:

10-7-2 Plans Required: All applications for building permits submittal documents shall comply with the currently adopted International building Codes including being prepared by a registered design professional. Exception: Submittal documents for construction completed under the International Residential Code prescriptive methods.

RECOMMENDATION:

Staff recommends that the planning commission review the proposed language, make any necessary changes and make recommendation to the city council

MOTION:

To recommend/not recommend the proposed amendments to §10-7-2 to the City Council, subject to the following changes {LIST ANY APPLICABLE CHANGES}.



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	10/24/2017

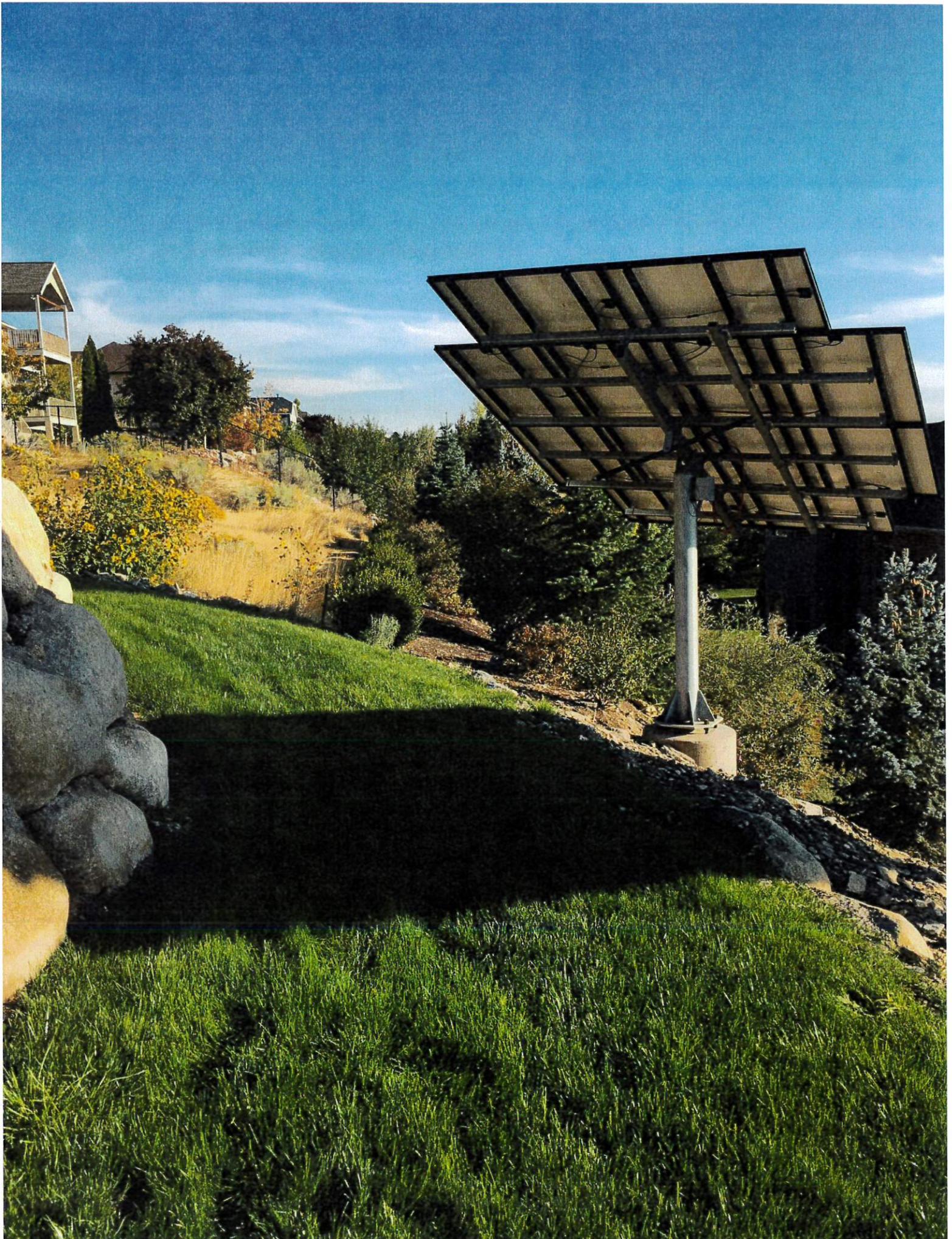
Planning Commission Agenda Item

SUBJECT:	Review/Recommendation on Renewable Energy Systems, Ground Mounted Solar
APPLICANT PRESENTATION:	n/a
STAFF PRESENTATION:	Chandler Goodwin, City Manager
BACKGROUND AND FINDINGS:	
<p>Based on City Council recommendation and the current desire for residents to have renewable energy systems installed at their homes, there is a need to regulate these systems so as to mitigate any negative impacts that may occur to the surrounding property owners.</p> <p>The proposed code provides a method for calculating the setback for a ground mounted solar system by having a minimum setback, plus an additional requirement based on the height of the system. Additionally, each mount is limited to 100 square feet.</p>	
PREVIOUS LEGISLATIVE ACTION:	
Nov. 2016, City Council adopted §10-5-38	
FISCAL IMPACT:	
n/a	
SUPPORTING DOCUMENTS:	
Cedar Hills City Code §10-5-38, Ground Mounted Solar Code	
RECOMMENDATION:	
Make recommendations for any proposed changes to §10-5-38	
MOTION:	
To recommend/not recommend the proposed changes to §10-5-38 renewable energy systems to the City Council subject to the following conditions {LIST ANY CONDITIONS}.	

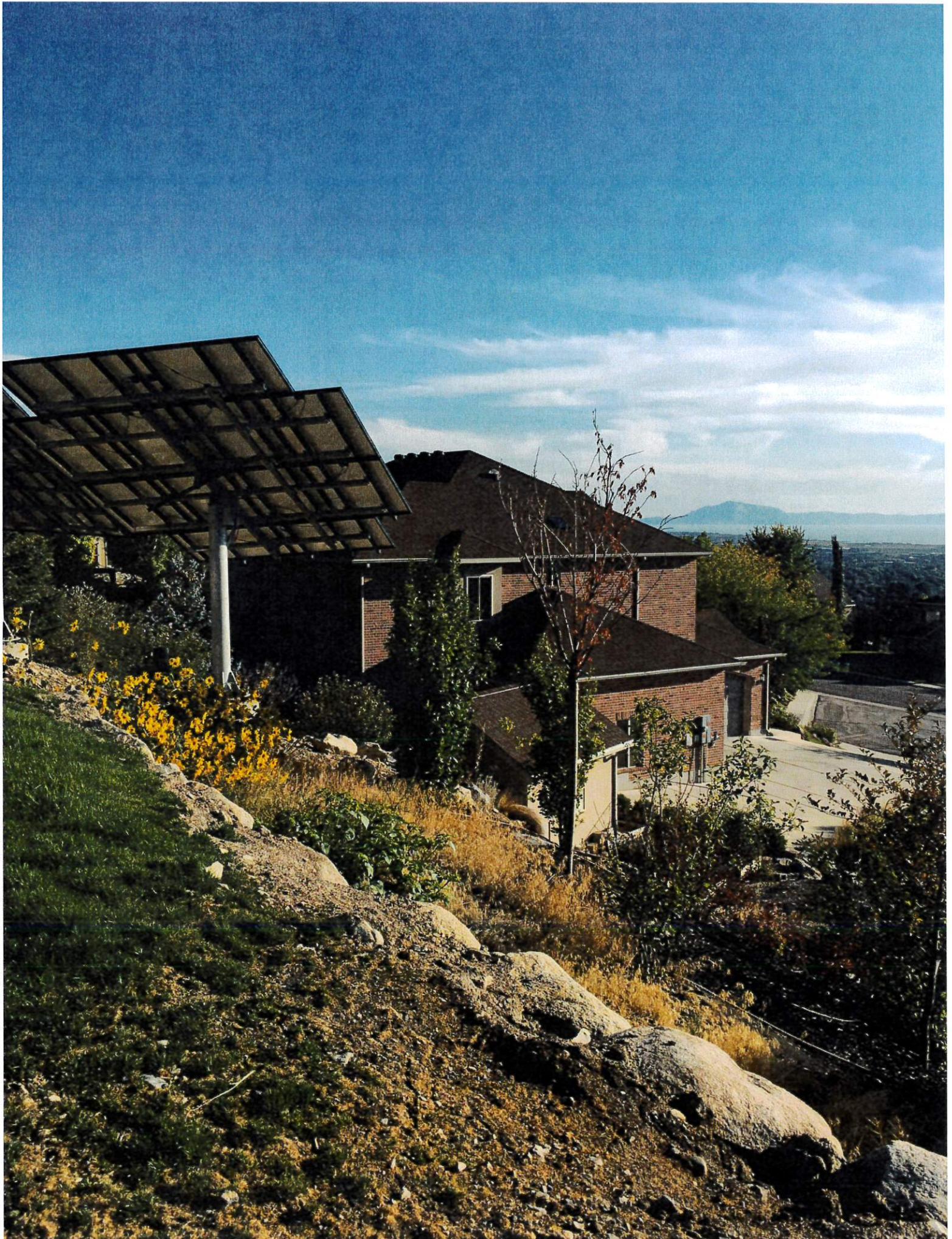
10-5-38: Renewable Energy Systems

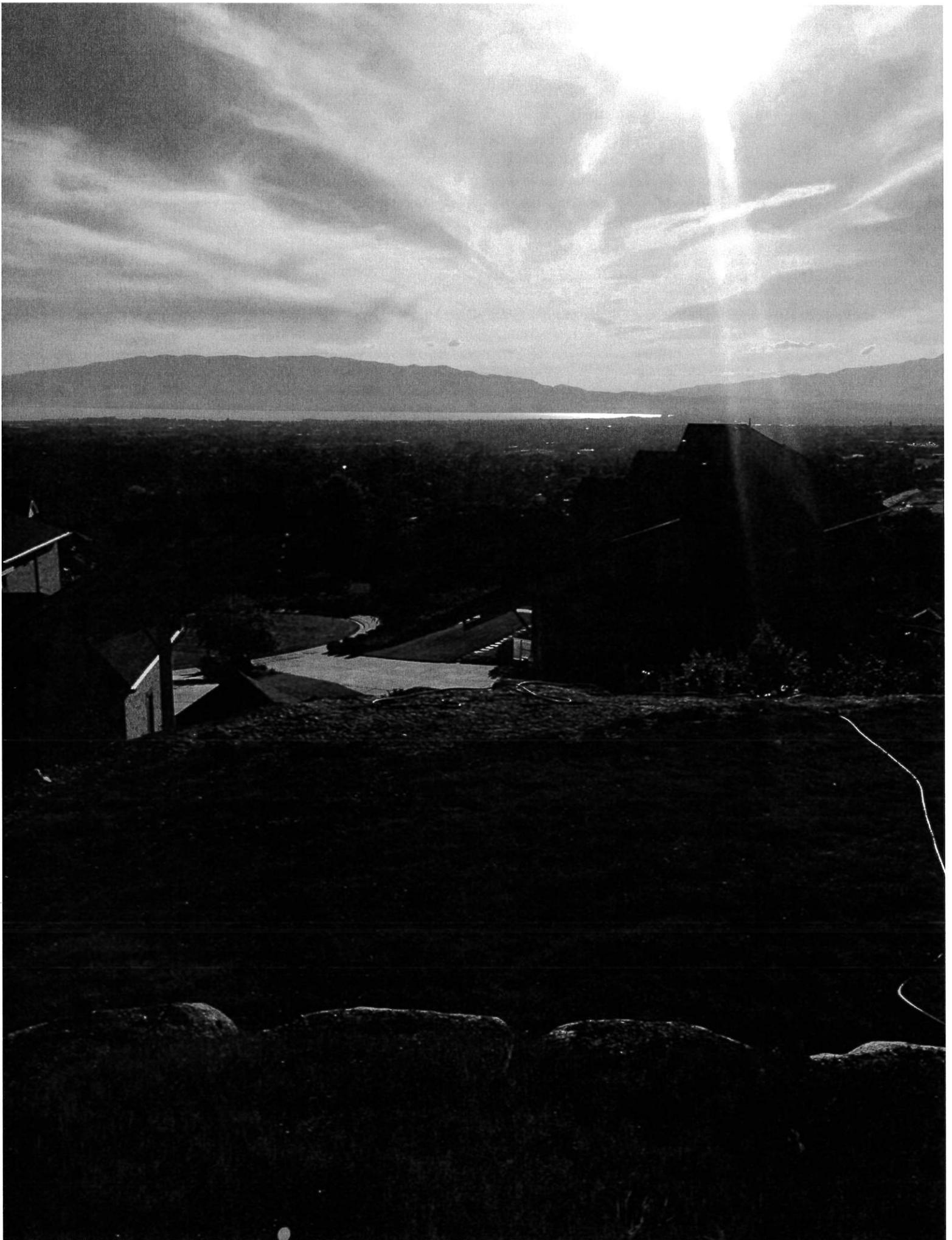
3. Ground Mounted Solar Energy Systems:

- a. Setback: Setbacks for ground mounted solar energy systems shall be the same as accessory structures found in [chapter 4](#) of this title fifteen feet (15'). For systems exceeding ten feet (10') in height, an additional two feet (2') of setback shall be required for each foot past 10'. Setback shall be measured from nearest property line to the edge of panel or base, whichever is nearest to the property line. And Ground mounted systems are prohibited within the front yard area and street side yard enclosure areas.
 - b. Height: The maximum height allowed for ground mounted solar energy systems is twenty feet (20') measured from the surrounding natural grade to the highest point of the system.
 - c. Square Footage: Ground mounted solar energy systems shall not exceed one hundred square feet (100' SF) per mount.
 - d. e. Fencing: Ground mounted solar energy systems shall be enclosed by a fence according to the provisions of section [10-5-18](#) of this chapter.
4. Solar Easement: Solar easements are not a requirement for city approval; nonetheless, a property owner who has installed or intends to install a solar energy system may negotiate a solar easement with adjacent property owners to ensure perpetual sun on the property. Any easement agreed upon must be recorded by the county recorder, with a copy provided to the city.





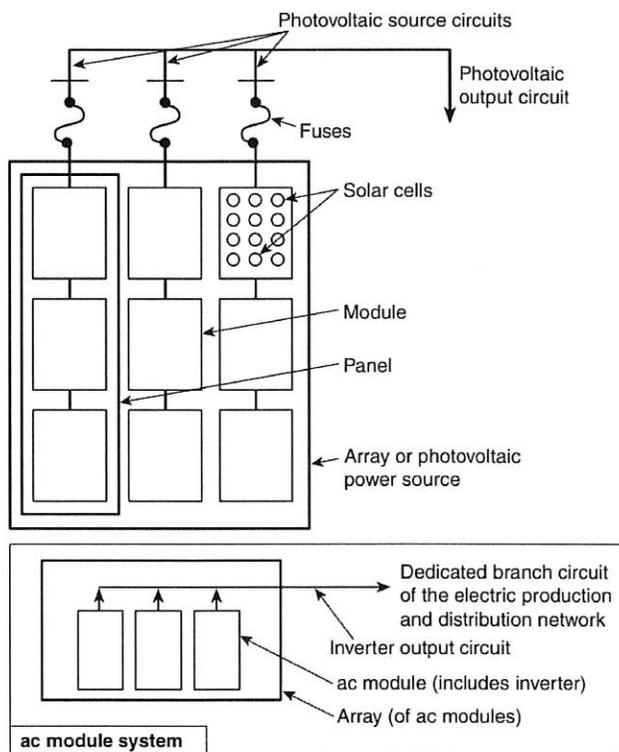




ARTICLE 690
Solar Photovoltaic (PV) Systems

I. General

690.1 Scope. The provisions of this article apply to solar PV electrical energy systems, including the array circuit(s), inverter(s), and controller(s) for such systems. [See Figure 690.1(a) and Figure 690.1(b).] Solar PV systems covered by this article may be interactive with other electrical power production sources or stand-alone, with or without electrical energy storage such as batteries. These systems may have ac or dc output for utilization.



Notes:

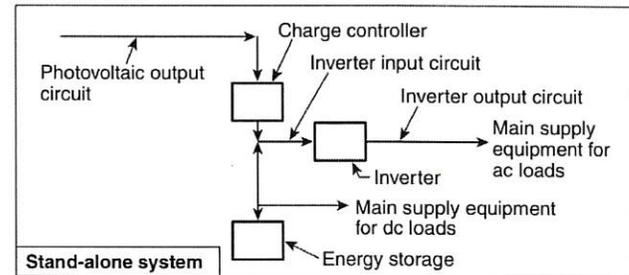
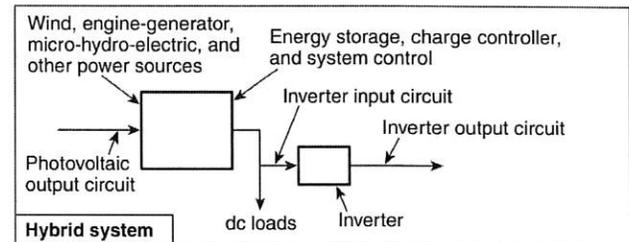
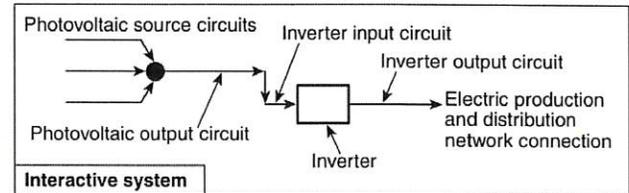
1. These diagrams are intended to be a means of identification for photovoltaic system components, circuits, and connections.
2. Disconnecting means required by Article 690, Part III, are not shown.
3. System grounding and equipment grounding are not shown. See Article 690, Part V.

Figure 690.1(a) Identification of Solar Photovoltaic System Components.

690.2 Definitions.

Alternating-Current (ac) Module (Alternating-Current Photovoltaic Module). A complete, environmentally protected unit consisting of solar cells, optics, inverter, and other components, exclusive of tracker, designed to generate ac power when exposed to sunlight.

Array. A mechanically integrated assembly of modules or panels with a support structure and foundation, tracker, and other components, as required, to form a direct-current power-producing unit.



Notes:

1. These diagrams are intended to be a means of identification for photovoltaic system components, circuits, and connections.
2. Disconnecting means and overcurrent protection required by Article 690, Part III, are not shown.
3. System grounding and equipment grounding are not shown. See Article 690, Part V.
4. Custom designs occur in each configuration, and some components are optional.

Figure 690.1(b) Identification of Solar Photovoltaic System Components in Common System Configurations.

Bipolar Photovoltaic Array. A PV array that has two outputs, each having opposite polarity to a common reference point or center tap.

Blocking Diode. A diode used to block reverse flow of current into a PV source circuit.

Building Integrated Photovoltaics. Photovoltaic cells, devices, modules, or modular materials that are integrated into the outer surface or structure of a building and serve as the outer protective surface of that building.

DC-to-DC Converter. A device installed in the PV source circuit or PV output circuit that can provide an output dc voltage and current at a higher or lower value than the input dc voltage and current.

Direct-Current (dc) Combiner. A device used in the PV source and PV output circuits to combine two or more dc circuit inputs and provide one dc circuit output.

Diversion Charge Controller. Equipment that regulates the charging process of a battery by diverting power from energy storage to direct-current or alternating-current loads or to an interconnected utility service.

Electrical Production and Distribution Network. A power production, distribution, and utilization system, such as a utility system and connected loads, that is external to and not controlled by the PV power system.

Interactive System. A solar PV system that operates in parallel with and may deliver power to an electrical production and distribution network. For the purpose of this definition, an energy storage subsystem of a solar PV system, such as a battery, is not another electrical production source.

Inverter. Equipment that is used to change voltage level or waveform, or both, of electrical energy. Commonly, an inverter [also known as a power conditioning unit (PCU) or power conversion system (PCS)] is a device that changes dc input to an ac output. Inverters may also function as battery chargers that use alternating current from another source and convert it into direct current for charging batteries.

Inverter Input Circuit. Conductors between the inverter and the battery in stand-alone systems or the conductors between the inverter and the PV output circuits for electrical production and distribution network.

Inverter Output Circuit. Conductors between the inverter and an ac panelboard for stand-alone systems or the conductors between the inverter and the service equipment or another electric power production source, such as a utility, for electrical production and distribution network.

Module. A complete, environmentally protected unit consisting of solar cells, optics, and other components, exclusive of tracker, designed to generate dc power when exposed to sunlight.

Monopole Subarray. A PV subarray that has two conductors in the output circuit, one positive (+) and one negative(-). Two monopole PV subarrays are used to form a bipolar PV array.

Multimode Inverter. Equipment having the capabilities of both the utility-interactive inverter and the stand-alone inverter.

Panel. A collection of modules mechanically fastened together, wired, and designed to provide a field-installable unit.

Photovoltaic Output Circuit. Circuit conductors between the PV source circuit(s) and the inverter or dc utilization equipment.

Photovoltaic Power Source. An array or aggregate of arrays that generates dc power at system voltage and current.

Photovoltaic Source Circuit. Circuits between modules and from modules to the common connection point(s) of the dc system.

