Sustainable Construction and Remodeling Manual

Vesta Sustainable Construction and Remodeling Manual

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Objective

The purpose of this Manual is to train and inform contractors and subcontractors about the variety of strategies that can be used during new construction projects and major renovations that minimize the negative impact of construction on occupants, operations, the environment, and society at large.

Additionally, since Vesta aims to certify 19% of its ABR portfolio by 2025, it is crucial to increasingly incorporate better ESG (Environmental, Social, and Governance) practices in the construction of our assets. This way, we will be better prepared for both construction and

operational certifications, reducing operational costs of any environmental impact and increasing value for our stakeholders.

Introduction

Building owners, designers, and constructors face the challenge of developing safer, more cost-effective, healthier, resilient, and sustainable facilities that are on the path to Zero Carbon, reducing risks, operating costs, any environment impact and negative effects for society.

The Vesta Sustainable Construction Manual has been developed as a strategic tool to support the Company's vision and its stakeholders regarding social, governance, and environmental responsibility in sustainable construction and remodeling, based on international standards and regulations.

Vesta aims for the planning, design, construction, and operation of sustainable and resilient buildings. The Company vision entails "becoming a global leader in sustainability" through environmental, social, and governance initiatives.

Therefore, we want to encourage all stakeholders and the value chain to follow the sustainable construction strategies identified and explained in this Manual. The goal is to have this document inspire you to explore the many ways we can work together to provide a healthy working environment for users and operators of our assets, and to contribute to the urgent decarbonization of the planet.

The benefits of sustainable buildings include:

- Maximizing energy and water efficiency
- Minimizing and managing waste
- Reducing operating costs (increasing NOI -Net Operating Income)
- Having and maintaining assets of greater quality and value (in terms of rentals and sales)
- Reducing risks associated with climate change
- Staying ahead of current and future government regulations
- Meeting the needs of investors, tenants, and users who increasingly demand a healthy, sustainable, and resilient environment

Green/Sustainable Buildings

A green/sustainable building, at any stage of the process, (conceptualization, design, construction, and operation) has a negligible or zero impact on the natural and urban surroundings. These buildings have the following features:

1. Location and placement (smart growth)
2. Materials used/ Value chains
3. Passive and active design in conservation, and in efficient and renewable energy
4. Efficient water use
5. Waste management (minimization, reuse, and recycling)
6. GHG (Greenhouse Gas) reduction
7. Pollution prevention (noise, water, air, soil, visual, and light)
8. Consideration of negative effects and impact on climate change, thus seeking greater resilience.
9. Prefab construction (structure and material recycling)
10. Impact minimization, protecting and/or improving biodiversity
11. Comprehensive and systemic approach (including an environmental management program)
12. Economics and society
    a. Adaptable, resilient, and healthy space availability
    b. Improvement to interior environment
    c. Quality of life enhancement

The goals of a sustainable building include environmental quality, its functionality/comfort, and the value of future use. The real estate sector worldwide has focused on implementing new construction techniques and processes that help to reduce environmental impact issues.

The Urgent Need for Sustainable Real Estate Transformation

The United Nations has concluded that urgent measures are needed to combat climate change and its global repercussions. The 2030 Agenda for Sustainable Development has established 17 goals that address climate change, and countries have adopted the Paris Agreement to limit the increase in global mean temperatures to well below 2°C (UN, 2021).

The planet is in a climate crisis. Some 39% of carbon emissions in cities come from buildings: 28% from operations (energy needed to heat, cool, and power them) and the remaining 11% from materials and construction (WGBC, 2019). There is little progress in reducing current emissions; therefore, the sector must focus its efforts on implementing environmental improvements through better designs, the use of new technologies in construction, and sustainable materials.

It is estimated that 80% of the buildings that will exist in 2050 are already built (UKGBC, 2021). These buildings are often less energy-efficient and more reliant on fossil-fuel heating compared to modern buildings. Analyzing materials, equipment, and construction processes is needed to achieve sustainability, and they must be replaced with more sustainable alternatives.

How to Use This Manual

The manual will be applicable for Vesta within the Design-Build development methodology. Said manual will be provided to contractors during the bidding stage to integrate sustainable

strategies into design and construction proposals, as appropriate. There should be follow-up on the strategies during all stages in which the contractor participates, from design to testing and operation.

This manual should begin its implementation in the stage of:

1. Bidding
    a. The Vesta Development team must deliver and include this Manual in the respective contracts (as an Appendix) to ensure that the contractor considers the necessary personnel, costs, timelines, and strategies in their proposal.
    b. It must be ensured that the prerequisites and mandatory sections (as designed by the manual) applicable to the project are included in the proposal.
    c. The contractor must commit to implementing these strategies once the bid is won.
    d. Contractors must review this Sustainable Construction and Remodeling Manual, which will be provided along with the bid documentation, to begin design development and apply value engineering to improve the strategy and ensure the same guidelines.
    e. Vesta's assigned Project Manager must also act as the sustainability leader for the project and be responsible for managing and monitoring Checklist completion (this will be done with the help of the contractor, LEED consultant, and other contractors and consultants). The Checklist must be completed in the following stages:
        i. Post-bid
        ii. Construction (review its completion every three months)
        iii. Project completion and testing
    f. Once assigned, the winning contractor must fill in the strategies to be integrated into the Manual Checklist for the project (Prerequisites, Mandatory, Credits, and Recommended) integrated into the executive proposal specific to the project, to allow control and follow-up in subsequent stages.
    g. Checklist sustainable strategies will be analyzed and submitted to the Vesta development team for review and approval.

2. Construction
    a. The manual and the project's approved Checklist will serve as guides to ensure the implementation of the strategies meets certification requirements.
    b. The Project Manager will act as the leader in implementing the Checklist to gather relevant information from subcontractors, green building consultants, and others.
    c. The Vesta Development team, Project Manager, green building consultants, and the outside consultant will continuously review the implementation and

completion of the Checklist (especially once work on site begins) to ensure full compliance with said checklist .

d. Upon project completion, the Project Manager must submit the fully completed and justified Checklist (with the necessary evidence) on all implemented strategies to the Vesta Development team and the outside consultant.

3. Project Completion and Tests
   a. The outside consultant must conduct the necessary calculations on cost-benefit analysis in the Final Checklist of the project with the purpose of obtaining the following estimated KPIs, depending on data delivered by the Project Manager:
      i. Total invest by line item
      ii. Economic savings achieved in construction and operation
      iii. Environmental benefits
         1. Energy and carbon footprint (embedded and in operation)
         2. Water
         3. Wastes (recycling, reuse, donation, composting, etc.)
      iv. Social benefits
         1. Jobs created
         2. Donations and benefits for the community
         3. Health and safety
   b. Vesta Development must verify and approve the project's Final Checklist and convey it to the corresponding stakeholders (tenants, investors, collaborators, contractors, community, etc.). Likewise, Vesta Development must provide VESTA ESG a final copy so the Director may report the corresponding accreditations (GRESB, CSA, CDP, TCFD, etc).

This manual is a management tool that outlines goals aimed at developing more resilient and sustainable construction. It is divided into categories with the greatest impact on construction, based on regulations, certifications, and innovative topics (such as materials, location, certifications, energy, water, waste, embedded carbon, etc.). Construction strategies are suggested with the purpose of achieving practical improvements to a building's life cycle, which can be implemented from the design stage through the operation and maintenance stages.

a. Structure

This manual contains basic line items and strategies for transforming Vesta assets and making them sustainable.

- Construction Plans

- Integrational Process
- Occupational Health and Safety Standards
- Location and Transport
- Biodiversity
- Sites
- Participation and Commitment with the Community
- Sustainable Sites
- Energy and Renewable Energy Sources
- Water Efficiency
- Materials and Resources
- Waste Management
- Internal Atmosphere Quality
- Innovation
- Regional Priority
- Embodied Carbon
- Climate Change and Resilience
- SC&RM Checklist

The strategies for each category are classified into four points: mandatory, prerequisites, LEED credits, and recommended. Said classification is based on compliance with the LEED manual and international recommendations for green buildings.

- Mandatory Point: These strategies are essential due to their quantitative value and their contribution to the goals for each category. They are indispensable for meeting Vesta requirements and cannot be omitted during construction or renovation processes.
- Prerequisites: These strategies are mandatory for LEED certification in cases where the asset under analysis is being considered for certification, in addition to complying with this manual.
- LEED Credit: These strategies aim to align the project with the sustainable measures outlined in the manual and contribute to LEED credit compliance.
- Recommended Point: These strategies are strongly encouraged as they help in achieving Vesta's sustainable objectives. However, they are not mandatory. The project can proceed by selecting alternative strategies.

The classification is mentioned after the title of each strategy with the following note: Each point must be tracked in the specific project Checklist to monitor KPI progress.

NOTE: This Sustainable Construction and Remodeling Manual and the attached Checklist are applicable to the design, construction, and maintenance/renovation stages.

b. Roles and Responsibilities

- Vesta PreCon Team:
  Preconstruction Stage: This stage is responsible for conceptual design and project development. It verifies the feasibility of the project, ensuring its quality by defining scopes and planning timeframes and costs, including the mandatory and/or applicable sustainable strategies from this Manual.
- Vesta D&CP Team:
  Responsible for managing project scope, timeframes, and costs. The team defines the work scopes during design development through to the completion of construction and testing.
- Architectural Firm:
  It is responsible for the project during the Schematic Design and Design Development stages.
- General Contractor:
  This person must take the design to Construction Documents, as well as all documentation and manage project contracting processes, labor, and execution.
- LEED Consultant:
  Joins the project at the construction phase, adapting project qualities to more efficient and LEED SCORE CARD-aligned strategies.
- Project Manager:
  Manages and supervises the construction on-site, maintaining the level of quality, time, and costs.
- To guarantee the proper use of this Manual during project execution, the Independent Consultant must:
  - Train process contractor and subcontractors (Manual and Checklist)
  - Ensure the Checklist is properly filled out for each project stage:
    - Post-bid
    - Construction
    - Project termination and tests
  - Produce the Checklist's final cost-benefit report (summary tab of Excel spreadsheet) to inform stakeholders (Vesta employees, lessees, investors, community, etc.) of the consolidated ESG KPIs included in the Manual (that is, savings and use of energy, water, embedded carbon, waste produced during construction, etc.).

Design-Build Process

Design-Build is the collaborative method that seeks to reduce asset cost and time through simultaneous design and construction. By using this method, the owner hires a single entity that conducts both stages under one single contract, that is, the joint planning makes the project management more efficient.

Design-Build - Vesta

Vesta employs the "Design-Build" methodology, characterized by a single collaborative model approach where architects, engineers, and other process-involved professionals work simultaneously. Utilizing technology platforms like PROCORE, which integrates design and construction stages, making it accessible to all involved, supplements the use of Building Information Modeling (BIM). This ensures a more cost-effective project.

Professionals such as architects, engineers, and specialists must be trained to manage the project collaboratively, making decisions together to advance the design in a comprehensive and well-analyzed manner. Complete alignment and understanding of project requirements, constraints, and opportunities across the team leads to better design decisions, enabling real-time collaboration in a shared model and optimizing informed decision-making, ultimately achieving established objectives.

BIM

Vesta requires that the BIM (Building Information Modeling) methodology be used for the building information related to industrial assets. BIM allows for a shared database within a software environment where all the professionals work on their corresponding tasks in a centralized model, eliminating the need for model duplication. This methodology, part of the Design-Build process, helps maintain control over project information and technical requirements.

MEP Design

As part of the BIM methodology, MEP (Mechanical, Electrical, and Plumbing) engineering design should be used. MEP refers to the process whereby the designer, contractor, and engineer plan, design, and manage systems collaboratively to meet all electrical and plumbing design requirements for any type of construction. This is achieved through methodologies like BIM, which facilitate task management without loss of information and integrate all project stakeholders.

What is Required So the Design-Build Process May Efficiently Achieve a Sustainable Project?

- Vesta will provide a Bid Form. Contractors must fill in the corresponding information to define the parameters needed for project planning and execution.

- Verify that the work team has the information, tools, and know-how necessary to carry out the project in both stages (DDSET, schematic plans, specifications, and established project execution dates).

Team and Relations

- Vesta will select a contractor who will be responsible for the executive design and construction of the entire project.

- The contractor will engage in interdisciplinary collaboration with other contractor professionals working on the same project.

- For more details on these points, please refer to the Scope of Work in force.

Project Implementation

Al Vesta projects must use the Design-Build process, whereby the following is required:

1. Initial Planning

Vesta PreCon Team internally plans new projects, with the following considered:

- Policies and regulations analyzed, including the Sustainable Construction and Remodeling Manual
- During the pre-construction stage, a project conceptual design is created
- The project cost is estimated
- The project feasibility level is established, which is then planned according to the corresponding requirements

2. Contractor Requirements

Vesta produces a document with project requirements, establishing the following:

- Environmental objectives for the project (Subjects related to biodiversity and environmental protection) and social issues (Community Outreach Protocol)

- Expected timeline, which refers to project schedule or a timeline for environmental and social goals

Conduct an Initial Meeting Prerequisite

In this meeting, the Vesta requirements document should be reviewed with the team that will be carrying out the project. It is essential to establish how each participant will achieve the set objectives. At the initial meeting there must be a minimum of four different disciplines, in addition to the Vesta representative.

The goal is to optimize the incorporation of ecological strategies in all aspects of pre-design, design, construction, and building operations by leveraging the expertise of all participants.

if pursuing a certification, in this initial meeting with the different professionals it is important to review the requirements for such certification, identify the possible level to be achieved, and determine the responsible parties for each strategy.

The different professionals should be able to review the strategies to be implemented and how they might relate to each other. As a result of this meeting, the project objectives and scope will be established to jointly define the final Scope of Work.

Deliverable: The Basis of Design (BOD) for each discipline responding to the “Owner/Vesta and project requirements.”

3. Conduct Preliminary Water and Energy Analysis

The LEED consultant must conduct the respective energy and water analysis so as to inform the contractor what has to be done, taking into account the following topics:

Energy:

A preliminary "simple box" energy modeling analysis must be conducted before completing the schematic design. This analysis should explore how to reduce the building's energy loads and achieve sustainability goals by questioning the predetermined assumptions. It is suggested to follow strategy 1 and strategy 2 together as described in the following table:

CONDITION	STRATEGY 1	STRATEGY 2

SITE CONDITIONS	Exterior Lighting Projects are generally located in exterior lighting zone 2 (zone determined according to ASHRAE 90.1-2010). The project team will design the exterior lighting system with the goal of reducing at least 50% of the lighting energy allowances listed in TABLE 9.4.3B of the ASHRAE 90.1-2010 standard.	Exterior Flooring/Surfaces Projects will select light-colored materials for exterior surfaces to reflect solar light and reduce heat absorption.
VOLUME AND ORIENTATION	Volume The project team will define the Shell (project foundations, floor, metal structure, roofing) coherently, following the Scope of Work, applicable current regulations, and analyzing the various possible volumetric variations.	Project Orientation The team will select the most suitable orientation for the guardhouse to reduce its cooling needs.
FEATURES OF BASIC BUILDING ENVELOPING	Insulation values Based on a preliminary analysis, the most appropriate values will be defined for the climate zone where the project is located.	Glazing Characteristics Conduct the preliminary analysis to define the most suitable specifications for the climate zone.
LIGHTING LEVELS	Electric lighting and natural light The project's appropriate lighting levels are set at 350 lux. The project team will preferably achieve this level by combining natural light and electric lighting, or at a minimum using only electric lighting.	Reflectance Surface The project will use materials that meet at least the following surface reflectance: • Walls 50% • Roofs 80% • Floors 20%
HEATING COMFORT RANGES	Temperature difference The project teams must design the appropriate set point based on outdoor temperature to	Comfort ranges Check ASHRAE 55-2010 for comfort ranges for project location.

	reduce energy consumption (see ASHRAE 55-2010).	
ENERGY LOAD NEEDS FOR OUTLETS AND PROCESSES	Reduction of process and outlet loads The reference process and outlet load densities for the project must be defined according to use through the ASHRAE 90.1-2010 standard.	Reduction of process and outlet loads In the event of having tenants, they will evaluate the electrical equipment to reduce their energy loads. The LEED consultant must check feasibility with VESTA.
PROGRAM AND OPERATIONAL PARAMETERS	Reduction of building footprint The space requirements for the project must be analyzed. Different versions of the building volume should be evaluated to select the most efficient version for both operation and orientation. The LEED consultant should review with VESTA if this has been done previously.	Anticipated operations and maintenance The electrical and mechanical systems must be selected considering potential benefits, such as energy reduction and maintenance during operation.

