Mapleton City

Planning Commission Staff Report

July 14, 2016

Item 5

Applicant: Mapleton City

Location: City wide

Prepared by: Brian Tucker, Planner

Public Hearing: Yes

Zone: All

Attachments:

1. Proposed Amendment.
2. Solar photovoltaic ground mounting data

REQUEST

Consideration of an ordinance amending Mapleton City Code (MCC) Section 18.84.440.D related to freestanding or yard mounted residential solar energy devices.

BACKGROUND AND DESCRIPTION

Currently Mapleton allows the installation of solar panels or "residential solar energy devices" on private, residential property as long as the devices are roof mounted. The current code, MCC 18.84.440, prohibits "freestanding devices," including ground mounted solar panels.

Mapleton City has issued 42 solar permits to date in 2016 alone. While the installation of roof mounted solar is very popular, in a few instances property owners and/or solar contractors have proposed ground mounted solar panels. These requests have been denied based on the prohibition on "freestanding devices." An applicant from Intermountain Wind a Solar made an application to change the zoning ordinance text to allow ground mounted solar. However, the applicant has withdrawn that application based on the reluctance on the part of Staff to recommend ground mounted solar devices within the front yard. Staff still feel that there is enough interest to bring the general question of ground mounted or "freestanding devices" to the Planning Commission and City Council. Are these ground mounted solar devices acceptable and if so under what circumstances?

The proposed Ordinance does the following:

- Allows ground mounted solar energy devices when a roof mounted device is not appropriate for reasons of efficiency or aesthetics as follows:
    - The device must meet the minimum side and rear setbacks for equivalent accessory structures,
    - Installations in front yards and the area between the home and the road are prohibited,
    - Installations in legal easements or in a manner that impedes storm water conveyance are prohibited,
    - Installations over 10' in height are prohibited,
    - The surface area of an installation may not exceed 5% of the lot area or contribute to the violation of the maximum coverage allowance for a lot,
    - Installations must be screened from adjacent property by a decorative fence or vegetative screen, and
    - Power transmission lines must be buried and proper warning signs must be posted.

EVALUATION

Mapleton City has issued 42 building permits for solar panel in 2016 to date. There may have been as many as 5 requests for ground mounted solar panels during that time and possibly a few others who declined to submit a permit application after being told that ground mounted panels were prohibited. The ground mounted requests are a relatively small slice of the solar permit pie but requests do occur.

The "residential solar energy devices" section of the zoning ordinance was adopted in 2011 and "freestanding devices" were specifically prohibited. This specific prohibition appears to have been intentional and there are reasons to continue to prohibit ground mounted systems if precautions aren't taken to mitigate the visual and other impacts that can accompany these systems. The staff proposal attempts to minimize the visual impacts by requiring adequate screening, requiring setbacks from property lines, prohibiting front yard installations, and minimizing the allowable height and surface are of these systems.

Staff have proposed caps on the height and surface area of ground mounted systems in accordance with various existing ordinances, model ordinances, and in light of data available on the typical ground mounted system. As for surface area, a 10,000 square foot lot could have up to 500 square feet of solar device surface area, the equivalent of a 20'X25' accessory structure or a two car garage. Data collected from various manufacturers and installers of ground mounted solar photovoltaic systems suggest that it is quite rare that a system would exceed 10' in height. Of the companies with data available only 3 of 15 companies have systems that cannot meet the 10' maximum height. At a 10' maximum height and with a setback of 10 or more feet should, along with the required visual screen, mitigate the visual impacts of ground mounted systems.

STAFF RECOMMENDATION

Recommend that the City Council amend MCC Chapters 18.84.440 as described in the attached ordinance.