Photovoltaic System Voltage. The direct current (dc) voltage of any PV source or PV output circuit. For multiwire installations, the PV system voltage is the highest voltage between any two dc conductors.

Solar Cell. The basic PV device that generates electricity when exposed to light.

Stand-Alone System. A solar PV system that supplies power independently of an electrical production and distribution network.

Subarray. An electrical subset of a PV array.

690.3 Other Articles. Wherever the requirements of other articles of this Code and Article 690 differ, the requirements of Article 690 shall apply and, if the system is operated in parallel with a primary source(s) of electricity, the requirements in 705.14, 705.16, 705.32, and 705.143 shall apply.

Exception: Solar PV systems, equipment, or wiring installed in a hazardous (classified) location shall also comply with the applicable portions of Articles 500 through 516.

690.4 General Requirements.

(A) Photovoltaic Systems. Photovoltaic systems shall be permitted to supply a building or other structure in addition to any other electrical supply system(s).

(B) Equipment. Inverters, motor generators, PV modules, PV panels, ac PV modules, dc combiners, dc-to-dc converters, and charge controllers intended for use in PV power systems shall be listed for the PV application.

(C) Qualified Personnel. The installation of equipment and all associated wiring and interconnections shall be performed only by qualified persons.

Informational Note: See Article 100 for the definition of qualified person.

(D) Multiple Inverters. A PV system shall be permitted to have multiple inverters installed in or on a single building or structure. Where the inverters are remotely located from each other, a directory in accordance with 705.10 shall be installed at each dc PV system disconnecting means, at each ac disconnecting means, and at the main service dis-

connecting means showing the location of all ac and dc PV system disconnecting means in the building.

Exception: A directory shall not be required where all inverters and PV dc disconnecting means are grouped at the main service disconnecting means.

690.5 Ground-Fault Protection. Grounded dc PV arrays shall be provided with dc ground-fault protection meeting the requirements of 690.5(A) through (C) to reduce fire hazards. Ungrounded dc PV arrays shall comply with 690.35.

Exception: Ground-mounted or pole-mounted PV arrays with not more than two paralleled source circuits and with all dc source and dc output circuits isolated from buildings shall be permitted without ground-fault protection.

(A) Ground-Fault Detection and Interruption. The ground fault protection device or system shall:

- (1) Be capable of detecting a ground fault in the PV array dc current-carrying conductors and components, including any intentionally grounded conductors,
- (2) Interrupt the flow of fault current
- (3) Provide an indication of the fault, and
- (4) Be listed for providing PV ground-fault protection

Automatically opening the grounded conductor for measurement purposes or to interrupt the ground-fault current path shall be permitted. If a grounded conductor is opened to interrupt the ground-fault current path, all conductors of the faulted circuit shall be automatically and simultaneously opened.

Manual operation of the main PV dc disconnect shall not activate the ground-fault protection device or result in grounded conductors becoming ungrounded.

(B) Isolating Faulted Circuits. The faulted circuits shall be isolated by one of the two following methods:

- (1) The ungrounded conductors of the faulted circuit shall be automatically disconnected.
- (2) The inverter or charge controller fed by the faulted circuit shall automatically cease to supply power to output circuits.

(C) Labels and Markings. A warning label shall appear on the utility-interactive inverter or be applied by the installer near the ground-fault indicator at a visible location, stating the following:

WARNING
ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED,
NORMALLY GROUNDED CONDUCTORS MAY
BE UNGROUNDED AND ENERGIZED

When the PV system also has batteries, the same warning shall also be applied by the installer in a visible location at the batteries. The warning sign(s) or label(s) shall comply with 110.21(B).

690.6 Alternating-Current (ac) Modules.

(A) Photovoltaic Source Circuits. The requirements of Article 690 pertaining to PV source circuits shall not apply to ac modules. The PV source circuit, conductors, and inverters shall be considered as internal wiring of an ac module.

(B) Inverter Output Circuit. The output of an ac module shall be considered an inverter output circuit.

(C) Disconnecting Means. A single disconnecting means, in accordance with 690.15 and 690.17, shall be permitted for the combined ac output of one or more ac modules. Additionally, each ac module in a multiple ac module system shall be provided with a connector, bolted, or terminal-type disconnecting means.

(D) Overcurrent Protection. The output circuits of ac modules shall be permitted to have overcurrent protection and conductor sizing in accordance with 240.5(B)(2).

II. Circuit Requirements

690.7 Maximum Voltage.

(A) Maximum Photovoltaic System Voltage. In a dc PV source circuit or output circuit, the maximum PV system voltage for that circuit shall be calculated as the sum of the rated open-circuit voltage of the series-connected PV modules corrected for the lowest expected ambient temperature. For crystalline and multicrystalline silicon modules, the rated open-circuit voltage shall be multiplied by the correction factor provided in Table 690.7. This voltage shall be used to determine the voltage rating of cables, disconnects, overcurrent devices, and other equipment. Where the lowest expected ambient temperature is below -40°C (-40°F), or where other than crystalline or multicrystalline silicon PV modules are used, the system voltage adjustment shall be made in accordance with the manufacturer's instructions.

When open-circuit voltage temperature coefficients are supplied in the instructions for listed PV modules, they shall be used to calculate the maximum PV system voltage as required by 110.3(B) instead of using Table 690.7.

Informational Note: One source for statistically valid, lowest-expected, ambient temperature design data for various locations is the Extreme Annual Mean Minimum Design Dry Bulb Temperature found in the *ASHRAE Handbook — Fundamentals*. These temperature data can be used to calculate maximum voltage using the manufacturer's temperature coefficients relative to the rating temperature of 25°C .

Table 690.7 Voltage Correction Factors for Crystalline and Multicrystalline Silicon Modules

Correction Factors for Ambient Temperatures Below 25°C (77°F). (Multiply the rated open circuit voltage by the appropriate correction factor shown below.)		
Ambient Temperature (°C)	Factor	Ambient Temperature (°F)
24 to 20	1.02	76 to 68
19 to 15	1.04	67 to 59
14 to 10	1.06	58 to 50
9 to 5	1.08	49 to 41
4 to 0	1.10	40 to 32
-1 to -5	1.12	31 to 23
-6 to -10	1.14	22 to 14
-11 to -15	1.16	13 to 5
-16 to -20	1.18	4 to -4
-21 to -25	1.20	-5 to -13
-26 to -30	1.21	-14 to -22
-31 to -35	1.23	-23 to -31
-36 to -40	1.25	-32 to -40

(B) Direct-Current Utilization Circuits. The voltage of dc utilization circuits shall conform to 210.6.

(C) Photovoltaic Source and Output Circuits. In one- and two-family dwellings, PV source circuits and PV output circuits that do not include lampholders, fixtures, or receptacles shall be permitted to have a maximum PV system voltage up to 600 volts. Other installations with a maximum PV system voltage over 1000 volts shall comply with Article 690, Part IX.

(D) Circuits over 150 Volts to Ground. In one- and two-family dwellings, live parts in PV source circuits and PV output circuits over 150 volts to ground shall not be accessible to other than qualified persons while energized.

Informational Note: See 110.27 for guarding of live parts, and 210.6 for voltage to ground and between conductors.

(E) Bipolar Source and Output Circuits. For 2-wire circuits connected to bipolar systems, the maximum system voltage shall be the highest voltage between the conductors of the 2-wire circuit if all of the following conditions apply:

- (1) One conductor of each circuit of a bipolar subarray is solidly grounded.

Exception: The operation of ground-fault or arc-fault devices (abnormal operation) shall be permitted to interrupt this connection to ground when the entire bipolar array becomes two distinct arrays isolated from each other and the utilization equipment.

- (2) Each circuit is connected to a separate subarray.
- (3) The equipment is clearly marked with a label as follows:

WARNING
BIPOLAR PHOTOVOLTAIC ARRAY.
DISCONNECTION OF NEUTRAL
OR GROUNDED CONDUCTORS
MAY RESULT IN OVERVOLTAGE
ON ARRAY OR INVERTER.

The warning sign(s) or label(s) shall comply with 110.21(B).

690.8 Circuit Sizing and Current.

(A) Calculation of Maximum Circuit Current. The maximum current for the specific circuit shall be calculated in accordance with 690.8(A)(1) through (A)(5).

Informational Note: Where the requirements of 690.8(A)(1) and (B)(1) are both applied, the resulting multiplication factor is 156 percent.

(1) Photovoltaic Source Circuit Currents. The maximum current shall be the sum of parallel module rated short-circuit currents multiplied by 125 percent.

(2) Photovoltaic Output Circuit Currents. The maximum current shall be the sum of parallel source circuit maximum currents as calculated in 690.8(A)(1).

(3) Inverter Output Circuit Current. The maximum current shall be the inverter continuous output current rating.

(4) Stand-Alone Inverter Input Circuit Current. The maximum current shall be the stand-alone continuous inverter input current rating when the inverter is producing rated power at the lowest input voltage.

(5) DC-to-DC Converter Output Current. The maximum current shall be the dc-to-dc converter continuous output current rating.

(B) Conductor Ampacity. PV system currents shall be considered to be continuous. Circuit conductors shall be sized to carry not less than the larger of 690.8(B)(1) or (2).

(1) One hundred and twenty-five percent of the maximum currents calculated in 690.8(A) before the application of adjustment and correction factors.

Exception: Circuits containing an assembly, together with its overcurrent device(s), that is listed for continuous operation at 100 percent of its rating shall be permitted to be used at 100 percent of its rating.



(2) The maximum currents calculated in 690.8(A) after the application of adjustment and correction factors.

(C) **Systems with Multiple Direct-Current Voltages.** For a PV power source that has multiple output circuit voltages and employs a common-return conductor, the ampacity of the common-return conductor shall not be less than the sum of the ampere ratings of the overcurrent devices of the individual output circuits.

(D) **Sizing of Module Interconnection Conductors.** Where a single overcurrent device is used to protect a set of two or more parallel-connected module circuits, the ampacity of each of the module interconnection conductors shall not be less than the sum of the rating of the single overcurrent device plus 125 percent of the short-circuit current from the other parallel-connected modules.

690.9 Overcurrent Protection.

(A) **Circuits and Equipment.** PV source circuit, PV output circuit, inverter output circuit, and storage battery circuit conductors and equipment shall be protected in accordance with the requirements of Article 240. Protection devices for PV source circuits and PV output circuits shall be in accordance with the requirements of 690.9(B) through (E). Circuits, either ac or dc, connected to current-limited supplies (e.g., PV modules, ac output of utility-interactive inverters), and also connected to sources having significantly higher current availability (e.g., parallel strings of modules, utility power), shall be protected at the source from overcurrent.

Exception: An overcurrent device shall not be required for PV modules or PV source circuit conductors sized in accordance with 690.8(B) where one of the following applies:

(a) *There are no external sources such as parallel-connected source circuits, batteries, or backfeed from inverters.*

(b) *The short-circuit currents from all sources do not exceed the ampacity of the conductors and the maximum overcurrent protective device size rating specified on the PV module nameplate.*

(B) **Overcurrent Device Ratings.** Overcurrent device ratings shall be not less than 125 percent of the maximum currents calculated in 690.8(A).

Exception: Circuits containing an assembly, together with its overcurrent device(s), that is listed for continuous operation at 100 percent of its rating shall be permitted to be used at 100 percent of its rating.

(C) **Direct-Current Rating.** Overcurrent devices, either fuses or circuit breakers, used in any dc portion of a PV power system shall be listed and shall have the appropriate voltage, current, and interrupt ratings.

(D) **Photovoltaic Source and Output Circuits.** Listed PV overcurrent devices shall be required to provide overcurrent protection in PV source and output circuits. The overcurrent devices shall be accessible but shall not be required to be readily accessible.

(E) **Series Overcurrent Protection.** In grounded PV source circuits, a single overcurrent protection device, where required, shall be permitted to protect the PV modules and the interconnecting conductors. In ungrounded PV source circuits complying with 690.35, an overcurrent protection device, where required, shall be installed in each ungrounded circuit conductor and shall be permitted to protect the PV modules and the interconnecting cables.

(F) **Power Transformers.** Overcurrent protection for a transformer with a source(s) on each side shall be provided in accordance with 450.3 by considering first one side of the transformer, then the other side of the transformer, as the primary.

Exception: A power transformer with a current rating on the side connected toward the utility-interactive inverter output, not less than the rated continuous output current of the inverter, shall be permitted without overcurrent protection from the inverter.

690.10 Stand-Alone Systems. The premises wiring system shall be adequate to meet the requirements of this Code for a similar installation connected to a service. The wiring on the supply side of the building or structure disconnecting means shall comply with the requirements of this Code, except as modified by 690.10(A) through (E).

(A) **Inverter Output.** The ac output from a stand-alone inverter(s) shall be permitted to supply ac power to the building or structure disconnecting means at current levels less than the calculated load connected to that disconnect. The inverter output rating or the rating of an alternate energy source shall be equal to or greater than the load posed by the largest single utilization equipment connected to the system. Calculated general lighting loads shall not be considered as a single load.

(B) **Sizing and Protection.** The circuit conductors between the inverter output and the building or structure disconnecting means shall be sized based on the output rating of the inverter. These conductors shall be protected from overcurrents in accordance with Article 240. The overcurrent protection shall be located at the output of the inverter.

(C) Single 120-Volt Supply. The inverter output of a stand-alone solar PV system shall be permitted to supply 120 volts to single-phase, 3-wire, 120/240-volt service equipment or distribution panels where there are no 240-volt outlets and where there are no multiwire branch circuits. In all installations, the rating of the overcurrent device connected to the output of the inverter shall be less than the rating of the neutral bus in the service equipment. This equipment shall be marked with the following words or equivalent:

WARNING

**SINGLE 120-VOLT SUPPLY. DO NOT CONNECT
MULTIWIRE BRANCH CIRCUITS!**

The warning sign(s) or label(s) shall comply with 110.21(B).

(D) Energy Storage or Backup Power System Requirements. Energy storage or backup power supplies are not required.

(E) Back-Fed Circuit Breakers. Plug-in type back-fed circuit breakers connected to a stand-alone or multimode inverter output in stand-alone systems shall be secured in accordance with 408.36(D). Circuit breakers marked “line” and “load” shall not be back-fed.

690.11 Arc-Fault Circuit Protection (Direct Current). Photovoltaic systems with dc source circuits, dc output circuits, or both, operating at a PV system maximum system voltage of 80 volts or greater, shall be protected by a listed (dc) arc-fault circuit interrupter, PV type, or other system components listed to provide equivalent protection. The PV arc-fault protection means shall comply with the following requirements:

- (1) The system shall detect and interrupt arcing faults resulting from a failure in the intended continuity of a conductor, connection, module, or other system component in the dc PV source and dc PV output circuits.
- (2) The system shall require that the disabled or disconnected equipment be manually restarted.
- (3) The system shall have an annunciator that provides a visual indication that the circuit interrupter has operated. This indication shall not reset automatically.

690.12 Rapid Shutdown of PV Systems on Buildings. PV system circuits installed on or in buildings shall include a rapid shutdown function that controls specific conductors in accordance with 690.12(1) through (5) as follows.

- (1) Requirements for controlled conductors shall apply only to PV system conductors of more than 1.5 m (5 ft) in length inside a building, or more than 3 m (10 ft) from a PV array.

- (2) Controlled conductors shall be limited to not more than 30 volts and 240 volt-amperes within 10 seconds of rapid shutdown initiation.
- (3) Voltage and power shall be measured between any two conductors and between any conductor and ground.
- (4) The rapid shutdown initiation methods shall be labeled in accordance with 690.56(C).
- (5) Equipment that performs the rapid shutdown shall be listed and identified.

III. Disconnecting Means

690.13 Building or Other Structure Supplied by a Photovoltaic System. Means shall be provided to disconnect all ungrounded dc conductors of a PV system from all other conductors in a building or other structure.

(A) Location. The PV disconnecting means shall be installed at a readily accessible location either on the outside of a building or structure or inside nearest the point of entrance of the system conductors.

Exception: Installations that comply with 690.31(G) shall be permitted to have the disconnecting means located remote from the point of entry of the system conductors.

The PV system disconnecting means shall not be installed in bathrooms.

(B) Marking. Each PV system disconnecting means shall be permanently marked to identify it as a PV system disconnect.

(C) Suitable for Use. Each PV system disconnecting means shall not be required to be suitable as service equipment.

(D) Maximum Number of Disconnects. The PV system disconnecting means shall consist of not more than six switches or six circuit breakers mounted in a single enclosure or in a group of separate enclosures.

(E) Grouping. The PV system disconnecting means shall be grouped with other disconnecting means for the system in accordance with 690.13(D). A PV disconnecting means shall not be required at the PV module or array location.

690.15 Disconnection of Photovoltaic Equipment. Means shall be provided to disconnect equipment, such as inverters, batteries, and charge controllers, from all ungrounded conductors of all sources. If the equipment is energized from more than one source, the disconnecting means shall be grouped and identified.



A single disconnecting means in accordance with 690.17 shall be permitted for the combined ac output of one or more inverters or ac modules in an interactive system.

(A) Utility-Interactive Inverters Mounted in Not Readily Accessible Locations. Utility-interactive inverters shall be permitted to be mounted on roofs or other exterior areas that are not readily accessible and shall comply with 690.15(A)(1) through (4):

- (1) A dc PV disconnecting means shall be mounted within sight of or in each inverter.
- (2) An ac disconnecting means shall be mounted within sight of or in each inverter.
- (3) The ac output conductors from the inverter and an additional ac disconnecting means for the inverter shall comply with 690.13(A).
- (4) A plaque shall be installed in accordance with 705.10.

(B) Equipment. Equipment such as PV source circuit isolating switches, overcurrent devices, dc-to-dc converters, and blocking diodes shall be permitted on the PV side of the PV disconnecting means.

(C) Direct-Current Combiner Disconnects. The dc output of dc combiners mounted on roofs of dwellings or other buildings shall have a load break disconnecting means located in the combiner or within 1.8 m (6 ft) of the combiner. The disconnecting means shall be permitted to be remotely controlled but shall be manually operable locally when control power is not available.

690.16 Fuses.

(A) Disconnecting Means. Disconnecting means shall be provided to disconnect a fuse from all sources of supply if the fuse is energized from both directions. Such a fuse in a PV source circuit shall be capable of being disconnected independently of fuses in other PV source circuits.

(B) Fuse Servicing. Disconnecting means shall be installed on PV output circuits where overcurrent devices (fuses) must be serviced that cannot be isolated from energized circuits. The disconnecting means shall be within sight of, and accessible to, the location of the fuse or integral with fuse holder and shall comply with 690.17. Where the disconnecting means are located more than 1.8 m (6 ft) from the overcurrent device, a directory showing the location of each disconnect shall be installed at the overcurrent device location.

Non-load-break-rated disconnecting means shall be marked "Do not open under load."

690.17 Disconnect Type.

(A) Manually Operable. The disconnecting means for ungrounded PV conductors shall consist of a manually operable switch(es) or circuit breaker(s). The disconnecting means shall be permitted to be power operable with provisions for manual operation in the event of a power-supply failure. The disconnecting means shall be one of the following listed devices:

- (1) A PV industrial control switch marked for use in PV systems
- (2) A PV molded-case circuit breaker marked for use in PV systems
- (3) A PV molded-case switch marked for use in PV systems
- (4) A PV enclosed switch marked for use in PV systems
- (5) A PV open-type switch marked for use in PV systems
- (6) A dc-rated molded-case circuit breaker suitable for backfeed operation
- (7) A dc-rated molded-case switch suitable for backfeed operation
- (8) A dc-rated enclosed switch
- (9) A dc-rated open-type switch
- (10) A dc-rated rated low-voltage power circuit breaker

Informational Note: Devices marked with "line" and "load" are not suitable for backfeed or reverse current.

(B) Simultaneous Opening of Poles. The PV disconnecting means shall simultaneously disconnect all ungrounded supply conductors.

(C) Externally Operable and Indicating. The PV disconnecting means shall be externally operable without exposing the operator to contact with live parts and shall indicate whether in the open or closed position.

(D) Disconnection of Grounded Conductor. A switch, circuit breaker, or other device shall not be installed in a grounded conductor if operation of that switch, circuit breaker, or other device leaves the marked, grounded conductor in an ungrounded and energized state.

Exception No. 1: A switch or circuit breaker that is part of a ground-fault detection system required by 690.5, or that is part of an arc-fault detection/interruption system required by 690.11, shall be permitted to open the grounded conductor when that switch or circuit breaker is automatically opened as a normal function of the device in responding to ground faults.

Exception No. 2: A disconnecting switch shall be permitted in a grounded conductor if all of the following conditions are met:

- (1) *The switch is used only for PV array maintenance.*
- (2) *The switch is accessible only by qualified persons.*
- (3) *The switch is rated for the maximum dc voltage and current that could be present during any operation, including ground-fault conditions.*

(E) Interrupting Rating. The building or structure disconnecting means shall have an interrupting rating sufficient for the maximum circuit voltage and current that is available at the line terminals of the equipment. Where all terminals of the disconnecting means may be energized in the open position, a warning sign shall be mounted on or adjacent to the disconnecting means. The sign shall be clearly legible and have the following words or equivalent:

WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS.
TERMINALS ON BOTH THE LINE
AND LOAD SIDES MAY BE ENERGIZED IN THE
OPEN POSITION.

