

ECONOMIE HOUSE

D a v i d W e i s s b e r g e r

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ABSTRACT

This thesis inquires into the nature of economy and its connection with the architecture of the house. Economy is a slippery term. In its original sense, the word had more to do with philosophy than finance. It raised issues of necessity, hierarchy, government, and happiness. Aristotle distinguished chrematistics, the art of getting wealth, from economy, the art of household management. Vitruvius, the first architectural theorist, offered a differing interpretation of the word, and included it as one of his six principles of architecture. Henry David Thoreau revisited Aristotle's ideas and invented a new, solitary economy. Both he and Aristotle emphasized that the purpose of economy is to meet material needs with sufficiency rather than surfeit. *Economie House* explores these ideas architecturally. On an imaginary site a perfect red cube sits on a concrete platform. Steel frames support a translucent, gabled roof. The cube opens in various ways to reveal machines that serve man's biological needs. Closed, the cube suggests the limits of material goods as contributions to the good life.

In loving memory of
Sydney Franklin (1912 - 2005)
and
Ida Lee Weissberger (1916 - 2006)

To those who have inspired, supported, and nudged me towards the good, I offer my thanks. For what is praiseworthy, they deserve a share of the credit; the faults are mine alone.

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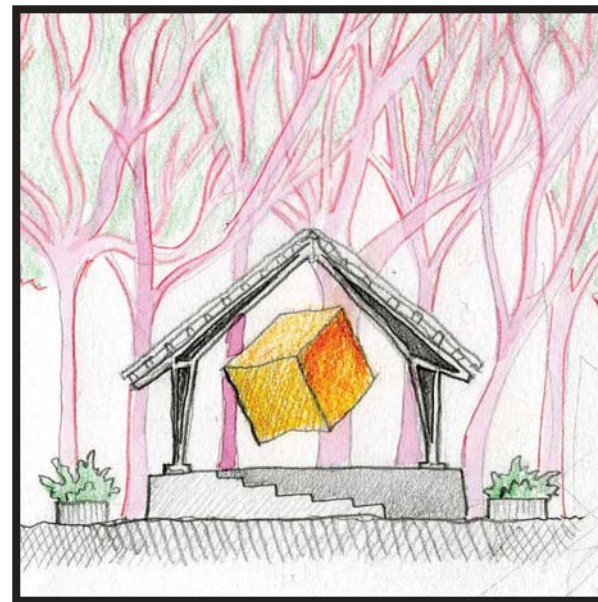
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* All drawings and photographs by the author

ECONOMIE HOUSE

An Essay on Economy in Architecture
David Weissberger, May 2007



“Most men appear never to have considered what a house is . . . “
Henry David Thoreau¹

Economy:

This thesis begins with a word. Though Architecture is not language, theorists through the centuries have delighted in attempts to define or explain Architecture in writing.² Some called Architecture *poetic* (from the Greek for making) in an attempt to distinguish it from the more prosaic act of building, but the term obscures essential differences between the arts of building and those of language. Architecture can begin in words. Great buildings have been inspired by the literary, mythical, religious, and philosophical ideas transmitted by language. Architecture can be described or analyzed in words. Language allows us to reason about architectural ideas, to explain and clarify our intentions (as in a program). But architecture cannot end in words. Though perhaps necessary³, words are not sufficient for architecture. They are part of the process, but the end of Architecture is not literal.

Economy, the word that informs this investigation, has a venerable pedigree in architectural theory. Vitruvius lists it (along with order, arrangement, eurythmy, symmetry, and propriety) as one of those ideas upon which “architecture depends.”⁴ Since Vitruvius esteemed Greek architecture more highly than that of his contemporaries, it should not surprise us that his architectural principles are heavily influenced by Greek thought.⁵ Economy is a Greek term, most fully developed by Aristotle in his Politics. The term did not survive the translation to Latin unscathed, however. Vitruvius seems to have had a different conception of economy than his Greek sources. Though not the intent of this thesis, the (mis)use of the term economy in architectural theory can be traced down through the years. A brief survey might include Jean-Nicolas-Louis Durand, who made economy a particularly prominent aspect of his positivist theories at the beginning of the nineteenth century⁶, and Le Corbusier, who did the same at the beginning of the twentieth.⁷ More recently, Malcolm Wells, in his Gentle Architecture of 1981, proposed an species of architectural economy (though he did not use the term) based on emerging ecological concerns.⁸

This thesis inquires into the nature of economy and its connection, if any, with architecture. Clearly, architecture does not presuppose economy. The essence of some art is abundance; it imitates nature’s dazzling formal multiplicity and her seeming celebration of superfluity and excess. In architecture, we might think of flamboyant Gothic traceries, or the work of Gaudi or Furness. But there also exists an art of economy that finds beauty in restraint and limit. It is a search for order in the tumult. It touches on abstraction and unadorned forms. The Japanese prints that so beguiled the 19th century artists in Paris speak to this economy and the formal beauty of simplicity shines from much Shaker furniture and architecture.

To answer the question of whether economy can be a generator for architecture, I turn to etymology. When we use a word as the basis for an architecture (or for any other reason!), we should know what it means . . . or what it might mean. Like most useful words, economy flirts with semantic ambiguity. Over the years it has accumulated various and sometimes contradictory meanings:

1. economy, with a lower-case “e”, in common usage means frugality or efficiency in use of methods or materials. This corresponds generally with Vitruvius’ idea of economy.⁹ He explains that, “Economy denotes the proper management of materials and of site, as well as a thrifty balancing of cost and common sense in the construction of works.”¹⁰

2. We also speak of “THE economy”. This is economics as taught in business schools. It is the study of financial matters, of markets and money. It is the art of getting wealth (as measured in coin), whether for nations or individuals. Though most common in contemporary usage, this is the most curious and contradictory sense of the word. When Aristotle discusses economy in his work on politics, he specifically excludes this form of the art of getting wealth, which he called *chrematistics*.¹¹

3. This brings us to classical economy. Our English word derives from the old Greek *oikonomia*, a compound of *oikos* (the household) and *nomos* (a manager, or he who distributes things). Aristotle sees economy as the prototype for all associations of men, hence its position at the beginning of the Politics. He claims that economy consists of three relationships and one art. The relations are between husband and wife, parent and child, and master and slave. The necessary art is that of acquiring property.¹² Here Aristotle diverges from the modern idea of economy by asserting that for the purposes of economy, the art of wealth-getting is limited and directed towards an end beyond itself. Economy is the getting of a living and its goal is the Good Life, rather than the boundless accumulation of money. He writes that, “The origin of this disposition [to accumulate coin] in men is that they are intent upon living only, and not upon living well; and as their desires are unlimited, they also desire that the means of gratifying them should be without limit” (Politics, Book I:9). The implication of this passage is that the practice of economy might involve disciplining one’s material desires as an alternative to the constant struggle to pay for them.

Reasoning from Aristotle, we might posit the house as the natural

architectural expression of the household and thus the proper location for the practice of economy. But here the contemporary architect runs into a problem: we don’t really have households anymore in the industrialized West. Thanks to technology and specialization, we live alone or in small family groups. Lacking households, most of us have abandoned economy. Having entered into society, we get our living solely by chrematistics. We trade our labor or service for money to buy what we need and what we want. Our culture exalts accumulation of wealth and property as its supreme value. The house is no longer a center of production. Machines do the work once performed by slaves and servants.¹³

4. In the first and longest chapter of Walden, Henry David Thoreau writes of his solitary economy on the banks of a small pond in Massachusetts.¹⁴ Though the idea of economy for a household of one seems somewhat oxymoronic,¹⁵ Thoreau succeeds in enriching the word’s connotations. He focuses, not on the household, but on the careful management of ones’ life. Economy then becomes the principle of looking at the cost and not just the price of things.

The essential activity of economy is accounting, which Thoreau raises to the level of philosophical inquiry.¹⁶ What he calls his “experiment” in deliberate living is an attempt to define necessities and come to grips with the true costs of property acquired beyond those limits.¹⁷ For Thoreau, as for Aristotle before him, economy is more of an ethical question than a financial one. Economy is a means to something else, to the good life. Careful accounting lets you minimize your day’s labor so that you can focus on your life’s work, be that philosophy, religion, science, or (even) architecture.

Program(s):

Possible programs for an architecture of economy:

-A house for living deliberately.

-A house for an economist (or two).

-A house for an economist without a household.

-A poor and a noble house.

-A house that grows into beauty.

-A repairable house / A house that acknowledges the “empire of Time”¹⁸

-A house that recognizes the difference between affordable and economical.

-A house that puts labor and work in their place.

-A house that provides for the celebration of daily life.

-A house that remembers.

House:

On an imaginary suburban lot (50’ x 150’) in a town not unlike Blacksburg, Virginia, Economie House begins with a square, 30 feet on a side. Reflecting this square from two opposite sides gives a rectangle 30 feet wide by 90 feet long. This 3-square rectangle (see **Print 1**) forms the geometrical basis for all of the elements of the design, of which there are primarily three:

1. The platform, of poured-in-place concrete, is extruded from the rectangle to a height of 22.5” (see **Prints 3 & 4**). The two front bays and the two rear bays are floated smooth, and the central bays are highly polished. A rounded marble molding (see **Print 6**) is inset at the edges all the way around to make it more comfortable for sitting. On the street-front, a driveway/entrance ramp is carved out. The platform covers most of the lot, eliminating the “default” lawn of most contemporary suburban houses. The lawn of the detached, single-family house is one of the few remaining symbols of home in the U.S. It has importance as an indicator of status and of acceptance (or rejection) of community standards. But maintenance of a lawn also entails significant labor. Designing an economical lawn thus becomes a matter of balance. The economical house includes a small, symbolic “front yard” and a larger “back yard” set into the platform. Different levels of economy might dictate the landscaping of these elements. Shown with turf-grass, they could also be planted with vegetables or filled with sand, gravel, or water. Rotated with respect to the base, both of the yards are squares and thus orthographic projections (at equal and reduced scales) of the cube that rises from the middle bay of the platform.

2. The cube derives from the geometry of the rectangle (see **Print 1**). It reciprocates by making visible and apparent that geometry. In the middle square of the platform, lines connecting mid-points to corners delineate the rotated base of the cube. One diagonal of that base lies on the diagonal of the rectangular platform. This diagonal forms the hypotenuse of a triangle with sides 1:3. Similarly, the edges of the cube’s base lie on the hypotenuse of other triangles with sides 1:2. These lines relate the central square to the squares on either side of it. The cube thus makes the inhabitant aware of the geometric form governing the design. Specifically, the cube shows that the platform is a rectangle made of three squares.

In terms of construction, the cube consists primarily of 2x6 balloon-framed wood stud walls (see **Prints 5 & 6**). Its exterior is finished with a red *stucco lustro*.¹⁹ The various doors and openings of the cube close flush with its surface and are painted red to match the plaster. The interior is sheathed in white-painted gypsum board with maple trim. The floor of the loft is of hardwood. On the main level, the concrete floor of the platform “spills” into the cube at its two entrances. The bathroom floor is finished with a glazed ceramic tile in a pattern that reiterates the underlying geometry of the design (see **Print 6**). The floor and walls of the basement are of concrete.

Functionally the cube satisfies man’s biological necessities (see **Prints 7 & 8**). Charles Moore would call it the “machine domain” of the house.²⁰ The kitchen is on the outside of the cube, revealed by a coiling metal door. The bathroom is inside on the first level. Stairs ascend to the summer sleeping loft, passing bookshelves and reading benches set into the wall. From the other side of the cube, stairs descend to the basement and the winter sleeping platform. Light penetrates the basement through the semi-circular glass block skylight that also serves to define the kitchen area above.

The cube also serves less utilitarian functions. The steward’s desk, for example, folds out from one of the exterior walls (see **Print 9**). Opened, it reveals cubbies and shelves for household records and correspondence. Here bills are paid and the house managed. This is the place for accounting. On a ship the bridge is located high above the ocean waves; it allows the captain to see through space. By contrast, from his vantage point on the house’s bridge, the steward peers through time. How has the house performed? How did people make their living there? What economies did they employ? With this information, he charts his own course.

On another exterior wall, a small niche protects a special book that serves as the memory and soul of the house (see **Print 7**). This chronicle preserves records of the house’s occupants (births, marriages, deaths, parties, visitors) and important events in its own life (repairs, renovations, costs, materials, names of builders and workmen). The book contains the construction and as-built drawings of the house. It includes an essay and drawings by the architect explaining his intentions and thoughts about the house. It serves as guide and operating manual, a compendium of the lessons and observations of previous occupants. The book, in fact, looks very much like this thesis book. (As a way of beginning to put these ideas into practice, please feel free to leave your name, the date, and any comments you might starting on **Print 18**)

With all of its doors and windows shut, the cube sheds its functional pretensions and reveals its formal perfection (see **Prints 11 & 14**). As the representation of a rational, geometrical (unattainable) ideal, the cube suggests that end to which economy is the means.²¹ I have furthered this intention by attempting to minimize the expression of materials and physical construction. The structure is hidden, the joints inarticulate. All of the visible exterior surfaces are colored red so they will not read as separate elements. Red was chosen for its association with man and the artificial. Finally, The *stucco lustro* finish has the further dematerializing effect of permitting light to penetrate a little past the surface, giving the impression of being able to see into or beyond the plane of the wall.

3. The last major element of Economy House is its sheltering roof. In section the roof borrows from the archetypal (western) image of the house with its steep gables. The house’s elevation, like its plan, derives from the thirty foot square (see **Prints 10 & 11**). The sixty foot long roof is supported by seven pre-engineered rigid-frames assembled from plates of weathering steel. The “walls” are eleven feet tall, and the “rafters” twenty-one feet long. In the first and last bays, cross-bracing of wire rope gives lateral stability in the planes of the walls and roof. Steel purlins run the length of the structure, tying the frames together and supporting the roof of translucent corrugated polycarbonate plastic. The roof extends past the thermally-enclosed central bays for one bay on either side, forming outdoor porches at front and rear. Above the two middle bays, the doubled purlins are connected to form a truss (see **Print 12**). The ceiling (of clear twin-wall polycarbonate panels) is attached to the lower chord of this truss. The gable-end pediments are glazed with fixed, triangular panels (see **Print 11**). Below, six large sliding doors run in three tracks set flush with the platform. The eaves-sides are enclosed with glazed garage-doors. A band of sandblasted glass runs around the house to a height of four feet, providing some privacy.

The high level of structural and material articulation apparent in the frames and roof is intended to contrast with the expression of the cube as a purely rational construction. The roof and its supporting structure are assembled from distinct parts connected with exaggerated joints. This can be seen particularly in the hinge connection to the platform at the base of the frames (see **Print 13**). Though statically this element always *acts* as a hinge, it is more typically constructed in a manner not particularly expressive of the rotational movement associated with a hinge. While its uniform redness reinforces a reading of the cube as dematerialized form, the constituent parts of the frame and roof acknowledge and express their materials. This can be seen in the tapering of the rigid frames (see **Prints 10 & 11**) where less steel is needed to resist smaller bending moments at the peak and base of the frames. Were the gable shape a purely graphic convention, it would be more effectively rendered by frames of unchanging section.

Operation:

In the winter months the glazed walls on the gable and eaves sides of the house can be shut to provide a thermal enclosure. In this season, living and sleeping take place, for the most part, inside the insulated cube and basement. Pipes beneath the concrete slab provide radiant heat. Light floods in through the translucent ceiling and walls of the enclosed area. The glass blocks set into the floor of the platform allow some of this light to pass down to the basement. Air trapped between the roof and ceiling is heated by the sun. Rising, it enters the living space through vents at the peak of the ceiling.

In the summer the gable-end doors can be slid out of the way and the eaves-side doors rolled-up under the roof. The house becomes open to the outside and the living area spills out onto the two porches (see **Prints 21f & g**). The extreme openness of the building allows for excellent cross-ventilation by even the slightest breezes. Sunlight still passes through the translucent roof, but ridge vents in the roof open to allow heated air to escape. Sleeping takes place on the loft level of the cube, under the roof but in the outside air.

Rain, in any season, falls from the roof onto the gravel paths that line the platform on its long sides. The water percolates through the gravel to a concrete trough which slopes to a cistern beneath the rear porch. This water can be used for watering the yard and flushing the toilet or, after filtering and purification, for cooking and drinking.

The severity of the scheme is somewhat softened by the accumulation of furniture and possessions that would, slowly or quickly, come to fill the space around the cube and the porches. Everyone strikes a different balance between economy and comfort in their lives. The hedonist knows that property makes life easier. The hermit knows, just as surely, that it adds burdens and increases care. So amidst the clutter and detritus of daily life, the red cube. It endures as a reminder that there are more important things than things. And when the house is vacant, that idea would be revealed again. The house is not affordable as that word is commonly used, as a synonym for inexpensive. Instead, I have tried to make it economical.

Conclusions:

Though framed primarily in the language of *philosophical* economy, other connotations of economy inadvertently influenced this inquiry. The semantic slipperiness and breadth of the term are part of what makes it a suitable candidate for architectural theorizing. Like Alberti’s *concinitas*, economy is a plastic term, capable of accepting a variety of interpretations and leading thence in various directions. Architects use words to impose limits and give focus to design, but the instability of language means that these boundaries can never be absolute. Like other “wordy” principles of architecture, economy lacks inherent, unambiguous formal implications. Part of the game that architects play is finding a way to make theory instrumental in practice. Good words for use in architecture lend clarity and precision to the endeavor while leaving room for aesthetic judgment. Such words are pliant enough to admit of more than one solution to a given set of constraints; they do not pretend to be deterministic.

The ambiguity inherent in a term like economy manifested itself throughout the process of this thesis. I noticed my focus shift and themes emerge and recede as my understanding of economy grew ever more expansive. When I began, I thought of economy as the antonym of waste and inefficiency. I explored built-in furniture and differentiated spaces for distinct seasons. As I came to understand some of the philosophical implications of economy, geometry assumed an increasing importance to the search, and the cube made its appearance. Through the whole process, I found myself dogged by the common notion of economy as minimum financial expenditure. Why, for instance, did I settle on rigid-frames as the structure for the building? Granted, they solved some formal problems (no horizontal tie-beams to interfere with the cubes, for instance). I had to wonder, though, whether their use in low-cost commercial buildings influenced my decision. What notion

of economy enjoined (or prescribed) the use of such a system? Did I use it because it was economical or because it was cheap?

The design seems to subscribe most closely to Thoreau’s notion of economy. While lauding the virtues of self-sufficiency, his solitary economy comes off as less independent than the households of ancient Greece. But Plato and Aristotle, living at the birth of democracy, lived in a fundamentally unequal society that unequivocally placed the good of the *polis* above that of the individual (or perhaps equated them). Thoreau attempted to reconcile economy with America’s cult of the individual (and the accompanying explosion of chrematistic excess in which we still live). Ironically, increased personal freedom has spawned a level of chrematistic inequality that Aristotle could never have imagined.

One of the questions raised by this thesis is whether economy presupposes a master and thus hierarchy (of people or ideas). Can a household tolerate anarchy? The ancients thought not. Aristotle went further, writing that the household is by nature a monarchy and cannot be a democracy²². The Internal Revenue Service makes tacit agreement with this argument by recognizing the “head of household”. Thoreau sought to sidestep the question by restricting himself to an economy of one, and dominion over himself. But economy at its root involves relationships and negotiations of power. It is the first association of man into units larger than himself.²³ Economy is the relationships we arrange to get what we all need to live. It involves accommodation and agreement as to proper roles. Economy seems to demand hierarchy in the relationship of ideas as well. For example, the choice of the good life (at the heart of the practice of economy) involves distinguishing it from the other possible ways of living.

These ideas manifest themselves in the thesis as a move away from the multiple, jostling cubes of earlier schemes (see **Print 16**) to the single, dominant cube of the most recent iteration, which seems to pose the question, “Who (or what) is to rule?”²⁴ Economy’s first task is judgment: the determination of what we need. Herein lies its connection with architecture, where we build with purpose. The more clearly we state our intentions (usually in words!), the better we can judge the success or failure of the resulting building.

What distinguishes architecture from building is its insistence on idea. Forms, being eternal, do not decay. Even the greatest buildings, however, eventually succumb to the ravages of time. Built for eternity, the pyramids have lost their smooth sheathing stones after only 5,000 years. The Parthenon, though younger, stands as a shell hollowed by war and the centuries, a glorious pile of rubble. We do not preserve them to honor the megalomaniacal dreams of the Pharoahs, or because we need a place to sacrifice to Athena. We admire them as supreme examples of man’s poetic power. They are evidence of the act of creation, of form realized in space. To truly endure, a building must serve an idea that captivates the mind of man. So the Barcelona Pavilion, most transient of carnival shacks, lives in the minds of architects half a century and more after it disappeared without a trace because it offered a compelling new vision of structure and spatial order. We no longer build for the ages. We have become so extravagant that even buildings are disposable. Considering only utility, we build as cheaply as we can. Architecture must be useful, but its transcendent aim is to give meaning through form. Economy, uniting utility and form, is an idea whose time has come (again).

