

REUSED AND REUSABLE

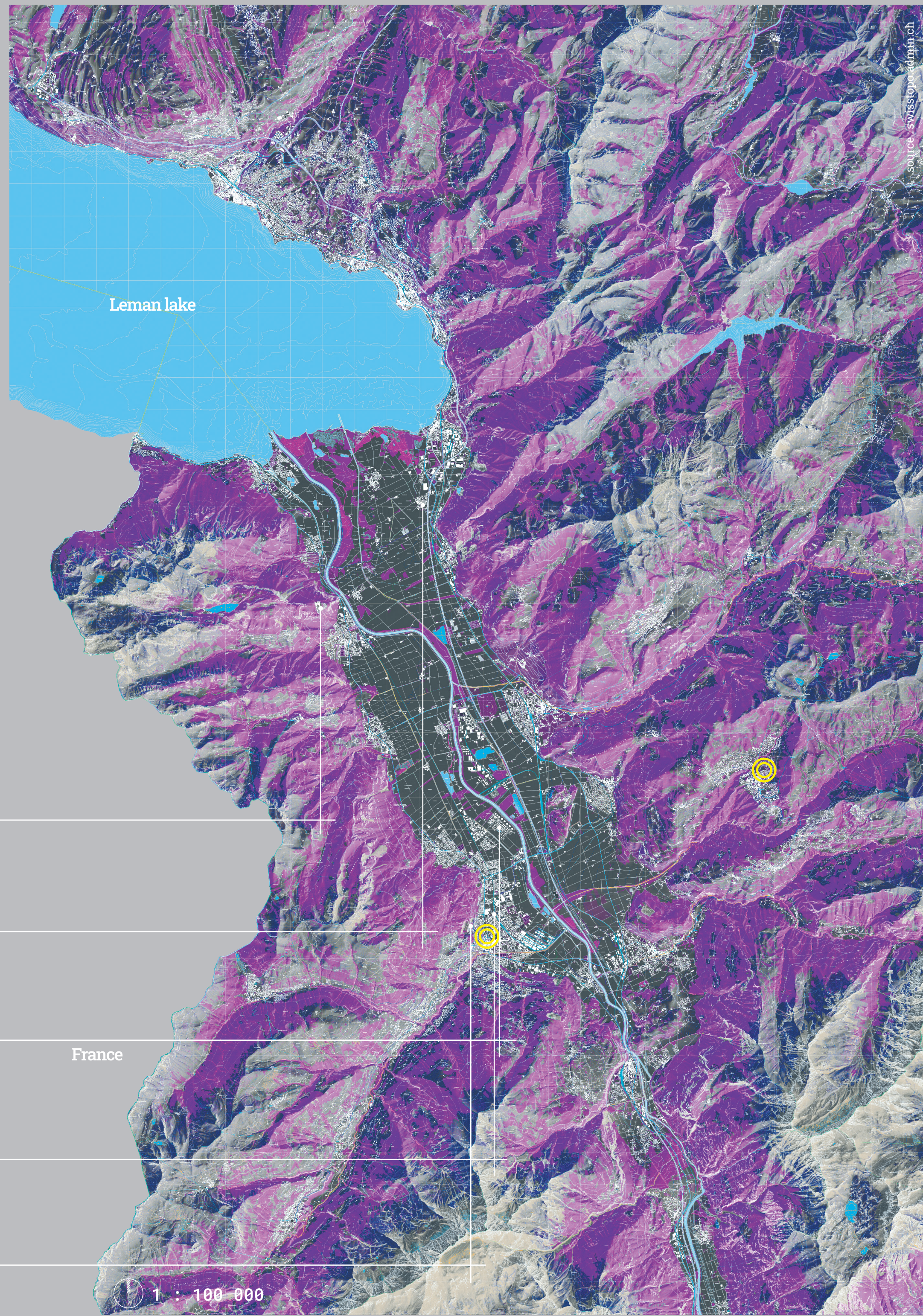
new life cycles for the components of an oil refinery in Switzerland

In a built environment deemed rigid, the frequent shifts in needs and uses are causing many buildings to become obsolete, even though their components retain most of their intrinsic value. One visible consequence of this lack of adaptability is embodied through the massive and decaying Tamoil refinery in Valais, which perpetrate heavy physical, social and environmental footprints for the local population.

By envisioning new lives for the refinery's components through the conception of versatile and reversible projects, the proposed 2nd and 3rd cycles are redefining the built environment as capable of adapting to new conditions and beyond a foreseeable future.

Carefully embracing reusable materials as a basis for the projects, the architecture of the recipient buildings acquires expressiveness through the structural and tectonic celebration of non-destructive strategies, thus fostering the development of a tangible image of adaptability for architecture.

Master Project 2021 - Maxence Grangeot
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France

forest urban footprint river stream main road

abandoned buildings in Chablais and intervention sites

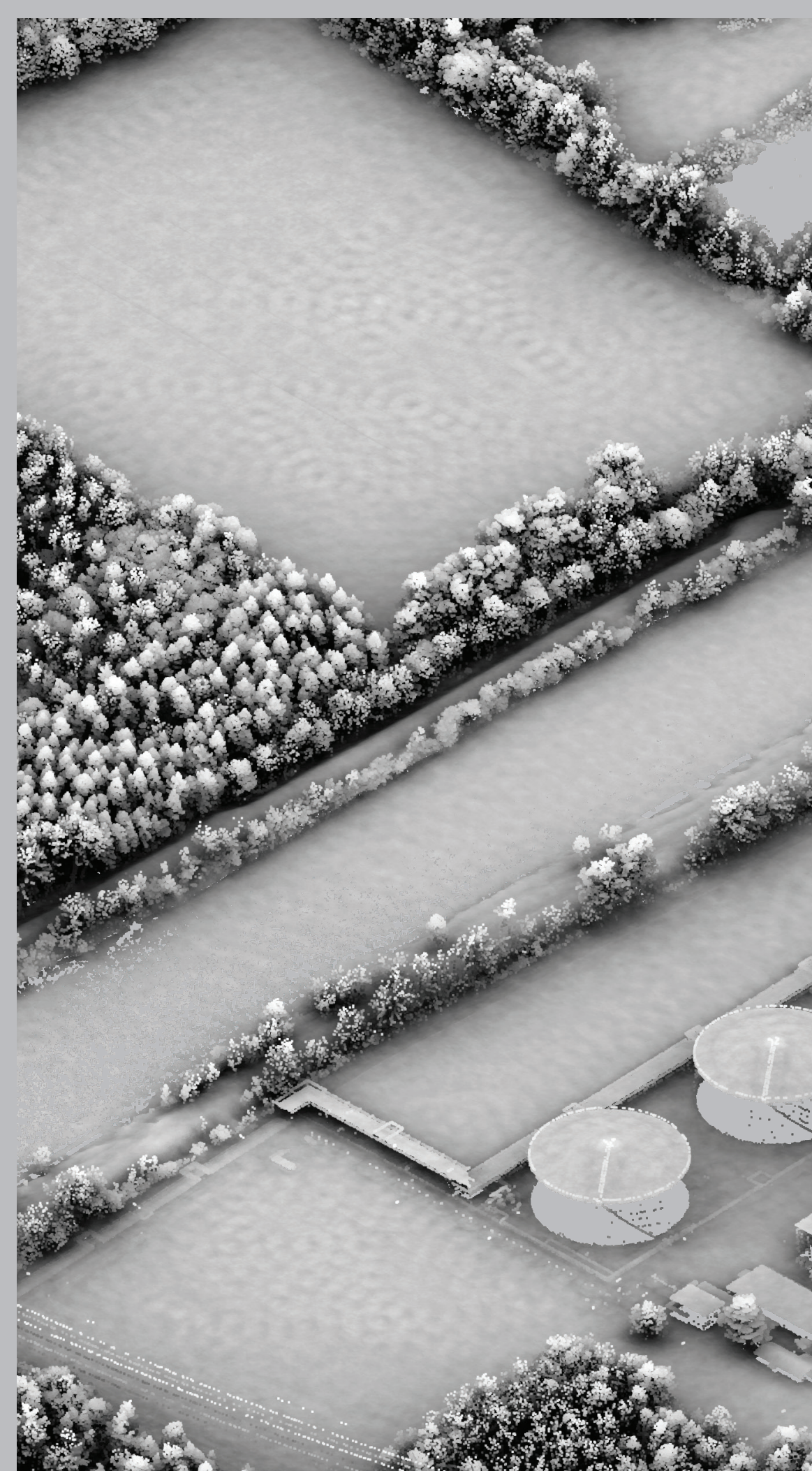


flood risk - high flood risk - medium flood risk - low forest/biodiversity

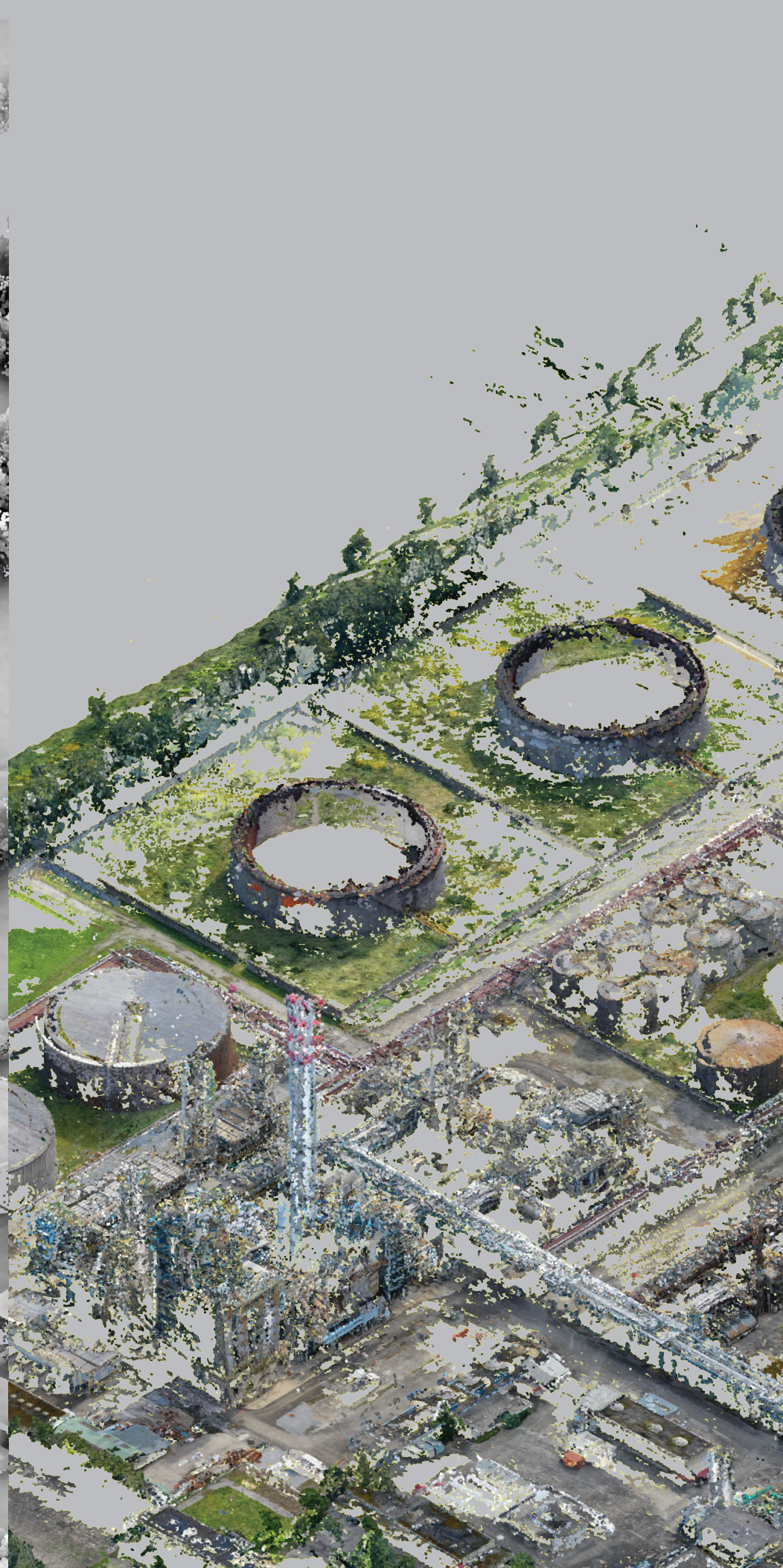
flood risks and urban situation of the refinery contributing to biological discontinuity



