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**BUSINESS CENTRE**

**LVIVO G. 68A, VILNIUS**

FOR AN INTERNATIONAL, INVITED DESIGN CONTEST

Explanatory Report

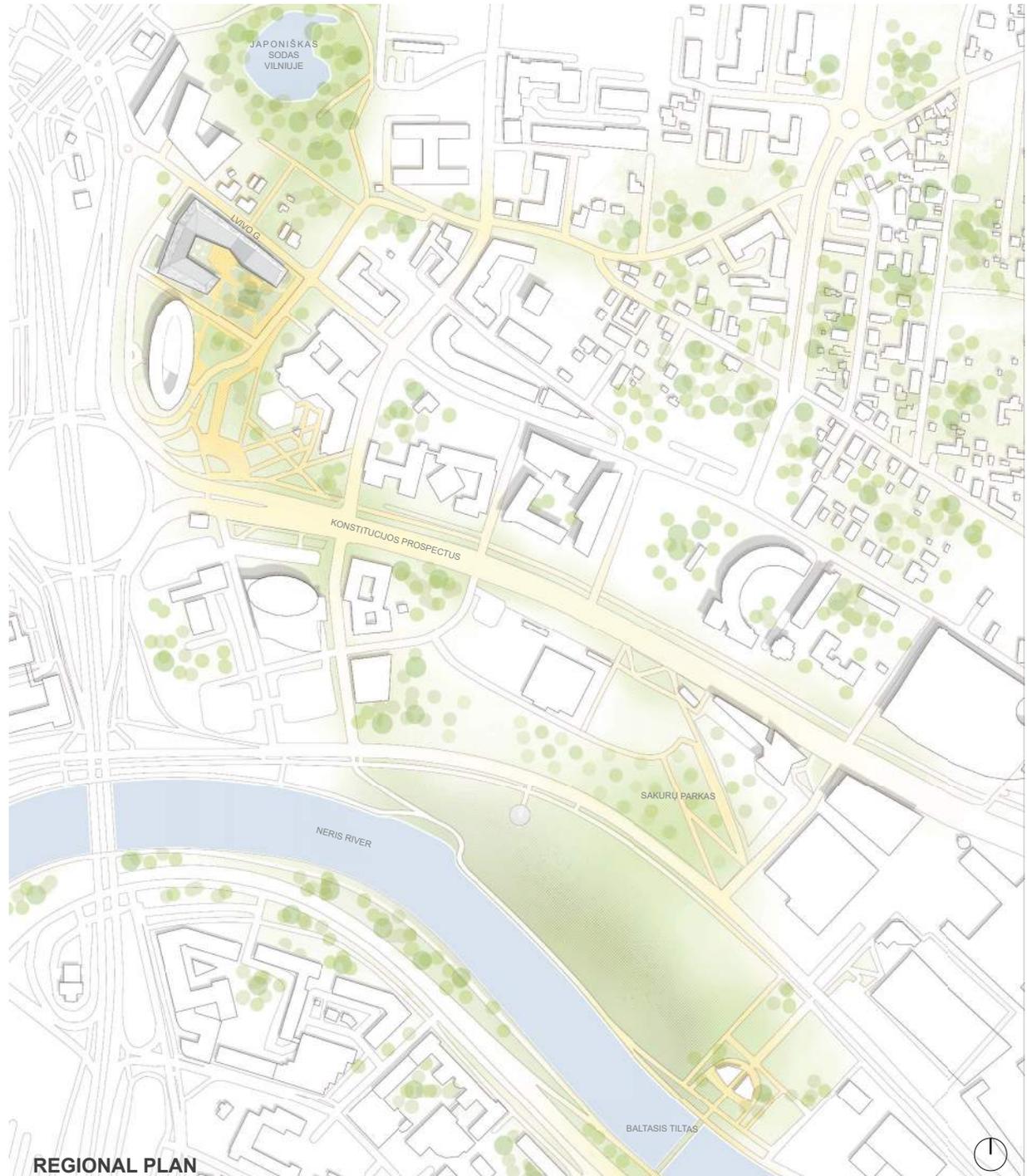


**VIEW FROM KONSTITUCIJOS PROSPECTUS (MANDATORY VIEW 3)**

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**REGIONAL PLAN**

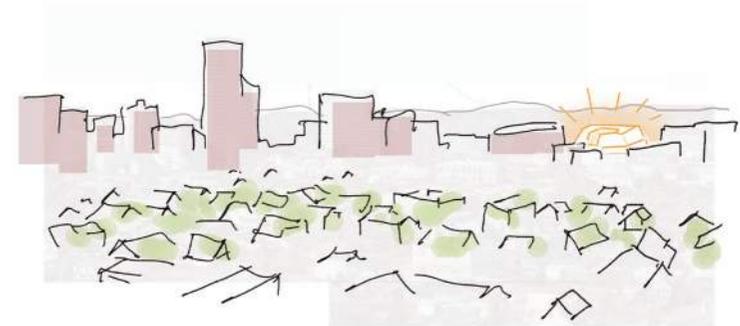
## URBAN IDEA

Vilnius has been defined by a harmony of its elements - its spacious parks and hilly terrain, structures of the old town intermingled, and layers of history accumulating. As the new Central Business District in Vilnius looks to the future with hopes of becoming internationally recognized as a growing center for economic prosperity, it is imperative that it not lose sight of the rich diversity of the culture of Vilnius. The project site must negotiate between the large, vehicular-centric roadways on the west, the busy and active avenue of Konstitujos Prospectos to the south, and the pedestrian-focused character envisioned for Lvivo Street. Likewise, the scale of the structures of the existing neighborhoods to the north and east in Šnipiškės present an alternative grain to that of the Central Business District. The wooden houses, cobblestone paths, shared yards, and gardens in Šnipiškės, are in strong contrast to the formal, large, glazed volumes of the new business centers.

This building presents an opportunity for reconciling the layers of Vilnius's rich culture and history with the promise of the new Central Business District, while looking forward to a human-scaled pedestrian experience in the built environment. The volumes of the building are informed by three main elements:

- Respecting site setbacks to preserve daylight for the neighboring public realm
- Adjusting the width and form of the building to privilege solar access and daylighting for occupants and for the newly created elevated garden
- Creating an active ground plane that prioritizes pedestrian circulation through the site and the multiplication of green spaces by the creation of an elevated garden space facing the courtyard.

