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The Architectural Drawing

Luke Taylor-Brown

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Luke Taylor-Brown
Syracuse University School of Architecture
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Thesis Proposal

Advising Committee:

Mark Linder
Anne Munly
Edward Sichta

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critical terminology

translate: 1: To render in another language. 2: To change from one form, function, or state to another; transform: *translate ideas into reality*. 3: To express in another medium.

transfigure: To alter the outward appearance of; transform.

represent: 1a: To stand for; symbolize. 1b: To indicate or communicate by signs or symbols. 2: To depict in art; portray. 3: To describe or put forward (a person or thing) as manifesting a specified quality.

thesis statement

It is the intent of this investigation to explore the translation which occurs between architectural drawing and built architecture. This translation occurs over a gap which exists between the realm of conception and the realm of construction. All forms of architectural representation (drawings, computer or physical models) bridge this gap in some way and, by doing so, translate architectural meaning. The architectural drawing is unique in that it reveals the way the architect understands his or her work through specific spatial issues. It therefore also translates architectural *intent*. The drawing types being considered here are the plan, section, axonometric, and what has been called the developed surface interior drawing.[1] Each of these drawings manifests an emphasis on specific qualities of space.

It is proposed that these specific drawing types be re-applied as literal spatial devices, that the proposed architecture be constructed in the same specifically limited ways designated by the drawing types. The result of this re-application will be an architecture which, through its relation to the specific spatial ideologies inherent in its constituent generative drawings, will reveal the conceptual construction of architecture.

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[1] Evans, Robin. 'The Developed Surface,' *Translations from Drawing to Building*. pp. 202

the architectural drawing

"Drawing in architecture is not done after nature, but prior to construction; it is not so much produced by reflection on the reality outside the drawing, as productive of a reality that will end up outside the drawing."

Robin Evans
Translations from Drawing to Building, 1997

"The function of drawing in architecture is simply to discover new ground, to gain insight, not to obfuscate, nor to justify a project."

James Corner
Representation and the Landscape: Drawing and making in the landscape medium, 1992

distance and indirectness

Architecture is unique among the arts in that it is perhaps the only profession whose practitioners are forced to operate at a physical and epistemological distance from their work. The tangible materials of buildings are removed from the architect's direct handling and can only be manipulated through mediating devices. While painters, sculptors, and other artists work directly with the medium of their art (i.e. stone, wood or metal for the sculptor, paint and canvas for the painter) architects must always understand their work indirectly through representations. It is these representations which serve as mediating devices and guide the work of architecture through the translation from conception to construction.

translation

The most pervasive of these forms of representation is the architectural drawing. As James Corner wrote, the drawing is the "locus of reconciliation between construal and construction."[2] Certainly construal and construction are two very different concepts, but what is meant by reconciliation? The term implies something

[2] Corner, James. *Representation and Landscape: Drawing and Making in the Landscape Medium*. (Reprinted in Word & Image, Vol. 8, No. 3, July-September 1992), pp. 265

more like a divorce than an amicable separation between subjects. What is being reconciled? The concepts of "construal" and "construction" are linked in that one is what the other cannot be; they are opposites. Both construal and construction in this context refer to conceptions of a given architectural space; this meaning unites them. However, the two terms describe this architectural space in different forms, one drawn and one built. It is the task of the drawing to translate meaning from the former to the latter. Therefore, the drawing reconciles meaning. It is the vehicle which bridges the epistemological gap that exists between conception and construction, between abstraction and actual experience.

drawings vs. models

The drawing, unlike other forms of architectural representation, presents a purposefully limited depiction of space. This limitation of information is necessary for the architect to isolate specific aspects of the designed space. Design tools like computer or physical models allow the architect to see relationships between all or many parts simultaneously. In addition, models allow this simultaneity of perception while presenting themselves as accurate, but scaled down, representations of the actual architecture. Drawings are always more abstract than this. However, it is this abstraction, required by the architect, which reveals the way the architect thinks about his or her own work. Architects chose particular drawing types to contemplate their work because of the unique emphasis on spatial experience that each type offers. Therefore, the process of contemplation about his or her work that the architect goes through (conception) is revealed in the choice of drawings.

drawing as generator

It is assumed that the architectural drawing is successful when the built work is seen to be the direct and literal translation of architectural idea into building. However, Robin Evans suggests that the real power of the architectural drawing may lie in its ability to transfigure its initial subject, to transform idea

instead of simply translating it.[3] The drawing, as Evans points out, is always made *before* the work is constructed, not *after*.[4] It is the fully worked out specifications of what the building is to be, and in it is embodied the architectural idea. In order to work this way, the architect must assume a correspondence between the two dimensional sheet of the drawing and the three dimensional work of architecture. It is understood that the former, though abstracted, represents the latter.

Due to these unique conditions of conception, the architectural drawing takes on a generative role in the making of architecture. It is not something which merely describes a built work, but instead, actively participates in the development of that work. In fact, the drawing is potentially more than this: it has the potential to both augment and perpetuate the creative process. This possibility involves an allegiance between architectural idea and drawing technique which furthers both. The drawing technique allows the idea to grow and change, even to the point where the built work no longer is representative of the original generative drawing. Evans speaks of a "perverse epistemology in which ideas are not put in things by art, but released from them. Accordingly, to fabricate would be to make thought possible, not delimit it by making things represent their own origin."[5] Here, the term "delimit" has a meaning which is oppressive; it describes the forming of conceptual boundaries within which the work of architecture is inscribed. This is true as long as one considers the kind of one to one correspondence between drawing and architecture that Evans argues against to be wrong. But it's worth asking: is it always a negative thing for a built work of architecture to represent its origins in drawing? Perhaps the built work doesn't represent drawing *per se*, but the process of creation through drawing which yields the built work of architecture.

