

ARTICLE 7

Dark Sky Lighting



Article 7 Dark Sky Lighting

Section 7.1: General

In Groveland, the darkness of the night sky should be preserved for stargazing, wildlife habitat, and human health.

A. Purpose & Intent The purpose of this Article is to protect the public health, safety, and welfare in Groveland by applying lighting standards intended to:

1. Preserve community character.
2. Permit reasonable uses of outdoor lighting for nighttime safety, utility, productivity, security, and enjoyment.
3. Promote efficient and cost-effective lighting and conserve energy.
4. Minimize light pollution, light trespass, glare, and offensive light sources.
5. Provide a nighttime environment that includes the ability to view stars and planets against a dark sky.
6. Reduce adverse impacts of outdoor lighting on wildlife habitat and human health.
7. Prevent inappropriate, poorly designed or installed outdoor lighting.
8. Encourage high quality lighting design.
9. Establish outdoor lighting standards and maximum light levels within and on property lines.

B. Application

1. **New Lighting.** All new lighting shall meet the requirements of this Article. This includes all new development and redevelopment including but not limited to: thoroughfares, commercial and industrial properties, recreational facilities, residential neighborhoods, multifamily parcels, single-family home sites, and illuminated signs.
2. **Additions or Modifications to Existing Structures.** If the total cumulative increase in floor area is greater than 50 percent for single-family residential or greater than 25 percent for all other uses, or if the total cumulative cost of any exterior modification, alteration, or repair is greater than 25 percent of the valuation of the building as determined by the City, then all exterior lighting fixtures shall comply and or be upgraded for compliance with this Code.
3. **Existing Lighting.** Cumulative modification, replacement, or repair of outdoor lighting constituting 25 percent or more of the permitted lighting output level for the parcel, no matter the actual amount of lighting already on the site, shall require all exterior lighting to comply with this Code. For purposes of this section, replacement of burned-out lamps with new lamps or fixtures of the same type and lighting output level is not considered a modification, replacement, or repair.



4. **Amortization Period.** The City adopts Ordinance 2022-40 requiring all existing outdoor lighting in Groveland to meet these Code standards within a period of ten years. Beginning August 8, 2032, this section shall apply to all exterior lighting city-wide, including existing residential lighting and illumination from existing outdoor signs. After that date no person shall install or maintain any light fixture or illuminated sign unless such fixture meets the requirements of this section. The City plans to update all City owned exterior lighting to meet the standards outlined in this code within a five-year period.

C. Lighting Measurements and Metrics

1. Light levels shall be measured for light trespass in the following locations:
 - a. At the property line; or
 - b. At the boundary of public right-of-way that adjoins the property; and
 - c. At finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up; and measured in footcandles (FC).
2. **Metrics**
 - a. Lumens per acre (included on Lighting/Photometric Plans)
 - b. Footcandles at property boundary (measured at Site Inspections)
 - c. Candelas (included on Permit Applications for Illuminated Signs)
 - d. Total Outdoor Light Output (for illuminated area of property, measured in lumens)

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Section 7.2: Administration

A. City Permitting Process

Approved City permits are required for all new residential, commercial, and industrial use exterior or outdoor lighting. During the site planning process, a photometric plan shall be submitted for staff review. A completeness check will be conducted to ensure all Submittal Requirements of Section 7.3C are included with the application. All proposed lighting fixtures should either carry an IDA (International Dark-Sky Association) *Fixture Seal of Approval* or meet the Dark Sky Lighting Standards outlined in this Article.