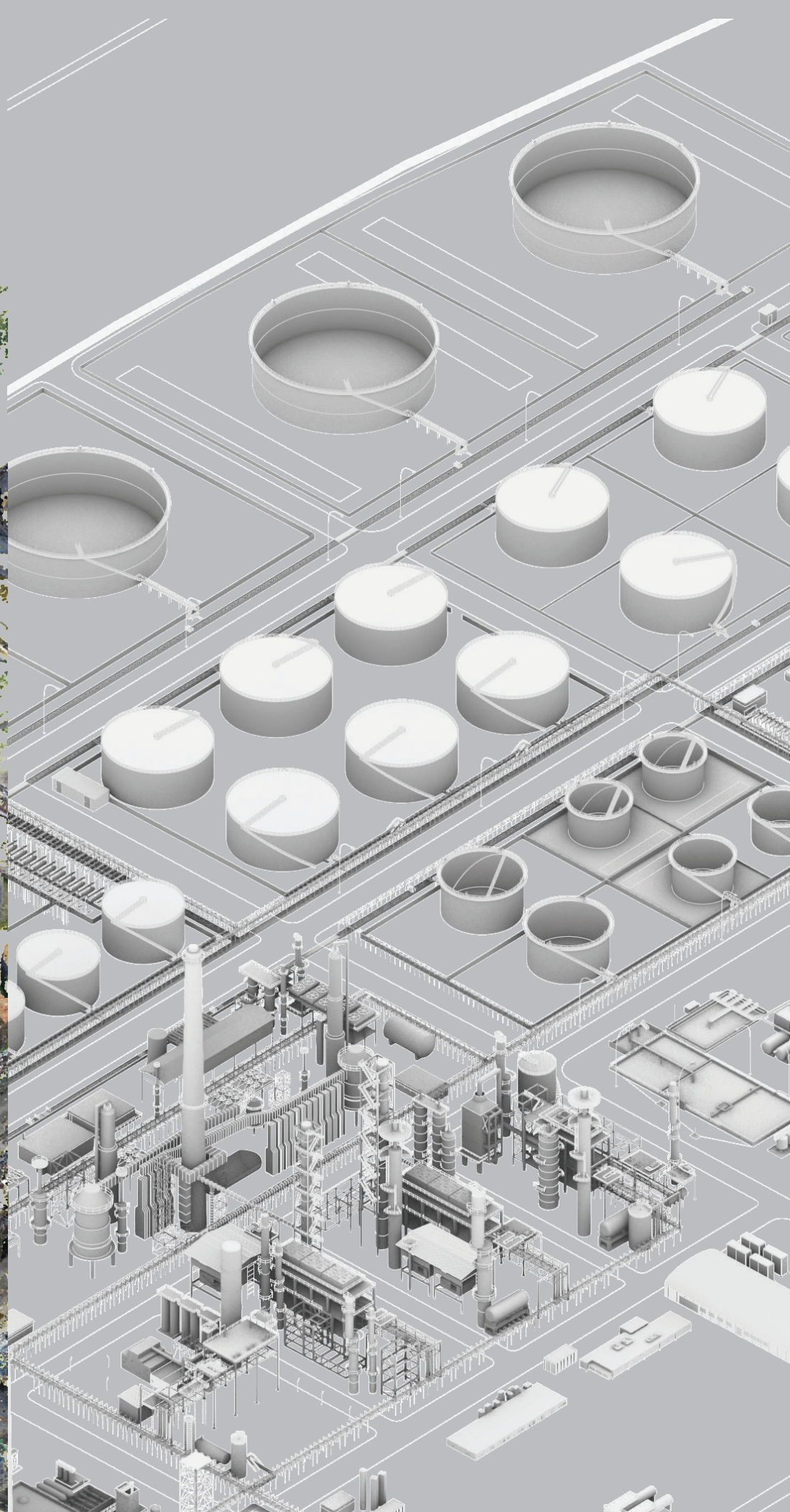
discarded architecture as open pit mines for building components



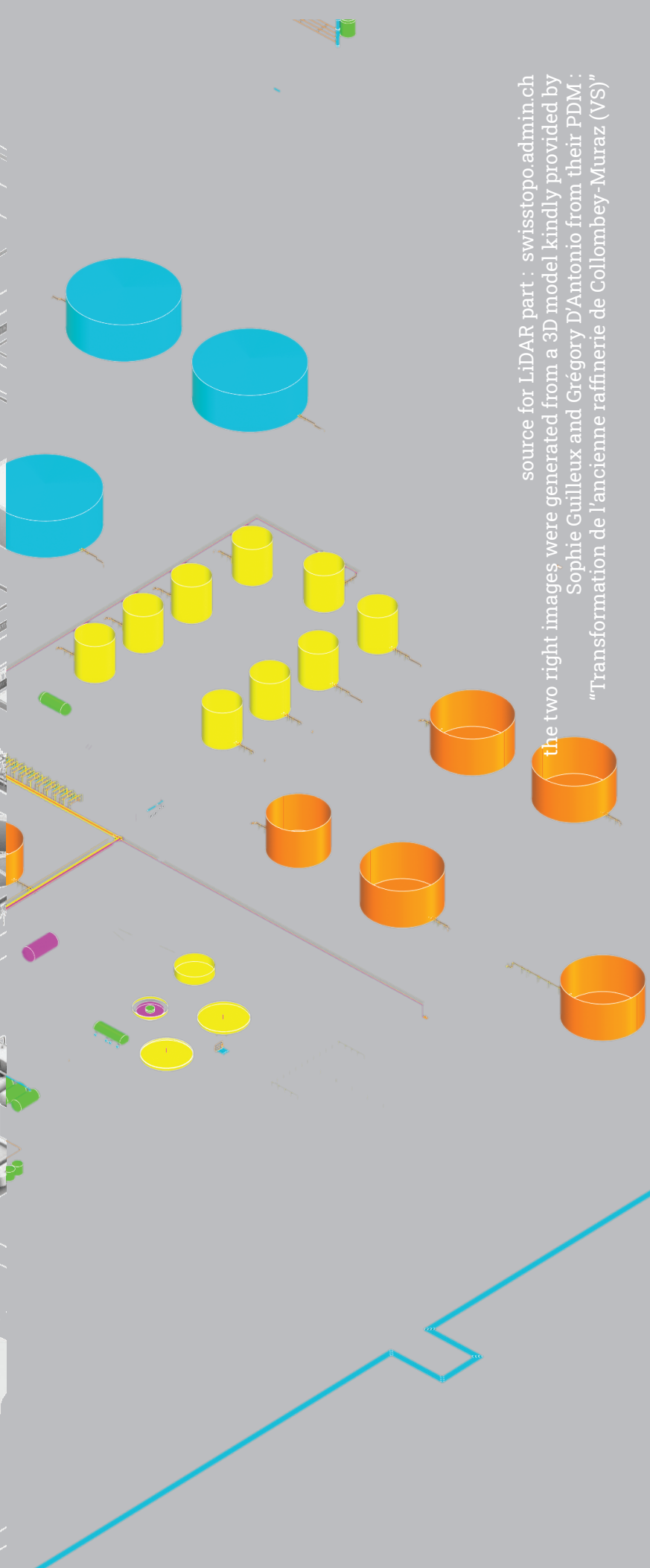
aerial LiDAR



drone photogrammetry



RANSAC shape detection and segmentation



cylinders analysis and classification

	diameter (m)	total length (m)	units	av. u. length (m)
tanks	55	85	20	4.3
	50	138	6	23.0
	33.5	368	24	15.0
	24	169	13	13.0
	12	253	25	10.1
	9.5	11	10	1.1
tanks + towers	8	126	6	21.0
	6.5	5	5	1.0
	6	52	7	7.4
	4.5	13	15	0.9
	4	331	24	13.8
	3.5	42	22	1.9
	3	78	30	2.3
	2.5	146	141	1.0
pipelines	2	16	8	2.0
	1.75	36	27	1.3
	1.5	6	6	1.0
	1.3	88	19	4.2
	1.15	58	13	4.5
	1	101	16	6.3
	0.8	67	18	3.7
pipes	0.7	98	14	7.0
	0.6	482	61	7.9
	0.5	33	20	1.7
	0.4	1114	113	9.9
	0.3	4847	296	16.4
	0.25	78	60	1.3
	0.20	12777	888	15.0
	0.15	19328	607	31.8
	0.13	116	71	1.6
	0.10	12739	3538	3.6
0.08	434	132	3.3	
0.08	237	73	3.2	
0.07	989	248	4.0	
0.06	243	89	2.7	
0.05	16173	488	33.7	

dimensional properties of 80% of the available cylindrical stock

resource diagnostic



the refinery before dismantling



54 tanks - including some thermally insulated



pipelines : 250 km of steel - 90 km pending dismantlement - preserved with azote



ventilation: metallic plates of various sizes



deconstruction of the east wing of Monthey hospital, providing reused insulation and concrete



prominent landmark of the landscape



chimneys : 2x bricks 100m + 1 x steel + steel torch ("without smoke")



