Drawn Through: The Sectional Perspective as a Tool of Engagement

The sectional perspective, or *perspection*, is the quintessential drawing of our time, simultaneously entering the realm of the object and showing relations between interior and exterior, above and below, cavity and membrane. This paper explores the use of the sectional perspective as a tool of representation, documentation, and exploration in the design studio, with a particular emphasis on the drawing as a mediation between investigation and intention.

INTRODUCTION

"No Ideas but in things."

—William Carlos Williams, "Paterson," 1963

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The sectional perspective is the quintessential drawing type for contemporary design, capturing a multiplicity of viewpoints, simultaneously analytical and experiential, bounded yet open-ended (see Figures 1a and 1b).

This paper examines this drawing type as one that by its very nature brings diverse frameworks of thought into a synthetic singularity. It serves as well to encourage the use of this drawing technique as an iterative tool of representation, documentation, and exploration in the design studio (see Figure 1c). To illustrate the potential of the sectional perspective to enhance contemporary design education, the authors have selected drawings from upper-level studios at three academic institutions. At the University of Kansas, fourth-year undergraduate students in a Comprehensive Studio prepared designs for a community and cultural center in New Orleans, LA, during the spring of 2012; most students focused on the rich traditions of Louisiana jazz, storytelling and the like. At Syracuse University, third-year undergraduate students in a Comprehensive Studio prepared designs for a culinary institute in Los Angeles, CA, during the spring of 2012; students incorporated a broadcast kitchen and food cart / outdoor market into their schemes. At Kansas State University, third-year undergraduates in urban-oriented studios prepared designs for a one-artist museum along the High Line in the Chelsea neighborhood of lower Manhattan, during the spring of 2010, and a martial arts center in the International District of Seattle, WA, during the spring of 2007.

The authors are guided in their investigation by our jointly held conviction that the sectional perspective not only exists as a form of media, but also functions as one, simultaneously instantiating action and reflection. As artifact, the sectional

perspective mediates between author and witness (most commonly, the student and the studio critic) and between the drawing itself and other forms of architectural artifacts (typically two-dimensional orthographic projections). As technique, the sectional perspective intervenes between and acts upon the student's awareness and understanding of design, between thinking about the making of a building and the (potential) reality of its execution.

As media/mediator, the sectional perspective does not precisely fit Marshal McLuhan's description of media as a prosthetic limb—an extension of the self beyond the self, or medium as an intervening substance. All cartographic descriptions, be they plans or isometrics, diagrams or digital models, could be seen as mediators between design and construction. Indeed, McLuhan's definition could be used to describe nearly any architectural artifact produced since the Renaissance, when the profession of architecture eschewed the role of Master Builder and came to concern itself primarily with the representations of constructed spaces rather than with the realizations of buildings.

Media as an extension of the hand, eye, or brain of any author (though we are concerned here with the architect) therefore seems insufficient in describing the unique qualities of the sectional perspective. The French philosopher and media

1a

1b

1c

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critic Bernard Stiegler extends and expands the McLuhan definition, arguing that humanity coevolved with modes of making and doing. Stiegler invites us to emphasize "technics (or the technics of invention)—the use of objects not simply as tools but as tools to make other tools."[1] The sectional perspective, whether a drawing constructed on paper or digitally imaged and/or projected, is just such a tool used to make other tools. It is both a medium and a mediating device, one which we potentially deploy to communicate design intentions; conjure forward the vision of a proposed architecture; study the integration of enclosure, climatic, egress and framing systems; situate inhabitable interior space within an environmental and/or urban context; or perhaps realize construction itself.

It is worth noting how, as media, the so-called "Fault of Epimetheus" characterizes how students might develop and deploy the sectional perspective in the design studio. Critical to Stiegler's conception is the understanding that perceived deficiencies foster innovation. Both Hesiod's *Theogony* and Plato's *Protagoras* recount tales of the paired brothers Epimetheus (after-thought) and Prometheus (fore-thought). In the Classical myth, Epimetheus distributes meritorious properties to all creatures save man, whom he has alas overlooked. In recompense, Prometheus steals fire from Olympus, raising mankind to the godhead; Zeus punishes Prometheus and visits upon humanity a host of ills (redeemed, perhaps, by the accompanying fragility of hope). Struggle and strife, therefore, are integral to the process of fabrication. Creativity must, if we are to rely on the inherent lesson of the myth, proceed from and through error.

