Leed bd c reference guide pdf

 This reference guide is designed to be developed and developed in conjunction with a classification system. Written by LEED user experts, it serves as a roadmap, describing steps to meet and document credit requirements and offering advice on best practices. In each section, the information is organized so that it flows from general guidance to more detailed guidance and finally to handle references and other information. The sections are designed with a parallel structure to support finding and minimizing repetition. Each credit category starts with a review that discusses sustainability and category-specific market factors. For each prerequisite and credit, readers will find the following sections: Intent & Requirements specifies the classification system requirements for achieving prerequisites or credit. They have been approved in the evaluation system development process and can also be found on the USGBC website. The intention is to combine achievements with greater sustainability problems and provides information on how credit requirements meet the intentions set out in the rating system. Step-by-step guidance suggests implementation steps and documentation that can be used by most projects, as well as generally used guidance and examples. Further explanations include for long calculations or special project situations, such as guidance on custom project types or different credit approaches. It includes the Campus section and, sometimes, the International Tips section. The required documentation contains a list of items that must be submitted for certification review. Related credit guidance identifies other loans that may influence the project team's decisions and strategies for a given loan; relationships between loans can mean synergies or trade-offs. The leed 2009 changes are a quick reference to the changes compared to the previous leed version. Referenced Standards lists technical standards related to credit and offers web links to find them. The performance sample specifies the threshold that must be reached to get a sample performance point, if available. Definitions give meaning to terms used in chalk. For more information on further explanations, please see the various subsections depending on the loan; two common subsections have been developed here. Campus Projects Campus refers to the Campus Program for Projects on a Shared Site of multiple buildings located in one place and under the control of a single entity. Examples include buildings on a corporate or educational campus and structures in commercial development. Only campus project teams must follow the directions in the Campus section; the guidelines do not apply to projects that are located in a campus environment or are part of a multi-access complex, but do not perform certification through the Campus Program. There are two approaches to multi-building certification under the Campus Program: Group Approach allows buildings that are essentially similar and are in one place to be certified as a single project that shares a single certificate. Campus Approach enables building sites that have a single location and location attributes to obtain a separate LEED certificate for each project, building space, or group on the home site. For each approach, the guide refers to any credit-specific information and provides two possible scenarios: Group Approach All buildings in a group can be documented as one. Buildings can meet credit requirements as a single group, for example by combining resources or buying and then submitting one set of documentation. Provide separate documentation for each building. Each building in a group project must meet the credit requirements individually for the project to get credit. Campus Approach Eligible. This credit can be documented once at the home site level, and then individual projects within the boundaries of the main site earn credit without submitting additional documentation. Ineligible. Any LEED project can implement Individually. Any project within campus boundaries can get credit, but each project must document Separately. Projects outside the United States The International Tips Section offers advice on determining the equivalence of U.S. standards or using non-U.S. reference standards referred to in the classification system. It is intended to supplement and not replace the remaining parts of the loan. Helpful tips for projects outside the US may also appear in the step-by-step tips section of each loan. If you don't need or have tips available, the International Tips header doesn't appear. Units of measure are given in both inch-pound (IP) and international system units (SI). IP refers to an inch, pound and gallon-based measurement system historically derived from the English system and commonly used in the U.S. AI is a modern metric system used in most other parts of the world and defined by the General Conference on Weights and Measures. If you specify a local equivalent, this means an alternative to the LEED reference standard, which is specific to the project location. This standard must be widely used and accepted by industry experts and, when applied, must meet credit intentions leading to similar or better results. If you specify a local equivalent approved by the USGBC, this means a local standard that is considered equivalent to that standard by the U.S. Council of Green Buildings through the non-U.S. establishment process. equivalence in LEED. Adopting an inclusive approach to design and construction The realization of the benefits of LEED begins with the transformation of the design process itself. Success in leed and green building design is best achieved through an inclusive design process that prioritizes cost-effectiveness in both the short and long term and engages all project team members in discovering beneficial mutual understandings and synergies between systems and components. By integrating technical and living systems, the team can achieve a high level of building performance, human performance and environmental benefits. Traditionally, design and construction disciplines operate separately, and their design solutions and construction challenges are fragmented. These solutions often have unintended consequences — some positive, but mostly negative. The consequence is that when areas of practice are integrated, it becomes possible to significantly improve construction results and achieve synergies that bring economic, environmental and health benefits. In the conventional design process, each discipline practice should design the components and components of the system under its control to achieve the greatest benefits and the lowest costs. In the integration process, the entire team — customer, designers, constructors, and operators — identifies relationships, services and exemptions between systems, so that dependency and benefits (which would not otherwise go unnoticed) go unnoticed) efficiency and reducing costs. To work in this way, design teams whose members represent different disciplines combine so that knowledge, analysis, and ideas from each discipline can communicate and connect to the systems and components of all other disciplines. In this way, LEED credits become aspects of the whole rather than separate components, and the entire design and construction team can identify interconnectedness and related benefits in many LEED credits. The coordination of construction and field systems should be considered at an early stage, preferably before a schematic project. The Credit Integrative Process formally introduces this way of working at LEED so that team members' knowledge of construction and field systems can communicate the efficiency, efficiency and effectiveness of each system. Integration strategies are recommended for all LEED projects as they encourage integration in the early stages of design when it is most effective. Credit introduces an integration process, focusing on the involvement of energy and water-related research and analysis to inform early design decisions through a high level of cooperation between all project team members. Approaching certification with an integration process gives your project team the best chance of success. The process involves three phases: Discovery. The most important phase of the integration process, the discovery can be thought of as an extensive extension of what is contractually called predesign. The project is unlikely to meet its environmental objectives in an economic way without this separate phase. Discovery work should take place before you start designing diagrams. Design and construction (implementation). This phase begins with what is traditionally called a schematic design. It resembles conventional practice, but integrates all the work and collective understanding of systemic interactions achieved during the discovery phase. Occupancy, operations, and performance feedback. This third phase focuses on preparing for performance measurement and feedback mechanisms. Assessing performance in relation to objectives is crucial for communicating