MULTILAYER CITY - ETTLINGEN

Multilayer architecture is a method of software development in which software is built up from different, overlapping layers that interlock and together produce the finished program. The MULTILAYER CITY is also built up from different concepts, which in their connection forma new multilayered system on the former ELBA area and represent the finished design.

The conceptual idea is the creation of a resilient, sustainable urban district, which in particular enables new forms of working, but also of living. The IT sector is in special focus here. On the former ELBA site, with the help of several concept LAYERS, a new urban district is being created that, with its newly developed urbanity and charisma, manages to unite the west of Ettlingen with the city as a whole.

In the sense of the EUROPAN 16 theme - Living Cities - the goal of the project is the creation of a resilient urban community that manages to remain viable and livable even under changing conditions and, moreover, to positively influence Ettlingen as a whole.

The overall design is composed of the three, therefore central concept layers: NEW WORK, MOBILITY AND CIRCULAR SYSTEMS, and GREEN AND BLUE INFRASTRUCTURE.

NEW WORK

In the subconcept "New Work", innovative forms of work are to be established and further thought through also should be recognized through the corresponding architecture and interior design. The forms of work we are familiar with lead to an unhealthy relationship with our work and make us sick. In order to counteract this, attention should be paid to the individual needs of workers and to make it possible for them to adapt flexibly, both spatially and conceptually. These include, for example, a 24-hour room-use system and various educational and compensatory opportunities. For "healthy-work-aspects", different working modes are supported in order to design workflows as stress-free and trouble-free as possible. Another aspect is the "working in the green", which is to take place primarily on the rooftops of the IT buildings, but also on the ground floor level. The aim is to enable working close to and with nature in order to establish a natural recreational character. In each of the buildings, there are spacious atria, which serve as communication zones. Therefore, it should encourage the exchange between different subjects in a natural way in order to create an interdisciplinary learning platform.

In addition, the mix of non-disruptive small businesses, housing, and small service providers should facilitate the interplay of work and private life. As a consequence, it is supposed to reduce stress, especially for families. The main users in our district are IT companies and the AVG. From a spatial perspective, the utilization of the commercial areas in Ettlingen and the surrounding area also plays a decisive role. This is because young companies and start-ups in particular have an increased demand for space during the growth phase and are therefore moving from the city centre of Karlsruhe to the surrounding area, where Ettlingen is one of the destination areas.

Due to the limited area, efficient and flexible area management, also with a view to protecting resources and avoiding ground sealing, is essential. Conceptually, the area management in the district should therefore be oriented towards the actual needs of the users and remain up-to-date with the help of regular queries and adjustments. In addition, a room is not assigned to a specific use but can be booked according to need via a booking system in order to be able to react flexibly to changes at short notice. This is supported by an integrated Artificial Intelligence, which is intended to support optimized land use.

The aim is therefore to develop a space-saving and adaptable district, which will further develop the positive location factors of Ettlingen and create a healthy, needs-oriented working environment for (IT-) companies.

MOBILITY AND CIRCULAR SYSTEMS

In the context of the deepening of mobility and cycles, the new urban district should help to protect resources and the environment, to meet the requirements of the new way of working and thus to be safe and resilient in the future. In addition, the goal of effectiveness and functionality of the neighborhood is pursued.

The subject area cycle is divided into the goods cycle, the nutrient cycle, and the energy cycle. The goods cycle stands for the exchange and use of goods, their upcycling, collection, and recycling of their materials. External companies and recycling yards in Ettlingen are integrated into the process. In the nutrient cycle, organic waste is converted into solid and liquid fertilizer through fermentation, which can be used for urban farming. The food grown there can be sold on-site and become part of the organic waste again in the neighborhood. Food stores from Ettlingen are to be involved. The energy cycle also uses municipal facilities such as the electricity and heating network. The district's own energy production is made up of PV-systems or biogas (created during the fermentation of the nutrient cycle). It is first used locally in the buildings of the district and then fed into the municipal grid for storage. In the district, the processes of all cycles are spatially bundled in the CIRCULAR CENTRE. This facilitates exchange within and between the circuits.

The consumption and the savings of the area can be viewed in a neighborhood app, also in relation to mobility. Existing systems, such as those of the KVV, will be integrated. In addition, connections, carpool offers, rental systems, repair services can be booked and other communications can take place.

The mobility concept is an important part of the MULTILAYERED CITY and focuses on pedestrians and cyclists as well as the expansion of the train station Ettlingen West, which is located in the north of the neighborhood. By increasing the frequency of the rail connection between Karlsruhe and Ettlingen and the new local passenger transport connection to the inner-city train station, an important junction is created at the new district. The future requirements will be taken over by the MOBILITY HUB in the listed railway hall. Offers such as car and bike sharing, exchange stations, and a bus stop will make the connection attractive. A new bus line through the area will be integrated into the surrounding network. The network of cycle paths with a minimum width of four meters also contributes to this and links up with the cycle expressway, which leads from Karlsruhe via Ettlingen West to the south of Ettlingen. A component of the cycle path is the pedestrian and bicycle underpass beneath the tracks at Ettlingen-Wast train station, which connects the plan area to the east with the commercial area in the west. The underpass is bright and inviting and includes wide pedestrian walkways as in the rest of the area. This will guarantee increased safety and attractiveness. The stationary traffic of the district is organized by neighborhood garages, created at connecting points in the area. Bicycle parking facilities are placed present in the public space and in the MOBILITY HUB of the station and the district in the form of bicycle parking garages. By integrating the social housing in the southeast of the neighborhood, traffic by car is also prevented in this area.

