



FORCE GREEN
an eco-eye initiative of Wipro

Leadership in Green Building Lighting

End to end Lighting Solutions and Lighting Management Systems for Green Buildings





End-to-End Lighting Solutions and Lighting Management Systems for Green Buildings

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WHAT IS GREEN



CII - Sohrabji Godrej Green Business Centre
The First Platinum rated Green Building in India

Architect: Karan Grover Associates
Consultant : Spectral Services
Lighting Solutions : Wipro Lighting

Maintaining a balance: the Green way

The Indian construction industry is growing at a stupendous pace, but there is still a long way to go in order to create world-class infrastructure. Although the high rate of growth is favourable for the industry but in turn, it also raises concerns about the impact on the environment and mounting pressure on the energy and resources. The need of the hour is to adopt such technologies and processes, which minimize the impending risks on the environment, attain optimum utilization of construction materials, and curtail the harmful effects of buildings on atmosphere and people.

What is a Green Building?

A Building which promotes energy conservation, encourages optimum use of resources, and mitigates negative impact on environment and people is known as a Green Building.

What is the need for Green Buildings?

Green Building is an ideal solution to address the booming construction industry in India and an opportunity to capitalize on our tropical climate. Due to our natural climate, we have abundance of natural heat and light.



environmental benefit:

- Reduces pressure on consumption of natural resources



economic benefits:

- Improves profitability of business
- Reduces operating costs and optimizes life cycle economic performance
- Increases building valuation



community and corporate benefit:

- Minimizes strain on local infrastructure and improves quality of life

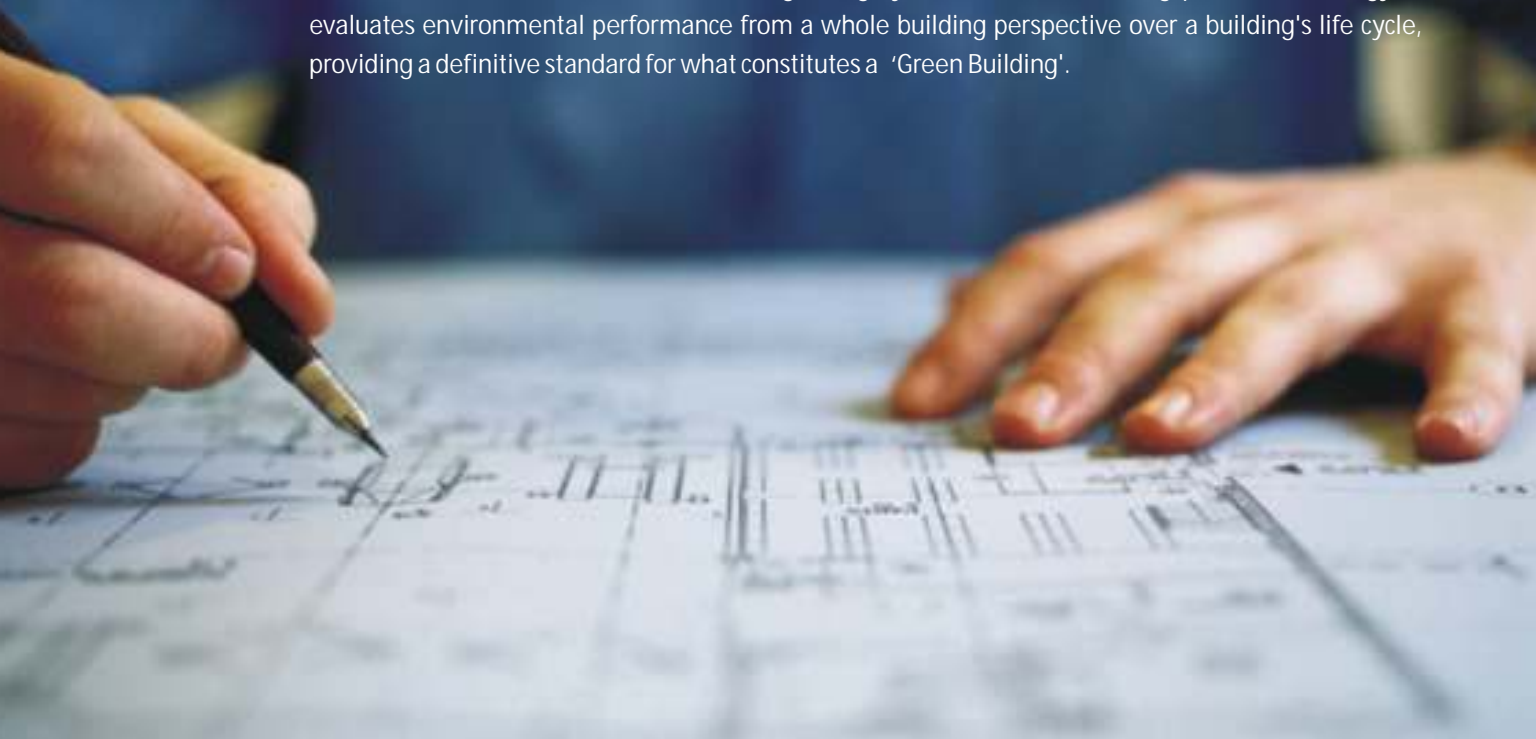


health and safety benefits:

- Enhances comfort and health of occupants
- Improves productivity
- Reduces absenteeism and increases efficiency

Leadership in Energy & Environmental Design (LEED)

LEED is a rating system sanctioned by the Indian Green Building Council (IGBC). It is a voluntary, consensus - based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a 'Green Building'.



