CASE STUDY

# MMM Group

100 Commerce Valley Drive,
Markham, Ontario

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fifthlight
technology

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## Background

The MMM Group is a professional engineering consulting firm that required energy efficient lighting for its new head quarters building. Before moving into the 8 storey, 200,000 sq. ft. of facility, the MMM group evaluated a variety of energy efficient lighting options and decided to deploy a dimmable lighting system. The previous lighting system is characterized as follows:

- 1,285 non-dimmable 2 lamp 32W T8 ballasts (347V)
- 67 Watts power consumption per fixture
- 1.1 W/sq ft lighting power density
- 6 hard wired zones per floor
- 2 four button low voltage switches per floor
- 1 single user software application providing scheduling and override control over each zone
- 1 dedicated network running proprietary data

## Project Objectives

The new lighting system had to meet the following key constraints:

- Constant 40-45 foot candle of light at desk height
- Open communication protocol for all devices
- Operate on a converged Cisco network with other IP devices including computers, VOIP phones and cameras.

## Solution Overview

To meet these challenges, Fifth Light's Signature Lighting Solution was chosen. This Solution consists of the following components:

- 1,285 DALI dimmable 2 lamp 32W T8 ballasts (347V)
- 10 low voltage occupancy sensors per floor
- 6 low voltage daylight sensors per floor
- 1 Lighting Control Panel per floor
- 1 multi-user web based Lighting Management Software application

### Project Highlights

Lighting energy consumption reduced by

**51%**

Lighting power density reduced to

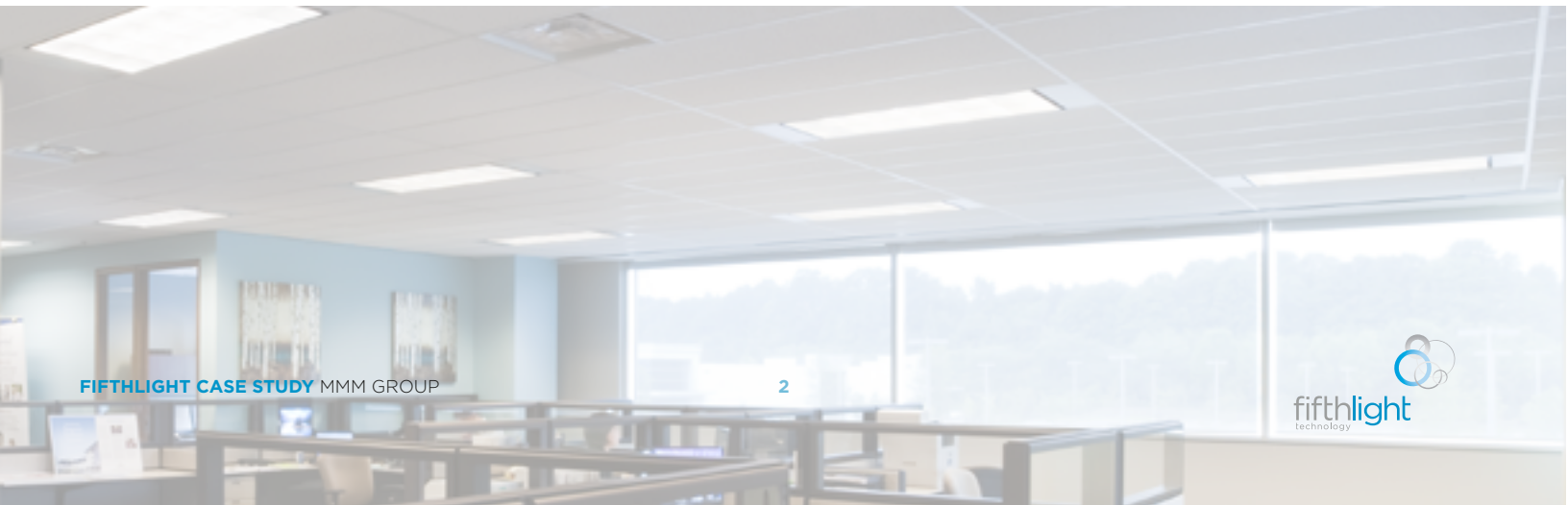
**0.7 W/sq ft**

Greenhouse gas emission reduction of

**150 tonnes a year**

An additional

**6 LEED[1] points**



The key lighting management features provided in this project include:

**1** Daylight Harvesting with gradient dimming. The row of lights closest to the window is dimmed more than the second row, which in turn is dimmed more than the third row. With virtual zones, a single sensor was used to control multiple rows of lights on different DALI busses.

**2** Occupancy Detection with sensor specific profiles. Each sensor is assigned a set of fixtures and a response pattern through software. Virtual lighting zones allow for the set of fixtures controlled by a given sensor to be modified at anytime without rewiring. Transition sequences gradually dim lights from the occupied light level to the vacant light level.

**3** Ballast Factor tuning. The maximum power consumed by each ballast was individually set based on site specific conditions. This allowed for the optimal lighting power density value to be achieved.

**4** Web based control on the converged network. The facility team is given password protected access through an internet browser.

# Results

The results of this project were assessed by comparing the lighting energy model before and after installation. The pre-installation lighting energy model was created by multiplying the measuring the power consumption of each lighting panel projected weekly operating hours (72 hours/week), which was supplied by the Client. The post-installation energy model produced by computer logs, which calculate and record the power consumption of every light fixture on an individual basis. The key results are listed below:

- Floor Light level: 40-45 foot candles
- Light Power density: 0.7 w/sq ft
- Energy Savings: 51%
- Greenhouse gas reduction: 150 tonnes $CO_2$ eq/year [2]
- This lighting solution gained 6 LEED[1] points

This case study is based on data produced 1 year after installation.

[1] LEED: Leadership in Energy Efficiency and Design green building rating system developed by the US Green Building Council.

[2] Canadian Energy Research Institute, *Comparative Life Cycle Assessment of Base Load Electricity Generation in Ontario*, October 2008.