



Student
Daniel Halman

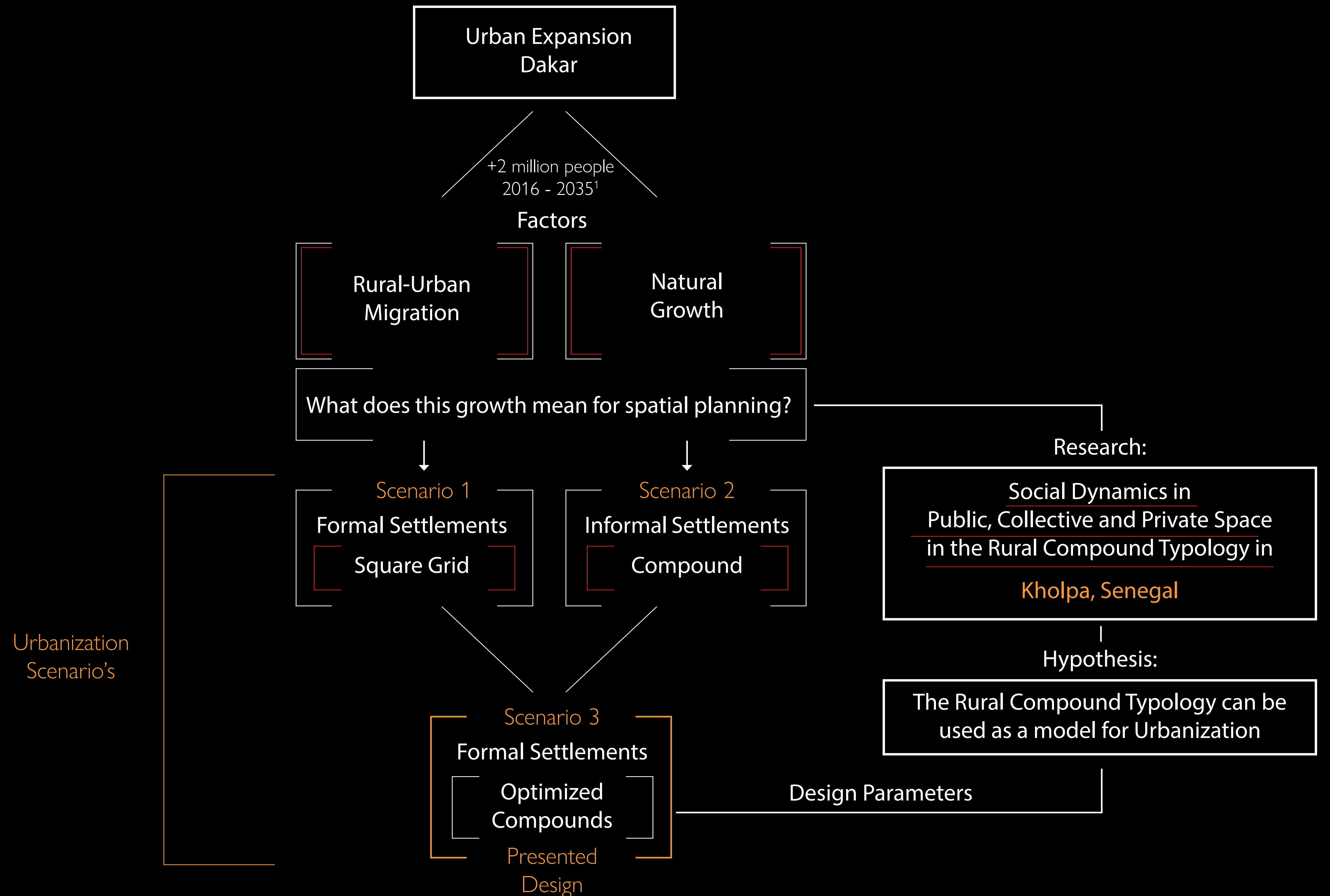
AR3AE100
P4 16|05|2023

Design Tutor
Ir. Thomas Offermans

BT Tutor
Ir. Paddy Thomesen

Research Tutor
Dr. Olga Ioannou



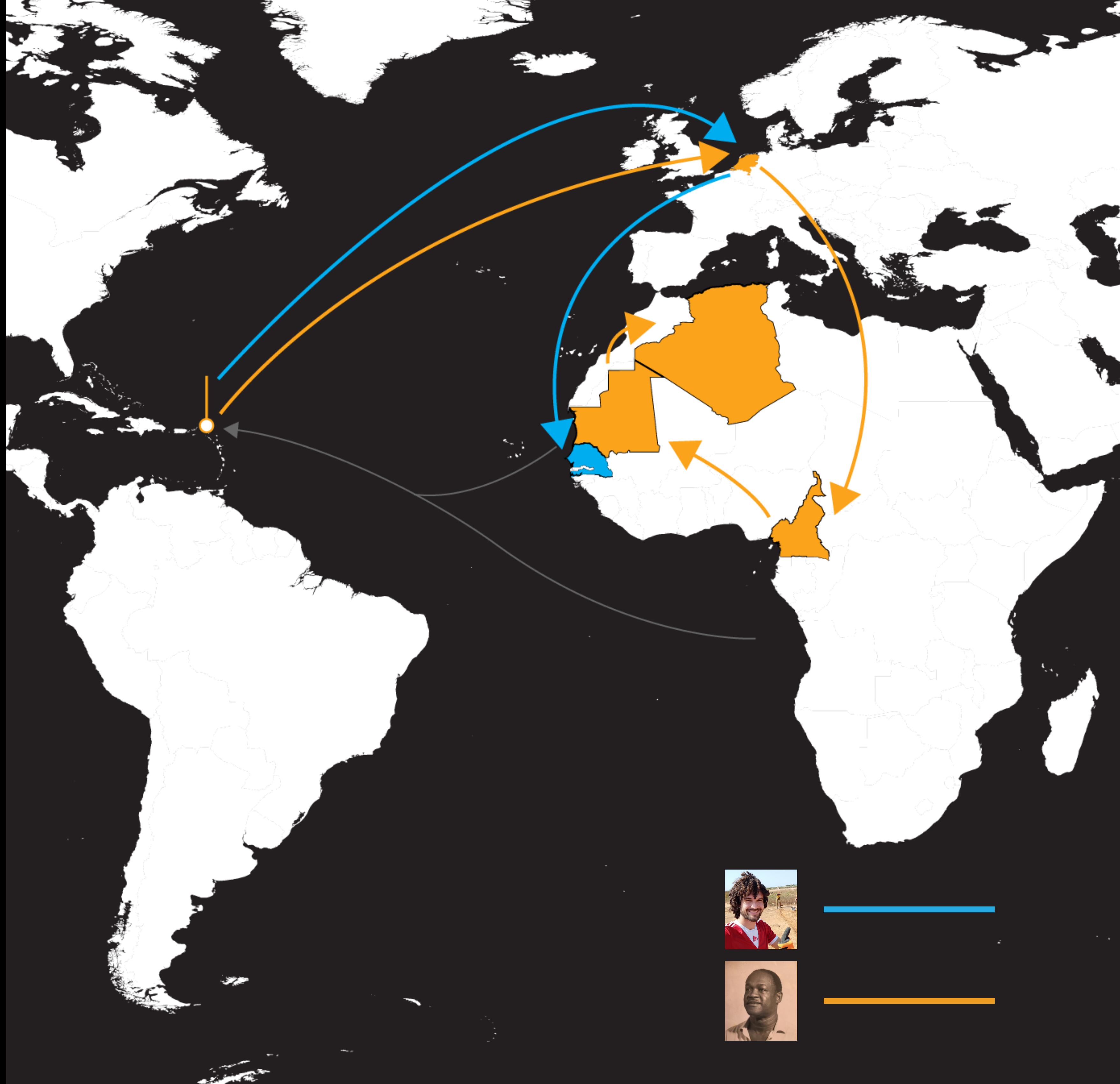


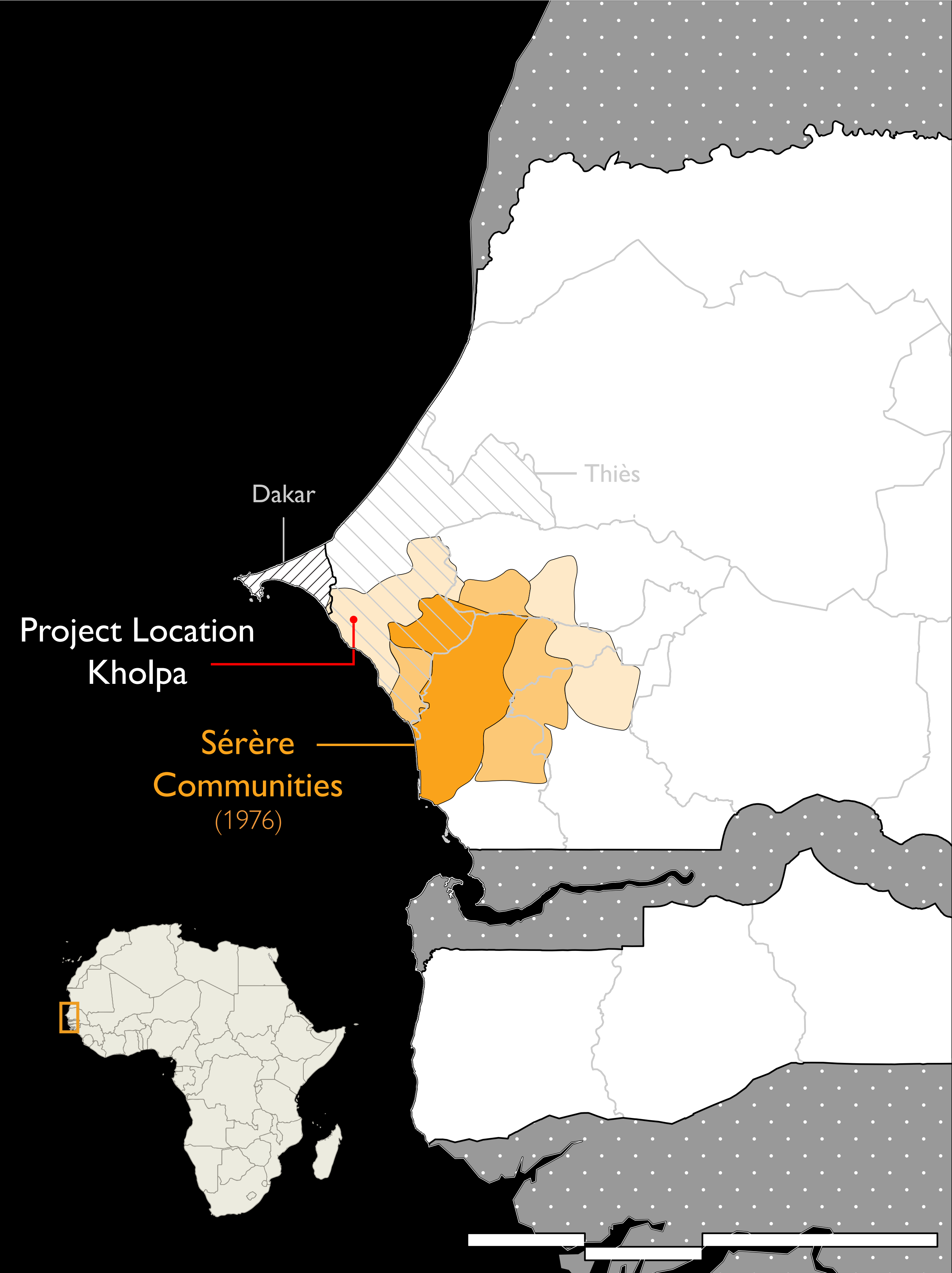
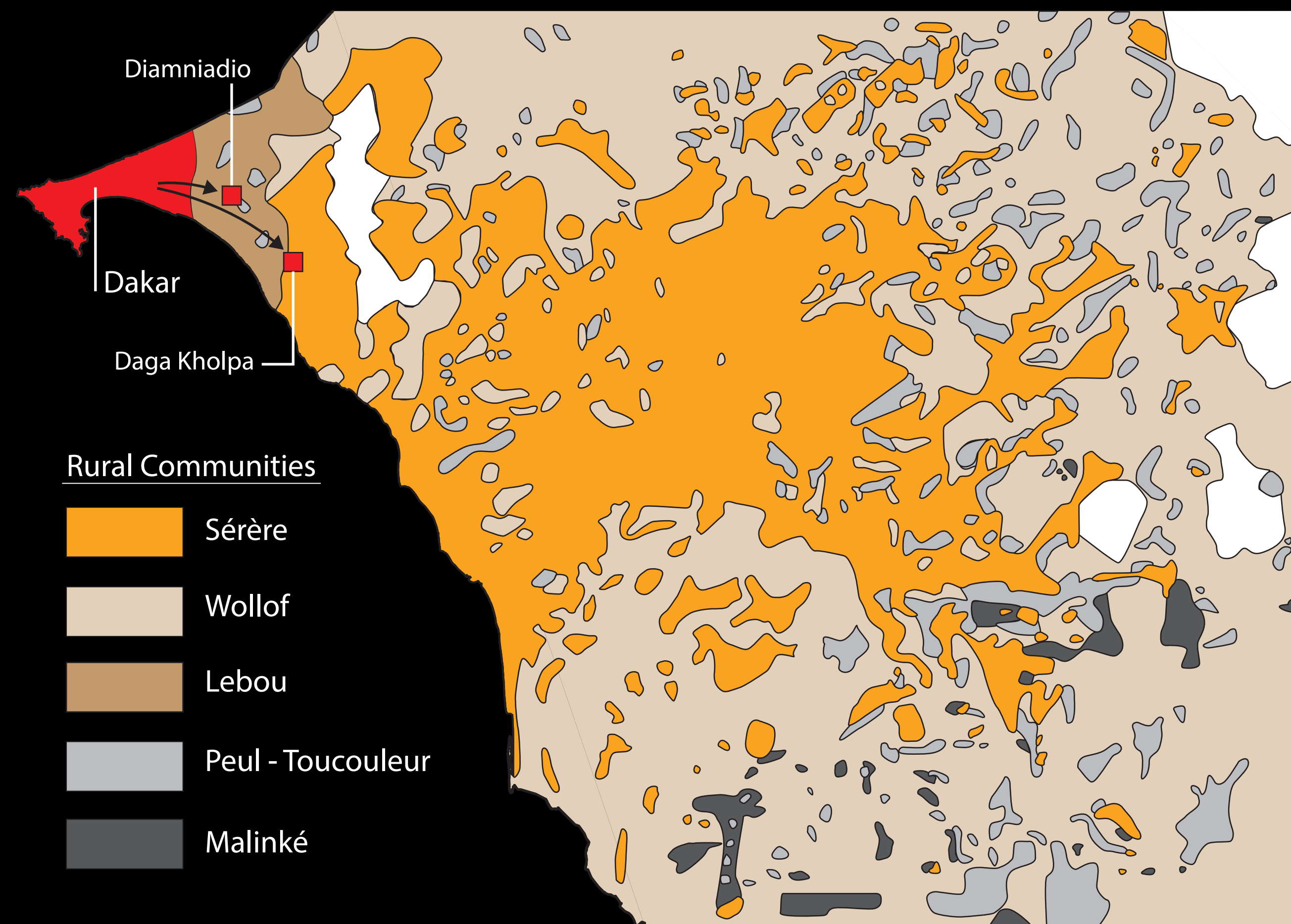


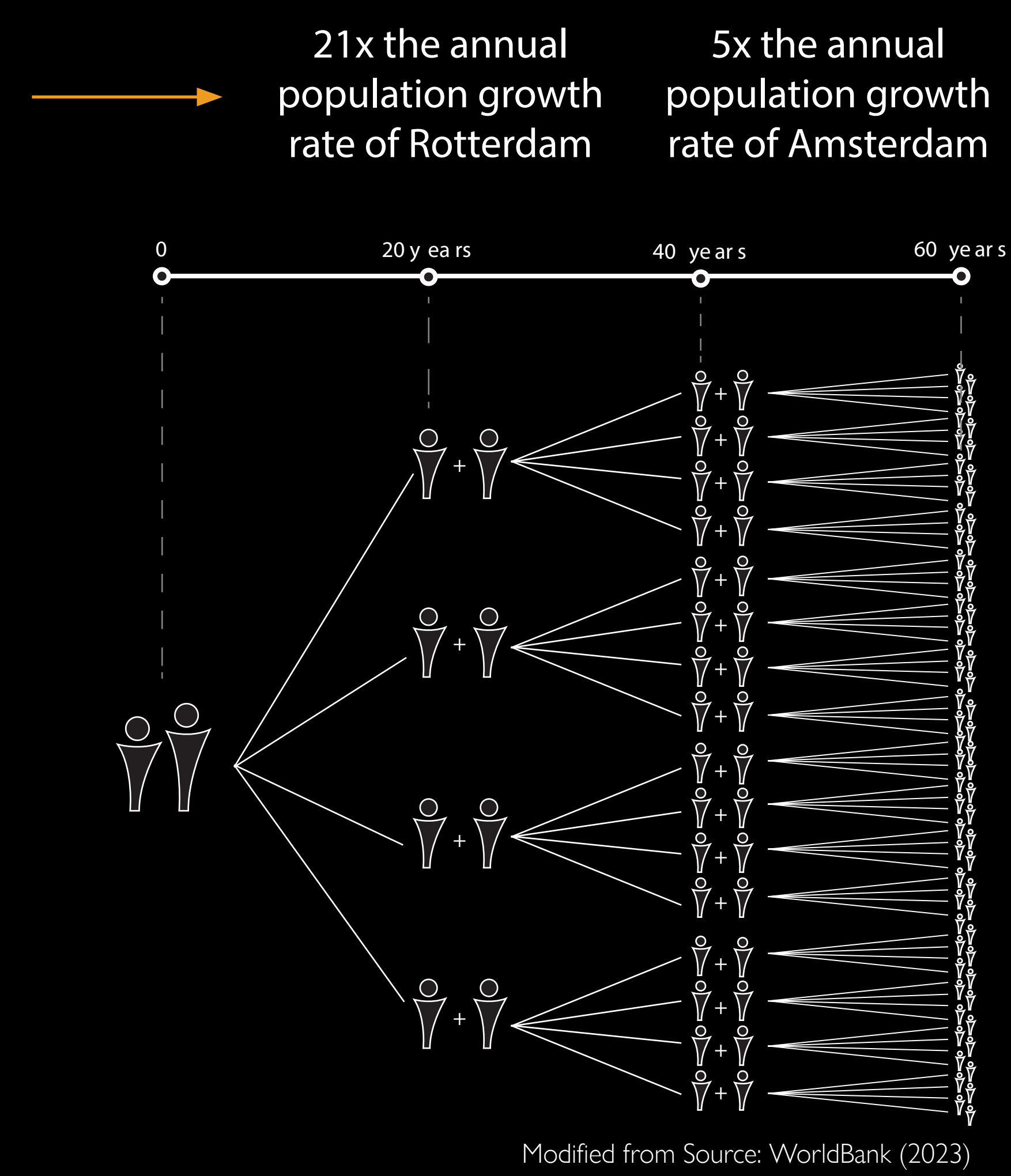
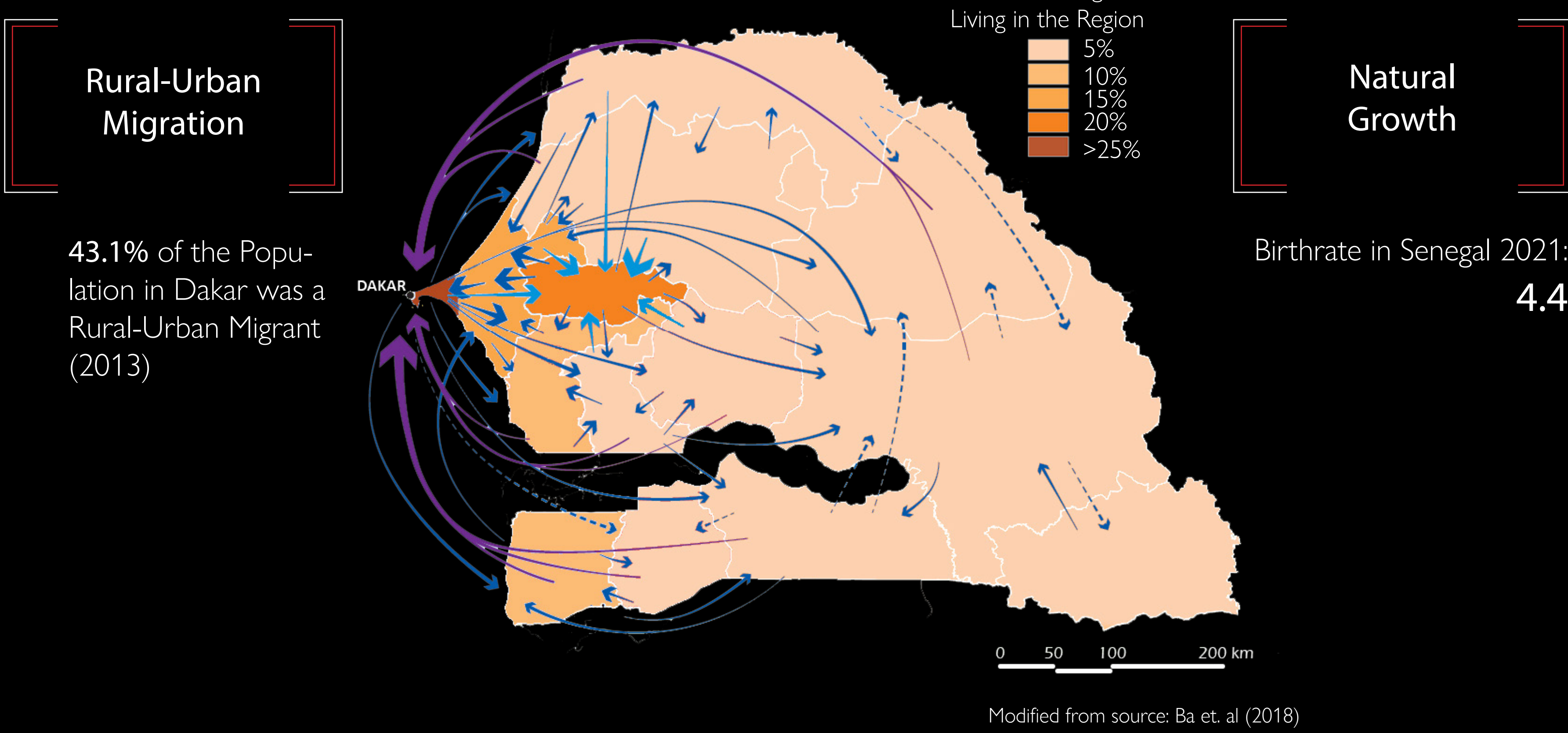
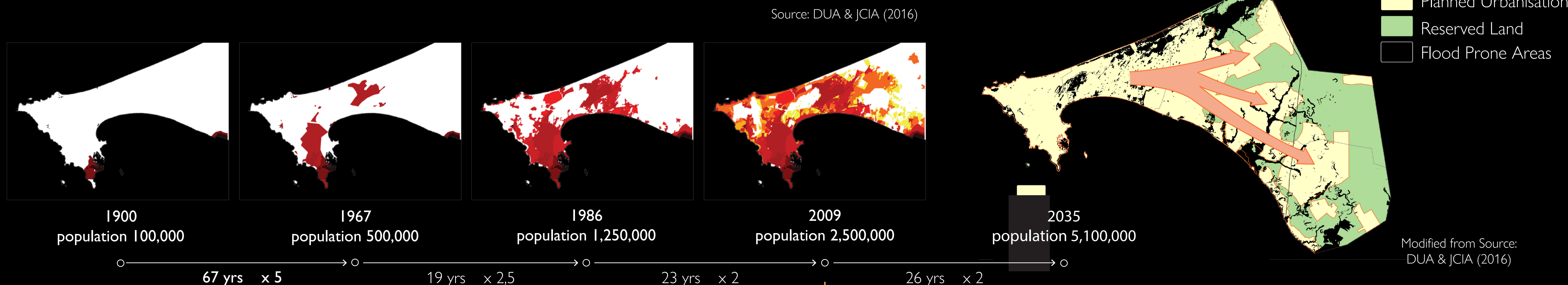
This Project is Dedicated to my Grandfather