“A house is a circumstantial house. It indicates how much money you have. It means who your client is. It means where it is or how many rooms it has. It means a lot of things. But the architect lies in his ability to make house, not a house. That is what architecture really is. . . He has to find somehow a realm of spaces where it is good to live”

-Louis Kahn²⁵

Notes:

1 (Thoreau, p.27)

2 A few examples:
 “Architecture is the art of how to waste space.”
 -Phillip Johnson, (New York Times, Dec. 27, 1964)
 “Architecture is what makes beautiful ruins.”
 -Auguste Perret, (Collins, p.163)
 “Architecture is the difference between the gross and the net square footage.”
 -Bernard Tschumi, (Weiner)
 “Architecture is a built mistake.”
 -Frank Weiner, (lecture notes)
 “Architecture is the will of an epoch translated into space; living, changing, new.”
 -Ludwig Mies van der Rohe, (Johnson, p.183)
 “Architecture is the masterly, correct, and magnificent play of masses brought together in light.”
 -Le Corbusier, (Le Corbusier, p.29)
 “Architecture is a second nature that is laid on top of the real one.”
 -Renzo Piano, (Losano)

3 “Sometimes we may be close to despair when trying to cope with the visual world through words: the harder we try the more we seem to get lost between shifting and elusive drifts of irrelevancy, inappropriateness or vacuity. Indeed an artist may feel that there is no place at all for verbal formulations in architecture and the visual arts; yet he will not be able to create without guidance from certain principles which he once acquired or formulated and which are in themselves not visual but conceptual. They may be as simple as a determination not to be influenced by any intellectual considerations during the process of creation, or they may extend beyond the individual to an entire group where they appear linked to more general habits of thought and procedure.” (Sekler, p. 89)

4 (Vitruvius, p.13)

5 Morris Hickey Morgan renders *distributio* into English as “Economy”, somewhat obscuring the purpose of Vitruvius’ own translation into the Greek. Stephen Kellogg’s emendation of Hickey preserves the Latin term alongside the Greek (Smith, p.67). That Vitruvius chose to explain a (presumably) familiar word with a foreign one reveals his intellectual sympathies.

6 In his introduction to Britt’s translation of Durand’s *Précis*, Antoine Picon finds the intellectual sources of Durand’s *économie* in ideas borrowed from the life sciences (“animal economy”) and mathematics (integral calculus). Economy, for Durand, involved not only cost-control, but also efficiency in the use of materials and selection of forms with large areas and small perimeters, like the circle. Picon quotes his assertion that, “[T]he more symmetrical, regular, and simple a building is, the less costly it becomes” (Durand, 34). Picon, however, argues that Durand’s professed positivism masked a, “utopianism [that sought] to free architecture from technical and economic restraints while simultaneously proclaiming their preeminence” (Durand, 34-35).

7 “The engineer, inspired by the law of Economy and governed by mathematical calculation, puts us in accord with universal law. He achieves harmony” (Le Corbusier, p.1). Though the architect does not use the “law of Economy” directly, “[t]he Engineer’s Aesthetic, and Architecture, are two things that march together and follow one from the other . . .” (Ibid.)

8 Wells disputes architect Robert Geddes’ assertion that, “an understanding of the nature of social institutions, their values, their norms of behavior, their rituals, is the most helpful way for an architect to get started” (Wells, p.46). Instead of social form, he posits a natural economy as the basis for architecture. This “gentle architecture” looks at ways that buildings can provide for man’s needs without destroying the world in the process. “The science fiction of architecture,” he writes, “with rare exceptions, is hopelessly man-centered. Sky cities, sea cities, bubble cities, stack cities, instant cities, media cities; biotecture, agrotecture, videotecture, cybertecture- what a roster! One can imagine the wildlife crying out in terror, ‘What in the hell are those bastards going to do next? Try this, try that. Whatever happened to the facts of life? Doesn’t the man-animal know about the budget?’ For life does have a budget; its currency is air, water, land, and a day’s ration of sunlight”(Wells, p.55). Wells posits economy as the determination of values. Like Aristotle, he places nature at the top.

9 Vitruvius is not known for his clarity. The “second stage” of Economy seems to be a repetition of ideas more appropriately associated with the principle of “décor” (propriety). These have to deal mostly with attention to designing status-appropriate dwellings. He writes, “A second stage of Economy is reached when he have to plan the different kinds of dwellings suitable for ordinary householders, for great wealth, or for the high position of the statesman.” (Vitruvius, p.16)

10 (Vitruvius, p.16)

11 “Now it is easy to see that the art of household management [economy] is not identical with the art of getting wealth, for the one uses the material which the other provides.” (Politics, Book I:8)

“The art of wealth getting which consists in household management . . . has a limit; the unlimited acquisition of wealth is not its business.” (Politics, Book I:9)

“Getting wealth is not the business of the household manager. It is presupposed by him, as is health: But as health-making is primarily the business of the physician, so wealth-getting belongs primarily to other fields.” (Politics, Book I:10)

12 “Property is part of the household, and the art of acquiring property is a part of the art of managing the household; for not man can live well, or indeed live at all, unless he be provided with necessaries . . . Thus, too, a possession is an instrument for maintaining life.” (Politics, Book I:4)

13 Though “. . . a complete household consists of slaves and freemen,” Aristotle recognizes that, “. . . if every instrument could accomplish its own work, obeying or anticipating the will of others . . . chief workmen would not want servants, nor masters slaves” (Politics, Book I: 3, 4) In modern architecture, it was Louis Kahn who recognized this and who most eloquently sought to accommodate the “order of machines” in his buildings. Thomas Leslie writes that, “[w]hile the organic, all-encompassing Order was thus the goal, Kahn was uniquely attuned to the need to build it up from such basic assumptions as structure and mechanical services, an admission of the contingent into the realm and constitution of the universal” (Leslie, p.10-11).

14 The chapter itself is titled “Economy”

15 “A man who lives alone must be either a god or a monster.” (Politics, Book I:2)

“He who by nature . . . is without a state, is either a bad man or above humanity.” (ibid.)

16 “I have always endeavored to acquire strict business habits; they are indispensable to every man. . . . It is a labor to task the faculties of a man, -such problems of profit and loss, of interest, of tare and tret, and gauging of all kinds in it, as demand a universal knowledge.” (Thoreau, p.15)

“Even the *poor* student studies and is taught only *political* economy, while that economy of living which is synonymous with philosophy is not even sincerely professed in our college.” (Thoreau, p.41)

New York: W.W.Norton, 2003.

Le Corbusier. Towards a New Architecture. Trans. Frederick Etchells. New York: Dover Publications, 1986.

Leslie, Thomas. Louis I. Kahn: building art, building science. New York: George Braziller, 2005.

Losano, Alberto. “Renzo Piano.” online posting. ee Powerhouse.db. Datenbank. 21 June 2007. <http://www.architektur.tu-darmstadt.de/powerhouse/db/248,id_19,s_Papers.fb15>

Moore, Charles, et al. The Place of Houses. Berkeley, California: U. of California Press, 2000.

Norberg-Schulz, Christian. Meaning in Western Architecture. New York: Praeger, 1975.

Neuhart, Marilyn. Eames House. Berlin: Ernst and Sohn, 1994.

Rowe, Colin. The Architecture of Good Intentions: towards a possible retrospect. London: Academy, 1994.

Ruskin, John. The Seven Lamps of Architecture. New York: Noonday Press, 1961.

Russell, Bertrand. A History of Western Philosophy. New York: Simon and Schuster, 1945.

Sekler, Eduard F. “Structure, Construction, Tectonics.” Structure in Art and in Science. Ed. Gyorgy Kepes. New York: George Braziller, 1965.

Seneca, Lucius Anneaus. On the Shortness of Life. New York: Penguin Group, 2005.

Smith, Thomas Gordon. Vitruvius on Architecture. Trans. Morris Hickey Morgan with emendations by Stephen Kellogg. New York: Monacelli Press, 2003.

Swank, Scott T. Shaker Life, Art and Architecture: hands to work, hearts to God. New York: Abbeville Press, 1999.

Thoreau, Henry David, Walden: or, Life in the Woods. New York: New American Library, 1999.

Ueda, Atsushi. The Inner Harmony of the Japanese House. Tokyo: Kodansha International, 1990.

Vitruvius Pollio, Marcus. The Ten Books on Architecture. Trans. Morris Hicky Morgan. New York: Dover Publications, 1960.

Weiner, Frank. Oral interview, 20 June 2007, by David Weissberger at the Research and Demonstration Facility on Price’s Fork Road in Blacksburg, Virginia. According to Weiner, Tschumi made the statement at the ACSA administrator’s conference in New York in November of 2001.

Wells, Malcolm. Gentle Architecture. New York: McGraw-Hill, 1981.

Wilson, Forrest. The Joy of Building: restoring the connection between architect and builder. New York: Van Nostrand Reinhold, 1979.

Yoshida, Tetsuro. The Japanese House and Garden. Trans. Marcus G. Sims. New York: Frederick A. Praeger, 1956.

*All drawings and photographs by the author

Appendix:

Original Statement of Thesis, September 5th, 2006
The Poor House: True Economy in Architecture

In times of excess, restraint may be looked on with suspicion or pity. Those who question the prevalent notion of progress may be treated with similar disdain. But sacrifice is not without its rewards. Many of the conveniences of “modern life” introduce vexation rather than increase comfort. Technology shortens distance and speeds our productivity, but of

17 “By the words, *necessary of life*, I mean whatever, of all that man obtains by his own exertions, has been from the first, or from long use has become, so important to human life that few, if any, whether from savageness, or poverty, or philosophy, ever attempt to do without it.” (Thoreau, p.8)

“I had three pieces of limestone on my desk, but I was terrified to find that they required to be dusted daily, when the furniture of my mind was all undusted still, and I threw them out the window in disgust.” (Thoreau, p.28)

18 (Russell, p.47)

19 This Italian technique involves the repeated application and polishing of a plaster mixed with marble dust. Colors are integral rather than applied.

20 “A machine is a piece of domestic equipment which assists us in a *specific* task . . . It is useful to think of the spaces around machines not as rooms but as *machine domains*. Machines and machine domains exist to serve us in our house, not to dominate, and they serve best when they do not infringe on the more general purpose of rooms.”(Moore, p.82)

21 The cube’s rational nature is emphasized by the incommensurability of its sides. Though easily drawn and conceptualized geometrically, $5/\sqrt{30}$ cannot be measured empirically. (It is close to 13.41640787. . .)

22 “The rule of a household is a monarchy, for every house is under one head.” (Politics, Book I:7)

23 “The family is the association established by nature for the supply of men’s everyday wants.” (Politics, Book I:2)

24 Norberg-Schultz makes a similar observation comparing the treasuries at Delphi with the Roman Temple of Fortuna. “. . . the path leads past the treasuries and memorials of the different city states. As representatives of Greek democratic society, none of them were allowed to dominate the others. [Vincent Scully notes that] ‘The movement is like that of free persons in a crowd,’ and the buildings are conceived of as individual plastic units” (Norberg-Schultz, p.32). By contrast, “Continuity is a basic formal property of the sanctuary [of Fortuna Primigenia] at Palestrina. It is not composed of individual plastic bodies, such as its Greek counterpart in Delphi, but consists of terraces, colonnades, ramps and stairs, which are unified to form an integrated whole” (Norberg-Schultz, p.49).

25 (Kahn, p.43)

Bibliography:

Aristotle. Works: Vol. # IX of Great Books of the Western World. Ed. Ross, William David. Chicago: Encyclopedia Britannica, 1955.

Alberti, Leon Battista. On the Art of Building in Ten Books. Trans. Joseph Rykwert, Neil Leach, and Robert Tavernor. Cambridge, Massachusetts: MIT Press, 1988.

Berry, Wendell. Home Economics: fourteen essays. San Francisco: North Point Press, 1987.

Blaser, Werner. Mies van der Rohe: the art of structure. Trans. D.Q. Stephenson. New York, Praeger, 1965.

Brand, Stewart. How Buildings Learn: what happens after they’re built. New York: Viking, 1994.

Carver Jr., Norman. Japanese Folkhouses. Kalamazoo, Michigan: Documan Press, 1984.

Collins, Peter. Concrete: The Vision of a New Architecture. London: Faber and Faber, 1959.

Durand, Jean-Nicolas-Louis. Précis of the Lectures on Architecture. Trans. David Britt. Los Angeles, California: Getty Research Institute, 2000.

Hales, Shelley. The Roman House and Social Identity. Cambridge, UK: Cambridge University Press, 2003.

Holl, Steven. Rural and Urban House Types in North America. New York: Pamphlet Architecture, 1982.

Friedman, Avi. Peeking through the keyhole: the evolution of North American Homes. Montreal: McGill-Queen’s U. Press, 2002.

Futagawa, Yukio, Ed. Frank Lloyd Wright: Usonian Houses. Tokyo: A.D.A Edita, 2002.

Johnson, Philip. Mies Van Der Rohe. New York: Museum of Modern Art, 1947.

Kahn, Louis. Essential Texts. Ed. Robert Twombly.

itself, it does not assure a better life. In the 1950’s, women were promised that the vacuum cleaner, dish washer, and other appliances would liberate them from housework. This has not proved to be the case. The time we “save” is often “spent” in maintenance of our machines or ruined by the noise and pollution they create. Life has gotten quicker and busier, but we have lost much at the same time. A real sense of place has been one of the casualties. Quiet is another; we are surrounded all our lives by an electronic hum. In many ways, our conveniences have become burdens.

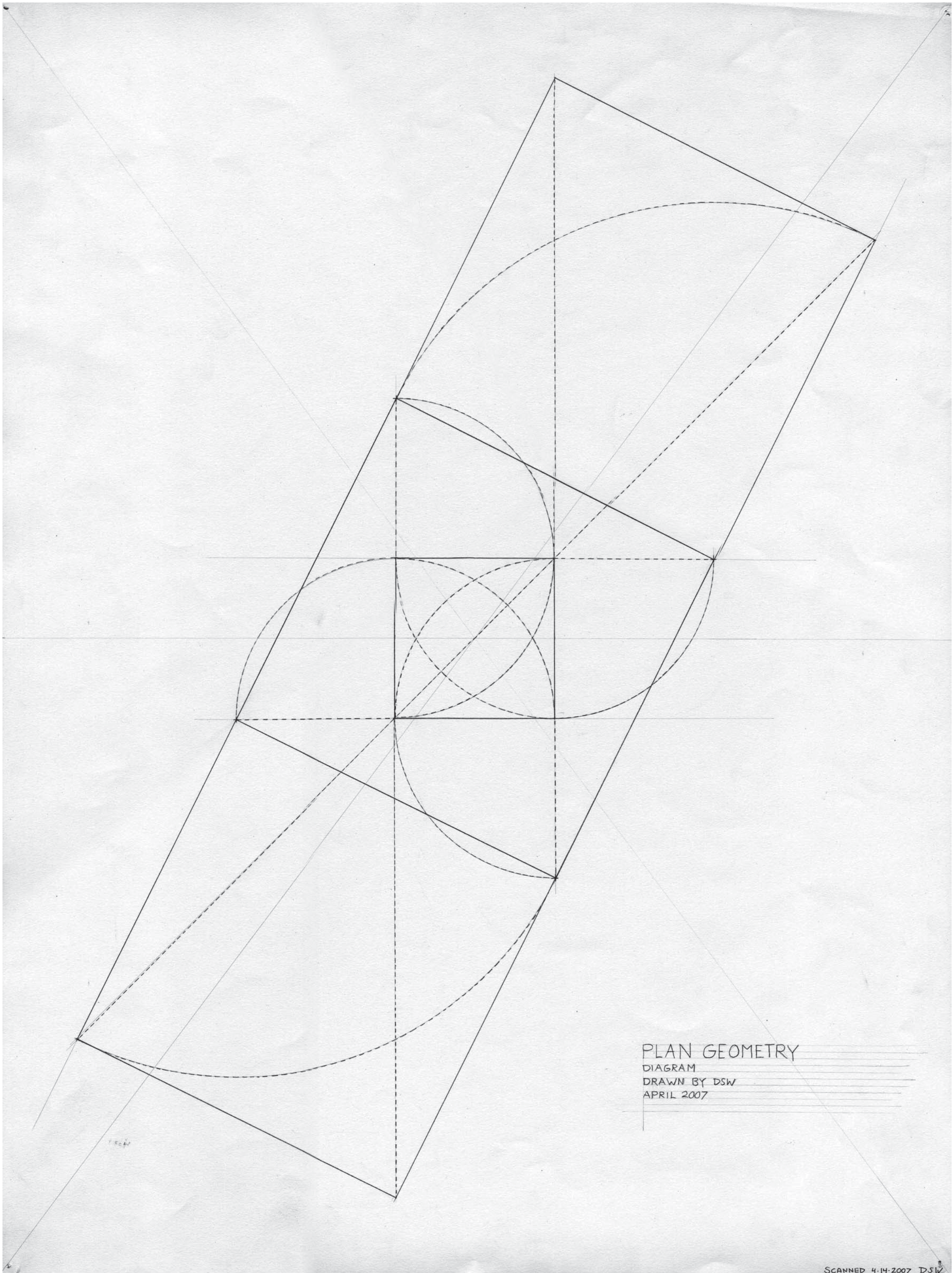
For some, America is excess. The liberty to consume is seen as the essential American value, the core of our way of life. But there also exists a very American strain of questioning the ultimate value of technological and material excess. This contrariness can be seen in such diverse manifestations as the Shakers, Thoreau, and Wendell Berry. They all had different motivations (religious, philosophical, ecological) for their renunciations of some of the cocooning comfort of technology. Even in poetry, American scholars recognize, alongside Walt Whitman’s love of abundance and excess, the jewel-like spiritual precision of Emily Dickinson.

Material goods have gained a prominent place in directing our lives. The ease with which we can acquire things blinds us to their cost. As early as 1854, Thoreau wrote, “I had three pieces of limestone on my desk, but I was terrified to find that they required to be dusted daily, when the furniture of my mind was all undusted still, and I threw them out the window in disgust” (Walden, page 28). With the rise in popularity of disposable products, our houses have lost something as well. What is the house? It is a container for consumer goods, a real estate investment. As such, it must have everything that “the market” expects of it. Otherwise it will not sell. But houses are not for sale. They are not for generating wealth. They are for dwelling in.

For my thesis I will explore the architecture of economy. I will design an urban house where one can live a dignified life without much money. How do the houses we build burden us with expenditures of time and money through their assumptions? (Why, for example, do we have lawns? Do we need them? Is their value proportionate to the expense required to maintain them?) How can we design in a manner that will eliminate unnecessary expenditures? This leads to the question of what we consider necessary for life and what for a good (dignified, decent) life. These are philosophical questions whose answers I do not at present pretend to know. What balance can we strike between necessity and convenience, and where does beauty enter the question? In the 15th century, Alberti wrote about a beauty of balance: the perfect, he noted, was that to which nothing could be added, from which nothing could be taken away (Alberti, p.???).

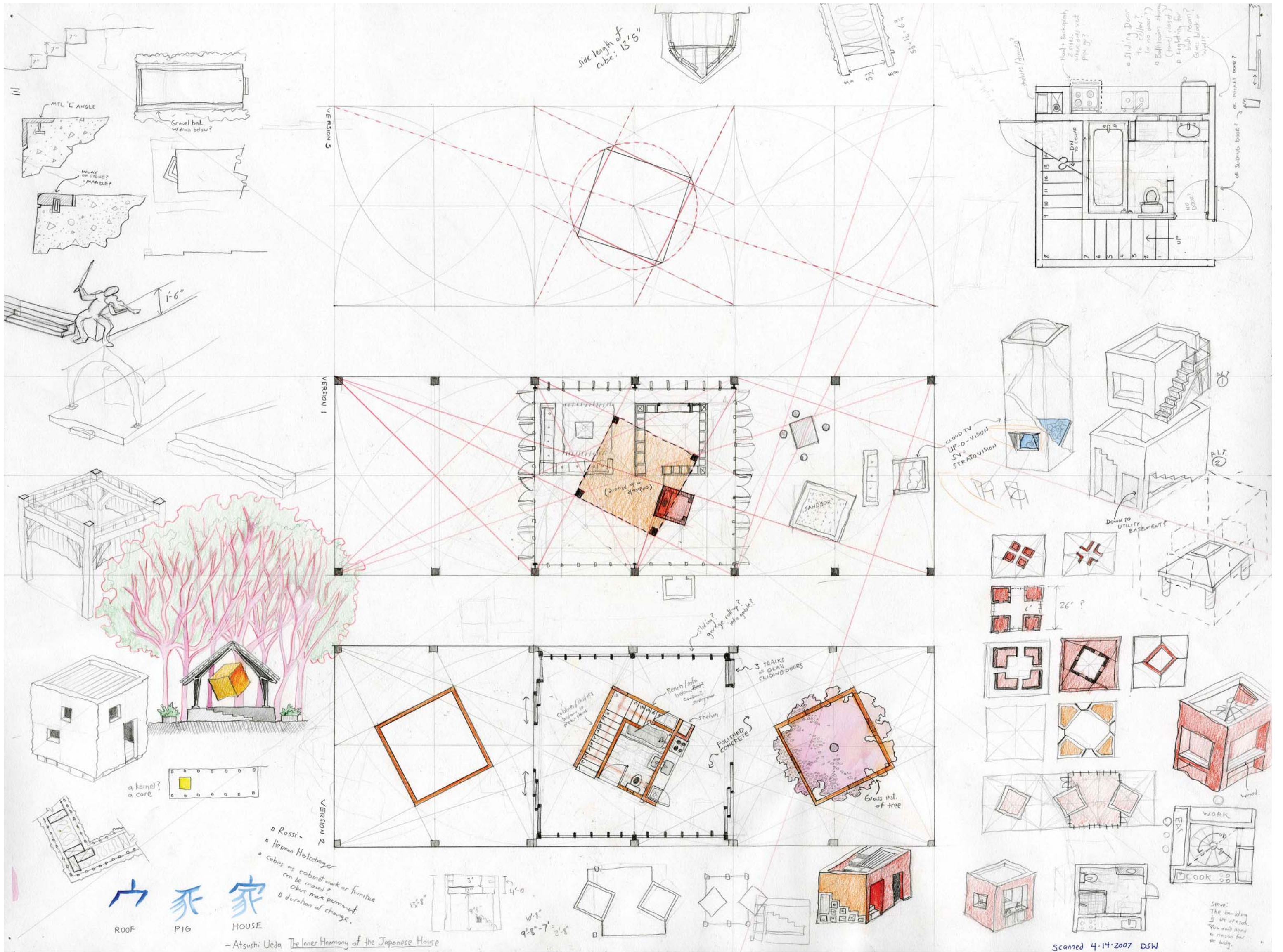
Some of my assumptions:

- Economy, from the Greek for management of the household, cannot be measured in monetary terms alone. It involves the quality of life, the celebration of the daily acts of living, and a sense of moderation.
- Work and labor are different. Life on earth as a human involves a balance between the two. The effect of design decisions on labor should be clearly thought out and accepted or rejected. A large house requires servants to maintain. These must be paid. This requires earning large amounts of money in a (usually) stressful environment. Thus do architectural decisions direct our lives. Architecture should accommodate a variety of choices. At present there are few choices represented in our housing stock and even fewer in the new houses being built.
- Economy does not mean austerity; it does not assume privation. It is a choice. The affordable house should be a delight to occupy. It does not encourage accumulation of material goods, but it does not deny their importance to our well-being and comfort. Economy is not the same as minimalism.
- The house should be capable of being loved in time. It should weather and acquire a patina, and so gain value with age, not from artificial fluctuations of the real estate market, but by being sanctified by use. It should show signs of being lived in: not damage, but wear like the polished thumbprint on the door handles of Cowgill, acknowledgment of the 100,000 lives that have passed through its doors.
- The poor house does not fight an unwinnable contest with nature. It accepts seasonal and diurnal variation in temperature and attempts to moderate rather than eliminate them. It accepts the inevitability of cycles of decay and repair.
- The poor house makes more sense in the city, where services are available and need not be replicated in each house.
- Poverty should not assume misery. Poverty of the checkbook and poverty of the spirit are different things. Usually we find them together. Is it possible to separate them?