The sectional perspective encourages speculation, iteration and enhancement, even as the trajectories of academic practice skew away from an embrace of this fortunate flaw:

> Of all the things we are wrong about, this idea of error might well top the list. It is our meta-mistake: we are wrong about what it means to be wrong. Far from being a sign of intellectual inferiority, the capacity to err is crucial to human cognition. Far from being a moral flaw, it is inextricable from some of our most humane and honorable qualities: empathy, optimism, imagination, conviction and courage. And far from being a mark of indifference or intolerance, wrongness is a vital part of how we learn and change. Thanks to error, we can revise our understanding of ourselves and amend our ideas about the world.[2]

The sectional perspective provides multiple parameters in a single experience, framing for the student the necessary explorations that comprise their design.

REPRESENTATION

> "All of old. Nothing else ever. Ever tried. Ever failed. No matter. Try again. Fail again. Fail better."

> —Samuel Beckett, "Westward Ho," 1983

The sectional perspective combines and conflates two modes of architectural representation commonly used by—and well-established within the cultural history of—the professions of architecture, design and engineering and it will be useful to parse out the words involved and how we use them.

The first term, "sectional" is simply the adjectival form of "section," a member of the triad (with "plan" and "elevation") used scholastically and professionally to delineate a three-dimensional object in two dimensions. The section can be

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understood as a graphic projection of the interior disposition of any object onto a substrate (typically, a sheet of paper). In each of the three, one needs to imagine a "cutting plane" intersecting an object. While the plan is a horizontal description, sections and elevations are vertical drawings. In the elevation, the cutting plane sits outside the surface of any volume. The section bifurcates the object and serves to reveal solids and voids within.

In all three, measured distances are consistent. Components neither recede nor emerge from the cutting plane. Typically, orthographic projections are drawn to scale, in which a given dimensional unit represents or refers to a larger size in lived experience.

The section is therefore quantitative and objective. The section is detached and removed.

The second term, "perspective," from the Latin *perspicere*, "to see through," represents on a two-dimensional surface an image as seen by the eye of an observer. After Brunelleschi, the perspective is grounded in the mathematical projection of actual dimensions (though such dimensions are constant only along a singular line within the drawing itself, and the location of such accurate measurements cannot typically be understood by someone examining the drawing). In perspective, objects become smaller as their distance from the observer increases. They are foreshortened, such that dimensions along the line of sight are shorter than they are across the line of sight. Distant objects are less distinct than nearer ones. Spectrally, components close to the horizon line appear to tend to blue.

Architects construct the perspective drawing by identifying the location of an observer, the horizon line (related to the eye height) of the observer, the cone of vision, and the (fixed and static) angle in which the observer glances.

The perspective is therefore qualitative and subjective. The perspective is immersive and engaged.

While sectional perspectives have been used to describe three-dimensional realities and propositions for centuries, this drawing method has witnessed a resurgence of late, with architects such as Diller Scofidio + Renfro and Lewis Tsurmaki Lewis deploying the sectional perspective to significant effect. Given its contemporary relevance, in the importance of the conflated qualities of section and perspective enumerated above, the authors deploy the portmanteau word "perspection," from perspective + section.

The perspection is at once quantitative and qualitative, objective and subjective, detached and immersive, removed and engaged (see Figure 1).

While the authors have incorporated the perspection in our studios for several years, we chose the studio work documented here in part due to the relationship between the primary functional attributes of the projects and our emphasis on the perspection as both media and mediator:

> The very concept of media is . . . both a new invention and a tool for excavating the deepest archaeological layers of human forms of life. It is our collective attentiveness to this deep, technoanthropological universal sense of media that allows us to range across divides . . . that are normally left unbroached: society-technology-aesthetics, empirical-formal-constitutive, social-historical-experiential.[3]

The programs thus emphasize various sensory modes, ranging from the aural and auditory (New Orleans), gustation and discernment (Los Angeles), vision and visuality (New York) and bodily movement and proxemics (Seattle). The perspection drawings shown here not only disclose the manners in which we advance architectural representation, documentation and exploration, but do so in service of projects in which architecture itself serves as a medium for sensate and experiential awareness.

