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Feldstadt am Heidjöchl

Welcome to the field!

The city of Vienna is one of the fastest growing metropolises in Europe, a fact that is especially apparent in the surroundings of the Heidjöchl project site with multiple ongoing large-scale developments. This urban growth sparked societal protest concerning the loss of farmland and the construction of a new highway ('Stadtstrasse') in direct adjacency to the site. Although Vienna is well known for its unparalleled social housing model, construction is typically carried out in concrete, covering large areas of open soil . The city's housing strategy needs yet to address the demands posed by the climate crisis. Feldstadt Heidjöchl therefore proposes an urban model that takes climate protection through soil management, bio-based building construction, and climate adaptation equally into account. By preserving and recultivating large areas of the agricultural land, the project offers its inhabitants to play a part in their own food supply. Living next to the field, the new district empowers its inhabitants to take an active role in confronting the climate challenges of today.

Building the ground

The project site is characterized by its intensive agricultural use, inaccessible to local residents and incompatible with the surrounding living areas due to its use of pesticides and fertilizers. Intensive land use also severely impairs the natural soil fertility and its water-holding capacity. To counter this development, Early Greenery is planted in orthogonal strips to the main wind directions to reduce soil erosion and increase biodiversity. The early planting is aligned with the public squares of the later urban design and provides fully grown trees and hedges once construction is completed.

Parceled into smaller entities, the project proposes a transformation of the large scale fields into bio-intensive and self-harvest agriculture, revitalizing the ground and introducing the wider neighborhood to the site before any development takes place. Self-harvest fields are increasingly popular among the inhabitants of Vienna who enjoy growing their own food under the guidance of professional farmers. The agricultural use seemingly contrasts with the newly realized connectivity, with two subway stations, one train and multiple tram stops in direct adjacency. Agriculture, as a central element of the development, will therefore be able to act as a point of attraction beyond the immediate surroundings and bring life to the district already before construction starts.

Feldstadt

Connecting people and agriculture is the underlying principle of the urban design proposal. Linear Living Line Houses open up towards the central field, while slightly taller Community Houses provide collective spaces in direct adjacency to self-harvesting areas and fields. Four City Towers point to the site's main public spaces and lead to public transportation links. Restraining urban development to the perimeter leaves a widely open field of 10 hectares with bio-intensive agriculture, self-harvesting areas, and a large orchard in the center. Raised garden beds and fruit trees also reappear throughout the network of streets and squares in the Feldstadt. The contrast between the wide field and the dense district produces a differentiated urban experience with a diversity of places and microclimates.

The building process is phased in seven self-sufficient districts, growing from the well-connected sides to the central fields. In this way, the urban development remains flexible to the actual housing demand of the city and leaves a chance for less soil to be built upon.

How to Build? (Bio-based construction, soil treatment, and climate adaptation)

Despite high sustainability targets, the city of Vienna continues to be built from CO2 intensive materials such as concrete or brick. Timber construction is often initially proposed but finally discarded due to the economic costs of increased fire protection standards for tall buildings. Feldstadt Heidjöchl therefore defines the maximum height for each building type to the limits given by the Viennese fire protection regulations for bio-based materials.

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This differentiation also corresponds to a different treatment of the ground. While the City Towers have underground floors, the Community Houses are limited to a simple ground slab and the Living Lines are lifted off the ground on pile foundations. These concrete poles also serve as geothermal probes for the districts' heating network. The reduction of sealed ground to an absolute minimum improves the water infiltration of the ground and cools the district through re-evaporation.

Climate adaptation considerations also inform the height and orientation of buildings. Buildings are predominantly south-facing to allow for a simple shading of the summer sun and a deep insolation during winter. As the city will move to the humid subtropical climate zone by 2050, outdoor areas are increasingly in need of shade. The street widths are therefore consciously held narrow and lined with trees. Medium rise buildings as well as the Early Green tree lines in front of those alleys serve as wind barrier for cold winter winds. Tall buildings are conceived as sun- and wind catchers and placed in western adjacency to the major squares. Thereby the public space profits from the buildings summer evening shade, the wind catchment of south-eastern summer winds and the blockage of westerly winter winds. The towers' stepped façade and ground floor podium alleviate the wind downwash effect.