Water:

Before completing the schematic design, a preliminary analysis of water consumption is required. The aim is to reduce potable water consumption in the project and achieve related sustainability objectives. Evaluate and estimate the possible sources of non-potable water supply and project water demand volumes, including the following.:

CONDITION	EVALUATE
INDOOR WATER DEMAND	Evaluate water demand volumes for bathroom fixtures and accessories. Establish a percentage for reduction, aiming for at least a 30% reduction as per the baseline established by the LEED certification prerequisite and credit for, WE Indoor Water Use Reduction.
OUTDOOR WATER DEMAND	Evaluate water demand volumes for irrigation of vegetation. Establish a percentage for reduction, aiming for at least a 50% reduction as per the baseline established by the LEED certification prerequisite and credit for, WE Outdoor Water Use Reduction.

PROCESS WATER DEMAND	Evaluate water demand volumes for kitchens, laundries, cooling towers, and other applicable equipment. Review the limits established in the prerequisite for WE Indoor Water Use Reduction (described in this Manual under the Water Efficiency section).
SUPPLY SOURCES	Evaluate all potential volumes of non-potable water-supply sources, such as rainwater and onsite graywater, non-potable water supplied by the municipality, and condensate from HVAC equipment.

Regulations and Benchmarking Standards

In keeping with the SOW in force, all construction and remodeling projects are performed taking into consideration standards and legislation in force presented in the Statement of Work.

LEED Certification

The USGBC (U.S. Green Building Council) established this third-party rating system to educate and reward project teams for voluntarily incorporating sustainable design practices in the construction of new and existing buildings. In doing so, USGBC has set the standard for what constitutes a "green" building.

Designing and building a LEED-certified structure requires collaboration from all members of the design and construction team. By focusing on an integrational design process and addressing environmental concerns early in the building design stages, the project team can deliver a building that shows notable improvements in areas such as water efficiency, energy use, materials and resources, indoor air quality, and waste management. Points are awarded based on various criteria divided into nine basic categories: Integrational Process, Location and Transportation (LT), Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Materials and Resources (MR), Indoor Environmental Quality (EQ), Innovation (IN), and Regional Priority. Credits can also be earned for exceeding credit thresholds for certain points or for innovative strategies. Projects achieve a level of certification —Certified, Silver, Gold, or Platinum— based on the total points earned.

Many of the ecological strategies outlined in this manual align with the guidance provided by LEED. Since Vesta has been implementing LEED for all new constructions since 2020, and formally certifying its buildings with LEED, these guidelines will prove useful.

a. What is LEED?

The USGBC (U.S. Green Building Council) is a not-for-profit organization that promotes sustainability in how buildings are designed, constructed, and operated.

USGBC develops and manages a green-building rating system called LEED - Leadership in Energy and Environmental Design. LEED is a system for identifying, implementing, and measuring green-building design, construction, operations, and maintenance. It is a voluntary, market-driven, consensus-based tool that serves as a guide and assessment mechanism. LEED rating systems address commercial, institutional, and residential buildings as well as neighborhood developments.

LEED aims to optimize the use of natural resources, promote regenerative and restorative strategies, maximize positive impacts, and minimize negative consequences on human health and the environment caused by the construction industry. It emphasizes integrational design, the incorporation of existing technology, and cutting-edge strategies that advance green-building practices and transform professional practices. The technical foundation of LEED strikes a balance between requiring current best practices and fostering leadership strategies. LEED establishes challenging yet achievable benchmarks.

b. LEED Objectives

The LEED rating systems aim to promote a transformation of the construction industry through strategies designed to achieve seven objectives:

c. LEED Categories

LEED promotes a comprehensive approach to sustainability by recognizing performance in the following categories:

d. LEED Process

The process begins when the owner selects the rating system and registers the project., The project is then designed to meet the requirements of all prerequisites (mandatory points) and credits (voluntary points) that the team has chosen to pursue. Once the documentation is submitted for certification, a project undergoes preliminary and final reviews. The preliminary review provides technical advice on additional work required for credit achievement, and the final review provides the project's final score and certification level. The decision can be appealed if a team believes further consideration is warranted. LEED has four levels of certification, depending on the point thresholds achieved:

- Certified, 40–49 points
- Silver, 50–59 points
- Gold, 60–79 points
- Platinum, 80 points and above

e. LEED Volume Program

For Vesta, this certification is desirable because the design of several of its projects can coincide in materials, construction processes, and basic design.

The LEED Volume Program is based on creating a prototype where a set of pre-approved strategies are considered, which can then be replicated across a group of projects that have significant elements in common. Therefore, they can collectively pursue LEED credit compliance.

This process occurs in three stages, which are:

1. **Registration**. A project is prepared, and a request is submitted to GBCI, and participation in program orientation workshops.
2. **Precertification**. The LEED prototype must be pre-certified to serve as the basis for replication for the projects intended for evaluation.
3. **Certification**. With the approved prototype, a simplified review of all projects can be conducted to expedite certification.

1. Construction Plans

1.1 Prevention Plan for Contamination Caused By Construction Activities

Phase: Construction Prerequisite

The objective is to reduce pollution from construction activities by controlling soil erosion, sedimentation in waterways, and airborne dust.

Requisites:
Create and implement an erosion and sedimentation control plan for all construction activities associated with the project.

Each project site is unique, and not all ESC measures identified in the CGP may be applicable or necessary. Evaluate which ESC measures are needed based on a simple site assessment that identifies the following:

- Preservation of topsoil and minimization of soil compaction
- Perimeter controls on the land, identifying natural buffers and minimizing disturbance of steep slopes
- Project site slope and where the water will drain
- Total soil disturbance area and duration to identify air quality and rainwater runoff effects on neighboring properties
- Location of existing rainwater management systems that need protection
- Planned construction sequence that may require additional ESC measures over time
- Weather and soil conditions that could cause rainwater runoff or generate dust
- Construction entrances and the erosion and sedimentation effects on local roads servicing the project site
- Maintenance of control measures for accumulated sediment or soils

Measures to be performed:

- Use mesh to cover all onsite drains and those adjacent to the site to prevent solids from entering the drainage system. The mesh must be cleaned regularly.
- Roadways adjacent to the project must be cleaned daily.
- A photographic report of the vegetation and a classification survey must be conducted before starting any work.

- Mesh must be installed to protect onsite vegetation, which must be watered continuously.
- The tires of any vehicle entering the site must be washed upon exit, either manually with a Karcher or similar system, or through a gravel and water trench.
- Concrete mixers must not place the mix directly on the ground. They must use an appropriately sized wooden tray, or place plastic under the hoppers in the case of booms or concrete pumps.
- The waste separation area must be properly identified. Hazardous waste must not be placed directly on the ground.
- Road mapping is required, indicating areas for maneuvering specialized equipment such as cranes, concrete booms, excavators, and unloading zones.
- The maximum speed limit for vehicles within the site is 10 kph. Signage indicating the speed limit must be posted.
- A portable toilet must be provided for no more than 25 persons per unit, with a maximum cleaning interval of two days. Example: toilets cleaned every Tuesday, Thursday, and Saturday.
- A policy for the use of disposables must be created for all construction personnel in case food, coffee, or deliveries are authorized onsite.
- A logbook must be kept for machinery usage, including fuel consumption, for both security control and data generation on greenhouse gas emissions.

1.2 Waste Management Plan

Phase: Design Prerequisite

Establish a provisional space for waste separation during construction project for recycling.

- At least 5 different waste groups must be considered, such as concrete, metals, plastics, glass, and cardboard. Depending on the construction, define the expected types of waste and the ones that can be adequately separated.
- Analyze and identify with the team the most frequently used materials to achieve successful separation and disposal, either for reuse or recycling.
- Check if there are prefabricated materials that can be used, avoiding the need for cutting or modifications onsite that generate waste.
- Accurately calculate material to reduce potential waste.
- Document actions implemented.

Phase: Construction (New Construction and Remodeling) Prerequisite

The project team must divert (prevent from reaching the landfill) at least 75% of the total construction and demolition material; the diverted materials must include at least four different materials.

1. At least four materials (both structural and non-structural) must be separated for diversion, meaning they should be sent elsewhere for recycling or reuse.
2. A record must be kept of all waste generated during construction, specifying the volume or weight of the waste and its destination.
3. At the end of construction, a final report must be submitted detailing all the waste generated, including disposal and diversion rates.
4. If there are products with mercury in the waste, such as lamps, batteries, or any other item, they must be specially handled and have a written management program detailing the control used.

1.3 Internal Atmosphere Quality Plan

Phase: Construction LEED Credit

Promote the well-being of construction workers and building occupants by minimizing indoor air quality issues associated with construction and renovation.

Develop and implement an IAQ (Indoor Air Quality) management plan for the construction and occupancy phases of the building. The plan must address the following:

- During construction, comply with or exceed all applicable control measures recommended by the SMACNA (Sheet Metal and Air Conditioning National Contractors Association) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3.
- Protect stored and installed absorbent materials from moisture damage.
- If ventilation systems are needed during construction, filters must be MERV 8 or class F5. Immediately before occupancy, replace all filtration media with final design filtration media and install according to manufacturer recommendations.
- Prohibit smoking inside the building and within 25 feet (7.5 meters) of the building entrance during construction.

Photographs of all actions must be taken, and reports on the activities carried out must be submitted regularly.

2. Integrational Process

2.1 BOD

The preliminary design of the building and during the project design phase, opportunities for synergies between disciplines and construction systems must be identified. The analysis will be conducted as described in the Construction Plans section of this manual.

3. Building Health and Safety Standards

Human Rights

It is mandatory for all parties involved to respect, protect, and uphold the human rights and fundamental freedoms of contractors and workers, without discrimination for race, sex, nationality, ethnic origin, language, religion, or any other condition, in accordance with human rights recognized in the principles underpinning the United Nations Global Compact, the ILO Declaration on Fundamental Principles and Rights at Work, the Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy, the United Nations Sustainable Development Goals, and the Guiding Principles on Business and Human Rights.

3.1 Health and Safety

Phase: Construction and Remodeling Mandatory Point

All contractor personnel must comply with industry standards and applicable regulations for health and safety in buildings, including but not limited to COVID-19, and the following Official Mexican Standards issued by the Secretary of Labor and Social Welfare (STPS):

- NOM-002-STPS-2010
- NOM-004-STPS-1999
- NOM-005-STPS-1998
- NOM-006-STPS-2014
- NOM-009-STPS-2011
- NOM-018-STPS-2015
- NOM-025-STPS-2008
- NOM-026-STPS-2008
- NOM-030-STPS-2009
- NOM-031-STPS-2011
- NOM-033-STPS-2015
- NOM-034-STPS-2016

According to OSHA, contractors are responsible for providing a safe and healthy workplace for all employees, respecting business ethics, prohibiting child labor, promoting community involvement, well-being, and human rights. These standards include, among others, principles related to the safe operation and handling of equipment and materials, environmental

practices, safe noise levels, appropriate medical and first aid response, workplace sanitation, fire safety, and low or zero levels of air pollutants.

The project team must have an onsite safety professional who manages risks, coordinates, and ensures safety on the site, demonstrating continuous performance improvements. Personal protection and rescue equipment must comply with local regulations in force, and the design for safety within the construction site must be communicated and promoted.

Note: Annually, the most current version of applicable regulations must be verified.

3.2 Health and Safety Indicators

Phase: Construction and Remodeling Mandatory Point

The Project Manager must monitor all indicators related to the health and safety of employees involved in the construction of the building, along with the calculation methodology for these indicators. Below are the most relevant indicators, not limited to those that may arise from the activities performed:

- Near-miss rates
- Incident rates
- Mortality rates
- Absenteeism rates
- Rates of days not worked
- Occupational illnesses
- Severity rates

During the construction process, workers must be informed about existing risks, procedures for handling these risks, the personnel responsible for safety and protection, and ongoing improvements in training. Additionally, there should be a medical professional available.

Note: The Checklist monitors compliance with this section

4. Location and Transportation

The existing characteristics of the surrounding community and how this infrastructure affects the behavior of inhabitants and environmental performance must be considered. Design should leverage existing infrastructure such as public transportation, street networks, pedestrian pathways, bike networks, services, and amenities, including utilities like electricity, water, gas, and drainage.

By integrating with the surrounding community, a building can offer various advantages to both owners and users. For owners, proximity to existing public utility lines and street networks avoids the cost of extending this infrastructure to the project site. For occupants, pedestrian-friendly areas and bike paths can enhance health by encouraging daily physical activity, while proximity to services and amenities can increase happiness and productivity.

Project Implementations

Vesta-conducted projects pursue the following strategies, when applicable:

4.1 Bicycle facilities
4.2 Reduced parking footprint
4.3 Green vehicles
4.4 Access to quality transportation

4.1 Bicycle Facilities

Phase: Design LEED Credit
Provide short-term bicycle storage for at least 2.5% of all peak visitors, but no less than four storage spaces per building. Provide long-term bicycle storage for at least 5% of all regular building occupants, but no less than four storage spaces per building in addition to the short-term bicycle storage. Long-term bicycle storage provided for building occupants is covered to protect bicycles from rain and weather.

Provide at least one onsite shower with dressing room facilities for the first 100 regular occupants of the building, and an additional shower for every 150 regular occupants thereafter.

Short-term bicycle storage should be within a walking distance of 100 feet (30 meters) from any main entrance. Long-term bicycle storage should be within a walking distance of 100 feet (30 meters) from any functional entrance.

Phase: Construction LEED Credit

1. Ensure that both short-term and long-term storage facilities are installed.

2. Installation of shower(s).

Note: this point will be executed provided there is a bike path nearby. (180 meters from the project site).

4.2 Reduced Parking Footprint

Phase: Design LEED Credit
Verify the case to which the project pertains:

- Case 1 Baseline location
- Case 2. Dense locations and/or with traffic service

Provide parking capacity that is 20% (Case 1) or 40% (Case 2) below the base ratios recommended by the Parking Advisory Council, as shown in the Transportation Planning Manual of the Institute of Transportation Engineers, 3rd edition, Tables 18-2 to 18-4 (project data reflected in the "VESTA Parking Reduction" table).

For VESTA projects, typically comprising a security booth + industrial warehouse, the base ratio is 1.99 parking spaces per 100 m2 of project area. The following table serves as a quick reference to verify compliance with parking space requirements. Calculations must be performed for each project to ensure compliance.

