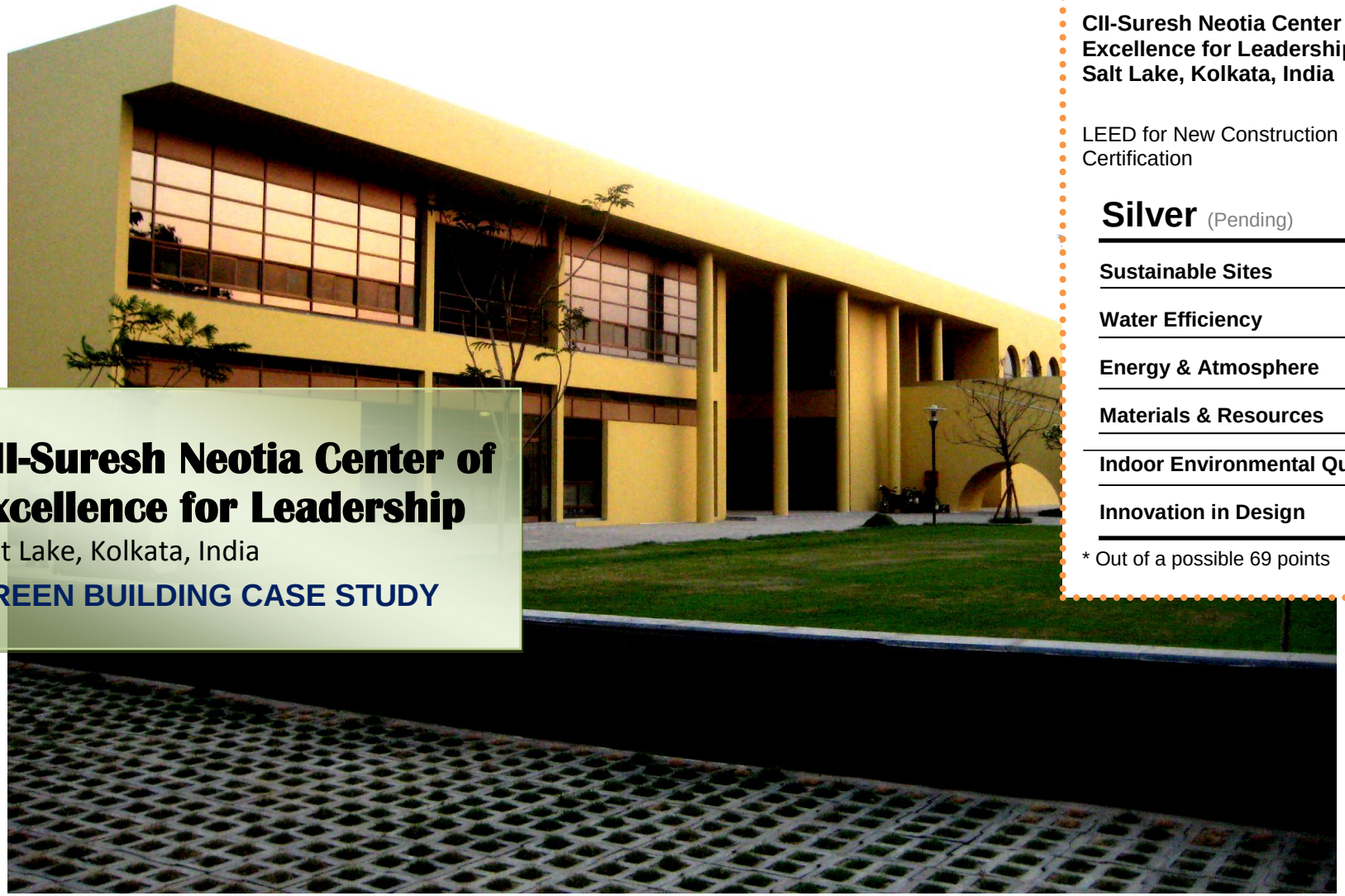

CII-Suresh Neotia Center of Excellence for Leadership

Salt Lake, Kolkata, India

GREEN BUILDING CASE STUDY

LEED Facts

CII-Suresh Neotia Center of Excellence for Leadership
Salt Lake, Kolkata, India

LEED for New Construction Certification

Silver (Pending)	**36***
Sustainable Sites	**9**
Water Efficiency	**2**
Energy & Atmosphere	**9**
Materials & Resources	**7**
Indoor Environmental Quality	**5**
Innovation in Design	**4**

* Out of a possible 69 points

"The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the growth of industry in India, partnering industry and government alike through advisory and consultative processes. This new building will serve as an institutional center housing industry talks and promoting the exchange of ideas to further advance India as a global leader."