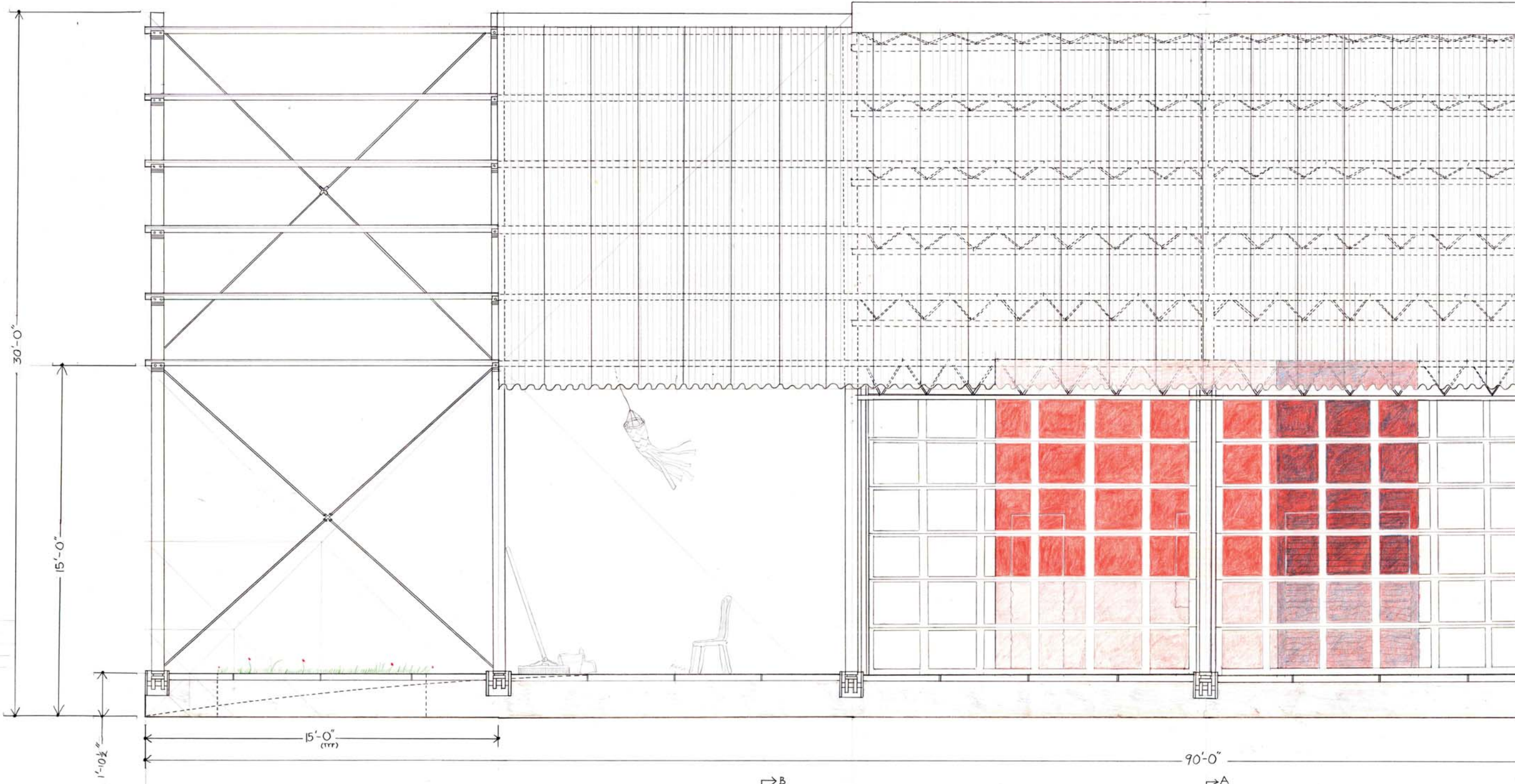


PLAN GEOMETRY
DIAGRAM
DRAWN BY DSW
APRIL 2007

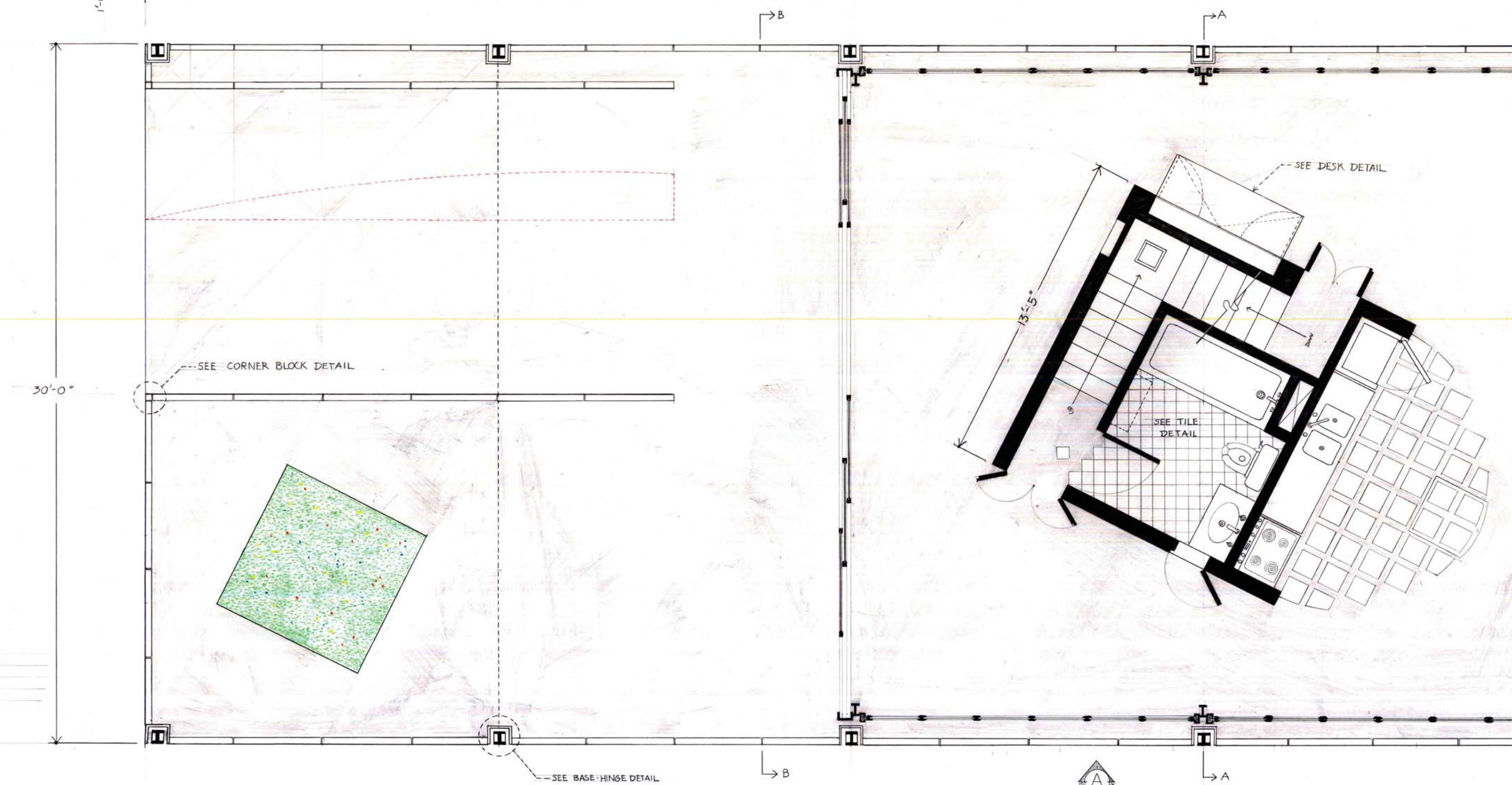
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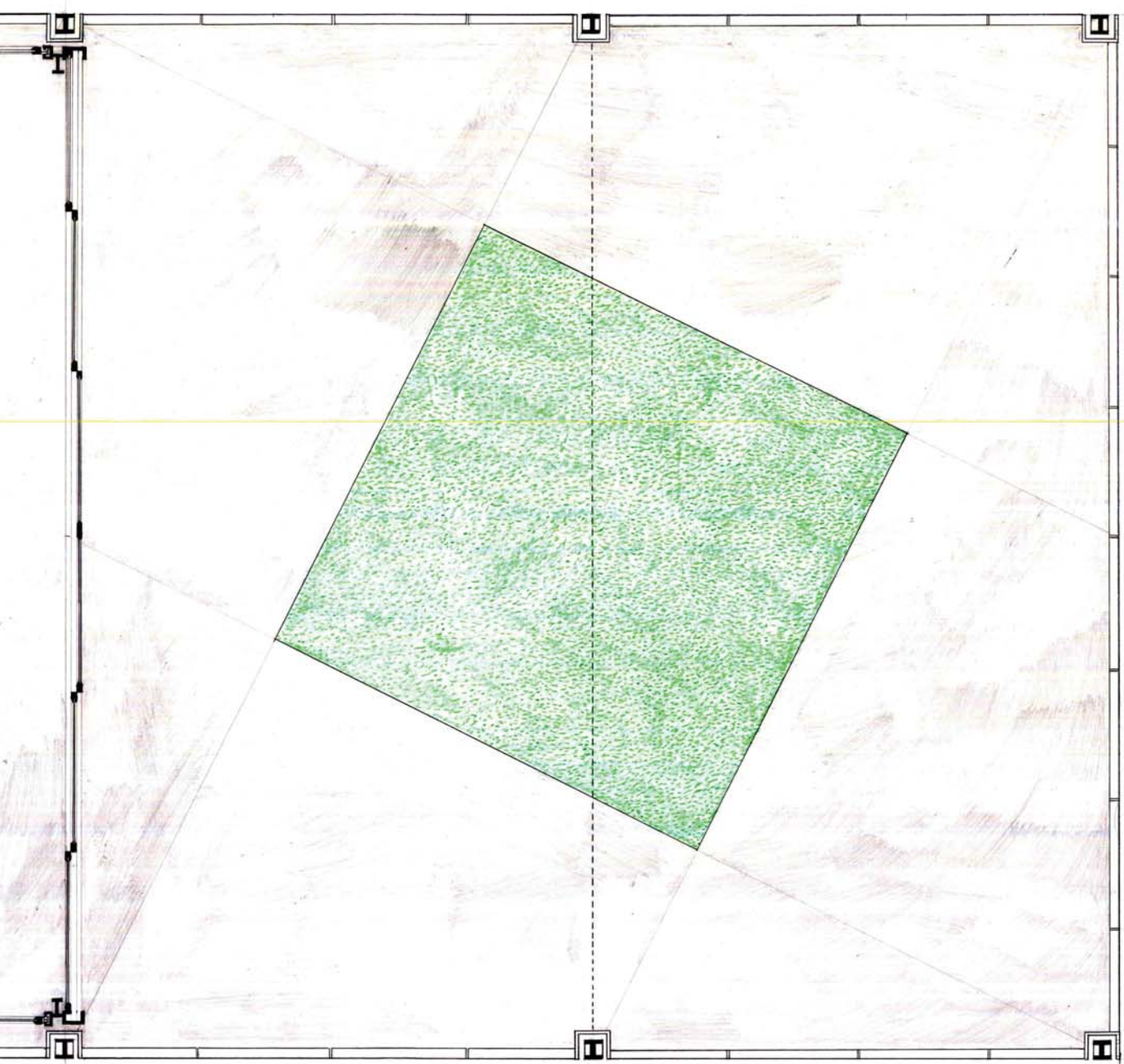
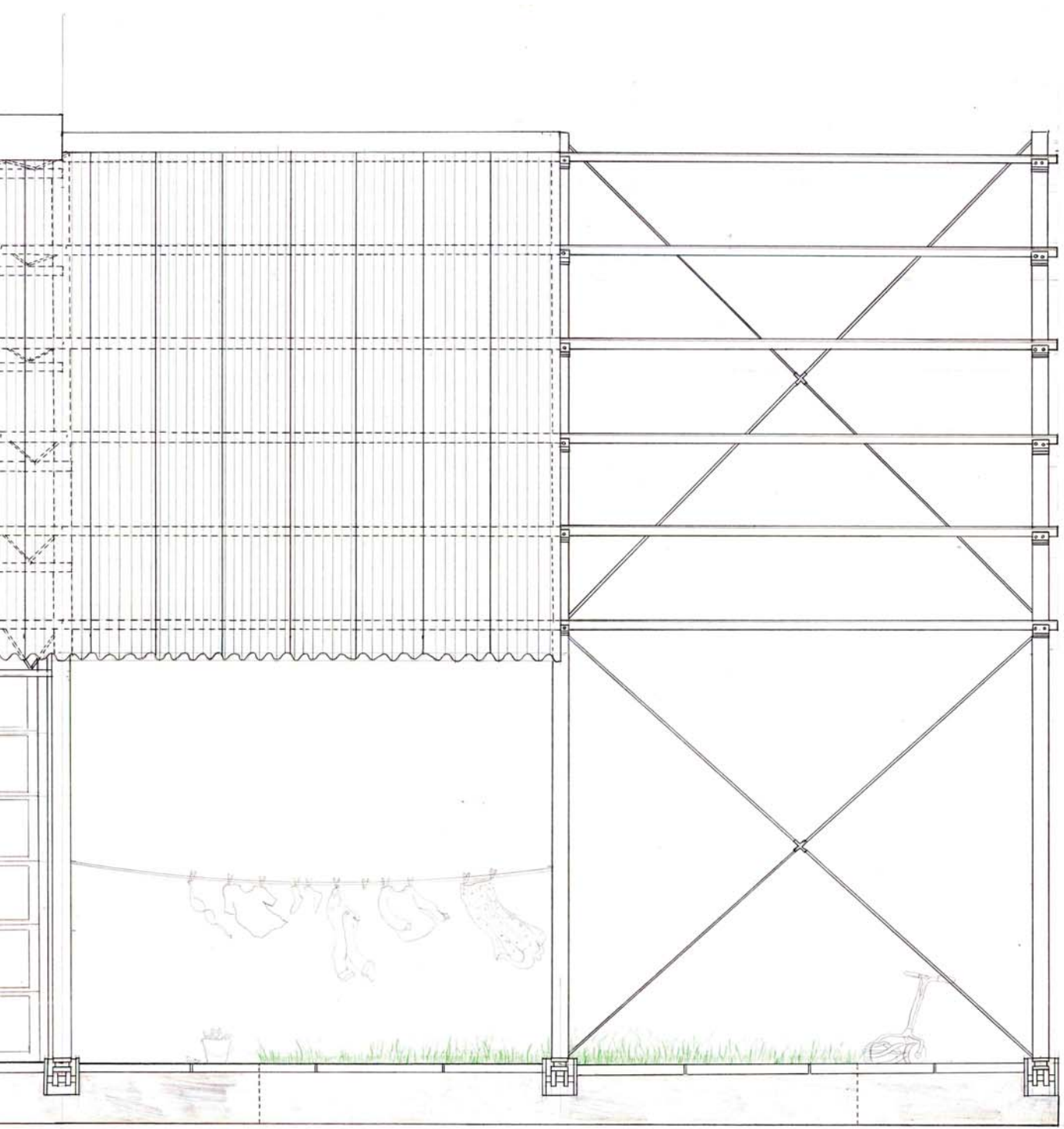


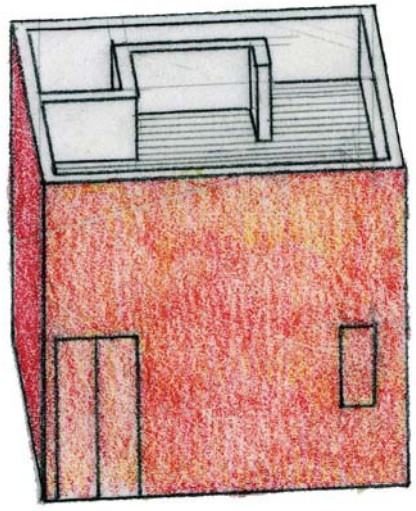
ELEVATION A
1/2" = 1'-0"
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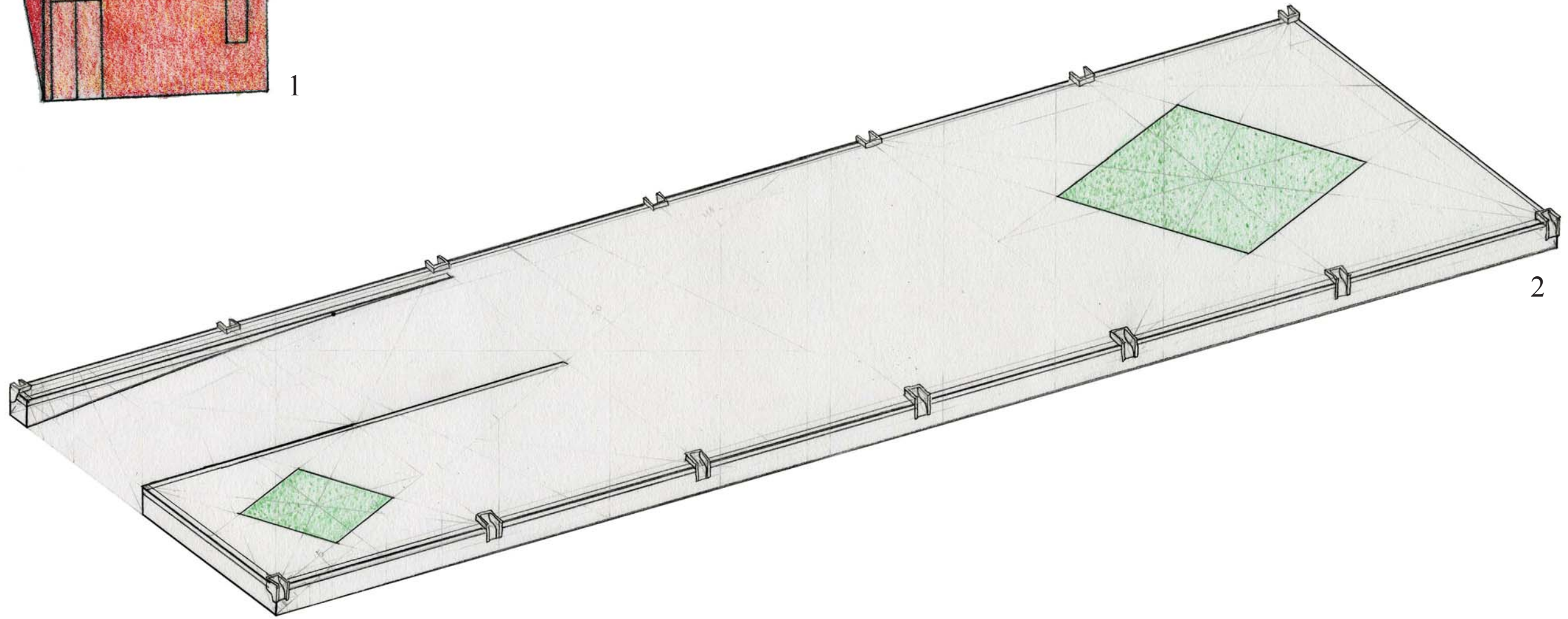
PLAN
1/2" = 1'-0"
DRAWN 5-3-2007 BY DSW