construction operations and determining the need for any corrective action. Achieving economic and environmental efficiency requires that every problem and all team members (customers, designers, engineers, constructors, operators) be introduced to the project at the earliest before anything is even designed. The structure of managing this flow of people, information and analysis is as follows: All members of the project team, representing all areas of design and construction, collect information and data relevant to the project. team analyse their information. Team members take part in workshops to compare notes and identify synergies. This process of research, analysis and iterative cycle, which improves design solutions. In the best case scenario, research and workshops shall continue until project systems are optimised, all reasonable synergies are identified and related strategies related to all LEED credits are documented and implemented. Development of the LEED work plan It is recommended that LEED applicants follow a number of certification steps. Step 1. Initiate discovery phase Start preliminary research and analysis (see Integration process credit). Once you have gathered sufficient information, organise a goal-setting workshop to discuss the findings. Step 2. Choose the LEED System LEED classification system consists of 21 adjustments designed to meet the needs of different market sectors (see Rating System Selection Guidelines). For many points, further clarification highlights the classification system and project type variants to help teams develop a successful approach. Step 3. Check the minimum requirements for the program All projects applying for certification must meet the minimum program requirements (MPR) for the relevant classification system, available in this reference guide and on the USGBC website. Step 4. Set project goals for priority certification strategies that are consistent with the context of the project and the values of the project team, owner, or organization. Once these values are formulated, project teams will be able to select the right strategies and related LEED credits to achieve their goals. The recommended method for setting project goals is to convene goal-setting workshops (see integration credit) for project team members and owners. Understanding owner goals, budget, schedule, functional programming requirements, scope, quality, performance goals, and residents' expectations will promote creative problem solving and encourage fruitful interaction. In order to capture as many opportunities as possible, the workshop should take place before any design work and include a broad representation in the field of design and construction. Step 5. Define the scope of the LEED project Review the project program and preliminary findings from the goal-setting workshops to identify the scope of the project. Specific issues include off-site or campus facilities or shared facilities for project users. Then map the LEED project boundary along the property line. If the design boundary is not obvious because of ownership by multiple entities, partial renovations, or other issues, see minimum program requirements. Share your final project boundary decision with your entire team, as this site definition affects many prerequisites and credits. Finally, it is necessary to examine any special certification that may apply based on the scope of the project, such as a tom program or campus program. If the project owner plans multiple similar buildings in different locations, locations, be a useful program to improve certification. If your project spans multiple buildings in one place, campus might be appropriate. Step 6. Develop a LEED scorecard Use project goals to identify credits and options that should be taken by your team. The Behind the Intent sections provide insight into what each credit is about to achieve and can help teams align goals with credits that bring value to the owner, environment, and community of the project. This process should focus on those loans of the highest value to the project in the long term. Once high priority loans have been selected, related loans should be identified that strengthen priority strategies and bring synergistic benefits. Finally, set a target LEED certification level (Certificate, Silver, Gold, or Platinum) and specify the additional credits needed to achieve it. Make sure that all prerequisites can be met and include a buffer a few points above the minimum for design and construction changes. Step 7. Continue the discovery phase Project team members should perform additional research and analysis as the project progresses, refine analysis, test alternatives, compare notes, generate ideas in small meetings, and evaluate costs. Examples of studies and analyses of energy and water-related systems are presented in the Process integrative chalk. The project team should meet on time from time to time to discuss overlapping benefits and opportunities (e.g. how to make the most of waste from one system for the benefit of other systems). This approach encourages the discovery of new opportunities, raises new questions and facilitates testing in different disciplines. Step 8. Continue the iterative process of the above pattern of research and analysis, and then the team workshops should continue until the solutions satisfy the design team and the owner. Step 9. Assign roles and responsibilities Select one team member to take primary responsibility for running the group through the application process and LEED documentation. This leadership role can change from project to construction, but both the project and construction leaders should be involved throughout the process to ensure consistency, transparency and inclusive approach. Crossdisciplinary ownership of the leed credit compliance team can help promote inclusive design while ensuring consistent documentation across different credits. On a credit basis, assign primary and secondary roles to relevant team members to achieve credit and documentation. Clarification of responsibility for ensuring that design decisions are accurately represented in drawings and specifications and that design details are consistent with design documentation. Establishment of regular dates and develop clear communication channels to streamline the process and solve problems quickly. Step 10. Develop Develop Documentation Consistent documentation is critical to obtaining a LEED certificate. Data collected throughout the construction process, such as the amount of building materials, should be collected and evaluated at regular intervals to enable the team to track current progress in credit performance and ensure that information is not misassed or omitted. Maintain consistency in the app below and review the credit category to discuss the numerical values and importance of the conditions that affect the achievement of multiple credits within the credit category. Step 11. Perform a quality assurance review and submit for certification quality assurance review is an essential part of the work program. Accurate quality control can improve the transparency and consistency of leed project documentation, thus avoiding errors that take time and expense to improve later in the certification process. The application must be carefully checked and checked for completeness. In particular, the numerical values that appear during the application process (e.g. site area) must be consistent across loans. Maintain consistency in your application Some issues persist across multiple credits and credit categories and must be treated consistently throughout the upload. Special projects on design situations with a combination of space types or unusual space types should pay particular attention to how these characteristics affect credit achievements. Typical project programs that require additional attention include the following: Mixed-use projects with a mix of applications may be helpful to familiarize yourself with design type variants and classification of system changes sections in the reference guide for advice. For example, if an office building certifying in the area of BD +C: The new design contains a small data center, the team should follow the data center guidelines for some loans; these guidelines are not limited to BD +C: Data Centers projects. Another typical scenario is a hotel project certifying under BD+C: Hospitality; by designing retail space on the ground floor of the hotel, the team could take advantage of advice on BD+C: Retail projects. Multi-site complex Some projects may be part of a large complex of buildings or a planned investment. Each project can follow a multi-prone, complex approach if it is part of the master plan development, regardless of whether the project uses the LEED Campus approach. Incomplete buildings and spaces that have been LEED certified should be completed until a final APPLICATION for LEED certification has been submitted. Complete means that no further work is needed and the project is ready for occupancy. Not more than 40% of the gross area of the LEED