Table. Reduction of VESTA Parking Spots

PROJECT SIZE (M^2)	# OF PARKING SPACES PER PROJECT		
	BASE RATIO	20% REDUCTION*	40% REDUCTION*
5,000 - 10,000 m^2	99.5 - 199	79 - 159	59 - 119
10,000 - 20,000 m^2	199 - 398	159 - 318	119 - 238
20,000 - 30,000 m^2	398 - 597	318 - 477	238 - 358
30,000 - 40,000 m^2	597 - 796	477 - 636	358 - 477
50,000 - 60,000 m^2	796 - 995	636 - 955	477 - 716
60,000 - 70,000 m^2	995 - 1,194	955 - 1,114	716 - 835
80,000 - 90,000 m^2	1,194 - 1,393	1,114 - 1,273	835 - 955

***** Numbers are rounded down

To comply with this strategy, the suggested reduction in the previous table is limited to ensuring that the number of parking spaces aligns with local building regulations. The option that provides more spaces designated for bicycles should be chosen.

Once the reduction is made, the project must provide:

Preferential parking for carpools (shared transportation/carpooling) for 5% of the total parking spaces.

Preferential parking: parking spaces that are closest to the project's main entrance (normally located adjacent to handicap parking spaces).

Signage specifications:
The language used in the reserved parking signage should include either "Exclusive Parking for Carpool Vehicles" or "Exclusive Parking for Shared Vehicles." The signage must be clearly visible, with vertical signage installed and/or the parking space painted accordingly.

Phase: Construction LEED Credit

1. Ensure that the number of parking spaces is appropriate to the necessary reduction.

2. Install signage for the preferential parking spaces.

4.3 Green Vehicles

Phase: Design LEED Credit
The project must comply with the following (calculations should be based on the total number of parking spaces):

- 5% of all parking spaces used by the project must be designated as preferential parking for green vehicles. Include signs identifying the preferential parking.

- In addition to preferential parking for green vehicles, install Electric Vehicle Supply Equipment (EVSE) in 2% of all parking spaces used by the project. Also include signs indicating that these parking spaces are for electric vehicle charging only.

EVSE must:

- Provide Level 2 (208-240 volts) or higher charging capacity.
- Comply with the relevant regional or local standard for electrical connectors, such as the SAE J1772 Recommended Practice for Surface Vehicles, SAE Conductive Charge Coupler for Electric Vehicles, or IEC 62196 from the International Electrotechnical Commission for projects outside the US.
- Be networked or internet-connected and capable of participating in a demand response or time-of-use pricing program to encourage charging during off-peak hours.

Preferential parking: parking spaces that are closest to the project's main entrance (normally located adjacent to handicap parking spaces).

Signage specifications:

- The language used in the reserved parking signage should include either "Exclusive Parking for Green Vehicles" or "Exclusive Parking for Green Cars". In the case of EVSE parking spaces, "Parking Reserved for Electric Chargers Only."
- The signage must be clearly visible, with vertical signage installed and/or the parking space painted accordingly.

Phase: Construction LEED Credit

1. Verify that Green Vehicle Parking signage is installed
2. Verify that electric chargers are installed

4.4 Access to Quality Transportation

Phase: Design LEED Credit

Check the project location for the distance to a low-speed bus stop, which should not exceed 400 meters. As a second option, measure the distance to a high-speed bus stop (referring to transport using dedicated lanes like BRT or express buses) and ensure it is not more than 800 meters. If neither option is met, a bus stop should be built to initiate service in the area.

Phase: Construction LEED Credit

Build a bus stop station as indicated by the project, even if it is outside the project boundaries, as it was part of the project's analysis for social benefit compliance and as an initiative of the project itself.

5. Biodiversity

Including biodiversity in real estate projects not only provides habitats for flora and fauna, but also brings benefits to human well-being such as improved air quality and special amenities, resulting in better workplaces. Simultaneously, it adds value to the economy by providing ecosystem services and benefits to industry, in addition to its intrinsic value. (GRESB 2021)

Project Implementations

In Vesta projects, the following biodiversity strategies will be incorporated:

5.1 Native Flora.
5.2 Gardens for Pollinators

5.1 Native Flora

Phase: Construction LEED Credit

A study should be conducted to identify the native vegetation of the area so that proposed fauna within the green areas of the project can adapt to the climate and do not require excessive irrigation to keep it alive. Proposals can be integrated into Vertical Gardens, also known as Green Walls, which are systems that allow vegetation to be placed vertically on existing walls or additional structures.

By including green walls on the properties, the concept of biophilic design is applied, aiming to connect spaces with Nature and have a healthier and more productive workforce, ultimately increasing profits within the Company.

- These provide significant benefits such as providing protection and insulation for the building against external temperature fluctuations, UV radiation, and/or severe storms, as well as helping to cool the outdoor environment.

5.2 Gardens for Pollinators

Phase: Construction Mandatory Point

Promoting and conserving biodiversity within projects through the implementation of Pollinator Gardens allows for the recovery of surfaces occupied by buildings and provides a space for this natural process that benefits ecosystems. A study of local flora and fauna should be conducted to integrate specific plants needed by pollinators to carry out this process. These spaces should be designed to include biodiversity, specifically pollinators and native plants, within real estate projects.

1. Sites

Vesta projects pursue the following strategies (when applicable, these points may be used for LEED certification in the Innovation section.

6.1 Site protection and recovery
6.2 Restoration of soils altered by construction
6.3 Control and treatment of invasive plants

6.1 Habitat Protection and Recovery

Phase: Design Recommendation

Vesta aims to protect and conserve existing natural areas and restore those damaged by construction activities and the impact of its assets on the environment.

Therefore, one of the actions to be considered in new construction is to allocate at least 40% of the total area to conservation and protection against any development and construction activity.

Phase: Construction LEED Credit

In the case of renovations, the approach will involve onsite rehabilitation using native or adapted vegetation. Specifically, it aims to restore 30% of the total site area, including the building footprint, to promote biodiversity.

6.2 Recovery for soils Affected by Construction

Phase: Construction (prior to installing vegetation/landscaping) Recommendation

Restore all site soils that were disturbed by current construction activities and will serve as final areas with vegetation:

- Identify reference soils to guide performance criteria appropriate for site vegetation, intended program, and site elements.
- Restore soils to a minimum depth of 12 inches (30.48 centimeters). Where trees are planted, restore soils to greater depth and volume to support the desired mature tree population biologically, structurally, hydrologically, and geotechnically.

6.3 Invasive Plant Control and Treatment

Phase: Design Recommendation

Only plant species that are not currently listed as invasive should be used:

- ENVIRONMENTAL STANDARD FOR MEXICO CITY -NADF-006-RNAT-2016
- Official Mexican Standard: NOM-059-SEMARNAT-2010, Environmental Protection - Native Species of Wild Flora and Fauna of Mexico - Risk Categories and Specifications for Inclusion, Exclusion, or Change -List of Species at Risk.

7. Participation and Commitment with the Community

The community is a stakeholder group that is highly important to Vesta. The positive transformation of a community is closely related to its economic growth and its residents'

access to quality infrastructure, employment opportunities, transfer of know-how, and connectivity alternatives. For this reason, our business strategy is oriented towards the sustainable development of the localities where Vesta is involved. The aspects to consider on this topic are:

- Prevention, reduction and mitigation of
  - Noise
  - Environmental, soil, and air pollution
  - Biodiversity management
- Support in the creation and improvement of green areas
- Use of spaces for the benefit of the community
- Donation of construction materials and recyclable waste when possible
- Support for education and ESG culture within the community, through familiarization with Vesta parks and involvement in other community-interest topics

Project Implementations

In the projects carried out by Vesta, the following strategies will be sought (where applicable):
7.1 Optimal accessibility, safety, and site orientation
7.2 Supporting the local economy
7.3 Engaging users and stakeholders
7.4 Having a Social Benefit/Support project

7.1 Optimum Accessibility, Safety and Site Orientation

Phase: Design Mandatory Point

Allow site use, incorporating the following elements into the project design:

- Accessibility: Provide site access and usefulness as required by local and national accessibility standards (e.g., Americans with Disabilities Act, NOM-030-SSA3-2013, and NOM-034-STPS-2016).
- Safety: Enhance the actual and perceived safety of site users by providing at least four of the following six components:
- Clear and defined spaces and access control
- Natural surveillance with adequate lighting levels
- Natural surveillance at entrances and pathways
- Clear visibility and good lines of sight
- A variety of access options
- Site design elements that enhance the effectiveness of security policies and efforts

- Finding Your Way: Create an environment for users to orient themselves easily and intuitively and move from one place to another by providing at least five of the following eight components:
- Entrances and doors
- Views and lines of sight
- Landmarks
- Decision points or nodes
- Pedestrian and vehicular circulation hierarchy
- Distinct areas and regions
- Orientation devices and systems
- Maps and brochures

Phase: Construction Mandatory Point

Ensure that construction is carried out according to the established design to meet the requirements for accessibility, safety, and orientation.

7.2 Supporting the Local Economy

Phase: Construction Recommendation

Promote hiring of locals and support local businesses during the construction phase. Conduct a minimum of two activities from the following list:

- Commit to hiring no less than 75% of workers at the vital minimum wage, or higher, for site construction.
- Some 75% of new hires during the construction phase should be locals
- Some 75% of new hires for the construction phase are low income
- Training must be provided for workers on subjects related to green construction
- 10% or more of the construction budget should be used to purchase construction materials and services from locally operated or locally-owned businesses

7.3 Involving Users and Stakeholders

Phase: Design Recommendation

Involve potential site users and stakeholders during the following design phases:

1. Site evaluation process and program plan

- Involve site users and stakeholders in identifying specific, quantifiable, reachable, realistic, and timely project objectives.

- Identify the programmatic and functional needs of the various site user groups.
- Provide site users and stakeholders with multiple schematic design alternatives and associated outcomes using visual representations.

2. Presentation and review of design development

- Invite site users and stakeholders to the presentation and review of design development.

3. Public design presentation

- Present the design to the public in at least two forms (e.g., website, community meeting, newspaper article, civic presentation).

7.4 Developing a Social Assistance Project

Projects developed for the community must be planned considering an impact area as the objective. The projects should have a social impact study, encompassing as many of the following areas as possible, or in any other area of greater impact to the community, such as an identified risk or effect:

- Environmental
- Housing affordability
- Impact on crime levels
- inhabitability
- Generation of local income
- Local generation of employment
- Residents' well-being
- Pedestrian access (Walkability score)
- Primary stakeholders affected

Phase: Pre-design, Pre-development and Construction Mandatory Point

Socioeconomic Impact Mandatory Point

If possible, Vesta should conduct a Community Needs Study consisting of the following aspects:

- Observations
- Listening
- Interviews

To identify the community's greatest needs, based on the previous results (including risk mitigation aspects in the community), a community support project should be carried out (in line with Vesta's Social Responsibility Policy), which may include but not limited to:

- Donating construction material
- Developing community support infrastructure (benches, bus stops, etc.)
- Organizing a volunteer day with the contractor and subcontractor for street cleaning, gardening, tree planting, etc.
- Developing a community education project, promoting health, etc.

Communication with the Community

Once the community project is selected, the Vesta development team will communicate the main aspects of the project to the community. This can be done in various ways, such as:

- Vesta ESG website
- Signs near the development site
- Community meetings

Implementation and Evidence of the Social Assistance Project

- The project must have a social objective, describing the amount in-kind or financial investment made and the number of people or the environment benefited. The area defined for the project application and focus must be evaluated in the short, medium, and long terms, quantifying the benefits and impact on the community. The impact evaluation process will be carried out during the planning and construction stages, describing its implementation, scope, and systematic monitoring process.

- Note: The Vesta Development team should contact the ESG area to review the community projects being planned along with the alliances with NGOs and tenants in the region, to ensure they are in line with the corporate and ESG strategy.

8. Sustainable Sites

To address sustainable sites, we must make decisions about the environment surrounding the building, with strategies that emphasize the vital relationships between buildings, ecosystems, and ecosystem services. It focuses on restoring site elements, integrating the site with local and regional ecosystems, and preserving the biodiversity on which natural systems depend.

Project Implementations

In the projects carried out by VESTA, the following strategies will be enacted (when applicable):

8.1 Site Assessment
8.2 Rainwater Management
8.3 Reducing the Heat Island Effect
8.4 Reducing Light Pollution

8.1 Site Evaluation

Phase: Pre-design LEED Credit
Complete and document a site survey or assessment with the following information:

- Topography
- Hydrology
- Climate
- Vegetation
- Soils
- Human use
- Effects on human health

The survey or assessment should demonstrate the relationships between site characteristics and the above-listed topics, and how these characteristics influenced the project design. Explain the reasons why any of these topics have not been addressed.

Phase: Design LEED Credit (Remodeling)

In the case of a renovation, it will be essential to have a site management policy that includes the site and/or asset requirements to support employee, society, and community needs.

8.2 Rainwater Management

Phase: Design LEED Credit

Harvest rainwater for reuse in the project. The 95th percentile of rainwater must be collected. Each site should determine the percentile.

The strategies to be used for rainwater are:
1. Having as much vegetation on the site as possible.
2. Harvesting rainwater from the roof.

3. Using permeable pavement or having pavement slopes to harvest the rainwater.

The collected rainwater must be stored and filtered for reuse.
Potential uses are:

a. Project cleanup
b. Irrigation
c. For WCs

Phase: Construction LEED Credit

Ensure storage system and filtration installation

8.3 Reducing Heat Island Effect

Phase: Design LEED Credit

Non-roof measures:
Use paving materials with a three-year solar reflectance (SR) value of at least 0.28. If three-year age information is not available, use materials with an initial SR of at least 0.33 at the time of installation.

The recommended material is hydraulic concrete (light gray). Use light colors for sidewalks. Avoid using asphalt.

High reflectance roof (low-slope roof):
Use roofing materials with a three-year solar reflectance index (SRI) value of at least 64. If three-year value information is not available, use materials with an initial SRI of at least 82 at the time of installation.

Phase: Construction LEED Credit

1. Ensure materials provided for pavement as well as for roof are installed.

8.4 Reducing light Pollution

Phase: Design LEED Credit

a) Uplight

Verify the lighting limit according to the characteristics of the site. The limits must be evaluated in each project if there are public sides, streets, or avenues.

Determine the lighting zone in which the project is located using Table 1. Lighting Zone:

LIGHTING ZONE	BASE RATIO	MAX. UPLIGHT	MAX. UPLIGHT OVER 90°
LZ 2 (lighting zone) – Moderate atmospheric lighting	Bldgs. not very high	U2 (Uplight rating)	0.1 lux
LZ 3 (lighting zone) – Slightly high atmospheric lighting	Suburban setting Moderate nighttime lighting	U3 (Uplight rating)	0.2 lux

b) Trespassing Light

After determining the lighting zone and establishing the lighting limit, measure the distance from the perimeter to the nearest luminaire and compare that distance with the mounting height to meet the backlight (B) and glare (G) rates as shown in the following table:

LIGHTING ZONE	(LUMINAIRE MOUNTING	BACKLIGHT	GLARE
LZ2 (lighting zone)	> 2	B4	G2
	1 to 2	B3	G1
	0.5 to 1	B2	G0
	< 0.5	B0	
LZ3 (lighting zone)	> 2	B5	G3
	1 to 2	B4	G1
	0.5 to 1	B3	G1
	< 0.5	B1	G0

Phase: Construction LEED Credit

1. Verify that the lighting fixtures in the project match the design specifications for BUG rate or photometric analysis.
2. Install all exterior fixtures with automatic control based on nighttime hours.
3. Conduct pre-functional and functional testing as directed by the Commissioning Agent of the project.