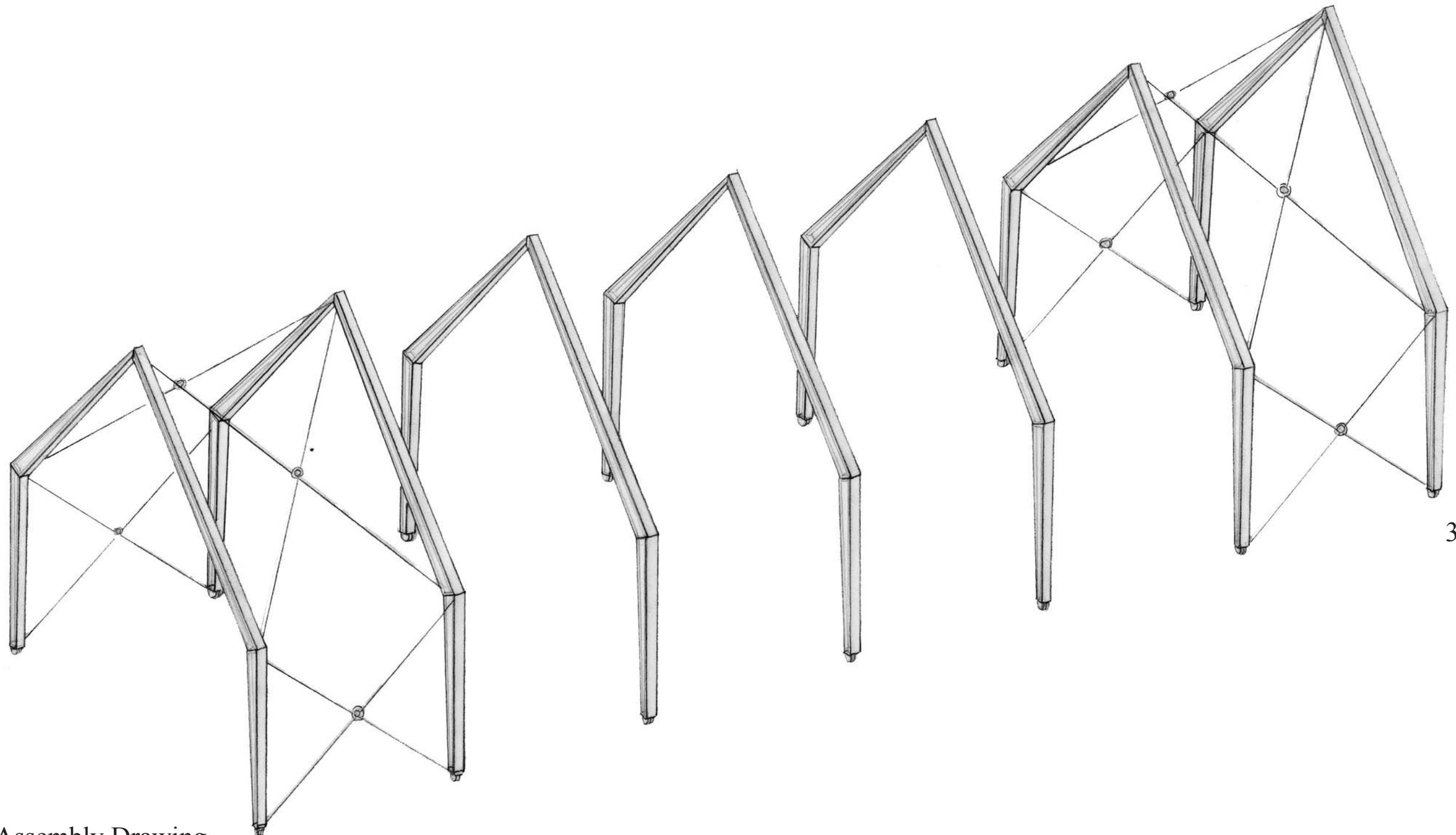




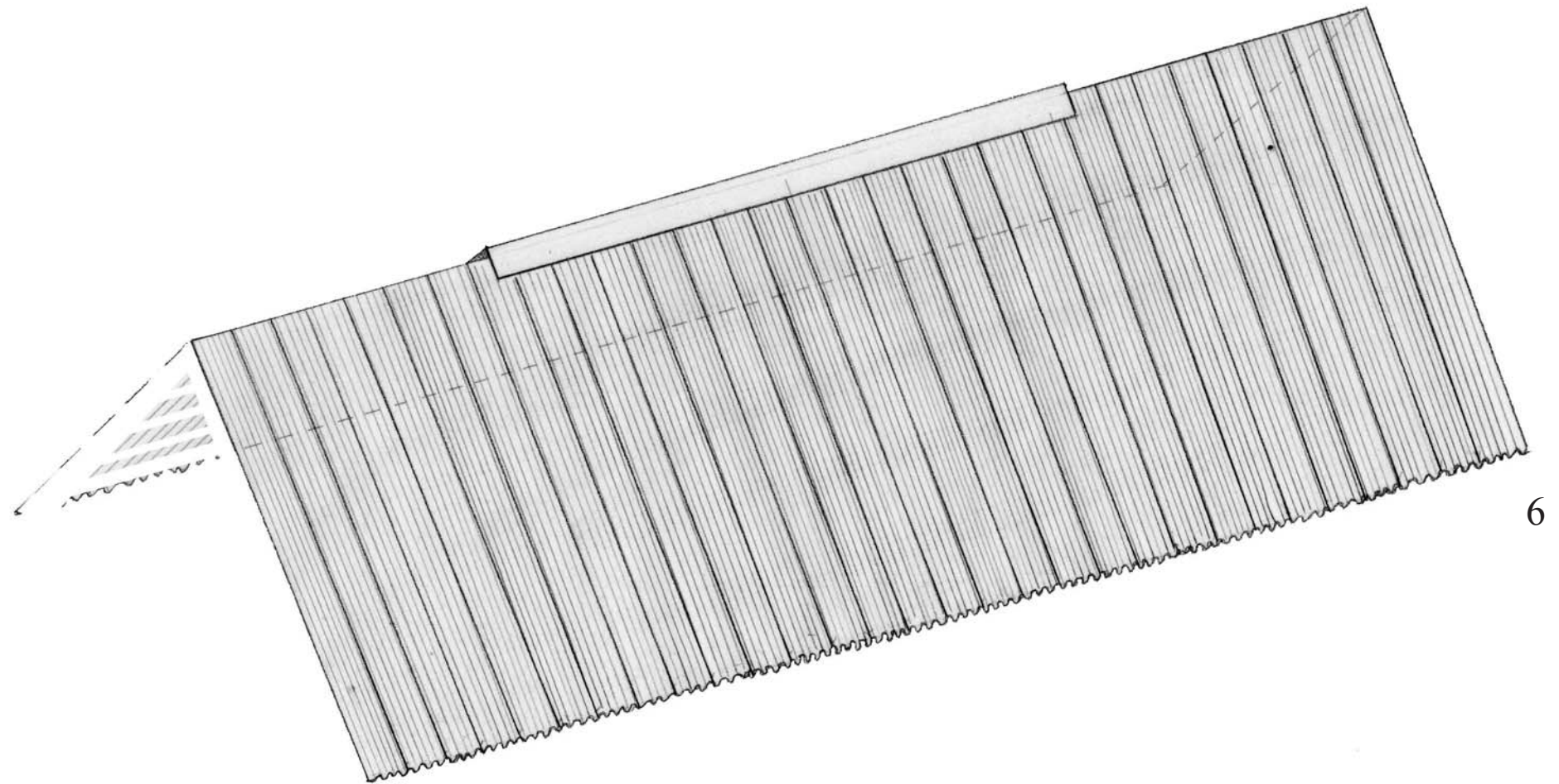
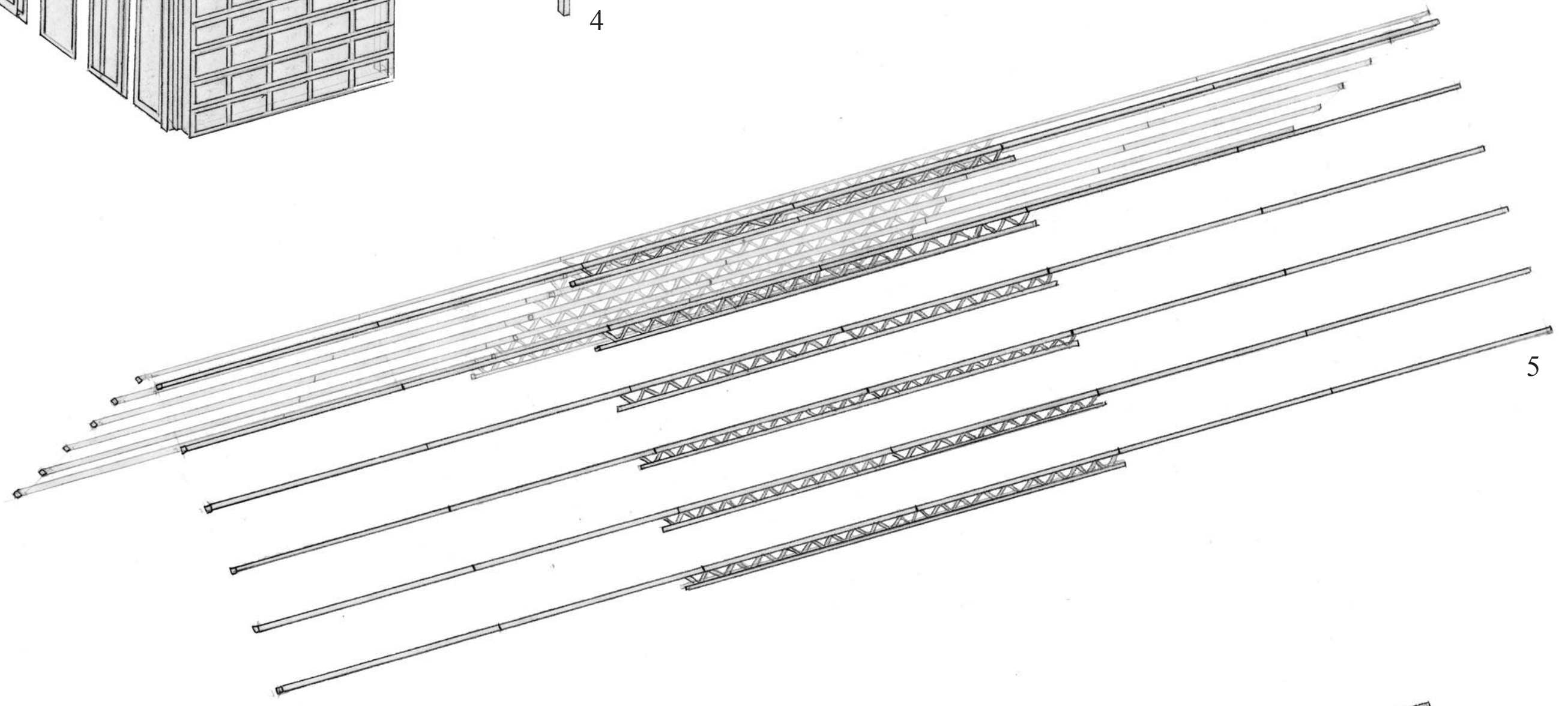
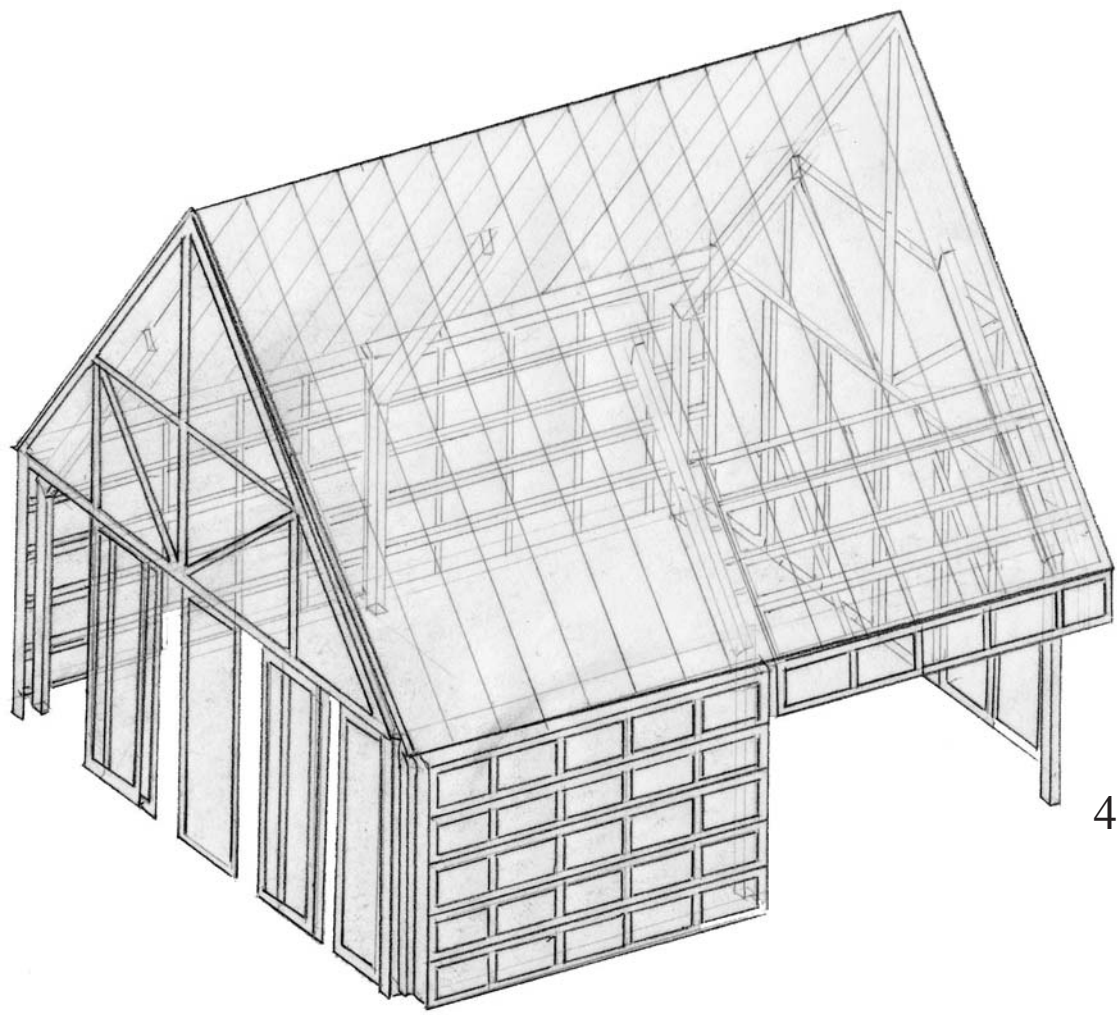
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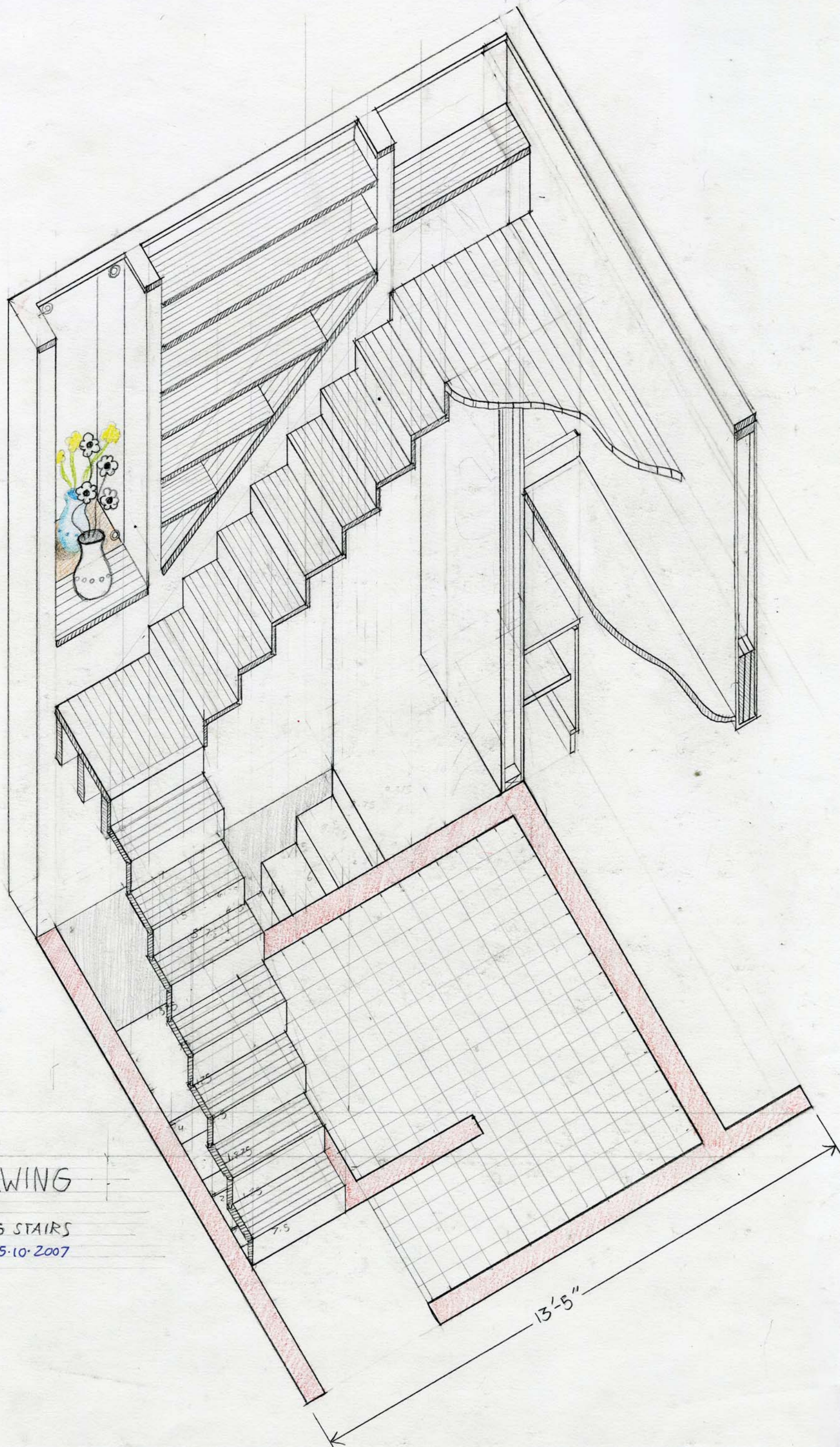
2



3



- 1 Red Cube
- 2 Foundation
- 3 Steel Rigid Frames
- 4 Thermal Enclosure
- 5 Steel Purlins
- 6 Polycarbonate Roof