Living Line

Long, slender and slightly bent housing rows are the base element of the project's urban layout. Inspired by the linear arrangement of fields, the orientation of the buildings lead to - and form - the central field of the site. The resulting north-south orientation of the façade and the narrow floor depth creates living spaces with two sided daylight access and cross-ventilation potential. The spacing between the rows and the balcony access ways together, act as structural shade designed to receive the low winter sun and protect from the high summer sun.

The vertical circulation elements are conceived as generous green shelves that pair up two rows and thereby create an intimate courtyard. This pairing is also reflected in the topography and in the distance between buildings, creating an alternating pattern of wide public access ways and lowered communal courtyards. In this way, each flat has a more public and a more private façade always mediated through greenery and a small vertical elevation. As a result of this topographical modulation, rainwater is collected in the courtyards and later guided towards the fields for irrigation and evaporative cooling.

The generous communal staircase as well as the courtyard provides space for urban agriculture. Storage and infrastructure space as well as communal areas such as a shared kitchens and cloakrooms dedicated to the agricultural context are found on all floors adjacent to the staircase. Studio flats at the southern public façade benefit from a more public appearance, making a semi commercial use possible.

Minimizing the use of concrete to a minimum, the building type is elevated on pile foundations enabling a ventilated wooden base floor slab and geothermal probes at the same time. The dimensions and the maximum height is set to building class 4 (GK4), making a wooden construction also in terms of fire precaution economically and ecologically feasible.

Community House

The point-block form of the community house interrelates its neighboring rows and mediates changes in orientation between them. It is conceived in adjacency to small squares and acts as a local center with an active ground floor use. Often directly neighboring the central field, its ground floor hosts communal and commercial uses related to urban agriculture. The small square acts as a transition zone between the living area and the field. A communal rooftop terrace with garden beds completes the building and acts as an additional attractor point for the local community. The slightly higher elevation (building class 5a) and north-south elongation protects the facing row-courtyards and streets from the prevailing winds.

The hybrid timber-wood construction is organized around a central circulation and offers east or west oriented flats with a generous room height to ensure daylight provision. Balconies with trellis mediate between the inhabitants and the field. The larger building depth allows for storage facilities around the concrete core and thereby renders the construction of a basement obsolete.

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Shadow catcher

The four highest buildings of Feldstadt Heidjöchl are located next to public transport stations and main access points to the district. The adjacent squares host small agricultural functions such as farmers markets, wine bars (“Heuriger”), composting, and elevated green beds that communicate the nature of the district at first sight and make curious for more. With their greenhouse roofing, the Towers act as visual guides of orientation within and outside of the development. The buildings shape and placement in the westernmost parts of the squares follows a microclimatic strategy that protects from wet and cold westerly winds and captures the beneficial summer winds from the southeast. Furthermore, the far west setting summer sun is shaded on the square, while not impairing the low standing southern sun in winter.

The timber-concrete hybrid construction takes an example in the neighboring HoHo high-rise, that exemplarily shows the possibility of high-rise wood construction. The Shadow Catcher combines commercial, living and parking uses in 13 to 19 upper and two basement floors. The bundling of the technical facilities for the geothermal energy system in their basement frees all other buildings in the Feldstadt from the need for underground construction and allows for the autonomous construction of each development phase.

Social Facilities

The social infrastructure and learning facilities are spread throughout the district in proximity to public transport connections. The educational campus of the city and the federal high school are located at the very heart of the district and encompass the central orchard. The fields and orchard are accessible to all inhabitants and provide both an educational and recreational environment. Members of the Heidjöchl Farm provide professional guidance to farming and are responsible for social, cultural, and educational activities for inhabitants and pupils. It is associated to the city’s educational campus.

