

TENANT GUIDELINES FOR DESIGN + CONSTRUCTION

June 2015

- I. INTRO TO LEED SYSTEM**
- II. DESIGN GUIDELINES**

To learn more please visit the sustainability section of our website:
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Prepared for
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INTRODUCTION

These guidelines are intended to assist and encourage current and future tenants of SL Green buildings to incorporate energy efficient and sustainable practices into the renovations of their commercial space.

Guidelines are based off of LEED-CI v2009 rating system guidelines and SL Green sustainability initiatives within their buildings.

USGBC and LEED

Leadership in Energy & Environmental Design (LEED) is a program set up by the U.S. Green Building Council (USGBC) to put forth a set of credible, effective, and attainable standards for constructing sustainable and high performance buildings, developments, and tenant spaces. LEED has rating systems for Existing Buildings Operations and Maintenance (EB+OM), Core and Shell (CS), New Construction (NC), Schools, Homes, Neighborhood Development (ND), Retail and Commercial Interiors (CI). The newest version of LEED, version 4, has additional categories of rating systems including Warehouses, Datacenters and Hospitality.

LEED version 4 is required starting October 2016. This set of guidelines will be updated to reflect LEED version 4 requirements at that time.

PURSUIING LEED-CI CERTIFCATION IN AN SL GREEN BUILDING

SL Green can also provide building specific information required for LEED certification showing how the base building can contribute to LEED points. If your firm requires LEED consulting expertise or additional resources, SL Green can provide recommendations.

Tenant Guidelines

Guidelines are organized based on LEED-CI v3 rating system sections. The sections are as follows:

- Water Efficiency – indoor and outdoor water use by occupants and landscaping
- Energy and Atmosphere –energy usage and refrigerant selection
- Materials and Resources –material selections and waste disposal methodology
- Indoor Environmental Quality –occupant comfort and well-being

The following are specific measures your company can take to earn LEED credits and design your space sustainably.

WATER EFFICIENCY GUIDELINES

- Select water efficient fixtures that have flow rates equal or below the following:

Restroom Fixtures:

- Toilets: 1.28 gallons per flush (GPF)
- Urinals: 0.125 GPF
- Bathroom Faucets: 0.5 gallons per minute (GPM) with an automatic sensor that turns water off after 12-sec or less

Office Fixtures (if applicable):

- Pantry Faucets: 1.0 GPM
- Pre-Rinse Spray Valves: 1.6 GPM

ENERGY AND ATMOSPHERE

- Have HVAC systems, lighting / daylighting controls systems, domestic hot water systems and renewable energy systems in demised premises commissioned by a third party.
 - Consider having the third party complete “Enhanced Commissioning”, which includes a review of the design drawings, reviewing submittals, ensuring a systems manual is put together, and returning to check on systems 10 months after the project construction is completed.
- Select lighting fixtures with the following attributes:

- Low wattage (energy efficient)
- Low or no mercury
- Dimmable
- Consider designing the space to meet or exceed ASHRAE 90.1-2007 lighting power density requirements:
 - Office: 1.1 watt/sq ft
 - Conference Room: 1.3 watt/sq ft
 - Lounge: 1.2 watt/sq ft
 - Restrooms: 0.9 watt/sq ft

Recommendations for reducing lighting power density:

- Select low wattage lighting fixtures such as LEDs
- Decrease amount of strip lighting
- Implement task lighting
- Maximize daylight into the space
- Select electronics and appliances that are ENERGY Star qualified. Electronics and appliances to consider include: computers, monitors, printers, dishwashers, refrigerators, icemakers and televisions. For a full list of products that are ENERGY Star qualified, go to www.energystar.gov.
- Implement the following lighting controls:
 - Occupancy / vacancy sensors controlling at minimum 75% of connected lighting load (wattage).
 - Daylight responsive controls that control lights within 15ft of all windows.
- Install HVAC systems that are compliant with the New Building Institute's Advanced Buildings Core Performance Guide Sections 1.4, 2.9, and 3.10.
- When zoning, ensure that each interior space and solar exposure is separately zoned.
- Include active controls capable of sensing space use (occupancy sensors or CO₂ sensors) and modulating HVAC system in response to space demand in all private offices, conference rooms and pantry areas.

- Submeter all energy uses including electricity, cooling water, steam, and natural gas.

