

# Design 3 Architecture

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## Why Light Fixtures with the Latest Lamp Technology May Be Needed

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Since Pennsylvania adopted the Uniform Construction Code (UCC) in 2004, the International Code Council's (ICC) 2003 International Energy Conservation Code (IECC) is the required minimum standard for the design and construction industry. The use of very efficient light fixtures and lamps will be required to meet the lighting power consumption established by this code or the alternate standards established by ASHRAE 90.1-1999.

The 2003 IECC limits the lighting power consumption to 1.1 watts per square foot (W/sf) in office portions of buildings. Even though the 1999 version of ASHRAE 90.1 still allows 1.5 W/sf, the 2004 version will limit consumption to 1.1 W/sf. (The 2004 version will take effect when the 2006 IECC is adopted at the end of this year.)

To put this in perspective, we commonly use fluorescent light fixtures with three T8 lamps. A typical distribution and spacing is usually one for every 64 sq ft, or one every 8 ft centerline in each direction. Each fixture uses approximately 96 watts each (three 32W lamps and electronic ballasts). A 40 ft x 50 ft open office area with lights every 8 ft would require 30 fixtures. This works out to be approximately 1.44 W/sf. A typical 9 ft x12 ft individual office with two fixtures would be 1.77 W/sf, and an 8 ft x10 ft exam room with two fixtures would be 2.5 W/sf (see enclosed examples).

We could switch to fixtures with two T8 lamps, though the light levels may be somewhat unsatisfactory (especially for an exam room), but we would still be at 1.18 W/sf in the small office and 1.6 W/sf in an exam room.

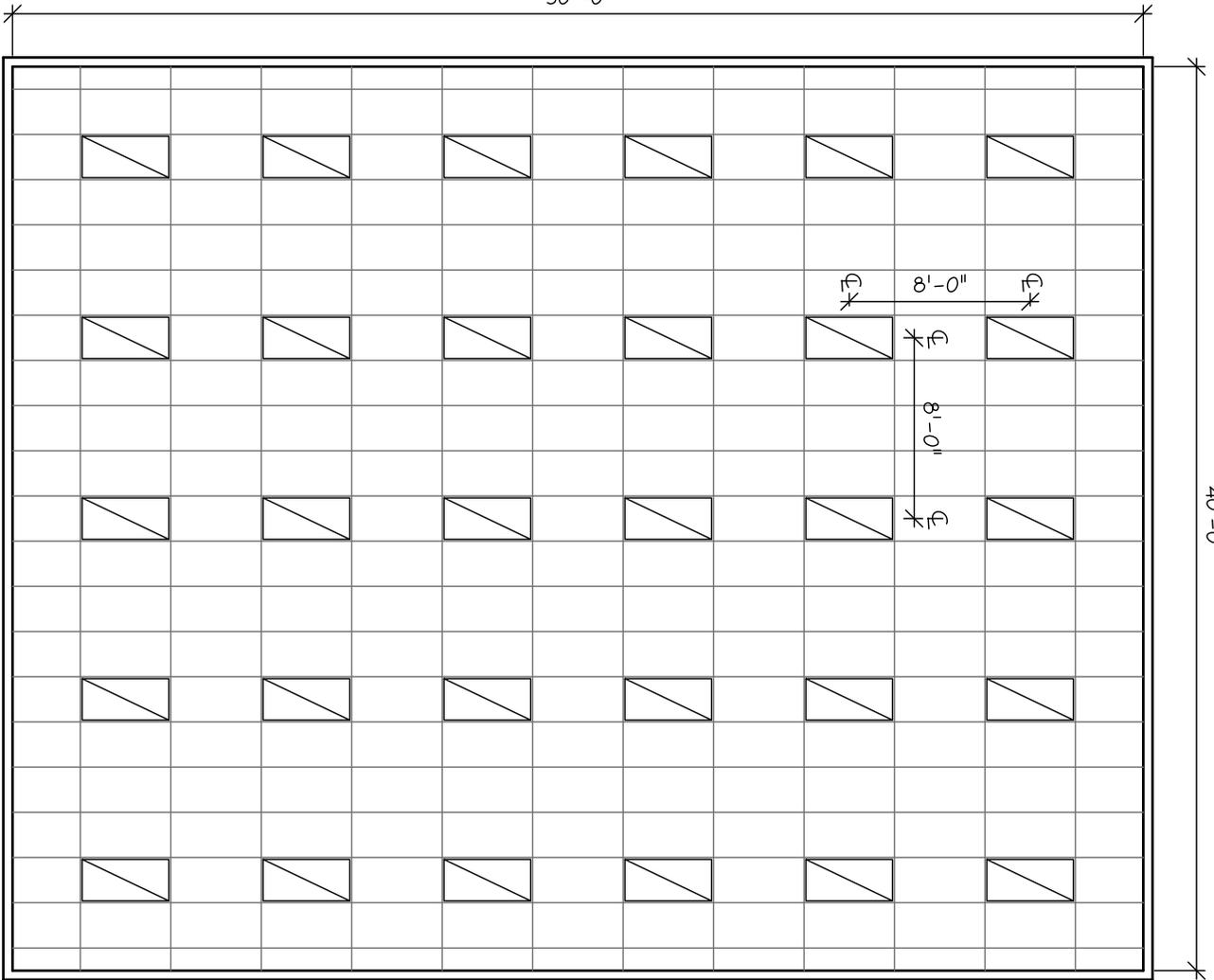
The new thinner T5 lamp technology has spurred fixture innovations and is providing new energy-efficient lighting solutions. A 46-inch 28-watt T5 lamp has about the same lumen output as a comparable 32-watt T8 lamp. However, the 28-watt T5HO (high output) lamp can provide 67% more lumen output and last 20% longer! These new products are enabling us to provide better light while satisfying the latest energy code standards.