4-16-2007 - SHOOTING AT VT
4-17-2007 -

ISOMETRIC DRAWING

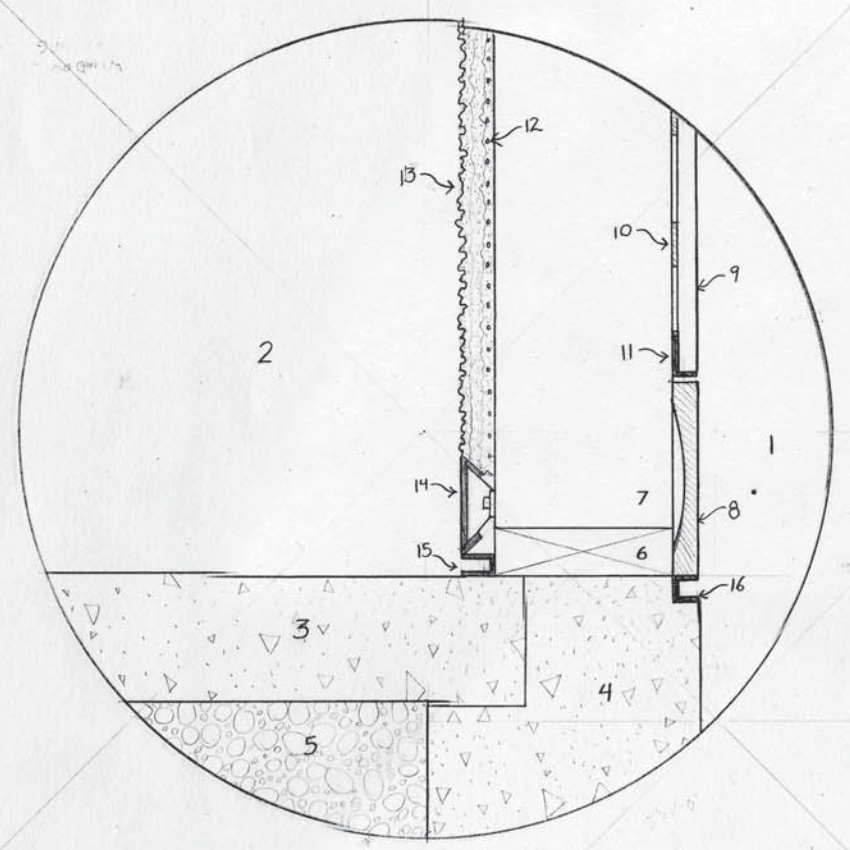
$\frac{1}{2}'' = 1'-0''$

INTERIOR OF CUBE SHOWING STAIRS

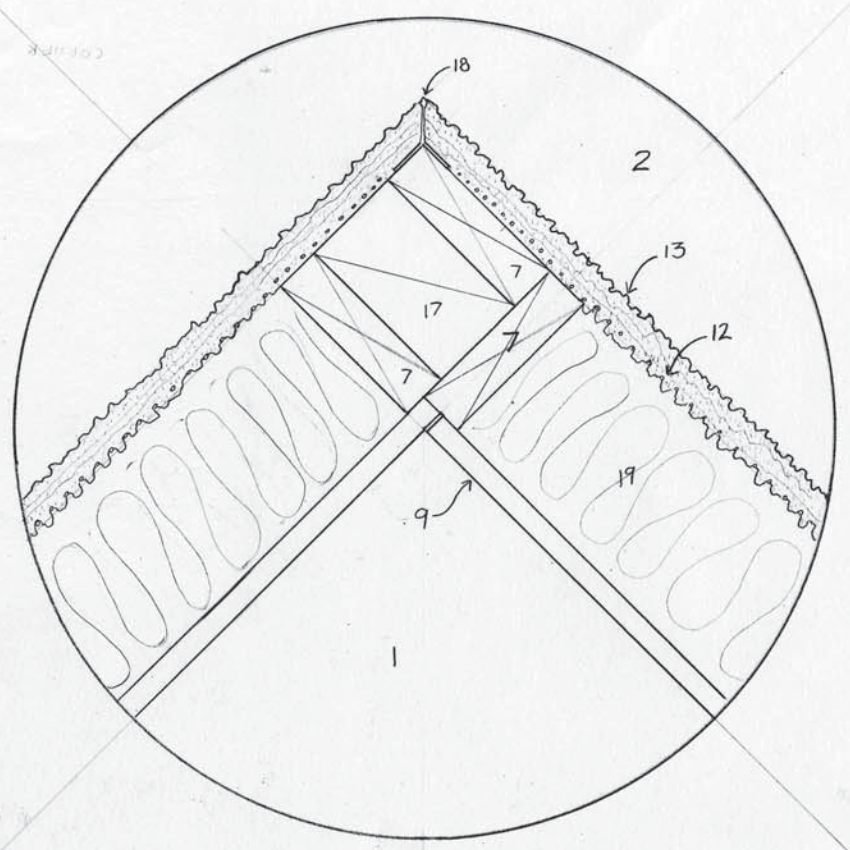
DRAWN BY DSW Scanned 5-10-2007

KEY

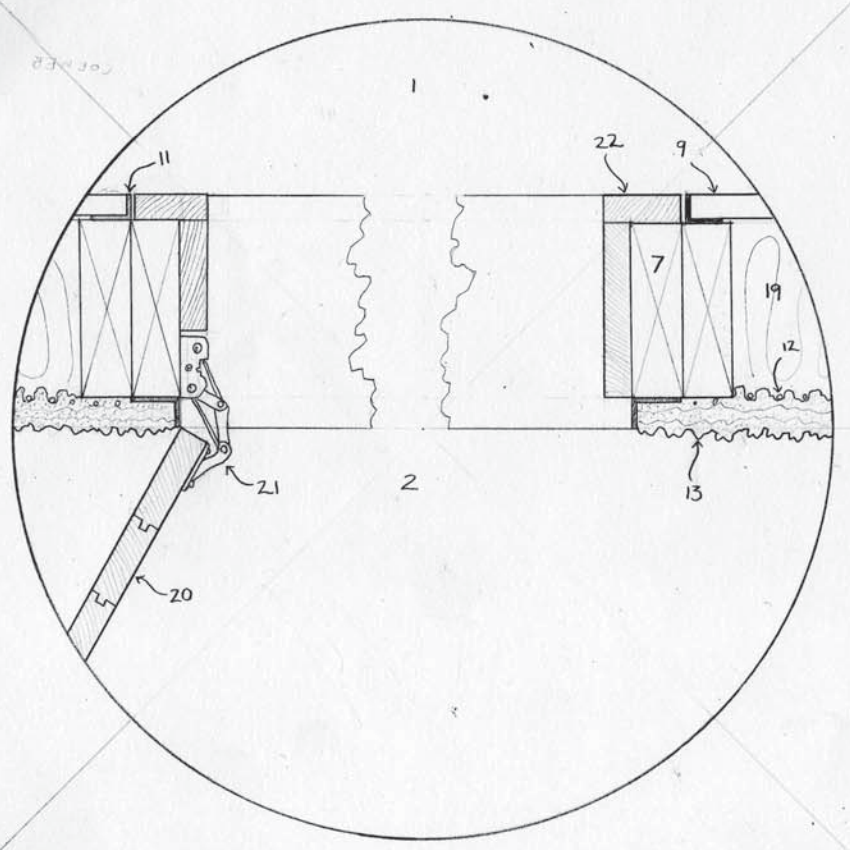
- 1 INSIDE OF CUBE
 - 2 OUTSIDE OF CUBE
 - 3 4" CONCRETE FLOOR SLAB
 - 4 FOUNDATION / BASEMENT WALL FOR CUBE
 - 5 GRAVEL FILL
 - 6 2x6 WOOD SILL PLATE
 - 7 2x6 WOOD STUD
 - 8 3/4" x 6" WOOD BASEBOARD W/ RELIEF
 - 9 1/2" GYPSUM BOARD
 - 10 1/4" x 2" WOOD FURRING STRIPS
 - 11 1 1/2" x 3/4" x 1/4" ALUMINUM ANGLE
 - 12 MTL EXPANDED LATH
 - 13 3 COATS STUCCO LUSTRO (RED)
 - 14 MTL CHANNEL BASEBOARD / PLASTER GROUND (PAINT RED)
 - 15 1" x 1/2" x 1/4" ALUMINUM CHANNEL
 - 16 3/4" x 3/4" x 1/4" ALUMINUM CHANNEL (CAST INTO FOUNDATION)
 - 17 WOOD BLOCKING @ 16" O.C.
 - 18 MTL CORNER BEAD
 - 19 BATT INSULATION WHERE INDICATED ON PLAN
 - 20 WOODEN DOOR, PAINT OUTSIDE RED
 - 21 180° HINGE
 - 22 WOOD TRIM BOARDS
 - 23 WOOD PARAPET CAP
- 5-1-2007 DRAWN BY DSW



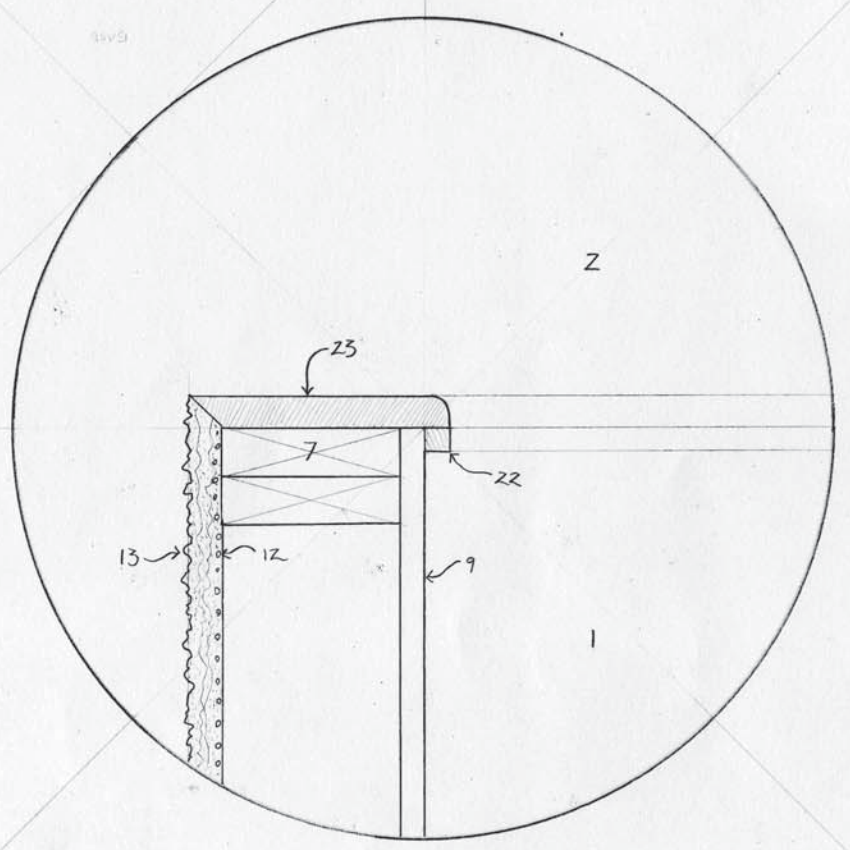
DETAIL 1A
CUBE TO FLOOR CONNECTION
3" = 1'-0"



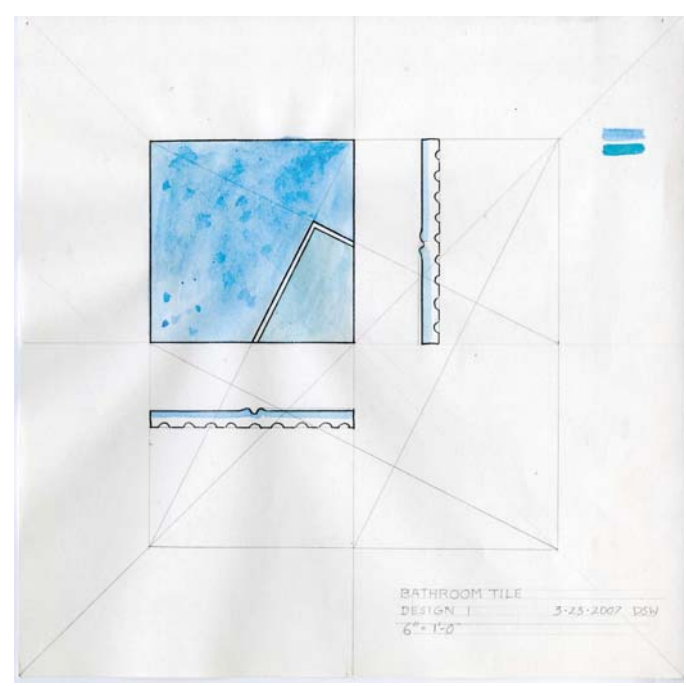
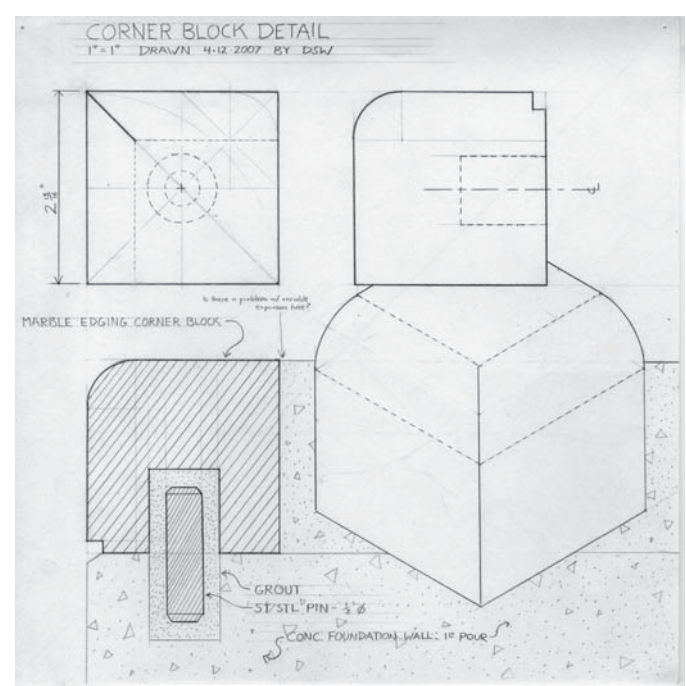
DETAIL 2A
CUBE CORNER SECTION (HORIZ)
3" = 1'-0"

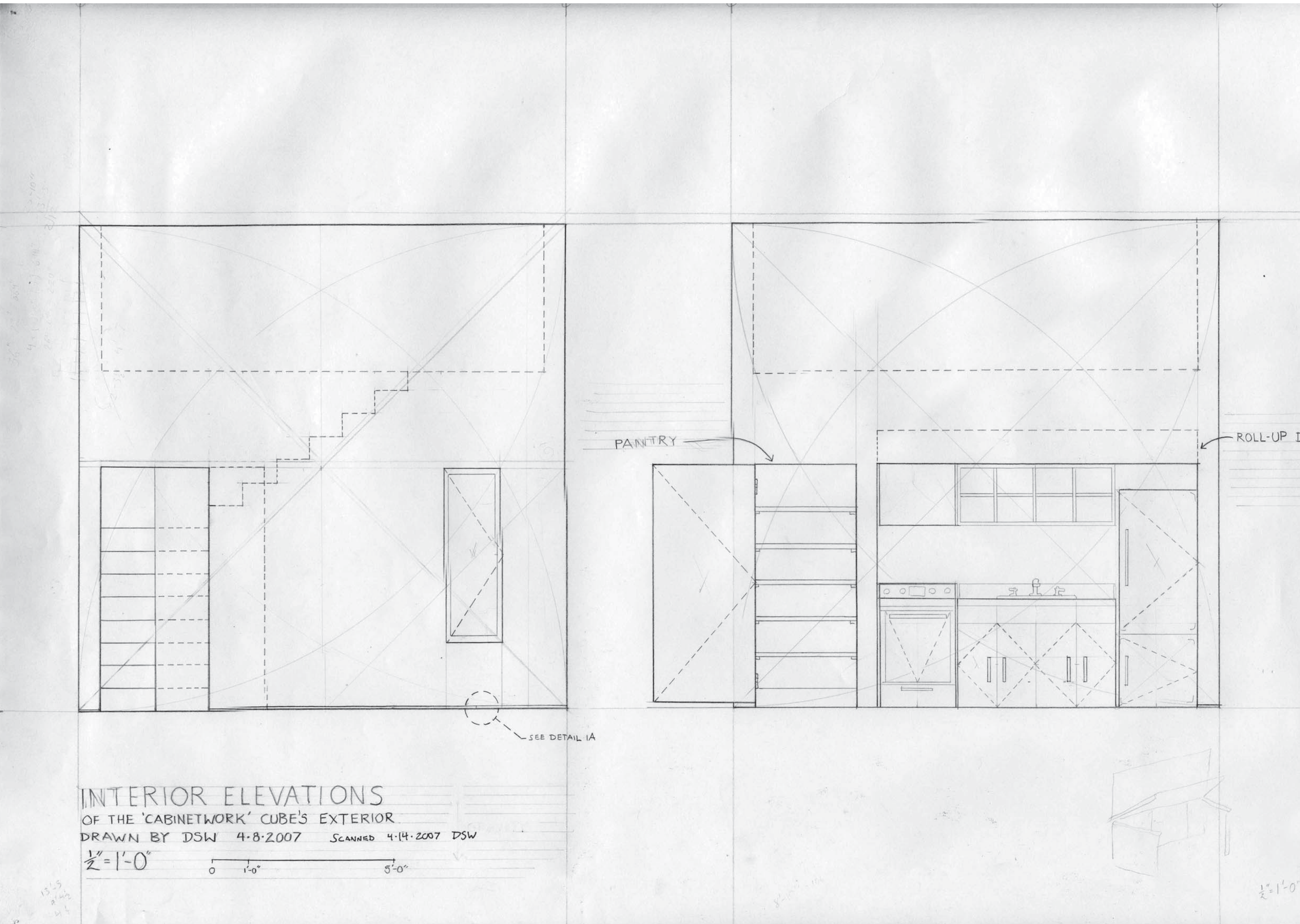


DETAIL 3A
WINDOW JAMB
3" = 1'-0"

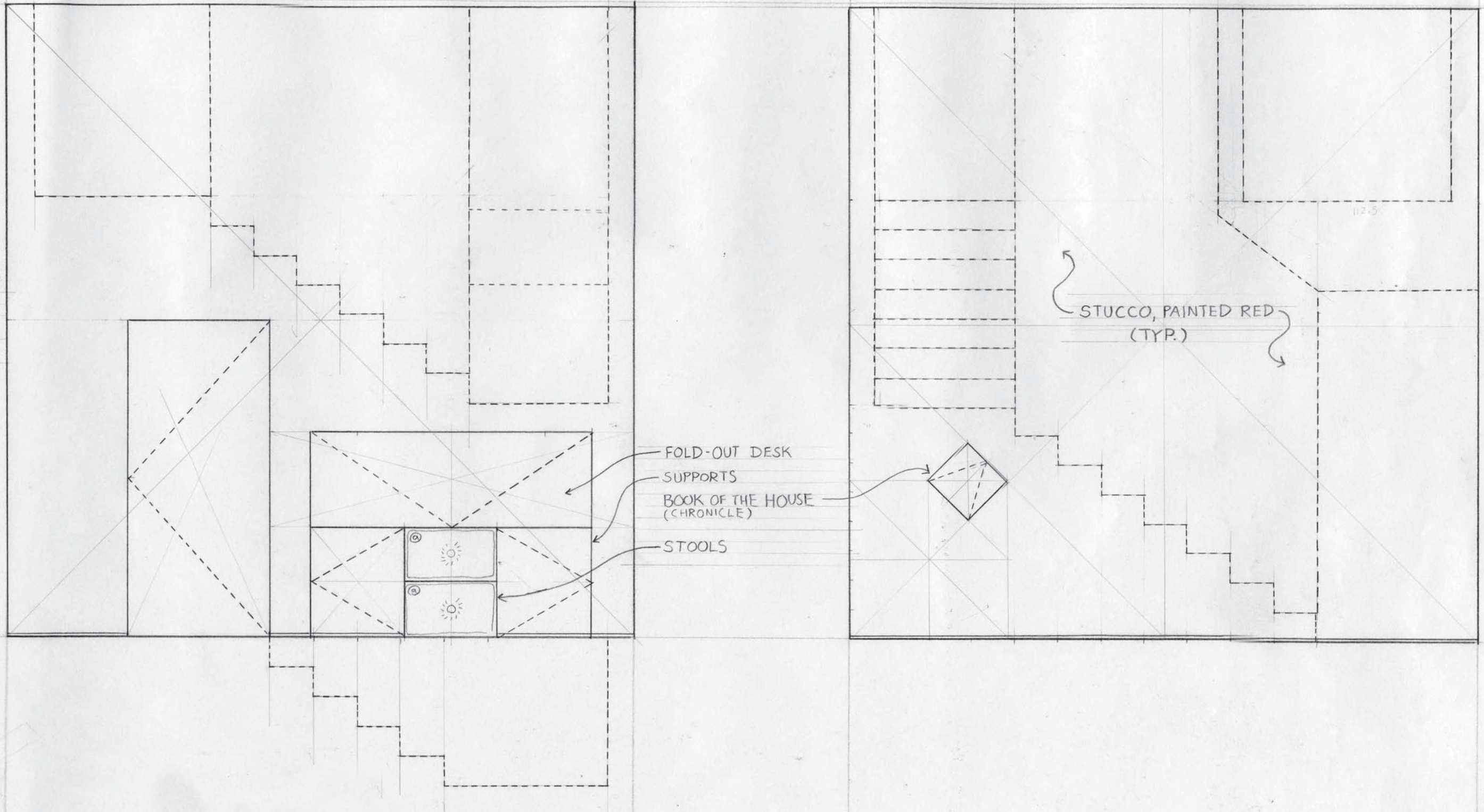


DETAIL 4A
CUBE PARAPET EDGE
3" = 1'-0"





DOOR

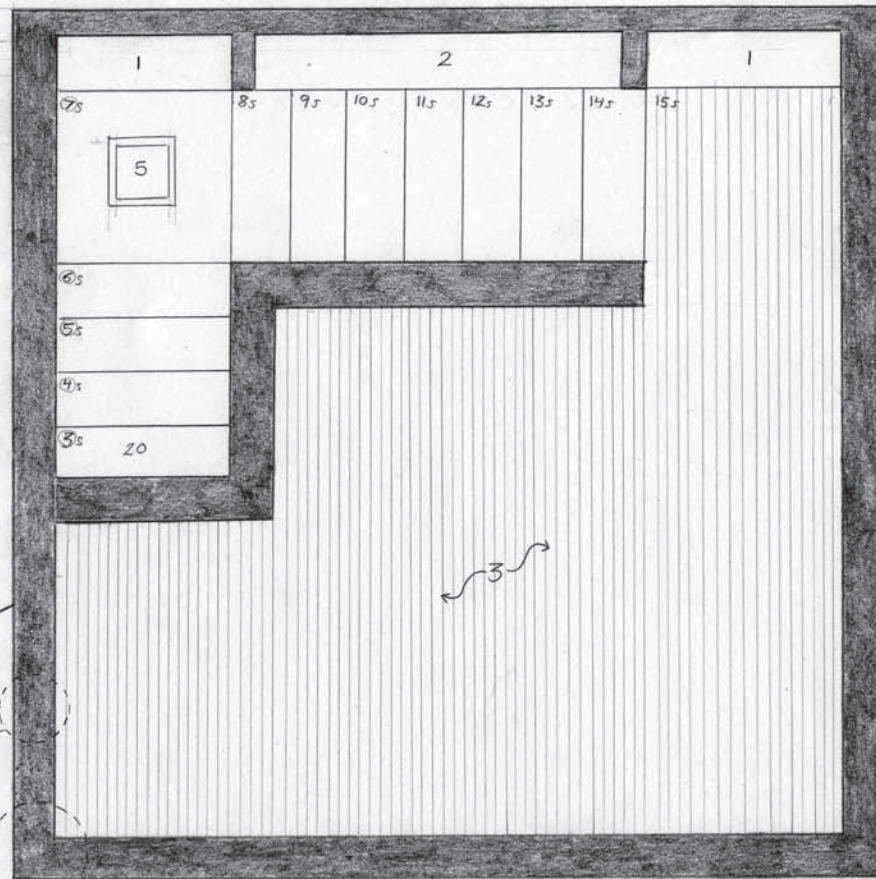


FOLD-OUT DESK
SUPPORTS
BOOK OF THE HOUSE
(CHRONICLE)
STOOLS

STUCCO, PAINTED RED
(TYP.)