Credits and Certifications

LEED INDIA offers a set of scientifically based performance criteria and a point system for LEED project certification. It is a performance-oriented system where credits are earned for satisfying criterion designed to address specific environmental impacts inherent in the design and construction. Different levels of green building certification are awarded based on the total credits earned.

The LEED rating system awards performance credits in various categories like New Construction (LEED-NC), Existing Buildings (LEED-EB), Commercial Interiors (LEED-CI), Core & Shell (LEED-CS), Homes (LEED-H) and Neighbourhood Development (LEED-ND). The objectives and criteria for each of these categories are different and need to be addressed individually.

LEED PRODUCT PORTFOLIO



LEED for New Construction

LEED for New Construction and Major Renovations is designed to guide and distinguish high-performance commercial and institutional projects.

LEED-NC



LEED for Existing Buildings

LEED for Existing Buildings is a benchmark for building owners and operators to measure operations, improvements and maintenance.

LEED-EB



LEED for Commercial Interiors

LEED for Commercial Interiors is a benchmark for the tenant improvement market that gives the power to make sustainable choices to tenants and designers.

LEED-CI



LEED for Core & Shell

LEED for Core & Shell aids designers, builders, developers and new building owners in implementing sustainable design for new core and shell construction.

LEED-CS



LEED for Homes

LEED for Homes promotes the design and construction of high-performance green homes.

LEED-H



LEED for Neighborhood Development

The LEED for Neighborhood Development Rating System integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design.

LEED-ND

FORCE GREEN INITIATIVE



The launch of FORCE GREEN

Wipro Lighting launched the FORCE GREEN initiative on 5 June 2008 - the World Environment Day. FORCE GREEN is part of Wipro's eco-eye initiative, which is a comprehensive programme that drives increasing ecological sustainability in all its operations and areas of influence.

Though Green Buildings are catching everyone's attention to deal with the growing concerns about the impact of booming construction industry on the environment, yet the general awareness about various factors associated with this approach is generally found to be scattered.

FORCE GREEN
an eco-eye initiative of Wipro

FORCE GREEN is a commitment and platform to support Green Buildings by providing high performance energy efficient lighting solutions through a dedicated team of experts. The objective is to minimize the negative environmental impact of buildings, enhance efficiency and moderate the use of materials, energy and development space.

ADVANTAGE 'FORCE GREEN'



Wipro Lighting's FORCE GREEN solution helps you to achieve 14 points, which is more than 20 percent of the total, as per LEED - New Construction Guidelines.

Lighting Technologies for high performance buildings with reduced impact on environment



PROVEN TRACK RECORD

We began our journey on the 'GREEN' way by providing Lighting Solutions and products to the first Platinum rated Green Building in India. Today we are proud of our experience in providing lighting solutions for more than 70% of the green buildings currently certified in the country.



TEAM OF EXPERTS

Our understanding of the requirements for Green has evolved with our experience. A dedicated team of experts at our 'Green Lighting Competency Center' design luminaires and lighting schemes compliant with all Green standards and help attain maximum credit points.



INTEGRATION WITH LIGHTING MANAGEMENT SYSTEMS

Lighting Controls play a critical role in lighting for Green Buildings. The combination of lighting design, right luminaires and a well integrated Lighting Controls solution help in creating the best possible solution for Green Buildings.

ROLE OF LIGHTING IN GREEN BUILDINGS



Lighting objectives as per LEED-NC and LEED-CI

Lighting forms an important part of any interior, and also contributes in a significant way towards the overall building's energy usage. It, therefore, plays a key role in building green. The right selection of luminaires along with a precise lighting design forms a perfect lighting solution, which contributes in earning green points.

Amongst all the LEED categories mentioned earlier, lighting plays a pivotal role in LEED-NC and LEED-CI and can contribute significantly in securing green points. This catalogue dwells into the objectives defined as per LEED-NC and LEED-CI, and explains Green objectives and Performance Criteria related to lighting.



LEED for New Construction (LEED-NC)

Maximum points that can be earned under Lighting : 14 points



LEED for Commercial Interiors (LEED-CI)

Maximum points that can be earned under Lighting : 7½ points

For more information on any of the other categories, please contact our Green Lighting expert near your city.

LEED RATING SYSTEM

LEED for New Construction (LEED-NC)

LEED India Green Building Rating System for New Commercial Construction and Major Renovation (LEED-NC) provides a set of Performance Criteria for certifying the design and construction phases of commercial, institutional and high-rise buildings. It is a measurement system based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts.

Performance Criteria for LEED-NC



Sustainable Sites

Total - 13 points
Lighting - 1 point



Energy & Atmosphere

Total - 17 points
Lighting - 1 to 10 points



Water Efficiency

Total - 6 points
Lighting - 0 point



Materials & Resources

Total - 13 points
Lighting - 0 point



Indoor Environmental Quality

Total - 15 points
Lighting - 2 points



Innovation & Design

Total - 5 points
Lighting - 1 point

Certifications



26 - 32 CERTIFIED GREEN POINTS



33 - 38 CERTIFIED GREEN POINTS



39 - 51 CERTIFIED GREEN POINTS



52 - 69 CERTIFIED GREEN POINTS



LEED for Commercial Interiors (LEED-CI)

LEED for Commercial Interiors Rating System (LEED-CI) provides a set of Performance Criteria for certifying tenant projects. The specific credits in the rating system provide guidelines for the design and construction of tenant spaces in government and private sectors for offices, retail, restaurant, healthcare, hotel / resort and education building applications. Tenants are defined as those who pay rent to use or occupy a building, occupants who dwell in a place and / or holders of buildings such as ownership or lease.

