Urban Remediation And Civic Infrastructure Hub
Centro de Acção Social por Música
Grotão, Paraisópolis
Sao Paulo Brazil

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Paraisópolis is an area that began to develop in the 1970s around a challenging topography of hills. For the last twenty years, informal settlement has spread throughout the area, creating a need for housing, schools, and other public services. As the area developed, the construction labor force began to informally occupy the area. Before this urbanization the area was mainly agricultural. In the 1970s a new zoning law determined illegal development on the site due to the high density of informal housing. As a result there was a influx of investors in Paraisópolis.

Despite its central urban location, the marginalized area of Grotão within Paraisópolis is still largely separated from the wider city. Critical social issues and danger zones have determined the site as one of many high-risk areas in the city; a socially inaccessible void in the otherwise dense fabric.

The project’s site-specific strategy forms the void into a productive area and centers public spaces through social infrastructure, public programs, and the integration of fragmented contexts. The intervention opens the edges of the void to re-establish connections within the existing urban fabric and to introduce social programs where they were once categorically ignored. Located moments of the program reinforce networked connections between public spaces, transportation infrastructure, replacement housing, and the Fábrica de Música, all simultaneously connect to the social and cultural assets of the site by the landscape of activated commons.

The lower site of the site contains the fábrica de música, which creates diverse programs to maintain the site potential. These include public transportation, sports facilities, and the music school, which contains studio and rehearsal spaces, social, engagement hall, and auxiliary spaces. The program for the music school and cultural programs into the fabric while forming a new spatial order that escape the pull of the void.

The upper zone contains new replacement housing for those displaced from high-risk zones. Commercial spaces that activate the street level and stimulate the micro- economy of the area.

The project proposes that anti-poverty strategies that connect, conserve, and transform social spaces to serve as an enabling connection between the opposing forces of the urban landscape. The sites of marginalized conditions are fed by a variety of sources. The proposed urban form seeks to materialize a strategy that seeks to provide equal access to housing, employment, technology, services, education, and resources—fundamental rights for all city dwellers into spatial solutions.

Brazil
Population: 181 Million
Geographic area: 8.54 million km²
Population density: 24/0.0 sq km

São Paulo
Population: 113 Million
Metropolitan Region: 171 Million
Geographic Area: 322,799 km²
Population density: 5760

Paraisópolis
Population: 80,000
Geographic Area: 322,799 km²
Population density: 29,000
No. of Lotes: 7,500
No. of Population: 17,432
Residential: 14,598
Other: 2,834
Project Catalysts:

High-Risk Zone

Increased erosion, ongoing mudslides, steep slopes, poor soil, and inadequate drainage systems have given rise to a high-risk zone. These areas are often prone to flooding and are therefore in need of innovative and imaginative solutions. There are many similar sites, not only in São Paulo, but also in cities throughout the world. It is imperative that solutions and prototypes are developed to address questions related to sustainability, social equity, and safety in these areas.

The poor topographical conditions are intensified by the city’s climate. Monsoon rains during the 8-month wet season transform the area into a water basin. With no outlet, the water sits stagnant at the bottom of the slope, creating a wetland. In addition, the top 5 meters of the ground covering is comprised of garbage and sand, making it exceptionally difficult to build. Due to extreme rain, mudslides, and floods, this site has become void. In order to transform this space from a dangerous garbage dump, the critical risks must be understood and the site must be stabilized.

The area of Paraisópolis suffers severe flooding due to heavy rainfall and lack of adequate runoff systems.

Lack of Public Space

There is a fundamental disparity between the built and unbuilt space in Paraisópolis, specifically within Gringó, where texts and social space are often neglected. Many of the sites are not used to the fullest extent, leaving much of the space vacant or underutilized. The available open space overlaps with areas defined as High-Risk Zones, making it difficult or impossible to build. It is therefore necessary to develop new and innovative solutions to this fundamental issue.

Lack of Social Infrastructure

Due to rapid urbanization and challenging topography, the necessary social infrastructure and engagement were not incorporated into the development of the community. While small scale commercial enterprises exist, there are minimal social infrastructures found in the dense Paraisópolis Fabric. There exists a strong cultural dynamic that lacks stability in the fabric, but unfortunately these are major hubs or networks within the neighborhood to accommodate the resistance.

