a form of construction
an inquiry into Architecture through the making of a school

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i am humbled by the prospect of Architecture.

it is not formulaic or linear in thought and action and at times it can be difficult and elusive to define.

i believe Architecture exists yet experience has shown that not all building endeavors lead to Architecture.

i search for Architecture with a willingness to embrace the unknown, allowing my practice to provide a defined realm into which Architectural questions and propositions can evolve and open new forms of discovery.
acknowledgements

those who have inspired, empowered and believed in me.

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in memory of my mother
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the work that follows is a search that seeks insight into Architecture.

a dialogue of action, reflection and speculation structures the search as the work unfolds through the measure and play of drawings, words, sketches, writings, photographs and models.

at the heart of the search is the examination of the conventional building process, the making of boundaries and the qualities of material and place that inform and inspire Architecture. the city, the school, the room and the building material studies provide scales of exploration and establish a place to test, challenge and transform these ideas into an Architectural proposition through the making of a Montessori School situated within the museum district of Houston, Texas.

it is a work in progress that seeks questions and looks to process as a way of building a foundation for future Architectural thought and inquiry.
the proposition

“a great building, in my opinion, must begin with the unmeasurable, must go through measurable means when it is being designed, and in the end must be unmeasurable. the only way you can build, the only way you can get the building into being, is through the measurable. you must follow the laws of nature and use quantities of brick, methods of construction, and engineering, but in the end, when the building becomes part of living, it evokes unmeasurable qualities, and the spirit of its existence takes over.

architecture has existence, but it has no presence, only a work of architecture has presence, and a work of architecture is presented as an offering to architecture.”

Louis I. Kahn
a form of construction
the act of constructing requires physical effort.
the weight of materials, gravity, and methods of assembly all play an integral role in the making of Architecture.
by understanding and respecting the physical act of building the work becomes more authentic.
the Architect is working from a place of sympathy that allows for an appreciation of how hand and mind come together in the making of Architecture.
concrete tilt-wall

Concrete tilt-wall is introduced into the Architectural proposition as a way of taking a conventional building technique and exploring its properties, searching for opportunities to elevate and incorporate its making into the design of a school. The work focuses on the relationships and sequences of casting, lifting, placing, and joining concrete tilt-wall.

The casting bed, the movement / placement of the crane and the panel joint define the realms of investigation where the proposition is played out.
the casting bed provides a place on the floor of the construction site for the forming and casting of concrete tilt-wall panels.

cast horizontally on the ground, the making of the wall physically imprints the elevation of the school into the floor of the construction site.

in turn, the floor is transferred to the casting face of the wall through surface textures and markings incorporated into the casting bed.

once lifted and placed the measure and order of the construction floor is brought to the building elevation.

the casting bed reveals remnants of the elevation, providing a formal structure to the floor of the construction site that can be used to inform future landscape and garden design.
the assembly of a school room

in concrete tilt-wall construction, the panel joint is typically treated as a 1/2” or 3/4” gap that is filled with sealant to provide a watertight seal.

reconsidering the joint as a spatial and qualitative condition elevates it from a typical construction detail to an extraordinary event where natural light, movement and visual connection come together to define the character and making of the joint.

the joint is given depth, continuity and extension through the measure and play of concrete, glass and steel.

panel joint
constructing a joint with concrete, glass and steel
materials

"It is important that you honor the material you use. You don't bandy it about as though to say, 'well, we have a lot of material, we can do it one way; we can do it another way.' It's not true. You must honor and glory the brick instead of shortchanging it and giving it an inferior job to do in which it loses its character, as, for example, when you use it as infill material, which I have done and you have done. Using brick so makes it feel as though it is a servant, and brick is a beautiful material. It has done beautiful work in many places and still does. Brick is a completely live material in areas that occupy three quarters of the world, where it is the only logical material to use. Concrete is a highly sophisticated material, not so available as you think. You can have the same conversation with concrete, with paper or papier-mache, or with plastic or marble or any material, the beauty of what you create comes if you honor the material for what it really is. Never use it in a subsidiary way so as to make the material wait for the next person to come along and honor its character."  

Louis I. Kahn
sand casting bed

formwork is constructed and embedded hardware set

insulation is inserted and fastened into the formwork after the first concrete pour to create a thermal barrier within the concrete tilt-wall.

concrete panel after removal from the formwork. sand from the casting bed is still adhered to the panel face.
a key to the school

1 school room: 3 - 6 years old
2 school room: 1st - 6th grade
3 library
4 school room: multi-use
5 administrative offices
6 school entrance and drop-off
7 parking lot
8 individual school room gardens [location of casting beds during construction]
9 shared school garden [location of crane during construction]
10 exterior covered walk
11 exterior canopy
the use of steel in the construction of the canopy and covered walks introduces a linear dimension and precision to the construction of the school, playing off the mass and coarseness of the concrete tilt-wall panels.