Prepared by **Silpa Green Building Technologies Pvt. Ltd.**

PROJECT PARTICIPANTS

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Confederation of Indian Industry

silpa
simple . scientific . sustainable
Building Energy & Sustainability

AmbujaRealty™

HCP DESIGN AND PROJECT MANAGEMENT PVT. LTD., AHMEDABAD

n. k. & associates

MIHIR N. PATEL, CONSULTING ENGINEER: HVAC

JHAVERI ASSOCIATES

The Project

Program

The CII-Suresh Neotia Center of Excellence for Leadership project, located in Salt Lake, Kolkata is a two story institutional building that has been developed through a collaborative initiative between the Confederation of Indian Industry (CII) and the Suresh Neotia Centre for Excellence for Leadership (SNCEL). The primary function of the building is to house a management college. Providing for the basic educational and commercial spaces needed for such an institution, the building includes a book-shop, library, seminar hall, auditorium, cafeteria, classrooms, and several office areas totaling a built-up area of 33,390 square feet. Nine crore rupees has been the total construction cost, and the building's yearly operational cost is estimated to be a total of one crore rupees. The project has been designed to meet the requirements needed for being a LEED® Certified building and uses a respectable quality of material in construction, as per Indian Standard code (IS Code).

Design

In regards to the aesthetic, the building has been designed of a contemporary style, playing with both rhythm and open spaces. The northern facade of the building makes use of large areas of glazing to introduce consistent daylight throughout the year as well as provide a more outward connection to the surrounding neighborhood. The southern facade has been optimized with a series of punctures to allow enough daylight in while at the same time preventing excess solar heat gain.

Style

Entry into the building is both expressive and interactive: a double-story open entrance to the ground floor creates a sense of grandeur and the long protruding staircase leading visitors directly to the first floor creates a more impressionable approach. The program of the building makes use of the central corridor to divide the building into both public and private spaces. The rear half of building houses the administration and services areas, while the front half of the building is comprised of recreational and institutional areas.

"While striving to sustain an environment conducive to industrial growth, CII also tries to maintain an environment that is itself sustainable. With this noble focus, their new project, the CII Suresh Neotia Centre of Excellence for Leadership, located in Kolkata, India will be LEED® Silver, being their second LEED® Certified building."

Achievable	Maybe	Not Achievable

IGBC LEED-NC® v1.0 Checklist

CII - Suresh Neotia Centre of Excellence for Leadership, Kolkata

			Credit	Credit Name
9	0	4	**Sustainable Sites**	
Y			Prerequisite	Erosion & Sedimentation Control
1			Credit 1	Site Selection
1			Credit 2	Development Density & Community Connectivity
		1	Credit 3	Brownfield Redevelopment
1			Credit 4.1	Alternative Transportation, Public Transportation Access
1			Credit 4.2	Alternative Transportation, Low Emission & Alternative Fuel Refueling Stations
1			Credit 4.3	Alternative Transportation, Parking Capacity
		1	Credit 5.1	Reduce Site Disturbance: Protect or Restore Habitat
		1	Credit 5.2	Reduce Site Disturbance: Development Footprint
1			Credit 6.1	Stormwater Design :Quantity Control
1			Credit 6.2	Stormwater Design :Quality Control
1			Credit 7.1	Heat Island Effect: non-roof
1			Credit 7.2	Heat Island Effect: roof
		1	Credit 8.0	Light pollution reduction
2	0	4		
		1	Credit 1.1	Water efficient landscaping, reduce by 50%
		1	Credit 1.2	Water efficient landscaping, no potable use or no irrigation
		1	Credit 2.0	Water Efficiency in A/C System: Reduce by 50%
		1	Credit 3.0	Innovative wastewater technologies
1			Credit 4.1	Water use reduction, 20% reduction
1			Credit 4.2	Water use reduction, 30% reduction

9	0	12	Energy and Atmosphere	
Y			Prerequisite 1	Fundamental Building systems commissioning
Y			Prerequisite 2	Minimum Energy Performance
Y			Prerequisite 3	Fundamental Refrigerant Management
7		3	Credit 1	Optimize energy performance
		3	Credit 2	Onsite Renewable Energy, 2.5%, 5%, 7.5%
		1	Credit 3.0	Additional Commissioning
1			Credit 4.0	Ozone Depletion
1			Credit 5.0	Measurement & Verification
		1	Credit 6.0	Green Power, 50%
7	0	4	Materials and Resources	
Y			Prerequisite 1	Storage and collection of recyclables
		1	Credit 1.1	Building reuse, maintain 75% of existing walls, floors and roof
		1	Credit 1.2	Building reuse, maintain 100% of existing walls, floors and roof
		1	Credit 1.3	Building reuse, maintain 100% shell + 50% non shell
1			Credit 2.1	Construction waste management, Divert 50% from disposal
1			Credit 2.2	Construction waste management, Divert 75% from disposal
		1	Credit 3.1	Resource Reuse, 5%
		1	Credit 3.2	Resource Reuse, 10%
1			Credit 4.1	Recycled Content, 5%
1			Credit 4.2	Recycled Content, 10%
1			Credit 5.1	Regional Materials, 20%
1			Credit 5.2	Regional Materials, 50%
1			Credit 6.0	Rapidly renewable materials, 5% of Building Materials
		1	Credit 7.0	Certified wood, 50% of wood based materials

"The building will serve as an institutional center housing industry talks and promoting the exchange of ideas to further advance India as a global leader."

