Designing for Constant Change

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How do you design a neighborhood from scratch when so many variables remain undetermined? This question is particularly pertinent to the rapidly expanding cities of the developing world that are very much works in progress. Evidence suggests that this condition will remain for the foreseeable future.

The city of Doha, Qatar offers one such case study. As this rapidly growing city evolves (population 1950: 25,000, population 2011: approaching 1.5 million) the leadership has expressed an explicit desire to do so in a sustainable fashion. Tellingly, sustainability in this case is defined broadly to encompass not only the environment, but culture and economics as well.
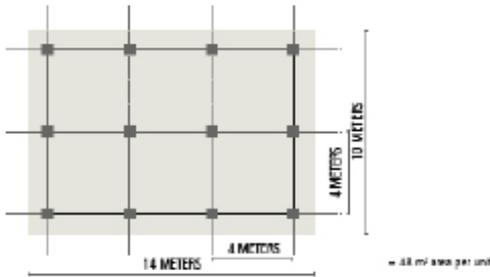
Until now the tendency has been to develop in a speculative manner — a propensity to build all at once without full consideration of how to fill it. As a result, a landscape of air conditioned two story buildings dominates. The climatic constraints are real: while the weather is quite livable for more than half the year, the hottest four months can be difficult to bear. Yet simple proposals can extend the time in which outdoor activity is comfortable, and indoor spaces can be cooled more efficiently through intelligent design.

Our solution proposes an idealized box, a simple yet care- fully calibrated variation of the plan domino that accommodates a plethora of space layouts, programs, and enclosures. Composed of a precise set of components and systems, the box can accept myriad functions. Because of its unit structure, it can be easily transported to the site on an as-needed basis and plugged into the site's infrastructure. A variety of façade and roof strategies based on performative criteria can help reduce solar gain and create a richly diverse architectural language. Orientation and function dictate not only the façade direction, but also how the buildings aggregate, as well as the height and distance between buildings.

With a set of basic rules, the addition of buildings can occur organically over time. At each stage of development, appropriately-scaled public spaces will accompany the buildings, including the park, the plaza, the courtyard, and the garden. Importantly, most streets are shaded, allowing easy pedestrian passage throughout the neighborhood.

Thus, tactics are sought to design for transition, which may or may not be as transitory as originally planned (what if the project is never completed?) as well as for uncertainty, which is certain to remain a characteristic of the geopolitical landscape.

Grid Structure Infrastructure

CONDITION

The tabula rasa condition assumed by some designers when approaching projects in the region is false. At the most elemental, there is always sun and wind. An understanding of both can lead to architecture that is truly contextual without resorting to empty algorithms or formal metaphors.

STRATEGY

TACTIC

Components & Systems

CONDITION
Repurposed spaces are poorly fitted out without extensive retrofitting.

STRATEGY
Utilising a range of enclosure types to create varying levels of accessibility and privacy will contribute to a dynamic façade system. It should also be demountable.

TACTIC
A track along the perimeter edge of the floor structures can support hanging the enclosure without directly affixing it to the structure.

Space Layout

14 METERS

4 METERS

10 METERS

4 METERS

= 48 m² area per unit

Residential Studio

Residential 2 Separate Units

Residential 2 Combined Units

Commercial Small Shared

Commercial Small

Commercial Medium

Institutional

Institutional Medium

Institutional Large

CONDITION

Interior layouts are rarely well-suited for multiple functions so repurposed spaces are often compromised.

STRATEGY

Utilize a regular grid structure to create opportunities for subdivision. By keeping the bay a perfect square, the partitions are easily altered in either direction.

