



# **Learning Hub @ GBRI**

## **Presents**

# CONNECTING THE DOTS FROM SYSTEMS THINKING TO SUSTAINABILITY: AN INTRODUCTION TO **INTEGRATIVE PROCESS** IN LEED





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## BACKGROUND

An integrative process represents a holistic approach to building systems and equipment, emphasizing collaboration and synergy. By closely examining the interconnections among systems and components, project team members seek mutual advantages that contribute to elevated building performance, human comfort, and environmental benefits. The Integrative Process is a key tool in sustainable design, enabling a multi-disciplinary approach that considers the long-term impact of design decisions.

Before we proceed to explore the details of the Integrative Process within the LEED framework, it's crucial to begin with an understanding of Systems Thinking. This concept is fundamental to the Integrative Process. Sustainability is all about designing and operating systems that can both survive and thrive over time. To understand sustainable systems, we need a solid grasp of what systems thinking entails.

If you're interested in a deeper dive into this topic, we encourage you to explore GBRI's course on systems thinking, called 'The Art of Systems Thinking: Holistic Pathways to Sustainability & Social Impact.'

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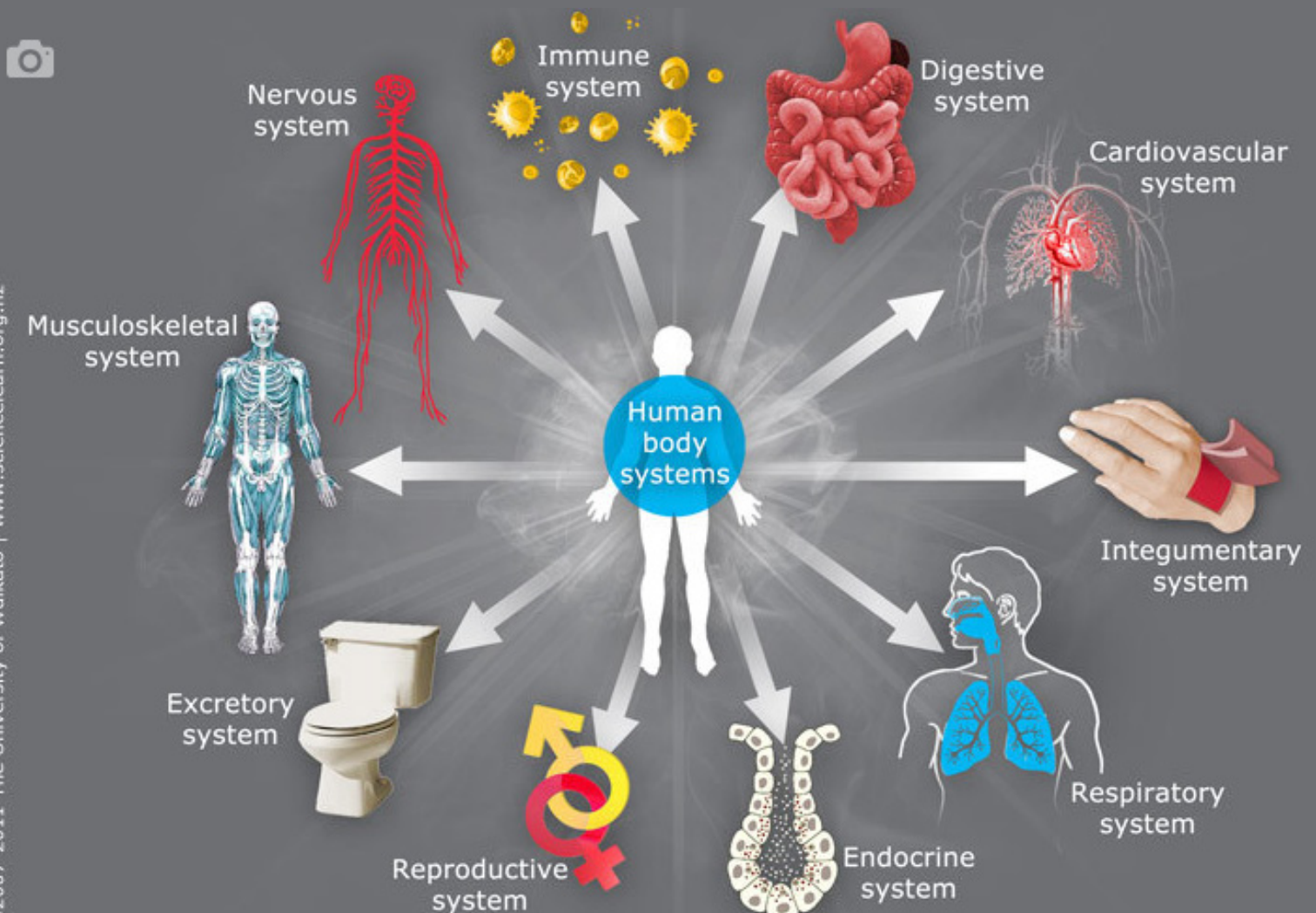


# WHAT IS SYSTEMS THINKING?

Systems thinking is a mindset or approach that perceives the world as a compilation of interconnected systems rather than isolated entities. This perspective involves understanding and analyzing how various components within a system interact and influence each other, as well as how the system functions as a whole. It recognizes that individual elements within a system are interdependent, and that changes in one part can generate ripple effects throughout the entire system.

Examples of systems can span from microscopic bacteria to the expansive universe. A classic example of a system is our human body. Each organ in the human body functions as a separate component, performing its unique tasks. Yet all organs work together, interacting and influencing each other, to maintain overall health and homeostasis. The human body is an excellent example of a system in itself, composed of numerous subsystems that all interact with one another.

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Systems thinking embodies a comprehensive perspective, much like how our human senses interact with our brain. Take the sense of sight, for instance. When we visually perceive something, the information isn't confined to our eyes. Instead, the eyes relay this information to the brain, which processes the input and triggers appropriate reactions throughout our body. These reactions can range from the sense of calm and pleasure we feel when viewing a beautiful flower or a stunning sunset, to the adrenaline rush prompted by a perceived threat. The body reacts as a unified whole, displaying the interconnectedness inherent in systems thinking.

This holistic perspective, recognizing and embracing the interconnectedness and interdependencies of parts within a larger system, forms the foundation for our exploration of the integrative process in green buildings.

Systems thinking encourages holistic and comprehensive thinking, focusing on the larger picture rather than isolated parts. It serves as a pivotal concept that resonates not only in biology and medicine but also in fields like sustainability and design.



