5-2010

Design as a Tool for Architectural + Social Development: the Kalighat Women's Resource Center

Lindsay Brugger
Roger Williams University, lbrugger096@g.rwu.edu

On India: Development through Architecture

Lindsay Brugger - Master of Architecture/Bachelor of Science - May 2010
Roger Williams University School of Architecture, Art + Historic Preservation

LINDSAY BRUGGER, AUTHOR DATE

ANDREW COHEN, ADVISOR DATE

STEPHEN WHTIE, DEAN DATE

ON INDIA: DEVELOPMENT THROUGH ARCHITECTURE

Architecture is not an object unto itself:
Architecture is an expression of identity.

Architecture represents People
Cultures
Environments

Architecture represents Politics
Countries
Economics

Architecture represents Aspirations
Limitations
Relationships

Architecture represents ***CHANGE***

Change is never isolated nor complete.
Change has a past that cannot be ignored: it is forever linked to what came before.
Change has motivation: political, economic, cultural.
Change is for the better. Change is for the worse. Change is relative.

Change should be well intentioned.

CONTENTS:

Architecture is ultimately for a people; it's designed, built by, and built for a group of people. This poses the question; shouldn't a piece of architecture reflect this human dependence? Furthermore, for an architecture to remain relevant, isn't this reflection of identity a necessity? The challenge arises when it is recognized that such a human reflection is comprised of multiple, ever changing external forces.

Architecture is a reflection of human identity. However, human identity – how we see ourselves, how others see us, how we want to be seen – is constantly evolving. Furthermore, the concept of identity is intricately linked with elements of politics, economics, and nationalism. For architecture to respond to this ever changing social identity it must become an active part of this change, it is only in this way that architecture can acquire a sense of timelessness.

The fact that the societal forces that architecture must respond to are ever changing insinuates that form, as symbolism, is obsolete. We have passed the point where a style or architectural typology can represent a people. These forms have become markers in history, like tombstones of past aspirations; now representing only the inevitable course of social change.

The spatial relationship between a user and their built environment plays a critical role in the connection between architecture and cultural identity. Form is obsolete, function is fleeting, space is the only element that has the ability to transcend time. Spatial relationships provide the opportunity for cultural reinterpretation through phenomenological aspects such as light, texture, and kinetics; as opposed to visual symbolism through form.

SPACE is at the heart of the architectural experience.

Architecture must create meaningful spatial relationships both within the building, as well as between the building and its site; because it is only when an architecture becomes an integral part of its surroundings that it achieves an element of timelessness.

The built form alters its environment. This is inevitable. But by integrating with its site, by improving the society of which it is a part, an architecture is able to become an integral part of the area. When an architecture is no longer perceived as an object within an environment, when it is instead unimaginable to think of an environment without that architecture, only then has the architecture moved past the realm of the present.

INDIA has been a country of rapid change; with its GDP growing at a steady 6-9% per year in recent years,[1] it is no wonder that the country is quickly moving from "developing" to "developed." That said; the country has not been without growing pains. Issues such as women's rights, malnutrition, health care, education, and poverty have continued to plague the nation. These are not issues that architecture can combat unilaterally. However, architecture can become an active part of the solution. By providing space that caters not only to the issues of today, but actually integrates itself into the fabric of society, architecture can become an integral component of social development.

India will be a testing ground for the exploration of architectural and social development for the women and children of the urban poor. India, as one of the worlds most rapidly developing countries epitomizes the aspect of *change*. The juxtaposition between India's deep cultural heritage and rapid modernization provides an intriguing setting for both the social and architectural aspects of this exploration.

The rapid growth of India's economy has driven hordes of people to its urban centers. Currently, 286 million Indians reside in these urban areas; over 80 million of whom are classified as "poor" – a population roughly equal to that of Egypt[2]. To add to this, the population of these urban areas is expected to increase to over 575 million people – roughly 41% of the population – by the year 2030.[3]

"TWO-THIRDS OF THE WORLD'S ILLITERATE ADULTS ARE ***WOMEN"*** [4]

_A child-centered preschool in Kathgodam

-New York Times

_Women beginning to take part in the male-dominated pottery business in Jaipur

-New York Times

_Odanadi Safehouse for victims of human trafficking in Mysore

-New York Times

Given that 40-60% of these people will live in poverty,[5] it is easy to see that it will be these urban centers that now, and in the future, will host the largest populations of the under served.

The lack of economic means available to the urban poor poses an inherent obstacle to obtaining an education. The Indian Constitution stipulates that there be "free and compulsory education for all children until they complete the age of 14."[6] Despite this 'free' education, roughly 45% of girls and 41% of boys drop out of school between grades one and five.[7] In many regards, this high drop out rate can be attributed to the student's economic situation. Even though schooling is free, the costs of books, uniforms, and in some cases, transportation, can become too much of a burden on an already economically challenged family.[8] Furthermore, children, and especially girls, are often kept home to care for younger siblings or so as to contribute financially to the family.[9]

Equally important as adequate education for children, is the education of their mothers. Mothers, as the primary adult in their children's lives, are a key component in the educational success of their children. It has been shown that educated mothers are more likely to send their children to school than uneducated mothers.[10] Furthermore, it is a children's home environment that begins the process of learning. An uneducated mother will undoubtedly limit the early development of the child.[11]

Aside from being the principal supporters of their children's education, women also have a need to become educated so as to overcome the patriarchal stipulations of Indian society. Males are much more highly regarded – and desired – than females. As per the 2001 Census, there were only 933 females for every 1000 males, far below the world average of 990 females per 1000 males.[12] Much of this is due to the high levels of foeticide throughout the country. A 2009 New York Times article emphasized just how rampant the "illegal" procedure was when it reiterated an ultrasound advertisement being used in the country: "pay 5,000 rupees today and save 500,000 rupees tomorrow."[13] Unfortunately, women are often seen as a burden rather than equal members of society.

Women, as "inferior," are less likely to be educated than their male counterparts,[14] thus leaving them economically dependent on their husbands. Due to this financial reliance, women often find themselves powerless when a marriage falls apart.[15] Furthermore, these financially dependent women are helpless against domestic violence. Every hour, a woman is raped. Worse, every 93 minutes a woman is burnt to death.[16] When an uneducated woman finds herself without the financial support or her husband, there are very few options available to her. Women usually find themselves working minor jobs in the informal economy. In some cases, women have no choice but to surrender to prostitution. A 2001 article estimated the world population of prostitutes to be 40 million,[17] 10 million of these women are estimated to reside in India.[18]

_Ahmedabad: a women who earns a living straightening old bottle caps - a successful recipient of a micro-loan
-New York Times

_Goal project at Deepalaya School, New Delhi
-New York Times

_A Self Help Women's group in Bihar
-New York Times

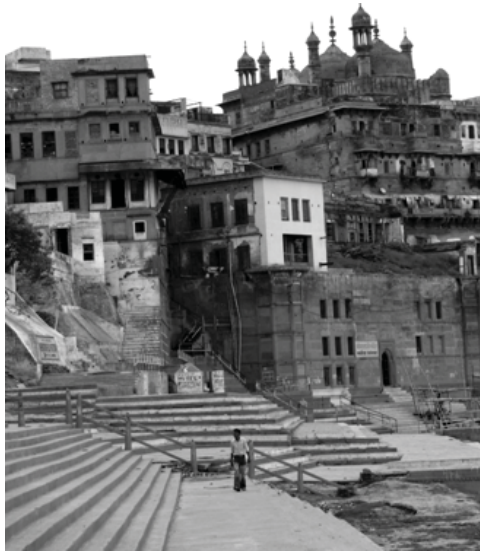
THIS PROJECT aims to serve, and ultimately enable, those who fall outside the realm of social recognition; specifically, women working in prostitution. The project will provide a place for these women to learn alternative skills, become educated, and rediscover themselves. This effort will be of particular importance to women aged 25-35. It is at this age when the women become less viable within their profession. Without a minimum number of clients the women are unable to pay their daily rent. Since very few have any sort of financial savings, many women end up either on the street, or becoming madams themselves; continuing the cycle of prostitution. This emphasis on women stems from recent studies that have concluded that "…aid [in developing countries] has often been most effective when aimed at women."[19]

_In the heart of the red light district, leading towards the NGO "New Light."
-Kalighat Lane, Kolkata

_Aerial view of a portion of Kalighat's red light district, with the NGO "New Light" in the background.
-Kolkata

_Resident's of Kalighat.
-Kolkata

_Ghats, or steps along the waters edge, are a traditional architectural element used for both functional washing as well as religious rituals.
-Ghats along the Ganges River, Varanasi



_The parasol roof, as explored by Le Corbusier, creates shade below while simultaneously allowing for a functional roof terrace.
-Le Corbusier's Chandigarh Museum

_Jali systems, used throughout India in both vernacular and modern buildings allow for privacy, diffused light, and ventilation.
-Laurie Baker

ARCHITECTURE – and architectural space – will be further explored in relationship to India's rich architectural history. India, as a rapidly transforming society, wants to be seen as a modern country. At the same time, India has deep roots - reaching back thousands of years - that cannot be ignored. Contemporary architects such as B.V. Doshi, Raj Rewal, and Charles Correa have already begun the search for a modern architectural style that still speaks of India. Their work will be explored and furthered through the expression of light, materiality, and architectural space.

A women's resource center is proposed. The facility will house vocational elements, as well as financial, psychological and literacy resources for women. It is the hope that these resources will empower the women of the area to redefine their role in society.

CULTURAL IDENTITY is an integral aspect to the relevancy of architecture. However, this identity is subject to exterior forces that are constantly changing, thus the concept of identity is in constant flux. In order for architecture to remain relevant it must acquire a sense of timelessness – which can be achieved architecturally through spatial experience and through active participation in the changes of society.

Existing relationships with the built environment will be explored and enhanced. This includes the existing courtyard typology, the ambiguity between interior and exterior space, and the privatization of public space.

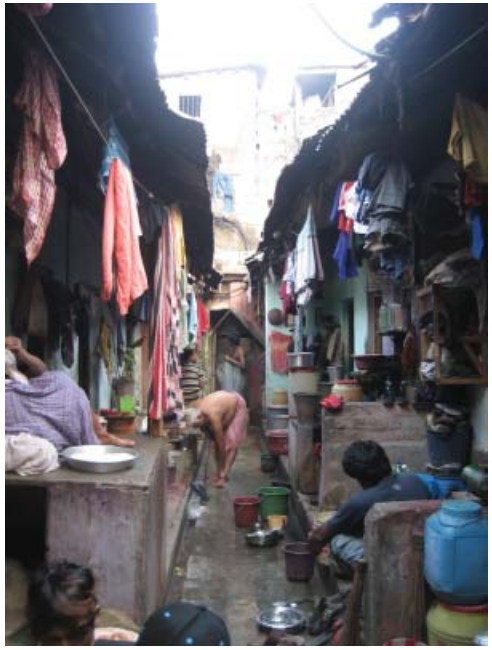
The architectural goal of the project is to move beyond the program; to create an architecture that not only programmatically relates to its societal environment, but spatially connects to the users of the building through movement, light, and materiality. It has been acknowledged that cultural identity is a fundamental component of creating meaningful architecture. Likewise, it has been recognized that such an identity is constantly evolving. The intention of this project is to examine the relationship between cultural identity, social development and spatial experience as an architectural contribution to the process of development.

_The juxtaposition between interior and exterior space is ambiguous, with common "indoor" activities bleeding outside the home. The space between "interior" and "exterior" is often mediated by a transition space such as a plinth, verandah, or overhang.

-Kolkata

_The courtyard is a common typology, used to create a communal gathering space. The alleyways leading between spaces allows for privacy and transition.

-Kolkata



PRIVATIZATION
OF
PUBLIC SPACE

THE KALIGHAT WOMEN'S RESOURCE CENTER will provide vocational services for the women of the Kalighat Red Light District as well as the general Kalighat community. In addition to vocational training areas, the center will also provide psychological counseling, clinical facilities, legal aid, and adult-literacy classes. The center will be built in conjunction with the re-design of the Kalighat Market, located adjacent to the Red Light District.

_New Light is currently attempting to empower the local women through the craft of Kantha Quilting. A traditional craft, the women design, create, and sell these quilts to raise scholarship money for their children. Currently the available space for this project is lacking.

-Kolkata

Kalighat Clinical Facility: 2,000 people

Gynecology		
Pre/Post Natal Care		
Family Planning		
Pediatrics		
Vaccinations		
Optical/Dental/Cardiac Care		
General Health		
HIV/AIDS/STDs		
Endocrinology		
Examination Rooms	(3)	250SF
(Shared between departments)		
Overnight Observation (3 beds)	(1)	400SF
Unisex Clinical Use Restrooms	(2)	100SF
Administrative Office	(1)	120SF
Storage	(1)	120SF

Market Place:

**quantities subject to change*		
Fish	(8)	80SF
Chicken	(12)	80SF
Mutton	(8)	100SF
Produce	(20)	120SF
Other	(10)	100SF
Women's Center Boutique	(1)	160SF
Canal Access	*as available*	

Shared Program:

Communal Gathering Space	(1)	1000SF
Exterior Space(s)	*as available*	
Kitchenette	(1)	60SF
Public Restrooms	(2)	100SF
Janitors Closet	(1)	30SF
Mechanical Space	*as needed*	

Women's Resource Center: 500 women

Counseling		
NGO/Financial Resources	(1)	300SF
Micro Finance		
Legal Aid		
Psychological Counseling	(1)	150SF
Dance/Art Therapy, Yoga	(1)	800SF
Vocational/Workshop Spaces		
Large Studios	(3)	600SF
Weaving		
Pottery		
Fashion Design		
Painting		
Woodworking		
Small Studios	(3)	400SF
Kantha		
Embroidery		
Jewelry Design		
Spice Grinding		
Classrooms	(5)	250SF
Literacy		
English		
Financial Education		
Information Technology		
Speech		
Administrative Office	(1)	120SF
Storage	(6)	250SF

KOLKATA, as one of India's four largest urban centers,[20] holds potential for a structure such as the women's resource center that is being proposed. As the economic center of eastern India, Kolkata offers both employment and educational opportunities to its inhabitants.[21]

A 2003 survey of Kolkata's 5511 slums found that the city's target groups for future educational development are those that are illiterate or have less than a primary level of education.[22] Statistically, this composes 51.9% of females and 44.2% of the total population.[23] Furthermore, the information found during the survey "strongly emphasizes the need for special literacy programs exclusively for women."[24]

THE SITE lies within the historic center of the city. The neighborhood of Kalighat is home to landmarks such as Mother Theresa's Home for the Dying and Destitute and the Kali Temple; as well as Kolkata's oldest Red Light District.

The plot is 57,000 SF with an existing market occupying the majority of the site along with a few squatter settlements along the edge of the canal. The market, currently in a state of disrepair, will be redesigned in conjunction with the Women's Resource Center. The way in which the canal interfaces with the site will also be rethought. This will coincide with the existing plan to dredge and widen the canal so as to allow for boat traffic.

_The Indian subcontinent

_Kolkata, with the district of Kalighat highlighted.

_The district of Kalighat with the site identified.

Red Light District

Kolkata's oldest Red Light District, 800-1000 Women

New Light

NGO dedicated to the Children of the Red Light area

Kalighat Market

Currently in a dilapadated state

Canal

Future plans to dredge and widen for boat traffic

Kali Temple

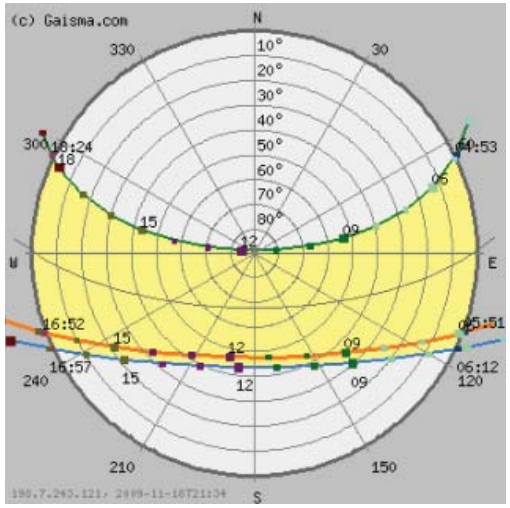
Important landmark for tourists and locals alike

Kalighat Road

Main road through the community

THE CLIMATE of Kolkata is a hot, humid, environment. The temperature range is not too extreme (55 degrees - 105 degrees), but the humidity level makes the summer months unbearable. This makes shaded areas, and breezes moving through these shaded areas, particularly important. Thus it is critical to note the maximum sun angles during the summer (87 degrees) and winter (42 degrees) months.

Also important to take note of is the excessive rain Kolkata receives during the monsoon season. Kolkata has an average of 84 rainy days a year, most of which occur in a four month period. This can result in flooding in many areas, including the Kalighat community.



