Facility Photocell and Exterior Lighting Timer Adjustment

1.0 Maintenance Objective & Frequency

The objective of this procedure is to calibrate facility photocells and adjust exterior lighting timers to ensure lights activate at the correct ambient light level (typically dusk) and deactivate at the appropriate time (dawn or scheduled off-time). Proper adjustment prevents unnecessary energy consumption, extends lamp life, and maintains safe illumination of walkways, parking lots, and building perimeters. This PM is to be performed semi-annually (spring and fall) to account for seasonal changes in daylight hours, or whenever a lighting zone is reported as malfunctioning.

2.0 Lockout/Tagout (LOTO) & Safety

• Electrical Isolation: Locate the dedicated circuit breaker or disconnect switch for the exterior lighting panel. Switch to OFF and apply a personal lock and tag. Verify zero voltage using a non-contact voltage tester before opening any control enclosures.
• Photocell Isolation: If the photocell is a plug-in type, unplug it from the receptacle. For hardwired units, ensure the circuit is de-energized before removing the photocell cover or accessing wiring terminals.
• Fall Protection: If the photocell or timer is mounted at height (e.g., on a pole or roof edge), use a ladder rated for the task or a scissor lift. Ensure the ladder is on stable ground and extends at least 1 metre above the working surface.
• Mandatory PPE: Safety glasses, Class 0 rubber insulating gloves (rated for 1000V AC) if working near live terminals, high-visibility vest, and hard hat when working outdoors or near vehicular traffic.

3.0 Required Tools, Parts & Lubricants

- Non-contact voltage tester (CAT III rated)
- Digital multimeter (True RMS, capable of measuring resistance and AC voltage)
- Small flathead screwdriver (for terminal adjustments)
- Phillips #2 screwdriver (for cover removal)
- Adjustable wrench (for conduit locknuts if needed)
- Replacement photocell (same model and voltage rating as existing)
- Replacement timer module (if timer is non-adjustable or faulty)
- Electrical tape (rated for outdoor use, 600V)
- Wire nuts (sized for the conductor gauge, outdoor rated)
- Lint-free cloth (for cleaning photocell lens)
- Isopropyl alcohol wipes (for lens cleaning)
- Permanent marker and label maker (for marking adjustment settings)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO on the exterior lighting circuit as described in Section 2.0. Confirm zero voltage at the photocell and timer terminals using the non-contact voltage tester.

2. Remove the photocell cover or access plate. For twist-lock photocells, rotate the unit counterclockwise to release it from the receptacle. For hardwired units, remove the cover screws and carefully pull the photocell out of the enclosure.

3. Inspect the photocell lens for dirt, debris, or physical damage. Clean the lens with an isopropyl alcohol wipe and a lint-free cloth. If the lens is cracked or yellowed, replace the photocell.

4. Using the digital multimeter set to resistance (ohms), measure the photocell resistance in full darkness (cover the lens with your hand or a dark cloth). The resistance should be near zero ohms (closed circuit). Then expose the lens to bright light (use a flashlight or sunlight) and measure again; resistance should be very high (open circuit, typically >100 kΩ). If readings are out of spec, replace the photocell.

5. If the photocell has an adjustable setpoint (e.g., a potentiometer), use the small flathead screwdriver to adjust the turn-on threshold. Typically, turning clockwise increases the light level required to turn on (delays activation), and counterclockwise decreases it (earlier activation). Set to the desired foot-candle level per facility specifications (commonly 10-20 foot-candles for dusk activation).

6. Reinstall the photocell. For twist-lock types, align the pins and rotate clockwise until fully seated. For hardwired units, reconnect the wires (line, load, neutral) using wire nuts and electrical tape, then secure the cover.

7. Locate the exterior lighting timer (if separate from the photocell). Open the timer enclosure. For electromechanical timers, check the clock mechanism for proper timekeeping. Adjust the trippers (on/off pins) to the desired schedule. For digital timers, navigate to the programming menu and set the on/off times per the facility lighting schedule (e.g., ON at sunset, OFF at 11 PM or dawn).

8. If the timer has an astronomical clock feature (astro timer), verify that the date, time, and geographic coordinates (latitude/longitude) are correctly programmed. This ensures the timer automatically adjusts for seasonal daylight changes.

9. Tighten all terminal screws to the manufacturer's recommended torque (typically 0.5-0.8 Nm for small terminals). Ensure no loose strands of wire are exposed. Close and latch the timer enclosure.

10. Remove LOTO devices. Restore power to the circuit. Observe the photocell and timer operation. The lights should turn off immediately if it is daytime (bright light on the photocell) or turn on if it is dark. Use a flashlight to simulate dusk on the photocell to verify the turn-on response (should activate within 30 seconds).

11. Record the adjustment settings (photocell setpoint, timer schedule, astro settings) on the PM work order and on a label affixed inside the enclosure. This provides a baseline for future adjustments.

5.0 Verification & Return to Service

1. After restoring power, perform a full dusk simulation test: cover the photocell completely with a dark cloth. The exterior lights should turn on within 30 seconds. Remove the cloth; the lights should turn off within 60 seconds. Repeat for each lighting zone controlled by the photocell.

2. Verify the timer operation: if the timer is set to override the photocell (e.g., turn off at 11 PM), manually advance the timer to the off setpoint and confirm the lights de-energize. Reset the timer to the correct time.

3. Inspect all exterior light fixtures for proper illumination (no flickering, dimming, or dead lamps). Replace any failed lamps or ballasts as needed.

4. Complete the PM work order in ServiceGrid, noting the photocell model, serial number, adjustment settings, and any parts replaced. Attach a photo of the label inside the enclosure.

5. Return the area to a clean, safe condition. Remove all tools, ladders, and debris. Ensure all enclosure covers are securely fastened and weatherproof.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.