TACTIC

Structural column grid at 4 meters on center. The grid is 2 bays in one direction and 3 in another and is flexible to accommodate several different kinds of programs.
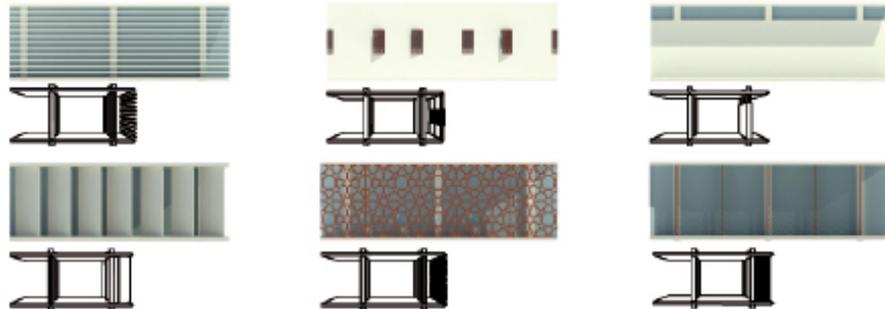
Enclosure

CONDITION

Too often, solar orientation is not properly considered in façade design. As a result, heat gain can make interior spaces unpleasant or uninhabitable.
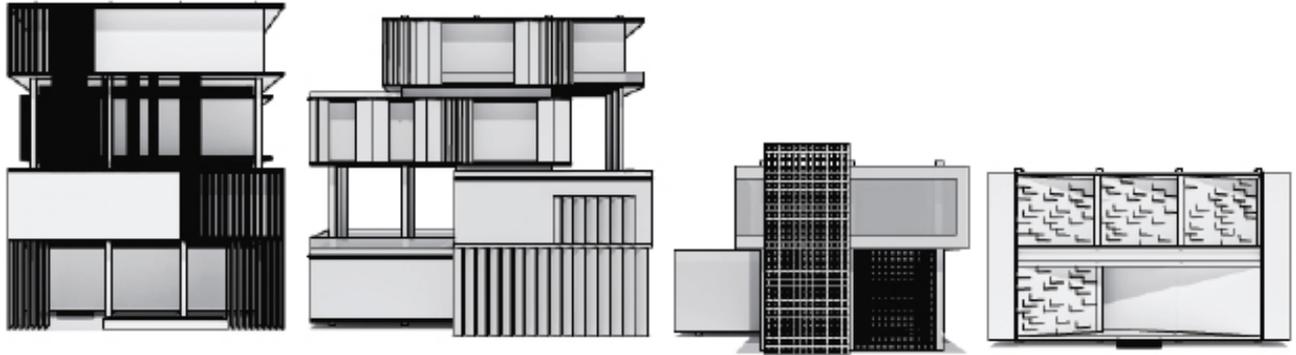
STRATEGY

Utilizing a range of enclosure types that are appropriate to their orientation will also create varying levels of visual accessibility and will contribute to a dynamic façade system.

TACTIC

Selecting the correct opening type and correct shading can greatly minimize solar gain, thus reducing energy costs and providing a regionally-specific characteristic without resorting to historical pastiche.
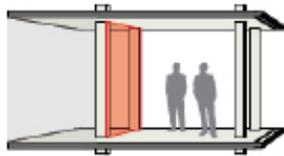
Enclosure

CONDITION

Construction is a variable process. Program and scale often change during the design process which are difficult to amend.
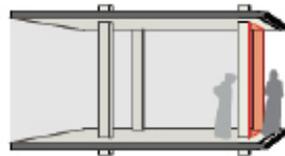
STRATEGY

Plan for change by using a modular unit which can be easily assembled and disassembled as the scope of the project changes. Systemize access to utilities.
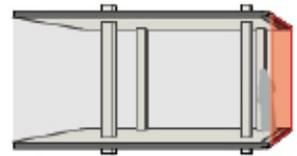
TACTIC

A pre-cast concrete unit that accepts multiple façade treatments.


Aggregate

CONDITION

Public spaces are too often considered late or even as an afterthought in development.

STRATEGY

Integrate appropriately scaled public space into the modularity of the unit so that the once "left over" space performs a critical function in the built environment.