In our studios, the authors encourage students to merge divergent media (e.g., digital and physical models, analog delineation, computer rendering software) within the studio context. Students may photograph a basswood model, populating and annotating it as required to communicate information about the project (see Figure 2a), construct a digital model and provide textures and lighting using software plug-ins (see Figure 2b) or interlace hand- and computer-drafting (see Figures 1a and 1b). Throughout the process, students relate the building to its place through the representation of three-dimensional experience. Through the

Figure 2a (below left): Katalyna Lee and Michael Ma, "Culinary Arts Institute," Syracuse University, Spring 2012.

Figure 2b (below right): Christian "Bo" Steadman, "Museum for Anselm Kiefer," Kansas State University, Spring 2010.
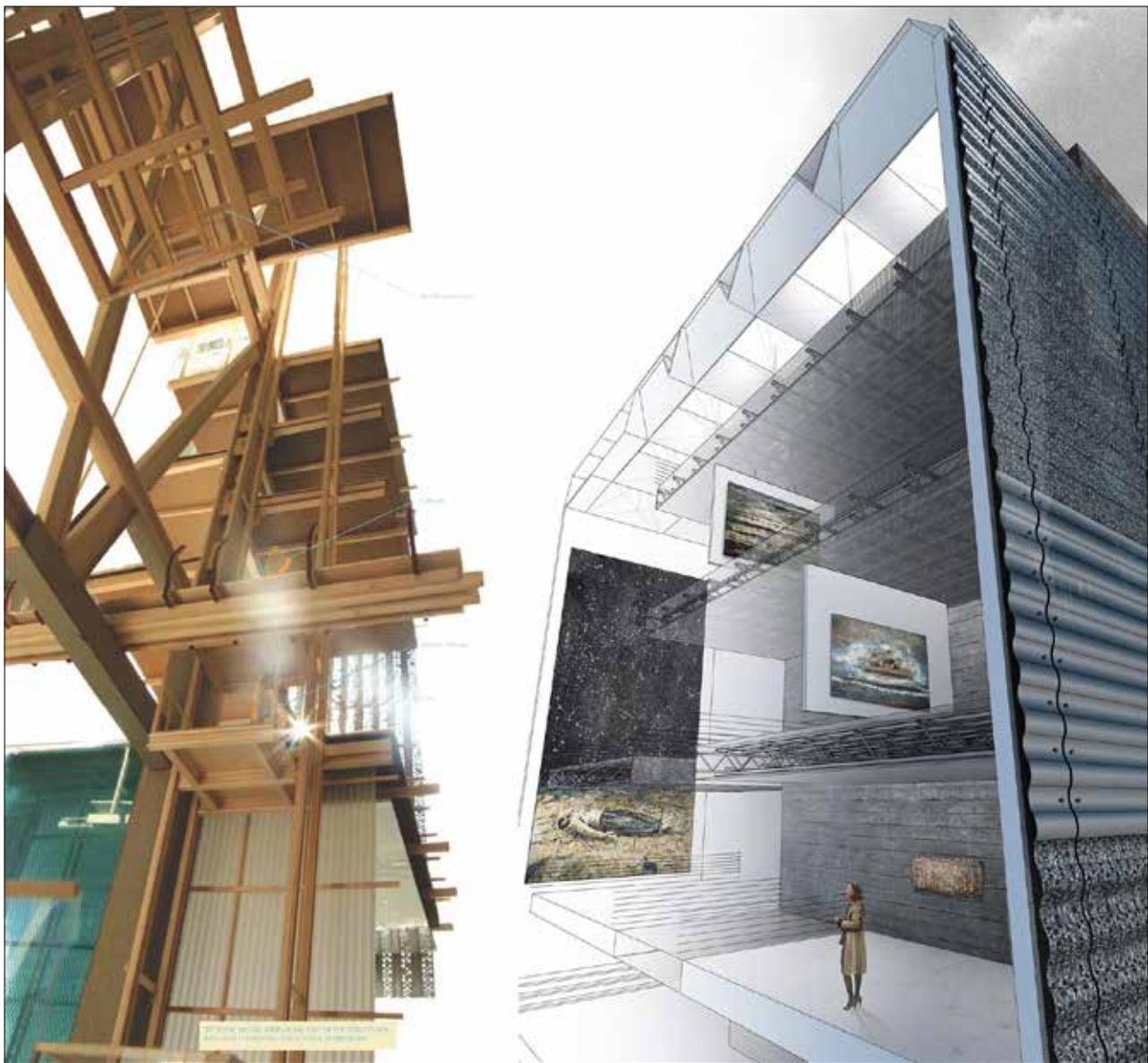
section, they engage the process of making a place in the environment using the systems of fabrication and assembly prevalent in our culture of building.