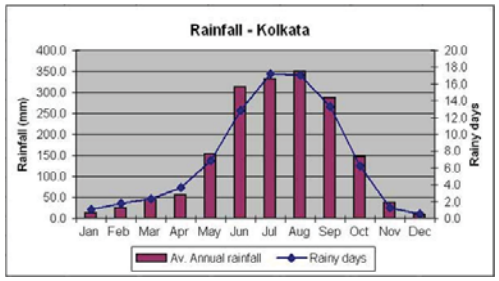
_Sun angles =
42 degrees in Winter
87 degrees in Summer

-Gaisma.com

Months	Av. Annual Rainfall (mm)	Rainy Days
Jan	12.1	1.0
Feb	24.5	1.8
Mar	44.8	2.4
Apr	55.7	3.7
May	153.6	6.8
Jun	311.9	12.8
Jul	332.5	17.2
Aug	349.5	17.0
Sep	287.3	13.3
Oct	147.0	6.3
Nov	36.9	1.2
Dec	9.4	0.5
Total	**1765.1**	**84.0**

_25 Year Average (1964-2005), info in conjunction with graph below

-rainwaterharvesting.org



_25 Year Average (1964-2005), info in conjunction with chart above

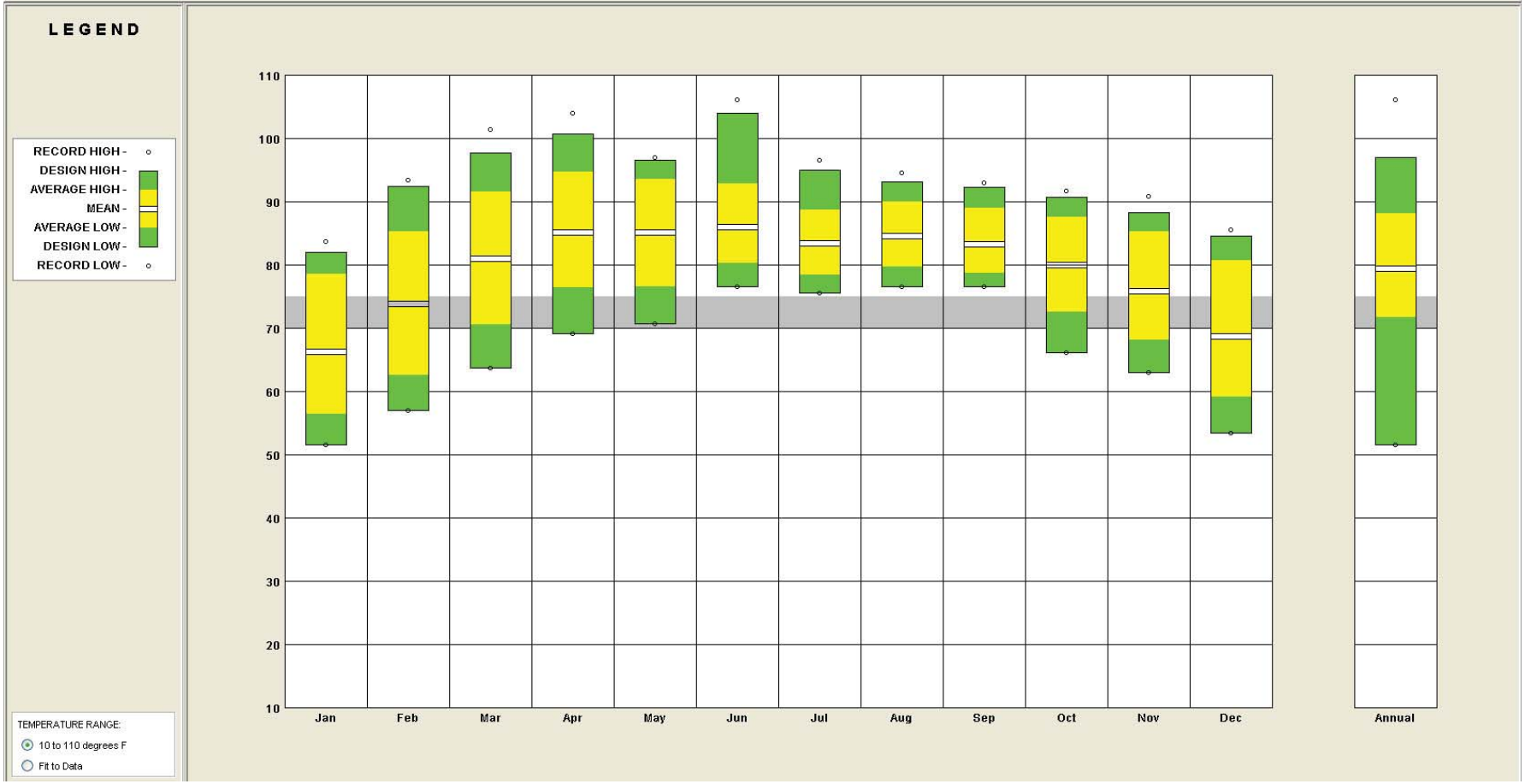
-rainwaterharvesting.org

_Opposite: Average Temperature by month

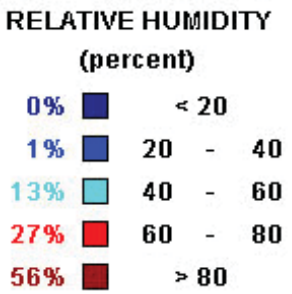
-Climate Consultant

TEMPERATURE RANGE

LOCATION: Kolkata, West Bengal, IND
Latitude/Longitude: 22.65° North, 88.45° East, **Time Zone from Greenwich** 5
Data Source: ISHRAE ISHRAE WMO Station Number, **Elevation** 19 ft

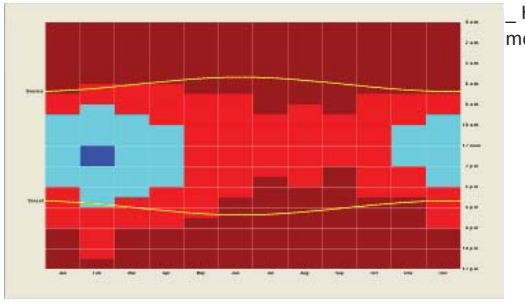


Relative Humidity is the primary reason for discomfort when outdoors. The relative humidity level is above the comfort zone over 60% of the time.



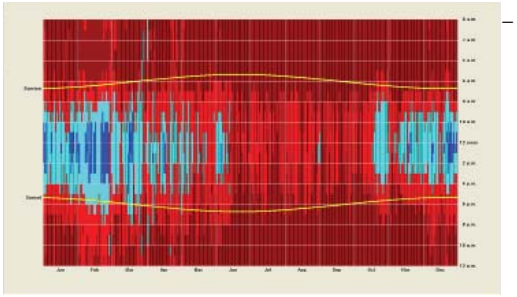
_ Chart in conjunction with below graphs

-Climate Consultant



_ Humidity data by month

-Climate Consultant



_ Humidity data by day

-Climate Consultant

_Opposite: Dry Bulb and Humidity data by month

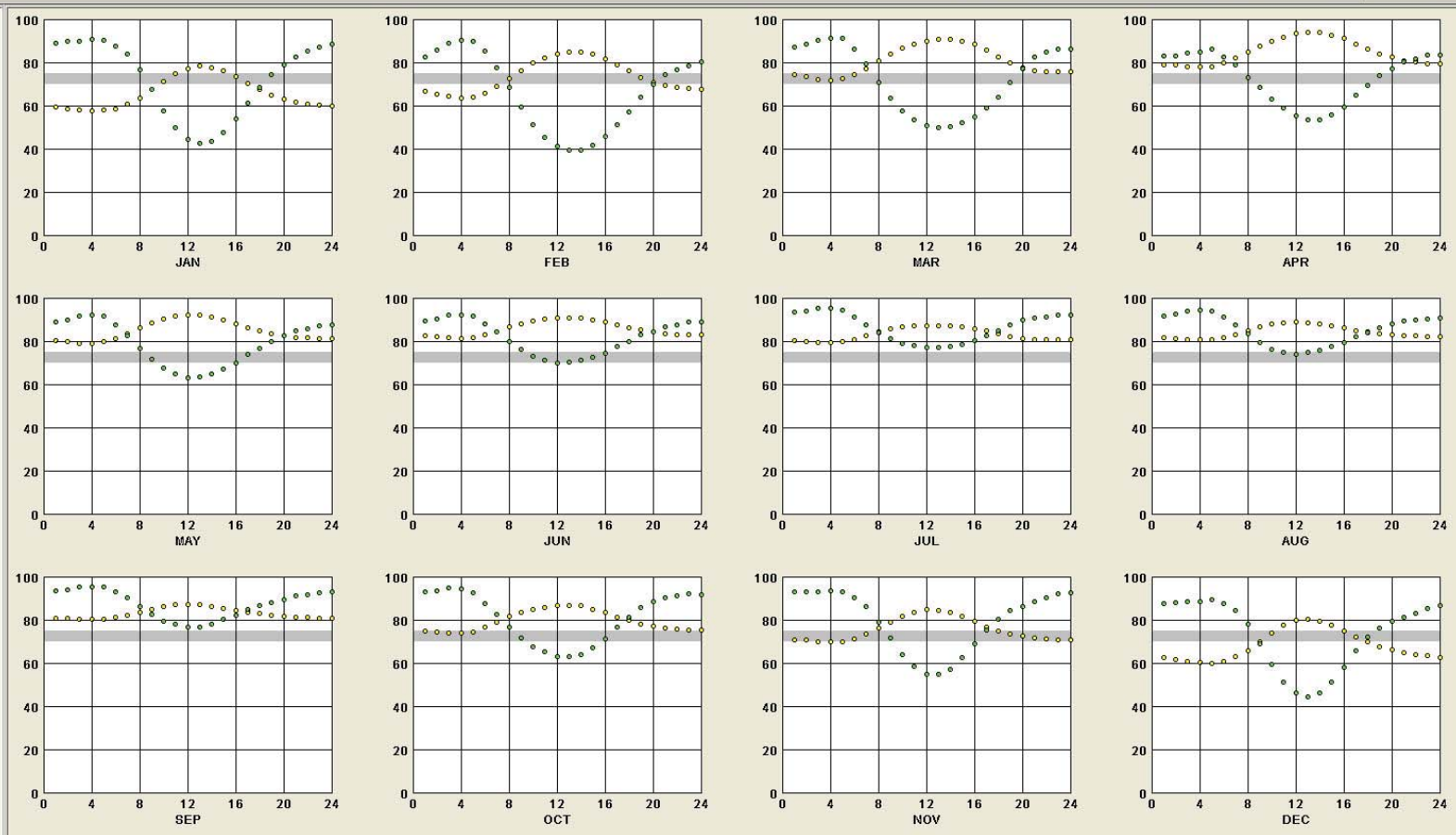
-Climate Consultant

DRY BULB X RELATIVE HUMIDITY

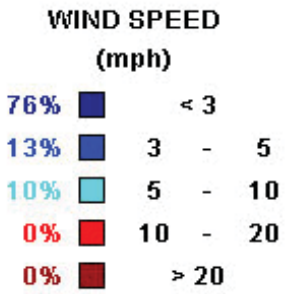
LOCATION: Kolkata, West Bengal, IND
Latitude/Longitude: 22.65° North, 88.45° East, **Time Zone from Greenwich** 5
Data Source: ISHRAE ISHRAE WMO Station Number, **Elevation** 19 ft

LEGEND

Dry Bulb
Humidity
Comfort Zone

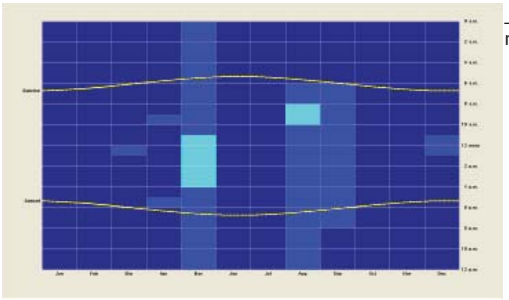


WIND and available breezes become very important because of the staggering discomfort caused by the high levels of relative humidity. High winds are rare, but slight breezes do occur on a semi-regular basis.



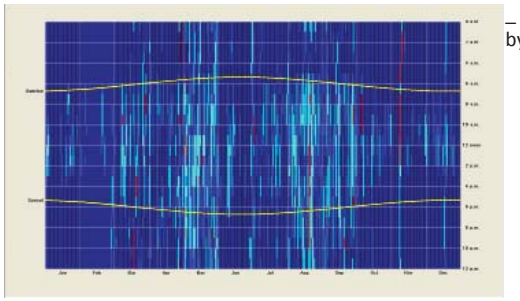
_ Chart in conjunction with below graphs

-Climate Consultant



_ Wind Velocity data by month

-Climate Consultant



_ Wind Velocity data by day

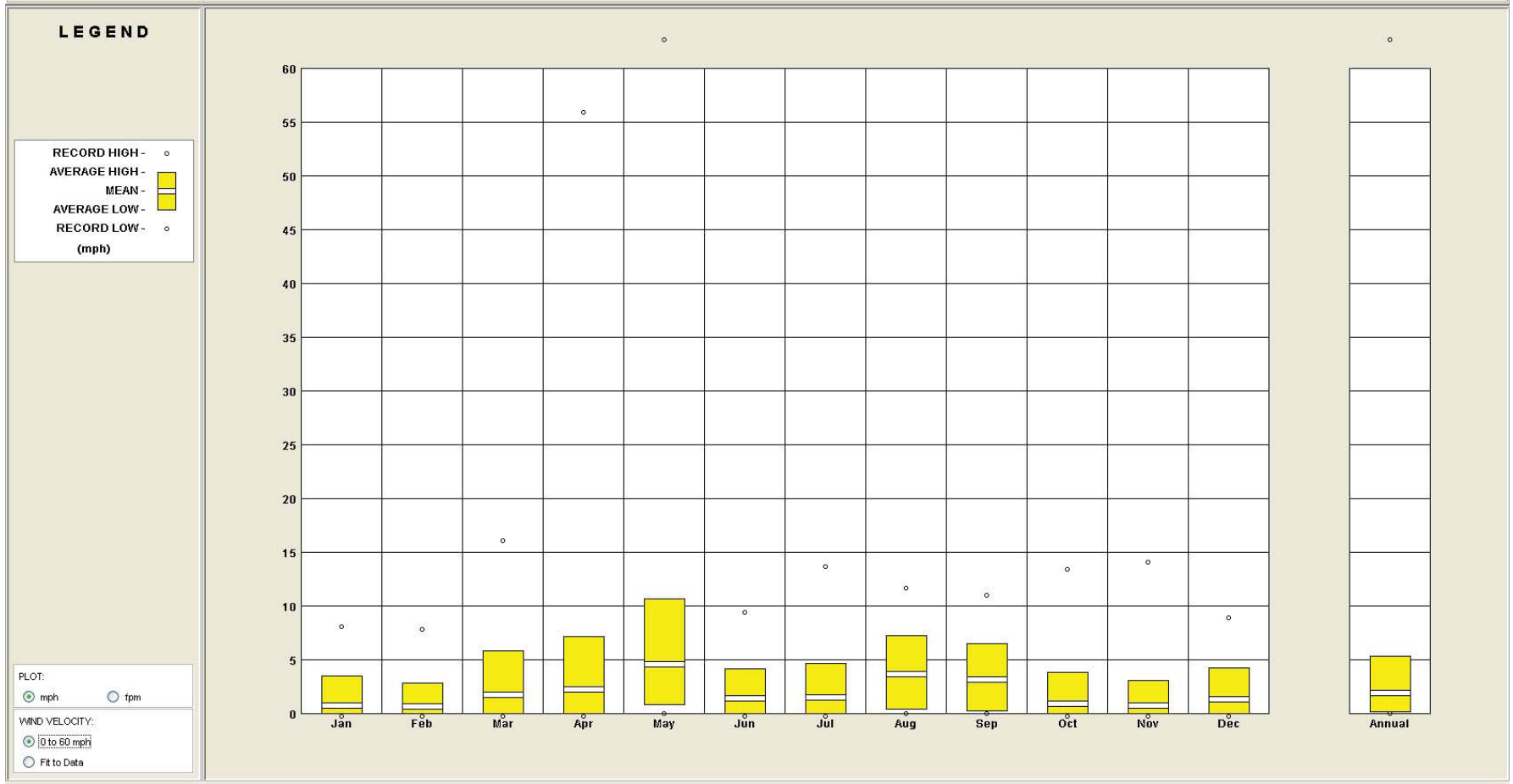
-Climate Consultant

_Opposite: Wind Velocity highs, lows, and averages by month

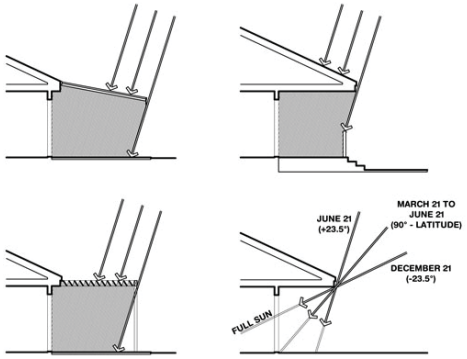
-Climate Consultant

WIND VELOCITY RANGE

LOCATION: Kolkata, West Bengal, IND
Latitude/Longitude: 22.65° North, 88.45° East, **Time Zone from Greenwich** 5
Data Source: ISHRAE ISHRAE WMO Station Number, **Elevation** 19 ft

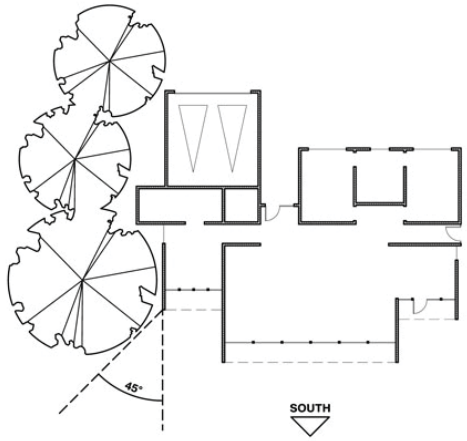


Design Strategies, such as the ones displayed here, provide suggestions for successful management of Kolkata's unique climatic demands.