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[3] Evans, Robin. 'Translations from Drawing to Building,' *Translations from Drawing to Building*. pp. 180

[4] Evans, *Translations from Drawing to Building*. pp. 165

[5] Evans, *Translations from Drawing to Building*. pp. 180

what comes out is what goes in

As Evans would have it "what comes out is not always what goes in"[6] However, what if what came out was literally what went in? That is, what if a built work of architecture were conceived of in terms of the two-dimensional conventions of architectural drawing? This possibility is especially interesting in regard to a specific breed of architectural drawing: the kind invented by the architect to study his or her work. These drawing types, including the plan, section, axonometric and developed surface interior, are manipulations of form which could only occur in drawing. They are conceptual drawings, different from other descriptive drawings used by the architect in that they describe aspects of architecture which are, and always will be, conceptual, not actual. Other descriptive drawings such as elevations and perspectives, although also abstract, purport to describe architecture as it will be. Making use of the abstract qualities of the drawing, these forms of representation allow the architect to study aspects of his work which he could not otherwise. Due to the fact that these drawing types were intended as analytical tools, they serve an explanatory role for both the architect and his client. For example, architects often speak of "working in plan or section" as ways of conceptually developing architecture. Each one of these drawing types is designed to describe a specific aspect of architectural space. The plan shows room layout and horizontal spatial relationships, the section describes vertical organization, the axonometric demonstrates the overall vision of the work, and the developed surface reveals the relationship between interior space and surface. These drawing types, although intended for use by the architect, have the ability to communicate to others the way in which architecture is conceived of and manipulated by the architect.

As stated earlier, it is the task of the drawing to translate meaning from conception to construction. While all architectural drawings perform this task, these special types of drawings perform another translating task as well. They reveal the way the architect thinks about his work, how he constructs it and how it comes to be the actual, built work. By reconsidering the purpose and the application of the architectural drawing, it is possible to reveal the design processes which construct that space. By repositioning a two-dimensional drawing as a literal spatial device,

the drawing attains a whole new level of communicative power. For example, the drawing convention of 'section' could be used in a built work of architecture to describe the vertical spatial organization of the building. The end of the building could be designed as if it were a conceptual cut through a building which extended past the section line. Some of Rem Koolhaas's work illustrates the possibilities of this phenomena (see page 16). Instead of limiting the communicative power of the drawing to describing the work itself, it can be allowed to signify the very processes of creation which lead from conception to construction.

methodology

The goal of this project is to transform drawing conventions (plan, section, axon, developed surface) into built form. The drawing types chosen have particular limitations which make them useful for exploring specific spatial ideas. The program of this project (Montessori School) also has specific pedagogical goals which have spatial ramifications. Accordingly, the program will be used as a vehicle to give specific intention and direction to the manifestations of these spatial ideas in the Montessori school.

To this end, two exercises have been undertaken:

1: The first exercise is intended to explore possible translations from drawing convention to actual architecture. This exercise is an exploration of the theme of translation as related to the drawing types being considered.

2: The second exercise is intended to organize the results of the first investigation and apply them to the Montessori school. The translations from drawing type to architecture which were more general in the first exercise are now given a bias. The particular spatial implications of each drawing type are now applied to various programmatic elements in order to relate the spatial agenda of the drawing to the spatial function of each room.

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[6] Evans, *Translations from Drawing to Building*. pp. 181

expectation of final result

It is the intent of this project to produce a Montessori school in downtown Syracuse. This building will clearly articulate the relationship between the drawing types of plan, section, axon, and developed surface and the program of the Montessori school. The drawing types selected have been done so because each reveals a specific attitude about space and describes this space in a specifically limited way. The application of these drawing types as literal spatial devices to the program of the Montessori school will reveal the spatial ideologies inherent in the Montessori school. These spatial ideologies are an integral part of what makes a Montessori school what it is. Therefore, any architectural understanding of such a school will attempt to render the school based on these ideologies.

architectural issues

a: pictorial representation of space

the following is an account of four particular modes of drawing, including a brief analysis of the qualities of each individual drawing type and how these qualities might inform an architecture which attempts to convert representational drawing directly into form. In the program selection and analysis section (p. 14) I have also speculated about the specific application of these drawings to the architecture of the Montessori school.

plan

Corbusier's famous edict, "the plan is the generator"[7] says much about the role of the plan in the design of architecture. For Corbusier, it was the drawing best able to facilitate spatial organization of rooms. The plan was drawn first in order to determine horizontal spatial relationships, upon which vertical spatial relationships were predicated. This hierarchical ordering of drawing types no longer predominates architectural design and production, yet the plan still posses particular traits which make it a uniquely integral design tool. The plan indicates a number of specific spatial qualities, including length and width dimensions of rooms,

widths of walls, and widths of windows and doors. More importantly though, it allows for an understanding of relationships between these individual parts. It composes these parts together so that each can be understood in terms of the overall context. This contextual understanding comes from the view of the plan, which is overhead. Making a conceptual 'cut' through the building, the plan then looks downward to reveal relationships between spaces. This is the quality of the plan that is ripe for exploitation. By making a building (or a part of a building) which has walls (and perhaps windows and doors) which are literally cut short from a normal floor to ceiling height, and thereby allowing the plan of the building to be seen from overhead, spatial relationships between rooms can become clearer. The viewer understands the building no longer as someone disengaged from the design process, but as someone who can understand space as the architect does.

section

The section has become a design tool with as much authority as the plan, in the sense that the plan was understood by Corbusier. Much like the plan, the section reveals specifically limited spatial information, in this case information about the vertical spatial organization of the building. The section drawing shows the heights of rooms, floor and roof thickness, and height of windows and doors. It also shows vertical relationships between rooms, as in Corbusier's famous "free-section" designs. All of this information which occurs behind the cut line is shown in elevation. This space depicted in elevation is compressed onto the drawing sheet. Like the plan, the strength of the section lies in its particular view, which binds elements together into a cohesive understanding. The section can also be used as a literal spatial device as a way to convey the processes of architectural production through drawing.