The process of making and coming to know the work is grounded in the subjective nature of perspective drawings: students encapsulate human experience as it relates to the city, demonstrate and signify programmatic uses, and depict bioclimatic forces and environmental strategies. The process of understanding and applying technical knowledge is grounded in the objective nature of the section. Students organize disparate and divergent program elements, link (and isolate) interiority to exteriority through transparency, velation, and opacity, and quantify, enumerate, and dimension technical and technological systems of enclosure, bearing, and environmental controls. As media, the perspection embeds procedural thought into the development of architectural artifacts, much as building physical models once encouraged discovery in design studios prior to the laser cutter, 3D printer and CNC router. While we continue to advocate the physical model as a study tool, we invite students to transform the model itself into an architectural rendering (see Figure 3). In the image shown, the student used Photoshop to merge source materials: a pair of photographs of a basswood presentation model, a line drawing from SketchUp and rendered photomontage. The perspection helps to reveal hidden elements within the solids and cavities—revealing imagined spaces and making connections that cannot be revealed by a purely perspectival vignette.

DOCUMENTATION

> [In Joyce's Finnegan's Wake,] . . . form is content, content is form. . . . His writing is not about something; it is that something itself. . . .
> —Samuel Beckett, ""Dante . . . Bruno. Vico . . . Joyce," 1929

Whatever the merits or deficiencies of the various representational tactics limned above, there are more significant attributes of perspections than these. In our experience and under our direction, students use the perspection as an opportunity to reveal spatial and experiential intentions, as documentation of the multifaceted nature of their design. Depending on their focus, the drawing may represent a project within the urban context, explore and reveal the relationship

between structure and enclosure, and/or manifest an approach to integrating daylight and electric light as well as accommodating environmental control systems (see Figure 3). In his drawing, Elvis Achelpohl transformed a model photograph into an exemplary rendering of a Martial Arts Studio Center in the International District of Seattle, WA. His perspection helps to reveal forces that, while outside of the confines of the building envelope, inform the architectural design—contextual research is revealed through the act of drawing and collaging the context.

The student proposes new ways that architecture can be made responsive, echoing the advice of Steven Holl:

> Through the phenomenological study of cities, we seek ways of incorporating … incomplete, perspectval, experience of space, into our vision and fabrication of architecture. A 'multiple-perspectives' approach to urban planning is facilitated by using the computer in the design process to find precise plan dimensions within perspectval views, and to test speed, angles of motion, and peripheral vision. However the pixelated digitized cannot simulate qualities of material, light and other sensations of full-scale urban experience. . . . We would thus propose to construct urban spaces on perceptual principals, allowing for movement between the absolutes of architectural intention and the indefinitive urban assemblage. Perhaps enlightened concepts of urbanism would evolve with an understanding of alternative ways of moving through cities.[4]