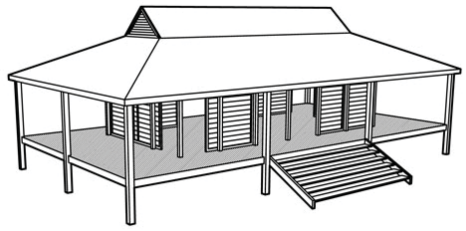
_Window overhangs designed with Kolkata's sun angles in mind can help reduce heat gain

-Climate Consultant



_Plantings can create important areas of shade, and, if placed on the western side of the building, can also help to keep the building cool

-Climate Consultant

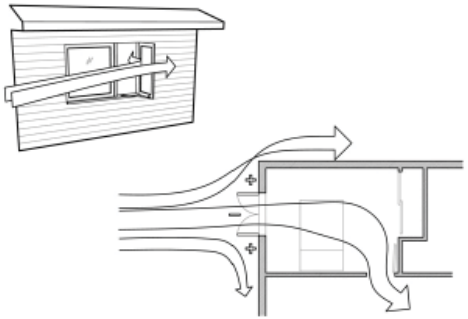


_Operable walls in conjunction with shaded porch space can add comfort in a humid environment

-Climate Consultant

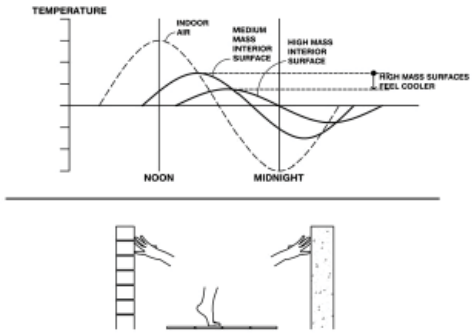
_Natural ventilation is extremely important in humid environments

-Climate Consultant



_High mass materials such as stone or brick mediate temperature swings and feel cool to the touch

-Climate Consultant



_High ceilings assist in pulling hot air up above the occupied space

-Climate Consultant

An analysis of the site reveals that there is one main road - Kalighat Road - along the eastern edge of the site. The western edge is bounded by the canal. To the north is the Kalighat Red Light district, home to roughly 800-1,000 sex workers. Many of these women have been trafficked here, sold by strange men or even their families. Others have come here because they have no other choice.

To the south are residential areas with commercial spaces along the street edge. Kalilghat Road is lined with commercial spaces while residential spaces exist just behind this fringe of commercial activity. Currently there are squatter settlements along the edge of the canal. The canal is scheduled to be dredged and widened within the next 2-20 years; when this occurs the squatter settlements will be disbanded.

To the northwest of the site, within the Kalighat Red Light District, is the NGO New Light. New Light caters to the children of the Red Light District, providing them food, counseling, education support, and a safe place to play while their mothers are working. New Light will be the theoretical client for the Women's Resource Center that is being proposed.

_Diagram of current circulation. Primary circulation (red) traverses Kalighat Road while secondary circulation (yellow) branches off perpendicularly.

_Private circulation towards the site.

_Public circulation towards the site.

KALIGHAT:
EXISTING PROGRAM

Site Images reveal a thriving community. Aspects that will be important to consider are the following:

_the canal: both for its consistent flooding during the monsoon season but also for its social significance within the Indian culture

_the existing density and texture of the street edge: contextually, it will be necessary to take into account the maximum building heights along Kalighat Road

_the commercial activity of the area: this will be important when designing the relationship between the market space and the street edge

_the existing market: key elements that will be important to maintain is ventilation and the ability to access the canal.


_The canal along the Western edge of the site and the social role it plays
-Kolkata

_A series of three story buildings lie between the dominant one-to-two story buildings along the Eastern edge of Kalighat Rd
-Kolkata

_Commercial activity along Kalighat Rd
-Kolkata


_The Kalighat Market and its relationship to the canal
-Kolkata

THE KALIGHAT COMMUNITY

The Kalighat Market is in rough shape; to say the least. The structure itself is falling apart, the roof has rotted away and has been compensated for with large tarps and other adhoc solutions. The market currently hosts stalls for chicken, fish, mutton, and produce. Near the main street, stalls selling non-food items have been established as well. The market also has a small point of access to the canal, which is used by the shop keepers (particularly those in the fresh meat business) to clean up in the afternoon.

Also important to consider is the informal market activity that currently exists along Kalighat Rd and some periphery streets. The re-design of the Kalighat Market will be a continuation of this existing market space.

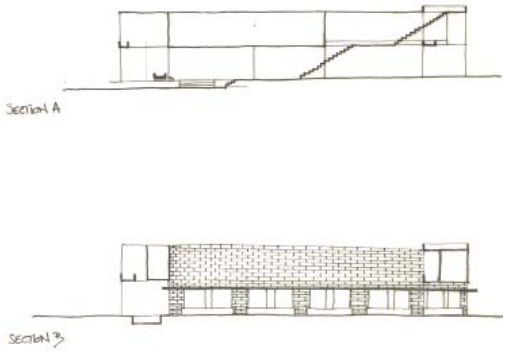
_The Kalighat Market is currently in disrepair.
-Kolkata

KALIGHAT:

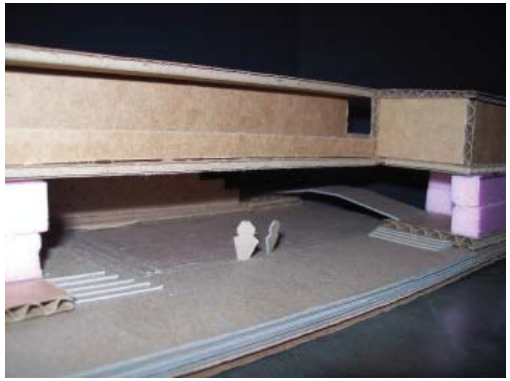
Market Activity

Preliminary Review: Scheme 1 focuses on the various interfaces throughout the site. This includes the relationship between the market and the women's center, the women's center and the red light district, the market and the street, and the role of the canal. Here the women's center builds on an existing courtyard space within the red light district, while a jali screen divides the women's center from the market space. The relationship between the market and the street/canal is established by elevating program to create a transition space. A bridge connects the women's center to the market and simultaneously privatizes a portion of the canal within the women's center.

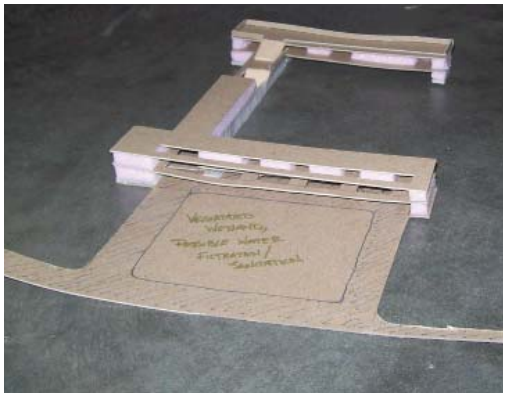
Successful elements of this scheme include the private interaction with the canal within the women's center and the transition between the street and the market area created by the elevated bar of program.



_Longitudinal Section demonstrating the vertical connection with the canal and cross section highlighting the elevated program bars over the east and west ends of the site.

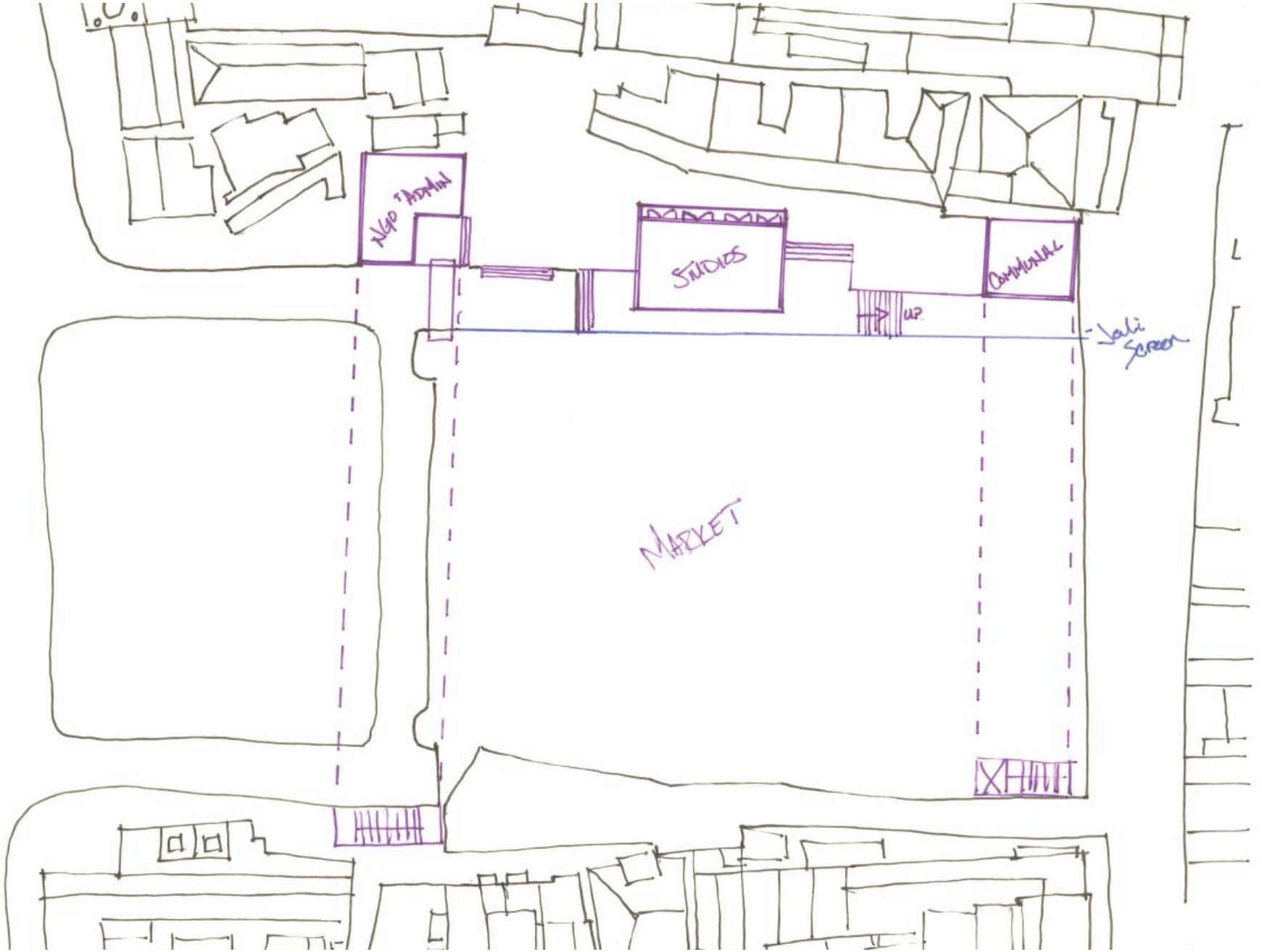


_Quarter-inch scale spatial model exploring the relationship between the canal and the women's resource center



_1/32" scale model of the entire complex, showing elevated program and relation to the canal.

_Opposite: ground floor plan

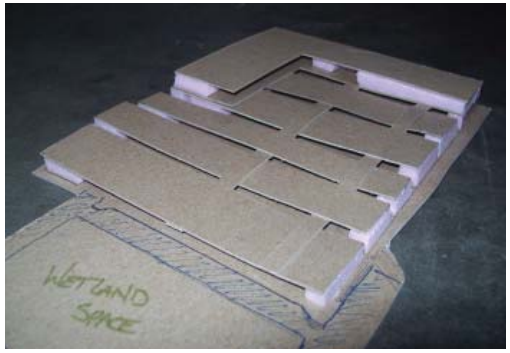

NGO ADMIN
STUDIOS
COMMUNAL
UP
Jali Screen
MARKET

Preliminary Review: Scheme 2 looked at the existing courtyard typology in creating appropriate exterior spaces. This manifested itself into a series of small “streets” and larger “courtyard” spaces for gathering. The women’s center was again divided from the market space through the use of a jali screen and the introduction of a strip of primary circulation space. A series of “woven” roof structures created shelter for the market space but allowed for minimal light and ventilation.

The plan organization of the scheme in regards to the “courtyard” typology was deemed successful. However, creating larger groups of program as opposed to separating each program element was suggested as a means of improvement.

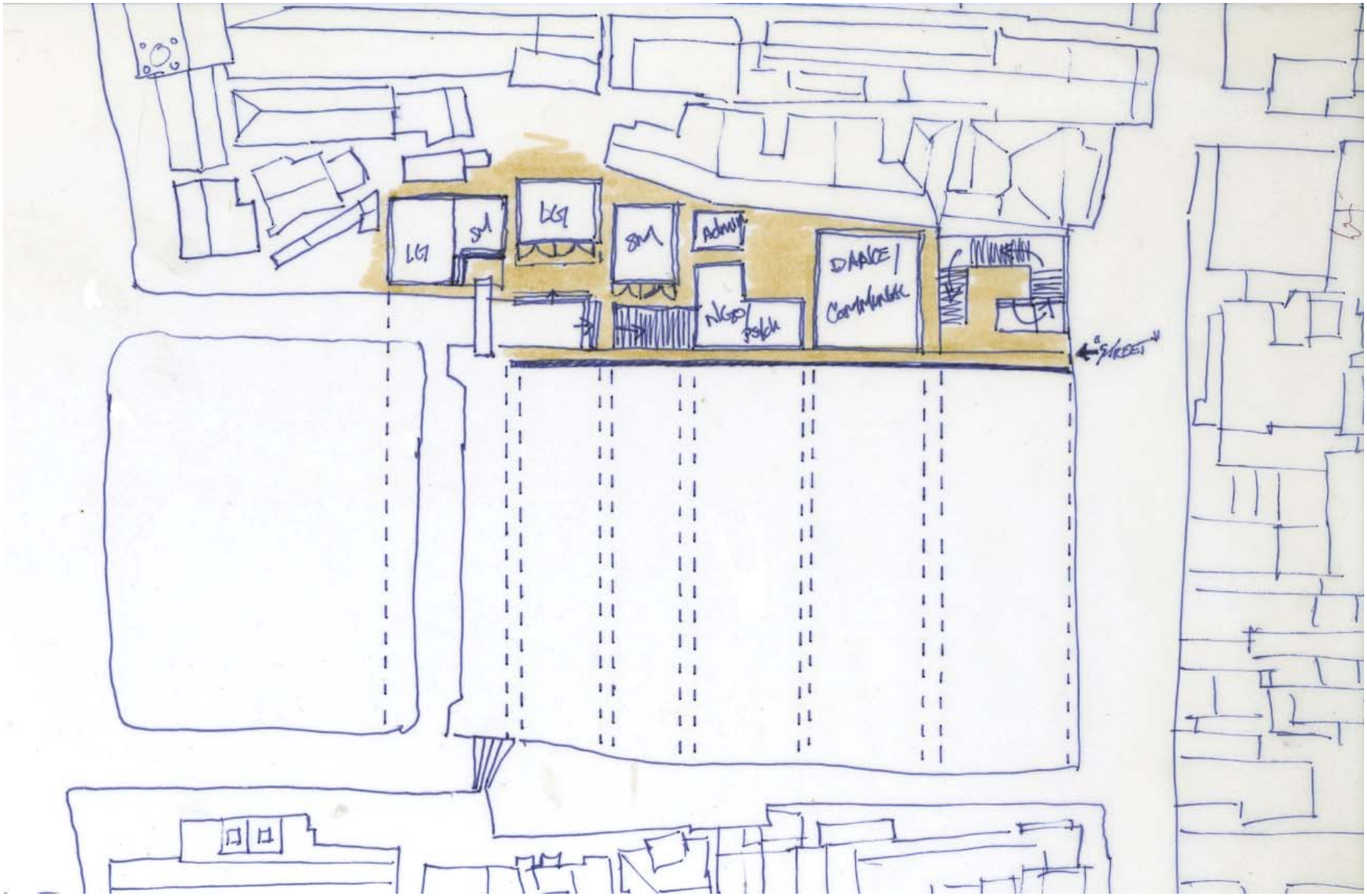
_Second Floor Plan

_1/32” scale model of the entire complex, showing “L” shaped program arrangement and covered market

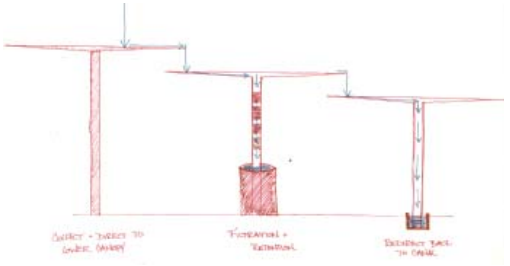


_1/32” scale model of the entire complex, highlighting the covered market

_Opposite: ground floor plan showing emphasis on exterior courtyard space

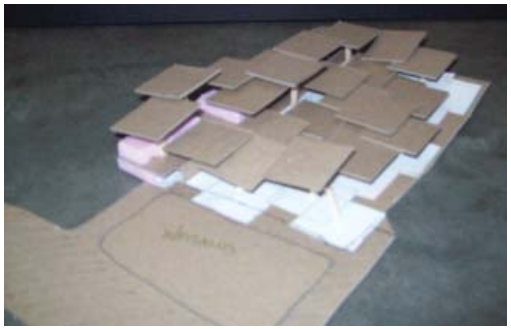

LG
SM
LG
SM
Admin
DANCE/
NGO/
STREET

Preliminary Review: Scheme 3 used the market as an area in which innovation within the realm of development could occur. The central component of this scheme was a system of canopies that collected, filtered, and retained rainwater for future use. This was considered an architectural manifestation of development as more than subsistence. These canopies covered the market area in a way that allowed for both sunlight and ventilation. The canopies spread further north to act as shading devices for the roof terraces



_Conceptual diagram of how canopies could be used to capture, filter, and retain rainwater

_Quarter-inch scale spatial model exploring the relationship between the canopies and the women's center as well as the relationship between interior and exterior space

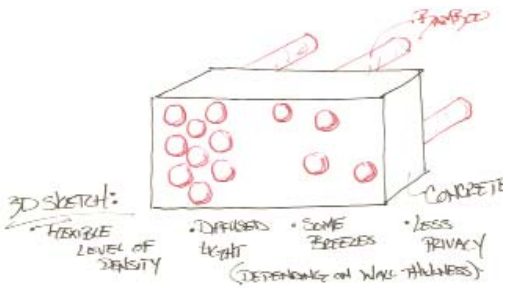


_1/32" scale model of the entire complex, highlighting the canopies over the market area

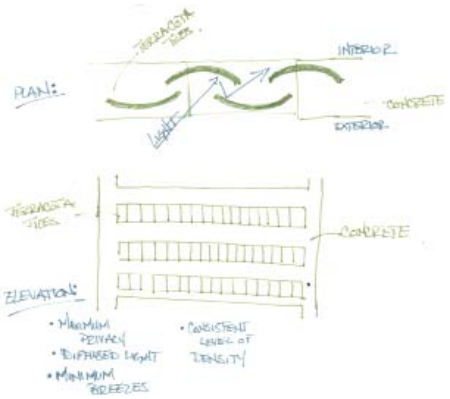
_Opposite: ground floor plan


STUDIOS
STUDIOS
NGO/PSYCH
COMMUNAL
UP

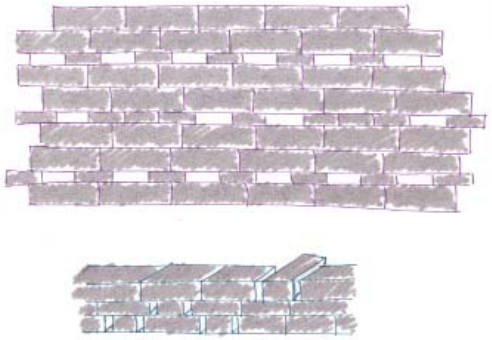
Development of Jali Screen began with a focus on local materials. This established a potential kit-of-parts that included: concrete, bamboo, brick, and terracotta tiles. All concepts attempted to incorporate aspects of light, privacy, and ventilation into the design.