Manuel (Bob) Halman

1938 - 2001

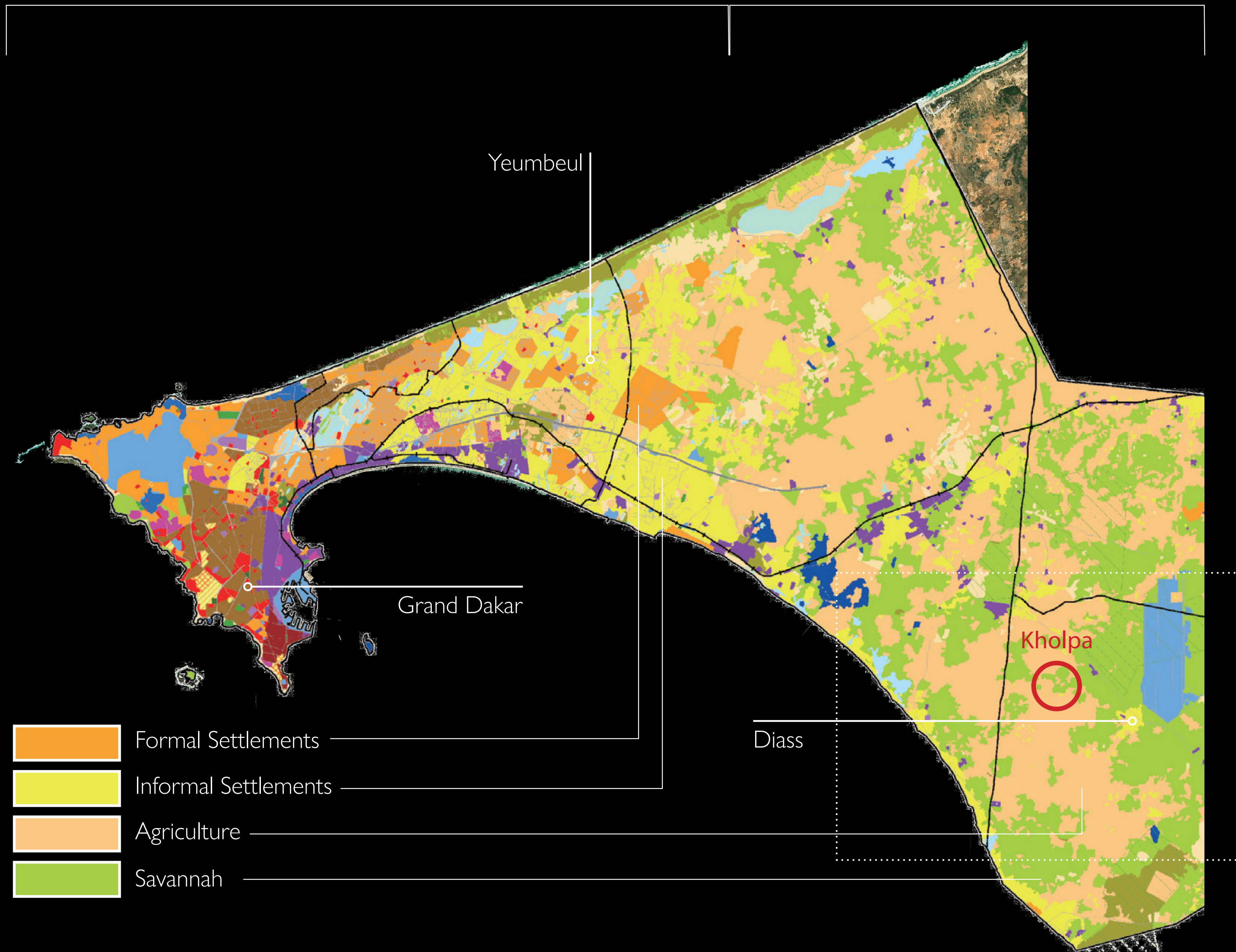




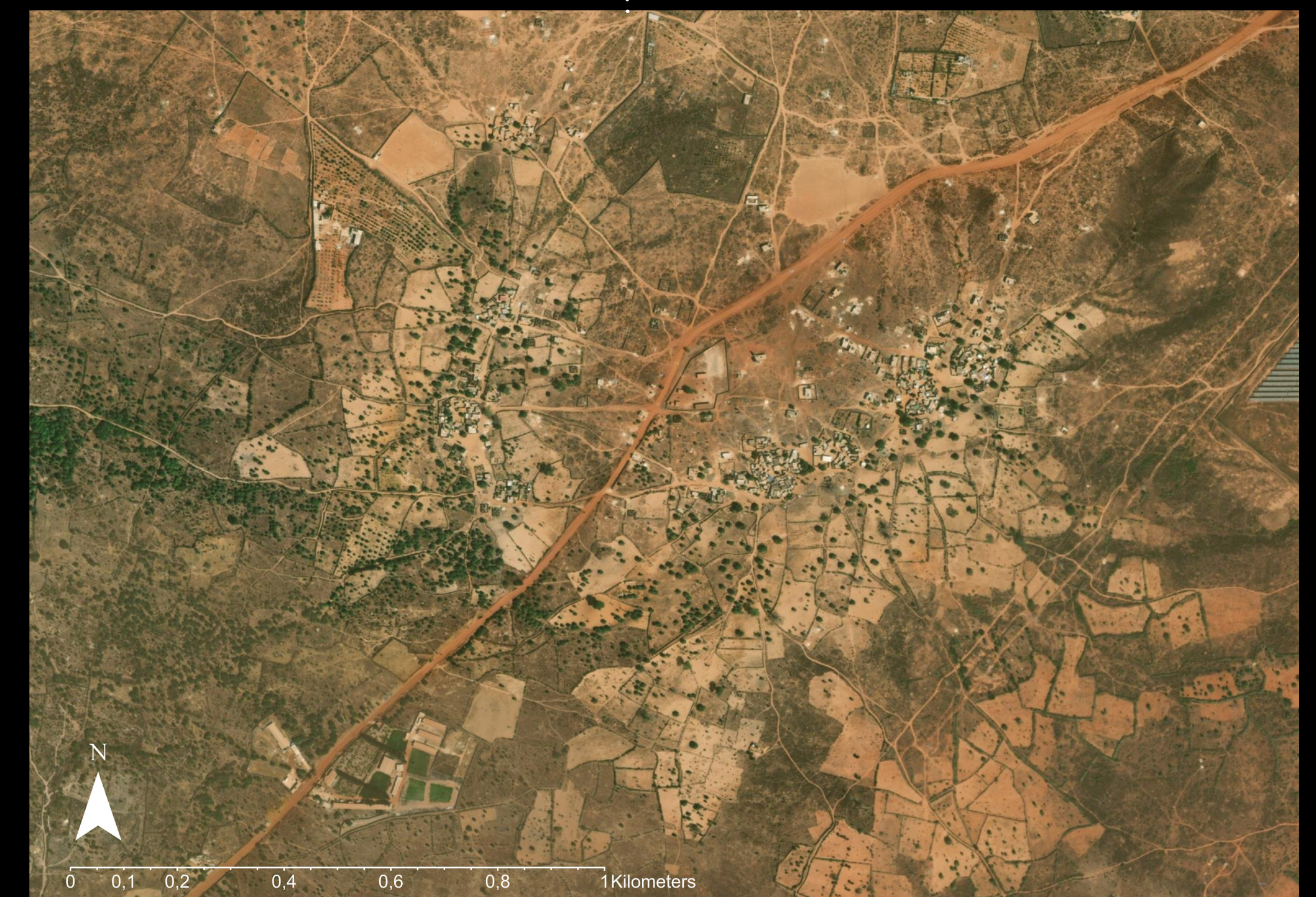
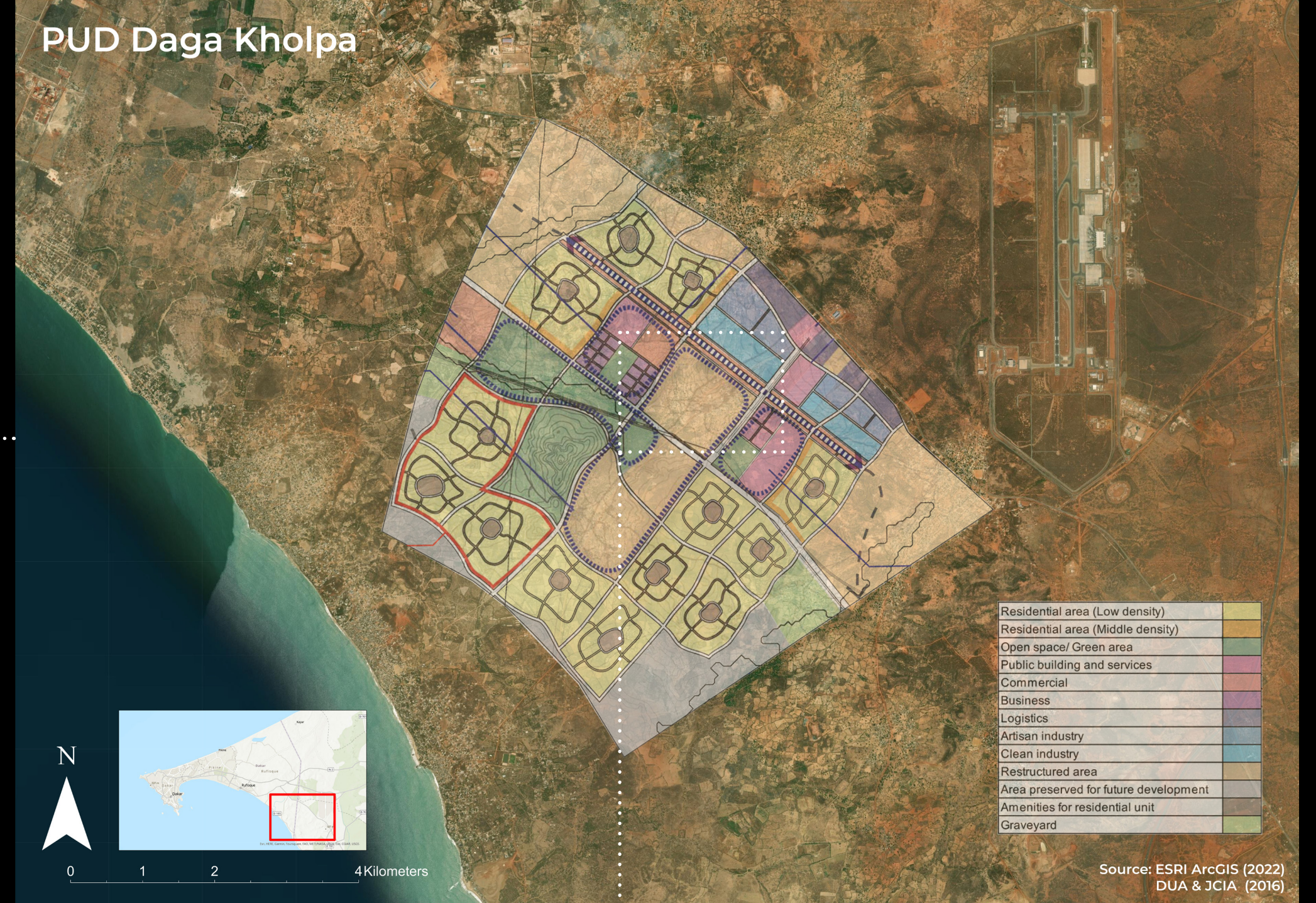


Urban Landscape

Peri Urban Landscape



Modified from Source:
DUA & JCIA (2016)



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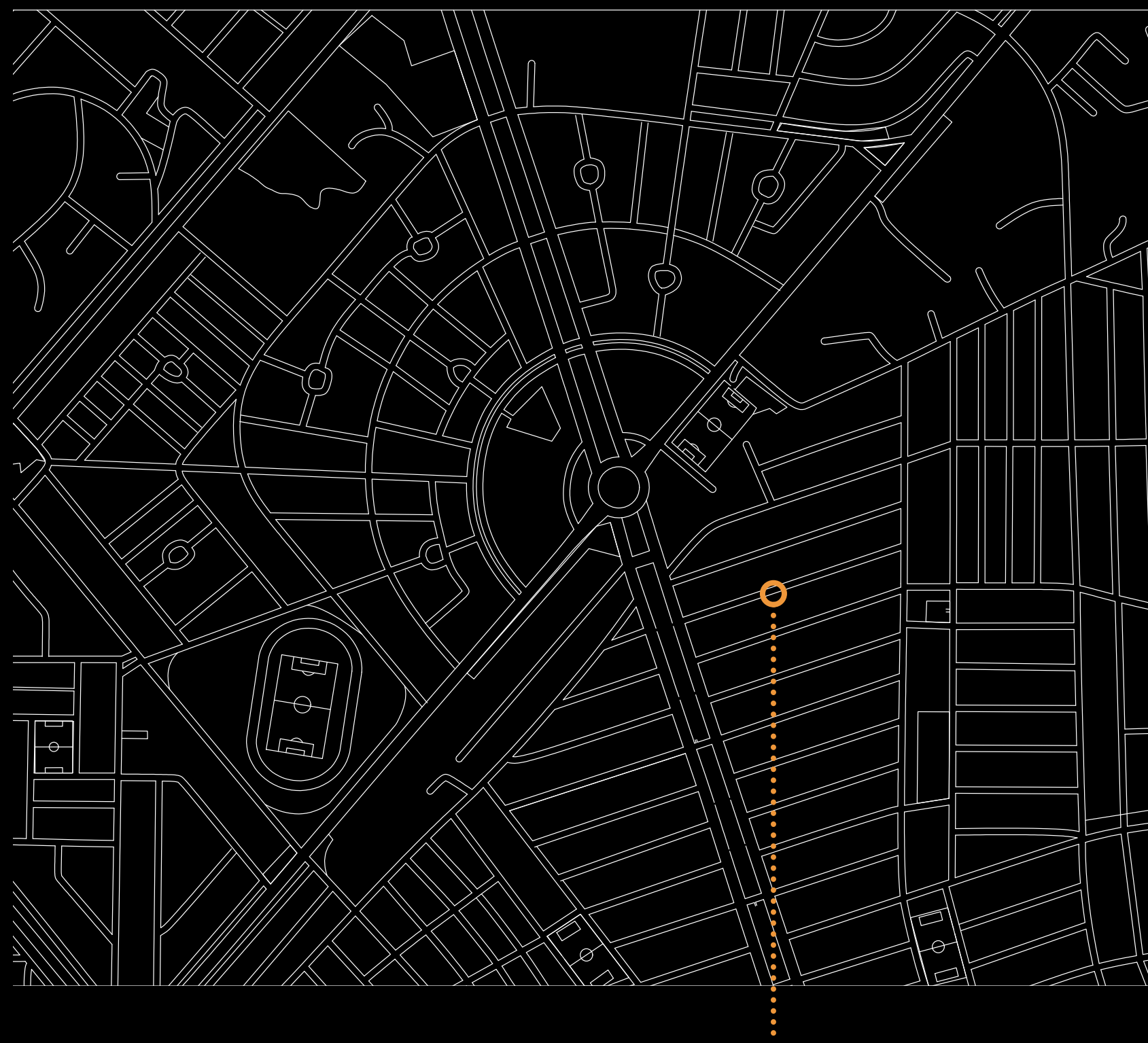
Nouvelles récentes



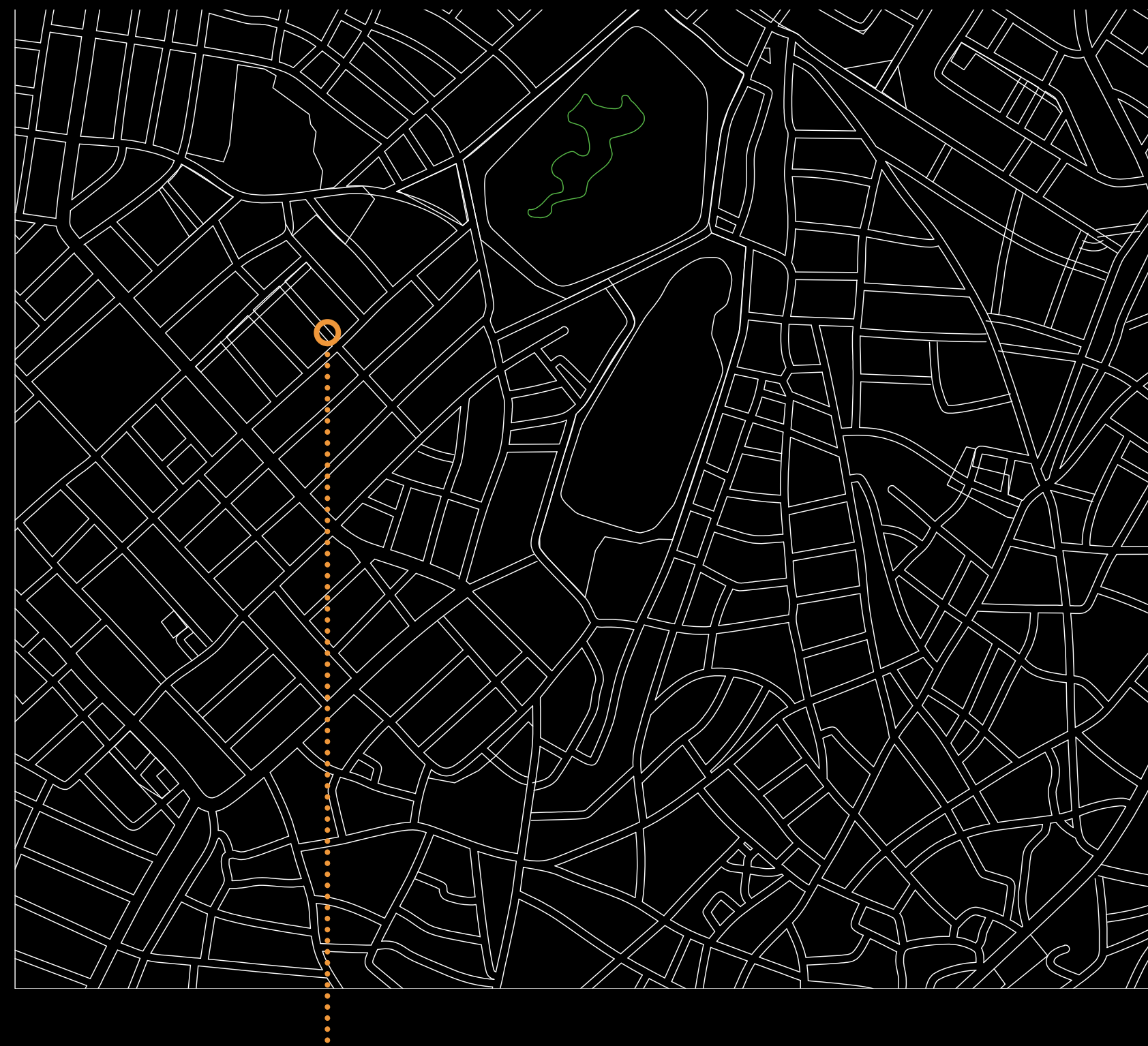
Source: senegalembassy.co.za & www.businessinsider.nl

Should New Senegalese Cities Look Like This?

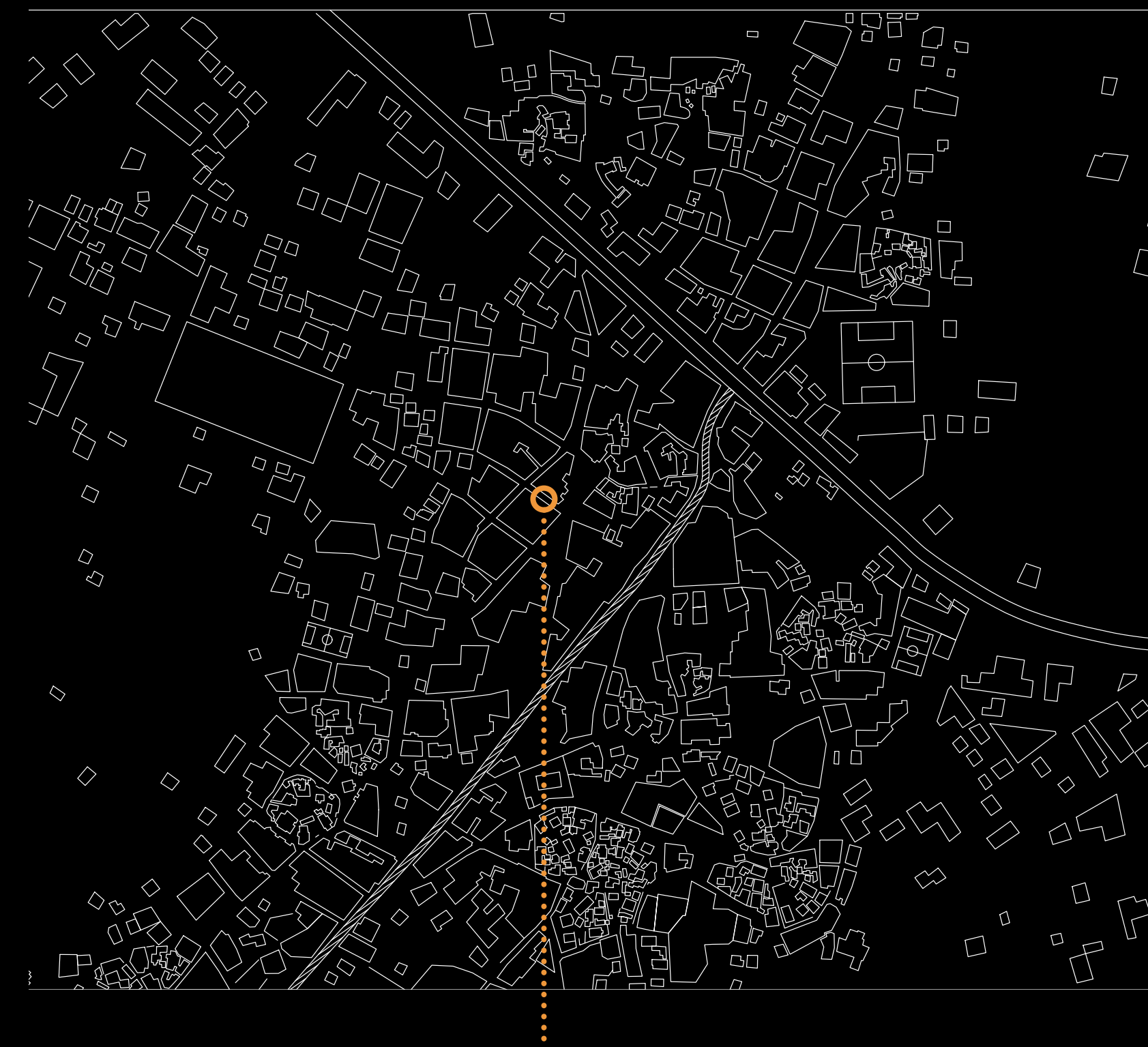
Grand Dakar



Yeumbeul



Diass













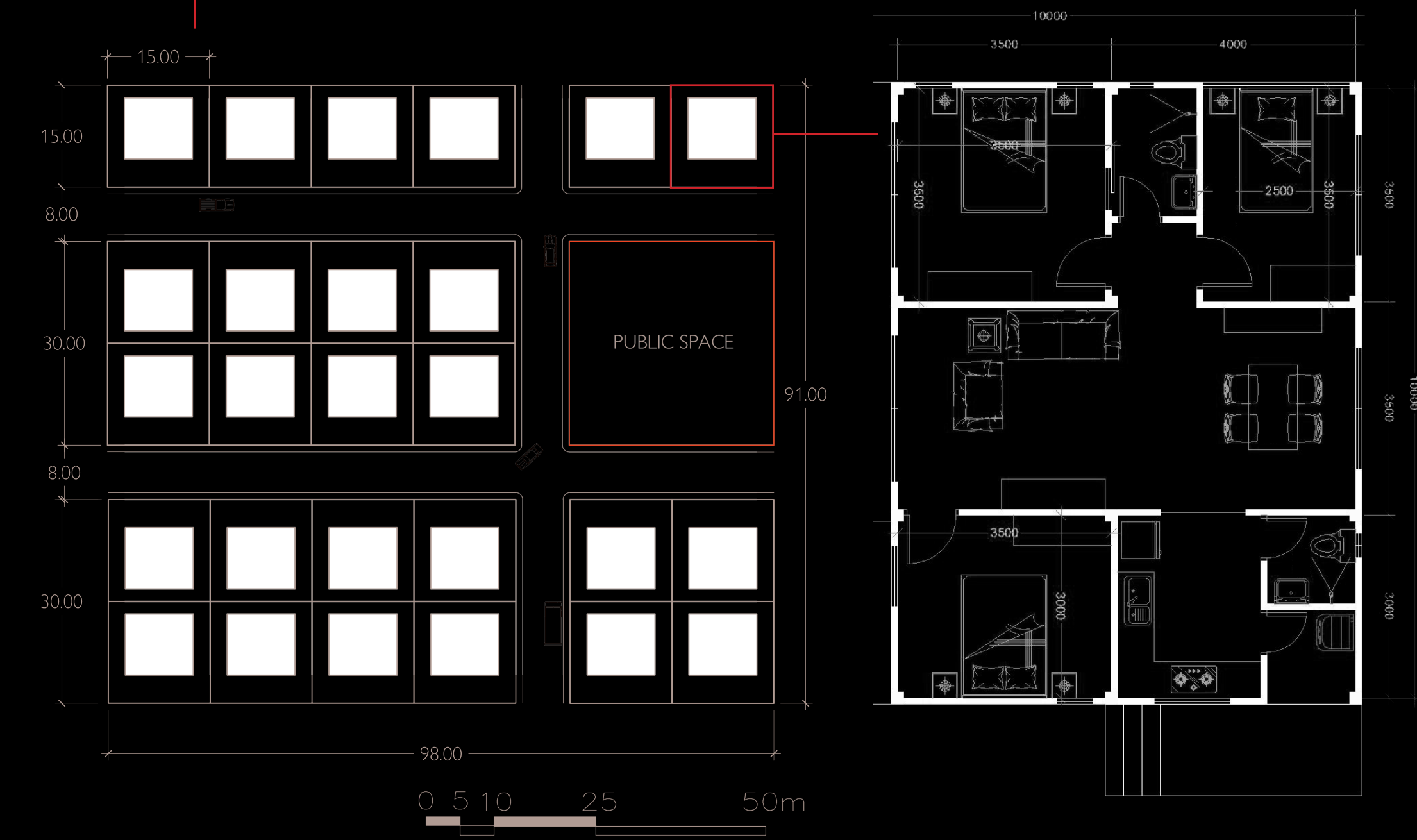




MUNICIPAL URBAN PLANNING APPROACH



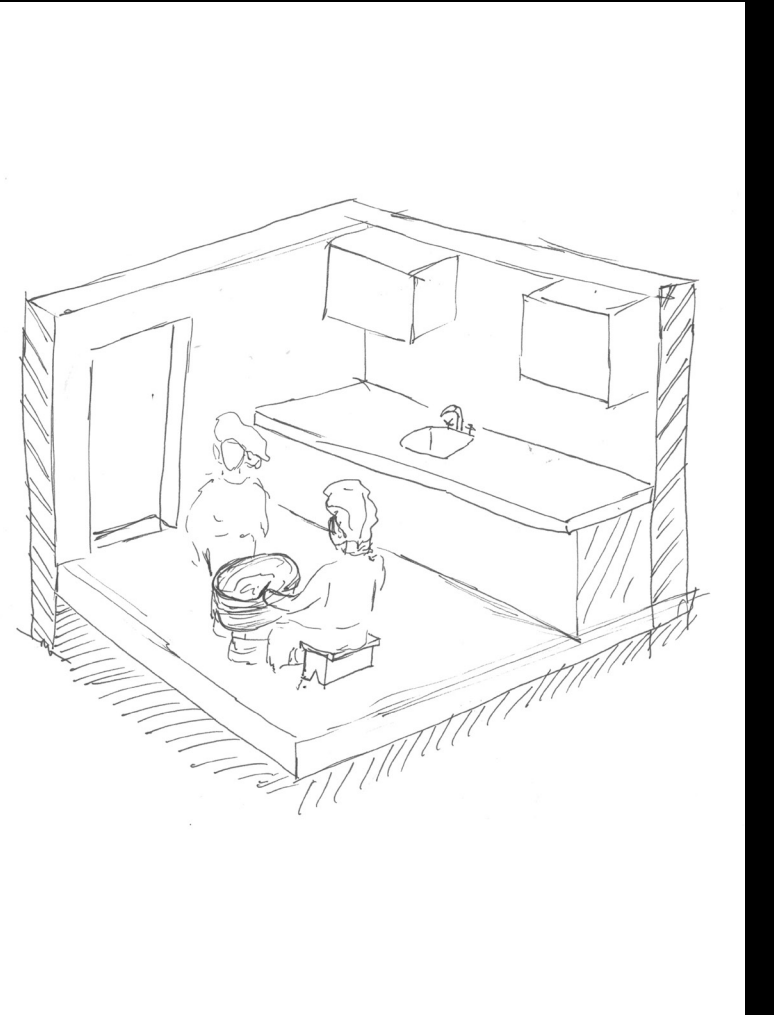
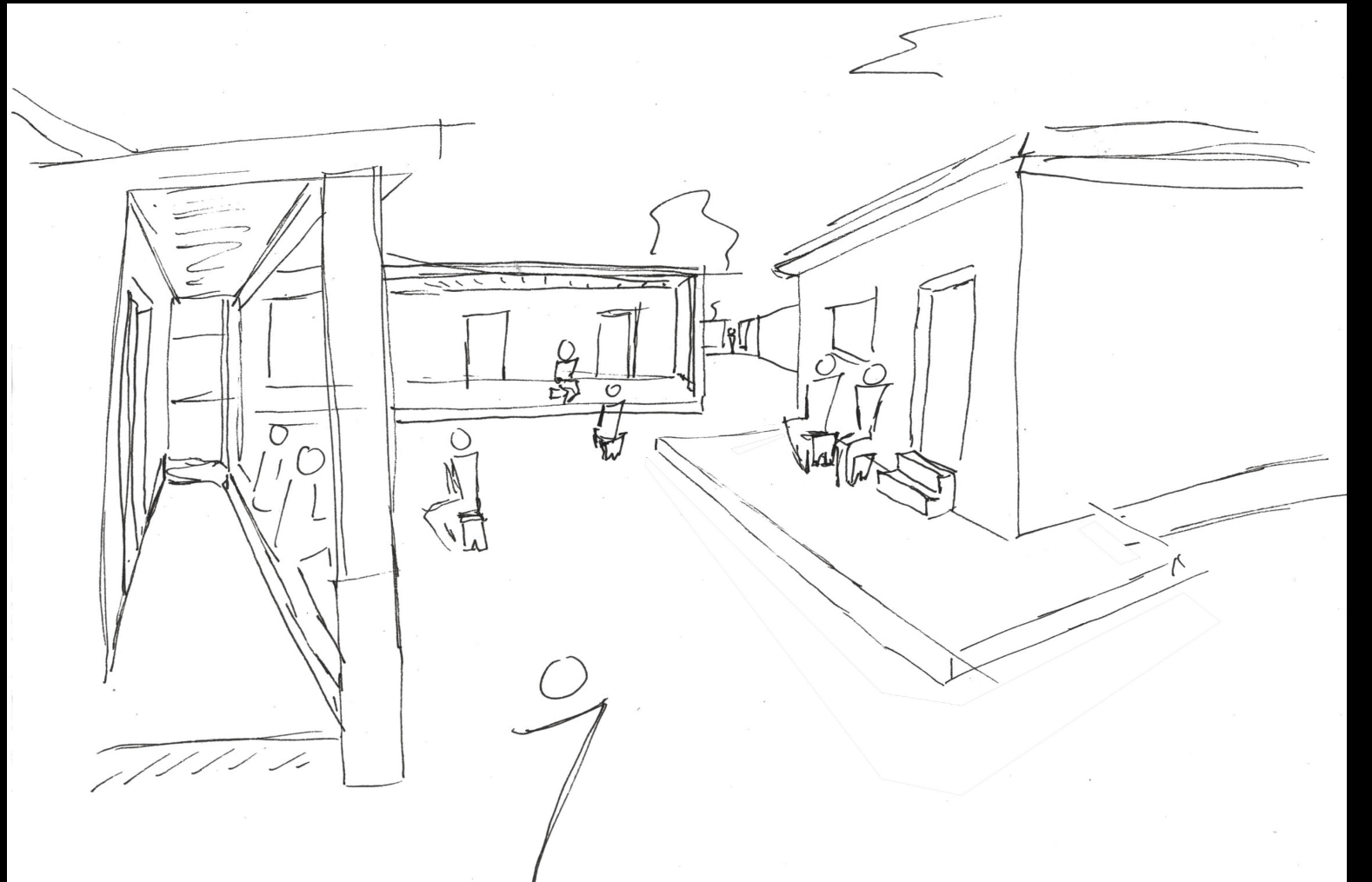
Source: Department of Urban Planning Commune Ndlass



