KERR COUNTY FRIENDS OF THE DARK SKY

Outdoor Lighting Assessment

Volunteer Training Manual

A practical guide for volunteers conducting outdoor lighting assessments

Source Acknowledgment

This manual is adapted from the *Lighting Assessment & Retrofit Project Training Manual V2* originally developed by **Cindy Luongo Cassidy** © 2020, Texas Section of the International Dark-Sky Association. Adapted with respect for the original work for use by Kerr County Friends of the Dark Sky volunteers.

Fixture guidance incorporates DarkSky Texas "Outdoor Light Fixture Replacement Options" (2020).

www.kerrcountydarksky.org

About This Manual

This manual trains Kerr County Friends of the Dark Sky (KCFDS) volunteers to conduct outdoor lighting assessments for homes, businesses, farms, and community facilities in the Texas Hill Country. Your work directly contributes to protecting the dark skies that make Kerr County special.

As a volunteer assessor, you will visit properties, inventory their outdoor lighting, and provide practical recommendations that reduce light pollution while meeting the property owner's safety and aesthetic needs.

What You Will Do

Volunteer Responsibilities

- Coordinate with the property owner before and after your visit
- Conduct a daylight and after-dark inventory of all outdoor fixtures
- Photograph and document fixture types, wattage, and color temperature
- Identify non-compliant fixtures and recommend cost-effective improvements
- Deliver a clear written assessment with prioritized recommendations
- Follow up to support the owner through the retrofit process

Why It Matters

Light pollution has grown dramatically over recent decades. About 80% of the U.S. population can no longer see the Milky Way. In Kerr County, our dark skies are a defining community asset — supporting ecotourism, stargazing, agriculture, and the health of our native wildlife. Every fixture we improve is a permanent contribution to protecting that heritage.

- Reduces sky glow — light scattered upward into the atmosphere that obscures stars for miles around
- Protects wildlife — artificial light disrupts migration, reproduction, and feeding behaviors in birds, bats, insects, and more
- Improves human health — exposure to artificial light at night suppresses melatonin production and disrupts sleep
- Saves money — well-directed efficient lighting costs significantly less to operate
- Improves visibility — shielded, low-glare lighting actually helps people see better at night

Your KCFDS Contact

Reach your KCFDS volunteer coordinator through the organization website at www.kerrcountydarksky.org. For questions about DarkSky International standards, visit darksky.org.

Why Outdoor Lighting Matters

The Problem with Most Outdoor Lighting

Most outdoor lighting is over-bright, poorly aimed, and active when no one is there to use it. This creates a cascade of problems:

Common Problems	Root Cause
Glare reduces visibility	Unshielded bulb visible in fixture
Sky glow obscures stars	Light escapes above horizontal
Light trespass on neighbors	Fixture not aimed at own property
Wildlife habitat disruption	Artificial light at night disrupts biology
Human health impacts	Blue-rich light suppresses melatonin
Wasted energy & money	Over-lit areas, always-on fixtures

Glare, Safety, and Security

A common misconception is that more light equals more safety. The opposite is often true. Glare from bright, unshielded lights actually reduces your ability to see by causing your eye to adapt to the brightest object in view. The surrounding areas then appear dangerously dark by comparison.

Research from the U.S. Department of Justice found no statistically significant evidence that street lighting reduces crime. However, sensor-activated lighting — that turns on suddenly when someone approaches — is an effective deterrent because it signals that someone is present. Such lights should still be shielded to avoid glare.

> **The Visibility Rule**
> If you can see the light source (the bulb or lens) directly, the fixture is producing glare. A well-designed fixture lights the area below it without the light source being visible from normal viewing angles.

Health and Ecology

Every living organism on Earth evolved with a natural cycle of light and dark. Artificial light at night disrupts these cycles in ways we are only beginning to understand:

- Human melatonin production is suppressed by even low levels of artificial light, particularly blue-rich light. Disrupted melatonin is linked to sleep disorders and increased risk of certain cancers.
- Birds navigating at night are drawn off course or into collisions with lighted towers and buildings. Millions die annually from light-related collisions.
- Insects, including native pollinators critical to our food supply, are attracted to and killed by outdoor lights in large numbers.
- Bats, an important predator of agricultural pests, avoid lighted areas, reducing their foraging effectiveness.