The site is perfectly positioned to help develop and strengthen a green pedestrian-centric connection that is in line with the city's goals in their recently adopted Green Wave proposal to regreen Vilnius's streets. Building a strong green connection in this zone could help draw people from the embankment of the Neris River, through the Sugiharos sakurų parkas, along Konstitujos Prospectos, and to the Japanese Garden at the north of the site. This new pedestrian route can be an amenity for the business occupants, residents, and visitors and tourists - creating a strong link between the planned Japanese garden and sakurų parkas with its blooming cherry blossoms.





**VIEW FROM KONSTITUCIJOS PROSPECTUS (MANDATORY VIEW 3)**

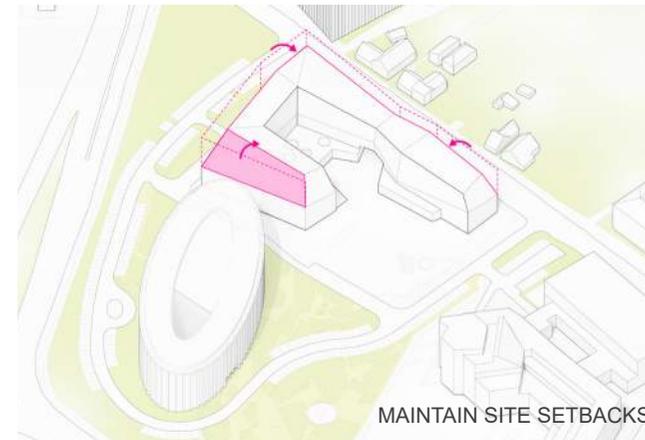
## ARCHITECTURAL IDEA

In order to respond to the specificities of the site at this western edge of the new Central Business District, the project needs to simultaneously address issues of scale and materiality, human comfort and user experience, sustainability and identity of place. The project leverages the public green space at the southeast corner of the site in order to strengthen the pedestrian link from Konstitujos Prospectos to Lvivo Street and the planned Japanese Garden. This creates a central gathering space at the center of the site that invites the community into the highly public ground floor, activating the interior of the courtyard with diversely programmed spaces. One-story volumes at the ground level react to the pedestrian movement through the site, and establish a scale that responds to the nearby neighborhoods and the envisioned pedestrian-focused public realm. The strong desire lines through the site are reinforced by the generous passage to Lvivo Street that separates the building massings at the ground level.

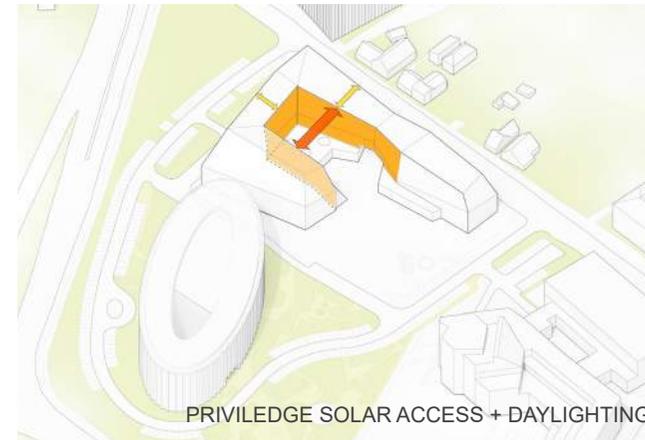
A large landscaped stair (accompanied by elevator access from the public lobby) provides access from the courtyard space to an elevated garden at the second story, welcoming the community and outside users to enjoy its spaces. This elevated garden brings the outdoor spaces closer

to the office occupants and increases the amount of usable green space on the site, while still allowing for a generous public ground floor. The public lobby at the ground floor exists as an 'indoor -outdoor' (or *mid-door*) space. This minimally conditioned space acts as an extension of the public courtyard in the winter months, allowing the community and building occupants numerous places to meet informally, gather, and connect with each other.

The undulating roofscape of the upper volumes attempts to reconcile the pedestrian scale of the streetscape and neighboring buildings to the northeast, with that of the new buildings in the Central Business District. This changing roofscape, with its photovoltaic shading screen, allows the building to mark the entry to the Central Business District from the adjacent highway, while lowering as it moves eastward towards Šnipiškės. The photovoltaic shading screen, located in areas that receive the most solar insolation, takes advantage of the sloped surfaces of the roofscape to generate renewable energy for the complex. This functionally-driven photovoltaic shading screen creates a strong identity for the building, speaking to its commitment to user-driven design and sustainability.



MAINTAIN SITE SETBACKS



PRIVILEGE SOLAR ACCESS + DAYLIGHTING



MULTIPLY GREEN SPACES + PEDESTRIAN ACCESS



**COURTYARD VIEW**

## FUNCTIONAL PLANNING OF THE BUILDING

The planning of the building allows for a highly public ground floor that can be programmed with a variety of meeting and amenity spaces to be utilized by building occupants and community members alike. In the warmer months, the mid-door space of the ground floor lobby can be opened fully to the exterior - assisting in building ventilation and strengthening the indoor-outdoor experience. This large public lobby can be used for conferencing,

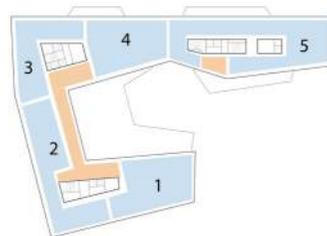
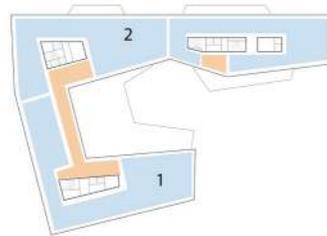
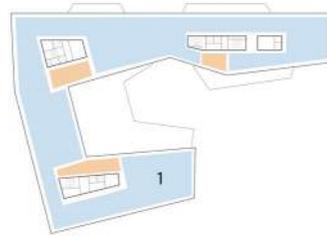
informal meeting, events, and temporary markets. In colder months, the public lobby continues to provide an indoor-outdoor experience with its generous plantings, openness, and numerous skylights. Restaurant and cafe spaces encourage people to spill out onto the courtyard during the warmer months, and welcome the community in during the winter months. At the southern edge of the site, a large community-based program, here shown

as Library and Exhibition Space, can be incorporated to help draw in the community during weekends and hours when the offices will be unused. This will help to keep the interior and exterior of spaces of the site occupied and active on a more continual basis. The Library and Exhibition Space can extend out onto the public courtyard along with various food and beverage spaces that activate the courtyard and Lvivo Street.