## CHAPTER 1-

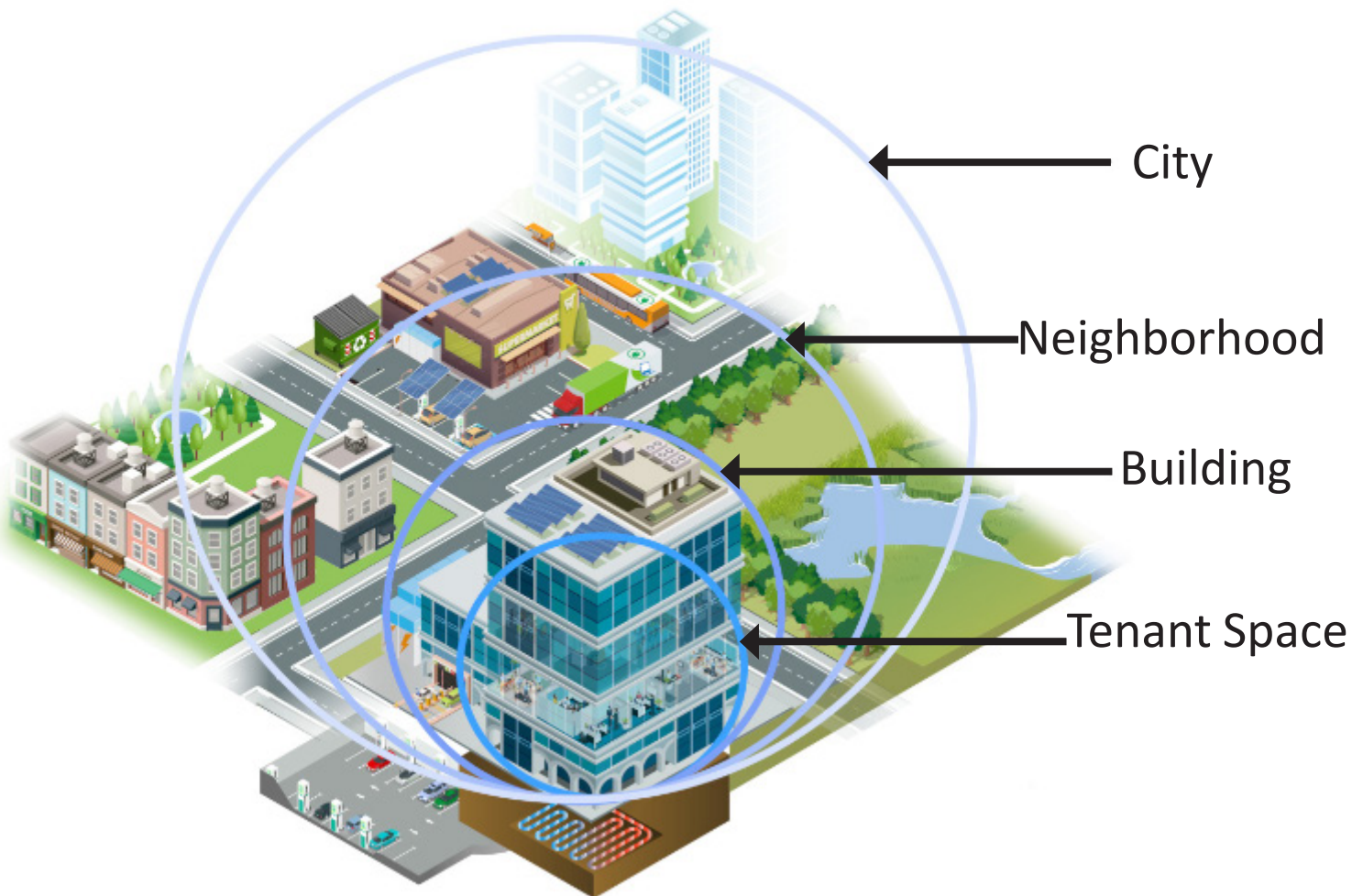
# UNDERSTANDING SYSTEMS THINKING IN THE GREEN BUILDING CONTEXT

In the context of systems thinking, we perceive the built environment as an intricate web of relationships, where each part impacts numerous others. The elements within these systems encompass materials, resources, energy, people, and information. The complexity arises from the interactions and exchanges occurring between these elements, across space and through time. Remember that your project is not an isolated entity. It is nested within larger systems, forming a network of mutual dependencies.

For instance, refer to the graphic below. The information and associated insights have been derived from the U.S. General Services Administration's (GSA) Sustainable Facilities Tool.

A tenant space is part of a larger building, a building is part of its surrounding neighborhood and a neighborhood is integrated into larger systems such as its watershed, air shed, tree canopy, and the broader city.

Consider these larger systems during the design process. This holistic perspective can guide you towards optimal solutions that not only benefit your project, but also enhance its surrounding systems.





# SYSTEMS THINKING & LIFE CYCLE APPROACH

The concept of green building necessitates a life-cycle approach, involving a thorough examination of every stage of a project, product, or service. Where will they go once their useful life ends? What effects do they have on the world along the way? Questions such as these encourage practitioners to ensure that buildings are adaptable and resilient and perform as expected while minimizing harmful consequences.