The warning sign(s) or label(s) shall comply with 110.21(B).

Exception: A connector shall be permitted to be used as an ac or a dc disconnecting means, provided that it complies with the requirements of 690.33 and is listed and identified for use with specific equipment.

690.18 Installation and Service of an Array. Open circuiting, short circuiting, or opaque covering shall be used to disable an array or portions of an array for installation and service.

Informational Note: Photovoltaic modules are energized while exposed to light. Installation, replacement, or servicing of array components while a module(s) is energized may expose persons to electric shock.

IV. Wiring Methods

690.31 Methods Permitted.

(A) Wiring Systems. All raceway and cable wiring methods included in this *Code*, other wiring systems and fittings specifically listed for use on PV arrays, and wiring as part of a listed system shall be permitted. Where wiring devices with integral enclosures are used, sufficient length of cable shall be provided to facilitate replacement.

Where PV source and output circuits operating at maximum system voltages greater than 30 volts are installed in

readily accessible locations, circuit conductors shall be guarded or installed in a raceway.

Informational Note: Photovoltaic modules operate at elevated temperatures when exposed to high ambient temperatures and to bright sunlight. These temperatures routinely exceed 70°C (158°F) in many locations. Module interconnection conductors are available with insulation rated for wet locations and a temperature rating of 90°C (194°F) or greater.

(B) Identification and Grouping. PV source circuits and PV output circuits shall not be contained in the same raceway, cable tray, cable, outlet box, junction box, or similar fitting as conductors, feeders, branch circuits of other non-PV systems, or inverter output circuits, unless the conductors of the different systems are separated by a partition. PV system conductors shall be identified and grouped as required by 690.31(B)(1) through (4). The means of identification shall be permitted by separate color coding, marking tape, tagging, or other approved means.

(1) PV Source Circuits. PV source circuits shall be identified at all points of termination, connection, and splices.

(2) PV Output and Inverter Circuits. The conductors of PV output circuits and inverter input and output circuits shall be identified at all points of termination, connection, and splices.

(3) Conductors of Multiple Systems. Where the conductors of more than one PV system occupy the same junction box, raceway, or equipment, the conductors of each system shall be identified at all termination, connection, and splice points.

Exception: Where the identification of the conductors is evident by spacing or arrangement, further identification shall not be required.

(4) Grouping. Where the conductors of more than one PV system occupy the same junction box or raceway with a removable cover(s), the ac and dc conductors of each system shall be grouped separately by cable ties or similar means at least once and shall then be grouped at intervals not to exceed 1.8 m (6 ft).

Exception: The requirement for grouping shall not apply if the circuit enters from a cable or raceway unique to the circuit that makes the grouping obvious.

(C) Single-Conductor Cable.

(1) General. Single-conductor cable Type USE-2, and single-conductor cable listed and labeled as photovoltaic (PV) wire shall be permitted in exposed outdoor locations in PV source circuits for PV module interconnections within the PV array.

Exception: Raceways shall be used when required by 690.31(A).

(2) **Cable Tray.** PV source circuits and PV output circuits using single-conductor cable listed and labeled as photovoltaic (PV) wire of all sizes, with or without a cable tray marking/rating, shall be permitted in cable trays installed in outdoor locations, provided that the cables are supported at intervals not to exceed 300 mm (12 in.) and secured at intervals not to exceed 1.4 m (4.5 ft).

Informational Note: Photovoltaic wire and PV cable have a nonstandard outer diameter. See Table 1 of Chapter 9 for conduit fill calculations.

(D) **Multiconductor Cable.** Multiconductor cable Type TC-ER or Type USE-2 shall be permitted in outdoor locations in PV inverter output circuits where used with utility-interactive inverters mounted in locations that are not readily accessible. The cable shall be secured at intervals not exceeding 1.8 m (6 ft). Equipment grounding for the utilization equipment shall be provided by an equipment grounding conductor within the cable.

(E) **Flexible Cords and Cables.** Flexible cords and cables, where used to connect the moving parts of tracking PV modules, shall comply with Article 400 and shall be of a type identified as a hard service cord or portable power cable; they shall be suitable for extra-hard usage, listed for outdoor use, water resistant, and sunlight resistant. Allowable ampacities shall be in accordance with 400.5. For ambient temperatures exceeding 30°C (86°F), the ampacities shall be derated by the appropriate factors given in Table 690.31(E).

(F) **Small-Conductor Cables.** Single-conductor cables listed for outdoor use that are sunlight resistant and moisture resistant in sizes 16 AWG and 18 AWG shall be permitted for module interconnections where such cables meet the ampacity requirements of 400.5. Section 310.15 shall be used to determine the cable ampacity adjustment and correction factors.

(G) **Direct-Current Photovoltaic Source and Direct-Current Output Circuits on or Inside a Building.** Where dc PV source or dc PV output circuits from building-integrated systems or other PV systems are run inside a building or structure, they shall be contained in metal raceways, Type MC metal-clad cable that complies with 250.118(10), or metal enclosures from the point of penetration of the surface of the building or structure to the first readily accessible disconnecting means. The disconnecting means shall comply with 690.13(B) and (C) and 690.15(A) and (B). The wiring methods shall comply with the additional installation requirements in 690.31(G)(1) through (4).

(1) **Embedded in Building Surfaces.** Where circuits are embedded in built-up, laminate, or membrane roofing materials in roof areas not covered by PV modules and associated equipment, the location of circuits shall be clearly marked using a marking protocol that is approved as being suitable for continuous exposure to sunlight and weather.

(2) **Flexible Wiring Methods.** Where flexible metal conduit (FMC) smaller than metric designator 21 (trade size ¾) or Type MC cable smaller than 25 mm (1 in.) in diameter containing PV power circuit conductors is installed across ceilings or floor joists, the raceway or cable shall be protected by substantial guard strips that are at least as high as the raceway or cable. Where run exposed, other than within 1.8 m (6 ft) of their connection to equipment, these wiring methods shall closely follow the building surface or be protected from physical damage by an approved means.

(3) **Marking and Labeling Required.** The following wiring methods and enclosures that contain PV power source conductors shall be marked with the wording **WARNING: PHOTOVOLTAIC POWER SOURCE** by means of permanently affixed labels or other approved permanent marking:

- (1) Exposed raceways, cable trays, and other wiring methods
- (2) Covers or enclosures of pull boxes and junction boxes
- (3) Conduit bodies in which any of the available conduit openings are unused

Table 690.31(E) Correction Factors

Ambient Temperature (°C)	Temperature Rating of Conductor				Ambient Temperature (°F)
	60°C (140°F)	75°C (167°F)	90°C (194°F)	105°C (221°F)	
30	1.00	1.00	1.00	1.00	86
31–35	0.91	0.94	0.96	0.97	87–95
36–40	0.82	0.88	0.91	0.93	96–104
41–45	0.71	0.82	0.87	0.89	105–113
46–50	0.58	0.75	0.82	0.86	114–122
51–55	0.41	0.67	0.76	0.82	123–131
56–60	—	0.58	0.71	0.77	132–140
61–70	—	0.33	0.58	0.68	141–158
71–80	—	—	0.41	0.58	159–176



(4) Marking and Labeling Methods and Locations. The labels or markings shall be visible after installation. The labels shall be reflective, and all letters shall be capitalized and shall be a minimum height of 9.5 mm ($\frac{3}{8}$ in.) in white on a red background. PV power circuit labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors. Spacing between labels or markings, or between a label and a marking, shall not be more than 3 m (10 ft). Labels required by this section shall be suitable for the environment where they are installed.

(H) Flexible, Fine-Stranded Cables. Flexible, fine-stranded cables shall be terminated only with terminals, lugs, devices, or connectors in accordance with 110.14.

(I) Bipolar Photovoltaic Systems. Where the sum, without consideration of polarity, of the PV system voltages of the two monopole subarrays exceeds the rating of the conductors and connected equipment, monopole subarrays in a bipolar PV system shall be physically separated, and the electrical output circuits from each monopole subarray shall be installed in separate raceways until connected to the inverter. The disconnecting means and overcurrent protective devices for each monopole subarray output shall be in separate enclosures. All conductors from each separate monopole subarray shall be routed in the same raceway. Bipolar PV systems shall be clearly marked with a permanent, legible warning notice indicating that the disconnection of the grounded conductor(s) may result in overvoltage on the equipment.

Exception: Listed switchgear rated for the maximum voltage between circuits and containing a physical barrier separating the disconnecting means for each monopole subarray shall be permitted to be used instead of disconnecting means in separate enclosures.

(J) Module Connection Arrangement. The connection to a module or panel shall be arranged so that removal of a module or panel from a PV source circuit does not interrupt a grounded conductor connection to other PV source circuits.

690.32 Component Interconnections. Fittings and connectors that are intended to be concealed at the time of on-site assembly, where listed for such use, shall be permitted for on-site interconnection of modules or other array components. Such fittings and connectors shall be equal to the wiring method employed in insulation, temperature rise, and fault-current withstand, and shall be capable of resisting the effects of the environment in which they are used.

690.33 Connectors. The connectors permitted by Article 690 shall comply with 690.33(A) through (E).

(A) Configuration. The connectors shall be polarized and shall have a configuration that is noninterchangeable with receptacles in other electrical systems on the premises.

(B) Guarding. The connectors shall be constructed and installed so as to guard against inadvertent contact with live parts by persons.

(C) Type. The connectors shall be of the latching or locking type. Connectors that are readily accessible and that are used in circuits operating at over 30 volts, nominal, maximum system voltage for dc circuits, or 30 volts for ac circuits, shall require a tool for opening.

(D) Grounding Member. The grounding member shall be the first to make and the last to break contact with the mating connector.

(E) Interruption of Circuit. Connectors shall be either (1) or (2):

- (1) Be rated for interrupting current without hazard to the operator.
- (2) Be a type that requires the use of a tool to open and marked "Do Not Disconnect Under Load" or "Not for Current Interrupting."

690.34 Access to Boxes. Junction, pull, and outlet boxes located behind modules or panels shall be so installed that the wiring contained in them can be rendered accessible directly or by displacement of a module(s) or panel(s) secured by removable fasteners and connected by a flexible wiring system.

690.35 Ungrounded Photovoltaic Power Systems. Photovoltaic power systems shall be permitted to operate with ungrounded PV source and output circuits where the system complies with 690.35(A) through (G).

(A) Disconnects. All PV source and output circuit conductors shall have disconnects complying with 690, Part III.

(B) Overcurrent Protection. All PV source and output circuit conductors shall have overcurrent protection complying with 690.9.

(C) Ground-Fault Protection. All PV source and output circuits shall be provided with a ground-fault protection device or system that complies with 690.35(1) through (4):

- (1) Detects ground fault(s) in the PV array dc current-carrying conductors and components
- (2) Indicates that a ground fault has occurred
- (3) Automatically disconnects all conductors or causes the inverter or charge controller connected to the faulted circuit to automatically cease supplying power to output circuits
- (4) Is listed for providing PV ground-fault protection

(D) Conductors. The PV source conductors shall consist of the following:

- (1) Metallic or nonmetallic jacketed multiconductor cables
- (2) Conductors installed in raceways
- (3) Conductors listed and identified as PV wire installed as exposed, single conductors, or
- (4) Conductors that are direct-buried and identified for direct-burial use

(E) Battery Systems. The PV power system direct-current circuits shall be permitted to be used with ungrounded battery systems complying with 690.71(G).

(F) Marking. The PV power source shall be labeled with the following warning at each junction box, combiner box, disconnect, and device where energized, ungrounded circuits may be exposed during service:

WARNING

ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED.

The warning sign(s) or label(s) shall comply with 110.21(B).

(G) Equipment. The inverters or charge controllers used in systems with ungrounded PV source and output circuits shall be listed for the purpose.

V. Grounding

690.41 System Grounding. Photovoltaic systems shall comply with one of the following:

- (1) Ungrounded systems shall comply with 690.35.
- (2) Grounded two-wire systems shall have one conductor grounded or be impedance grounded, and the system shall comply with 690.5.
- (3) Grounded bipolar systems shall have the reference (center tap) conductor grounded or be impedance grounded, and the system shall comply with 690.5.
- (4) Other methods that accomplish equivalent system protection in accordance with 250.4(A) with equipment listed and identified for the use shall be permitted to be used.

690.42 Point of System Grounding Connection. The dc circuit grounding connection shall be made at any single point on the PV output circuit.

Informational Note: Locating the grounding connection point as close as practicable to the PV source better protects the system from voltage surges due to lightning.

Exception: Systems with a 690.5 ground-fault protection device shall be permitted to have the required grounded

conductor-to-ground bond made by the ground-fault protection device. This bond, where internal to the ground-fault equipment, shall not be duplicated with an external connection.

690.43 Equipment Grounding. Equipment grounding conductors and devices shall comply with 690.43(A) through (F).

(A) Equipment Grounding Required. Exposed non-current-carrying metal parts of PV module frames, electrical equipment, and conductor enclosures shall be grounded in accordance with 250.134 or 250.136(A), regardless of voltage.

(B) Equipment Grounding Conductor Required. An equipment grounding conductor between a PV array and other equipment shall be required in accordance with 250.110.

(C) Structure as Equipment Grounding Conductor. Devices listed and identified for grounding the metallic frames of PV modules or other equipment shall be permitted to bond the exposed metal surfaces or other equipment to mounting structures. Metallic mounting structures, other than building steel, used for grounding purposes shall be identified as equipment-grounding conductors or shall have identified bonding jumpers or devices connected between the separate metallic sections and shall be bonded to the grounding system.

(D) Photovoltaic Mounting Systems and Devices. Devices and systems used for mounting PV modules that are also used to provide grounding of the module frames shall be identified for the purpose of grounding PV modules.

(E) Adjacent Modules. Devices identified and listed for bonding the metallic frames of PV modules shall be permitted to bond the exposed metallic frames of PV modules to the metallic frames of adjacent PV modules.

(F) All Conductors Together. Equipment grounding conductors for the PV array and structure (where installed) shall be contained within the same raceway or cable or otherwise run with the PV array circuit conductors when those circuit conductors leave the vicinity of the PV array.

690.45 Size of Equipment Grounding Conductors. Equipment grounding conductors for PV source and PV output circuits shall be sized in accordance with 250.122. Where no overcurrent protective device is used in the circuit, an assumed overcurrent device rated at the PV maximum circuit current shall be used when applying Table 250.122. Increases in equipment grounding conductor size to address voltage drop considerations shall not be required. An equipment grounding conductor shall not be smaller than 14 AWG.

690.46 Array Equipment Grounding Conductors. For PV modules, equipment grounding conductors smaller than 6 AWG shall comply with 250.120(C).

Where installed in raceways, equipment grounding conductors and grounding electrode conductors not larger than 6 AWG shall be permitted to be solid.

690.47 Grounding Electrode System.

(A) Alternating-Current Systems. If installing an ac system, a grounding electrode system shall be provided in accordance with 250.50 through 250.60. The grounding electrode conductor shall be installed in accordance with 250.64.

(B) Direct-Current Systems. If installing a dc system, a grounding electrode system shall be provided in accordance with 250.166 for grounded systems or 250.169 for ungrounded systems. The grounding electrode conductor shall be installed in accordance with 250.64.

A common dc grounding-electrode conductor shall be permitted to serve multiple inverters. The size of the common grounding electrode and the tap conductors shall be in accordance with 250.166. The tap conductors shall be connected to the common grounding-electrode conductor by exothermic welding or with connectors listed as grounding and bonding equipment in such a manner that the common grounding electrode conductor remains without a splice or joint.

An ac equipment grounding system shall be permitted to be used for equipment grounding of inverters and other equipment and for the ground-fault detection reference for ungrounded PV systems.

(C) Systems with Alternating-Current and Direct-Current Grounding Requirements. Photovoltaic systems having dc circuits and ac circuits with no direct connection between the dc grounded conductor and ac grounded conductor shall have a dc grounding system. The dc grounding system shall be bonded to the ac grounding system by one of the methods in (1), (2), or (3).

This section shall not apply to ac PV modules.

When using the methods of (C)(2) or (C)(3), the existing ac grounding electrode system shall meet the applicable requirements of Article 250, Part III.

Informational Note No. 1: ANSI/UL 1741, *Standard for Inverters, Converters, and Controllers for Use in Independent Power Systems*, requires that any inverter or charge controller that has a bonding jumper between the grounded dc conductor and the grounding system connection point have that point marked as a grounding electrode conductor (GEC) connection point. In PV inverters, the terminals for the dc equipment grounding conductors and the terminals for ac equipment grounding conductors are generally connected to, or electrically in common with, a grounding busbar that has a marked dc GEC terminal.

Informational Note No. 2: For utility-interactive systems, the existing premises grounding system serves as the ac grounding system.

(1) Separate Direct-Current Grounding Electrode System Bonded to the Alternating-Current Grounding Electrode System. A separate dc grounding electrode or system shall be installed, and it shall be bonded directly to the ac grounding electrode system. The size of any bonding jumper(s) between the ac and dc systems shall be based on the larger size of the existing ac grounding electrode conductor or the size of the dc grounding electrode conductor specified by 250.166. The dc grounding electrode system conductor(s) or the bonding jumpers to the ac grounding electrode system shall not be used as a substitute for any required ac equipment grounding conductors.

(2) Common Direct-Current and Alternating-Current Grounding Electrode. A dc grounding electrode conductor of the size specified by 250.166 shall be run from the marked dc grounding electrode connection point to the ac grounding electrode. Where an ac grounding electrode is not accessible, the dc grounding electrode conductor shall be connected to the ac grounding electrode conductor in accordance with 250.64(C)(1) or 250.64(C)(2) or by using a connector listed for grounding and bonding. This dc grounding electrode conductor shall not be used as a substitute for any required ac equipment grounding conductors.

(3) Combined Direct-Current Grounding Electrode Conductor and Alternating-Current Equipment Grounding Conductor. An unspliced, or irreversibly spliced, combined grounding conductor shall be run from the marked dc grounding electrode conductor connection point along with the ac circuit conductors to the grounding busbar in the associated ac equipment. This combined grounding conductor shall be the larger of the sizes specified by 250.122 or 250.166 and shall be installed in accordance with 250.64(E). For ungrounded systems, this conductor shall be sized in accordance with 250.122 and shall not be required to be larger than the largest ungrounded phase conductor.

(D) Additional Auxiliary Electrodes for Array Grounding. A grounding electrode shall be installed in accordance with 250.52 and 250.54 at the location of all ground- and pole-mounted PV arrays and as close as practicable to the location of roof-mounted PV arrays. The electrodes shall be connected directly to the array frame(s) or structure. The dc grounding electrode conductor shall be sized according to 250.166. Additional electrodes are not permitted to be used as a substitute for equipment bonding or equipment grounding conductor requirements. The structure of a ground- or pole-mounted PV array shall be permitted to be considered a grounding electrode if it meets the requirements of 250.52. Roof-mounted PV arrays shall be permitted to use

the metal frame of a building or structure if the requirements of 250.52(A)(2) are met.

Exception No. 1: An array grounding electrode(s) shall not be required where the load served by the array is integral with the array.

Exception No. 2: An additional array grounding electrode(s) shall not be required if located within 1.8 m (6 ft) of the premises wiring electrode.

690.48 Continuity of Equipment Grounding Systems.

Where the removal of equipment disconnects the bonding connection between the grounding electrode conductor and exposed conducting surfaces in the PV source or output circuit equipment, a bonding jumper shall be installed while the equipment is removed.

690.49 Continuity of Photovoltaic Source and Output Circuit Grounded Conductors.

Where the removal of the utility-interactive inverter or other equipment disconnects the bonding connection between the grounding electrode conductor and the PV source and/or PV output circuit grounded conductor, a bonding jumper shall be installed to maintain the system grounding while the inverter or other equipment is removed.

690.50 Equipment Bonding Jumpers. Equipment bonding jumpers, if used, shall comply with 250.120(C).

VI. Marking

690.51 Modules. Modules shall be marked with identification of terminals or leads as to polarity, maximum overcurrent device rating for module protection, and with the following ratings:

- (1) Open-circuit voltage
- (2) Operating voltage
- (3) Maximum permissible system voltage
- (4) Operating current
- (5) Short-circuit current
- (6) Maximum power

690.52 Alternating-Current Photovoltaic Modules.

Alternating-current modules shall be marked with identification of terminals or leads and with identification of the following ratings:

- (1) Nominal operating ac voltage
- (2) Nominal operating ac frequency
- (3) Maximum ac power
- (4) Maximum ac current
- (5) Maximum overcurrent device rating for ac module protection

690.53 Direct-Current Photovoltaic Power Source. A permanent label for the direct-current PV power source indicating the information specified in (1) through (5) shall be provided by the installer at the PV disconnecting means:

- (1) Rated maximum power-point current.
- (2) Rated maximum power-point voltage.
- (3) Maximum system voltage.

Informational Note to (3): See 690.7(A) for maximum PV system voltage.

- (4) Maximum circuit current. Where the PV power source has multiple outputs, 690.53(1) and (4) shall be specified for each output.

Informational Note to (4): See 690.8(A) for calculation of maximum circuit current.

- (5) Maximum rated output current of the charge controller (if installed).