-thicken wall @ desk
+ decrease width of stools
to get sufficient depth for cubbies
- put in shelves in that thick wall
@ landing?

UPPER LEVEL
11'-3" ABOVE GRADE



SEE DETAIL 4A

SEE DETAIL 2A

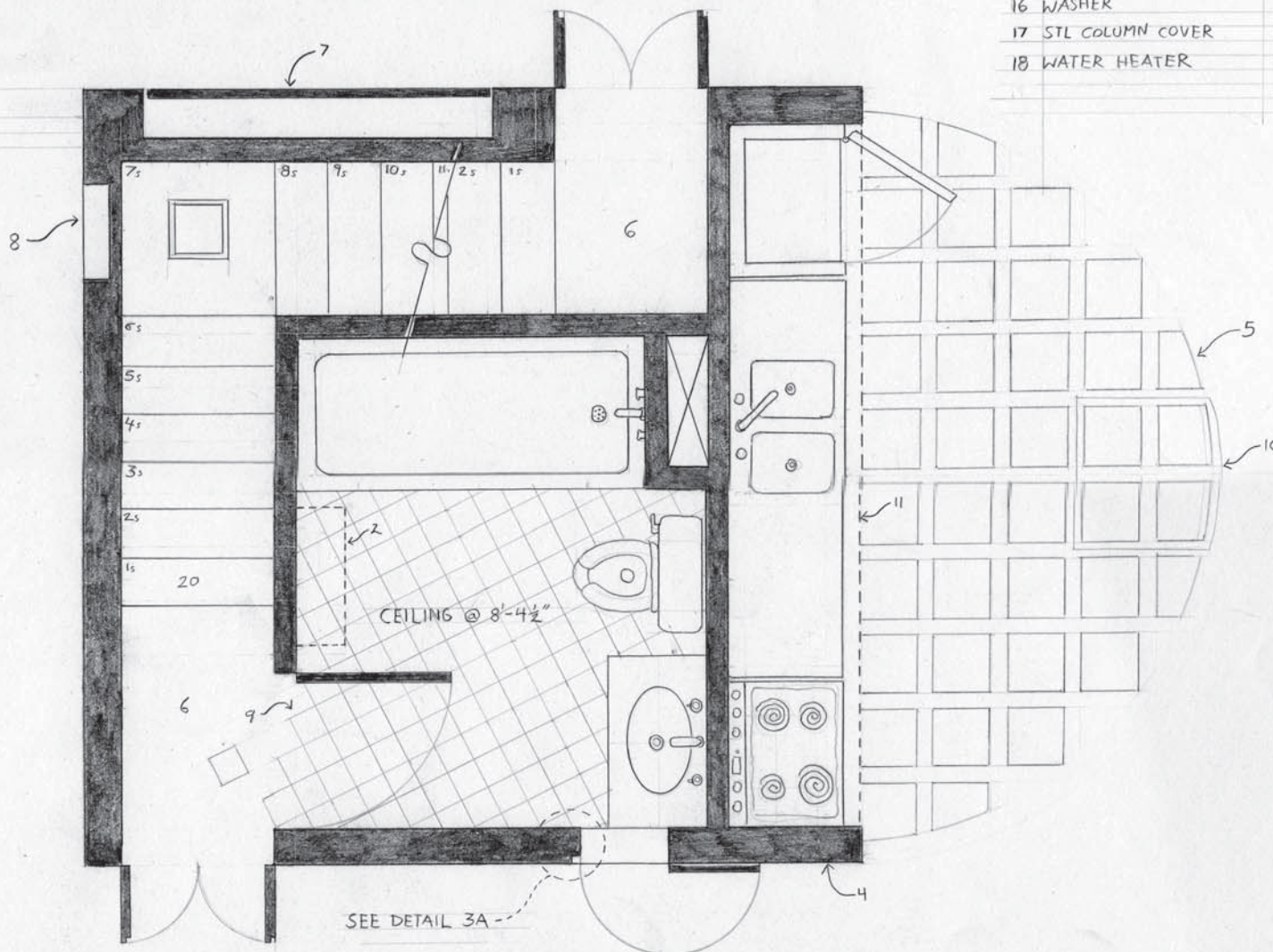
CUBE FLOOR PLANS

1/2" = 1'-0"
DRAWN 5-3-2007 DSW

KEY

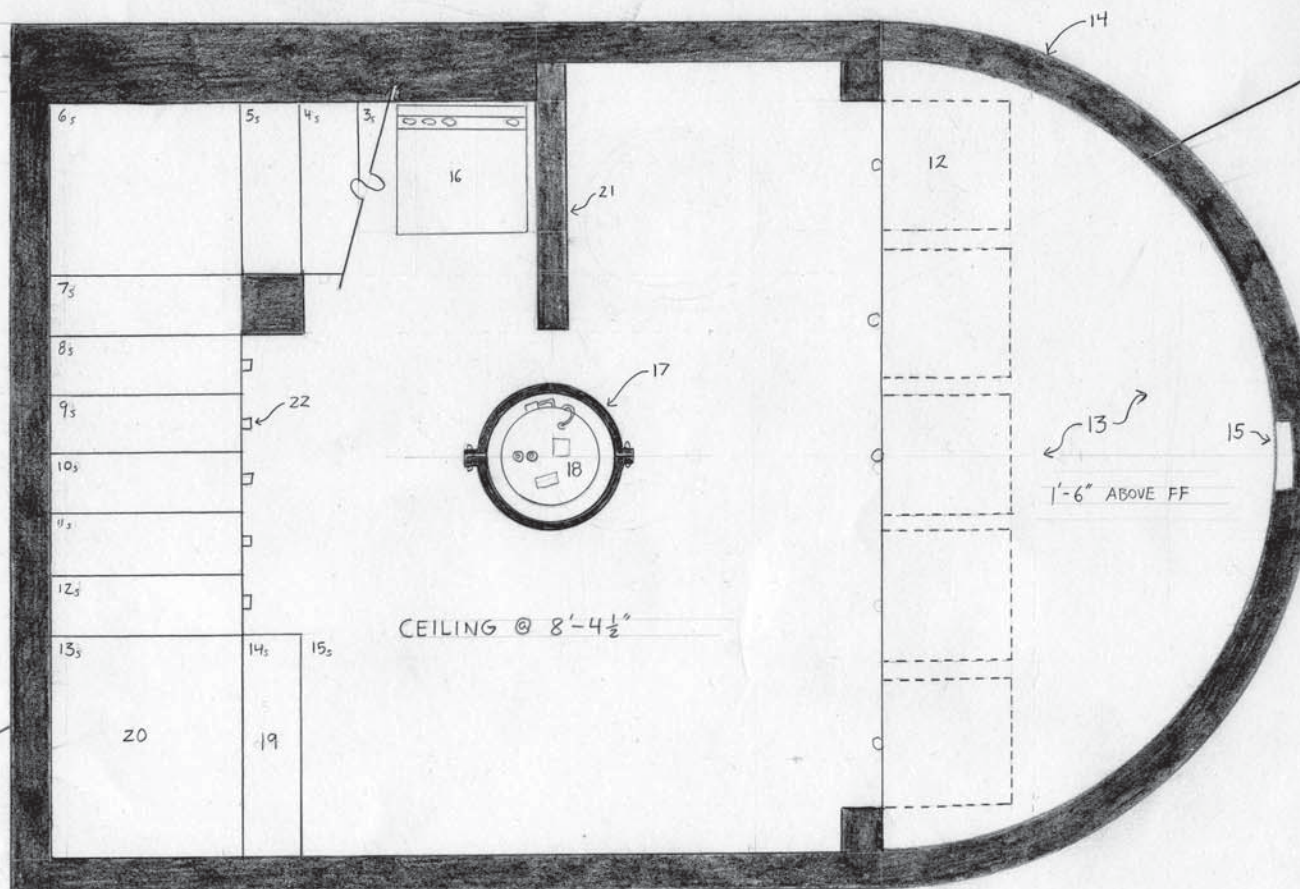
- | | |
|-------------------------|---------------------|
| 1 BENCH | 19 CONCRETE STEP |
| 2 SHELVES | 20 WOODEN STEP |
| 3 HARDWOOD FLOORING | 21 2x4 STUD WALL |
| 4 2x6 STUD WALL | 22 STL STAIR HANGER |
| 5 GLASS BLOCK | |
| 6 POLISHED CONCRETE | |
| 7 FOLD-DOWN DESK | |
| 8 BOOK NICHE | |
| 9 6"-6" CERAMIC TILE | |
| 10 ESCAPE HATCH | |
| 11 COILING MTL DOOR | |
| 12 TRUNDLE DRAWER | |
| 13 SLEEPING PLATFORM | |
| 14 CONCRETE WALL | |
| 15 CAST-IN-PLACE LADDER | |
| 16 WASHER | |
| 17 STL COLUMN COVER | |
| 18 WATER HEATER | |