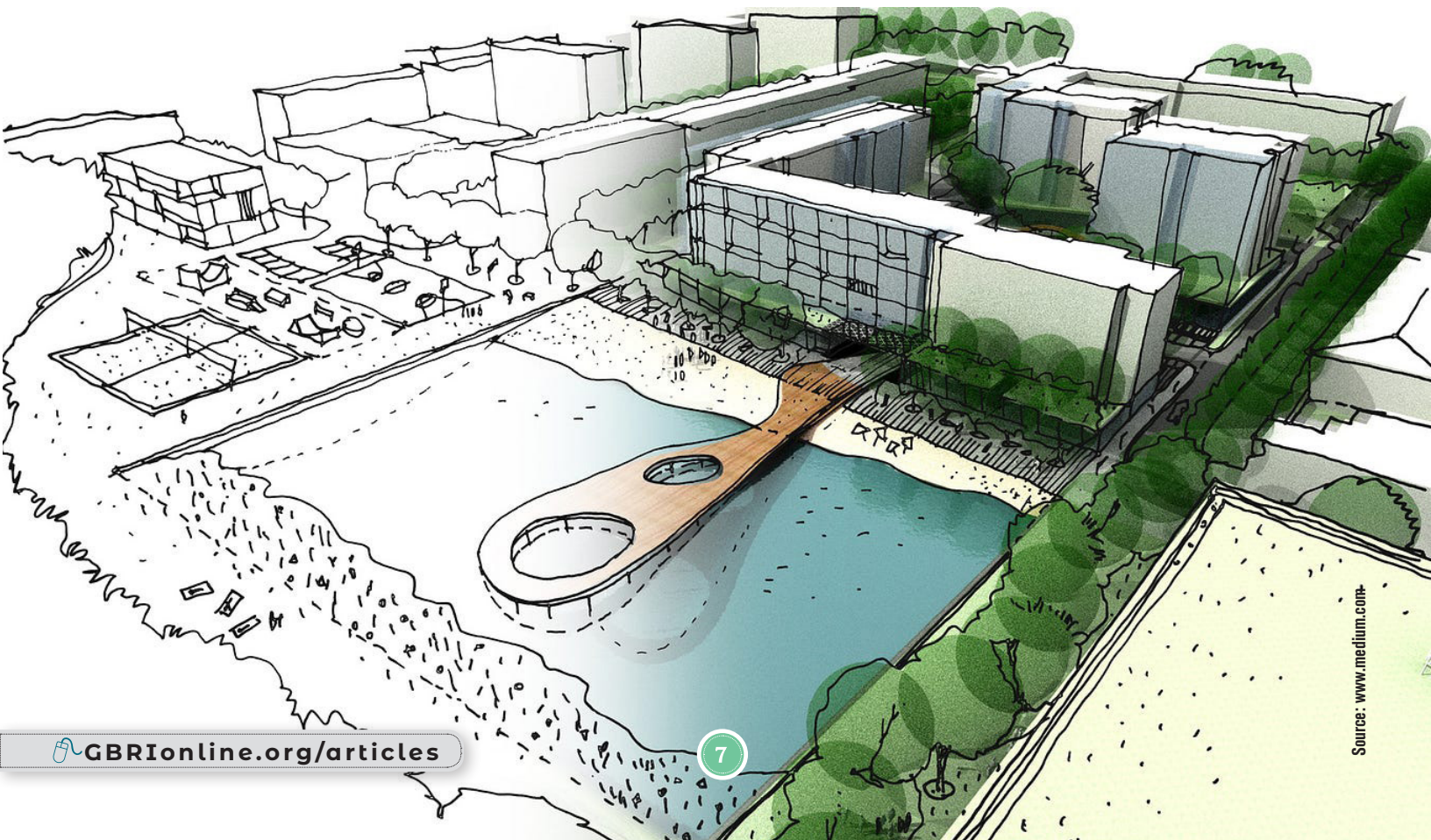
*Keep in mind that the goal of systems thinking in green building is to create buildings that are not just collections of individual sustainable features, but function as integrated, whole systems.*

The life cycle approach, within the context of systems thinking, refers to the comprehensive consideration of a product, project, or service throughout its entire life cycle. It involves evaluating the environmental, social, and economic impacts associated with each stage of the life cycle, from resource extraction and manufacturing to use, maintenance, and disposal. By adopting a life cycle approach, practitioners can assess the sustainability performance of a system holistically and make informed decisions to minimize negative impacts and optimize resource efficiency. It recognizes the interconnectedness of various stages and components within a system and aims to identify opportunities for improvement and innovation at each stage to achieve overall sustainability goals.

Keep in mind that the goal of systems thinking in green building is to create buildings that are not just collections of individual sustainable features, but function as integrated, whole systems.

Finally, to achieve results that are based on whole systems across their entire life-cycle, building professionals must adopt an integrative process.

The concept of Integrative Process is integral to the development and sustainability of green buildings, and the idea of Systems Thinking plays a vital role in facilitating this approach.





## CHAPTER 2 -

# INTEGRATIVE PROCESS

The Integrative Process is an approach that emphasizes the collaboration and interconnectivity of different disciplines and stakeholders involved in a project. Unlike traditional linear processes where each stage of a project is handled in isolation, the Integrative Process seeks to engage all parties from the beginning and throughout the entire lifecycle of the project. This promotes open communication, synergy, creativity, and optimization, resulting in more effective and sustainable outcomes.

**Inefficiencies Surrounding Linear Planning and Design Processes:** Traditional planning and design processes can be inefficient because they often involve a sequential or linear approach in which one step follows another in a predetermined order. This can lead to missed opportunities for synergy and integration, and can result in designs that fail to take full advantage of potential efficiencies. In contrast, an integrative design process, which is a key component of LEED, emphasizes collaboration and interaction among all project team members from the beginning, leading to more efficient, effective, and sustainable outcomes.

This holistic approach underscores the importance of connectivity and communication among professionals and stakeholders throughout a project's lifecycle. It advocates for the dissolution of disciplinary boundaries and challenges linear planning and design processes, which could potentially yield inefficient solutions. While the phrase 'integrative design' is primarily associated with new construction or renovation projects, the integrative process is pertinent to any phase in a building's life cycle.

## TRADITIONAL DESIGN PROCESS



## INTEGRATED DESIGN PROCESS



## SUSTAINABILITY CHARRETTES

A charrette, derived from the French term for "cart" or "chariot", is an intensive design and planning session where stakeholders and experts collaborate on a visual solution or design for a specific issue. The term originated from the École des Beaux-Arts in Paris during the 19th century, where architectural students would work right up until a deadline, at which point a cart, or "charrette," would be wheeled around to collect their models and drawings. It's said that students would often even continue working on their submissions in the cart, thus the phrase "working en charrette" came to mean working feverishly to meet a deadline.

In the context of sustainable design and planning, a charrette is a collaborative session that brings together all stakeholders - owners, architects, designers, engineers, contractors, facility managers, and sometimes even community members - to brainstorm and strategize about the project's goals and objectives, including those related to sustainability and green building practices. This process encourages active participation and information exchange among all attendees, fostering a shared understanding and ownership of the project's sustainability targets.



## Stock Photo - Charrette in Action: Collaborative Sustainability Planning Sessions

*It's a particularly effective tool for complex, multidisciplinary projects like those seeking LEED certification, as it allows for the exploration of synergies among design strategies and the development of integrated, holistic solutions.*

While traditionally seen as a single session or workshop, the concept of the charrette has evolved and can now refer to an ongoing process of collaborative design and decision-making that occurs throughout the project lifecycle. This approach can help foster creativity, ensure alignment among the team, expedite decision-making, and increase the likelihood of project success. It's a particularly effective tool for complex, multidisciplinary projects like those seeking LEED certification, as it allows for the exploration of synergies among design strategies and the development of integrated, holistic solutions.

# INTEGRATIVE PROCESS THROUGH THE LENS OF SYSTEMS THINKING

In summary, here's how Systems Thinking aligns with the Integrative Process:

## 1. Holistic View

Systems Thinking and Integrative Process both advocate for a holistic approach. Where Systems Thinking recognizes the interconnectedness of various components within a system, the Integrative Process acknowledges the interdependence of different stakeholders, disciplines, and stages in a project. By seeing the whole system rather than individual parts, it enables the identification of synergies, efficiencies, and innovative solutions.

