



“Until now we’ve had to make do with stop-gap solutions for offices with low ceilings. Now there’s a product that offers controlled brightness, uniform distribution and exceptional energy performance. This is the office luminaire we’ve been waiting for.”

– John Benson, PIVOTAL Lighting Design, Affiliated Engineers

Project

Affiliated Engineers Inc. (AEI)
Westlake Center Office Tower
Seattle WA

Challenge

Lighting a multi-functional office with low 8’ 6” ceilings for good visual ergonomics, aesthetics and energy efficiency.

Solution

PureFX™ recessed luminaires with MesoOptics® technology; one 40W T5 lamp in each 2’x2’ luminaire.

Results

Controlled brightness and visual comfort with work-plane uniformity of 1.2:1 max/min ratio. Maintained levels of 35 fc. Power density load of 0.59 W/sq.ft is 40% below Seattle’s 1.0W/sq.ft code. Exceptional energy performance qualifies for LEED and provides opportunity to earn several points.

Lighting Experts Select PureFX™

Affiliated Engineers Inc. (AEI) is a professional services consulting firm founded in 1927 and headquartered in Madison, Wisconsin. Today AEI employs 450 professionals across the United States who service technically complex projects in healthcare, manufacturing, R&D, higher education, and a range of commercial and industrial spaces – including their own.

When AEI moved its Seattle offices to a new location they enlisted PIVOTAL Lighting Design, their in-house group of illuminating experts, to solve the project’s lighting challenges. The new space in the Westlake Center Office Tower is a conventional mix of open-area workstations, private offices and conference rooms with low 8’ 6” ceilings throughout.

The project’s lighting objectives were established “to provide an ergonomic and visually healthy workspace,” said PIVOTAL Project Manager John Benson. “That meant evenly illuminating the ceilings, walls and work surfaces, while minimizing glare and unwanted reflections.”

Considering the limitations of traditional recessed fixtures, these objectives were easier said than done. Parabolic luminaires, Benson believes, work well to reduce reflections on computer monitors but are notorious for casting harsh, cave-shape contrasts that create “gloomy work environments.” He also considered using recessed indirect luminaires. These, he says, create aesthetically bright environments but usually at the cost of high-angle glare, a common cause of eye strain and discomfort.

The project's lighting design was further complicated by its ambitions for energy performance. AEI was seeking LEED certification, a voluntary system for Leadership in Energy and Environmental Design. To be eligible, they had to meet Seattle's stringent energy codes – some of the toughest in the country.

With demands for quality visual ergonomics running up against restrictive energy codes, AEI's offices were precisely the kind of space that test the limits of conventional lighting. "If we went with traditional recessed lighting, I knew we would have to compromise somewhere."

Instead Benson's research led him to consider PureFX™, a new family of recessed luminaires from Ledalite Architectural Products. PureFX uses proprietary MesoOptics® technology to purify and control light. MesoOptics consists of microstructures produced in a manner similar to the holograms that appear on most credit cards. These microstructures, fixed on the PureFX lens, remove striations and hot spots and create highly controlled beam patterns. MesoOptics microstructures also allow 95 per cent of light that enters to pass through, enabling PureFX to achieve up to 20 per cent more efficiency than traditional alternatives.

Benson tested the luminaires using computer modeling software and found the ratio between the highest and lowest illuminances (max/min footcandles) was 1.2:1 for PureFX compared to 3:1 for parabolic and 4:1 for recessed indirect alternatives.

“ My colleagues can't believe it's only 35 foot-candles. They feel the light is very bright and clean. ”

"In addition to providing a bright, pleasant environment, these new luminaires produced an even distribution of light, indicated by the ratio." That uniformity was key, Benson says, in his decision to use PureFX because it let him design to a lower light level where he could achieve significant energy savings.

"When a space is evenly illuminated – across walls, ceilings and work surfaces – people perceive it to be much brighter. I've always believed that a lower footcandle level could be used if the light was evenly distributed throughout the space."



“...PureFX was the best investment we could have made.”

Instead of using the standard recommendation of 50 footcandles for a typical office space, Benson designed the AEI offices to 35 footcandles. My colleagues can't believe it's only 35 footcandles. They feel the light is very bright and clean," a big improvement, Benson says, over the parabolics in their previous space. "People walk into our offices now and feel that they're in a luminous, natural environment."

By lowering light levels, Benson also met the project's energy objectives. The installation required one 40W TT5 lamp in each 2'x2' luminaire. That converts to a load of 0.59W/sq.ft – a full 40 per cent under Seattle's strict 1.0W/sq.ft power density requirements. As a result, Benson qualified for 3 points toward LEED certification in the Commercial Interiors Program.

"Until now we've had to make do with stop-gap solutions for offices with low ceilings. Now there's a product that offers controlled brightness, uniform distribution and exceptional energy performance. In terms of LEED points for dollars, I believe PureFX was the best investment we could have made. This is the office luminaire we've been waiting for."



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