CURRENT NOTATIONS

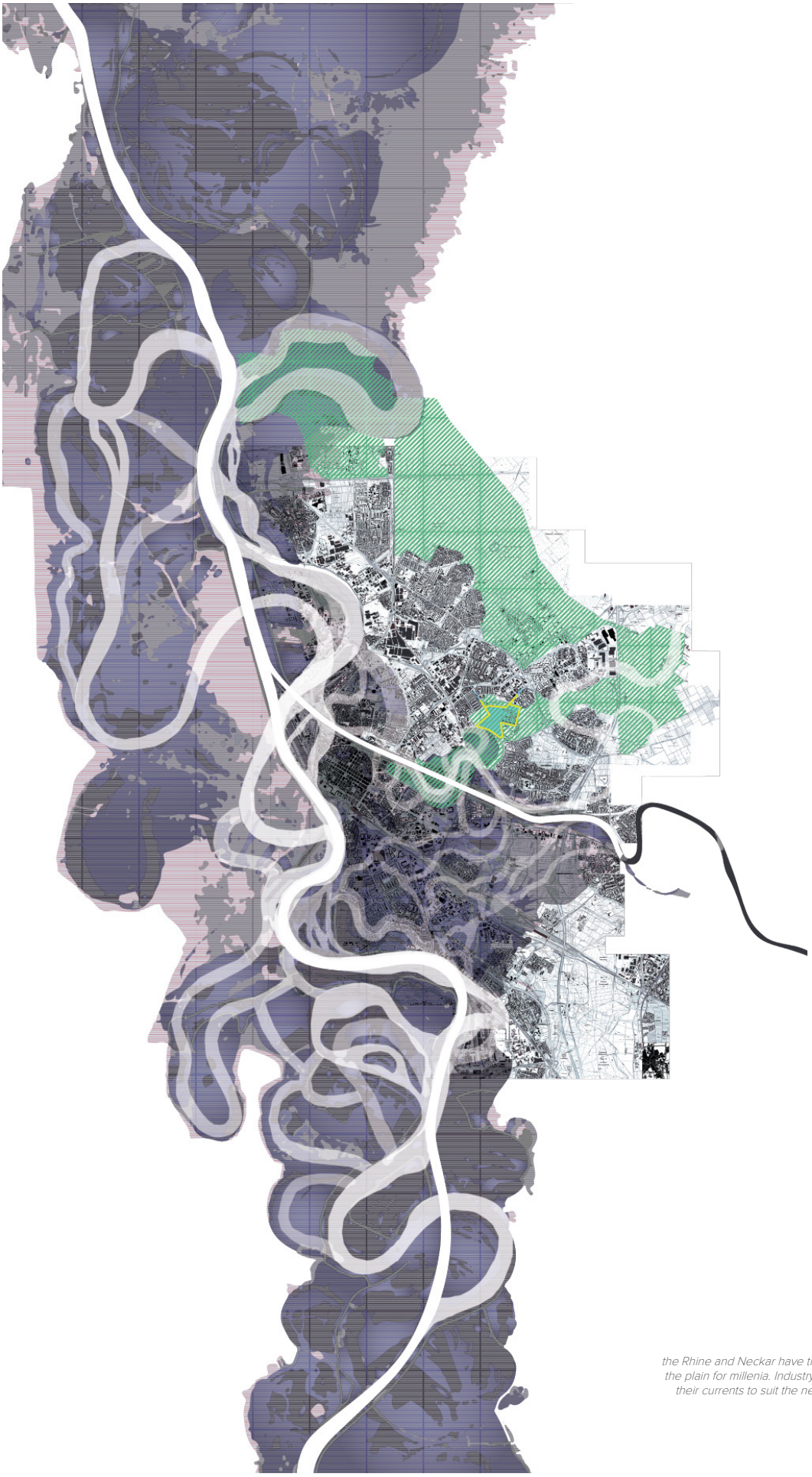
INTRODUCTION

Mannheim is a city born from water: meandering rivercourses making their way from the high passes of the Swiss Alps to the marshy flats of the Rhine-Meuse delta have carved out a perch for human settlement that dates to the Roman Empire.