_Concrete wall with bamboo perforations to allow light and ventilation



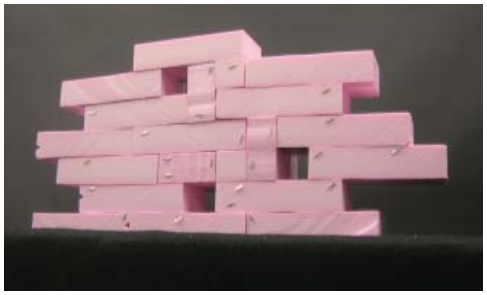
_Rows of terracotta tiles integrated within a concrete wall, limited light and ventilation



_Use of bricks with voids to create opportunities for the required light and ventilation

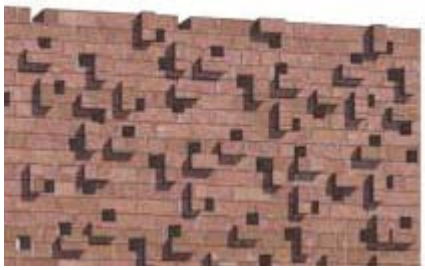
Final Jali Screen utilized bricks that were sometimes laid perpendicularly so as to create openings. These openings allowed for light, ventilation, and privacy while the portions of the bricks that jutted out created a series of shadows along the elevation.

The pattern of the openings was created using a set unit of three openings, with each opening corresponding to a perpendicular brick. This unit of three was then rotated ninety degrees each time it was added to the sequence. This created an intricate pattern that was not easily perceptible at first glance.

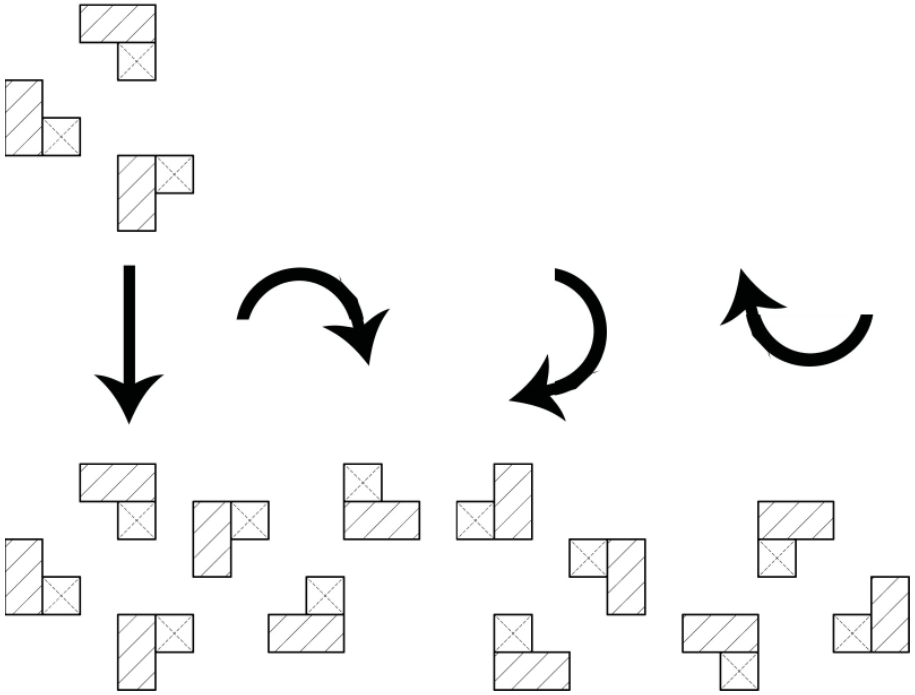


_1:1 scale model of final Jali Screen design, view from the interior of a space

_1:1 scale model of final Jali Screen design, view from the exterior



_Rendering of shadow patterns along the exterior elevation of the final Jali Screen

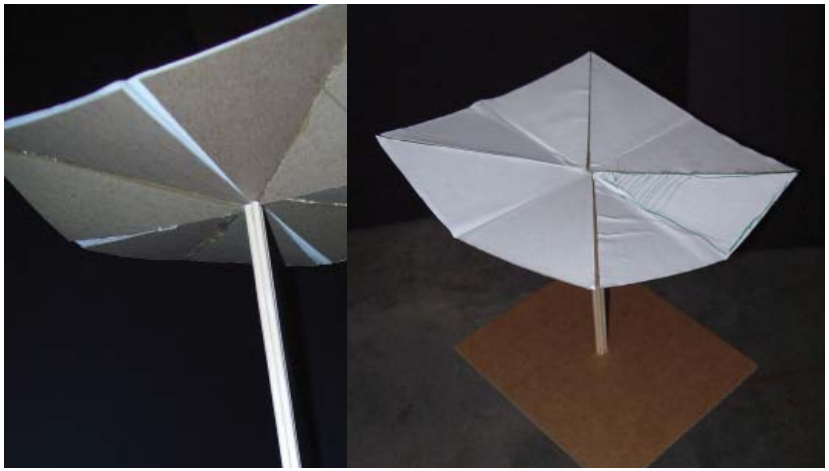


_Far Right: Pattern sequence within final Jali Screen

Development of Canopy focused on utilizing local bamboo to not only create shade over the market, but also a way to direct rainwater towards a central collection point. Also important was the ability to allow breezes to pass through the structure so as to avoid uplift.

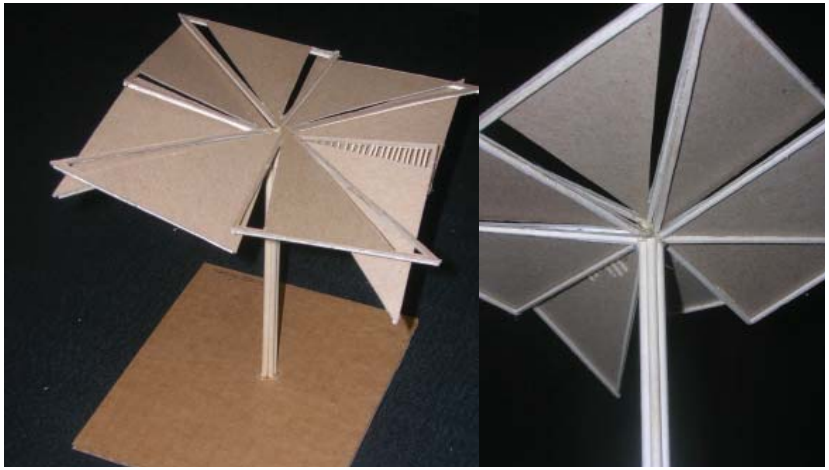
_Initial canopy design exploring color and dynamism; attempting to filter rainwater along a series of gutters

_Further exploring the concept of a series of gutters to collect rainwater, also examining structural needs



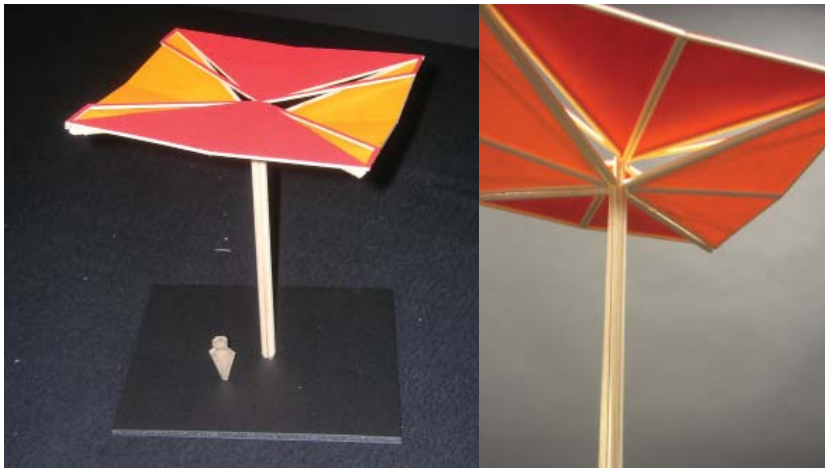
_Creating a series of peaks and valleys to direct rainwater towards the central point of the canopy structure

_Breaking apart the peaks and valleys to allow for breezes to pass through the structure



_Adding structural truss to assist in supporting the series of peaks and valleys

_Final design. Simplifies previous ideas of ventilation, water collection through peaks and valleys, and dynamic use of color into one cohesive structure

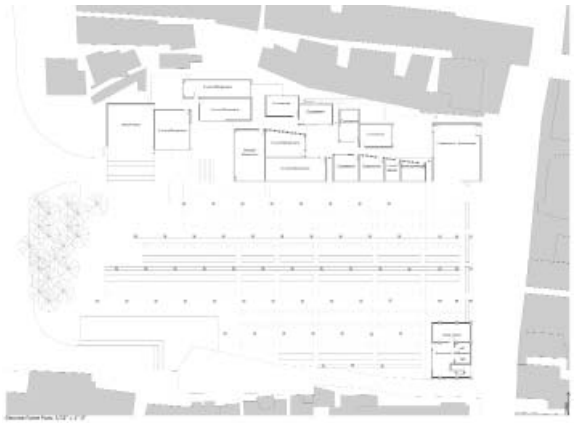


Final Canopy is 24’ x 24’ and utilizes local bamboo as well as durable canvas coverings. The canvas is died bright colors to add a level of brightness to the area and is reminiscent of the various sarees worn by Indian women. The canopy is essentially four large triangles, each with a “valley” at their center to help direct rainwater towards the center point of the canopy. These four triangles are grouped into two pairs that sit opposite each other. The two pairs are slightly offset from each other to allow breezes to flow through the canopy. The lower pair of triangles have gutters along their interior perimeter to assist in catching as much rainwater as possible.

MidTerm Review

establishes a plan that is based on the “leaky courtyard’ typology and introduces the concept of a bamboo screen used to link exterior space with interior space

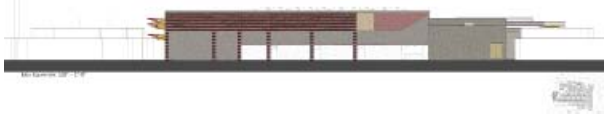
The question of how the building should relate to the street arose and required further study.



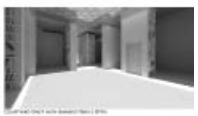




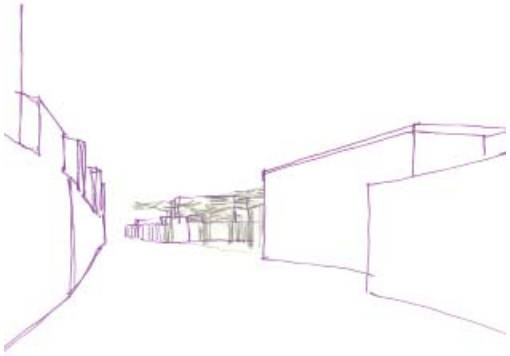




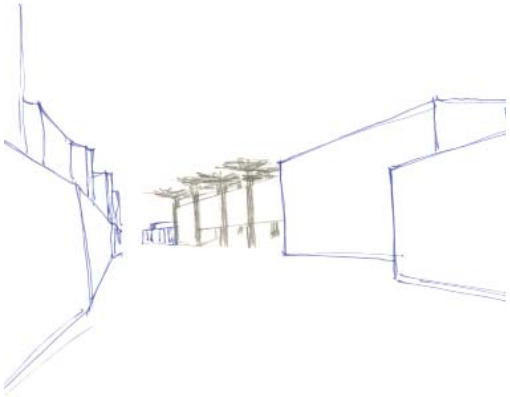


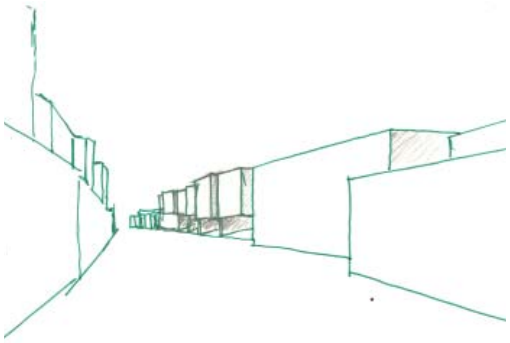
Exploration of Relationship between Market and Street looked at three potential design solutions: allowing the market to bleed into the street, creating a screening element along the street edge, or maintaining the elevated bar of program but down playing its massiveness by creating a series of pushes and pulls within the volume.



_View looking South along Kalighat Road if market is open along the street

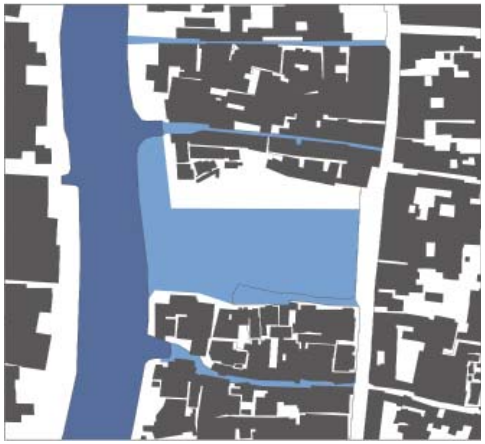


_View looking South along Kalighat Road if market is screened along the street



_View looking South along Kalighat Road if bar of program is elevated along the street edge

_Study of how existing streets lying perpendicular to the canal act as direct access points to the waterway.



_Study of existing market activity

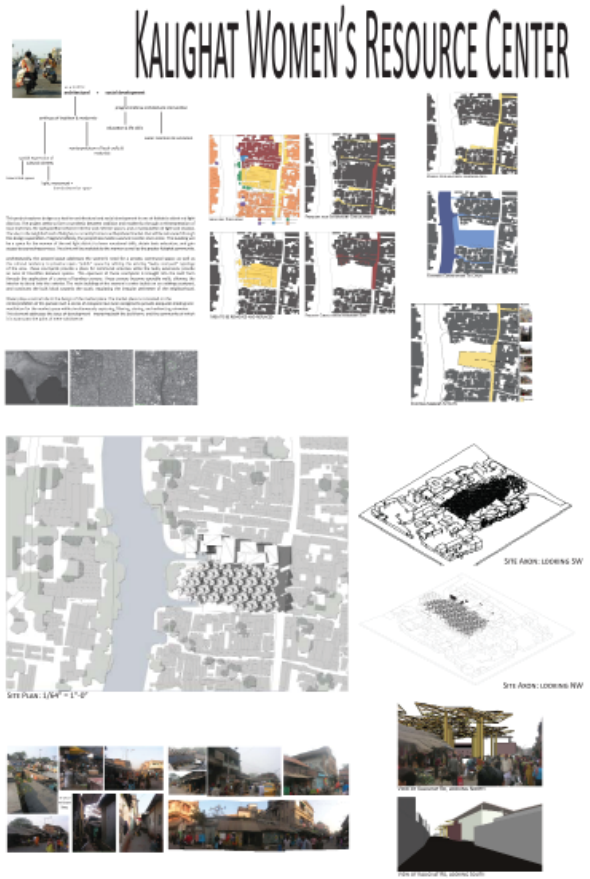
_Final montage of street view looking North along Kalighat Rd.