TACTIC

A sequence of nested scales for public space and the road network which are directly correlated to the scale of the building as well as each other.
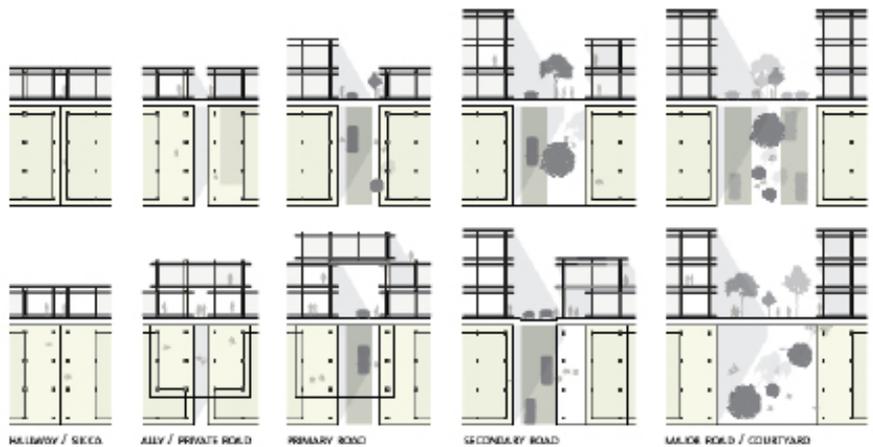
The height of buildings and their distance from each other has a profound impact on the quality of outdoor space.
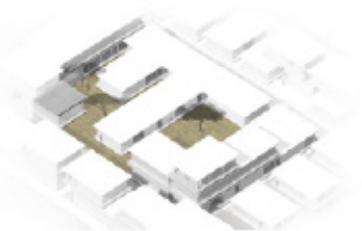
Garden
An intricate open space that
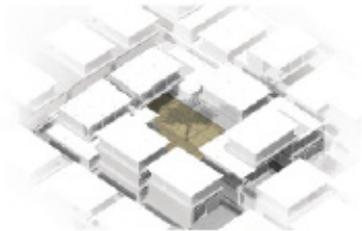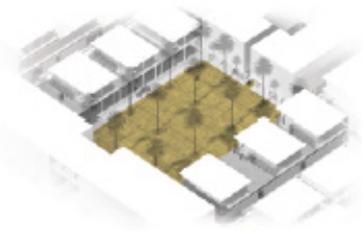allows for small scale interactions.

Courtyard
A medium-scaled open space
that can operate as a residential
communal area or as a collective
gathering space for office workers.

Plaza
A large formal open space that
serves as the central public
domain of the neighborhood

Aggregate

CONDITION
Public spaces often exist in isolation as island oasis of green dropped into
the urban fabric as needed.

STRATEGY
A varied spatial arrangement of smaller "stepping stones" between large
public spaces provides alternate pathways through the built fabric, while
maintaining an overall linearly-oriented array between larger spaces. These
places act differently however than the larger, more formal patches (like
the plaza) which is a destination within the network.

TACTIC
Dispersed but connected patches of related scales form a network of
open spaces.
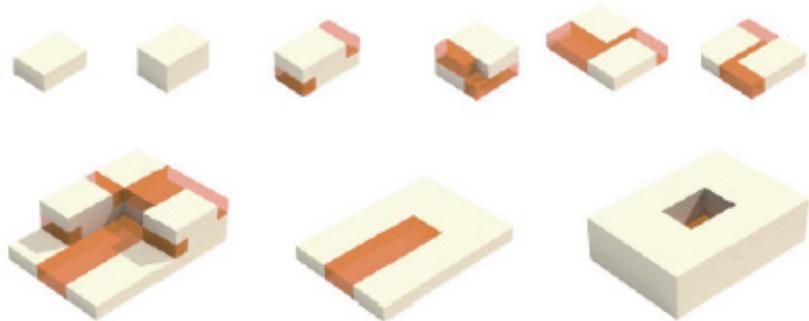
Aggregate

CONDITION
Development projects grow so large as to become
near instant cities. When this happens, it becomes
difficult to consider and coordinate the many
systems that interact at this scale.

STRATEGY
Create a system that allows for dynamic growth
over time.

TACTIC
Start development with anchor buildings and major
gates to help define the larger elements of the
project. Front major roads and leave spaces to be in
filled as the area grows.