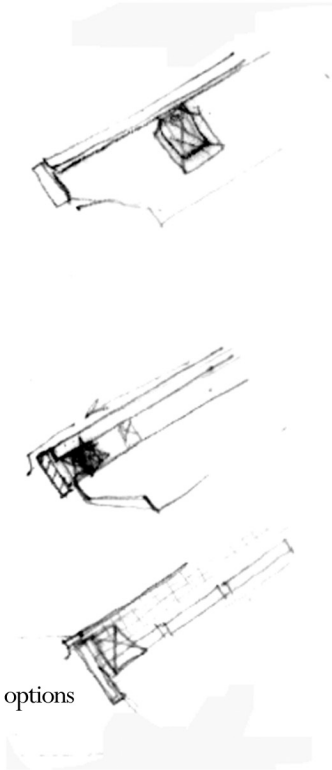
a system of elements

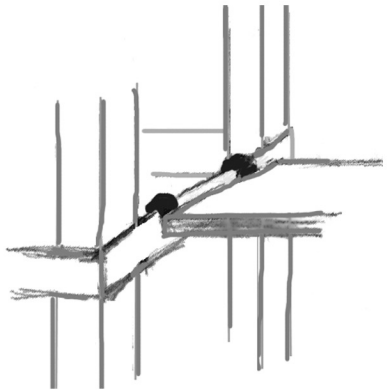
Steel-framed, farmers market shed row
Blacksburg, Virginia

A SYSTEM OF ELEMENTS

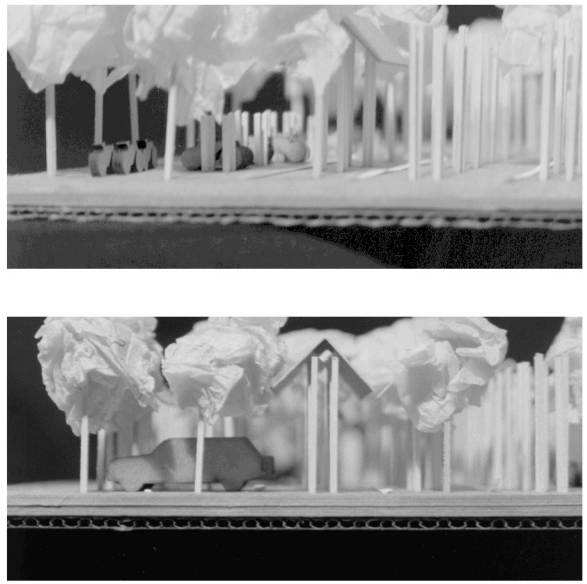
The earliest schemes for a system of elements were wood-framed translations of the simple shed structures found at train depots, early rural service stations and bus stops. Conventional framing and detailing favored a gable roof design. After much working with this system and studying the range of the system, rainwater proved to be the impetus for a design shift. Farmers markets and bus routes continue rain or shine. Gable roofs are like umbrellas - they work great if you're completely under the canopy, but that continual edge drip is very annoying.