Informational Note: Reflecting systems used for irradiance enhancement may result in increased levels of output current and power.

690.54 Interactive System Point of Interconnection. All interactive system(s) points of interconnection with other sources shall be marked at an accessible location at the disconnecting means as a power source and with the rated ac output current and the nominal operating ac voltage.

690.55 Photovoltaic Power Systems Employing Energy Storage. Photovoltaic power systems employing energy storage shall also be marked with the maximum operating voltage, including any equalization voltage and the polarity of the grounded circuit conductor.

690.56 Identification of Power Sources.

(A) Facilities with Stand-Alone Systems. Any structure or building with a PV power system that is not connected to a utility service source and is a stand-alone system shall have a permanent plaque or directory installed on the exterior of the building or structure at a readily visible location acceptable to the authority having jurisdiction. The plaque or directory shall indicate the location of system disconnecting means and that the structure contains a stand-alone electrical power system. The marking shall be in accordance with 690.31(G).

(B) Facilities with Utility Services and PV Systems. Buildings or structures with both utility service and a PV system shall have a permanent plaque or directory providing the location of the service disconnecting means and the PV system disconnecting means if not located at the same

location. The warning sign(s) or label(s) shall comply with 110.21(B).

(C) Facilities with Rapid Shutdown. Buildings or structures with both utility service and a PV system, complying with 690.12, shall have a permanent plaque or directory including the following wording:

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

The plaque or directory shall be reflective, with all letters capitalized and having a minimum height of 9.5 mm ($\frac{3}{8}$ in.), in white on red background.

VII. Connection to Other Sources

690.57 Load Disconnect. A load disconnect that has multiple sources of power shall disconnect all sources when in the off position.

690.60 Identified Interactive Equipment. Only inverters and ac modules listed and identified as interactive shall be permitted in interactive systems.

690.61 Loss of Interactive System Power. An inverter or an ac module in an interactive solar PV system shall automatically de-energize its output to the connected electrical production and distribution network upon loss of voltage in that system and shall remain in that state until the electrical production and distribution network voltage has been restored.

A normally interactive solar PV system shall be permitted to operate as a stand-alone system to supply loads that have been disconnected from electrical production and distribution network sources.

690.63 Unbalanced Interconnections. Unbalanced connections shall be in accordance with 705.100.

690.64 Point of Connection. Point of connection shall be in accordance with 705.12.

VIII. Storage Batteries

690.71 Installation.

(A) General. Storage batteries in a solar photovoltaic system shall be installed in accordance with the provisions of Article 480. The interconnected battery cells shall be considered grounded where the photovoltaic power source is installed in accordance with 690.41.

(B) Dwellings.

(1) Operating Voltage. Storage batteries for dwellings shall have the cells connected so as to operate at a voltage of 50 volts, nominal, or less.

Exception: Where live parts are not accessible during routine battery maintenance, a battery system voltage in accordance with 690.7 shall be permitted.

(2) Guarding of Live Parts. Live parts of battery systems for dwellings shall be guarded to prevent accidental contact by persons or objects, regardless of voltage or battery type.

Informational Note: Batteries in solar photovoltaic systems are subject to extensive charge-discharge cycles and typically require frequent maintenance, such as checking electrolyte and cleaning connections.

(C) Current Limiting. A listed, current-limiting, overcurrent device shall be installed in each circuit adjacent to the batteries where the available short-circuit current from a battery or battery bank exceeds the interrupting or withstand ratings of other equipment in that circuit. The installation of current-limiting fuses shall comply with 690.16.

(D) Battery Nonconductive Cases and Conductive Racks. Flooded, vented, lead-acid batteries with more than twenty-four 2-volt cells connected in series (48 volts, nominal) shall not use conductive cases or shall not be installed in conductive cases. Conductive racks used to support the nonconductive cases shall be permitted where no rack material is located within 150 mm (6 in.) of the tops of the nonconductive cases.

This requirement shall not apply to any type of valve-regulated lead-acid (VRLA) battery or any other types of sealed batteries that may require steel cases for proper operation.

(E) Disconnection of Series Battery Circuits. Battery circuits subject to field servicing, where more than twenty-four 2-volt cells are connected in series (48 volts, nominal), shall have provisions to disconnect the series-connected strings into segments of 24 cells or less for maintenance by qualified persons. Non-load-break bolted or plug-in disconnects shall be permitted.

(F) Battery Maintenance Disconnecting Means. Battery installations, where there are more than twenty-four 2-volt cells connected in series (48 volts, nominal), shall have a disconnecting means, accessible only to qualified persons, that disconnects the grounded circuit conductor(s) in the battery electrical system for maintenance. This disconnecting means shall not disconnect the grounded circuit conductor(s) for the remainder of the photovoltaic electrical system. A non-load-break-rated switch shall be permitted to be used as the disconnecting means.

(G) Battery Systems of More Than 48 Volts. On photovoltaic systems where the battery system consists of more than twenty-four 2-volt cells connected in series (more than 48 volts, nominal), the battery system shall be permitted to

operate with ungrounded conductors, provided the following conditions are met:

- (1) The photovoltaic array source and output circuits shall comply with 690.41.
- (2) The dc and ac load circuits shall be solidly grounded.
- (3) All main ungrounded battery input/output circuit conductors shall be provided with switched disconnects and overcurrent protection.
- (4) A ground-fault detector and indicator shall be installed to monitor for ground faults in the battery bank.

(H) Disconnects and Overcurrent Protection. Where energy storage device input and output terminals are more than 1.5 m (5 ft) from connected equipment, or where the circuits from these terminals pass through a wall or partition, the installation shall comply with the following:

- (1) A disconnecting means and overcurrent protection shall be provided at the energy storage device end of the circuit. Fused disconnecting means or circuit breakers shall be permitted to be used.
- (2) Where fused disconnecting means are used, the line terminals of the disconnecting means shall be connected toward the energy storage device terminals.
- (3) Overcurrent devices or disconnecting means shall not be installed in energy storage device enclosures where explosive atmospheres can exist.
- (4) A second disconnecting means located at the connected equipment shall be installed where the disconnecting means required by 690.71(H)(1) is not within sight of the connected equipment.
- (5) Where the energy storage device disconnecting means is not within sight of the PV system ac and dc disconnecting means, placards or directories shall be installed at the locations of all disconnecting means indicating the location of all disconnecting means.

690.72 Charge Control.

(A) General. Equipment shall be provided to control the charging process of the battery. Charge control shall not be required where the design of the photovoltaic source circuit is matched to the voltage rating and charge current requirements of the interconnected battery cells and the maximum charging current multiplied by 1 hour is less than 3 percent of the rated battery capacity expressed in ampere-hours or as recommended by the battery manufacturer.

All adjusting means for control of the charging process shall be accessible only to qualified persons.

Informational Note: Certain battery types such as valve-regulated lead acid or nickel cadmium can experience thermal failure when overcharged.

(B) Diversion Charge Controller.

(1) Sole Means of Regulating Charging. A photovoltaic power system employing a diversion charge controller as the sole means of regulating the charging of a battery shall be equipped with a second independent means to prevent overcharging of the battery.

(2) Circuits with Direct-Current Diversion Charge Controller and Diversion Load. Circuits containing a dc diversion charge controller and a dc diversion load shall comply with the following:

- (1) The current rating of the diversion load shall be less than or equal to the current rating of the diversion load charge controller. The voltage rating of the diversion load shall be greater than the maximum battery voltage. The power rating of the diversion load shall be at least 150 percent of the power rating of the photovoltaic array.
- (2) The conductor ampacity and the rating of the overcurrent device for this circuit shall be at least 150 percent of the maximum current rating of the diversion charge controller.

(3) PV Systems Using Utility-Interactive Inverters. Photovoltaic power systems using utility-interactive inverters to control battery state-of-charge by diverting excess power into the utility system shall comply with (1) and (2):

- (1) These systems shall not be required to comply with 690.72(B)(2). The charge regulation circuits used shall comply with the requirements of 690.8.
- (2) These systems shall have a second, independent means of controlling the battery charging process for use when the utility is not present or when the primary charge controller fails or is disabled.

(C) Buck/Boost Direct-Current Converters. When buck/boost charge controllers and other dc power converters that increase or decrease the output current or output voltage with respect to the input current or input voltage are installed, the requirements shall comply with 690.72(C)(1) and (C)(2).

- (1) The ampacity of the conductors in output circuits shall be based on the maximum rated continuous output current of the charge controller or converter for the selected output voltage range.
- (2) The voltage rating of the output circuits shall be based on the maximum voltage output of the charge controller or converter for the selected output voltage range.

690.74 Battery Interconnections.

(A) Flexible Cables. Flexible cables, as identified in Article 400, in sizes 2/0 AWG and larger shall be permitted within the battery enclosure from battery terminals to a nearby junction box where they shall be connected to an approved wiring method. Flexible battery cables shall also

be permitted between batteries and cells within the battery enclosure. Such cables shall be listed for hard-service use and identified as moisture resistant.

Flexible, fine-stranded cables shall be terminated only with terminals, lugs, devices, or connectors in accordance with 110.14.

IX. Systems over 1000 Volts

690.80 General. Solar PV systems with a maximum system voltage over 1000 volts dc shall comply with Article 490 and other requirements applicable to installations rated over 1000 volts.

690.81 Listing. Products listed for PV systems shall be permitted to be used and installed in accordance with their listing. PV wire that is listed for direct burial at voltages above 600 volts, but not exceeding 2000 volts, shall be installed in accordance with Table 300.50, column 1.

690.85 Definitions. For the purposes of Part VIII of this article, the voltages used to determine cable and equipment ratings are as follows.

Battery Circuits. In battery circuits, the highest voltage experienced under charging or equalizing conditions.

Photovoltaic Circuits. In dc PV source circuits and PV output circuits, the maximum system voltage.

X. Electric Vehicle Charging

690.90 General. Photovoltaic systems used directly to charge electric vehicles shall comply with Article 625 in addition to the requirements of this article.

690.91 Charging Equipment. Electric vehicle couplers shall comply with 625.10. Personnel protection systems in accordance with 625.22 and automatic de-energization of cables in accordance with 625.19 are not required for PV systems with maximum system voltages of less than 80 volts dc.

ARTICLE 692 Fuel Cell Systems

I. General

692.1 Scope. This article identifies the requirements for the installation of fuel cell power systems, which may be stand-alone or interactive with other electric power production sources and may be with or without electric energy

storage such as batteries. These systems may have ac or dc output for utilization.

692.2 Definitions.

Fuel Cell. An electrochemical system that consumes fuel to produce an electric current. In such cells, the main chemical reaction used for producing electric power is not combustion. However, there may be sources of combustion used within the overall cell system, such as reformers/fuel processors.

Fuel Cell System. The complete aggregate of equipment used to convert chemical fuel into usable electricity and typically consisting of a reformer, stack, power inverter, and auxiliary equipment.

Interactive System. A fuel cell system that operates in parallel with and may deliver power to an electrical production and distribution network. For the purpose of this definition, an energy storage subsystem of a fuel cell system, such as a battery, is not another electrical production source.

Maximum System Voltage. The highest fuel cell inverter output voltage between any ungrounded conductors present at accessible output terminals.

Output Circuit. The conductors used to connect the fuel cell system to its electrical point of delivery.

Informational Note: In the case of sites that have series- or parallel-connected multiple units, the term *output circuit* also refers to the conductors used to electrically interconnect the fuel cell system(s).

Point of Common Coupling. The point at which the power production and distribution network and the customer interface occurs in an interactive system. Typically, this is the load side of the power network meter.

Stand-Alone System. A fuel cell system that supplies power independently of an electrical production and distribution network.

692.3 Other Articles. Wherever the requirements of other articles of this Code and Article 692 differ, the requirements of Article 692 shall apply, and, if the system is operated in parallel with a primary source(s) of electricity, the requirements in 705.14, 705.16, 705.32, and 705.143 shall apply.

692.4 Installation.

(A) Fuel Cell System. A fuel cell system shall be permitted to supply a building or other structure in addition to any service(s) of another electricity supply system(s).

(B) Identification. A permanent plaque or directory, denoting all electric power sources on or in the premises, shall be installed at each service equipment location.

SOLAR FRIENDLY ZONING TOOLBOX:

This Model Solar Ordinance is a component of the Solar Friendly Zoning Toolbox, a collection of tools and resources to help local officials develop comprehensive and well-balanced local ordinances and master plans that allow citizens the choice, now and in the future, to power their homes with clean solar energy.



3. Model Solar Zoning Ordinance

FOR RESIDENTIAL AND NON-RESIDENTIAL DISTRIBUTED SOLAR ENERGY SYSTEMS

1.0 Purpose

An ordinance to amend the zoning ordinance of [MUNICIPALITY NAME], by amending [ARTICLE/SECTION], *Definitions*, by adding definitions for solar energy systems and by amending [ARTICLE/SECTION], adding a new section to permit solar energy systems as an accessory use to permitted, conditional, and special exception uses in any zoning district.

This ordinance aims to promote the accommodation of distributed, on-site residential and non-residential solar energy systems installed to reduce on-site energy consumption and associated equipment, as well as adequate access to sunlight necessary for such systems. This ordinance does not address utility-scale solar energy systems, intended for the sale of electricity to utilities, industries, and/or businesses.

This ordinance permits, as an accessory use, solar energy systems, while protecting the safety and welfare of adjacent and surrounding land uses through appropriate zoning and land use controls.

A solar energy system shall be permitted in any zoning district as an accessory use, subject to specific criteria as set forth below. Where general standards and specific criteria overlap, specific criteria shall supersede general standards.

2.0 Definitions

- 2.1. **Accessory Use:** A use customarily incidental and subordinate to the primary use or building and located on the same lot therewith. A use which dominates the primary use or building in area, extent, or purpose shall not be considered an accessory use.
- 2.2. **Battery Back-Up:** A battery system that stores electrical energy from a solar PV system, making the electricity available for future use. Battery Back-Up systems are common in Off-Grid Systems and Hybrid Systems.



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- 2.3. Combiner or Junction Box:** Combines the inputs (electrical flows) from multiple strings of solar panels (or micro-inverters) into one output circuit.
- 2.4. Crystalline silicon cells:** Solar photovoltaic cells fashioned from either mono-crystalline, multi-crystalline, or ribbon silicon capable of converting sunlight into electricity. Crystalline silicon solar PV panels are the most commonly used and are generally the most efficient.
- 2.5. Distributed Solar:** For the purposes of this Ordinance, distributed solar refers to solar energy systems located on-site and designed to provide solar thermal energy or solar PV electricity to a property owner, occupant, and/or facilities.
- 2.6. Grid-tied Solar** - A solar PV system that is interconnected with the utility grid via net metering and interconnection agreements with the utility.
- 2.7. Electricity Generation (aka production, output)** - The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).
- 2.8. Electrical Equipment:** Any device associated with a solar energy system, such as an outdoor electrical unit/control box, that transfers the energy from the solar energy system to the intended on-site structure.
- 2.9. Grid-tied Solar Photovoltaic Systems (aka grid-tied PV, on-grid, grid-connected, utility-interactive, grid-intertied, or grid-direct):** Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage. Any excess electricity generated is sent to the electric utility grid, credited via a customer's net metering agreement with their local utility. Grid-tied are typically installed without battery back-up system to store electricity. As such, these systems provide no power during an outage. Typical system components: PV panels, inverter(s), and required electrical safety gear.
- 2.10. Ground-Mount System:** A solar energy system that is directly installed on specialized solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home or building. Ground-mount systems may be applicable when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.
- 2.11. Hybrid Solar Photovoltaic Systems (aka grid-tied PV with battery back-up):** Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage, while also utilizing a battery back-up in the event of a power outage. This is the only system that provides the ability to have power when the utility grid is down. Typical system components include: PV panels, inverter(s), and required electrical safety gear, battery bank, and a charge controller.



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- 2.12. International Residential Code (IRC)** - Part of the International Building Code (IBC), the IRC sets buildings standards for residential structures.
- 2.13. Inverter:** A device that converts the Direct Current (DC) electricity produced by a solar photovoltaic system is converted to useable alternating current (AC).
- 2.14. Kilowatt (kW)** - Equal to 1000 Watts; a measure of the use of electrical power.
- 2.15. Kilowatt-hour (kWh)** - A unit of energy equivalent to one kilowatt (1 kW) of power expended for 1 hour of time.
- 2.16. Mounting** - The manner in which a solar PV system is affixed to the roof or ground (i.e. roof mount, ground mount, pole mount).
- 2.17. Megawatt (MW)** - Equal to 1000 Kilowatts; a measure of the use of electrical power.
- 2.18. Megawatt-hour (MWh)** - A unit of energy equivalent to one Megawatt (1 MW) of power expended for 1 hour of time.
- 2.19. National Electric Code (NEC)** - Sets standards and best practices for wiring and electrical systems.
- 2.20. Net Meter:** On-grid solar PV systems connected to the utility grid use a net meter, typically provided and installed by the local utility, to measure the flow of electricity from the solar system for the purposes of net metering.
- 2.21. Net Metering:** A billing arrangement that allows customers with grid-connected solar electricity systems to receive credit for any excess electricity generated on-site and provided to the utility grid.
- 2.22. Off-Grid Solar Photovoltaic Systems with battery back-up:** Solar photovoltaic electricity systems designed to operate independently from the local utility grid and provide electricity to a home, building, boat, RV (or remote agricultural pumps, gates, traffic signs, etc.). These systems typically require a battery bank to store the solar electricity for use during nighttime or cloudy weather (and/or other back-up generation). Typical system components include: PV panels, battery bank, a charge controller, inverter(s), required disconnects, and associated electrical safety gear.
- 2.23. Orientation (or Azimuth):** In the northern hemisphere, true solar south is the optimal direction for maximizing the power output of solar PV. Although, systems can be oriented east,



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southeast, southwest, and west, while still providing 75%-85% of maximum production, depending on the tilt. Proper orientation and access to sun are critical for achieving maximum energy production potential (ideally, the orientation of the solar energy system ensures that solar access is not obstructed by other buildings, shade trees, chimneys, HVAC systems, or other equipment).

- 2.24. **Passive Solar:** Techniques, design, and materials designed to take advantage of the sun’s position throughout the year (and the local climate) to heat, cool, and light a building with the sun. *Passive solar* incorporates the following elements strategically to maximize the solar potential of any home or building (namely, maximizing solar heat gain in winter months and minimizing solar heat gain in summer months to reduce heating/cooling demand; and maximizing the use of daylighting to reduce demand for electricity for lighting): strategic design and architecture, building materials, east-west and building lot orientation, windows, landscaping, awnings, ventilation
- 2.25. **Photovoltaic (PV) System:** A solar energy system that produces electricity by the use of semiconductor devices, called photovoltaic cells, which generate electricity when exposed to sunlight. A PV system may be roof-mounted, ground-mounted, or pole-mounted.
- 2.26. **Pole-Mount Systems:** A solar energy system that is directly installed on specialized solar racking systems, which are attached to pole, which is anchored and firmly affixed to a concrete foundation in the ground, and wired underground to an attachment point at the building’s meter. Unlike ground-mount systems, pole-mount systems are elevated from the ground. Pole-mounted systems can be designed to track the sun (with single-axis or dual-axis tracking motors) and maximize solar output throughout the year.
- 2.27 **Power** - the rate at which work is performed (the rate of producing, transferring, or using energy). Power is measured in Watts (W), kilowatts (kW), Megawatts (MW), etc.
- 2.28. **PV-Direct Systems:** The simplest of solar photovoltaic electric systems with the fewest components (no battery back-up and not interconnected with the utility) designed to only provide electricity when the sun is shining. Typical system components include: PV panels, required electrical safety gear, and wiring.¹
- 2.29 **Racking:** Solar energy systems are attached securely and anchored to structural sections of the roof-mounted or pole-mounted systems. Specially designed metal plates called flashings prevent leaks and are placed under shingles and over bolts to create a water-tight seal.