Performance Criteria for LEED-CI



Sustainable Sites

Total - 7 points
Lighting - ½ point



Energy & Atmosphere

Total - 12 points
Lighting - 4 points



Water Efficiency

Total - 2 points
Lighting - 0 point



Materials & Resources

Total - 14 points
Lighting - 0 point



Indoor Environmental Quality

Total - 17 points
Lighting - 2 points



Innovation & Design

Total - 5 points
Lighting - 1 point

Certifications



21 - 26 CERTIFIED GREEN POINTS



27 - 31 CERTIFIED GREEN POINTS



32 - 41 CERTIFIED GREEN POINTS



42 - 57 CERTIFIED GREEN POINTS

LIGHTING OBJECTIVE

light pollution reduction

INTENT : Minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve night time visibility through glare reduction, and reduce development impact on nocturnal environments.

LEED for New Construction (LEED-NC)

Light pollution reduction

CREDIT 8.0 – 1 Green point

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cut-off luminaires, low-reflectance surfaces and low-angle spotlights.

LEED for Commercial Interiors (LEED-CI)

Light pollution reduction

CREDIT 1.0 – ½ Green point

A building that meets or provides lower light levels and uniformity ratios than those recommended by IESNA*. The building must have designed the exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cut-off IESNA Classification.

The maximum candela value of all interior lighting shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light from that luminaire crosses the property boundary.

*IESNA – Illuminating Engineering Society of North America



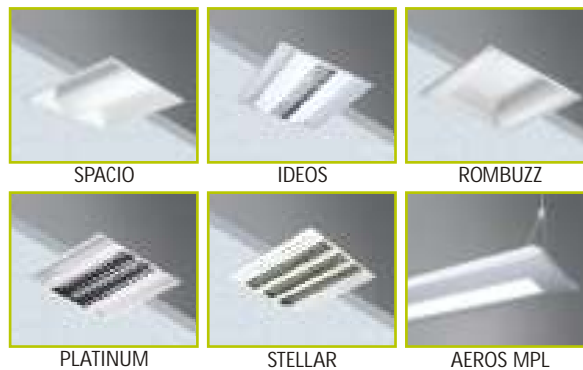
FORCE GREEN SOLUTION for light pollution reduction

Selecting the right luminaires with precise light distribution

Interior Lighting

In case of lighting up the interiors, it is necessary that the angle of maximum candela from each interior luminaire located in the building needs to intersect opaque building interior surfaces and not exit out through the windows. However, structures where all interior surfaces are not opaque, lighting and luminaire design plays an important role.

We bring you a portfolio comprising of Brightness Management luminaires which are ideal for such buildings. These luminaires are well-shielded using louvres or diffusers and do not cause direct glare.



Refer page 39 and 40 for product details and specifications



Selecting the luminaires with correct shielding to eliminate uplight

Exterior Lighting

Lighting plays an important role in external beautification of the campus. Green buildings recommend to use lighting more functionally, limiting it only in areas where it's needed to create safety and comfort. Hence, selecting the right luminaire becomes extremely critical as the luminaire design needs to have only downward illumination without having any component of upward illumination.

Our Urbano and Fantasy range of outdoor lighting luminaires provide right illumination, that are ideal for such functional as well as decorative purposes.



URBANO BOLLARD



URBANO BOLLARD



URBANO PATHWAY



URBANO PATHWAY



URBANO STEPLIGHT



STREETLIGHT

Refer page 42 and 43 for product details and specifications

LIGHTING OBJECTIVE

optimize energy performance

INTENT: Achieve increasing levels of energy performance above the pre-requisite standard to reduce environmental impact associated with excessive energy use.

LEED for New Construction (LEED-NC)

Optimize energy performance

CREDIT 1.0 – 1 to 10 Green points

10.5% reduction	1 point
14% reduction	2 points
17.5% reduction	3 points
21% reduction	4 points
24.5% reduction	5 points
28% reduction	6 points
31.5% reduction	7 points
35% reduction	8 points
38.5% reduction	9 points
42% reduction	10 points

Table 2.1 – Points earned with respect to percentage reduction in energy consumption

Design the building envelope and building systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

Lighting power consumption in a building is around 15% to 25%, and is a significant contributor in the over all energy consumption in the building.

The main objective under this performance criterion is to reduce Light Power Density (LPD) – measured in watt / sq. ft. or watt / sq. meter. The ASHRAE / IESNA 90.1–2004 (on Page 20) gives the LPD for various areas.

Percentage reduction in energy consumption

With ASHRAE / IESNA standards as the basis (refer page 20), further percentage reduction in energy consumption yields additional points. For e.g., 10.5% reduction yields 1 point, 14% reduction in energy consumption yields 2 points and so on (refer Table 2.1).

*ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers



LEED for Commercial Interiors (LEED-CI)

Optimize energy performance, lighting power

CREDIT 1.1 – 1 to 3 Green points

Design the connected lighting power to maximize energy performance. If the project warrants, consider a computer simulation model to assess the performance and identify the most cost-effective, energy efficiency measures.

Reduce connected lighting power density, as shown in Table 2.2, below that allowed by ASHRAE/IESNA Standard 90.1-2004 (refer table on page 20) using either the Space-by-Space Method or by applying the whole building lighting power allowance to the entire tenant space.

Option A	Reduce lighting power density to 15% below the standard	1 point
Option B	Reduce lighting power density to 25% below the standard	2 points
Option C	Reduce lighting power density to 35% below the standard	3 points

Table 2.2 – Points earned with respect to percentage reduction in LPD

Optimize energy performance, lighting controls

CREDIT 1.2 – 1 Green point

Design the lighting controls to maximize energy performance. Install daylight responsive controls in all regularly occupied spaces within 15 feet of windows and under skylights.

