ATMOSPHERIC INTERVENTIONS

by

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Bachelor of Arts in Architecture
University of California, Berkeley, 2008

Submitted to the department of architecture in partial fulfillment of the requirements for the degree of Master of Architecture at the Massachusetts Institute of Technology.

February 2015

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### THESIS COMMITTEE

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Humans have been sheltering themselves from the harsh elements of their surroundings to maintain comfort since the discovery of the hearth. With the rise of the Industrial Revolution came innovations that made mitigating external conditions convenient and easy. The standard 70 degree Fahrenheit, with 30-candle-feet of illumination, 30-50% humidity, and ventilation became the norm and is replicated and placed regardless of existing conditions, creating homogeneous environments.

Our conventional conception of the relationship between architecture and the environment is based on false assumptions that we reside comfortably in the standard air-conditioned 70 degrees, effectively producing desensitizing spaces. For a body to understand and experience space, it is important for these environments to have an atmospheric affect that is absorbed through the senses. Architecture is then seen as a stimulus by provoking and challenging the body and creating a consciousness of body and environment. This thesis states that the sensorial appreciation in architecture can be explored through sequenced and curated experiences of architecture to use, amplify and appease the senses. This creates new atmospheric conditions conceived of relative sequencing and juxtapositions, rather than appeasing and mediating the existing environment.

This idea is explored through three interventions on the Harvard Bridge in Boston, Massachusetts that seeks to engage the hostile environmental conditions.
All this would not be possible without the amazing support and friendships I’ve made over the past four years and more.

To Brandon Clifford for your seemingly bottomless amount of patience and faith. Your wisdom and advice not only guided me through my project but through personal growth, down to the last moment when I resisted pushing the volume down button.

To my readers, John Fernandez and Kazys Varnelis for the insights and encouragements. Each conversation pushed the project a little further or grounded it a little more.

To Joel Lamere for being one of the most understanding instructors. Thanks for the early talks and anxiety control.

To the MArch class of 2015 for the family-like environment, La Verde runs, late night chats and post-review Asgard dinners.

To Kev Young, Moe Amaya, James Coleman, Lizzie Yarina, Jongwan Kwon, Enas Alkhudairy and Alice Kao for the support, near and far, during the most critical hours with renderings, diagrams, models, milling and snacks.

Thank you to my friends who always welcomed me home despite my absence during the semester. To Shelly for taking me in and allowing your apt to be my second home in NYC.

To Nico Guida for all that you’ve done for me that is impossible to list here. I sincerely appreciate every hour you put into my models, the clutch advices from the spray paint to layout and, most importantly, for believing in me.

Finally, to the Yang clan--Mom, Dad & Sandra--for the never ending support, love, and humor. Love you guys.
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HEARTH

VS

WEATHER

wind
rain
snow

sight
warmth
cooking

ROOF
carpentry

ENCLOSURE
weaving

MOUND
earth work
Architecture, according to Gottfried Semper, emerged from the hearth. Humans congregated around the hearth as it was a source of light when it was dark, it provided warmth when it was cold, and a means of cooking. The architectural elements that emerged from the need to protect the hearth and those who use it from the hostile elements of nature were the roof, the enclosure and the mound.

As early societies migrated and found themselves in varying climatic zones, their strategy for shelter has evolved with the environmental change. The cave, one of the commonly perceived earliest shelter, provided a cool interior and a shelter against the winds such as the Chauvet Cave in France. The Pitjantjara Camp in Australia built fences on the East side of their sleeping quarters to break the prevailing winds and protect the small fire pits that sat between sleeping areas. The Inuit Hunters of Alaska use compacted snow to form dome shaped structures, relying on the thermal mass of the snow and the curved shape to redirect winds away from the structure. In Catal Hoyuk, Turkey, the inhabitants relied on thick mud and brick walls for warmth during the winters. There were no streets between dwellings in this compact settlement. Instead, the roofs were used as public spaces. The few who lived in the Skara Brae Settlement in Orkney, Scotland sank their houses into the ground and formed mounds.
Paintings were found in the cave with signs of settlement outside of the opening of the cave, hinting at the caves being used as sacred place.