Total Area

The target of soil preservation and the use of bio-based building materials limits the development capacity of the site. This design study concludes that with sustainable construction methods, 80% of the demanded area can be achieved. The proposal meets the set framework for social and commercial facilities as well as educational and care facilities.

Building Phase	**A**	**B**	**C**	**D**	**TOTAL**	
Shadow Catcher hybrid timber construction (concrete core and timber concrete composite slabs)	47700	-	7350	-		
Shadow Catcher UG concrete	6000	-	1750	-		
Community House hybrid timber construction (concrete core with attached timber construction)	45600	27500	17930	4800		
The living line full timber construction	56500	78500	30500	11000		
Living line circulation area full timber construction	19100	28150	10800	5400		
Heidjöchl farm	2000					
					Actual	**Set**
TOTAL GFA	**176900**	**134150**	**68330**	**21200**	**400580** 81,75%	**490000**
Kindergarten	2300	2400	-	-		
Educational Campus	33300					
Federal school	16800					
					Total	**Parking sp**
Parking garages	36600		6900	6500	50000	1600

Data in m2

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Mobility Network

The proximity of the site to multiple public transport links and the crossing of a tram line make it an ideal place for urban development. The internal network prioritizes pedestrians and cyclists while only allowing punctual access for motorized vehicles. A clear hierarchy of accessibility is established between: all traffic, emergency & delivery, cyclists & pedestrians, and pedestrians only.

Two major pedestrian walkways structure the district in an east west direction and house most public functions along: A Field Route leading through the more intimate areas of the district and opening up to the widths of the field. And an Orchard Route that connects the main public areas and the central orchard along the tram lines. The smaller pedestrian paths align with the water collection elements leading towards the fields and squares making it easy to orient in the district.

The Field Boulevard follows the orientation in adjacency to the field and connects the cycling networks north and south of the project site. Two roads crossing from north to south connect to the main road network and are accessible to all modes of mobility. The connection to the major “Stadtstrasse” road is established through an elevated Viaduct that creates the opportunity for shops and shaded playing areas underneath. Parking garages and mobility points are placed in the tower podiums and at connection points to the major adjacent roads. The standalone garages are potentially to be transformed into Community Houses in a less car dependent future.

Soil management & surface sealing

A key goal of the project is to keep the sealed area to the minimum. Whereas only the two crossing roads are conventionally paved, other connection lines are either infiltration capable or water permeable. The alternating access pattern for the Living Line buildings allows a clear differentiation of private courtyards and access roads for delivery and emergency. These access roads are limited to an elevated drive lane with adjacent green strips open to filtration. Occasional bridging of the sloped green enables access to the building whilst giving a degree of privacy for flats on ground floor. Due to the elevation of the row houses infiltration water is gathered inside the communal courtyard, channeled and let along overflow basins for irrigation to infiltration basins in the fields. In this way, rainwater usage as well as protection from future heavy rain events is ensured.

Energy Generation Circuit & PV

The pile foundations of the Living Line houses are at the same time the geothermal probes supplying the whole district with sustainable heating and cooling. In this way a total of 2200 probes are provided. In order to avoid the common problem associated with timber construction and green roofs, almost all roofs (roof area 60.700 m2) are inaccessible and equipped with PV modules with a total energy harvest potential of 8700 kWp. The largely homogeneous height development avoids overshadowing and allows for a maximum energy output.

Green Corridor & Biodiversity

Intensive agriculture is especially harmful to biodiversity. With the small scale structure of self harvest, bio-intensive agriculture, and the planting of Early Greenery the project ensures to provide habitats for all species. Since it has been suggested during the site visit that a proper wildlife crossing bridge across the rail tracks is unfeasible to realize, the Feldstadt proposes to build an underpass instead.

Conclusion

Feldstadt Heidjöchl proposes a new urban model for housing in Vienna by introducing urban agriculture, bio-based construction and climate adaptation to a city with a unique planning and housing tradition. The district of Donaustadt showcases a heterogeneous arrangement of - sometimes radical - urbanistic ideas realized throughout the last century. The Feldstadt follows this tradition and proposes a consistent approach to building in the climate crisis.