project may be unless the project uses the LEED BD+C: Core and Shell classification system. In addition, projects contain incomplete spaces must use Appendix 2 Default occupancy numbers to determine the number of people in incomplete spaces. In the case of incomplete spaces in projects with a classification system other than LEED BD+C: Core and Shell, the project team must provide additional documentation. File a letter of commitment signed by the owner indicating that the remaining incomplete spaces will meet the requirements of each pre-requirement and credit achieved by this project, if and when it is completed by the owner. This letter may include an obligation in a general manner and does not have to be responsible for any precondition or individual judgment. In the case of incomplete premises intended for completion by tenants (i.e. parties other than the owner), a set of non-binding guidelines for the design and construction of the tenant must be submitted, with a brief explanation of the circumstances of the project. In the case of pre-requirements with fixed base points (e.g. precondition for the use of internal water, minimum energy performance of EA) and credits dependent on calculations in the initial requirements, the proposed design must be equivalent to a baseline for incomplete spaces. Project teams that want to apply for environmental performance or benefits that extend beyond the baseline for incomplete spaces should refer to the Lease Agreement and Sales Agreement section. Projects with several physically distinct structures for primary and secondary school projects, hospitals (general medical and surgical), hotels, resorts and resort properties, as defined for the classification of ENERGY STAR buildings, shall be eligible for the inclusion of more than one physically distinct structure in a single LEED project certification application without the need for campus, subject to the following conditions. The buildings to be certified must be part of the same identity. For example, buildings are part of the same primary school, not a mix of primary and secondary schools. The project must be analysed as a whole (i.e. taken together) against all the minimum programme requirements (MPR), preconditions and credits in the LEED rating system. All areas of land and all building areas within the limits of the LEED project must be included in any precondition and credit postponed for certification. There is no specific limit on the number of structures, but the total gross area included in a single project must not exceed 1 million square feet (92,905 square meters). Any single structure that is larger than 25,000 square feet (2,320 square meters) must be registered as a separate project or treated as a separate building in the approach to group certification. Renovations and Refer to the minimum requirements of the program for information on how to draw boundaries for renovation and addition projects. In addition, the following guidelines should be used for the treatment of energy systems in each project by mechanical systems. Separate systems. Mechanical Mechanical are completely separate from existing buildings (except emergency generators) and can be modelled separately. Shared central systems outside the project building or space. Each precondition and credit section related to energy modelling provides detailed guidance on how to deal with this situation; in particular, see ea's minimum energy performance guidelines. The LEED BD +C: Core and Shell tenant sales and lease agreement aims to address a speculative development market where project teams routinely do not control all aspects of building construction. The scope of Core and Shell is limited to those project elements under the direct control of the owner/developer. At a minimum, the range covers the core and shell of the base building, but can vary greatly depending on the design. Given that Core and Shell are limited in their ability to control the design and construction of tenants' interior fittings, design teams should implement credits that relate to parts of the building as part of the LEED project. Only parts of the building for the LEED project should be used for credit calculations. If the project team wants to implement additional loans or thresholds beyond the scope of construction of the LEED project, a binding contract of sale and lease of the tenant must be submitted in the documentation. This must be signed by the future tenant and include conditions related to how the technical credit requirements will be performed by the tenant. An unsigned or sample lease agreement is unacceptable. Please note that lease agreements are not required to implement Core and Shell. They are used only if the project is aimed at gaining additional points considered outside the scope of the project and construction, which will be matched by the future tenant. Previous investment Several loans require an assessment of a part of the land to determine whether it has been previously developed, defined as follows: previously developed recosuring, construction and/or land use, which would normally require regulatory authorisation (changes may exist now or in the past). Land which has not previously been developed and landscapes altered by current or historical clearing or filling, agricultural or forestry use or preserved use of natural areas shall be considered as undeveloped land. The date of the previous issue of the building permit is the date of the previous investment, but the issue of the permit does not in itself constitute an earlier study. Difficult lands to assess include those with few buildings present. If the land previously buildings, it is considered to have previously developed, even if these buildings have since been demolished. Another often confusing situation is the park. Particular attention should be paid to the type of Improved parks with well-groomed landscape and playgrounds (e.g. city park) are considered to have been previously developed. Land which has been cleared or graded, without additional improvements, shall not be considered to have been previously developed. Land maintained in its natural state (e.g. forest reserve) is not considered to be previously developed, even if there are small elements such as walking paths. Footprint Development The design footprint of the project is all its impermeable surfaces. development area The total area of the project site covered with buildings, streets, car parks and other typically impermeable areas built under the project Paved surfaces (at least 50% permeable) are excluded from the development footprint. Density density can be calculated separately for residential and non-residential elements or as a single value. The following definitions apply: the density of the covering of a building on a given plot to the size of that parcel. The density can be measured using the floor surface ratio (FAR); dwellings per acre (DU/acre) or residential units per hectare (DU/hectare); square meters of built-up area per acre of built-up land; or square meters of built-up land per hectare of built-up land. It does not include a structured car park. built-up land part of the land on which the construction may be built, including land voluntarily set-up and unbuilt. Where density calculations are used, the land to be built does not include public rights and land excluded from development by codified law. Land voluntarily set-up and not built on, such as open space, is considered to be buildable because it was available for construction but set off voluntarily. For example, the 5 acres (2 hectares) of park space required by the Local Government Code would be considered unsamaged, but if a developer voluntarily sets aside an additional 3 acres (1.2 hectares) for more park space, those 3 acres (1.2 hectares) must be classified as built-up land. After determining the land to be built, calculate the residential or non-residential density or the aggregate density. To calculate the density of housing development, divide the number of dwellings by the amount of residential land. To calculate non-residential density, use the floor area ratio (FAR): the ratio of floor area to area (FAR) density of non-residential land use, with the exception of structural parking, measured as the total area of a non-residential building divided by the total area of residential land available for non-residential buildings. For example, in a 930-square-metre area with a non-residential area of 10,000 square feet (930 square meters), a 1,000-square-foot (930-square-meter) building square meters (930 square meters) would have 1.0. In the same place, a building of 5,000 square feet (465 square meters) would have far 0.5; a building of 15,000 square feet (1,395 square meters) would have FAR 1.5; and a building of 20,000 square feet (1860 (1860) square meters) would have FAR 2.0. To calculate the aggregate density for residential and non-residential areas, use far. Occupancy Many types of people use a typical LEED building, and the mixture varies depending on the type of project. Occup persons are