GRUPO AEROPORTUARIO
DE LA CIUDAD DE MÉXICO

Report 5

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Mexico City Airport Trust NAICM Green Bond Reporting

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NAICM
AIRPORT PROGRAM
PARSONS PROJECT MANAGEMENT OFFICE

1. Introduction

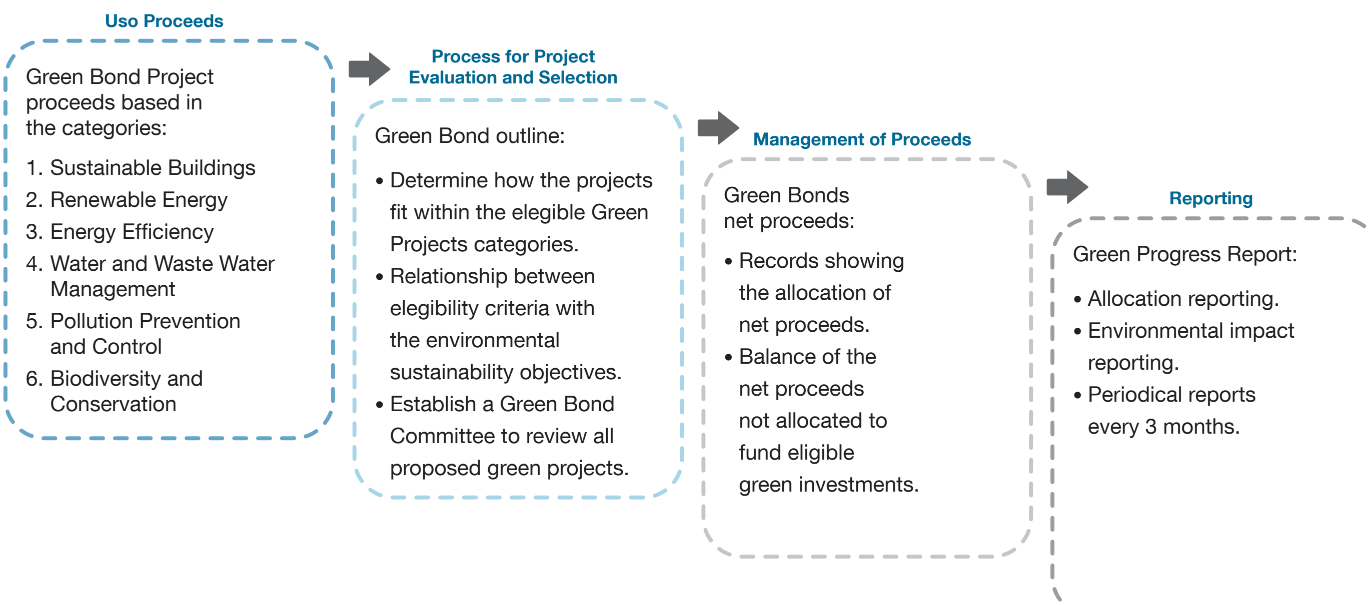
Grupo Aeroportuario de la Ciudad de México, S.A. de C.V. (GACM) is responsible for the preparation and providing a fair representation of this Green Bond Framework as of September, 6th 2016, which will cover the issuance of Green Bond from Mexico City Airport Trust.

For each Green Bond issued by the Mexico City Airport Trust, GACM management asserts that it will adopt the use of the proceeds eligibility criteria and processes and policies as set out in the Mexico City New International Airport (NAICM by its Spanish acronym) Green Bond Framework as outlined in Figure 1.

This report describes an outline of the green works that are currently underway for the Airport program development paying particular attention to currently designed elements and the initial construction and site preparation activities.

This report will be updated quarterly to report on specific activities which have occurred in the report time-frame and to show development of the performance indicators.

Figure 1 - NAICM Green Bond Framework



2. Green Bond Eligibility Categories

The eligibility categories are focused in the planning, design and construction of the NAICM project according to green building & environmental best practices standards.

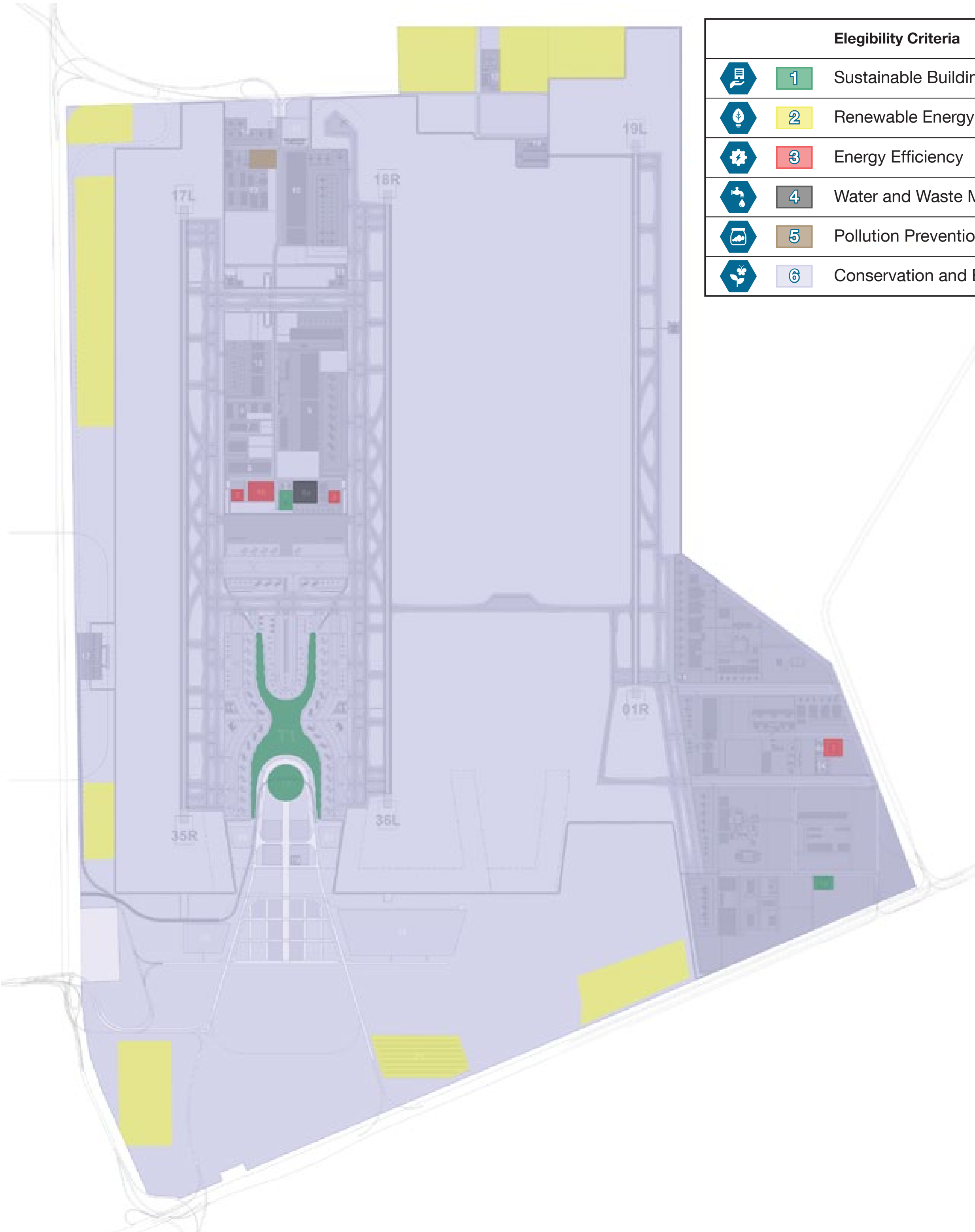
Six categories were selected to describe the different areas of sustainability focus for the project scope. These are described below:

- **Eligibility Categories**

1. Sustainable Buildings
2. Renewable Energy
3. Energy Efficiency
4. Water and Wastewater Management
5. Pollution Prevention and Control
6. Conservation and Biodiversity

The project is utilizing the rating system Leadership in Energy and Environmental Design version 4 (LEED v4). The rating system seeks to enhance architectural and engineering designs and construction processes to reduce the environmental impacts of the building and its occupants, improve the indoor environmental quality and minimize changes to natural systems. Four of the airport buildings on the site are being designed and constructed to meet these LEED requirements, in particular the 743,000 m^2 Passenger Terminal Building.

The project undertook Environmental Impact Assessment, commonly known in Spanish as *Manifestación de Impacto Ambiental* (MIA), as it is required for all new major projects in line with SEMARNAT (*Secretaría del Medio Ambiente y Recursos Naturales*) requirements. The MIA is an instrument of environmental policy that is required to present all information about the environmental conditions of the site and analyze and outline requirements for the works and activities that could cause environmental or ecological imbalance.