5	0	10	Environmental Quality	
Y			Prerequisite 1	Minimum IAQ performance
Y			Prerequisite 2	Environmental Tobacco Smoke Control
		1	Credit 1	Outdoor Air Delivery Monitoring
		1	Credit 2	Increased Ventilation, 30% above ASHRAE 62.1 requirements
1			Credit 3.1	Construction IAQ management plan, during construction
		1	Credit 3.2	Construction IAQ management plan, before occupancy
1			Credit 4.1	Low emitting materials, adhesives & sealants
1			Credit 4.2	Low emitting materials, Paints
1			Credit 4.3	Low emitting materials, Carpet
1			Credit 4.4	Low emitting materials, Composite wood & Agrifiber products
		1	Credit 5.0	Indoor chemical & pollutant source control
		1	Credit 6.1	Controllability of Systems, Lighting
		1	Credit 6.2	Controllability of Systems, Thermal Comfort
		1	Credit 7.1	Thermal comfort, Design
		1	Credit 7.2	Thermal comfort, Verification - 6 to 18 months
		1	Credit 8.1	Daylight & Views, daylight 75% of spaces
		1	Credit 8.2	Daylight & Views, Views for 90% of spaces
4	0	1	Innovation and Design	
1			Credit 1.1	Innovation in Phase 1 (Green Education)
1			Credit 1.2	Innovation in Phase 1 (Green Housekeeping)
		1	Credit 1.3	Innovation in Phase 1
1			Credit 1.4	Innovation in Phase 1 (Exemplary for Recycled Content)
1			Credit 2	LEED accredited professionals

Total		
Y		N
36	0	33

Certification Rating
SILVER RATING

Currently, the project is aiming for 36 possible points and the project team is working tirelessly to provide necessary supporting documentation as required by IGBC to secure these points in order to achieve Silver rating for the project.

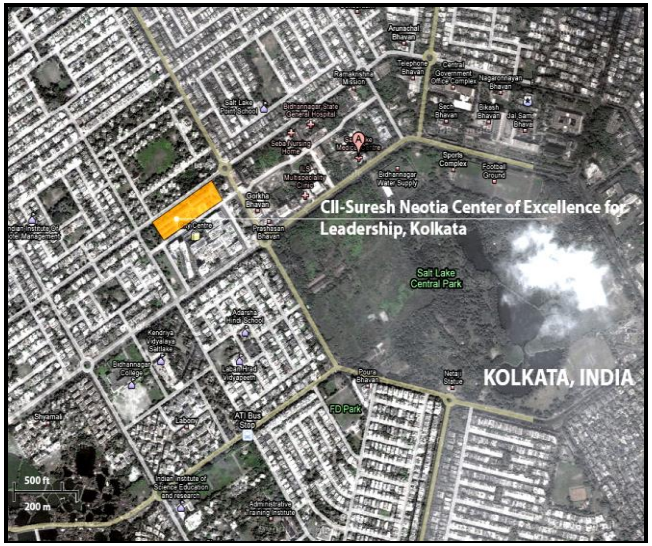
Purpose

The location of the project site and its condition has many implications on the overall sustainability of the project. Careful site selection is important such that inappropriate sites are avoided, thereby, reducing the environmental impact from the location of a building on a site.

One should also understand the current condition of the site and how construction may disturb the local ecosystem in a myriad of ways, such as pollution to nearby streams or the literal destruction of habitats for locally situated wildlife.

The proximity of the site to public transportation is important, but so is the proximity to basic services, enabling occupants to walk or bike for their needs. While such design promotes healthy living, it also reduces the environmental pollution caused by transportation.

Sustainable Sites



Select appropriate Site

"To avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site."

NOT developed on a site that is:

- A prime farm land
- Undeveloped land that is lower than the 5 feet above 100-year flood line
- Habitat for threatened or endangered species
- Within 100 feet of a wetland
- Within 50 feet of a water body
- Public Parkland

Connect with Community

"To channel development to urban areas with existing infrastructure, protect green fields and preserve habitat and natural resources."

The building has been constructed on a previously developed site AND is within ½ mile of both a residential zone of the required density and 10 Basic Services. AND with pedestrian access between building and services.

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Purpose

While it is always advantageous to locate the site in close proximity to public transportation one should always attempt to utilize the proximity to already developed facilities, including basic services such as commercial and educational centers. Proximity to public transportation reduces transportation related emissions.

Besides, the project should provide incentive to staff or visitors driving alternative fuel vehicles, such as electric cars by providing car parking spots. Alternative fuel vehicles reduce the pollution caused by burning fossil fuels.