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[7] Le Corbusier. *Towards a New Architecture*. (Dover Publications, New York: 1986.) pp.43

axonometric

The axonometric drawing also has its set of devout practitioners. Among them is Peter Eisenman, many of whose works seem to be generated out of an insistent use of the axon as a design tool (see House El Even Odd, pp. 17). The axon is a drawing which describes all three dimensions of actual space. However, it does so in a way that twists these dimensions and represents them in a way in which they would never appear in actuality. The axon is a manipulated abstraction of actual space. It is therefore a *misrepresentation* of actual space. However, this misrepresentation is purposeful; it allows the architect to understand the relationships between spaces and individual elements like columns, beams and stairs. And it does so by representing these elements in terms of their length, width and height, as opposed to the plan or section, which limits itself to depicting two of these dimensions. The axon is externalized; it directs its attention to all points, in all directions. It allows the architect to understand all of these relationships simultaneously. The possibility for the axon to be used as a literal spatial device is dependent on this externalization of meaning. By creating a built space which is *actually* an axonometric construction, the relationships between all parts can be understood simultaneously as it exists in reality and as it exists in conception for the architect.

"the developed surface"

This peculiar drawing, most popular during the Eighteenth century, depicts the plan of a room with the interior elevations of that room folded down, as if a box had been compressed and its sides, attached to the base, were folded outwards. Evans observes that "like the conventional section, the developed surface interior is a three-dimensional organization reduced to a two-dimensional drawing, but it is much less easy to restore apparent depth, because while the section merely compresses space, the developed surface also fractures space and destroys its

continuity."[8] The developed surface is therefore a somewhat unusual drawing type in that it is, essentially, non-spatial. It represents space in terms of surfaces, or rather, the inscription of objects within a space upon that space's boundary surfaces.

As opposed to the externalized axonometric, the developed surface is acutely internalized and self-referential. Evans suggests that the use of this drawing, by at least one practitioner, Robert Adam, was in response to an architecture of homogenous individual rooms. The drawing, which celebrates the individual qualities of a room to the exclusion of all other rooms, is the perfect foil to this equality of space. Also important is Evans observation about the way the drawing technique orients all other rooms toward it. A room rendered in this technique becomes a point of focus within the building, "towards which everything faces, non-specific and empty yet very much in evidence..." This understanding of the developed surface would make its translation into a literal spatial device most successful if it were made into a centralized room. perhaps a room onto which all others faced, such as the Panopticon.

site selection and analysis

The site chosen for this project is a lot on Montgomery Street in Syracuse, New York. Montgomery Street is the site for the proposed "Avenue of the Arts," a collection of museums, schools and an art education facility. Together these arts-oriented buildings will create a district within the city which serves as a haven for the arts. The creation of this district is important for the survival of progressive art in the area. Architecture, as an art, is constantly under exploration by its practitioners and the mission of this project in particular is sympathetic to the goals of a project like the Avenue of the Arts. It is hoped that this new Montessori school will contribute to an environment of exploration in the arts in Syracuse.

The site is an open lot with three sides facing streets. It is important that this building have room around it since the proposed translation of drawing convention into built architecture and the assumed perception of this translation renders the work an 'object building' which must be seen from all sides.

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[8] Evans, *The Developed Surface*, pp. 203

program selection and analysis

"Although the eyes of the baby are perfect, even before birth, the infant has to learn to use its eyes. The perfect eye of the young infant conveys a complete picture of the surroundings to the brain, but the brain still has to learn to interpret what it receives. This learning to interpret lies at the core of Montessori's sensory training curriculum."

Robert M.W. Travers
Training Human Intelligence: Developing Exploratory and Aesthetic Skills, 1985

The program selected for this investigation is a Montessori school. The Montessori method of education involves distinguishing qualities of the environment through the senses, especially visually. Therefore, Montessori students are taught to understand their environment and its spatial qualities first through actual experience. It is only after they have mastered concepts through sensorial exercises that the students are allowed to proceed on to more abstract versions of these lessons. These lessons take place in an atmosphere which is unobstructed and fosters the sharing of ideas. Classrooms are often directly connected or have overlapping spaces in order to allow the students to interact. The architecture of the Montessori school is both open and intimate; open in its layout and intimate in its articulation of the surfaces of the environment. Therefore, the spatial ideologies inherent in the pedagogy of this system of education are ones of open planning, interpenetrating spaces, and of articulation of surfaces.

programmatic summary and estimated square footage

entry	200 sq. ft.
classrooms (3)	2000 sq. ft.
library	2000 sq. ft.
central atrium/light well	200 sq. ft.
gardens (3)	300 sq. ft.
gymnasium	4000 sq. ft.
teacher's lounge	200 sq. ft.
administration	800 sq. ft.
cafeteria	1000 sq. ft.
circulation	1200 sq. ft.
mechanical	2000 sq. ft.
total square footage	**14,000 sq. ft.**

summary of key spaces and sequences

classrooms - The classroom is the heart of the Montessori school. It is where the students spend the majority of their time and is the environment in which lessons are taught and learned. Each individual classroom has its own identity, but all classrooms are linked in an open, unobstructed way. The classrooms may be thought of in terms of the drawing types of plan, section and axonometric. Each of these drawing types could illustrate various spatial conditions of each classroom. So in effect, there would be a "plan classroom," a "section classroom" and an "axon classroom."

library - The library is the other major site for learning in the school. As in the classrooms, it is proposed that this space take on a more direct involvement in the education of the students.

central atrium - This is a collective space which allows light into all the classrooms (and other rooms). It could be occupied, but this space acts more as a room in which other rooms are oriented. All surrounding rooms face into this space, so it is most introspective, centralized area of the school. This understanding of this space makes it conceivable in terms of the developed surface drawing. This drawing type also looks inward and is self-referential.

precedents and analysis

programmatic precedents

The Montessori school in Maida Vale, London by Sergison Bates Architects exhibits an interesting approach to materiality. The roof and exterior walls are made from translucent polycarbonate panels which allow light to pass through into the classrooms. Depending on the time of day, this creates various effects of light inside. The construction is a simple wood frame which is, for the most part, left untreated. The total effect of the interior environment is of revelation: revelation of construction technique and revelation of the effects of light. This environment seems particularly suited to a Montessori school since it initiates this attitude of

exploration of one's surroundings. This attitude is perpetuated through the deliberate and creative use of materials and it is this aspect which suggests an approach to the Montessori school.