- Baby sea turtles are disoriented by coastal lighting. In the Texas Hill Country, our native wildlife — deer, owls, fireflies, and migratory songbirds — all depend on natural darkness.

The LED Opportunity — and Its Risks

LED technology offers tremendous advantages: longer life, lower energy use, and better directional control. But not all LEDs are dark-sky friendly. The key issue is color temperature.

White LEDs with high color temperatures (above 3000K) contain significant blue-wavelength light. Blue light scatters more in the atmosphere, worsening sky glow, and has the greatest impact on melatonin suppression and wildlife disruption. The American Medical Association recommends minimizing blue-rich lighting in community environments.

> **The Color Temperature Rule**
> Choose LEDs rated at 2700K or below for general outdoor use. Where dark sky protection is a priority (as in Kerr County), choose 2200–2400K or narrow-band amber (NBA) at 590nm. Amber and warm-toned LEDs provide excellent visibility while dramatically reducing sky glow and wildlife impacts.

The Five Principles of Responsible Outdoor Lighting

Every recommendation you make as a volunteer assessor should be grounded in these five principles, established by DarkSky International and adopted by Kerr County Friends of the Dark Sky.

Five Principles for Responsible Outdoor Lighting

- 1. USEFUL — Use light only if it is needed. All light should have a clear purpose.
- 2. TARGETED — Direct light so it falls only where needed. Use shielding and careful aiming.
- 3. LOW LEVEL — Light should be no brighter than necessary. Use the lowest effective level.
- 4. CONTROLLED — Use light only when it is needed. Use timers, dimmers, and motion sensors.
- 5. WARM-COLORED — Use warmer color lights. Limit blue-violet wavelengths to the least needed.

Applying the Principles to Any Fixture

Principle	Recommendation
• Is it needed?	If you can't identify a clear purpose for a light, recommend removing it. Lighting an empty field all night wastes energy and light.
• Is it aimed correctly?	All light should fall within the property and below horizontal. Light escaping upward or onto neighbors' property is wasted and harmful.
• Is it the right brightness?	When you switch from an unshielded to a shielded fixture, the concentrated light usually means you can reduce wattage significantly without sacrificing effectiveness.
• Is it on at the right times?	Dusk-to-dawn photocells that leave lights on all night are common. Motion sensors or timers are almost always a better choice.
• Is it the right color?	Always recommend the warmest color temperature available for the application. Amber is best; 2700K or below is good; above 3000K should be avoided.

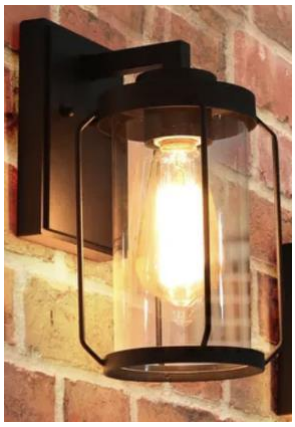
Fixture Identification & Replacement Guide

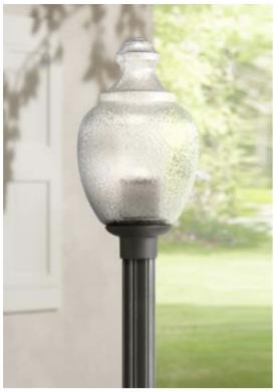
This section helps you identify common fixture types during your assessment and recommend appropriate replacements. The guidance here incorporates current best practices from DarkSky Texas's "Outdoor Light Fixture Replacement Options".

> **Key Principle**
> The preferred outdoor fixture uses a narrow-band amber (NBA) light source at 590 nanometers. Where NBA is not available, select the lowest Kelvin rating offered and specify the least amount of blue-spectrum light possible.