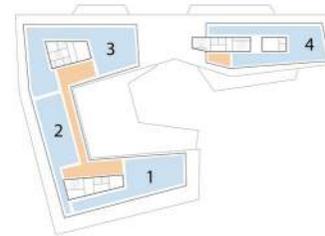
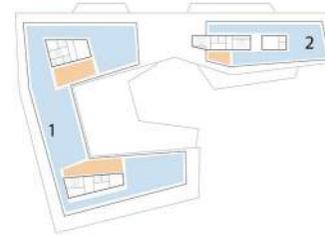
EAST-WEST SECTION (B-B)

**TENANT DIVISION  
DIAGRAMS**



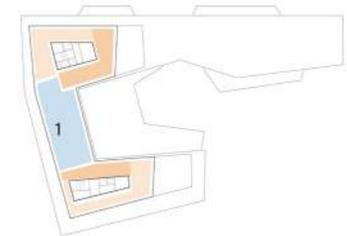
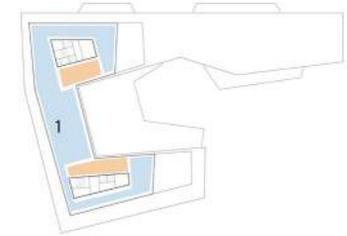
**TYPICAL OFFICE FLOORS**

At the typical office floors, the three distinct lobbies allow each floorplate to be subdivided to accommodate tenant space needs. Floors can be occupied by a single tenant, or sub-divided among as few as two or three tenants, or as many as five tenants.



**FLOOR 6**

The sixth floor is easily subdivided into two or four rental units, depending on tenant needs.



**FLOOR 7**

Floor 7 is ideal for renting to a single prominent tenant that could occupy the full floor. Alternatively, it could be rented to a single tenant with a smaller footprint and allow the remainder of the floor to be house meeting and amenity spaces that can be shared among the occupants of the full building. These spaces include a roof terrace with views out over the Vilnius landscape. Stair access in case of emergency would be through the suite.



**GROUND FLOOR**

The heavily planted public lobby serves as an agora space for the community and the building, as well as an entry point to two of the office lobbies. The building has three lobby spaces that serve the office floors above. These lobbies allow for maximum flexibility for dividing rental units in the above grade floors. Office lobbies A and B are accessed from the public lobby on the courtyard side, with a secondary connection back to the

existing at grade parking. Office lobby C is accessed at the ground floor directly from Lvivo Street, along with various retail and food and beverage establishments.

Large meeting and conference spaces are located at the western edge of the ground floor and allow for a variety of events. Additionally, a small amount of office space is located off of Office Lobby A on the most private portion of the site.



**NORTH-SOUTH SECTION (A-A)**



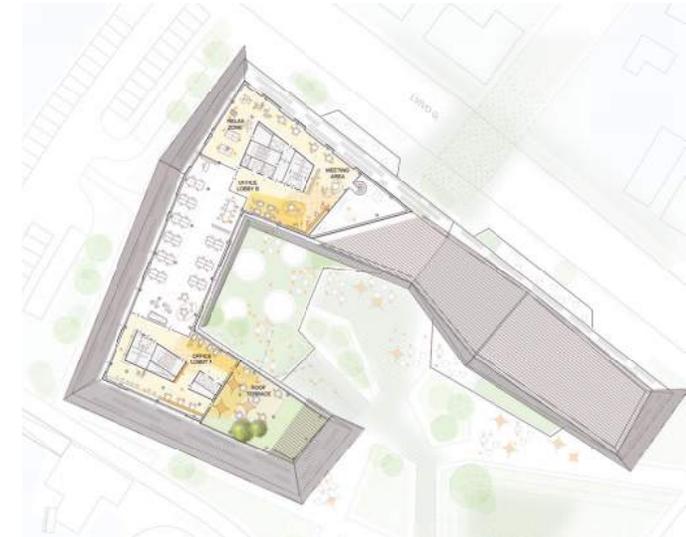
**VIEW FROM OFFICE LOBBY B TOWARDS COURTYARD**



**FLOOR 4**



**FLOOR 6**

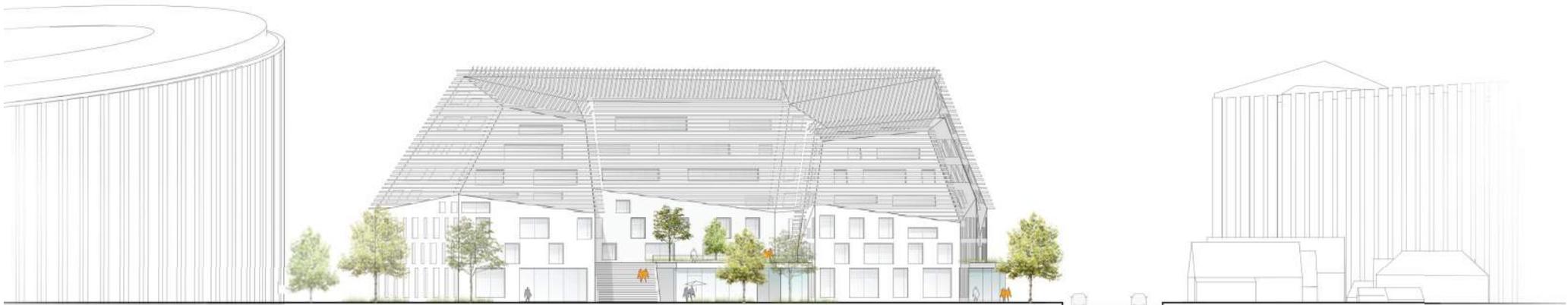


**FLOOR 7**

The flexibly programmed office and meeting spaces on the upper floors allow tenants to define their spaces as needed, and also provide critical access to daylight, views, nature, and materiality that are essential to human comfort. Above the ground level, each of the lobbies looks outward on to the courtyard space and the elevated garden. At the second level, each of the office lobbies also has direct access to exterior space, strengthening the connection to nature for the building occupants.

The unique massing of the building provides additional opportunities for tenants occupying multiple floors to have open stairs for increased connectivity.

At the upper most floor, additional amenities can be located to serve the occupants of the whole building. A roof terrace, relaxation areas, meeting spaces, and informal collaboration zones at this level, add to the identity of the building and help to distinguish this space from other buildings in the district.