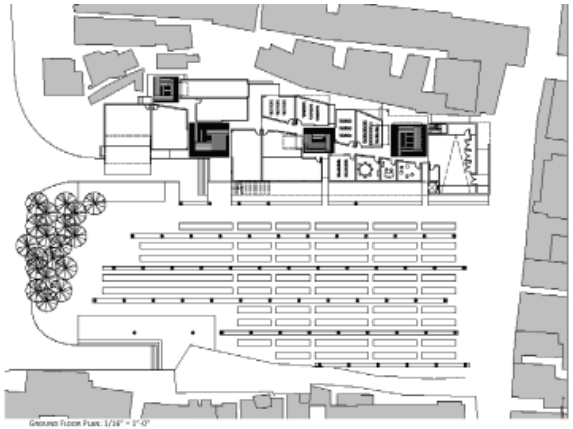
Resolution of Relationship between Market and Street

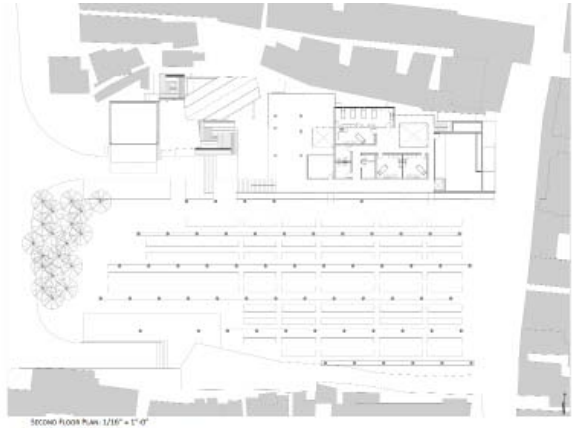
ultimately came after evaluating existing site conditions. Currently, the Kalighat area has a series of streets that run perpendicular to the canal and are essentially direct access points to the waterway. Furthermore, the existing market activity exists not only within the space of the market but informally along the main roadway and even along some side roads. These elements suggested the appropriate solution to be one in which the market remained open to the street and allowed access through the space to the canal.

Gate Review included detail-oriented design aspects such as floor patterns, construction details, materiality and HVAC.

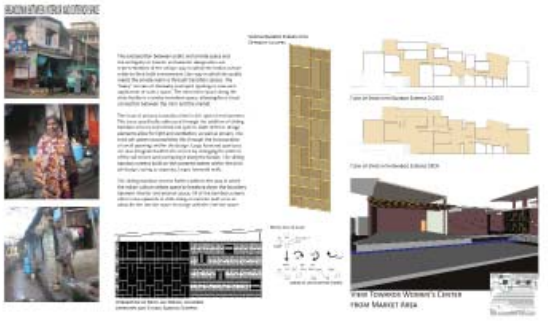
After the review, the process of water collection and the integration of water and landscape elements throughout the site were further investigated.

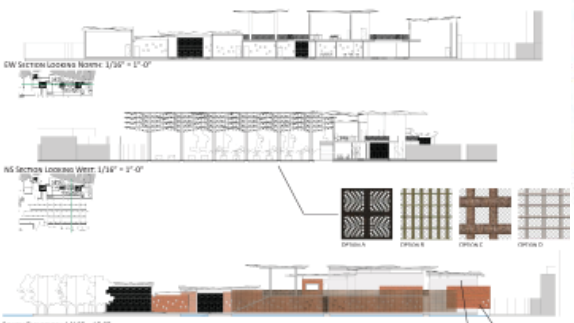



Ground Floor Plan: 1/16" = 1'-0"


Second Floor Plan: 1/16" = 1'-0"

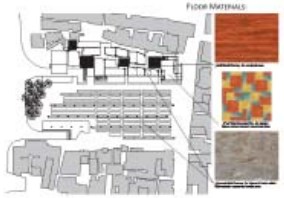

Second Floor Clinic (M22/Admin)
Over Looking Market Area
View of Stairs to Second Level


View Towards Women's Center
From Market Area

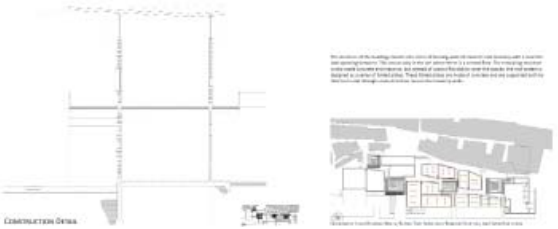

EW Section Looking North: 1/16" = 1'-0"
NS Section Looking West: 1/16" = 1'-0"
South Elevation: 1/16" = 1'-0"


"Easy Courtyard" Typology
View of Central Courtyard
View of East Courtyard


Canopy Unit
Water Collection & Filtration
View of Market Area


Floor Materials

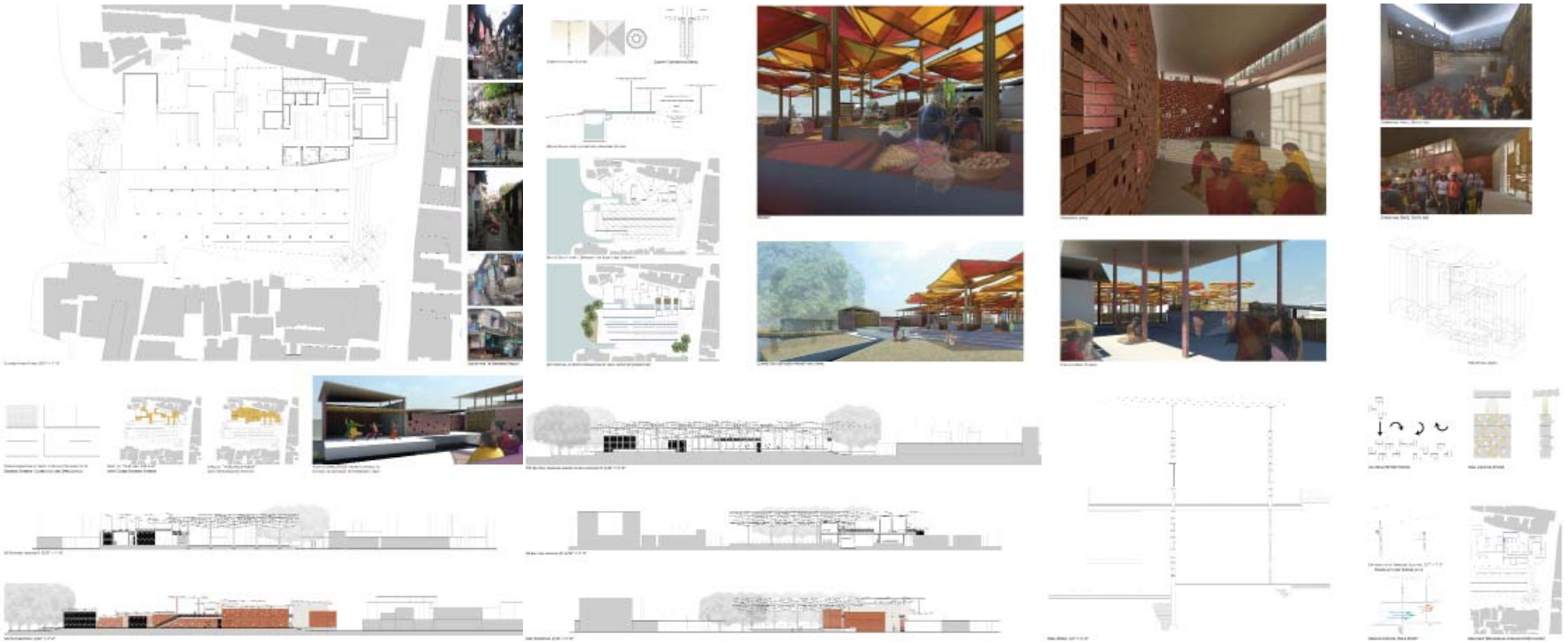

Use of Roof Planes to Direct Heavy Rains Back to the Canal


Construction Detail

Final Presentation demonstrates an exploration of design as a tool for architectural and social development. The project seeks to form a synthesis between tradition and modernity through a reinterpretation of local materials, the juxtaposition between interior and exterior spaces, and a manipulation of light and shadow.

Architecturally, the project layout addresses the need for a private, communal space; as well as the cultural tendency to privatize open, “public” space.

Furthermore, water plays a central role in the design; becoming the aspect that most directly addresses the issue of development - improving both the built form, and the community of which it is a part; past the point of mere subsistence.



EDGE CONDITIONS are responded to through transition spaces. Along the eastern edge of the site (Kalighat Road) a series of steps mediates the transition between the informal market activity along the street and the formal market space beneath the canopies. Similarly, a grove of mango trees provides a transition between the canal and the market space. The building itself uses narrow exterior spaces to funnel the visitor into the building from the busy street.

_Final montage of street view looking North along Kalighat Rd.

_Final montage of street view looking South along Kalighat Rd.

_Final render of view from the canal

_Opposite: Site Plan

SITE PLAN: 1/32" = 1"-0"

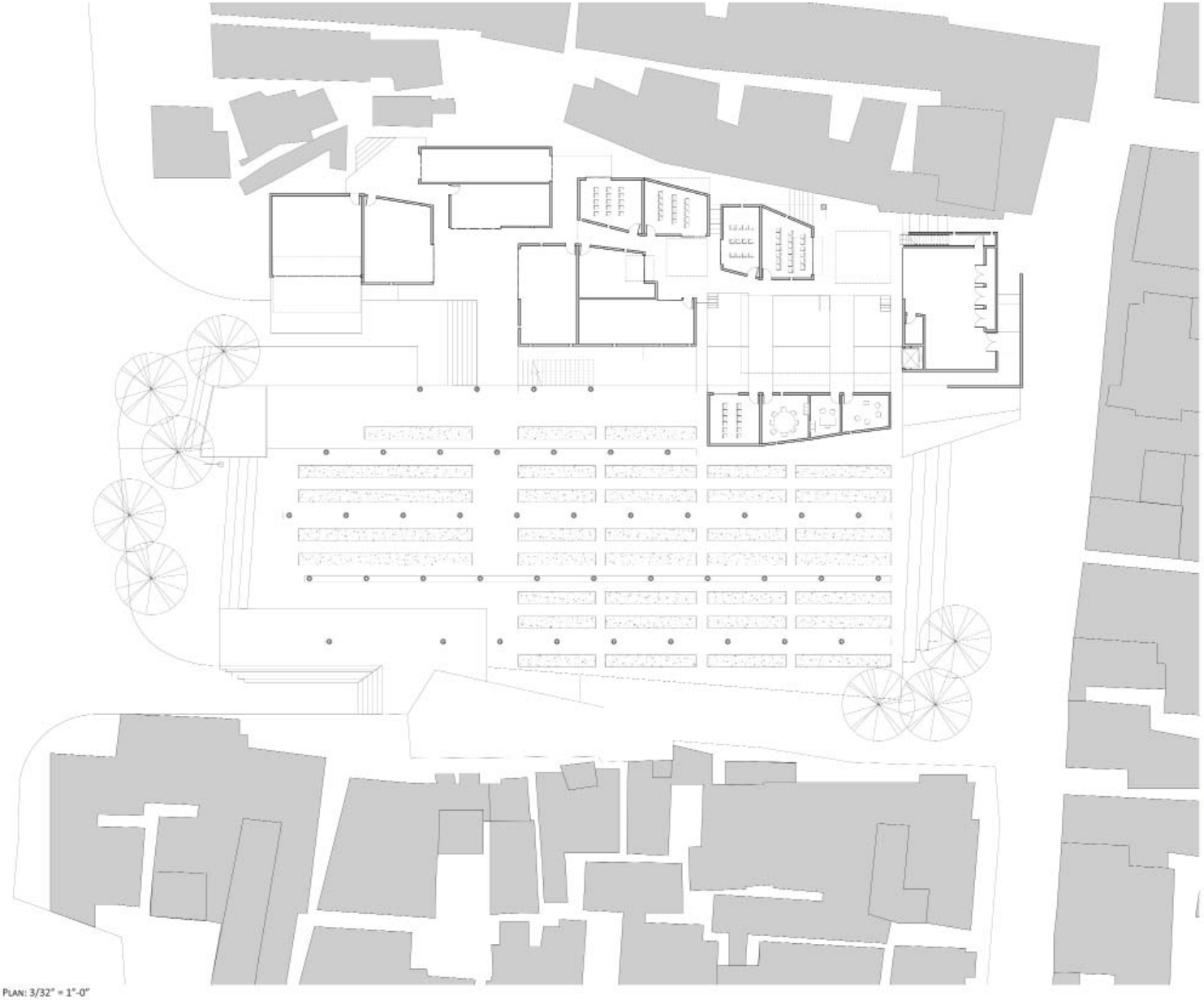
Leaky Courtyard Typology is used to further mediate public and private space. The courtyards provide a series of private communal spaces for the users of the building while the narrow spaces that lead into and out of the courtyards act as privatizing transition spaces; not only filtering traffic but also minimizing views into the private courtyard space.

_Final render of central courtyard

_Final render of east courtyard showing relationship between the Women's Center and the canal, as well as landscape elements

_Final render of west courtyard showing relationship between the Women's Center and the canal

_Opposite: Ground Floor Plan



GROUND FLOOR PLAN: 3/32" = 1'-0"

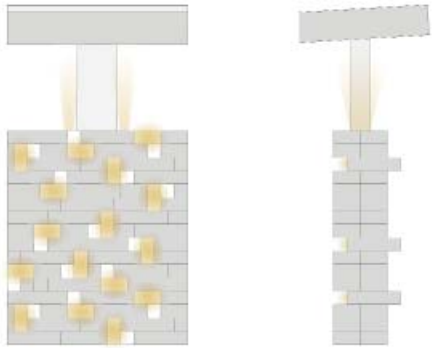
EXISTING COURTYARD TYPOLOGY

Further Articulation of Outdoor Space

is accomplished through a variety of means. Floor patterns are conceived to highlight the communal courtyard spaces as well as the circulation between the Women's Center and the market. The exterior space within the building is further articulated by illuminating the walls that form the space. On the second floor a roof terrace is enhanced through the addition of a roof plane, supported by a colonnade, to create shade for the inhabitants below.

_Floor pattern diagram highlighting the points at which interior and exterior space merge

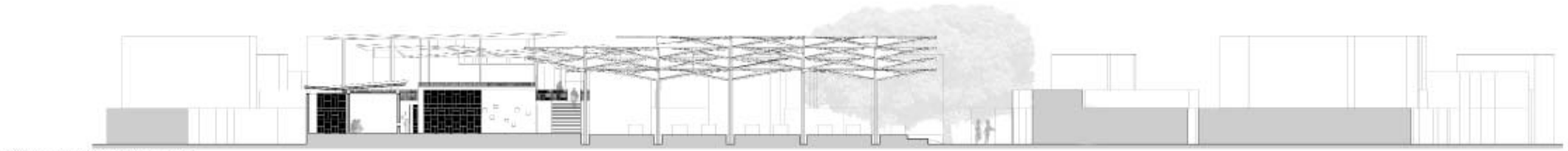
_Final render of roof terrace



_Lighting diagram demonstrating the integration of light within the Jali screen wall, highlighting the formation of exterior space

_Opposite: EW Section, NS Section, and South Elevation

EW Section through courtyards looking S: 3/32" = 1"-0"



NS Section looking E: 3/32" = 1"-0"

South Elevation: 3/32" = 1"-0"

Ambiguity between Interior and Exterior Space

Space is created through the conception of operable bamboo screens. The screens either slide or elevate to blend the interior space with the exterior space; which in most cases opens into one of the three courtyard areas. In the case of the dance therapy space, the elevated screen transforms the space into an informal performance space.

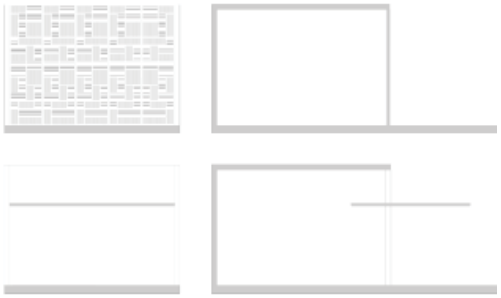


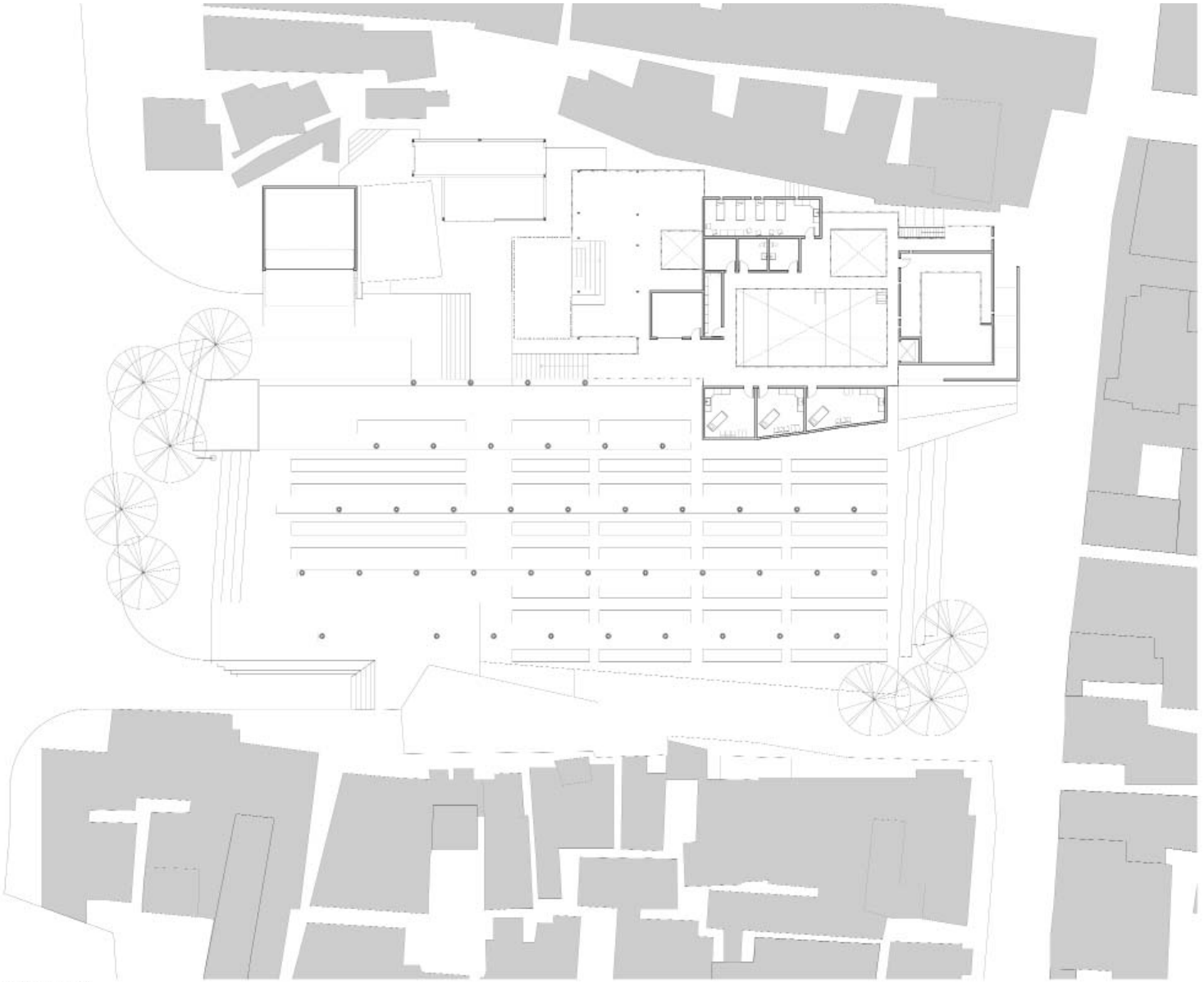
_Diagram of how space changes based on whether or not the operable bamboo screen is closed (top: elevation on left, section on right) or open (bottom: elevation on left, section on right)