4. Measure lighting across the entire lighting limit as part of light trespass pollution.

9. Energy and Renewable Energy Sources

To address energy issues, it must be approached from a holistic perspective, focusing on reducing energy use, energy-efficient design strategies, and renewable energy sources.

The current global energy-resource mix is heavily tilted toward oil, coal, and natural gas. Besides emitting greenhouse gases, these resources are non-renewable; their amounts are limited or they cannot be replaced as quickly as they are consumed. Three buildings, representing approximately 40% of the total energy used today, significantly contribute to these problems.

Energy efficiency in green buildings starts with a design approach that reduces overall energy needs, such as building orientation and glazing selection, and choosing climate-appropriate construction materials. Strategies like passive heating and cooling, natural ventilation, high-efficiency HVAC systems, and the use of smart controls further reduce a building's energy use. Onsite renewable-energy generation or purchasing green energy helps cover parts of the remaining consumption with non-fossil fuel energy, reducing reliance on traditional sources.

The commissioning process is essential to ensure a high-performance building. Early involvement of a commissioning authority helps prevent long-term maintenance issues and energy waste by verifying that the design meets the project Scope of Work requirements and functions as intended.

All applicable regulations should be considered for each aspect, including but not limited to the following standards:

- NOM-001-ENER-2014
- NOM-003-ENER-2011
- NOM-004-ENER-2014
- NOM-006-ENER-2015
- NOM-007-ENER-2014
- NOM-008-ENER-2001
- NOM-009-ENER-2014
- NOM-010-ENER-2004
- NOM-011-ENER-2006
- NOM-013-ENER-2013
- NOM-014-ENER-2004
- NOM-016-ENER-2016

- NOM-017-ENER-2012
- NOM-018-ENER-2011
- NOM-020-ENER-2011
- NOM-021-ENER-2017
- NOM-022-ENER/SCFI/ECOL-2000
- NOM-022-ENER-2014
- NOM-023-ENER-2018
- NOM-028-ENER-2017
- NMX-ES-003-NORMEX-2007
- NADF-008-AMBT-2017

Note: The most current version of the applicable regulations must be verified annually.

Project Implementations

In the projects carried out by VESTA, the following strategies will be enacted (when applicable):

9.1 Fundamental and Enhanced Commissioning
9.2 Energy Performance Optimization
9.3 Energy Measurement
9.4 Refrigerant Use
9.5 Renewable Energy

9.1 Fundamental and Enhanced Commissioning

Phase: Design Prerequisite

The design team must follow the ASHRAE 90.1-2010 standard to achieve energy efficiency in the HVAC system, ventilation, electrical distribution, lighting, and plumbing systems.

With the support of the commissioning agent (CxA), the owner must develop the Owner Project Requirement (OPR) document. This document provides an overview of the project and should include all systems to be commissioned (HVAC, lighting, electrical distribution, plumbing, control, and automation of each system) as well as the scope of work for the building envelope.

Include the following goals:

1. Reduce lighting power density according to the requirements set in the SOW (in force) for lighting zone 2 and interior use such as storage; seek the maximum feasible savings.

2. Design the HVAC system according to ASHRAE 62.1 - 2010 (Sections 4 to 7) to meet minimum ventilation rates, and control and monitoring requirements for the core, envelope, and storage.
3. Reduce indoor water consumption by 40% and outdoor water consumption by 50%.
4. Reduce water use for irrigation by 50%.
5. Ensure description of the envelope.
6. The design team must develop the Basis of Design (BOD) where all requirements listed in the VESTA Owner Project Requirements (OPR) document are addressed using local and international standards, providing all the necessary technical information to purchase, install, and operate each system.
7. Cx agent must approve all equipment to ensure compliance with all design standards and best practices.
8. Consider envelope reviews; it must be evaluated and comply with NIBS Guideline 3-2012.

Phase: Construction Prerequisite

1. The construction team must install only the approved equipment and conduct pre-operating inspections during the installation of each system.
2. The Commissioning agent will present the issue report and recommendations.
3. The functional testing will be conducted by the CxA, contractor, and subcontractor.
4. The HVAC installation team must prepare a testing and balancing report.
5. Meters must be installed and calibrated according to the manufacturers' recommendations.
6. During functional inspections, operators will receive training, and this will be documented.
7. Functional inspections will be conducted in different seasons throughout the year to assess the performance and operation of the systems.
8. After ten months, a building inspection will be conducted to ensure that the systems are still performing at their best.

9.2 Optimization of Energy Yield

Phase: Design Prerequisite

For all projects, the design team must consider all mandatory requirements listed in the most current SOW of the ASHRAE 90.1-2010 Standard. An energy model for the entire building must be developed to ensure project sustainability goals are achieved through suitable energy efficiency strategies.

9.2.1. Envelope

The Vesta project envelopes must be designed to reduce the needs for cooling and heating. The roof, walls, and windows should be selected according to project's climate zone.

The climate zones of Mexico are defined as follows:

ZONE NO.	ZONE NOMENCLATURE	THERMAL CRITERIA
1	Very Hot–Humid (1A), Dry (1B)	9000 < CDD50°F
2	Hot–Humid (2A), Dry (2B)	6300 < CDD50°F < 9000
3A and 3B	Warm–Humid (3A), Dry (3B)	4500 < CDD50°F < 6300
3C	Warm–Marine	CDD50°F ≤ 4500 and HDD65°F ≤ 3600
4	Mixed–Humid (4A), Dry (4B)	CDD50°F < 4500 and 3600 < HDD65°F < 5400

Envelope criteria according by climate zone:

WEATHER ZONE	ROOF INSULATION VALUE	WALL INSULATION VALUE (U)	WINDOWS (U/SHGC)
1	R-19	R-6	0.60 - 0.30
2	R-19	R-6	0.58 - 0.30
3	R-16	R-6	0.58 -0.30
4	R-16	R-8	0.58 -0.30

Note: Check SOW in force for thermal envelope and glazing specifications

9.2.2. Indoor Lighting

Always take into consideration:

- Automatic controls for natural lighting for skylights
- Automated shutoff controls.
- Occupancy sensor controls: all lighting controls must comply with SOW specifications in force

- Lighting systems will be designed to reduce lighting power density by at least 50% compared to Table 9.6.1 of ASHRAE 90.1-2010.
- The use of LED lamps and exploration of high-energy efficiency solutions will help achieve these goals. Generally, lamps with voltages between 140 and 206 and intelligent design distribution may meet requirements. Indoor lighting throughout the building is considered according to the SOW specifications in force.

9.2.3 Outdoor Lighting

- The lighting system includes and outdoor lighting control
- The lighting system will reduce total exterior lighting power by 55% according to Table 9.4.3B Individual Lighting Power Allowances for Building Exteriors, Zone 2
- The use of LED lamps and exploration of high-energy efficiency solutions will help achieve these goals
- Maximum power density for outdoor spaces must be based on Point 2.9 of the SOW in force

9.2.4 Process Loads

The list of equipment and electrical devices to be installed in Vesta's projects should be reviewed.
Review the energy demand of mechanical equipment. Determine a limit for process load consumption for each type of project.
Main circuits will be sized for a maximum voltage drop according to the SOW in force.

9.2.5 HVAC Ventilation and Extraction

Equipment selection should be based on energy efficiency, with a minimum SEER of 16, as well as refrigerant type and load.
If a ventilation and extraction system is required, Scope of Work specifications must be followed.

Phase: Construction Prerequisite

1. Be sure what is established in the design is also installed in construction.
2. Verify CxA has the latest specifications to ensure correct functioning and placement of each item.

9.3 Energy Measurement

Phase: Design
Install advanced energy metering for the following:

- All energy sources used by the entire building; Prerequisite
- Any individual end-use of energy that represents 10% or more of the building's total annual consumption. LEED Credit

Phase: Design Remodeling Prerequisite

Conduct an energy audit that meets the requirements of the ASHRAE preliminary energy-use analysis and an ASHRAE Level 1 assessment.

Phase: Design for New Construction and Remodeling Mandatory Points

Advanced energy metering must have the following characteristics.

- The installation of advanced electrical meters and the records for locating meters must be carried out according to the SOW in force
- Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location
- Electricity meters must record both consumption and demand. Whole-building electricity meters must record the power factor, if applicable.
- The data collection system must use a local area network, a building automation system, a wireless network, or comparable communication infrastructure
- The system must be capable of storing all meter data for at least 36 months
- Data must be remotely accessible
- All system meters must be able to report energy use by hours, days, months, and years

Phase: Construction Mandatory Point
The energy meters must match the specifications in the drawings as well as the deliveries. The energy meters must be correctly installed in the project and easily accessible for verification.

9.4 Use of Refrigerants

Phase: Design for New Construction and Remodeling Prerequisite

Do not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilation, air conditioning, and refrigeration (HVAC&R) systems.

Select refrigerants used in HVAC&R equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The refrigerant impact should be less than 13 for SI units and less than 100 for IP units.

Phase: Construction LEED Credit

Verify that equipment in the design is the same as the equipment actually installed.

9.5 Renewable Energy

Phase: Design LEED Credit

Use renewable energy systems to offset building energy costs.
Aim for 1-3% of the total energy consumption of VESTA projects comes from renewable sources.
Exterior lighting should have its own photovoltaic cells.

Phase: Construction LEED Credit

Commission renewable energy systems.

10. Water Efficiency

When talking about Water Efficiency (WE), the subject of water should be approached comprehensively, analyzing indoor use, outdoor use, specialized uses, and the importance of measurement. The focus will be on "**efficiency first**" for water conservation, then finding the use of non-potable water sources and alternatives. Strategies are limited to what is stipulated in the “Mechanical Installations” section of the Scope of Work for each project.

All applicable regulations in force must be considered for each aspect, including but not limited to the following standards:

- NOM-001-SEMARNAT-1996
- NOM-002-SEMARNAT-1996
- NOM-003-SEMARNAT-1997
- NOM-004- SEMARNAT -2002
- NOM-001-CONAGUA-2011
- NOM-003-CNA-1996
- NOM-008-CNA-1998
- NOM-009-CNA-2001
- NOM-010-CNA-2000
- NOM-015-CNA-2007
- NMX-C-415-ONNCCE-2013

Note: The most current version of the applicable regulations must be verified annually.

Project Implementations

In VESTA projects, the following strategies will be employed, and certain mandatory points will be considered for each section.

10.1 Reduced outdoor water consumption
10.2 Reduced indoor water consumption
10.3 Water consumption metering

Mandatory points for this subject

Reduced water usage

10.1 Reduced Outdoor Water Consumption

Phase: Design Prerequisite

Identify the project vegetation areas. The vegetation must be selected to seek one of the following options, and it is mandatory to comply with one of the following two:

- Option 1. No irrigation required: Demonstrate that the landscape does not require a permanent irrigation system beyond a maximum establishment period of two years.
- Option 2. Reduce irrigation: Reduce the project's landscape water requirement by at least 30% from the baseline calculated for the site's peak irrigation month. Reductions must be achieved through the selection of plant species and the efficiency of the irrigation system, as calculated by the EPA's WaterSense, a water budgeting tool. This tool is an Excel spreadsheet that will contain project information, location, and plant selection. Since it is a North American tool, the location must be interpolated to a zone with similar characteristics here in Mexico.
- For Option 2, tool can be found at: https://www.epa.gov/watersense/water-budget-tool

The vegetation must meet the requirements established in the SOW (current: native, endemic, adapted) and it must be verified that there are no plants classified as invasive species. For the irrigation system, an efficient system must be used according to the SOW in force.

Phase: Construction Prerequisite

1. Ensure that vegetation species are those approved in the design to meet one of the two options.

2. The installed irrigation system must be drip irrigation.

10.2 Reduced Indoor Water Consumption

Phase: Design New Construction and Remodeling Mandatory Points

For bathroom fixtures and accessories, as applicable to the project scope, the aim is to reduce total water consumption by 40%.

Bathroom fixtures and accessories must comply with the water consumption rates mentioned in the current Scope of Work (SOW) in force:

Phase: New Construction and Remodeling Mandatory Points

1. Ensure that bathroom fixtures and accessories approved in the design are the ones actually installed.
2. Conduct pre-functional and functional tests

10.3 Water Consumption Metering

Phase: Design
Overall Metering: Mandatory Point (Construction and Remodeling)
Install permanent water meters that measure the total potable water use for the building and associated grounds. If all water comes from a public water supply and the utility company's water meter provides monthly consumption data, that system's meter meets the requirement.

Submetering of water: Prerequisite
The design team must specify permanent water meters for the following systems:

- Irrigation system
- Indoor plumbing accessories (hot water, sanitary fixtures, process water)

Note: Depending on the project, at least 2 of these meters:
Phase: Construction and Remodeling Mandatory Points

1. The general water meter must match the specifications in the drawings, as well as the deliverables. Project water meters must be correctly installed and be easily accessible for verification.
2. Verify meter installation and calibration, according to manufacturer recommendations.

11. Materials and Resources

When selecting materials for our projects, focus should be on minimizing embodied energy and other impacts associated with material extraction, processing, transportation, maintenance, and disposal. The strategies are designed to support life-cycle approaches that improve performance and promote resource efficiency.

When selecting material types, those requirements established within the SOW in force for each project must be considered. The material sustainability selection must be referenced against the VESTA Sustainable Purchasing Policy, including established lines of action and guidelines.

Project Implementations

In Vesta projects, the following strategies will be enacted (when applicable):

11.1 Environmental Product Declaration
11.2 Raw Material Extraction
11.3 Policy on Remodeling Projects LEED Credit

11.1 Environmental Product Declaration

Phase: Design LEED Credit

Use at least 10 different products installed permanently from at least 3 different manufacturers that meet one of the following disclosure criteria:

- Product-specific Declaration: Products with a critically reviewed and publicly available life-cycle assessment in accordance with ISO 14044 that have at least one cradle-to-grave approach.
- Environmental Product Declarations (EPD meeting ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 standards: These declarations must have at least one cradle-to-grave approach.
- Generic Industry EPD: Products with third-party certification (Type III), including independent verification, where the program operator explicitly recognizes the manufacturer as a participant.
- Type III Product-specific EPD: Products with third-party certification (Type III), including independent verification, where the program operator explicitly recognizes the manufacturer as a participant.

Phase: Construction LEED Credit

1. Verify purchase and installment of selected materials

11.2 Raw Material Extraction

Phase: Design LEED Credit

Use products that meet at least one of the following responsible extraction criteria for at least 25%, by cost, of the total value of permanently-installed construction products in the project.

- Extended Producer Responsibility: Products purchased from a manufacturer (producer) who participates in an extended producer-responsibility program or who is directly responsible for extended producer responsibility.
- Wood Products: Wood products must be certified by the Forest Stewardship Council or an equivalent approved by the USGBC.
- Material Reuse: Reuse includes recovered, refurbished, or reused products.
- Recycled Content: Recycled content is the sum of post-consumer recycled content plus half of pre-consumer recycled content, based on cost.