MAIN FLOOR
1'-10 1/2" ABOVE GRADE

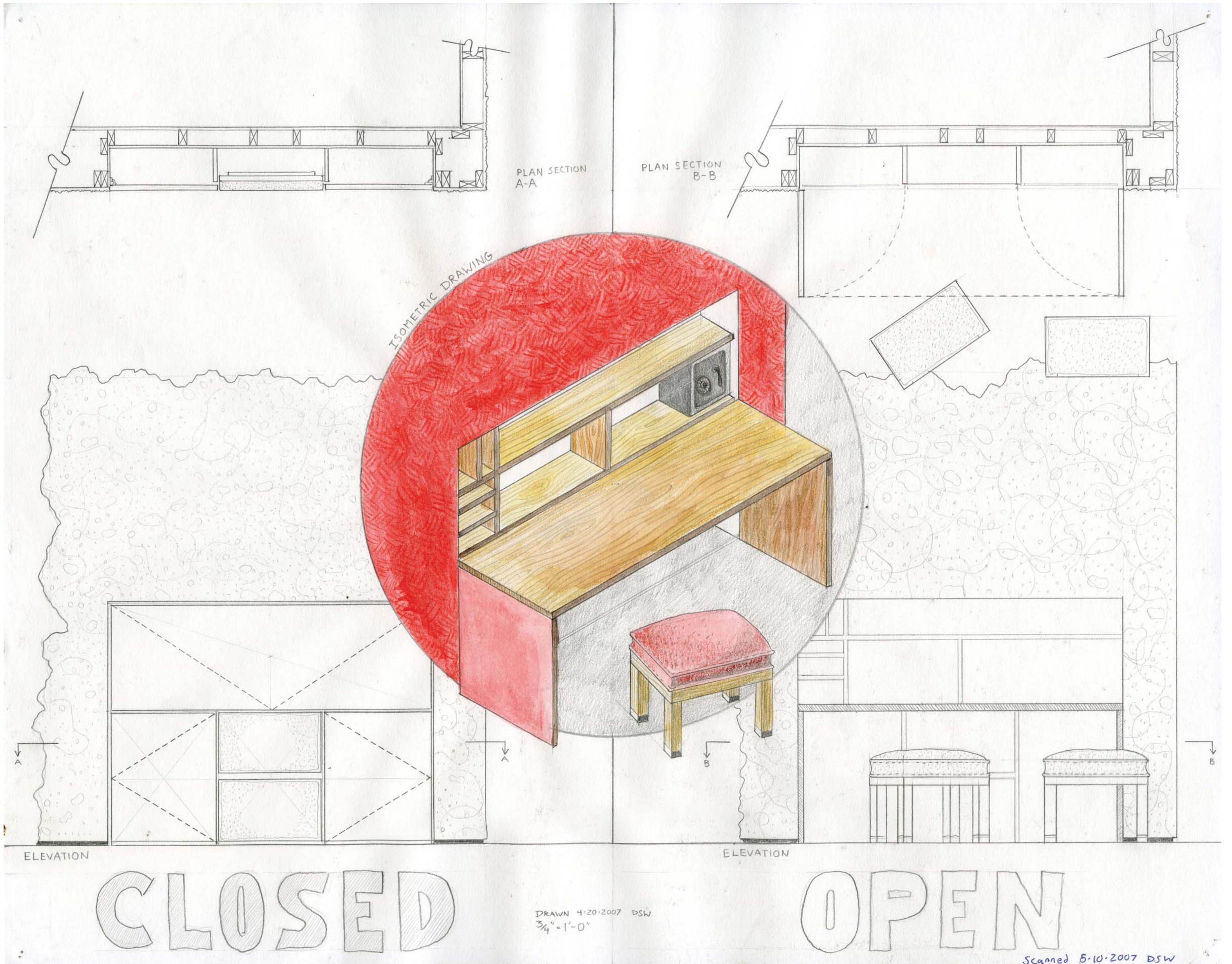


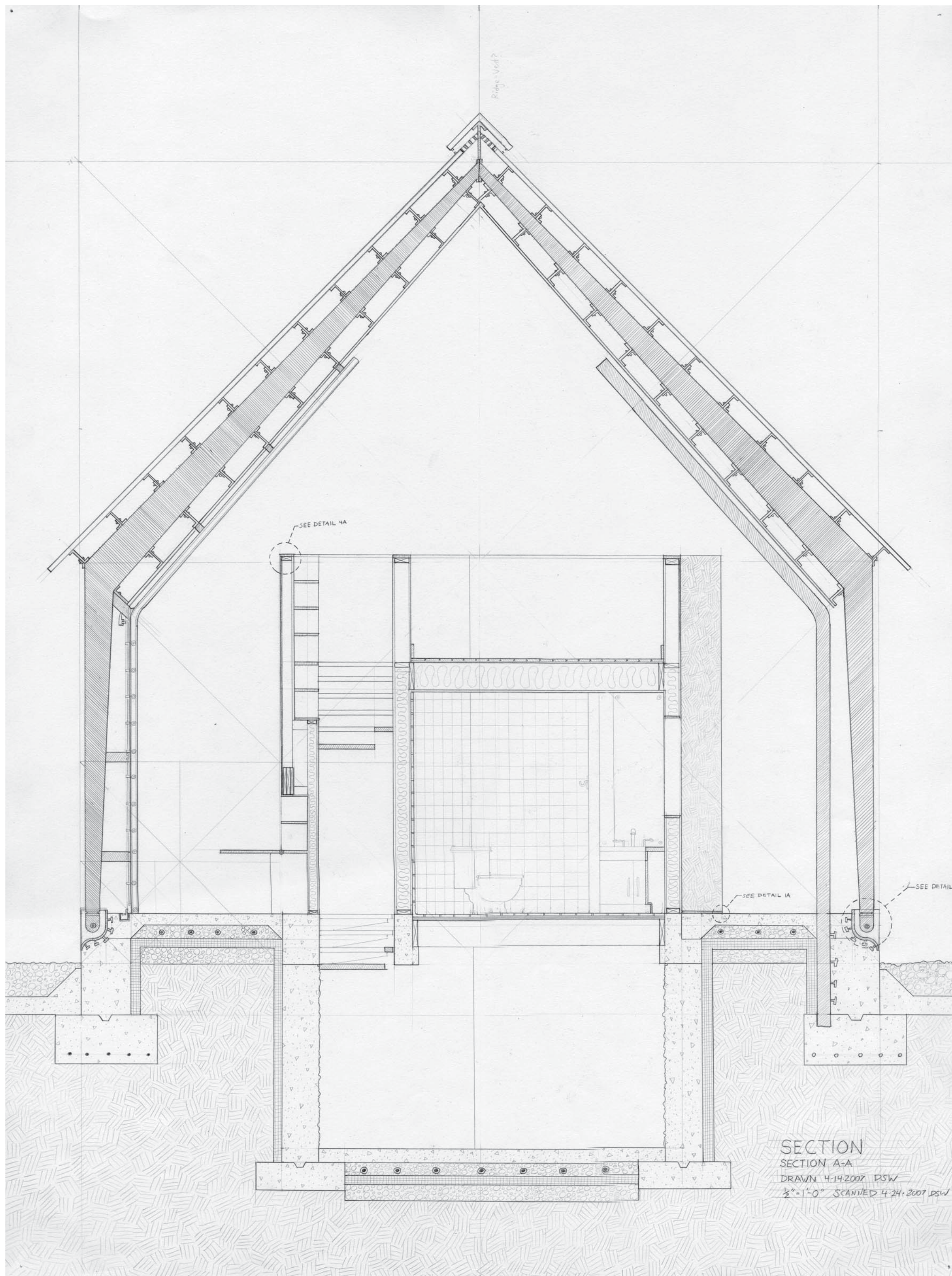
SEE DETAIL 3A

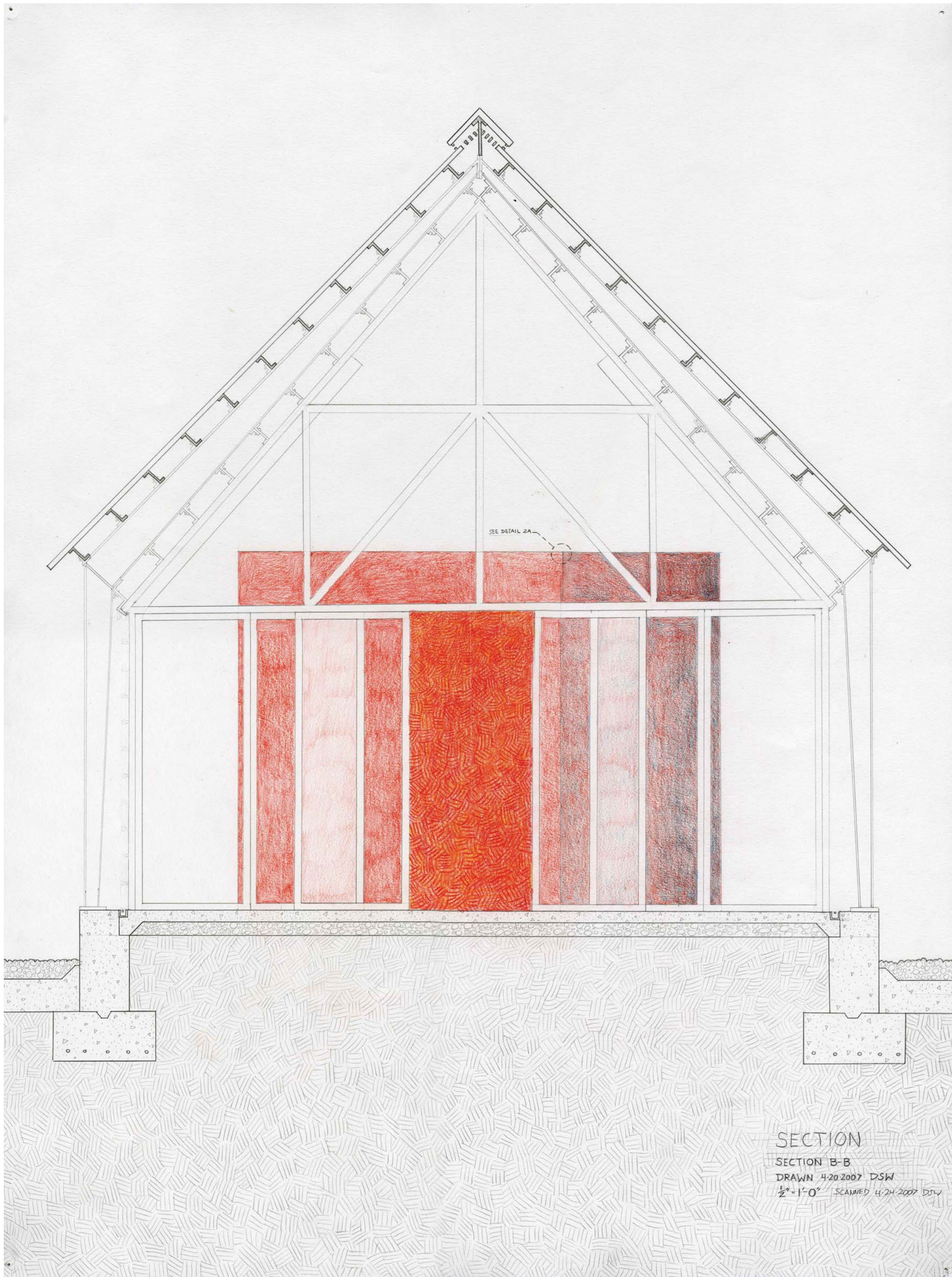
LOWER LEVEL
7'-6" BELOW GRADE

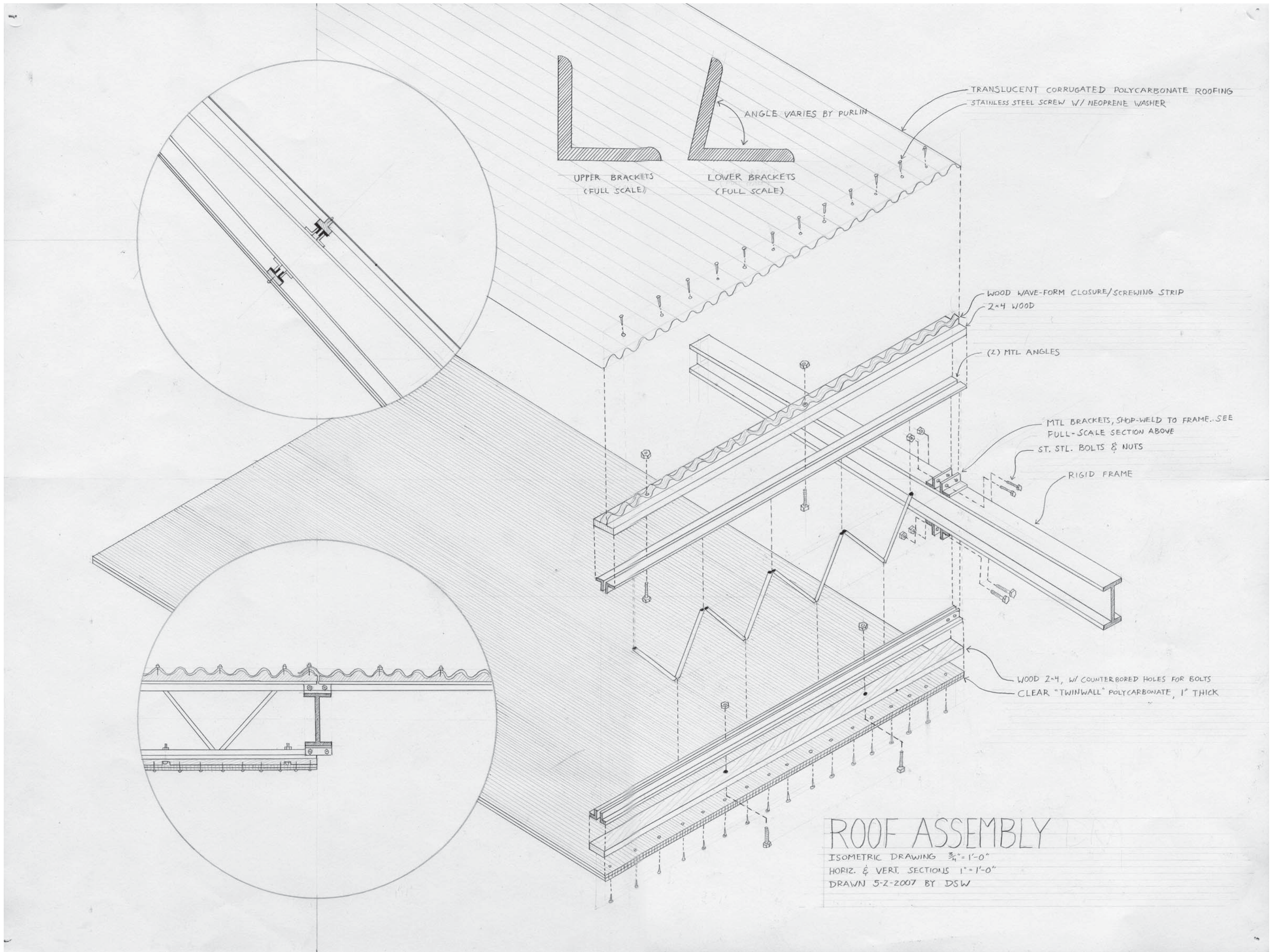


1'-6" ABOVE FF



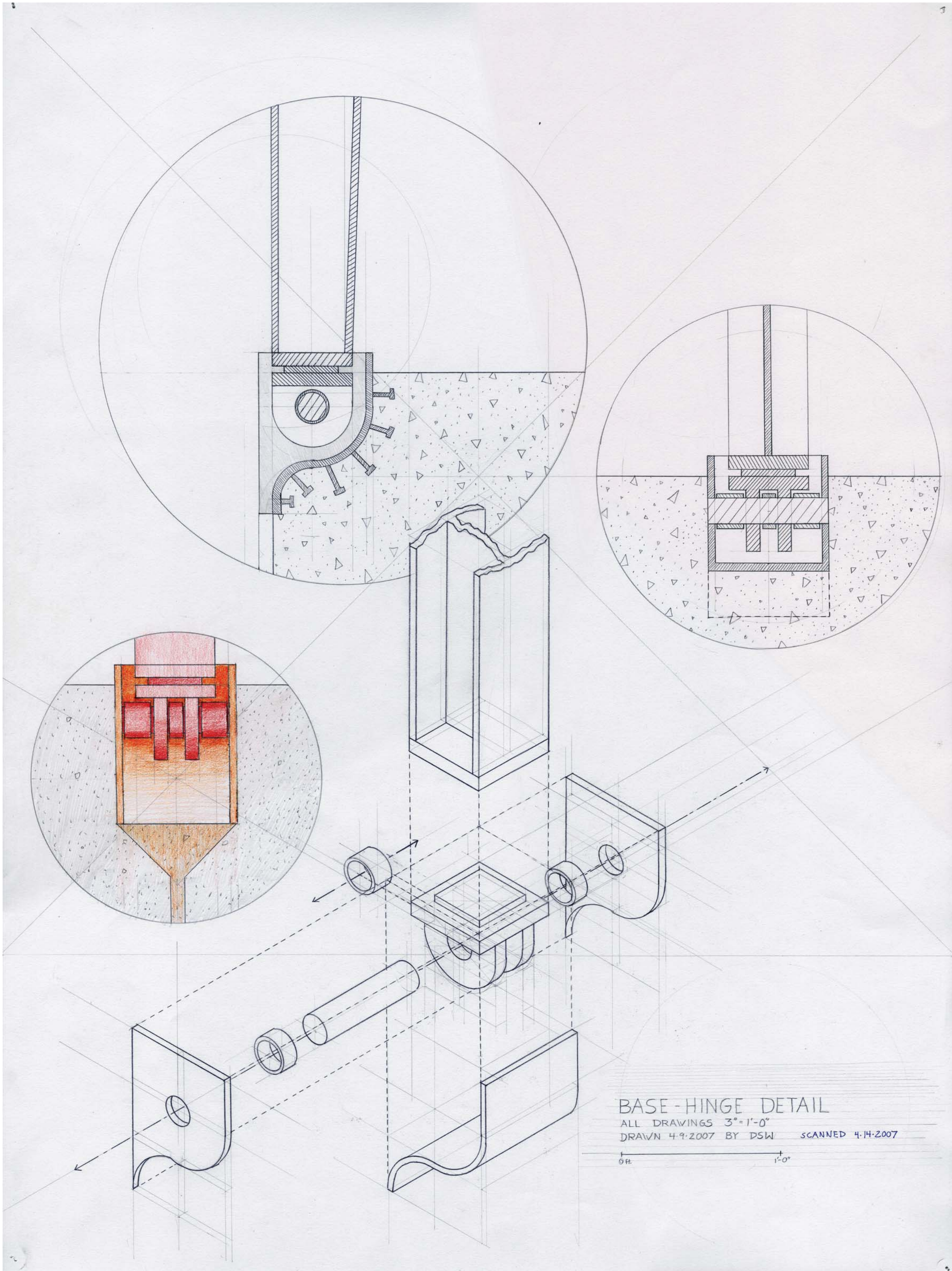






ROOF ASSEMBLY

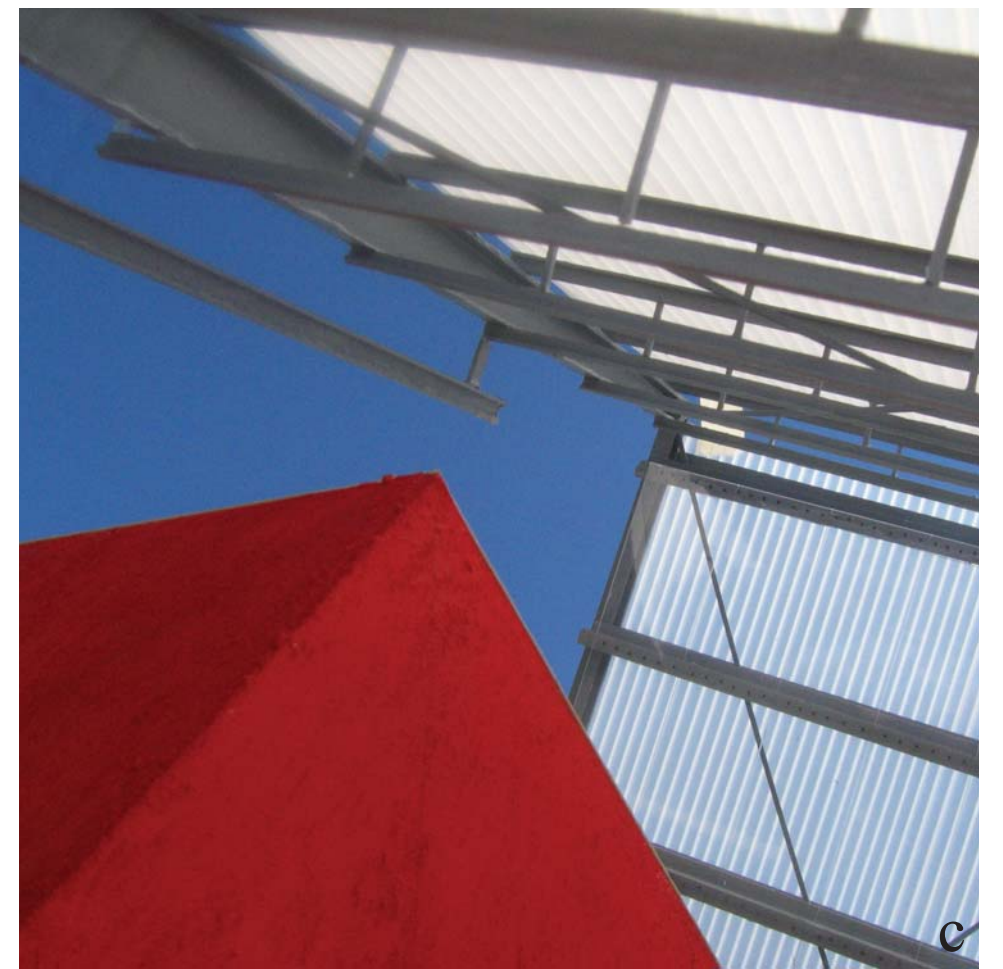
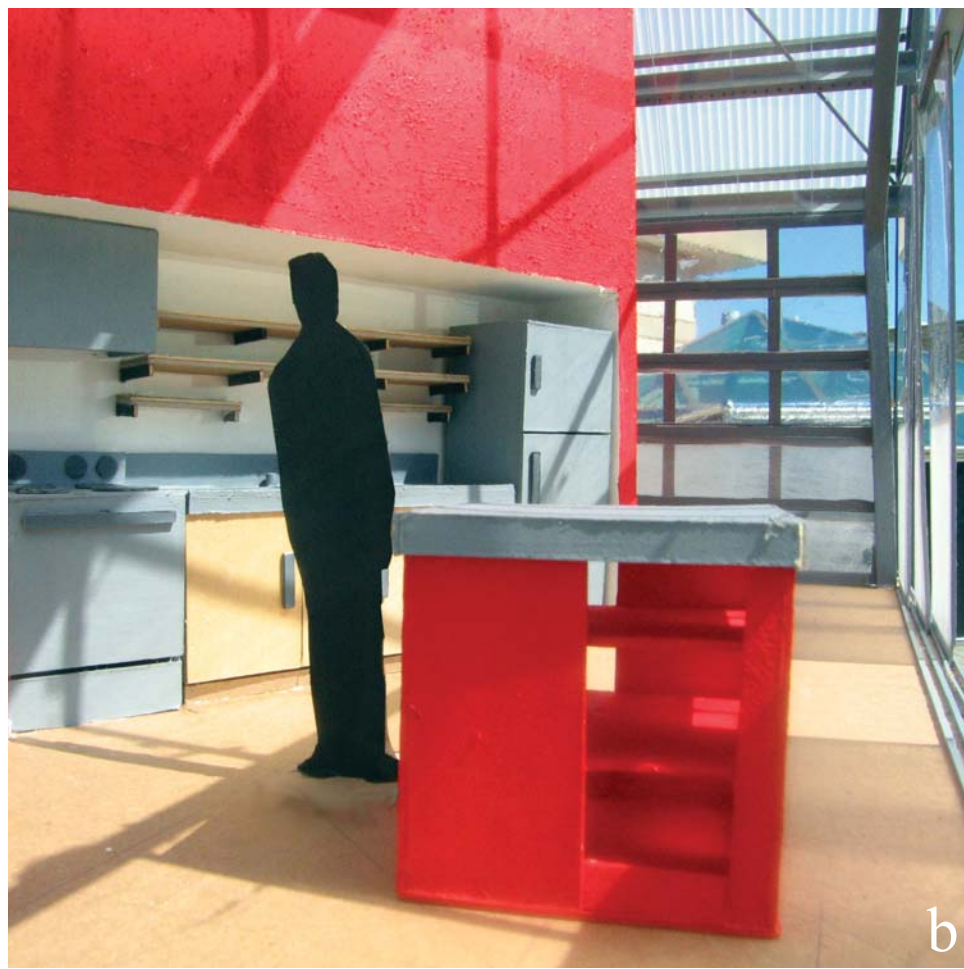
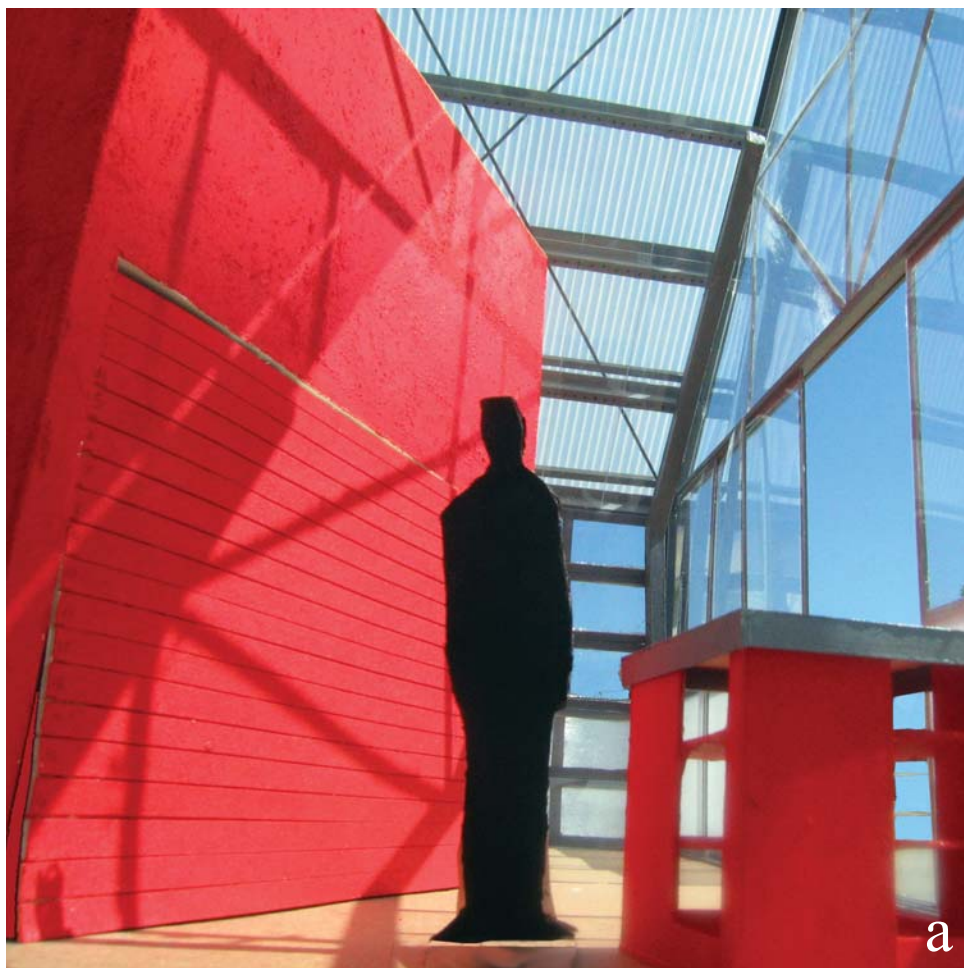
ISOMETRIC DRAWING $\frac{3}{4}'' = 1'-0''$
 HORIZ. & VERT. SECTIONS $1'' = 1'-0''$
 DRAWN 5-2-2007 BY DSW



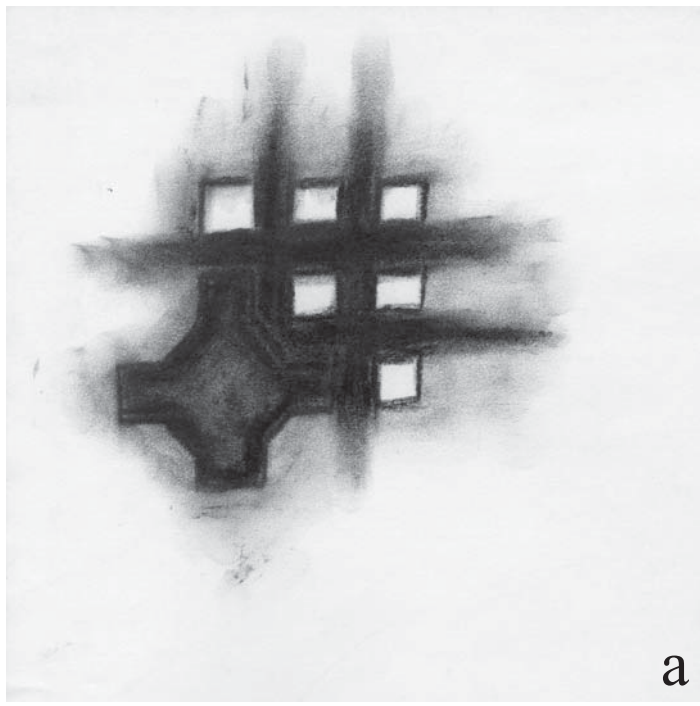
BASE-HINGE DETAIL

ALL DRAWINGS 3"=1'-0"
 DRAWN 4-9-2007 BY DSW SCANNED 4-14-2007





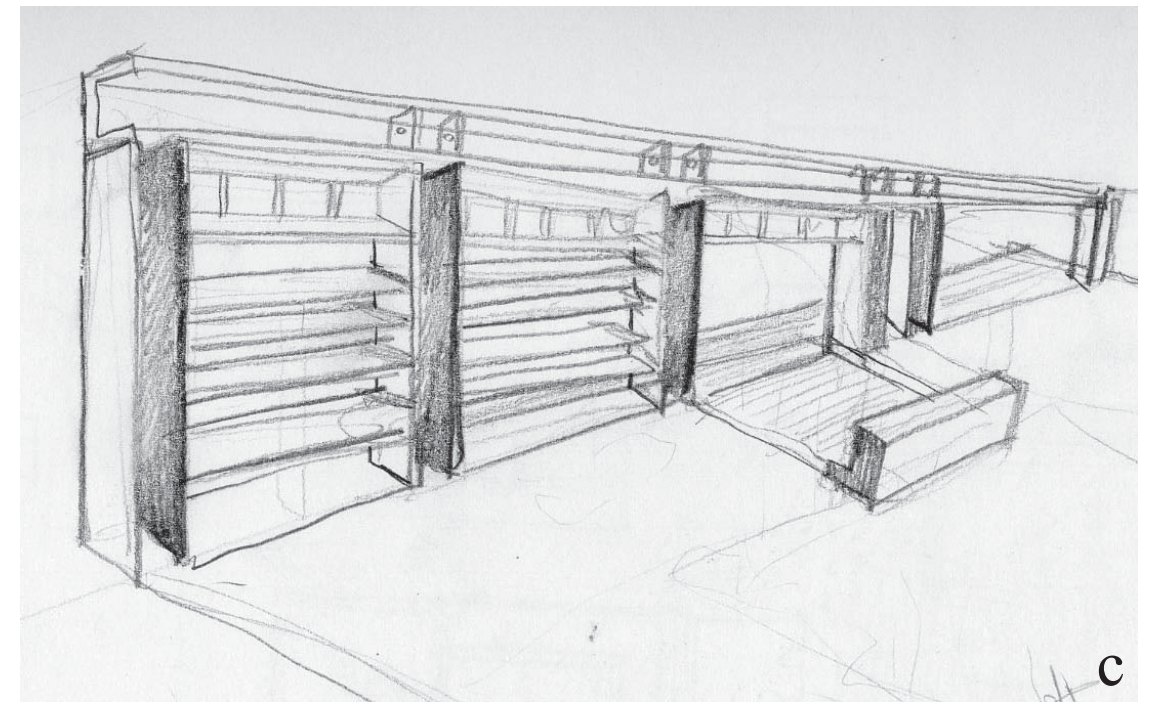
a (closed) Cube: reason
b (open) Cube: function
c Translucent ceiling above Cube
d Loft
e Cube
f Summer Configuration
g View from Rear Porch
h View from Front Porch