MATERIALS AND RESOURCES

- Designate recycling storage and collection receptacles for mixed paper, plastic / glass / metal, and cardboard. If possible, also set up recycling receptacles for light bulbs, batteries and electronics. Include signage so that all bins are clearly designated.
- Use the following types of environmentally preferable materials where possible:
 - Reused / refurbished furniture or materials. Materials that are reused or refurbished are the most sustainable. Some examples are furniture from from a liquidator that specializes in re-selling office furniture, refurbished wood recovered from a barn or water tower, materials purchased from a salvage business such as BIGNYC and doors taken and remade into tables.
 - Materials containing Post-consumer Recycled Content and/or Pre-consumer (Post-Industrial) Recycled Content. Some examples of this are concrete with fly-ash, gypsum board with 95% recycled content and steel with 100% recycled content.
 - Materials with Regional Content. LEED defines regional content to be within 500 miles of the project site. There are two levels of regional content – regionally manufactured and regionally manufactured as well as extracted / recovered / harvested.
 - Materials made with Rapidly Renewable Content. LEED defines rapidly renewable content as a material with a harvest cycle of 10 years or fewer. Some common materials that meet this definition are: bamboo, cork, cotton batt insulation, linoleum, natural rubber flooring, soy insulation and wool carpeting.
 - Materials containing Certified Wood. LEED recommends selecting wood certified by the Forest Stewardship Council (FSC). Compliant wood will have a chain-of-custody number given by the last person / company to alter the wood. FSC certification indicates that wood is sourced and handled responsibly from forest to project installation. For more information, visit the FSC website: <https://us.fsc.org/>
 - (LEED v4) Products with any of the following third party certifications or documents:

- Environmental Product Declaration - Type III (EPD) – standardized independently verified reports based on life-cycle assessment. An EPD will typically report the following impact potentials of a product: global warming, acidification, eutrophication, ozone depletion and smog creation.
- Health Product Declaration (HPD) – standardized format of product contents, emissions and health information. It includes health-based information that is not included in an EPD. To be LEED compliant, the manufacturer must do the following items in the HPD: affirm “full disclosure of known hazards”, confirm the level of disclosure in the residuals disclosure section and attain the HPD standards for the 1,000 ppm level.
- Cradle to Cradle (C2C) – a third party certification that rates the material “health”, material reutilization potential, energy required for production, water usage / discharge quality, and social responsibility associated with producing products. The system considers all steps in the production process. Products can be certified at the basic, silver, gold and platinum levels.

INDOOR ENVIRONMENTAL QUALITY

- Ensure that HVAC systems are designed to meet ASHRAE 62.1-2007 minimum outdoor air requirements. Consider increasing the percentage of outdoor air to 30% to enhance occupant well-being. Take into consideration additional energy required to heat / cool the additional outdoor air.
- Prohibit smoking 25 feet from every entrance, outdoor air intake and operable window. This may require no smoking signage near entrances to the exterior and terraces. Notify all employees of the No Smoking policy.
- Consider adding CO₂ sensors into all densely occupied spaces (25 or more people per 1,000 sf). The sensors should notify appropriate building personnel if the CO₂ levels in a space vary by more than 10% from design conditions, so that adjustments can be made. This will ensure that densely occupied spaces will have adequate outside air on a consistent basis.
- Require that contractors working in the space follow the SMACNA guidelines for indoor air quality best management practices during construction. These guidelines require the following: HVAC equipment / ductwork protection, source control to limit contaminants from entering the space, pathway interruption to prevent contaminants from moving throughout the space, housekeeping, and

scheduling to intelligently order tasks that introduce contaminants in such a way to limit exposure.

- Indoor Air Quality Testing: Consider having a third party come and test the quality of the air once construction is completed and before occupants move into the space. Testing should be completed in compliance with LEED-CI v2009 IEQcr3.2: Construction IAQ Management Plan – Before Occupancy Option 2.
- Flushing Out Air Before Occupancy: Consider “flushing-out” the project space once construction is completed to clear air out before occupants move into the space. To have a LEED compliant flush-out, consult the requirements of LEED-CI v2009 IEQcr3.2: Construction IAQ Management Plan – Before Occupancy Option 1.
- Select low-emitting options (options that off-gas fewer toxic chemicals) for the following types of products:
 - Adhesives and Sealants Recommended VOC limits. Note - VOC contents are typically listed on their MSDS (material safety data sheet).

▪ Indoor Carpet Adhesives	50 g/L
▪ Carpet Pad Adhesives	50 g/L
▪ Wood Flooring Adhesives	100 g/L
▪ Rubber Floor Adhesives	60 g/L
▪ Subfloor Adhesives	50 g/L
▪ VCT & Asphalt Adhesives	50 g/L
▪ Drywall & Panel Adhesives	50 g/L
▪ Cove Base Adhesives	50 g/L
▪ Multipurpose Construction Adhesives	70 g/L
▪ Structural Glazing Adhesives	100 g/L
▪ PVC Welding	510 g/L
▪ CPVC Welding	490 g/L
▪ ABS Welding	325 g/L
▪ Plastic Cement Welding	250 g/L