**EAST ELEVATION**



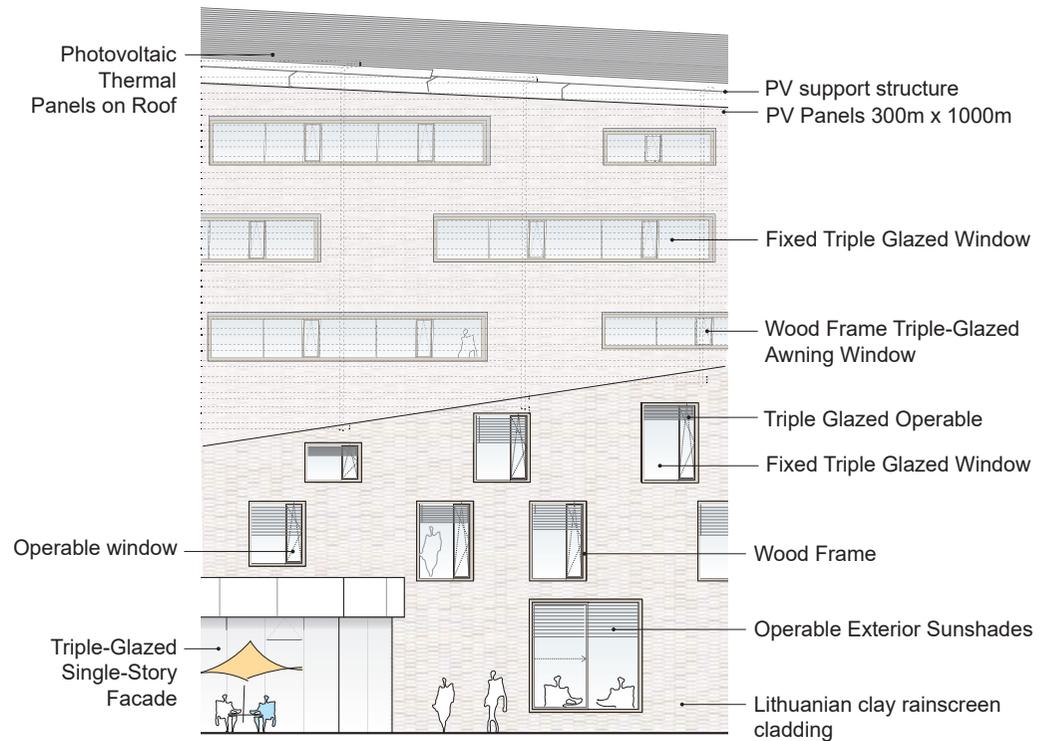
**NORTH ELEVATION**

# BUILDING MATERIALS

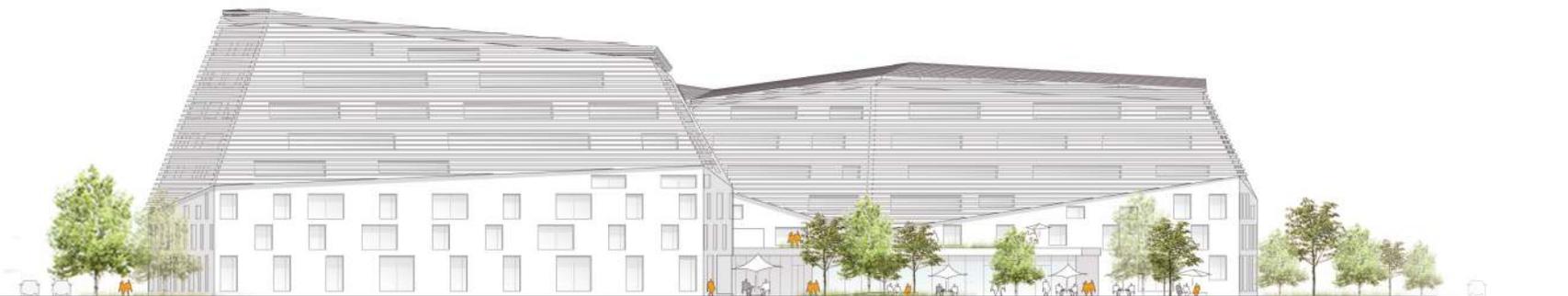
To build upon the unique heritage of Vilnius, we take inspiration from the local building materials and traditions. We want to preserve the inherent characteristics that stimulate the senses and celebrate human-scaled interactions with the built environment. Therefore, our design proposes to use the opaque portions of the insulated facade to create a human-scaled experience using local brick cladding. For the primary building structure and furniture, the design uses local wood from Lithuania. A layered construction aesthetic will showcase the rich and deep history of Vilnius.