		Elegibility Criteria
	1	Sustainable Building
	2	Renewable Energy
	3	Energy Efficiency
	4	Water and Waste Management
	5	Pollution Prevention and Control
	6	Conservation and Biodiversity

Figure 2 - Site polygon showing location of main program elements per eligibility criteria.

2.1. Categories Description

The project must meet one or more of the following eligibility criteria:

1. Sustainable Buildings:

Any project for an existing or new building;

(i) that has received, or expects to receive based on its design, construction and operational plans, rating according to third party verified green building standards such as LEED Silver or higher, or an equivalent rating scheme; and

(ii) that has achieved, based on third-party assessment, a reduction in energy consumption of at least 15% relative to industry standards and benchmarks such as ASHRAE 90.1 or equivalent.

2. Renewable Energy:

Development, construction, installation, operation and upgrades of;

(i) equipment or facilities wholly dedicated to renewable energy generation; or

(ii) wholly dedicated transmission infrastructure for renewable energy generation sources.

The projects must meet the definitions of renewable energy outlined in Mexico's Energy Transition Law (Ley de Transición Energética) and may include wind, solar, tidal, geothermal, biomass and run-of-river hydro projects.

3. Energy Efficiency:

Development, construction, installation, operations and upgrades of any projects (products or technology) that reduce energy consumption or improve resource efficiency in airport management and operations, including but not limited to;

(i) projects that enable energy performance monitoring and modelling such as design and installation of computer controls, sensors, or building information systems; or

(ii) projects that optimize the amount and timing of energy consumption and minimize peak loads such as design and installation of metering, peak load shedding, or fuel switching systems;

(iii) projects that involve installation, maintenance or replacement of energy efficient heating, ventilation, air-conditioning, cooling, lighting and electrical equipment.

4. Water and Wastewater Management:

Development, construction, installation, operations and upgrades of any projects (products or technology) that reduce water consumption or improve resource efficiency in airport management and operations, including but not limited to;

(i) new or existing facilities that are used for the collection, treatment, recycling, or re-use of water, rainwater, wastewater or sewage; or

(ii) infrastructure for flood prevention, flood defense or storm-water management such as wetlands, retention berms, reservoirs, lagoons, sluice gates, drainage systems, tunnels and channels.

5. Pollution Prevention and Control:

Development, construction, installation, operations and upgrades of any projects (products or technology) that reduce and manage waste generated in airport management and operations, including but not limited to:

(i) new or existing facilities, systems and equipment that are used for the collection, treatment, recycling or re-use of solid waste, hazardous waste or contaminated soil; or

(ii) new or existing facilities, systems and equipment that are used to divert waste from landfills and reduce emissions from transport of waste.

6. Conservation and Biodiversity:

Any projects for;

(i) reforestation and ecological restoration;

(ii) creation and protection of forests and wetlands; or

(iii) monitoring and mitigation of adverse impacts on flora and fauna such as potential impacts from construction and noise pollution.

3. Use of Proceeds Summary

Description	Amount USD
Net Proceeds from Green Bonds	$5,764,394,697

Allocated Amount to each Eligible Category (USD)						
Category	1	2	3	4	5	6
USD	**Sustainable Buildings**	**Renewable Energy**	**Energy Efficiency**	**Water and Waste Water Management**	**Pollution Prevention and Control**	**Conservation and Biodiversity**
Disburse Amount	**$470,157,714.64**	**$420,133.53**	**$13,264.49**	**$19,133,963.08**	**$46,917,541.39**	**$21,786,222.38**
Total	**$558,428,839.52**					

Description	Amount
Amount Available for Allocation	$5,205,965,857.48

Note: Values are shown in dollars. The exchange rate used from MXN to USD is the applicable rate at the time for each disbursement being paid.

4. Characteristics of the sustainable design of the NAICM project

4.1. Introduction

The LEED v4 rating system presents sustainable benefits that elevates a megaproject such as NAICM. The project is aligned with international commitments with reduction of greenhouse gases that were approved under the Paris Agreement, at the United Nations Conference (COP21). While at a national level NAICM's construction encourages local product manufacturers to enhance their production processes, and obtain necessary certifications for their products that are friendlier to the environment and to building-occupants, such as Environmental Product Declarations (EPD), or the Healthy Product Declaration (HPD). Due to this effort, LEED is helping generate national manufacturing opportunities to grow the industries in developing eco-friendly construction techniques and practices which reduces the impact of such a large project as NAICM and for other projects nationally and internationally in the future.

4.2. Brief description of LEED

The LEED v4 rating system verifies a development's sustainability, energy and environmental performance for the design and construction of different buildings. For commercial buildings there are nine categories organized in *prerequisites and credits*. The *prerequisites* are mandatory minima criteria, while the credits offer different options, and give amounts of points to attain different certification levels. Figure 1 shows the number of prerequisites and credits for each of the 9 categories, as well as the total number of points possible by complying with all the requirement outlined in the LEED guide.

Figure 3 - LEED Categories

LEED Categories

Integrative Design Process
- 1 CREDIT
- 1 POINT

Location and Transportation
- 8 CREDITS
- 16 POINTS

Sustainable Sites
- 1 PREREQUISITE
- 6 CREDITS
- 10 POINTS

Water Efficiency
- 2 PREREQUISITES
- 4 CREDITS
- 11 POINTS

Energy and Atmosphere
- 4 PREREQUISITES
- 7 CREDITS
- 33 POINTS

Materials and Resources
- 2 PREREQUISITES
- 5 CREDITS
- 13 POINTS

Indoor Environment Quality
- 2 PREREQUISITES
- 9 CREDITS
- 16 POINTS

Innovation Design
- 6 CREDITS
- 6 POINTS

Regional Priority
- 4 CREDITS
- 4 POINTS

The rating system has four certification levels that depend on the score being pursued by the client and design team:

- Certification (40-49 points)
- Silver (50-59 points)
- Gold (60-79 points)
- Platinum (points and over)

The LEED v4 rating system is a system which is broken down into different sustainable strategies that should be implemented in the design and construction of a project. This system comprises of nine categories for the strategies:

Integrative Process
This category promotes design integration from the early stages of design, when the owner's aspirations, performance goals and needs of the project are defined. Through the integrative process, the project team identifies synergies amongst different systems. These synergies are used to optimize and focus the design and construction processes, which can offer cost and schedule savings in the short and long-term, by mitigating project changes.

Location and Transport
This category encourages projects to be developed in areas that have the necessary infrastructure and transport needs to support the facility. For transportation, the rating system supports the mobility of the building occupants and users through alternate means of transportation such as providing facilities for bicycle use and having good connection to public transit systems. Having close proximity to useful and necessary amenities for the occupants is also promoted to reduce necessary impacts associated with the construction of such support installations.

Sustainable Sites
This category is focused on reducing the environmental impact from the design process through construction. The objective is to foster an eco-friendly interaction between buildings and their surroundings. Some of the strategies put forward in this category are:

- Preventing contamination due to construction activities.
- Evaluating impacts of the project in the environment, preserving environmentally protected areas.
- Maintaining and fostering natural areas.
- Utilizing best-management practices for storm water and reducing heat-island effect and light pollution.

Water Consumption Efficiency
The purpose of this category is to encourage projects to reduce water consumption indoors and outdoors. The category stipulates that an analysis of water consumption is undertaken from the design phase to understand the benefits of implementing technologies for reducing water consumption or reusing water with different quality levels for systems that do not require drinking water. Provision of water meters allows active management of water use and helps detect leaks or undetected failures.

Energy and Atmosphere
This category aims to reduce the energy consumption within buildings and carries the most points available within the rating system. Most points are associated with developing an energy simulation model to determine the energy cost savings through energy conservation methods or adoption of renewable energies. The strategies also put forward in this category are metering energy use levels and following best management practices for refrigerants to minimizing ozone depletion and the release of climate change gases.

Another important aspect in this category is the commissioning of every major system of the buildings (Air Conditioning and Heating, Electric, Plumbing, Renewable Energies and their associated controls). The commissioning process is conducted by a verifying authority who confirm that all systems operate in the anticipated way to comply with the Owner's Project Requirements (OPR).

Materials and Resources
This category is focused on maximizing the energy consumption and other impacts associated with the extraction, procedures, transport, maintenance and disposal of construction materials. The strategies propose to carry out a life-cycle analysis to improve performance and foster efficiency in the consumption of resources.

Indoor Environmental Quality

This category seeks to improve indoor environmental quality (IEQ) to help enhance the experiences, well-being and productivity for occupants. There are major strategies considered for thermal comfort, visual comfort and access to views of outdoors, acoustic comfort, provision adequate illumination levels and the amount of human control for each space. The category also promotes the use of products with of low-emission of Volatile Organic Components (VOCs) in occupied spaces, to optimize well-being for the buildings' users.

Innovation

Through this category additional sustainable measures can be explored or expanded for any of the categories, this can allow further reductions to sustainable impacts from the development using innovation technologies or techniques.