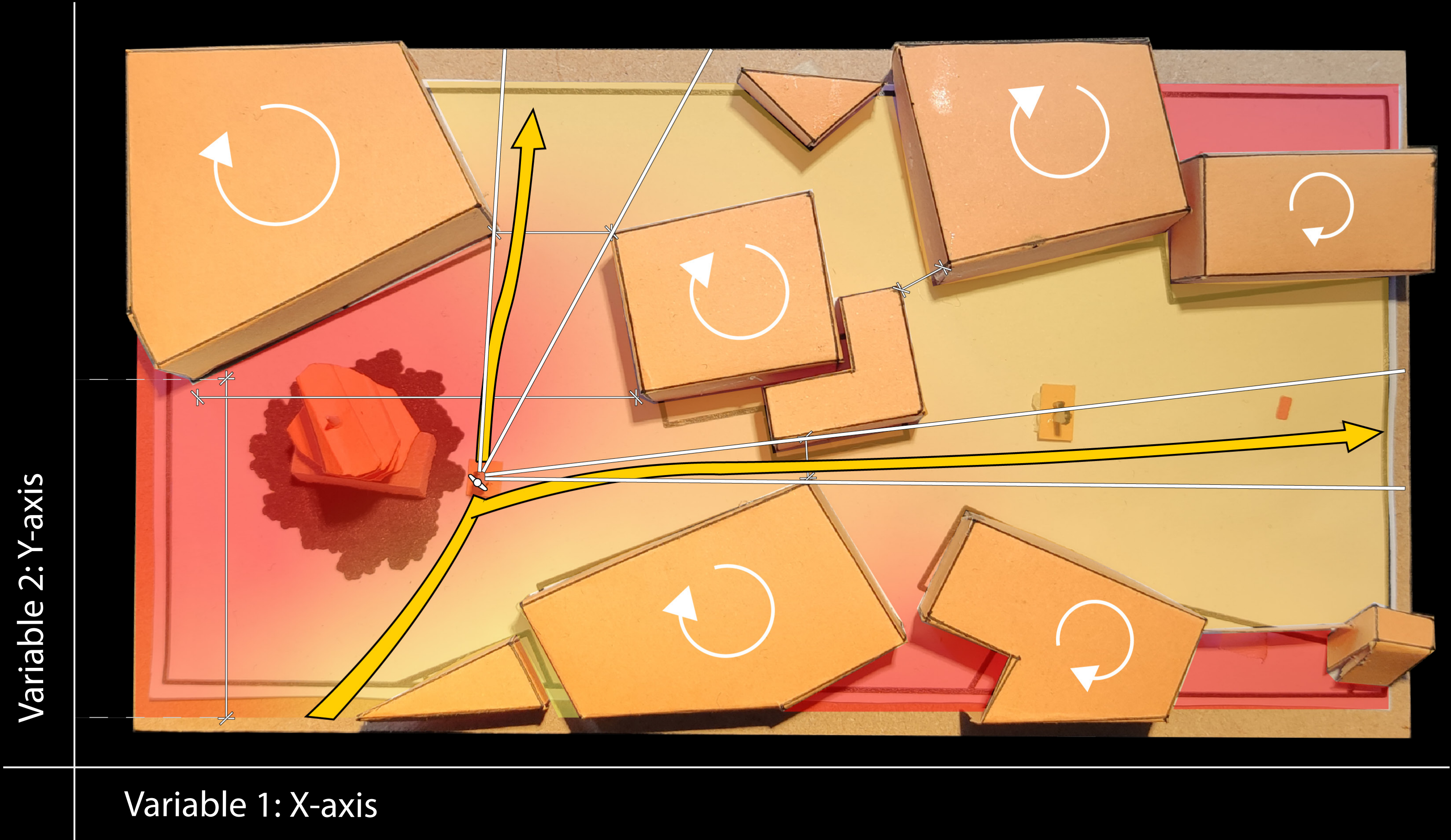
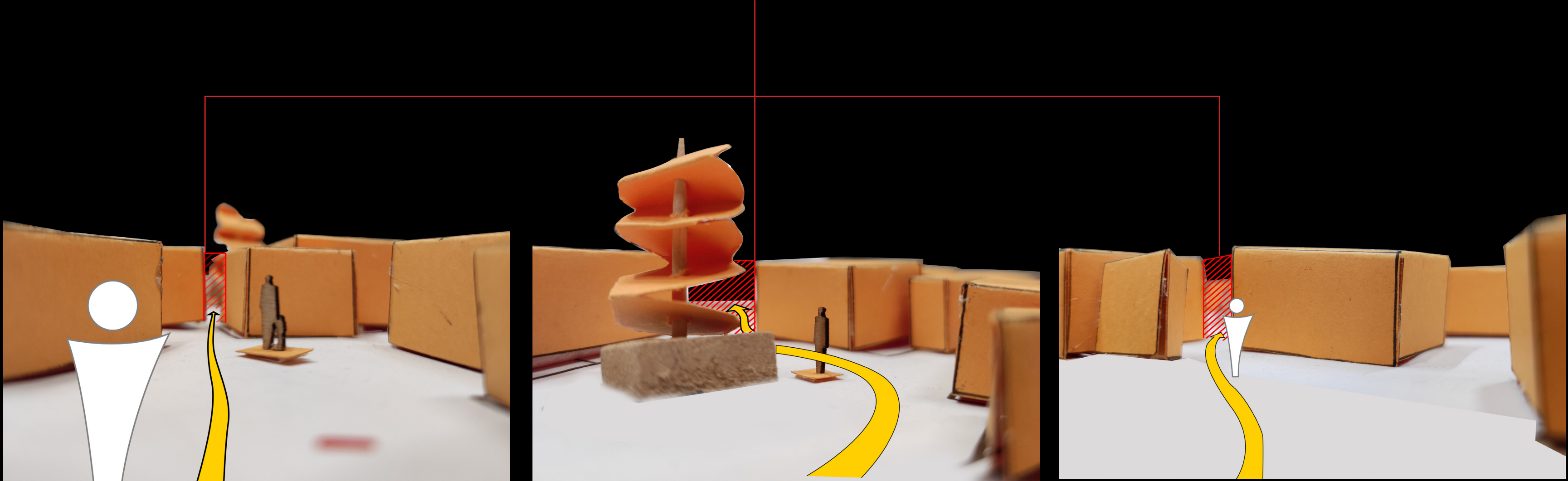


LEGEND





Curiosity Window: Inspires pedestrians to continue walking into a direction

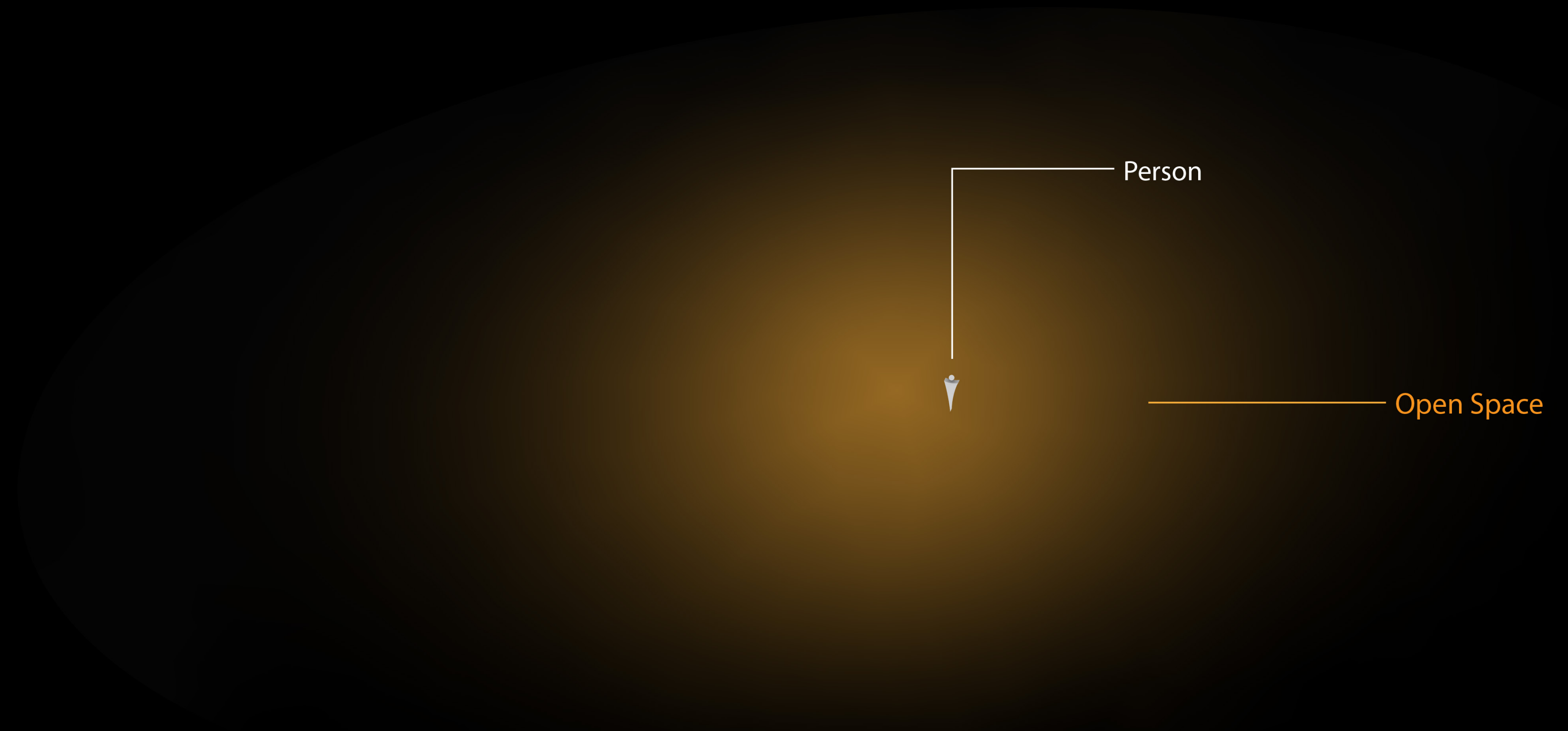








Permeability of Open Space in the Compound



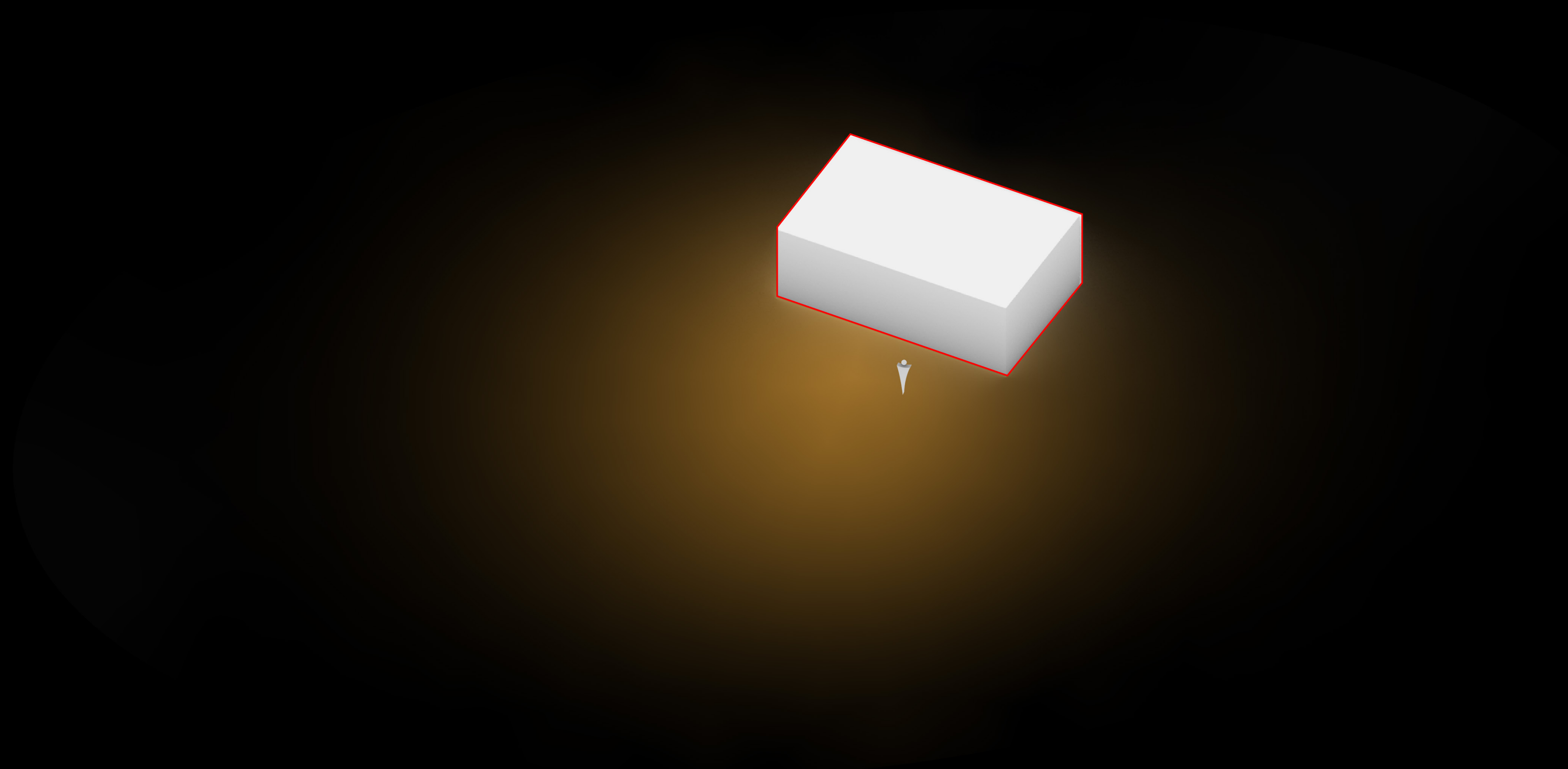
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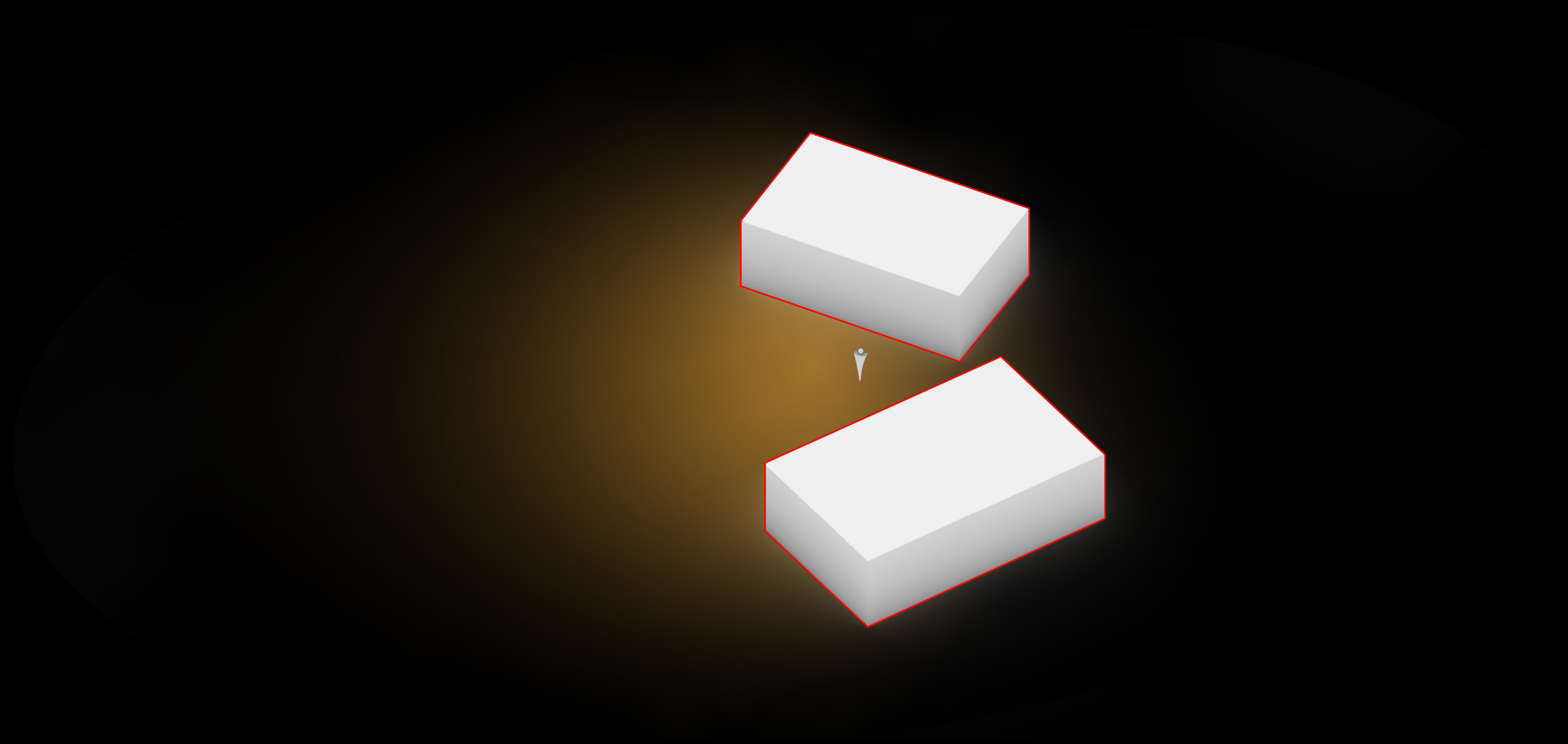


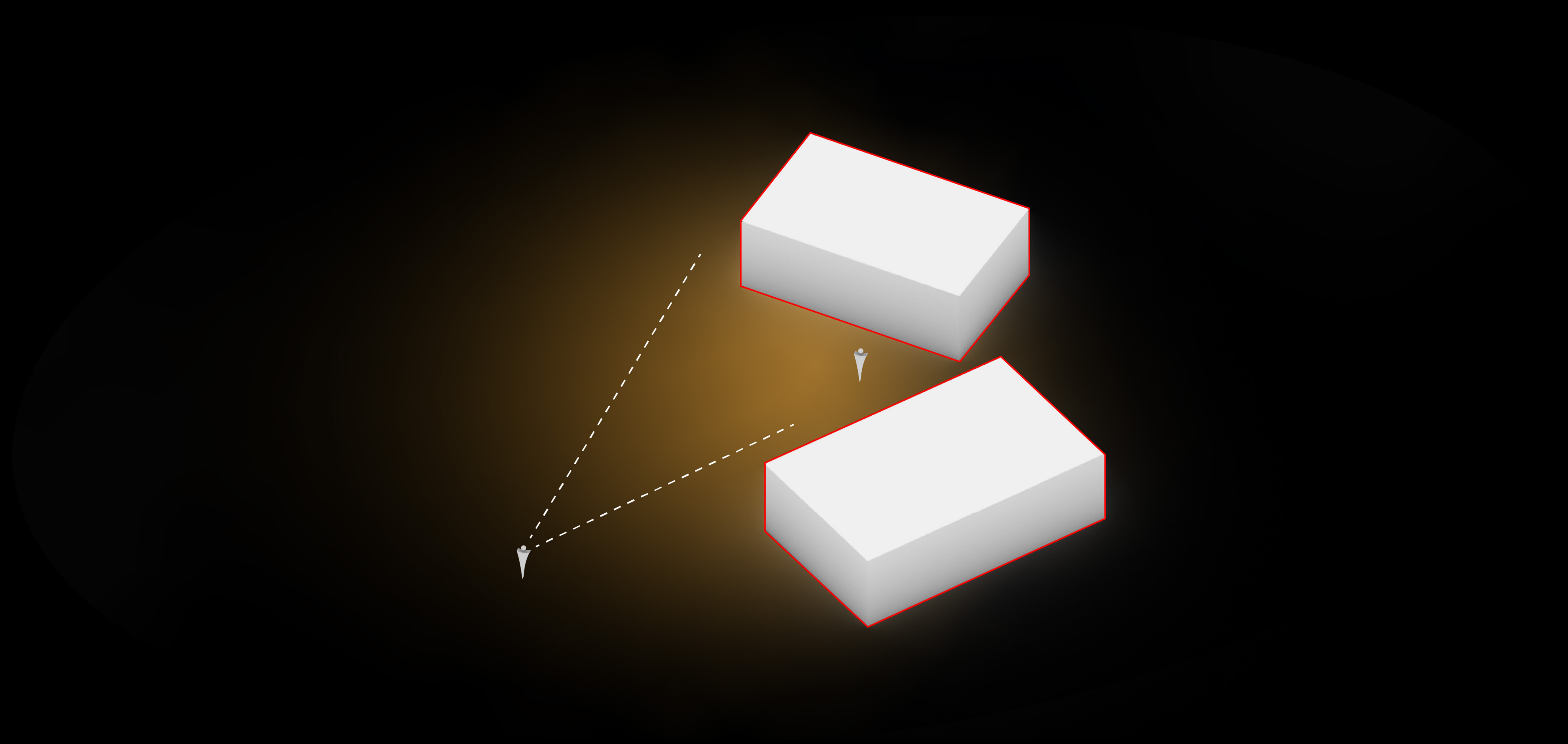
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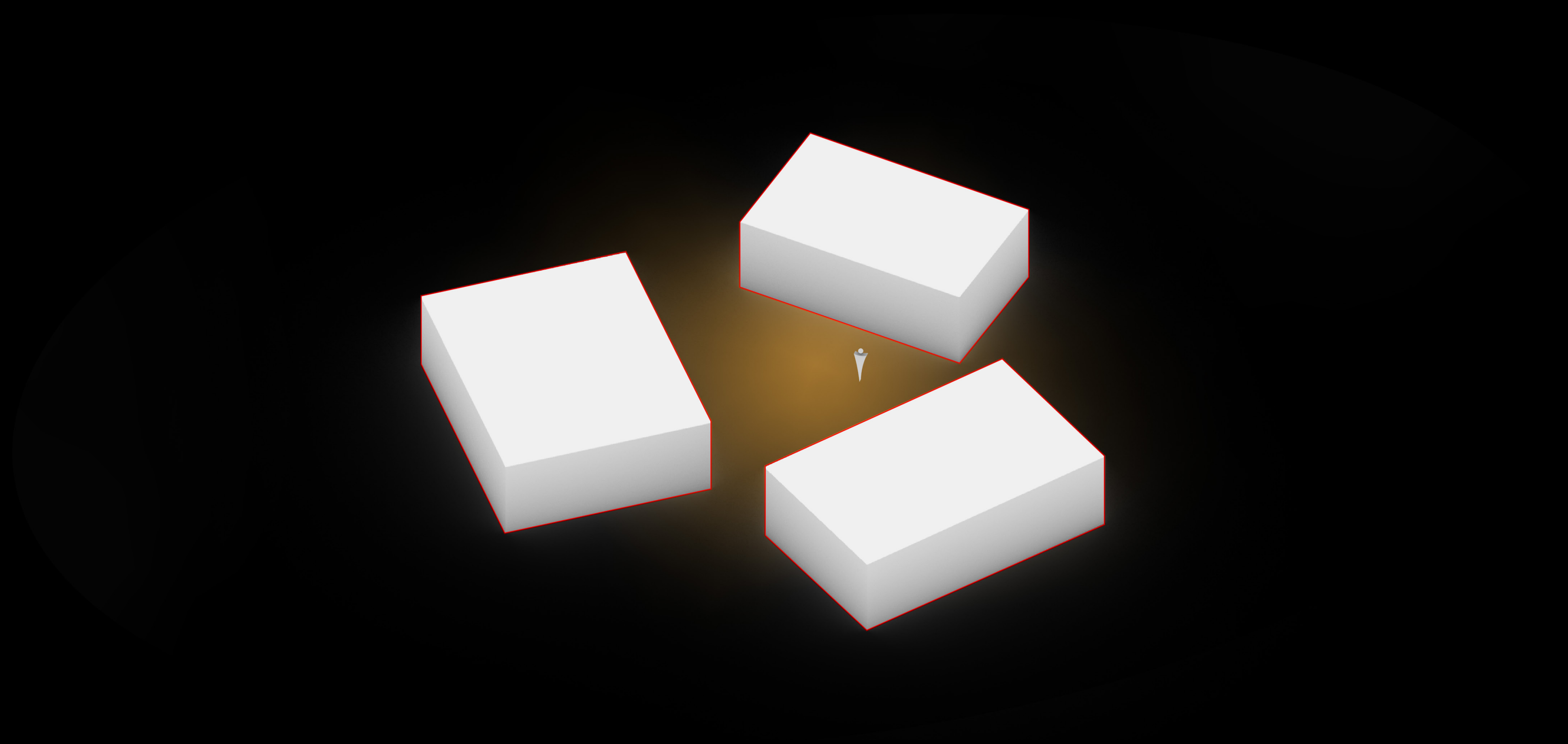