ASHRAE / IESNA STANDARD 90.1-2004 for optimizing energy



Lighting Power Densities (LPD) using Building Area Method

Building Area Type*	W/sq ft
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Cafeteria / fast food	1.4
Dormitory	1.0
Exercise Center	1.0
Gymnasium	1.1
Health Care-Clinic	1.0
Hospital	1.2
Hotel	1.0
Library	1.3
Manufacturing Facility	1.3
Museum	1.1
Office	1.0
Parking Garage	0.3
Retail	1.5
School/ University	1.2
Sports Arena	1.1
Town hall	1.1
Transportation	1.0
Warehouse	0.8
Workshop	1.4

Lighting Power Densities (LPD) using Space by Space Method

Common Space Type*	W/sq ft	Common Space Type*	W/sq ft
Office Open Plan	1.1	Dinning Area	0.9
Classroom/Lecture/thinking	1.4	For Hotel	1.3
Lobby	1.3	Food Preparation	1.2
For Hotel	1.1	Laboratory	1.4
Audience/seating Area	0.9	Restrooms	0.9
For gymnasium	0.4	Dressing/Lockers/Fitting Room	0.6
For exercise center	0.3	Corridor/Transition	0.5
For convention center	0.7	For Hospital	1.0
For sports arena	0.4	For Manufacturing Facility	0.5
For transportation	0.5	Stairs- Active	0.6
Atrium - first three floors	0.6	Active Storage	0.8
Atrium - Each Additional floor	0.2	For Hospitals	0.9
Lounge/Recreation	1.2	Inactive storage	0.3
For Hospital	0.8	For Museum	0.8
Building Specific Space Types	W/sq ft	Building Specific Space Types	W/sq ft
Gymnasium / Exercise Center		Manufacturing	
Playing area	1.4	Low Bay <25 ft Ceiling Height	1.2
Exercise Area	0.9	High Bay < 25 ft Ceiling Height	1.7
Convention Center Exhibit Space	1.3	Detailed Manufacturing	2.1
Library		Equipment room	1.2
Card File and Cataloging	1.1	Control room	0.5
Stacks	1.7	Hotel Guest Rooms / Dormitory	1.1
Reading Area	1.2	Museum	
Hospitals		General Exhibition	1.0
Emergency	2.7	Restoration	1.7
Recovery	0.8	Bank/Office-Banking Activity Area	1.5
Nurse Station	1.0	Sports arena	
Exam/treatment	1.5	Ring Sports Area	2.7
Pharmacy	1.2	Court Sports area	2.3
Patient Room	0.7	Indoor Playing Field Area	1.4
Operating Room	2.2	Warehouse	
Nursery	0.6	Fine Material Storage	1.4
Medical Supply	1.4	Medium/Bulky Material Storage	0.9
Physical Therapy	0.9	Transportation	
Radiology	0.4	Airport- Concourse	0.6
Laundry-Washing	0.6	Air/Train/Bus - Baggage Area	1.0
Automotive-Service/Repair	0.7	Terminal - Ticket Counter	1.5

* In case where both general building area type and a specific building area type are listed, the specific building area type shall apply.



FORCE GREEN SOLUTION for optimizing energy performance

Optimize energy through use of high efficiency luminaires

The design of the luminaire has a significant effect on the output it delivers. Understanding this, the product design team at Wipro Lighting, design and develop luminaires using special materials, lenses, reflector and louvre systems, which deliver very high efficiency.

- Portfolio of luminaires that create perfect visual ambience
- Unique design features delivering higher efficiency to help reduce Light Power Density (LPD) in the building
- High Light Output Ratio (LOR) through high efficiency luminaires

Special design features of Luminaires



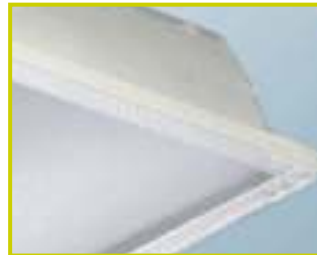
Special high efficiency lens

Lens used in AEROS MPL refracts light significantly higher than any standard diffuser



Louvres & Reflector

The louvre & reflector system in IDEOS, PLATINUM and STELLAR ensures higher light output without causing harmful glare



Rhomboid Profile

The unique rhomboid profile in ROMBUZZ and SPACIO enhances luminaire efficiency by 30%



Ribbed housing

The ribbed housing in ROMBUZZ, SPACIO and IDEOS increases downward light ratio thus enhancing the light output



Optimize energy through use of high efficiency light sources

Efficacy (lumen/watt), high performance, lamp life, colour rendering index, etc, are some of the important aspects that contribute in optimizing energy costs for any installation. Choosing the right light source to match the application requirements, is extremely critical.

- Luminaires with Fluorescent Tubular (FTL-T5) and Compact Fluorescent (CFLs) lamps, and Light Emitting Diodes (LEDs)
- High luminous efficacy light sources FTL (T5): 75-105 lm/W; CFLs: 65-80 lm/W; LEDs: 40 - 80 lm/W
- High colour rendering index (CRI 80 - 99) and longer service life

Light Sources with excellent lumen efficacy and colour rendering index



Fluorescent Lamps (T5)

Wattage - 14W, 24W, 28W, 35W, 54W
Efficacy - 75-105 lm/W
Colour Rendering Index - 80-99



Compact Fluorescent Lamps (CFL)

Wattage - 18W, 36W, 40W
Efficacy - 65-80 lm/W
Colour Rendering Index - 80-99



Light Emitting Diodes (LED)

Wattage - 1W, 0.1W
Efficacy - 40-80 lm/W

FORCE GREEN SOLUTION for optimizing energy performance

Optimize energy through use of high efficiency control gear



ACTIVE

Active Power Factor Correction – APF ballast (fixed output)

Wipro ACTIVE ballast is designed and manufactured with the latest Application Specific Integrated Chip (ASIC) technology that delivers energy savings upto 30%, high power factor > 0.98, and Total Harmonic Distortion (THD) level below 10%; constant wattage & light output operation and conformance to stringent international standards and norms.