Regional Priority

This category looks to minimize sustainable impacts the project, thatproject that are deemed of high importance at a local level and in particular those which are a result of human activity.

For a project such as NAICM, which is complex, large and design for a specific use, is not possible to obtain all the credits and their associated point due to the limitations of the rating system. Nevertheless, the designers have included sustainable measures whenever possible within the design, even if this has not been possible to fully meet the LEED requirements to gain all of the associated points.

4.3. The buildings striving for LEED at NAICM

The NAICM project strives to obtain the LEEDv4 certification in four buildings:

- Passenger Terminal Building (PTB)
- Ground Transportation Center (GTC)
- Air Traffic Control Tower (ATCT)
- Area Control Center (CC)

Each of the four buildings have set a certification target with specific credits identified to reach the number of points required, during the design and construction stages for each building. The following chart describes the target level and total number of points each building must obtain to reach the certification level:

Tabla 1 - Niveles de certificación para el NAICM

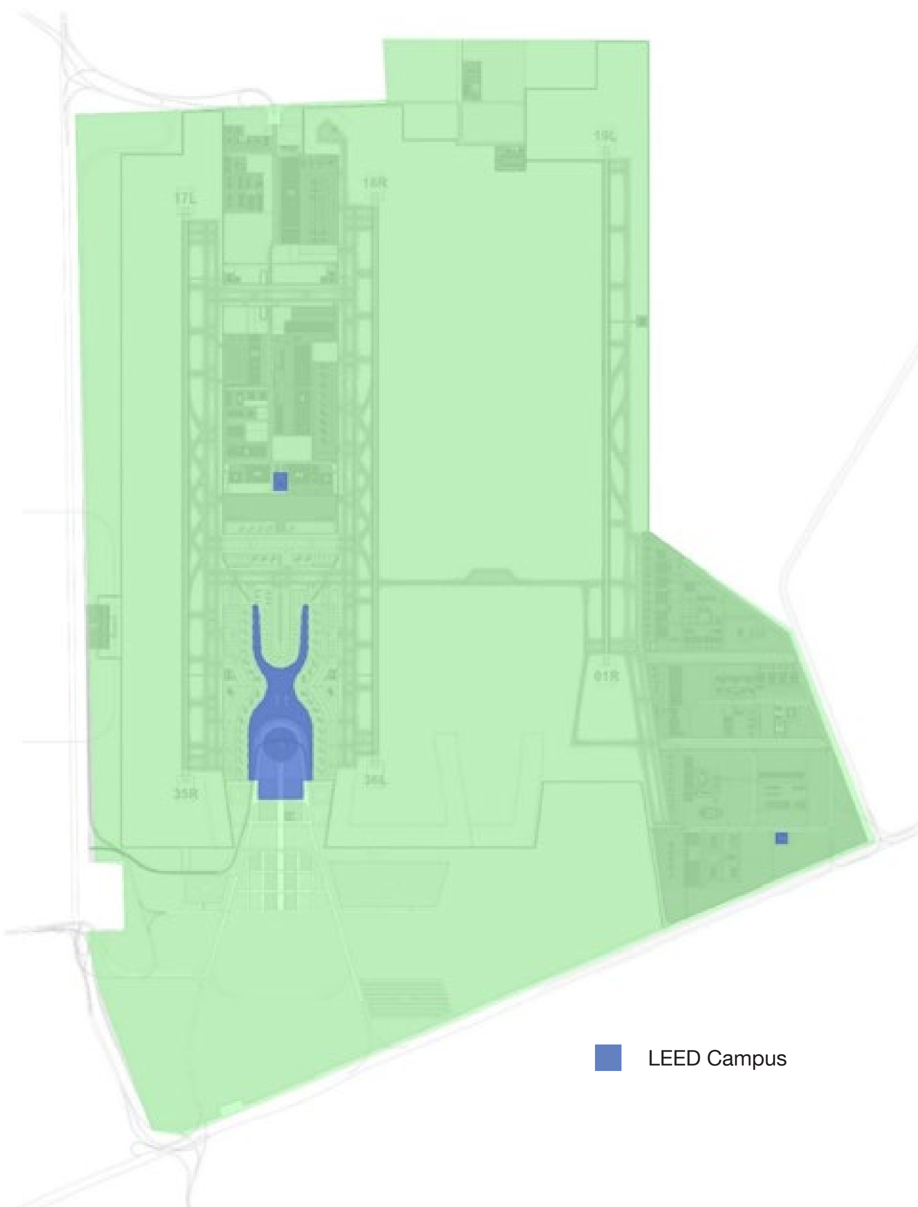
<table>
<tr><th>Building</th><th>Total Points</th><th>Levels of LEED Certification</th><th>Range of Points to achieve LEED Level</th></tr>
<tr><td>PTB</td><td>81</td><td>Platinum</td><td>80 to 110</td></tr>
<tr><td>GTC</td><td>72</td><td>Gold</td><td rowspan="3">60 to 79</td></tr>
<tr><td>ATCT</td><td>71</td><td>Gold</td></tr>
<tr><td>ACC</td><td>65</td><td>Gold</td></tr>
</table>

The following provides a brief description of general characteristics of the buildings and the LEED Campus strategy being implemented and their current status of the design documents uploaded to the LEED online platform which will be submitted to the U.S. Green Building Council USGBC/GBCI. GBCI is the certifying agency who will review the submitted documentation and subsequently grant the level of certification at the end of the process.

- Campus

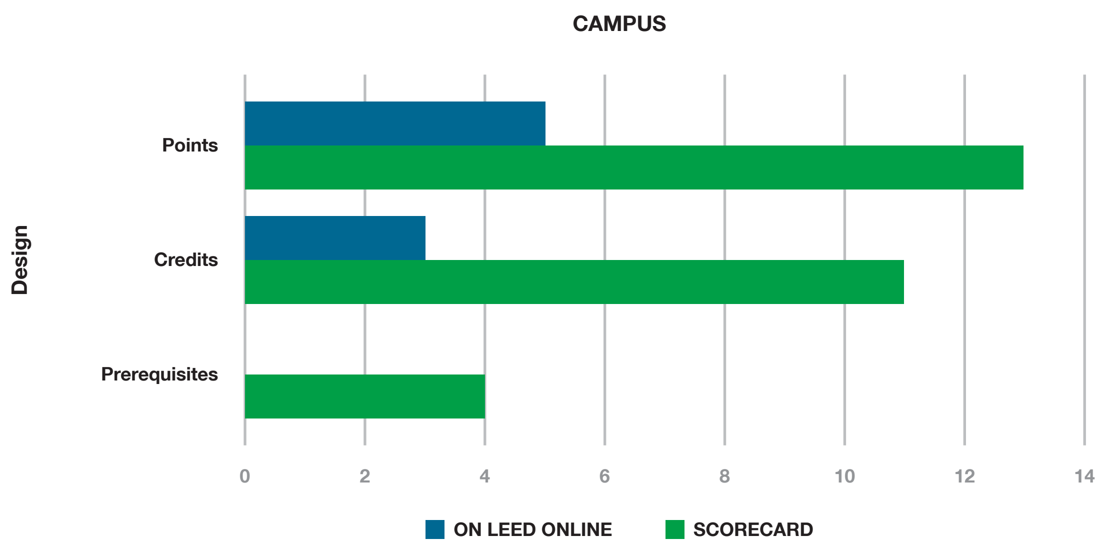
The registration for NAICM with USGBC/GBCI was made using a Campus strategy. This consists of documenting some of the credits and prerequisites in a combined and consistent way across the different buildings to generate synergies within the project site. Additionally, the Campus is defined for NAICM by 3 non-continuous areas as shown in figure 4.

Figure 4 - LEED Campus



The Campus seeks to document 6 design credits that amount to 9 points, which to be reviewed, need to be applied to each of the four buildings. These 9 points have already been included in the total amount of points shown for each building in the following summaries. The status of the Campus documents presents a 50% progress in the design stage. (See Figure 5). It is important clarifying that the progress of the design credits already on the LEED platform have not yet been evaluated by GBCI.