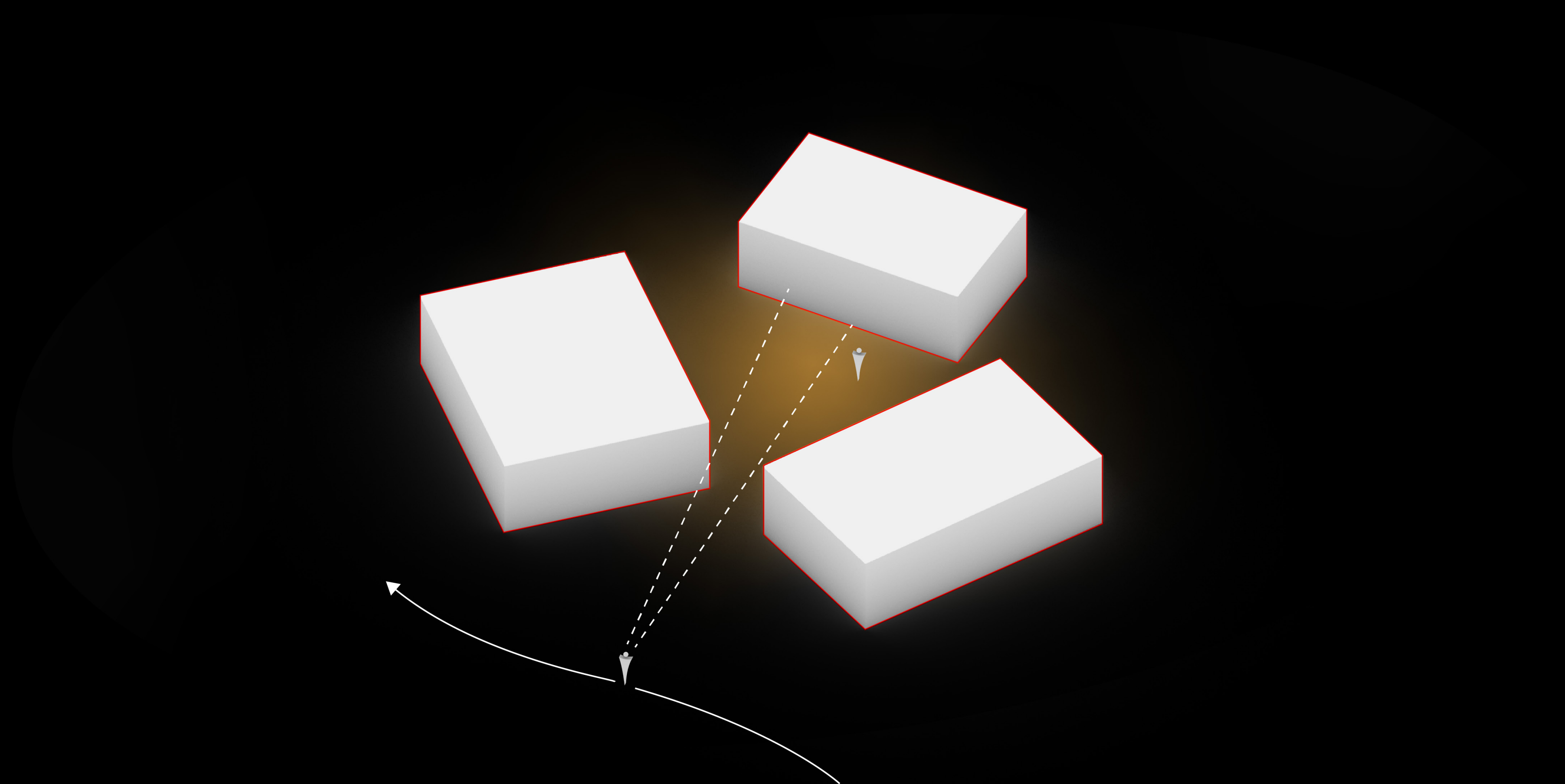
Visual

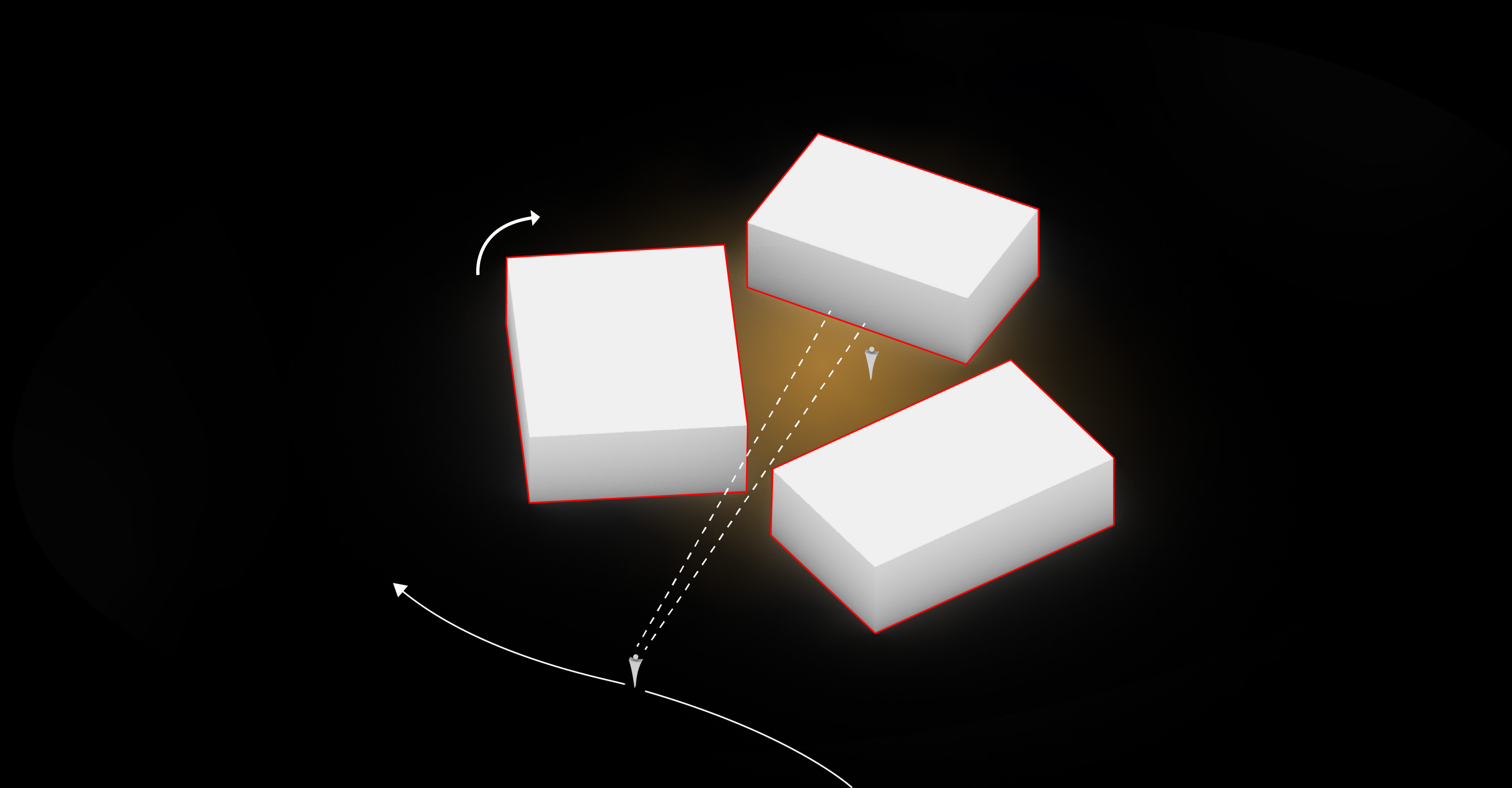


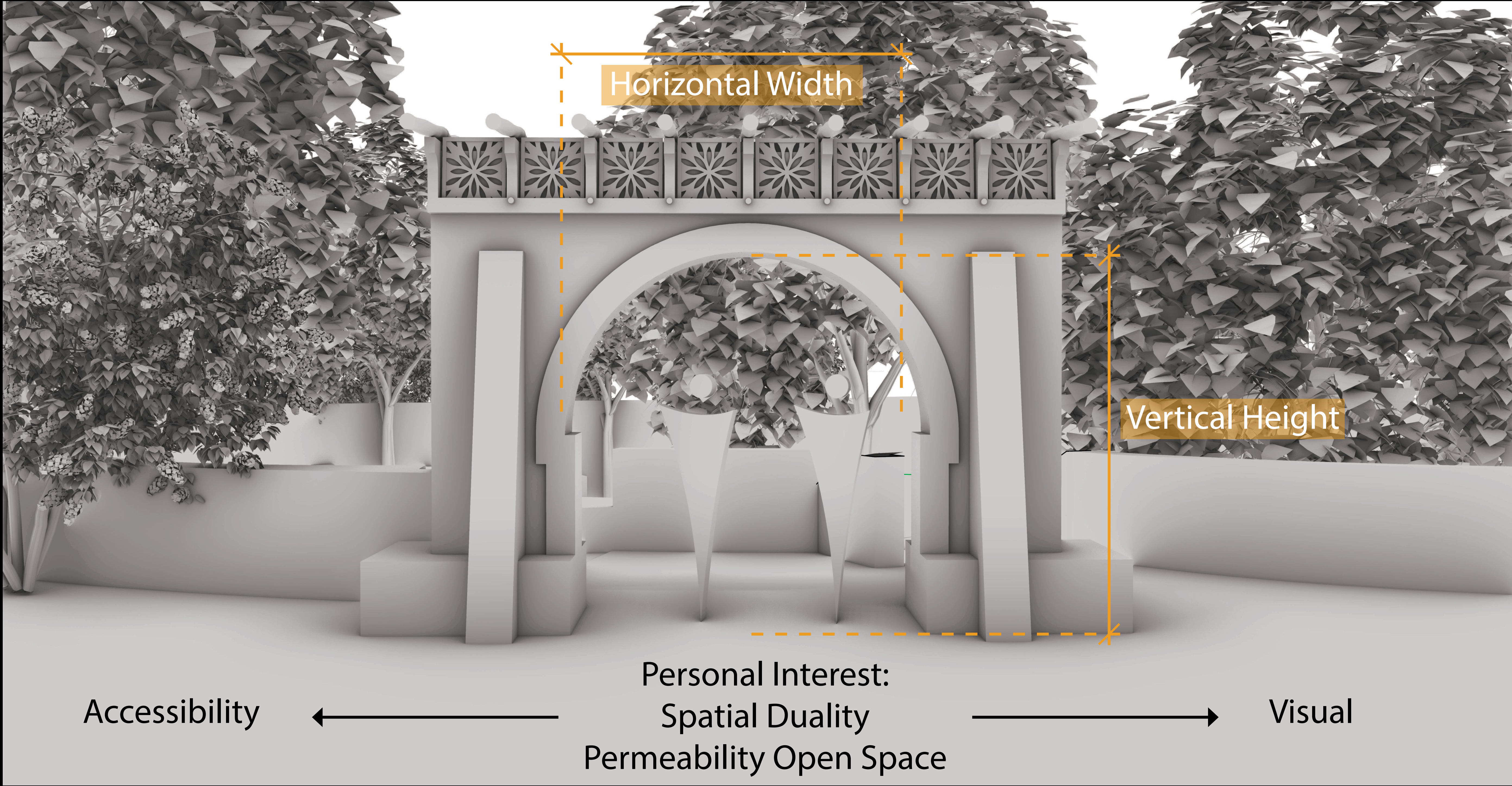












Horizontal Width

Vertical Height

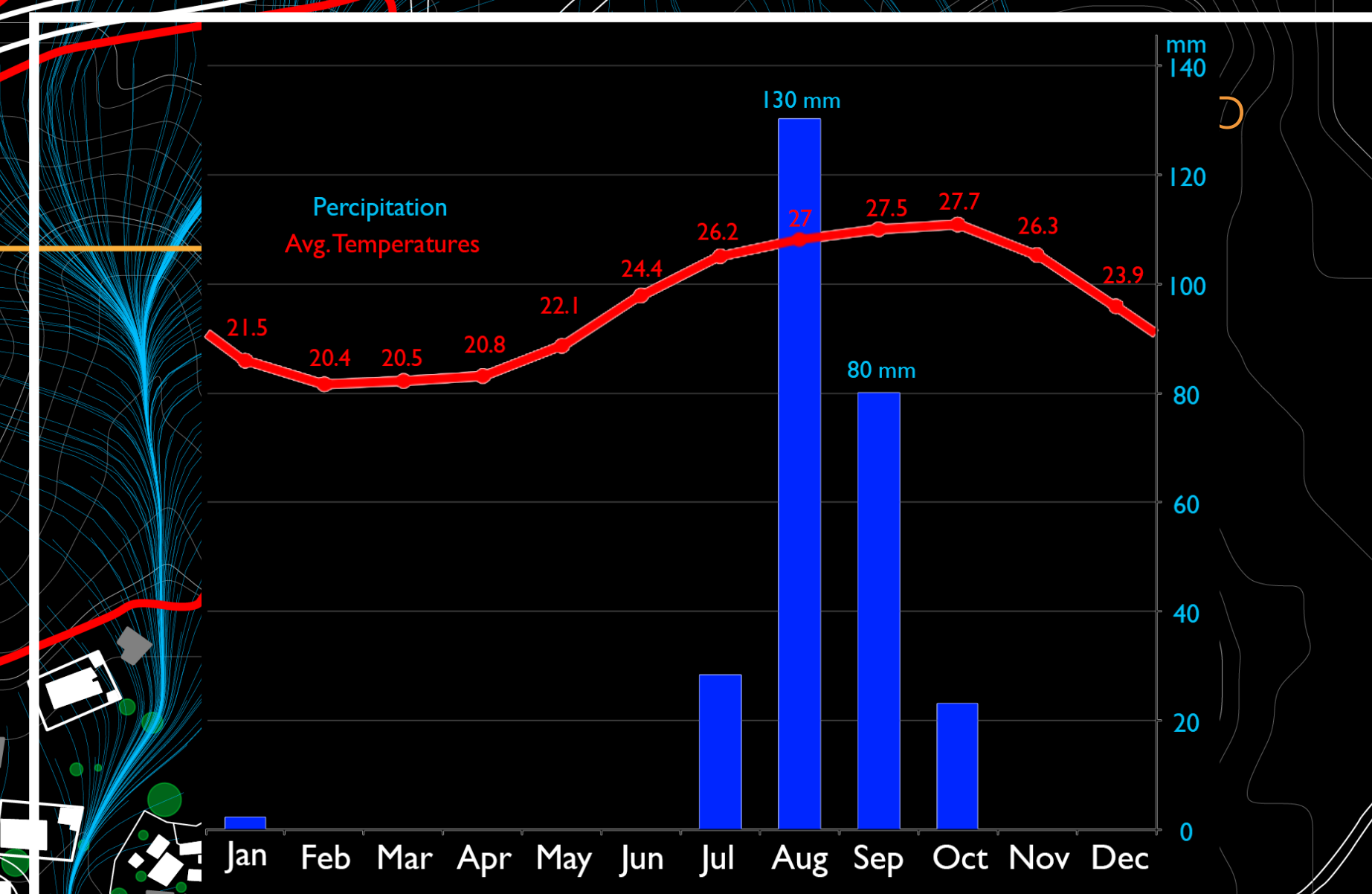
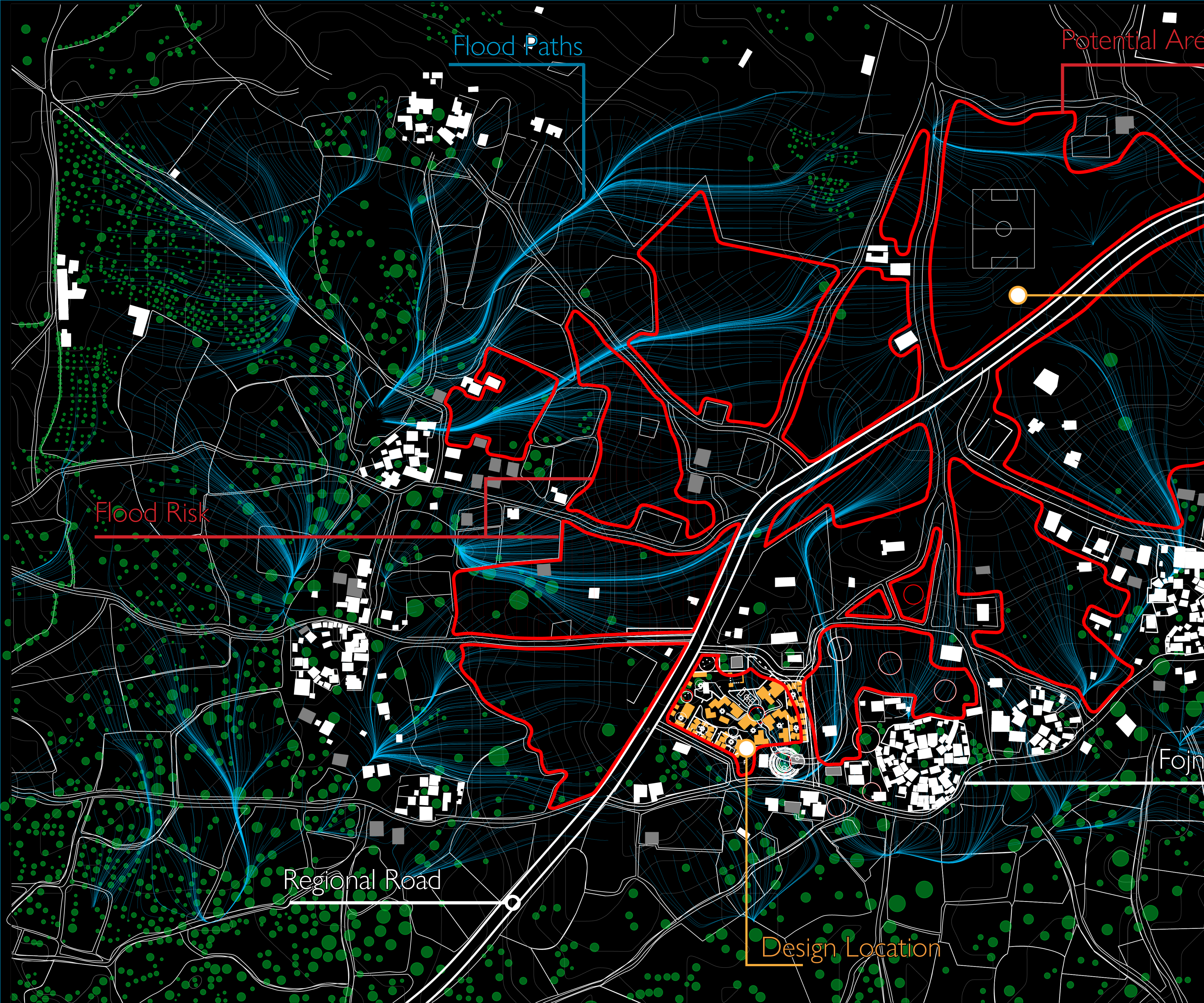
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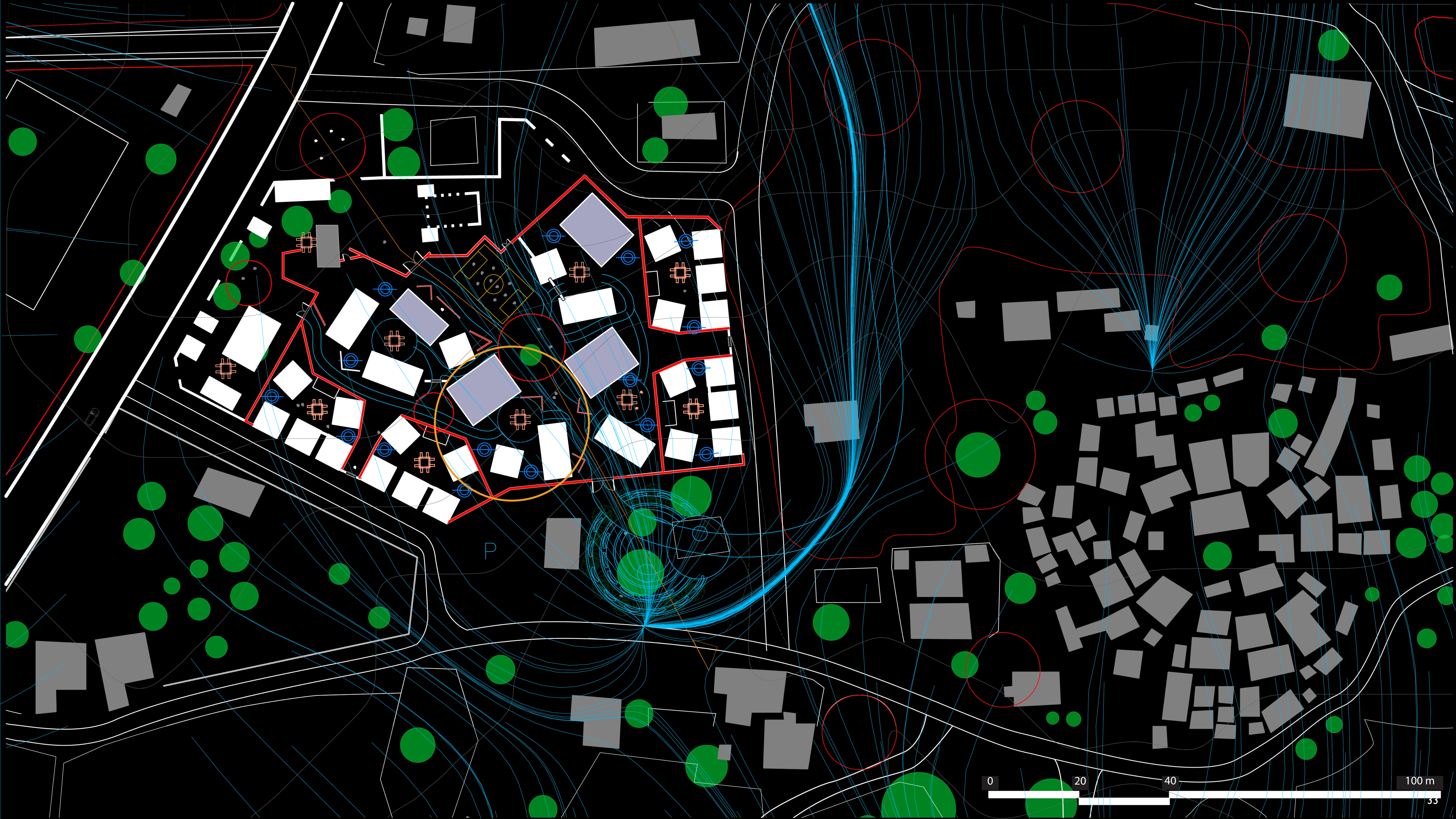
Personal Interest:
Spatial Duality
Permeability Open Space



Visual



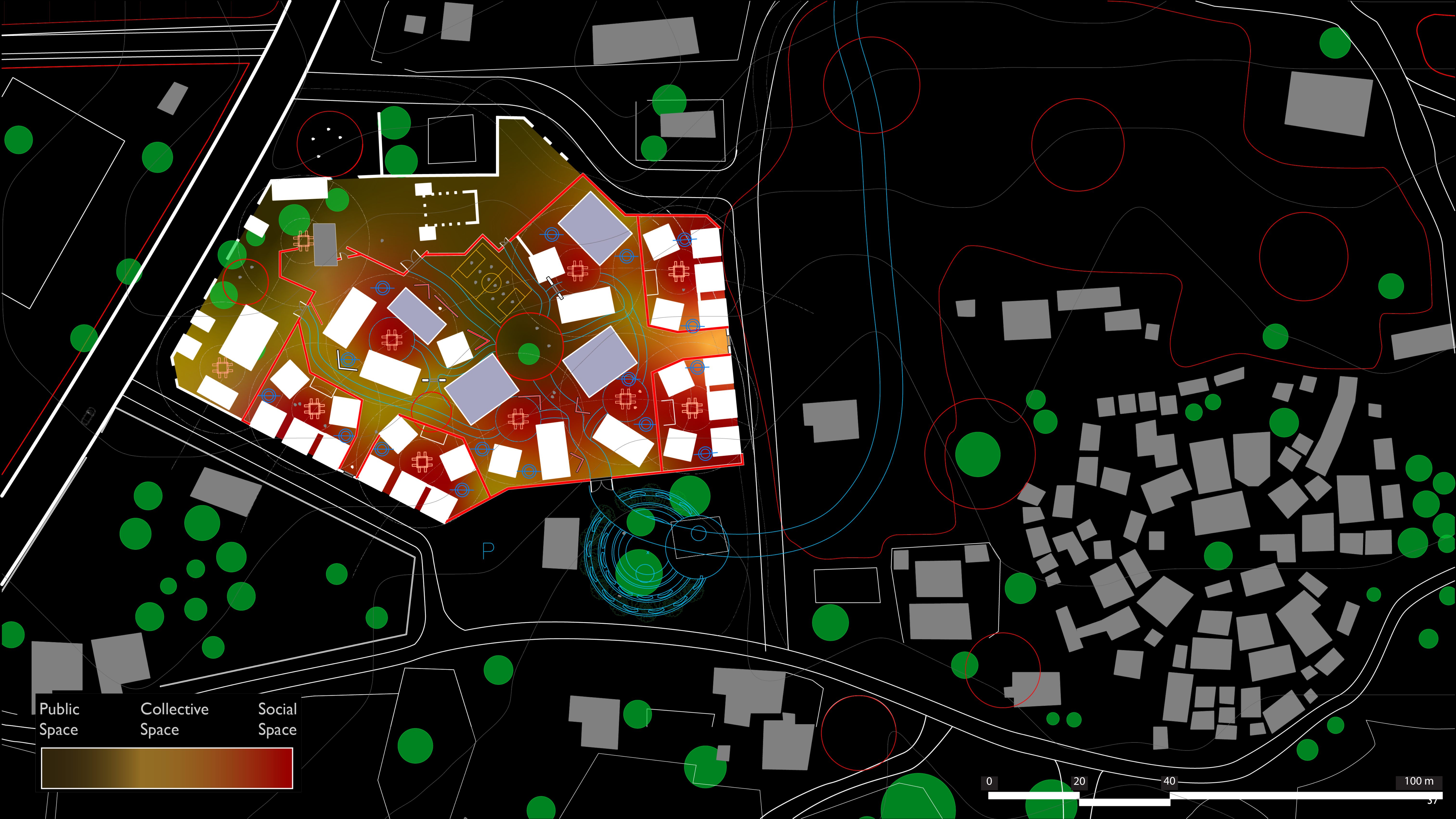
Sources: <https://en.climate-data.org/africa/senegal/dakar/dakar-521/>
<https://www.reuters.com/world/africa/senegal-capital-wades-through-floodwater-after-heavy-rain-2022-07-20/>