Compliance with lighting power standards and some other aspects of the newer building codes are sometimes not uniformly enforced; however, designers are still required to adhere to these codes. Many municipalities have retained the services of third party code compliance firms to review their permit document submittals. In these municipalities, we find that energy code compliance and lighting power usage are indeed scrutinized, often requiring envelope compliance certificates or "com-check" forms.

Although this new lighting technology may increase construction costs, the payback period is often quite reasonable, especially with the recent trends in energy rates, and less lighting power load often reduces the required size of air conditioning units. Therefore, our clients should expect to pay a little more for light fixtures, but to reap the energy-saving benefits for the life of the building.

50'-0"

40'-0"



1

# OPEN OFFICE PLAN

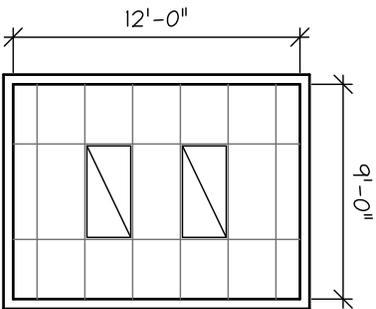
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NOTE:  
8x8 GRID = 1 LIGHT PER 64 SQUARE FEET

2

# OFFICE

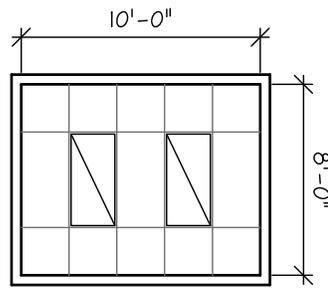
Scale: 1/8" = 1'-0"



3

# EXAM ROOM

Scale: 1/8" = 1'-0"



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Project: Lighting Study  
Typical Reflected Ceiling Plan Layouts