Quick Reference: Common Fixtures

Fixture Type	Issue	Recommended Replacement / Action	
Barn / NEMA Head 	Refractive lens sends light in all directions; unshielded bulb visible	Replace entire fixture. Best: gooseneck-style shielded barn light (RLM or similar). Specify warm LED bulb, 2200–2700K. Ensure bulb does NOT extend below fixture lip. Products: Designers Fountain Bayport, Rickey Outdoor Barn Light, Pine S lope (use 2400K bulb).	
Cobra Head (Drop or Flat Lens) 	Drop lens sends light in all directions. Flat lens better but still creates near-horizontal light	Replace with full-cutoff LED area fixture with 360-degree external visor/shield. Best products: Acuity/Lithonia DSX0 or DSX1 with 360-degree shield; Crossroads LED Astrophile (amber); Lithonia RSX1 with Exterior 360 Full Visor. Cooper Lighting Streetworks (2200K preferred, 2700K acceptable).	

Fixture Type	Issue	Recommended Replacement / Action	
Shoe Box / Area Light 	Often acceptable if bulb is recessed; LED versions may need 360° shielding	Add 360-degree external visor if glare is visible from adjacent properties. If replacing, choose Acuity DSX0/DSX1 or Sellux Saturn Cutoff with 2700K or amber option.	
Wall Pack 	Most standard wall packs send light above horizontal and create glare	Replace with full-cutoff downlight wall pack. Top must be closed (downlight only). Best: Lithonia WDGE1 LED Wall Mount (2700K); Envirolux Sphere Wallpack (amber/2700K); Ligman UQU Quarter (amber with frosted lens). Budget option: cover old pack with RAB Shade (does not reduce energy use). Bulb must NOT extend below fixture metal.	
Wall Sconce (Residential) 	Clear-sided or globe fixtures expose bulb; light goes in all directions	If bulb is pointing down, shield the bulb with a lamp shade/shroud and keep fixture. Replace with fully shielded downlight sconce: Ripley Collection, Sage Ridge, Pine Slope — available at Home Depot, Lamps Plus, Lowes. Use 2200–2400K bulb (Bulbrite 5W 2200K, Maxlite 6.5W 2000K, TCP 7W 2400K PAR20).	

Fixture Type	Issue	Recommended Replacement / Action	
Spot / Flood Lights 	Aimed outward or upward; light source visible; high glare	Shield with clip-on or built-in shroud; point bulb straight down. Or replace with bullet-style fixture with long shroud (fully shielded) and 2700K bulb. Products: Generation Lighting Sea Gull Collection; Access Lighting Fin Collection (2800K); MIK Solutions LED Spot with 2700K bulb.	
Post Top Fixtures 	Globe or open-top lanterns emit light upward and sideways	Replace with fully shielded post top: Designers Fountain Bayport post top; Ripley Collection 16-inch post light (Kichler); Capital Lighting Dark Sky Outdoor Lantern. Ensure bulb is set low in fixture and does not protrude above fixture lip.	
Path / Bollard Lights 	Unshielded bollards send light horizontally and upward	Replace with fully shielded downlight path fixtures or fully shielded bollards. Color temp 2700K or less. Keep brightness low — eyes adapt to dark environments quickly. Products: Selux Inula Bollard (amber); EcoLights (500 lumens or less).	

Fixture Type	Issue	Recommended Replacement / Action	
Flag Lighting 	Upward-aimed floodlights are excessive and cause skyglow	Best practice: lower and raise the flag daily. If night lighting is needed: Eagle Mountain Stargazer Flag Light (amber or 3000K model) OR a shielded downlight mounted on the flagpole arm aimed down at the flag. Maximum output: 75 lumens per foot of flagpole height.	