sometimes referred to in a general sense; for example, Provide respite places that are available to patients and visitors. In other cases, the persons in the vehicle must be counted for calculations. Definitions of the types of persons by person who can be changed or replaced in a given breath, where applicable (such changes are noted in the section of the guide to individual loans). Most credits group users into two categories, ordinary building users and visitors. Regular residents of buildings Regular residents of the building are ordinary users of the building. All of the following are considered ordinary residents of the building. Employees include part-time and full-time workers and sums are calculated using full-time equivalence (EPC). A typical project can count FTE employees by adding full-time and part-time employees tailored to their working hours. Equation 1. ECA employees = Full-time employees + (Σ daily part-time hours) / 8 For buildings with more unusual occupancy patterns, calculate the eca building occupancy on the basis of the standard eight-hour occupancy period. Equation 2. ECA employees = (Σ all working hours) / 8 Employees are synonymous with employees for LEED calculations. Volunteers who regularly use the building are synonymous with employees for LEED calculations. Residents of the project are considered ordinary residents of the building. This also applies to residents of the dormitory room. If the actual number of residents is not known, use the default number of bedrooms in a residential unit plus one, multiplied by the number of such residential units. Primary and secondary school students are usually permanent residents of buildings (see exception at LT Credit Bicycle Facilities). Hotel guests are usually considered ordinary residents of the building, with some credit exceptions. Calculate the number of nights based on the number and size of units in the project. Let's say there are 1.5 people per room and multiply the resulting total resulting by 60% (average hotel occupancy). Alternatively, the number of guests staying at the hotel may come from actual or historical occupancy. Hospitalized patients are medical, surgical, obstetrician, special and intensive care patients whose length of stay exceeds 23 hours. Peak patients are the highest number of hospitalised at a given point during a typical 24-hour period. Visitors (including temporary visitors) occasionally use the LEED building. All of the following are considered visitors: Retail customers are considered visitors. In the case of credits for water efficiency, retail customers are considered to be average daily number of visitors. Outpatients visit a hospital, clinic or related medical facility for diagnosis or treatment that lasts 23 hours or less (see SS Credit Direct Exterior Access for credit-specific exceptions). Peak outpatients are the largest number of outpatient patients at a given point in a typical 24-hour period. Volunteers who periodically use the building (e.g. once a week) are considered visitors. Higher education students are considered visitors to most buildings, except when they are residents of the dorm, in which case they are residents. In the calculation, passenger types are usually calculated in two ways: daily averages include all passengers of a given type for a typical 24-hour working day. Peak totals are measured at the time of a typical 24-hour period when the highest number of a given passenger type occurs. If possible, use actual or expected occupancy. If occupancy cannot be accurately predicted, one of the following resources to estimate occupancy: Default passenger density with ASHRAE 62.1-2010, Table 6-1 Default passenger density with CEN Standard EN 15251, Table B.2 Appendix 2 Default occupancy Counts the results of the relevant tests. If the numbers vary seasonally, use the number of occupancys, which are a representative daily average throughout the building's operating season. If occupancy patterns are unusual (overlap, significant seasonal fluctuations), explain these patterns when submitting documentation for certification. Table 1 lists prerequisites and credits that require a specified number of occupancy for calculations. Pop-up Table 2. Credit attributes GS2_Credit BDC Attributes Minimum Program Requirements (MPR) are the minimum characteristics or conditions that make a project suitable for LEED certification. These requirements have a fundamental basis for all LEED projects and specify the types of buildings, spaces and districts that the LEED classification system is intended for evaluation. View the minimum program requirements. Guidance projects for the selection of the classification system are required to use the classification system that is most suitable. However, when the decision is not clear, it is the responsibility of the project team to make a reasonable decision when choosing a classification system before registering the project. These tips help design teams choose a LEED classification system. View guidelines for choosing a rating system. Lt Category Location and Transport (LT) review rewards thoughtful building location decisions with credits that encourage compact development, alternative transportation, and connection to amenities such as restaurants and parks. LT is an outgrowth of the Sustainable Sites category that previously covered topics related to location. While the SS category is currently ecosystem services, the LT category takes into account the existing characteristics of the surrounding community and how this infrastructure affects population behaviour and environmental performance. Well-located buildings use existing infrastructure — public transport, street networks, pedestrian paths, bicycle networks, services and facilities, and existing utilities such as electricity, water, gas and wastewater. Recognizing existing development patterns and land population, project teams can reduce the environmental burden from the material and environmental costs that accompany the creation of new infrastructure and a hard landscape. In addition, compact communities promoted by LT credits encourage robust and realistic alternatives to private car use, such as walking, cycling, vehicle shares and public transport. These gradual steps can bring significant benefits: a 2009 Urban Land Institute study found that improving land use patterns and investment in public transport infrastructure could reduce greenhouse gas emissions from transport in the US by 9% to 15% by 2050; worldwide, the transport sector accounts for about a quarter of energy-related greenhouse gas emissions. If the building is integrated into the surrounding community, it can offer clear benefits to building owners and users. For owners, the proximity of existing power lines and street networks avoids the cost of introducing this infrastructure into the project site. For those on a walk and on a bike, locations can improve health by encouraging daily physical activity, and proximity to services and amenities can increase happiness and productivity. Its location in a vibrant, livable community makes the building a destination for residents, employees, customers and visitors, and the building's residents will contribute to the area's business, creating a good model for future development. Re-use of previously developed land, clearing brownfield sites and investing in disadvantaged areas, saving undeveloped land and ensuring the efficient provision of services and infrastructure. Design strategies that complement the location of the building are also rewarded in the LT section. For example, by limiting parking, the project may encourage building users to transport alternatively. By providing bike storage, alternative fuel equipment and preferred parking for green vehicles, the project can help users looking for transport options. Consistent documentation of walking and cycling distance walking and distance cyclists are measuring how far a pedestrian and cyclist will travel from origin to destination, such as Bus. This distance, also known as the shortest path analysis, replaces the simple straight line radius used in LEED 2009 and better reflects the access of pedestrians and cyclists to including safety, convenience and obstacles to movement. This, in turn, better provides for the use of these facilities. Walking distances must be measured along infrastructure that is safe and comfortable for pedestrians: pavements, pavements along the entire surface, pedestrian crossings or equivalent pedestrian amenities. Cycling distances must be measured along infrastructure that is safe and comfortable for cyclists: on the streets of bike paths, off-street bike paths or trails, and streets with low speed of the target vehicle. Project teams can use cycling distance instead of walking distance to measure the proximity of bike storage to the bike network in LT Credit bicycle devices. When calculating the walking or cycling distance, sum up the continuous sections of the walking or cycling route to determine the distance from origin to destination. A radius of a straight line from the