Eave options

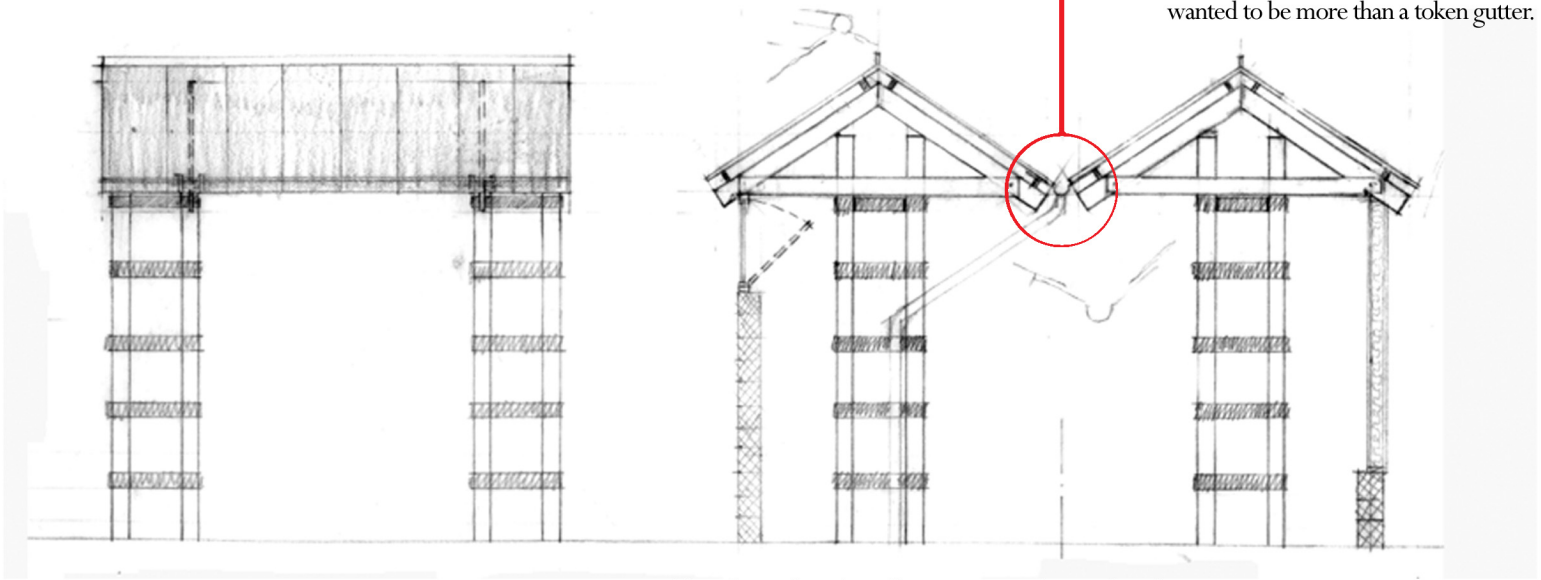


Shelving attachment

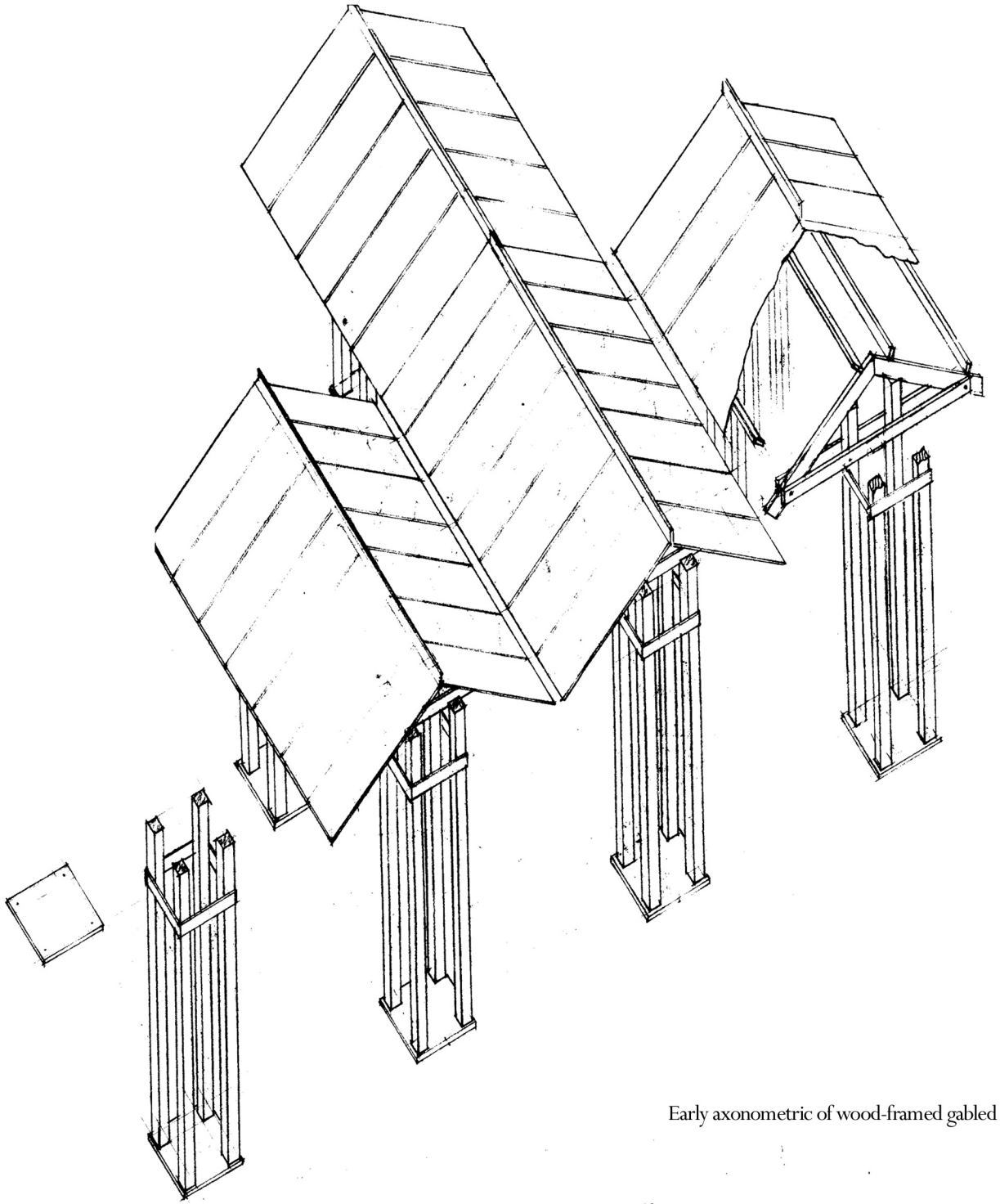


Model images

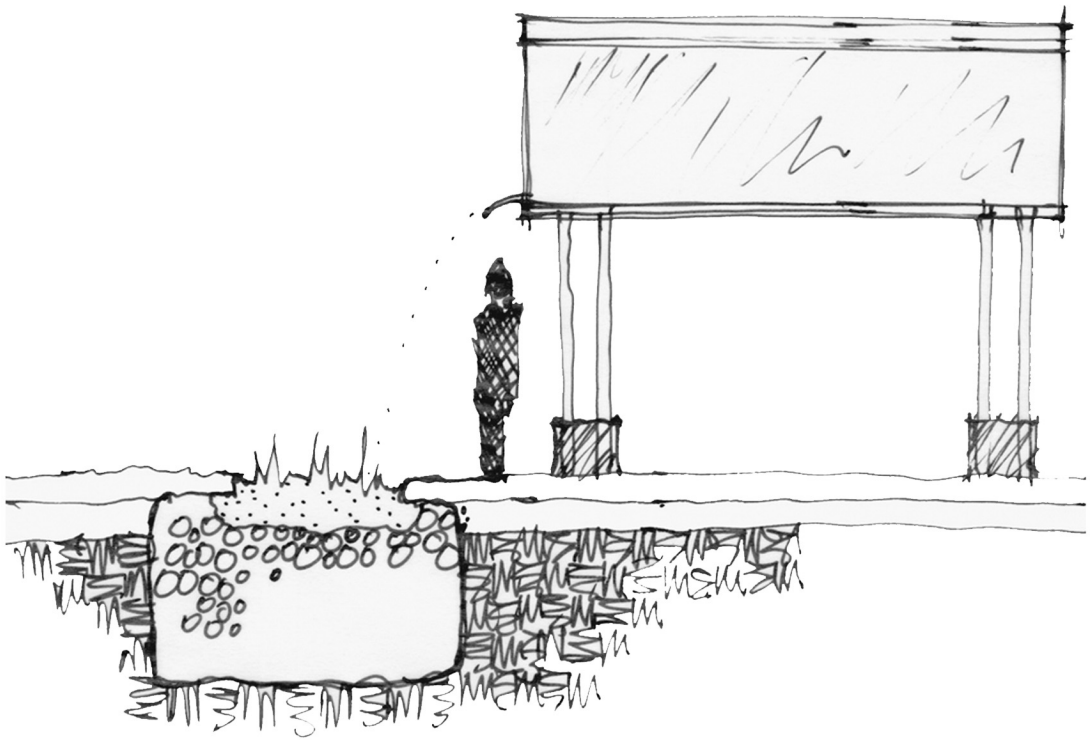
An important realization was that the connection between the canopy elements wanted to be more than a token gutter.



