

# UNITIZED WALL SYSTEMS

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## OVERVIEW

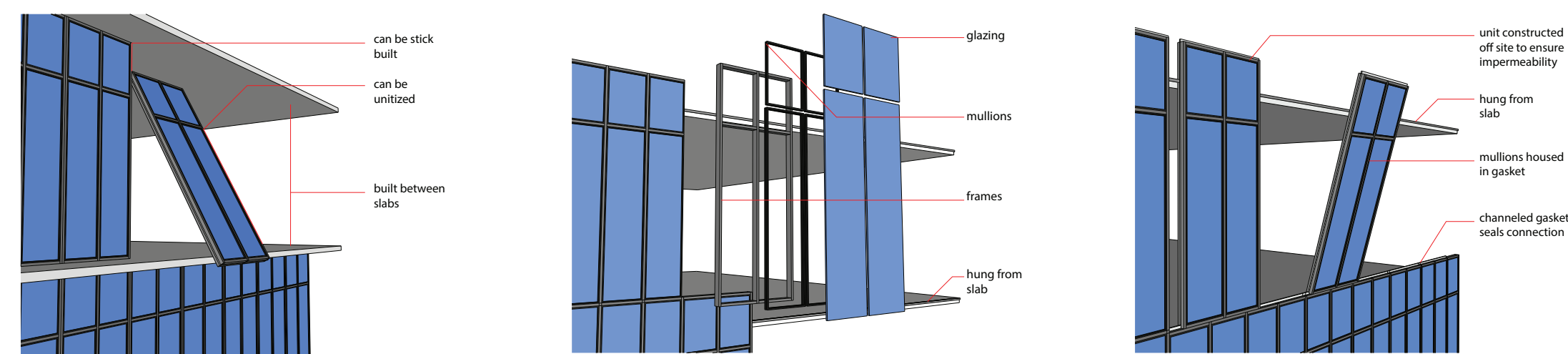
ZGF is working on multiple large towers with short timelines that would benefit from quicker construction, which led us to unitized wall panels from a series of manufacturers.

What often makes the construction process difficult is that there are independent organizations with differing priorities that must work together toward a common goal. By decreasing the number of trades, and minimizing construction time, a prefab system might allow earlier occupancy to regain building costs.

With direction from discussions with the ZGF team, our efforts were initially focused on the comparison of three specific unitized wall systems: Island Exteriors, Sotawall and Enclos.

Our team's goal was to unveil the curtain wall system alternative that offers the "best" building performance capabilities based on efficiency from construction, initial cost and performance standpoints. Concluding that Island was the most optimal system, but discovering the potential local manufacturing was not an option—a main goal of ZGF's—we redirected our research to development.