B. Photometric Plan Submittal Requirements

A site lighting photometric plan for all outdoor lighting shall be submitted for review and shall provide the following information:

1. A site plan showing the location of all buildings and building heights, parking, and pedestrian areas on the lot or parcel.
2. The location and description including mature height of existing and proposed trees
3. The location and height above grade of all proposed and existing light fixtures on the subject property.
4. The fixture type, initial lumen rating, correlated color temperature, and color rendering index of each lamp source.
5. The general style of the light fixture such as cutoff, lantern, coach light, globe, and a copy of the manufacturer's catalog information sheet and IESNA photometric distribution type, including any shielding information such as house side shields, internal, and/or external shields.
6. Control descriptions including type of controls (timer, motion sensor, time clock, etc.), the light fixtures to be controlled by each type, and control schedule when required.
7. A light calculation which shows the maximum light levels on a grid not to exceed ten feet by ten feet across the entire site and a minimum of ten feet beyond the lot or parcel property line. The grid shall also indicate maximum to minimum uniformities for each specific use area such as parking and circulation areas, pedestrian areas, and other common public areas.
8. Photometric design layout for the site of all illuminated vertical and horizontal surfaces showing the design footcandle levels.
9. Lighting shall be significantly reduced using adaptive controls during non-operational hours, allowing only lighting necessary for security purposes and meeting the lighting control provisions of Policies 7.4.F.2 and 7.4.F.3. The photometric plan submitted for review shall note

where this distinction occurs.

10. A calculation of the Total Outdoor Light Output for the illuminated area of the property, calculated in lumens. If any partially shielded lighting is included on the plan, this light output amount shall be distinguished and included in the calculations.
11. Aiming angles and diagrams for sports lighting fixtures.

C. Warranting

1. Warranting. New installations of outdoor lighting will only be installed on public properties and rights-of-way upon determination by the Town Manager that a public safety hazard exists in the area to be lit, and that the hazard can only be effectively mitigated through the use of outdoor lighting and not through some other passive means, such as reflectorized roadway paint or markers.

D. Installation and Maintenance

1. City approval. All exterior light fixtures shall be approved by the City prior to installation.
2. Certification of Installation. For all projects where the total initial output of the proposed lighting equals or exceeds 70,000 fixture lumens, certification that the lighting, as installed, conforms to the approved plans shall be provided by a certified engineer before the Certificate of Occupancy is issued. Until this certification is submitted, approval for use of a Certificate of Occupancy shall not be issued for the project.
3. Underground Electrical Service Required. New electrical utilities required for exterior lighting shall be located underground.

E. Final Inspection

Prior to a building permit final inspection or the issuance of a certificate of occupancy, the applicant shall provide a letter of certification that the outdoor lighting as installed complies with the approved photometric plan and the requirements of this Article. The letter of certification shall be completed and signed by the architect, electrical engineer, electrical contractor, or lighting consultant responsible for the plans or the final installation.

F. Variance

Any applicant seeking a variance from any requirement or standard of Article 7 regulations shall follow the Variance process outlined in Sec. 1.2 of the Community Development Code.

G. Exemptions

The following lighting shall be exempt from the lighting standards contained in this Article:

1. Emergency Lighting. Emergency lighting that is only turned on in the event of a power failure or when an alarm is

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is activated is excluded from the total lumen calculations for the site. Use of such lighting outside of an emergency is strictly prohibited.

2. Emergency Services Lighting. Searchlights, floodlights, laser source lights, strobe or flashing lights, or any similar high intensity lights are permitted for use by police, fire, medical, or utility personnel or at their direction.
3. Infrared Security Lighting. Lights emitting infrared radiation for remote security systems is permitted with the following restrictions:
 - a. Fixed lights must be fully shielded; and
 - b. Movable lights, such as spotlights, must be mounted so that the lights cannot be directed higher than twenty (20) degrees below the horizontal. Light must be measured from the center of the beam to determine the threshold.
 - c. Fixtures must meet the lighting control provisions of Policies 7.4.F.2 and 7.4.F.3
4. Temporary decorative holiday lighting. Temporary seasonal lighting between Thanksgiving and January 15 annually shall not be subject to this Article, provided such lighting does not create glare to motorists or result in light trespass onto adjacent properties.
5. Strings of Light. Strings of light, not exceeding a maximum of fifty lumens per lamp, (equivalent of a seven-watt C7 incandescent light bulb) on properties located in all residential zoning districts or on properties that are used exclusively for residential uses shall be exempt from the requirements of this chapter. Strings of light are permitted as a white light clear bulb as accent lighting and shall not consist of blinking or chasing lights and shall be tightly fastened to the building for safety.
6. Residential Landscape Lighting. Low voltage (twelve volts or less), low wattage ornamental landscape lighting fixtures, and solar operated light fixtures having self-contained rechargeable batteries, where any single light fixture does not exceed one hundred lumens shall be exempt from the requirements of this Article. Homeowners should extinguish landscape lighting by 11:00 p.m.