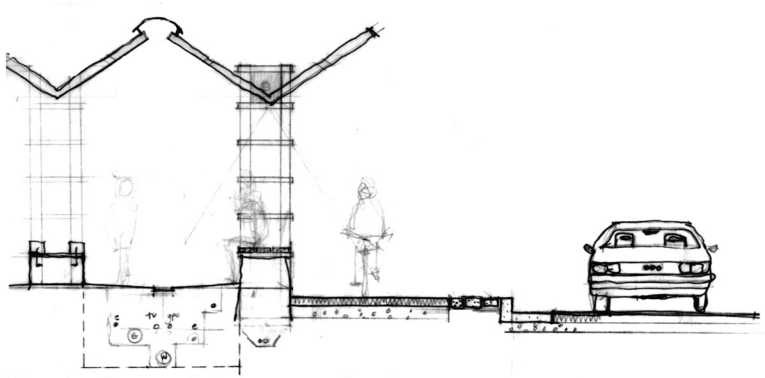
Elevation and section of gutter connections and enclosure



Early axonometric of wood-framed gabled system



Longitudinal section - rainwater directed to bioretention/infiltration area



Inverted gable and utility tunnel along street right-of-way

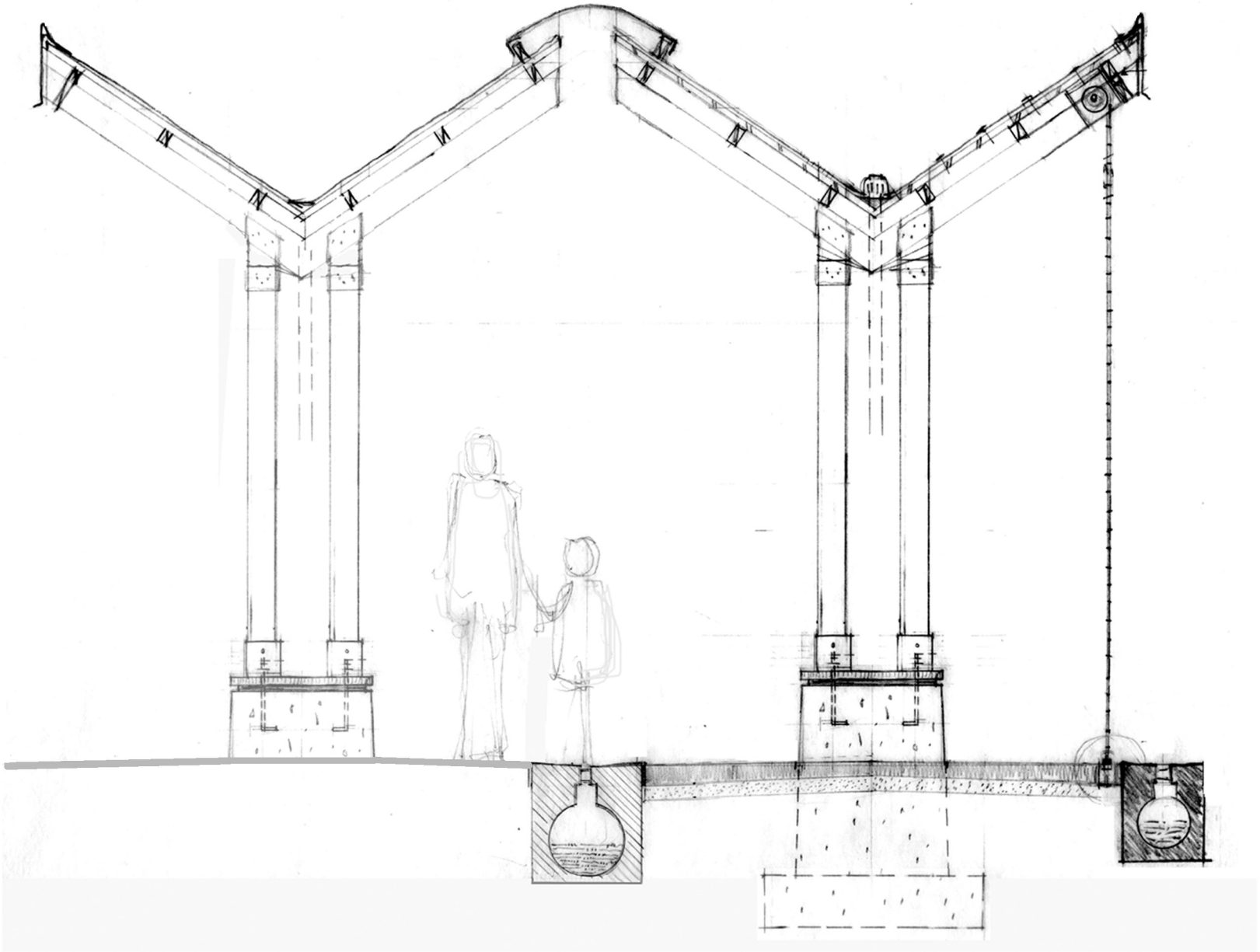
INVERTED GABLE

Inverting the gable roof to collect rainwater dramatically transformed the design. The space defined by the canopy began to open up, to become inviting. Larger spans better corresponded with the typical parking space module of 9 feet by 18 feet. This system also began to work better with a larger and taller tree canopy encouraged for shading.

