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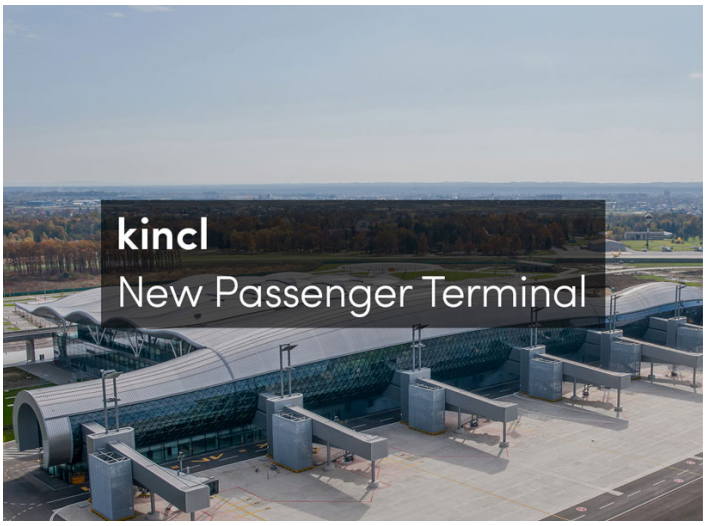

NEW PASSENGER TERMINAL AT FRANJO TUDMAN INTERNATIONAL AIRPORT

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In 2008, an international architectural design competition was held to select the best project for the New Passenger Terminal at Franjo Tuđman International Airport Zagreb. In order to ensure architectural excellence, an international competition jury invited 10 world-renowned architects, together with 10 accomplished Croatian architects, to participate, ultimately awarding first prize and commission to the entry designed by Croatian authors-architects Branko Kincl, Velimir Neidhardt and Jure Radić.

The French concessionaire started building in 2013, executing the design delivered by authors-architects and design companies IGH Projektiranje d.o.o., Kincl d.o.o., Neidhardt arhitekti d.o.o. The

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new terminal complex opened in March 2017, and the first-phase construction of 65,000 m^2 serves up to 5 million passengers a year.

The first-phase site plan has eight boarding bridges linked to the terminal building on the north side and an arrival/ departure ramp with a viaduct on the south. The viaduct is built to accommodate the extension of the terminal building to the east, when the airport capacity increases to over 5 million passengers. To the east and west, extensions will reach 10, 12 and finally 15 boarding bridges in several phases, according to the number of passengers. At the end of the 30-year concession, the second-phase additions will ultimately serve 8 million passengers.

The spatial organization of the surroundings at the terminal entrance allows for the dominance of a pedestrian esplanade in the middle. The traffic circulates between two roundabouts, which serve as connecting points to viaduct ramps leading to or from the departure-level curb at 10.2 m above the ground.

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Internal roads and arrival/departure ramps flank the central pedestrian surface. A passenger car park is situated to the east, and to the west there is employee parking, bus and taxi stops and rental car amenities, including parking.

Main public levels on the landside of the terminal are connected by outdoor escalators and elevators and by interior sets of elevators and stairs within circulation cores.

Three levels of reinforced concrete structure form the terminal's base. A dynamic roof envelope, which unwraps itself to levitate above the terminal hall, generates the free dynamics of the structural net: an iconic expression of the landscape and its relief features as original attributions of the generated architectural form. The distinctiveness of the architectural design is achieved through

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a composition of hypars. The envelope structure is a spatial truss gently curved in two directions, deploying tens of thousands of prefabricated steel tubes and nodes based on the triangular off-grid module ending in bright, glossy and clean roof surfaces.

In the same way, the interior is enriched with the originality of the curved ceiling and a construction that is bursting with a multitude of steel elements for the spatial steel structure. This computer-generated harmony pushes the engineering interpretation towards the top of the architectural concept materialization.

The terminal building's interior spaces are neat, clearly arranged areas that follow the functional requirements of airport protocols. Well-lit spaces with natural and artificial diffused lighting present

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high functionality through a clear organization of short connections/paths. Large glass façade surfaces give passengers the chance to enjoy the landscape while moving through the terminal building. The perception of interior and exterior spaciousness contributes to a sense of comfort while staying in the terminal building, makes travel more appealing.

The flexibility of the conceptual scheme allows for adaptability with the open spaces, formed largely by a 14.4 x 14.4 m modular column grid at the concrete base. A post-stressed reinforced concrete structure is built on a grid pattern with various spans that are multipliers of the base module: 7.20 m, 14.40 m etc.

Inside vertically and horizontally deployed and interconnected spaces, there are 18 reinforced

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concrete columns ending in upside-down conic clusters of six closed-umbrella-like steel pylons on the floor plan grid of 28.8 m x 43.2 m. They support the dynamic roof envelope structure above the departure hall. This steel truss structure is built on a modular grid of 3.60 x 3.60 m, with an off-grid displacement between the upper and lower truss level

The pier design allows for the flexibility that is necessary to sustain the expected increase of air traffic in the future.

The dimensions of the new passenger terminal building are 153 m x 153 m, reaching to a height up to 35 m, with a 284 m long pier, for a total gross building area of 65,000 m2.

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Functional organization is developed and distributed vertically among the four levels:

The arrivals level is located on the ground floor, level “0” ground. Along the northern perimeter, this level is also home to the baggage handling system. On both sides of the terminal there are also departure/arrival hall areas serving bussed passengers. In addition, it houses complementary facilities such as food and beverage establishments, ATM machines, car rental offices, restrooms, a tourist information center, etc.