Mulga branches were weaved into fences and used as windbreakers against the East wind for the sleeping quarters.

Compacted snow are cut into blocks to form this vaulted form relying on thermal mass for warmth.

**CHAUVET CAVE**  
France  
Paintings were found in the cave with signs of settlement outside of the opening of the cave, hinting at the caves being used as sacred place.

**PITJANTJARA CAMP**  
Australia  
Mulga branches were weaved into fences and used as windbreakers against the East wind for the sleeping quarters.

**INUIT HUNTER**  
Alaska  
Compacted snow are cut into blocks to form this vaulted form relying on thermal mass for warmth.
This compact settlement had thick walls made of mud bricks for warmth during the winter, while the roofs are used as public spaces during the summer.

Stone built houses are sunk into the ground into the mounds as insulation for the harsh winters and stability.

Houses are made of wood and are elevated for ventilation above the rice terraces and security. The pitched roof is used to deter rain and to insulate the house from the sun.
to insulate during the harsh winters and for structural stability. The people of Ifugao, Philippines built their houses out of wood and raised them above the rice terraces for ventilation in the tropical weather. These groups were all able to design specifically for their climatic needs without mechanized heating and cooling.

The rise of the machine and the industrial revolution gave way to equipment such as the air conditioner (1902) to allow for control over the internal temperature and humidity for a more comfortable environment. Shelters are now able to mitigate external conditions while maintaining a steady internal temperature. Reynar Benham, an advocate of machines and new technology such as air conditioning and electricity, believed that buildings can rely completely on machines which would allow architects to focus on architecture. Benham elaborated on his ideas in *The Architecture of Well-Tempered Environment* (1969), and his article “A Home is Not a House” (Art in America #2, 1965). In the article, Benham attacks the internal wirings of the house by starting his article with

> When your house contains such a complex of piping, flues, ducts, wires, lights, inlets, outlets, ovens, sinks, refuse disposers, hi-fi reverberators, antennae, conduits, freezers, heaters – when it contains so many services that the hardware could stand up by itself without any assistance from the house, why have a house to hold it up?

Instead, Benham proposes to strip the equipment down to the necessities and have all the heavy tools be externalized, allowing for the shape of the shelter to be independent. “The Environmental-Bubble” is a transportable, conditioned air-

Diagram illustrating Reynier Benham’s The Environmental-Bubble’s lack of climatic consideration
original image by Reynier Benham and Francois Dallegret from “A Home is not a House"
inflated transparent plastic bubble dome. It appears to be its own entity and creates a well-tempered environment for living, however, it still requires a source of energy, the car. The portability of the bubble and the equipment allows this shelter to exist anywhere despite the existing environmental and climatic conditions. A famous example of this is the Glass House by Philip Johnson in Connecticut.

The Glass House is infamous for its entirely glass façade. However, Connecticut is known for their humid continental climate with cold winters averaging 29 degree Fahrenheit (-3 degree Celsius) and hot summers averaging 87 degree Fahrenheit (31 degree Celsius). To maintain an inhabitable temperature inside the Glass House, much of its utilities are found in the neighboring brick house, the Guest House, and piped underground to the Glass House. Philip Johnson resided in the house, but eventually moved into the Guest House and used the Glass House only for entertaining.

Architecture has found itself in a steady state of controlled interiors. A well temperate space is defined by the ASHRAE (American Society of Heating and Air-Conditioning Engineers) technical committee and their scientifically researched “comfort zone.” It is a standard that has created architecture where its sole purpose is to stabilize the human habitat irrespective of the local needs or preferences and in some cases, creating negative effects. Three buildings in the United Kingdom has fallen fault of these characteristics. In London at 20 Fenchurch Street, the building dubbed “The Walkie-Talkie” for its resemblance to a phone, features a curved glass façade designed by Rafael Vinoly. Unbeknown to the designer, this curved surface focuses
a high beam of sunlight onto the neighboring buildings and the street for two hours over two to three weeks in a year. While under construction, the focused light has melted a parked car. Meanwhile in Leeds, the Bridgewater Place is one of the tallest residential tower in the area, but also sits in a very windy city. The up-draft created by this tower has generated enough wind effect at the base of the building to flip vehicles and trucks and cause one death and 25 injuries. Another tall tower in Manchester features a tall blade at the top of the tower made of thinner blades of glass, and has been reported to create a loud humming and whistling sounds during storms which could be heard over 100 meters away.