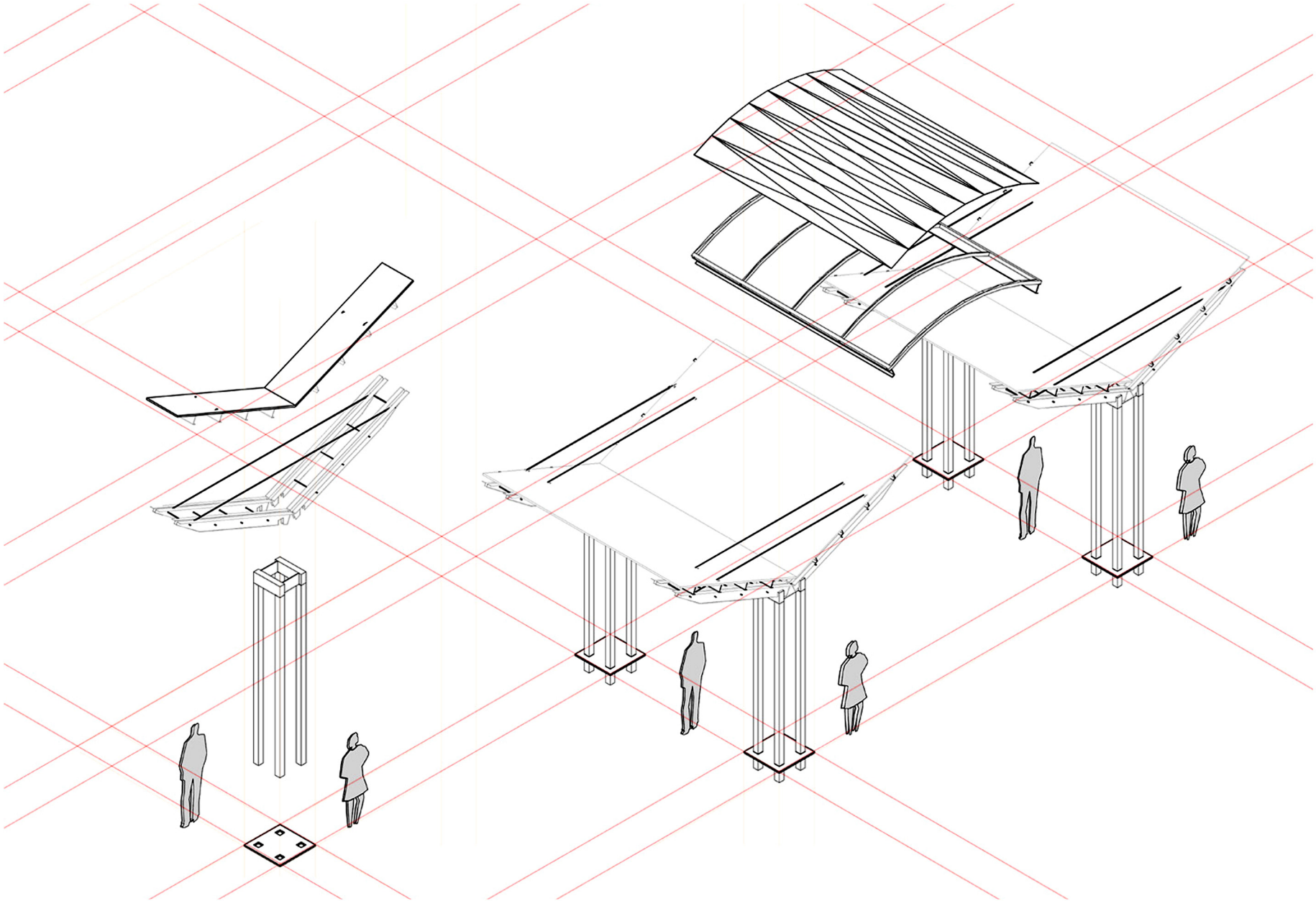
Rainwater is collected in the vee.

Its journey can be expressed with a spout to one side directed to a pervious surface,

or it can drain to a downspout contained within the multiple members of the column.

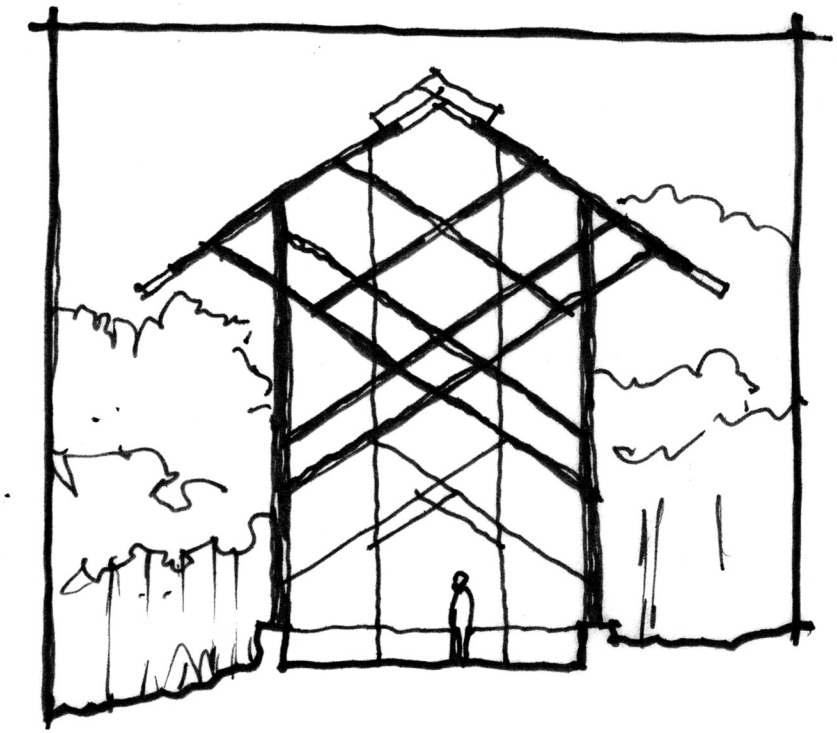


Section showing cast drainage channels, coiling grille at eave enclosure and base mounting



Axonometric of pavilion system - base, column, single, double, joined with curved skylight

Train shed - Union Station, Washington DC
Architect : Daniel Burnham, 1907



Dimensional lumber and "the discontinuous connector"
Thorncrown Chapel, Arkansas
Architect : E. Fay Jones, 1980

MATERIAL & JOINERY CHOICES

What is a typical construction for this structure type?

One precedent might be the sloped or inverted roof of the train shed. A railroad company would design a series of prototype stations and sheds, develop a series of construction contracts and site adapt in an expedient manner - much like a convenience store/gas station today. Historically the train shed would consist of cast iron elements that were riveted together in a modular fashion. The central column was typically a single piece.