BLUE & GREEN INFRASTRUCTURE

On the urban level, the new district represents an important building block for the large-scale green systems. It will close the gap in the existing green ring around the eastern part of the city and, as a central connecting point, offers the possibility of establishing a further green ring around the western part of Ettlingen. The connection between the eastern and western parts of Ettlingen can thus be created not only on a structural level but also on a green spatial level.
In addition to the green rings, there is another design element at the urban level. Due to the areas to the south where cold air is generated, three fresh air corridors are created in the district, which are crossing the district in a south-north direction. The entire neighborhood will be formulated in an open design so that the fresh air corridors will also allow the inner areas of the constuction fields to benefit from the cold air.
In view of the changes in the global climate and the resulting consequences for the weather on a small-scale level, it is of particular importance to design the newly emerging neighborhood in a climate-sensitive manner and to prepare it for the future. The goal here is to achieve a leveling between the two increasing extremes of dry periods and heavy rainfall events and to prepare the neighborhood for persistent hot spells.
In order to bring cooling effects through green infrastructure within the new urban district, a central green space will be created that does not fall below a size of one hectare. In this way, the green space can positively influence and cool down the temperature within a radius of 200 to 300 meters. Also important for the regulation of the local temperature is the proportion of leafy greenery, which is ensured by green facades and roofs, as well as a high tree population. The focus is not only on transpiration, which is responsible for regulating the temperature but also on shaded areas that allow people to work and spend time outdoors.
The Horbach, which runs in the north of the area, will be cleared. With the help of this measure, the evaporation effect will additionally positively influence the microclimate in the northern part of the planning area, and at the same time, seating steps along the Horchbach will create a higher quality of stay. The element of water is made tangible. The seating elements are designed in such a way that they can be flooded during heavy rainfall events and serve as an extended riverbed.
Unsealed and landscaped areas, in particular, serve to absorb increased rainwater volumes that threaten to overload the sewage system in the event of a heavy rainfall event. For this reason, retention areas in the green space, as well as underground cisterns, are planned in the urban district to minimize the amount of runoff into the local sewer system on the one hand, and to retain water for dry periods on the other. This water will eventually be used to irrigate the greenery located in the neighborhood, thus binding it locally in a natural water cycle.

URBAN DESIGN

First of all, the guideline was set to achieve an approximately equal distribution of built-up and unbuilt-up areas in order to create qualitative open spaces that are not available in the immediate vicinity. (50/50)
The functions of the three concept layers can be seen in the urban design of the district. It mediates in its grain between the small-scale development in the east and the diffuse commercial structures characterized by large-scale forms in the west of the area.
The district begins in the north with the Ettlingen-Wast train station. This is adjoined to the south by the listed railroad hall, which has been moved and converted into the Mobility Hub. The actual prelude to the district is a HIGH POINT. The landmark is complemented on the other side of the railroad line by another high point, the „CATHEDRAL TOWER". The interplay of the two buildings creates a gateway effect that is visible from a greater distance along the bicycle path and the tracks. Together with the station buildings, the landscaped squares, and the underpass, a new gateway to Ettlingen and the neighborhood is created.
The relocation of the supermarket and the bus terminal to the northeastern edge of the area makes it possible to formulate a square as the start of the district. The actual development begins next to this square. The cubatures form a coarse-grained structure that mediates in its grain between the west, which is characterized by large-scale forms, and the east, which is characterized by small-scale development and runs through the district from northwest to southeast. This allows the project to be implemented in block-related construction phases. In the northern part, the use of the buildings is mainly characterized by NEW WORK and mixed forms with housing. Several construction fields are created, in which the buildings are each arranged around a green open space. Thus, each building has a direct connection to green space. This creates important interfaces between indoor and outdoor spaces for new forms of working.
In the center of the district, the development opens up to a large open space that fulfills climatic functions as the green lung of the area and also creates qualitative local recreation areas.
The southern part of the area focuses on mixed-use buildings, but with an emphasis on housing. Together with the existing development in the southeast, an inner courtyard is created that creates a connection between the subsidized apartments and the new development, thus integrating the residents into the new neighborhood.
There are different typologies of buildings in the district.

The NEW WORK buildings contain the workplaces already described for the IT sector with their space requirements. In addition to recreational areas, this also includes gastronomic offerings, among other things. The emphasis is on open floor plans in the building cores so that the stair cores can be understood as meeting zones.

The MIXED-USE buildings are characterized by a mixture of offices and other uses on the lower floors and residential uses on the upper levels. Open spaces for the residents are located on the roof. The result is a mixed-use neighborhood with lively first-floor zones.

The aforementioned CIRCULAR CENTRE is located in the southwest and is thus easily accessible for delivery traffic. The same applies to the crafts store in the south, which provides space for local crafts.
The result is an integrated urban district that mediates between all players and shapes connections in the neighborhood itself and into the city through the community of different uses.

GROSS FLOOR AREA (GFA)

NEW WORK:	~67.700 m²	AVG-OFFICES:	~24.300 m²
MIXED-USE:	~37.200 m²	TRAIN-DEPOT:	~12.500 m²
PARKING:	~41.900 m²	BUS-DEPOT:	~ 7.000 m²