## WALL SYSTEMS

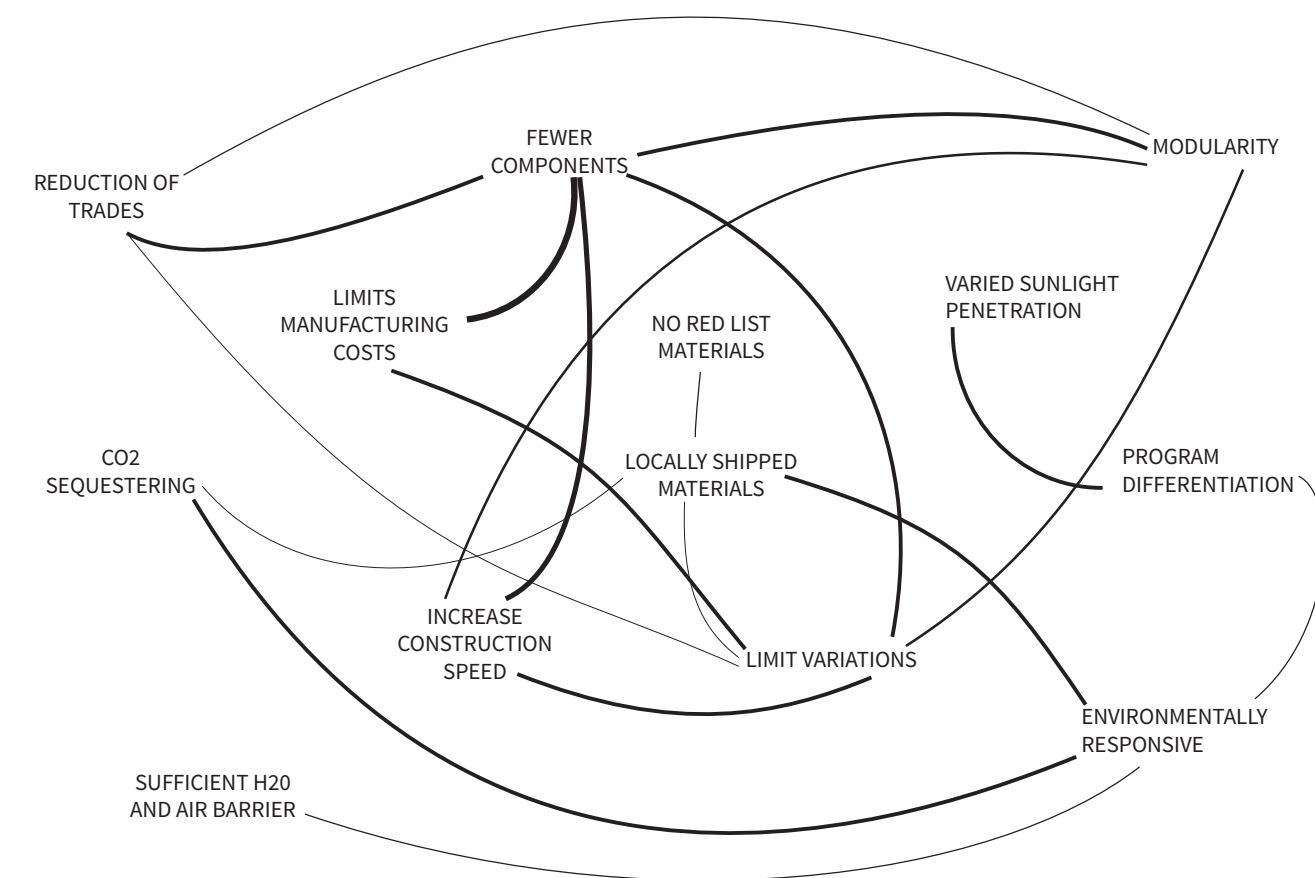
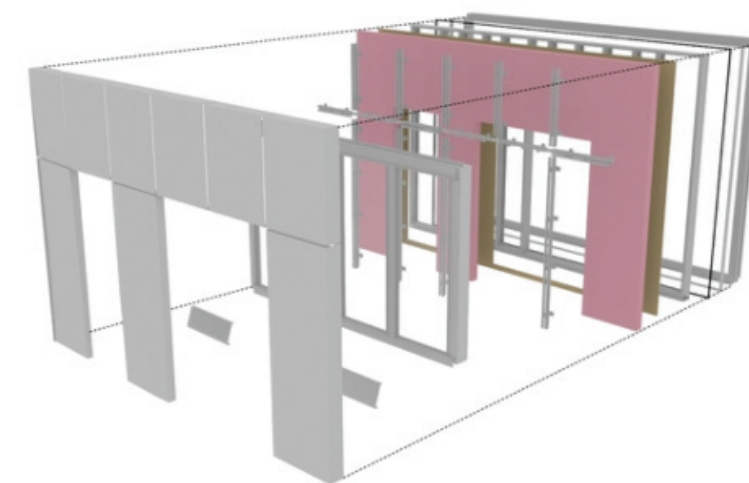


Window Wall System v. Stick-Built Curtain Wall System v. Unitized Curtain Wall System