What changes or innovations could be made to the typical construction? What if metal became wood? If the column itself were made multiple members, then the individual pieces could be slimmer if they also spread apart. The presence, or perceived footprint, of the column becomes larger than a single piece. Opening the center of the column provides a protected place for services such as electric lighting or downspouts. It also makes the column transparent and airy.

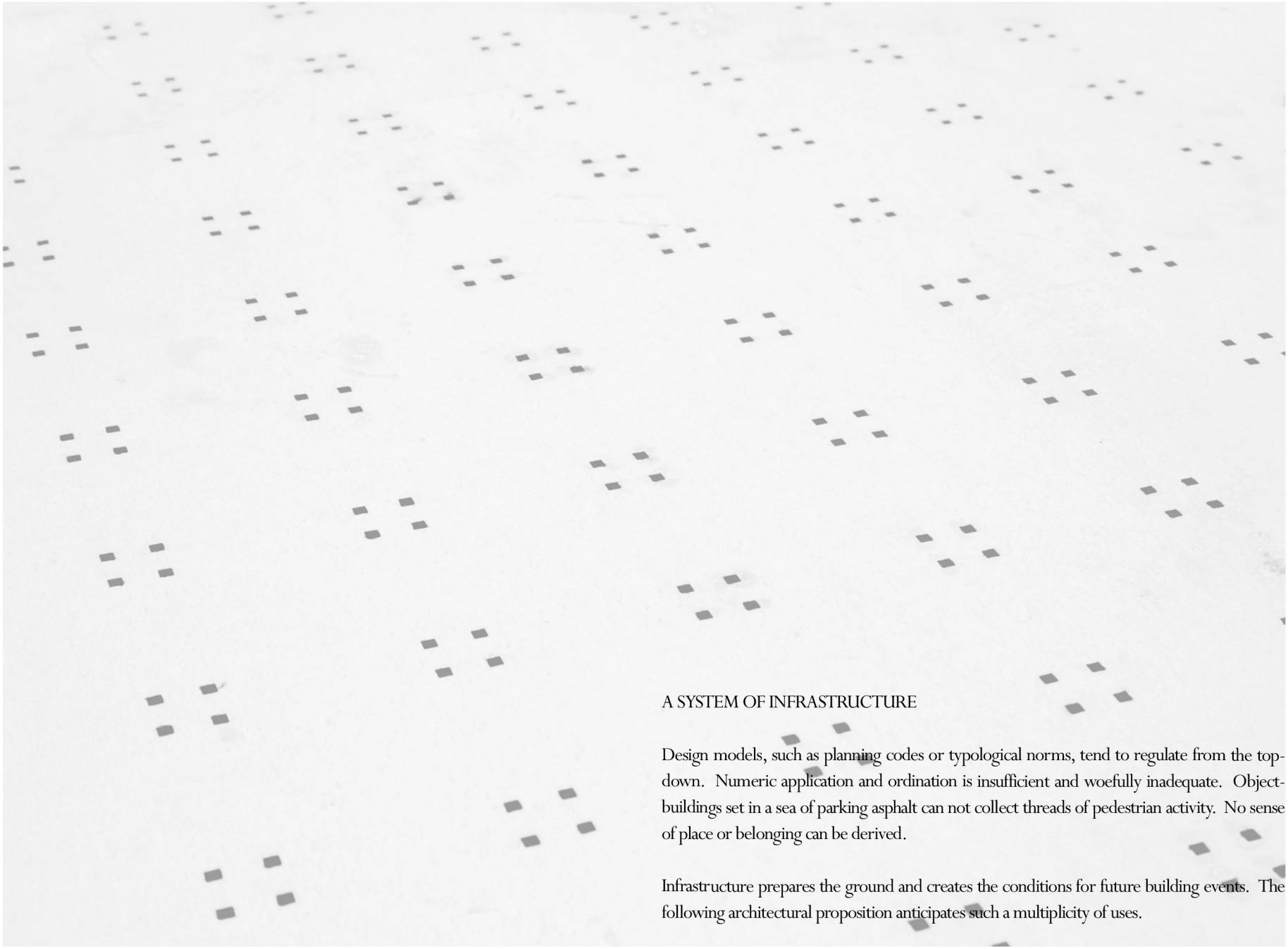
PRECEDENT - THORNCROWN CHAPEL

A heavily wooded site in the Ozark mountains precluded heavy earth-moving equipment or massive construction materials. Portage by two men on a narrow hillside path became the touchstone of all design decisions. Multiple pieces of two-inch framing lumber in tension form the cross-lattice structural system. These small pieces are joined with "the discontinuous connector" - four steel strips notched and welded together leaving the center open. This diamond shape is repeated throughout the building.

The second concept that Jones introduced at Thorncrown was what he termed "the operative opposite." Although the chapel alludes to Gothic cathedral architecture, Jones reversed the rule of Gothic construction. External flying buttresses which push the structure upward and inward were replaced with "wooden tensile members pulling from within."

OPPORTUNITY

Making even small innovations in the normal can generate something far beyond the norm.