_Plan diagram designating exterior space

_Plan diagram demonstrating the merging of interior and exterior space

_Final render of dance space with operable screen elevated to create performance area

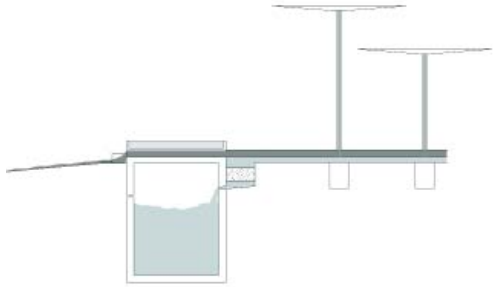
_Opposite: Second Floor Plan



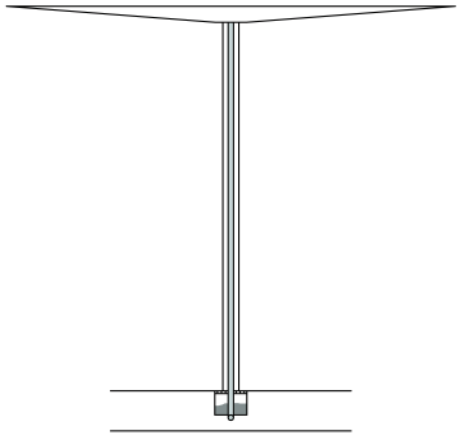
SECOND FLOOR PLAN: 3/32" = 1"-0"

USE OF THE "IN-BETWEEN REALM"

Water Management is achieved through a series of catchment systems. The primary system acts within the canopy layout that covers the market space. The canopies themselves are designed to capture rainwater. The rainwater is directed down the center of the canopy column and into an underground pipe that leads to a sand filter, and ends at a cistern. The water collected in the cistern is accessed via a nearby water pump. The cistern sits below a pool that also collects rainwater, allowing for users to informally interact with the water. Runoff at ground level is directed into a series of troughs that lead the water back towards the canal. Rainwater that falls onto the roof is also directed back towards the canal thanks to the valleys created by folding the roof planes.



_Sectional diagram of rainwater collection, filtration, and retention process



_Sectional diagram of rainwater collection via canopy structure

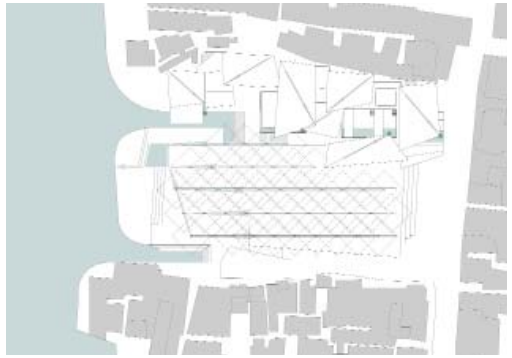
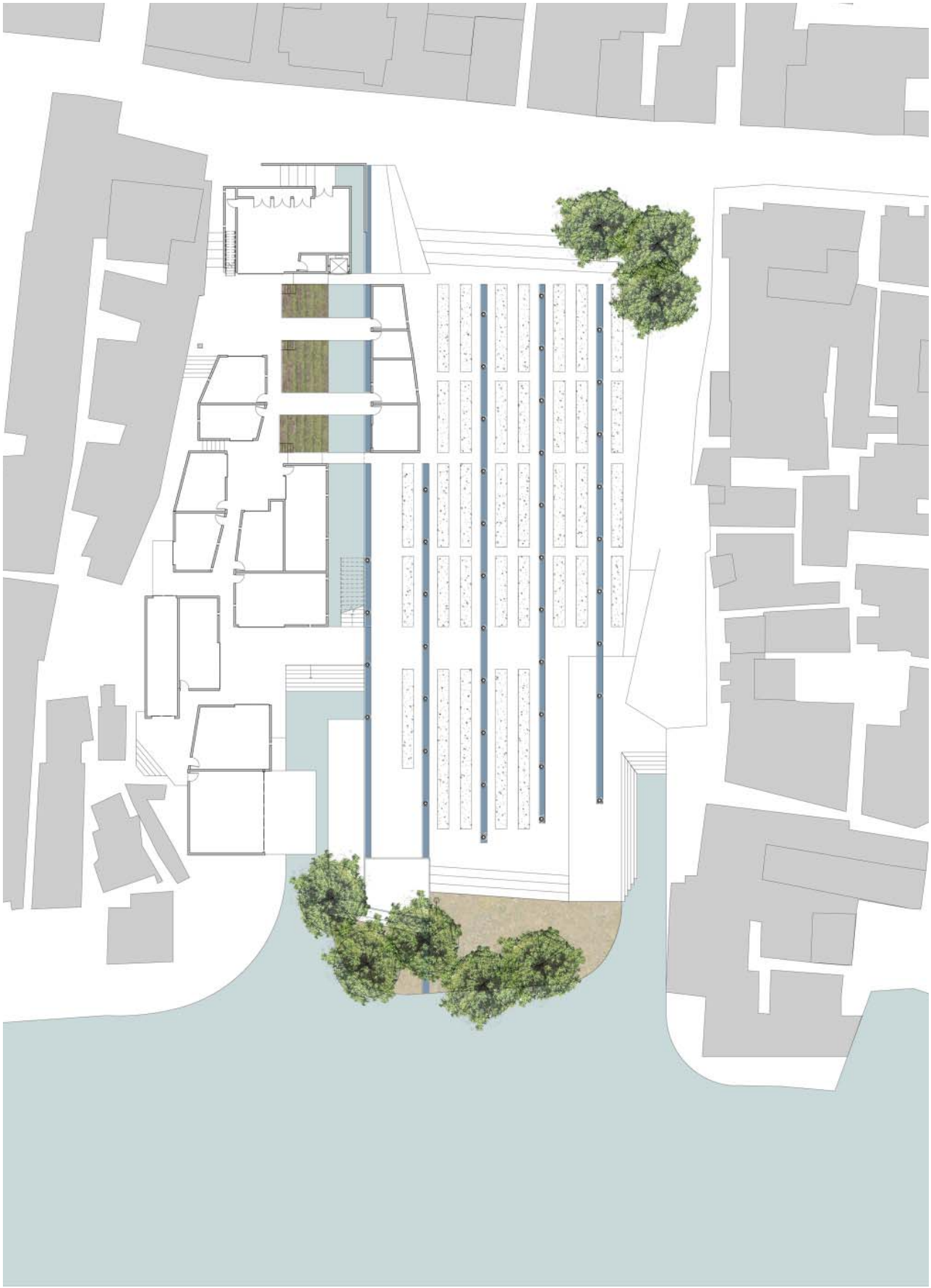


_Diagram of rainwater management

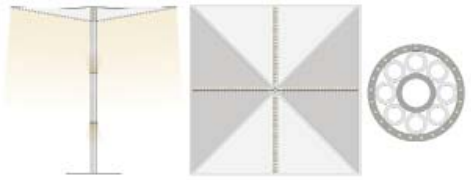
_Opposite: Landscape and water integration within site



Spatial Experience of Water Management

is enhanced by integrating the water management systems within larger architectural elements. The canopies themselves create a dynamic experience beneath the multi-layerd colored panels while the lighting that is imbedded within the canopies maintains that dynamism after dark. The pool above the cistern allows for social interaction along with the trough that leads from the pool back to the canal.

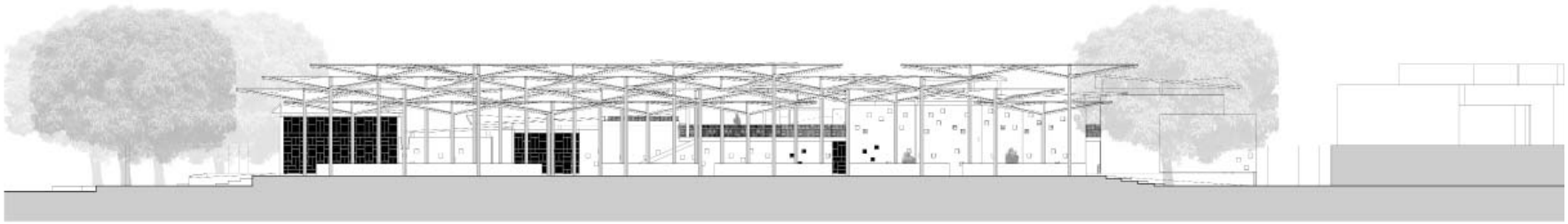
_Final render of relationship to canal



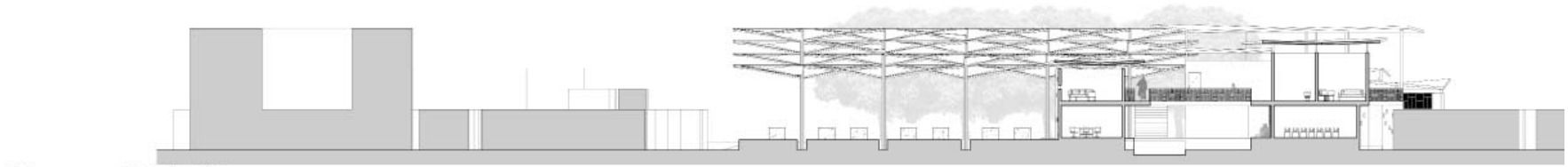
_Lighting diagram demonstrating how the canopies not only collect water but also light the market space

_Final render of market space

_Opposite: EW section through market, NS section, East elevation



EW Section through market space looking N: 3/32" = 1"-0"



NS Section looking W: 3/32" = 1"-0"

East Elevation: 3/32" = 1"-0"

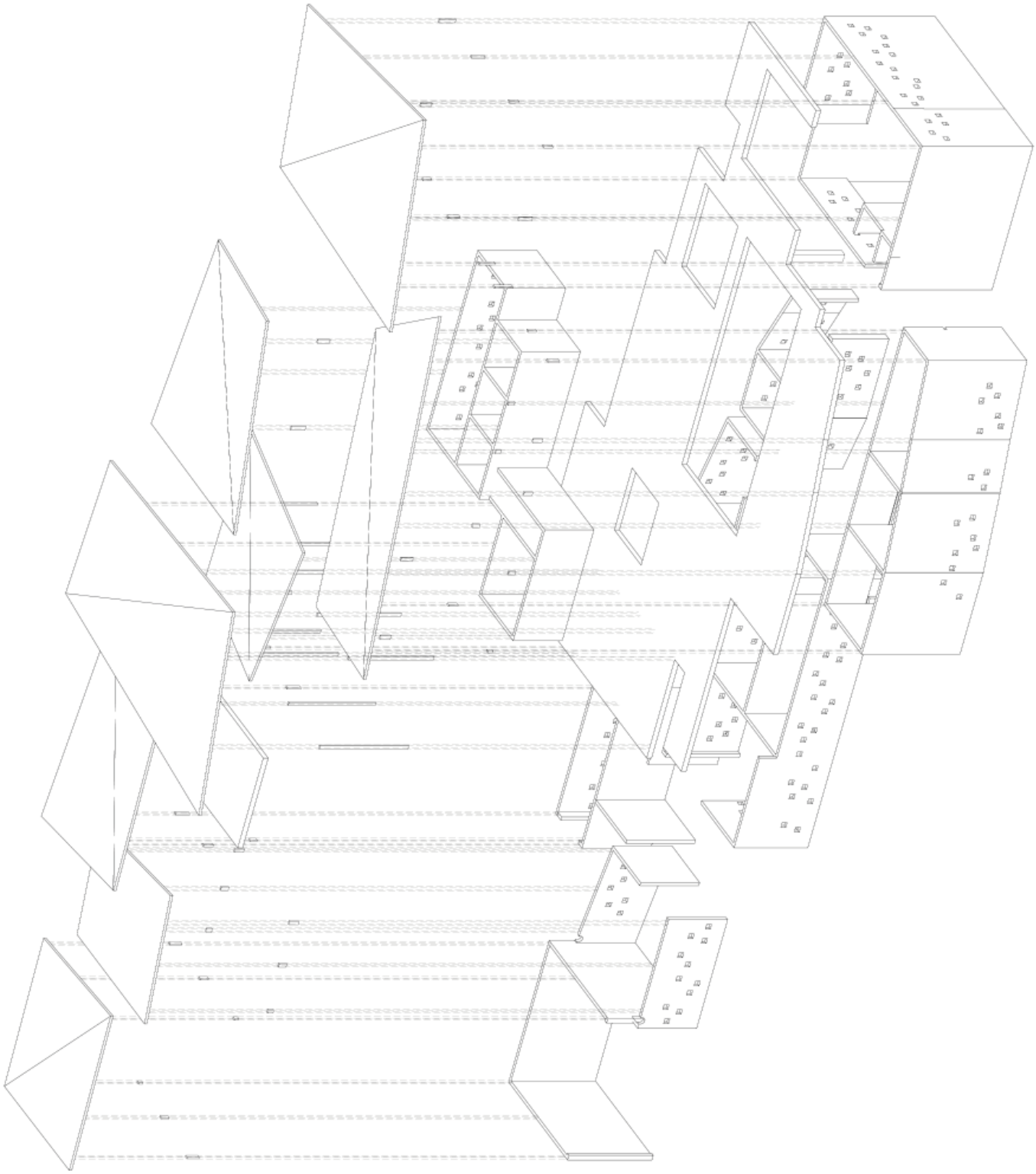
Interior Spatial Experience is dominated by a play of light, shadow, and materiality. Local materials are manipulated to allow light to permeate the space. This is accomplished through the brick jali system, the operable bamboo screens, and lifting the folded roof planes up away from the tops of the walls; creating a thin strip of light.

_Final render of workshop space showing the play of light and shadow through the operable bamboo screen and the brick Jali wall.

_Final render of the communal space, looking North

_Final render of the communal space, looking South

_Opposite: Structural axon showing system of bearing walls, columns, and folded roof planes



Technical Systems are designed in conjunction with the spatial experience. The voids that allow for an unique play of light also allow for ventilation; creating a stack affect that brings cool air in and allows warm air to escape.