Phase: Construction LEED Credit

Verify purchase and installment of selected materials

11.3 Policy on Remodeling Projects

Phase: Design LEED Credit Remodeling

Vesta must have a renovation policy in place prior to a remodeling project, which should include necessary points to consider from design through construction, and where the total purchasing cost of materials must meet the following conditions:

- Recycled content in the material
- Wood that meets FSC certification
- Reused materials
- Materials with extended producer-responsibility (where the producer participates in an extended producer-responsibility program)
- GreenScreen v1.2 benchmark test
- Cradle-to-Grave certification (see required levels)
- Products participating in supply chain optimization
- Products with low VOC (volatile organic compound) emissions

12. Waste Management

Waste is defined in the General Law for Waste Prevention and Comprehensive Management of (LGPGIR) as materials or products discarded by the owner or holder that are in solid, semi-solid, liquid, or gaseous state and found in containers or deposits; these may be susceptible

to assessment or require treatment or final disposal pursuant to provisions of the same Law (DOF, 2003).

Waste generated by human activity contaminates soil, water, and air, and occupies land if not treated. This has become a social and public health problem; it is estimated that by 2050 there will be more plastic than fish in the ocean (Sánchez, 2019). Waste management is essential and necessary for the survival of our species and of many others.

Waste management refers to the human activity involved in the collection, transportation, disposal in prepared facilities, and finally, treatment conducted to either utilize or eliminate the waste in question. This implies that the waste generator must assume responsibility and undertake actions to prevent it from accumulating in landfills.

Some of the benefits obtained from managing waste include:

- Lowering costs and producing new sources of income
- Contributing to opportunities for environmental protection
- Helping improves the Company's image and positioning
- Reducing the ecological footprint
- Enhancing the quality of a company's value chain
- Decreasing the amount of waste sent to landfills

All applicable regulations in force should be considered for each aspect, including but not limited to the following standards:

- NOM-052-SEMARNAT-2005
- NOM-056-SEMARNAT-1993
- NOM-161-SEMARNAT-2011

Project Implementations

In Vesta projects, the following strategies will be enacted (when applicable):

12.1 Spaces designed for waste separation
12.2 Waste separation during construction

12.1 Spaces for Waste Separation

Phase: Design Mandatory Point

Provide accessible areas dedicated for waste haulers and occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be in separate locations. Recyclable materials should include mixed paper, corrugated board, glass, plastics, and metals. Additionally, the separation, collection, storage, and safe disposal of two of the following should be addressed: batteries, mercury-containing lamps, and electronic waste.

The following table provides an estimate for the space needed:

M^2 OF CONSTRUCTION	MINIMUM AREA FOR SEPARATION (M^2)
0 to 464 m2	8 m2
464 to 1,393 m^2	12 m2
1,394 to 4,645 m^2	17 m2
4,646 to 9,290 m^2	21 m2
9,291 to 18,580 m^2	26 m2
18,580 m2 or more	47 m2

Phase: Construction Mandatory Point

Verify construction of space for waste separation that complies with the classification of at least 5 categories of waste.

12.2 Waste Separation During Construction

Phase: Design Mandatory Point

During the design phase, managing waste is crucial because, if done correctly, it will result in less waste during the construction phase. It is essential to choose environmentally- friendly construction materials and propose a building structure that minimizes environmental impact. For example, incorporating a titanium dioxide layer into the structure helps convert CO_2 into a less toxic hydrocarbon due to the photocatalytic effect produced when sunlight hits the TiO_2 layer.

Additionally, a quantitative analysis of the materials to be used is necessary to efficiently utilize the available materials and avoid excessive use of unnecessary materials.

When designing the construction, access point creation waste removal and the existence of composting bins are important to extending product and material life. In the waste separation area, spaces should be clearly designated for sorting and sending metal, cardboard, paper, plastic, wood, organics, hazardous waste, bulbs, lighting fixtures, and electronic waste to proper recycling.

Phase: Construction Mandatory Point

During the operation and construction phases, a significant amount of waste is generated. For example, concrete, asphalt, blocks, sand, gravel, bricks, soil, and clay represent about 50% of the total waste. Another 20% to 30% typically consists of wood and related products, such as formwork, frames, and boards. The remaining 20% to 30% of waste includes miscellaneous items like metals, glass, asbestos, insulation materials, pipes, aluminum, and electrical parts. Currently, an exceedingly small percentage of these materials is recovered.

The actions that should be implemented to manage waste correctly in any project include waste reduction, material recovery, energy utilization, and waste treatment. These actions not only help counteract any negative environmental impact, but also promote the sectorial environmentally friendly competitiveness through careful resource production methods and measures for material and raw material recovery in the industrial, commercial, and service sectors.

The possibilities for assessment and utilization through reuse, recycling, or co-processing of construction and demolition waste depend on individual waste-material markets and the ability to process unsorted items or to separate each material. The materials usually found in debris that can be used in recycled aggregate production belong to two groups:

a) Materials composed of cement, lime, sand, and stone: concrete, concrete blocks, and concrete masonry.
b) Ceramic materials: roof tiles, pipes, bricks, and floor tiles.

A third group of non-recyclable waste materials that may have other recycling or co-processing destinations in different industries includes: soil, plaster, metal, wood, paper, plastic, cardboard, organic matter, rubber, fabrics, glass, and Styrofoam. Some of these materials can be selected and repurposed for other uses. For example, paper and cardboard packaging, wood, glass, and metal can be collected for reuse, recycling, or co-processing.

Regarding recycling options, recovered material can be used in waste management improvement projects (e.g., landfill covering or road construction within the landfill), and civil engineering projects (e.g., access roads in affected areas, embankments, slopes, riverbank reinforcement, etc.).

To establish a reuse and recycling program, it is necessary to evaluate its potential for the same, as well as conducting economic analyses that compare reuse and recycling against developing a solid-waste landfill program. It is recommendable to follow programs that identify which materials can be utilized; the necessary equipment for collection and transportation; the approximate value of recovered or recycled materials and their market; community involvement; and the economic, social, and environmental viability of the program. (Pan American Health Organization, 2002).

- Asphalt: Most asphalt waste comes from repaving projects. Most of the reclaimed pavement is processed to form a road base layer, but up to 40% can be included in new pavements.
- Concrete: Most recovered concrete comes from roads, bridges, and foundations; it is processed for use as a road base layer, asphalt pavement aggregate, and as a substitute for gravel in new concrete aggregate.
- Wood: Wood waste from construction or demolition comes from structures and formwork made of laminated and composite wood, and from wood contaminated with paint, asbestos, or insulation material. Most wood waste is processed to produce boiler fuel and for landscaping, with smaller quantities used for landfill cover, feeding pulp and paper mills, intermediate landfill cover, and composting of wastewater treatment-plant sludge.
- Metals: Primarily iron and steel, which can be melted down for recovery and reuse.
- Concrete: Can be used in land reclamation, embankments, non-load-bearing fills, and slopes, or disposal in landfills as inert material designated for that purpose. (Information based on documentation from the Pan American Health Organization, 2002).

13. Indoor Atmosphere Quality

It is crucial for projects to have decisions made on indoor air quality and thermal, visual, and acoustic comfort for the benefit of all occupants. Green buildings with good indoor atmospheric quality protect the health and comfort of building occupants.

When discussing indoor atmospheric quality, the results are improved productivity, reduced absenteeism, increased building value, and decreased liability for designers and building owners. Numerous design strategies and environmental factors must be considered: air

quality, lighting quality, acoustic design, and control over one's environment, all of which influence how people learn, work, and live.

Project Implementations

In VESTA projects, the following strategies will be enacted (when applicable):
13.1 Strategies for Indoor Environmental Quality
13.2 Control of tobacco smoke
13.3 Low-emitting materials
13.4 Thermal comfort
13.5 Natural lighting

13.1 Strategies for Indoor Air Quality

Phase: Design

The design team must follow the ventilation rates for each space of the project as described in the ASHRAE 62.1-2010 standard (Sections 4 to 7). Prerequisite (New Construction and Remodeling)
Where possible increase ventilation by 30%. Recommendation

Equipment with MERV 13 filtration, based on the SOW in force, must be specified for each unit supplying outside air to the spaces.

For spaces with mechanical ventilation (and for mixed-mode systems when mechanical ventilation is activated), control the outside air intake flow as follows:

- For variable air volume systems, provide a direct outside air flow metering device capable of measuring the minimum outside air intake flow. This device must measure the minimum outside air intake flow with an accuracy of ±10% of the minimum outside air flow design rate, as defined in the previous ventilation requirements. An alarm should indicate when the outside air flow value varies by 15% or more from the outside air flow setpoint. Prerequisite (New Construction and Remodeling)
- For constant-volume systems, balance the outside air flow with the minimum outside air flow design rate defined by ASHRAE 62.1-2010 (with errata) or higher. Install a current transducer on the supply fan, an airflow switch, or a similar monitoring device.
- The system should consider four air changes per total building height/hour mounted on the wall for production and storage with a separate control panel based on the SOW in force.

- Fans should have automatic controls that comply with ASHRAE 90.1-2010, capable of and configured to turn off the fans when not needed based on the SOW in force.

Prerequisite For naturally ventilated spaces, CO_2 (carbon dioxide) meters should be installed. These meters must be installed in each distinct classified zone and on each level of the building. They should have both visual and audible alarms and be positioned at a height between 90 and 180 cm from the floor.

Install permanent entry systems of at least 10 feet (3 meters) in length in the main travel direction to capture dirt and particles entering the building through extensively used exterior entries. Acceptable entry systems include permanently installed grills, slotted systems allowing cleaning underneath, foldable mats, and any other material manufactured as entry systems with equivalent or greater performance. Maintenance of these systems should be conducted weekly.

Phase: Construction Prerequisite

1. Verify that the mechanical equipment matches the previously approved designs.
2. Verify with the CxA that the equipment supplies the desired amount of air.
3. Ensure that new filters have been installed.

13.2 Tobacco Smoke Control

Phase: Design New Construction and Remodeling

Smoking inside the building is forbidden. Prerequisite
Prohibit smoking outside the building except in designated smoking areas. The location and distance are determined in the SOW in force, located at least 25 feet (7.5 meters) from all entrances, outdoor air intakes, and operable windows. Also, prohibit smoking throughout the project perimeter.

Phase: Construction Prerequisite

Ensure signage is installed indoors and outdoors.

13.3 Low Emission Materials

Phase: Design Recommendation

Select low-emission materials.
They must comply with the following categories (indoors):

- All paints, varnishes, adhesives, sealants, ceilings, floors, and acoustic and thermal insulations must have low emissions and be certified as mentioned in the SOW in force, including:
    - Paints and coatings: At least 75% of all paints and coatings, by volume or surface area, comply with the VOC-emissions evaluation, and 100% comply with the VOC-content evaluation. This point also includes paint, coating, and touch-ups for metal structures.
    - Adhesives and sealants: At least 75% of all adhesives and sealants, by volume or surface area, comply with the VOC-emissions evaluation, and 100% comply with the VOC-content evaluation.
    - Flooring: At least 90% of all flooring, by cost or surface area, complies with the VOC-emissions evaluation, or with the criteria for inherently non-emitting sources, or the criteria for recovered and reused materials.

Phase: Construction LEED Credit

Ensure selected materials are purchased and installed.

13.4 Thermal Comfort

Phase: Design LEED Credit

HVAC systems and the building envelope must be designed to meet the requirements of ASHRAE Standard 55-2010, Thermal Comfort Conditions for Human Occupancy, with errata or a local equivalent.

Include one or more of the following design alternatives in regularly occupied areas of storage, sorting, and distribution spaces in industrial buildings:

- Radiant flooring
- Circulating fans
- Passive systems, such as night air, heat ventilation, or wind flow
- Localized active cooling (refrigeration or evaporation systems) or heating systems
- Area fans with wiring that provide air movement for occupant comfort
- Another equivalent thermal comfort strategy

Provide individual thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal-comfort controls for all shared multi-occupant spaces.

Thermal comfort controls, whether in individual spaces or shared multi-occupant spaces, allow occupants to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

Phase: Construction LEED Credit

Ensure that strategies selected during design are applied in the areas.

13.5 Natural Lighting

Phase: Design LEED Credit

Ensure that at least 75% to 90% of regularly occupied spaces achieve illumination levels between 300 lux and 3000 lux at 9 a.m. and 3 p.m., both on a clear day at the equinox.

During the design phase, perform a simulation to verify that these illumination levels are met.

Phase: Construction LEED Credit

Ensure that lighting levels are met in spaces frequently occupied.

14. Innovation

Project Implementations

In VESTA projects, the following strategies will be enacted (when applicable):

14.1 Training on green buildings

14.1 Training on Green Buildings

Phase: Design Recommendation

Reflect the implemented strategies through signage to inform occupants and visitors. Similarly, have a section on VESTA's website explaining the sustainability strategies of each of their projects. Install signage at the project site reflecting the implemented strategies.

The signage should preferably be placed at the entrance.

Phase: Construction Recommendation

Verify signage is installed.

15. Regional Priority

Strategies that aim for community development will always be sought in VESTA projects, as it is one of the requirements for complying with the different standards to which they are already registered as part of the path towards meeting the SDGs. Therefore, although it is a voluntary point, its analysis must always be considered.

Project Implementations

In VESTA projects, the following strategies will be enacted (when applicable):

15.1 Project Environment Needs

15.1 Project Environment Needs

Phase: Construction LEED Credit

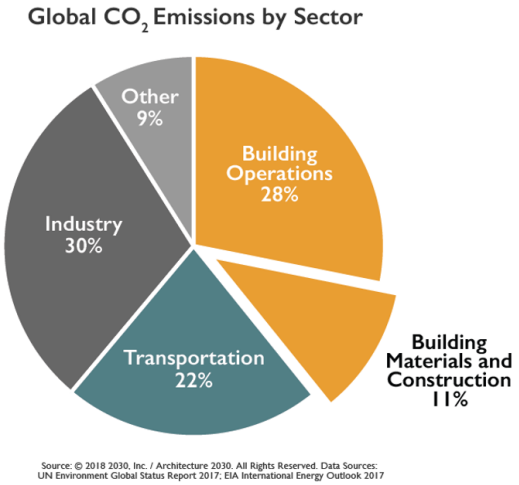
This chapter strives for the project to support some of the sustainable needs in the project's location. For LEED, specific needs have been identified for certain locations in Mexico (which is where we are interested), and these needs can be reviewed on their platform. By addressing one or more of these needs, additional points can be earned if seeking certification. It is possible to achieve up to four points depending on the level of compliance.

The website to learn about projects within the USGBC is https://www.usgbc.org/regional-priority-credits On this page, you can enter the version of LEED certification you are pursuing, the type of project, and the project location. The site will then show you the regional options available. There will always be 6 options, from which you can choose a maximum of four. If your project contributes to improvements in the selected options, additional points can be earned.

16. Embodied Carbon

The operation and construction of buildings account for approximately 40% of all global CO_2 emissions related to energy. Embodied carbon is responsible for 11% of global greenhouse gas (GHG) emissions. Embodied carbon encompasses all GHG emissions resulting from the extraction, harvesting, processing, manufacturing, transportation, and installation of building materials.

Given its significant impact, the construction sector (and embodied carbon) plays a crucial role in achieving the goals of the Paris Agreement.



Net-Zero Carbon Emissions

The construction sector significantly contributes to global carbon emissions. These emissions are not limited to the operational phase of a building but also include those generated throughout the entire lifecycle of a building. The trend for buildings is to manage construction processes with a zero-net approach to limit global warming.