¹ All content taken directly from Home Power – Solar Electricity Basics “What is Solar Electricity”. URL: <http://www.homepower.com/articles/solar-electricity/basics/what-solar-electricity>



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- 2.30 Roof-Mount System (aka rooftop mounted, building mounted):** A solar energy system consisting of solar panels are installed directly on the roof of a home, commercial building, and/or an accessory structure, such as a garage, pergola, and/or shed. Solar panels are mounted and secured using racking systems specifically designed to minimize the impact on the roof and prevent any leaks or structural damage. Roof-mount systems can be mounted flush with the roof or tilted toward the sun at an angle.
- 2.31. Solar Access:** the ability of one property to continue to receive sunlight across property lines without obstruction from another’s property (buildings, foliage or other impediment). Solar access is calculated using a [sun path diagram](#).
- 2.32. Solar Array:** Multiple solar panels combined together to create one system.
- 2.33. Solar Collector:** A solar PV cell, panel, or array, or solar thermal collector device, that relies upon solar radiation as an energy source for the generation electricity or transfer of stored heat.
- 2.34. Solar Easement:** An easement recorded pursuant to U.C.A. §§ 57-13-1 and 57-13-2, the purpose of which is to secure the right to receive sunlight across the real property of another for the continued access to sunlight necessary to operate a solar energy system. According to Utah law, parties may voluntarily enter into written solar easement contracts that are enforceable by law. An easement must be created in writing and filed, duly recorded and indexed in the office of the recorder of the county in which the easement is granted. A solar easement, once created, runs with the land and does not terminate unless specified by conditions of the easement.
- 2.35. Solar Energy System:** A system capable of collecting and converting solar radiation into heat or mechanical or electrical energy and transferring these forms of energy by a separate apparatus to storage or to point of use, including, but not limited to, water heating, space heating or cooling, electric energy generation, or mechanical energy generation. This definition shall include Solar Thermal, Photovoltaic, and Passive Solar Systems.
- 2.36. Solar Glare:** The potential for solar panels to reflect sunlight, with an intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility.
- 2.37. Solar Photovoltaic (Solar PV) System–** Solar systems consisting of photovoltaic cells, made with semiconducting materials, that produce electricity (in the form of direct current (DC)) when they are exposed to sunlight. A typical PV system consist of PV panels (or modules) that combine to form an array; other system components may include mountain racks and hardware, wiring for electrical connections, power conditioning equipment, such as an inverter and/or batteries. For the purposes of this Ordinance, a solar PV system is defined as generating capacity of not more than 25 kilowatts for residential facilities and not more than two



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megawatts for non-residential facilities. [*Solar PV systems larger than this are governed by another Ordinance*]

- 2.38. **Solar Panel (or module):** A device for the direct conversion of sunlight into useable solar energy (including electricity or heat).
- 2.39. **Solar Process Heat** technologies provide industrial specific applications, including ventilation air preheating, solar process heating, and solar cooling.
- 2.40 **Solar-Ready:** The concept of planning and building with the purpose of enabling future use of solar energy generation systems. Solar-ready buildings, lots, and developments make it easier and more cost-effective to utilize passive solar techniques and adopt active solar technologies in the future. Solar-Ready Buildings are built anticipating future installation of active solar energy systems (including structural reinforcement, pre-wiring or plumbing for solar, and east-west building orientation). Solar-Ready Lots are oriented to take maximal advantage of a location’s solar resource. Solar-Ready Developments expand this concept to entire subdivisions.
- 2.41. **Solar Thermal System (aka Solar Hot Water or Solar Heating Systems):** A solar energy system that directly heats water or other liquid using sunlight. Consist of a series of tubes that concentrate light to heat either water or a heat-transfer fluid (such as food-grade propylene glycol, a non-toxic substance) in one of two types of collectors (flat-plate collectors and evacuated tube collectors). The heated liquid is used for such purposes as space heating and cooling, domestic hot water, and heating pool water.
- 2.42. **Thin Film Solar PV** – Capable of generating electricity from the sun, thin film solar PVcells consist of layers of semiconductor materials (made from amorphous silicon, cadmium telluride, copper indium gallium diselenide, among other materials) a few micrometers thick, which allow for greater flexibility. Thin film is made by depositing one or more thin layers of photovoltaic material on a substrate; products include rooftop shingles and tiles, building facades, the glazing for skylights, and other building integrated materials.
- 2.43. **Tilt:** The angle of the solar panels and/or solar collector relative to their latitude. The optimal tilt to maximize solar production is perpendicular, or 90 degrees, to the sun’s rays at true solar noon. True solar noon is when the sun is at its highest during its daily east-west path across the sky (this is also known as 0° Azimuth). Solar energy systems can be manually or automatically adjusted throughout the year. Alternatively, fixed-tilt systems remain at a static tilt year-round
- 2.44. **Watts (W)** - A measure of the use of electrical power (power (Watts) = voltage (volts) X current (Amps)).
- 2.45. **Wiring:** Specified by electrical codes, solar PV system wires are routed from the panels or micro-inverters through conduit into the inverter and buildings meter.



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3.0 Applicability

- 3.1. This ordinance applies to all distributed solar systems installed and constructed after the effective date of this Ordinance. For purposes of this Ordinance, “solar energy system” means a distributed solar energy system as defined herein.
- 3.2. Solar energy systems constructed prior to the effective date of this ordinance shall not be required to meet the requirements of this ordinance.
- 3.3. All solar energy systems shall be designed, erected, and installed in accordance with applicable local, state, utility, and national codes, regulations, and standards.

4.0 Solar Energy System Requirements

- 4.1. To the extent practicable, and in accordance with [municipality] law, the accommodation of solar energy systems and associated electrical equipment, and the protection of access to sunlight for such, shall be encouraged in the application of the various review and approval provisions of the [municipality] code.
- 4.2. Solar energy systems are permitted in all zoning districts as an accessory use to permitted, conditional, and special exception uses *[if building permits are not required for solar, insert appropriate provisions]*.
- 4.3. A solar energy system shall provide power for the principal use and/or accessory use of the property on which the solar energy system is located.
- 4.4. The installation and construction of a *roof-mount solar energy system* shall be subject to the following development and design standards:
 - A. A roof or building mounted solar energy system may be mounted on a principal or accessory building.
 - B. Any height limitations of the [municipality] Code shall not be applicable to solar collectors provided that such structures are erected only to such height as is reasonably necessary to accomplish the purpose for which they are intended to serve, and that such structures do not obstruct solar access to neighboring properties.
 - C. Placement of solar collectors on flat roofs shall be allowed by right provided that panels do not extend horizontally past the roofline.
- 4.5. The installation and construction of a *ground-mount or pole-mount solar energy system* shall be subject to the following development and design standards:



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- A. The height of the solar collector and any mounts shall not exceed 20 feet when oriented at maximum tilt.
- B. The surface area of a ground- or pole-mounted system, regardless of the mounted angle, shall be calculated as part of the overall lot coverage.
- C. The minimum solar energy system setback distance from the property lines shall be equivalent to the building setback or accessory building setback requirement of the underlying zoning district. *[Please note that some municipalities have less stringent accessory structure setbacks, e.g. 10 foot side yard setback for sheds. If accessory structure setbacks are less stringent than the primary structure setback, it is recommended that the municipality apply less stringent setback requirements to solar energy systems].*
- D. All power transmission lines from a ground mounted solar energy system to any building or other structure shall be located underground and/or in accordance with the building electrical code, as appropriate.

4.6. All electrical equipment associated with and necessary for the operation of solar energy systems shall comply with the following:

- A. Electrical equipment shall comply with the setbacks specified for accessory structures in the underlying zoning district. *[Please note that some municipalities have less stringent accessory structure setbacks, e.g. 10 foot side yard setback for sheds. If accessory structure setbacks are less stringent than the primary structure setback, it is recommended that the municipality apply less stringent setback requirements to solar energy systems.]*

4.7. Solar panels are designed to absorb (not reflect) sunlight; and, as such, solar panels are generally less reflective than other varnished or glass exterior housing pieces. However, solar panel placement should be prioritized to minimize or negate any solar glare onto nearby properties or roadways, without unduly impacting the functionality or efficiency of the solar system .

4.8. A solar energy system shall not be used to display permanent or temporary advertising, including signage, streamers, pennants, spinners, reflectors, banners or similar materials. The manufacturers and equipment information, warning, or indication of ownership shall be allowed on any equipment of the solar energy system provided they comply with the prevailing sign regulations.

4.10. A solar energy system shall not be constructed until a building/zoning permit has been approved and issued.



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5.0 Safety and Inspections

- 5.1. The design of the solar energy system shall conform to applicable local, state and national solar codes and standards. A building permit reviewed by department staff shall be obtained for a solar energy system. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems).
- 5.2. The solar energy system shall comply with all applicable [municipality] Ordinances and Codes so as to ensure the structural integrity of such solar energy system. *Please note that the existing roof structure and the weight of the solar energy system shall be taken into consideration when applying for a solar energy system permit.*
- 5.3. Prior to operation, electrical connections must be inspected by [an appropriate electrical inspection person or agency, as determined by the [municipality]].
- 5.5. Any connection to the public utility grid must be approved by the appropriate public utility.
- 5.7. If solar storage batteries are included as part of the solar collector system, they must installed according to all requirements set forth in the National Electric Code and State Fire Code when in operation. When no longer in operation, the batteries shall be disposed of in accordance with the laws and regulations of [municipality] and any other applicable laws and regulations relating to hazardous waste disposal.
- 5.9. Unless otherwise specified through a contract or agreement, the property owner of record will be presumed to be the responsible party for owning and maintaining the solar energy system.

6.0 Abandonment and removal

- 6.1. If a ground mounted solar energy system is removed, any earth disturbance as a result of the removal shall be landscaped in accordance with [local rules]
- 6.2. A ground or pole-mounted solar energy system is considered to be abandoned or defective if it has not been in operation for a period of twelve (12) months. If abandoned, the solar energy system shall be repaired by the owner to meet federal, state, and local safety standards, or be removed by the owner within the time period designated by a [City] Building Code Official. If the owner fails to remove or repair the defective or abandoned solar energy system, the [City] may pursue a legal action to have the system removed at the owner's expense.

7.0 Appeals



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- 7.1. If the owner of a solar energy system is found to be in violation of the provisions of this Ordinance, appeals should be made in accordance with the established procedures of the [municipality] code.
- 7.2. If a building permit for a solar energy system is denied because of a conflict with other goals of the [municipality], the applicant may seek relief from the [municipality board of zoning appeals], which shall regard solar energy as a factor to be considered, weighed, and balanced along with other factors.

8.0 Solar-Ready Zoning

- 8.1. New structures will, to the extent possible and insofar as practical, be situated on the lot to take advantage of solar access, including the orientation of proposed buildings with respect to sun angles, the shading and windscreen potential of existing and proposed vegetation on and off the site, and the impact of solar access to adjacent uses and properties.
- 8.2. To permit maximum solar access to proposed lots and future buildings, wherever reasonably feasible and where consistent with other appropriate design considerations, new streets shall be located on an east-west axis to encourage building siting with the maximum exposure of roof and wall area to the sun.
- 8.3. [Municipal] tree-planting programs shall take into account the impact of street trees on the solar access of surrounding properties and, where possible, efforts shall be made to avoid shading possible locations of solar collectors.
- 8.4. When the [planning/zoning board] reviews and acts upon applications for subdivision approval or site plan approval, it shall take into consideration whether the proposed construction would block access to sunlight between the hours of [9:00 am and 3:00 pm] Mountain Standard Time for existing ground-mount, pole-mount, or roof-mount solar energy collectors or for solar energy collectors for which a permit has been issued.
- 8.5. Where reasonable and appropriate, new subdivisions should be platted so as to preserve or enhance solar access for either passive or active systems, consistent with the other requirements of the [municipality] code.
- 8.6. The plan for development of any site within cluster subdivisions shall be designed and arranged in such a way as to promote solar access for all dwelling units. Considerations may include the following:
 - A. In order to maximize solar access, the higher density dwelling units should be placed on a south-facing slope and lower-density dwelling units sited on a north-facing slope.



The Solar-Friendly Zoning Toolbox was created by Utah Clean Energy with support from Salt Lake City, Salt Lake County, the Wasatch Solar Challenge, the U.S. Department of Energy, SunShot Initiative

- B. Subject to the [municipality’s] setback requirements, structures should be sited as close to the north lot line as possible to increase yard space to the south for reduced shading of the south face of a structure.
- C. A tall structure should be sited to the north of a short structure.

8.7. Solar-Ready zoning should be considered as one among multiple considerations in planning new developments.

9.0 Restrictions on Solar Prohibitions

In Accordance with Utah Code [Utah Code 57-13](#) and [Utah Code 10-9a-610](#), [Municipality] and the [Zoning Governing Authority] maintains and reserves the right to refuse any plat or subdivision plan if deed restrictions, covenants or other agreements running with the land prohibit or have the effect of prohibiting reasonably sited and designed solar collectors or other renewable resource devices.

10.0

All other portions, parts and provisions of the Zoning Ordinance of [Municipality name], as heretofore enacted and amended, shall remain in force and effect.

11.0

This Ordinance shall take effect [XX days] after the date of its enactment.

DULY ORDAINED AND ENACTED the _____ day of _____, 20__, by the [Governing Body] of the Town/City of [Municipality name], in the County of [County name], in the State of Utah, in lawful session duly assembled.

[Governing Body] of [Municipality name]

ATTEST:



The Wasatch Solar Challenge is a diverse partnership of local governments and local non-profit organizations working collaboratively to create a "solar-friendly" environment that increases adoption of residential and commercial solar PV. Through workshops, trainings, and peer-to-peer exchange forums, partners collaborated to identify workable best practices for solar permitting, inspections, interconnection, zoning, and financing.



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	10/24/2017

Planning Commission Agenda Item

SUBJECT:	Review/Recommendation on Artificial Turf, Amending Requirements of §10-5-27 Landscaping Development Standards
APPLICANT PRESENTATION:	n/a
STAFF PRESENTATION:	Chandler Goodwin, City Manager

BACKGROUND AND FINDINGS:

A resident has requested that the City consider allowing artificial turf as an acceptable form of landscaping. Other municipalities have considered and adopted provisions allowing artificial turf within a set of guidelines. Ogden has adopted an ordinance allowing artificial turf. Cedar Hills City Code §10-5-27 would need to be amended to allow for the installation of artificial turf. Currently, §10-5-27 (B) states, "The front yard area of any existing lot containing a dwelling shall be landscaped. It shall be unlawful for the owner of any residential lot within the city to refuse to install and maintain landscaping within the front yard area of any existing residential lot containing a dwelling. The front yard area shall consist of the entire lot area from the front lot line to the face of the dwelling, or the front setback area, whichever is greater (except for approved designated parking areas). Corner lots have two (2) front setback areas. Landscaping shall be properly maintained including removing weeds and mowing turf areas. Turf grass shall not exceed six inches (6") in height. (Ord. 10-20-2009C, 10-20-2009) This provision is exclusively for the front yard.

The proposed code would allow the use of artificial turf as a method of landscaping in the front and side yard areas. After a review by the city council, they have made recommendation to the planning commission for a code that would allow the installation of artificial turf as an acceptable landscaping method. The city council feels that as we push residents to be more water conscious, artificial turf is a method that may be suitable for residents. Concerns would be on how to maintain the turf to meet acceptable requirements, and what would the penalties be for non-compliance.

PREVIOUS LEGISLATIVE ACTION:

Xeriscape was added as an approved landscaping option in May 2015
City Council made recommendation to the planning commission to draft a code that would allow for the installation of artificial turf.

FISCAL IMPACT:

n/a

SUPPORTING DOCUMENTS:

Proposed Cedar Hills City Code §10-5-27, Artificial Turf Code

RECOMMENDATION:

Make recommendations for any proposed changes to §10-5-27

MOTION:

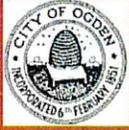
To recommend to the City Council the amendments to the landscaping code §10-5-27 by adding artificial turf as an acceptable landscaping method for the front and side yard areas, pending the following changes {LIST ANY APPLICABLE CHANGES}.

10-5-27 Landscaping

(C) (3) Artificial Turf

If artificial turf is used as ground cover:

- a. It shall consist of green lifelike individual blades of grass that:
 1. Emulate natural turf in look and color
 2. Have a minimum pile height of 1.5 inches, except in rear yards where shorter pile height may be installed for planned recreational surfaces; and
 3. Have a minimum tufted weight of 56 ounces per square yard.
- b. In no case shall it be installed within:
 1. Permanent drainage features (e.g. ponds, swales, and retention and detention basins); or
 2. Any public right-of-way;
- c. It shall have a minimum eight year manufacturer's warranty protecting against color fading and decrease in pile height;
- d. The use of indoor or outdoor plastic or nylon carpeting as a substitute or replacement for artificial turf or natural turf is prohibited;
- e. It shall be properly anchored to ensure that the turf will withstand the effects of wind;
- f. All seams shall be nailed and glued, not sewn, and edges shall be trimmed to fit against all regular and irregular edges to resemble a natural look;
- g. Proper grading, compaction and drainage shall be provided for all artificial turf installations to prevent excess runoff or pooling of water and artificial turf installations shall have a minimum permeability of thirty inches (30") per hour per square yard;
- h. It shall be visually level, with the grain pointing in a single direction;
- i. An appropriate solid barrier device (e.g., concrete mow strip, bender board) is required to separate the artificial turf from planters and live vegetation;
- j. A minimum four foot (4') separation between artificial turf and tree trunks and two foot (2') separation between artificial turf and shrubs shall be maintained to ensure roots are not damaged with the installation of artificial turf and that the overall health of the living plant material is not compromised;
- k. It shall be cleaned regularly and maintained in an appropriate and neat manner;
- l. It shall be replaced if it is worn, uneven, discolored, or damaged;
- m. It shall comply with subsection C of this section if it is proposed to be used, either solely or in combination with other nonliving ground cover, for more than ten percent (10%) of the ground area required to be landscaped; and
- n. Artificial turf is limited to not more than fifty percent (50%) of the total landscaping area, unless it is installed and used in the construction of public or private athletic fields, or on playgrounds associated with a:
 - i. Public or private community center;
 - ii. Park; or
 - iii. School.



City Council Meeting COUNCIL STAFF REVIEW

ZONE TEXT AMENDMENT ALLOWING ARTIFICIAL TURF AS A LANDSCAPING OPTION

COUNCIL DETERMINATION:

- Adopt/not adopt ordinance

PLANNING COMMISSION

RECOMMENDATION: Denial of the zone text amendment (7-0)

Executive Summary

A petition has been submitted to the City to amend the zoning ordinance to allow artificial turf as an option for ground cover for landscaping. The proposal was reviewed by the Planning Commission and given a recommendation of denial. Although the recommendation from the Commission was for denial, the Council felt that the language initially drafted by the Planning Department could serve as the basis for a viable ordinance. A draft ordinance has been developed and is before the Council for consideration.

Background

The applicant, Pamela Clark, Executive Director of the Family Support Center of Ogden, submitted a petition to allow artificial turf as a ground cover option in the City's landscaping ordinance. Ms. Clark arranged to have artificial turf installed at the Family Support Center facility at 3340 Harrison Boulevard. After the artificial turf was installed, the City's code services division informed Ms. Clark that artificial turf was not an option listed in the City's code for landscaping ground cover and that the artificial turf would need to be removed. Upon notification of the violation, Ms. Clark submitted the petition to amend the code to allow artificial turf as an acceptable ground cover.

Within the City's ordinance under the definition of Landscaping there are certain ground coverings listed that may be used in commercial and residential landscaping as elements of an overall landscaping plan. The options include landscaping rocks, gravel, mulches, and wood chips. The ordinance states that the ground coverings may be used if such materials do not comprise more than 10% of the area required to be landscaped. If more than 10% is desired, the landscaping plan must be approved by the Planning Department and must meet the requirements of the City's landscaping standards ordinance. In this case, the ground covers listed are not examples but rather approved materials and since artificial turf is not listed as a ground cover option it is not permitted.



City Council Meeting COUNCIL STAFF REVIEW

November 18, 2014

At the work session of November 18, 2014, the proposal was reviewed by the Council. The Council reviewed the concerns and recommendation of the Planning Commission and reviewed the previously developed language the Planning Department had proposed in response to the petition. The Council recognized the Planning Commission's concerns but felt that with appropriate controls in place the proposal could be a viable option for residents in the City. At the request of the Council, an ordinance was developed to be placed on the Council's agenda for consideration.

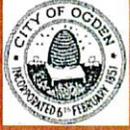
April 28, 2015

The proposed ordinance was presented to the Council on April 28, 2015. Several members of the public spoke at the meeting. In response the comments made with regard to shorter turf lengths for things like putting greens, the Council tabled the item and directed that language be added to the ordinance to allow for the accommodation of such features. In response, Legal, Planning and Council Staff discussed the issue and developed language that would allow for planned recreational features in rear yards. This change has been included in the ordinance for consideration.

Current Proposal The petitioner is requesting that artificial turf be listed among the acceptable ground cover options within the City's landscaping definition. In researching the topic, the Planning Department developed language for the installation and maintenance of artificial turf. This language was presented to the Planning Commission but was given a recommendation of denial. The Council felt that with a few minor changes, the language would be sufficient in providing the necessary controls that would allow residents and businesses to use artificial turf as a landscaping option.

The proposal would allow artificial turf as a ground cover option when combined with other living plant materials. If artificial turf is used as a ground cover, the following standards apply:

1. It shall consist of green lifelike individual blades of grass that:
 - a. Emulate natural turf in look and color;
 - b. Has a minimum pile height of 1.5 inches, except in rear yards where shorter pile height may be installed for planned recreational surfaces; and
 - c. Has a minimum tufted weight of 56 ounces per square yard.