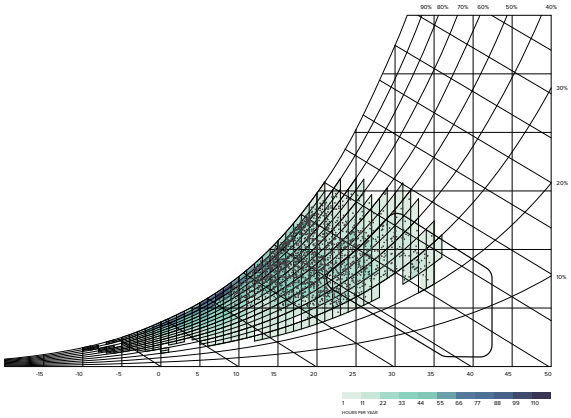
For millenia, the Rhine and Neckar rivers have carved a meandering course across the Rhine Plain. Historically these habitats have existed in a state of symbiotic balance with the flooding of the river. Regular surges of water beyond the banks recharge the soil with nutrients and stem overgrowth and overpopulation of the meadow zones. Riparian ecosystems at the waters edge bring a vast cross section of mammals, birds, reptiles, and fish, while meadow flats provide habitat for essential pollinators, and grasses which stabilize the soil against the prodding currents.

As Mannheim developed into a crucial site for inland river transport, manufacturing, and commerce, these historic courses were channelized according to the efficient and linear logic of commerce and exchange. The traditional floodplains were reconfigured into canals, warehouses, docks, and factories. This tremendous boom of prosperity and growth has built Mannheim into a strong economy, a major academic hub, and a rich cultural and historical attraction. This has all come at a cost: the ecosystems which for so many millenia maintained a delicate system balance have been thrown out of order.

"View Over Heidelberg," 1837, Barend Cornelius Koekkoek
Pastoral floodplains of the Rhine extend to the horizon:
a world on the precipice of ecological reconfiguration.



the Rhine and Neckar have traced meandering contours across the plain for millenia. Industry and commerce have channelized their currents to suit the needs of shipping and port logistics .



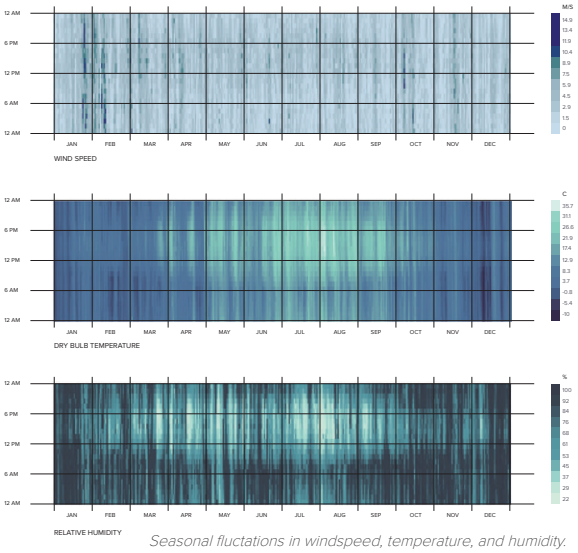
Annual psychrometric chart; black dots indicate hourly temperatures during June, July, and August.

RELATIVE HUMIDITY (%)

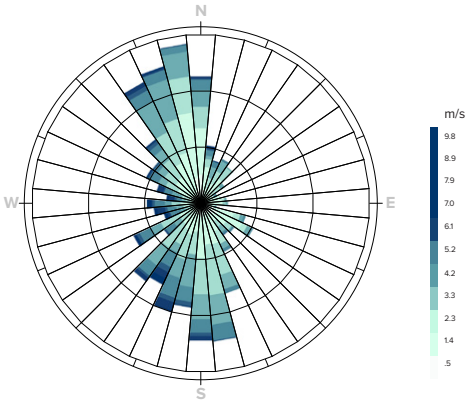
TEMPERATURE (C)