Our conventional conception of the relationship between architecture and the environment is based on false assumptions that we reside comfortably in controlled and sealed temperate conditions. Our body and nervous systems are calibrated to sense change and not steady states. This thesis states that the sensorial appreciation in architecture can be explored through sequenced and curated experiences of architecture to use, amplify and appease the senses. This creates new atmospheric conditions conceived of relative sequencing and juxtapositions, rather than appeasing and mediating the existing environment.

For 2-3 weeks, 2 hours per day, a high beam of concentrated sunlight hits its neighboring buildings and streets. While under construction, the beam melted a car parked in the path of the beam.
As the tallest residential tower in Leeds, this building generates enough wind effect at the base of the building to flip trucks, cause one death and 25 injuries.

**BRIDGEBRIDGEWATER PLACE**
Leeds, UK

**BEETHAM TOWER**
Manchester, UK

Tall blade at the top creates humming or whistling sounds when the wind passes.
ATMOSPHERIC EXPERIENCES

“Aside from keeping the rain out and producing some usable space, architecture is nothing but a special effects machine that delights and disturbs the senses.”

–Liz Diller, TedTalk, December 2007

To challenge current assumptions of the well temperate, enclosed environments, this project must use architecture that exposes, explores and challenges the existing “hostile” elements of nature and take these characteristics to create an atmospheric experience. The Blur Building by Diller Scofidio, in which Liz is referring to in her quote during her TedTalk, uses the fog and the mechanics of it to confuse and envelop, engaging the visitor’s visual, audio, oratory and tactile senses. Unlike the Blur building, this thesis does not create an artificial atmosphere with machines, but take advantage of what is existing and amplify or mute to engage the inhabitant’s senses. To further develop the experience, there is an untapped potential of the moments between atmospheric conditions and the act of passing through them. According to the Zeroth Law of Thermodynamics, our bodies and objects seek thermal equilibrium, therefore we can easily and quickly adjust to the standard “comfort zone.” We can all relate to the feeling of extreme relief through our cheeks and nose tingling when stepping into a slightly warmed room and out of the below zero wind chilled winters. Or the feeling of passing a large piece of wall that has
been warmed by the afternoon sun. Normally, if it was a nice spring day, you wouldn’t even think twice about this wall, but when you’ve been hit by the fall wind, the sudden radiant heating from the thermal mass is well welcomed. Depending on the amount of heat (energy) transfer required, one may or may not reach an equilibrium, since we all have different sensitivities to temperature and comfort levels. Through the sequencing and juxtapositions of moderate and extreme conditions, the transitions between these conditions, architecture can create a sensorial experience.

For architecture to use and exploit these effects, material and climate becomes an important aspect of this project. Like the early societies and their use of shape, mass and position, these strategies can be used to encourage a type of atmosphere—temperature, auditory, visual—but ultimately, it is in the control of the season and time of day. As Mark Wigley writes in his article “Architecture of Atmosphere,”

Atmosphere seems to start precisely where the construction stops. It surrounds a building, clinging to the material object. Indeed it seems to emanate from the object. The word “atmosphere” was first used to describe the gas that surrounds celestial bodies and was originally thought to come out of the planet, to be a part of it. Likewise the atmosphere of a building seems to be produced by the physical form. It is some kind of sensuous emission of sound, light, heat, smell, and moisture; a swirling climate of intangible effects generated by a stationary object.