H. Prohibited Lighting

No person or business shall install any of the following types of outdoor lighting fixtures:

1. City approval. All exterior light fixtures shall be approved by the City prior to installation.
2. Unshielded lights.
3. Mercury vapor lamps.
4. Low pressure sodium lamps.
5. Blinking, flashing, moving, revolving, flickering, changing intensity or color, and chase lighting, except lighting for temporary seasonal displays, lighting for public safety, or

required for air traffic safety

6. Blinking, flashing, moving, revolving, flickering, changing intensity or color, and chase lighting, except lighting for temporary seasonal displays, lighting for public safety, or required for air traffic safety.
7. Any light fixture that may be confused with or construed as a traffic control device.
8. Any upward oriented lighting except as otherwise provided for in this section.
9. Searchlights, beacons, and laser source lights, strobe or flashing lights, illusion lights, or any similar high intensity light.
10. Lamps emitting a Correlated Color Temperature (CCT) in excess of 3,000 Kelvin.



Shielded lights help to reduce light pollution by directing light only to the area intended.

I. Enforcement

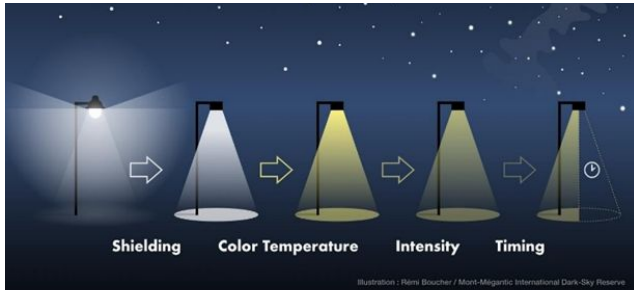
Code enforcement officials having jurisdiction in the area governed by this article are hereby authorized to enforce the provisions of this article. In addition, the city may also delegate enforcement responsibility to other agencies and departments of the city government.

Section 7.3 Lighting Standards

A. Lighting Classifications

1. Class 1 Lighting (*High Activity Areas*) Lighting used for highways, outdoor sales or eating areas, assembly or repair areas, signage, recreational facilities, and other similar applications where accurate color rendition is important to preserve the effectiveness of the activity.
2. Class 2 Lighting (*Security and Public Safety*) Lighting used for illumination of local roadways, walkways, bike paths, equipment yards, parking lots, and outdoor security where general illumination for safety or security of the grounds is the primary purpose.
3. Class 3 Lighting (*Decorative and Accent*) Lighting used for decorative effects such as architectural illumination, flag and monument lighting, and illumination of landscaping elements.

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4. Multi-Class Lighting. Lighting used for more than one purpose such that the use falls within more than one class as defined for Class 1, 2, or 3 lighting. Multi-class lighting must conform to the standards that apply to the most restrictive included class.