	2	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
24	12.2	12.8	13.9	14.4	15	16.1	16.7	17.2	17.8	18.3	18.9	19.4	20	20.6	**21.1**	**21.7**	**22.2**
27	13.9	14.4	15.6	16.7	17.5	17.8	18.9	19.4	20	20.6	**21.7**	**22.2**	**22.8**	**23.3**	**23.9**	24.4	25
29	16.1	16.7	17.2	18.3	19.4	20	21.1	**21.7**	**22.2**	**22.8**	**23.3**	23.9	24.4	25	26.1	27.2	
32	17.8	18.3	19.4	20.6	**21.1**	**22.2**	**23.3**	24.4	25	25.6	26.1	27.2	27.8	28.3	28.9	30	
35.0	19.4	20	**21.1**	**22.2**	**23.3**	24.4	25.6	26.1	27.2	27.8	28.9	29.4	30.6				
38	20.5	**21.6**	**22.8**	24.4	25.6	26.7	27.8	28.3	29.4	30.6	31.1						
41	**22.2**	**23.3**	25	26.1	27.2	28.9	30	31.1	31.7								
43	**23.9**	25	26.7	28.3	29.4	30.6	32.2	33.3									
46	25.6	26.7	28.3	30	31.7	32.8	34.4										
49	27.2	28.3	30	32.2	32.2	35											
52	28.3	30	32.2	33.9	35.6												

Climatic conditions for maximally effective evaporative cooling.



Seasonal fluctations in windspeed, temperature, and humidity. Summertime temperatures peak in the afternoon as humidity drops and winds speed up.



Wind patterns for June, July, and August are dominated by northerly and southerly breezes.

SITUATION 2022

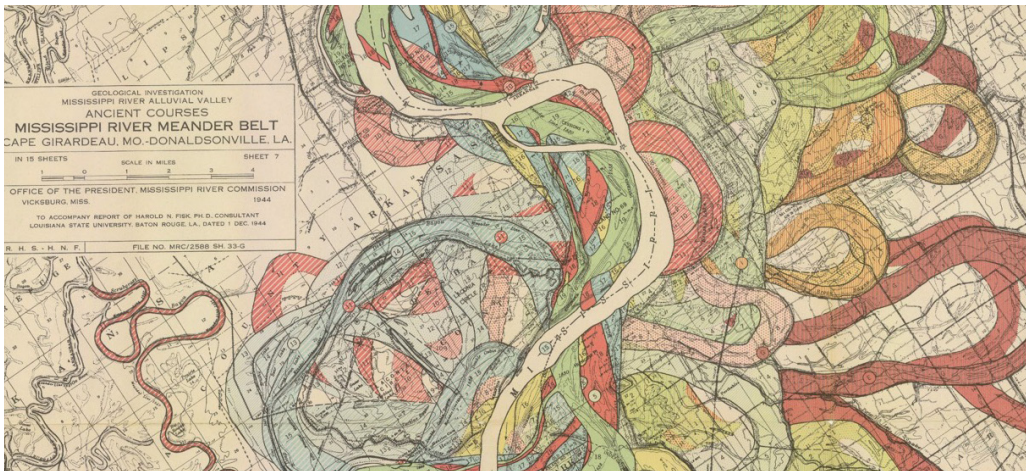
New challenges now rear their head. Crises which for decades seemed to many as a far-off, lingering future threat are now on the doorstep. In 2022 Europe has been rocked by previously-unkown heat, extended droughts and resulting crop yield losses, while the great ancient rivers of the Loire, Po, Danube, and Rhine begin to run dry. In this context, three crises loom particularly large and challenge the continued stability of Mannheim: urban heat island effects, inconsistent groundwater fluctuation, and biodiversity loss.

Climate change is already altering precipitation patterns across the globe. Alpine rivers, already of concern due to uncertain snowfall snowfall, are running even more dangerously low due to infrequent summer rain. Water management now becomes a matter of critical importance in locations where it has until recently been an abundant resource. In the face of the challenge brought on by two centuries of intensive global industrialization, cities around the world must now begin an urgent project of adaptation. This must not come at the cost of human dignity and civic solidarity: landscapes for gathering and play must be be a deliberate component of adaptive infrastructure.

“WORKING TITLE”

Mannheim is a city born from water. Remembering the landscapes which for so many thousands of years cradled the growth of the city, and accommodating the geography of the city to the rhythms of the floodplain, will help Mannheim face looming crises. The city should be understood as a continuum in time, a dynamic and reconfiguring site of geologic, hydrologic, biotic, and industrial transformations. CURRENT NOTATIONS proposes a design intervention which adapts the reclaimed Spinelli Barracks as a site of hybrid ecologies, reconfiguring the synthetic material of the barracks into new formations which recall the contours of the primordial landscape of the floodplain. The southern boundary of the Spinelli site is of particular symbolic significance: the steep embankment marks the former course of the Neckar River as it wound its way to a confluence with the Rhine.