Thus the object in relation with material with climate will guide
and change the experience of these spaces. It may be that one person never experiences the same atmospheric effect as another due to varying temperature tolerances, or the same effects doesn’t occur due to a change in wind direction with a change in temperate at a specific moment. There is much unpredictability to account for but to use what we, as architects, understand with material, shape, positioning, and climatic changes, we can design architecture that can create individualized experiences.

<table>
<thead>
<tr>
<th>WINDY</th>
<th>STEAMY</th>
<th>HOT</th>
<th>COLD</th>
<th>MISTY</th>
<th>HUMID</th>
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<td><img src="image" alt="Diagram" /></td>
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Actual body temperature vs thermal comfort for various bodies in space.
Below: Material thermal characteristics and how it affect space.
SITE AND EXPERIENCE

The site for the atmospheric interventions will require a spectrum of climatic changes. The Harvard Bridge in Boston, Massachusetts will be the site of this thesis. Boston is known for their wide range of climatic variations, from snowy winters to humid summers. The Harvard Bridge is ideal for this project as there are no obstructions on or around the bridge to allow for an expansive view but also exposure to the extreme elements. It sits on the Charles River and is one of five bridges in the area. The bridge serves as a major artery between Cambridge and Boston, known as Massachusetts Avenue and attract high foot and vehicle traffic. The bridge is also used recreationally by runners and bikers as it is connected to the estuary, forming a green belt around the river. The site is anchored by MIT on the Cambridge side and Back Bay on the Boston side.
Harvard Bridge is less than half a mile long, or 2,164.8 feet (650 meters), or more infamously known, 364.4 smoots. For its span, it takes less than one minute to drive across, three minutes to run, and seven minutes to walk. However, when asked, the perception of the time it takes to cross the bridge is often longer. A reason is the expansive view—the ability to see the end point at all times—makes progress seem slower than it is. Coupled with the exposure to a combination of the sun, wind, snow and traffic noise can often create an unpleasant and uncomfortable experience thus extending the journey. Despite the wide sidewalk, there is barely enough room to stop and enjoy the view without joggers, bikes and pedestrians weaving around you.

The following pages are studies done to understand the site conditions, from the average year round temperatures, sun paths, visual anchors and imagery of the site.

**Activities**

**Section of Harvard Bridge**

<table>
<thead>
<tr>
<th>DISTANCE</th>
<th>0.4 MILES / 2164.8 FEET / 650 METERS / 364.4 SMOOTS +/- ONE EAR</th>
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<tbody>
<tr>
<td>DRIVING</td>
<td>1 MINUTE WITHOUT TRAFFIC</td>
</tr>
<tr>
<td>RUNNING</td>
<td>3 MINUTES</td>
</tr>
<tr>
<td>WALKING</td>
<td>7 MINUTES</td>
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Climatic Averages

Left: Climatic Averages in Boston and on the site
source: http://en.wikipedia.org/wiki/Boston and weatherspark.com

Right: Sun path diagram and dry bulb temperature at different times of the day
source: http://apps1.eere.energy.gov/
Panoramic view from the middle of the Harvard Bridge, facing downriver towards the East.
Panoramic view from the middle of the Harvard Bridge, facing upriver towards the West
Left: Images on the bridge during different weather conditions and various occupants

Right: View of the bridge from the Northwest
To understand the experience and perceptions on the bridge, it is important to analyze the type of element/condition, duration of exposure to elements/conditions, and the user’s body temperature. These characteristics will allow for us to predict the type of experience we would want the user to encounter. Four types of users are chosen, the Runner, the Stroller, the Errand-Runner, and the Commuter. The activity of each group implies an objective, a body temperature and a type of movement. For example, the Runner will move through the site at a faster speed, at a higher body temperature, and will be wearing exercise clothing. On the other hand, the Strollers will likely move at a slower pace and stop occasionally for the views and because they are moving at a slower pace, their body temperatures are normal, but are not generating much heat. The Errand-runner...
and the Commuter both have an objective and will walk at a faster pace, generate some body heat.