Emissions from construction primarily come from concrete, steel, asphalt, heavy transportation, and construction machinery. Carbon emissions include direct emissions from construction processes as well as indirect emissions from the production of materials and components. Below are the strategies that VESTA considers necessary to decarbonize its buildings.

Project Implementations

In VESTA projects, the following strategies will be enacted (when applicable) in line with meeting net-zero carbon goals:

16.1 Machinery and transportation
16.2 Material embedded carbon
16.3 Offsetting waste emissions

16.1 Machinery and Transportation

Phase: Design Recommendation

Planning and projecting the routes for vehicles used during the construction process is recommended to optimize the transportation of materials and personnel.

Phase: Construction Recommendation

The use of machinery and vehicles during the construction phase should be reduced, including minimizing energy consumption. Transportation trips for raw materials, materials, and tools or equipment that are unavoidable and necessary for construction should be controlled or automated.

Use machinery (large or small) and transport that are free from fossil fuels during construction. Consider using electric vehicles, smaller machinery, or those that use biofuels from sustainable sources.

16.2 Embedded-Carbon Materials

Phase: Construction Mandatory Point

Construction processes should optimize the use of resources and materials to improve managing the same. The aim is to reduce, reuse, and, if necessary, substitute materials with high embodied-carbon content to avoid waste.

Design optimizations and innovations should be considered to reduce the use of materials with high embodied-carbon content and to use eco-friendly products through a material usage evaluation. The selection of materials, products, and services should consider management and supply chain processes involved in providing these resources.

Carbon Calculator for Industrial Warehouses

We have compiled information from various databases from recognized sources for LEED certification, resulting in a calculation where the embedded carbon is graphically displayed for an industrial warehouse-type project, focusing on civil works, i.e., foundations, building, structure, and roofing. It is a resource analyzed on demand for a specific project.

The purpose of the calculator is to identify the material's embedded carbon during the production stage from cradle to gate (A1 to A3) in the life cycle of a building. The calculator quantifies information in TCO_2eq (tons of carbon dioxide equivalent) and $KgCO_2eq/m2$ (kilograms of carbon dioxide equivalent per square meter) for the materials used in the substructure and superstructure of the building, which are parameters that can be compared with similar buildings.

The calculator must be completed (request the Excel file from the Development area) so that it can be filled out and reviewed by PIIMA as part of the Checklist evidence.

16.3 Offsetting Waste Emissions

Phase: Construction Mandatory Point

Decarbonization includes offsetting the remaining carbon emissions. Materials that cannot be replaced due to their specific properties, such as concrete or steel, must be products to be manufactured with lower impact.

The steel used must be from recycled sources. The steel specifications should be verified with the supplier, through technical data sheets, Environmental Product Declarations (EPD), studies, or letters indicating the recycled content.

The use of concrete, certified wood, and materials with low carbon-content specifications is recommended. Efforts should be made to offset the remaining emissions through the use of renewable energy or support for projects minimizing greenhouse gas emissions.

17. Resilience and Climate Change

The world is already experiencing changes in average temperatures, shifts in seasons, and an increasing frequency of extreme weather events and other effects of climate change, as well as slow-onset phenomena. The faster the climate changes and the longer adaptation efforts are delayed, the more difficult and costly it will become. (UNCC, 2021)

Based on TCFD, (Taskforce on Climate-related Financial Disclosures) risks are classified into chronic and acute risks:

Chronic risks refer to long-term changes in climate patterns, such as:

- Droughts
- Water accessibility
- Extreme heat
- Rises in sea levels

Acute risks refer to those driven by extreme weather events, such as:

- Forest fires
- Hurricanes
- Flooding
- Cyclones

To identify Climate Physical Risk, it is necessary to implement an analysis where the specific risk for each asset is identified.

Project Implementations

In VESTA projects, the following strategies will be enacted (when applicable):

17.1 Physical Risks

17.1 Physical Risks

Phase: Design Mandatory Point

The project team must identify and, if necessary, update Vesta's Physical Risk Matrix and available National Information (INEGI, Risk Atlas, etc.) to determine the type of physical risks the property faces. Once identified, actions should be proposed for prevention and mitigation, especially concerning floods, earthquakes, and storms.

Suggested sources to identify physical risks:

- INEGI Indicator Bank:
  - https://www.inegi.org.mx/app/indicadores/default.aspx?tm=8#divFV620010896062001089606200108944 *Prediction System for the Danger of Forest Fires in Mexico http://forestales.ujed.mx/incendios2/#
- National Risk Atlas of Mexico:
  - http://www.atlasnacionalderiesgos.gob.mx/
- Ciclociudades Ranking:
  - https://ciclociudades.s3.us-west-2.amazonaws.com/Ranking2020.pdf
- Global FM:
  - https://www.fmglobal.com/research-and-resources/nathaz-toolkit/flood-map
- https://www.wbdg.org/design-objectives/secure-safe/natural-hazards-mitigation

Phase: Construction Mandatory Point

Verify that there is a comprehensive planning program where the physical risks of the asset are identified, and mitigation strategies have been applied.

Conclusions

This manual has the purpose of incorporating sustainability principles into industrial real estate properties, serving as a guide and reference framework for achieving the objectives outlined above. It follows sustainability standards as references for the design and construction of green buildings, along with case studies and current Vesta properties.

The sustainability strategies covered in this manual focus on the development of best practices for site selection and development, achieving energy efficiency, and the selection and management of materials and resources.

SC&RM Checklist

It is a comprehensive analysis and control tool that provides information on the selection, implementation, monitoring, and cost-benefit analysis of a building's sustainability initiatives. It allows for identifying improvement opportunities in the different stages of Design, Construction, and/or Remodeling. Additionally, it enables reporting/communicating the progress and performance of these areas to various stakeholders (primarily employees, contractors, investors, tenants, users, and the community at large).

a. Checklist Objective

The Checklist strives to track the compliance and value-added sustainability initiatives in any Vesta new construction, remodeling, or expansion projects, and to align with the ESG strategies of its portfolio and assets, thus helping to report and capitalize on opportunities with various stakeholders. Additionally, it supports Vesta's Level 3 Strategy and the decarbonization of buildings.

b. Checklist Structure

The Matrix content is divided into the same categories as this Manual, listing the KPIs to identify those which, through implementation, enhance development, remodeling, and expansion of Vesta project activities.

c. Checklist Use

The Checklist is a supplementary tool provided alongside the Vesta Sustainable Construction and Remodeling Manual.

NOTE: Since the Checklist is a document that needs to be constantly updated and will serve as support and analysis throughout the project stages, it is crucial to complete the relevant aspects at each stage, as indicated in the section "How to Use This Manual."

The steps for correctly applying this tool are as follows:

1. The Implementation Checklist contains the strategies listed in this manual (Vesta Sustainable Construction and Remodeling Manual). This tool will help track sustainable strategy requirements to ensure compliance during the different phases of application.

2. The Project Manager must meet the requirements and perform the actions established in the Checklist and provide the requested evidence for each credit, as applicable. To ensure clarity for each indicator, all notes and/or additional contextual observations supporting the provided evidence should be noted.
3. Applicable regulations, codes, and national and international standards must be considered for each category, adhering to the most stringent requirements, as established in the SOW in force.
4. The completion and review of the Checklist will follow the guidelines established in the "How to Use This Manual?" section of the Vesta Sustainable Construction and Remodeling Manual.

Appendix

Appendix A: Overview

The following table shows the summary and overview of the credits integrated throughout this manual.

STRATEGIES	MANDATORY		FEASIBILITY		CERTIFICATION
	NEW CONSTRUCTION	REMODELING	HIGH/MEDIUM/ LOW	FACTOR	
DESIGN-BUILD PROCESS					
Integrational Process	Yes	Yes	High	Time	LEED BD+C v4
PLANES DE OBRA					
Pollution Prevention from Construction Activities	Yes	No	High	-	LEED BD+C v4
Waste Management Plan	Yes	Yes	Medium	Cost	LEED BD+C v4 LEED O+M v4

Indoor Atmosphere Quality Plan	No	No	High	-	LEED BD+C v4
BUILDING HEALTH & SAFETY STANDARDS					
Health & Safety	Yes	Yes	High	Time	VESTA
Health & Safety Indicators	Yes	Yes	High	Time	VESTA
LOCATION AND TRANSPORTATION					
Bicycle Facilities	No	No	Low	Location	LEED BD+C v4
Reduce Parking Footprint	No	No	Medium	Local Construction Regulations	LEED BD+C v4
Green Vehicles	No	No	Medium	Cost	LEED BD+C v4
Access to Quality Transportation	No	No	Medium	Cost + Permits	LEED BD+C v4 LEED O+M v4
BIODIVERSITY					
Native Flora	No	No	Medium	Cost	VESTA
Pollinator Gardens	Yes	No	Medium	Cost	VESTA
SITES					
Habitat Protection and Recovery	No	No	Medium	Cost	SITES v2
Restore Soils Altered by Construction	No	No	Media	Cost	SITES v2

Control and Manage Invasive Plants	No	No	High	-	SITES v2
PARTICIPATION AND COMMITMENT WITH THE COMMUNITY					
Optimal Site Accessibility, Safety, and Orientation	Yes	No	Medium	Logistics	SITES v2
Support the Local Economy	No	No	Medium	Cost	SITES v2
Engage Users and Stakeholders	No	No	Medium	Time	SITES v2
Develop a Social Assistance Project	Yes	No	Medium	Cost + Permits	VESTA
Socioeconomic Impact	Yes	No	Medium	Cost	VESTA
Sustainable Sites					
Site Evaluation	No	Yes	High	Time	LEED O+M v4
Rainwater Management	No	No	Medium	Cost	LEED BD+C v4
Heat Island Effect	No	No	Low	Costo	LEED BD+C v4
Reduce Light Pollution	No	No	Medium	Cost	LEED BD+C v4
Energy and Renewable Energy					

-Fundamental and Enhanced Commissioning	Yes	No	Medium	Cost	LEED BD+C v4
Optimization of Energy Performance	Yes	Yes	Medium	Cost	LEED BD+C v4 LEED O+M v4
Energy Metering	Yes	Yes	Medium	Cost	LEED BD+C v4 LEED O+M v4
Use of Refrigerants	Yes	Yes	High	-	LEED BD+C v4 LEED O+M v4
Renewable Energy	No	No	Low	Cost	LEED BD+C v4
WATER EFFICIENCY					
Reduce Outdoor Water Use	Yes	Yes	High	-	LEED BD+C v4 LEED O+M v4
Reduce Indoor Water Use	Yes	Yes	High	-	LEED BD+C v4 LEED O+M v4
Water Metering	Yes	Yes	High	-	LEED BD+C v4 LEED O+M v4
MATERIALS AND RESOURCES					
Environmental Product Declaration	No	No	High	Cost	LEED BD+C v4
Material Extraction	No	No	High	Cost	LEED BD+C v4
Policy on Remodeling Projects	No	Yes	High	Cost	LEED O+M v4
WASTE MANAGEMENT					

Spaces for Waste Separation During Operation	Yes	Yes	High	-	LEED O+M v4
Waste Separation During Construction	Yes	Yes	High	-	LEED BD+C v4
INDOOR ATMOSPHERE QUALITY					
Air Quality Improvement Strategies	Yes	Yes	Medium	Cost	LEED BD+C v4 LEED O+M v4
Tobacco Smoke Control	Yes	Yes	High	-	LEED BD+C v4 LEED O+M v44
Low-emission Materials	No	No	Medium	Cost	LEED BD+C v4
Thermal Comfort	No	No	Low	Cost	LEED BD+C v4
Natural Lighting	No	No	Low	Design	LEED BD+C v4
Access to Views	No	No	Low	Design	LEED BD+C v4
INNOVATION					
Training on Green Buildings	No	No	High	-	LEED BD+C v4
REGIONAL PRIORITY					
Needs of the Environment	No	No	Medium	Cost + Time	LEED BD+C v4
EMBODIED CARBON					

Machinery and Transportation	No	No	Medium	-	VESTA
Material Embodied Carbon	Yes	Yes	High	Time	VESTA
Offsetting Waste Emissions	Yes	No	Medium	Cost	VESTA
RESILIENCE AND CLIMATE CHANGE					
Physical Risks	Yes	Yes	High	Time	VESTA

Appendix B: Embedded Carbon Matrix (Request Excel from the Development Area to Fill it Out as Part of the Checklist Evidence)

Appendix C: Environmentally Preferable Alternatives to Conventional Materials

APPENDIX 1 contains supplementary but no less important contextual information on the various topics addressed in the Sustainable Construction and Remodeling Manual.

Trends in Sustainable Construction

Trends in the construction market are constantly evolving. Therefore, we suggest reviewing the innovations available within value-added engineering and proposing them according to the specific requirements of each project. Some examples of these trends are as follows:

Generative Design:
Software that can make changes to buildings and calculate performance in real-time (such as airflow, space temperature, leveraging sunlight and lighting, and ways to optimize energy use).

Net-Zero Energy Building:
Those buildings that manage to eliminate their energy footprint by generating the energy they consume throughout their lifecycle.

Materials with Lower Embodied Carbon
The carbon footprint of the built environment stems both from construction operations and construction materials and reducing building emissions requires emphasis on both. Unless the industry starts addressing the need to reduce embodied carbon in construction materials by 2050, these emissions will equal those from operations considering all new constructions planned for the next 30 years. (Facility Executive, 2021).

Water conservation, assessment, and management:
Water prices are rising at a faster rate than inflation and increasing more rapidly than other utilities due to infrastructure costs, water scarcity and/or droughts. There is a growing awareness in both the public and private sectors of the correlation between water savings and the use of potable water; as a result, water conservation is a topic that deserves attention and investment.

Native and sustainable landscaping:
In the past, landscaping was chosen solely for its aesthetic appeal, which led to many invasive pests, such as rampant bamboo that grows wild in many areas. Native and sustainable landscaping is designed around what naturally grows in the area, so only indigenous flowers and plants are used. Meanwhile, sustainable landscaping often leans towards designs that require minimal maintenance, especially regarding water waste.

Eco roofing and walls:
They can have water catchment systems, filtration systems, or reduce the temperature of building interiors; consequently, this can improve the habitat and comfort of the users..

Grid parity:
Energy generated from renewable sources (photovoltaic, wind, and solar energy sources).

Bio-concrete:
Bacteria-based concrete that helps regenerate bio-concrete, making it an environmentally-friendly option. It has the ability to heal cracks by producing calcium carbonate.

Air quality:
Indoor air quality is influenced by factors such as the use of paints with harmful compounds, poor air filtration, and ventilation. Using paints with low VOC (volatile organic compounds) helps reduce the carbon footprint of the building structure. Employing air purifiers and materials with zero emissions also contributes to better indoor air quality.

Smart Tech:
Using technology in buildings such as Domótica (home automation), 5G networks, and more efficient resource-distributing technologies while also considering sustainability.

Prefabricated:
This trend involves the use of prefabricated materials, offering advantages such as reduced construction time, easy assembly, and flexible spaces within the building. Modular construction -a system for creating and assembling standardized modules- reduces the environmental impact that the building might generate.

Biodiversity:
This trend entails reducing the impact to zero and even becomes biodiversity-positive, that is, to leave site biodiversity in better conditions than originally found. Biodiversity adds value to the economy and human well-being by providing ecosystem services for industry, agriculture, tourism, and recreation. This inclusion not only provides habitats for flora and fauna but also

produces benefits such as better air quality or special amenities, resulting in improved workplaces. Projects that consider sustainability and biodiversity become more attractive and profitable for investors.