Advantages from Wipro ACTIVE (APF) ballast are as follows :

- Power factor dynamically corrected and maintained close to unity
- Excellent visual comfort through maintenance of illumination levels at workplace (constant wattage, constant light output)
- Compliance with RoHS norms (Restriction of Hazardous Substances Directive)

Dimmable ballast (1-10V Analog, DSI, DALI)

While use of Active Power Factor correction ballast reduces energy consumption by 30%, usage of dimmable electronic ballast in combination with Lighting Controls can further reduce energy upto 70%

Advantages of dimming are as follows :

- Increased Lamp life
- Reduction in energy consumption
- Reduction in HVAC load
- Dynamic lighting

Refer page 40 for product details and specifications



Optimize energy through Lighting Controls



MS 1200 PF / MS 2000 DF

Lighting Controls

Lighting Controls plays an equally important role in cutting down the energy costs as it regulates the usage of the luminaire as per the requirement. Any luminaire wastes energy if it is ON, or at full output, when not needed. In a modern office today, people are away from their desks on breaks, in meetings, carrying out tasks in other areas for a surprising amount of time. Saving this wasteful use of energy during these intervals amounts upto 70% of total energy costs.



MP 2000 UF

Occupancy sensors

The best form of energy saving is to use it only where and when necessary avoiding any kind of wastage. Use of occupancy sensors helps in automatic switching OFF or regulating of luminaires when the areas are vacant. Lighting Controls with LightSpot is purely based on identifying individual lighting needs or presence of human being in the area; and controlling lighting as per the prevalent conditions.

Refer page 40 for product details and specifications

LIGHTING OBJECTIVE

controllability of systems – lighting

INTENT : Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (i.e. Class rooms or Conference Areas) to promote the productivity, comfort and well-being of building occupants.

LEED for New Construction (LEED-NC)

Controllability of Systems – lighting

CREDIT 6.1 – 1 Green point

Design the building and systems with comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces.

Provide individual lighting controls for 90% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences.

AND

Provide lighting system controllability for all shared multi-occupant spaces to enable lighting adjustment that meets group needs and preferences.

LEED for Commercial Interiors (LEED-CI)

Controllability of Systems – lighting

CREDIT 6.1 – 1 Green point

Design the tenant space with occupant controls for lighting. Strategies to consider include lighting controls and task lighting.

Provide lighting controls for at least 90% of occupants, enabling adjustments to suit individual task needs and preferences, and all shared multi-occupant spaces where transient groups must share lighting controls.





FORCE GREEN SOLUTION for controllability of systems – lighting

Select luminaires with personalized controls

Going one step further, for creating lively, cheerful and productive workspaces, is through providing personalized lighting – lighting that can be controlled to suit personal needs or the task carried out. Research shows that providing lighting for a particular task enhances performance, as one stays engaged in tasks longer and with less fatigue.

my-light – workstation mounted personal light

MY-LIGHT is designed and developed on the basis of extensive research done to understand the key needs and concerns, from specifiers and users of multiple working environments.

Personalized – My-light offers personalized controls and flexibility to direct light where necessary

Elegant – Sleek design and easy adaptability to any office furniture system.

Saves energy – Provides adequate illumination for the desired task, significantly cutting down on luminaires required for ambient lighting



MY-LIGHT – workstation mounted personal light



Lighting Controls

Lighting controls play an important role in cutting down the energy costs as it regulates the usage of luminaires as per the requirement. Building occupants appreciate the convenience of lighting that is provided automatically and at appropriate levels. It also offers a great level of security and comfort as lights never switch off when an area is occupied.

Lighting Management System – Zoning/Grouping of workstations is done through a combination of Communicating Sensors and Dimmable Ballasts

Convenience and Comfort – Ambient lighting conditions are maintained creating a pleasant and comfortable working ambience

Security – Lights never switches OFF in a workplace when occupied, creating a safe and secure atmosphere

MULTI SENSOR



DIGIDIM ROUTER



REMOTE CONTROL



PUSH-BUTTON PANEL



Refer page 41 for product details and specifications

LIGHTING OBJECTIVE

daylight and views

INTENT : Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

LEED for New Construction (LEED-NC)

Daylight and views

CREDIT 8.2 - 1 Green point

Design the building to maximize interior daylighting and outside viewing opportunities. Strategies to consider are building orientation, shallow or no plates, increased building perimeter, exterior and interior shading devices, high performance glazing, and photo-integrated light sensors. Model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved.

LEED for Commercial Interiors (LEED-CI)

Daylight and views

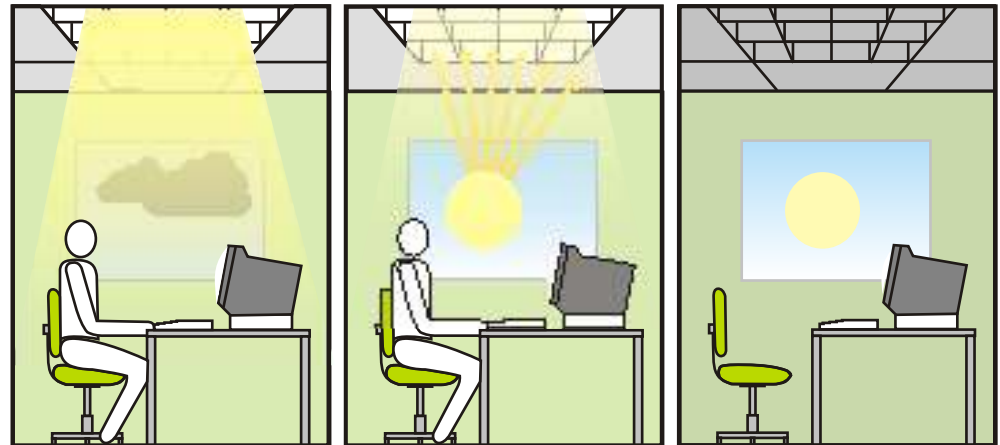
CREDIT 8.2 - 1 Green point

Design the space to maximize interior daylighting and outside viewing opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing and photo-integrated light sensors. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved.