beginning, which is not compatible with the infrastructure for pedestrians and cyclists, will not be accepted. Review specific credits to select the right starting and destination points. In all cases, the origin must be accessible to all users of the building and the distance of walking or bicycles must not exceed the distance specified in the credit requirements. Total vehicle parking capacity When determining the total parking capacity, include all off-street spaces available to users of the project building. This can include spaces both inside and outside the design boundary. If parking spaces are common to two or more buildings (parking with swimming pool), specify the share of this parking for the project. Include this number of spaces in the total parking capacity and provide a justification for distributing the parking lot if necessary. If users of the project building are not assigned to park off the street, the team is eligible to use a parking footprint with LT credit restriction, but is not eligible for LT Credit Green Vehicles. The following parking spaces must be included in the total parking capacity: New and existing surface parking spaces New and existing garage or multi-storey parking spaces Any parking spaces outside the project area that are accessible to users of the building The following parking spaces should not be included in the total parking capacity: Parking spaces on the street (parallel or restrained) on public roads Parking spaces for fleet and storage vehicles unless these vehicles are regularly used by employees for commuting, as well as for business purposes Parking spaces Preferred parking Preferred parking have the shortest walk to the main entrance to the project, with places for people with disabilities. If the car park is located on multiple levels of the property, find your preferred places at the level closest to the main entrance to the building. If the parking lot is divided into different types of buildings (e.g. customers and employees, employees and students, ranking military officials), the project can allocate the required preferred parking spaces proportionally to each parking lot. This also applies to service stations at LT Credit Green Vehicles. Alternatively, a project that divides your parking can provide one overall preferred parking lot with enough space for all types of users (based on total parking capacity). In this case, the car parks outside the preferred parking area would still be separated from the type of user. This also applies to service stations at LT Credit Green Vehicles. Reservation of preferred parking spaces is required for both motorhomes and vanpool vehicles in the LT Credit Reduced Parking Footprint and for eco-friendly vehicles at LT Credit Green Vehicles. Projects implementing both loans will have to reserve a larger proportion of preferred parking spaces. Parking and parking spaces and green vehicle areas may be placed at the discretion of the project team (i.e. green spaces for vehicles may be closer to the main entrance than parking and wavanpool spaces or vice versa), provided that the number of spaces reserved for each type meets the credit requirements. While not encouraged, preferred parking lots and signage for vanpool cars and vehicles and eco-vehicles can be combined if 10% of the total parking capacity is reserved with this signage and both a reduction in parking footprint and Green Vehicles credits are achieved. The SS Overview Sustainability Category (SS) rewards decisions about the environment surrounding the building through credits that highlight important relationships between buildings, ecosystems, and ecosystem services. It focuses on rebuilding project site elements, integrating land with local and regional ecosystems and preserving the biodiversity on which natural systems are based. Earth's systems depend on biologically diverse forests, wetlands, coral reefs and other ecosystems, which are often referred to as natural capital because they provide regenerative services. A United Nations study indicates that for ecosystem services that have been assessed worldwide, around 60% are currently degraded or used unsustainable1. The result is deforestation, soil erosion, water level drop, extinction of species and rivers that no longer run to the sea. Recent trends, such as exurban development and sprawling, are encroaching on other natural landscapes and farmland, fragmenting them and replacing them with scattered hardscapes surrounded by non-family vegetation. Between 1982 and 2001 in the United States alone, about 34 million acres (13,759 hectares) of open space (an area the size of Illinois) lost to development, about 4 acres per minute, or 6,000 acres per day2. The run-off of rainwater from these hardscape areas often overwhelms the ability of natural systems to infiltrate, infiltrate, both the quantity and the pollution of the run-off. Rainwater run-off carries pollutants such as oil, sediments, chemicals and lawn fertilizers directly into streams and rivers, where they contribute to eutrophication and harm ecosystems and aquatic species. A Washington State Department of Ecology study noted that rainwater runoff from roads, parking lots and other hardscapes carries about 200,000 barrels of oil to Puget Sound each year, more than half of what was spilled in the 1989 Exxon Valdez accident in Alaska3. Design teams that meet ss prerequisites and credits protect vulnerable ecosystems by conducting early site assessments and planning locations of buildings and terrain to avoid damage to habitats, open spaces and reservoirs. They use low-impact development methods that minimize building pollution, reduce the effects of heat islands and light pollution, and mimic natural water flow patterns to manage rainwater runoff. They also correct areas on the project site that are already in decline. In LEED v4, the SS category combines traditional approaches with several new strategies, including the backlit-uplight-light-glare (BUG) method (light pollution reduction credit), working with conservation organizations to target financial support for off-site habitat protection (Site Development-Protect or Restore Habitat credit), replicating natural site hydrology (Credit Rainwater Management), and using three-year age SRI values for roofs and SR values for nonroof hardscape (Heat Island 1 UN Environmental Protection Program, state and trends in the environment for the period 1987-2001, Section B, Chapter 5, unep.org/geo/geo4/report/05_Biodiversity.pdf. 2 U.S. Forest Service, Quick Facts, fs.fed.us/projects/four-threats/facts/open-space.shtml (accessed September 11, 2012). 3 Cornwall, W., Stormwater's Damage to Puget Sound Huge, Seattle Times (December 1, 2007) , seattletimes.com/html/localnews/2004045940_ecology01m.html (accessed September 14, 2012). Overview The Water Efficiency Section (EC) deals with water holistically, looking at indoor use, outdoor use, specialized applications and measurements. The section is based on an efficiency approach primarily to saving water. As a result, each prerequisite concerns water efficiency and the reduction of drinking water consumption itself. Subsequently, EC credits further recognise the use of unfit and alternative water sources. Conservation and creative reuse of water are important because only 3% of earth's water is fresh water, and of this, just over two-thirds are trapped in glaciers1. Typically, most of the building's water cycle flows through the building and then flows outside the plant as wastewater. In developed countries often comes from a public water system away from the construction site, and waste water leaving the site must be the plant, after which it is discharged into a distant body of water. This through system reduces the flow of stream in rivers and depletes freshwater aquifers, causing water tables to collapse and wells to dry. In 60% of Europe's cities, where more than 100,000 people live, groundwater is used faster than can be replenished2. In addition, the energy needed to process drinking water, transport it to and from a building and dispose of it is a significant amount of energy consumption that is not captured by the building's utility meter. Research in California shows that about 19% of all energy consumed in this U.S. state is consumed by water treatment and pumping3. In the United States, buildings account for 13.6% of drinking water consumption4, the third largest category, behind thermoelectric power and irrigation. Designers and builders can build green buildings that use far less water than conventional structures, using native landscapes that eliminate the need for irrigation, installing water-efficient facilities, and reusing wastewater for unpritable water. The Green Building Market Impact Report 2009 found that LEED projects were responsible for saving a total of 1.2 trillion gallons (4.54 trillion liters) of water5. LEED's EC credits encourage project teams to take every opportunity to significantly reduce their overall water consumption. Cross-cutting issues The EC category comprises three main elements: internal