## 2. Collaboration and Communication

The Integrative Process breaks down disciplinary boundaries and encourages constant communication between team members. Systems Thinking's focus on relationships and interactions supports this, encouraging a deeper understanding of how different elements influence one another. This understanding facilitates more effective collaboration and a unified vision.

## 3. Iterative Decision Making

Both Systems Thinking and the Integrative Process embrace iterative patterns. In Systems Thinking, continuous assessment of the system leads to ongoing improvements. In the Integrative Process, the iterative nature allows for constant refining and adaptation, ensuring that the project remains aligned with its sustainability goals. It allows for agility in responding to new insights or changes.

## 4. Sustainability Charrettes and Real-time Feedback

As mentioned previously, charrettes are intensive collaborative sessions involving all stakeholders. In the context of Systems Thinking, these charrettes act as real-time feedback mechanisms where different components of the system (stakeholders, goals, strategies) are continuously evaluated and adjusted. This adaptive process ensures that the project is dynamically responsive to various challenges and opportunities, enhancing overall sustainability.

## 5. Optimization of Resources

The Integrative Process emphasizes optimal resource efficiency, aligning with the Life Cycle Approach. Systems Thinking helps to identify leverage points and bottlenecks within the system, allowing for targeted interventions that can lead to significant positive changes. This approach supports the wise utilization of resources, minimizing waste, and enhancing sustainability.

Before we delve further into the integrative process prerequisites under LEED, it's essential to familiarize ourselves with certain key terminologies that play a critical role in this approach:

## OWNER'S PROJECT REQUIREMENTS (OPR)

A written document that details the ideas, concepts, and criteria determined by the owner to be important to the success of the project. It sets the vision and expectations for the project's performance, functionality, and sustainability goals. The OPR is essentially the owner's vision for the project. It outlines their expectations, goals, functionality, performance requirements, sustainability objectives, and any constraints that must be considered. This document defines what the owner expects the project to achieve.



## BASIS OF DESIGN (BOD)

Basis of Design (BOD) is the information necessary to accomplish the owner's project requirements, including system descriptions, indoor environmental quality criteria, design assumptions, and references to applicable codes, standards, regulations, and guidelines. It serves as the designer's response to the OPR.

## CHARRETTE

An intensive, multiparty workshop that brings people from different disciplines and backgrounds together to explore, generate, and collaboratively produce design options.

## SIMPLE BOX ENERGY MODELING ANALYSIS

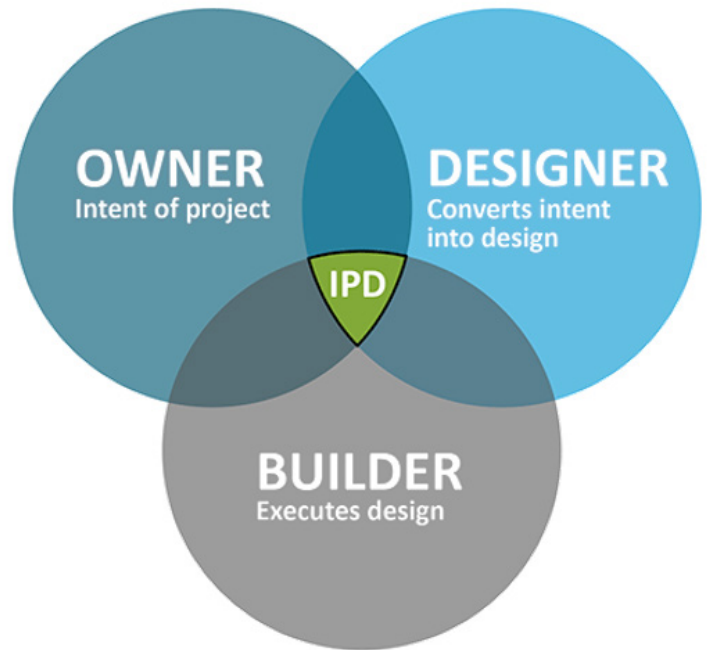
A straightforward base case energy analysis that informs the team about the building's likely distribution of energy consumption and is used to evaluate potential project energy strategies. It serves as a valuable tool for evaluating potential project energy strategies and promoting energy-efficient design in alignment with the integrative process.

## WATER BUDGET

The water budget represents a project-specific method for calculating the building's water requirements, both inside and outside, including process and makeup water demands. By taking into account on-site supplies such as estimated rainfall, it allows the team to plan and implement sustainable water management practices. The budget is usually associated with specific time frames (e.g., a week, month, or year) and quantities of water (e.g., kgal, or liters).

## COMMISSIONING (CX)

Commissioning is the process of verifying and documenting that the building systems and components are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements (OPR). It is conducted by a Commissioning Authority (CxA), who engages with the project team throughout all stages of the project. The commissioning process begins during the pre-design phase, where the OPR and BOD are established, and continues through design, construction, and into occupancy.