Choosing the Right Bulb

When the fixture is acceptable but the bulb is not, replacing the bulb is often the fastest and most cost-effective improvement. Key rules:

- Bulb must not protrude below the lowest point of the fixture
- Aim for 2000–2400K; 2700K is acceptable when warmer options are unavailable
- Narrow-band amber (590nm) is the best choice for dark-sky protection and wildlife
- For decorative fixtures you cannot replace, try a flicker flame bulb and add a separate shielded downlight

Lamp Type	Color Temp	Dark Sky Rating	Notes
Narrow Band Amber (NBA)	590 nm	**Best**	First choice. Minimal sky glow, wildlife-friendly. Increasingly available.
High Pressure Sodium (HPS)	~2200K	**Excellent**	Warm amber-orange. Very energy efficient, low blue content.
Warm LED / Incandescent	2000-2700K	**Good**	Select lowest Kelvin available. Ensure bulb does not extend below fixture.
Cool White LED	3000-4000K	**Avoid**	High blue content worsens sky glow and harms wildlife. Avoid for outdoor use.
Daylight LED / Metal Halide	>4000K	**Do Not Use**	Significantly increases sky glow and light pollution. Not acceptable.

Estimating Lamp Type and Wattage

During your inventory you will need to identify bulb types, even if fixtures are unlabeled. Visual cues:

- LED — Array of small diodes visible through lens. Often labeled on fixture housing.

- High Pressure Sodium (HPS) — Amber-orange warm glow. Oval bulb similar to Metal Halide but warm-toned. Very efficient.
- Metal Halide — Blue-white light. Similar bulb shape to HPS. High blue content. Recommend replacement.
- Incandescent / CFL — Round or spiral bulb. Incandescent runs warm (~2700K). CFLs often 2700–3000K with spiral element visible inside.

If you cannot confirm wattage from the fixture label, use this table to estimate based on lumen output:

Light Output (Lumens)	Incandescent (W)	CFL (W)	LED (W)	High-Efficiency LED (W)
200–375	25	6–8	2–3	2 or less
450–700	40	9–13	4–5	3–4
800–900	60	13–15	6–8	4–5
1100–1200	75	18–25	9–13	6–7
1500–1800	100	23–30	16–20	7–9
2000–2600	150	30–35	25–28	10–13
2800–3000	200	45–50	35–40	14–15
5000–10,000	—	100	65–133	25–50

Estimating Color Temperature

You can use a smart phone to obtain color and light intensity estimates. Kelvin readings from a phone are reasonably reliable but should be treated as estimates. Consider downloading:

Platform	App Name
iOS	Photone, Luxmeter, Light Meter LM-3000, Lumu Light Meter, Lux Light Meter for Mobile
Android	Photone, Light Meter – Lux & Kelvin (BTI), Light Meter – Lux, Exposure, Lux Light Meter

You can estimate Kelvin rating visually by comparing the light color to known references:

- Amber/orange glow — approximately 2000–2200K (HPS or amber LED)
- Warm white, similar to incandescent — approximately 2700K
- Neutral white — approximately 3000–3500K
- Cool white or blue-white — 4000K or higher (avoid for outdoor use)

Have two volunteers independently estimate the Kelvin rating of any bulb you cannot confirm from documentation. Agreement between observers is sufficient for assessment purposes.

Estimating Excessive Lighting

Phone sensors measure *lux* (how much light hits a surface), not lumens (total light output of a fixture). For assessment purposes, lux at a point tells you whether an area is over-lit. Eyes adapt to low light levels quickly — 2 lux is genuinely sufficient for safe pedestrian passage on a walkway once your eyes

have adjusted. The common instinct to flood an area with 50–100 lux creates glare that actually makes the surrounding area harder to see.

The IES (Illuminating Engineering Society) has set industry-standard figures used by lighting professionals and dark-sky advocates:

Footcandle to lux conversion: 1 fc = 10.76 lux

Area	Recommended Average	Maximum
Building entrance (active)	2 fc / **22 lux**	5 fc / 54 lux
Building approach	0.2 fc / **2 lux**	—
Sidewalks & walkways	0.2 fc / **2 lux**	5 fc / 54 lux
Residential driveways	~0.5–1 fc / **5–10 lux**	—

Light trespass limits (from these same guidelines): light crossing a property line should not exceed 0.1 fc (1 lux) at a neighboring business boundary, and 0.05 fc (0.5 lux) at a residential boundary.