Round columns supporting the canopy are grouped in pairs to reduce their diameter, accentuating and reinforcing the slenderness and verticality of the exterior covered walks and canopies.

The columns are capped with I-beams that establish a bounded horizon to the school.

Translucent panels create the canopy roof, filtering the sunlight while illuminating the ‘ceiling’ of the school.
sketch model:  october 2006 - april 2007
exterior canopy and covered walk
spatial sequence through school room

1. exterior canopy and elevated walk
2. entry vestibule where cubicles and benches provide storage for the children's personal items
3. ramp that transitions the elevation change within the room
4. formal work space of the room
5. pivoting wall panels allow direct access to the exterior gardens
openings are formed along the floor to provide the children with a visual connection to the gardens beyond. the center skylight marks the gathering area for the school room.
the room

"the large room and the small room, the tall room and the low room, the room with the fireplace and the room without, all become great events in your mind. you begin to think, not what are the requirements, but rather what are the elements of architecture that you can employ to make an environment in which it is good to learn, good to live, or good to work." 

Louis I. Kahn

cement tilt-wall panels provide the primary structural support and spatial definition to the school
sketch model: october 2006 - april 2007

the assembled school room [multi-use]

ordering of the roof scape: light wells and hvac roof-top units

ordering of room interior: coupling of columns, layering of ceiling, rhythm of skylights, panel joints, and wall openings

ordering of room exterior: openings for structure, viewing, and joining

pivoting glass wall panel
"of all things, i honor beginnings. i believe, though, that what was has always been, and what is has always been, and what will be has always been. i do not think the circumstantial play from year to year, from era to era, has anything to do with what is available to you. the person of old had the same brilliance of mind that we assume we have now. but that which made a thing become manifest for the first time is our great moment of creative happening."

Louis I. Kahn
thoughts on Architecture and the making of a school

[Sketchbook entry from 14 June 2006]

The process of making
Being sensitive to the play of form, size, [space, mass] toward
order, geometry...

[Creating or (re)active]

Making and craftsmanship
Sculptor: Making is the site where ideas are made
and knowledge (constructed).

Laws where materials, such as clay, become... hard body, subject (object)
Can be both supported and
used.

What is it made of? What is it created? What is it (object)?

What is it made of? How can it be defined?

The question: Where is it made of? What is it made of?

- Knowledge: Economy; efficiency; team, pattern
- Quantitative: fixed, careful, report, formation
- Qualitative: innovation, response to climate; design; influence connection theory...
the wall

the search begins by pushing the building massing to the edges of the site, using the walls and rooms of the school to create a physical boundary and define the street edge.

this is done with the intention of establishing a spatial continuity of order, rhythm and scale within the existing built environment.

the school's role, seen in the larger urban fabric of Houston, is to anchor and bring structure to the surrounding built conditions by mending the fragmentary and weak edges created by adjacent parking lots, ad hoc building placement, and autonomous box like buildings that have eroded the physical edges of the city.
august 2006
initial [re]action to the situation of the school's massing and place within the city

september 2006
refinement of the building massing focusing on opacity and transparency

october 2006
articulation of structure, joints, and openings within the building massing

sketch models: august - october 2006
the role of the garden within the city

pushing the building massing to the edges of the site creates an opportunity to develop a series of exterior gardens within the school.

a large garden comes to define the school’s center serving as both a shared gathering place as well as an entry. smaller private gardens are developed for use by the individual classrooms.

a dialogue of interior and exterior spatial relationships are developed allowing the physical presence of the classroom to extend beyond it’s interior confines and into the exterior environment.
August 2006
A shared garden is created by the initial building massing.

September 2006
The garden is physically elevated to further define the ‘floor’ of the school. Translucent canopies are incorporated to define the ‘ceiling’ of the school.

October 2006
The shared garden establishes the entry into the school, providing a transition from the parking lot to the school.

April 2007
The building massing is adjusted so that multiple gardens are defined within the school. These gardens provide a place for the casting beds and the crane during the construction of the school.

Sketch models: August 2006 - April 2007
continuity of thought

Throughout the search, larger-scaled sketch models were developed in conjunction with the smaller-scaled sketch models.

These larger models bring into focus the measure and scale of spatial, tectonic, and qualitative aspects of the individual rooms within the school, while the smaller models explore the building’s relationship and place within the site and surrounding urban context.