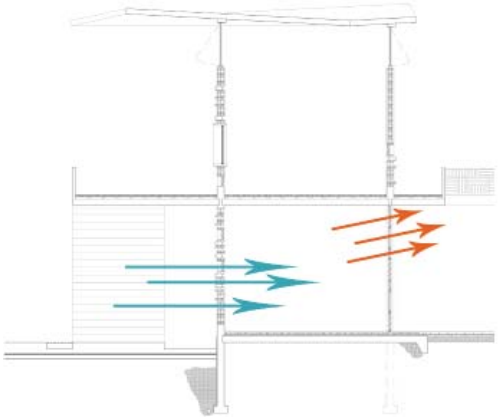
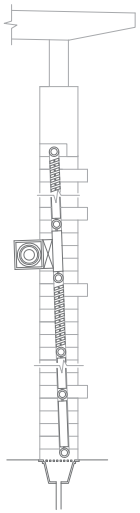
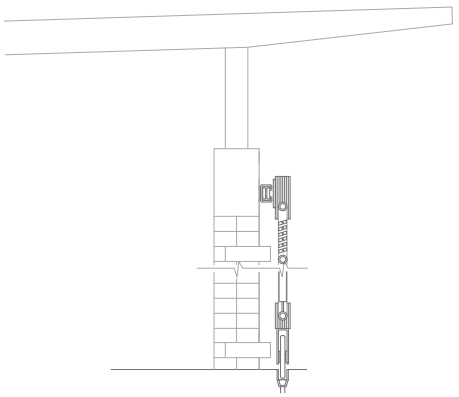


_Diagram of passive cooling through the stack affect

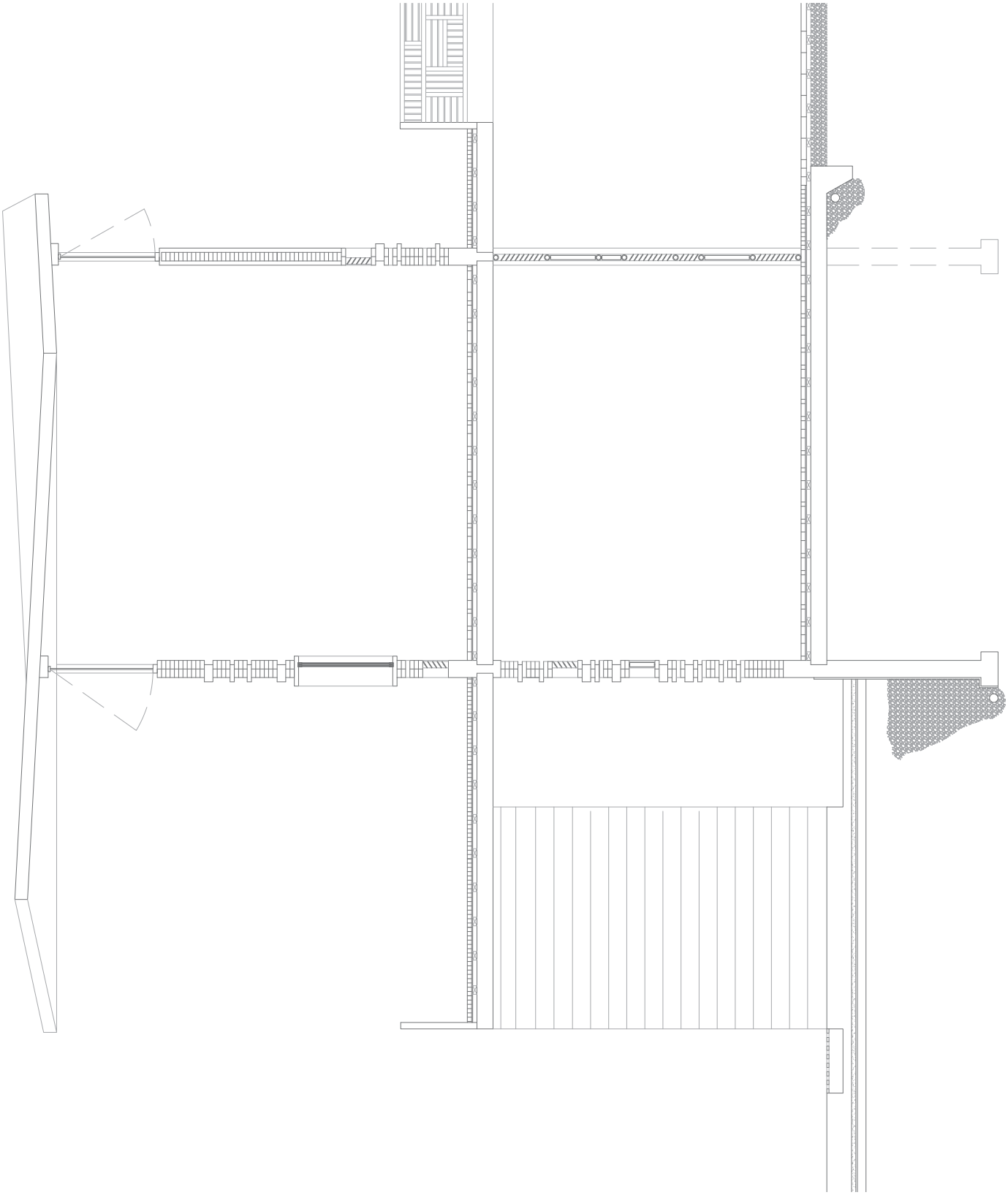


_Detail of rotating bamboo screen



_Detail of sliding bamboo screen

_Opposite: Detailed wall section



Concluding Thoughts...

Design - architecture - as a tool for development. That was the exploration; and to a degree it was successful. The Indian culture was carefully observed, resources were detailed and accounted for, challenges were met, and, in many cases, transformed into opportunities. The technological opportunities available should have been more fully integrated within the design and the aspect of security should have been more closely examined. But overall, the exploration was worthwhile. Worthwhile because not only did it examine questions of tradition and modernity, of social trends and cultural appropriateness, but it also raised new questions. Questions of real world application and the extent to which architecture can play a role within the realm of development.

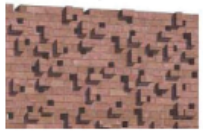
Development is about more than subsistence; it is about transcendence - transcending the current issue and inciting long lasting change. Architecture, in contrast, is commonly a reactive element. It's the end product; reacting to site, to climate, to existing needs. Yes, there are many examples of architectural transformations that revive occupation, stimulate use, or encourage interaction; but it should do more. It should go beyond an initial, foreseeable, goal and create a domino effect of catalytic change. So the question remains, can it be pushed further? can architecture truly overcome its reactionary nature and become a proactive force?

design as a tool for

architectural + social development

synthesis of tradition + modernity

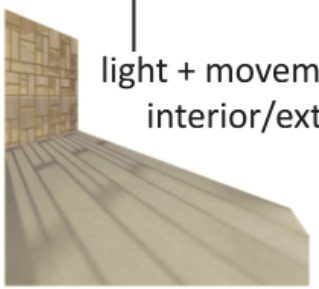
reinterpretation of local crafts + materials



spatial expression of cultural identity

interstitial space

light + movement + interior/exterior space



programmatic + architectural intervention

education + life skills

water retention + filtration

Appendix:

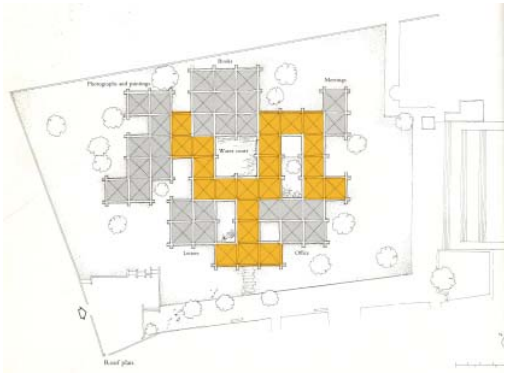
The Gandhi Smarak Sangrahalaya, completed in 1963 and designed by Charles Correa, is located in Ahmedabad, India. The site is significant for the fact that Gandhi lived in the area for a time, and began his infamous salt walk from the location. Ahmedabad is on the western edge of India but, like Kolkata, was at one point a thriving industrial area. The project successfully explores spatial relationships through the use of sight lines and the juxtaposition between interior and exterior spaces.

The spaces consist of both open air and enclosed areas and are arranged in a cluster, reminiscent of typical village organization. This casual organization is anchored by a central water court. Aside from incurring notions of Indian vernacular, this organization also creates dynamic sight lines and is modulated to allow for expansion.

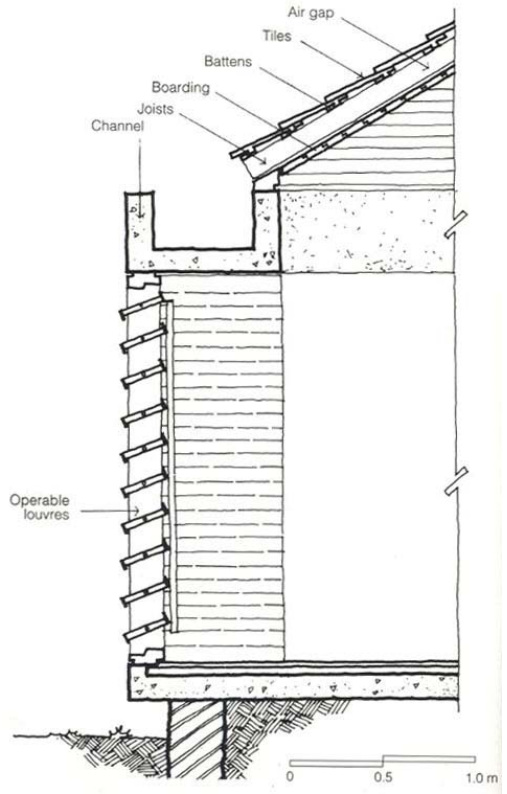
Gandhi Smarak Sangrahalaya

Charles Correa — Completed 1963

Ahmedabad, India

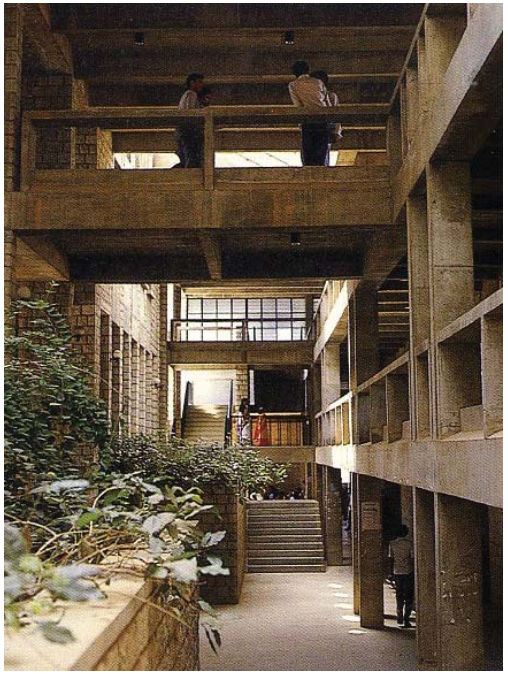


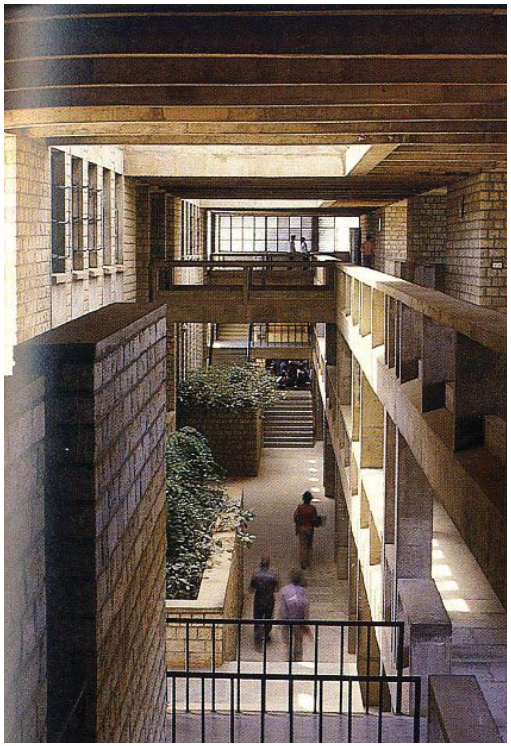
THE SPATIAL EXPERIENCE within the building is primarily an aspect of the juxtaposition between the built, semi-built, and (un)built spaces. There are three levels of "built" space within the complex: enclosed, semi-enclosed, and open courtyards. The module aspect of the complex, paired with these varying degrees of built space allow views through the complex to change as the visitor moves from one exhibit to the next; creating a visually dynamic experience. In addition, the open spaces create a stark contrast between light and shadow, and allow for opportunities to relate "earth to sky."



THE VERNACULAR RESPONSE of the building can be seen through the material selection and application. The materiality of the complex is influenced from the nearby ashram buildings; consisting of tiled roofs, brick walls, stone floors, and wooden doors. Reinforced concrete is also used as channels/beams to allow both for drainage and future expansion of the 6m x 6m module. The temperature within the enclosed areas of the complex can be regulated through the use of the wooden louver system. No glass or HVAC is used.

The spatial experience within the building primarily represents the sensorial communicative abilities of space. The Indian Institute of Management is a large university complex consisting of a series of interior pedestrian “streets.” These streets are the primary circulation route throughout the complex. Light is diffused into these spaces through an overhead trellis, inviting students and faculty to utilize these streets, encouraging discourse, learning, and chance encounters. The diffused light of the streets also creates deep shadows within the building, offering relief from heat and a visual contrast between circulation space and program space.

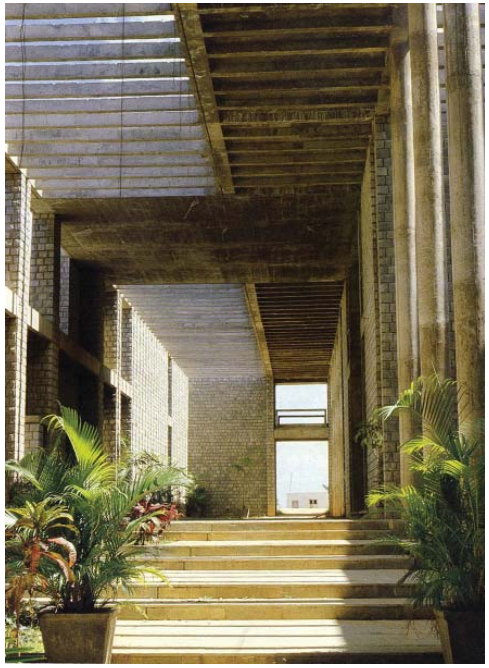


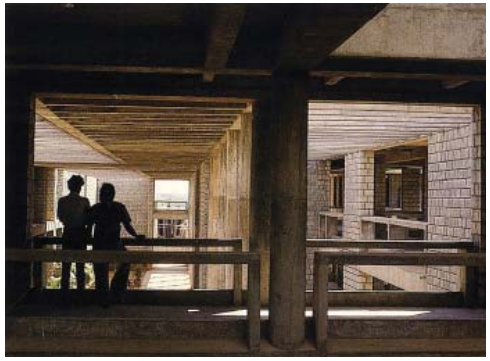


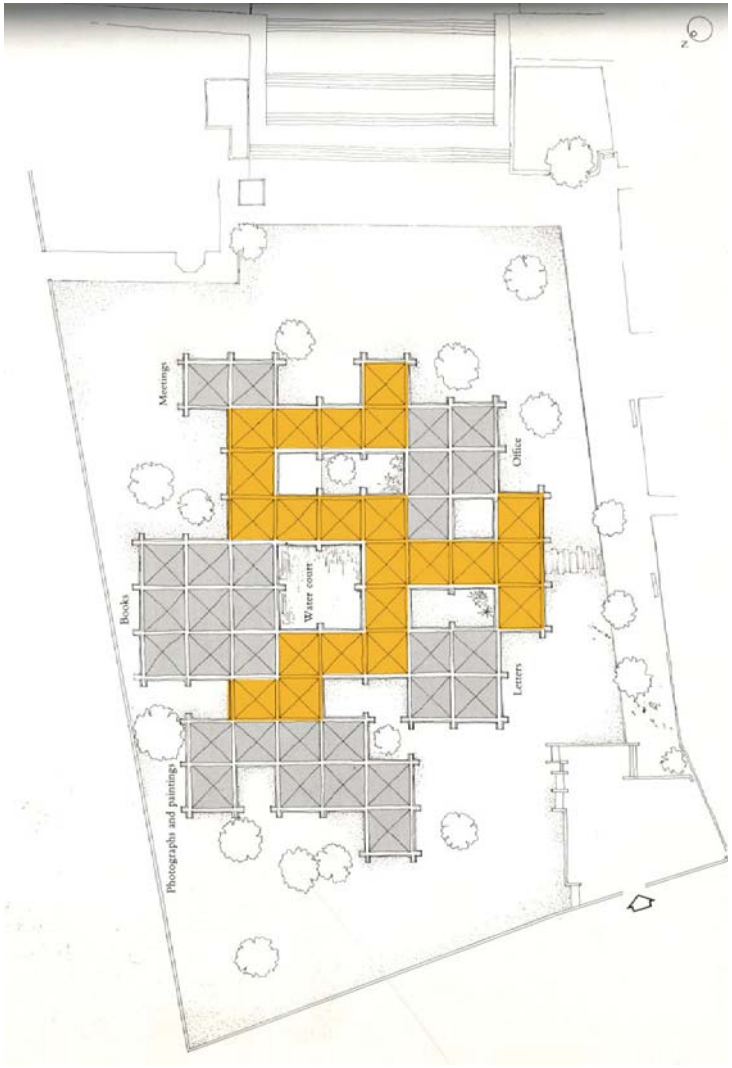
Indian Institute of Management

Balkrishina Doshi — Completed 1983

Bangalore, India

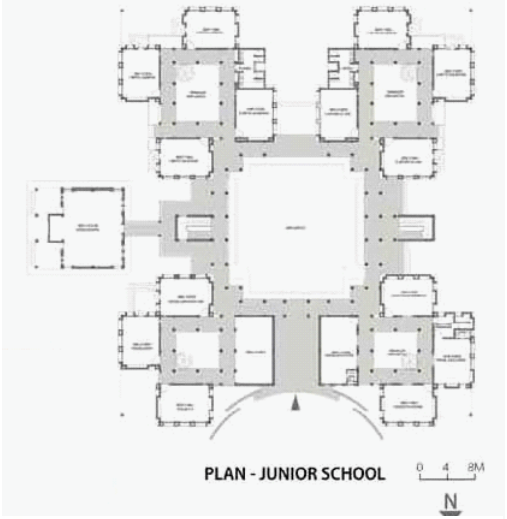





Meetings
Office
Books
Water court
Letters
Photographs and paintings

The Nalanda International School, completed in 2004 and designed by Brinda Somaya, is located in Baroda, India. Baroda differs significantly from Kolkata in that is a more rural area on the western side of the country. The project, however, is quite similar in scale and program.

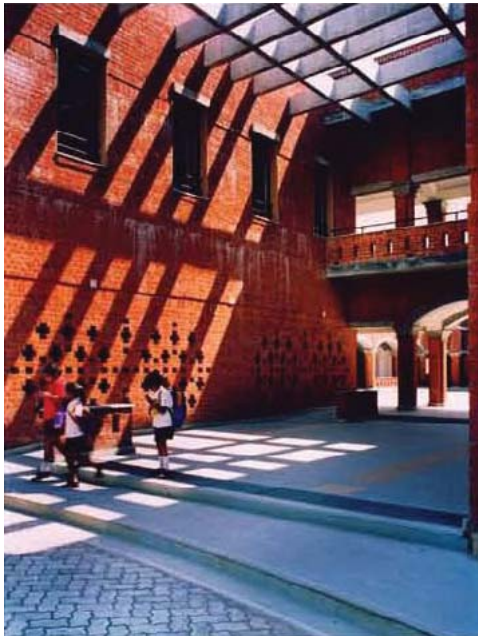
The Nalanda International School is a twenty acre complex that includes a pre-primary school, a junior school, a middle school, a senior school, and recreational fields. The particular portion being looked at here is the Junior School. The Junior School is a 48,200 SF two story building with a footprint of 24,500SF.[86] The project successfully integrates interior and exterior spaces while creating a modern structure that still responds to the Indian vernacular.