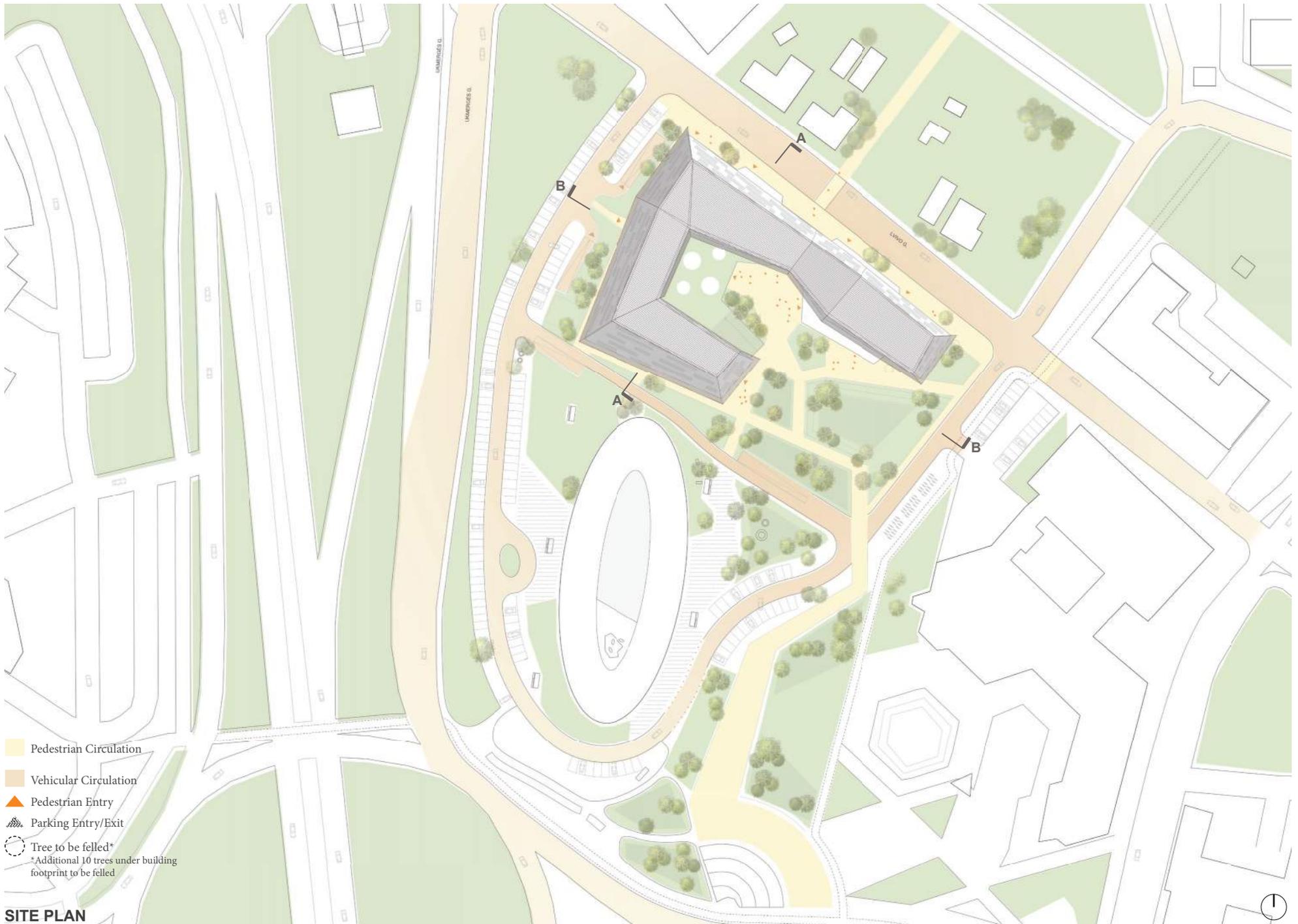
LOCAL BUILDING MATERIALS

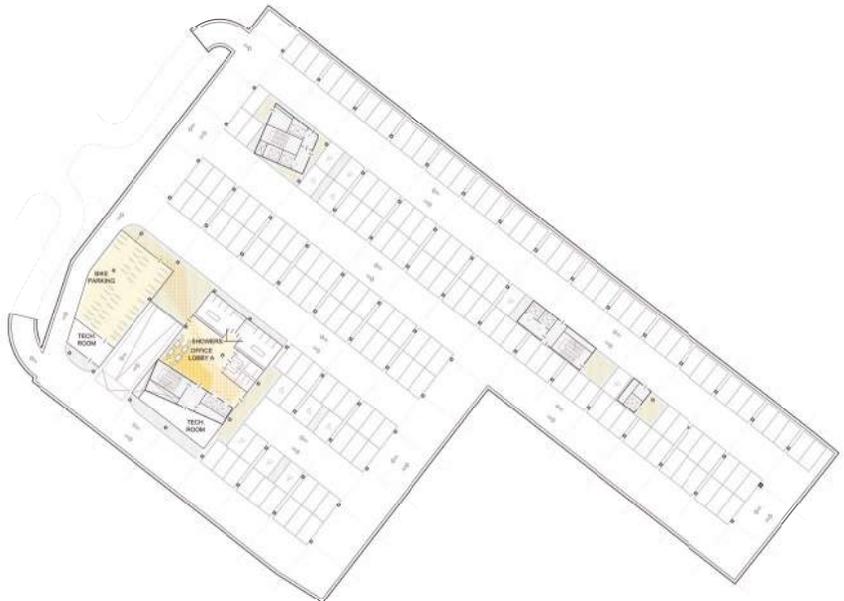
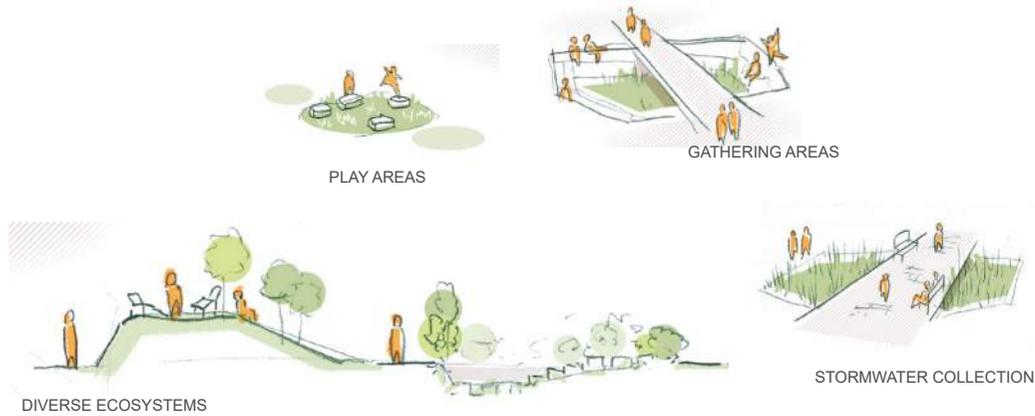


FAÇADE MATERIAL DIAGRAM



SOUTH ELEVATION





TYPICAL PARKING LEVEL

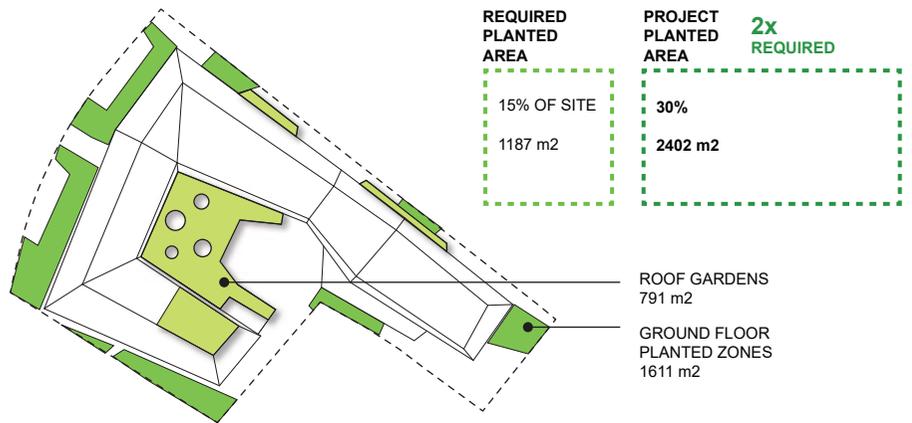
# TRANSPORT AND PEDESTRIAN FLOW SOLUTIONS

The Lvivo Business Centre is situated along a main pedestrian path between the Neris riverwalk and the Japanese Garden. The building's open courtyard and elevated garden reach out to connect with this pedestrian path, intermingling itself with densely planted landscapes and strategically lined paths. Between these paths are a variety of gathering spaces and local plantings acting as an extension of Vilnius' Green Wave initiative. It is important that these paths and plantings weave themselves into the neighboring public avenue, as a continuation of the urban forest within Vilnius.