Figure 5 - LEED Campus status

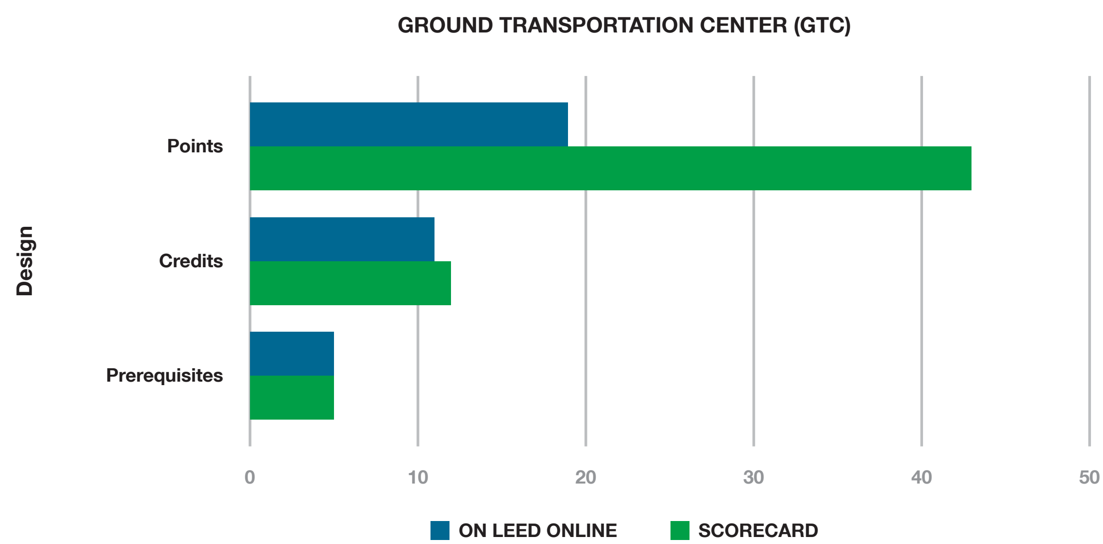


- Ground Transportation Center (GTC)

The GTC design incorporates the necessary requirements to provide ground transportation services to approximately 246 million people using different means of transportation. The GTC includes the construction of a multi-level facility that includes parking areas, interurban bus station, as well as metrobus and metro stations. The design of the building is formed with an oval geometry with multiple connected spaces and a green roof and has a total of area of 240,000m^2.

The GTC project seeks to obtain the LEED Gold level with a total of 72 points; 59 points correspond to the design stage and 13 points to the construction stage. During the design stage 24 credits will be documented, which will give 55 points. The progress of documents regarding the design credits in the LEED online platform is 46%. (See figure 6).

Figure 6 - GTC LEED status

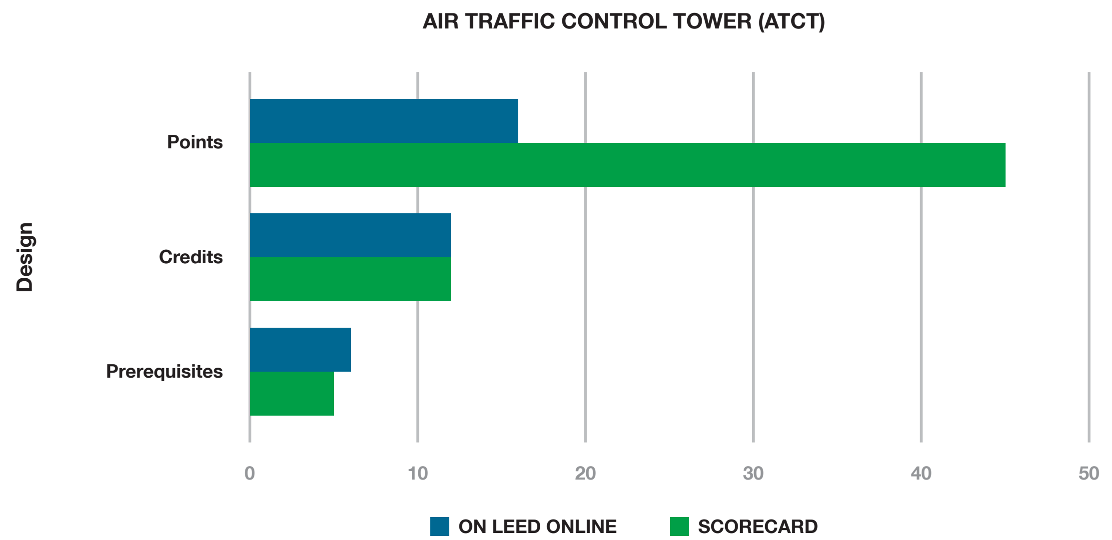


- Air Traffic Control Tower (ATCT)

The Air Traffic Control Tower design has the objective of addressing the functional requirements needed by the air traffic control for NAICM. The ATCT is 90m high distributed over 9 levels, with a total area of 4,700m².

Aiming to attain the LEED Gold, the ATCT design seeks to obtain a total of 72 points; 58 points corresponding to the design stage and 13 points to the construction stage. During the design stage 27 credits will be documented, which will amount to 55 points. The current progress of documents in the design stage is 44% (See figure 7).

Figure 7 - ATCT LEED status



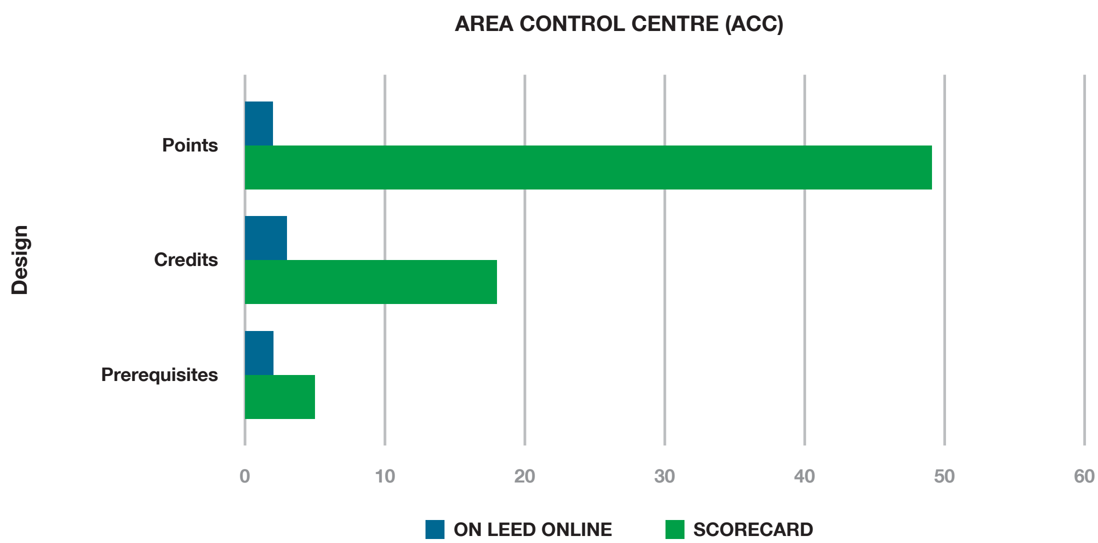
- Area Control Center (ACC)

The ACC design incorporates the installations required to put into operation the on-route air traffic control, the approach control in the Mexican region, as well as all the functional spaces and support installations required by Air Traffic Services.

The building is organized in primary operative spaces, equipment rooms and other installations distributed over two levels and a mezzanine amounting to an area of 19,000m^2. In addition to external recreational facilities in the campus that include soccer fields, basketball courts and a gym.

Aiming to attain the LEED Gold, the ACC seeks to obtain a total of 65 points, 52 points corresponding to the design stage and 13 points to the construction stage. The intent is to document 28 credits during the design stage, which amount to 51 points. The current progress of the design credits is 11%. (See figure 8).

Figure 8 - ACC LEED status

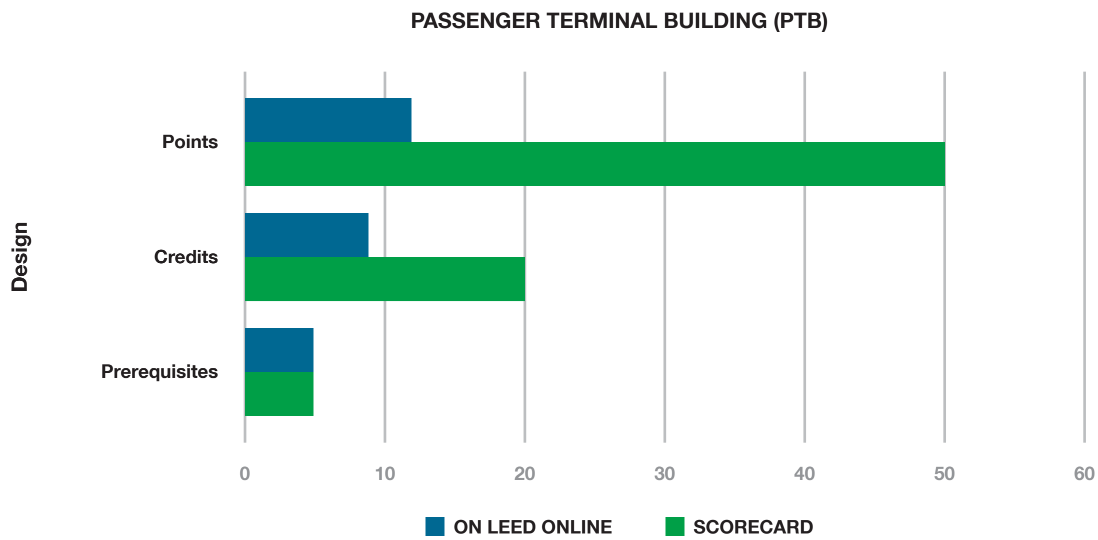


- Passenger Terminal Building (PTB)

The Passenger Terminal Building design incorporates the necessary requirements to serve 57 million passengers with an area of 743.000m2 distributed over four levels and a basement. The structure of the project aims to concentrate all the installations at ground level, in such a way that the envelope forms a continuous surface that covers the whole building including the fixed links.