18.84.440: RESIDENTIAL SOLAR ENERGY DEVICES:

A. Purpose: The purpose of this section is to:

1. Regulate the permitting of residential solar energy devices for personal, nonutility scale use; and

2. Encourage renewable energy practices while mitigating negative effects.

B. Scope: This section shall regulate all "solar energy devices" (defined as devices designed to capture, convert, store, or use solar energy) within the boundaries of Mapleton City, including, but not limited to:

1. Photovoltaic solar panels; and

2. Solar water heating devices.

C. Roof Mounted Devices: Roof mounted solar energy devices are allowed in residential zones, if they are incidental to the main dwelling unit, or incidental to any other dwelling units, subject to the following conditions:

1. Solar energy devices must be mounted parallel to the roof, or mounted with a maximum separation of three feet (3') vertically above the roof surface in order to facilitate cooling or more efficient angles for capturing solar energy;

2. In no case shall roof mounted solar energy devices extend above the peak of the roof of a building; and

3. In no case shall the solar energy device be closer than three feet (3') from the end of the sides of the roof.

D. Freestanding Devices: Ground mounted solar energy devices are allowed in residential zones when a roof mounted device is not appropriate for reasons of efficiency or aesthetics. ~~Freestanding solar energy devices are not allowed in any residential zone, except incidental devices used exclusively for public utility or governmental entity.~~

1. Setbacks
   a. The minimum yard setbacks for a ground mounted solar energy device from side and rear property lines is 10 feet.
   b. Ground mounted solar energy devices are prohibited in front yards, between the principal building and the public street.
   c. Ground-mounted solar energy device shall not be placed within any legal easement or right-of-way location, or be placed within any storm water conveyance system or in any other manner that would alter or impede storm water runoff from collecting in a constructed storm water conveyance system.
2. Height
   a. Ground mounted solar energy device shall not exceed ten (10) feet in height at maximum tilt above the natural grade surrounding the systems.
3. Coverage
   a. The surface area of the arrays of a ground mounted solar energy device, regardless of the mounted angle of any solar panels, shall be considered impervious and calculated in the lot coverage of the lot on which the system is located.
   b. The total surface area of the arrays of ground mounted solar energy device on the property shall not exceed more than five (5%) percent of the lot area. For example, 10,000 sf lot X 5% = 500 sf.
4. Screening
   a. Ground mounted solar energy device shall be screened from any adjacent property that is residentially zoned or used for residential purposes. The screen shall consist of plant materials which

Solar photovoltaic ground mounting

Contents

Abstract

This page summarizes physical characteristics of commercially available ground mount racking units for solar PV systems. Please feel free to help us fill it in.