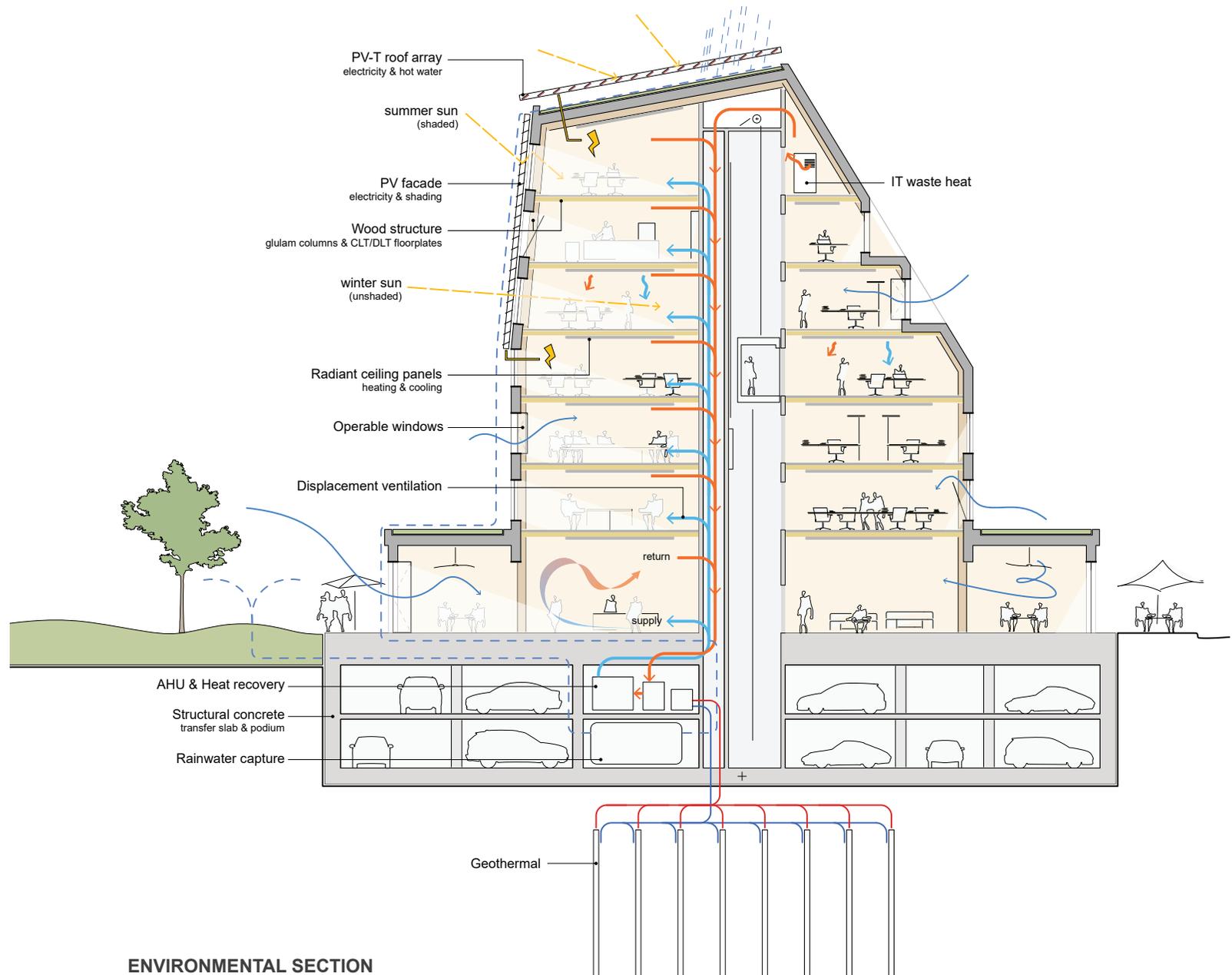
Garden. For southbound foot traffic on Lviv street, the throughway acts as a gate into the open landscape courtyard. With a generous double-height space the throughway is flanked by retail spaces inviting pedestrians to and from the courtyard.

The building volume not only receives the pedestrian flow but also redirects it. For northbound foot traffic the throughway directs pedestrians towards the Japanese

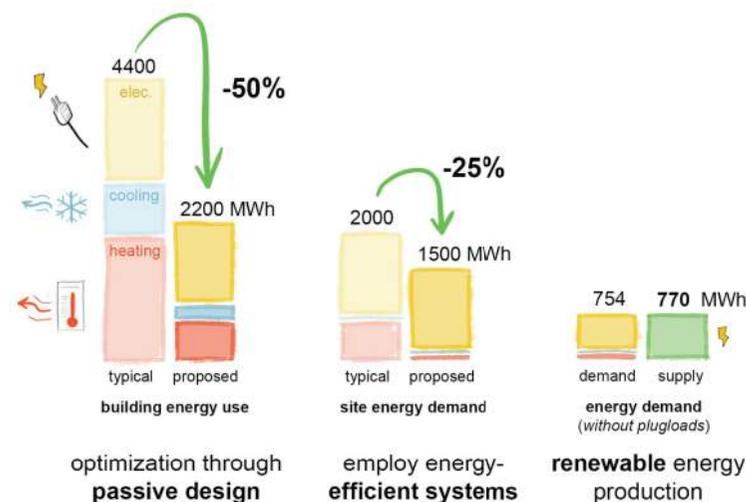
Parking egress and ingress is located at the northwest side of the building volume minimizing any vehicular disturbance for the patrons within the building. This parking area is also a strategic location as it is situated away from the children's parks at K29, Children and Youth Centre and the shared space between lots 1 and 2. In addition the ramps cause limited disturbance to the current K29 parking layout while seamlessly integrating itself within the parking spaces rhythm.



GREEN SPACE DIAGRAM



ENVIRONMENTAL SECTION



## GREEN SOLUTIONS

With the impending climate crisis, it is important to be as carbon neutral as possible. This building aims to be energy self sufficient by producing renewable energy on site and minimizing energy demand. Rather than follow the status quo of sacrificing sustainability and occupant comfort for a highly-glazed, generic facades, this building utilizes its architectural expression as an asset towards reducing energy consumption. The orientation and massing considers the local environment and historical built context. An optimized window-wall ratio and triple glazing and combined with materials that can be locally sourced. The fixed façade screen shades summer sun, allows winter sun

in, and generates energy for the building using its integrated photovoltaic panels and photovoltaic thermal (PVT) panels.

The thin polygonal floor-plate width creates a pleasant and sunny working environment for longer hours throughout the day and create natural transitions between units. Finally, the lush natural ground floor and podium levels draw the outdoors in towards the building, creating an energetic public sphere at the base of the structure that can also help manage on-site stormwater and provide opportunities for water reuse on site.