Promoting carpooling is a must for new commercial buildings. Offering preferred parking and other incentives for employees are a great way to promote carpooling. It is most advantageous to set up a service for the occupants of the building, by taking them to drop points if not their individual residences.

Sustainable Sites

SSc 4.1: Alternative Transportation: Public Transportation Access
CII - SURESH NEOTIA CENTRE OF EXCELLENCE FOR LEADERSHIP, KOLKATA
HCP DESIGN AND PROJECT MANAGEMENT PVT LTD

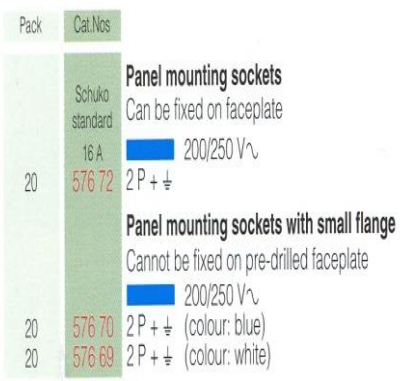
Alternate Transportation

"Reduce pollution and land development impacts from automobile use."

The project is located within .4km of four public bus lines, thereby enabling convenient access to public transportation.

A parking spot has been designated for alternative fuel vehicles only and equipped with a plug-point to serve as an alternative-fuel refueling station.

Three parking spots have been designated as preferred parking spaces for carpools.



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Purpose

During construction, it is important to develop erosion and sedimentation control plan to prevent soil erosion – either by water or by air. Sedimentation of eroded soil clogs stormwater drains and promotes flooding during rain.

Understanding stormwater design is an integral part of good civil design. Stormwater runoff should be reduced with increased vegetation and an overall increase in permeable surfaces.

There are two major criteria that need to be ascertained during the stormwater design. They are – stormwater flow rate and quantity. Careful stormwater design has reduced stormwater flow rate such that during a storm, it does not erode due to force of water moving on the surface. Secondly, reduced quantity of water flow during storm is also of critical importance. This can be achieved by allowing water to percolate in soil.

Sustainable Sites

Control Erosion & Sedimentation

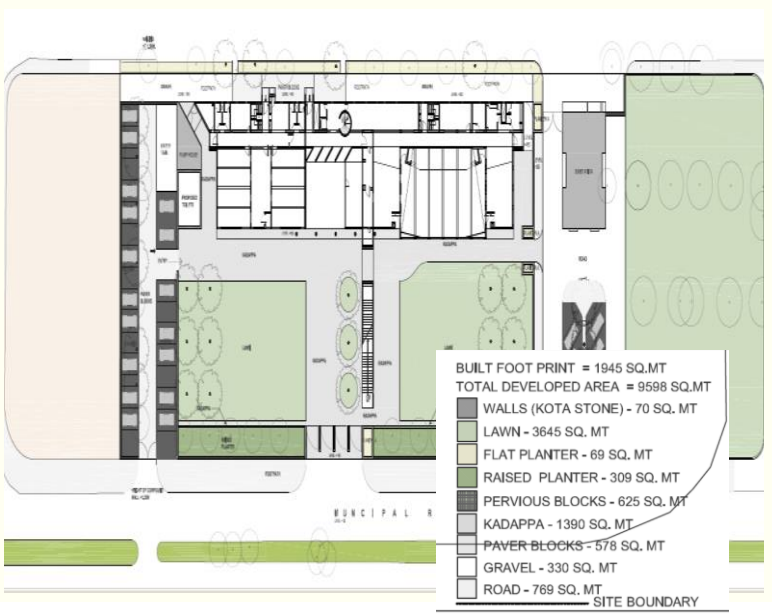
"Control erosion to reduce negative impacts on water and air quality."

*The as designed project has an overall imperviousness of **58%**, which provides a **28%** decrease in the rate and quantity of stormwater compared to the base case, which has an overall imperviousness*

Manage Stormwater

"Limit disruption and pollution of natural water flows by managing stormwater runoff."

The as designed project has an overall imperviousness of **58%**, which provides a **28%** decrease in the rate and quantity of stormwater compared to the base case, which has an overall imperviousness of 86%. This has been achieved by using surfaces such as Green Pervious Blocks, Concrete and Vegetation.