What this means in practice: if you measure a walkway or entrance at 20–30 lux, it's almost certainly over-lit. A well-aimed 2700K LED downlight pulling 5–8 watts is typically all that's needed to hit the 2–5 lux target for a residential walkway.

Conducting the Assessment

Before You Arrive

Good preparation makes the site visit efficient and professional.

Contact the Property Owner

- Introduce yourself and the purpose of the assessment
- Outline the process: a daylight walk, an after-dark visit, and a written report
- Confirm contact person and best method of follow-up communication
- Get any access permissions needed (gated properties, HOAs, etc.)

Prepare Your Kit

What to Bring

- Data Collection Forms (print or digital — see Appendix)
- Aerial view or map of the property (Google Maps works well)
- Flashlight or headlamp
- Clipboard, pen, and pencil
- Camera (phone camera is fine; tripod helpful after dark)
- Copy of this manual for reference

The Site Visit

Daylight Inventory

Start early enough to complete the full property in daylight. This allows you to see fixture mounting, shielding, and wiring details that are harder to observe after dark.

- Walk every area of the property systematically
- Record each fixture: location, fixture type, estimated wattage and color temp, current shielding, controls (photocell, switch, timer, motion sensor)
- Photograph each fixture type once — no need to photograph every instance
- Note any lights left on during the day (often photocell failures)
- Note the apparent purpose of each light — ask the owner if unclear

After-Dark Inventory

Return after dark to observe the lighting in operation. This reveals problems invisible in daylight.

- Observe and photograph the actual light distribution of each fixture
- Note glare: can you see the light source directly?
- Note light trespass: does light extend to neighboring properties?
- Note sky glow: is light escaping upward?
- Note fixtures that stay on all night vs. those with motion control

- Note the color of the light
- Note the Lux readings along walkways, driveways, entrances
- Note Lux readings at property boundaries

Photography tip: most phone cameras will auto-adjust exposure and make the scene look brighter than it is. Try manual or night mode. If photos don't capture what your eye sees, write a description.

Questions to Ask at Every Fixture

- What is the purpose of this light?
- Is it really needed? Could reflective markers, paint, or signage serve the purpose instead?
- Is the light source (bulb or lens) visible from anywhere on or off the property?
- Does the light extend beyond the area that needs to be lit?
- Could it be on a timer or motion sensor instead of dusk-to-dawn?
- Is it the right fixture for the purpose?
- Is the light brighter than it needs to be?

Common Retrofit Recommendations

- Replace fixture with fully shielded downlight equivalent
- Add external shield or visor to reduce glare from acceptable fixture
- Replace bulb with warmer-temperature equivalent (2200–2700K)
- Adjust fixture aim so light falls only on needed area
- Replace dusk-to-dawn photocell with timer or motion sensor
- Remove fixture that serves no purpose
- Reduce lumen output when switching from unshielded to shielded fixture

Understanding the Costs and Savings

Cost is often the first question a property owner asks. The good news is that dark-sky lighting improvements almost always pay for themselves — and faster than expected.

The Simple Case for Replacement

When you replace an inefficient fixture with a properly shielded, energy-efficient LED:

- Energy use drops dramatically — a 230W metal halide fixture is often replaced by a 40–60W LED with better light distribution
- Maintenance costs drop because LEDs last far longer than older lamp types
- Hardware costs for many simple fixtures are modest ($30–$150 for residential; $150–$500 for commercial)
- Break-even for hardware cost alone is often 6–18 months, based on energy savings alone

Basic Cost Estimation

For each fixture to be replaced, you can estimate savings with a simple calculation:

> **Energy Savings Formula**
>
> - Current monthly cost = (Quantity × Watts × Hours/day × 30) ÷ 1000 × $0.11
> - New monthly cost = (New Quantity × New Watts × Hours/day × 30) ÷ 1000 × $0.11
> - Monthly savings = Current cost − New cost
> - Break-even (months) = Fixture cost ÷ Monthly savings
>
> Substitute current electric rate for $0.11/kWh if known. KPUB residential rates run approximately $0.09–$0.11/kWh. Commercial rates run approximately $0.08–$0.09/kWh