water (used by luminaires, equipment and processes such as cooling), irrigation water and water measurement. Depending on the specific water saving strategies, the project includes several types of documentation. Site plans. Plans are used to document the location and size of vegetated areas and the location of meters and submeters. In the building, floor plans show the location of equipment, equipment and equipment of process water (e.g. cooling towers, steam condensers), as well as internal submeters. The same documentation can be used for credits in the Sustainable Sites category. Fastening sheets. Projects must document their luminaires (and equipment, where applicable) by means of mounting sheets or manufacturers' literature. This documentation is used in the condition of reducing indoor water consumption and credit. Alternative water sources. A project that includes the reuse of grey water, rainwater collection, municipally supplied wastewater (purple tubular water), or other reused sources qualifies for credit in the EC Credit Outdoor Water Use Reduction, WE Credit Indoor Water Use Reduction, WE Credit Cooling Tower Water Use, and MY Credit Water Metering. However, the team cannot apply the same water to multiple credits unless the water source has sufficient to cover the need for all applications (e.g. irrigation plus toilet flushing). Occupancy calculations. The condition for reducing indoor water consumption and depending on how people are used. The Location and Transport and Sustainable Areas categories also benefit from project occupancy calculations. Review the occupancy section in the introduction to learn how people are classified and counted. See also: We Prerequisite Indoor Water Use Reduction for additional guidance specific to the WE section. Also see WE Prerequisite Indoor Water Use Reduction for additional guidance specific to the WE section. 1 U.S. Environmental Protection Agency, Water Trivia Facts, water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm (accessed September 12, 2012). 2 Statistics: Graphs & Maps, UN Water, (accessed July 9, 2014). 3 energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF. PDF 4 USGBC, Green Building Facts, . 5 Green Outlook 2011, Green Trends Driving Growth (McGraw-Hill Construction, 2010), aiacc.org/wp-content/uploads/2011/06/greenoutlook2011.pdf (accessed September 12, 2012). EA Review The Energy and Atmosphere (EA) category approaches energy from a holistic perspective, addressing energy efficiency reduction, energy-efficient design strategies and renewable energy sources. The current global mix of energy resources is heavily weighted towards oil, coal and natural gas1. In addition to greenhouse gas emissions, these resources are non-renewable: their quantities are limited or cannot be replaced as soon as they are consumed2. Although estimates of the remaining amount of these resources vary, it is clear that the current dependence on non-renewable energy sources is not sustainable and involves increasingly destructive extraction processes, uncertain supplies, rising market prices and vulnerability to national security threats. Buildings, which currently account for about 40% of the total energy consumed today3, contribute significantly to these problems. Energy efficiency in a green building begins with a focus on design that reduces overall energy demand, such as building orientation and glass selection, as well as the choice of climate-appropriate building materials. Strategies such as passive heating and cooling, natural ventilation and high-performance HVAC systems that work with intelligent controls further reduce energy consumption in the building. The production of energy from renewable sources on site or the purchase of green energy allows for the supply of part of the remaining energy consumption from non-fossil energy, which reduces the need for traditional sources. The start-up process is crucial to ensure high-performance buildings. Early involvement of the actuating authority helps prevent long-term maintenance and energy waste problems, whether the project meets the requirements and functions of the owner's project as intended. In an operationally efficient and efficient building, staff understand what systems are installed and how they function. Staff must be trained and open to learning new ways to optimize system performance so that efficient design is transferred to efficient performance. The EA category recognises that reducing fossil fuel consumption goes far beyond the walls of the building. Projects can contribute to increasing the efficiency of the electricity grid by enrolling in a demand response programme. Responding to demand allows utilities to call on buildings to reduce their electricity consumption during peak hours, reducing grid load and the need to operate more power plants, potentially avoiding the cost of building new power plants. Similarly, on-site renewable energy not only distances the market from dependence on fossil fuels, but can also be a reliable local source of electricity to avoid transmission losses and grid loads. The American Physical Society stated that if current and emerging cost-effective energy efficiency measures are applied to new buildings and existing buildings due to the mention of their heating, cooling, lighting and other equipment, the increase in energy demand in the construction sector could fall from a projected increase of 30% to zero by 2030. The EA section supports the objective of reducing energy demand through credits related to reducing consumption, designing for efficiency and complementing energy supply with renewable energy sources. 1 iea.org/publications/freepublications/publication/kwes.pdf 2 cnx.org/content/m16730/latest/ 3 unep.org/sbci/pdfs/SBCI-BCCSummary.pdf MR Overview The credit category Materials and resources (MR) focuses on minimising contained energy and other effects related to the extraction, processing, transport, maintenance and disposal of building materials. These requirements are intended to support a life-cycle approach that improves efficiency and promotes resource efficiency. Each requirement identifies a specific action that fits into the broader context of the life-cycle approach to the contained impact reduction. The construction and demolition waste hierarchy accounts for about 40% of the total solid waste stream in the United States and about 25% of the total waste stream in the European Union. In its solid waste hierarchy, the U.S. Environmental Protection Agency (EPA) ranks source reduction, reuse, recycling, and waste-to-energy treatment as the four preferred waste reduction strategies. The MR section refers directly to each of these recommended strategies. Source reduction comes at the top of the hierarchy as it avoids environmental damage throughout the material lifecycle, from supply chain and use to recycling and waste disposal. The reduction of sources encourages innovative construction strategies such as prefabrication and design of dimensional building materials, thus minimizing material cut-offs and inefficience. The reuse of buildings and materials is another because re-attaching existing materials avoids the environmental burden of the production process. Replacing existing materials with new materials would entail the production and transport of new materials, and it would take many years to balance the associated greenhouse gases by increasing building efficiency. LEED consistently rewards the reuse of materials. LEED v4 now offers greater flexibility and rewards all material reuse achieved by the project – both in situ, as part of the reuse strategy of the building and off site, as part of the rescue strategy. Recycling is the most common way to discharge waste from landfills. In conventional practice, most of the waste is landfilled, an increasingly unsustainable solution. In urban areas, the area of the landfill reaches capacity, which requires the conversion of more land elsewhere and an increase in the cost of transporting waste. Innovations in recycling technology improve sorting and processing to deliver raw materials to secondary markets, keeping these materials in the production stream longer. However, since secondary markets do not exist for every material, the next most beneficial use of waste is conversion to energy. Many countries reduce the burden on landfills by solving the treatment of waste into energy. In countries such as Sweden and Saudi Arabia, waste-to-energy facilities are much more frequent than landfills. When enforcing stringent air quality control measures, energy waste can be a viable alternative to fossil fuel extraction to generate energy. In total, LEED projects are responsible for diverting more than 80 million tonnes (72.6 million tonnes) of waste from landfills, and this volume is expected to increase to 540 million tonnes (489.9 million tonnes) by 2030. Between 2000 and 2011, LEED projects in Seattle diverted an average of 90 percent of construction waste from landfill, resulting in 175,000 tons (158,757.3 tons) of waste being diverted. If all newly built