Herman Hertzberger has built two Montessori schools, one in Delft in 1969 and one in Amsterdam in 1984. Given Hertzberger's interest in materials I am interested in how these projects deal with the issue. I have tried to find information about these projects from the library but they the resources are currently in use. I will have more information about these projects in the future.

conceptual precedents

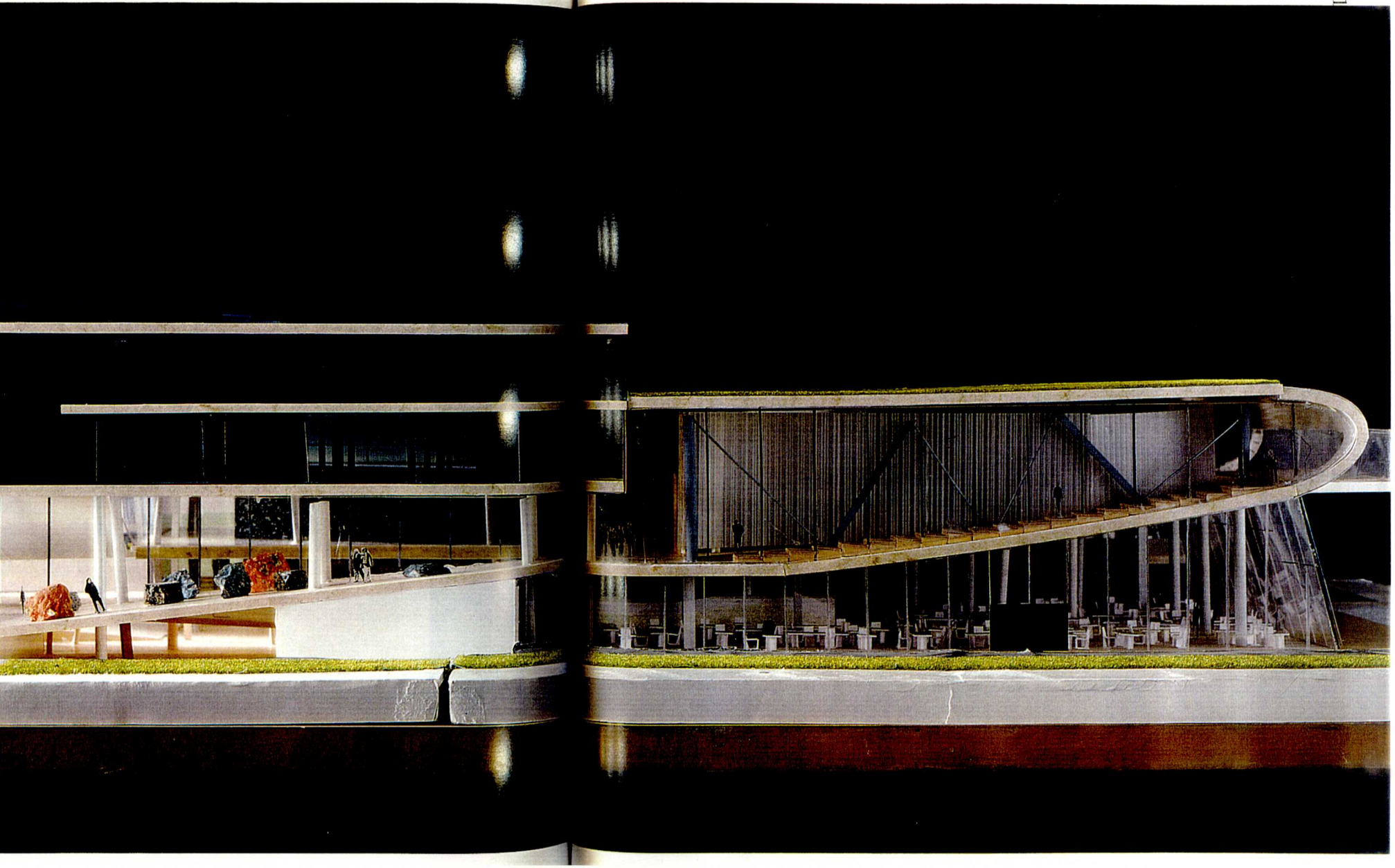
The Educatorium at the University of Utrecht in Holland, designed by Rem Koolhaas in 1994, exhibits a particular attitude toward the concept on 'section' which is of interest. One of the "facades" of the building acts like a section through the building, exposing the strategy of spatial overlap which occurs between the auditorium and office spaces. Here, the idea of section is proposed not as a convention of architectural representation, but as a literal spatial device which articulates architectural intention.

Peter Eisenman's House El Even Odd is interesting for its transformation of the axonometric drawing type into actual architecture. Eisenman cleverly plays up the ambiguous spatial readings of the axon by creating an architecture which, while literally an axonometric construction, also can be read as a plan and as having interpenetrating axonometrically rendered objects. This is one possible understanding of the transformation between drawing convention and architecture.