Presenting the Value

When presenting your assessment, focus on the total picture — not just the break-even calculation:

- Energy and maintenance savings over time
- Reduced glare and improved visibility (a safety benefit)
- Elimination of light trespass (a neighbor relations benefit)
- Contribution to protecting the dark skies that define Kerr County
- Potential eligibility for DarkSky International recognition programs

A cost analysis spreadsheet template is available from KCFDS. For properties where cost analysis is critical to decision-making, complete the full spreadsheet showing break-even for each fixture type. For most residential assessments, a simple summary is sufficient.

Delivering Your Assessment

The Assessment Letter

Your assessment deliverable is a professional letter with the inventory and recommendations attached. It should be respectful, constructive, and focused on the owner's interests.

- Brief overview of the property and the purpose of the assessment
- Summary of current lighting: what's good, what needs attention
- High-level recommendation: how many fixtures, general approach
- Estimated cost and break-even period (if calculated)
- Offer to meet, review selected replacement fixtures, or answer questions
- Thanks for their participation

For your first few assessments, ask your KCFDS coordinator to review your letter before sending.

The Inventory

The inventory is the detailed record that accompanies the letter. For each fixture location, record:

- Location description and photo
- Fixture type, quantity, wattage, color temperature
- Current shielding and controls
- Assessment: compliant / needs attention / remove
- Recommended action

Sample Assessment Letter

[Property Owner Name and Address]

Outdoor Lighting Assessment

Date: [Date] | Assessor(s): [Your Name]

Dear [Owner Name],

Thank you for welcoming us to assess the outdoor lighting at [property description]. This assessment is part of Kerr County Friends of the Dark Sky's volunteer program to help our community protect the dark skies, reduce light pollution, and improve the efficiency of outdoor lighting across Kerr County.

We found [X] outdoor fixtures, of which [Y] meet dark-sky guidelines and [Z] would benefit from modification or replacement. The attached inventory details each fixture and our recommendations. The proposed improvements would reduce your outdoor lighting energy costs by approximately [estimated savings] per month, with a typical break-even period of [X] months.

We would welcome the opportunity to walk the property with you to discuss the recommendations, or to review any replacement fixtures before purchase. Please feel free to reach out with any questions.

With appreciation,

[Your Name(s)]

> *Kerr County Friends of the Dark Sky — Volunteer Assessor*

Follow-Up

- Schedule a follow-up meeting with the property owner to discuss findings
- Offer to review proposed replacement fixtures before purchase
- Keep copies of all assessment documents and share with your KCFDS coordinator
- Track whether recommended changes were implemented — this data helps KCFDS demonstrate community impact

Appendix: Data Collection Form

Copy and use the form below for each property. Also available digitally from your KCFDS coordinator.