Public Space Collective Space Social Space



0 20 40 100 m



P
Flood Water
Reservoir

Drain Well





P
Flood Water
Reservoir

Drain Well

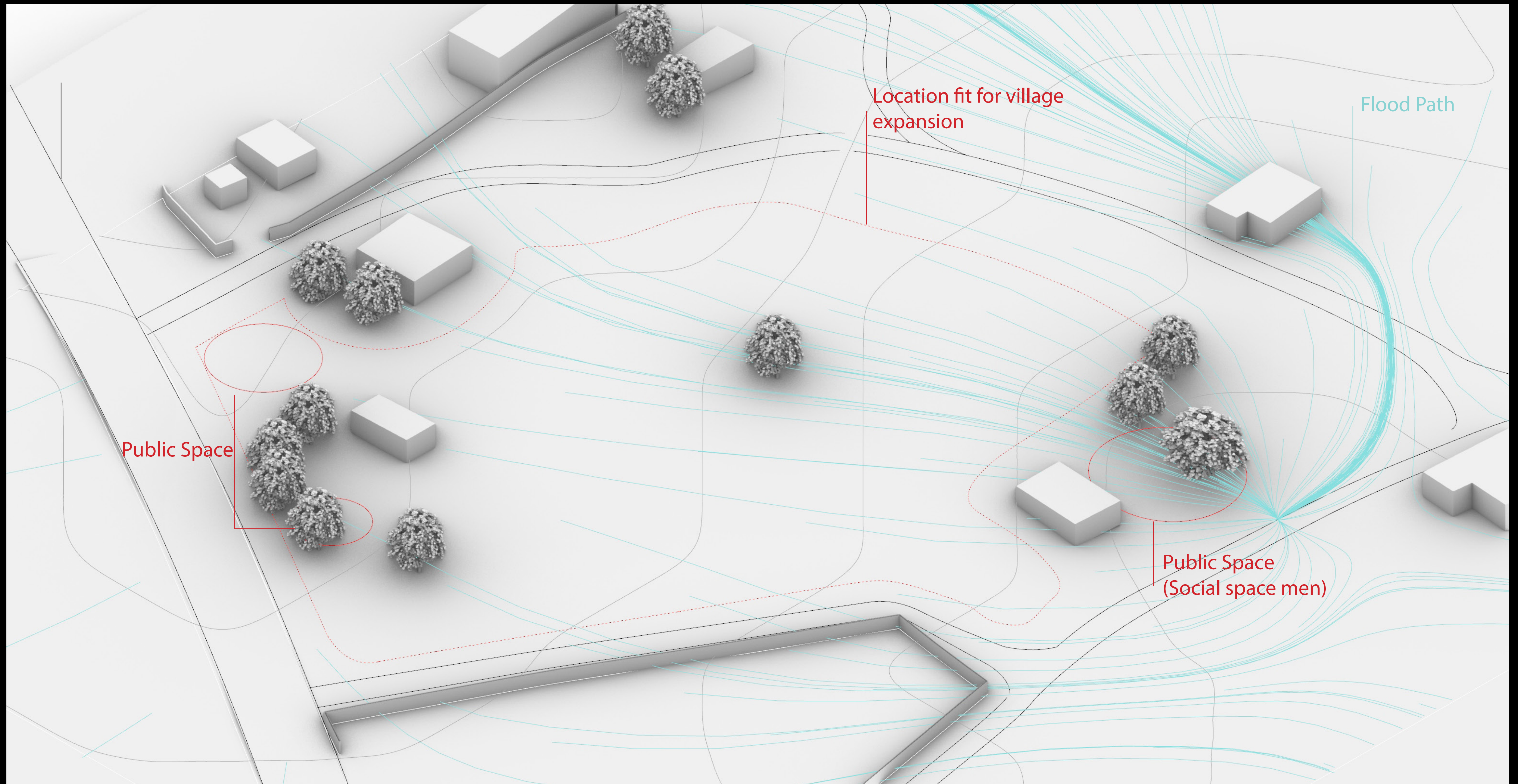
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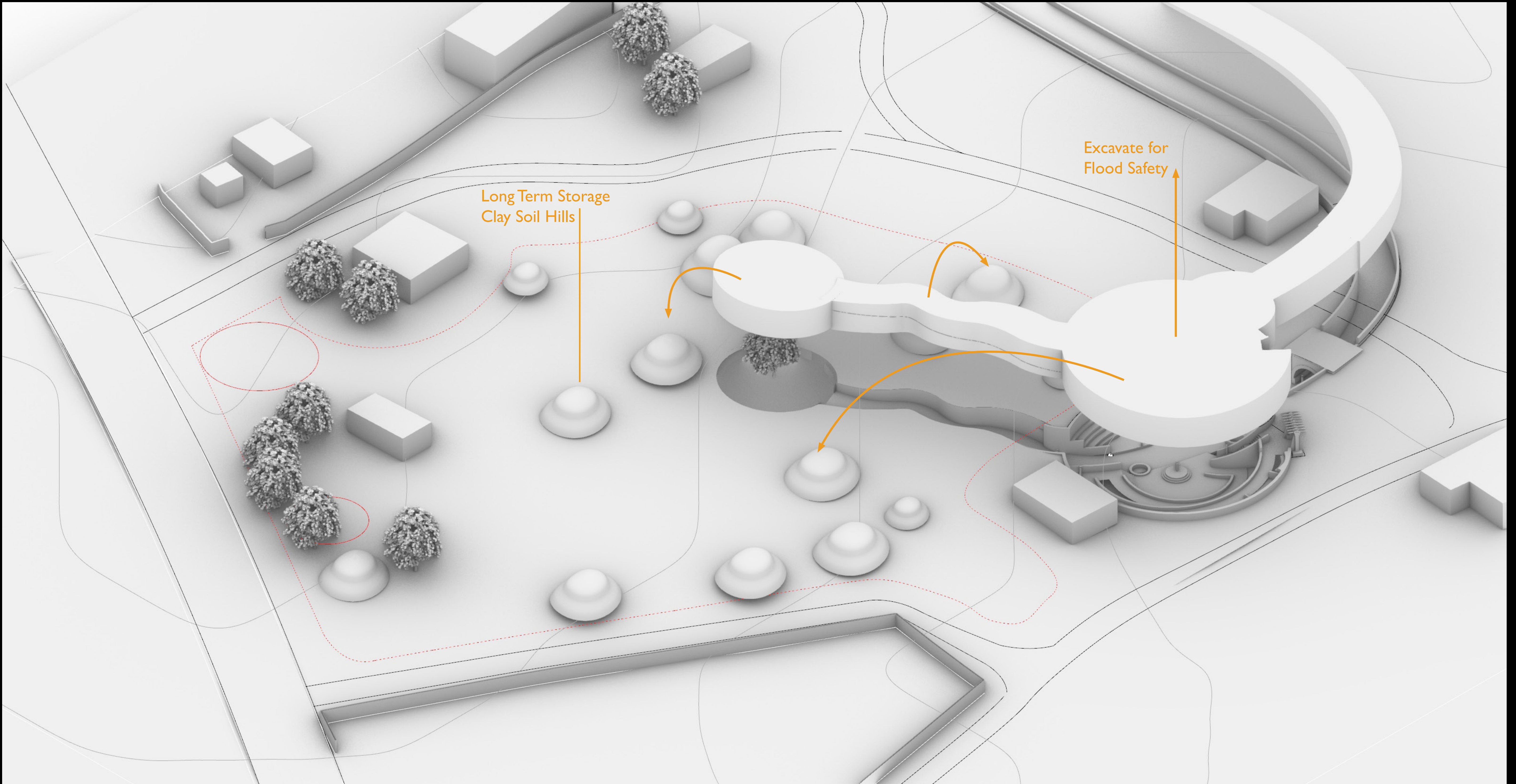
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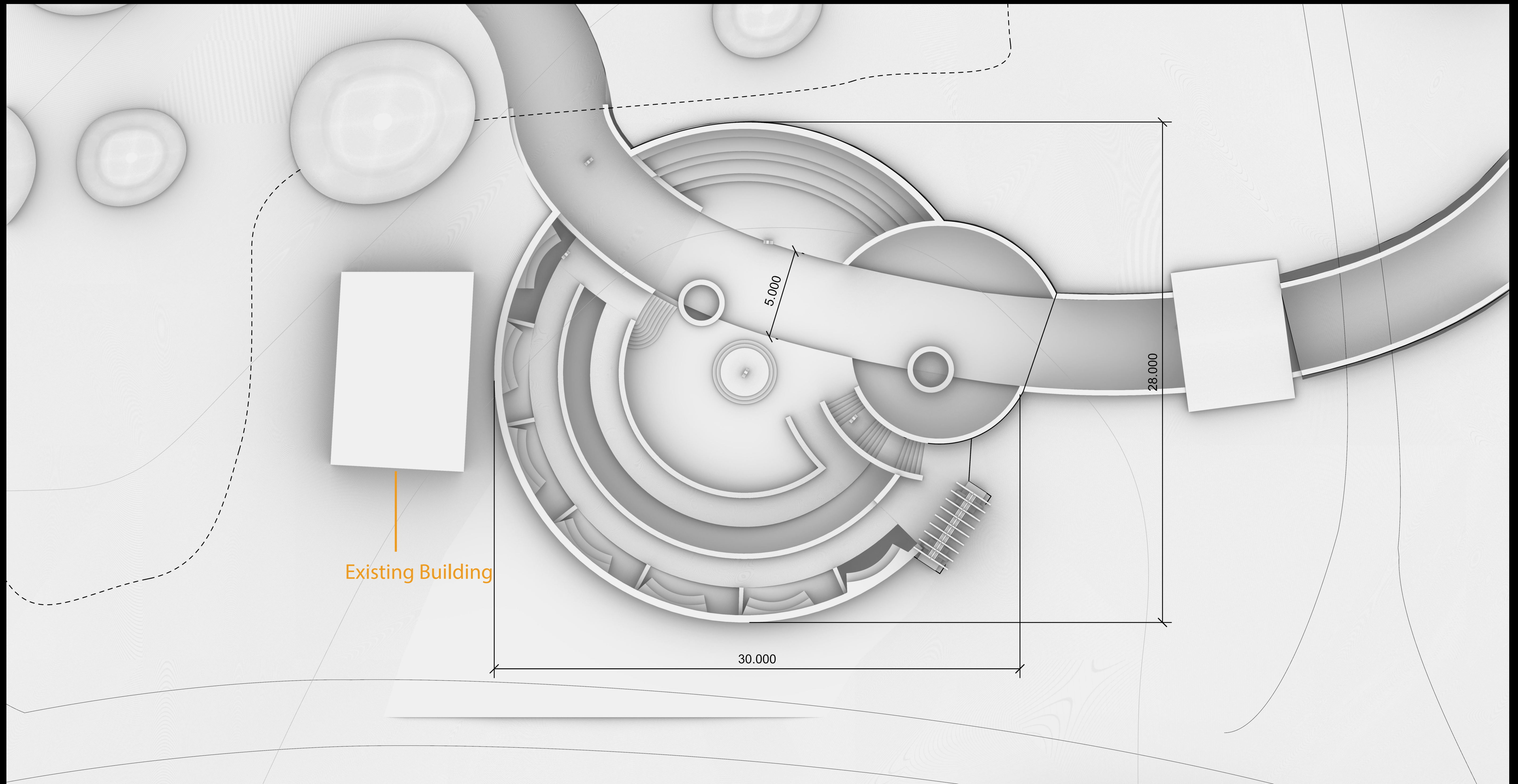
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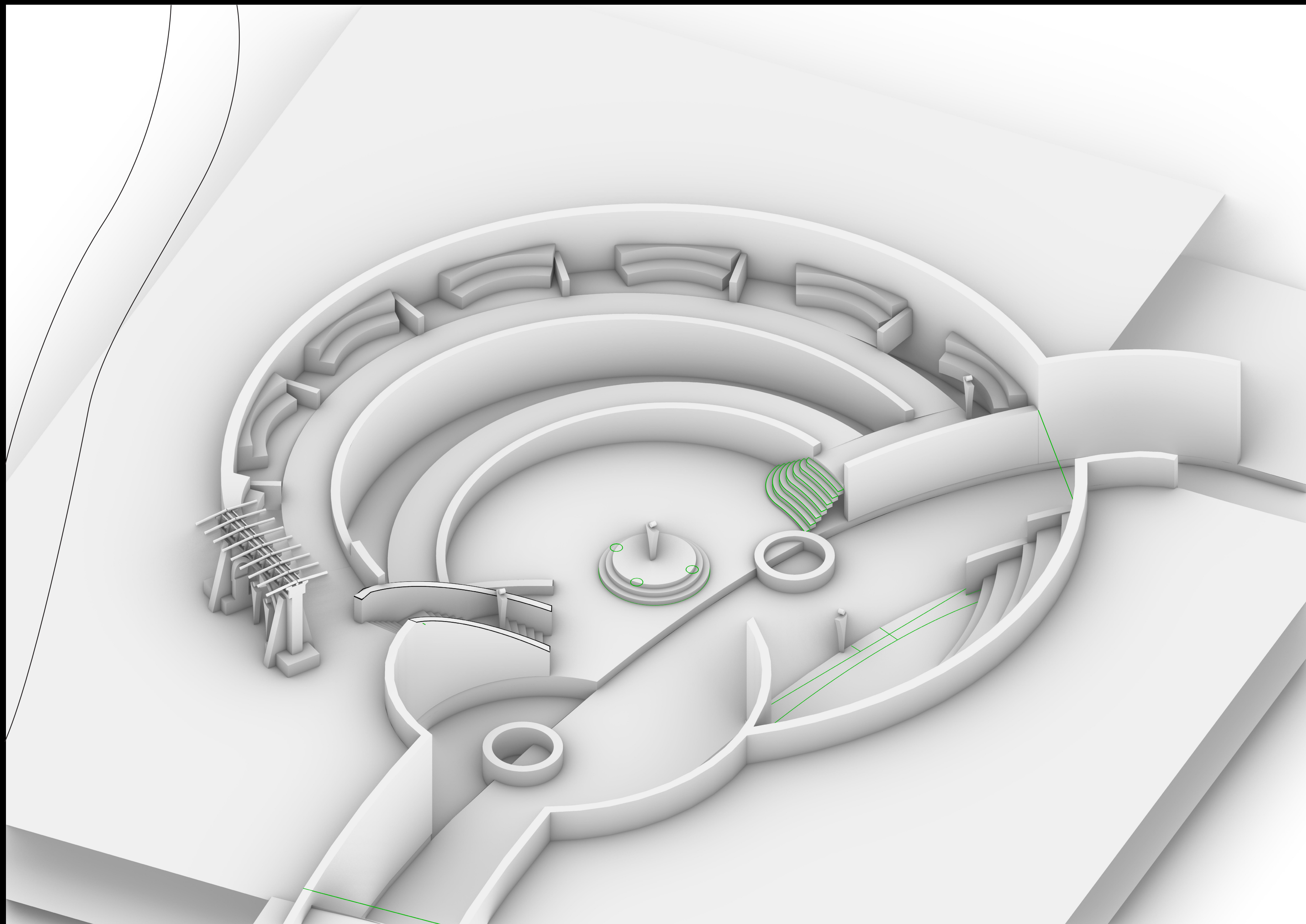
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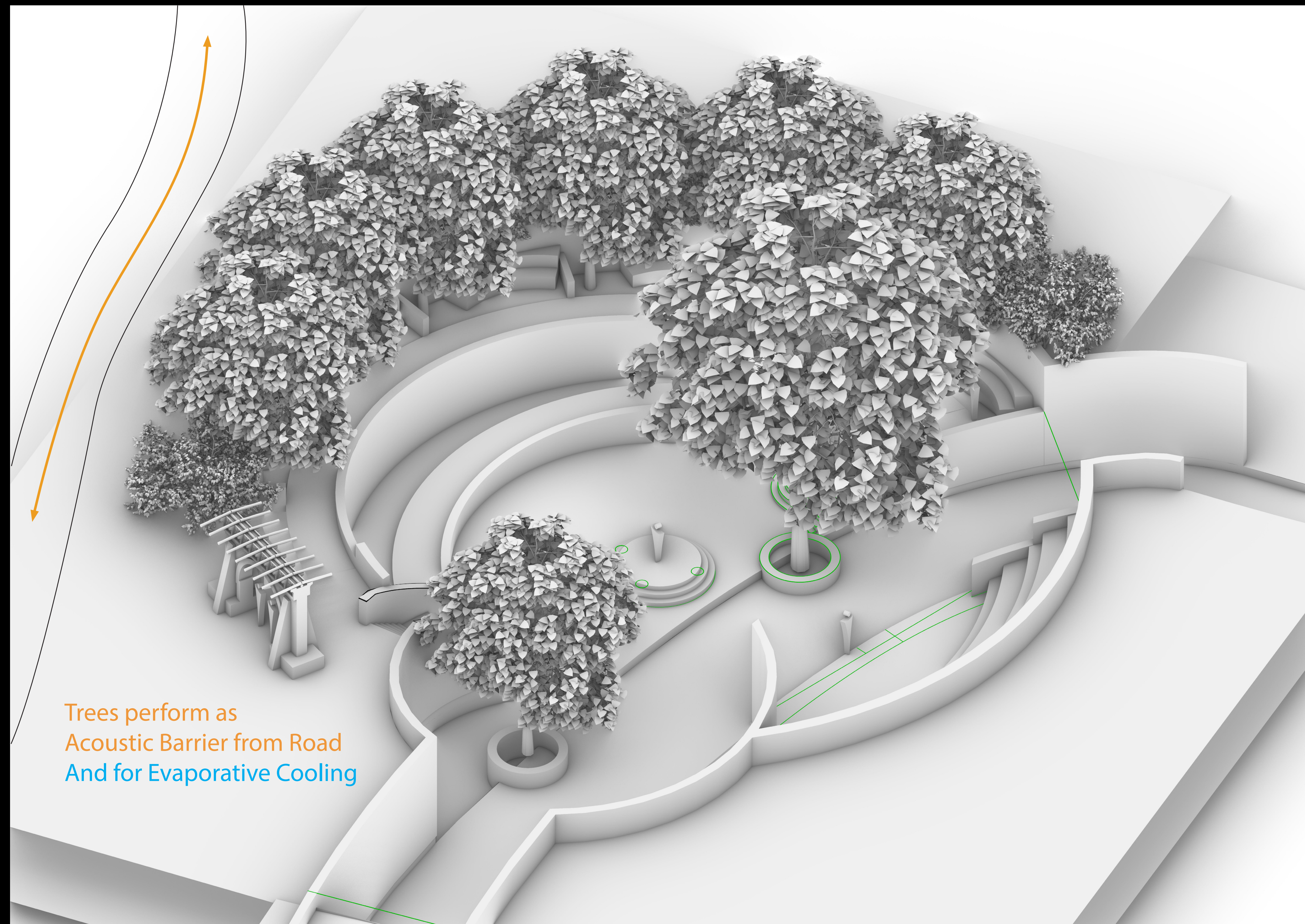
100 m



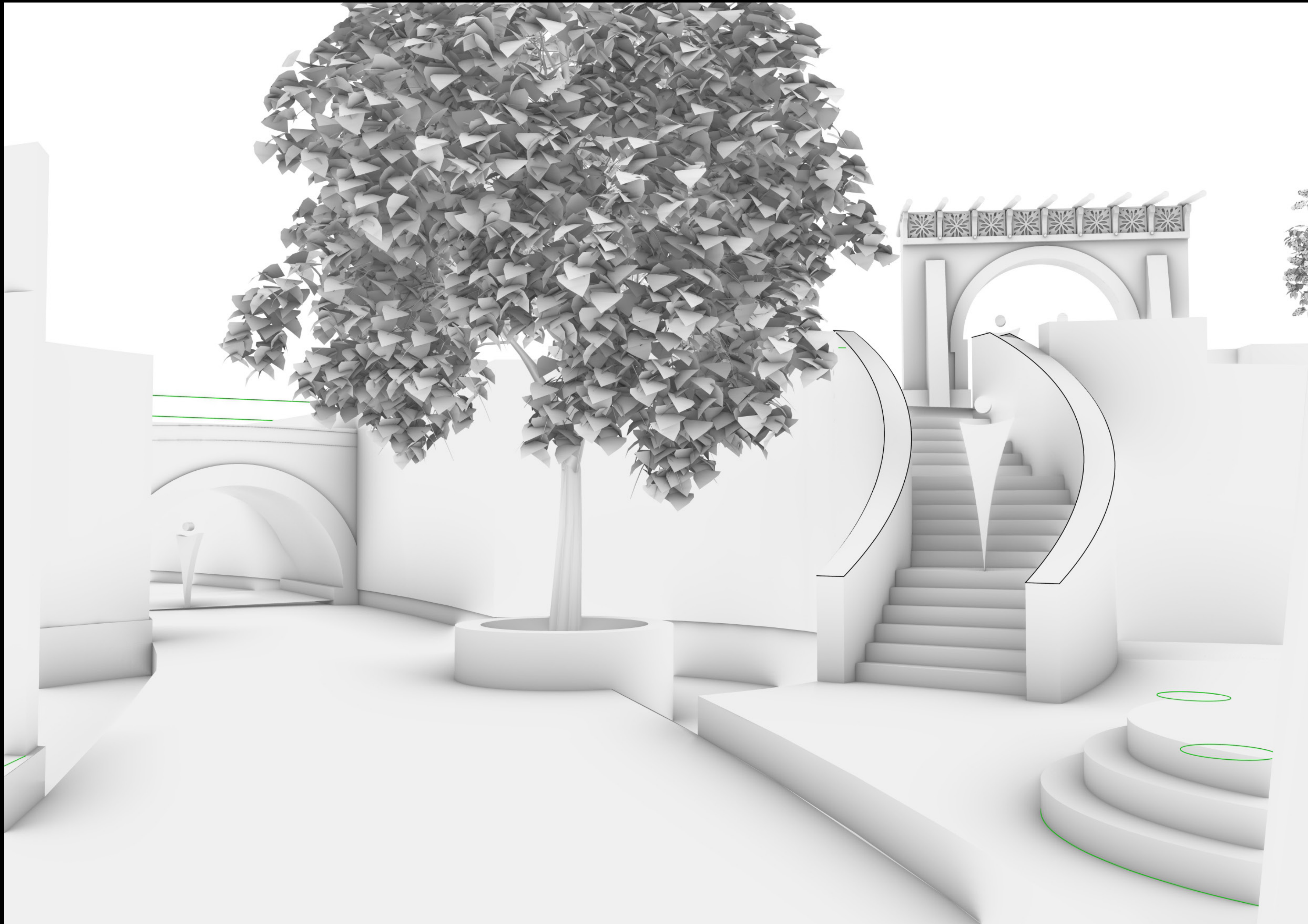


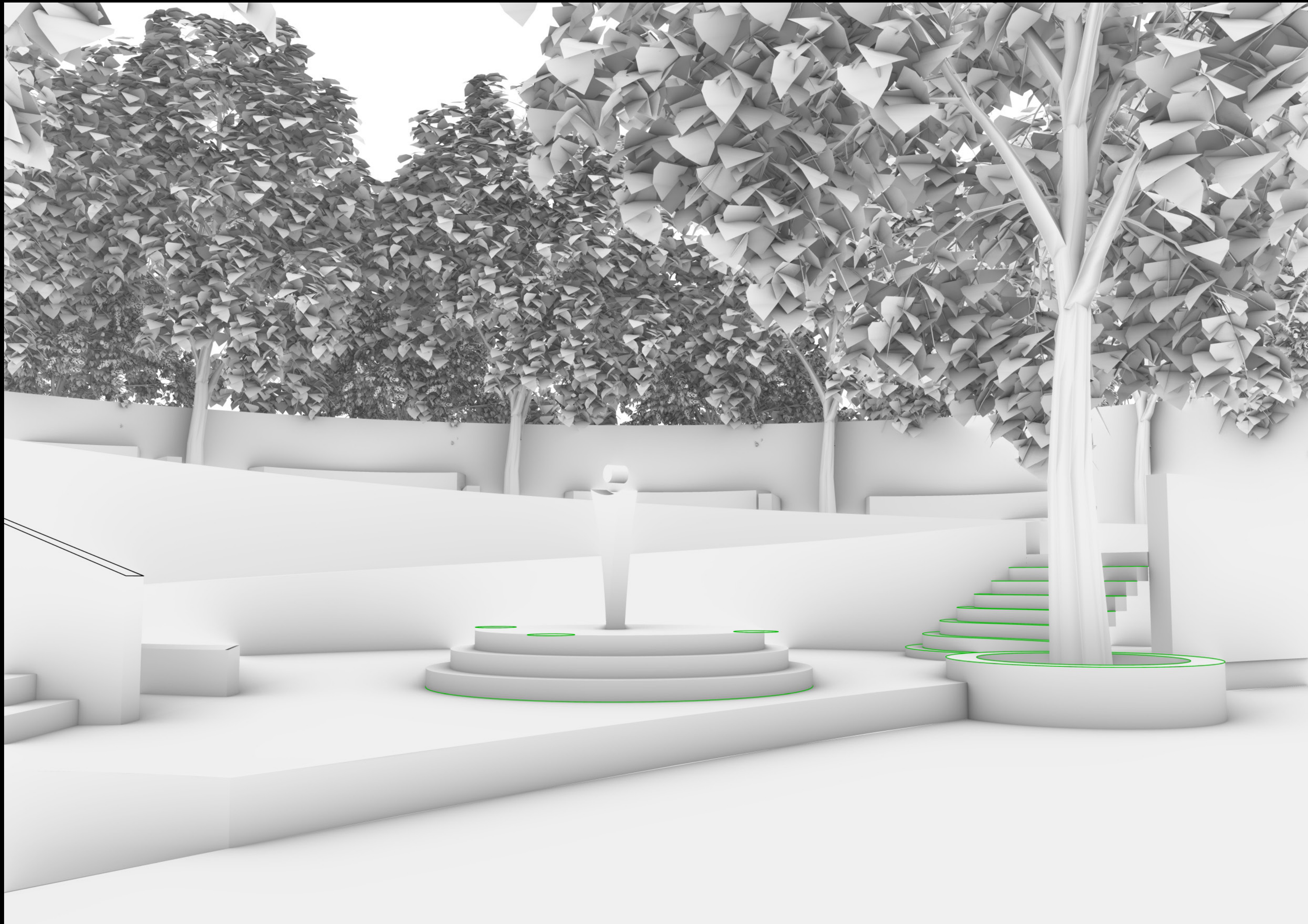






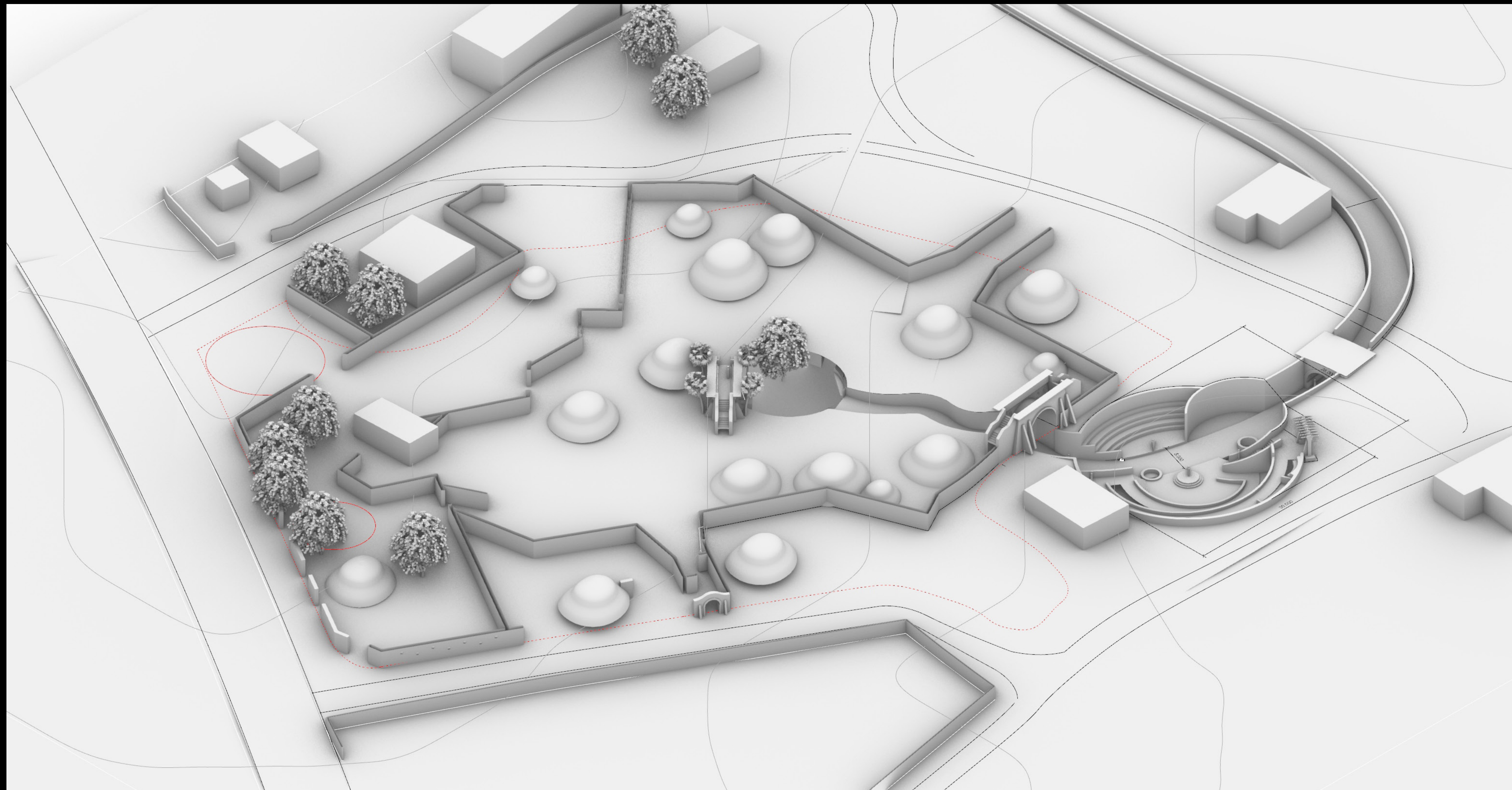
Trees perform as
Acoustic Barrier from Road
And for Evaporative Cooling

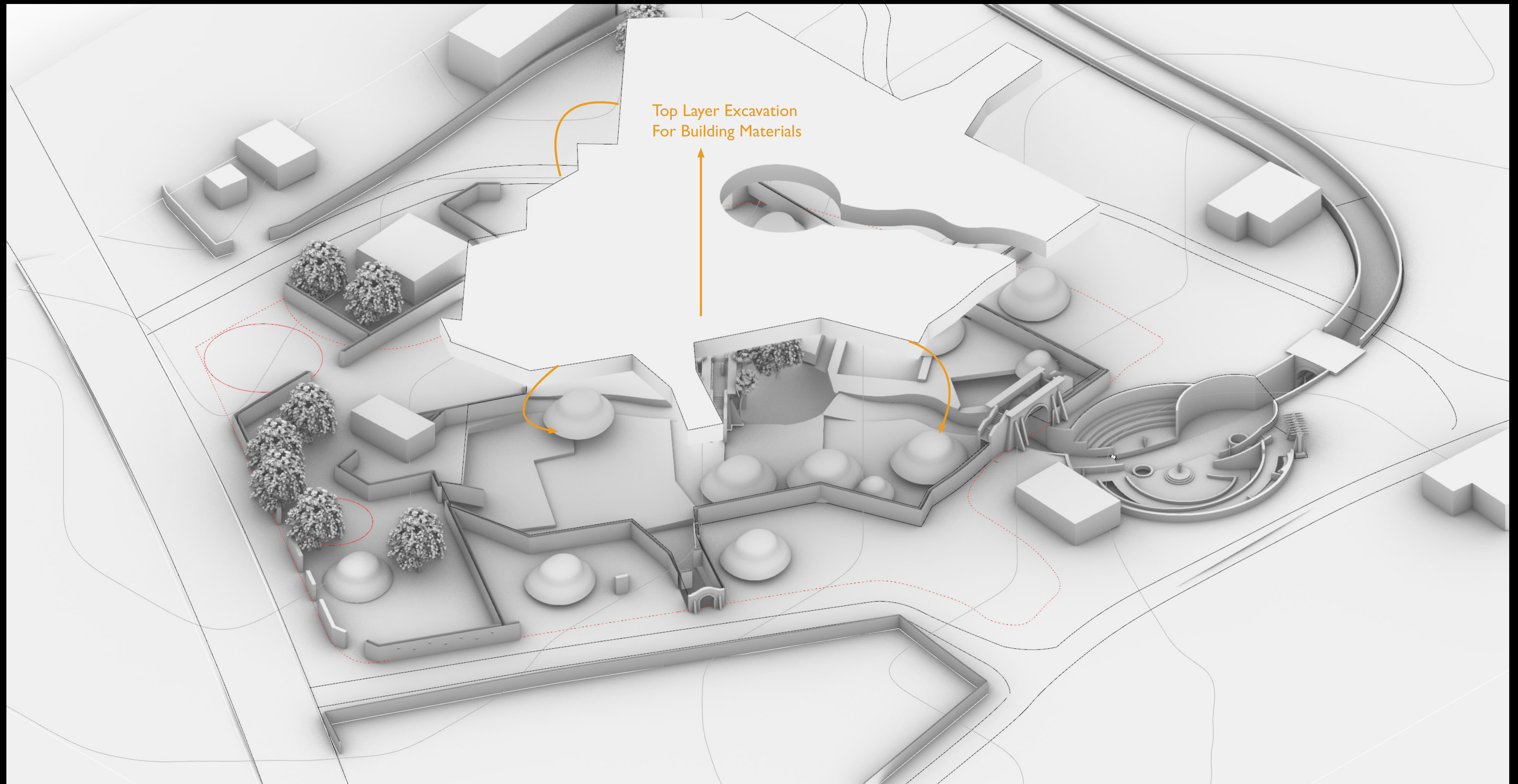






Use Clay Soil to Build
Peripheral Wall



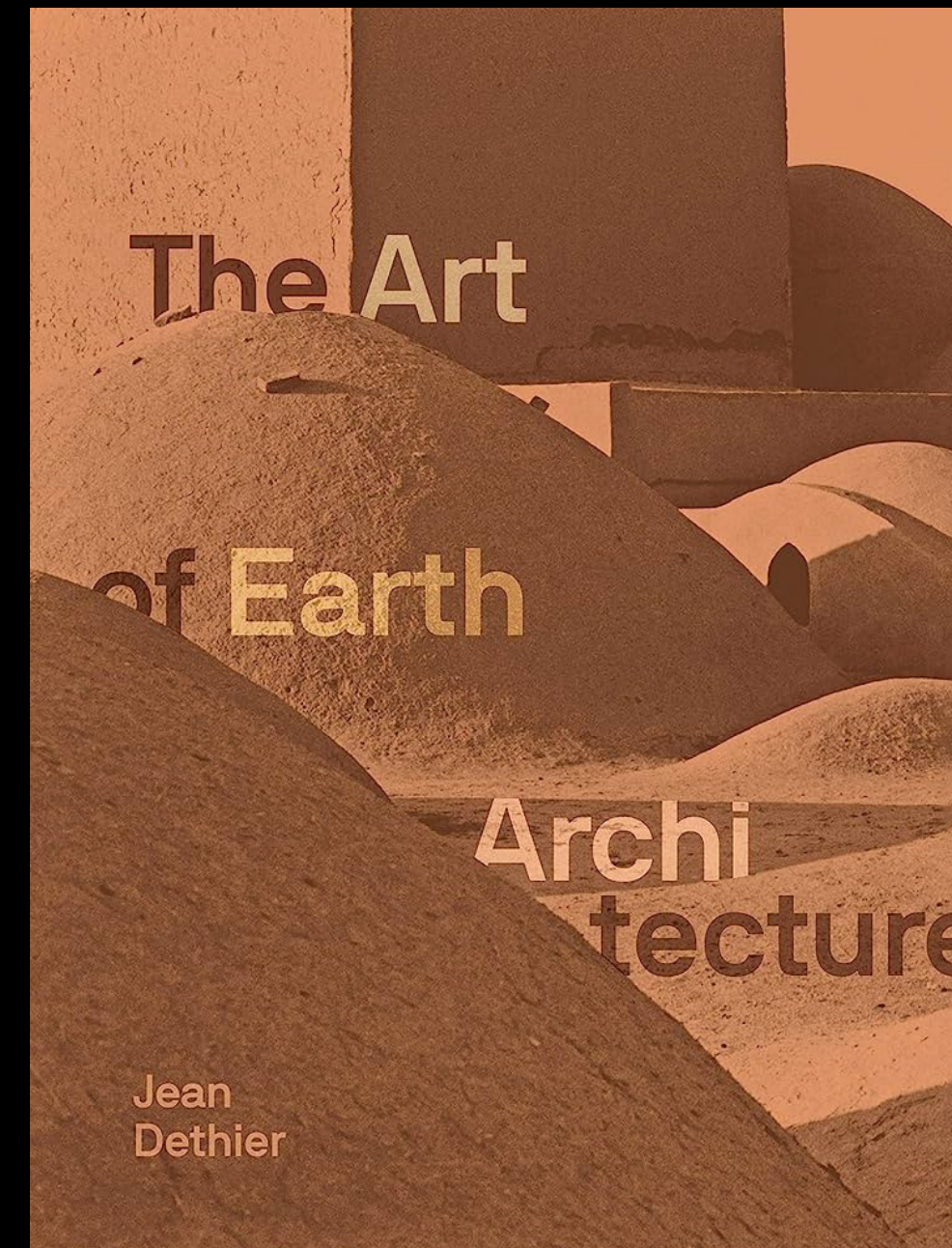




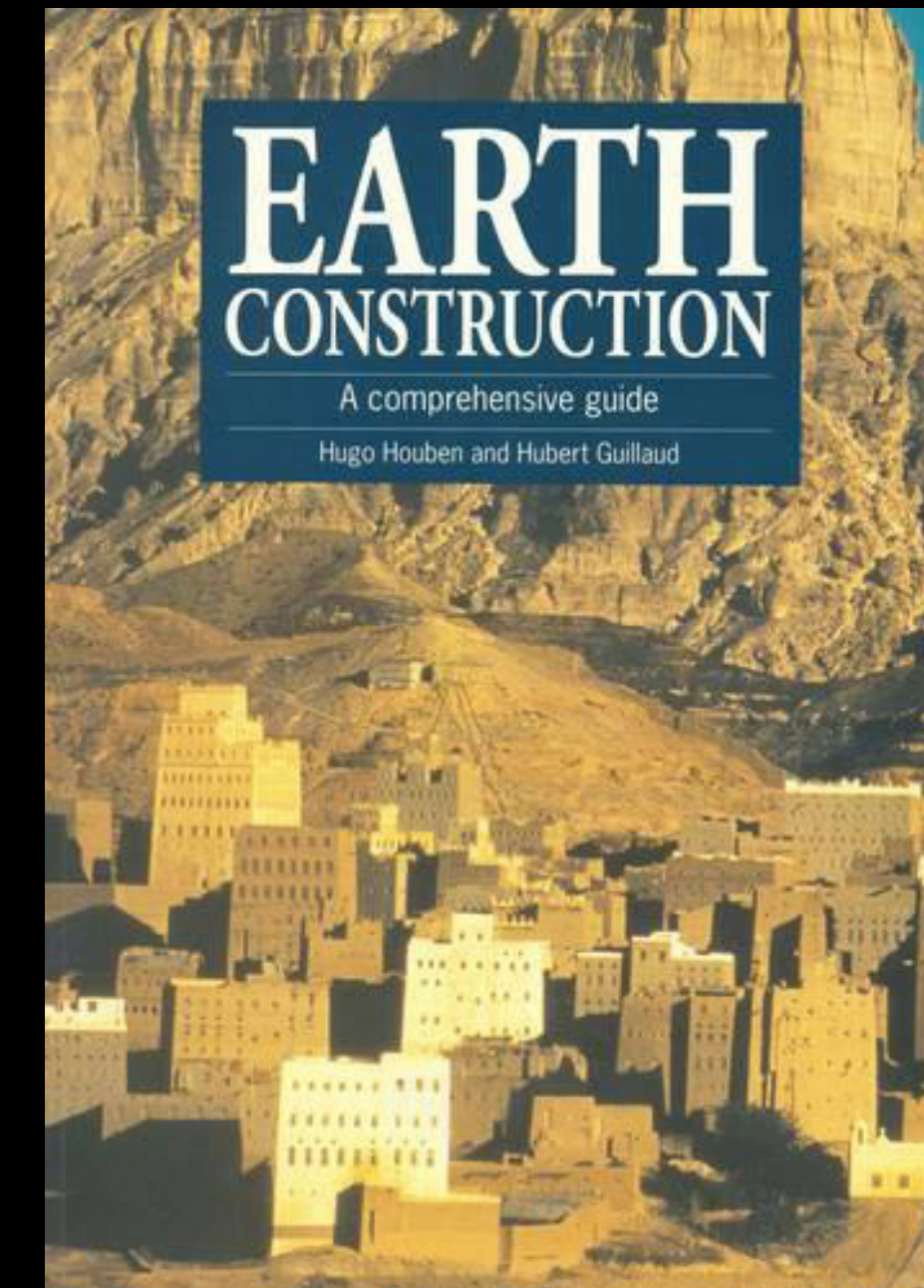
R0 Refuse To Use Concrete and Steel Due to Their High Emissions
 R1 Rethink Building Approach Based on Vernacular Materials

Circular economy		Strategies	
Increasing circularity	Smarter product use and manufacture	R0 Refuse	Make product redundant by abandoning its function or by offering the same function with a radically different product
		R1 Rethink	Make product use more intensive (e.g. by sharing product)
	Extend lifespan of product and its parts	R2 Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials
		R3 Reuse	Reuse by another consumer of discarded product which is still in good condition and fulfils its original function
		R4 Repair	Repair and maintenance of defective product so it can be used with its original function
		R5 Refurbish	Restore an old product and bring it up to date
		R6 Remanufacture	Use parts of discarded product in a new product with the same function
	Useful application of materials	R7 Repurpose	Use discarded product or its parts in a new product with a different function
		R8 Recycle	Process materials to obtain the same (high grade) or lower (low grade) quality
R9 Recover		Incineration of material with energy recovery	
Linear economy			

¹ Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. Resources, conservation and recycling, - 224.