The PTB project strives to obtain the LEED Platinum with a total of 81 points, whereof 67 correspond to design and 15 to construction. The intent is to document 26 credits during the design stage, which amount to 58 points. The current progress of documents is 35%. (See figure 9).

Figure 9 - LEED PTB status



4.4. Design elements and sustainable solutions for the PTB

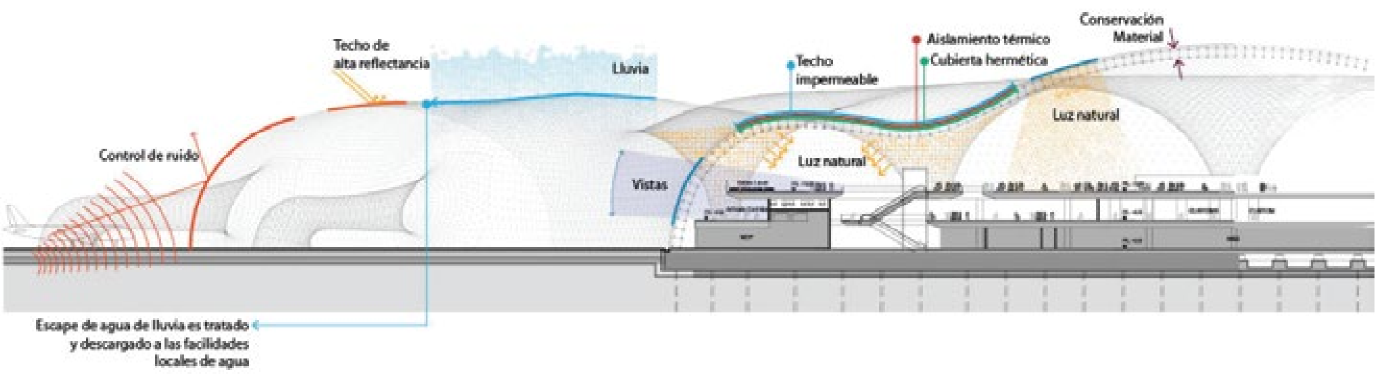
This section describes the design elements of the PTB which have been included to meet LEED design credits or to provide a more sustainable solution. To explain the sustainable strategies that distinguish this building, the information is divided into two general areas; the first refers to the characteristics of the envelope and the second to the efficient use of energy and water.

It is important to clarify that this description only includes design information, and that the reports, technical specifications and the bases of design developed by the Master Architect and the Master Civil Engineer were referenced for its development.

4.4.1. Architectural design of the envelope

The double curvature of the grid structure that creates the design of the shell is supported by 21 vertical components known as funnels and at its perimeter. The structural system inside of the envelope is independent, therefore, the superstructure of the shell is a "unique system" that creates a continuous shell. Furthermore, the grid design is flexible enough to support movements caused by thermal expansion, live loads and seismic events, without compromising the impermeability of the metallic panels and glass system that make-up the envelope.

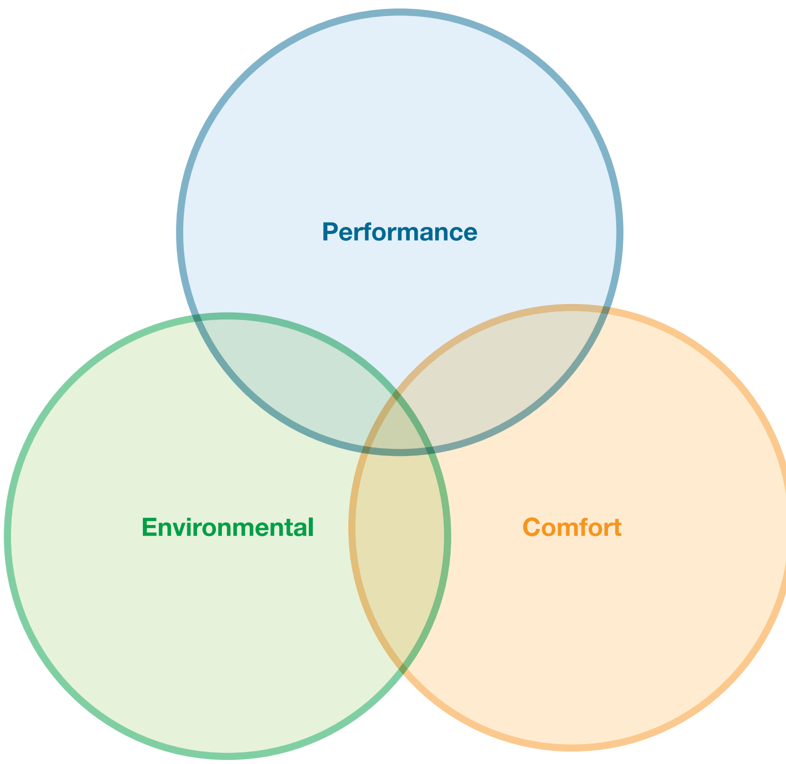
Figure 10 - PTB cross section



Although the envelope of the PTB is characterized by its structural function, it also incorporates design features to support sustainable criteria. These criteria are intended to minimize environmental impacts, optimize building performance and improve user comfort (See Figure 11). In this way, the structural system of the envelope takes advantage of natural lighting, improves visual connectivity, optimizes thermal efficiency, reduces noise pollution, incorporates materials of low environmental impact and promotes the management of the rainwater through the funnels.

This section describes the envelope's characteristics, as well as the studies and tests required by the design process to complement the LEED credits.

Figura 11 - Design criteria for sustainable buildings



- Natural light analysis

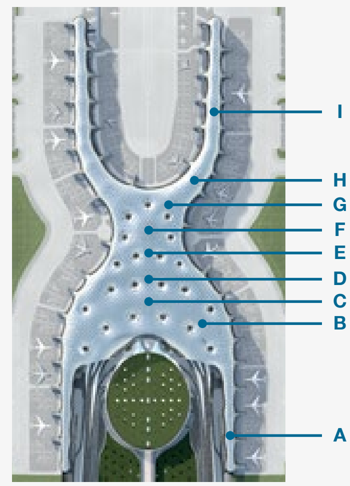
The design with glazing of the PTB envelope strives to make the most of the incoming natural light and to provide glare protection. The natural light system is constituted by three primary elements: triangular skylights, perimeter glazing systems and glazing in funnels. It is noted that the calculation of the control and lighting systems specified in the credit *Interior Lighting*, which belongs to the Interior Environment Quality could not be met for the building due to functional needs of the building.

Figure 12 - PTB interior view

Aiming to evaluate the natural light systems' performance and the distribution of light inside the building spaces, the Master Architect conducted a simulation with the purpose of determining the natural light autonomy. This natural light analysis serves to understand the uniformity of light and to maximize the daylight autonomy during the day as shown in Table 2. The spacing of skylights was optimized to facilitate the design.

Table 2 - PTB Illuminance

Code	Location	Target (Lux)	Daylight Autonomy
A	Concourse	150	90%
B	Ticketing	150	93%
C	Ticketing	150	95%
D	Security	300	80%
E	Retail	150	96%
F	Retail	150	88%
G	Retail	150	97%
H	Concourse	150	95%
I	Concourse	150	97%



This study analyses the reduction of light levels of the skylights, in relation to the glazing calculation. It also evaluates the relative probability of direct sunlight on each side of the façade through the annual sun-hour calculation. The result of the study presented in the environmental report of the PTB, shows that the exposure to sunlight of the glass on the Southeast and Southwest sections of the South façade is limited during winter. Similarly, the glass panels along the perimeter create a network of skylights to provide excellent natural light distribution levels, as well as a high degree of visual connectivity between the interior and the exterior.

- Envelope Thermal Performance

The envelope needs to be high performing to minimize thermal solar gains since the building requires a mechanical design which seeks to minimize its energy consumption. Thermal analyses were undertaken to evaluate heat gains and losses of the components of the cladding systems, with the purpose of identifying the thermal requirements for the insulation, glazing elements and calculating the energy consumption needs for cooling and heating. These analyses are fundamental for complying with LEED’s energy reduction targets and for the *Commissioning of the Envelope*, which is a requirement of the *Advanced Commissioning* credit that belongs to the Energy and Atmosphere category. This verifies the design based on tests for lighting and thermal transmittance of the glazing elements, overall envelope thermal conduction gains and losses as well as building air-tightness. These tests seek to confirm that the shell system's performance is acceptable to meet the efficiency needs and reduce the energy use throughout its service life.