a



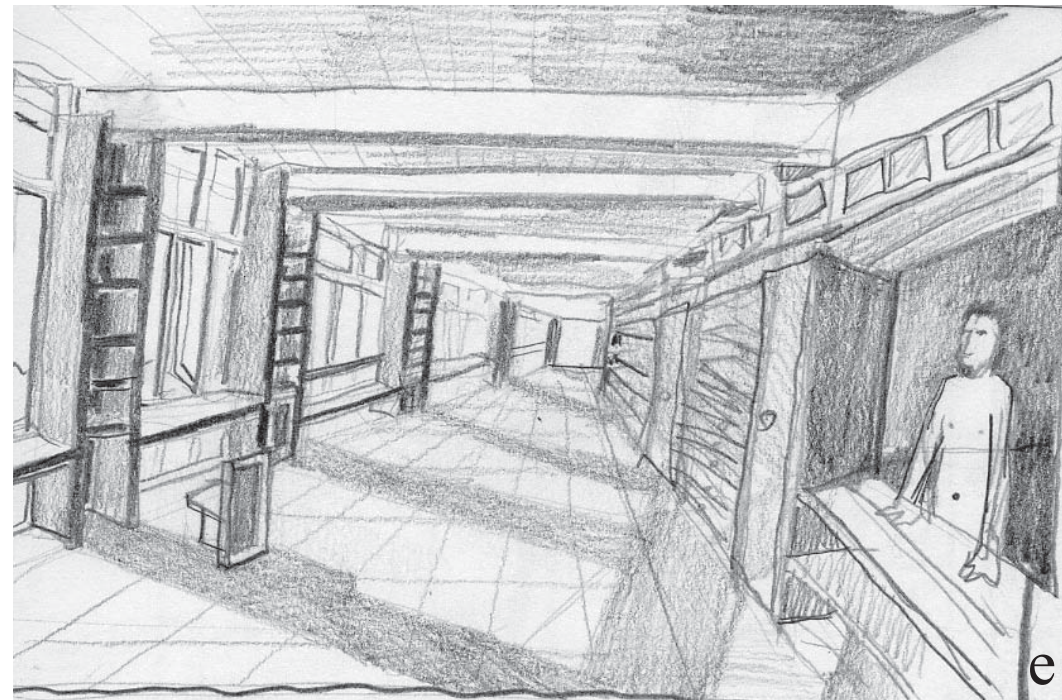
b



c



d



e



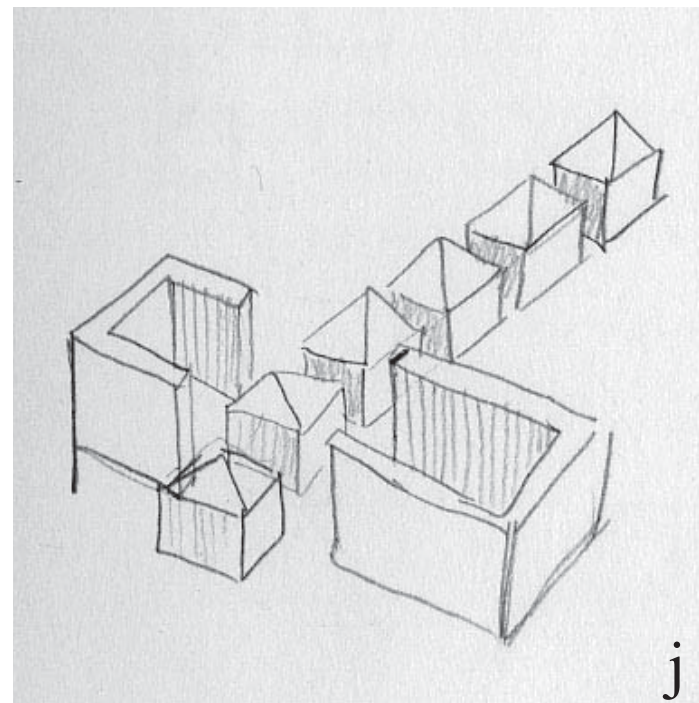
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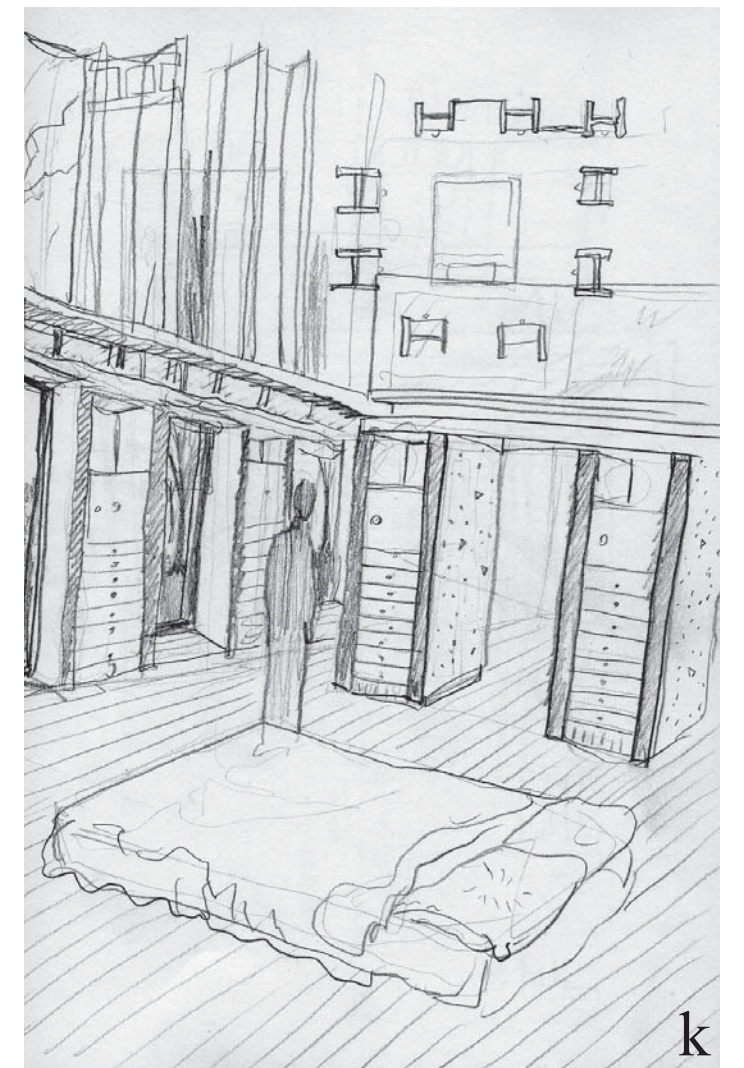
g



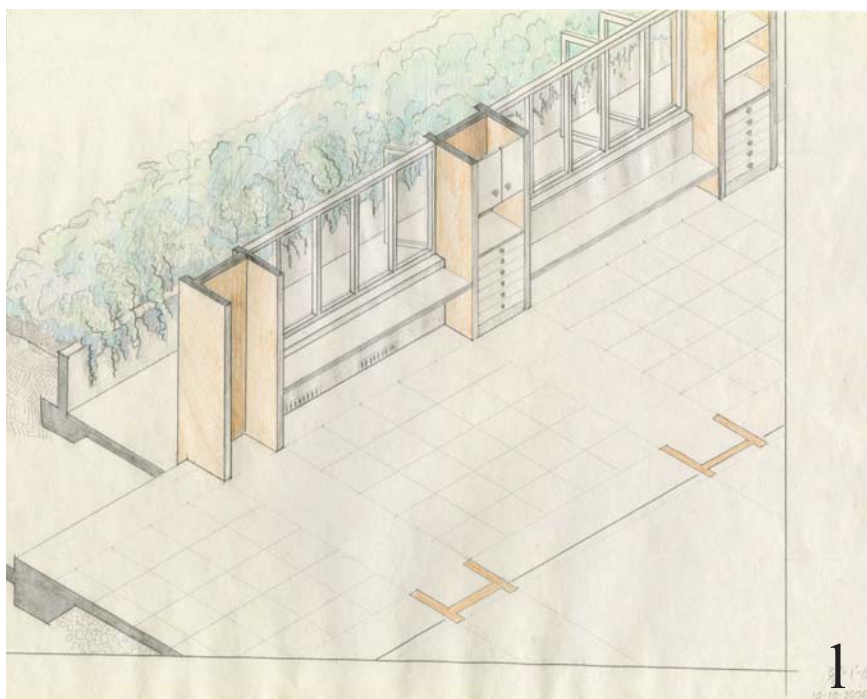
h



j



k



l



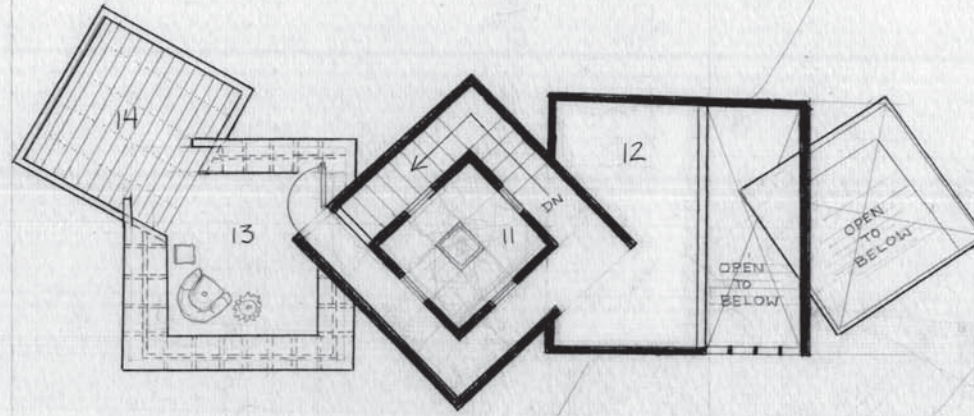
m

a Early sketch with cubic rooms
b Model of discrete rooms with pre-cast corner units
c Hallway of precast units
d Detail of precast post with built-in furniture
e Sketch of gallery and rooms
f Model of Cube through a Roof
g Sketch of a place for reading
h Study model of a column-footing

j Sketch of Cubes marching through an enclosure
k Sketch of a place for sleeping
l Isometric study of a gallery constructed from precast post units
m Model of Cube piercing a roof and indoor/outdoor spaces

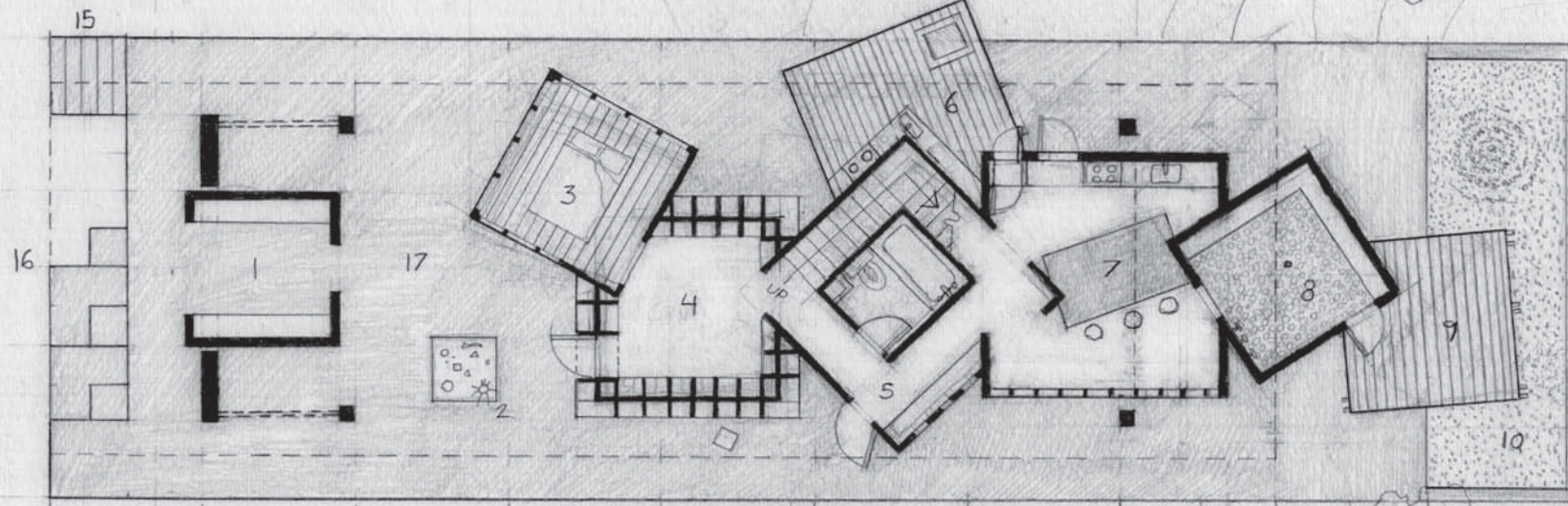
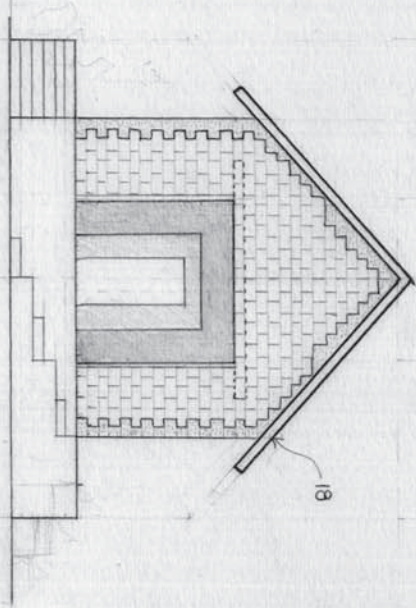
KEY

- 1 RED CUBE FOR SITTING / ENTERING / EXITING
- 2 BLUE CUBE FOR OBJECTS FOUND DURING THE DAY
- 3 ROOM FOR SLEEPING WHEN IT IS SULTRY
- 4 ROOM FOR 10,000 THINGS
- 5 VESTIBULE / ENTRY HALL / BENCH FOR FOOTWARE
- 6 OUTDOOR COOKING AREA
- 7 ROOM W/ TOO BIG TABLE
- 8 ROOM FOR BEING NAKED IN THE RAIN
- 9 PLATFORM FOR CONTEMPLATION OF THE MOON'S REFLECTION
- 10 REFLECTING POOL
- 11 ROOM FOR CONTEMPLATION OF DESIRE / IDEAL ORDER
- 12 SLEEPING LOFT
- 13 ROOFTOP LIBRARY
- 14 ROOFTOP FOR CALISTHENICS / NAPPING
- 15 STEPS FOR THOSE IN A HURRY
- 16 STEPS FOR PHILOSOPHERS
- 17 ROOM THAT IS MOSTLY OUTSIDE
- 18 FOLDED PLATE CONCRETE ROOF

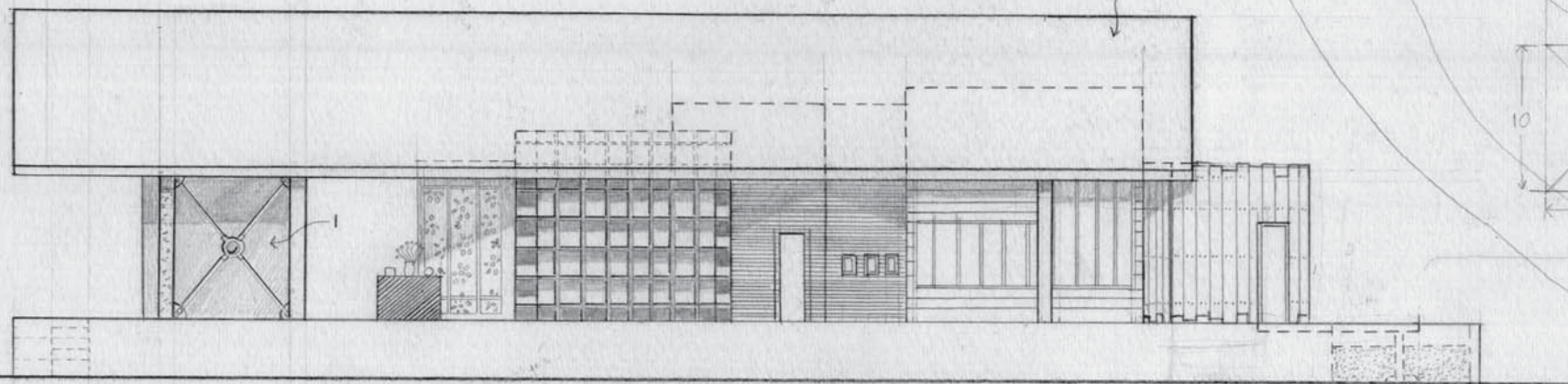


PLAN - LEVEL 2 $\frac{1}{8}''=1'-0''$

ELEVATION $\frac{1}{8}''=1'-0''$



PLAN - LEVEL 1 $\frac{1}{8}''=1'-0''$

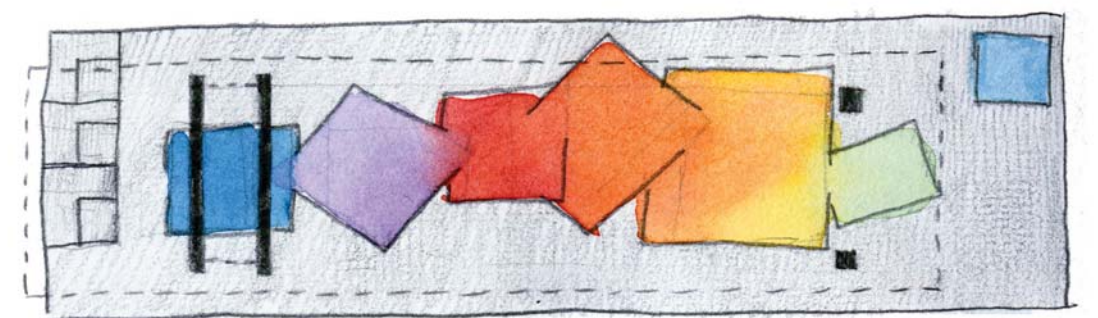


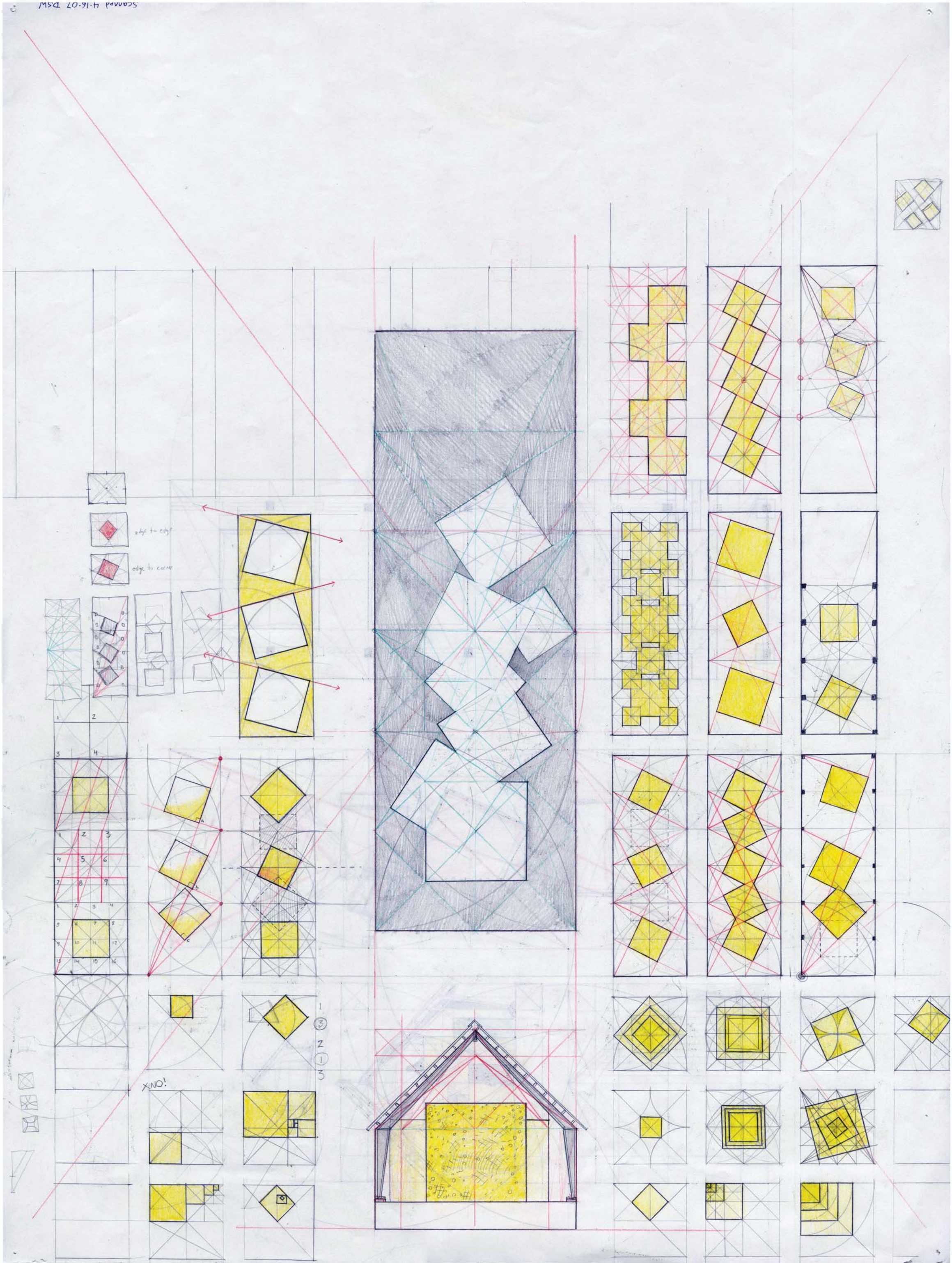
ELEVATION $\frac{1}{8}''=1'-0''$

- Room for sitting to diff. heights
- Room for "being naked in the rain" / watching the stars

MISSING:
- BIG empty room (No room?)
- room for dialogue
- room w/ big table
- room that is mostly outside
- YELLOW ROOM?

DSW 2/14/2007





Dear Reader, please inscribe your name and the date along with any comments on the ideas contained in this thesis book.

6 17 2007

David Weissberger, the author

Thanks for visiting my thesis. Let me know what you think.