With the user groups defined and a prescribed path for each user, each group is charted in all four seasons for their comfort levels in relation to their body temperatures and its fluctuations with the elements such as temperature and wind, and sound. Several characteristics emerged through this analysis. The wind is a common occurrence on the bridge and happens in bursts. For a runner in the summer, these bursts are welcomed. For a runner in winter, depending on their outfit and how long they’ve been running, it may not be as welcomed and makes the run across the bridge seem longer than it is as the wind is driving their body temperature down below comfortable. There are also moments when the sound of the wind hitting your ear drum in conjunction to the traffic noise on the bridge can drive down comfort levels. For a few, the view at the middle of the bridge can alleviate some discomfort—a beautiful view in exchange for some discomfort.

The bridge is an ideal location for these interventions because of its existing fluxes for various users. The potential to tap into the existing conditions of the site and provide an alternative experience to crossing the Charles River.

Left: User experience during different seasons and a description of characteristics for each user
Right: Overlay of all users and average experience
Next Page: Seasonal break down for each user
FALL  chilly&windy
temperature: 62F high; 39F low
humidity: 100% high; 35% low
wind gusts: 49mph high; 18mph low
rain: .5”
snow: none
10/22/2014

WINTER  cold&frigid
temperature: 35F high; 20F low
humidity: 92% high; 54% low
wind gusts: 43mph high; 5mph low
rain: .1”
snow: 10”
2/14/2014
SPRING_warm&breezy

- Temperature: 71°F high; 42°F low
- Humidity: 85% high; 25% low
- Wind gusts: 50 mph high; 3 mph low
- Rain: .05”
- Snow: none

4/14/2014

SUMMER_hot&humid

- Temperature: 93°F high; 75°F low
- Humidity: 90% high; 50% low
- Wind gusts: 22 mph high; 5 mph low
- Rain: none
- Snow: none

8/17/2014
THREE INTERVENTIONS

Three locations on the bridge were chosen to be the moments of intervention. Each location is focused towards a different season—Spring, Summer and Winter—and are each subjected to the external elements and the diurnal changes. Depending on the time of day, parts of one design may be more desirable than another part. In an annual time span, one intervention may be more ideal than another and one may not be inhabitable at all. Without the use of mechanical devices, the atmosphere of the space is completely reliant on the season. Other considerations include lighting, exposure and duration of exposure to elements, amplifying conditions, counteracting conditions, and directing views. Conditions of the interventions rely on materials to emanate its properties to create an auditory, visual and temperate experience for the passerby.

Although these projects are not programmed, they are seen as transitional spaces with the potential to occupy for a short period of time and as a secondary means of experiencing the bridge. They do not alter the bridge beside the openings in the railings to allow for pedestrians to pass on and off the bridge, and seek to occupy the other spaces of the bridge.

The interventions will be focused on individually, leaving space for the imagination to experience them all sequentially or separately. Each project is accompanied with a narrative and respective representation.
Through the rest of the book, color will be of importance in the representation of the atmosphere. The material qualities within the space emanate a temperature that is represented through color creating a different type of visual for the space. Instead of the conventional renderings of the material color, its thermal properties creates the space’s climatic condition is represented through warm and cool colors. Wind, light and darkness are also represented to provoke sensorial feelings drawing from personal experiences.

Each intervention will be accompanied with a plan, section, two unrolled sections--one material and one with an atmospheric overlay--and renderings. The renderings have a plan and section key to orient where in space you are and a narrative. Although the perspectives are a prescribed sequence and experience, these designs are plastic and change to the seasons thus altering the experience.
INTERVENTION #1 - SPRING

The larger of the interventions was made to elongate the experience of the bridge while also moving the user in, out, around and next to the bridge. A large switchback corridor directs the user towards the West side of the river, capturing a view of the Fenway Neighborhood. While under the bridge, openings in the floor focuses the attention to the Charles while reflecting the motion and waves of the water inside the space. Stones are used in this space as seating but also penetrate the walls to capture the sun’s warmth during the day. Finally a large set of stairs are used to move the user up and down to give a sense of how high the user has descended below the sidewalk.