Keywords: photovoltaics, solar, energy

Specifications

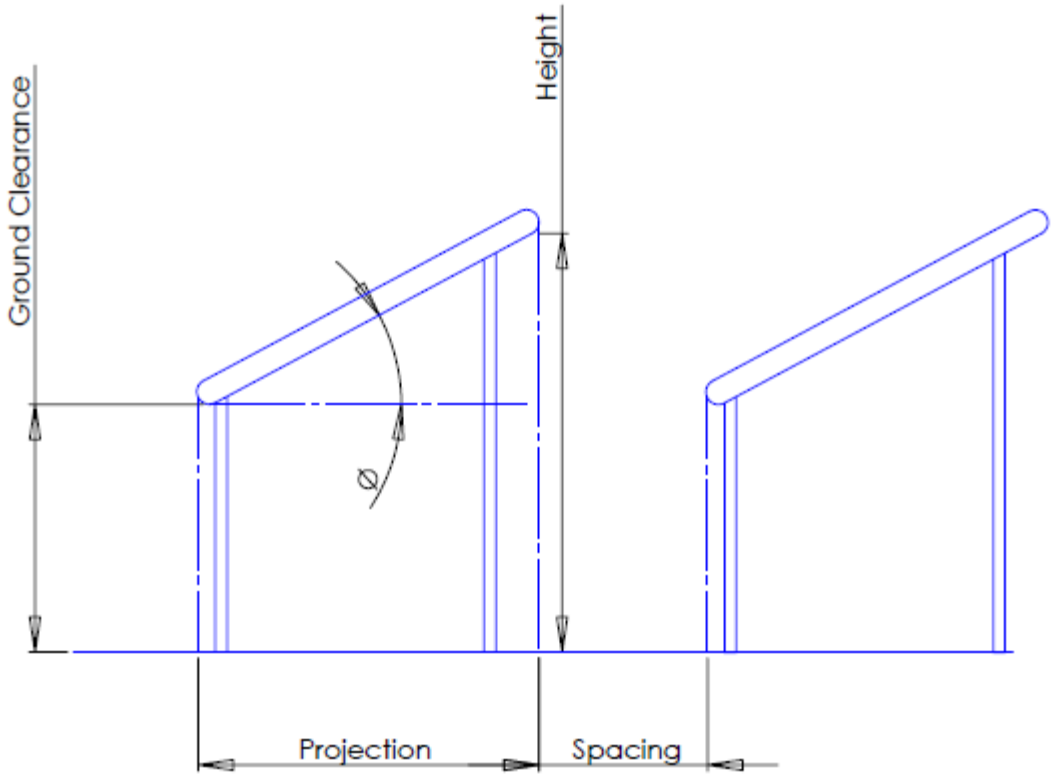

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Table of Ground Mount Racking Systems

Racking System with ref. to spec.	Manufacturer	Degrees of Freedom (fixed, multi, 1 axis, 2 axis)	Type (pole mounted, trays, etc)	Ground Clearance (m)	Height (m)	Materials (weight/m2 PV)	Notes
Sunwize 950SWUSA-104 Universal Multi-Module Adjustable Roof and Ground Mount - 104 Inch Rail	Sunwize	1 axis adjustable tilt 25-55(deg)	ground mount, up to 5 landscape modules	<.5m	1.1m - 2.2m	brushed aluminum, 18.5 lbs	Sunwize Universal Ground Mount $248.63, possible reflector
3 module - utility scale 72 cell module - Crystalline	AP Alternatives	Fixed - 10°, 15°, 20°, or 25°	ground mount, 3 landscape modules	.79m	2.13m	High strength steel, cable wiring	AP Alternatives 3 Module Ground Mount Pre-panelization/pre-wiring, minimal field work, 1m anchor, wiring system for strength, snow load 25psf,

T6 ground mount system	Applied Energy Technologies	1 axis adjustable pivot - multiple angles	Pole mounted, 2 portrait mounted rows, up to 28 modules wide	.6m - 1m	1.3m - 3.5m	Aluminum frame, galvanized steel posts	Applied Energy Technologies Pole Mount 4 posts for every 28 modules, fits all major solar panels
WaveRack Ground Mount	Brittmore	fixed tilt 5° - 35°	post mounts, 3 landscape modules, driven post ground screw	<1m	3m	grade 50 structural steel, hot dip zinc	Brittmore WaveRack 14m^2 between posts, shuttle for installation, all hardware included, snow load 30psf,
Power-Fab Large Ground Mount system	DPW Solar, Solar Panels Plus	capable of any fixed tilt angle	steel posts and module frame, 2 - 6 landscape modules, x amount wide	adjustable, as low or as high as needed	adjustable, varies with amount of modules	steel piping, steel frame, stainless steel module clamps and hardware, aluminum rails	DPW Large Ground Mounts TIG welding may be necessary, smaller foundations, high strength and reliability
*GC Ballasted Ground System	GameChange Racking	15°, 20°, 25°, 30° tilt angles	ground mount, no soil penetration - all on surface, landscape or portrait modules	.5m - .7m	approx. 2m	G90 or G140 galvanized, hot dip and stainless steel components	GameChange Ground Mount $0.179/watt, concrete cinder blocks to secure to ground
IronRidge Ground Mount System	IronRidge	0° - 45°	steel pipe anchor, landscape or portrait modules	approx. .5m	2.7m - 3.4m	aluminum, cast steel ASTM A216, 40 pipe, stainless steel fasteners	IronRidge GMS approx. $0.56/watt, local hardware and materials, snow load 90psf, 150mph wind speed (category B,C,&D)
Jupiter Ground Mount System	Orion Solar Racking	fixed - 5°, 10°, 15°, 20°	ground mount, 5 rows of landscape modules, x amount of columns,	adjustable to specific needs without exceeding 18m	.5m<x<20m	22-55 lb/m^2, aluminum alloy, stainless steel 304	Jupiter Ground Mount System concrete blocks, ground screws or buried concrete for foundation, snow load <1.4N/m^2
Sun Bear Ground Mount	Panel Claw	fixed - 20°, 25°, 30°	ground mount, landscape - 60 cell modules 4x4 or 4x2, 72 cell 4x3 or 4x2	1m minimum	approx. 6m	aluminum, stainless steel 304, galvanized steel, and hot dip g. steel	Sun Bear Ground Mount snow load 50psf, accommodates for thermal growth and contraction
Patriot Solar Fixed Pole Mount	Patriot Solar Group	fixed - 20°-80°	top of single pole mount, 4x4 landscape modules	<2m	approx. 4m	steel pole, aluminum racking	Patriot Fixed Pole Mount