CURRENT NOTATIONS introduces a syntax of berms (earthwork embankments), fins (linear photovoltaic arrays), and totems (battery storage towers) at four key cyclist and pedestrian intersections, which gently lift the meadow and inscribe a pattern of channels and berms. As the berms trace, hug, and pull away from the walkways in a dream0like recollection of the watercourses that once flowed freely through the meadow, they offer shade, respite, and wonder to those passing between their shady banks.



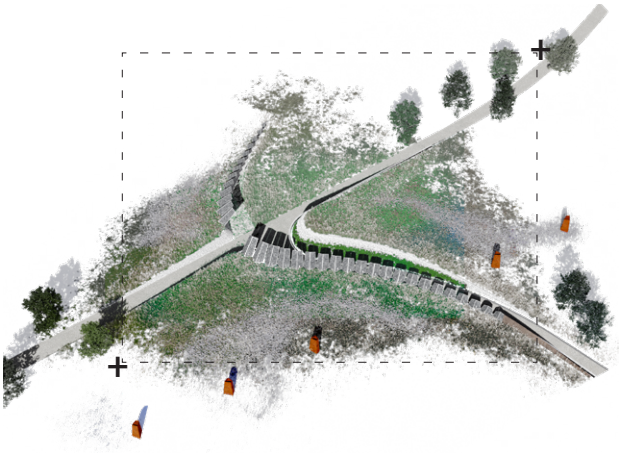
"Mississippi River Meander Belt," 1944, Harold Fisk

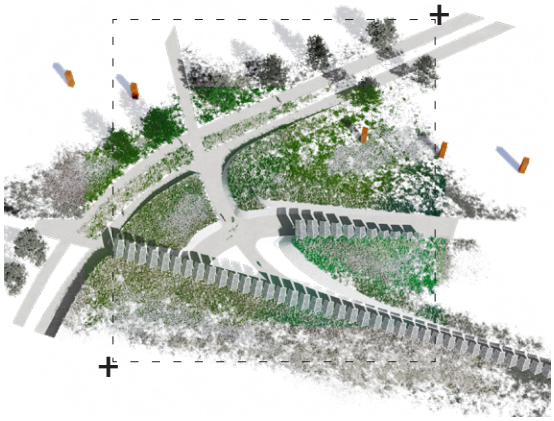
"Schunnemunk Fork," 1991, Richard Serra

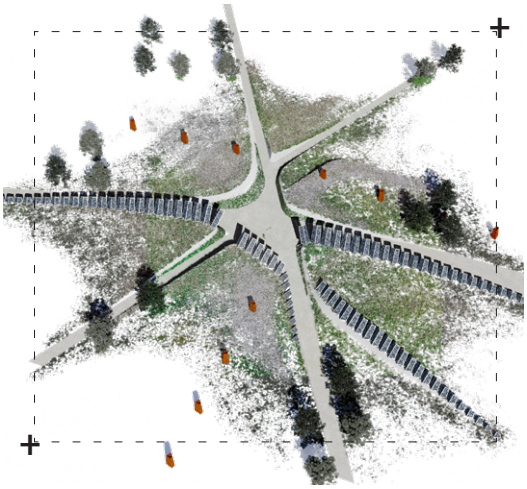
"Wheatfield," 1982, Agnes Denes

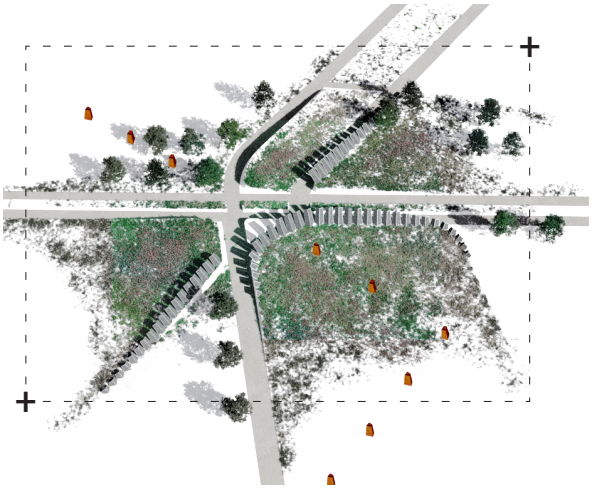
Reference works offer spatial, formal, and ecological concepts.