evaluation criteria

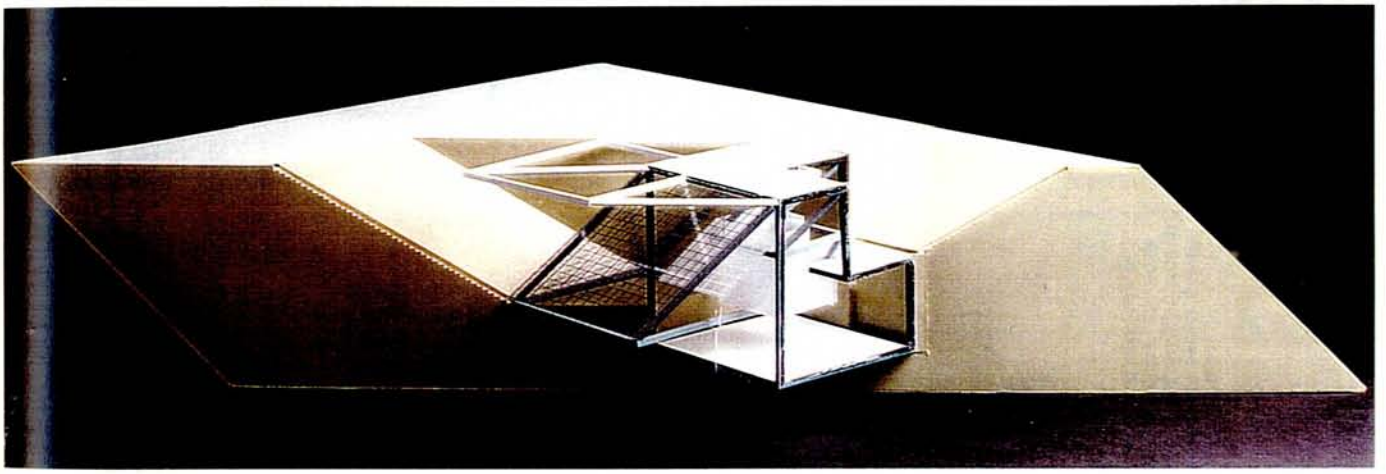
Since the goal of this project is to better understand the relationship between real and represented space, it must be judged on the clarity of this issue as produced in the final project. I would hope that this project is more than a theoretical proposition and that it is able to make sense of how the specified drawing techniques

delimit architectural production. I also hope that this project is able to clearly articulate the possibilities of using such drawing techniques as spatial devices. This possibility illuminates the power of the drawing to communicate architectural intention. This "articulation" will be made through drawings and models. To the extent that these drawings and models manifest these ideas and a viable architectural reaction to them, this project will be successful.



1 Axonometric
2 First level plan
3 Second level plan
4 Presentation model
5 Third level plan
6 Fourth level plan

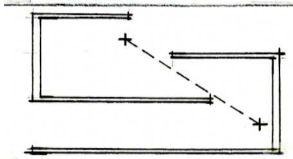
17



GRIDDINGS SCALINGS TRACINGS FOLDINGS

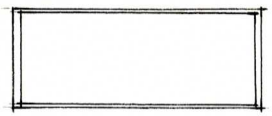
section (1) Drawing the Montessori school

development of form based on sectional design constraints



spatial overlap

1



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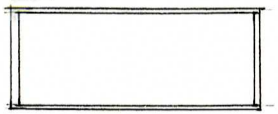

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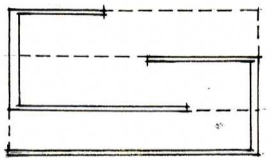
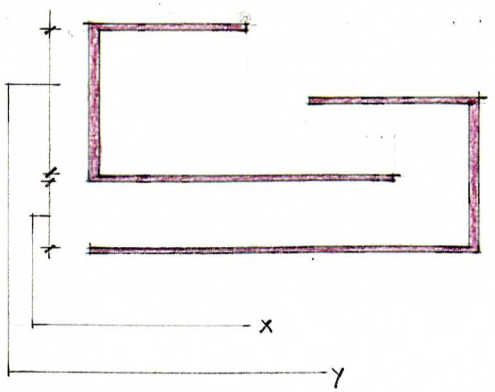
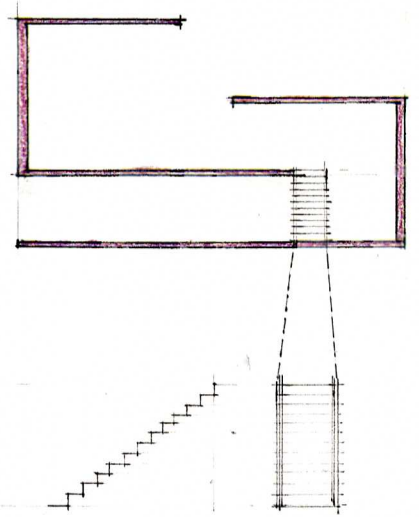


The idea of shared space, inherent in the pedagogy of the Montessori school, is potentially manifested in multiple ways. In section, this spatial idea could be thought of in terms of the overlapped "c" section (above). This is an analysis of one possible way this type of section, drawn at first, could be developed into a literal spatial device related to the Montessori school.



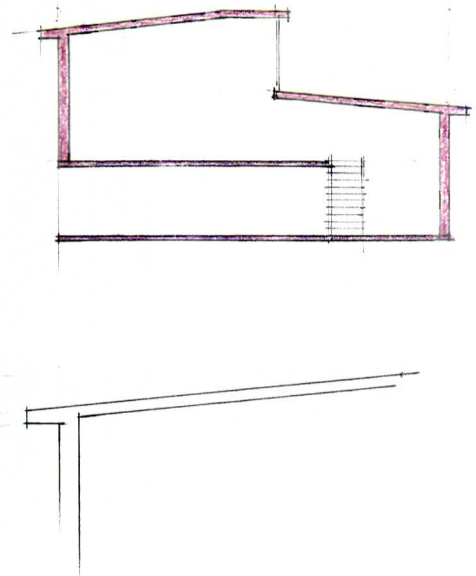
The use of minimum or maximum allowed (code) floor to ceiling heights defines the height of the space. This begins to limit spatial possibilities. This is of primary importance for the section drawing, which is particularly suited for studying vertical (height) relationships between spaces.