							snow load 40psf, manually adjustable
*300i Series Post Driven Ground Mount	Patriot Solar Group	adjustable 1 axis tilt from center of module - 10°-40°	ground mount, one section contains 1 row of 5 modules portrait, # of sections depends on costumer	.8m - 1m	1.7m - 1.8m	370lbs + 250lbs per added section, glavanized rails and electroplated powder coated truss and post (aquence 930 coating)	300i Series data sheets up to 100 sections wide - 5 modules a section,
Ground Mount Solar	RBI	fixed - 0°-45°	driven post, concrete pier, duel post, screw piles, concrete ballast, or spread footings - 3 landscape or 2 portrait modules	.5m - 1.2m	project specific	high strength steel with corrosion protection	RBI Ground Mount Solar minimal field work, universal modules
Series 200 Ground Mount	SnapNrack	fixed - 0°-45°	4 rows of landscape modules, x amount of columns; concrete piers, ballast blocks, driven pipes, grade beams	.6m	.6m - 2.4m depending on tilt	Schedule 40 or 80 galvanized pipe, 6000 series aluminum, stainless steel	Series 200 Ground Mount snow load 50psf, universal modules
Large Scale GMS **50kW or more**	Sunlink	fixed 15°-35°	3 or 4 rows of landscape modules, x amount of columns; steel I-beam	.8m - 1.5m	approx. 1.8m - 3.5m	galvanized steel and stainless steel	Large Scale GMS universal modules
*TerraFarm Ground Mount	TerraSmart	fixed 5° - 45°	up to 7 modules high and 12 long at landscape	.3m - 1.2m	.35m - 2.9m (approximate based on typical 162" long panel)	galvanized steel (G90 or better)	TerraFarm Ground Mount snow load 80psf,

List of Solar Mounting Systems Manufacturers

A full list of all manufacturers of solar mounting systems can be found here: http://www.enfsolar.com/directory/component/mounting_system

References

See Help:Footnotes for more.

Categories:

- Photovoltaics
- Queens Applied Sustainability Group
- MOST
- Solar

provide a visual screen. In lieu of a planting screen, a decorative fence meeting requirements of the zoning ordinance may be used. Visual screening or fencing is subject to the height and location restrictions found in 18.84.130.

5. Safety

a. All power transmission lines from a ground mounted solar energy device to any building or other structure shall be located underground and/or in accordance with the applicable electric code.

b. Appropriate safety/warning signage concerning voltage shall be placed at ground mounted electrical devices, equipment, and structures. All electrical control devices associated with the solar energy device shall be locked to prevent unauthorized access or entry.

E. Reduction Of Glare: All solar energy devices shall have a dark colored surface/finish on the majority of the device, excluding incidental framing parts, which shall be designed to reduce glare.

F. Installation: The installation of solar energy devices shall require a building permit in all cases, and shall be subject to building code requirements adopted by Mapleton City.

G. Solar Easements: Recognizing the property rights of other property owners to construct buildings as allowed by Mapleton City zoning ordinances, and the rights of property owners to plant trees or vegetation on their properties, Mapleton City shall have no obligation to ensure access to sunlight for owners of any solar energy devices. Any property owner desiring to maintain access to sunlight for their property through adjacent properties shall obtain solar easement(s) as provided in Utah code title 57, chapter 13, solar easements, as amended. Solar easements shall be privately enforced through civil action by private property owners.

H. Conflicting Provisions: Notwithstanding the provisions of this section:

1. Individual residential zones may contain stricter provisions regulating solar energy devices; and

2. In the case of any conflict between the provisions of this section, the individual residential zone's provisions shall prevail.

I. Support: A structural engineer shall certify that the structure to which a solar energy device is mounted is engineered to properly support the solar energy device. (Ord. 2011-14, 9-20-2011, eff. 10-20-2011)