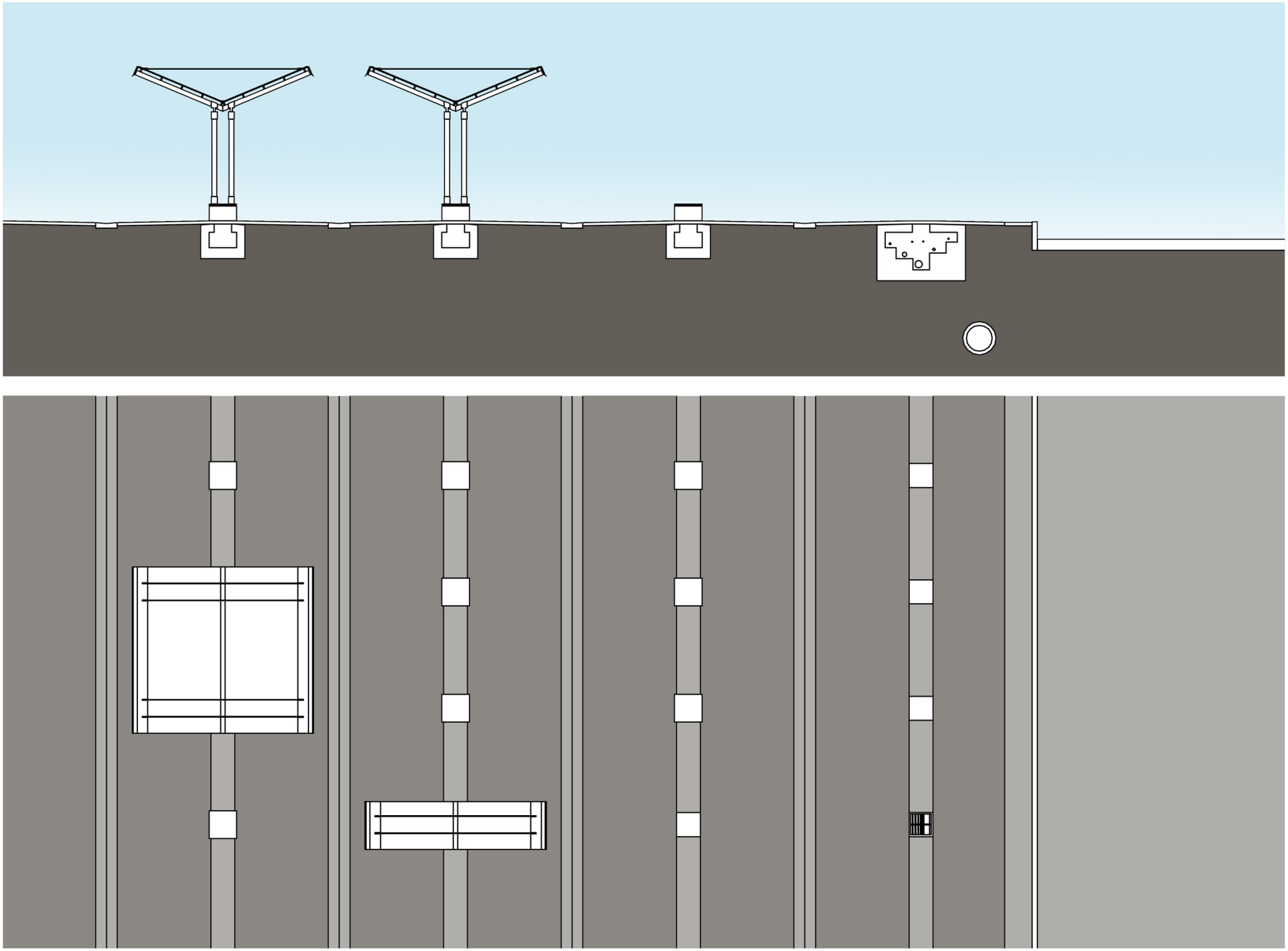


A SYSTEM OF INFRASTRUCTURE

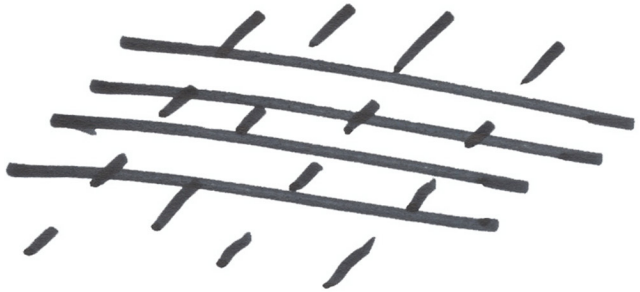
Design models, such as planning codes or typological norms, tend to regulate from the top-down. Numeric application and ordination is insufficient and woefully inadequate. Object-buildings set in a sea of parking asphalt can not collect threads of pedestrian activity. No sense of place or belonging can be derived.

Infrastructure prepares the ground and creates the conditions for future building events. The following architectural proposition anticipates such a multiplicity of uses.

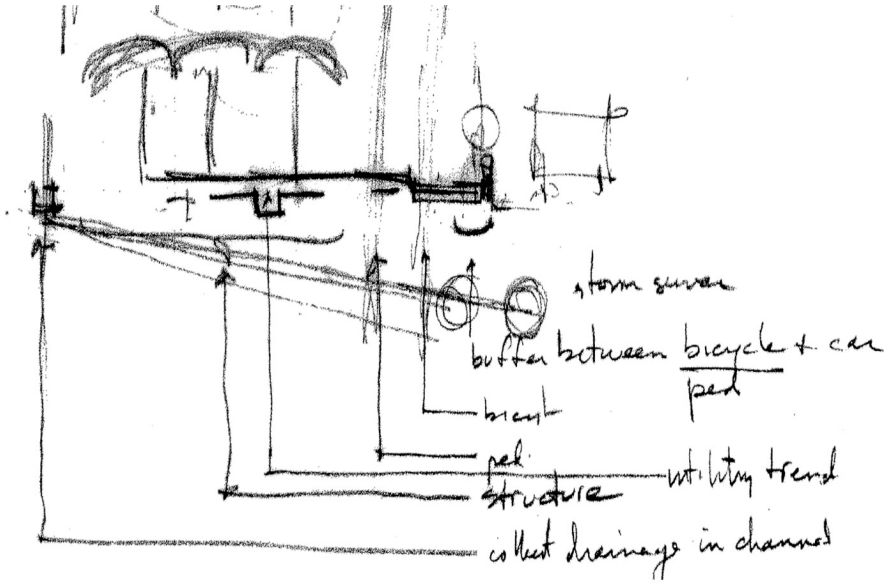
Model base with nodes identified as weft points over a warp of utilities and services



Section and plan of built elements as the weft over the warp of underground utility lines