Four sites will form a connective network of microclimatic interventions across the new park.







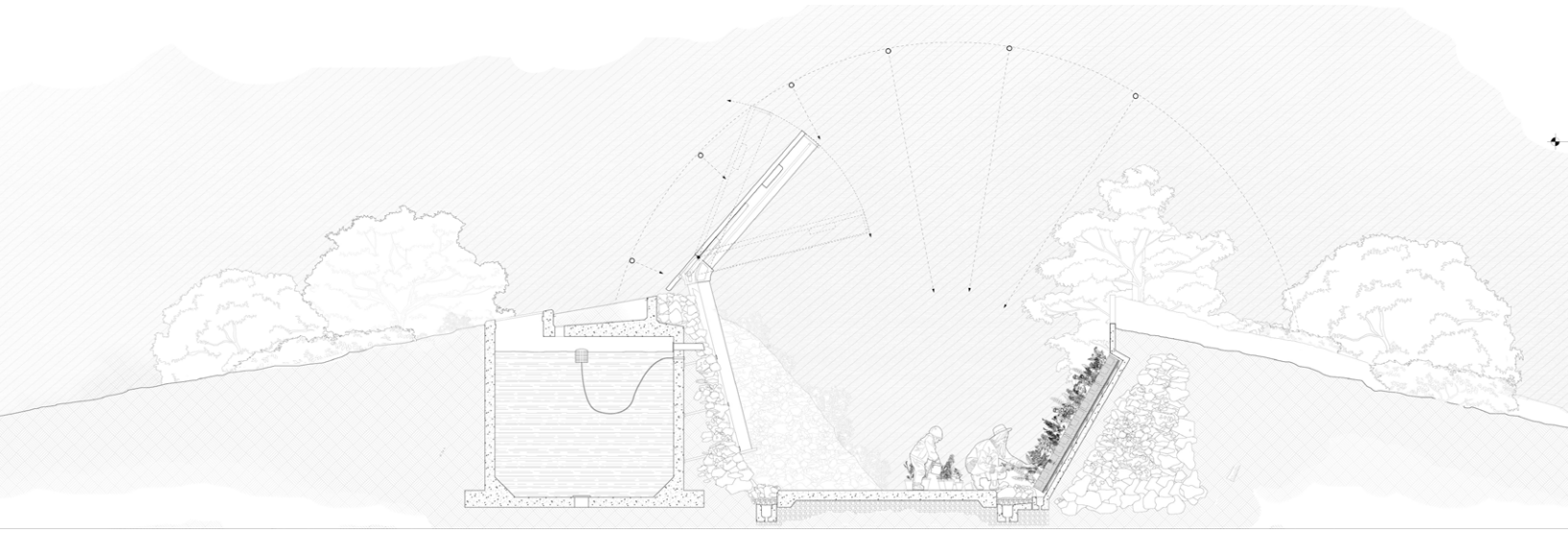


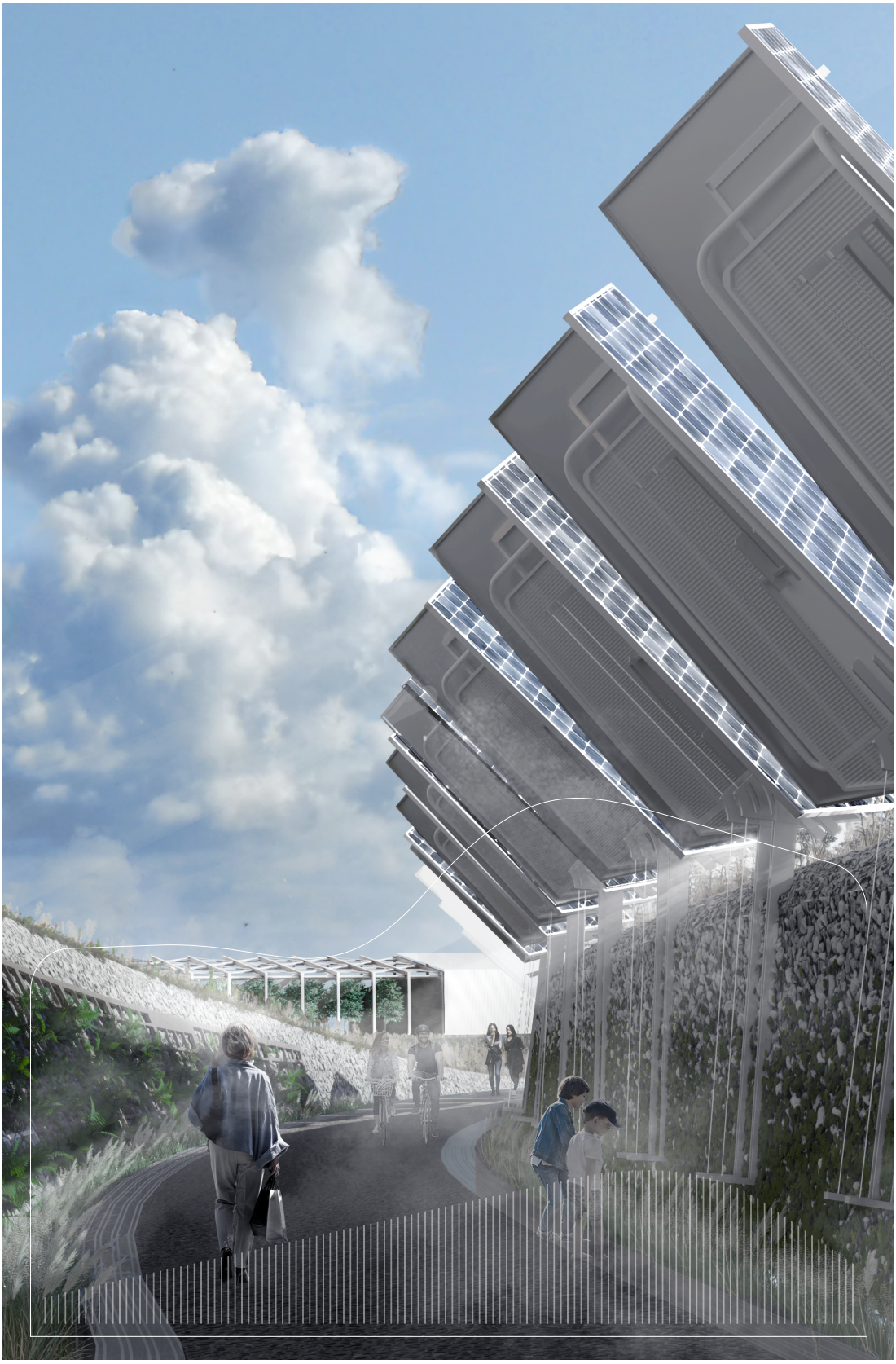
CURRENT NOTATIONS responds to the ambitions of the BUGA23 festival, the Mannheim Klimopass masterplan, and the UN SDGs by focusing on climate-driven challenges to the water cycle. The abstracted riverbed landscape conceals a technical program of water collection, retention, and distribution, enabled by the electricity generated on site. The new landscape of berms acts as a collection bathtub, funneling stormwater to concealed cisterns for storage and redistribution.

Based on existing and projected climate patterns in Mannheim, evaporative cooling may be a valuable, low intensity method for both residential and urban scale interventions. By introducing moisture into low humidity air, latent heat is absorbed out of breezes and dry bulb temperatures drop. Sensor arrays housed within the totems will control evaporative cooling misters during optimal alignments of temperature, relative humidity, and wind speed. Under these specified conditions, pumps supply water to misting jets housed in panels on the back face of the photovoltaic array. Shade from the photovoltaic fins above, combined with weather-triggered evaporative cooling and the transpiration of dense plantings in the pedestrian channels will foster a uniquely comfortable and hospitable microclimate for pedestrians and cyclists passing through the park.