Gustavo Di Bella conducts the FEINGUV—Youth Orchestra in an informal settlement. This demonstrates both the lack of necessary social infrastructure as well as the importance that music brings to the neighborhood.
Project Components:
Each project component embodies one of the five key pillars and serves as a transferable prototype.

**Ethical Standards and Social Equity**
- The project aims to meet the needs of sustainability beyond environmental ones by integrating social dimensions.
- Improvement strategies must be based on the foundations of social equity, ensuring inclusivity and accessibility.
- The design must prioritize the needs of the community, especially marginalized groups.

**Environmental Quality and Resource Efficiency**
- The project utilizes site orientation to optimize natural resources and reduce environmental impact.
- Design practices are efficient in managing water resources and energy use.
- The project integrates renewable energy sources and promotes sustainable materials.

**Contextual and Aesthetic Impact**
- The project is designed to harmonize with the local context, respecting cultural and historical significance.
- The design enhances the aesthetic value of the site, creating a visually appealing environment.
- Its impact on the community is considered, ensuring positive social and economic outcomes.

**Economic Performance and Compatibility**
- The project is economically viable, ensuring cost-effectiveness and sustainability.
- It is designed for compatibility with existing structures and infrastructures.
- The project aims to improve economic opportunities for the community.

**Innovation and Transferability**
- The project incorporates innovative design solutions, pushing the boundaries of sustainability.
- The design is transferable, applicable to a wide range of contexts.
- It promotes the integration of new technologies and methods.

**Integration/Connections**
- The project connects different parts of the site, improving accessibility and connectivity.
- It integrates various elements to create a cohesive and functional whole.

**Field, Performance Area**
- The performance area is designed to optimize the use of space and facilitate versatile use.
- It accommodates different types of activities and events.

**Music School**
- The music school is designed to support music education and performance.
- It integrates sound and acoustical considerations.

**Public Ramp System**
- The ramp system is designed for accessibility and safety, accommodating people of all abilities.
- It enhances the connectivity and accessibility of the site.

**Public Elevator**
- The public elevator is designed for accessibility and mobility, connecting different levels of the building.
- It is an essential component for universal access.

**Site Access**
- The site access is designed to accommodate pedestrian and vehicular traffic efficiently.
- It integrates accessibility features to ensure ease of use.

**Before**
- The current state of the site.

**After**
- The proposed improvements and transformations.

**Terraces**
- The new terrace system combines necessary physical infrastructure with social infrastructure, providing space for flexibility and adaptability.
- The terraces also make important connections to the surrounding neighborhoods.

**Wetlands**
- The new wetlands provide ecological filters that maintain water quality.
- The wetlands are designed to improve the ecological health of the site.

**Urban Agriculture**
- The urban agriculture helps transform the space into an energy-equalizing productive space within an urban node.
- It integrates sustainable agriculture practices.

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Landscape and Urban Agriculture:
The Parque de Música and the landscape is a new building, each one working with the other to form a comprehensive whole.

- Grass: Permeable grass is used to retain the steep landscape, absorb excess stormwater, and reduce the required construction on site.
- Grass Pavers: Permeable material to mitigate runoff and erosion
- Agriculture: Introduce fresh produce, agricultural education, and more awareness into the community
- Wetlands: Massively filter water for grey water applications and irrigation for agriculture

Landscape Circulation:
- Terraces Integration: The social system flows into existing paths to allow the public to be integrated into the context through the simple void
- Terraces Integration: The terraced system continues into the Fabrica de Música through a series of fiddles. Using the terraces as an urban network is also connected to the public's ideas for activating space within the main school

- Ramp: A landscape accessible public ramp provides access throughout the entire site and moves the landscape into and through the Fabrica de Música
- Terraced Surface: The bridges at the 200-level form an extended surface that connects into the building. The main school is simultaneously building and landscape
### Water Model:

- **Rainfall Water Flow**
  - Runoff from impermeable surfaces, absorption, permeability, and infiltration into water storage
  - Sheet runoff directs the water towards evaporation or site storage

- **Roofed Water Flow**
  - Runoff from roofed elements like water tanks in roof-dependent locations
  - Sheet runoff directs the water to an evaporative or holding reservoir

- **Treated Water**
  - Treated overflow from the water tanks is collected into holding reservoir and used for irrigation
  - Treated water is recycled to local quality standards with rapid sand filtration and pumped to elevated tanks for reuse

- **Water:**
  - Filtrated during dry periods to provide irrigation to adjacent areas
  - Treated water is available for non-potable uses, such as direct flushing

- **Infiltration System:**
  - Infiltration system is discharged to the public sewer when not in use.