Weft lines of access over warp lines of service



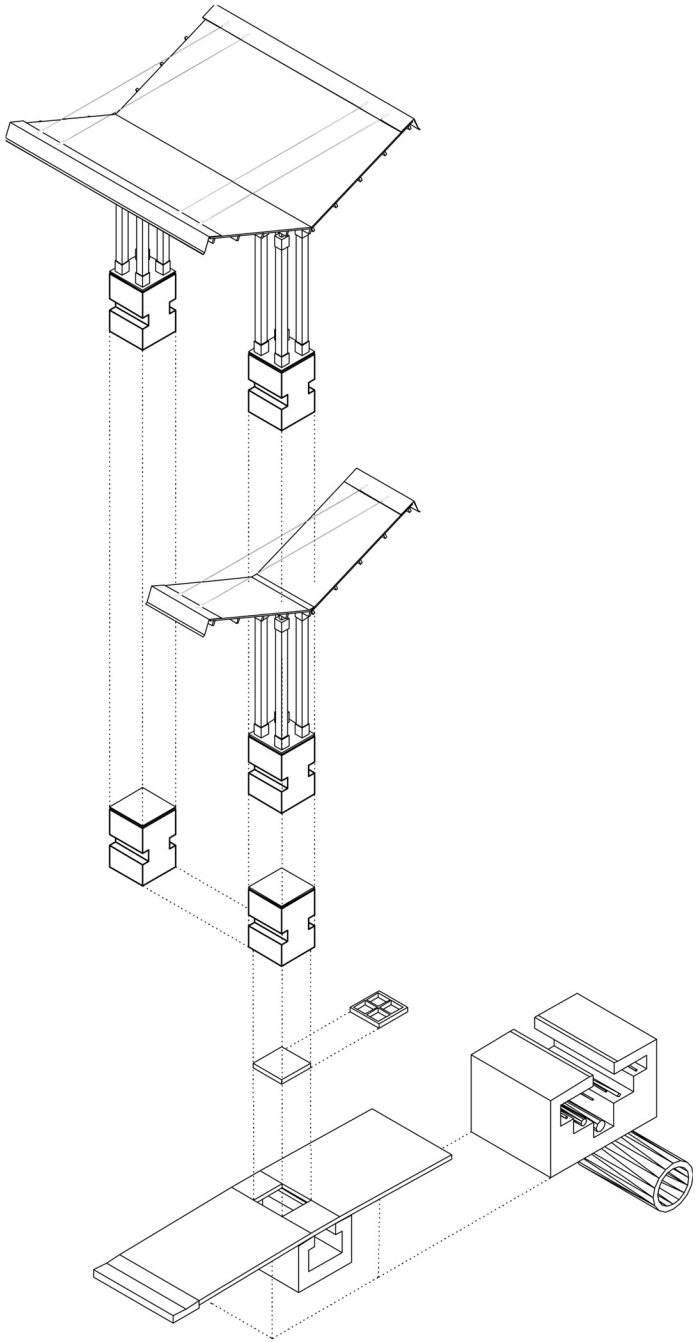
Plug-in elements accessing the underground utility infrastructure

WARP ELEMENTS

The system of elements is distributed in a warp and weft pattern across the site. Visible and invisible parallel lines establish the underlying warp. Points of access create the weft lines.

In preparing the site, a warp of utility trenches is laid parallel with the street. These utility trenches provide power, water, telephone, data, etc. Trenches closest to the street or perimeter can accommodate municipal trunk lines, even taking on the appearance of college steam tunnels. Smaller utility trenches can provide power and water - the services most conducive for alternative uses and additional pedestrian programme. Surface drainage channels can run in this direction also as a more visible indication of the utility warp.

The floor of the parking lot works primarily to the surface channels; secondarily, to the actual drains, or drop inlets, which fall along the weft lines. Stormwater infiltration trenches can form part of this warp also.



System of elements - exploded axonometric

WEFT ELEMENTS

Weft lines are revealed as a series of points or receptacles. The receptacle is a moment of repose along the utility trenches. This node has architectural possiblility as a place of starting or it could become an artifact. The receptacles accept plug-ins of varying intensity.

The lowest order is an access port with a removable cover similiar to a manhole.

The receptacle could also become a light to indicate path or place, using LEDs.

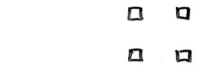
The second order of identification is the base. This base is located at the receptacle and can take on many roles. It can become a traffic bollard, a seat, a drinking fountain or a game table.

With the addition of columns which fit into the base, other identities are acquired: signage, display, light, telephone, disposal, mailbox. Adjacent concrete bases with or without columns greatly expand the possibilities.

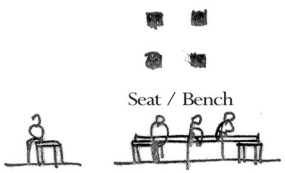
The addition of a roof augments the single column scenario, but its primary application is over two adjacent columns, creating a pavilion. A pavilion can shelter a bank of telephones, newspaper boxes, post office center, ATM machines, or other pedestrian-oriented conveniences.

A single pavilion with two columns can be linked to another pavilion, running parallel, by a skylight element.

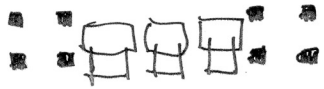
Two pavilions joined thusly could then support a curtain wall enclosure with a coiling grill or a fixed weather-resistant envelope.



Unit "A"

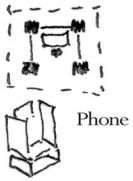


Seat / Bench

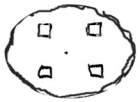


Newspaper Boxes

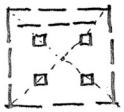
Trash Can



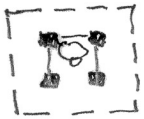
Phone



Fountain



Unit "B"



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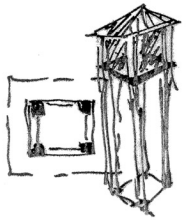
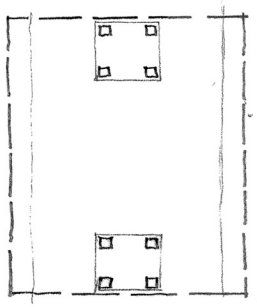
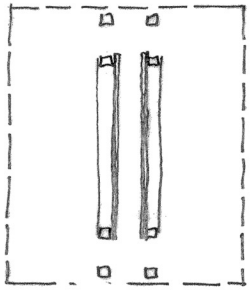


Light Column

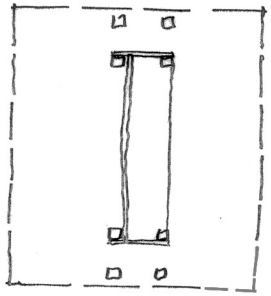
Tower



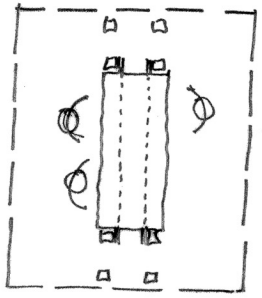
Unit "C"



