Extreme Ocularity
Helsinki Central Library
Helsinki, Finland

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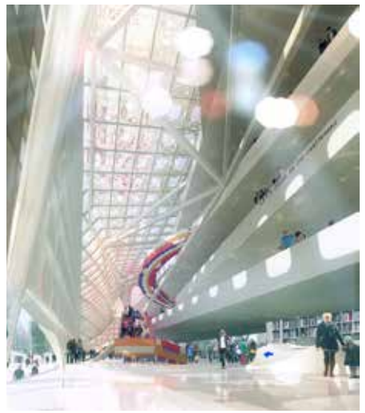
The cityscape in all its variety—the idyllic Baltic Sea, the broad expanse of skyline dotted with spires and the urbanized plane of Töölönlahti was the incentive to design a building that concentrates on the vertical. In contrast to the other buildings in the Töölönlahti District, an essential component of the design involved creating a public space at the top of the library—visually connecting Töölönlahti to Senate Square and the city at large.

The library is organized by six intersecting axes that afford spectacular vistas while creating a variety of spatial configurations for the library's program. With its six floor levels each pointing toward a celebrated landmark, the Central Library becomes a symbolic center for city. Public living rooms are located within the three sloping peaks, the Reading Room, Sauna and Restaurant. Designed as a spatial sequence with surprising transitions, each floor of the library presents connections from public spaces such as Reading Platforms, Sunrooms and the Observatory to Helsinki's enduring icons. With panoramic views of the city and Senate Square dome, the Observatory terminates the promenade of escalators and staircases that dynamically rise through the building.

A series of programmatic strips are stacked to create a narrow building that is optimal for the Helsinki climate and library program. The strips feature 11.5 m deep plates that allow for flexibility in collections layout and maximize available natural light, creating an ideal reading environment crucial for the library. A superimpostion of the strips is extruded up to maximum height generating a prismatic volume that contains a public void at the ground level. Along the plaza is a multi-height atrium which opens up to the park and pedestrian pathway draws people into the library.

The landscape block is at the same time integrated and outstanding, traditional and contemporary. It creates a stage-like space for the annual gathering of the National Day of Finland.

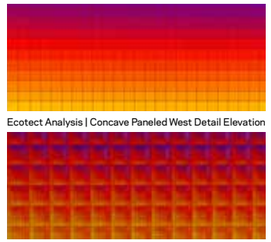
The new Helsinki Central Library conception has been led by the requirements of the zero carbon building objective. At the earliest stage of design, environmental analysis via simulation tools enabled design decisions that optimized the sustainable performance of the building form and envelope.



FACADE DEVELOPMENT

Environmental Analysis
At the earliest stage of design, environmental analysis via simulation tools enabled design decisions that optimized the sustainable performance of the building form and envelope. Subtractions within the roofline increased solar access for upper floor public programs while the volumetry along the west orients surfaces to capture daylight.

Performance Parameters
Taking a holistic approach, we propose a framework of performative design criteria based on program requirements (reading, archiving and views) and environmental factors (solar access/heat loss). Within this framework, a mix of triple glazed and thermally insulated panels is performatively distributed across the envelope. This environmentally responsive approach aims to reduce heat loss in Helsinki's cold climate while providing sufficient transparency for daylight and view access. Within a multitude of possibilities, an initial ratio of 60% thermal/40% glazed is represented.



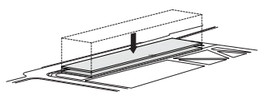
Ecotect Analysis | Concave Paneled West Detail Elevation

Concave Solar Collectors
Concave panel profiles act as mini solar collectors across the library's facade. The concave geometry optically magnifies light and heat, focusing it into the building which reduces energy demand while creating dynamic illumination.

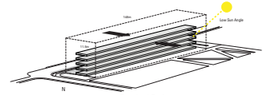
Solar Access
Accumulated solar gains in [kWh/m2] suggest the greatest solar access on the west elevation and roof. The library's outer contours were designed to scoop light from Helsinki's low sun angles during the winter with rising sun angles in the SE and setting sun in the SW along a 35° rotation against the N-S-axis.