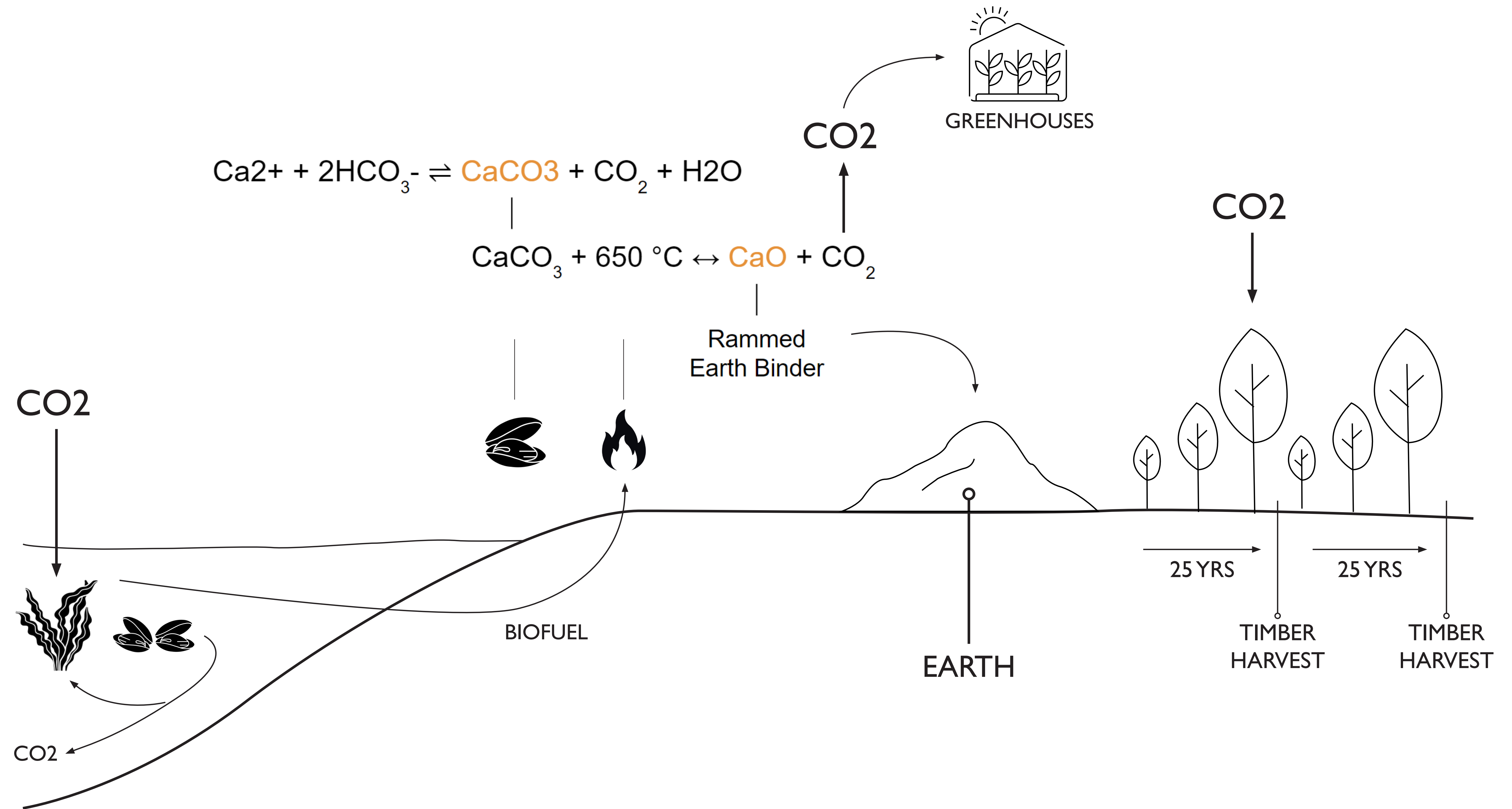


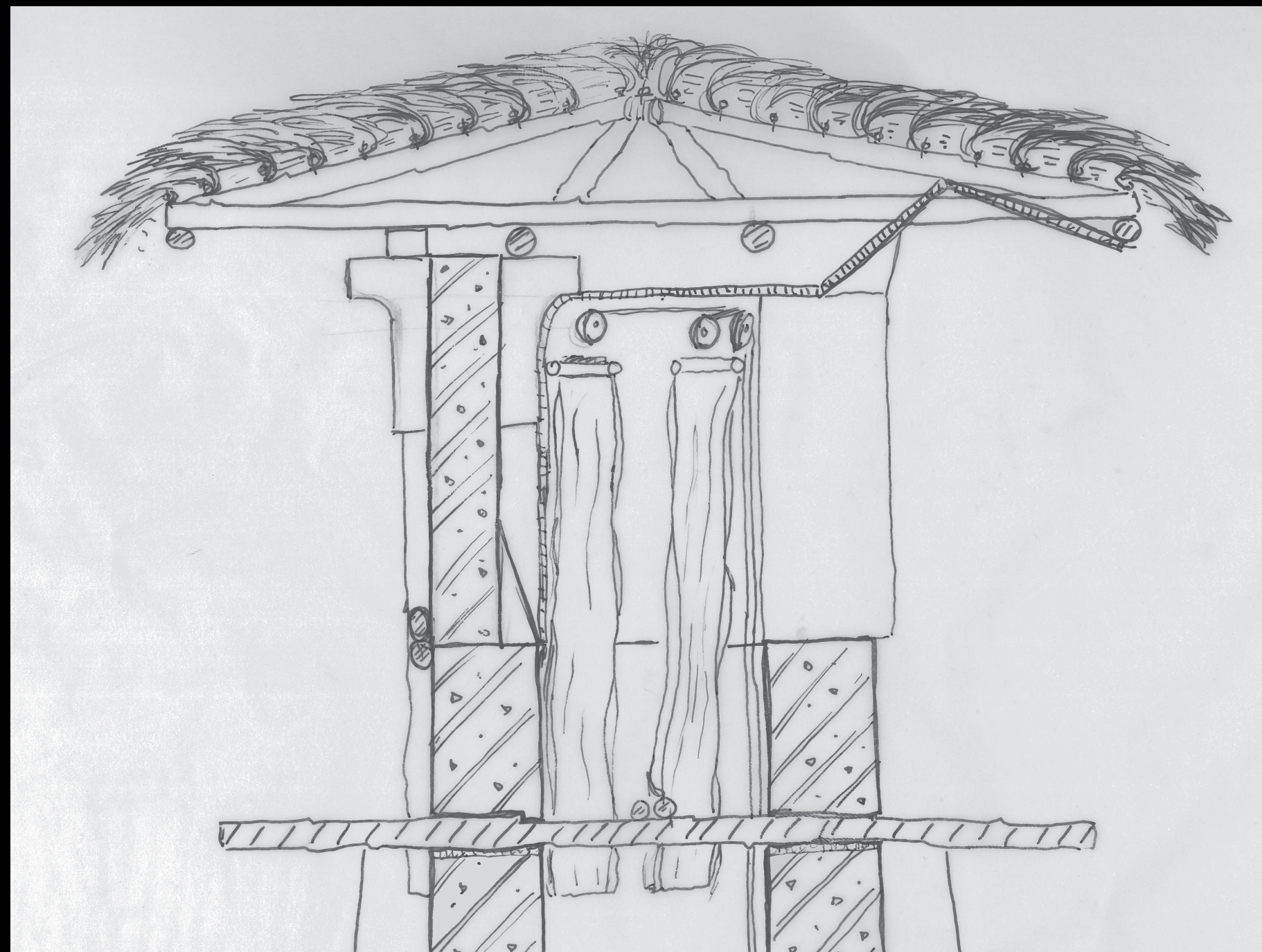
Dethier, J. (2020). The Art of Earth Architecture: Past, Present, Future. Princeton Architectural Press.



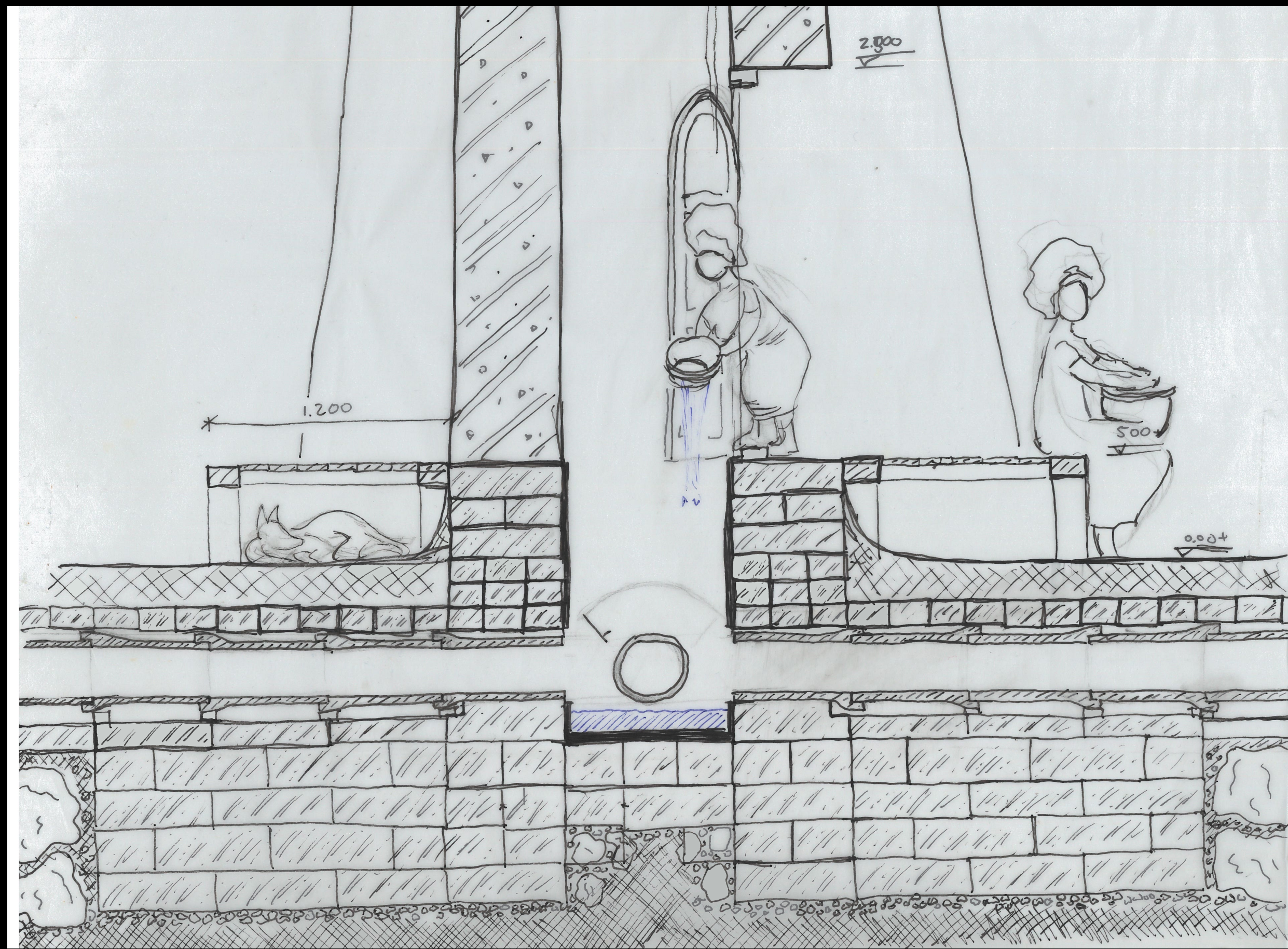
Houben, H., & Guillaud, H. (1994). Earth Construction: A Comprehensive Guide.



