UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-530-01 Design: Interior, Exterior Lighting and Controls

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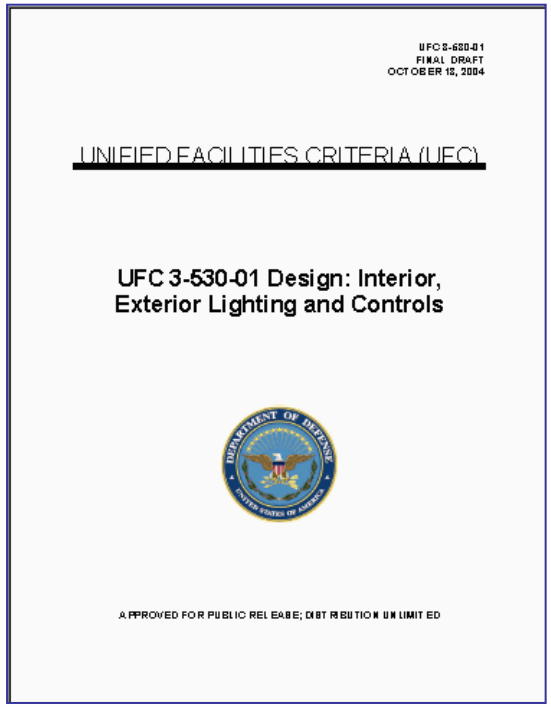
UFC 3-530-01
Design: Interior, Exterior Lighting and Controls

- Purpose:
  - Provides the criteria necessary to create effective and efficient lighting designs for the wide variety of DoD facilities. It also introduces emerging technologies to further reduce the energy consumption of DoD Facilities.

- Lead Agency: Navy
  - Point of contact: Richard Cofer

- Current Document Status:
  - Base document Completed, awaiting ESEP signatures
  - Adding section on Security Lighting


UFC 3-530-01
FINAL DRAFT
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INTRODUCTION

- This UFC updates the DoD criteria to meet the current IESNA standard of practice 9th Edition Handbook
- Lighting practitioners must evaluate the application and consider the important lighting design criteria including **direct glare, surface luminances, and uniformity**. Also, the importance of **daylight** on human health and productivity is emphasized.
- Exterior lighting design now addresses the **role of glare on creating poor visibility.**

DESIGN CONSIDERATIONS

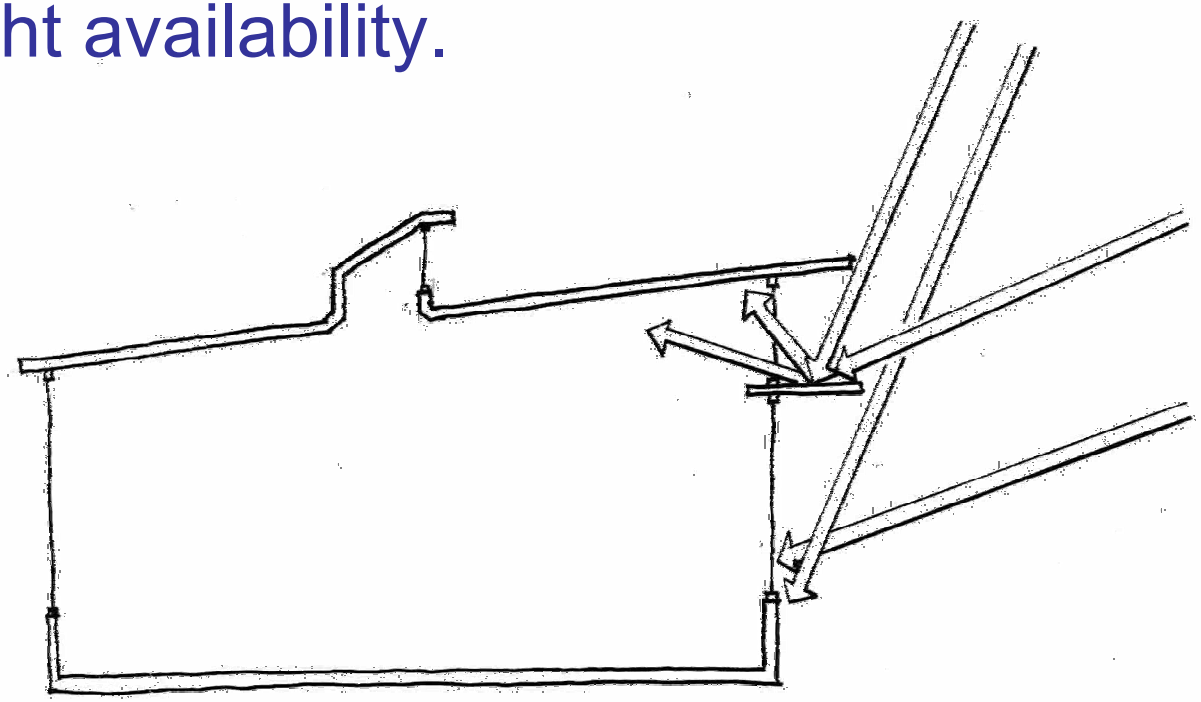
- Minimize glare
- Increase uniformity
- Provide effective illuminance levels
- Light surfaces
- Design ambient/task/accent
- Controls!