The arrivals gallery/transfer-transit level on the first floor provides the passengers arriving from eight air bridges with their first impressions of the terminal. Various facilities related to airplane travel safety are situated on this floor: security and passport controls, health controls.

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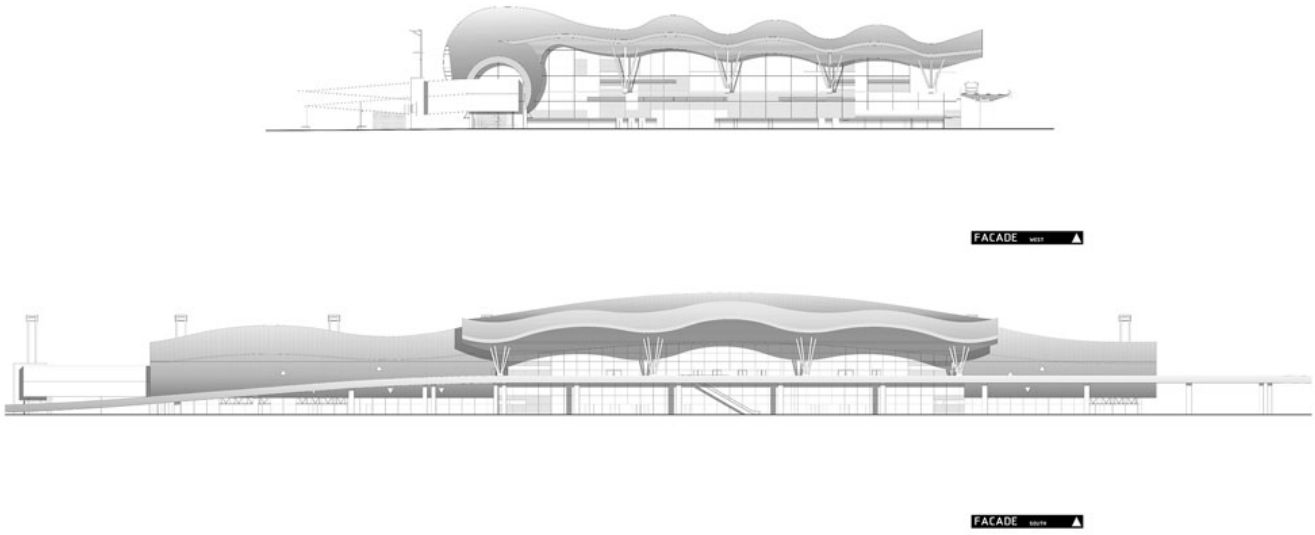
Departure hall areas with check-in islands on the second floor level are accessible from the urban traffic domain by sloped inbound and outbound ramps. There are 30 check-in counters in phase one, which will be expanded to 60 check-in counters in phase two, self-check-in points, a central info counter, food and beverage establishments, and a multiconfessional chapel.

Leaving the check-in areas, passengers reach the boarding ticket control counter and are subsequently invited to ascend to the departure gallery on the third floor level. After going through the security check and passport control, passengers descend to the duty free/commercial amenities area: shops, bars, restaurants, waiting areas and a CIP lounge, are located ahead of the air bridges to gates on the departure hall level.

The NPT building could sustain a major crisis, possibly caused by a failure of all standard energy supply sources. All other procedures support an ecologically sustainable concept of the completed design.



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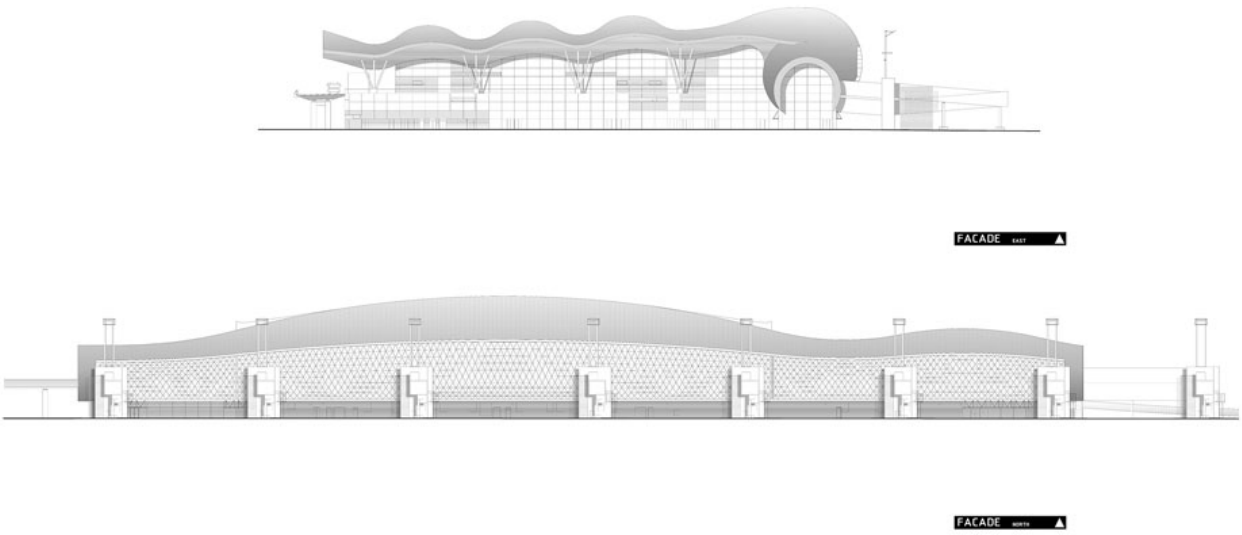

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