The building's mass and siting were carefully considered to optimize the

impacts of local climate, sun exposure, seasonal prevalent winds, and noise. The courtyard space is cleverly shielded from strong western winds and road noise while maximizing exposure from the low winter sun. The terrace level of the courtyard creates a sunny common space for office occupants, and extends the green space to the south, while also creating a capacious public entry and event space.

The shallow office floor-plates flood the workspaces with natural light while the large podium atrium creates a volume of semi-conditioned air that connects the building's occupants with the outside world while reducing energy demand. This 'mid-door' entry area creates an

environmental buffer which remains comfortable year-round, and can host a variety of social functions and informal gatherings. The space is sunny and warm in the winters, and can be opened to the outdoors in the summers to give an inside-outside quality to the atrium.

The high-performance building envelope features a low window-to-wall ratio and low-leakage triple-glazed windows, as well as excellent insulation in the opaque façade to passively maintain a comfortable interior environment. In summer, a combination of fixed-screen facades and retractable blinds help counteract solar radiation that would otherwise overheat the office spaces.

### OPTIMIZATION BY PASSIVE DESIGN



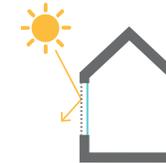
**High Insulation**  
following class A++



**Thermal Mass**  
to stabilize temperature  
differences and provide  
comfort in summer

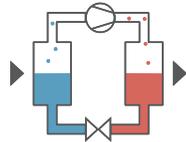


**Optimized Window  
Wall Ratio**  
to balance daylight  
and heat-loss

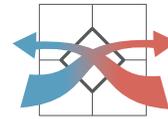


**External Shading +  
Operable Windows**  
to block unwanted  
solar gains

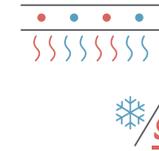
### EMPLOY ENERGY EFFICIENT SYSTEMS



**High Efficiency  
Reversible Heat Pump**  
in combination with  
geothermal and solar  
thermal

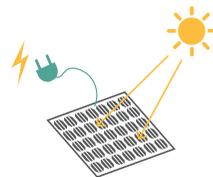


**High Efficiency Heat  
Recovery + Waste Heat  
Recovery**  
from IT servers

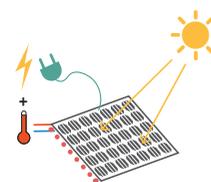


**Low Temp. Radiant Heating  
+ Cooling + DOAS System**  
to provide minimum fresh  
air volume, instead of  
conventional system of high air  
volume system

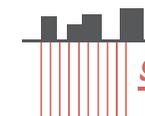
### RENEWABLE ENERGY PRODUCTION



**Photovoltaics Energy  
Generation**  
on roof and facade



**Solar Thermal Energy**  
by PVT units on roof



**Geothermal  
Energy**

However, this shading is designed such that it does not affect useful solar gain in the winter and access to daylight year-round. In addition to shading, in the summertime the building uses automatically-operated windows to flush heat into the cool night air, using interior thermal mass to capture this cooling momentum and extend its effects into daylight hours. This same passive ventilation helps keep the building comfortable throughout the spring and autumn, without needing to rely on extensive mechanical cooling and heating.

Radiant clay ceiling panels circulate warm water in the winter and cool water in the summer to provide excellent thermal comfort by radiating or absorbing heat directly to and from the human body. This greatly reduces the volume of conditioned air required to be circulated throughout

the space, thereby reducing one of the most energy-hungry parts of a buildings mechanical systems. This also reduces the size of ducts and area of technical space, while improving actual perceived comfort well-beyond solely forced-air systems.

The building uses displacement ventilation, supplying conditioned air at the floor and extracting exhaust air at the ceiling. This method of ventilation is highly-efficient, working in concert with the natural buoyancy of warm air, while reducing the unpleasant effects of drafts and requiring lower volumes of supplied air for the same level of air quality. The building extracts its pre-conditioned supply air from the mid-door courtyard, and can recover 80% of the heat in the exhaust air. After heat recovery this exhaust is released in the parking levels to sufficiently condition this

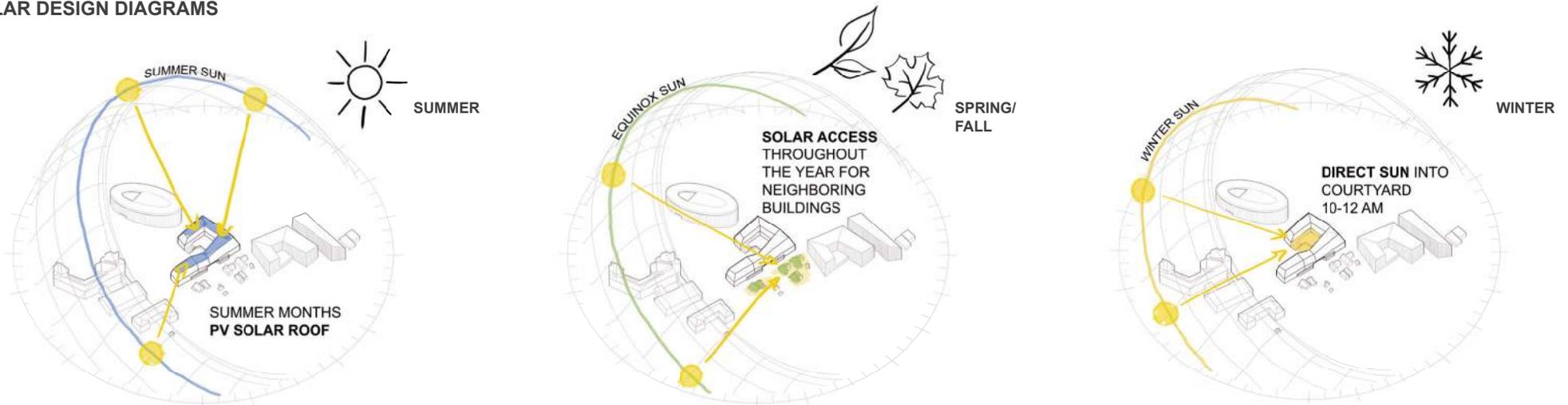
space and not waste pre-conditioned air. Photovoltaic panels and photovoltaic plus thermal (PVT) panels are located on the screen facades and roof to meet the electrical and hot water demands of the building, while also providing energy for electric mobility charging and low-temperature space heating demands. This system is combined with geothermal wells to supply free heat in the winter and a huge heat sink in the summer. The water from the wells and PVT panels is further conditioned to the desired temperature by high-efficiency, reversible heat pumps.