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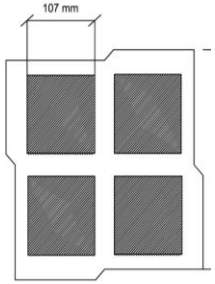
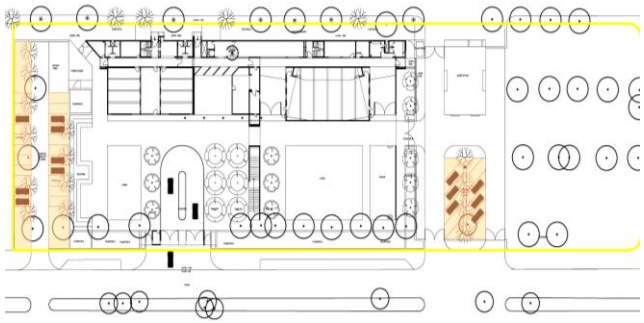
Purpose

Studies have shown significant impact on local climates due to heat-island effect. Heat island effects caused by the high heat absorption by hard surfaces, both roof and non-roof, causes higher building energy consumption due to increased temperature surrounding the building. Besides, heat island effect impacts the landscape and water bodies on the site.

Minimization of heat island effect involves designing of roof and non-roof systems with light colored building materials - white concrete pavements and / or using open grid pavement system such that hard surfaces are reduced by, at a minimum, 50%. White surfaces have high Albedo (or more reflectance property of the material). Rather than absorbing the heat and radiating to the surrounding surfaces, the high Albedo material reflects sun rays from being absorbed by the material, thereby reducing heat island effect.

Sustainable Sites





Parking lot area uses open-grid pavement system. Besides, roof has white-china tile having Solar Reflective Index of 78.

The open-grid pavement system helps in stormwater quantity design by allowing stormwater to percolate in soil rather than draining in stormwater drains.

Reduce Heat Island Effect

"Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat."

Open-grid pavement for **100%** of the parking lot area.

White china tile, having an SRI of over 78, for **100%** of the roof.

White Cement | Wallcare Putty | Textura | Kool-n-Seal | GRC

Home > Products > White Cement > Specifications

Specifications

Characteristics	IS:8042.1989 Requirement	Birla White	
1. Chemical		Normal Range	Average Value
a Insoluble Residue %	Max. 2.0	Max. 1.0	0.60
b.Iron Oxide %	Max. 1.0	Max. 0.25	0.22
c.Magnesium Oxide %	Max. 6.0	Max. 2.5	1.80
d.Sulphur Trioxide %	Max. 3.0	Max. 3.2	3.00
e.Lime Saturation Factor	Min. 0.66	0.85 to 0.91	0.90
f. Loss of Ignition	0.66 to 1.09	<3.0%	2.6
2. Physical			
a Degree of Whiteness %			
ISI Scale	Min. 70	Min. 87	88+
Hunters Scale	-	91 to 91.8	91.5+
b. Fineness (Blaine) M^2/KG (Specific Surface)	Min.225	390 to 410	400*
c. Setting Time (Minutes)			
1.Initial	Min.30	Min.60	90
2.Final	Max.600	Max.140	120
d. Soundness			
1. Lechateliers Method	Max. 10	Max. 1.5	1.0
2. Autoclave expansion %	Max. 0.8	Max. 0.15	0.08
e. Compressive Strength (Cement and Std. Sand Mortar 1:3)			
1. 3 days	Min. 14.4	Min. 35	40
2. 7 days	Min. 19.8	Min. 45	48
3. 28 days	Min. 29.7	Min. 55	60
f. Retention on 63 micron sieve %	--	--	1.00
		Max 1.0	0.80

*Or even more Fineness can be supplied against specific contract.

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Purpose

As fresh water reservoirs are drying up, it is important to conserve fresh, potable water. In essence, water use reduction should be practiced in all buildings of all forms and types / functions. For commercial and institutional buildings, the majority of water consumption comes from restroom use (faucets and water-closets) and landscaping.

For the restroom areas, new advancements in equipment have made it easy to reduce water waste. Faucets can be fitted with aerators to reduce the flow of water to one fifth while maintaining a high velocity. Additionally, they can be timed or automated regulating the waster use of the occupant. Low-flow water closets and waterless urinals are another must. They work just as effectively and recent improvements have mitigated the offensive smell that used to be associated with the waterless technologies.

Water Efficiency

Reduce Water Use

"Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems."

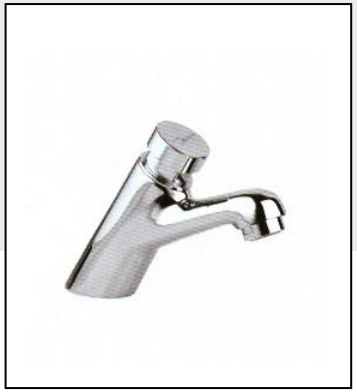
The design case demonstrates a **32.38%** improvement over the base case in overall water use excluding landscaping. The project specifically makes use of high efficiency, water saving closets, urinals, and faucets.

Water Closets Valve #1015

Flow value @ 5.5 bars is 4.20 Liters / Flush (or 1.1 GPF)

Pressmatic Urinal Valve #077

Flow value @ 3.0 bars is 1.50 Liters / Flush (or 0.4 GPF)



Pressmatic Bibcock # 031

Flow value @ 5.5 bars is 4.08 Liters / Flush (or 1.1 GPF) restrictor, 12 secs.