a: floor heights



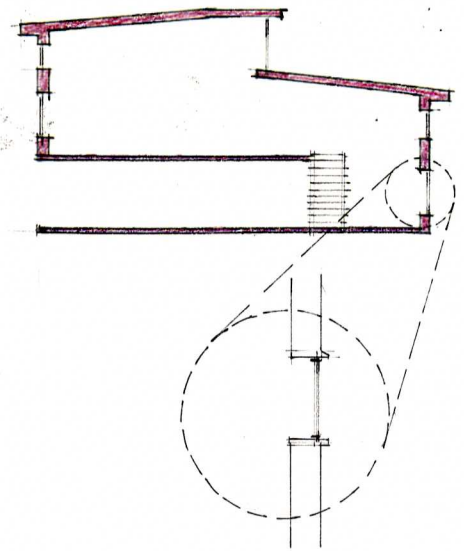
The insertion of vertical circulation further defines the space. The section is the primary drawing used for study of vertical circulation. It is the drawing which explains the location and mode of travel between floors. The insertion of a particular circulation device
(stair, elevator, escalator ramp) limits the path of travel between floors.

b: vertical circulation



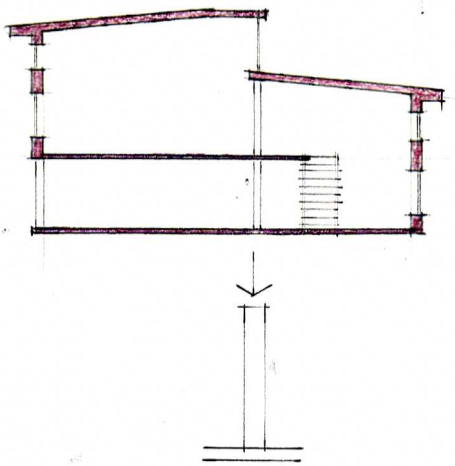
Issues such as water drainage, light penetration and mechanical equipment, as well as aesthetic issues all contribute to the shaping of the roof. These issues are understood primarily through section.

c: roof sections