SUSTAINABILITY ISSUES

- SPiRiT or LEED rating
- Utilizing daylight reduces energy while improving the quality of the indoor spaces.
- Lighting controls payback in 3 to 7 years
- Minimize Light Pollution / Light Trespass

DAYLIGHTING

- Maximize daylight potential
- Proper orientation, shading and glazing type and size
- Electric lighting must be controlled in response to daylight availability.

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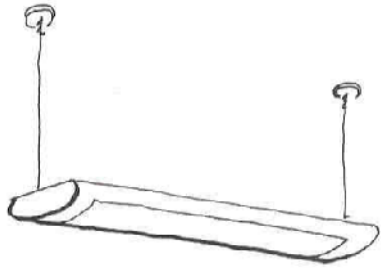
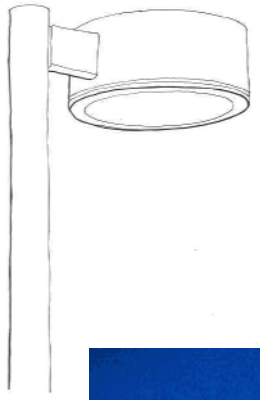
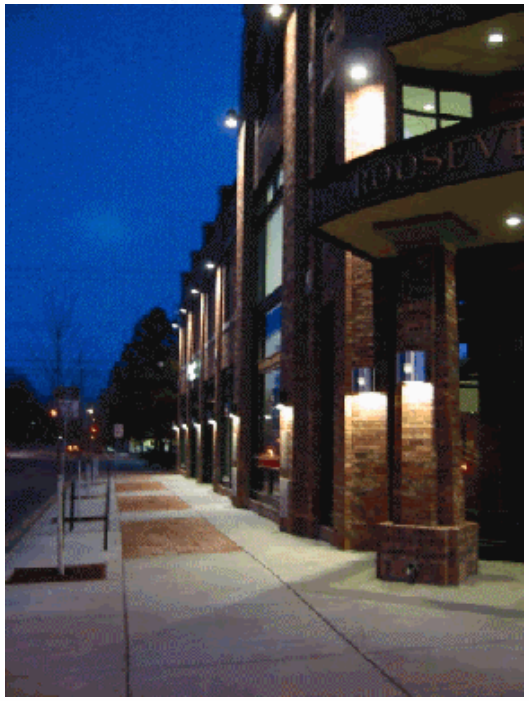
LIGHTING EQUIPMENT