support structure : IPE steel - 30 000 tons + concrete pillars & beams



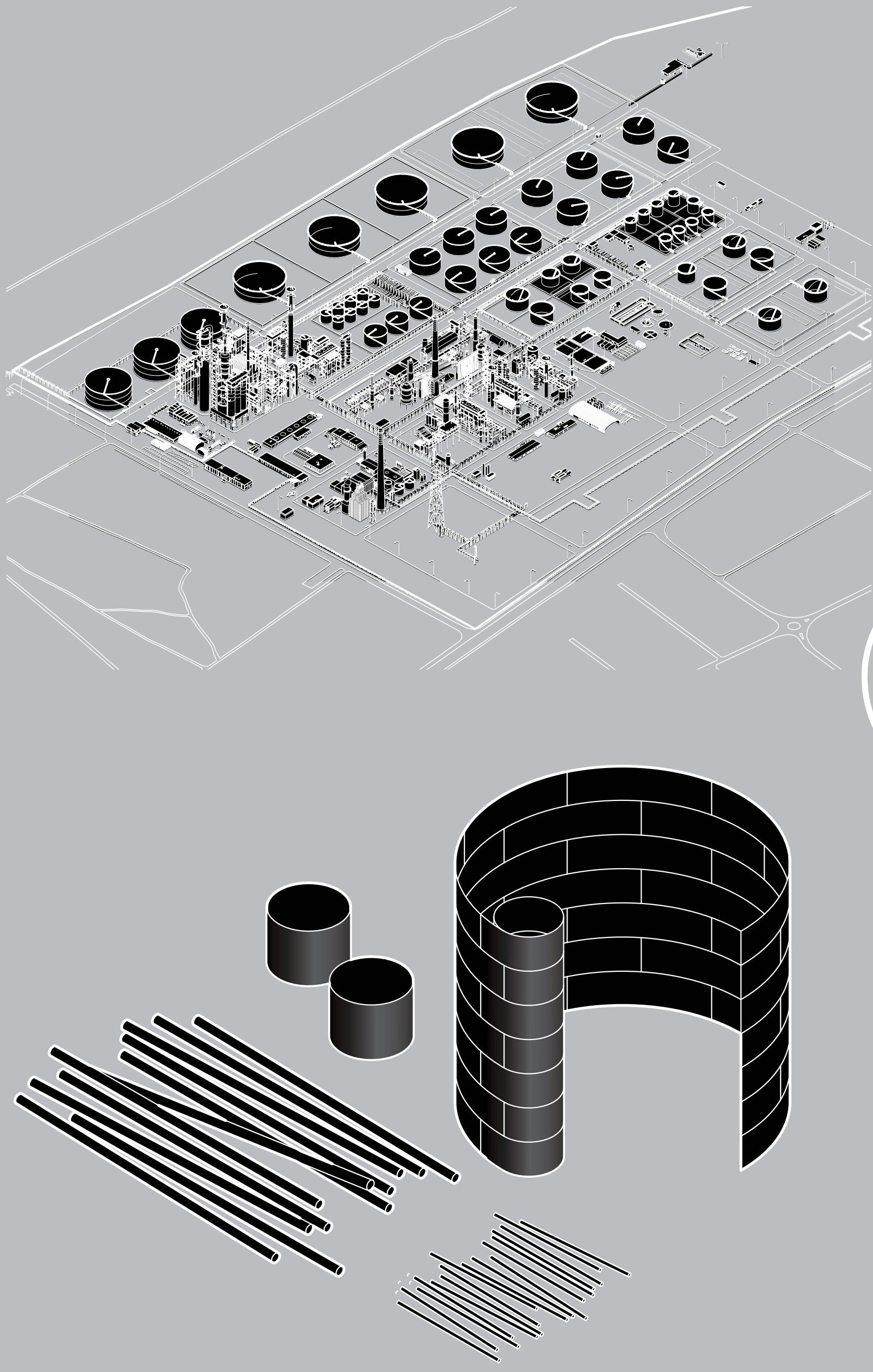
administrative buildings & technical buildings : prefabricated and cast concrete



deconstruction of industrial sheds, providing corrugated metallic and transparent PVC plates

1ST CYCLE OF COMPONENTS

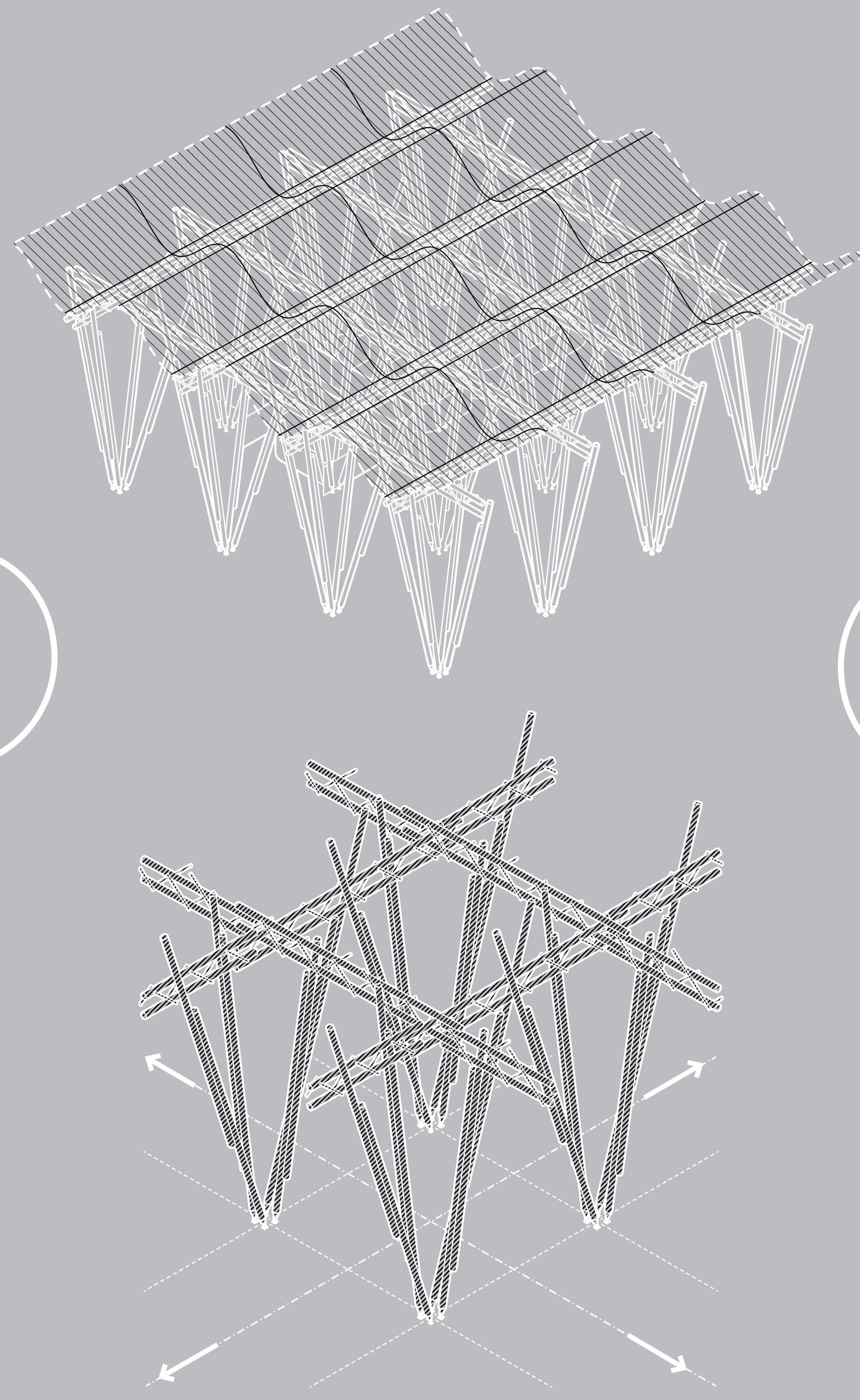
dismantlement of an oil refinery in
Collombey-Muraz
46°17'11.2"N 6°56'53.4"E



dismantled kit of parts samples from the refinery

2ND CYCLE OF COMPONENTS

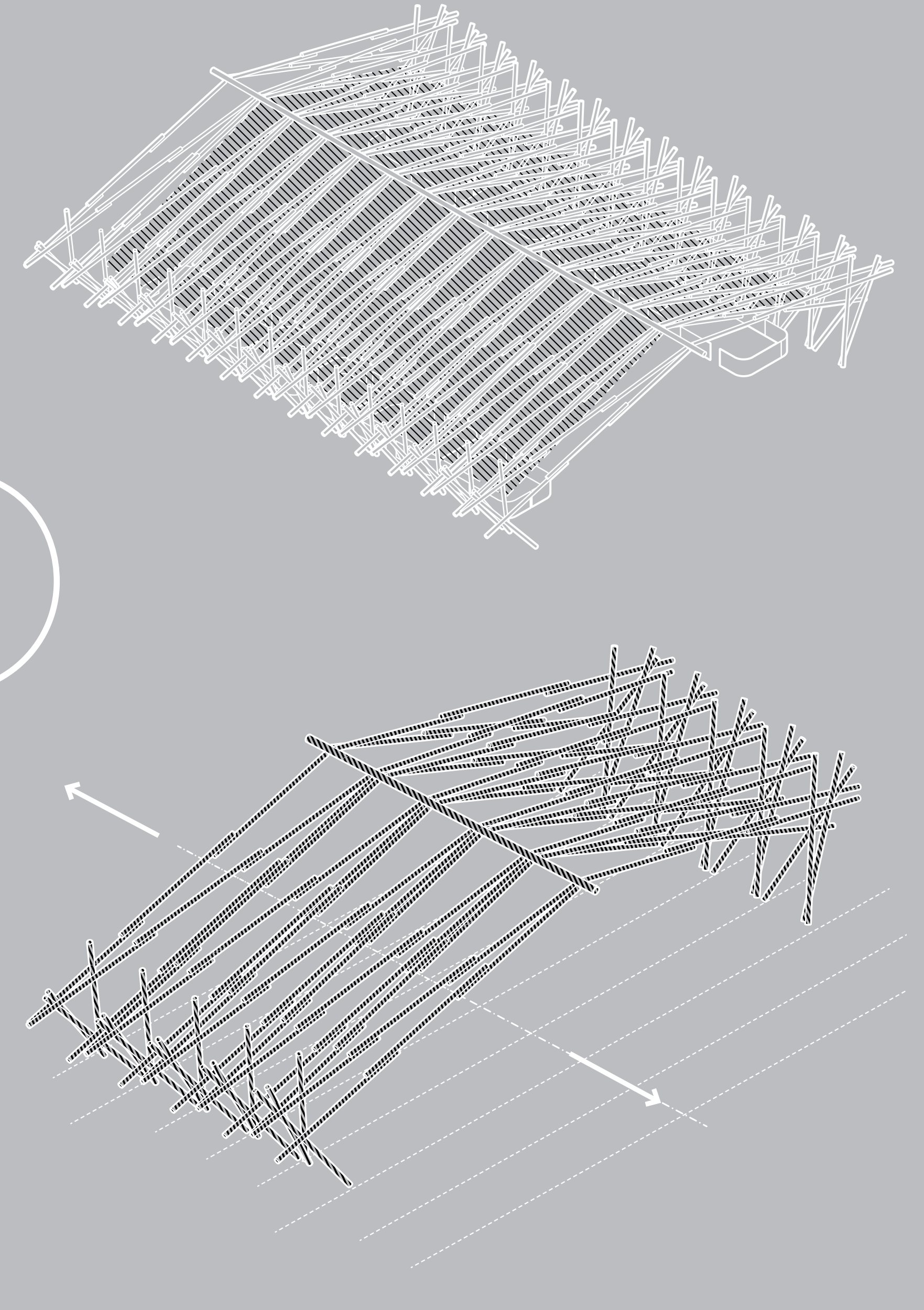
through a versatile and reversible event hall in
Monthey
46°15'16.729"N 6°57'2.952"E