FORCE GREEN SOLUTION for daylight and views

Daylight regulation is yet another important aspect in GREEN lighting solutions. It takes into consideration the intensity of the natural light in an area and regulates the luminaire output accordingly. Apart from contributing to huge savings, this also helps in maintaining uniform lighting levels throughout the day creating more favourable work conditions.



Presence Detected - Insufficient daylight - Lights on

Presence Detected - Sufficient daylight - Light output regulated

Absence Detected - Lights off



Daylight sensors

Photocell sensors take advantage of the freely available natural light, reduce the energy costs and increase the life of lamps. These are best suited for areas with large windows or skylights, such as perimeter offices, malls, classrooms and atria. Additionally, the combination of photocell sensors with MY-LIGHT (the personal light luminaire) can be a very energy efficient combination for such daylight rich areas.

Regulating photocell sensors are available for 0-10 V analogue or digital dimming. The basic principle revolves around sensing available natural daylight and regulating the lighting as per these conditions. Use of regulating photocell sensors incorporates light level setting for maintained illuminance and pre-set levels. These sensors observe the controlled spaces, not just the daylight, and take account of all light contributions.

MS 2000 DF / MS 2001 AF MP 2000 UF



DF - DSI dimmable ballast
AF - 1-10 V Analog dimmable ballast

Refer page 40 for product details
and specifications

LIGHTING OBJECTIVE

innovation in design

INTENT : Provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

LEED for New Construction (LEED-NC)

Innovation in design

CREDIT 1.1 - 1 Green point

In innovation and design process the intent is to substantially exceed the LEED performance credit such as energy performance. It also helps to gain a GREEN point by applying strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

LEED for Commercial Interiors (LEED-CI)

Innovation in Design

CREDIT 1.1 - 1 Green point

Substantially exceed a LEED performance credit such as energy performance or water efficiency. Apply strategies or measures that are not covered by LEED such as acoustic performance, education of occupants, community development or lifecycle analysis of material choices.



FORCE GREEN SOLUTION for innovation in design

Green Lighting Competency Center (GLCC)

Innovation is the way of life at Wipro. Wipro Lighting's Product Design Team has been able to create many path-breaking designs which revolutionized the lighting trends and practices. Simply stated, it is a process of turning innovative ideas into Green reality.

Our Product Design team has developed luminaires that have won 'Design Excellence Awards', while several luminaires with unique features are Design Registered (patented) and have helped customers create impressive, efficient and productive workspaces.

Force Green Solution

Green Lighting Competency Centre (GLCC) comprising of Green lighting experts, lighting designers and product designers

Customer centric product solutions

Innovations and new technologies to design state-of-the-art luminaires



IDEOS
Luminaires registered for Special Design Features



ROMBUZZ



APF BALLAST
Delivers constant wattage, constant light output



Highest Platinum rated Green Building outside US

WIPRO TECHNOLOGIES, Gurgaon

Architect
Design & Development

Services
Spectral Services

Structural Consultants
Juneja Techno Consultants

Landscape
Quittessence

Energy Consultants
EDS
Godrej & Boyce Mfg.
CII Godrej GBC



To make a platinum rated green building the need was to bring down the power density even below 1.2 W per sq ft. We looked towards Wipro and they helped us in giving the right lighting solutions. Thus Wipro Lighting became our partners in this Green building movement.

Ashish Rakheja

Chief Operating Officer, Spectral Services Consultants, Noida

Wipro Technologies, Gurgaon campus is ranked as the highest 'Platinum' rated GREEN building outside United States, while its facility in Kochi has been awarded the Gold certification.

Ecological Sustainability is not only an initiative but a core embedded belief in the organization. Building GREEN structures was one of the many initiatives adopted by Wipro to make its internal operations GREEN. It has resulted in 13% reduction in electrical consumption and addressed almost 52% of water requirements with recycled water.

THE CONCEPT

The main focus of the design is the inverted cone, the tip of which symbolizes the seed of this software world which grows both horizontally and vertically. The dynamic flower symbolizes the growth of technology. In the interior of the cone, are the meeting rooms, conference rooms, training rooms and cafeteria which are a link between the outside and inside world. People meet in these areas, and exchange ideas and information. With this cone as the centre (seed), there originate various axes which symbolize the ideas and thoughts radiating into action. The main circulation spines both horizontal and vertical, originate from this dynamic public realm axis focussing at visual nodes.





Wipro Technologies, Gurgaon facility was awarded 57 out of 69 GREEN points. This building contains rain water collection system, double heat insulation, use of re-cycled materials and solar energy. Also most importantly, a significant factor in optimizing energy costs was Intelligent Lighting design and efficient Lighting Controls.

The task was to create an environment friendly, energy efficient and reliable lighting system, that delivered perfect visual ambience and also could adapt to the users' changing needs.

To create an exemplary energy-efficient building, high performance glass with optimum visual light transmission; light shelves and overhangs for all windows, efficient lighting using FTL (T5) lamps and ample day-lit spaces with photo sensor controls, were used.