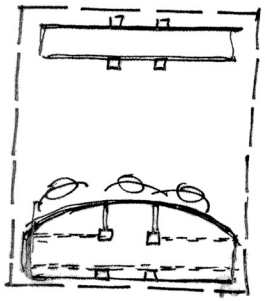
Display Board



Display Board/Counter



Service Counter

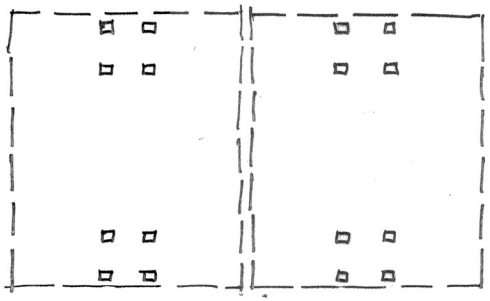


Standing Tables

Bike Rack

ATM

Storage Lockers



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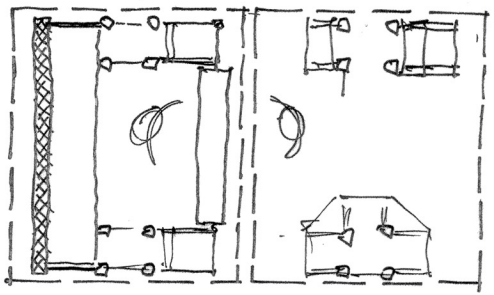
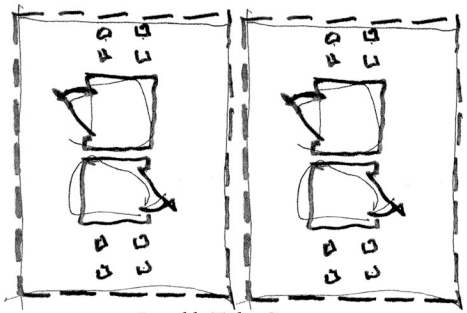
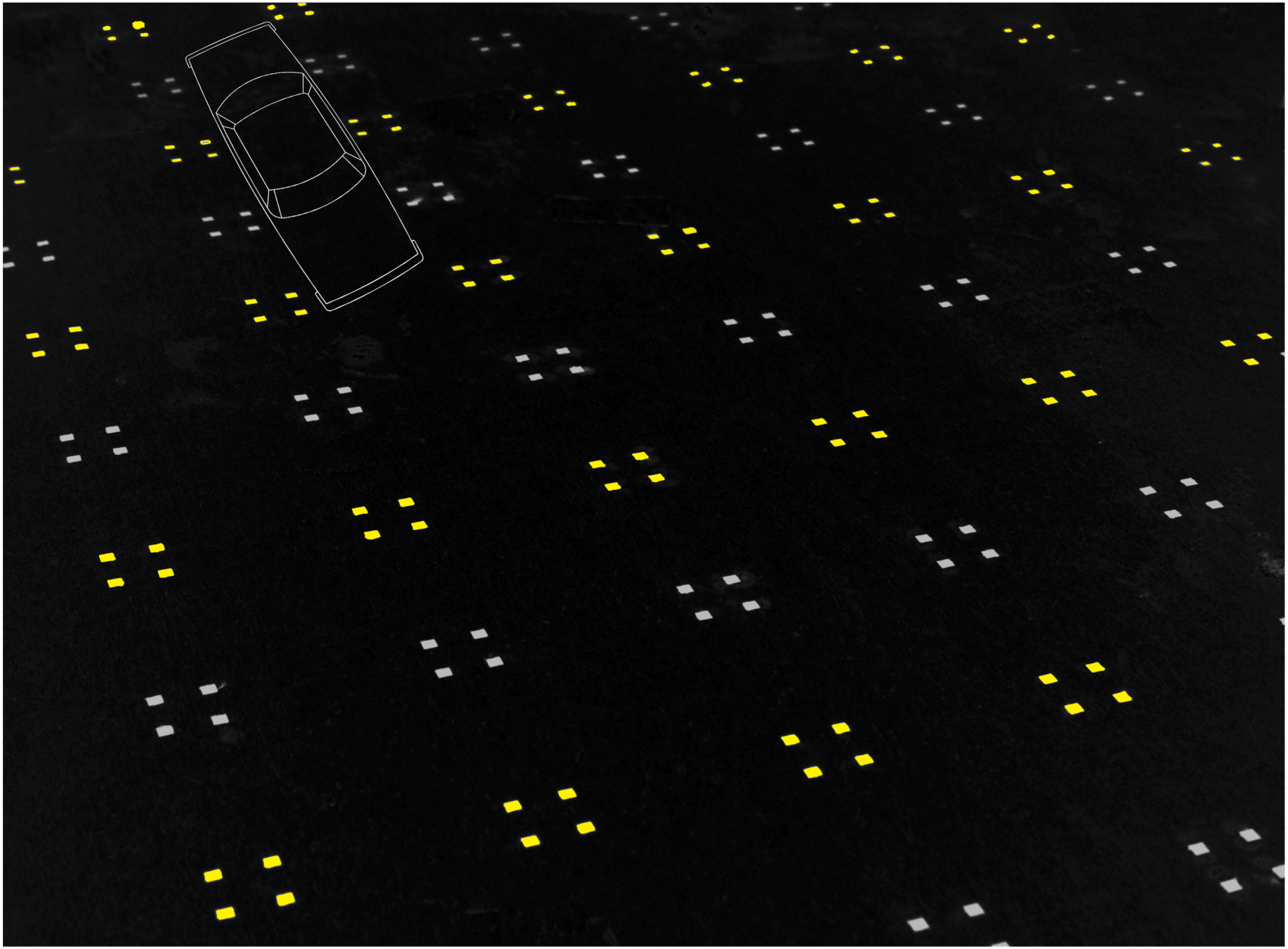


Kitchen with Eating Counters



Portable Toilet Canopies

Some of the possibilities of pedestrian programme support



Parking lot as lighted plaza with LEDs