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Purpose

Buildings consume approximately a third of the energy produced in the world. It is thus evident that to combat the global energy crisis, and especially the one in India, we must construct buildings in a new and more efficient manner. By taking a bit more time during the design stage one can incorporate various strategies that reduce the overall energy consumption, and even generate energy on site to satisfy the buildings own power needs. Positively, many of these strategies are also economically and readily achievable.

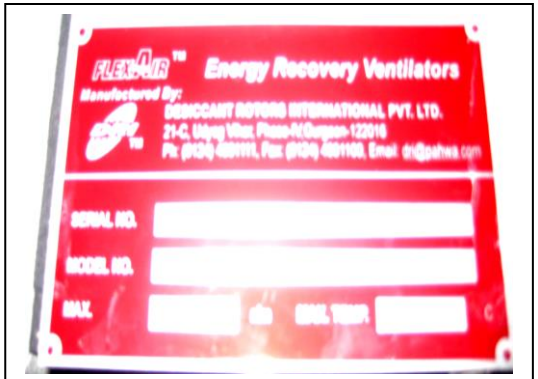
The operation of a building is closely related to the climate in which it is located, and so too are the energy savings from energy conservation measures (ECMs). Efficient HVAC systems are very important.
Space conditioning often times accounts for 30% of the total building energy consumption. Using more efficient chillers and devices such as heat recovery wheels can aid greatly.

Energy & Atmosphere

Reduce Energy Use

"Achieve increase levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use."

The design case demonstrates a **34.4%** improvement over the base case in overall energy use.
The project specifically makes use of the following high performance strategies: High Performance Glazing, Cool Roof, High Efficiency Lighting Fixtures, Variable Refrigerant Volume Air Conditioning System, Energy Recovery Ventilators, and Efficient Exterior Lighting.



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Purpose

CFCs and HCFCs (used in refrigerants) are the major causes of ozone depletion. By identifying the correct refrigerant, ozone depletion can be reduced significantly.

Commissioning of energy systems – HVAC, lighting and daylighting controls, domestic hot water and renewable energy systems is of critical importance. Commissioning process will help optimize the systems and improve their performance.

Even if a building has been designed with cutting-edge energy saving technology, one must make sure that appropriate measures are installed and verify if the energy systems are operating correctly.

Energy & Atmosphere

Manage Refrigerant

"Reduce ozone depletion."

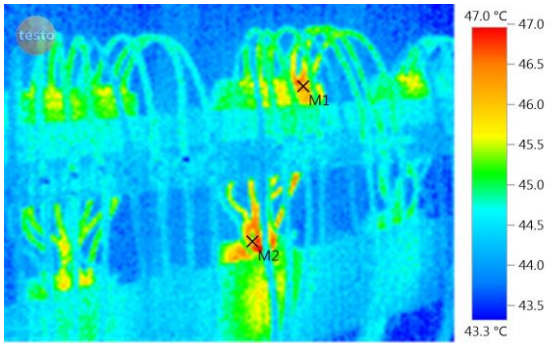
Blue Star VRF system installed uses the refrigerant R410A which is neither a CFCs nor HCFC.

Fire suppression system does not contain any Halons.

Commission Systems

"Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as needed."

Commissioned systems include HVAC & R systems and controls; lighting controls and other electrical systems.



Measure and Verify Energy use

"Ongoing accountability of building energy consumption over time."

One main meter and two sub-meters are provided to track electricity consumption of the building. The sub-meters measure HVAC & R power consumption and the other measures electric power consumption by total lighting load excluding external lighting. Readings of the meters registered on a daily basis and accumulated for months.

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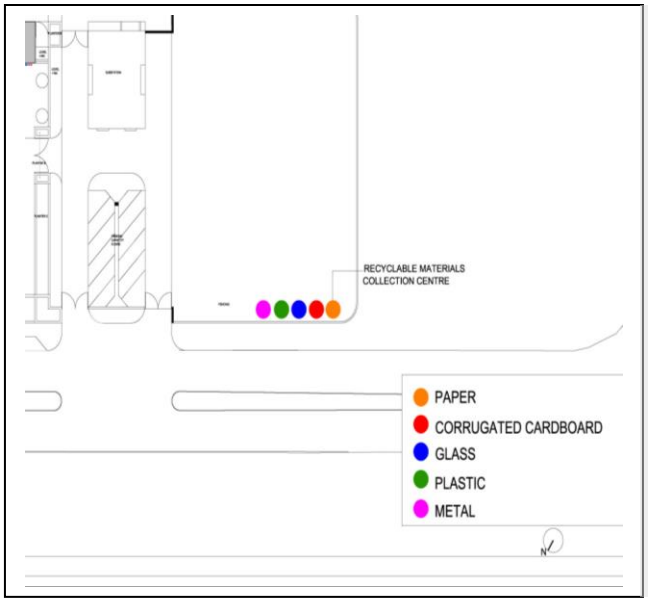
Materials & Resources

Purpose

The selection of building materials is as critical a decision as any in regards to defining the level of sustainability of a building. Each material carries with it an embodied energy, the energy put in from extraction to application. This embodied energy can be high, and at times undermine the sustainable intention of the product. Moreover, within the material selection process is the option to reuse salvaged materials or materials that can be rapidly replenished, thus removing usable materials from the waste stream and also helping protect earth's less renewable natural resources.