City Council Meeting COUNCIL STAFF REVIEW

2. In no case shall it be installed within:
 - a. Permanent drainage features (e.g. ponds, swales, and retention and detention basins); or
 - b. Any public right of way.
3. It shall have a minimum eight year manufacturer's warranty protecting against color fading and decrease in pile height;
4. The use of indoor or outdoor plastic or nylon carpeting as a substitute or replacement for artificial turf or natural turf is prohibited;
5. It shall be properly anchored to ensure that the turf will withstand the effects of wind;
6. All seams shall be nailed and glued, not sewn, and edges shall be trimmed to fit against all regular and irregular edges to resemble a natural look;
7. Proper grading, compaction and drainage shall be provided for all artificial turf installations to prevent excess runoff or pooling of water and artificial turf installations shall have a minimum permeability of 30 inches per hour per square yard;
8. It shall be visibly level, with the grain pointing in a single direction;
9. An appropriate solid barrier device (e.g. concrete mow strip, bender board) is required to separate the artificial turf from planters and live vegetation;
10. A minimum four foot (4') separation between artificial turf and tree trunks and two foot (2') separation between artificial turf and shrubs shall be maintained to ensure roots are not damaged with the installation of artificial turf and that the overall health of the living plant material is not compromised;
11. It shall be cleaned regularly and maintained in an appropriate and neat manner;
12. It shall be replaced if it is worn, uneven, discolored, or damaged; and
13. It shall comply with subsection 15-13-16.C if it is proposed to be used, either solely or in combination with other non-living ground cover, for more than ten percent (10%) of the ground area required to be landscaped.



City Council Meeting COUNCIL STAFF REVIEW

14. Artificial turf is limited to not more than 50% of the total landscaping area, unless it is installed and used in the construction of public or private athletic fields, or on playgrounds associated with a;
 - a. Public or private community center;
 - b. Park;
 - c. School; or
 - d. University

There were several issues that Council members raised during the work session on November 18, 2014. Two of these issues were the 50% maximum allowance of artificial turf and the approval process to ensure compliance with the standards in the ordinance. Council members indicated that the 50% maximum allowance for artificial turf was high and recommended a lower number indicated they would like a number based on other ordinances and industry standards. Planning staff reviewed ordinances from other cities and looked at available resources on the subject and found no consistent maximum allowance. The proposed ordinance keeps the maximum listed at 50%. The Council may reduce that percentage if Council members feel that there is another more appropriate percentage.

The second issue Council members expressed concern about was the approval process for allowing artificial turf. Council members indicated that a no-fee permit process should be included to ensure that if a resident or business installs artificial turf that the product and installation would meet the ordinance. In reviewing ordinance, it was felt that an adequate process exists that allows an applicant to have their plans reviewed by the Planning Staff at no cost prior to the installation. This process currently exists for both landscaping and fencing.

As staff has been reviewing and developing the ordinance another issue was raised. The issue was specific to allowing artificial turf in parkstrips. This was not addressed by either the Planning Staff or Planning Commission. As Planning, Legal, and Council staff reviewed this, it was felt that artificial turf should not be allowed in parkstrips due to the narrow nature of the strip and the requirements that artificial turf be kept away from trees and shrubs. It was felt that these restrictions would make it difficult for a resident or business owner to properly install and maintain the turf in such small areas. There are still other non-grass options available to residents for parkstrips. The proposed ordinance prohibits artificial turf installation in public rights-of-way. This would prohibit its use in parkstrips.



City Council Meeting COUNCIL STAFF REVIEW

Planning Commission

The proposal was reviewed by the Planning Staff and presented to the Planning Commission at the September 3, 2014 meeting. Planning Staff researched the topic and provided background on common issues related to artificial turf. These issues included appearance, maintenance, permeability, heat generation, sanitary conditions, and quality and warranty standards. Planning Staff reviewed the potential benefits of artificial turf as well as the common difficulties related to artificial turf. Planning Staff provided an initial recommendation of approval with a draft of ordinance language providing standards addressing the common concerns.

The Planning Commission reviewed the information and expressed serious concerns about the maintenance, aesthetics, and code enforcement issues that might come with allowing artificial turf as a ground cover option. The Planning Commission ultimately forwarded a recommendation of denial to the Council with a vote of 7-0. The Planning Commission gave the findings that the proposed amendment is not consistent with the intent of the zoning ordinance and policies outlined in the general plan, that it would be difficult to enforce, and that it has impacts that are too detrimental.

Public Comment The petitioner was not present at the Planning Commission meeting and no other persons spoke regarding the proposal at the meeting.

Attachments

1. Transmittal from Administration
2. Ordinance 2015-17 (*Update from April 28, 2015*)
3. Planning Commission Report
4. Petition 2014-8
5. Petitioner's Letter
6. Amendments as recommended by Planning Staff

Memos Prepared By:

Administrative Contact:
Council Staff

Greg Montgomery, 629-8931
Glenn Symes, 629-8164

ORDINANCE NO. 2015-17

AN ORDINANCE OF OGDEN CITY, UTAH, AMENDING THE OGDEN MUNICIPAL CODE BY AMENDING SECTION 15-2-13 TO MODIFY THE DEFINITION OF LANDSCAPE OR LANDSCAPING; AMENDING SUBSECTION 15-13-16.C TO ADOPT A NEW PARAGRAPH 5 TO ALLOW ARTIFICIAL TURF AS A LANDSCAPING GROUND COVER; AND BY PROVIDING THAT THIS ORDINANCE SHALL BECOME EFFECTIVE IMMEDIATELY UPON POSTING AFTER FINAL PASSAGE.

The Council of Ogden City hereby ordains:

SECTION 1. Section amended. Section 15-2-13 of the Ogden Municipal Code is hereby amended to read and provide as follows:

15-2-13: ["L" DEFINITIONS:]

LAND USE ORDINANCE: Any planning, zoning, development or subdivision ordinance of the city, including, but not limited to, the provisions of title 14 of this code, commonly referred to as the subdivision ordinance of Ogden City, and this title, commonly referred to as the zoning ordinances of Ogden City, Utah. It is not intended to refer to the Ogden City general plan.

LAND USE PERMIT: A permit, approval or authorization under the provisions of this title for the erection, construction, reconstruction or alteration of any building or structure, or the use of any building, structure or land.

LANDSCAPE OR LANDSCAPING: The installation of living plant material (i.e., turf grasses or turf type fescues, ground cover, annual and perennial flowering plants, vines, shrubs, and trees) planted directly on the property and kept free from all hard surfaces. The following may also be defined as landscaping when they are combined with installed living plant material:

- A. Water features (i.e., pools, fountains, falls and streams) and sculptures;
- B. Paving materials (i.e., bricks, pavers, flagstones, textured concrete) used to create a useful open space, add color or texture to the design, and create visual interest provided that such materials in the front yard setback are used only as trim or edging and not used as patios, sports surfaces, or areas where vehicles can be parked;
- C. Existing natural vegetation of shrubs (e.g., Wood's rose, willows, currant, sagebrush) or trees (e.g., box elder, Gambel oak, maple, birch); or
- D. Landscaping rocks, gravel, mulches, artificial turf or wood chips may be used solely or as ground covers under other plant materials, provided such materials used solely as ground cover without plants above do not cover more than ten percent (10%) of

the ground area required to be landscaped. If more than ten percent (10%) is desired, approval must be given by the planning staff based on the criteria in section 15-13-16 of this title.

LAUNDROMAT OR LAUNDERETTE: A self-service laundry establishment where clothes are cleansed in a coin operated machine. Laundromats or launderettes may include individual dry cleaning machines.

LINEAR BLOCK: Both sides of that portion of any street that has street numbers ranging between any two (2) consecutive multiples of 100, such as 100 and 200, or between 2200 and 2300, etc. A corner tavern or private club shall be included in the particular linear block indicated by the street address of such establishment.

LODGE: A building used by a local chapter of a national fraternal beneficiary society or domestic fraternal society for meetings and activities associated with the organization and its programs.

LOT: A parcel of land occupied or to be occupied by a main building or group of buildings (main or accessory), together with such yards, open spaces, lot width and lot areas as are required by this title and having frontage upon a street; provided, that frontage upon a street shall not be required for lots in PRUD subdivisions as permitted in the subdivision title. Except for group dwellings and a guesthouse, not more than one dwelling structure shall occupy one lot.

LOT, CORNER: A lot abutting on two (2) intersecting streets where the interior angle of intersection or interception does not exceed one hundred thirty five degrees (135°).

LOT, INTERIOR: A lot other than a corner lot.

SECTION 2. Subsection amended. Subsection 15-13-16.A of the Ogden

Municipal Code is hereby amended by adopting a new paragraph 5 to read and provide as follows:

A. General Requirements:

1. All plantings shall be maintained in a healthy and attractive condition.
2. Landscaping materials shall be contained so as not to spill into the public right of way.
3. All yard and setback areas not occupied by buildings or parking shall be landscaped; the area within the public right of way between the curb and gutter and the sidewalk, otherwise known as the park strip, shall be landscaped, unless

the area falls along a gateway or entry corridor as designated in the general plan. Park strip landscaping outside of gateway or entry corridors shall not exceed a maximum height of two feet (2') for shrubs or grasses, and trees in the park strip shall have a minimum height of seven feet (7') for the lowest branches of a tree when they extend above the curb or sidewalk. Notwithstanding the branch height, no evergreen tree is allowed in the park strip. Public rights of way defined by a curb or gutter shall be landscaped utilizing one of three (3) methods:

- a. Grass with trees spaced at a maximum of forty feet (40') on center;
- b. Ground covers, trees and shrubs. When shrubs or ground covers other than grass are used for landscaping, the spacing, type and size of plants used shall be such that seventy five percent (75%) of all landscaped areas shall be covered with living material within three (3) years of planting; or
- c. Rock ground cover with trees spaced at a maximum of forty feet (40') on center. When such rock ground cover is used, there shall not be a concrete surface underneath the ground cover. The rocks used in the ground cover must be between 1.5 inches and four inches (4") in size or, alternatively, if a size smaller than 1.5 inches is used, then:

- (1) Areas of living plant material are required that extend the full width of the park strip in a distinguishable patterned design for the length of the park strip, or

- (2) A varying rock size or color pattern must be used.

4. For all uses except single-family dwellings, all landscaping shall be serviced by an acceptable underground sprinkling or irrigation system.

5. If artificial turf is used as a ground cover:

a. It shall consist of green lifelike individual blades of grass that:

(1) Emulate natural turf in look and color;

(2) Have a minimum pile height of 1.5 inches, except in rear yards where shorter pile height may be installed for planned recreational surfaces; and

(3) Have a minimum tufted weight of 56 ounces per square yard.

b. In no case shall it be installed within:

(1) Permanent drainage features (e.g., ponds, swales, and retention and detention basins); or

(2) Any public right-of-way;

c. It shall have a minimum eight year manufacturer's warranty protecting against color fading and decrease in pile height;

- d. The use of indoor or outdoor plastic or nylon carpeting as a substitute or replacement for artificial turf or natural turf is prohibited;
- e. It shall be properly anchored to ensure that the turf will withstand the effects of wind;
- f. All seams shall be nailed and glued, not sewn, and edges shall be trimmed to fit against all regular and irregular edges to resemble a natural look;
- g. Proper grading, compaction and drainage shall be provided for all artificial turf installations to prevent excess runoff or pooling of water and artificial turf installations shall have a minimum permeability of 30 inches per hour per square yard;
- h. It shall be visually level, with the grain pointing in a single direction;
- i. An appropriate solid barrier device (e.g., concrete mow strip, bender board) is required to separate the artificial turf from planters and live vegetation;
- j. A minimum four foot (4') separation between artificial turf and tree trunks and two foot (2') separation between artificial turf and shrubs shall be maintained to ensure roots are not damaged with the installation of artificial turf and that the overall health of the living plant material is not compromised;
- k. It shall be cleaned regularly and maintained in an appropriate and neat manner;
- l. It shall be replaced if it is worn, uneven, discolored, or damaged; and
- m. It shall comply with subsection 15-13-16.C if it is proposed to be used, either solely or in combination with other non-living ground cover, for more than ten percent (10%) of the ground area required to be landscaped.

SECTION 3. Subsection amended. Subsection 15-13-16.C of the Ogden

Municipal Code is hereby amended by adopting a new subparagraph 5 to read and provide as follows:

- C. More Than Ten Percent Nonliving Ground Cover: When considering if more than ten percent (10%) of nonliving ground cover shall be allowed, the following principles shall be in place in the landscaping or landscaping design:
 - 1. The overall landscaping on the property enhances the visual environment by:
 - a. Adding visual interest through texture, color, size and shape, etc., and

- b. Enhancing perspective by framing views complementing architecture, screening and creating points of interest and activity;
- 2. The design includes elements which work with existing topography and is designed in such a way as to make softened transitions from the landscaping of adjoining properties to the property in question;
- 3. Plant species that are a public nuisance or that cause excess litter should be avoided;
- 4. The other aspects of waterwise design are included on the property which are:
 - a. An overall landscape design for the entire property,
 - b. Mulches are used in planting bed areas,
 - c. Turf areas are used in high use areas of the lot,
 - d. Plants are selected and installed which are appropriate for the physical condition of site specific locations, and
 - e. The landscaping is kept free of weeds and junk materials.
- 5. Artificial turf is limited to not more than 50% of the total landscaping area, unless it is installed and used in the construction of public or private athletic fields, or on playgrounds associated with a:
 - a. Public or private community center;
 - b. Park;
 - c. School; or
 - d. University.

SECTION 4. Effective date. This ordinance shall be effective immediately upon posting after final passage.

PASSED, ADOPTED AND ORDERED POSTED by the Council of Ogden City, Utah this _____ day of _____, 2015.

CHAIR

ATTEST:

CITY RECORDER

TRANSMITTED TO THE MAYOR ON: _____

MAYOR'S ACTION: Approved Vetoed

MAYOR

ATTEST:

CITY RECORDER

POSTING DATE: _____

EFFECTIVE DATE: _____

APPROVED AS TO FORM: MMJ 4/30/15
Legal Date

* The headings, catchlines or catchwords suggested for use in the Ogden Municipal Code and which are bracketed at the beginning of sections or subsections, shall not be considered to be a part of the ordinance adopted herein.

OGDEN CITY COUNCIL TRANSMITTAL

DATE: September 3, 2014

TO: Ogden City Council

THRU: Mark Johnson, CAO

FROM: Tom Christopulos, CED Director

RE: Consideration to amend the zoning ordinance to allow artificial turf as a type of landscaping groundcover

STAFF CONTACT: Greg Montgomery, Planning Manager

REQUESTED TIMELINE: October 28, 2014

RECOMMENDATION: Denial of the proposed zoning ordinance amendment to allow artificial turf as a type of landscaping groundcover

DOCUMENTS: Staff Report

DISCUSSION

Planning Staff explained to the Commission that the proposal to amend the zoning ordinance to allow artificial turf as a type of landscaping groundcover. This is a result of artificial turf being installed at 3340 Harrison Blvd. The owners of this property, Family Support Center of Ogden installed the artificial turf which is not allowed by ordinance. This resulted in Code Enforcement issuing citations on the property. It was noted that the petitioner's desire to amend the ordinance was not only to allow them to keep the installed artificial turf, but was also based on the petitioner's belief that artificial turf could be a benefit to the entire city. The benefits noted by the petitioner included a decrease in water usage and low maintenance demands.

Staff briefly explained that the existing ordinance only allows rocks, gravel, mulches and wood chips as nonliving groundcovers. It was also noted that the ordinance requires certain design criteria to be met if the allowed nonliving groundcovers exceed 10% of the landscaped area. It was pointed-out that artificial turf originated from its extensive use on sports fields. Over the years the technology has improved to create artificial turf with a much more realistic appearance, which has led to its use in landscaping applications. Staff noted that research indicated the use of artificial turf in landscaping was more prevalent in hotter southern regions, particularly in areas prone to drought. Staff also explained that other areas which allow artificial turf typically implement regulations and requirements to mitigate the negative impacts associated with artificial turf.

Staff discussed the commonly addressed benefits and concerns associated with artificial turf. Benefits typically include: water conservation, green waste reduction in landfills, noise reduction from mowers and trimmers, improved air quality from reduction in mower and trimmer usage, and a reduction of the use of fertilizers and chemicals. The concerns typically include: aesthetics due to poor installation or a low quality product, heat generation, expense to replace over time, harboring bacteria from animal waste, impacts to the health of the underlying soil, and the fact it remains green in the winter season. Staff noted that while there are negative impacts associated with artificial turf, the benefits cannot be ignored, especially the conservation of water. Staff pointed-out that the conservation of water is becoming more and more critical as population increases and water reservoirs are low. Staff recommended to the Commission, approval of artificial turf being used as a landscaping groundcover, subject to specific regulations being met that are associated with the quality of material, installation, maintenance, and amount of artificial turf being implemented within a landscaped area.

The Commission discussed some of the issues associated with artificial turf. One of the major concerns discussed was the substantial heat the artificial turf produces. It was pointed out that the heat would not only impact the property the artificial turf was installed on, but would also impact surrounding properties. The Commission also discussed the expense involved with the product and the burden associated with replacing it when worn or damaged. Some Commissioners also had concerns with regulating an appropriate color when artificial turf is being proposed, feeling that the choice would be too subjective. Getting quality materials and monitoring artificial turf installations were also concerns discussed by the Commissioners. Another issue discussed by the Commission was the lack of proper inspections and enforcement to ensure the artificial turf was being installed and maintained properly.

PLANNING COMMISSION ACTION

The Planning Commission reviewed this item on September 3, 2014, and *recommended denial*, finding that the proposed ordinance amendment to allow artificial turf as a landscaping groundcover is not consistent with the intent of the zoning ordinance and policies outlined in the general plan, that it would be difficult to enforce, and it has impacts that are too detrimental.

PLANNING COMMISSIONERS VOTE

	<u>Yes</u>	<u>No</u>
Blaisdell.....	X	
Holman.....	X	
Hueton.....	X	
Orton.....	X	
Schade.....	X	
Southwick.....	X	
Wright.....	X	

CONCERNS OF CITIZENS

None

September 3, 2014

ATTACHMENT ITEM K

OGDEN CITY PLANNING COMMISSION

SUBJECT:

Public hearing for petition# 2014-8 to amend the Zoning Ordinance to allow artificial turf as a landscaping ground cover

PETITIONER'S REQUEST: Approval to amend the Zoning Ordinance to allow artificial turf as a landscaping ground cover

PLANNING STAFF RECOMMENDATION: *Approval* of the proposed Zoning Ordinance amendment subject to staffs recommended regulations

FINDINGS FOR ACTION

The Commission will need to determine whether or not the proposed ordinance amendment to allow artificial turf as a landscaping ground cover is consistent with the intent of the zoning ordinance and policies outlined in the general plan

CONTACTS

Petitioner: Pamela Clark
Family Support Center of Ogden
3340 Harrison Blvd. #100
Ogden, UT 84403

Staff report: Joseph R. Simpson
(801)629-8923
josephsimpson@ogdencity.com

APPLICABLE GENERAL PLAN PROVISIONS

6.D.1.D. Establishing and enforcing land use ordinances regarding junk and debris, preservation of vegetation, pollution, etc. that may negatively affect waterways.

APPLICABLE ORDINANCES

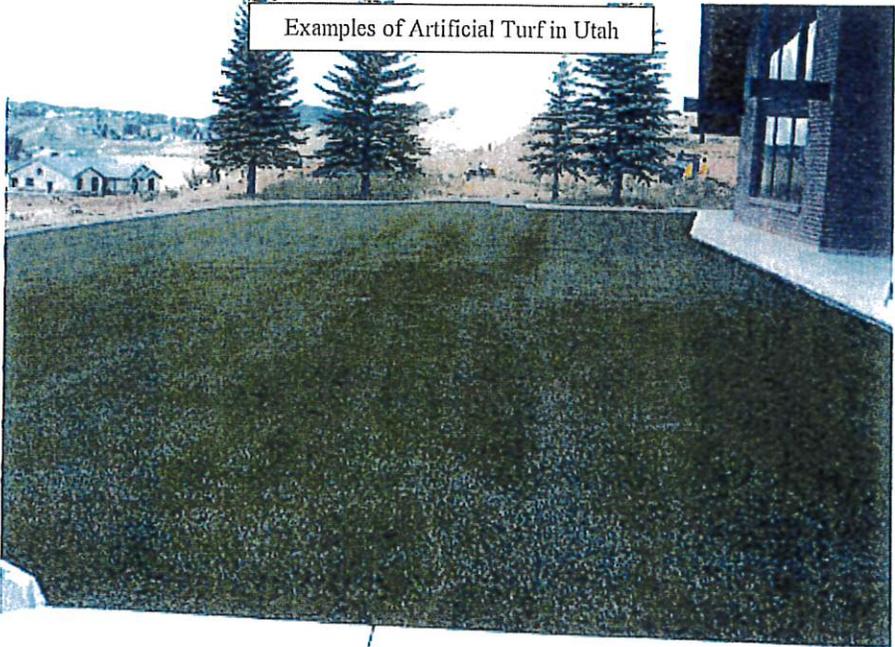
15-2-13 Definition of landscaping
15-4-5.E Landscaping standards for new development
15-13-16 Landscaping requirements for all zones

A. DESCRIPTION OF PROJECT

The petitioner recently removed existing grass landscaping at 3340 Harrison Blvd. and replaced it with artificial turf. The current ordinance does not recognize artificial turf as a landscaping ground cover, and as a result, the petitioner has been receiving zoning code violation notices. This petition is requesting that the definition (15-2-13) of landscaping be modified in the zoning ordinance to include artificial turf as an acceptable type of landscaping ground cover. In the attached petitioner's letter, she explains that they want went to artificial turf due to high water costs and difficulty in

maintaining the grass. She adds: "As long as the following issues are addressed by those seeking to add artificial turf to their landscaping, it would beautify public areas and private homes that might otherwise show signs of neglect." The "issues" described by the petitioner includes: drainage, soil impact, calcium deposits, heat island effect, and wear and tear. The petitioner has not proposed any specific ordinance language to address these issues.