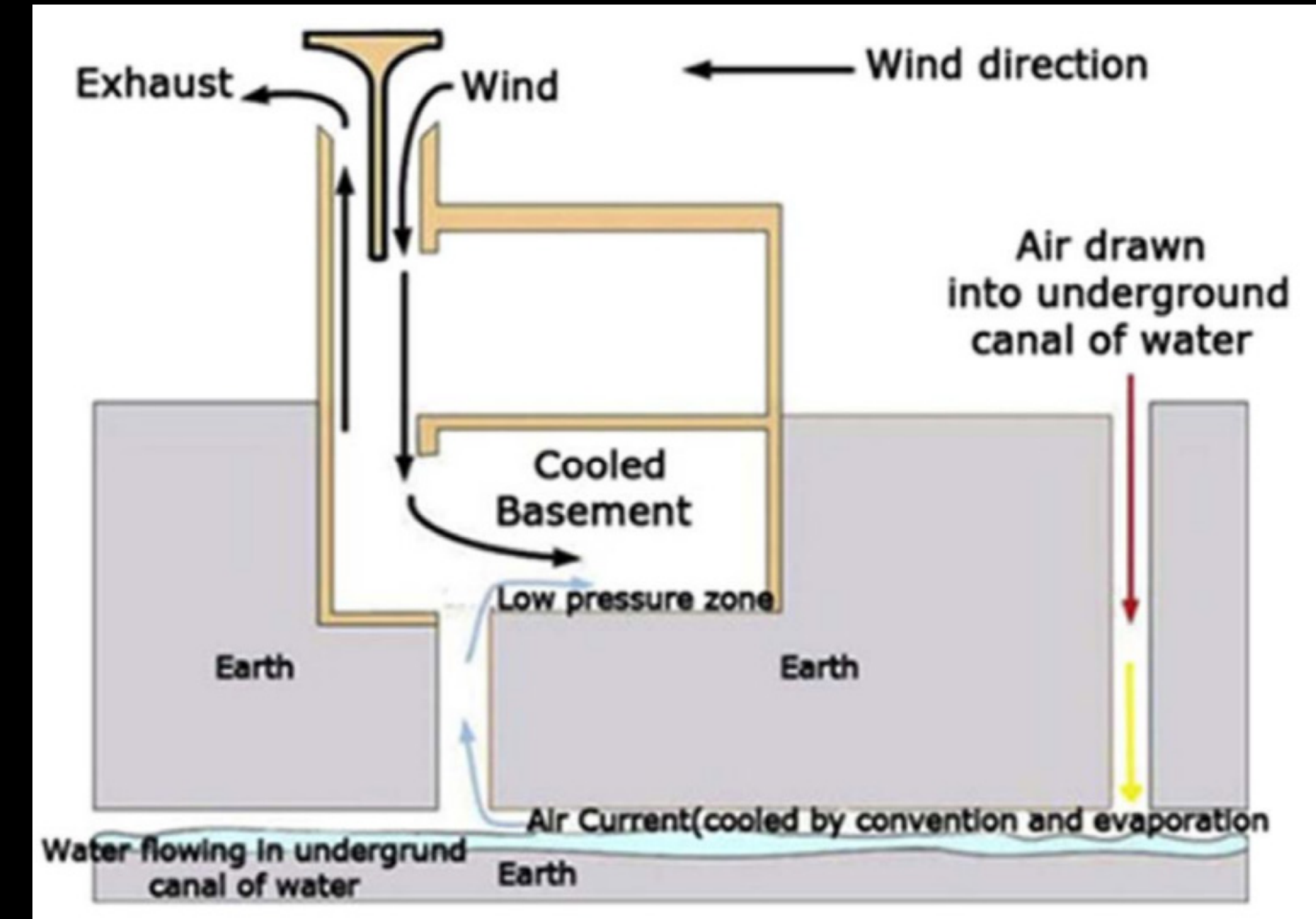




Adapted Design to Senegal Climate

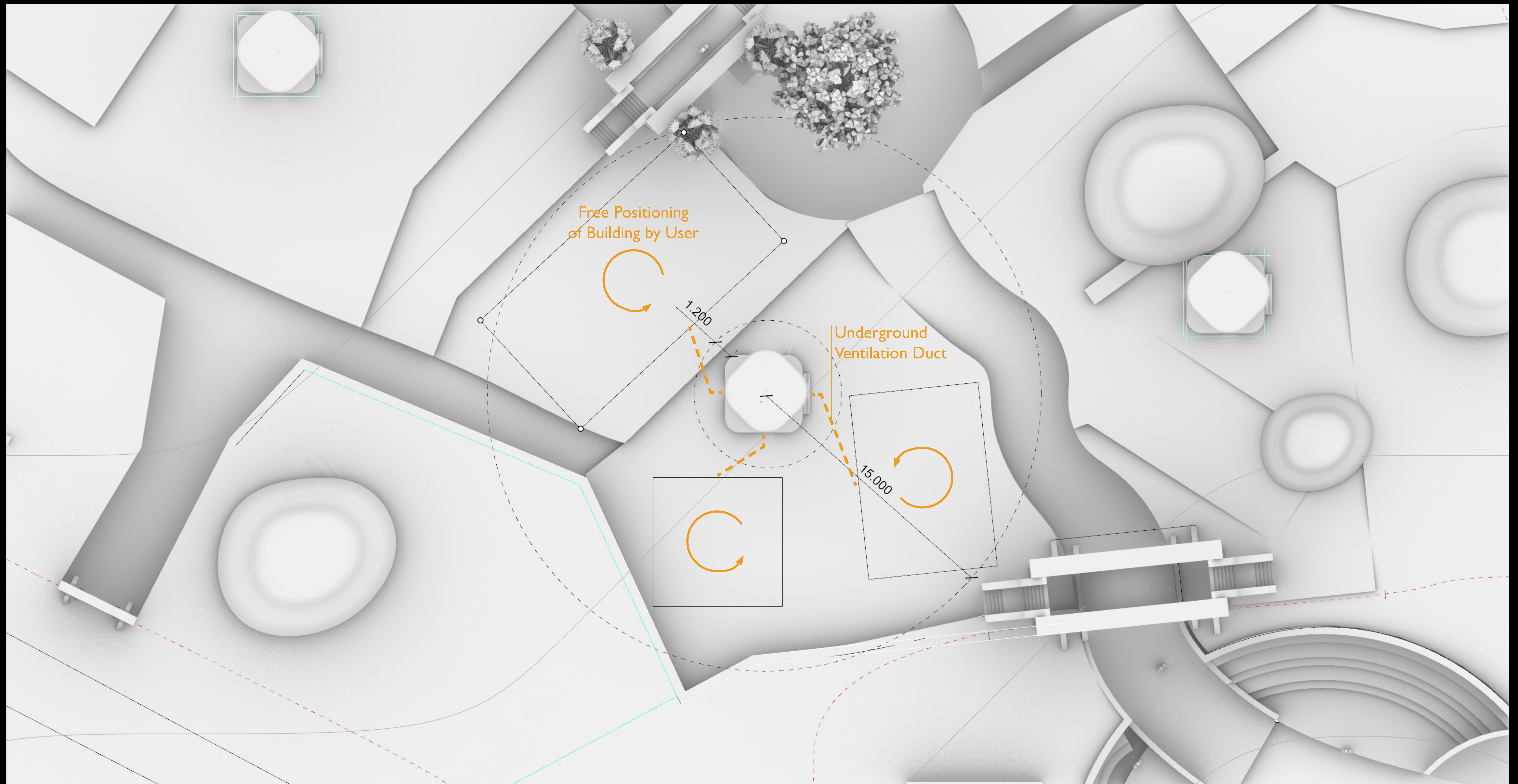


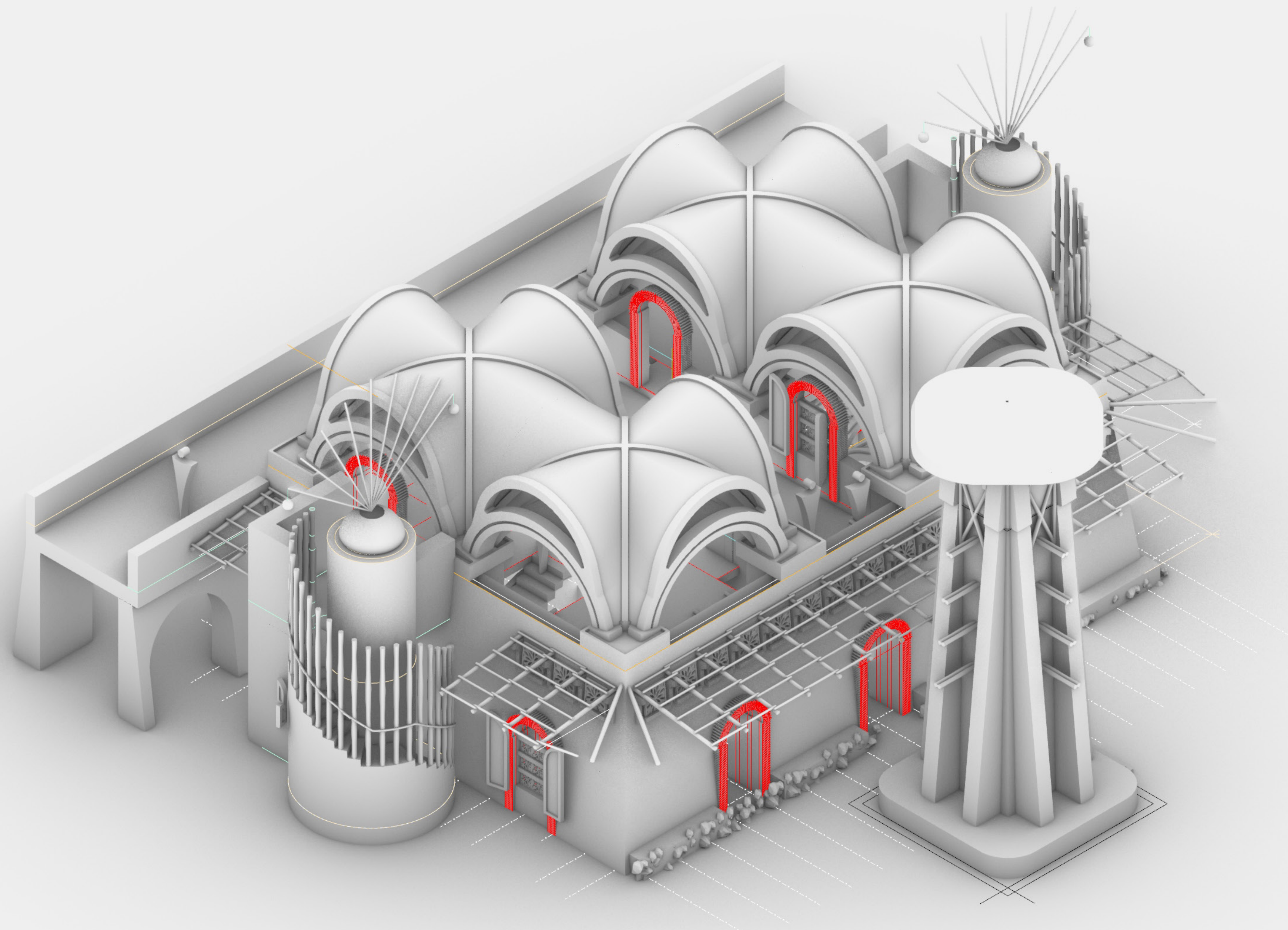
Iranian Windcatchers

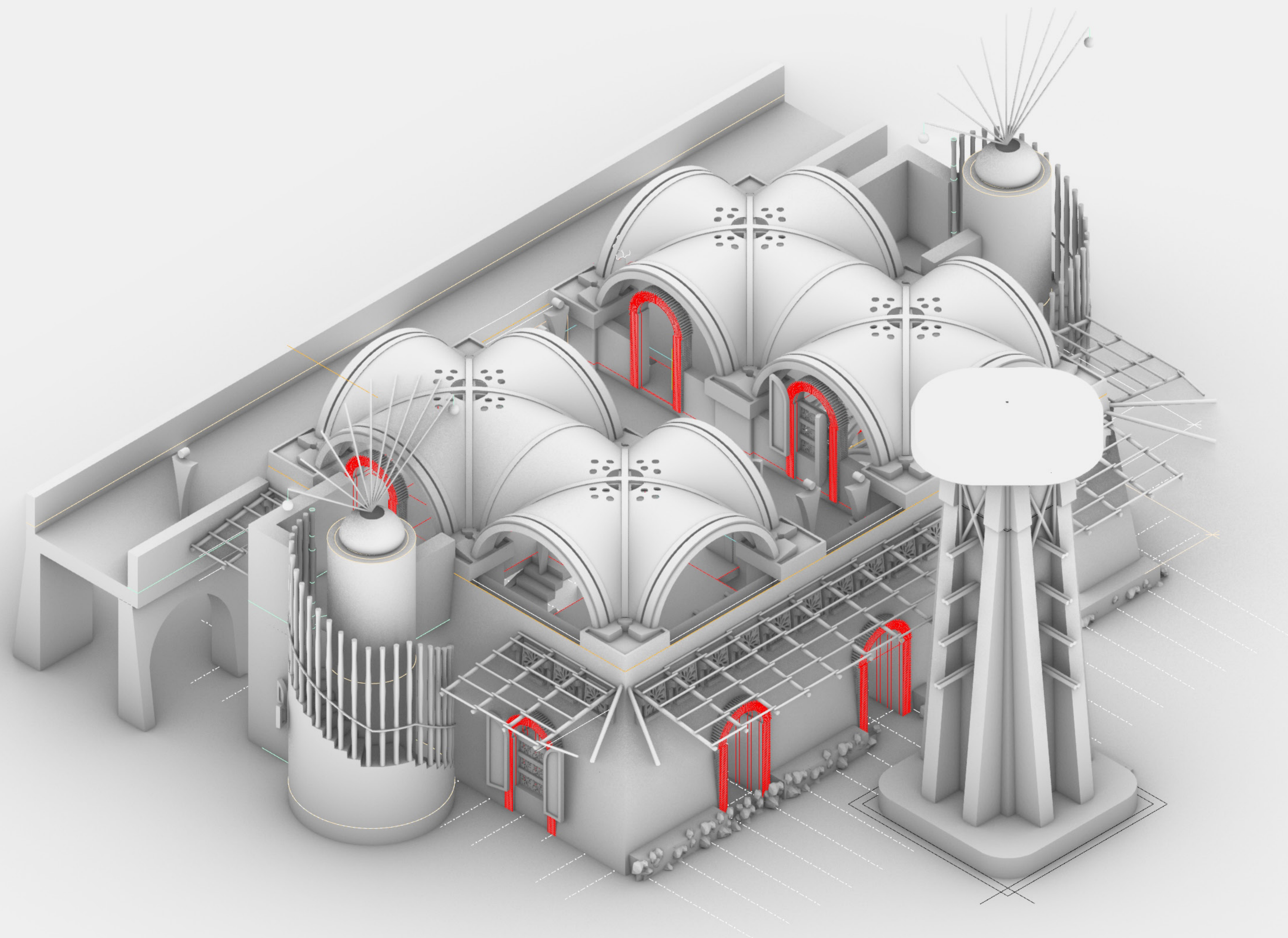


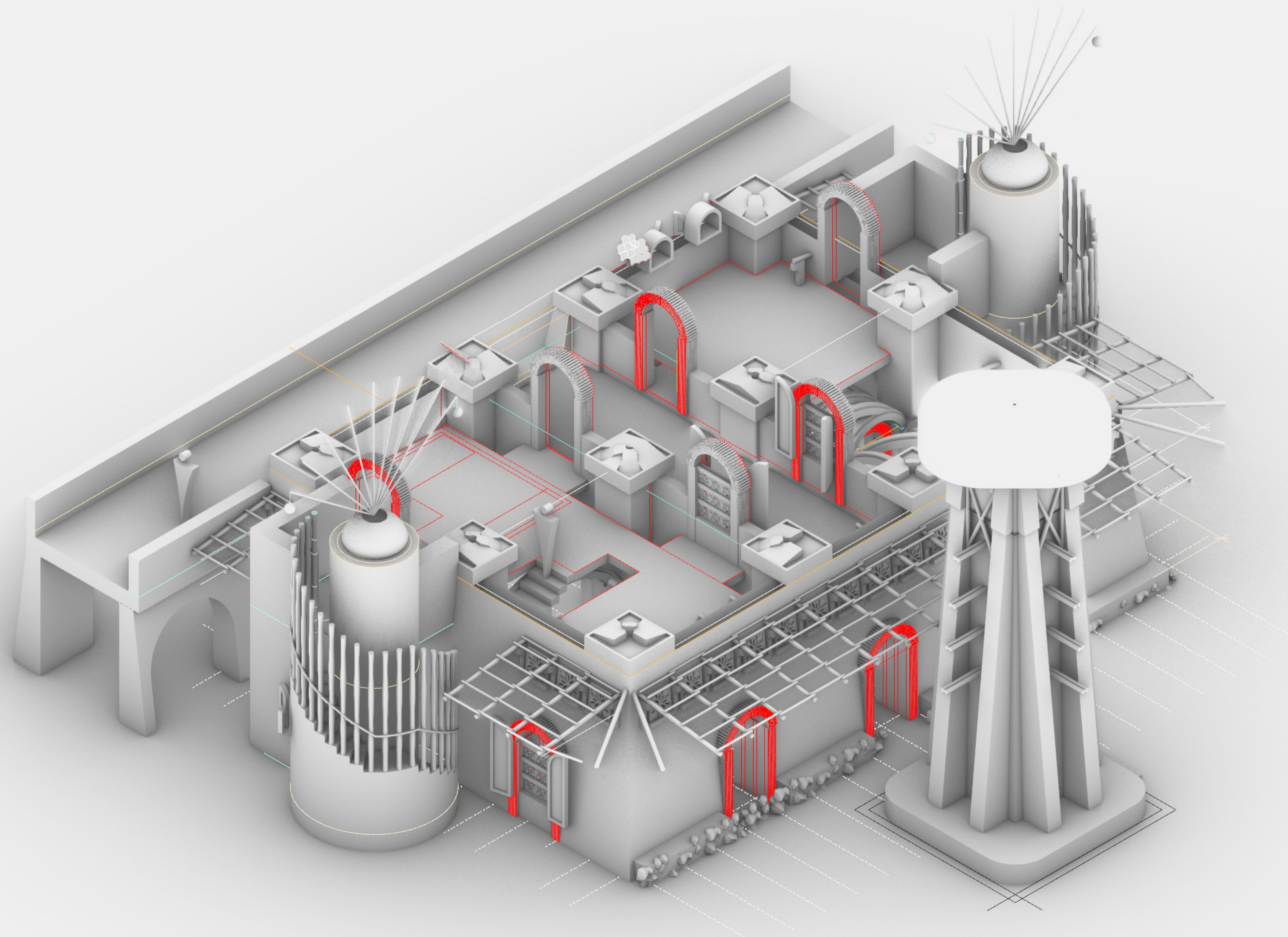
Houben, H., & Guillaud, H. (1994). Earth Construction: A Comprehensive Guide.