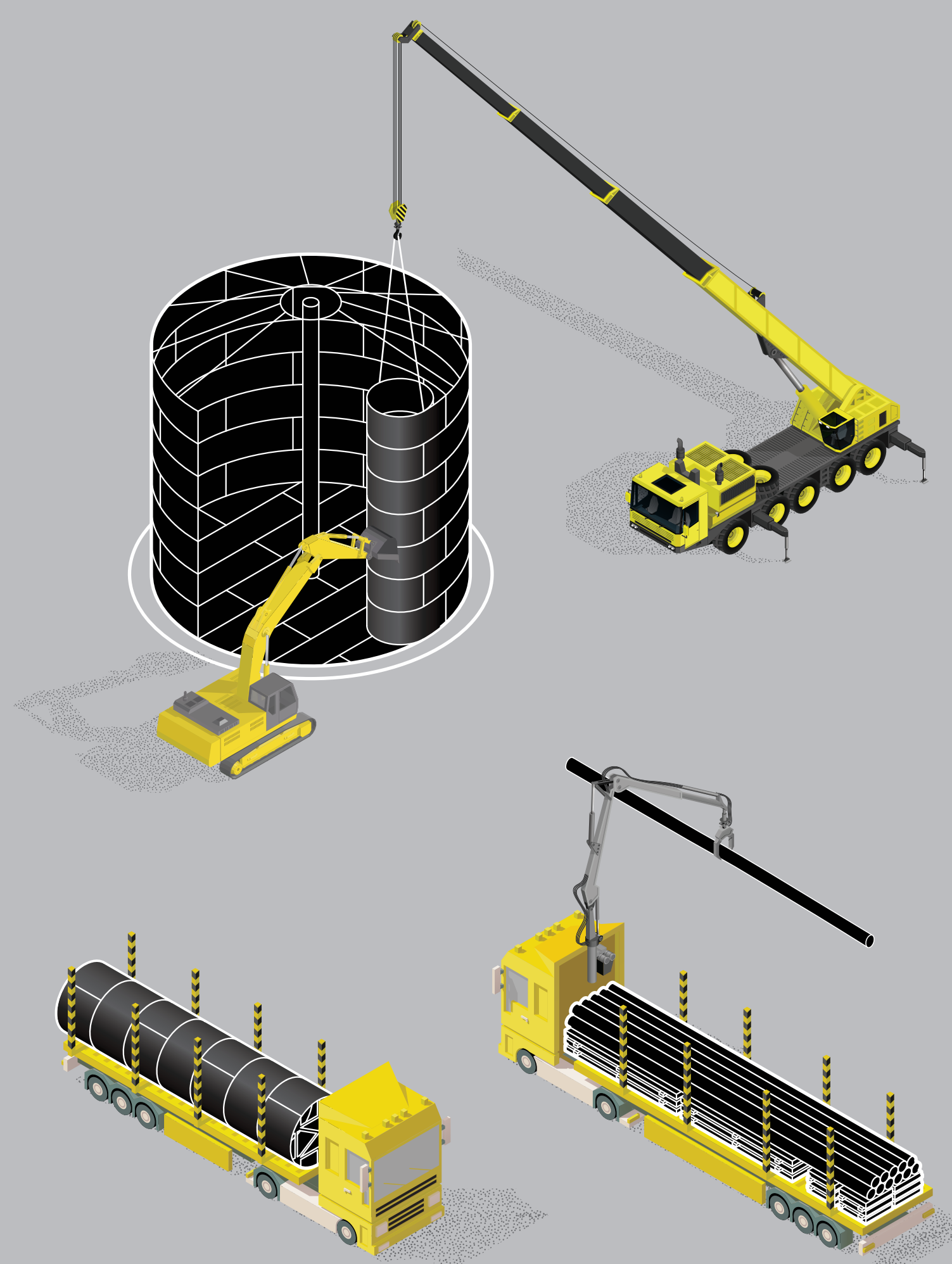
the pursued versatility of the generated spaces and the planned reversibility of the reused components enables to embrace future or unplanned changes of use without downcycling the components

3RD CYCLE OF COMPONENTS

through a versatile and reversible sport center in
Villars-sur-Ollon
46°18'6.872"N 7°3'9.836"E

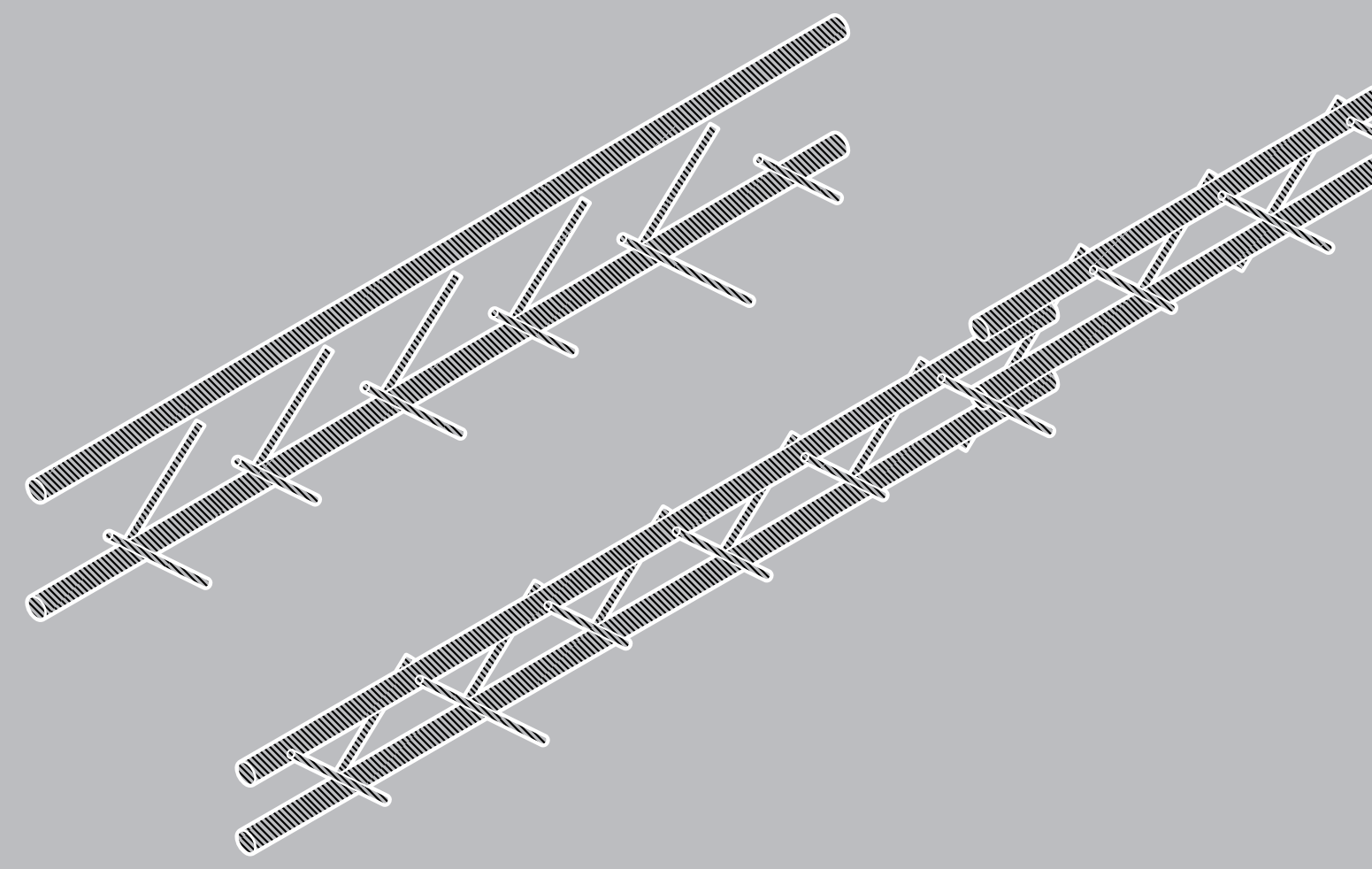


how to dismantle an oil refinery to value its components

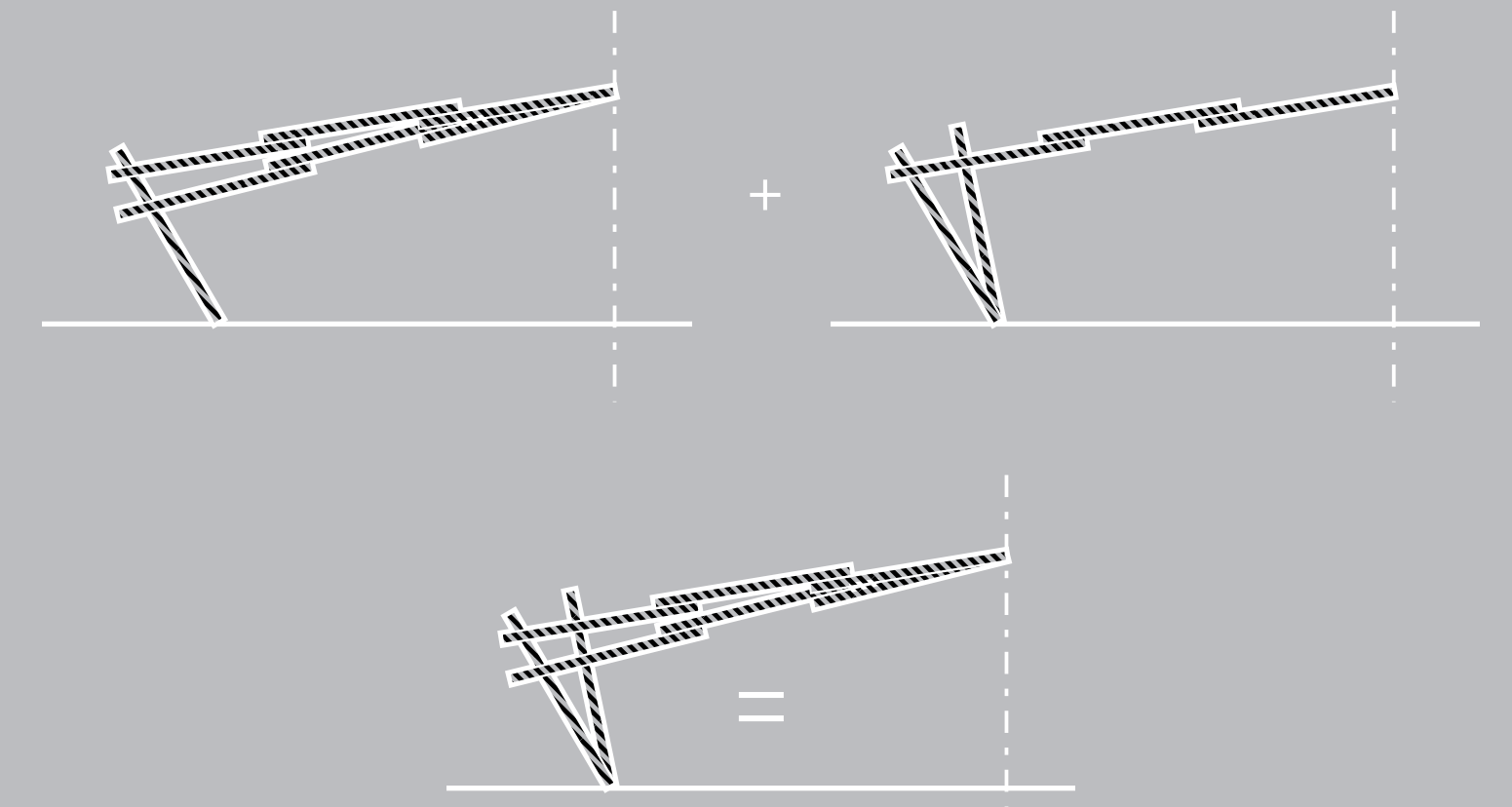


transport optimisation to avoid downcycling : recoiling tanks and efficient packing

how to reuse pipes to be reusable ?