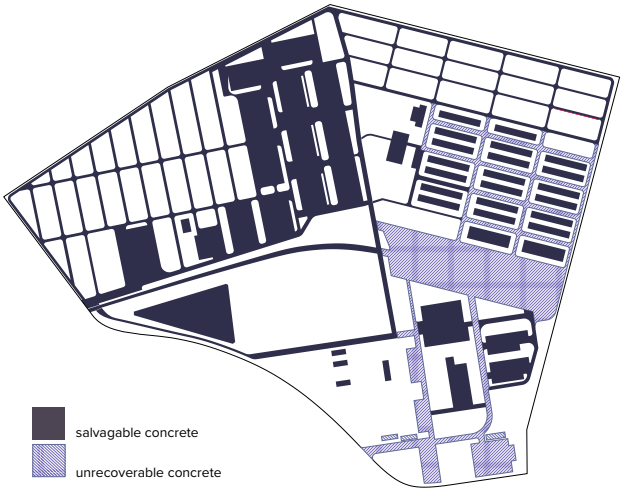
The meadow species of the long slope of the berm contrast with the ferns and mosses that thrive in the shadier, cooler and wetter biomes of tree-lines riverbanks. These species will be supported in verdant wall planter beds and grown in contained soil pods, which can be swapped out and brought home by visitors as a kind of transplant archive, providing opportunities to distribute regional species to home gardens around the city.

The sum effect of the installation is one of deep (literally) experience- walking through a new landscape which is simultaneously artificial, consisting of industrial aggregate and sinuous technical infrastructure, and intensely native, as prodigal ecosystems creep back into being. The proposal distills the many lives of the landscape into a coherent whole, where a former site of military discipline and rigor is handed back to the intuition and whims of the creatures sharing the landscape with the citizens of Mannheim.





Sensor-driven pumps supply mist jets for evaporative cooling of the pedestrian "channel" through the berm



Based on an existing hardscape concrete surface area of 2,035,000 ft2, and a volume of 1,526,000 ft3 of concrete is available as a "palette" for the proposed intervention.

Representeative volume of salvagable rubble from the Spinelli site.

1. BERMS

Berms will be built up from the existing plain using salvaged rubble from the demolition vehicle depots and barracks slabs left over from the military installation on the site. Much of the concrete on the barracks site is scheduled for demolition according to the new landscape design for the park. This material was produced at tremendous ecological cost, and although no longer viable as primary structural material is an asset that can be repurposed.

This concrete rubble will be redirected to serve as fill and retention surface for the proposed embankments. An internal retaining wall of gabion baskets will serve as the primary structural system, concealed beneath a loose surface of rubble aggregate. This fill will allow for water drainage behind the face of the berm and down to the swales flanking the pedestrian path. A layer of clay will serve as a catchment surface beneath the pedestrian pathways and direct the runoff water to cisterns buried within the berm for long-term storage and release. The cisterns will be sized to meet the conditions of changing climate patterns: summers marked by less frequent but farm more severe rainfall events. The long slopes of the berms will be planted with restored meadow species.

2. FINS

A photovoltaic array perches on the crest of the berm, rising like the dorsal fin of a great fish. Panels are positioned to optimize for electrical production, and to shade the pedestrian channel below- the panel surface cantilevers are stayed in place above the pathway with high strength steel cables and hollow section compression members. The slim steel arms and tension cabling stand in visual juxtaposition to the heavy geologic features of the berm: they appear as a slender technical machine emerging from the earth.

The technical apparatus of each panel (wiring, controller, inverter) is concealed behind a perforated mesh panel, which also serves as a armature for the mist jet conduit and high-efficiency grow light infrastructure. The grow lights operate in the Photosynthetically Active Radiation spectrum between 400-700nm, and supplement the photosynthesis of the planting beds which might otherwise be too shaded by the panel array.