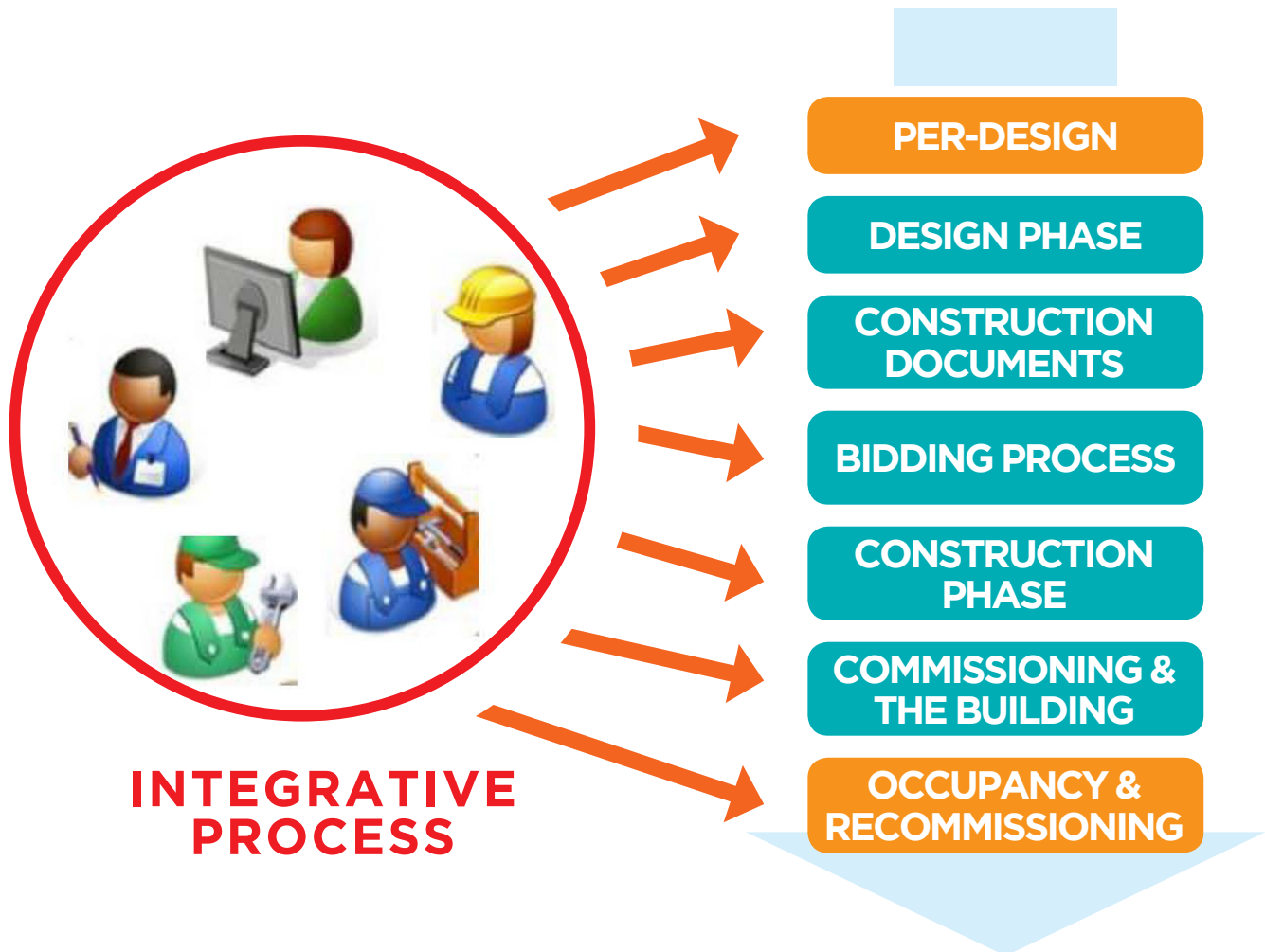


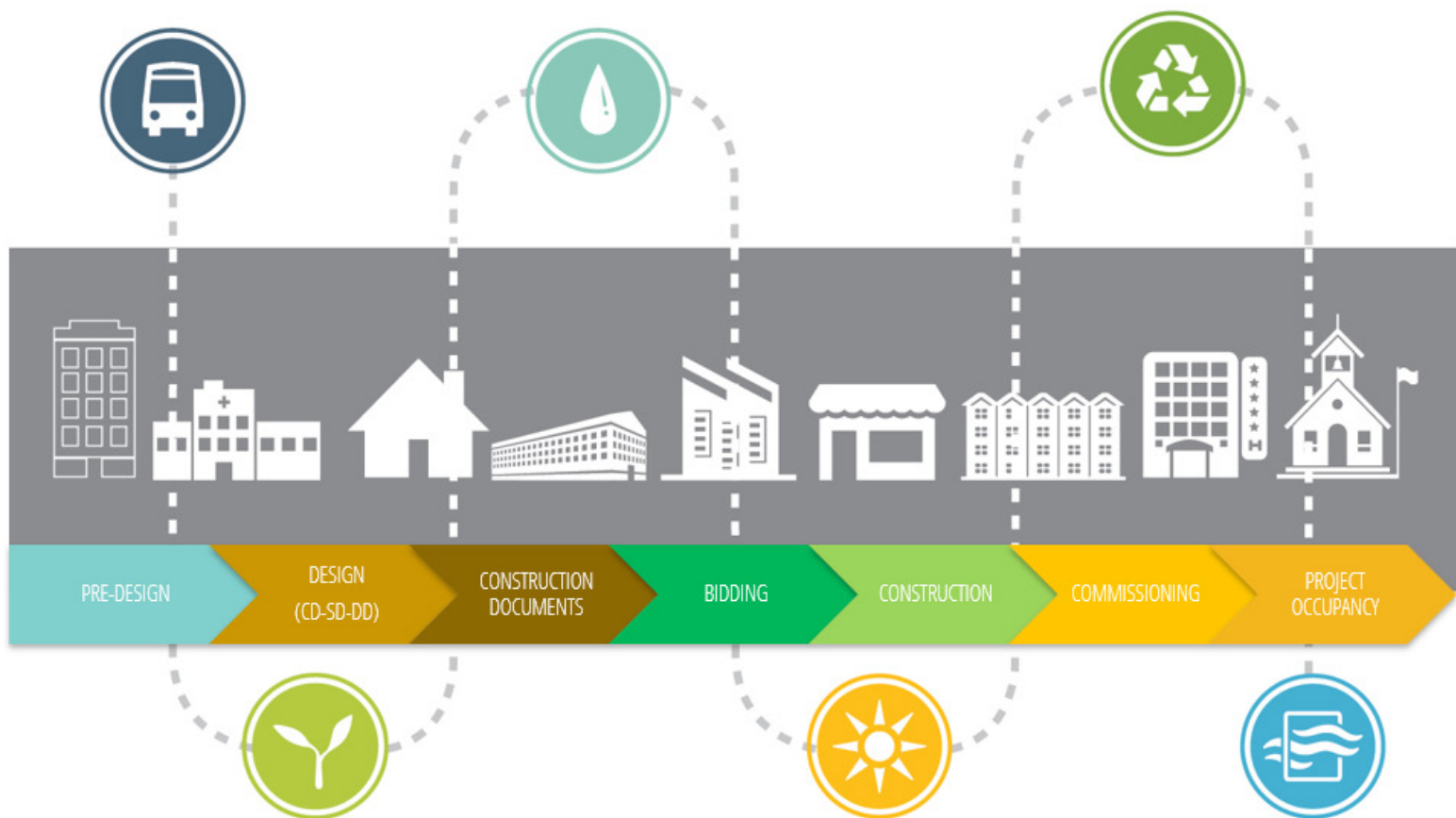
## CHAPTER 3

# INTEGRATIVE PROCESS UNDER LEED V4.1

In LEED v4.1, the Integrative Process has been embraced across various rating systems, including LEED BD+C (Building Design + Construction), LEED ID+C (Interior Design + Construction), and LEED Cities and LEED Communities. It is a pilot credit under LEED O+M rating system. This adoption underscores the significance of a holistic and collaborative approach in advancing sustainability goals.

The Integrative Process was initially introduced in the LEED v3 2009 pilot program under the Integrated Project Delivery method. The phases of the Integrative Process follow a familiar progression but with the added emphasis on collaboration among multiple disciplines during the early stages of design inception and schematic planning. For a LEED project, the integrative process should ideally be integrated throughout the entire project life cycle, starting from pre-design all the way through design, construction documents, bidding process, construction phase, commissioning, and project occupancy.





The Integrative Process is embedded throughout the LEED rating system, rewarding project teams for their collaborative approach and integration of sustainability principles across all credit categories.