Fixture #1

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Fixture #2

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Fixture #3

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Fixture #4

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Fixture #5

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Fixture #6

Location / Purpose: _____

Fixture Type: _____ Quantity: _____ Photo Ref: _____

Est. Wattage: _____ Est. Color Temp (K): _____ Bulb Type: _____

Current Shielding: ☐ None ☐ Partial ☐ Full cutoff ☐ Other: _____

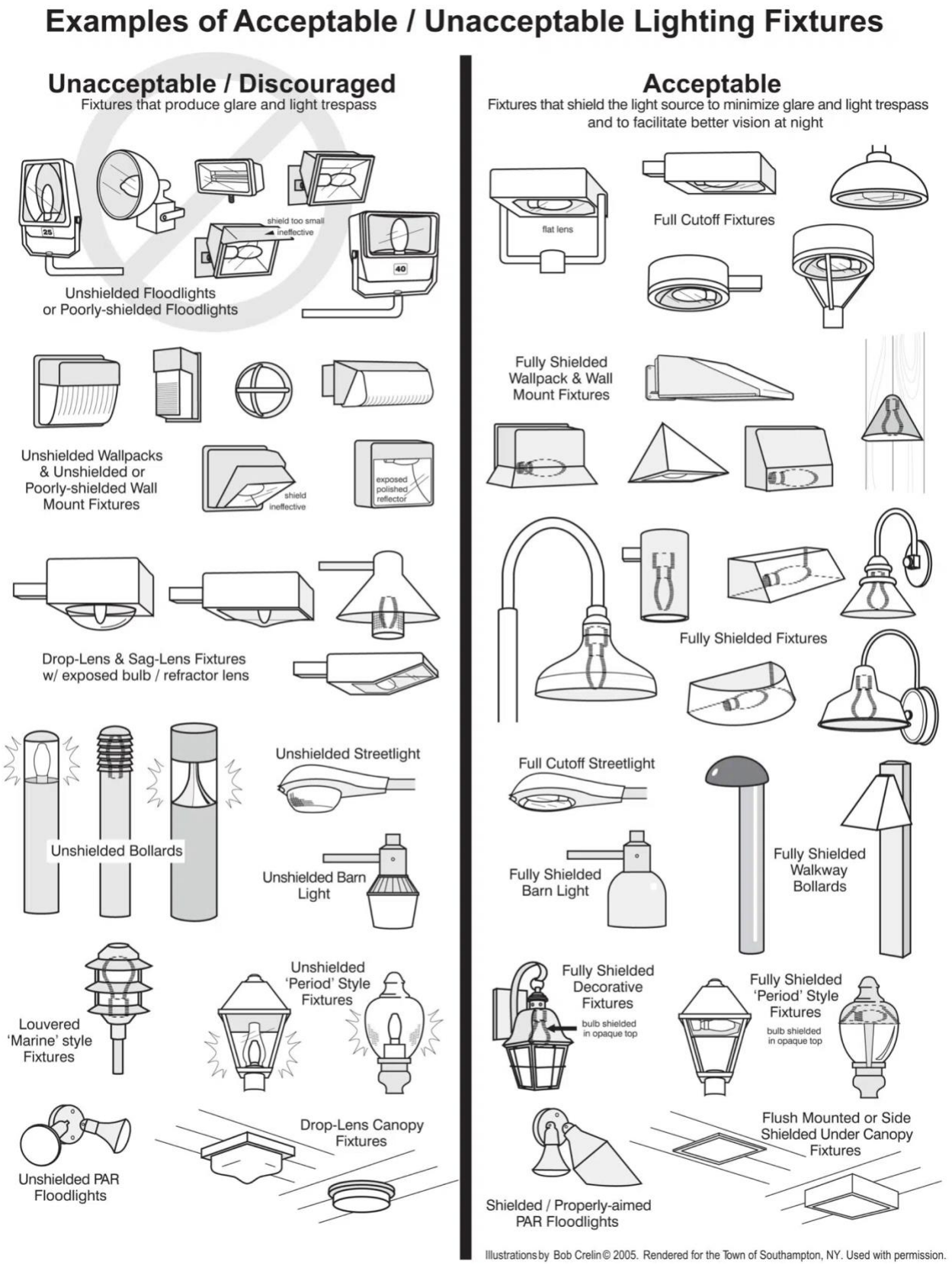
Controls: ☐ Always on ☐ Photocell ☐ Timer ☐ Motion sensor ☐ Manual switch

Assessment: ☐ Compliant ☐ Needs attention ☐ Remove ☐ Priority

Recommended Action: _____

Notes: _____

Appendix: Common Lighting Fixture Options



Appendix: Resources

- DarkSky International: darksky.org
- DarkSky Texas: darkskytexas.org
- DarkSky-approved fixture finder: darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/
- Kerr County Friends of the Dark Sky: kerrcountydarksky.org
- DarkSky outdoor sports lighting criteria: darksky.org/what-we-do/darksky-approved/outdoor-sports-lighting/