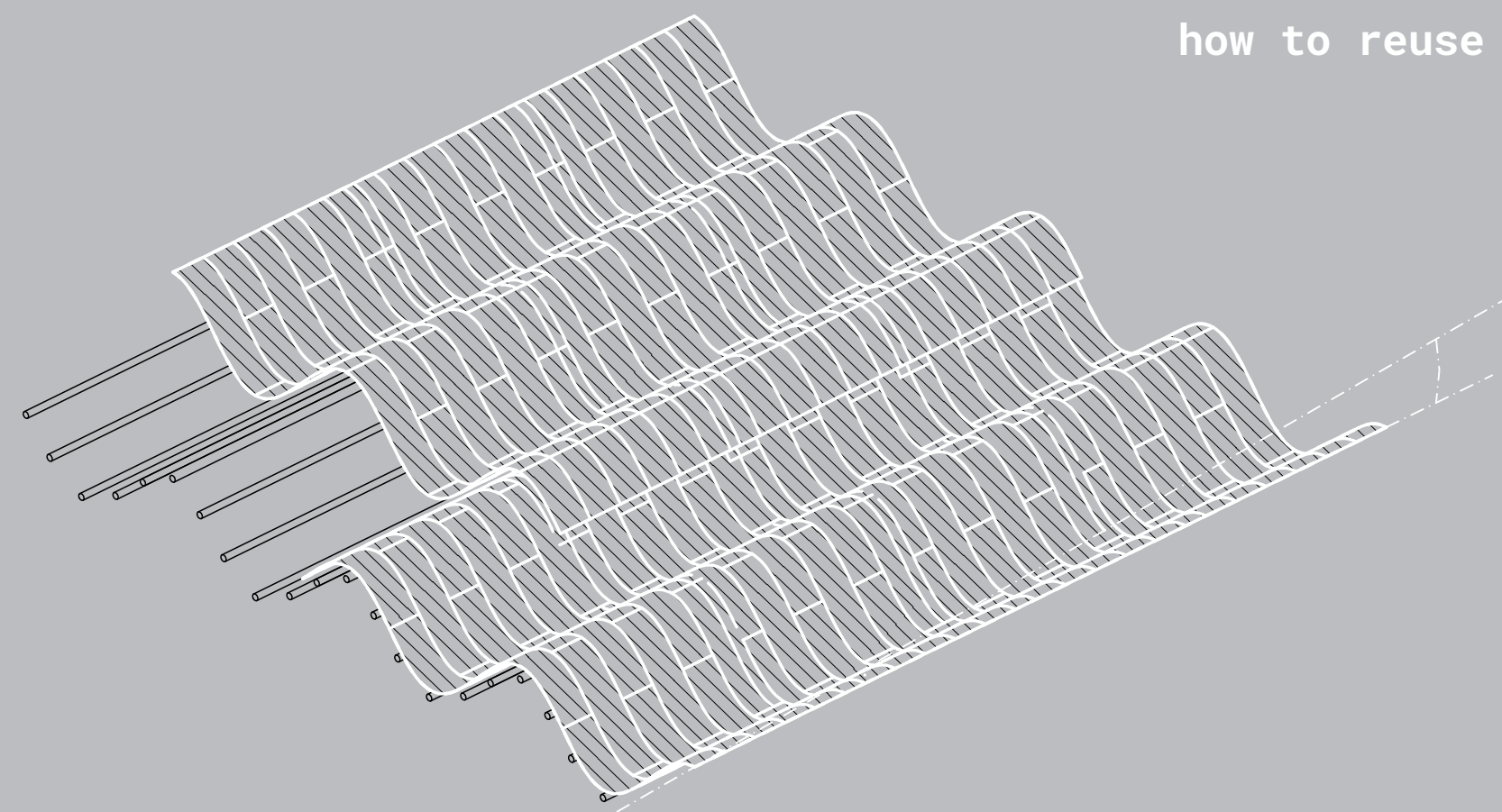


as member of a truss with tangential connections

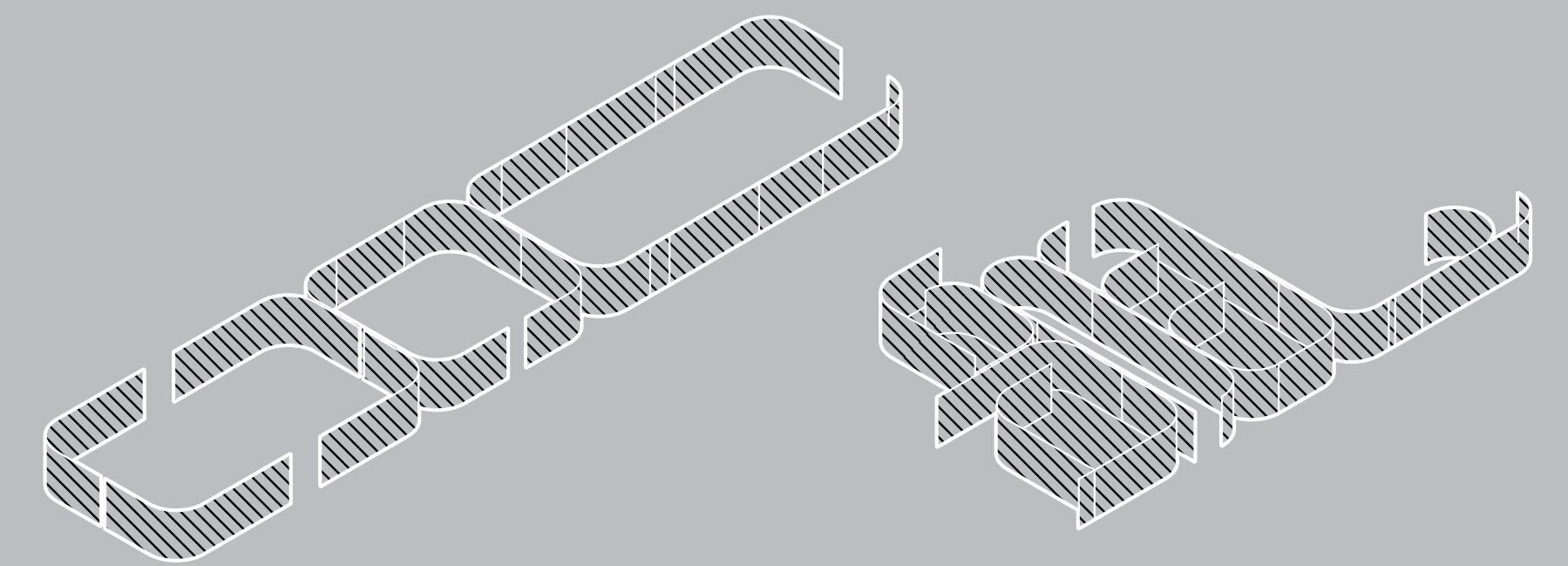


as a 3-pin frame with tangential connections

how to reuse tanks to be reusable?



as a first layer in a roof composition, using corrugation as structural property, and with an overlap in both directions



as internal partitions, simply unrolled and bent within the elasticity of the original metal plates

deconstruction



concrete "dismantlement" experiment using a diamond blade circular saw

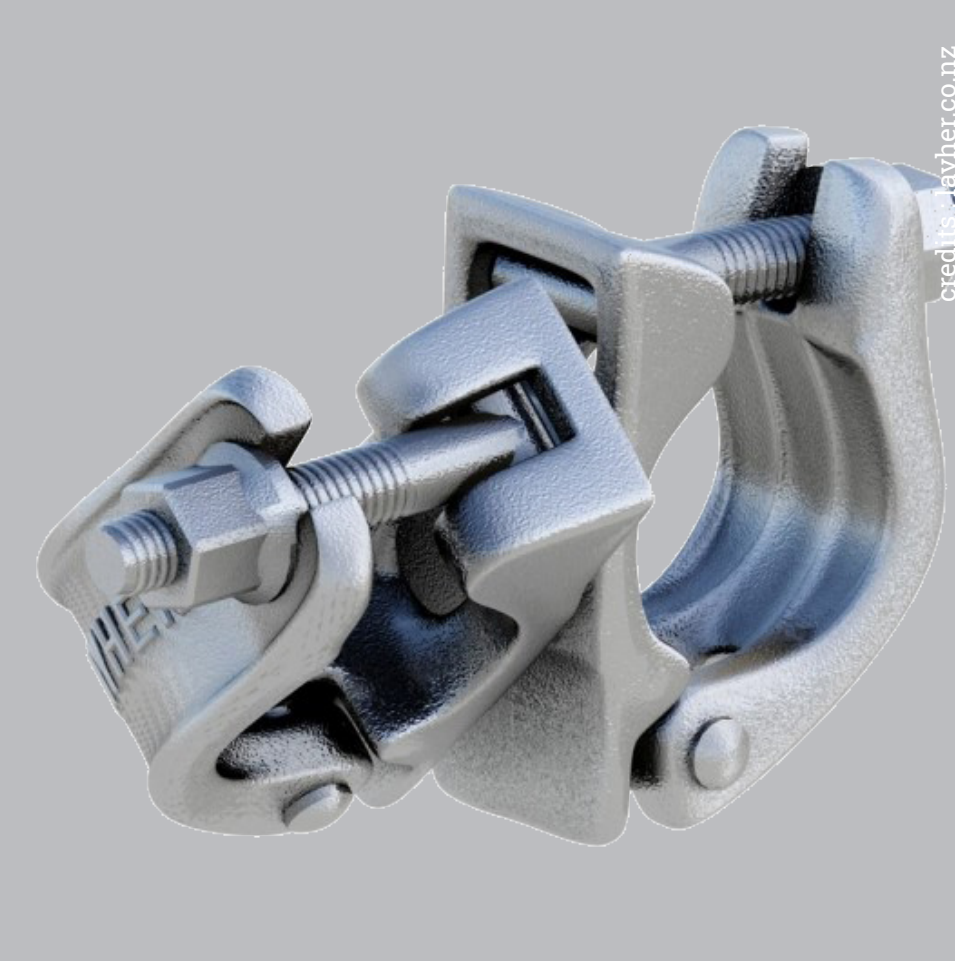


sawing only when needed and at maximum dimensions to minimize downcycling

reconstruction details



6 bolts oil platform clamp



non-destructive swivel coupler with coarse thread



clamp with longer grip for higher forces



reclamation outlet of reusable sawn concrete blocks



coiling method: welded in factory, up to 16m long, weight adjusted for transportation, unrolled on site