## INTEGRATIVE PROCESS TEAM

Over the duration of the design and construction process, several parties are involved, making decisions and affecting the project in different ways.

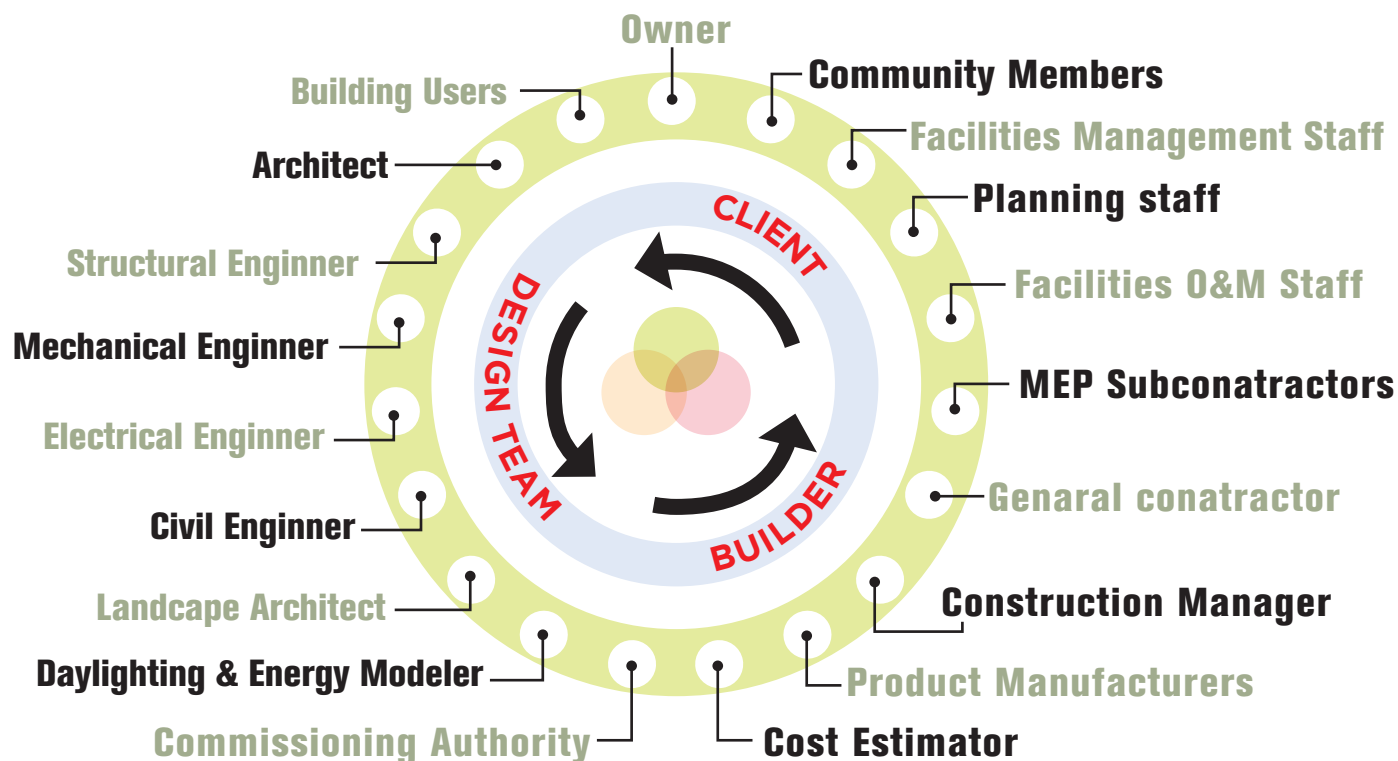
In an integrative process, it is crucial to involve a larger and diverse set of team members from the beginning stages of a project. This includes the client or clients, designers, architects, engineers, builders, project managers, construction managers, landscape designers, interior designers, building users, and other relevant stakeholders. It is common for project teams to have meetings and discussions without ever meeting the actual users of the building. However, the input and understanding of the building users' needs, daily routines, and usage patterns are essential in informing the design process.

Another key stakeholder in the integrative process is the building operational manager or facility manager. Their insights and expertise are valuable in shaping the design and ensuring efficient operation and maintenance of the building.

It's important to note that there is no definitive answer to who should be included in the integrative process. The composition of the team depends on the project, the project culture, the client's requirements, and the initial group of professionals involved. Flexibility is key in determining the appropriate stakeholders to bring to the table.

The diagram emphasizes the collaborative nature of the integrative process. It illustrates the need to bring together the client, design team, builder, and various disciplines, showing that it is not a linear process. Identifying the right professionals to involve at each stage is crucial for effective collaboration and integration.





Now that we have a very good understanding of the integrative process, let's look at LEED Prerequisites and Credits directly related to integrative process.

In LEED v4 and v4.1, the integrative process does not have its own credit category. Instead, it relates to all credit categories and is considered a foundational element.

In the context of LEED, there is a distinction between prerequisites and credits. For the Integrative Process, there is only one prerequisite, which is specifically applicable to Healthcare projects. On the other hand, the corresponding credit is available to all project types, reflecting the universal importance of the integrative process in sustainable building design and construction.

Let us now explore in detail the prerequisite titled 'Integrative Project Planning and Design,' specifically tailored for Healthcare Projects.

## INTEGRATIVE PROJECT PLANNING & DESIGN (APPLICABLE TO HEALTHCARE PROJECTS)

This prerequisite emphasizes the critical importance of maximizing opportunities for integrating green design and construction strategies, with a particular focus on human health. The intent of this prerequisite is to maximize the opportunities for integrating cost-effective green design and construction strategies while emphasizing human health as a fundamental evaluative criterion for building design, construction, and operational strategies. The aim is to utilize innovative approaches and techniques for green design and construction in healthcare facilities.

**OWNER'S PROJECT REQUIREMENTS DOCUMENT (OPR)**

**PRELIMINARY RATING GOALS**

**INTERRELATED PROJECT TEAM**

**DESIGN CHARRETTE**

To fulfill the intent, healthcare projects must adhere to four key requirements:

1. Develop a health mission statement and incorporate it in the Owner's Project Requirements (OPR) document.
2. Create preliminary rating goals (preferably before schematic design) and develop a LEED® action plan.
3. The project shall assemble an integrated project team.
4. Conduct a minimum four-hour integrated design charrette.

Let's look at each of them.

During the preliminary stages of a healthcare project, it is important for healthcare projects to conduct a LEED meeting with a minimum of four key project team members. This meeting should take place as early as practical, preferably before the schematic design phase. The purpose of this meeting is to create a LEED action plan that outlines the project's goals and strategies for pursuing LEED certification.