The relationship between window heights and the space they provide light to is a design issue which can be studied through section. This drawing type allows one to understand how varying angles and types of light affect the space.

d: window heights



It is through the section drawing that the connection between the vertical support elements (columns, walls) and beams or floor slabs is understood. The section shows the entire length of the vertical support element and how it is interrupted or continued at various points.

e: vertical structure

section is suited for developing
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diagram demonstrates the
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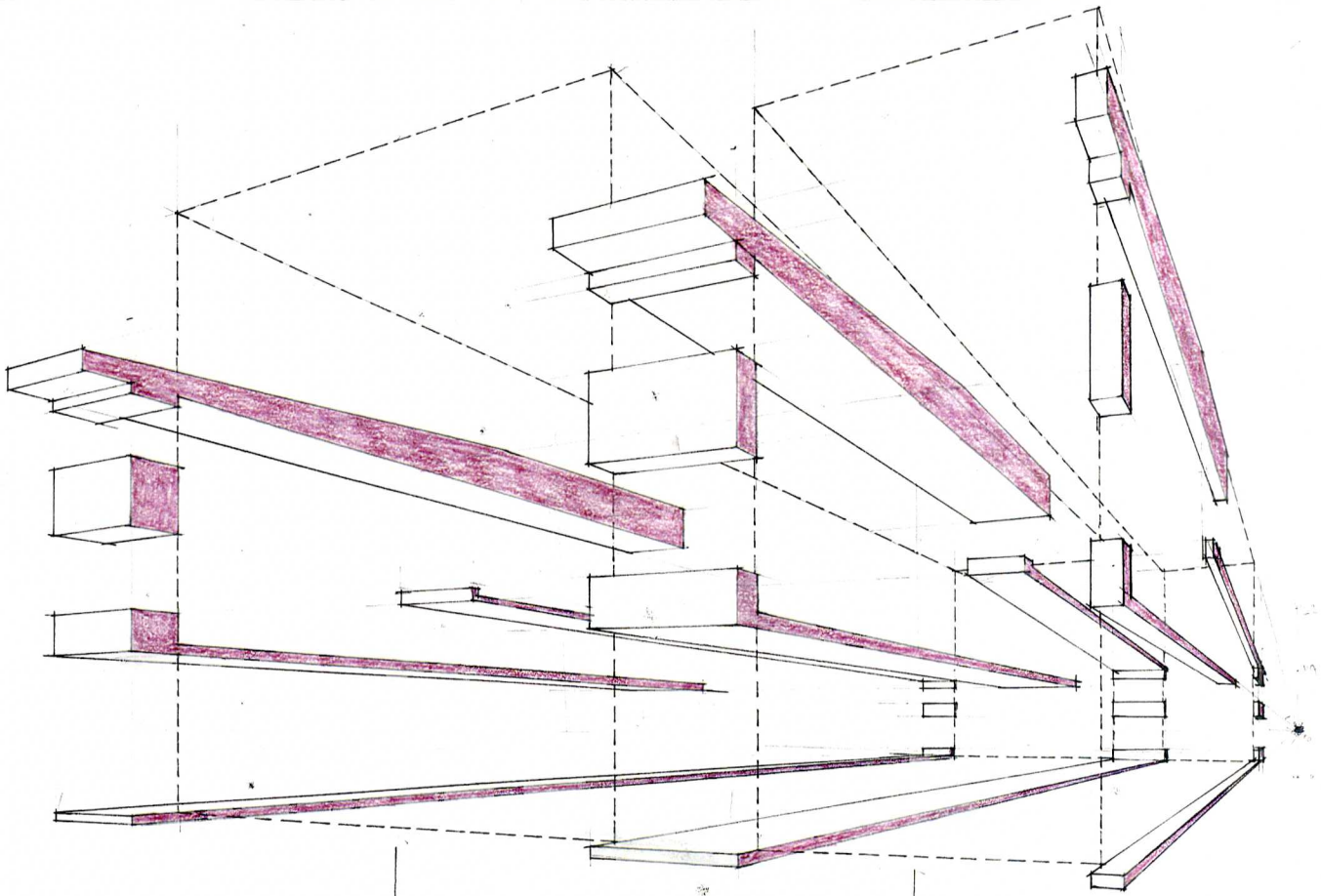
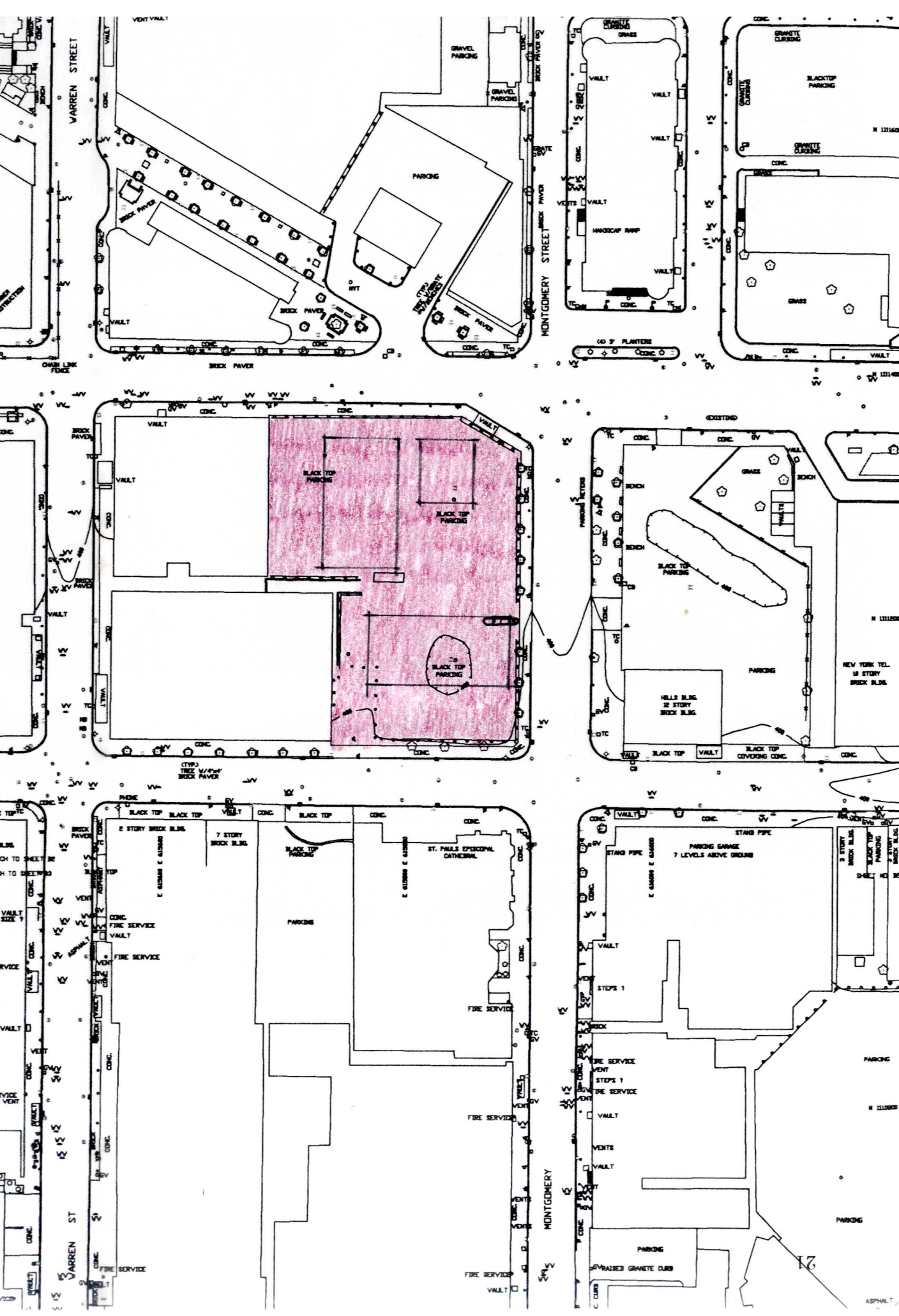