buildings had achieved the 90 percent diversion rate shown in 102 LEED projects in Seattle, the result would be staggering. Building debris is no longer waste, it is a resource. Life cycle assessment in LEED Through MR credits, LEED has ushered in a transformation of the construction products market, creating a cycle of consumer demand and the delivery of industry-preferred products. LEED design teams have created demand for increasingly sustainable products, and suppliers, designers and manufacturers are responding. From responsible wood to increased recycled content to bio-based materials, the increased supply of sustainable materials has been measurable in LEED history. Several MR credits reward the use of products, well meet certain criteria. However, it is difficult to compare two products that have different balanced attributes , for example, cabinet cabinets wheat husks originating all over the country and combined into resin compared to solid wood cabinets made of local wood. Life Cycle Assessment (LCA) provides a more comprehensive picture of materials and products, enabling project teams to make more informed decisions that will have greater overall environmental, human health and community benefits, while encouraging manufacturers to improve their products through innovation. LCA is a compilation and evaluation of inputs and products and the potential environmental impact of a product system throughout its life cycle. The entire life cycle of the product (or building) is investigated, processes and components identified, and their environmental impact assessed both upwards, from the point of production or extraction of raw materials, and at subsequent stages, including transport, use, maintenance and end of life. This approach is sometimes called from cradle to grave. Going even further, from cradle to cradle, it emphasizes recycling and reuse at the end of life, not disposal. In the 1960s, material assessment methods began with carbon accounting models. Since then, LCA standards and practices have been developed and improved. In Europe and several other parts of the world, manufacturers, regulators, specifiers and consumers use life-cycle information in many areas to improve product selection and environmental profiles. Until recently, however, there was a lack of data and tools to support LCA in the US. Now more and more manufacturers are ready to document and publicly disclose the environmental profiles of their products, and programs that help in this effort and help users understand the results are available. LEED aims to accelerate the use of LCA tools and LCA-based decision-making, thus stimulating market transformation and improving database quality. Recognising the limitations of the life-cycle approach to human health and the consequences of the raw material extraction ecosystem, LEED uses alternative complementary approaches to LCA in credits that address these topics. Cross-Cutting Issues Required Products and Materials The mr credit category range includes a building or part of a building that is being built or renovated. Parts of an existing building which are not part of a construction contract shall be excluded from the MR documentation, unless otherwise stated. For guidance on how to treat supplements, see minimum program requirements. Eligible products and exclusions The MR section refers to permanently installed construction products which, as defined by LEED, refer to products and materials which form or are attached to a building. Examples include structural and enclosure elements, installed finishes, frames, interior walls, cabinets and doors and roofs. Most of these materials belong to the Construction Specifications Institute (CSI) 2012 MasterFormat Divisions 3-10, 31 and 32. Some products covered by MR credits do not belong to these divisions. Furniture does not need to be included in credit calculations. However, if furniture is included in mr credit calculations, all furniture must be consistently included in all cost-based credits. In previous LEED versions, all mechanical, plumbing and electrical (MEP) equipment classified as CSI MasterFormat 11, 21-28 and other specialised departments have been excluded from MR credits. This allows flexibility in optional assessment of piping, pipe insulation, ducts, channel insulation, wires, plumbing, batteries, shower heads and lamp enclosures. If products or optional materials are included in cost-based credit calculations, such as option 2 for each credit disclosure and optimization of construction products, they must be consistently included in all cost-based credit calculations. In addition, if optional products and materials, such as option 1, are included in the product-based calculations for each disclosure and optimization credit for construction products, they do not need to be included in cost-based credit calculations. However, unlike furniture, if some of these products are included in the credit calculations, not all products of this type need to be included. Special equipment, such as elevators, escalators, process equipment and fire protection systems, is excluded from credit calculations. Products purchased for temporary use in the project, such as concrete formwork, are also excluded. For healthcare projects, MR Credit's range of furniture and medical equipment includes all freestanding furniture and medical equipment. Freestanding furniture contained in this credit cannot be counted in any credits for disclosing and optimizing construction products to avoid double counting. Permanently installed components, such as aeration and built-in mills, should be included in the disclosure and optimization credits of construction products, not in MR Credit furniture and medical furniture. Define a product with several credits in this category to calculate an achievement based on the number of products instead of the cost of the product. For these credits, a permanently installed construction product or product is defined by its function in the project. The product contains the physical components and services needed to operate the Function. If there are similar products in the specification, each contributes as a separate product. Here are some scenarios. Products that arrive at the design site ready for installation: metal pins, pins, and concrete masonry units are separate products. In the case of gypsum wall board, binder and primer are required for the product to work, so each component does not count as a separate product. Concrete is a single product because it usually arrives as a mixed product ready to pour. Products that arrive as an ingredient or ingredient used in a product assembled on site: Lumber for non-standard milling work. The components of the concrete mixture (admixtures, aggregate and cement) can be considered as separate products if they reach the site as separate products. Similar products of the same manufacturer with different preparations compared to similar products of the same manufacturer with aesthetic variations or reconfigurations: Paints with different gloss levels are separate products, because each type of paint is determined to perform a different function, such as water resistance. Different colors of the same paint are not separate products, because they serve the same function. Carpets of different stack heights are separate products because they are used for different types of walking. The same carpet of a different color is not a separate product. Desk chairs and side chairs from the same product line are different products because they serve different functions. Two side chairs differing only in aesthetic terms, such as the presence of weapons, are not different products. The determination of product costs and material costs includes all taxes and expenses related to the delivery of material to the project site incurred by the contractor, but does not include the costs of labor and equipment required for installation after the material has been delivered on site. To calculate the total cost of project materials, use the actual material cost or the default material cost. The actual cost of the materials. This is the cost of all materials used on the project site, excluding labor, but including supplies and taxes. The default cost of materials. An alternative way to determine the total cost of materials is to calculate 45% of the total construction costs. This default material cost can override the actual cost of most materials and products as specified above. If your design team includes optional products and materials, such as furniture and MEP elements, add the actual value of these items to the default value for all other products and materials. Location valuation factor Several credits in the MR section include a location valuation factor that increases the value of locally produced products and materials. The aim is to encourage the purchase of products that support the local economy. Products and materials that are mined, manufactured and purchased within 100 miles (160 kilometers) of the project are valued at 200% of their cost (i.e. the valuation