As part of the LEED action plan, the following steps should be taken:

- Determine the desired level of LEED certification to pursue, which can be Certified, Silver, Gold, or Platinum. This decision should align with the project's sustainability objectives and aspirations.
- Select the specific LEED credits that will be targeted to meet the desired certification level. These credits should be carefully chosen based on their relevance to the project and their potential to contribute to the overall sustainability performance.
- Identify the responsible parties who will ensure that the requirements of each LEED prerequisite and selected credit are met. This includes assigning roles and responsibilities to team members who will be accountable for implementing and documenting the necessary strategies and measures.
- By conducting a preliminary LEED meeting and developing a clear action plan, healthcare projects can establish a roadmap for achieving

*To foster collaboration and generate innovative ideas, healthcare projects pursuing LEED certification should conduct an integrated design charrette. The charrette should be scheduled as early as possible in the design process, preferably before schematic design.*

their desired LEED certification level. This process ensures early collaboration, sets clear goals, and assigns responsibilities, promoting a comprehensive and integrated approach to sustainable design and construction.

To promote collaboration and interdisciplinary decision-making, healthcare projects pursuing LEED certification should assemble an integrated project team. The team should consist of a minimum of four professionals, in addition to the owner or owner's representative. While it may not be feasible to include all of these professionals, the goal is to involve as many of them as possible:

To foster collaboration and generate innovative ideas, healthcare projects pursuing LEED certification should conduct an integrated design charrette. The charrette should be scheduled as early as possible in the design process, preferably before schematic design.

To fulfill the documentation requirements for the Integrative Project Planning and Design prerequisite, healthcare projects pursuing LEED certification must provide a narrative explaining how the health mission statement address credit requirements and an action plan from the preliminary ratings goals meeting. This is the LEED action plan we talked about few minutes ago. These documentation requirements serve as evidence of the project's commitment to an integrated and sustainable design approach. They demonstrate that the project team has actively engaged in collaborative decision-making processes and has incorporated green design and construction strategies from the early stages of the project.

# INTEGRATIVE PROCESS CREDIT

The Integrative Process credit is worth 1 point for all projects except healthcare and hospitality projects under the BD+C Rating System, 2 points under ID+C Rating system, and 1 point under O+M Rating System under the innovation category as a pilot credit. Healthcare and hospitality projects under BD+C Rating System can earn up to 5 points for implementing the credit integrative process.

The intent of this credit is to support high-performance, cost-effective, and equitable project outcomes by conducting an early analysis of the interrelationships among different building systems.

**An integrative process comprises three phases. The first discovery—is also the most important and can be seen as an expansion of what is conventionally called predesign. Actions taken during discovery are essential to achieving a project’s environmental goals cost-effectively. The second phase, design and construction, begins with what is conventionally called schematic design. Unlike its conventional counterpart, however, in the integrative process, design will incorporate all of the collective understandings of system interactions that were found during discovery. The third phase is the period of occupancy, operations, and performance feedback. Here, the integrative process measures performance and sets up feedback mechanisms. Feedback is critical to determining success in achieving performance targets, informing building operations, and taking corrective actions when targets are missed. A fully integrative process accounts for the interactions among all building and site systems; this credit serves as an introduction, rewarding project teams that apply an integrative approach to energy and water systems.**

The Integrative Process credit in LEED v4.1 has undergone several changes compared to LEED v4. These changes include:

**Clarification of EA Credit Performance Targets:** In LEED v4.1, the performance targets for Energy and Atmosphere (EA) credits, which were previously established in the schematic design phase, are now specifically mentioned in the Integrative Process

credit.

**Updated Documentation Requirement:** The documentation requirement for the Integrative Process credit has been updated from a worksheet to a project team letter.

**Exemplary Performance Options:** LEED v4.1 has introduced exemplary performance options for the Integrative Process credit. These options allow project teams to earn additional recognition by demonstrating exceptional performance in specific areas such as site selection, social equity (BD+C and ID+C), health and well-being, and assessment for resilience. This encourages project teams to go above and beyond the basic requirements of the credit and incorporate innovative strategies to achieve greater sustainability and positive social impacts.

The updated version of the Integrative Process credit in LEED v4.1 emphasizes the importance of documenting the integrative design process and the decision-making involved. The project team is now required to submit a project team letter that outlines the nature of the process, the understanding of system relationships, and the resulting decisions made by all team members.

This documentation enables project teams to clearly demonstrate how the integrative approach differs from the standard approach, particularly in key areas such as energy and water.

Beginning in pre-design and continuing throughout the design phases, project teams should identify and use opportunities to achieve synergies across disciplines and building systems. Use the analyses to inform the owner’s project requirements (OPR), basis of design (BOD), design documents, and construction documents.

Under LEED v4.1, several new elements have been introduced to enhance the integrative process. These elements include site selection, social equity, and health and well-being. These additions reflect the evolving priorities in green building design and construction, highlighting the importance of considering the environmental impact of site selection, promoting equity and inclusivity in communities, and prioritizing the health and well-being of building occupants.



By incorporating these elements into the integrative process, project teams can address a broader range of sustainability factors and create buildings that positively impact both the environment and the people who inhabit them.

Let's look at each of these starting with Energy-Related systems.

For energy-related systems, it is crucial to establish an energy performance target during the schematic design phase. This target should be determined using one of the specified metrics, which include site energy use, source energy use, greenhouse gas emissions, or energy cost. By setting clear performance targets, project teams can effectively measure and improve the energy efficiency of their buildings.

Before completing the schematic design, it is important to conduct a preliminary "simple box" energy modeling analysis. This analysis aims to explore ways to reduce energy loads in the building and achieve sustainability goals by challenging default assumptions. The analysis should assess various strategies related to site conditions, massing and orientation, basic envelope attributes, lighting levels, thermal comfort ranges, plug and process load needs, and programmatic and operational parameters. This comprehensive assessment will help identify opportunities to optimize energy efficiency, improve thermal comfort, and reduce overall energy consumption in the building.

Similarly, before completing the schematic design, it is important to conduct a preliminary water budget analysis. This analysis aims to explore ways to reduce the use of potable water in the building, lessen the reliance on municipal water supply and wastewater treatment systems, and achieve sustainability goals. The analysis should assess and estimate the project's potential nonpotable water supply sources and water demand volumes. This includes evaluating indoor water demand, outdoor water demand for landscape irrigation, process water demand for

equipment such as kitchens and cooling towers, and potential nonpotable water supply sources like rainwater, graywater, and HVAC equipment condensate. By analyzing these factors, the project team can identify opportunities to reduce potable water loads and incorporate nonpotable water sources to meet water demand requirements.