The proposed envelope technology presents a very efficient system, as well as a thermal protection and double glazing panels to improve thermal comfort and promote energy conservation. Aiming to mitigate the increase of heat gain and reflectivity, it is proposed to apply a cladding of six different ceramic patterns to the glass panels of the envelope the design of each pattern was made according to the dimension variations and angles of the panels, in such a manner that each pattern provide different levels of solar protection to reach the thermal and visual standards proposed.

- Envelope Acoustic Performance

There are two main performance requirements for the acoustics needs of the envelope. The first is minimizing airborne noise breaking through the roof assembly, and the second is providing sufficient sound absorption in the interior spaces of the building to minimize reverberation within the space for aural comfort as well as the important need for sound intelligibility within the Terminal spaces. For noise penetration the whole roof build-up has been analyzed to prevent nuisance noise. On the internal side of the triangular panels that are lower part of the build-up of the roof structure there is an acoustic insulation layer for noise absorption which reduces noise reflection within the internal spaces. Similarly, the panels also incorporate micro-pierced metallic plate to cover the structural plate. By doing this, the design of the acoustic components integrates completely into the interior surface of shell system, thus avoiding visual obstructions.

Figure 13 - Acoustic design

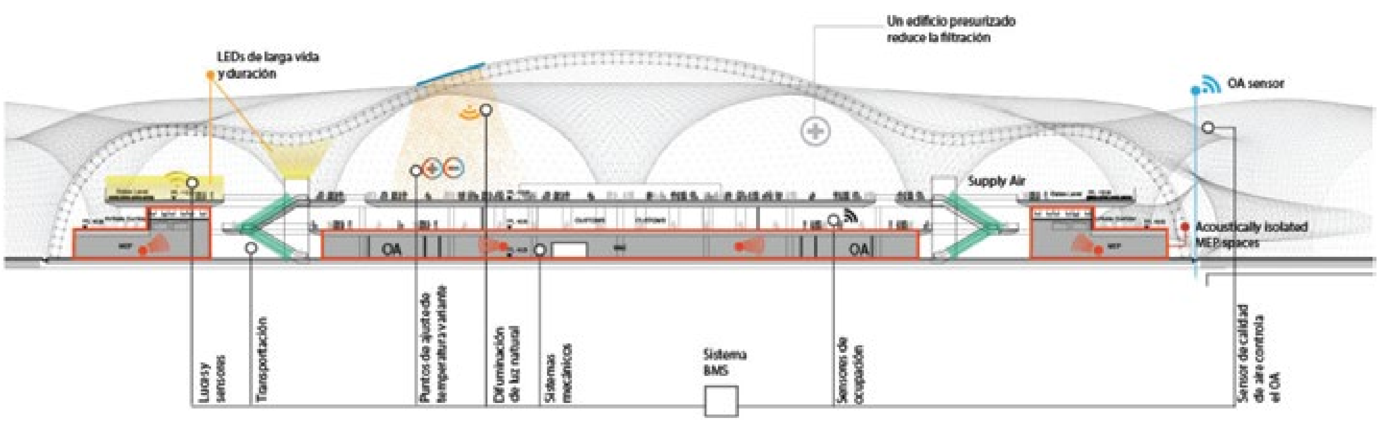
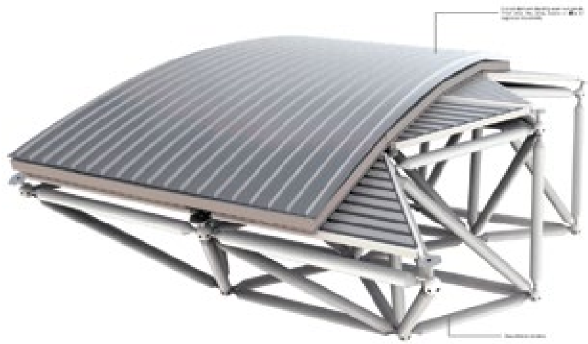
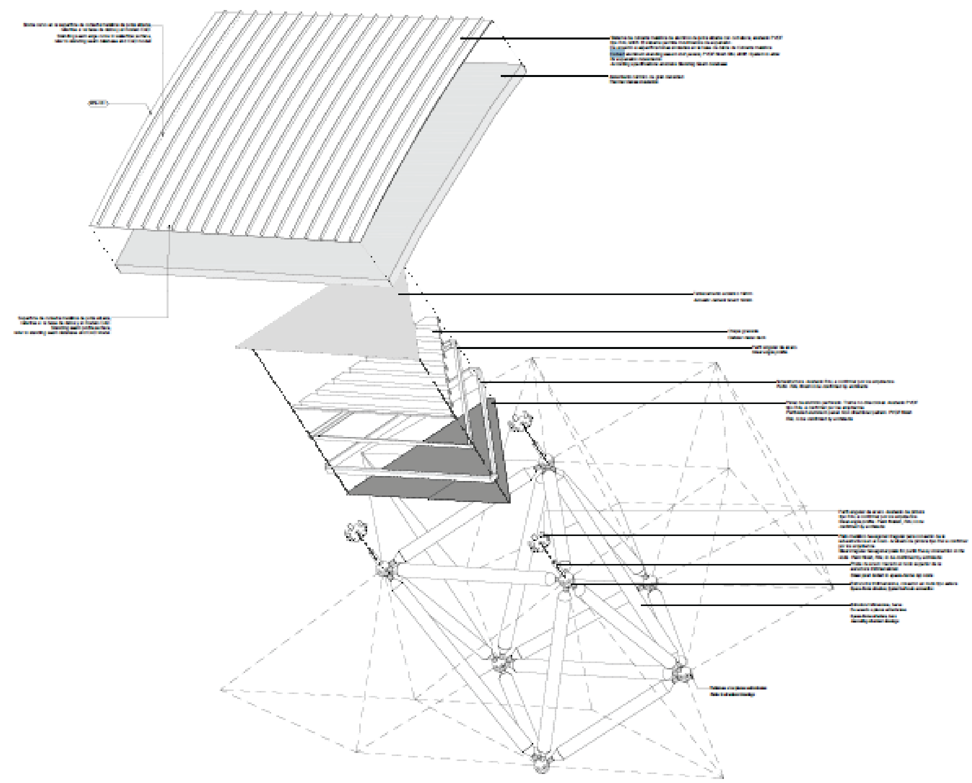