The panels range in length from 1.5 m to 17 m as they trace the contours of the new landscape. Each site layout is unique, so production capacity also varies:

Site 1: 70 kW
Site 2: 120 kW
Site 3: 225 kW
Site 4: 160 kW

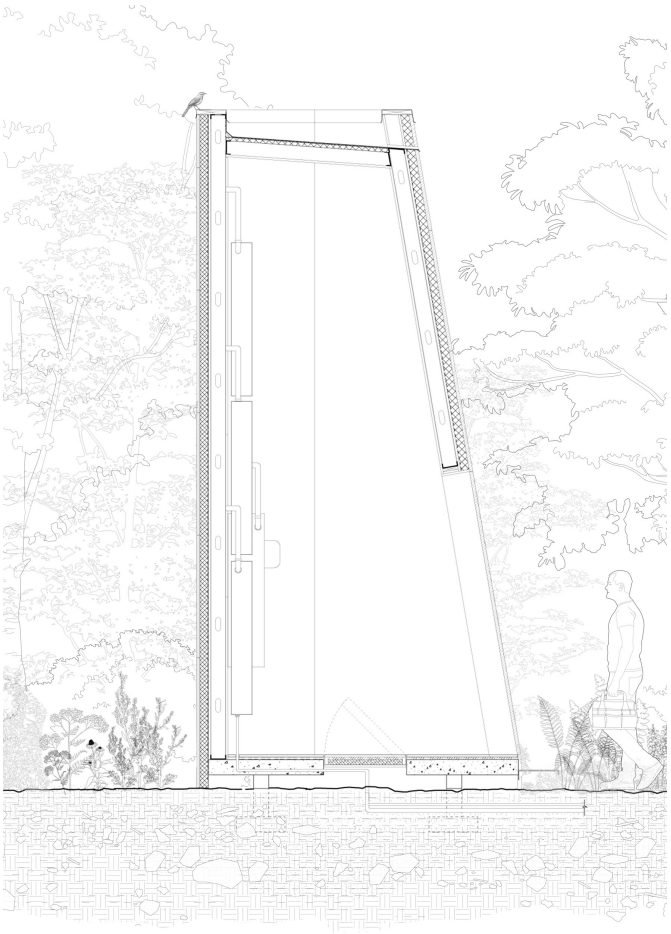
Total: 645 kW

A system of this size is capable of generating 582,250 kWh annually. This energy production will be sufficient to power the distribution pump and grow lights, and surplus electricity will be distributed to the regional grid.

3. TOTEMS

Punctuating the field condition of berms and fins is a family of totems dotting the meadow. Taking the form of crisp prismatic silhouettes and clad in a modest shell of oxidized steel panels, these figures define a strict grid superimposed across the landscape.

Their unassuming presence conceals the battery packs and distribution equipment mounted on vertical racks inside. An access hatch allowd for monitoring and maintenance; the simple steel paneling teel panels can easily be removed and replaced as needed for repairs. Their elevated and prismatic forms lift the battery racks above the hazards of the ground plane. Internal weather-tight housings shield the batteries from rain and snow. An insulated skin will help ensure high operating efficiency during winter months, as ambient heat from electrical equipment will keep interior temperature within effective operating ranges.



ENVIRONMENTAL IMPACT SUMMARY

CURRENT NOTATIONS proposes an energy-neutral, closed loop installation as a scaffold for targeted ecosystem interventions and stabilizations.

Implementing a strategic and climate driven program of evaporative cooling and microclimatic intervention supports the city's ambitions to encourage passive and land-based climate resiliency. The Manheim Klimopass will funnel cooling breezes through the Spinelli site and into the heart of Mannheim; as wind moves across the meadow it will help drive the cooling effects of the CURRENT NOTATIONS installations.

The photovoltaic fin arrays provide ample power to support the operation of the lighting fixtures and pumping demands. These panels are produced at a substantial carbon cost, but encourage a civic participation in the reimagination of a climate resilient Mannheim and offer a hopeful symbol for a carbon neutral future. Their ability to affect future change is worth the carbon cost.

Redirecting the construction waste from site demolition, and keeping excavated soil on site will keep a significant volume of material out of landfills, and eliminate the need for expensive and polluting transportation.

Replanting the diverse species of forgotten meadow biomes will encourage the return of migrational species and provide additional habitat for critical pollinators and other insects. Biodiversity loss threatens ecosystem functions at a fundamental level; providing even modest links in the landscape for native species to coexist will be an essential component of all future land use.

Introducing new topographic features on the site will inevitably impact existing hydrologic patterns, particularly regarding stormwater runoff and groundwater absorption. The berm features will be designed to optimize on-site retention and minimize disturbance to sensitive biomes, while simultaneously allowing for delayed release of water back into the ecosystem long after massive storm events. This will require further study to ensure that no chemical, structural, or biological threats are posed to the surrounding farms and wetlands.