In Figure 4a, Anne Norgaard depicts features of climatically sensitive New Orleans design—shading, cross-ventilation, vegetation and drainage—and uses siting and massing to oscillate and manipulate these flows of light, air and water. In Figure 4b, Devin Mills envisions a building used predominately in the evening, when film is projected onto and within vertical surfaces. Deploying the phenomena of dimness and illumination, the building finds its purpose. Both designs emerged as a response to factors outside of themselves: the architecture becomes a vessel to direct, contain or divert forces. This way of working radically alters the student's focus, so that rather than making an expressive architecture, students craft a responsive one that frames and enlivens qualities outside of itself. The drawing serves to transcribe the discourse that exists between an existing external context and the imagined space of the interior. The perspection simultaneously enters the realm of the object, showing relations between interior and exterior, above and below, and cavity and membrane. The perspection yields the architectural equivalent of an anatomical dissection, a media that at once embodies intention and discloses the inner workings of that figuration.

Figure 4a (below left): Anne Norgaard, "New Orleans Center for Documentary Studies," University of Kansas, Spring 2012.

Figure 4b (below right): Devin Mills, "New Orleans Center for Documentary Studies," University of Kansas, Spring 2012.
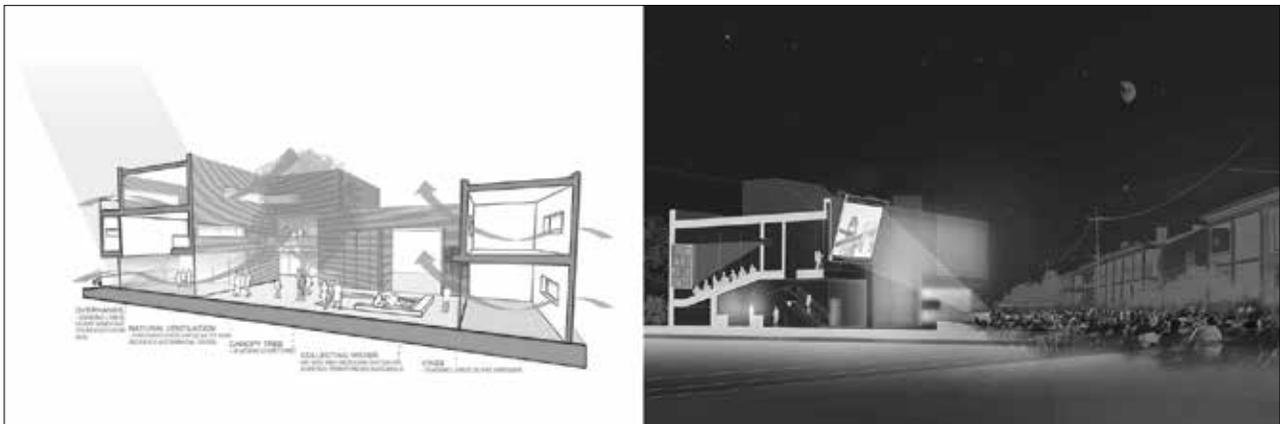
We argue that as documentation, the perspection transcends the subjective / objective synthesis described above, performing a meta-function that we may turn once again to Stiegler to understand. In *Technics and Time: The Fault of Epimetheus*, the philosopher argues that "human beings have evolved . . . by exteriorizing their know-how and collective memory in the form of cultural artifacts and objective memory supports."[5]

But how does the perspection "exteriorize know-how"? How might we understand the drawings as "cultural artifacts and objective memory supports"? Here, we assert that architecture students preparing a perspection, like other practitioners of media studies, engage in "what [Katherine] Hayles calls the "materialities of embodiment" in several different registers, working . . . to rematerialize media by exhibiting the physical interaction that occurs between humans and technology and disclosing the multilayered histories that lie within any technology of communication."[6] The perspection does not simply convey information about, say, framing or cladding; it situates the observer in direct contact with the material fact of how that information is presented. It is the very artistry or craft of the drawing that compels us to encounter simultaneously technology and technique. In millwork and casework, carpenters often fabricate a jig, an apparatus used to guide the movement of a tool or fix the location of a component. Typically, we assign a hierarchy to the (seemingly) unused (by the end user) part that facilitates the making of the useful (by the end user) product, with the jig occupying a lower status.