Left: Plan
Top: Unrolled section with material mapping

Bottom: Unrolled section with atmospheric overlays, environmental conditions and comfort level
It’s a warm Spring day with the occasional wind while you’re on the bridge. Your ears are ringing from the wind and the fast cars passing, the bus and trucks that seem to just be driving back and forth on the bridge. Ah, a place to step off this bridge.
You step onto wood and feel the soft comfort against your shoes rather than the cold concrete on the bridge. You descend while looking at the views around you and feel yourself leaving the bustling bridge behind.
You feel the edge of the walkway get narrow and suddenly find yourself in a dark space, but see the water in the distance. The walls are warm and you lean in closer to feel it radiating heat from the morning sun. The walls are close and you feel like you’re being hugged by warmth.
You reach the platform and take a breath and feel the wind whiz past you while still feeling the comforting warmth of the walls behind you.
Another whiff of air, and it’s too cold again. *Time to duck back into the walls.*
Once again, descending into a much darker, but still warm space, guided by a small window at the end. You turn the corner and catch another glimpse of the bridge before realizing you’re feeling a chill.
You wind into a larger space that is dark and your footsteps are not longer light and soft but sharp and loud. It has gotten cooler, the air is a little more crisp. Reflections of the river is the only light source in here, and you realize you’re close to the water below you, but have no visual reference except for the slits in the floor. You take a seat on the blocks along the wall and noticed they’re a little warm.
The chill is penetrating your skin and you’re feeling a little cold and decide it is time to leave. Continuing forward, you enter a tall corridor of brick walls. The sun is shining through one side of the wall and you shake off your chills.
Half way up the stairs, you’ve built enough energy and warmth to start sweating. Fortunately the occasional wind from the windows kept you from dripping sweat. At the top of the steps, the brick walls give you one last hot uncomfortable squeeze before you are back on the bridge.
Left: Model with bridge
Right: Model without bridge
Left: Model
Right: Model without bridge
INTERVENTION #2 - SUMMER

This design features a tall tower, with an opening towards the summer wind directions to act as an wind tower. In addition, Two openings are made in the ceiling to allow for directed light to move along the interior walls. Several moves to raise and lower the surface above were made to give the inhabitant a vertical compression and contraction. Other openings were made to play with light and winds. The large platform has a low ceiling to trap heat, but also features a section that drops below the water for engagement with the river.

Left: Plan
Right: Section B
Top: Unrolled section with material mapping

Bottom: Unrolled section with atmospheric overlays, environmental conditions and comfort level
It’s hot and the breeze on the bridge is barely cooling your skin off. The cars zooming by seem to rub their hot energy right onto your skin. As you pass a dark opening, you’re hesitant to enter, but the cold temperature it’s radiating is alluring.
It's very cool, dark and airy, thus quiet with the occasional rocking from the buses and trucks. A light streak of light breaks through the ceiling is comforting. You lean back against the wall for a break, but to be startled by the coolness.
You notice the seating along the wall. The cold metal briefly ice your thighs, but is a welcome relief from the hot and humid summer. Curious about where this leads to next, you look down the next opening and see that it is bright at the end of the space. Coming down, and the slow exposure of the sun on your skin begins to warm you up again.
When you reach the end and turn into the next opening, your eyes are blinded by the brightness of the bouncing reflections everywhere. There’s an amazing view, but the space is hot, stuffy and humid. No one is in here--you hesitate to even enter. Your body aches for the cool contact with the stone and metal. You turn around and decide to return in the fall.
Left: Model from the East
Right: Model from the bridge
INTERVENTION #3 - WINTER

This design is heavy in thermal mass to counter the winter cold, but also harness and amplify the unpleasant for an extreme experience of winter. The first point of entry features a curved wall to capture and bounce ambient noise, such as the traffic and pedestrians. Fipples are directed towards the winter winds and are used to break the high speed to create resonance and sounds. Curved walls in the space are used to amplify the effect. A break between the sound space and the stairs allow the user to reset to the bridge experience. A walkway under the bridge leads to the heavy stone clad seating and resting area relies on thermal mass for occupancy during specific hours.
Top: Unrolled section with material mapping

