Architect Design and Builds Home Addition

Process Explained in Terms of Cause, Effect

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ITHACA, NY, 2004-05 — Design is a process in which cause and effect are mediated by analysis. The process is linear (since we live and act in real time) but iterative, so that "effect" often becomes a new "cause.

Design is also a process influenced by both abstract ideas (about form) and practical ideas (about reality, including issues of cost, construction, structure, energy, etc.). Abstract ideas about design are often in conflict with ideas about reality. While this tension between appearance (form) and necessity (gravity, thermal behavior, and so on) is what gives architecture its charm, it also makes the design process rather difficult for designers who place inordinate value on the mental aspects of reality. This is especially true in my case, not only because I have difficulty prioritizing the arbitrary and capricious over the logical and sensible, but because I have decided not only to design, but to engineer and build much of this project myself. Every possible pleasure in manipulating appearance/form is therefore immediately directed to that other part of my brain that says: "Can I build that?" "Does this make sense?" "How much will it cost?"

In what follows, I have schematized and summarized my design process beginning with a first "cause" and leading to a final "effect"; the design and construction of an addition to my house in Ithaca, NY. For additional details on the actual construction process, check out: www.peoplecornell.net/pages/ja04/practice/04-04/04-01.html.

Why Need more space.

Options and Analysis: We need more space. No doubt about it. We're sleeping on a futon in the living room, there's no place to create artwork, the bathroom is too small to meet the code's criteria, I choose to place 2" rigid insulation around the inside perimeter of the foundation wall. Placing the insulation outside the foundation wall is more efficient thermally, but I prefer to have the hard concrete, rather than the soft insulation, on the outside surface. This presents a problem at two points where the insulation continuity is interrupted by interesting interior foundation walls (i.e., where the main block meets the 1st floor wide connecting link)

Options and Analysis: New York State's Energy Code provides guidance for insulating foundation walls around slabs to meet the code's criteria, I choose to place 2" rigid insulation around the inside perimeter of the foundation wall. Placing the insulation outside the foundation wall is more efficient, but I prefer to have the hard concrete, rather than the soft insulation, on the outside surface. This presents a problem at two points where the insulation continuity is interrupted by interesting interior foundation walls (i.e., where the main block meets the 1st floor wide connecting link).

Options and Analysis: Any state supplies. This question remains unsolved as the formal implications and opportunities of the scheme begin to be examined. Eff. 2006-07-30...
with a traditional pitched roof similar in form to the existing house, and one in an early-20th-century-modernist vocabulary, complete with flat roof (accessible roof deck), and proportions governed by the golden ratio. The traditional design is easy to cut, releasing silica dust into the air. Research this problem, and decide to purchase a new circular saw with a diamond blade and built-in dust collector to reduce airborne silica dust. I'll also do all cutting outside. (2) Stair controversies, while creating a better side entrance while adding the new stair. Most important, I check out Corb's Ozenfant House and confirm that his big corner windows are oriented, like mine, to the east and north.

Effect: Decision to use a modernist vocabulary adds a roof deck to the project brief.

Cause: Decision to use a modernist vocabulary adds a roof deck to the project brief (part 1).

Options and analysis: To gain access to the roof deck, an exterior stair from the mezzanine level crosses the main salon (and smallest) but internal family squabbling puts such a stair on hold. In fact, the unresolved problem of vertical circulation places the entire project in doubt. A revised scheme is necessary. I examine the site plan again, and notice that the angle of the driveway with respect to the

Air vents through soffit vents (left and soffit through "attic vents connecting to plenum within parapet wall) (right) panels nailed to stud. Because the continuity of this necessary parapet/shear wall is in conflict with the requirement to have a continuous roof gutter (and soffit vent), a compromise is worked out. I extend the parapet wall over gutter for 4 feet from the stair connection at the south-west corner of the addition, sufficient length to develop adequate shear resistance in the wall panel, and design the roof with a 4-foot "cracket" at this corner to divert water to the smaller gutter. Because there are no soffit vents at this corner, I cut notches into the sloped joists providing ventilation in this zone of the roof. In addition, I design a special beam-column at this corner consisting of two vertical 2x6 members (Ranges) connected to two 2x3 members (web). The result is a 5-1/2 square foot consistent with the corner windows framed immediately below the parapet.

Effect: Decision to vent roof using soffit and attic vents consistent with structural requirements of external stair.