The perspection is a jig you cannot resist beholding.

EXPLORATION

> We shall not cease from exploration. And the end of all our exploring will be to arrive where we started and know the place for the first time.

—T.S. Eliot, "Little Gidding" from The Four Quartets, 1943

While this documentary aspect of the work advances a holistic, comprehensive understanding of the means by which students integrate their aesthetic and experiential intentions with structural, cladding, and environmental systems, the drawing also serves as tool for exploration. Under faculty guidance, students optimize the viewing angle, orientation, and emphasis of a perspection. They come to understand their designs through the process of making the perspection. Such a drawing can provide a glimpse of what the spaces may be like in relation to how the building is made, whereby the subjective and the objective are related in one drawing—ultimately each informing the other. Designers often struggle in their attempt to simultaneously imagine the qualities of a design, how it relates to the landscape beyond and how it is tectonically assembled. The perspection effectively encapsulates these related yet divergent points of view in a single moment. In the words of Steven Holl,

> (T)he architectural synthesis of foreground, middle ground, and distant view, together with all the subjective qualities of material and light, form the basis of 'complete perception.' The expression of the originating 'idea' is a fusion of the subjective and objective. That is, the conceptual logic which drives a design has an inter-subjective link to the questions of its ultimate perception.[7]

In Figure 5, we exhibit a sampling of Nick Fratta's efforts to move among media and scales, as he undertook a lengthy and rigorous process of discovering how he might advance his ambitions. The student sought to discern where he might best cut a section. The very question reveals the opportunities and limitations of any

orthographic decision: How can any architectural proposition promote a desired spatial, even social, relationship?   What factors determine the address and scope of design decisions? What sorts of relationships will be revealed? Is the proposed section the only one that should be studied? Are there others? Why?

When the scale is increased, more detail can be shown and other questions emerge. How is the envelope assembled? How much detail should the drawing disclose? Why? The student learns to work back and forth between the configuration of the building, its sequence of fabrication, and the impact both have on the interior and exterior spaces of the design.

The determining parameters of the perspective (vantage point, cone of vision, etc.) help to reveal activities and relationships beyond the objective nature of the

Figure 5 (below): Nick Fratta, "New Orleans Center for Documentary Studies," University of Kansas, Spring 2012.