Bottom: Unrolled section with atmospheric overlays, environmental conditions and comfort level
You’re in long pants, a sweatshirt with gloves and earmuffs and you’re running along the estuary. Two miles in, you’ve ran long enough for your body to adjust to the cold and started to generate some warmth. Your face is still freezing from the mix of wind and sweat. The bridge is especially torturous as the wind speeds gather. However, you suddenly feel a quick break of the wind and a light warming on one side of your body, your running slows.
Needing a break from the wind, you walk up to opening and hear slight echoes of the cars coming by. You slide into a slit and feel the walls very close to you. Enticed by the view of Cambridge and the warmth, you continue.
Another breeze hits you and draws your attention to another opening. It’s lit by an opening above, but there’s a faint echo of humming and some breeze. Curious, you approach.

Left: Plan and unrolled section key
Right: Interior view of the second corridor.
The humming is louder and comes with the occasional whistle. It is windy and chilly. One side of the space opens up to the view of Fenway but the wind and sound makes it difficult to stay long.
Escaping the sounds, you’re squeezed back outside, but you’re parallel to the bridge now. More wind and cold and you decide to run into the next opening, despite the darkness.
Sheltered from the wind once again, you wind your way down the stairs in the dark and find another shaded and open walk way under the bridge.
The walkway is shaded and chilly, but the experience of walking under the bridge and being close to the river is fascinating to you. You come off the walkway to a soft but also warm despite it open to the air. You lay down to absorb the warmth of the stone below you.
Your blood is flowing again, you hop off your seat and begin your jog again. Running up the stairs, you rebuild your heat and you’re ready to finish running the cold bridge.
Left: Model with bridge
Right: Model without bridge
Left: Overhead view of model
Right: View of walkway below the bridge
APPENDIX

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1 - ADDITIONAL RESEARCH
Sound behavior study
source: http://www.physicsclassroom.com/

How a fipple interacts with an air stream to make sounds
source: http://course1.winona.edu/
Experience gradient with proximity.

Possible combinations of extremes:
2 - MID-REVIEW & STUDY MODELS

October 23, 2015, 9am
Architecture Department, Building 7, 4th Floor
Massachusetts Institute of Technology

Guest Critics:

Timothy Hyde
Lecturer, MIT

Kian Goh
PhD Candidate in Urban Studies and Planning, MIT

Brandon Clifford, Thesis Advisor
John Fernandez, Thesis Reader
The project at midterm was still trying to find its program and purpose. At this point, the program was a spa to inform climatic needs. Programs were situated next to each other for most apparent effect or through a smooth transition. Certain programs were also elongated to recalibrate the body to feel the affects of the neighboring climates. After the discussion, the project was refocused away from the spa and on the sequencing and juxtapositions of various climatic characteristics.
Left: Comfort levels in relation to program and space
Right: Section and plan of design
The sound and wind chamber model was a study of how create the effects of the wind turbine while creating an inhabitable space. Here, openings are made to capture the wind, but also serve as entrances. Slits are opened at an angle to allow for the pressure inside to exit, creating a whistle. A dome is also placed to further move the wind around the space.

Top Left: Sequential renderings passing through the different rooms
Bottom Left: Mid-review model
Right: Model of a sound and wind chamber
3 - THESIS DEFENSE

December 15, 2015, 9am
Media Lab, Building E-14, 6th Floor
Massachusetts Institute of Technology

Guest Critics:

Pierre Belanger
Associate Professor of Landscape Architecture, Harvard University

Ed Eigen
Associate Professor of Architecture and Landscape Architecture, Harvard University

Igor Marjanovic
Associate Professor, Washington University in St. Louis

El Hadi Jazairy
Assistant Professor of Architecture, University of Michigan

Nader Tehrani
Professor of Architecture, MIT

Simon Frommenwiler
Lecturer, MIT

Brandon Clifford, Thesis Advisor
John Fernandez, Thesis Reader
Final Review Panels
Left: Final site model
credit: Juney Lee

Right: Presentation time
crédit: Alice Kao