B. Dark Sky Lighting Standards

The primary elements of Dark Sky Lighting generally include:

1. Outdoor lighting shall be installed only in locations where necessary.
2. All outdoor light fixtures (with the exception of partially shielded allowance specified in Table 7.1) shall be fully shielded to prevent skyglow.
3. LED panels should be recessed within the fixture housing to prevent unnecessary backlighting and glare.
4. All outdoor lighting shall be warm in color temperature with a maximum correlated color temperature (CCT) not to exceed 3,000 Kelvin for Class 1 lighting and 2,700 Kelvin for Class 2 lighting.
5. For Class 1 lighting, a development may be eligible for an additional 10 percent increase in the total lighting output level allowed pursuant to Table 7.1 if 50 percent or more of the Class 1 lighting is 2,700 Kelvin CCT or below.
6. Light lumen levels shall be the minimum required for security and utility, not to exceed total outdoor light output maximums for the site pursuant to Table 7.1.
7. Residential lighting is limited to 450 lumens per fixture.
8. Commercial and residential light fixtures shall carry the International Dark-Sky Association Seal of Approval or meet equivalent standards.



Warmer light color temperatures and intensity can help improve night time vision and create a safer environment.

C. Maximum Lighting Output Levels

1. Outdoor lighting shall be installed only in locations where necessary.
2. Lighting levels shall not exceed the maximum outputs in Table 7.1 below, specified as initial lumens per net acre of any development project (net acreage is the total developed area of the parcel).
3. The lumen per net acre values are an upper limit and not a design goal; design goals should be the lowest levels that meet the requirement of the task.
4. Lumen per net acre values exclude government owned street lights used for illumination of public rights-of-way and outdoor recreation facilities (active recreation areas and athletic fields only per Policy 7.5G).

Table 7.1

Use Type	Total Site Output (includes landscape lighting)	Partially Shielded
Single-family residential	5,000 initial lumens per lot	1,250 initial lumens per lot (counts toward total site output)
All other uses, including multifamily (excludes outdoor display lots and parking lots)	70,000 initial lumens per net acre	3,850 initial lumens per net acre (counts toward total site output)

D. Shielding and Light Trespass

Light trespass is defined as light projected onto a property from a light source located on a different property.

1. All light fixtures greater than 450 lumens are required to be fully shielded.
2. All light fixtures shall be aimed and shielded so that the direct illumination shall be confined to the property boundaries of the source. Lighting shall not be aimed onto adjacent properties, except in cases of shared parking, shared pedestrian pathways, or for coordinated development sites spanning multiple parcels.
3. The light level at any property used for governmental, recreational, and public purposes in all zoning districts shall not exceed 0.1 footcandle at the property lines.

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4. The light level at any property used for residential purposes shall not exceed 0.1 footcandle at the property lines.
5. The light level at any property used for commercial or industrial purposes should not exceed 0.5 footcandles at the property lines.

E. Approved Light Fixtures

Many manufacturers offer lighting fixture options that carry the International Dark-Sky Association's *Fixture Seal of Approval*.

1. All new fixtures must either carry the International Dark-Sky Association's *Fixture Seal of Approval* or meet equivalent dark sky standards consistent with this Article



Dark-Sky compliant lighting fixtures marked with the IDA *Fixture Seal of Approval*. These fixtures are featured at the City Annex building in downtown Groveland. Fixtures can be found at Home Depot and other local retailers.

F. Lighting Controls

1. Light dimmers that reduce lumen levels during non-peak hours to between 35% and 50% of the light's maximum output are recommended for all new streetlights and for outdoor lighting in appropriate locations.
2. Motion sensors may be used to limit lighting; however, the sensor must be triggered by activity within the property lines and not triggered by activity outside the property lines.
3. Motion sensing fixtures shall be fully shielded and properly adjusted, according to the manufacturer's instructions, to turn off in a reasonable timeframe no longer than five minutes after the detected motion ceases.

G. Lighting Time Limitations

1. Except for flagpole lighting and security lighting on adaptive controls and meeting the lighting control provisions of Policies 7.4.F.2 and 7.4.F.3, commercial and industrial lighting shall be extinguished during non-business hours. Lodging and other 24-hour businesses are encouraged to reduce lighting by 50% between 10:00 p.m. and sunrise.

2. Homeowners and businesses should extinguish landscape lighting by 11:00 p.m.

H. Uplighting

Uplighting or ground-mounted lighting is considered Class 3 lighting.