Drawn Through
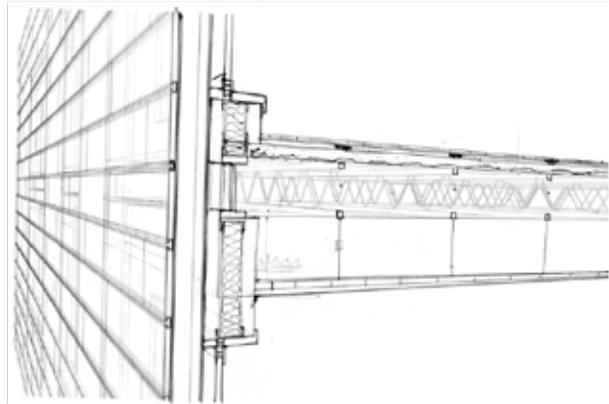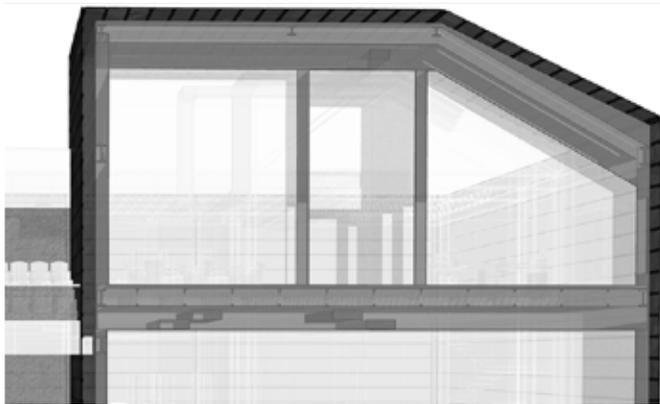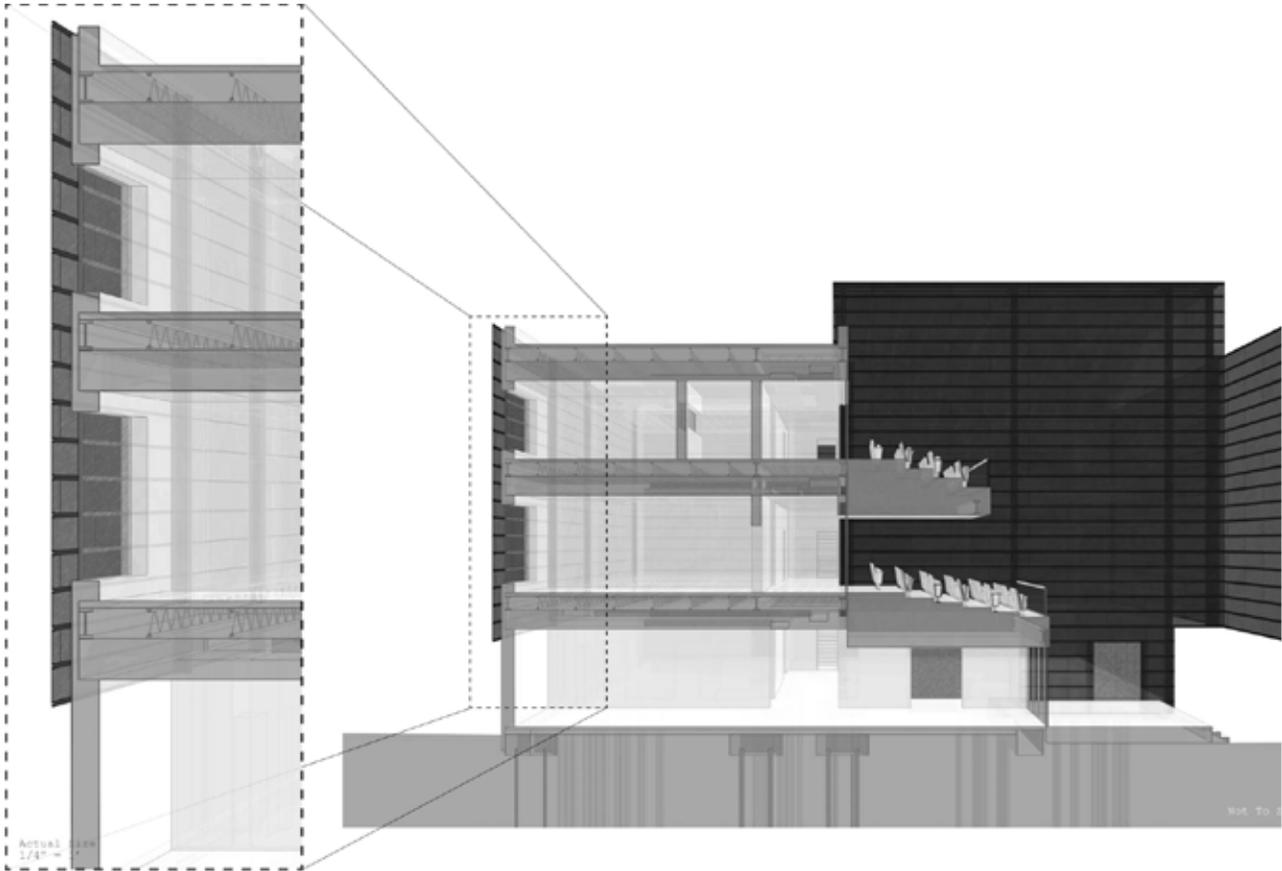
assembled components. Students begin to prepare artifacts, review the results, and then respond iteratively. The emerging architect engages in a repeated process of action and reaction. The perspection affords discussion and dialogue within the work that neither a singular section nor perspective alone can achieve. The perspection prompts different points of view, between subject and object, changing in scale as the imagination of lived tactility begins to infuse the drawing with texture, character and quality. Kathryn Schulz argues that, while we might find this travail "troubling, we should also find it comforting[:]"