factor is In order for a product to qualify for a location valuation factor, it must meet two conditions: conditions: (including distribution) of the product and its materials must be within this radius (Figure 1) and the product (or part of the assembled product) must meet at least one of the sustainability criteria (e.g. FSC certification, recycled content) specified in the loan. Products and materials that do not meet the location criteria but meet at least one of the sustainability criteria are valued at 100% of their cost (i.e. the valuation factor is 1). The distance must be measured as the crow flies, not by the actual travel distance. The purchase point is considered the location of the purchase transaction. For online transactions or other transactions that do not take place in person, the point of purchase is considered the distribution location of the product. For a valuation factor for the location of recovered and reused materials, see MR Credit Building Product Disclosure and Optimization - Raw Material Acquisition, Further Explanations, Material Reuse Considerations. Figure 1. Material radius example Specifying a team material contribution Many sustainability criteria in the MR category apply to the entire product, as is the case with product certificates and programs. However, some criteria apply only to parts of the product. The part of the product which contributes to the credit may be a percentage of the homogeneous material or a percentage of the eligible components which are mechanically or permanently fixed together. In both cases, the contributing value is based on weight. Examples of homogeneous materials include composite floors, ceiling tiles and a rubber wall base. Examples of assemblies (mechanically or permanently fixed together) include office chairs, removable partition walls, ready-made window assemblies, and doors. Calculate the value that contributes to credit compliance as a percentage, by weight of the material or component meeting the criteria, multiplied by the total cost of the product. product value ($) = Total cost per product ($) x (%) product component by weight x (%) sustainability criteria, Figure 2. In a sustainable way produced elements of the $500 office chair Table 1. Sample calculations for the $500 Office Chair EQ Overview Indoor Environmental Quality (EQ) category rewards decisions made by design teams about indoor air quality and thermal, visual and acoustic comfort. Green buildings with good quality indoor environment protect the health and comfort of the inhabitants of the building. High-quality indoor environments also increase productivity, reduce absenteeism, improve building value, and reduce the responsibility of designers and building owners1. This category covers countless design strategies and environmental factors – air quality, lighting, acoustic design, control of the environment — which affect the way people learn, work and live. The relationship between the internal environment the health and comfort of the inhabitants of the buildings is complicated and still not fully understood. Local customs and expectations, residents' activities and building area, design and construction are just some of the variables that make it difficult to determine and measure the direct impact of a building on its inhabitants2. Therefore, the EQ section balances the need for prescriptive measures with more performance-oriented credit requirements. For example, source control is addressed first, in a preliminary state, and then later determines the indoor air quality assessment to measure the actual outcome of these strategies. The EQ category combines traditional approaches, such as ventilation and thermal control, with emerging design strategies, including a holistic approach based on emissions (credit for low-emission materials), source control and monitoring of user-defined pollutants (Enhanced Indoor Air Quality Strategies credit), lighting quality requirements (interior lighting credit), and advanced lighting indicators (daylight credit). The new acoustics credit is now available for all projects using the BD +C. 1 U.S. Environmental Protection Agency, Health Buildings Healthy People: A Vision for the 21st Century, epa.gov/iaq/pubs/hbhp.html (October 2001) (accessed July 25, 2013). 2 Mitchell, Clifford S., Junfeng Zhang, Torben Sigsgaard, Matti Jantunen, Palu J. Lioy, Robert Samson and Meryl H. Charles, Current state of science: Health effects and quality of the internal environment, environmental health perspectives 115(6) (June 2007). Cross-Cutting Problems Floor Surface Calculations and Floor Plans For multiple credits in the EQ category, compliance is based on a percentage of the area that meets credit requirements. In general, floor areas and space categorisation should be consistent in EQ credits. Any excluded spaces or discrepancies in the values of the floor area should be clarified and highlighted in the documentation. See Space Categorization, below, for additional information on which surfaces should be included in which credits. Space Characteristics category Category EQ focuses on the interaction between the inhabitants of the building and the rooms where they spend their time. For this reason, it is important to determine which spaces are used by residents, including visitors (transition states) and what activities they perform in each space. Depending on the categorisation of the space, credit requirements may or may not apply (Table 1). Occupied compared to unoccupied space All spaces in the building must be classified as occupied or occupied. Occupied spaces are enclosed areas intended for the activities of Free spaces are places intended primarily for other purposes; they are occupied only occasionally and for a short time — in other words, they are inactive areas. Examples of space space are usually uncommitted include the following: Mechanical and electrical rooms Outgoing stairs or dedicated emergency exit corridor Cabinets in the residence (but the dressing room is occupied) The floor area of the data center, including raised floor area Inactive storage area in the warehouse or distribution center For areas with equipment recovery space is not occupied only if the download is sporadic. On a regular basis, compared to non-regulatory spaces, occupied spaces are further classified as regularly occupied or irregularly occupied, depending on the duration of occupancy. Regularly occupied spaces are enclosed areas where people usually spend time, defined as on average more than one hour of continuous occupancy per person per day; people can sit or stand while working, studying or performing other activities. For rooms that are not used daily, the classification should be based on the time that a typical passenger spends in space when in use. For example, a computer workstation can be largely free for an entire month, but when busy, an employee spends one to five hours there. This would then be considered to be regularly occupied, as this time is sufficient to affect a person's well-being, and he or she would expect thermal comfort and control over the environment. Occupied spaces which do not meet the definition of regularly occupied shall be inregulationally occupied; these are areas through which people pass or areas used on average less than one hour per person per day. Examples of regularly occupied seats are as follows: Hangar aircraft Hospital operating room Private office Auditorium Hospital patient room Reception Auto service bay Hospital recovery area Residential teller station Hospital staff room Dining room Conference room Conference room Surgical hospital Apartment Kitchen Kitchen Correctional cell facility or living room Hospital lounge Room Living room network date center operating center diagnostic center and treatment area Residential offices , den, work Data center security center operations center hospital center laboratory Retail area of goods and related circulation Room in dorm Hospital nursing station Retail sales area Exhibition Exhibition hall Demonstration room Hospital solarium School class staff hospital waiting room Hospital medical center Staff workstation Hotel reception Hotel student activity room Food service dining area Hotel guest room Study hall Food service facility kitchen area Hotel housekeeping area Shipping and receiving office Gymnasium Hotel study lobby carrel Hospital autopsy and and morgue Information Office Magazine materials-handling area Hospital care area Room Hospital room hospital dialysis and infusion area Natatorium Hospital examination room Conference room Open-office workstation Examples of irregularly occupied occupied include the following: Break room Space circulation Room Copy apparatus Corridor Fire station bay Hospital linen area Medical hospital area Hospital patient room bathroom Hospital short-term charts space Hospital prep and cleaning area in surgical suite Lobby interrogation room (except hotel lobby)* Cloakroom Bathroom residential laundry room Residential dressing room Toilet Area furnishings Retail warehouse shooting range Stairway Stairway