- Adhesive Primer for Plastic 550 g/L
 - Contact Adhesive 80 g/L
 - Special Purpose Contact Adhesive 250 g/L
 - Structural Wood Member Adhesive 140 g/L
 - Sheet Applied Rubber Lining Operations 850 g/L
 - Top & Trim Adhesive 250 g/L
 - Metal to Metal 30 g/L
 - Plastic Foams 50 g/L
 - Porous Material (except wood) 50 g/L
 - Wood 30 g/L
 - Fiberglass 80 g/L
 - Architectural Sealants 250 g/L
 - Non-membrane Roof Sealants 300 g/L
 - Single-Ply Roof Membrane Sealants 450 g/L
 - Other Sealants 420 g/L
 - Architectural Non Porous Sealant Primer 250 g/L
 - Architectural Porous Sealant Primer 775 g/L
 - Other Sealant Primers 750 g/L
- Paints and Coatings – Recommended VOC limits. Note - VOC contents are typically listed on their MSDS (material safety data sheet).
- Flats 50 g/L
 - Non – Flats 150 g/L
 - Anti-corrosive / anti-rust paints 250 g/L
 - Clear wood finishes varnish 275 g/L
 - Clear wood finishes lacquer 275 g/L

- Floor Coatings 50 g/L
- Industrial maintenance coatings 100 g/L
- Waterproof Sealer 100 g/L
- Shellac - clear 730 g/L
- Shellac – pigmented 550 g/L
- Stains 100 g/L

- Flooring –

- Carpets that are certified under the Green Label Plus program contain significantly less VOCs than average carpets on the market.
- Hardflooring that is certified under the Floorscore program contains significantly less VOCs than average hardflooring on the market. Hardflooring types that Floorscore covers include: SDT tile, VCT tile, rubber flooring, wallbase and linoleum.
- Consider selecting flooring options that do not off-gas such as ceramic tile, masonry, non-treated wood, cut stone and terrazzo.

- Plywoods / MDFs / Composite / Agrifiber Boards / Laminating Adhesives – select options with no added urea-formaldehyde (NAUF). Urea-formaldehyde has been reported to most notably create / aggravate upper respiratory issues, among other issues.

- Furniture – select options that are Greenguard certified to ensure that products with have low chemical emissions. Another option is to find furniture that has undergone testing by an independent third-party air quality testing laboratory to meet the standards of the ANSI/BIFMA M7.1-2007 and ANSI/BIFMA X7.1-2007 protocols.

- Interior Air Quality: Where possible within the Demised Premises, use building approved MERV 13 filters on HVAC equipment.
- Interior Air Quality: If any rooms in the project will have potentially hazardous materials (such janitorial closets or copy rooms with 40,000+ copies per month) separately exhaust space, install self-closing doors, and deck-to-deck partitions or hard-lid ceilings.
- Lighting Controllability (Individual): Consider providing task lighting at 90%+ workstations so that occupants have controllability of their lighting levels.

- Lighting Controllability (Multi-Occupant): Consider providing switching in multi-occupant spaces (such as conference rooms, auditoriums and teaching rooms) that allow for multiple lighting levels to meet occupant needs. LEED-compliant types of switching include dimming switches, multiple-banks of lightings, and complex lighting controls. Occupancy sensors, vacancy sensors and daylight dimming controls do not meet the requirements of improving occupant controllability, but are effective methods to reduce energy use.
- Thermal Controllability (Individual): Consider providing occupants with a means of regulating air / radiant temperature, humidity and air speed. Some typical means include heating radiators or radiant panels with individual temperature controls, operable windows and / or adjustable local air diffusers. To meet the LEED requirement, there must be individual control for at least 50% of occupants.
- Thermal Controllability (Multi-Occupant): Provide thermal comfort controls in 100% of multi-occupant spaces so that occupants can adjust temperature, humidity and/or air speed to meet the group's needs.
- Mechanical Design for Occupant Comfort: Design HVAC systems to meet ASHRAE Standard 55-2004 or better.
- Verification of Occupant Thermal Comfort: Consider administering a survey of occupants to determine what their thermal comfort levels are. If more than 20% express a concern with thermal comfort, send building staff to inspect issues.
- Daylight and Views: Consider designing the project space to maximize daylighting and occupant views to the exterior. Design methodologies include: selecting furniture that allows for views at a 42" seated height, having glass partition walls instead of opaque walls and putting the most highly occupied spaces near exterior windows.

SUSTAINABLE DESIGN RESOURCES

The following is a partial listing of resources for sustainable design:

- LEED ID+C v2009 (v3) Reference Guide
- LEEDuser – www.leeduser.com
- U.S. Green Building Council (USGBC) – www.usgbc.org
- Green Building Certification Institute (GBCI) – www.gbci.org
- Construction Specifications Institute (CSI) – www.csinet.org
- Contractors guide to preventing waste – www.resourceventure.org
- Green building products:
 - Building Green (go to website and click “Green Products”)
<http://www2.buildinggreen.com/>
 - Green Wizard (must sign up for a free account that grants access to the product library): <https://www.greenwizard.com/sign-up/>
 - Cradle to Cradle (list of compliant products):
<http://www.c2ccertified.org/products/registry>
 - Pharos (subscription based, free trial available):
<https://www.pharosproject.net/pricing>
- Forest Stewardship Council – www.fscus.com
- ASHRAE – www.ashrae.org
- Environmental protection agency – www.epa.gov/iaq
- SMACNA – www.smacna.org
- Low emitting materials – www.aqmd.gov
- Carpet & Rug Institute – www.carpet-rug.com