> The miracle of the human mind, after all, is that it can show us the world not only as it is, but also as it is not: as we remember it from the past, as we hope or fear it will be in the future, as we imagine it might be in some other place or for some other person. We already saw that 'seeing the world as it is not' is pretty much the definition of erring—but it is also the essence of imagination, invention and hope. . . . . [O]ur errors sometimes bear far sweeter fruits than the failure and shame we associate with them. True, they represent a moment of alienation, both from ourselves and from a previously convincing vision of the world. But what's wrong with that? 'To alienate' means to make unfamiliar; and to see things—including ourselves—as unfamiliar is an opportunity to see them anew.[8]

CONCLUSION

Ring the bells that still can ring.
Forget your perfect offering.
There is a crack, a crack in everything.
That's how the light gets in.
—Leonard Cohen, "Anthem," 1992

The perspection invites both the author and the witness to see the world as it is not, but as it might someday become; the integrated, iterative process of realizing the perspection has been especially useful for some students. As media, the perspection will not suffice for experience. But as far as media go, perspections are a synthesis, a hybrid not only of form (turning models into drawings, combing analog and digital drafting techniques) but also content (grounded at once in a point of view yet revealing embedded systems that cannot ordinarily be viewed). Perspections are imperfect in that they cannot represent reality, merely approximate it. But in this lack of perfect representation, other attributes of the building are revealed, attributes hidden or unconscious in the (potentially) constructed building (which is itself inherently imperfect with respect to its idealized representation in orthographic drawings). These revealed attributes give rise to more perspection and design iterations, a series of discoveries of hidden possibilities.

The success of the perspection as a comprehensive mode of representation could paradoxically limit its capacity to advance formative design stages: students struggle to integrate those framing, enclosure and environmental systems that they cannot yet envision. But once the design process is underway, the perspection can become a motivating force in the work. One sectional perspective does not typically suffice. There is always another viewpoint to develop. It is the assemblage of multiple viewpoints that not only identifies gaps in the work, but begins to address them.

In a 2003 interview with the *New York Times*, the playwright Tony Kushner defined writing as "a series of mistakes that you correct."[9] As with writing, so too with architecture. The perspection offers the merits of the fortunate flaw.

ENDNOTES

1. Bernard Stiegler, from *TTechnics and Time: The Fault of Epimetheus,* cited in Mark B.N. Hansen and W.J.T. Mitchell, "Introduction," in *Critical Terms for Media Studies*, ed. Mark B.N. Hansen and W.J.T. Mitchell (Chicago and London: The University of Chicago Press, 2010), xiii.

2. Kathryn Schulz, *Being Wrong: Adventures in the Margin of Error,* (New York: Ecco Press, 2010), 5.

3. Mark B.N. Hansen and W.J.T. Mitchell, "Introduction," in *Critical Terms for Media Studies*, ed. Mark B.N. Hansen and W.J.T. Mitchell (Chicago and London: The University of Chicago Press, 2010), ix.

4. Steven Holl, *Questions of Perception*, (Tokyo: a + u Publishing Co., Ltd., 1994), 55.

5. Mark B.N. Hansen, "New Media," in *Critical Terms for Media Studies*, ed. Mark B.N. Hansen and W.J.T. Mitchell (Chicago and London: The University of Chicago Press, 2010), 177.

6. Bill Brown, "Materiality," in *Critical Terms for Media Studies*, ed. Mark B.N. Hansen and W.J.T. Mitchell (Chicago and London: The University of Chicago Press, 2010), 56.

7. Steven Holl, *Questions of Perception*, (Tokyo: a + u Publishing Co., Ltd., 1994), 45.

8. Kathryn Schulz, *Being Wrong: Adventures in the Margin of Error,* (New York: Ecco Press, 2010), 5.

9. Alex Abramovich, "THEATER; Hurricane Kushner Hits The Heartland," New York Times, November 30, 2003, accessed June 1, 2012, http://www.nytimes.com/2003/11/30/theater/theater-hurricane-kushner-hits-the-heartland.html.