coiled tank sheets ready for transportation



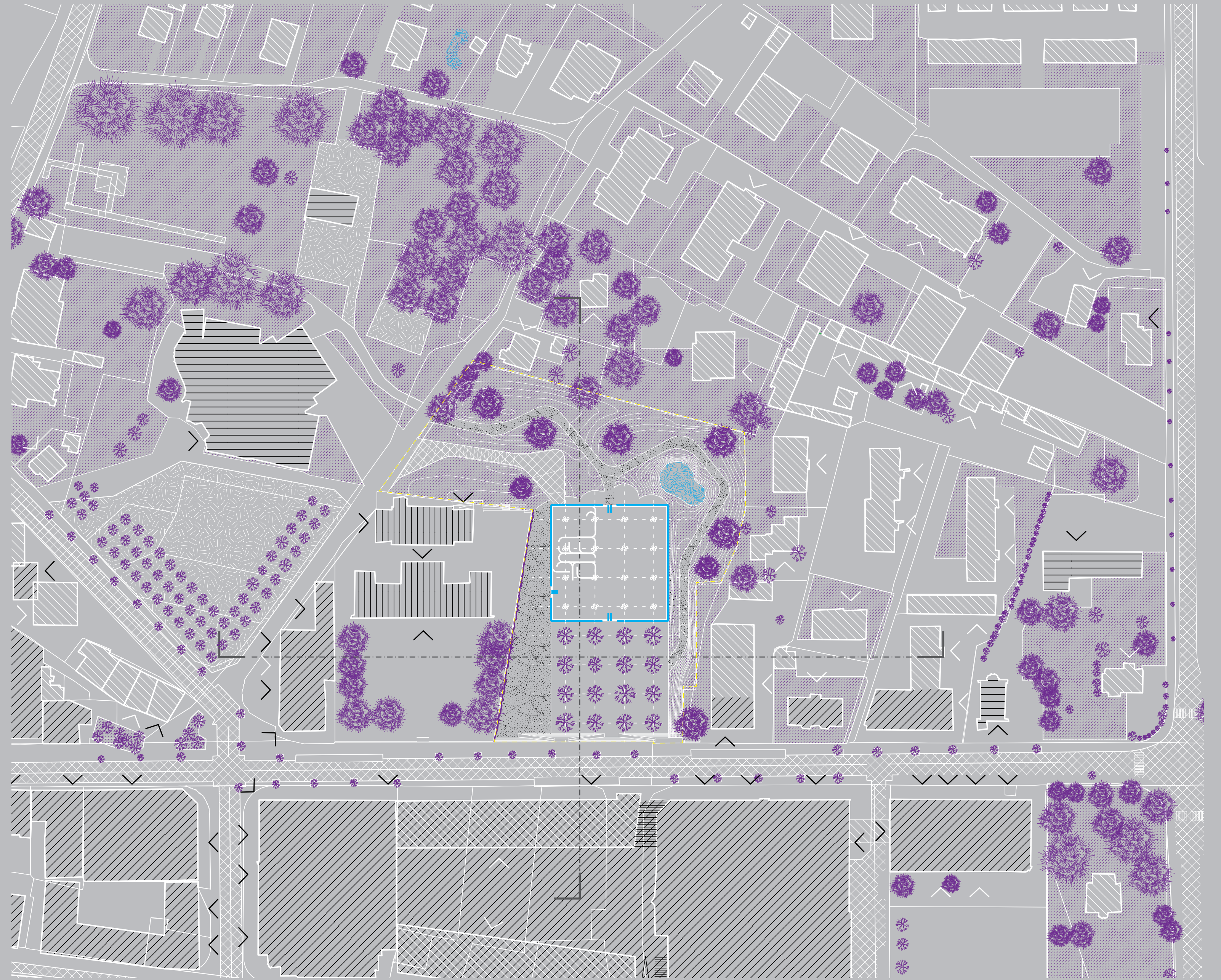
ringlock scaffolding jack base of screw rod with jack nut scaffold adjustable feet



heavy duty saddle clamp for non-destructive linear connections

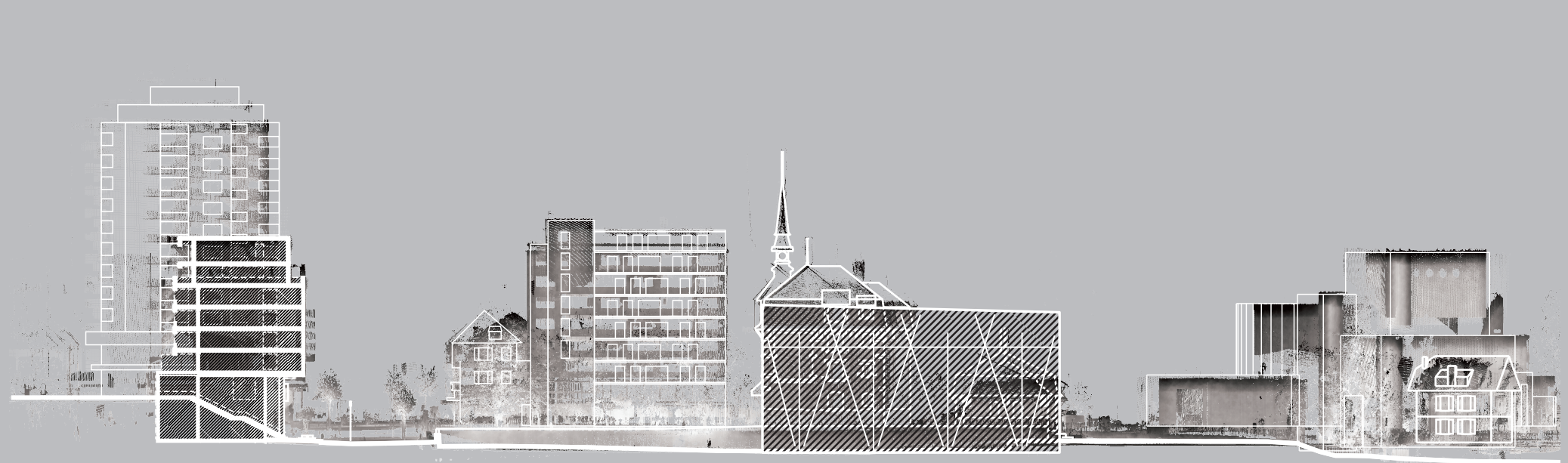


situation plan - 1 : 10 000

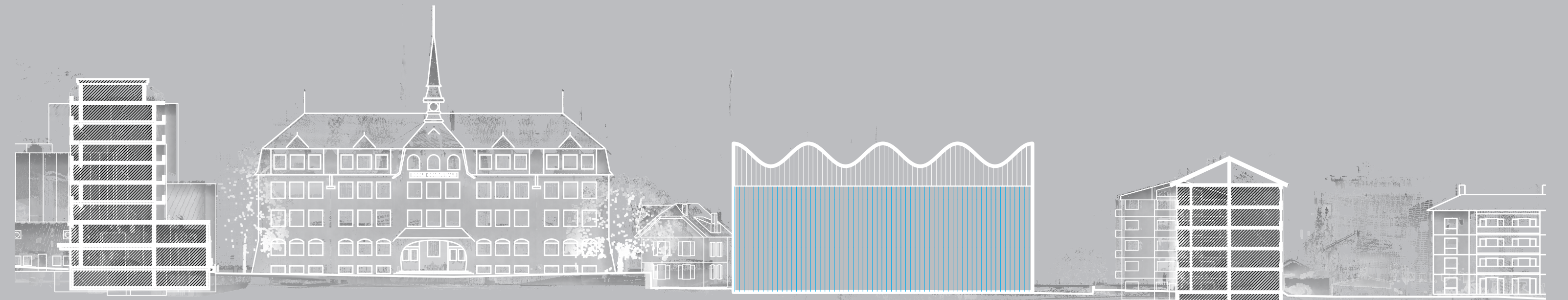


housing commerce education cultural fine gravel grass housing entrance public entrance