While providing recycling opportunities is straight forward, it is still very important to optimize the process for best results. For example, one should always place a normal waste can next to other recycling bins to prevent the contamination of the recycling bins, and vice versa to promote recycling.



Collect & Recycle

"Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills."

The Center has implemented a recycling program that includes the collection and storage of paper, corrugated cardboard, glass, plastics, and metals. There are bins placed in various areas throughout the building based on space type and use. The contents of these bins will then be collected and transported to a central collection area.

Manage Construction Waste

"Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites."

The project has implemented a construction waste management plan, that details ways to reduce divert and recycle waste during construction. Diversion of materials includes either sending it to other construction sites for reuse or selling it to other scrap dealers.

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Purpose

Construction and demolition wastes constitute more than a third of the total solid waste stream. Thus, a construction waste management plan is always recommended to help divert much of the waste from landfills. Coordination and education with the contractor is necessary for this to be successful. When possible, attempt to use materials that are either salvaged or contain recycled content. Salvaged materials can often times help save on cost and also add a certain degree of character to the building. In terms of using materials with recycled content, there are various opportunities from the building envelope (such as fl y-ash, steel, and window frames) to internal assemblies (such as furniture).

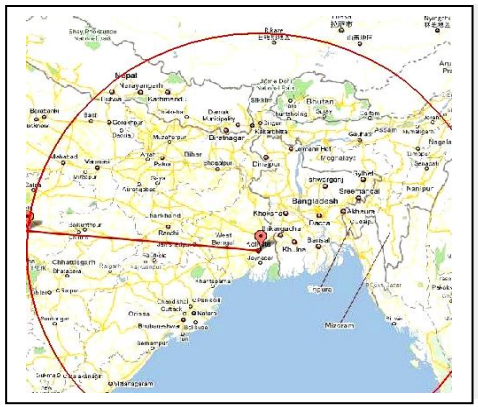
MR category is the one that requires a lot of attention. While many of these credits only require certain percentage thresholds, it also necessitates careful selection from the initial stages.

Materials & Resources

Use Recycled Materials

"Increase demand for building products that incorporated recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials."

Recycled materials constitutes **18.47%** of the total value of the materials in the project.



Use Regional Materials

"Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation."

68% of building materials and products used are extracted, harvested or recovered (as well as manufactured) **within 800 km of the project site**.

Use Rapidly Renewable Materials

"Reduce the use and depletion of finite raw, and long-cycle renewable materials by replacing them with rapidly renewable materials."

MDF used in interior tables, partitions, loose chairs is made of **rapidly renewable materials**, which constitutes **85%** of the total value of all building materials and products used in the project.

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Purpose

Ensuring a comfortable environment (thermal, olfactory, and visual) with properly controlled thermostats, plenty of outdoor air ventilation, choosing materials with low toxicity, and proper daylighting will not only make the occupant happier but will usually increase their productivity as well.

Relating directly to occupant needs, providing ample fresh air should be a prime consideration. Often times occupant compliant about stagnant air, but providing more fresh air will flush out the stale air and also increase the amount of oxygen. Tied to this strategy is also ensuring that the air is not contaminated and thus smoking is always suggested to be prohibited in buildings.

Indoor Environment Quality

Enhance Indoor Air Quality Performance

"Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, thus contributing to the comfort and well-being of the occupants."

Project has adhered to ASHRAE 62.1-2004 **Ventilation** requirements

Manage Indoor Air Quality

"Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants."

The project had implemented a Construction IAQ Management Plan

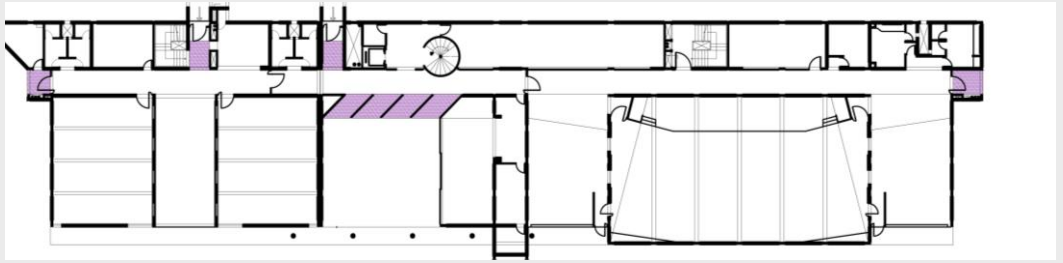
Use Low Emitting Materials

"Reduce the quantity of indoor air contaminants that are odorous or potentially irritating and harmful to the comfort and well-being of installers and building occupants."