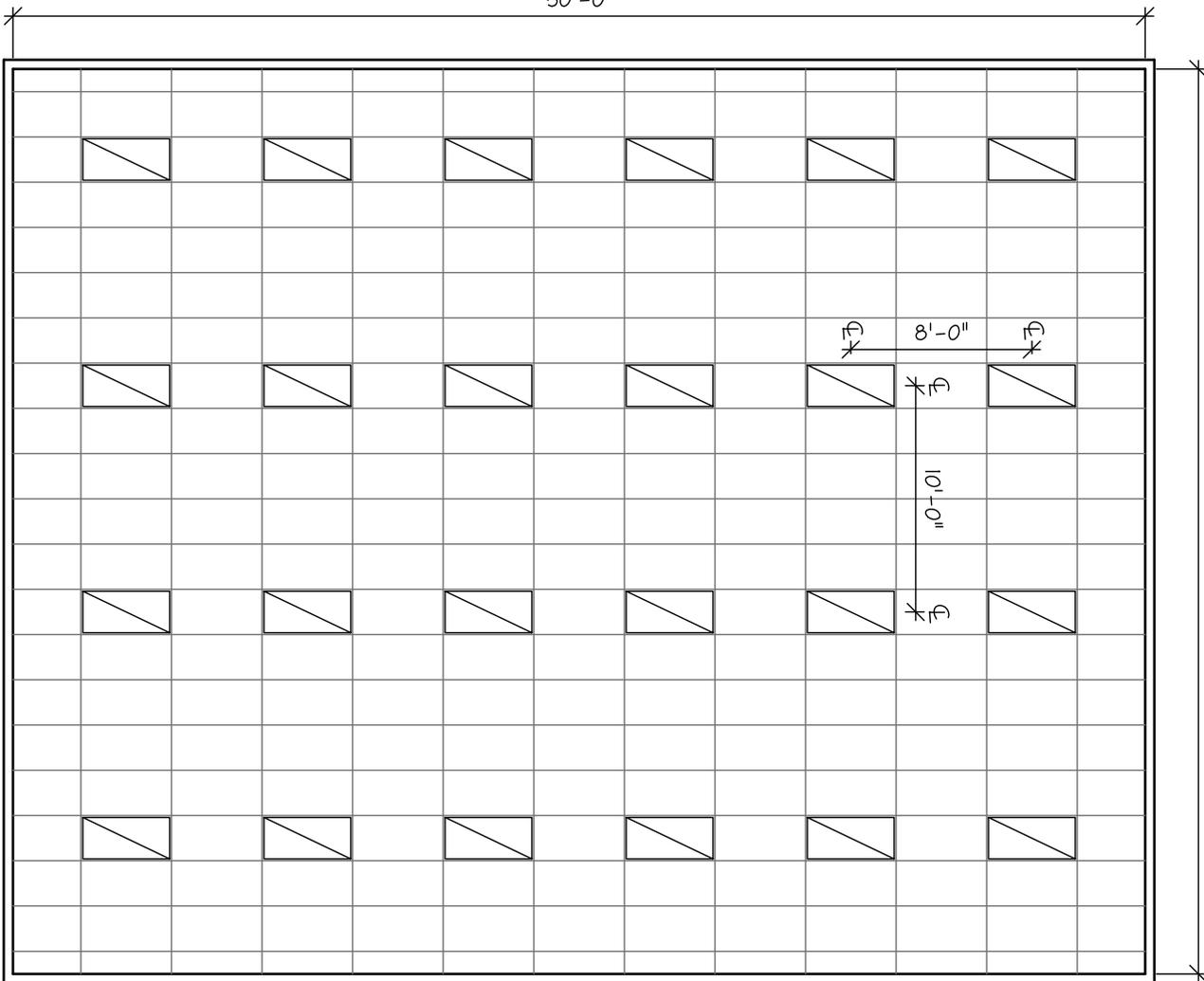
Title: Open Office Plan-8x8 Grid  
Office, Exam Room

Date: 08/03/06 No.



50'-0"

40'-0"



1

B

# OPEN OFFICE PLAN

Scale: 1/8" = 1'-0"

NOTE:

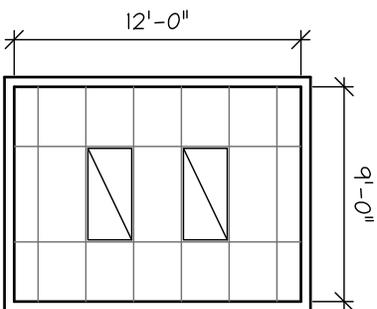
8x10 GRID = 1 LIGHT PER 80 SQUARE FEET

2

B

# OFFICE

Scale: 1/8" = 1'-0"

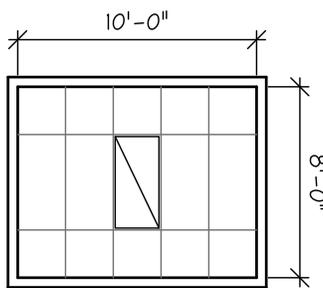


3

B

# EXAM ROOM

Scale: 1/8" = 1'-0"



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Project: Lighting Study  
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Title: Open Office Plan-8x10 Grid  
Office, Exam Room

Date: 08/03/06 No.

# B