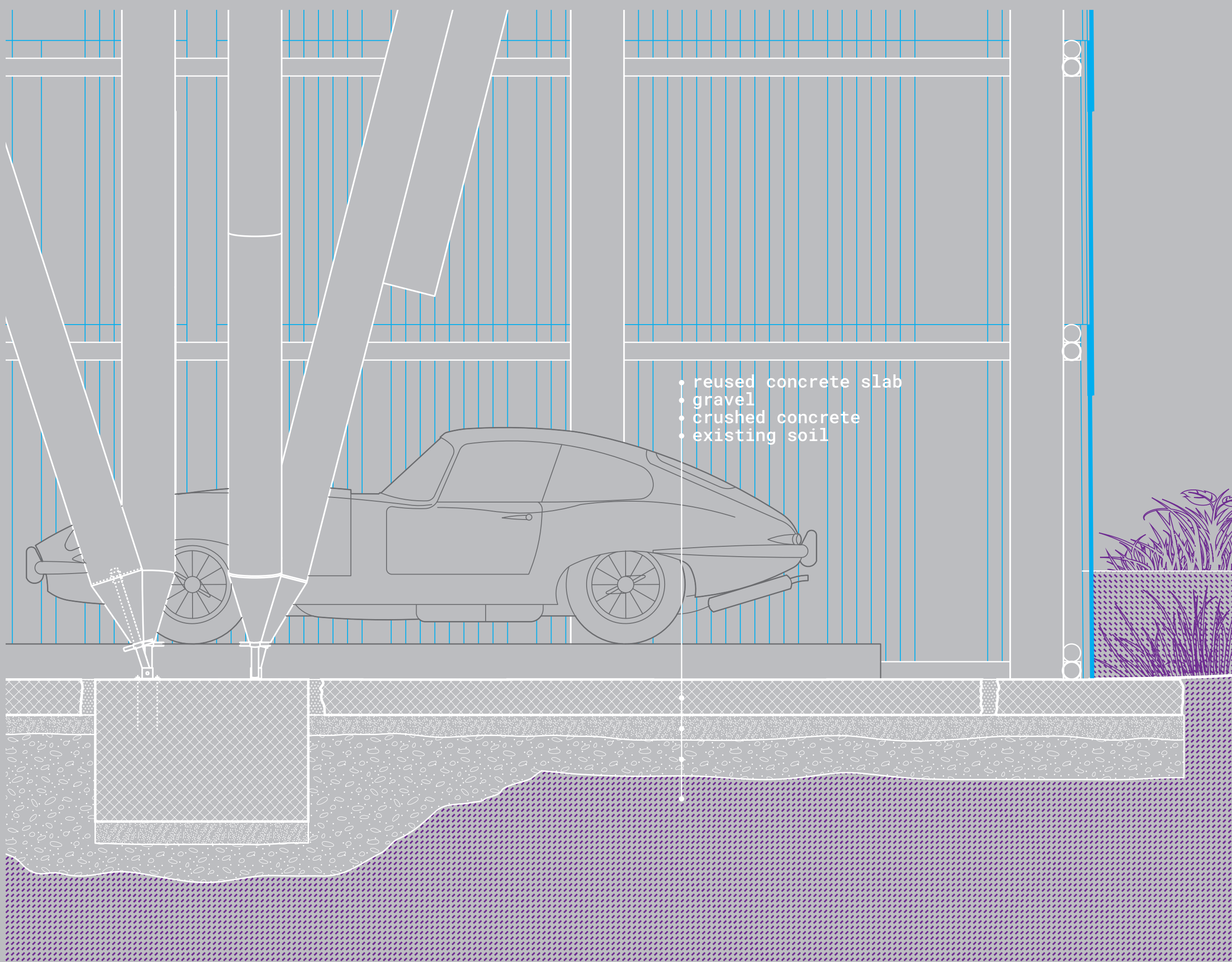
mass plan - 1 : 1000



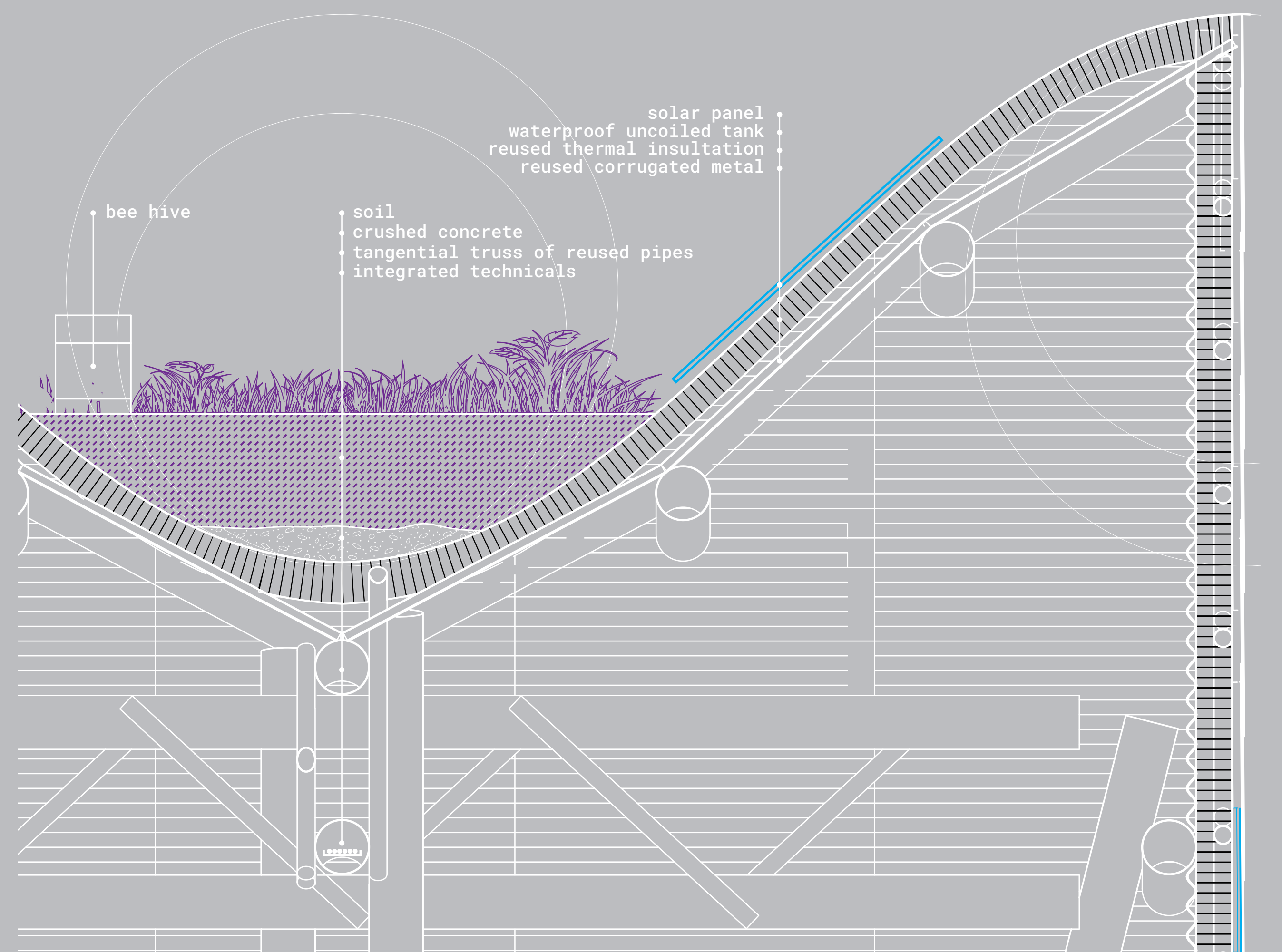
longitudinal section - 1 : 750



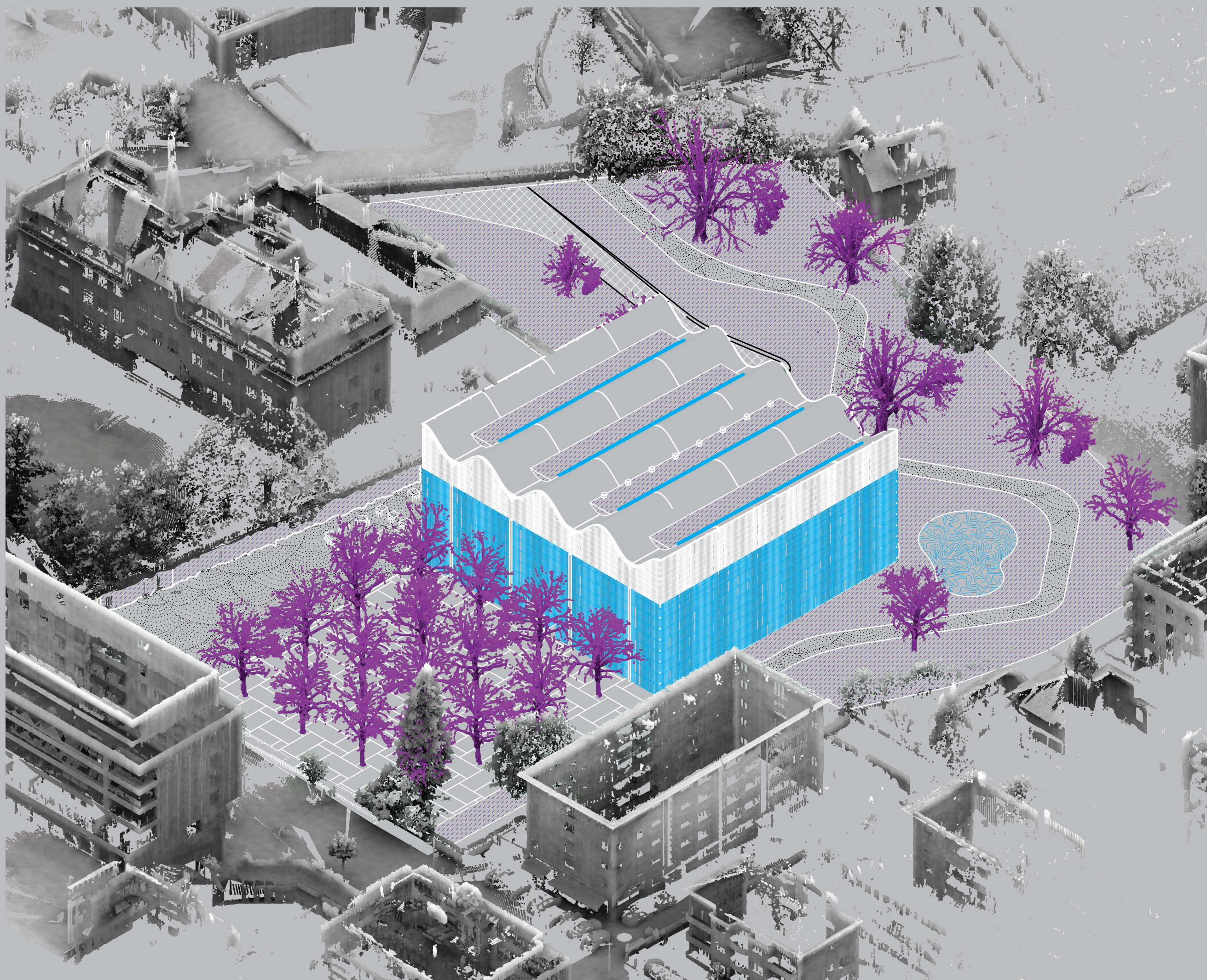
transversal section - 1 : 500



foundations, adjustable foot and slab from reused concrete elements - 1 : 20



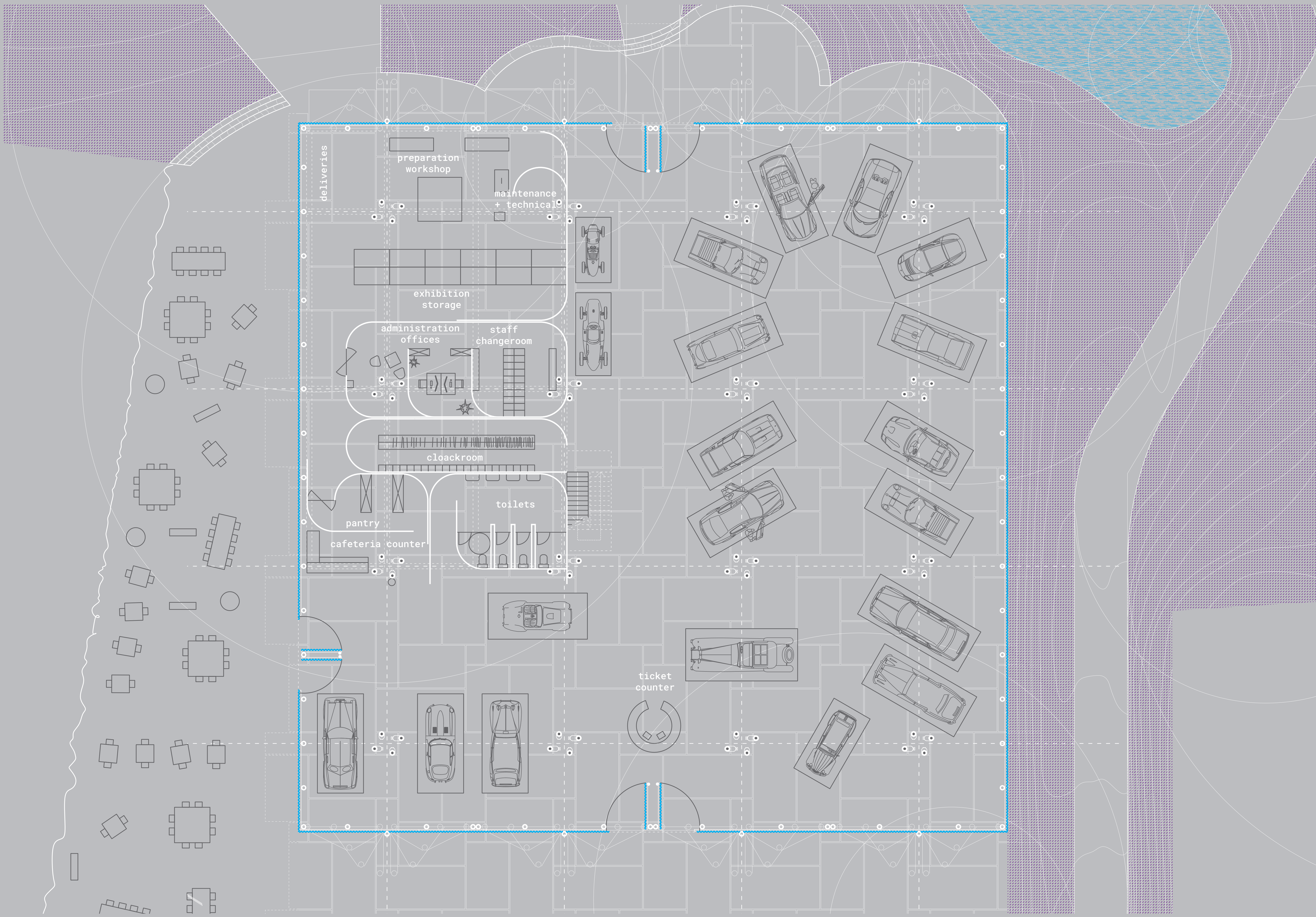
integrating technicals within the hollow structure, and using the corrugation of the steel plate for the static height - 1 : 20