Nalanda International School

Brinda Somaya
Baroda, India
USD

Completed 2004
Cost $606,761

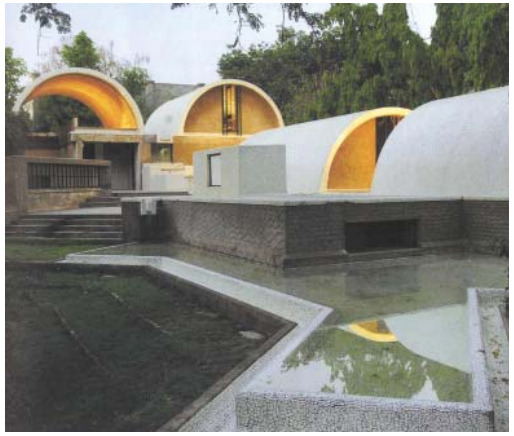


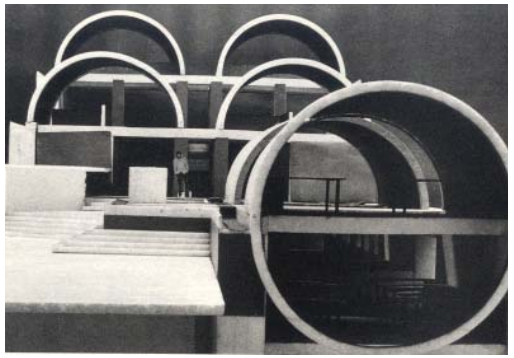
THE SPACES within the school are arranged in clusters around central courtyards. These outdoor spaces become extremely important to the life of the school; offering spaces for communal gathering, informal meetings, and chance happenings. The programmatic spaces of the building consist of classrooms (with 20-28 students per classroom),[87] an auditorium, and a library; as well as spaces to learn and celebrate traditional Indian crafts.

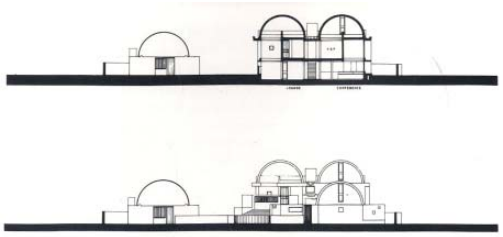
THE VERNACULAR is considered within the design of the Nalanda International School primarily through the materiality of the project. Native bricks are used as both a structural and a thermal material. The structure of the project is a series of brick piers and vaults. Additionally, there are cavity walls that allow the interior spaces to be kept cool during the summer and warm during the winter.[88]

The bricks are also manipulated to allow for breezes and filtered light. These manipulations take the form of a “punched” opening design, which is adapted from the traditional Indian *jail* screens.[89]

SANGATH is often considered Doshi's greatest work; a true synthesis of his ideals. The building combines lessons from both Doshi's time in Le Corbusier's Atelier as well as elements of traditional Indian architecture. Nature, as an important aspect of Indian culture, is prominent within Sangath. The complex becomes part of its site through submerging the lower level beneath ground level, as well as through the integration of landscape and the incorporation of water troughs. The forms are inspired by vernacular building methodologies and the construction process was able to be completed by unskilled laborers. The forms have further geometric significance and are based on a cylindrical geometry as well as principles of the golden section. The envelope of the building is a combination of clay and concrete. The forms are then covered with a layer of broken china. This unique inclusion serves to reflect heat and glare, as well as give new use to the traditional Indian craft of pottery.





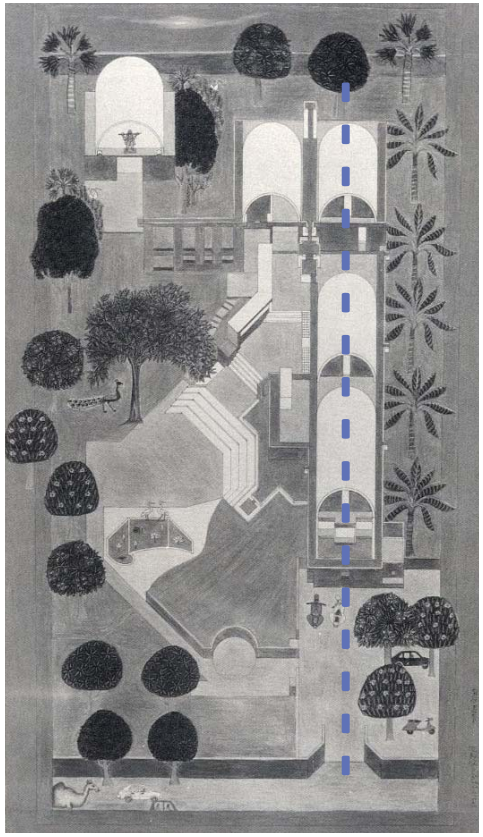


SANGATH

BALKRISHINA DOSHI

Ahmedabad, India

Completed 1980



THE SPATIAL EXPERIENCE of the building connects to traditional Indian architecture in its process of approach, or "la promenade architecturale," as Le Corbusier terms it. The visitor enters the complex on axis with the largest arched segment, but is forced to traverse around the building before gaining entry. Furthermore, water, pottery, and landscape elements act as baffles along the path so as to call for pause and reflection during the journey.

ENDNOTES:

1. NY Times “India’s GDP grew 6.1% in Quarter.” Aug. 2009
2. *India: Urban Poverty Report 2009 Factsheet*. United Nations Development Programme: 2009.
3. *India: Urban Poverty Report 2009 Factsheet*. United Nations Development Programme: 2009.
4. Sanlaap
5. Renu Khosla. *Addressing Gender Concerns in India’s Urban Renewal Mission*. United Nations Development Programme: New Delhi, 2009.
6. Victoria Velkoff. “Women’s Education in India.” *Women of the World*: Oct. 1998.
7. Victoria Velkoff. “Women’s Education in India.” *Women of the World*: Oct. 1998.
8. Victoria Velkoff. “Women’s Education in India.” *Women of the World*: Oct. 1998.
9. Victoria Velkoff. “Women’s Education in India.” *Women of the World*: Oct. 1998.
10. ProLiteracy
11. Kolkata educational survey
12. Renu Khosla. *Addressing Gender Concerns in India’s Urban Renewal Mission*. United Nations Development Programme: New Delhi, 2009.
13. NY Times “The Daughter Deficit.” Aug. 2009
14. Victoria Velkoff. “Women’s Education in India.” *Women of the World*: Oct. 1998.
15. Manushi “Destined to Fail: Inherant Flaws in the Anti Dowry Legislation.” May-June 2005.
16. Renu Khosla. *Addressing Gender Concerns in India’s Urban Renewal Mission*. United Nations Development Programme: New Delhi, 2009.
17. Sisyphe.org “Decriminalize Prostituted Women, Not Prostitution.” Nov. 2004
18. Sanlaap
19. Washington Post “The Women’s Crusade” Aug. 2009
20. Dr. Natai Kundu. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.
21. Dr. Natai Kundu. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.
22. Dr. Natai Kundu. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.
23. Dr. Natai Kundu. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.
24. Dr. Natai Kundu. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.

Bibliography:

"A Woman's World." *New York Times*: Aug. 2009.

Aga Khan Award for Architecture. *Nalanda International School*. 2007.

Architecture and Identity: proceedings of the regioanl seminar in the series Exploring Architecture in Islamic Cultures. Concept Media: Singapore, 1983

Architecture for a Changing World. Aga Khan Trust for Culture: Geneva, Switz, 1996.

Architecture for Humanity. Ed. *Design Like You Give a Damn: architectural responses to humanitarian crisis*. Metropolis Books: New York, 2006.

Arnold, Fred, Sunita Kishor, and T. K. Roy. "Sex-Selective Abortions in India." *Population and Development Review*, Vol. 28, No. 4 (Dec. 2002), pp. 759-785.

Audet, Elaine and Micheline Carrier. "Decriminalize Prostituted Women, Not Prostitution." *Sisyphe.org*: Nov. 2004

Bahga, Sarbjit, Surinder Bahga and Yashinder Bahga. *Modern Architecture in India: Post-Independence Perspective.* Galgotia: New Delhi, 1993.

Banergee, Tamaghna. "Dead Hospitals Dig Into Healthcare Budget." *The Telegraph*: June, 2008.

Bhatt, Vikram and Peter Scriver. *Contemporary Indian Architecture: After the Masters.* Mapin: Ahmedabad, 1990.

Bureau of Energy Efficiency. Energy Conservation Building Code 2006. US Agency for International Development and International Institute for Energy Conservation: 2006.

Charleson, Andrew. *Seismic Design for Archiects: Outwitting the Quake.* Elsevier Architectural Press: Boston, 2008.

Chattopadhyay, Suhrid Sankar. "Not Helpless Victims of Fate." *Hindu*: Vol 22, no 8.

Correa, Charles. *Charles Correa*. Concept Media: Singapore, 1984

Correa, Charles. *Charles Correa*. Thames & Hudson: London, 1996.

Cotton, H. E. A. *Calcutta Old and New: A Historical & Descriptive Handbook to the City.* W. Newman & Co. Calcutta, 1907.

Curtis, William J. R. *Balkrishna Doshi: an architecture for India*. Rizzoli: New York, 1988.

"Delhi Turns Spotlight on Women's Issues." *The Hindu*: Dec. 2008

Exploring Architecture in Islamic Cultures I: Architecture and Identity. Concept Media: Singapore, 1983.

Findley, Lisa. *Building Change: architecture, politics and cultural agency*. Routledge: New York, 2005.

Freire, Paulo. *Pedagogy of the Oppressed*. Continuum, New York: 2000.

Gardner, Howard. *Intelligence Reframed: multiple intelligences for the 21st century*. Basic Books: New York, 1999.

Giedion, Sigfried. *Space, Time and Architecture: the growth of a new tradition.* Harvard University Press: Cambridge, MA, 2008.

Grant, Matthew. "Girl-Trafficking Hampers Aids Fight." *BBC News*: Nov. 2004

Herdeg, Klaus. *Formal Structure in Indian Architecture*. Rizzoli: New York, 1990.

Herrle, Peter and Erik Wegerhoff. Ed. *Architecture and Identity*. Lit: Berlin, 2008.

"India's GDP grew 6.1% in Quarter." *New York Times*: Aug. 2009

"India's School Shortage." *New York Times*: Feb. 2008

International Code Council, *International Building Code*. The Council: Falls Church, VA, 2009.

Khan, Hasan-Uddin. *Charles Correa.* Concept Media: Singapore, 1987.

Khosla, Renu. *Addressing Gender Concerns in India's Urban Renewal Mission*. United Nations Development Programme: New Delhi, 2009.

Kishwar, Madhu Purnima. "Destined to Fail: Inherent Flaws in the Anti Dowry Legislation." *Manushi* no. 148.

Kishwar, Madhu Purnima. "Diagnosing and Remedying Backwardness: English Education Defines the New Brahmins and the New Dalits of India." *Manushi* no. 154.

Kundu, Dr. Natai. “The Case of Kolkata, India.” *Understanding Slums: Case Studies for the Global Report on Human Settlements*, 2003.
Lakshmanan, N., S. Gomathinayagam, P. Harikrishna, A. Abraham and S. Chitra Ganapathi. “Basic Wind Speed Map of India withLong-Term Hourly Wind Data.” *Current Science*: April 2009.
Liggett, Robin and Murray Milne. “Climate Consultant 4.0” Computer Program. 2008.
Luce, Edward. *In Spite of the Gods: the rise of modern India*. Anchor Books: New York: 2008
Panda, Ananya. “Mission of Empowering Women Still a Far Cry.” *The Tribune*: Dec. 2008
Pandya, Yatin. *Concepts of Space in Traditional Indian Architecture.* Mapin: Easthampton, MA, 2005.
Ravi, Padmalatha. “Are New Teaching Methods Working?” *India Together*: Jan. 2007.
Robinson, Julia W. “Premises, Premises” in *Type and the [Im]Possibilites of Convention*. University of Minnesota College of Architecture and Landscape Architecture: Minneapolis, 1991.
Rybczynski, Witold. *How the Other Half Builds*. Centre for Minimum Cost Housing: Montreal, 1984
Shah, Mansi and Sreyashi Sen. “Education Mapping in a Slum Area: An Analysis of the Dynamics of Demand and Supply.” CCS Working Paper No. 201. Centre for Civil Society: 2008.
Sinha, Neha. “Nation to Follow Delhi on Green Code.” *Express India*: Aug. 2009.
Sreedhar, M.V. “Reaching the Unreached: Enabling Dalit Girls to Get Schooling.” *Manushi* no. 111.
Steele, James. *Rethinking Modernism for the Developing World: The Complete Architecture of Balkrishna Doshi*. Whitney Library of Design: New York, 1998.
Subramaniam, Kandula. “60 yrs after it shut, money is raining on Kolkata Old Mint.” *Indian Express*: May 2008.
“Surplus Males: The Need for Balance.” *Bridges*. 1999-2000 Annual Report Issue.
“The Women’s Crusade” *Washington Post*: Aug. 2009
Tillotson, G. H. R. ed. *Paradigms of Indian Architecture: space and time in representation and design*. Curzon: Richmond, VA: 1998
United Nations Development Programme. *India: Urban Poverty Report 2009 Factsheet*. 2009.
Velkoff, Victoria. “Women’s Education in India.” *Women of the World*: Oct. 1998.
Yucel-Yang, Sebnem. “Identity Calling” in Caicco, Gregory. *Architecture, Ethics, and the Personhood of Place*. University Press of New England: Hanover, NH, 2007.
Zhang, Yanhong, T. Neville Postlethwaite and Aletta Grisay. Ed. *A View Inside Primary Schools: A World Education Indicators (WEI) Cross-National Study*. UNESCO Institute for Statistics: Montreal, 2008
Zumthor, Peter. *Thinking Architecture.* Lars Muller: Baden, CA, 1998

Media Resources:

ArchNet: Islamic Architecture Community: http://www.archnet.org/lobby/
Aronson, Raney. *INDIA - The Sex Workers.* Frontline Video. 2004.
Briski, Zana and Ross Rauffman. *Born into Brothels.* DVD. 2004.
CARE: http://careindia.org/ManageHome/Home.aspx
Centre for Social Research, An Institution for the Women of India: http://www.csrindia.org/
Climate of Kolkata: http://en.wikipedia.org/wiki/Climate_of_Kolkata
Deepayala: http://www.deepalaya.org/
Delhi Master Plan 2021: http://delhi-masterplan.com/
Durbar Mahila Samanwaya Committee: http://www.durbar.org/index.asp
Freeset Global: http://www.freesetglobal.com/
Gaisma: http://www.gaisma.com/en/location/calcutta.html
Google Maps: http://maps.google.com/
Hooghly River: http://en.wikipedia.org/wiki/Hooghly_River
Imperial Gazetteer of India, 1907-1909 Calcutta http://www.payer.de/quellenkunde/quellen1603.htm
Kolkata Municipal Corporation: http://www.kolkatamycity.com/index.asp
Maps of India: http://www.mapsofindia.com/
Mehrotra, Rahul. *One City, Two Worlds*
Monsoon: http://en.wikipedia.org/wiki/Monsoon
Nalanda International School: http://www.nalandaschool.org/
National Center for Education Statistics: http://nces.ed.gov/
ProLiteracy: http://www.proliteracy.org/NetCommunity/Page.aspx?pid=191&srcid=-2
Rain Water Harvesting: http://rainwaterharvesting.org
Sanlaap: http://www.sanlaapindia.org/
Smile Foundation: http://smilefoundationindia.org/
Sulabh International Social Service Organization: http://www.sulabhinternational.org/
The World Bank: http://www.worldbank.org/
UNESCO Institute for Statistics: http://www.uis.unesco.org/ev.php?ID=2867_201&ID2=DO_TOPIC
United Nations Development Programme: http://www.undp.org.in/
VIDYA Intergrated Development for Youth and Adults: http://www.vidya-india.org/Default.aspx
Yuva Parivartan: http://www.yuvaparivartan.org/yuvaparivartan/Index.aspx

Additional Resources:

Hagenah, Charles. RWU School of Architecture Professor, familiar with India with a focus on Chandigarh.
Hermann, Elizabeth Dean. RISD Faculty, familiar with the Kalighat Community
Intwala, Snehal. RWU School of Architecture Alum, native of India.
Khan, Hasan-Uddin. RWU School of Architecture Distinguished Professor, familiar with India.
Lebra, Joyce. Former Professor of Japanese History and Indian History at the University of Colorado.
Mani, Meena. Principal at Mani Chowfla Associates, an architectural firm based in New Delhi, India.
Patel, Nikul. Current RWU student of Indian heritage.
Silas, Sandeep. Associate of M. Tait, native of India.
Tait, Marhsa. Public Policy Consultant, Nonprofit Management and Governance, former VP of ProLiteracy.
Turan, Mete. RWU School of Architecture Professor, structural advisor
Viola Ochoa, Roberto. Associate at Sasaki Associates Inc, familiar with India.
Visvanathan, Susan. Professor of sociology at Jawaharlal Nehru University, New Delhi.
White, Stephen. RWU School of Architecture Dean, former resident of India.