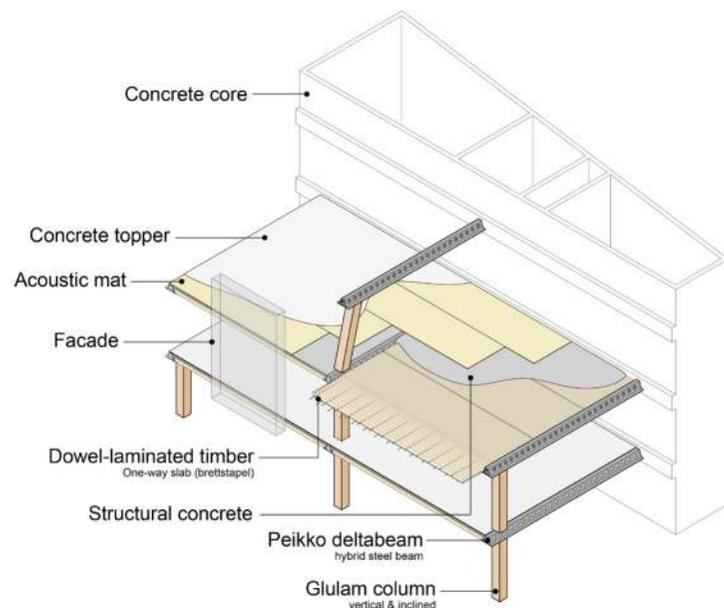
Though heat pumps are quite typical in a building of this type, they are far more efficient when combined with geothermal, PVT, and a low-temperature heating system. For example, a conventional system might receive water at -10°C and

need to raise it ninety degrees before it can be used. In our system, the input is water starts twenty degrees warmer than normal and only needs to be raised thirty degrees to be useable for heating. This dramatically reduces the energy needs of the building.

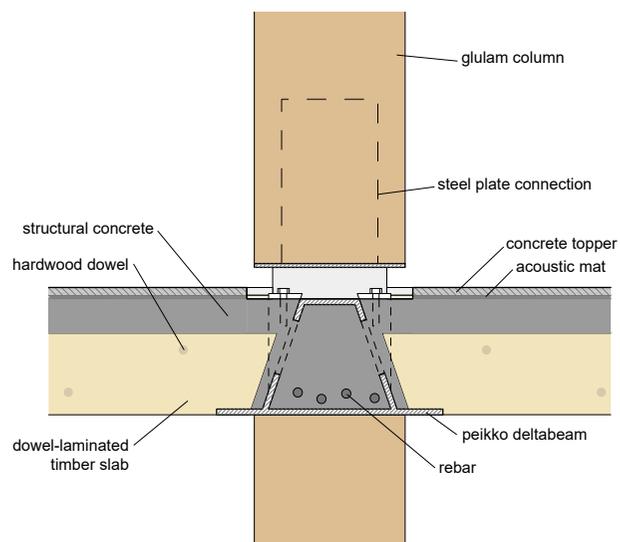
The district heating network is only used during peak load events in winter as the carbon emissions of the city's network cannot be guaranteed to be low. This design aims to lead the city and region in terms of building efficiency, comfort, and minimized carbon emissions, while also meeting local and international energy codes for a nearly energy neutral building. It aims to meet the NZEB class of A++ as defined by the EPBD, as well as BREEAM "Outstanding".

**SOLAR DESIGN DIAGRAMS**





**STRUCTURAL SYSTEM DIAGRAM**



**STRUCTURAL DETAIL**

## BUILDING STRUCTURAL SOLUTIONS

The 28m high office building is designed as timber/concrete/steel hybrid construction in order to minimize the embodied carbon in the building structure. The upper stories are to be built using vertical mass timber and hybrid timber/concrete horizontal elements, and the lower basement floors are to be constructed using conventional reinforced concrete. In addition to storing carbon, the mass timber elements are lighter, faster and safer to assemble, and create a comfortable and attractive interior environment. This not only makes sense from the point of view of environmental protection, but can also provide identity for the building and help in recruiting successful businesses and employees to the area.

The polygonal floor layout with office use can be realized with a fully prefabricated hybrid wood construction. A concrete core accommodates the escape stairwells and building services and gives the construction rigidity. All interior columns are designed as wooden supports made of high-strength glue-laminated construction beech. For reasons of fire protection, the facade supports and the edge beam are made of reinforced concrete. Solid doweled timber floor panels with a structural concrete topping are used as

a horizontal construction element, which are supported by steel Delta beams from Peikko. The concrete topping on the timber slabs fills the hollow beams and becomes a hybrid part of the slab. This system ensures ensure a generous column grid of 8,10 x 8,10m, while reducing vibration and sound transmission between office floors. The concrete encasing of the steel beams meets all fire protection requirements without any additional measures.

Efficient production methods, a reduction in the variety of parts and quick and easy construction are the major advantages of this construction method in addition to the sustainability aspects. Timber columns, slabs, and facade panels come to the construction site prefabricated and are modularly assembled. The construction of a story can thus be made weather-tight in a few days.

While an ecological and economical construction and dismantling concept (cradle-to-cradle) is decisive for the construction costs, the physical properties of the building and the efficient system technology ensure low operating costs.

## GENERAL INDICATORS OF PLOT AND BUILDING

	<b>TOTAL</b>	<b>PLOT 1</b>	<b>PLOT 2</b>
Plot area ( $m^2$ )	7 911	4 405	3 506
Intensity of Development ( <i>above grade</i> )	3,0	3,2	2,7
Density of Development (%)	56,5	57,3	55,6
Use of Building	<i>office space, catering, retail, conference, public space</i>		
Gross Floor Area ( $m^2$ ) ( <i>above grade</i> )	<b>23 461,0</b>	13 975,1	9 485,9
Gross Floor Area ( $m^2$ ) ( <i>below grade</i> )	14 195,7	8 077,2	6 118,5
Total Useful Floor Area ( $m^2$ ) ( <i>above grade</i> )	<b>16 800,7</b>	9 742,2	7 058,5
<i>Useful; Office</i>	<i>13 064,4</i>	<i>7 453,2</i>	<i>5 611,2</i>
<i>Useful; Catering, Retail, Public Space</i>	<i>720,2</i>	<i>2 289</i>	<i>1 447,3</i>
Volume of the Building ( $m^3$ ) ( <i>above grade</i> )	87 497,0	51 896,6	35 600,4
Number of Storeys ( <i>above grade</i> )	7	7	7
Max. Height of Building (m)	27.75	27.75	25.75
Type of Use	K, K1		
Parking	372	<i>(if desired, an additional below grade floor can be added for 189 more spaces)</i>	