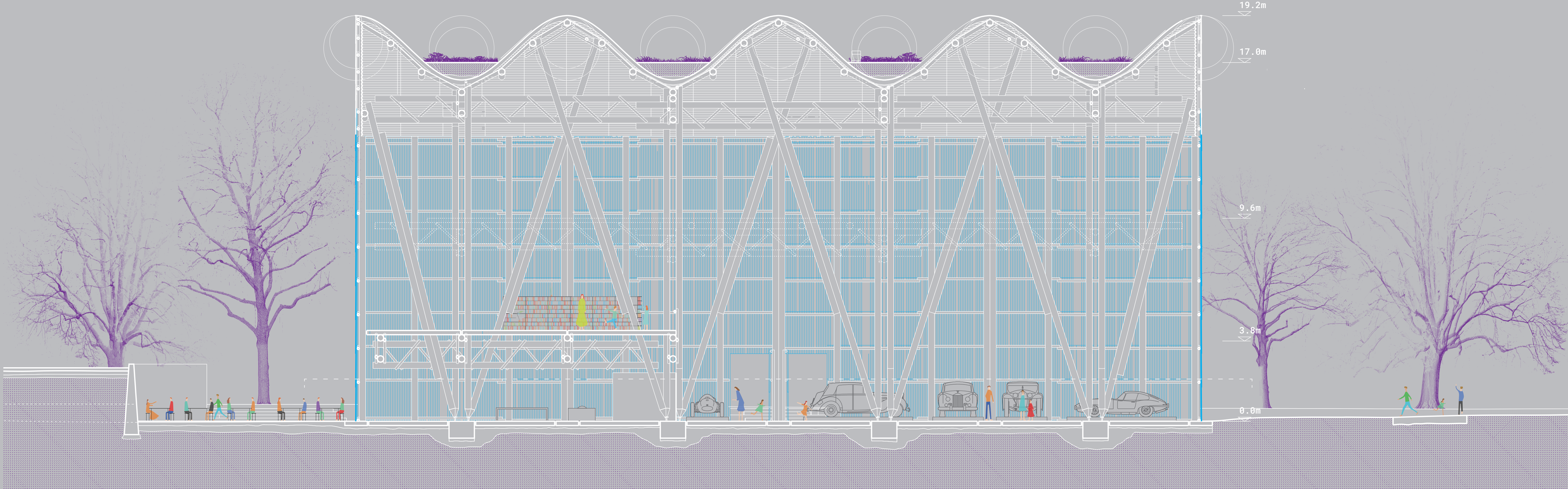
aerial perspective



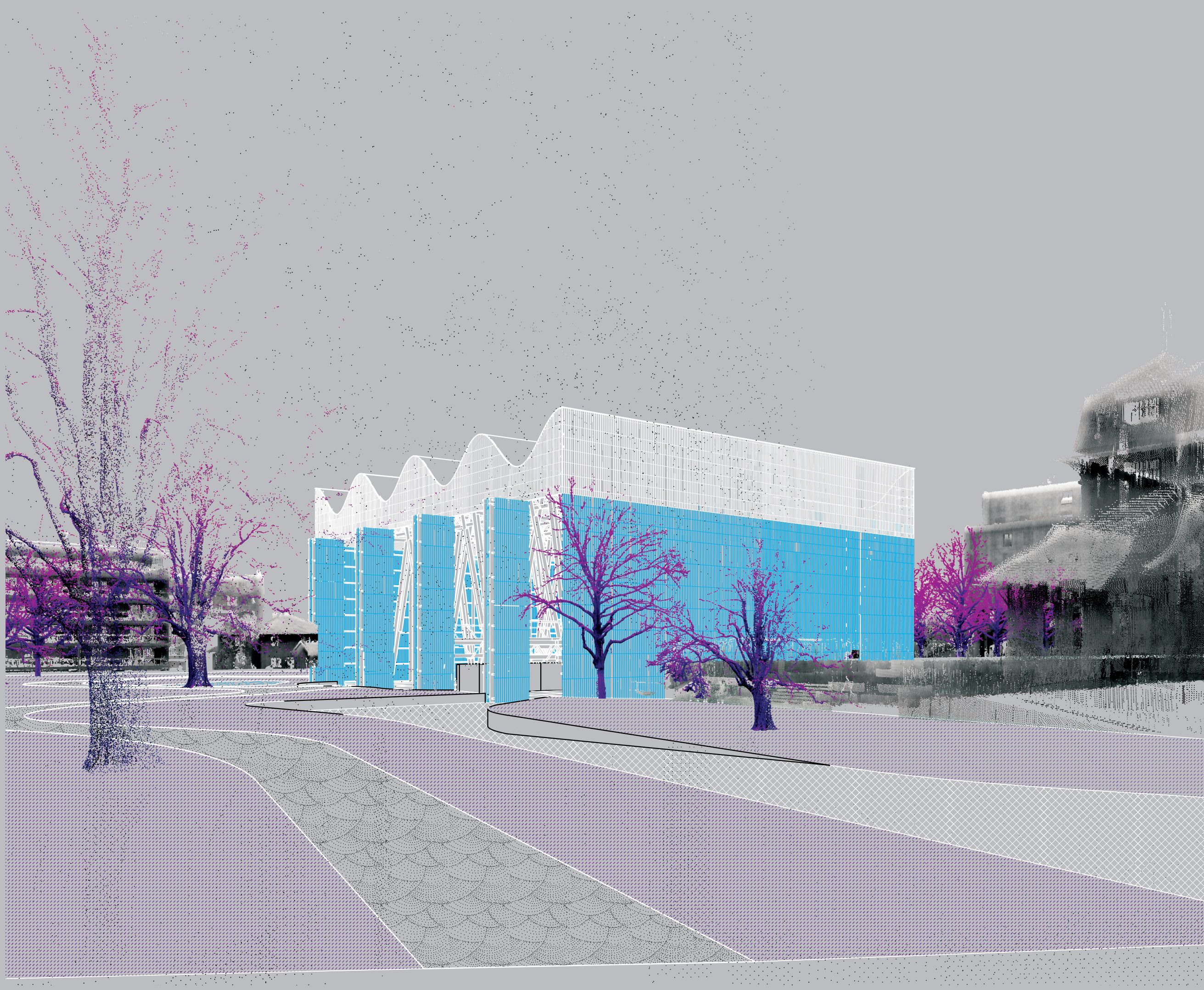
entrance perspective - from rue de la gare



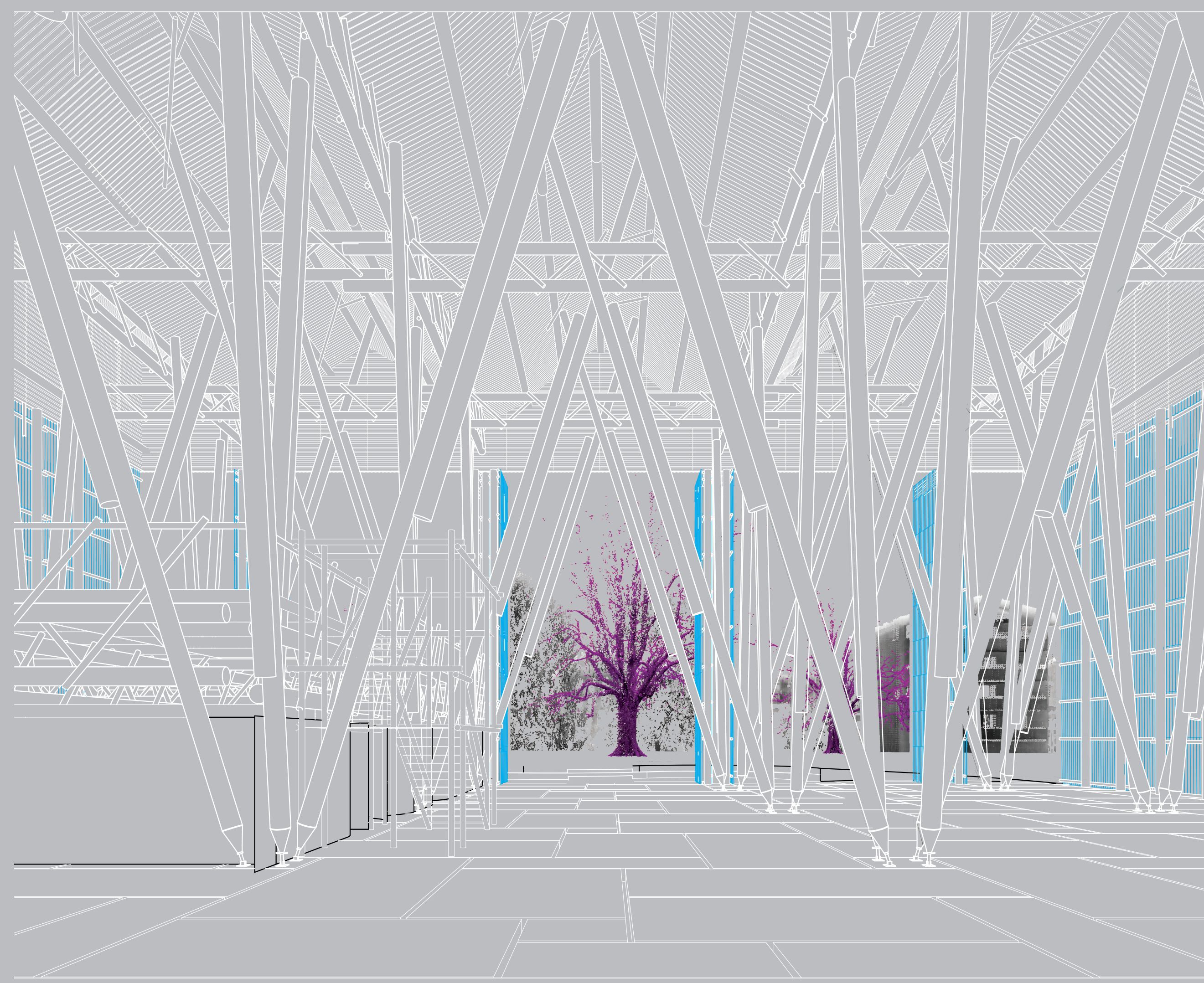
ground floor plan - h = 2 m - 1 : 100



transversal section - 1 : 100



perspective from the park entrance



interior perspective