Light efficiency has been achieved with the help of following initiatives -

- Reduced depth of building for increased daylight
- Lower floors have bigger windows for better light penetration
- Recessed glazing on higher floors for shade
- Light coloured walls in courtyard for diffused reflected light

LIGHTING CONTROLS

Daylight was an important factor to be considered while doing the lighting design. Light output was regulated using Lighting Controls that nicely followed the daylight through the course of the day, adjusting subtly to its changes. The energy simulation tool estimates savings in electricity when natural light is available sufficiently for performing interior tasks.

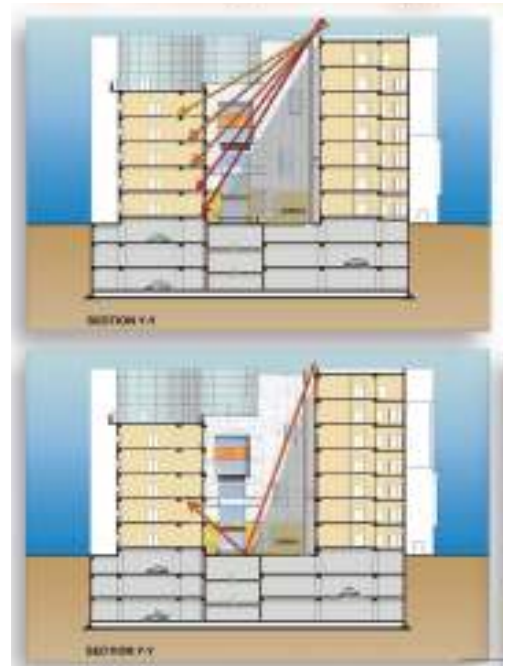
All open office spaces look into the courtyard. As a result these spaces have good access to daylight. Light shelves have been provided for maximum penetration of daylight. Along with daylight, luminaires were also controlled by Wipro occupancy sensors, which detected presence and switched on /off the luminaires avoiding a lot of energy wastage.

HIGH EFFICIENCY LUMINAIRES and CONTROL GEAR

Individual requirements were largely considered while planning the ambient as well as task light for the workspaces. High efficiency luminaires from the Wipro Brightness Management portfolio were selected that aided in optimizing energy utility and their features ensured uniform illumination, creating a soothing glare-free atmosphere at the same time. These luminaires were used along with APF Ballast, that ensured Power Factor correction and constant light output, in addition to high energy savings.

Exterior lighting was mostly limited to functional requirements and less of decorative effects. The luminaires were selected after thoroughly evaluating the quality standards, light distribution and ingress protection.

At the end of it, Wipro Gurgaon facility truly stands to be a winner.



Sectional illustration of the centralized duct called "Light Well"



Credits earned (related to Lighting)

Light pollution reduction - 1 point

Optimizing energy performance (overall) - 8 points

Controllability of systems - 1 point

Daylight and views - 1 point

Innovation in design - 4 points

From the current scenario, it looks imminent that in near future India would implement stringent norms like Energy Conservation and Building Code (ECBC) of the Bureau of Energy Efficiency. This would affect the buildings which are under construction or renovation in future.

Wipro Lighting's FORCE GREEN Portfolio provides a complete range of products which comply with ECBC norms.



IDEOS 2x36 W, 2x40 W, 2x55 W CFL (TC-L) & 4x14 W FTL (T5)

Recess mounted direct-indirect downlight luminaire with an option of Double Parabolic louvres or Paralite P5 louvres and acrylic diffuser

An indirect-direct light luminaire with excellent glare free downlight through Double Parabolic or Paralite P5 louvres
Enhanced efficiency with ribbed housing

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere



ROMBUZZ 2x36 W, 2x40 W & 2x55 W CFL (TC-L)

Recess mounted indirect-direct lighting luminaire with ribbed rhomboid housing and side mounted acrylic diffusers

Unique rhomboid shape profile and ribbed housing ensure better light distribution
Side mounting of lamps with acrylic diffuser avoids inward light spillage

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere



PLATINUM 2x36 W, 2x40 W, 2x55 W CFL (TC-L) & 4x14 W FTL (T5)

Recess mounted direct-indirect downlight luminaire with detachable double parabolic louvres

High efficiency luminaire with excellent downlight distribution
Excellent glare control with double parabolic louvres

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere



STELLAR 4x18 W FTL (T8)

Recess mounted glare free downlight luminaire with special geometric mirror optics

High efficiency luminaire with excellent light output through special reflector system
Better light output through back closed scalloped cross louvres

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere



AEROS DP 2x28 W & 2x54 W FTL (T5)

Pendant mounted direct-indirect up-down luminaire with double parabolic louvres in the centre

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere

High efficiency pendant luminaire with upward and downward component of light
Excellent glare control through double parabolic louvre system



AEROS MPL 2x28 W & 2x54 W FTL (T5)

Pendant mounted indirect-direct up-down luminaire with special micro-prismatic lens in the centre

Ideal for accrediting points under:
Sustainable sites | Energy & Atmosphere

High efficiency pendant luminaire with upward and downward component of light
Excellent glare control and enhanced light output through special lenses



ACTIVE – Active Power Factor correction ballast

Active Power Factor correction ballast delivers visual comfort by maintaining constant illuminance levels

Ideal for accrediting points under:
Energy & Atmosphere | Indoor Environmental Quality

Delivers energy savings upto 30%
High power factor >0.98
THD level below 10%
Constant wattage constant light output



SILVER LIGHTSPOT

MS 1200 PF / MS 2001 AF / MS 2000 DF - High performance, programmable presence detector for lighting control in offices, conference rooms and open plan workstations

Ideal for accrediting points under:
Energy & Atmosphere | Indoor Environmental Quality

Switches off luminaires in case of non-occupancy in the detection area, thus saving energy