- Luminaires
- Lamps
- Ballasts
- Controls

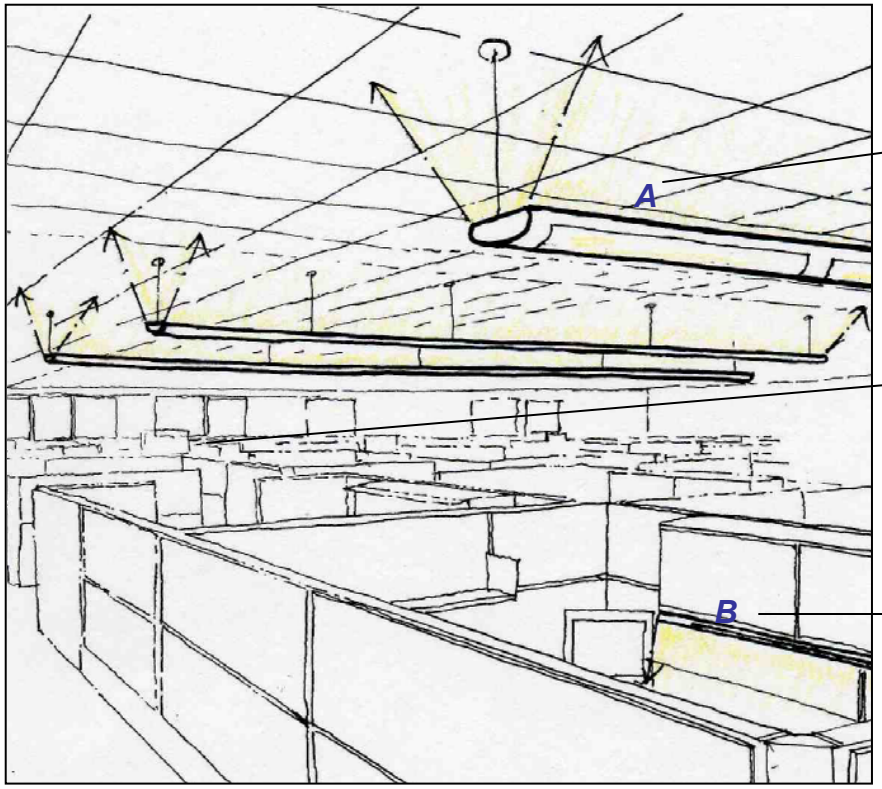




Space Type	Controls Type	Maximum Expected Yearly Energy Savings
Private Office	Occupancy Sensor	45%
	Sidelighting w/ photosensor	35%
	Manual dimming or multilevel switching	30%
Open Office	Sidelighting w/ photosensor	40%
	Occupancy Sensor	35%
Classroom	Multilevel switching	15%
	Sidelighting w/ photosensor	40%
	Occupancy sensor	25%
Grocery Store	Adaptive compensation	15%
	Toplighting w/ photosensor	40%
Big Box Retail	Toplighting w/ photosensor	60%
	Bilevel switching	10%



INTERIOR APPLICATIONS



Pendant mounted direct/indirect luminaires selected and located to prevent direct and reflected glare.

Introduce daylight from north and south facades and control glare. Integrate daylight with electric lighting system where appropriate.

Undercabinet task lights increase illuminance on desks.

EQUIPMENT RECOMMENDATIONS:

LUMINAIRELAMPCONTROLS

A *Pendant mounted linear fluorescent, indirect / direct luminaire, mounted 0.5 – 0.9m (18" – 36") below ceiling. (There are some luminaires available for ceiling heights of 8' with short pendants.)4' linear fluorescent T8, T5HO lamps 3500K color temperature, 75 CRI +Daylight dimming or switching. Manual dimming over workstations is also available. Consider the use of occupancy sensors for cubicle groups.*

B ***U****nder cabinet task lighting designed for minimal veiling reflections.2', 3', and 4' linear fluorescent T8 lamps 3500K color temperature, 75 CRI +Manual on/off or on local occupancy sensor.*

RULES OF THUMB:

- Pendant spacing: When beginning a design, start with 3.0 – 3.7m (10’ – 12’) spacing for T8 luminaires (5.5 – 6.0m or 18’ – 20’ for T5HO systems) and modify accordingly to meet critical design issues.
- Pendant length: Pendant lengths range from 0.5 – 0.9m (18” – 3’). High performance luminaires may achieve a minimum of 0.3m (12”) pendant lengths. Specialty luminaires for low ceiling applications may be mounted even closer to the ceiling.
- Lighting Power Density: The lighting power density for open office areas can range from 0.9 – 1.2 watts /square foot.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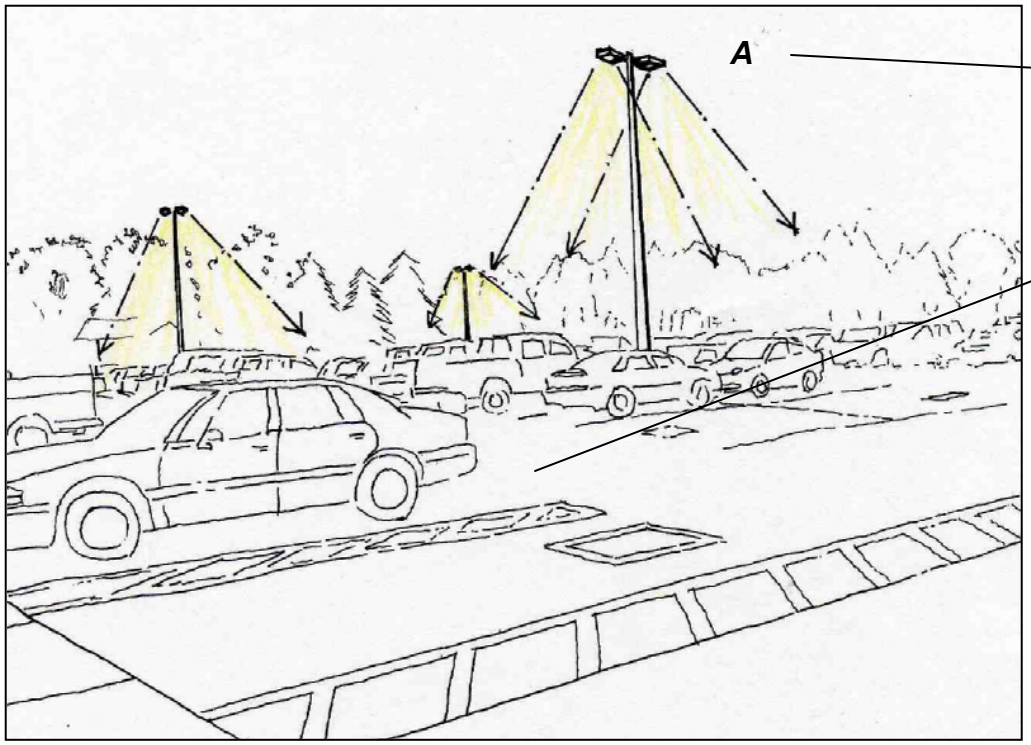
EXTERIOR APPLICATIONS



Fully shielded or full cut-off luminaires control glare and reduce light pollution and trespass.

Spacing of luminaires provides uniform horizontal illuminance in parking areas.

EQUIPMENT RECOMMENDATIONS:

	LUMINAIRE	LAMP	CONTROLS
A	*Pole mounted metal halide, induction, or HPS luminaire.*	*Metal halide, induction, or high pressure sodium lamp.*	*Control with photocell, timeclock, or motion sensor (only with induction lamp).*

RULES OF THUMB:

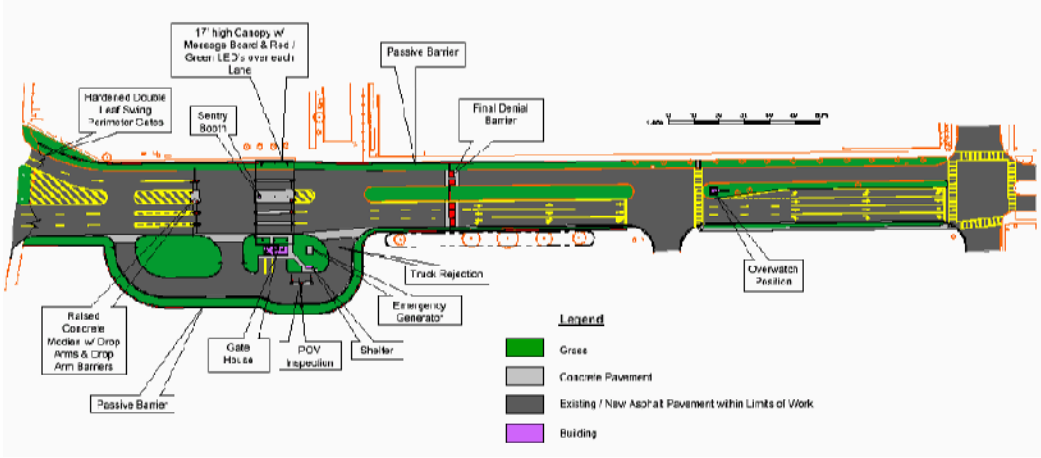
- Spacing to mounting height:
  Start with a 4:1 spacing to mounting height ratio and modify accordingly to meet critical design issues.
- Distribution: Use Type V distributions for luminaires within the parking areas. Use Type III and IV distributions for luminaires along the perimeters.

The Old Criteria

The New Criteria

What's Next?

- Security Lighting:
  - Concepts
    - Glare Projection
    - Controlled
    - Light Pollution
    - Lighting for CCTV
  - Facilities
    - Entry Control Facilities
      - Vehicle access
      - Pedestrian access
      - Inspection areas
    - Controlled Perimeters
    - Restricted Areas
    - Storage areas
  - Special Applications
    - Waterfront



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