classroom

classroom


WARREN STREET
MONTGOMERY STREET
VENT VAULT
GRAVEL PARKING
BRICK PAVER
PARKING
CONC.
VAULT
GRANITE CURBING
GRASS
HANDICAP RAMP
VENTS
BLACKTOP PARKING
BLACK TOP PARKING
BLACK TOP COVERING CONC.
HILLS BLDG. 12 STORY BRICK BLDG.
NEW YORK TEL. 18 STORY BRICK BLDG.
BENCH
PARKING GARAGE 7 LEVELS ABOVE GROUND
STAND PIPE
ST. PAULS EPISCOPAL CATHEDRAL
2 STORY BRICK BLDG.
7 STORY BRICK BLDG.
3 STORY BRICK BLDG.
FIRE SERVICE
STEPS
RAISED GRANITE CURB
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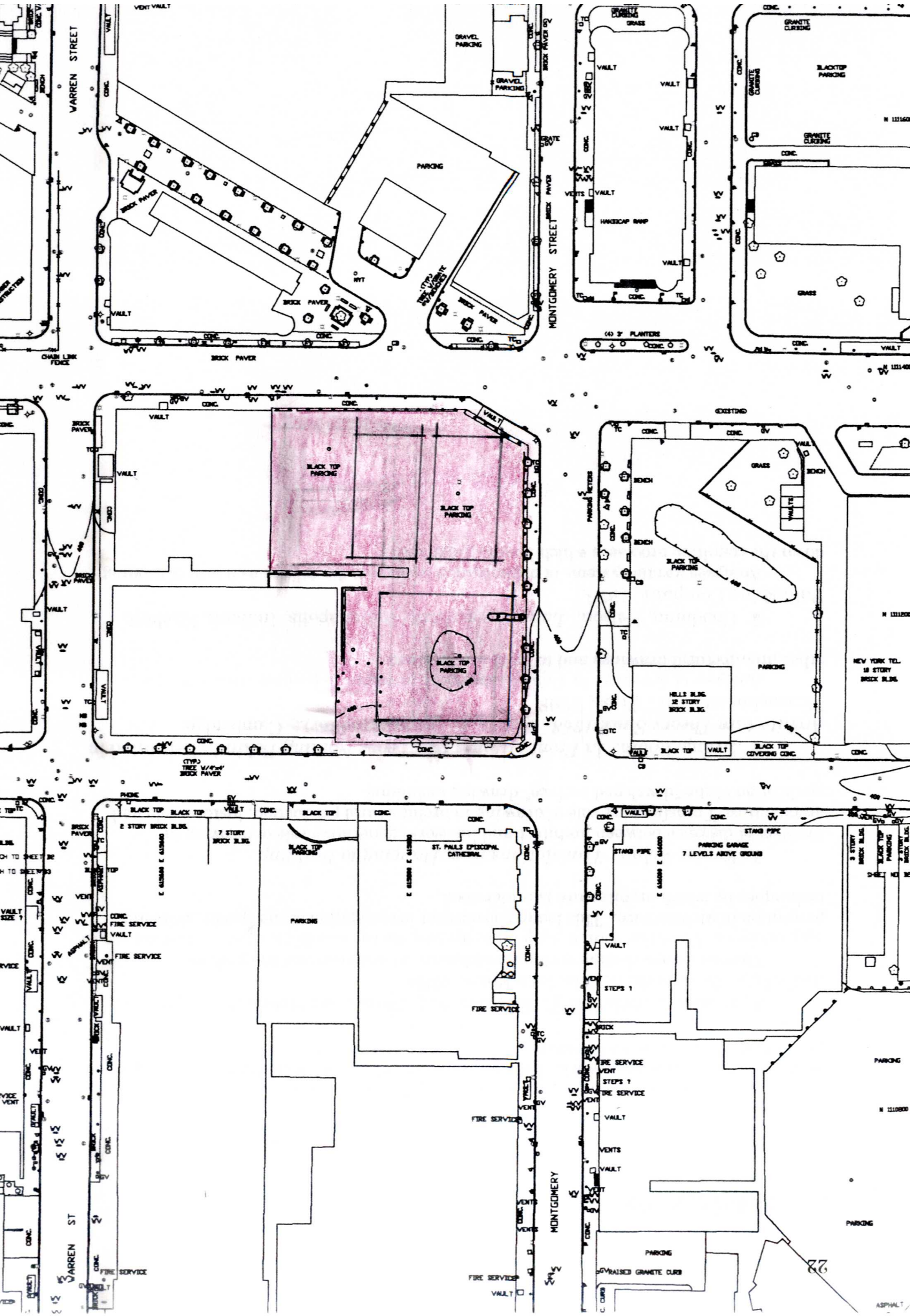
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BLACKTOP PARKING
BLACK TOP PARKING
BLACK TOP COVERING CONC.
(EXISTING)
BENCH
WALLS
HILLS BLDG. 12 STORY BRICK BLDG.
NEW YORK TEL. 18 STORY BRICK BLDG.
(TYP.) TREE W/4'x4' BRICK PAVER
PHONE
2 STORY BRICK BLDG.
7 STORY BRICK BLDG.
ST. PAUL'S EPISCOPAL CATHEDRAL
FIRE SERVICE
PARKING GARAGE 7 LEVELS ABOVE GROUND
STAND PIPE
STEPS 1
RAISED GRANITE CURB
ASPHALT

annotated bibliography

1. Corner, James. *Representation and the Landscape: drawing and making in the landscape medium*. Word & Image, Vol. 8, No. 3, July-September 1992

Relationship between medium of drawing and landscape, problem of distance between architect and built work. Relationship and affect of various drawing techniques on production of landscape architecture.

2. Dickie, G., Sclafani, R. & Robin, R. (editors). *Aesthetics: A Critical Anthology*. New York: St. Martin's Press, 1989.

Various essays dealing with approaches to art criticism and the problem subject/object. Used this source early on to investigate the role of pictorial representation in perception of architecture. This led to the current investigation of the specific drawing techniques by which architecture is understood.

3. Evans, Robin. *Translations from Drawing to Building*.

Problem of distance between architect and his work, generative role of drawing in architecture, Transfiguring role of drawing in architectural production, historic role and application of the "developed surface" drawing technique.

4. Evans, Robin. *In Front of Lines that Leave Nothing Behind*. Reprinted in *Architecture Theory Since 1968*. Hayes, K. Michael (editor).. Cambridge, Massachusetts: MIT Press, 1998.

Analysis of drawings by Daniel Libeskind. Attempt to position them relative to other architectural drawings and to built architecture.

5. Goodman, Nelson. *Languages of Art*. Indianapolis, Indiana: Hackett Publishing Company, 1976.

Analyzes formal systems of organization in artistic disciplines as a way of pinning down the cognitive processes which lead to judgment.

extended bibliography

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2. Le Corbusier. *Towards a New Architecture.* Dover Publications, New York: 1986.

3. Dessoir, Max. *Aesthetics and the Theory of Art.* Detroit, Michigan: Wayne State University Press, 1970.

4. Goodman, Nelson. *The Structure of Appearance.* New York, Bobbs-Merrill Co., 1966.

5. Harries, Karsten. *The Ethical Function of Architecture.* Cambridge, Massachusetts: MIT Press, 1997.

6. Panofsky, Erwin. *Perspective as Symbolic Form.* New York: Zone Books, 1991.

7. Prall, David Wright. *Aesthetic Analysis.* New York: Thomas Crowley Company Publishers, 1936.

8. Woodfield, Richard (editor). *The Essential Gombrich.* Hong Kong: Phaidon Press Limited, 1996.

9. "Child's Play." Architectural Record. Vol 174 # 12, October, 1986. Pp. 112-115

10. Dunlop, Beth. "Montessori Island School: Tavernier, Florida." Architectural Record. Vol 185 # 10, October, 1997. Pp. 118-121

11. A + U. #12 (327) December, 1997. Pp. 60-67.

12. Croquis. # 79, 1996. Pp. 142-163.