Examples of Artificial Turf in Utah



In considering the proposed zoning ordinance amendment to allow artificial turf as a landscaping ground cover, it is important to keep in mind that the ordinance amendment would apply to the entire City and not just the petitioner's property.

B. SUMMARY OF ISSUES

1. Should the zoning ordinance be amended to allow artificial turf as a landscaping ground cover?
2. If artificial turf is allowed as a landscaping ground cover, what regulations should be applied, if any?

C. STAFF ANALYSIS OF PROPOSAL

The zoning ordinance currently allows rocks, gravel, mulches, and wood chips as nonliving landscaping ground covers. The zoning ordinance does not allow nonliving ground covers to be used exclusively on their own. Nonliving ground covers are generally only allowed as less than 10% of the overall required landscaping. Requests to have more than 10% ground covers requires a special review by Planning Staff, which follows the criteria outlined in ordinance 15-13-16.C. These criteria look at design of the overall landscaping theme of the property to ensure it enhances the environment.

As technology has improved over the years in the creation of artificial turf (mostly for athletic fields), it is apparent that artificial turf has become much more realistic appearance. This improvement in visual appearance has led to more consideration of artificial turf as an appropriate ground cover in non-athletic field settings. The current regulations (described above) that the city has for ground covers seem to be a good approach, however there are concerns with this unique ground cover that staff feels may warrant additional regulations. In reviewing other city standards staff has discovered several regulations that have been implemented to ensure that artificial turf ground covers enhance the overall landscaping. Research has shown that there are some clear benefits and concerns with using artificial turf over traditional living grass turf. These include the following:

Benefits	Concerns
Water conservation	Aesthetics
Green Waste Reduction in Landfills	Heat
Noise Reduction from Mowers and Trimmers	Lifespan
Improvement to Air Quality from Reduction in Mower and Trimmer Usage	Bacteria
Reduction of Fertilizers and Chemicals	Drainage and Soil
	Green Appearance in Winter Season

To ensure artificial turf has good aesthetics and a long lifespan (which typically go hand-in-hand), some city regulations emphasize the manufacturer quality and also the installation of the product. While the technology has greatly improved in the development of artificial turf to the point where they have a very realistic appearance,

there are still types of artificial turf being manufactured that are lacking in quality and aesthetics. Cities typically regulate the quality by requiring minimum pile heights and weights of the artificial turf and also requiring it to have manufacturer warranties. In addition to the quality of the artificial turf, city regulations often require specific installation requirements to ensure quality aesthetics and lifespan of the product. These regulations look at proper anchorage, creating durable seams, and maintaining directional grain of the artificial turf. It is often recommended that artificial turf be cleaned regularly to remove salt and calcium deposits in areas with winter seasons to prevent discoloration. Areas to the south do not need to be concerned about the look of green grass with the artificial turf in the winter time as they are typically in warmer climates. This is one concern with artificial turf in our area as living grass turns brown as it goes dormant in the winter months, artificial turf will stand-out.

Another concern is the heat generated from artificial turf. The petitioner has provided information from an artificial turf manufacturer that indicates newer products do not have this problem, and that significant heat problems only occur in temperatures exceeding 101 degrees for extended periods of time. There has been recent research done on the heat generated by artificial turf. Research shows that air temperatures in the upper 70 degree range can cause artificial turf to heat-up between 117 degrees and 130 degrees (see table below). This significant generation of heat can cause severe damage to surrounding plants and also increase air conditioning utility requirements for surrounding buildings. To overcome this issue of heat generation, city regulations typically look at limiting the amount of artificial turf in a landscaping scheme, and requiring it to be broken-up by planters so there are not large expanses of artificial turf. Regulations also require some separation between plants and artificial turf so there is no physical contact with plants and roots. While the existing 10% regulation is in place for nonliving ground covers, staff is recommending that the regulations restrict artificial turf to 50% of the landscaped area and also require it to be separated from plants to reduced impacts of heat.

Location	Surrounding Air Temperature (°F)	Surface Temperature of Artificial Turf (°F)
Brigham Young University (BYU) – Utah	78°	117°
University of Missouri	98°	178°
Penn State University	79°	120°
	78°	130°
	85°	146°

⁴ *FACT SHEET – Crumb-Rubber Infilled Synthetic Turf Athletic Fields*. State of New York Department of Health, Aug. 2008. Web. 14 Mar. 2012. <http://www.health.ny.gov/environmental/outdoors/synthetic_turf/crumb-rubber_infilled/docs/fact_sheet.pdf>.

There is concern with the development of bacteria on artificial turf. The bacteria is typically introduced by animal waste. The increased heat and synthetic nature of the artificial turf can encourage bacterial growth from the waste, which can be a health concern. Regulations will typically require regular cleaning of artificial turf to alleviate these concerns. Regular cleanings also help to maintain the aesthetics of the artificial turf.

Drainage is another important aspect in maintaining the aesthetics and longevity of artificial turf. Because of the potential growth of algae on artificial turf, which can have a huge impact on its appearance and life, artificial turf should have proper drainage. Because of this issue, artificial turf should also never be used in retention or detention basins. Proper drainage is also essential in maintaining healthy soil beneath artificial turf. The bacteria, earth worms, and other organisms that contribute to healthy soil conditions need the water in the soil. Regulations typically require a minimum amount of drainage, or permeability for artificial turf. Staff is recommending a minimum permeability of 30 inches per hour per square yard, which seems to be a common standard.

D. ALTERNATIVE ACTIONS

- Deny the proposed ordinance amendment
- Approve the proposed ordinance amendment with additional recommendations and/or requirements

E. PLANNING STAFF RECOMMENDATION: *Approval* of the proposed Zoning Ordinance amendment subject to staffs recommended regulations.

Attachments:

1. Submitted Petition
2. Petitioner Letter
3. Staff Recommended Regulations



Petition to Amend Ogden City's Zoning, Sign or Subdivision Ordinance

Ogden City Recorder's Office
2549 Washington Blvd. Suite 220
Ogden, Utah 84401
(801) 629-8930

Please print legibly and complete all areas:

The following checklist will assist you with your application to change the existing language in the Ogden City zoning, sign or subdivision ordinance.

Petition Checklist

- Review this application with a Planner prior to filing at the City Recorder's office.
- In the space provided below, explain what portion of the ordinance you want to change and why the change would be in the best interest of the general public. Attach another sheet, if necessary.
- Include suggestions of how the regulations or requirement *should* read, if amended.
- Attach any documentation showing that other cities have similar requirements.
- Pay the \$600 filing fee at the City Recorder's office and submit this petition at the same time.

Petitioner Contact Information

Name: Family Support Center of Ogden, Inc Pamela Clark, Executive Dir.

Address: 3340 Harrison Blvd #100 City: Ogden State: UT

Zip: 84403 Phone: 801-393-3113

E-mail (please print): DirFSC@aol.com

Petition to amend the Zoning, Sign or Subdivision Ordinance (please circle one)

I (we) the undersigned do respectfully request that the Ogden City Zoning Sign Subdivision (circle one)

Ordinance be amended by changing or eliminating Title 15-2-13.L.D (Ordinance reference)

Please amend the ordinance as follows:

Landscaping rocks, gravel, mulches, artificial turf or wood chips may be used solely or as ground covers under other plant materials, provided such materials used solely as ground cover

without plants above do not cover more than 10 percent of the ground area required to be landscaped.

This change is in the best interest of the general public because:

See attached.

Petitioner's signature(s):

Pamela Clark

Filed in office of City Recorder

Petition No. 2014-8

By Pamela Clark

Date 8/13/14

Fee \$100.00

Chk Credit card

Date: 8/13/14

This change is in the best interest of the general public because:

Artificial turf as a landscaping option is beneficial to Ogden City and its citizens. First, it uses no water. In our case, the Center had multiple issues with poor sprinkler system pipes. The results were an extreme waste of valuable water (we are on a culinary water system as Pine View water is not available to us), high utility bills that were a hardship to our charitable agency and an unsightly lawn that was very visible from Harrison Blvd. Second, it looks good while requiring very little maintenance.

As long as the following issues are addressed by those seeking to add artificial turf to their landscaping, it would beautify public areas and private homes that might otherwise show signs of neglect.

- 1- Drainage: Artificial turf must drain properly to keep it in top condition. In our case, the turf has been added on an incline that allows for proper drainage.
- 2- Soil Impact: In the early years of artificial turf, leeching chemicals into the soil underneath was a concern. According to BuildDirect, a leading manufacturer of artificial turf, modern turf poses no such threat. Furthermore, proper installation of turf requires a landscaping fabric and at least 3 inches of road sand material as barriers between the turf and the soil. In our case, proper installation guidelines were used to further protect the soil.
- 3- Calcium deposits: To keep a well maintained artificial turf, occasional cleanup is required. Dirt, sand and salt can accumulate and leave deposits. Artificial turf is easily cleaned with a hose and broom. According to BuildDirect, there are also biodegradable cleansers that can also be used if more cleaning is necessary.
- 4- "Heat Island" Effect: This effect can occur when artificial turf is exposed to constant sun and creates "hot spots" over and near the turf. According to BuildDirect, this phenomenon is a rare as artificial turf continues to improve. This effect occurs when temperatures exceed 101 degrees for extended periods of time and the turf is exposed to the sun longer than 12 - 14 hours a day. In our case, the sun does not hit the turf until close to 1 pm, giving it only a maximum possible exposure time of 8 hours.
- 5- Wear and Tear: Proper installation and design is important to assist in long-term maintenance and care of the artificial turf. For example, installing artificial turf flush to a sidewalk can cause damage to the turf from snow blowers and shovels. In our case, we designed the artificial turf pattern with long-term care in mind to insure minimum damage.

Please do not hesitate to contact the Center if you have any questions or concerns. We thank you in advance for your attention to this matter.

DEFINITION AMENDMENT

15-2-13: "L" DEFINITIONS:

LAND USE ORDINANCE: Any planning, zoning, development or subdivision ordinance of the city, including, but not limited to, the provisions of title 14 of this code, commonly referred to as the subdivision ordinance of Ogden City, and this title, commonly referred to as the zoning ordinances of Ogden City, Utah. It is not intended to refer to the Ogden City general plan.

LAND USE PERMIT: A permit, approval or authorization under the provisions of this title for the erection, construction, reconstruction or alteration of any building or structure, or the use of any building, structure or land.

LANDSCAPE OR LANDSCAPING: The installation of living plant material (i.e., turf grasses or turf type fescues, ground cover, annual and perennial flowering plants, vines, shrubs, and trees) planted directly on the property and kept free from all hard surfaces. The following may also be defined as landscaping when they are combined with installed living plant material:

- A. Water features (i.e., pools, fountains, falls and streams) and sculptures;
- B. Paving materials (i.e., bricks, pavers, flagstones, textured concrete) used to create a useful open space, add color or texture to the design, and create visual interest provided that such materials in the front yard setback are used only as trim or edging and not used as patios, sports surfaces, or areas where vehicles can be parked;
- C. Existing natural vegetation of shrubs (e.g., Wood's rose, willows, currant, sagebrush) or trees (e.g., box elder, Gambel oak, maple, birch); or
- D. Landscaping rocks, gravel, mulches, artificial turf or wood chips may be used solely or as ground covers under other plant materials, provided such materials used solely as ground cover without plants above do not cover more than ten percent (10%) of the ground area required to be landscaped. If more than ten percent (10%) is desired, approval must be given by the planning staff based on the criteria in section 15-13-16 of this title.

LANDSCAPING ORDINANCE AMENDMENT

15-13-16: LANDSCAPING REQUIRED:

When an area is required to be landscaped under the terms of this title, the requirements shall be met by the installation and maintenance of improvements as set forth below:

- A. General Requirements:

1. All plantings shall be maintained in a healthy and attractive condition.
2. Landscaping materials shall be contained so as not to spill into the public right of way.
3. All yard and setback areas not occupied by buildings or parking shall be landscaped; the area within the public right of way between the curb and gutter and the sidewalk, otherwise known as the park strip, shall be landscaped, unless the area falls along a gateway or entry corridor as designated in the general plan. Park strip landscaping outside of gateway or entry corridors shall not exceed a maximum height of two feet (2') for shrubs or grasses, and trees in the park strip shall have a minimum height of seven feet (7') for the lowest branches of a tree when they extend above the curb or sidewalk. Notwithstanding the branch height, no evergreen tree is allowed in the park strip. Public rights of way defined by a curb or gutter shall be landscaped utilizing one of three (3) methods:
 - a. Grass with trees spaced at a maximum of forty feet (40') on center;
 - b. Ground covers, trees and shrubs. When shrubs or ground covers other than grass are used for landscaping, the spacing, type and size of plants used shall be such that seventy five percent (75%) of all landscaped areas shall be covered with living material within three (3) years of planting; or
 - c. Rock ground cover with trees spaced at a maximum of forty feet (40') on center. When such rock ground cover is used, there shall not be a concrete surface underneath the ground cover. The rocks used in the ground cover must be between 1.5 inches and four inches (4") in size or, alternatively, if a size smaller than 1.5 inches is used, then:
 - (1) Areas of living plant material are required that extend the full width of the park strip in a distinguishable patterned design for the length of the park strip, or
 - (2) A varying rock size or color pattern must be used.
4. For all uses except single-family dwellings, all landscaping shall be serviced by an acceptable underground sprinkling or irrigation system.

B. Gateway And Entry Corridor Rights Of Way:

1. For areas at an entry point or along an entry corridor, the area within the public right of way between the curb and gutter and sidewalk may be fully landscaped, or may invoke a combination of landscaping, pavers and other design elements to create the desired visual impact. The use of landscaping and pavers at entry points and along entry corridors should substantively satisfy the following objectives:
 - a. Landscaping, combined with pavers and other design elements such as lighting, seating, etc., as deemed appropriate, should enhance the visual environment by creating a visually obvious and definite entry point or entry corridor through use of a texture, color, size and shape, etc., enhancing perspective by framing views, complementing architecture, screening, and creating points of interest and activity;
 - b. Landscaping combined with other design elements should ensure public safety by:
 - (1) Guiding the circulation of cars and people,
 - (2) Controlling access to parking lots, and

(3) Making traffic diverters prominent; and

c. Landscaping combined with other design elements should minimize maintenance to ensure these points of first impression are maintained at an optimum level.

2. Care should be taken to integrate the design of the entry point or entry corridor to the surrounding areas in a way that maximizes the assets of the area while still maintaining the desired continuity and visual impact.

3. Visual continuity and overall design shall control the balance of landscaping and other design elements. However, whenever possible, landscaping shall be used.

C. More Than Ten Percent Nonliving Ground Cover: When considering if more than ten percent (10%) of nonliving ground cover shall be allowed, the following principles shall be in place in the landscaping or landscaping design:

1. The overall landscaping on the property enhances the visual environment by:

a. Adding visual interest through texture, color, size and shape, etc., and

b. Enhancing perspective by framing views complementing architecture, screening and creating points of interest and activity;

2. The design includes elements which work with existing topography and is designed in such a way as to make softened transitions from the landscaping of adjoining properties to the property in question;

3. Plant species that are a public nuisance or that cause excess litter should be avoided;

4. The other aspects of waterwise design are included on the property which are:

a. An overall landscape design for the entire property,

b. Mulches are used in planting bed areas,

c. Turf areas are used in high use areas of the lot,

d. Plants are selected and installed which are appropriate for the physical condition of site specific locations, and

e. The landscaping is kept free of weeds and junk materials.

5. Artificial turf:

a. Artificial turf shall consist of green lifelike individual blades of grass that emulate natural turf in look and color and shall have a minimum pile height of 1.5 inches and shall have a minimum tufted weight of 56 ounces per square yard.

b. Artificial turf shall be permitted in the construction of public or private athletic fields and playgrounds associated with a public or private community center, park, school or university.

- c. In no case shall artificial turf be installed within permanent drainage features (e.g., ponds, swales, and retention and detention basins).
- d. All artificial turf shall have a minimum eight year manufacturer's warranty that protects against color fading and decrease in pile height.
- e. The use of indoor or outdoor plastic or nylon carpeting as a replacement of artificial turf or natural turf shall be prohibited.
- f. All artificial turf installations shall be anchored to ensure that the turf will withstand the effects of wind.
- g. All seams shall be nailed and glued, not sewn, and edges shall be trimmed to fit against all regular and irregular edges to resemble a natural look.
- h. Proper drainage shall be provided for all artificial turf installations to prevent excess runoff or pooling of water. Artificial turf installations shall have a minimum permeability of 30 inches per hour per square yard.
- i. Artificial turf shall be visually level, with the grain pointing in a single direction.
- j. An appropriate solid barrier device (e.g., concrete mow strip, bender board) is required to separate artificial turf from planters and live vegetation.
- k. A minimum of 4' separation between artificial turf and tree trunks and 2' separation between artificial turf and shrubs shall be maintained to ensure roots are not damaged with the installation of artificial turf and that the overall health of the living plant material is not compromised.
- l. With the exception of athletic fields, artificial turf shall not be used for over 50% of the total landscaping area.
- m. Artificial turf areas shall be cleaned regularly and maintained in an appropriate and neat manner.
- n. Artificial turf that is worn, discolored, or damaged shall be replaced.

Synthetic grass installation gets green light in Ogden

POSTED 9:42 PM, MAY 12, 2015, BY TIFFANY DEMASTERS AND TODD TANNER, UPDATED AT 07:15AM, MAY 13, 2015

This is an archived article and the information in the article may be outdated. Please look at the time stamp on the story to see when it was last updated.

Artificial turf debate



OGDEN, Utah -- Some Ogden residents and businesses have turned to artificial turf as an option to water conservation.

Although city planners were concerned about such installations, the Ogden City Council voted unanimously Tuesday night to allow the synthetic grass.

The vote resolves an issue that started almost a year ago when a building owner on the city's east side was cited for a code violation when she decided to replace her lawn with synthetic grass.

"Between the amount of water we were consuming and the size of our water bill it just became not very cost efficient for the family support center to continue to water grass," said Pamela Clark with Family Support Center.

Last summer, Clark decided to replace her building's aging sprinkler system with artificial turf. But half way through installation, she was told it was a code violation.

"I called them and I said, 'it doesn't say I can't have artificial turf,' and the city planners came back and said that 'it doesn't say that you can,'" Clark said.

Clark asked the city to create a new ordinance, to legalize her artificial turf and open the way for others to install as well.

The Ogden Planning Commission expressed concerns, citing studies that show real grass cools the environment, while artificial grass heats it up.

The council voted to allow the synthetic grass.

"It seems like the response I've had has been more positive to allow people to do it," said City Councilwoman Amy Wicks. "I think the concerns people had were, what happens when this material reaches the end of its expected life."

Residents wanting artificial turf will be required to notify the city first.

The turf is not allowed to cover more than 50 percent of a yard in Ogden and needs to be an inch and a half long.

SPONSORED CONTENT

Idris Elba reveals how he stays in such great shape



JUL 20, 2017, BY CONNATIX

Idris Elba is one of the hottest men in Hollywood right now, and even at the age of 44 maintains an impressive physique. In a recent interview, he opened up ...



A mother shares loss after child swept away in the Ogden River



'We prayed': woman who helped mom after son fell into Ogden River recounts search



Bikers form funeral procession for Ogden boy who loved motorcycles

Artificial Turf Requirements and Guidelines

Definitions: Artificial Turf. A man-made substitute for organic turf, lawn, or sod which effectively simulates the appearance of a well-maintained lawn and meets all of the quality, material and installation standards listed in this Section

Zones: Artificial turf requirements and guidelines are applicable to the following zones:

RR-1-20,000	Rural residential zone
R-1-15,000	Residential zone
R-1-11,000	Residential zone
PR 2.2	Planned residential zone
PR 3.4	Planned residential zone
H-1	Hillside development zone
SC-1	Shopping center zone
PF	Public facilities zone
TR-1	Townsite residential zone

General Requirements:

The City reserves the right to require removal/replacement of any area of artificial turf which does not meet the standards set forth by these guidelines.

Artificial turf must be professionally installed by a licensed representative of the manufacturer and covered by a manufacturer's warranty of at least seven years. The installation contractor must be licensed, bonded and insured.

Any request for installation of artificial turf to the front yard must include a minimum of a one square foot boxed sample (including infill) of the exact finished turf product, along with the manufacturer's product specifications. Allowable tufted face weight (Pile weight) range is between 30 ounces to 78 ounces per square yard. The maximum width of the stitch gage is 3/4 inch.

A minimum of 3 inches of compacted aggregate material shall be installed under the artificial turf surface (sub-base materials).

Artificial turf must be installed in such a way as to appear seamless and uniform. All seams must be glued. Only natural colors are acceptable, to remain unchanged from the natural green lawn appearance, and subject to approval by the City.

The length of the artificial turf shall be minimum of 1-½ inches, not to exceed 2 1/4 inches.

HOA Covenants: Home Owner Associations shall be permitted to prohibit the use of artificial turf, but must follow city requirements and guidelines in this section if permitted.

Lead free: Artificial turf and associated backfill shall be lead free.

Warranty: A minimum eight (8) year manufacturer's warranty is required for an installation .