1. Uplighting may be used to accent unique features of a building and/or surrounding landscaping such as exceptional architectural features, specimen trees with dense year-round foliage, or large native shrub masses. Uplighting or ground-mounted lighting shall be low wattage and designed and installed to minimize glare with special consideration to vehicular and pedestrian traffic.
2. Uplighting shall be shielded to contain and direct the light onto the feature or object to be illuminated.
3. All uplighting shall be considered partially shielded lighting for purposes of calculating total lighting output levels in Table 7.1.
4. All Class 3 lighting shall be selected, designed, installed, and aimed so that there is a minimum amount of light spillover beyond the area intended to be lighted
5. Flagpoles should be illuminated from above where feasible. Flagpoles with a height equal to or less than twenty (20) feet above ground level may be illuminated from below. If ground-level illumination is used, flagpoles may be illuminated with up to two (2) spotlight type luminaires, utilizing shields or diffusers to reduce glare, whose maximum combined lumen output is 75 lumens per linear foot of pole height, measured from the level of the luminaire above grade to the top of the flagpole. Luminaires are to be mounted so that their lenses are perpendicular to the flagpole and the light output points directly toward the flag(s). Flagpoles greater than 20 feet in height shall be illuminated from above.
6. Lighting of any portion of a building or structure with a polished or glass exterior surface is prohibited.



Dark-Sky compliant street light. The fixture is fully-shielded and downward facing with a warm color temperature.

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Section 7.4: Lighting Standards for Specific Uses

A. Exterior Building Lighting

Exterior building lighting may be considered Class 1, Class 2, or Class 3 lighting, depending on the size, function, illumination, design, and lighting intent.

1. Soffit-mounted light fixtures shall be recessed into the soffit or otherwise fully shielded.
2. Architectural lighting shall only be used to highlight special features.
3. Lighting of expansive wall planes or lighting resulting in hot spots on wall or roof planes shall be prohibited.
4. Lighting above or beside entryways or along building perimeters shall use fully shielded fixtures.

B. Streetlights

Highway streetlights are considered Class 1 lighting, and local roadway streetlights are considered Class 2 lighting for purposes of this Code.

1. New streetlights shall be fully shielded fixtures of approved historical design, utilizing a minimum output consistent with the safety of drivers and pedestrians.
2. Governmental owned streetlights may only create light trespass below within one hundred (100) feet of its installed location.
3. Utility Exemption: Utility companies entering into a duly approved contract with the City of Groveland in which they agree to comply with the provisions of all Article 7 regulations, shall be exempt from applying for and obtaining a permit for the installation of outdoor light fixtures.

C. Pedestrian Walkway Lighting

All pedestrian walkway lighting shall be considered Class 2 lighting.

1. Entries from streets or footpaths shall have at least one downward projecting “mushroom” light placed at the intersection of street and path, and footpath and entry. These lights shall be controlled by a photocell (dusk to dawn).
2. Pedestrian walkway lighting shall use shatterproof lamp coverings and shall not be located to present hazards for pedestrians or vehicles.
3. Post or bollard-type lights shall be painted dark colors such as black, dark gray, dark brown, or dark earth tone.

D. Parking Lot Lighting

All parking lot lighting shall be considered Class 2 lighting.

1. All parking lot lighting shall use fully shielded fixtures.
2. Parking lot poles shall not exceed 12 feet in height.
3. Structured Parking. Interior lighting within parking structures shall not count toward the lighting output level established in Table 7.1 but must conform to all other applicable standards of this Article.
4. Structured parking lighting, including interior and rooftop lighting, shall not trespass beyond the footprint of the parking structure.

E. Outdoor Display Lots

New and Used Auto, Boat, and RV Dealerships (or similar businesses) are considered Outdoor Display Lots for purposes of this Article.