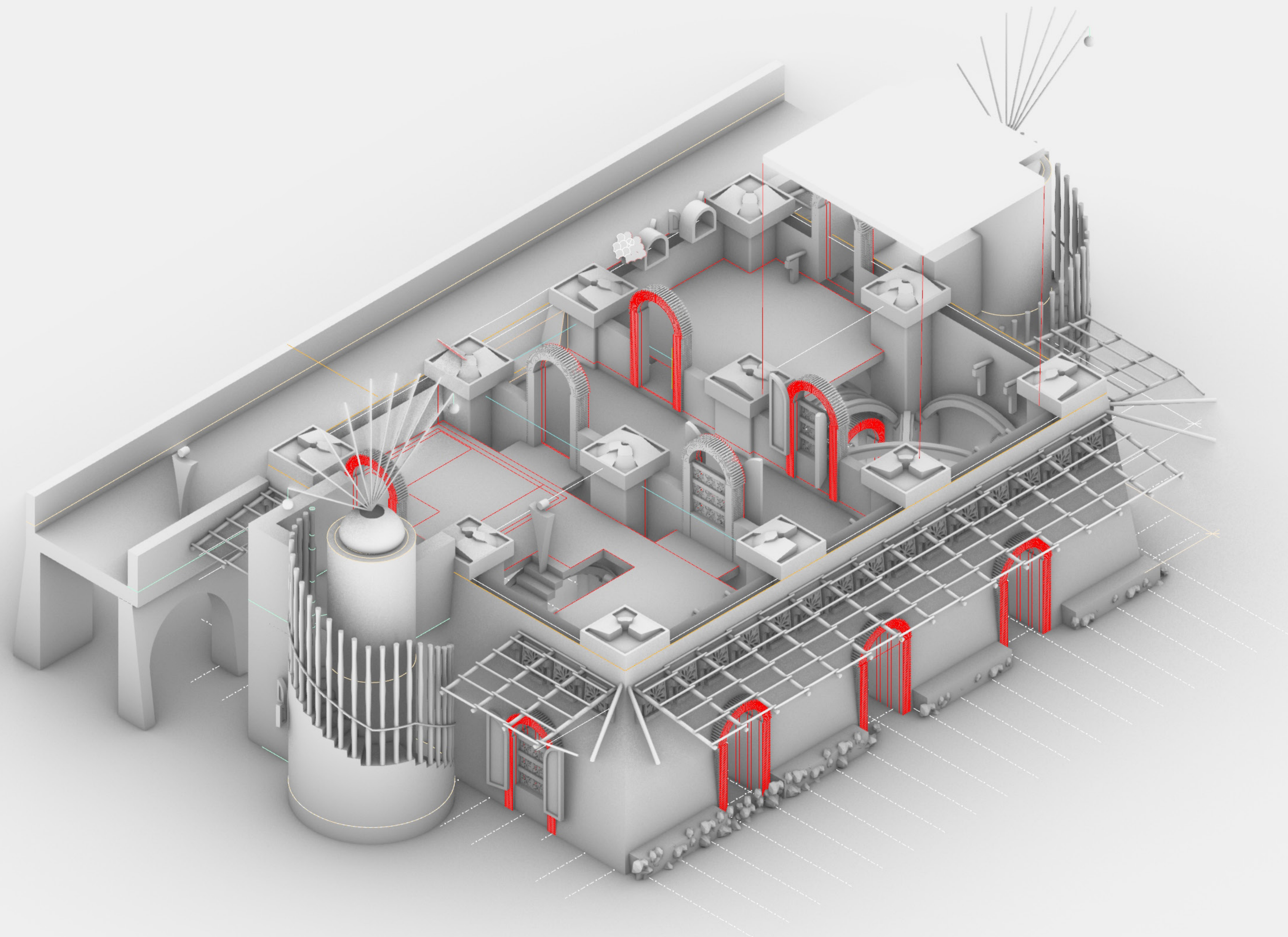


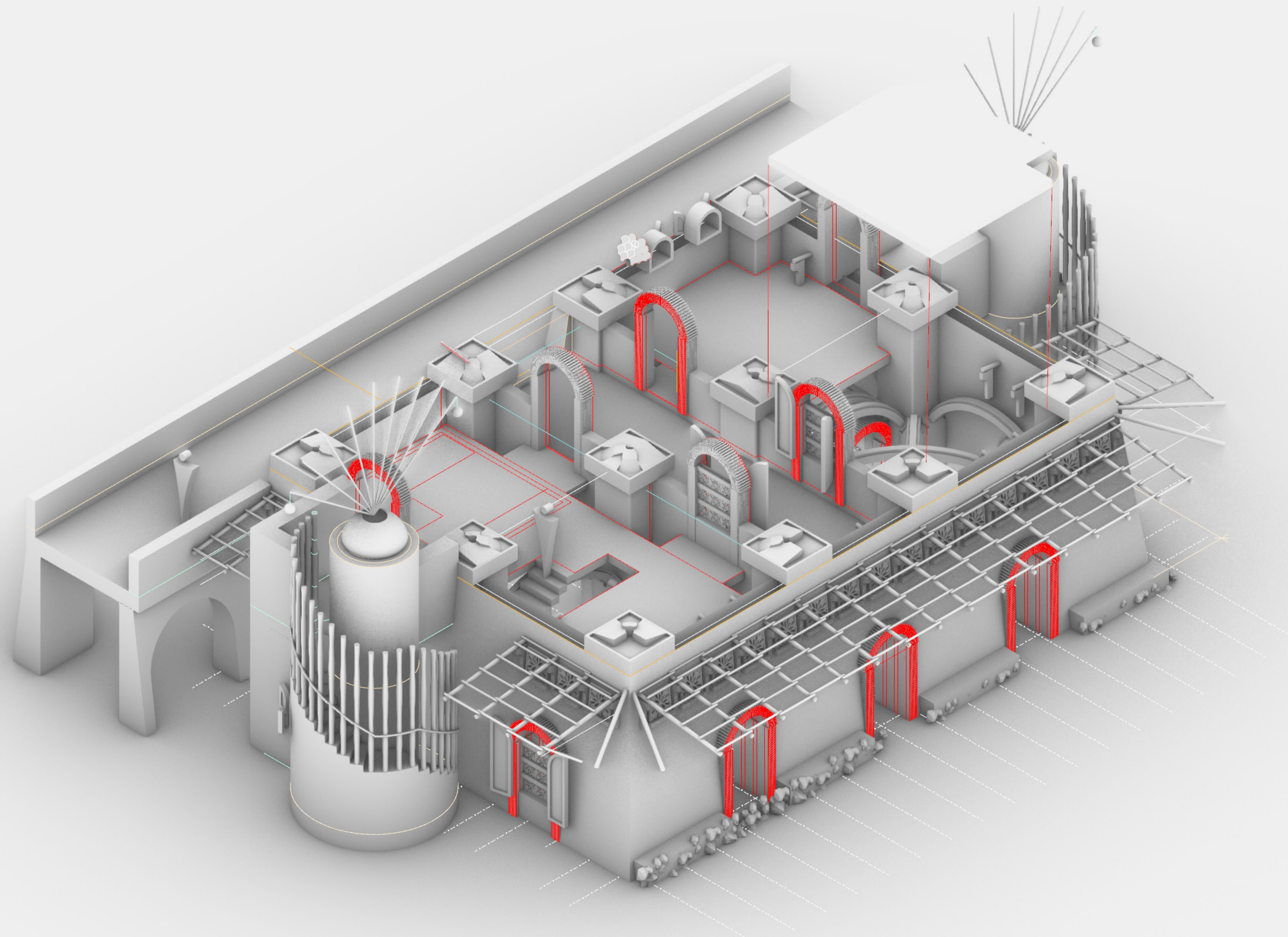


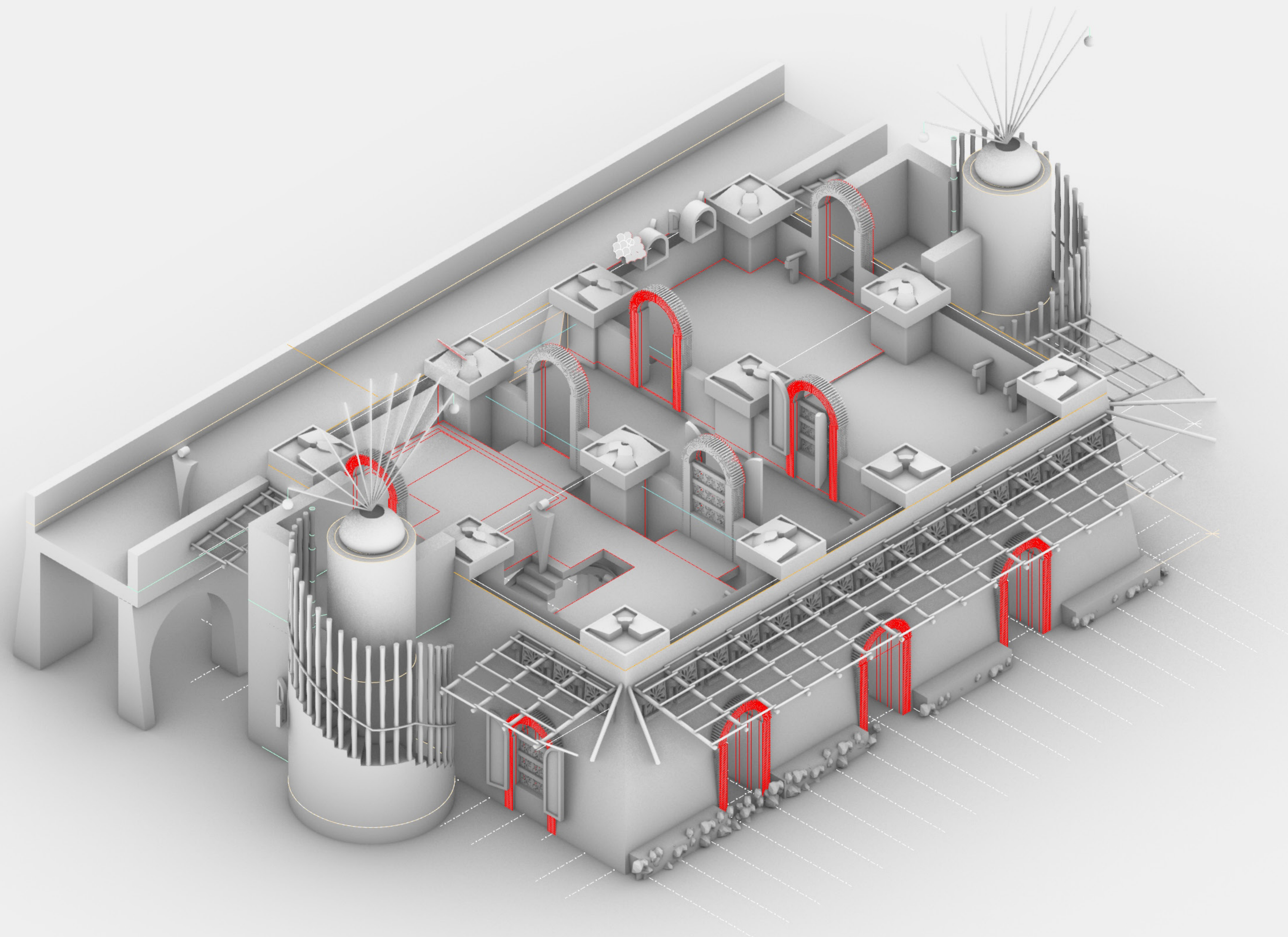


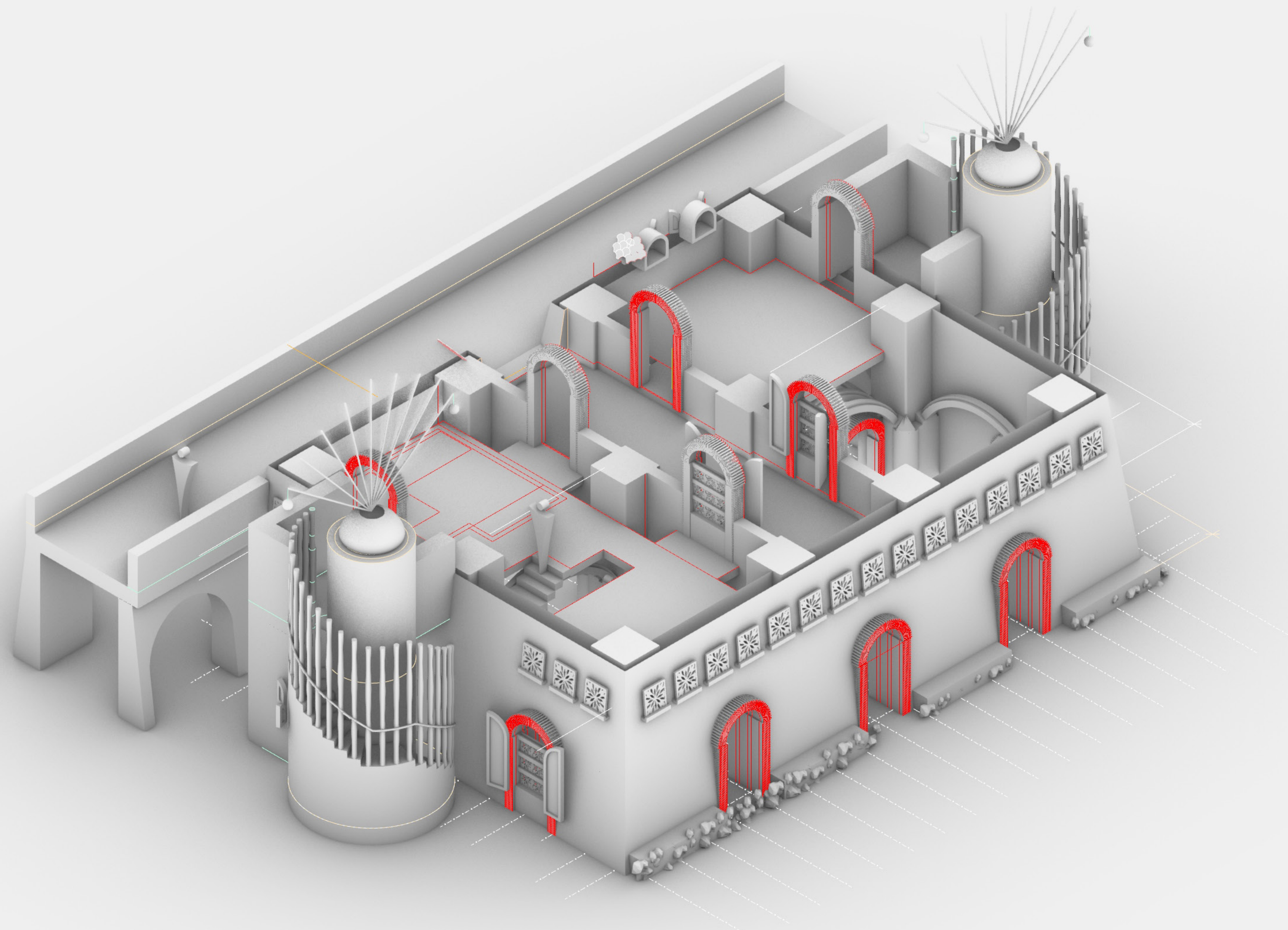


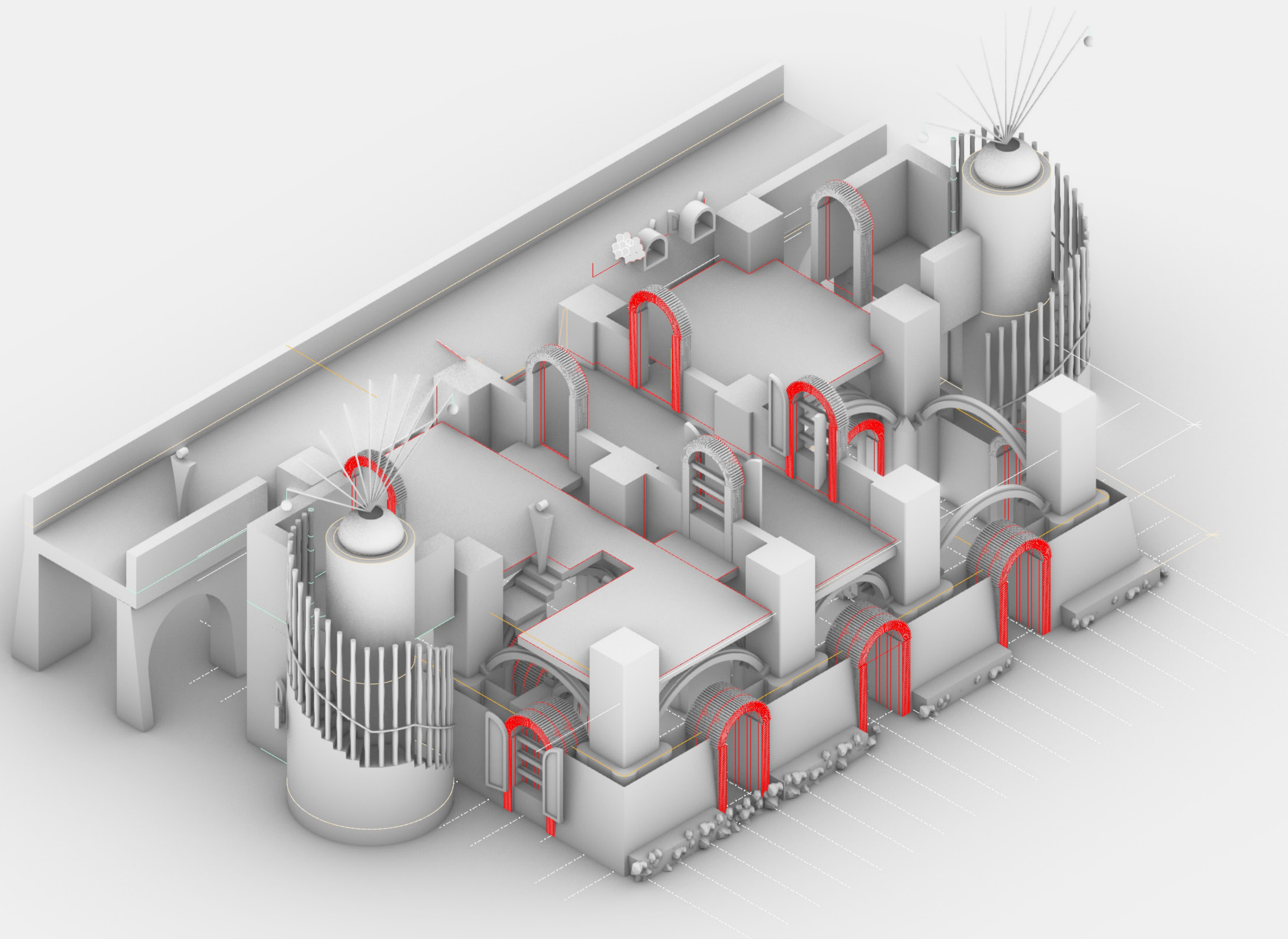


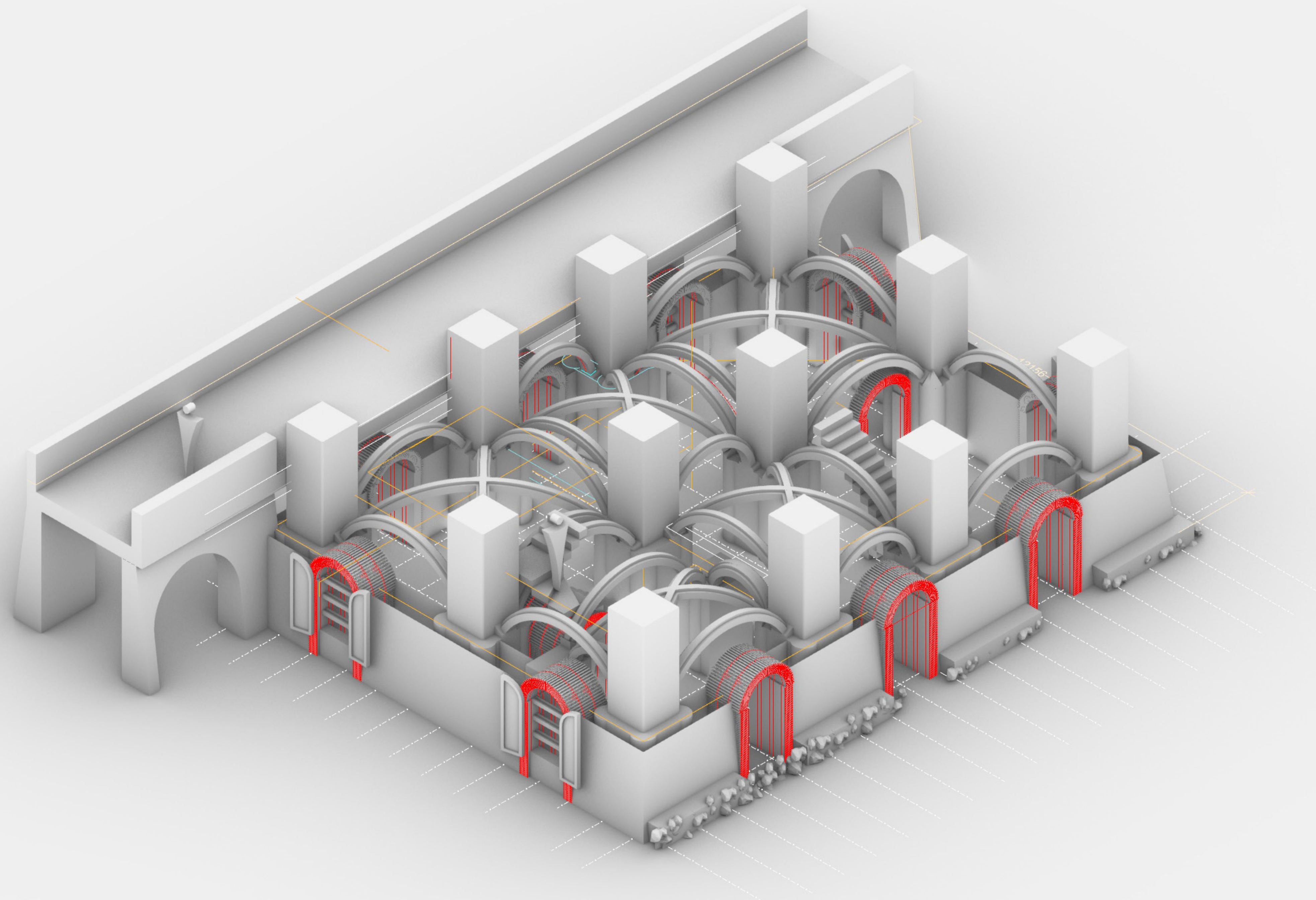


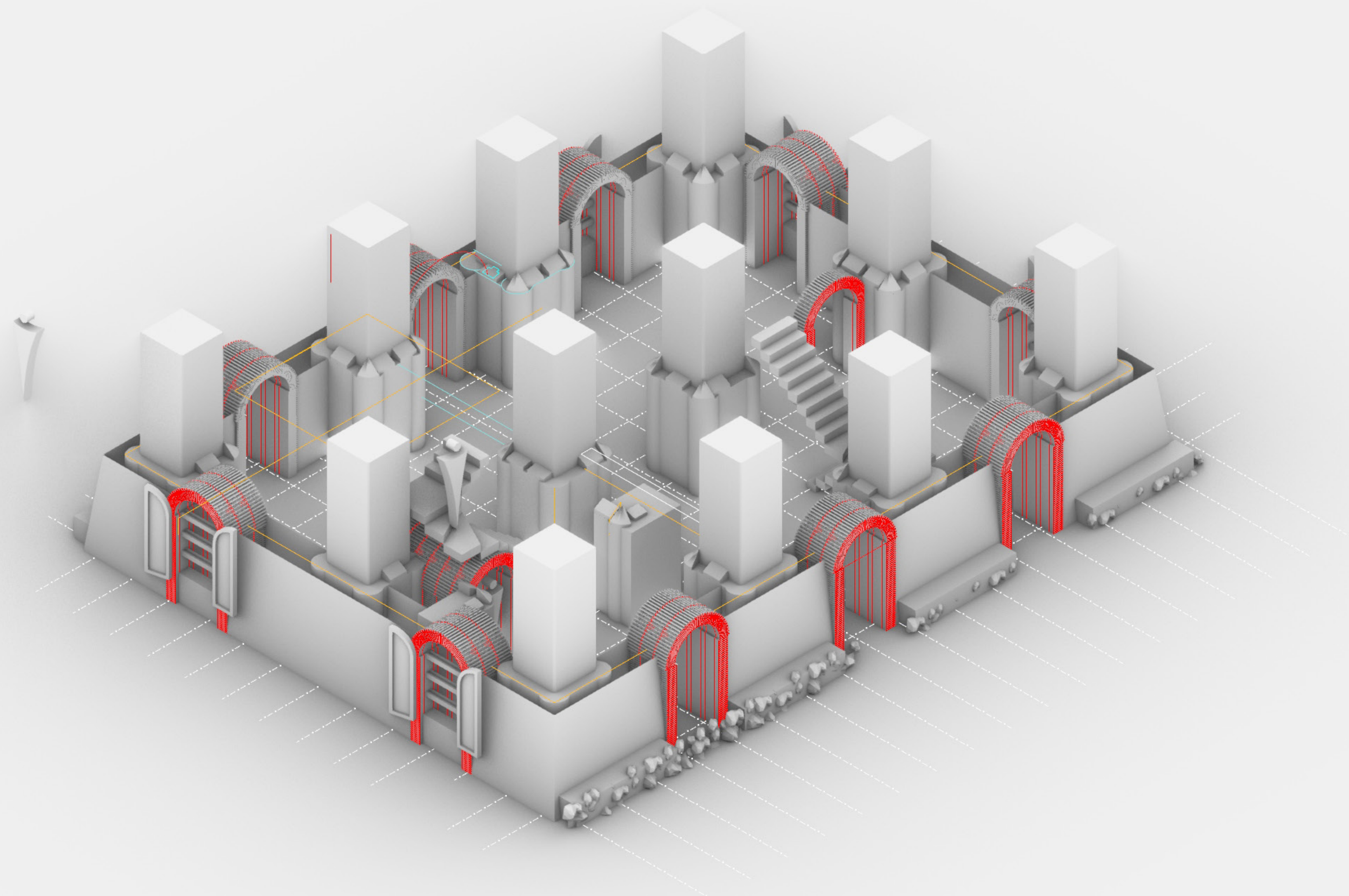


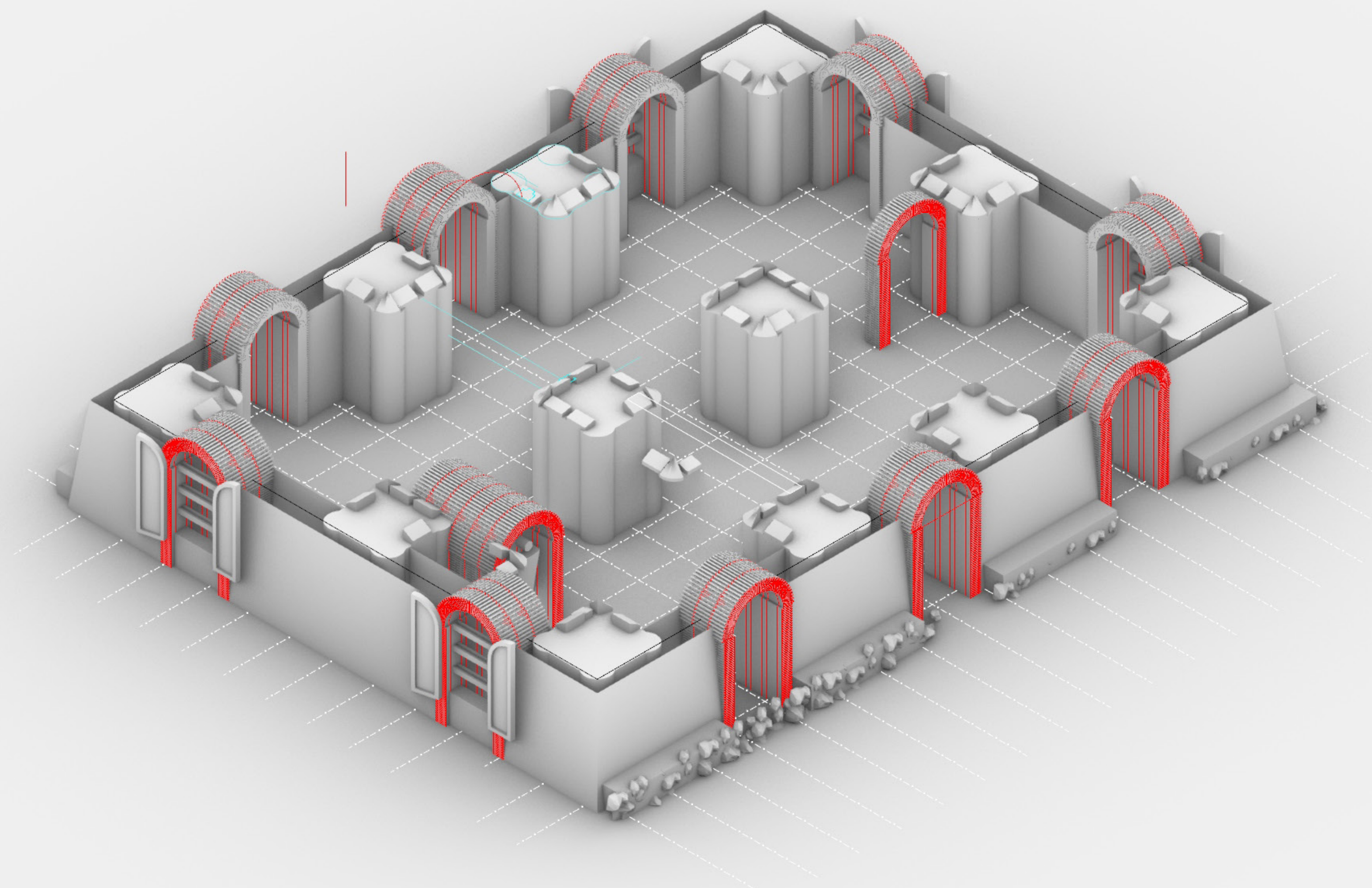


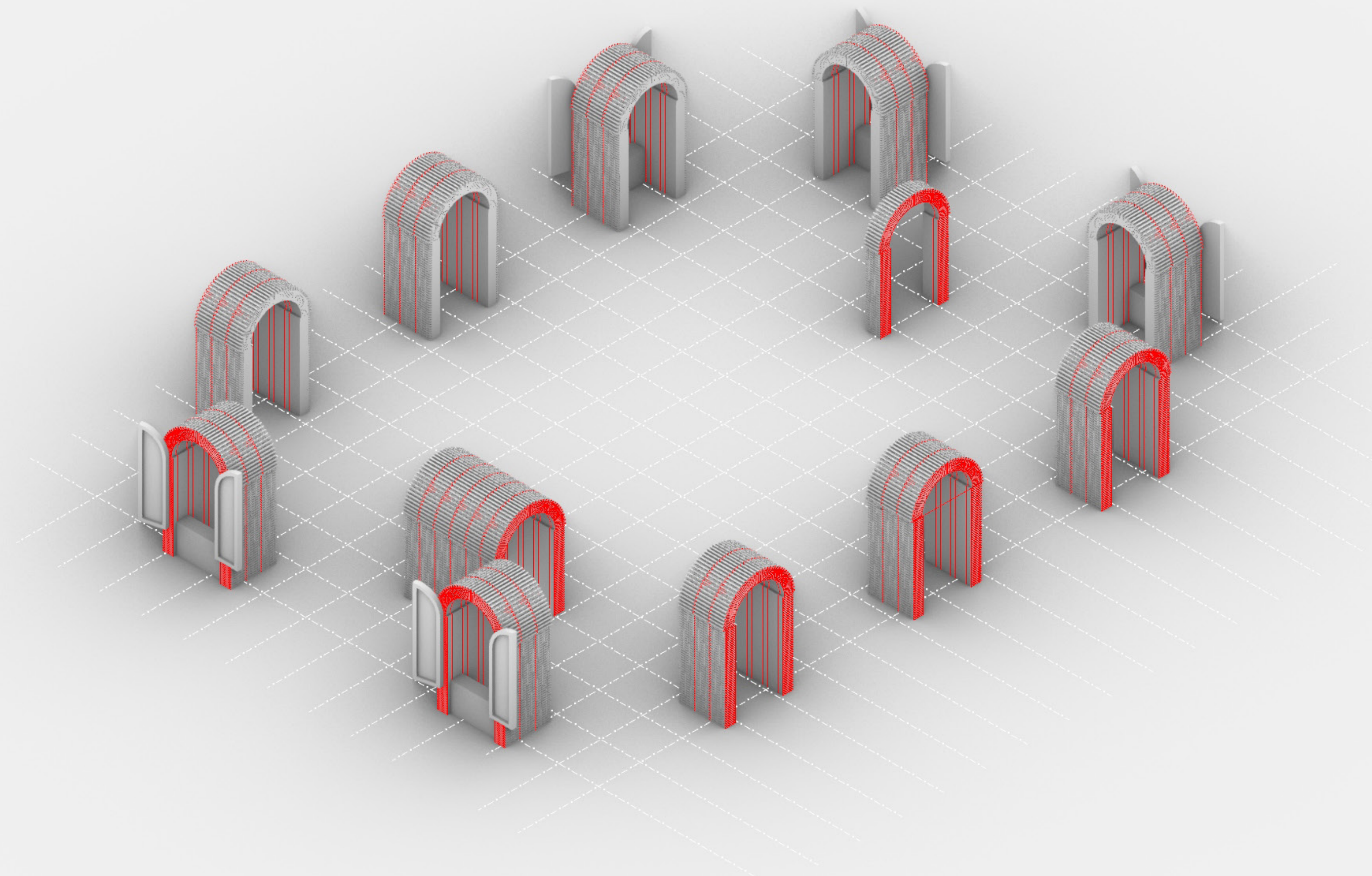


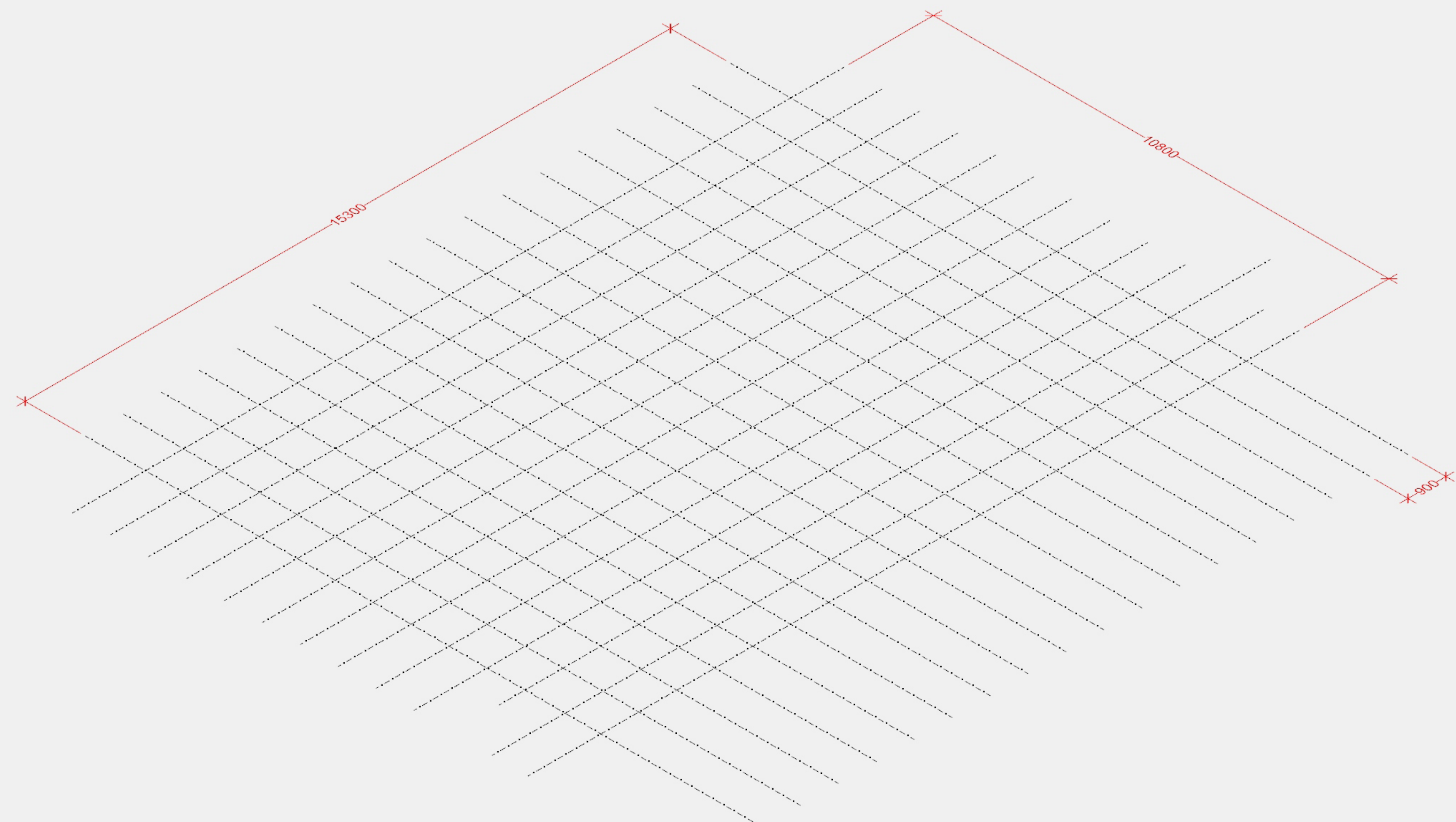


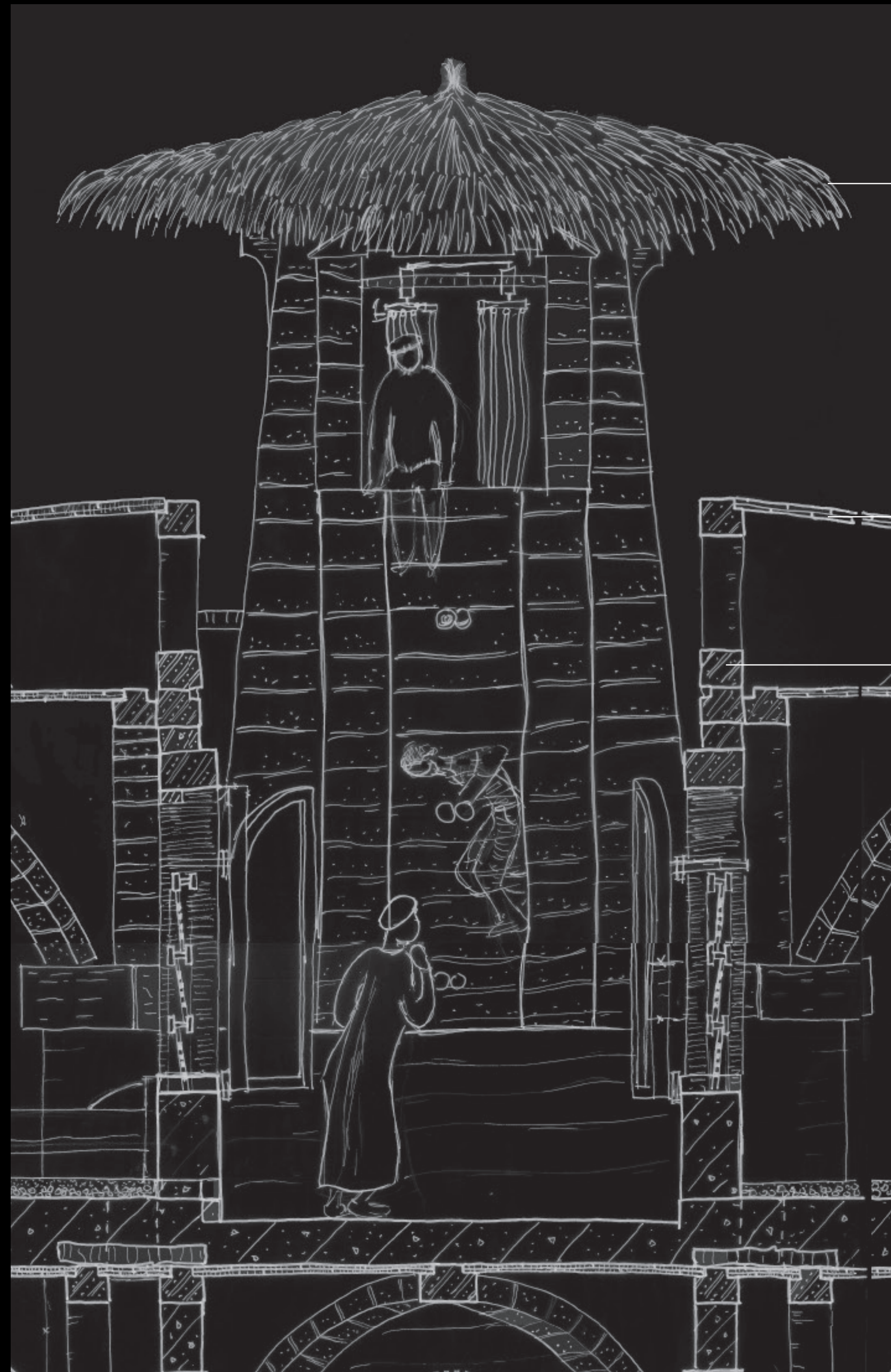












Local 'Kuni'
Palm Leaves

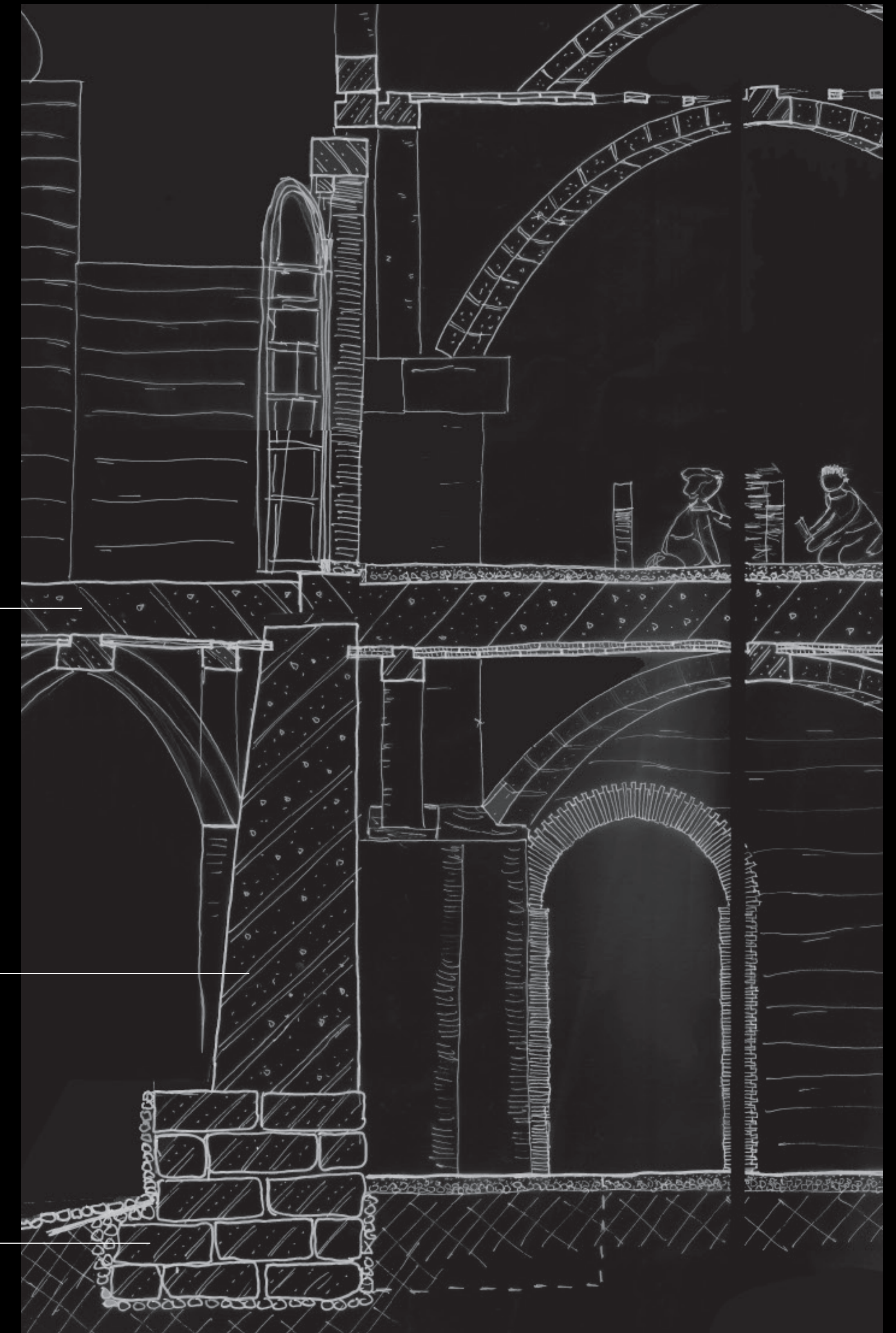
Thin Tile Catalan
Vault Structure

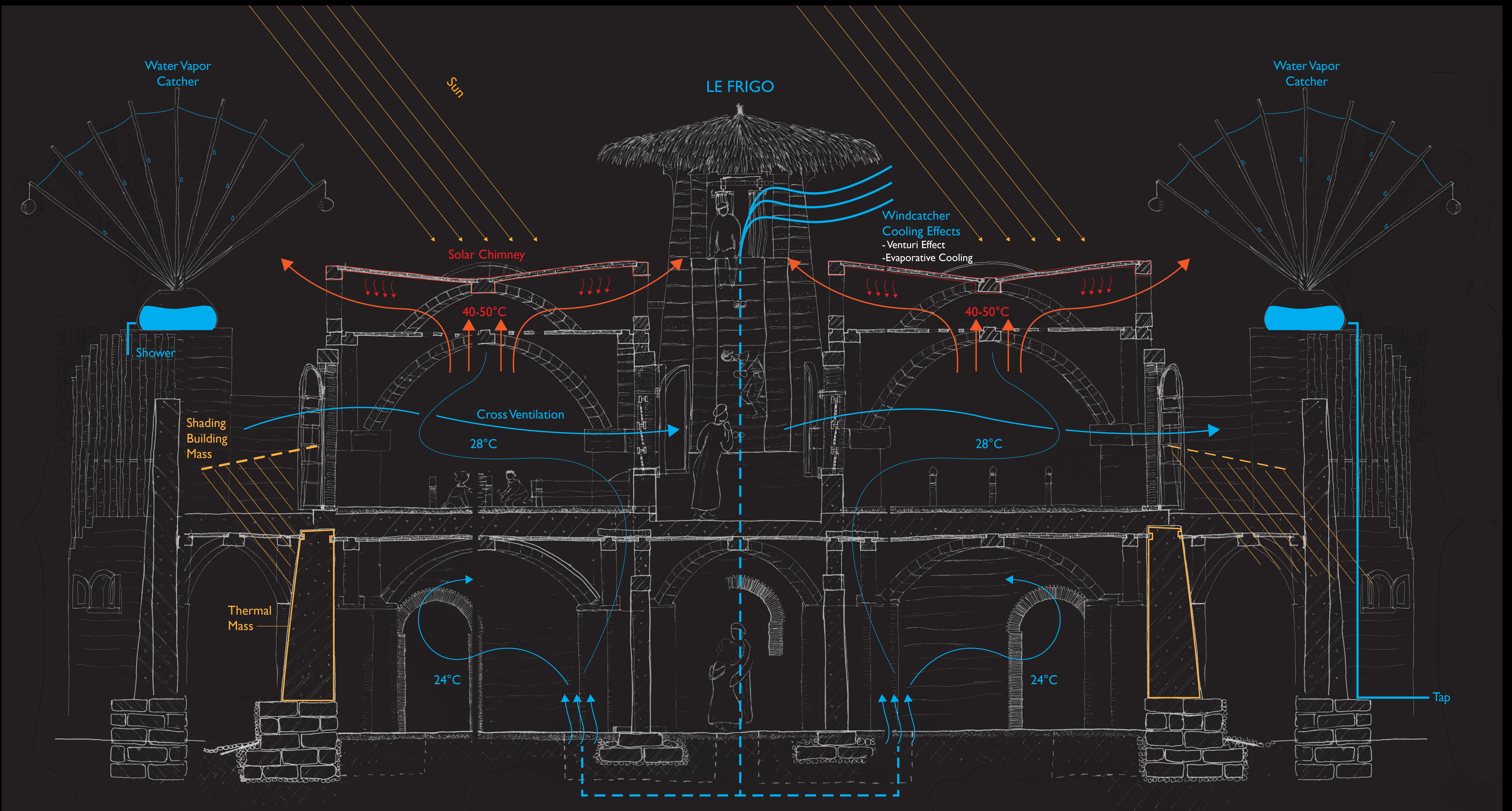
Unstabilized Earth and
Rubble Back Fill

Groin Vault
Burnt Clay Bricks
CaO + Sand + Earth Mortar

Calciumoxide Stabilized
Rammed Earth

Burnt Clay Bricks
300x150x100























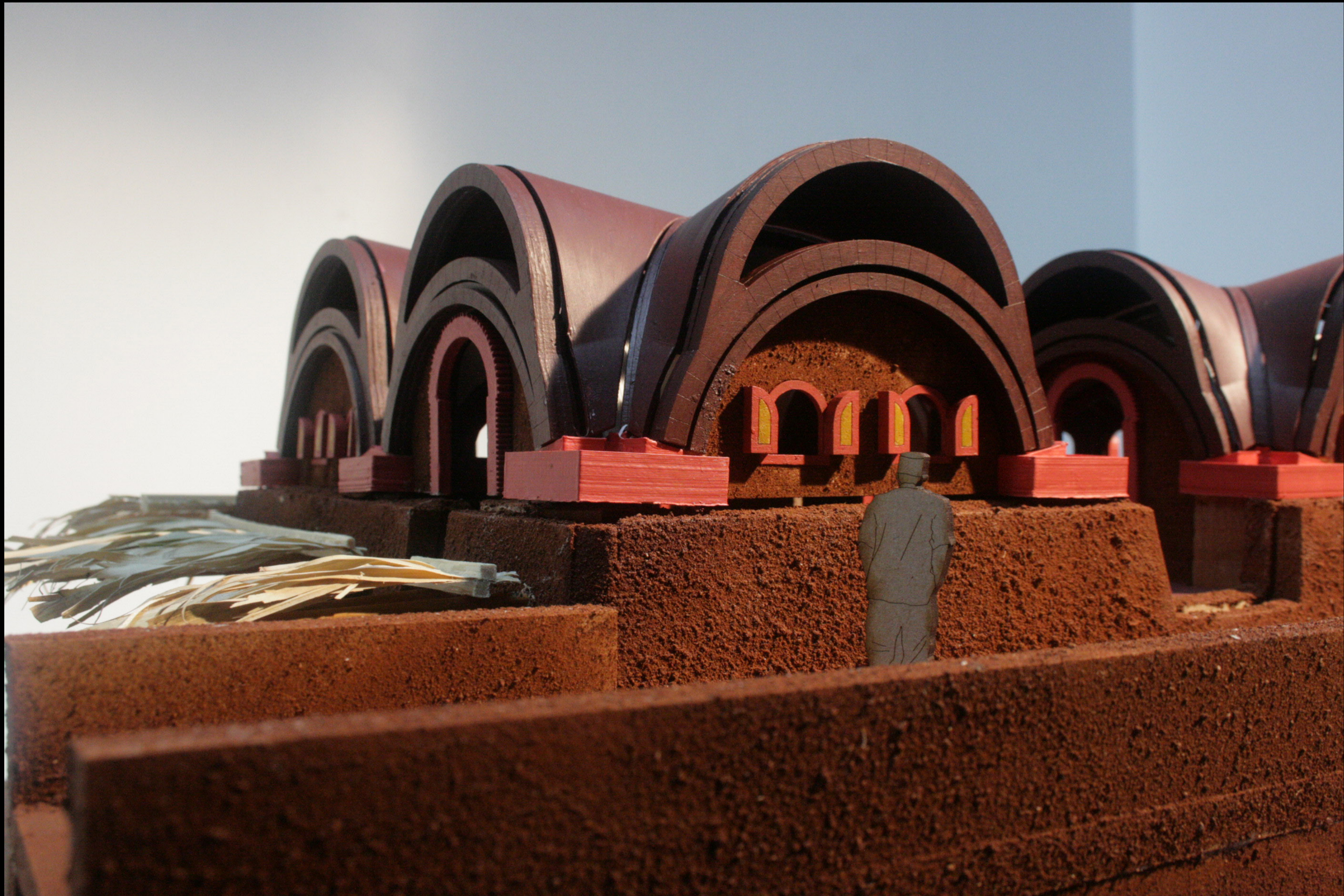






























Chorka lai!!