Resilience:
As seen with both COVID-19 and natural disasters, governments and the private sector alike, including building owners and operators, must plan, remodel, and construct resiliently, as well as have disaster-response plans in place.

Similarly, investors view climate considerations as a fiduciary responsibility to their stakeholders and are realizing that building for resilience, at the property, portfolio, and citywide levels, is crucial to staying competitive. Information on city-scale risks, including fiscal policy constraints, investment, critical infrastructure repairs and replacement, and the level of commitment to improving resilience, are key factors to consider. (Facility Executive, 2021).

Zero Waste in Construction:
Some governments, such as the UK, are currently pushing to eliminate all types of waste by 2050. The goal is to promote the zero-waste concept across all stages of construction, including its life cycle, design, construction, maintenance, procurement, renovation, and demolition, along with its value chain. The real estate sector is one of the largest producers of waste in terms of tons, which is why strategic plans have been proposed to achieve material recovery or, if not possible, keeping them at the highest level of the waste hierarchy by preparing them for reuse, closed-loop recycling (where waste is used as raw material in the same process), or open-loop recycling (where waste is repurposed as raw materials for a different use). Hazardous or contaminating waste is unsuitable for further use. (CLC,2020)

Trends in Mexico

BIM (Building Information Modeling):

It is a management system that integrates big data, analytics, and construction. BIM is a construction information model that involves architects, engineers, and regulatory teams. It analyzes data from the building throughout its life cycle and construction, leading to time and resource-expenditure optimization for design and construction. The goal is to digitally centralize all project information.

Vertua Eco-Concrete:
Vertua is an eco-friendly concrete from Cemex that reduces CO_2 emissions by 30 to 100%, as compared to traditional concrete. When used, it issues a certificate detailing the amount of CO_2- reduction achieved during construction. Cemex has a special calculator for this.

This product can be used in slabs, columns, walls, foundations, prefabricated elements, sidewalks, and pavements, among other applications.

Thermal Insulation:

Owens Corning offers fiberglass-based products that provide thermal insulation, helping to save up to 30% on electricity. This insulation maintains a comfortable indoor temperature, reducing the need for heaters in winter or fans in hot weather. Additionally, this product offers acoustic insulation.

PET Sheets:

Quimiplastic, a Mexican company, has created PET (polyethylene terephthalate) sheets made from 100% recycled material. These sheets offer benefits such as fire resistance and thermal and acoustic properties. They are also easy to install, as they can be custom-manufactured to specific dimensions.

Certifications:
In addition to construction trends, there are building evaluation systems that focus on ESG aspects. These systems help identify building opportunities; improve production processes; social and governance-scale management; and measure environmental impact. Certifications enhance competitiveness, reduce expenses on service consumption, and prevent penalties for non-compliance with environmental regulations.

Attachment D: Contextual Information
Case Studies

The financial performance of assets with sustainability and energy certifications is greater than those without them. According to the UN Environment Program Finance, a certified building can have up to a 100% higher rental income compared to a non-certified asset (HSF, 2021). The following will present global case studies on the benefits of sustainable constructions.

Green Construction as a Sound Business

In the United Kingdom, several researchers compared 336 buildings with sustainability certifications against 2,000 non-certified construction projects that were executed between 2003 and 2014, with similar qualities in location and construction times. The conclusion was that a sustainable asset costs 6.5% more than the average one. However, it has been demonstrated that such assets, like industrial warehouses, rent between 13.3% and 36.5% higher. Assets may have different costs and ROI times due to market dynamics, but they are always more attractive to developers and investors.

The initial costs of sustainable construction are higher, divided into two main stages: design and finishes/equipment. Design costs are approximately 32% more expensive, while finishes cost between 28% and 32% more than a conventional asset. The benefits of this increase are seen during the asset's lifetime, as it comes with a plan that ensures project success. This initial investment also increases the rate of return by 2.6% compared to conventional construction.

Sustainable design will eventually see cost reductions as global ESG knowledge and learning moves forward.

Sustainable construction benefits both occupants and developers. Beyond financial returns, it improves occupants' health, increases their comfort, and consequently enhances productivity and overall performance. (NBS,2020)

World Bank Group (International Finance Corporation)

According to an IFC report, Director Alzbeta Klein states that green buildings present an investment opportunity, showing that the better the quality and sustainability of a project, the better the investment can be. It was also found that people working in green industrial facilities have lower utility bills, saving between 15 and 20%, and show greater resource efficiency, using 20 to 40% less energy and water compared to traditional industrial facilities.

These industrial assets generate higher returns for investors and financiers, up to 8% more, and sale premiums are 31% higher. Occupancy rates are 23% higher, and tenant retention is also better (IFC, 2019).

Green asset financing interest rates are 0.5 to 2% lower than conventional loans, due to reduced construction times and high profitability.

Certifications for parks and industrial facilities, according to developers, bankers, and government officials, build investor confidence and provide a clear definition of a green building, avoiding inconsistent standards and "greenwashing." This makes the assets eligible for financing and helps achieve real sustainability goals.

Case Study: Mexico

The Center for Innovation in Building Systems and Renewable Energies of Grupo Metal Intra (CIINOVA, GMI) is an industrial building that implements innovative systems, technological development, and integrates modern construction systems and sustainable processes. Located in the state of Querétaro, it has a built area of 5,092 m² and accommodates 340 occupants.

The building incorporates a series of sustainable strategies and measures, including:

- 100% of wastewater treated
- 100% of outdoor areas with adapted plants
- 87% reduction in potable water consumption
- 85% of total space with natural lighting
- 70% of outdoor surfaces are permeable
- 56% energy savings compared to baseline

It was demonstrated that building energy costs are $634,326 pesos lower compared to the baseline cost of similar buildings. Water reuse systems save 122,820 gallons annually,

equivalent to 96,859 toilet flushes. The plant species used are adapted plants, reducing the need for irrigation. Another benefit of energy implementation is that the natural lighting of the project reduces energy use and enhances the productivity, health, and well-being of the users. (SUME,2021)

Certifications and Classification Systems for Green, Eco-Friendly, and Sustainable buildings

Considering certification for real estate projects not only has a direct benefit on the environment, but also on the value of the assets. Internationally, developers have shown interest in this topic due to the opportunities available in the market. By reducing the costs of the property throughout the building's life cycle, they become more profitable for investors and create improvements in the work and social environment. Certifications have different scopes depending on their focus and specific objectives. Below are the most common certifications within the real estate sector.

The main aspects driving sustainable construction in Latin America today are shown in the following figure:

ite: Revista inTEGRA, 3era Ed. - 2019 con datos del World Green Building Trends 2018, DODGE Data & Analytics

Similarly, the main benefits of using certification systems in sustainable construction are shown in the following graph:

Companies and individuals have been empowered to take actions that tangibly improve the social, environmental, and economic aspects of their surroundings. In line with this, study participants agree that the most important benefits of sustainable construction are:

Potential of Green Buildings

In the IFC report titled Green Buildings: A Finance and Policy Blueprint for Emerging Markets, it was determined that by 2030, the market potential for green buildings will be approximately USD 24.7 trillion in emerging-market cities with more than half a million inhabitants, where USD 15.7 trillion corresponds to the residential sector. It is expected that, from now until 2023, green buildings will grow worldwide at a combined annual rate of over 10%, according to the Principles for Responsible Investment. Projections depend on the evolution of global markets and whether there is a significant short-term contraction. (EDGE, 2021).

In Search of Continuous Progress in Regulatory Matters

In 2018, the World Green Building Council launched the Advancing Net Zero initiative to encourage both public and private sectors to undertake immediate action to achieve net-zero carbon emissions in new construction projects by 2030 and net-zero carbon emissions in all remodeled buildings by 2050. This initiative is complemented by Zero Carbon Buildings for All, which challenges financial and sector alliances to provide expert opinions and commit to investing USD 1 trillion by 2030. The Rocky Mountain Institute states that global construction emissions must decrease by 50% by 2030 and carbon emissions must reach zero by 2050 so the construction sector may play an active role in energy transition.

To achieve these ambitious goals, more investors, developers, and governments need to share their insightful testimonies on how to work together to meet the demand for buildings in a way that is economically beneficial and aligned with global climate objectives. An empirical database will also contribute significantly to providing quantifiable evidence to support the business case for green building in emerging markets. This will result in new investors and developers taking on a leadership role.

Economic Benefits of Green Buildings

It has been demonstrated in established economies that certified industrial buildings not only increase profits, but also attract and retain clients. Green or sustainable assets generate up to an 8% increase in tenant revenues with occupancy rates up to 23% higher. For developers building for sale, the sale premiums of commercial assets are up to 31% higher (EDGE, 2021).

Although only a small percentage of buildings are currently certified in emerging markets, this is where certification can have the greatest economic and environmental impact., Green buildings have recently begun to appear in surprising and unexpected locations, indicating that the best is yet to come. This trend can be attributed to increased awareness of the value of certification, the competitive instinct to outpace peers who continue conventional construction practices, and a genuine response to minimize harm to an increasingly threatened environment. Emerging incentives in multiple markets are further driving the growth of green buildings and creating a turning point; this is compounded by more banks and governments offering preferential financing rates and the rise of progressive government policies. (EDGE 2021).

LEED

For further information on LEED, visit the USGBC website: http://www.usgbc.org/leed#rating

LEED for the design and construction of BD + C buildings

For building design and construction, LEED is the ecological benchmark for the new construction market. Requirement: New buildings or major renovations. At least 60% of the gross floor area of the project must be completed at the time of certification (except for LEED BD+C: Core and Shell). It must include the gross floor area of the entire building in the project.

This applies for

- Recent constructions, including parks and industrial warehouses
- Major renovations
- Core and shell
- Schools
- Retails businesses
- Hospitality
- Data centers
- Depots and Distribution or Health Centers

Operations and Building Maintenance LEED (O + M)

For building operations and maintenance, LEED is the benchmark for the existing building market. It is the recognized system for certifying high-performance green buildings. It applies to:

- Existing buildings undergoing improvement or minor to no construction
- Schools
- Retail
- Hospitality
- Data centers
- Warehouses and distribution centers

Requirement: Buildings must be fully operational and occupied for at least one year. The project can be undergoing improvement or have minimal or no construction. It should include the gross floor area of the entire building in the project.

LEED for Interior Design and Construction (ID+C)

For interior design and construction, LEED is the green benchmark for complete interior equipping in the tenant improvement market. It is the recognized system for certifying high-performance green interiors that are healthy and productive places to work, cost less to operate and maintain, and have a reduced environmental footprint. In interior design and construction, LEED provides the power to make sustainable decisions for tenants and designers who do not always have control over the entire building's operations.

It applies to:

Commercial interiors or retail spaces
Hospitality interiors

Certifications and Sustainable Evaluations

In the real estate market, there are different assessments that evaluate sustainable aspects within buildings. The credits and prerequisites of these certifications can be part of the value engineering that the contractor can propose.

c. EDGE

An innovation by IFC, a member of the World Bank Group, EDGE (Excellence in Design for Greater Efficiencies) provides market leaders the opportunity to gain a competitive advantage by differentiating their products and adding value to their customers' lives. EDGE brings speed, market intelligence, and an investment-focused approach to the next generation of green building certification in over 170 countries. IFC created EDGE to address the need for a measurable and credible solution that demonstrates the business case for green building and unlocks financial investment. EDGE includes a cloud-based platform to calculate the cost of going green and utility savings. The next-generation engine has a sophisticated set of climate and cost data, consumption patterns, and city algorithms to predict the most accurate performance outcomes.

When choosing EDGE certification, banks have a verification tool for their green real estate investments and have access to projections on carbon emissions at both asset and portfolio levels. These projections are crucial for comparing certified and non-certified assets and for assessing the risk exposure of poorly performing buildings, enabling more strategic decision-making in the future. The aim is to develop stronger and more resilient long-term real estate investment portfolios that can withstand financial, regulatory, and reputational risks associated with the transition to low-carbon economies.

b.2 EDGE Software

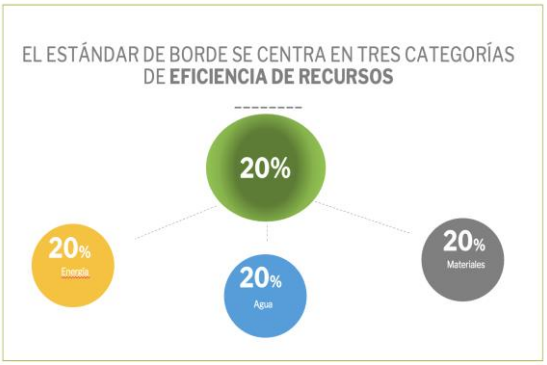
EDGE software can be used free of cost to design a resource-efficient commercial or residential building in 160 countries. Enter as much information as possible about your building, then choose systems and solutions to see how your savings increase. To discover the benefits of smart building design, identify the options that offer the best results at the lowest cost.

EDGE calculates utility savings and the reduction of the impact of your green building's emissions, comparing them to a baseline. The panel indicates how much additional money is

needed to build green buildings and how quickly this money can be recovered through operational savings.

Meet the EDGE standard when your project achieves a 20% savings in energy, water, and embodied energy in materials, and the project will be ready to obtain EDGE certification. The demo of EDGE Software shows how to design a resource-efficient building.

Standard



There are 3 ways to obtain EDGE, based on energy, water and material yields:

EDGE success stories for parks, assets, and industrial portfolios.

c. WELL

c.1. What is Well?

It is a certification designed to promote health and well-being in buildings and communities worldwide. WELL is the culmination of seven years of rigorous research in collaboration with leading doctors, scientists, and industry professionals.

IWBI, the International WELL Building Institute, manages the WELL Building Standard IWBI was established in 2013 in line with the Clinton Global Initiative commitment to improve the quality of life of occupants by developing spaces that enhance their health and well-being through global sharing of the WELL Standard.

Delos® is a pioneer in integrating health and wellness technologies into the places where we live, work, and learn. By placing health and wellness at the center of design, construction, technology, and programming decisions, Delos® is transforming our homes, offices, schools, and other indoor environments into spaces that actively contribute to human health and well-being.

The WELL Building Standard® is based on multiple scientific disciplines and presents a comprehensive approach that reimagines the built environment around its occupants, transforming the places where we live, work, and learn into systems designed to promote and enhance human health and well-being. It is based on the understanding that facets of our environment interact with personal, genetic, and behavioral factors to shape our overall health and wellness.

WELL recognizes that many behaviors are unconsciously driven by external signals and therefore carefully considers the interactions between humans and the built environment that shape not only our physical health but also our behavior.

c.2. Benefits of WELL

The commercial benefits to be obtained by obtaining WELL certification are as follows:

- Productivity
- Greater satisfaction
- Talent retention
- Return on investment
- Industry leader

c.3. WELL Structure

Certification is divided into 7 concepts:

1. Air
2. Water
3. Nutrition
4. Light
5. Physical condition
6. Comfort
7. Mind

Each concept includes characteristics to be followed, a total of 105. They are intended to address specific aspects of occupant health, comfort, or knowledge. It is divided into sections, which are often tailored to a specific type of building.

The characteristics can be:

- Performance-based standards that permit flexibility in how a project meets acceptable quantified thresholds
- Prescriptive standards that require the implementation of specific technologies, design strategies, or protocols.

There are preconditions (which are mandatory) and optimizations, which determine the level of certification that can be obtained.