Regulating photocell adjusts luminaire output to maintain constant light levels



PHOTOCELL SENSOR

MP 2000 UF - High performance regulating and switching photocell for DSI, DALI, Analogue 1-10V and non-regulating ballasts

Ideal for accrediting points under:
Energy & Atmosphere | Indoor Environmental Quality

Evaluates the entire controlled space, not just daylight, and takes into account all light contributions

Regulating photocell adjusts luminaire output to maintain constant light levels



MULTI SENSOR

The Multi-sensor module contains the required sensors to provide the energy saving benefits of an automated lighting control system; a passive infra-red (PIR) presence detector and infra-red (IR) remote control receiver

Ideal for accrediting points under:

Energy & Atmosphere | Indoor Environmental Quality

Omni -directional PIR Detector
Light sensor - constant light control
IR - remote control



DIGIDIM ROUTER

New architecture allowing larger DIGIDIM systems - 2xDALI connectors, allowing up to 128 DALI and DIGIDIM devices

Ideal for accrediting points under:

Energy & Atmosphere | Indoor Environmental Quality

On board astronomical time clock
Flash memory stores all settings
Router interconnect using Ethernet and can operate on private or existing network infrastructure



PUSH-BUTTON PANELS

Seven-button panel with default operation of 4 scenes and off, complete with scene raise and lower

Ideal for accrediting points under:

Energy & Atmosphere | Indoor Environmental Quality

Easily reconfigured and fully programmable
Out of box operation, supplied pre-programmed



LCD TOUCH SCREEN

An LCD touch panel that can be configured easily to meet individual customer lighting controls requirements

Ideal for accrediting points under:

Energy & Atmosphere | Indoor Environmental Quality

A full colour, 3.5" high resolution LCD Touch-screen
Wide range of easily selectable button configurations and functions



REMOTE CONTROL

The remote control is designed to operate basic system functions

Ideal for accrediting points under:

Energy & Atmosphere | Indoor Environmental Quality

On / Off button
Raise (modifier button)
Lower (modifier button)
Four scene recall buttons



URBANO BOLLARD 1 x 26 W CFL (TC-D)

Decorative bollard with symmetrical light distribution

Ideal for accrediting points under:
Sustainable sites

Aesthetically appealing international styling and design

Completely avoids light trespass in non-function areas
Energy efficient wattage configuration



URBANO BOLLARD 1 x 26 W CFL (TC-D)

Decorative bollard with symmetrical light distribution for glare free lighting

Ideal for accrediting points under:
Sustainable sites

Aesthetically appealing international styling and design

Completely avoids light trespass in non-function areas
Energy efficient wattage configuration



URBANO PATHWAY 1 x 70 W & 1 x 150 W HIT-CE

Decorative indirect light pathway luminaire with white painted aluminium reflector

Ideal for accrediting points under:
Sustainable sites

Aesthetically appealing international styling and design

Completely avoids light trespass in non-function areas



URBANO PATHWAY 1 x 70 W & 1 x 150 W HIT-CE

Decorative indirect light pathway luminaire with white painted aluminium reflector

Ideal for accrediting points under:
Sustainable sites

Aesthetically appealing international styling and design

Completely avoids light trespass in non-function areas



URBANO STEPLIGHT 1 x 26 W CFL (TC-D) & 1 x 70 W HIT

Wall recessed step light with housing in die cast aluminium and light direction frame

Ideal for accrediting points under:
Sustainable sites

Exterior steplight with high ingress protection

High efficiency design with excellent downlight
Light does not spill in upward direction



UNO 1 x 150 W, 1 x 250 W HPSV (T) & 1 x 250 W MHL (T)

IP 66 Die-cast aluminium top maintainable street light luminaire with curved toughened glass and pot optics reflector with an IP 54 Control Gear Box compartment

Ideal for accrediting points under:
Sustainable sites

Designer streetlight with high ingress protection

Special design features reducing light pollution in non-functional areas (i.e. upward direction)



LEO 1 x 150 W, 1 x 250 W, 1 x 400 W HPSV (T) & 1 x 250 W, 1 x 400 W MHL (T)

IP 66 Die-cast aluminium street light luminaire with curved toughened glass and pot optics reflector with an IP 54 Control Gear Box

Ideal for accrediting points under:
Sustainable sites

Designer streetlight with high ingress protection

Special design features reducing light pollution in non-functional areas (i.e. upward direction)

Wipro Lighting launches revolutionary products for lighting Green Buildings



SPACIO

New recess mounted indirect lighting luminaire with high efficiency



MY-LIGHT

Workstation mounted personal light which helps in reducing ambient lighting luminaires significantly



NEW LED Range

Launching soon an entire range of indoor and outdoor luminaires with LEDs

Customer Speak



experience of providing lighting solutions for over 70% of GREEN buildings in the country



an eco-eye initiative

ECO ACTION at WIPRO



AZIM H. PREMJI
CHAIRMAN, WIPRO CORPORATION

“We firmly believe business cannot be built at the cost of ecology. It is not sustainable. Ecological Sustainability will increasingly be the defining force for society and business globally. Wipro believes Ecological Sustainability is the right thing to do – in fact it is the only way forward.”

Wipro will work on the dimensions of carbon neutrality, water balance, waste management and bio-diversity. “Eco Eye is the ‘eye’ through which we attempt to see everything, and act for ecological sustainability.”



A corporation wide initiative on ecological sustainability

Drives increasing ecological sustainability in all operations, as also areas of its influence

Aims to become carbon neutral, water positive organization, achieve defined level of bio-diversity footprint and set new standards in recycling waste

Initiatives adopted to make its internal operations green, has resulted in 13% reduction in average electricity consumption





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