## CASE-STUDY RESEARCH

Island Exteriors::Megapanel Wall System

BENEFITS   ISLAND EXTERIORS	DRAWBACKS   ISLAND EXTERIORS
SPEED OF INSTALLATION	RELATIVELY HIGH UPFRONT COST
ECONOMIC EFFICIENCY	POTENTIAL NEED FOR CUSTOMIZATION
DURABILITY	STORAGE + TRANSPORTATION
AESTHETIC FLEXIBILITY	OVER ENGINEERED FOR INSTALLATION
SAFETY + SECURITY	
CONSTRUCTABILITY	

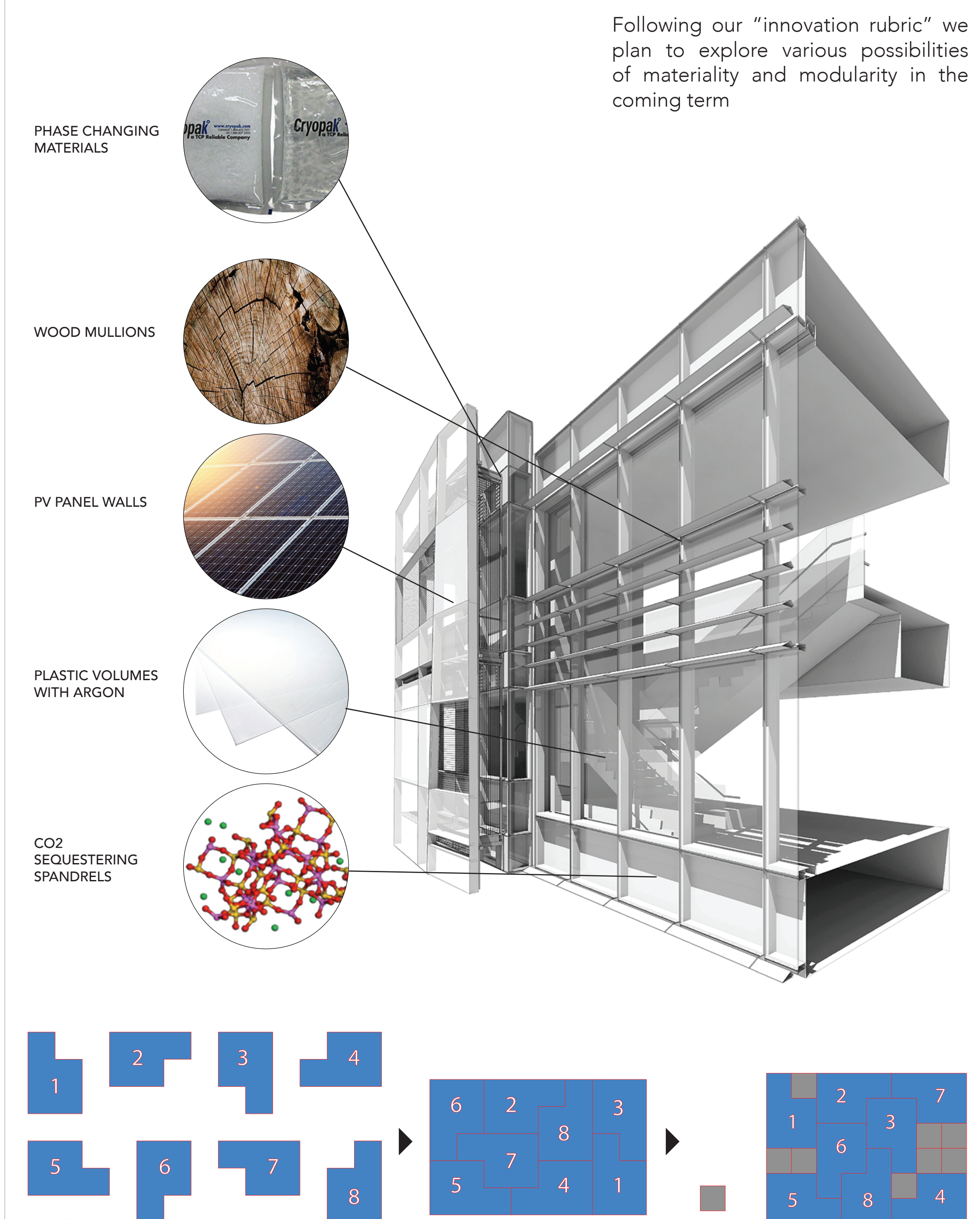


## INNOVATION RUBRIC

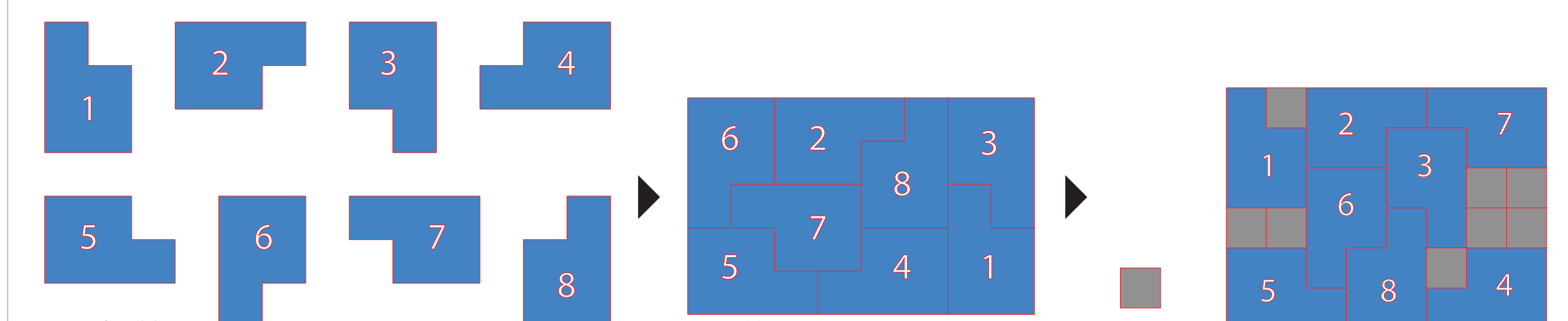
Looking into innovative curtain wall systems that push the boundaries of normal construction, we have developed a "case study for innovation." This case study will guide our own innovation next term. We have also set out certain parameters for designing an optimal curtain wall system.

STRUCTURE	ENVIRO IMPACTS	MATERIALS	PROGRAM	FEATURES	COST
Walls vs. Windows	Locality	Wood	Daylighting (Offices)	Modularity	# of Joints
Clip System	Shipping Distances	Glass	Thermal Comfort (Residences)	Multiple Skins	# of Skins
Girts / Support	Toxicity	Bamboo	Storefront (Changeability)	H2O Capture	# of Unique Pieces
Construction Tolerances	Thermal Bridging	Plastic	Performance Optimization	Opacity Changes	# of Trades
Ease of Construction	Heat Gains	Insulation	Solar Orientation	PV Panel	
Time of Construction	H2O Infiltration	Concrete	Carbon Sequestration	Heat Exchanger	
# of Trades	Air Infiltration				

## WHAT IF..



Following our "innovation rubric" we plan to explore various possibilities of materiality and modularity in the coming term



Wall systems will be optimized in a series of parameters. Some include: structure and loads distributed through the wall, environmental impacts and how they correspond with the building code, cost in a relative sense, program and how it differentiates between masses, materials and their proximity to the site, and finally the features that the wall can possess (e.g. natural ventilation and filtration).

A matrix of these that would allow for similarities and synergies to pop up as materials relate to cost, which relates to program will allow for us to push on the limits of what's been built and add these layers of interconnected fragments to make a cohesive design and implementation plan.