A continuity of thought is established between the play of scales that helps to inform architectural decisions from larger urban contextual issues to the refinement of building details.
room study: development of structural relationships between columns, beams and wall panels

building elevation: the rhythm of wall panels, joints and openings that form the street edge

room study: natural light enters the room through panel joints and openings in the roof structure
formal realization

each successive iteration of the work brings a level of refinement and clarity to the search, reinforcing initial actions and thoughts, strengthening the proposition.
intentions of an Architect

- listen to intuition
- honor process
- edit with sensitivity and objectiveness
- design and build from conviction, not opinion
- seek quality over quantity
- make a commitment to explore, challenge, and TAKE risks
- ‘solve the problem’
- draw when in doubt
- draw to ‘SEE’
- look for the questions, not answers
- seek the extraordinary from the ordinary
- seek out people and places that inspire passion
- empower colleagues, students and clients
- share, critique, and listen
- understand the nature of materials
- value the importance of past experiences

BUILD
- practice with integrity
- be assertive
- experiment and test
- embrace the ‘mistake’
- strive for the poetic

“... the Architect who combines in his being the powers of vision, of imagination, of intellect, of sympathy with human need and the power to interpret them in a language vernacular and true - is he who shall create poems in stone...”

Louis H. Sullivan
notes

1  see 'appendix a: notes on the plan for a school' for additional information on the Architecture of Houston see the Houston Architectural Guide by Stephen Fox.

2  'Architecture' (Lobell, p. 48)

3  see 'appendix b: a place within the city' for additional information on the Architecture of Houston see the Houston Architectural Guide by Stephen Fox.

4  The Concrete Tilt-Up Design and Construction Manual by Hugh Brooks provides a very thorough and detailed explanation of concrete tilt-wall construction.

5  'Materials' (Lobell, p. 40)

6  'The Garden and the Room' (Lobell, p. 38)

7  'Time Beyond Time' (Lobell, p. 54)

8  this quote [that appears on the frontice page of Bush-Brown's book] is an excerpt taken from Sullivan's essay, "Concerning the Imperial Hotel, Tokyo, Japan".  
Architectural Record, April, 1923, p. 333. (Bush-Brown, n. pag.)

n. pag. - no pagination given
all photographs, drawings, sketches, and models by author


bibliography

media and illustrations

all photographs, drawings, sketches, and models by author
appendix a: notes on the plan for a school
appendix b: a place within the city
Cy Twombly Gallery [1995]
Architect: Renzo Piano

The Menil Collection [1987]
Architect: Renzo Piano

Rothko Chapel [1971]
Architects: Howard Barnstone and Eugene Aubry

University of St. Thomas [1958]
Architect: Philip Johnson

images: 30 december 2006
built environment adjacent to proposed thesis site
appendix c: material studies

too often the lines drawn on paper are just lines. they lack the embodiment and knowledge of the material and its joining.

to draw as an Architect one often has to abandon drawing as the primary way of searching and go directly to the material itself.

build the formwork
mix the concrete
mill the wood
cut the steel

feel the material in hand, struggle with its assembly and craft in order to learn and appreciate both its limitations and potentials.
the crafted precision of wood
the machined precision of steel
the cast coarseness of concrete
joined together through layering and separation / gesture and extension / shadow and light
the material studies introduce a form of resistance into the work that brings awareness to the act of making.

assumed or expected constructed outcomes are often and immediately put into question by the limitations of the material chosen.

how and why a material is being used begins to structure and focus the study providing a critical voice that informs Architectural decisions based on constructive and material realities.
materiality

the search allows the material studies to expand beyond the limitations of scaled analog study models and address specific material aspects such as texture, joining, and edge conditions.

an appreciation, understanding, and respect for the material is brought back and integrated into the work, strengthening and energizing the Architectural proposition.
material finish studies: january - april 2007

A thermal barrier is created with the placement of rigid insulation within the wall panel.

The use of contrasting building materials accentuates the unique qualities of each.

Embedded wall hardware assists in the fastening of wall finishes.

The play of wall textures brings awareness to surface and shadow.
recommendations

books

For An Architecture of Reality - Michael Benedikt
After the City - Lars Lerup
Letters to a Young Poet - Rainer Rilke
Beginnings: Louis I. Kahn's Philosophy of Architecture - Alexandra Tyng
Learning From Las Vegas - Robert Venturi, Denise Scott Brown, Steven Izenour
Thinking Architecture - Peter Zumthor

places

Chinati Foundation: Marfa, Texas
www.chinati.org
DIA: Beacon: Beacon, New York
www.diabeacon.org
The Kimbell Art Museum: Ft. Worth, Texas
www.kimbellart.org
The Menil Collection: Houston, Texas
www.menil.org
The Rothko Chapel: Houston, Texas
www.rothkochapel.org
Storm King Sculpture Park: Mountainville, New York
www.stormking.org
The University of Virginia: Charlottesville, Virginia

architects

Louis Kahn
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