The project used: Low Emitting Adhesives & Sealants, Paints and Carpets

"Minimize exposure of building occupants, indoor surfaces and ventilation air distribution systems to Environmental Tobacco Smoke (ETS)."

CII-SNCEL is a Smoke-Free Facility



"Minimize exposure of building occupants to potentially hazardous particulates and chemical pollutants."

Grates have been installed in the major entry ways to capture dirt and other particulates from entering the building. Additionally no hazardous gases or chemicals will be stored in the building, as eco-friendly housekeeping will be implemented.

"The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the growth of industry in India, partnering industry and government alike through advisory and consultative processes. While striving to sustain an environment conducive to industrial growth, CII also tries to maintain an environment that is itself sustainable."

Purpose

Dissemination of green building knowledge to the general public will trickle down the concepts incorporated in the project down to their homes and offices. Green education is one such method of dissemination which should be practiced by all new buildings. This includes encouraging visitors to the new building to view and learn green building technologies. A comprehensive signage program, comprehensive case study and comprehensive outreach program becomes part of the green education.

In today's sustainably conscious world, one should not settle for the standard but supersede it. Besides the building, the housekeeping materials used in the building should be carefully selected such that it does not pose any potential contamination to the building occupants. Implementing a green housekeeping will improve indoor air quality, occupant well-being and the environment.

Innovation

Green Educational Campaign

"To take advantage of the educational value of the green building features of the project, develop an actively instructional education campaign."

The green educational campaign will include a comprehensive signage program to inform occupants and visitors about the green features of the building. The campaign will also include (1) this case study to inform the design of other buildings based on the successes of the project and will be made available to IGBC for sharing with other projects and (2) a comprehensive green educational outreach program, using the project as an example.

Comprehensive Signage Program

Signage has been placed throughout the building to inform occupants and visitors about the green features of the building.

Comprehensive Case Study

Informs the relative environmental and health impact of buildings and the design of green building features, to interested stakeholders, based on the success of this project.

Comprehensive Outreach program

Green Building Tours for School and College Students.

Green House-keeping

"To reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical contaminants that adversely impact air quality, occupant well-being, and the environment."

The project has implemented a comprehensive Green Cleaning program, including training, performance standards, and a list of approved chemicals and practices.

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About Silpa Inc.

The LEED India NC certification consulting of the CII-SNCEL building has been handled by Silpa Green Building Technologies Pvt Ltd., a unit of Silpa Inc USA. Silpa's team includes technical-review experts from various technical fields helping to ensure a quality product. At Silpa, a whole building approach is undertaken for building projects of any size, type and function. Silpa helps in verifying that the project is compliant with the certification requirements, and provides creative strategies resulting not only in achievement of the desired rating level, but also a reputation as a more unique green building. Silpa works alongside with the MEP to aid in analysis of the mechanical design and additional ECMs that can be implemented to provide additional savings. Silpa Inc website is http://silpainc.com

Silpa Green Building Technologies Pvt Ltd is head by **Prem Srinivasan**, a fifteen year veteran with extensive project management and outsourcing experience.

Innovation

LEED Accredited Professionals

"At least one principal participant of the project team shall be a LEED Accredited Professional (LEED AP)."

This project has been assisted on an ongoing basis by a team of dedicated LEED Accredited professionals, facilitating and streamlining the LEED documentation process through the indepth knowledge of the LEED process.

Ravi Srinivasan
BArch, MS(Civil),
MS(Arch), (PhD Arch)
Assoc AIA, LEED® AP,
CEM & Certified Trainer
AIIA, COA Architect

Ravi's expertise is in building simulation & energy studies, sustainability & high performance strategies. Prior to co-founding Silpa Inc, Ravi was the Project Coordinator for the University of Pennsylvania Campus Sustainability Plan, the first ever campus sustainability plan ever conducted at the University with 269 acres in West Philadelphia, USA, and 151 buildings. Ravi has over 18 peer-reviewed journal and conference publications and several unpublished reports in the field of building energy and sustainability.

Jayasubha Lakshmanan
MAcc, LEED® AP

Jay brings in ten years of process, audit, compliance, quality, energy and sustainability experience. Jay in her role as the Chief Operating Officer at Silpa Inc manages the day-to-day operations, process and quality of numerous sustainability projects. Prior to co-founding Silpa Inc, Jay was working as Operations / Information Technology Auditor at American Water, a Fortune 500 company and the largest publicly traded water utility company in the United States.

Silpa Vision: "Together we transform buildings and communities into supportive, strengthening, and sustaining forces that will reinstate environmental balances, reinforce natural coexistence, and invigorate health, well-being & prosperity."