WELL has 3 levels of certification:

- Silver: 100% of the preconditions
- Gold: 100% of the preconditions and 40% of the optimizations
- Platinum: 100% of the preconditions and 80% of the optimizations.

e. Health and Wellness: Fitwel

The Fitwel certification was developed by the Centers for Disease Control and Prevention (CDC) and is operated by the Center for Active Design. This certification provides guidelines for creating health and wellness spaces in buildings during their design and operation stages. Key benefits include:

- Affordable costs
- Interface is user-friendly, with evidence-based platform
- Applicable to both design and operational stages (no prior requirements)
- Increases productivity and reduces absenteeism
- Significant improvement in the health and well-being of users and the community

Fitwel is quite versatile in its application and can be applied to community sites, commercial, industrial, and residential applications, among others. This gives rise to evidence-based designs and operational strategies that allow for the identification of a wide range of opportunities in behaviors and risks to the health and well-being of tenants and/or users of the space and/or building to be managed, allowing for the creation of an integrated and interconnected system of elements that enable an evaluation without a dominant category. Fitwel has seven impact categories:

1. Community impact: Strategies involving the neighboring community, connecting the project not only to the building's occupants but also to those they interact with on a daily basis.
2. Reduction of mortality and absenteeism: Decrease in rates of chronic diseases and mental health conditions.
3. Social equality for vulnerable populations: This strategy aims to ensure social equality for vulnerable populations by seeking greater access to health promotion opportunities.
4. Well-being: Strategies aimed at promoting inclusion, relaxation, and a sense of security through spaces and times that allow for better contact with nature and social participation.
5. Healthy foods: Strategies that provide access to affordable foods, increasing the availability of fruits, vegetables, and other nutritious food options for occupants.
6. Occupant safety: Strategies that enhance occupant safety by reducing the risk of crime and injury.
7. Physical activity: Strategies that increase physical activity by incorporating opportunities for these activities into daily life.

To obtain Fitwel certification, it is necessary to score a minimum of 90 out of the available 144 points. There are three levels of certification:

- 1 star: A minimum score of 90 and a maximum of 104
- 2 stars: A minimum score of 105 and a maximum of 124
- 3 stars: A minimum score of 125 and a maximum of 144

Fitwel is a versatile and affordable certification that demonstrates short, medium, and long-term benefits, allowing for the responsible management of the health and well-being of employees and the community.

f. True Zero Waste

Spaces certified by TRUE are environmentally responsible, more resource-efficient, and help turn waste into savings and additional revenue sources. By closing the loop, they reduce greenhouse gases, manage risk, decrease waste and pollution, reinvest resources locally, create jobs, and add more value to their company and community. TRUE also certifies events to enhance their sustainability. (1)

The certification is available for any physical facility and its operations, including buildings owned by businesses, property managers, schools, government agencies, and non-profit organizations. (2)

The goal of a TRUE project is to divert all solid waste from landfills, incineration (waste-to-energy conversion), and the environment. Facilities achieve certification by meeting seven minimum program requirements and earning at least 31 points on the TRUE application form.

The requirements to be met when applying for certification:

- The company or project seeking certification has a zero-waste policy.
- The project has achieved an average of 90% or more overall diversion from landfills, incineration (waste-to-energy), and the environment for non-hazardous solid wastes over the past 12 months. Diverted materials are reduced, reused, recycled, composted, and/or recovered for productive use in Nature or the economy.
- The project complies with all federal, state/municipal, and local recycling and solid waste management laws and regulations.
- The project meets all required air, water, and land discharge permits for material collection, handling, or processing.
- The project has data documenting a baseline year of waste diversion and measurements since the baseline year that adjust for changes in the size, type, and nature of the business.
- The project submits 12 months of waste diversion data to GBCI annually to keep the certification current.
- The project does not exceed a contamination level of 10% for materials leaving the site.
- The company submits a case study of zero-waste initiatives to be published on this website.

* A 90% waste diversion rate is required.

g. RELi2

RELi is a rating system and leadership standard that takes a holistic approach to resilient design. It is used by companies, developers, urban planners, architects, bond insurers, and more to assess and plan for all acute hazards that buildings and communities may face during unplanned events, prepare to mitigate these hazards, and design and construct buildings to maintain critical life-saving services in cases of prolonged power, heating fuel, or water outages.

Worldwide, governments, businesses, private developers, city planners, and officials are leading a growing movement to make structures in vulnerable communities more resilient through better preventive action. The increasing frequency of dramatic weather events has brought an even greater urgency to the need to create buildings and communities that are better adapted to changing climate conditions, thus more capable of recovering from its effects.

Resilience entails more than physically withstanding major natural disasters; it is a crucial factor in how we survive extreme weather conditions, economic disruptions, and resource depletion. Ultimately, it is about a community's ability to come together after an extreme event. Green buildings are one of the best ways for businesses and communities to prepare for the future, support climate action, improve quality of life, and have an immediate impact. Designs, technologies, materials, and methods that enhance resilience are being promoted; green buildings should incorporate practices such as the use of durable materials, careful site-selection, rainwater harvesting, demand response, grid islanding, maximum energy efficiency, onsite renewable energy generation, and more. All these strategies are explored, exemplified, and measured by the RELi rating system.

Managed by GBCI, RELi's comprehensive approach lays the foundation for resilient, regenerative, and healthy outcomes that support quality of life. The rating system includes 15 requirements and 43 credits across 8 categories, including panoramic design; threat preparedness and adaptation; community vitality; productivity, health, and diversity; energy, water, and food; materials and devices; and applied creativity. (GBCI, 2021)

RELi is a certification process stemming from collaborative efforts among agencies and stakeholders, with a focus on building design. It is designed to encourage the development of buildings that protect occupants, provide amenities for local communities, and ensure business continuity while addressing the human and economic impact of climate change.

Resilience cannot wait; the U.S. has seen the consequences of climate change and how they affect properties. It is important to understand the risks to assets by identifying the main ones present, which allows for a better focus and a more accurate response to potential impacts.

Biodiversity

Due to the global biodiversity crisis, governments, investors, and scientists from Latin America and around the world are working together to undertake actions that mitigate issues arising from human activities such as biodiversity loss.

The trend of ESG criteria is a key point for the conception of sustainable projects having environmental conservation objectives. Understanding the consequences of biodiversity loss provides us with a broad view of the strategies that must be implemented and makes us re-evaluate the importance of environmental issues within ESG topics. This is why real estate projects seek to implement strategies that promote biodiversity protection and raise awareness, as well as to include Mexican endemic species within them.

“Cities and towns represent 3% of the Earth's land area, produce more than 70% of the Earth's CO_2 emissions, and consume between 60 to 80% of the world's energy.” (BPN, 2020)

BNP Paribas lists seven specific objectives that drive this transformation towards biodiversity conservation:

- Protect, restore, and develop biodiversity by integrating it into our product and service offerings from the outset
- Support our clients in the development and implementation of biodiversity within their sites and assets
- Advocate for biodiversity performance in our operations through labels and certifications
- Mobilize and engage our employees by developing a culture of biodiversity expertise
- Educate and inform our clients and stakeholders about the benefits of biodiversity
- Participate in initiatives and work related to biodiversity
- Measure, track, and account for our actions.

Biodiversity net gain

The net biodiversity gain (or positive net gain) is a quantitative and phased process applied to a development with the goal of leaving biodiversity in better conditions than before. To achieve this, GRESB proposes 4 steps to be implemented within real estate developments for the benefit of biodiversity:

Avoidance: Measures taken to avoid generating impact from the outset. For example, planning the project location to have the least possible impact.

Minimization: Measures taken to reduce the duration, intensity, extent, and/or likelihood of any impact that cannot be avoided.
Restoration/Rehabilitation: Measures adopted to improve degraded ecosystems after exposure to any impact that cannot be completely avoided or minimized.
Compensation: (off-site compensation): Measures taken to offset any adverse residual impact after fully implementing the first three steps of the Mitigation Hierarchy.

Biodiversity Assessments

Sites

Sustainable Sites Initiative™ (SITES™) is a program based on the understanding that land is a crucial component of the built environment and that it can be planned, designed, developed, and maintained to avoid, mitigate, and even reverse a negative impact.

SITES provides guidance and incentives that can transform land development and management practices toward regenerative design. The United States Botanical Gardens, the Lady Bird Johnson Wildflower Center at the University of Texas at Austin, and the American Society of Landscape Architects led the development of these guidelines, which involve many other organizations and individuals.

SITES is used by landscape architects, designers, engineers, planners, ecologists, architects, developers, legislators, and others to align land development and management with innovative sustainable design.

Land is a crucial component of the built environment and can be planned, designed, developed, and maintained to protect and enhance the benefits we derive from the healthy functioning of landscapes. SITES helps create ecologically resilient communities and benefits the environment, property owners, and local and regional communities and economies.

Others

The inclusion of biodiversity in real estate projects is on the rise, along with some metrics and labels that protect and address biodiversity aspects.

1.- Biodiversity

The IPBC is a French council that promotes best practices in urban biodiversity during the planning, development, maintenance, operation, and improvement phases of the real estate cycle. The BiodiverCity schemes, a brand initiated by the IBPC, serve as the main tools by providing a strong purpose in creating environments that accommodate various living nature spaces. (IBPC, 2021)

It considers and evaluates the following points:

- Commitment: Project management and environmental aspects
- Project: Architect, concepts, biodiversity, and interior layout
- Potential: Ecology, natural and scientific indicators
- Services: User and city resident, well-being, and services provided by enhanced biodiversity

2.- Biodiversity Metric Net Gain

Calculates the net biodiversity gain of a project or development.

The biodiversity metric is a habitat-based approach used to assess the value of an area for wildlife.

The biodiversity metric can be used to calculate how a development or a change in land management will alter the biodiversity value of a site. For example, building houses, planting a forest, or sowing a wildflower meadow. It evaluates the biodiversity unit value of a land area by demonstrating net gains or losses in biodiversity.

It also measures and accounts for direct impact on biodiversity by comparing and generating improvement proposals for the site's habitat. (Natural England,2021)

Calculation of Embedded Carbon

Nowadays there are various methods used to calculate construction carbon. Buildings and construction with an embodied carbon footprint require analyzing a large number of materials, products, and setups. This can be a laborious task; therefore, embodied carbon calculators can be extremely helpful.

Here is a selection of carbon footprint and embodied-carbon assessment calculators and tools for construction (Circular Ecology, 2021). At the moment, tools with true BIM integration are lacking.

The first step towards achieving Net Zero Carbon construction is measurement. This is where embodied-carbon tools can assist with options to find reductions in embodied carbon and more sustainable construction methods. This leaves the remaining embodied carbon footprint, where the final step towards net zero is carbon offsetting. High-quality embodied-carbon calculations are essential in supporting claims of carbon neutrality.

There are organizations with their own customized internal tools. However, not everyone can access these carbon calculators. As a result, only publicly available carbon calculators and tools are listed here.

The Structural Engineers

This is an institution of engineers specialized in structural issues that publishes a variety of information on its website, including publications, research on various related topics, and a calculator for the embodied carbon of a project. The calculator is an Excel file that can be downloaded for free and covers aspects from substructure to superstructure, including certain finishes, and allows for the addition of products with EPDs to include them in the calculations. The information can be consulted at https://www.istructe.org

Embodied carbon tool for asphalt pavement – aspect

asPECT provides a methodology and a way to calculate the lifecycle of greenhouse gas emissions or "carbon footprint" for asphalt used in road construction. The project offers the asPECT calculator as a Windows-friendly program that can be downloaded for free.

EC3 Embedded Carbon Calculation

The EC3 calculator is a website where users can register for free and review the embedded-carbon values for materials, including average and optimal values. Additionally, it allows users to add new Environmental Product Declarations (EPDs) that meet site requirements so future users can benefit from them. It can be used in Mexico, as there are already several products included in its database. https://buildingtransparency.org/ec3

eTool

eTool is a web-based Life Cycle Assessment (LCA) tool for buildings. It is one of the few tools available that is compatible with BRE IMPACT. It is an online subscription-based software.

For the construction environment, Life Cycle Assessment allows for quantifying and measuring all aspects of a project's environmental impact and identifying critical areas for improvement.

Life Cycle Design & Assessment:

1. Ensures a sustainable and high-performance project outcome.
2. Quantifies and measures the design, removing the guesswork from sustainable construction.
3. Identifies key areas for improvement in the project design.

This tool can be used in projects of any type and scale, providing studies on CO_2e, costs, energy, water, zoning, ozone depletion, human toxicity, among others.

It is a Revit plugin for BIM integration. eToolLCD generates user-friendly technical reports with complementary marketing material, ensuring you make the most of your LCA. For more information, see: https://etoolglobal.com/about-etoollcd/

One Click LCA

It is a tool capable of performing life cycle analysis, life-cycle cost analysis, and monitoring the impact of a construction project. The platform can be used to achieve BREEAM and LEED v4.0 and v4.1 credits. The software also assists with projects that are not seeking specific certification but are interested in using reliable sustainability indicators.

The benefits of using LCA include reducing environmental impact through:

- Evaluating the construction site to select the option with the lowest impact
- Comparing the environmental impact of renovation versus demolition and rebuilding
- Comparing design alternatives to choose those with the lowest impact
- Identifying a building's critical environmental points and undertaking measures to reduce them
- Calculating the lifetime impact of building materials and products to help find the most sustainable options

The implementation process consists of 3 steps:

- Importing design data from Building Information Models (BIM), energy models (gbXML), or Excel spreadsheets
- Automatically transforming the data into LCA results in compliance with the chosen certification scheme
- Analyzing the results to identify the most significant project improvement opportunities

Subsequently, critical points of the building regarding carbon footprint are identified, allowing for the proposal of solutions to address these issues. For more information, please consult: https://www.oneclicklca.com/construction/carbon-footprint/

Carbon Calculation by the Highways Construction Agency

The Highways Agency has developed a carbon calculator for construction and therefore their business and supply chain has a consistent and transparent methodology for compiling and calculating carbon emissions. This data is used to calculate an annual carbon footprint for the Highways Agency, including maintenance, construction, and operational activities (offices and travel). Excel-based carbon calculators are available for free.

Carbon Leadership Forum

It is a non-profit industry-research partnership in collaboration with the University of Washington that works together with industry professionals. They have collected data from various projects to issue a baseline list of embedded-carbon values for various basic construction products.

Climate Change

For some time, investor-owners have been incorporating ESG policies into their strategies. However, as stakeholder and occupant requirements increasingly align with standards and objectives in this area, the real estate sector must prepare for new changes. A recent goal arising from COP26 has given significant weight to climate change and resilience within the actions and considerations that both the public and private sectors will need to address going forward, such as low-carbon emission systems. Some important points to begin with are:

- Governments will need to provide enabling policies to unlock new investments and commit to sustainable climate actions
- Improve disaster and climate risk disclosure by ensuring economic and development policies, from land-use planning to infrastructure standards, procurement processes, and budgeting.
- Subsidy resources will play an important role in funding initial work and preparing public and private projects. (COP26,2021)

Real estate must be planned and transformed based on future natural risks resulting from climate change. Projects may need to conduct environmental impact assessments that consider the vulnerability of the development to climate change effects and the extent to which the development contributes to carbon emissions. Urgent consideration must be given to broader ESG strategies that involve developers, supply chains, occupants, investors, and lenders through modern construction methods. Finally, it is necessary to build defenses, early-warning systems, and resilient infrastructure and agriculture to prevent the loss of homes, biodiversity, and even lives resulting from climate change. (HSF,2021)

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