Lighting for outdoor display lots shall be considered Class 1, and shall conform to the lumens per acre limits established by Table 7.1 and the following provisions:

1. All such lighting shall be fully shielded; partially shielded fixtures shall be prohibited.
2. Outdoor display lot illumination design shall be certified by a Florida registered engineer as conforming to all applicable restrictions of this Code.
3. Outdoor display lot lighting shall conform to the hours of operation as established under Class 1 lighting standards pursuant to Section 7.4G.
4. Lighting poles shall not exceed 12 feet in height.



The photo depicts prohibited unshielded pedestrian walkway lighting versus fully-shielded lighting installed with 2700K CCT LED light.

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Section 7.4: Lighting Standards for Specific Uses

F. Service Stations

Lighting for service station canopies shall be considered Class 1 lighting.

1. Automobile service station pumping areas shall be required to meet a minimum standard of 10 footcandles and not exceed a maximum of 30 footcandles.
2. All luminaires shall be recessed within the canopies and use flat glass or plastic covers.
3. All lighting mounted under the canopy shall be included in the total lighting output levels for the site pursuant to Table 7.1.

G. Recreational Facilities and Athletic Fields

Lighting not specific to active outdoor recreational facilities or athletic areas must comply with outdoor lighting standards in Section 7.4 and Table 7.1.

1. Lighting for outdoor athletic fields, courts, or tracks shall be considered Class 1.
2. Lighting at public and private outdoor recreational facilities, including but not limited to playing fields, arenas, and tracks, will be shielded to the greatest practical extent to reduce glare, safety hazards, light trespass, and light pollution.
3. Lighting will provide levels of illuminance that are adjustable according to task.
4. Recreational lighting shall be provided exclusively for illumination of the surface of play and adjacent viewing stands, and not for any other application, such as lighting a parking lot.
5. Recreational lighting must be extinguished by 11:00 p.m. or within one (1) hour of the end of active play.
6. Outdoor recreational facility lighting shall be fitted with mechanical or electronic timers to prevent lights from being left on accidentally overnight and shall make appropriate use of adaptive controls when possible.
7. Recreation facility illumination design shall be certified by a professional engineer (PE) licensed in the state of Florida as conforming to all applicable restrictions of this Code.
8. Outdoor recreational facility lighting will be exempted from the other regulations of this article if its design and installation, as certified by a professional engineer (PE) licensed in the state of Florida, adheres to the version of the International Dark-Sky Association's Criteria for Community-Friendly Outdoor Sports Lighting operative at the time when the construction permit is submitted to the City for review. Activities shall follow the illuminance and uniformity guidelines of the IESNA according to the appropriate class of play.



This Dark Sky restroom is featured at the campground at Kissimmee Prairie State Preserve Dark Sky Park. Red light preserves night time vision and has least environmental impact on nocturnal wildlife.

H. Greenhouses

Greenhouses are permitted on industrial and agriculture zoned properties.

1. 100% of the greenhouse facility is required to be screened if indoor lighting is used during nighttime hours, which is between sunset and sunrise.
2. No artificial lighting for cultivation or agricultural purposes shall be visible from outside. Black out curtains or another type of light obstruction must be used.

I. Illuminated Signs

All illuminated signs must follow the provisions of both Article 7 and Section 6.8 Signage.

3. Lighting for outdoor athletic fields, courts, or tracks shall be considered Class 1.
4. Bottom mounted sign lighting attached to the sign structure shall not be used.
5. Illumination of off-site signs is prohibited.
6. Digital Outdoor Display Signs (LED, LCD, Plasma or equivalent) are prohibited.
7. Sign illumination curfew. Illuminated signs shall be turned off at the curfew times listed in Section 7.4G or when the business activities cease, whichever is later.

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J. Special Events

Special events that have been issued a Special Events Permit by the City shall be allowed temporary lighting for the duration of the event, provided such lighting does not create glare to motorists or pedestrians or result in light trespass onto adjacent properties.



The Central Florida IDA chapter tables at local events to raise awareness about the effects of light pollution.