***For energy-related systems, it is crucial to establish an energy performance target during the schematic design phase. This target should be determined using one of the specified metrics, which include site energy use, source energy use, greenhouse gas emissions, or energy cost.***

During the site selection process, it is crucial to analyze project goals and identify the optimal building site or base building that offers the most opportunities and fewest barriers for the project. This analysis should consider at least two potential locations or base building options, taking into account various factors. These factors include assessing the building site attributes, such as location and site design characteristics. Additionally, it is important to evaluate transportation options and ensure convenient access to alternative transportation for tenant occupants' commuting needs. The analysis should also consider occupant and community well-being, including factors like daylight and views, indoor air quality, and other indoor environmental quality characteristics. Furthermore, identifying community assets and evaluating the proximity of vulnerable populations surrounding the project is essential. The project should strive to provide positive social, economic, and environmental benefits to the existing community members while minimizing any potential negative impacts.



# SOCIAL EQUITY IS ANOTHER NEW ELEMENT ADDED UNDER LEED V4.1

During the pre-design and design phases, it is important to review and complete the LEED Project Team Checklist for Social Impact. This checklist aims to assess and select strategies that address issues of inequity within the project and its community, team, and supply chain. Through research and consultation with key stakeholders, the checklist should be thoroughly evaluated, and responses should be documented as either "Yes" or "No" for each item. It is essential to complete all sections for Stakeholders and Goals, ensuring that the project team is actively addressing social impact considerations and striving to create an equitable and inclusive environment.

In the early stages of the project, during pre-design and throughout the design phases, it is important to establish health goals that prioritize the well-being of key stakeholders. These stakeholders include building occupants and users, the surrounding community, and the supply chain involved in the project. The health goals should be specific, measurable, and aligned with promoting a healthy environment for these groups.

Projects should develop a statement of health goals for each population, including a summary of how this health goal relates to the highest priority health need for each population. Projects shall prioritize design strategies by selecting specific design and/or programming strategies to address the project's health goals. This could be accomplished by holding a stand-alone "health charrette" or by integrating health considerations into an existing green charrette.

Projects should assess the expected impacts of the prioritized design strategies on population health behaviors and outcomes. This includes considering how the implemented strategies will positively influence factors such as physical activity levels, social interactions, and overall health behaviors of the targeted populations.

Here are the implementation steps for this credit.

**Step 1** is to Become familiar with integrative process.

**Step 2 & 3** include Conducting a preliminary energy & water research and analysis.

**Step 4** is to Convene goal-setting workshop.

**Step 5 & 6.** include Evaluating possible energy & water strategies.

**Final step or Step 7** is to Document how analysis informed design and building form.

The purpose of reference standards within LEED is to provide additional guidance and support for project teams. These standards serve as authoritative sources of information, offering specific criteria, methodologies, and best practices related to the sustainable design, construction, and operation of buildings and communities. One such important standard is the ANSI Consensus National Standard Guide© 2.0 for Design and Construction of Sustainable Buildings and Communities. This standard serves as the reference for the integrative process credit and the prerequisite.

## LEED v4 vs LEED v4.1

In the LEED v4.1 version of the credit, there is a more balanced approach that allows project teams to understand, improve, and document both the process and outcomes of integrated design. This is achieved through a new documentation approach using a project team letter.

One notable feature of the LEED v4.1 Integrative Process credit is the flexibility given to project teams to share the story of their integrative process. Additionally, teams can earn points for exemplary performance in new areas of interdisciplinary analysis, such as social equity and public health, which demonstrates LEED's commitment to addressing broader sustainability concerns.

# FINAL THOUGHTS – INTEGRATIVE PROCESS

A fully integrative process accounts for the interactions among all building and site systems. By understanding building system interrelationships, project teams will ideally discover unique opportunities for innovative design, increased building performance, and greater environmental benefits.

Through the integrative process, project teams can more effectively use LEED as a comprehensive tool for identifying interrelated issues and developing synergistic strategies. When applied properly, the integrative process reveals the degree to which LEED credits are related, rather than individual items on a checklist.

As a result, solving one problem without considering the whole system may inadvertently create other problems elsewhere. This highlights the importance of an integrated approach, where solutions are developed with a holistic view of the entire system.

For example:

- Separating residential and commercial uses and failing to connect them with alternative transportation means that people will drive cars to reach their destinations, generating air pollution and traffic
- Filling a landscape with ornamental plants not appropriate for the local climate means that large amounts of water may be required throughout the life of the project
- Creating air-tight buildings for energy efficiency without providing adequate ventilation results in poor indoor air quality for building occupants

When an integrated, systems-based approach is used, the solution to one problem can lead to solutions to many problems. The process of planning a project's water use might lead to the design of systems that capture rainwater and greywater to meet water supply and irrigation needs while reducing runoff and protecting water quality. More broadly, by thinking about the system across the entire life-cycle, integrative strategies can be developed synergistically.

For example:

- Locating homes near jobs and shops and designing safe, pedestrian-friendly streets can encourage people to walk, both reducing vehicle emissions and improving their health
- Designing landscapes that use native species can both reduce water consumption and provide habitat for local fauna
- Orienting buildings appropriately on a site and designing them to catch sunlight for heating and illumination and natural breezes for cooling and ventilation can save energy, improve indoor air quality, and even increase workers' productivity
- Composting improves the quality of the soil and reduces greenhouse gas emissions related to trash hauling





## CONCLUSION

The Integrative Process is a crucial approach in the development of green buildings and sustainable solutions. By incorporating Systems Thinking into this process, it ensures a more comprehensive, collaborative, and adaptive approach that recognizes the complex interconnections within a project. It fosters creativity, alignment, and efficiency, leading to more resilient and sustainable outcomes.

This strategic alignment between Systems Thinking and the Integrative Process not only enhances the effectiveness of the project but also embodies the very principles of sustainability that it seeks to achieve. It's a methodology that can be applied across various sectors and scales, reflecting a universal approach towards creating a more sustainable and responsible future.

The practices like charrettes, iterative decision-making, and a focus on collaboration are not mere tools but part of a philosophical shift in how projects are approached. It goes beyond mere technique to become a fundamental ethos guiding every stage of planning, design, construction, and beyond.

As a reader deeply engaged in sustainable practices, we invite you to reflect on the integrative process. How do you perceive its role in your projects? Have you had the opportunity to implement this holistic approach? Your insights and experiences are invaluable to this conversation, and we encourage you to share them in the comments section below.

## TEST YOUR LEED V4.1 IQ - INTEGRATIVE PROCESS

We've created an interactive, engaging, and informative quiz on Kahoot about LEED v4.1 and its integrative process! This is a fun and fantastic opportunity to test your knowledge, learn something new, and see how you measure up against your peers from around the globe.

<https://kahoot.it/challenge/001233669>

*See you on the leaderboard!"*



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