### Building Systems:

- **Natural Ventilation Chimney**
  - Combination of stack, solar, and wind-supported ventilation system

- **Hydroelectric Panels**
  - Solar panels facing the sky, 360° of the year.

- **Air Conditioner**
  - Protects against solar exposure along the east and west facade

- **Solar Cooling**
  - Temperatures using concrete structure with embedded hydronic piping

- **Vapor Ventilation**
  - Facial ventilation in shoulder areas, operation in conjunction with refrigeration systems

- **Drip Irrigation**
  - Wind from south direction provides cool air, water coils coming from south direction are blocked by the hill

- **Rainwater Collection**
  - Collection from the roof water system:
    - Rainwater collection from the roof
    - Treatment system in the roof
    - Treatment system in the roof

### Climate Concept:

**Climate:**

The climate in São Paulo is hot and humid throughout the year due to its proximity to the equator. This climate is characterized by high temperatures and high humidity levels, which can cause discomfort for occupants. The design of the building incorporates strategies to mitigate these effects and provide a comfortable indoor environment.

**Climate responsive concept:**

- **Passive strategies:**
  - To resist both the hot and humid climate, two passive approaches are employed: the first approach is to encourage the building's orientation and design to take advantage of the microclimates and reduce energy consumption in conditioning.

- **Active strategies:**
  - The design of the building employs a combination of active and passive strategies to improve energy efficiency and reduce the need for mechanical cooling. These include:
    - Utilization of natural ventilation to provide fresh air and reduce the need for mechanical cooling.
    - Integration of solar panels to harness solar energy for heating and cooling purposes.
    - Use of passive cooling systems, such as shaded overhangs, to reduce the heat gain through the building envelope.
    - Implementation of insulation and thermal mass materials to improve the building's thermal performance.

- **Active elements:**
  - To improve indoor climate, the thermal mass of the building is exploited by actively using solar energy. Water tanks are employed to store and deliver heat to the building during the day, while heat is released back into the building during the night.

- **Drip irrigation:**
  - The drip irrigation system is designed to provide water to the plants and reduce water loss due to evaporation. The system is integrated with the building's water supply and can be controlled to provide the optimal amount of water to the plants.
Facade Concept:

An innovative concept is one that can be transferred into a sustainable product or production methodology. In some cases, the concept is transferred into a diversity of products and architectural projects. The facade of the Fábrica da Música opens both innovation and understanding of form and function through introducing the idea of modular, industrialized, and demountable units. In this case, the facade is a modular building system in a modular building system, allowing each unit to be as low-tech or high-tech as necessary.

The individual block and the wall construction are highly transferable. There's a strong drive that these simple concrete blocks can be produced locally. This will have a strong economic and social impact on the production of the new economy. Furthermore, the local production will introduce the knowledge of the section block construction, a modular system that is not only a core component of the hydropower plant, community members who work in the energy economy, or as local knowledge building. This is essential for the independent companies, where they can produce these units and sell them. It also introduces the concept of the modularity, which is an essential part of the modular construction. The modular system will be introduced into the community's construction dialogue. A variety of the bricks, mortars are built into the block. Individual blocks will substitute the section block for the complete block from the positive environmental impact. Through this block and the other design components, the building will understand how to solve the energy demand on the same time. These elements are representative for the future of energy around the perimeter and other places, adapting the concepts to the local conditions.

Landmark Building:

The Gharbi Project setting out on a landmark project serving as an innovative example of a sustainable and participatory building. The concrete blocks and columns can be utilized as small and intimate elements, providing a sense of cohesion and connection. The building will serve as a model for the future of energy demand on the same time. These elements are representative for the future of energy around the perimeter and other places, adapting the concepts to the local conditions.

Over the year, the building produces more energy by photovoltaics than consumes. The hybrid collectors covering the roof will produce ~140,000 kWh/a. The excess energy can be used by the surrounding buildings.