Landscape Plan: A landscape plan shall be submitted for approval by the city that meets the requirements set forth in section 6-4-4 Landscape Requirements.



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	10/24/2017

Planning Commission Agenda Item

SUBJECT:	Review/Recommendation on Elevation Sign Update for Walmart
APPLICANT PRESENTATION:	n/a
STAFF PRESENTATION:	Chandler Goodwin, City Manager

BACKGROUND AND FINDINGS:

Walmart is in the process of updating their store to fit in with the current color and design scheme of their brand. Walmart is proposing to alter their current signage by adding a blue background to the current "Walmart" sign, as well as add a "Pickup" sign on the northwest corner of the building with an orange badge. The pickup is a new service offered by Walmart, this portion is a new sign location on the building.

During the April 3, 2017 City Council meeting, the Walmart site plan was accepted with the provision that, "signs shall be subject to all provisions of the Cedar Hills sign ordinance. The City Council will make a finding at final site plan approval as to which facades of the building will be determined to be the front." The proposal alters the current signage on the front as stated above, as well as changing the verbiage of the sign on the south of the structure from "Outdoor Living" to "Lawn & Garden".

PREVIOUS LEGISLATIVE ACTION:

City Council made final approval 4-3-2007

FISCAL IMPACT:

n/a

SUPPORTING DOCUMENTS:

Walmart Signage

RECOMMENDATION:

Review changes, make any necessary recommendations

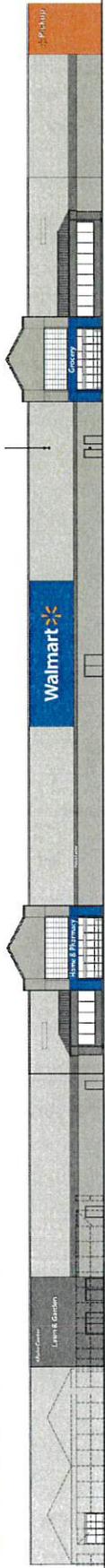
MOTION:

To recommend/not recommend to the City Council the changes proposed to the current Walmart signage {SUBJECT TO THE FOLLOWING CHANGES}.

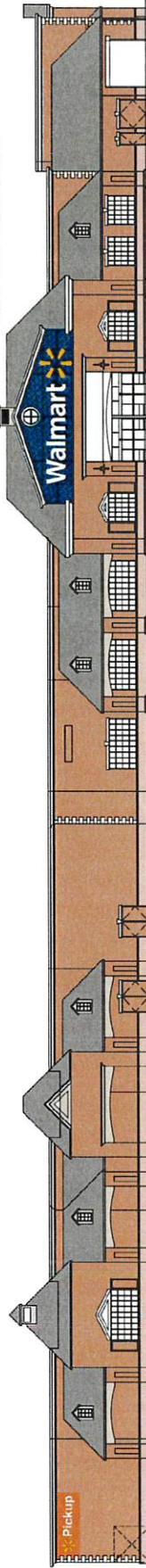


Exceptions	Revision History
Brand Blue	09/19/2017
Brand Orange	BRC Submittal
Brand Grays	Not Allowed
Active Special Projects	BRC Approval
FM Painted 2017	Not Allowed
	AHJ Submittal
	No
	AHJ Approval
	No
	TBD
	TBD

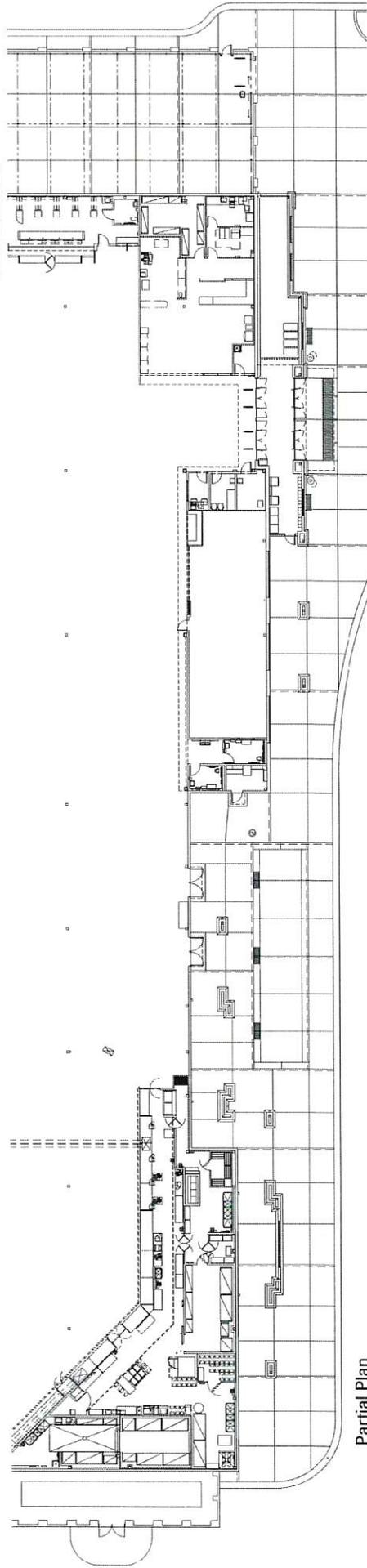
Paint Disclosures:
 This store is part of a shopping zone district built with similar materials and earthtones. Change of those colors would not be allowed to change since Walmart was used as a base for new construction to be designed from. There is an opportunity to provide a blue badge on the brand wall. This proposed change can be submitted for preliminary office review prior to a Planning Commission and City Council Approval. Planning Board meets the 4th Tuesday each month and the city council meets the 1st and 3rd Tuesday each month (but only once in Nov & Dec). The process will take approximately 2 - 2.5 months depending on when we submit.



192 Proto Supercenter



Front Elevation



Partial Plan

SGA Design Group, Inc.

September 22, 2017



Cedar Hills, UT - Store #4689

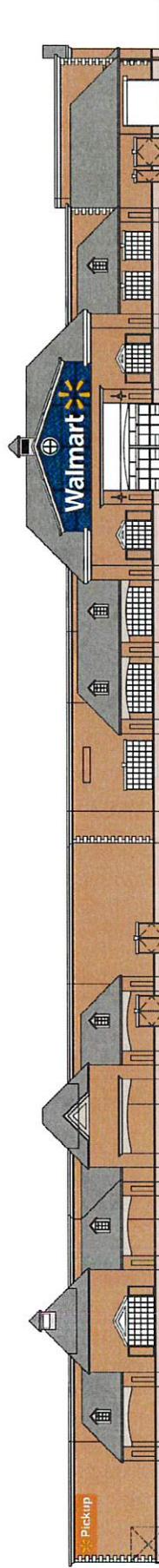
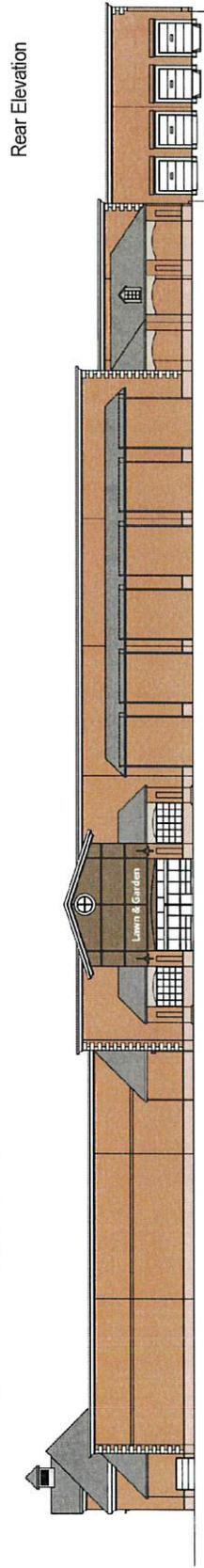
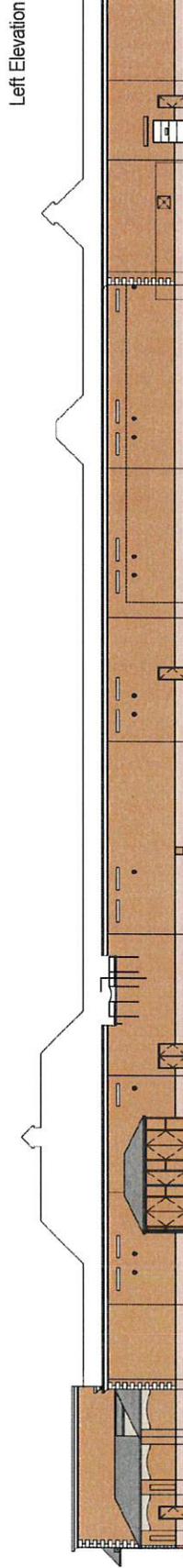
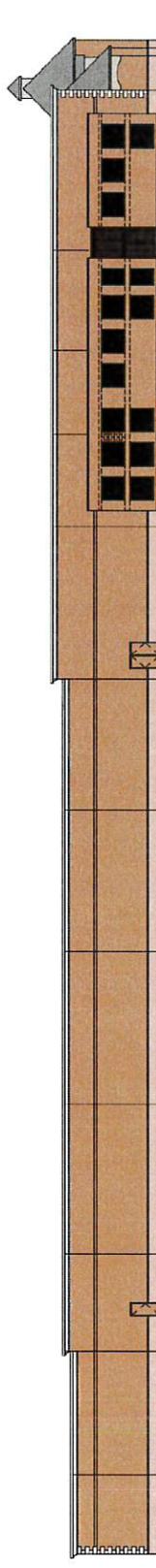
FOR AHJ DESIGN REVIEW ONLY NOT FOR CONSTRUCTION

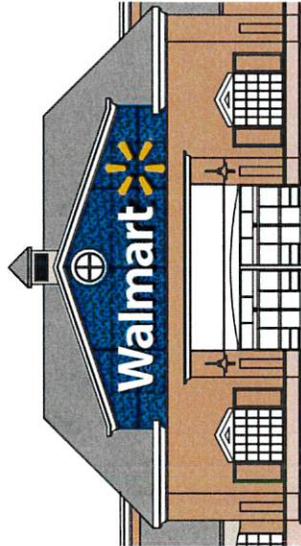
Proto Comparison

1

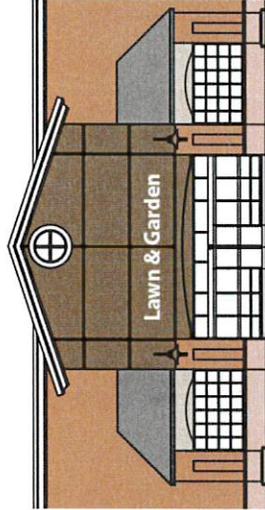
DESIGN REPRESENTATION ONLY - NOT FOR CONSTRUCTION The building images shown are a representation of the current design intent only. The building images may not reflect variations in color, tone, hue, tint, shading, ambient light intensity, materials, texture, contrast, construction variations required by building codes or inspectors, material availability or final design detailing.

Color Legend	
PA	COLOR NAME
P49	SW #7019 "GAUNTLET GRAY"
P76J	MEDIUM WALMART BLUE (URETHANE)
P128J	SW #6885 "KNOCKOUT ORANGE"
P134	SW #7015 "ROSE GRAY"
P135	SW #7017 "DORIAN GRAY"
P140	SW #7006 "SNOWBOUND"
HRC4	HEAT RESISTANT COATING TO MATCH SW #7019
P103	SW #6995 "TOASTY"

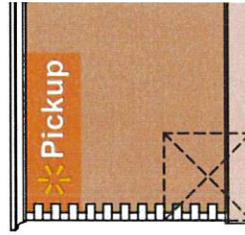




5'-6" Walmart (298.00 SF) ETR



2'-0" Lawn & Garden (41.02 SF)



2'-6" Pickup (66.76 SF)

EXISTING SIGNAGE SCHEDULE

SIGNAGE LOCATION	QTY	LIGHTED	COLOR	SIZE	INDIVIDUAL AREA	TOTAL AREA
FRONT SIGNAGE						
Walmart	1	LED	WHITE	5'-6"		
Spark	1	LED	YELLOW	8'-0"	298.00 SF	298.00 SF
TOTAL FRONT SIGNAGE						
SIDE SIGNAGE						
Outdoor Living	1	N/A	WHITE	2'-0"	49.48 SF	49.48 SF
TOTAL SIDE SIGNAGE						
TOTAL EXISTING BUILDING SIGNAGE						
					49.48 SF	347.48 SF

NEW SIGNAGE SCHEDULE

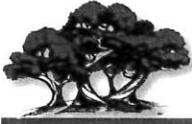
SIGNAGE LOCATION	QTY	LIGHTED	COLOR	SIZE	INDIVIDUAL AREA	TOTAL AREA
FRONT SIGNAGE						
Walmart	1	LED	WHITE	5'-6"		
Spark	1	LED	YELLOW	8'-0"	212.48 SF	212.48 SF
Pickup	1	LED	WHITE	2'-6"		
Spark	1	LED	YELLOW	4'-0"	51.88 SF	51.88 SF
TOTAL FRONT SIGNAGE						
SIDE SIGNAGE						
Lawn & Garden	1	N/A	WHITE	2'-0"	41.02 SF	41.02 SF
TOTAL SIDE SIGNAGE						
TOTAL NEW & EXISTING BUILDING SIGNAGE						
					41.02 SF	305.38 SF

EXISTING SIGNAGE AREA: 347.48 SF
 PROPOSED SIGNAGE ARE: 305.38 SF
 SIGNAGE AREA ALLOWABLE: 276.14 SF or 75 SF
 NO SITE SIGNAGE EXISTING

Signage Disclosures:

Section 10-5-26(D)(4) is for Commercial Zones and allows for a cumulative total max sign area of 25% of the facade area for signs. However, Section 10-6A-4(E) is for Planned Commercial Developments. It allows a cumulative total max sign area of the lesser of 10% of the facade or 75 sf. A preliminary sign package can be submitted to the department for evaluation and direction. The proposed signs may comply and be approved based on their review of the ordinances and original building submittals. If not, the signs may follow the variance process with the Board of Adjustment, whose meetings are scheduled on an as-needed basis.

No site signage existing.



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	10/24/2017

Planning Commission Agenda Item

SUBJECT:	Discussion on Group Homes
APPLICANT PRESENTATION:	n/a
STAFF PRESENTATION:	Chandler Goodwin, City Manager

BACKGROUND AND FINDINGS:

Cedar Hills has had numerous inquiries as it relates to code related to group homes, homes for disabled persons, or group living arrangements. This discussion is meant to begin to draft code that would allow for these types of uses as permitted by the City. South Ogden City code has been provided to help guide the discussion.

South Ogden definitions:

DISABLED PERSON: A person with a physical or mental impairment that substantially limits one or more of a person's major life activities, including a person having a record of such an impairment or being regarded as having such an impairment; a person with a "disability" under title 57, chapter 21 of the Utah code, as amended; a person with a "disability" under 42 USC section 12102(1), as amended; and a person with a "handicap" under 42 USC section 3602(h), as amended. A "disabled person" does not include a person engaged in the current illegal use of, or addiction to, any federally controlled substance, as defined in section 102 of the controlled substances act, 21 USC section 802.

GROUP LIVING ARRANGEMENT: A group living or congregate living arrangement where groups of more than four (4) unrelated persons live together in a single dwelling or housekeeping unit, including, but not limited to, assisted living unit, boarding house, lodging house, nursing home, senior housing, assisted living facility, nursing care facility, residential facility for disabled persons, dormitory, student housing, fraternity, club, institutional group, halfway house, convent, monastery, or other similar group living or congregate living arrangement of unrelated persons. A group living arrangement does not include clinics, medical or dental; hospital(s) or hospital/clinic.

NURSING HOME: A residential facility for people with chronic illness or disability. A place where people who are unable to take care of themselves can live and be taken care of. Also known as "convalescent home" and "long term care facility".

PREVIOUS LEGISLATIVE ACTION:

N/A

FISCAL IMPACT:

N/A

SUPPORTING DOCUMENTS:

South Ogden Code 10-14-16, South Ogden Definitions (see above)

RECOMMENDATION:

Make recommendations to help guide the process of drafting code for residential facilities for persons with a disability.

MOTION:

No motion necessary, discussion item only.

10-14-16: RESIDENTIAL FACILITIES FOR PERSONS WITH A DISABILITY:

- A. Purpose: It is the intent of the city that this section shall be interpreted and applied in a manner that is consistent with title 57, chapter 21, Utah fair housing act, the federal fair housing amendments act of 1988, 42 USC section 3601 et seq., title II of the Americans with disabilities act and the rehabilitation act.
- B. Scope: If any group living arrangement, facility, residence, congregate living or other housing arrangement meets the definition of a residential facility for disabled persons as defined in section [10-2-1](#) of this title, the requirements of this chapter shall govern the same notwithstanding any conflicting provision of this title or this code. Except as provided herein, the requirements of this chapter shall not be construed to prohibit or limit other applicable provisions of this title, this code or other laws.
- C. Permitted Uses:
1. Notwithstanding any contrary provision of this title, a residential facility for disabled persons shall be a permitted use in any zone where a group living arrangement is allowed either as a permitted or conditional use, subject to the same development standards as are applied to group living arrangements in this title.
 2. In determining whether a group living arrangement is allowed, only those uses currently and presently allowed by ordinance shall be considered; variances, prior accommodations, preexisting nonconforming buildings, or preexisting nonconforming uses shall not be considered.
- D. Reasonable Accommodation:
1. None of the requirements of this chapter shall be interpreted to limit any reasonable accommodation necessary to afford a disabled person an equal opportunity to use and enjoy a dwelling as required by the fair housing amendments act of 1988, title II of the Americans with disabilities act, the Utah fair housing act, the rehabilitation act, and any other federal or state law requiring a reasonable accommodation for a disabled person.
 2. Any person or entity wanting a reasonable accommodation shall submit an application to the accommodation review committee (ARC) and shall in writing:
 - a. Provide the address of the property to which the accommodation will be applied;
 - b. Specify the accommodation requested, including the regulation(s), policy or procedure for which an accommodation is sought;
 - c. Explain why the accommodation is reasonable and absolutely necessary to afford a disabled person an equal opportunity to use and enjoy a dwelling; and
 - d. Provide all information necessary and sufficient for the findings set forth in subsection D4 of this section.

3. The ARC shall evaluate all reasonable accommodation requests based on the criteria set forth in subsection D4 of this section.
4. Within thirty (30) days after receipt of a complete application, the ARC shall issue a written decision on the requested reasonable accommodation. The ARC may either grant, grant with modifications, or deny a request for reasonable accommodation in accordance with the following factors:
 - a. Whether the housing, which is the subject of the request for reasonable accommodation, will be used by a disabled person;
 - b. Whether the requested accommodation is necessary to afford disabled persons equal opportunity to use and enjoy a dwelling when compared to similarly situated persons or groups without a disability;
 - c. Whether the requested accommodation would impose an undue financial or administrative burden on the city;
 - d. Whether the requested accommodation would require a fundamental alteration in the nature of the city's land use, zoning or building programs;
 - e. Whether the requested accommodation is reasonable;
 - f. Whether the request for accommodation would result in a dwelling being made available to an individual whose tenancy would constitute a direct threat to the health or safety of other individuals or whose tenancy would result in substantial physical damage to the property of others; and
 - g. Any other relevant considerations under federal or state law.
5. If a reasonable accommodation request is denied, the decision may be appealed to the hearing officer in the manner provided for appeals of administrative decisions set forth in [chapter 4](#) of this title. The review of all such appeals, including any appeals from the hearing officer to the district court, shall be based upon the record presented to the ARC and shall not be de novo.
6. A reasonable accommodation shall not be deemed a variance or to run with the land.
7. If the ARC fails to render a written decision on the request for reasonable accommodation within the thirty (30) day time period allotted by subsection D4 of this section, the request shall be deemed denied based upon the insufficiency of the applicant's information to satisfy the criteria set forth in subsection D4 of this section.
8. While a request for reasonable accommodation is pending, all laws and regulations otherwise applicable to the property that is the subject of the request shall remain in full force and effect.
9. It is the applicant's burden to demonstrate that the accommodation is necessary and reasonable under the standards and definitions set forth in federal and state law, including federal and state case law.

E. Accommodation Review Committee (ARC):

1. The purpose of the ARC is to assure that all reasonable accommodation requests comply with the provisions of this title and that all decisions on reasonable accommodation requests are reviewed and handled in compliance with this title, the fair housing amendments act of 1988, title

II of the Americans with disabilities act, the Utah fair housing act, the rehabilitation act, and any other federal or state law requiring a reasonable accommodation for a disabled person.

2. The ARC shall consist of five (5) members: the city manager, the city planner, the fire chief, the chief building official, and the city attorney or their designee(s). The police chief, the city engineer, the public works director and any other person(s) designated by the ARC shall serve as advisors to the ARC.
3. The city manager shall serve as the chairperson of the ARC.
4. The ARC may establish procedures for the preparation of its agendas, the scheduling of meetings, and the conduct of meetings and field trips, if any.
5. The ARC may retain the services of any other outside professionals or technical experts to help evaluate any and all requests for accommodation. (Ord. 16-20, 12-6-2016)