Figure 14 - Details of envelope building

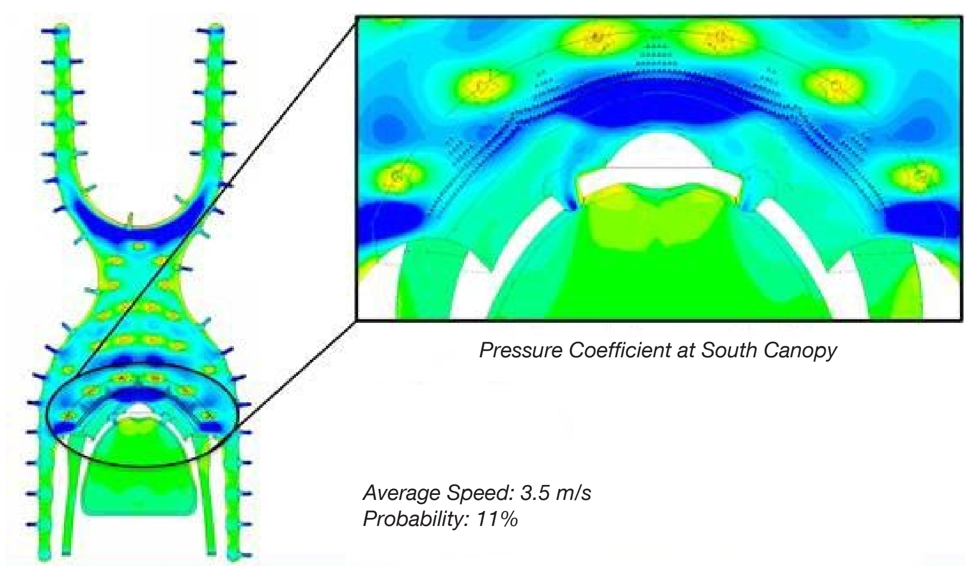




- Ventilation & cooling integration strategies

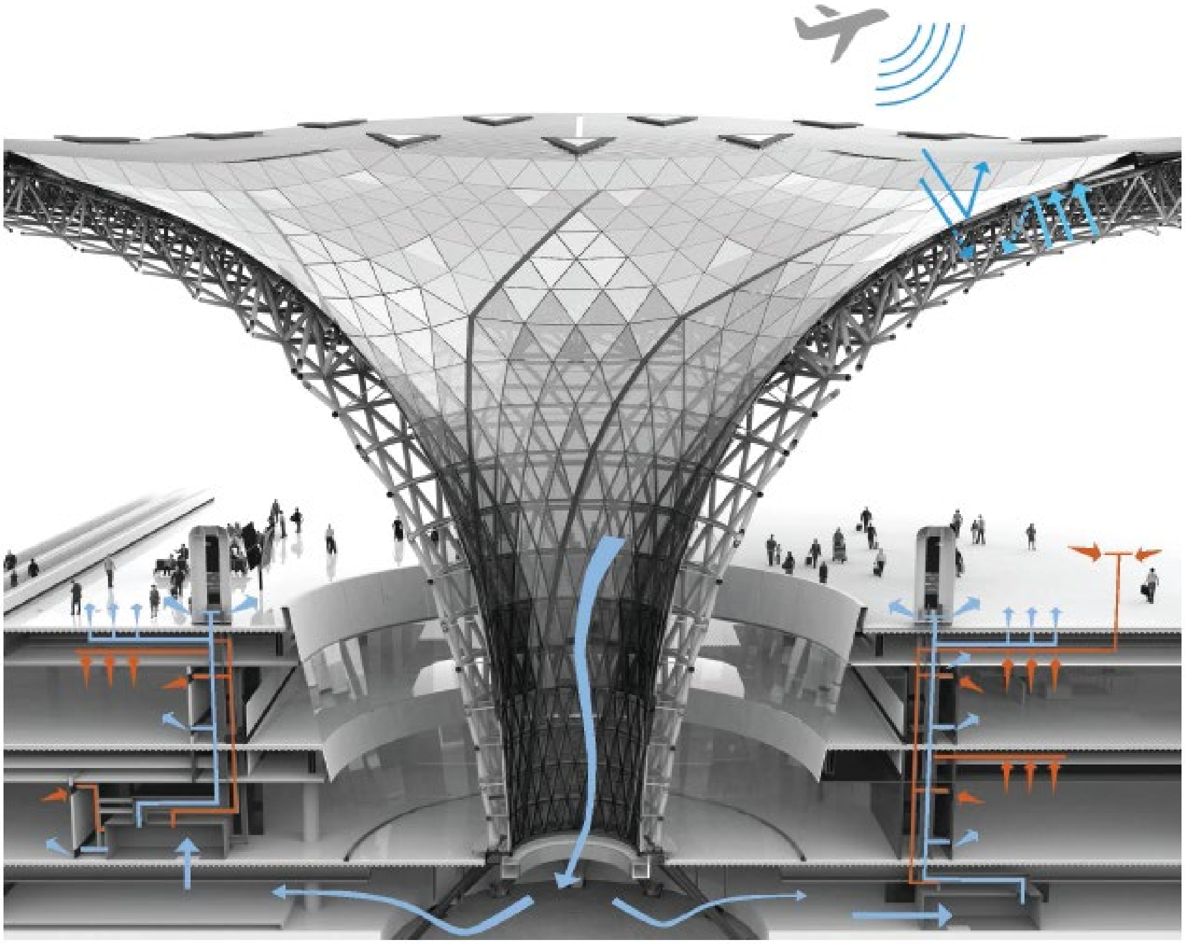
The envelope design has two integrated elements that contribute to the PTB's ventilation and cooling strategy. The first is the South Canopy, this is an overhang for the large South façade. The overhang benefits both the microclimate for the external drop off location by minimizing direct solar impacts and allowing natural ventilation to keep this external zone cool and this also protects the South façade from high solar gains entering the building which minimizes loads on the mechanical systems. This external area was also analyzed to check there was no local concentrations of contamination from the vehicles dropping off or picking up passengers. The South area analysis included a carbon monoxide (CO) exposure factor caused for vehicular congestion, among other parameters, to know the ideal location of added extraction ventilation openings in the canopy. It was found that the best location for air vents would be the highest part at the center of the canopy, and that this reduces the accumulation of CO sufficiently without mechanical fan power.

Figure 15 - Ventilation analysis



The second integrated feature are the funnels; this design allows outside air for building ventilation to be pulled from locations away from the aircraft which are a pollution source. This air is also tempered as it passes through the sub-grade high thermally massive plenum to the air handling equipment and reduces heating and cooling power needs.

Figure 16 - Air collection



Funnel cross section.

- Rainwater collection

The rippled geometry of the PTB shell strives to ease the discharge of water and hail in an efficient manner through the funnels. The funnels, apart from serving as structural support they serve as drainage to collect and convey rainwater to a system of collectors and sumps that discharge in a lagoon managed by CONAGUA. Although the water collected by the funnels system will not be reused inside the building, this wider system's design seeks to contribute to sending the collected water for use in irrigation or agricultural lands outside the city.

- Materials of low environmental impact

To incorporate materials of low environmental impact in the project, it is necessary to carry out an analysis of the Life Cycle Assessment of the building, also known as LCA. This analysis is designed to reuse and optimize the performance of PTB products and materials. To estimate the mitigation of environmental impacts during the design stage of the PTB, the LCA method compares the construction of the PTB using conventional materials with the construction of the building considering environmental friendly materials. This analysis is part of the LEED strategies of the Life Cycle Assessment credit that belongs to the Materials and Resources category.

The analysis also explains the benefits of the life cycle analysis of the envelope and the structural materials with regards to the use of the cumulative energy, as well as the environmental impacts resulting from all the phases of the building's life-cycle, including global warming, erosion of the stratospheric ozone layer, acidification of the soil and aquifer resources, eutrophication, formation of tropospheric ozone and consumption of nonrenewable energy sources.

4.4.2. Energy and water reduction

The PTB seeks to achieve two goals, reducing energy-use by 50% in cost saving and water consumption by 50% inside the building such as in the bathrooms and 100% in outdoor area for irrigation.

Below a brief description of the design of the systems proposed for the reduction of water and energy during the operation of the PTB is presented.

- Mechanical (HVAC) systems

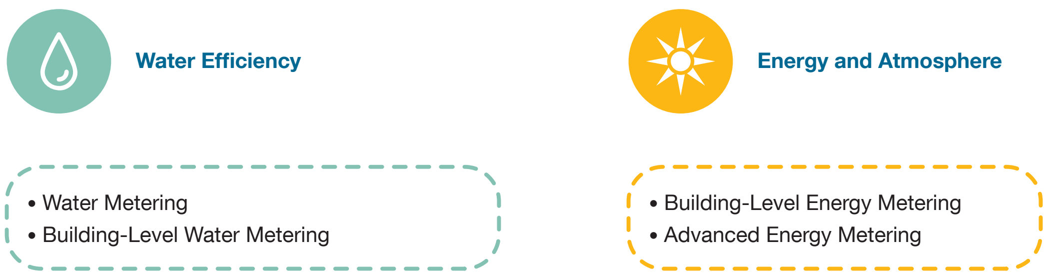
The design intent for the mechanical systems is providing thermal comfort and air quality to users, aiming to reduce the consumption of energy for cooling the areas. The project proposes to use economizers in air conditioning equipment with 100% of exterior air collected through the funnels. The free cooling will be effective when the temperature of exterior air is low enough to deliver the environmental conditions inside the building. In addition, it is being considered to use economizers on the water side with heat exchangers, making the most of the condensate water energy that comes from the cooling towers when the environmental conditions favor the free cooling of chilled water and is feasible to reduce the energy consumption to cool water down to the temperature required by the air conditioning equipment. The system also uses low pressure drop ductwork and displacement ventilation to reduce fan power energy.

With the purpose of avoiding the entrance of combustion gas odors coming from the aircrafts, all the air conditioning units will have gas phase filtration with activated carbon and particle filtration, thus guaranteeing compliance with the prerequisite *Minimum Efficiency in Interior Air Quality*, which is part of the Interior environment quality category. The air conditioning systems proposed combine different filters classified in MERV 7-9 (minimal efficiency 30%) and filters MER 12-14 (efficiency 80-95%). MERV, (Minimum Efficiency Rating Value), is the retention capacity in a filtering unit.

- Building Management System (BMS)

The PTB design incorporates a Building Management System, which will be in charge of maintaining the comfort parameters (temperature and humidity) in an efficient and automatic manner. Among the functions of this system we find: initiate, stop, monitor and measure the use of energy by mechanical and electrical equipment. This system is part of the LEED strategies of the credits and prerequisites included in the two categories described below.

Figure 15 - Link between the BMS and the categories



- Lighting

The quality of illumination in interior spaces is fundamental to provide comfortable and productive environments that foster the wellbeing of users. In this regard, the PTB design is based on the *Interior Illumination* credit strategies, part of the Energy and Atmosphere category of the LEED Certification. Among the strategies, it is proposed to calculate by means of a software, or through measurements, the illumination levels to optimize the interior lighting quality since the design stage. This, with the goal of determining the average lighting levels according to the surface and position of the light fixture in relation to the type of space, meaning, whether it is individual or multi-user.