Picture Windows
The library interior is designed as a spatial sequence with surprising transitions and views of Töölönlahti and Helsinki landmarks. Anthropometrically scaled 2m high windows act as frames, celebrating the city by offering unparalleled views through the framing of the library.

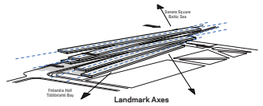
SPATIAL AND SYSTEMS STRATEGIES



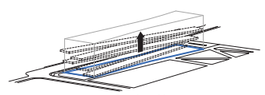
Maximum Occupation
The building site is wedged into a dense context between the emblematic architectures of Alvar Aalto's Finlandia Hall and Steven Holl's Kiasma Museum. The site connects the road to Makasiini Park on axis with the Finnish Parliament House.



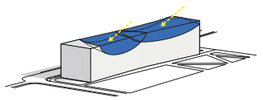
Stacked Strips
A series of programmatic strips are stacked to create a narrow building that is optimal for the Helsinki climate and library program. The strips feature 11.5 m deep floor plans that allow for flexibility in library layout and maximize available natural light, creating an ideal reading environment crucial for the library.



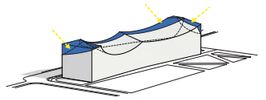
Landmark Axes
The library is organized by intersecting axes that increase view corridors and solar access while creating a variety of dynamic configurations for the library's program. With it's six floor levels each pointing toward a celebrated Helsinki landmark, the Central Library becomes a symbolic center for the city.



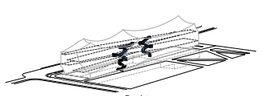
Superimposition
A superimposition of the strips is extruded up to maximum height generating a tailored volumetry that envelopes diverse configurations in space which are ideal for the varied requirements of the library.



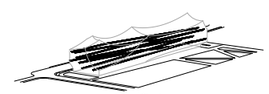
Deformation Toward Makasiini Park
Deformation of the volumetry along the west reduce the building scale toward the pedestrian plaza and while creating dyanmic western views from upper floors.



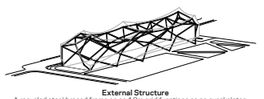
Increased Solar Access
At the earliest stage of design, environmental analysis via simulation tools enabled design decisions which optimize the performance of the building form and envelope. Roofline deformations increase solar access for the public programs on upper floor.



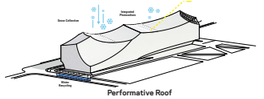
Escalators
The continuous spiral of circulation is expressed clearly as elements of the plates twisting between floors. Connecting the lobby to the restaurant, reading room and sauna on level 5. Stairs within cores provide emergency egress.



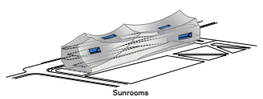
Internal Structure
A long-spanning truss system integrates with the library's raised floor system. This extremely efficient solution, provides flexible, column free floor plans while seamlessly integrating in-plenum building services. The trusses span between recycled steel I-beams which tie into the external structure on an 18m grid.



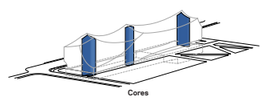
External Structure
A recycled steel braced frame on an 18m grid functions as an exoskeleton with the flexibility to mediate between the rotated geometry of the floor plates with structural efficiency.



Performative Roof
Integrated solar panels and snow/rain water capture are elements of a comprehensive sustainability strategy that aims to meet the library's zero carbon objective.



Sunrooms
Positioned as interstitial spaces between inside and out, Sunrooms are protected from the harsh Helsinki climate. Oriented toward sky and vistas Sunrooms offer unparalleled event spaces for all season.



Cores
Three structural cores integrate elevators, emergency egress stairs and mechanical risers. Mechanical rooms are located at the top of each core, one to service each zone of the building.