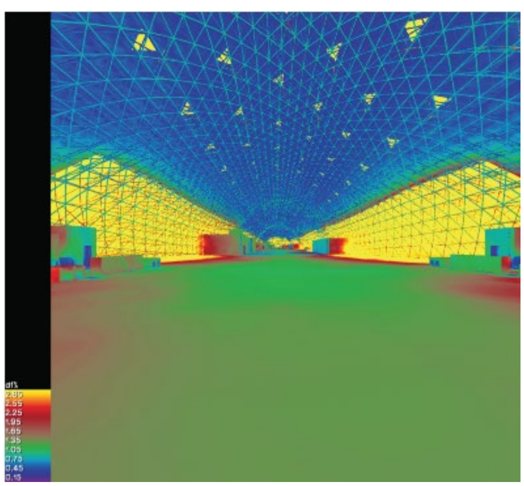
The table shown below contains a summary of the intervals between the maximum and minimum value of the lighting levels required according to the type of space. The information presented in the table is based on the illuminance levels per type of space specified in the basis of design.

Table 3 - PTB Lighting per aea

Space	Lighting (Lux)
Administrative	300
Baggage handling (Claim, Manual and Automated Areas, Warehouse)	100-400
Areas of Access and Descent	6-30
Concourse	50-100
Customs / Immigration	100-400
Elevators and Mechanic Escalators	50
Boarding Gates	100-300
Dining Room and Rooms	150
Check-in Counter	200
WC	50-150
Operating Rooms	100-200

In terms of energy conservation, it is fundamental to consider, since the design phase, the performance of light fixtures and efficient controls to attain substantial energy savings. Specifically, the PTB design proposes to maintain energy through fluorescent LED (Light emitting diode) lighting fixtures, with durability of 75% of the total illumination charge and a life-cycle of 10,0000 hours. Also, during the design phase, it is required to define the type of controls required for each space, depending on whether it is individual or multi-user.

Figure 18 - Natural lighting analysis



According to the PTB technical specifications, the proposed controls are conformed by a distributable system of clock-controlled adjustable LED units, local commutators, occupancy and daylight sensors. This system can control the LED units and set-up the projected illumination levels in each area with dual-technology sensors for minimizing declines.

- Water consumption

In relation to the design of bathrooms for the PTB, it is proposed to reduce water consumption inside the building through the installation of efficient furniture and bathroom fixtures. The furniture and equipment specifications are based on the strategies proposed in credit *Indoor Water Use Reduction*. Striving to reduce water consumption, the technical specifications propose a minimal pressure of 60 psi (415 kPA) for fixtures and elements in public bathrooms and kitchens, and a pressure of 80 psi (550kPA) for showers.

With regards to the maximum values of discharge flow rate, the toilets proposed in the technical specifications consume 1.28 gal/discharge (4.84 L/discharge), while a conventional toilet consumes 6L/discharge, and urinals consume 0.125 gal/discharge (0.47 L/discharge). Striving to reduce the potable water consumption in toilets and urinals, the design suggests feeding them with treated water coming from the water treatment system. The Master Plan developed by the Civil Engineer estimates a potable water consumption of 1,506 m^3/day and 3, 864m^3/day.

Aiming to comply with credit *Water Consumption Measurement*, the PTB design also considers the installation of treated and potable water submeters, with the purpose of monitoring consumption during the operation. The landscaping design also seeks compliance with the Exterior Water Consumption credit; therefore, the design proposes a drip irrigation system that uses treated water to maintain green areas in the exterior, which are in the area of connection with the ground transport, also known as Frontage Area.

- Vertical and Horizontal Transportation Systems

The PTB design includes visible stairs to encourage users to use the stairs instead of escalators and escalators. For the vertical and horizontal transportation systems consisting of escalators, moving walkways and elevators, energy saving systems will be used, such as: Usage sensors, motors with speed variation, premium-efficiency motors, regenerative braking. All these elements will also use LED illumination and a “waiting” mode (for illumination and ventilation) after a programmed interval.

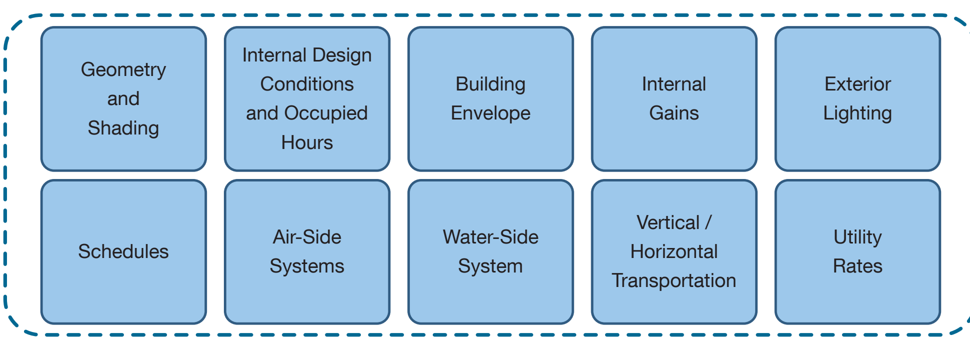
Figure 19 - Elevators and escalators view from the PTB

- Energy Model

The PTB design includes an energy simulation to determine the minimum energy performance, or any other additional savings during the operation of the building. The purpose is complying with the energy efficiency international standards specified in the *Energy Performance Optimization* credit, to reach the performance levels, as well as mitigate the environmental and economic impact.

The modeling is a tool that facilitates the design process and keeps the designers informed; it also allows them to identify and choose the suitable cost-effectiveness strategies. Different issues related to the energy impact are taken into consideration for the development of the model. Some of the factors previously presented are part of this model; figure 2018 shows the aspects providing the information for the proposal and the energy model baseline.

Figure 20 - Energy modeling of PTB



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5. Performance Indicators

Specific performance indicators are being developed for tracking through the on-going reporting in line with the Green Bonds framework.

5.1. Eligible Buildings

The Airport program is currently developing designs for LEED v4 ratings for the following buildings.

Building	LEED v4 Rating Target
Passenger Terminal Building	Platinum
Ground Transportation Center	Gold
Air Traffic Control Center	Gold
Area Control Center	Gold

In addition to the specific buildings undergoing the LEED rating process, there are impacts for other ancillary buildings and systems to achieve these targets.

The Central Utility Plants A & B (CUPs) are located in the West airfield and supply chilled water for cooling the Passenger Terminal Building (PTB) and Air Traffic Control Tower (ATCT), as well as facilities to the North within the Midfield area. The cooling systems are being designed to a high level of energy efficient performance.

The Ground Transportation Center will include a bus station and a metro rail station. A further bus station will be located to the North of the site for employees of the Midfield areas. Connectivity for the airport workers as well as passengers is critical for successful opening of the project and reducing car travel.

The project includes a dedicated Waste Water Treatment Plant. All black water from the initial phase of development will be treated to a high level to meet California Building Code requirements to provide a supply of treated water to airport buildings for lavatory flushing, irrigation and cleaning needs.

5.2. Energy and Water Consumption and Reduction Strategies

The MIA reviewed the currently observed values of water and energy consumption at the existing airport; based on these usages the new airport is targeting a reduction of around 70% in its use of potable water and 40% for energy usage.

All the buildings seeking a LEED rating are currently targeting a 50% energy cost reduction to meet the full points available. This 50% cost reduction is being designed through the following strategies:

- Implementation of Energy Conservation Measures (ECM's) within the building.
- Connection to a High Efficiency Campus Central Utility Plant.
- Power sourced from renewable energy sources.

Water consumption is being reduced through the following strategies:

- Dedicated on-site Waste Water Treatment Plant to provide a supply of treated water.
- Use of low flow fixtures for toilet flushing using treated water in buildings seeking a LEED rating.
- Use of low flow fixtures for lavatory fixtures using potable water in buildings seeking a LEED rating.

5.3. Greenhouse Gas Emissions

As laid out in the MIA the proposed building designs, boilers and power plants will reduce the Greenhous Gas emission by 50% compared to the current Mexico City Airport.

Reduction in Greenhouse Gas emissions aligns with the energy reduction strategies noted above for energy consumption.

Other opportunities which are being implemented or investigated at this time are as follows:

- Use of photovoltaic panels to provide site lighting and perimeter protection during construction.
- Provision of sufficient infrastructure to allow electric Ground Source Equipment (eGSE) for airlines and ground handlers to reduce non-aircraft airside air pollution.
- Identification of locations of natural resources and products to reduce pollution from transportation to the site.

5.4. Waste Reduction and Diversion from Landfill

LThe MIA outlines a range of reduction and recycling targets. Overall the new airport seeks a reduction of 10% to 30% in waste generation and an improvement of 10 to 30% in the amount to waste diverted to recycling facilities.

5.5. Energy Purchased or Generated On-site from Renewable Energies

The use of photovoltaics is currently being utilized for site lighting.

An extensive feasibility study is also currently in progress. This is to determine the best cost solution to meet the LEED demands of the project.