Cause: Need to define exterior wall and window systems.

Options and analysis: Once the roof design is in place, the facade design, until now treated quite abstractly, must be developed. Two primary issues are at stake: siding material and windows. Cost, ease of installation (I'm doing it myself), and long-term maintenance are the main criteria. (1) Siding. Vinyl siding is almost OK, but I've never liked the deep grooves, with which the vinyl siding meets door and window joints and rely on metal z-bar flashing at the horizontal joints, but it's vague about requirements for the vertical joints, recommending the use of battens (I've said, fake board and batten seems to be the main application of the product). In the end, I decide on vinyl or stainless flashing product because the horizontal joints made specifically for the unusually thin dimension of Hardieplank; this solution minimizes the appearance of vertical joints. In contrast, we eventually chose the horizontal, much like FLW's manipulation of these joints at the Robie House. Strategically cutting the Hardieplank, flashed horizontal joints can be aligned with window joints and/or carvings, not only facilitating construction and waterproofing, but reinforcing the proportional divisions based on the golden ratio that are inherent in the abstract design. (2) Windows. The search for the perfect, cheap window takes us on journeys all around the Finger Lakes region. There are several cheap versions of wood or fiberglass windows (Pella, Marvin, Andersen), but their casement seem poorly designed and constructed. In contrast, some of the vinyl windows we examine are not only cheaper and more energy-efficient, but seem stronger and more thoughtfully detailed. We examine countless vinyl windows, finally choosing Farley, a Canadian company distributed by one of the "local" home stores. Good price, good hardware, good thermal performance. I detail the windows as a "replacement" rather than "new construction" for several reasons:

(1) Replacement windows are routinely manufactured to the existing opening, rather than the actual increments.

(2) Replacement windows can be installed from the inside, so we won't need to carry them up and installing them from scaffolding.

(3) Replacement windows can be easily removed and replaced if they prove unsatisfactory, while new construction windows are essentially built in to the outside siding or exterior trim. (4) Replacement windows are set moved into the exterior wall, allowing some protection from rain, while typical new construction windows are installed on the outside shiplaching, so that the plane of glass is beyond the outside surface of the wall. Aside from affording more protection against rain, the recessed replacement window make the abstract idea of the facade design more evident, providing a stronger contrast to the plane of the siding. Of course, I'll need to build 26 window frames if I use replacement windows, but I can do this at a low cost, using #2 pine and clever detailing.

Effect: Decision to use fiber-cement siding and vinyl replacement windows.

Cause: Need to define interior finishes.

Options and analysis: The exterior design having been finalized, it is now possible to deal with interior finishes. Corb's Ozenfant House is used for walls and ceilings in the main addition "block." I decide to keep 2x2" CED plywood Athabasca cypress on the 3-1/2 foot wide soffits, since it's there anyway, and the requirement for a neutral light-reflecting surface doesn't apply in these circulation spaces. Of course, I'm also influenced by the use of this material as an ironic and iconic commentary on great taste by F. Gilkey in several of his public buildings in LA (like Loyola Law School and Disney Concert Hall) come to mind). We decide to leave the ground slab-slab-on-grade as is, and do an extensive search for an appropriate concrete scale. Since we are installing the seating walls in the middle of winter, with no possibility of opening windows for ventilation, we discover a non-VOC sodium silicate–based compound with no odor that hardens and scales concrete while leaving its surface looking pretty much as is. We also examine alternate salvaged materials, and decide to buy 600 square feet of polished porcelain tile for the kitchen and entrance.

Syrcases. The cost is about the same as the cheapest pre-finished bamboo ($1.50 per square foot for the tile itself, plus another $1.50 for cement-based underlayment, thin-set mortar, and grout).

Effect: Decision to use a concrete soaker on the ground floor and porcelain tile everywhere else.

Cause: Need to trim out spaces.

Options and analysis: Trim is required along the bottom edges of walls (baseboard) and around doors (framing). The baseboard protects the walls from damage, especially when floors are being cleaned, and covers the space left at the perimeter of finish floor surfaces. It must be wide enough to cover the bottom of the finished floor, but can be

of polished porcelain tile in the kitchen and entrance.

Traditional casing shown around a double glass door salvaged from Canandaigua City Hall and used for handyman entry narrow at the top to minimize horizontal surfaces on which dust collects. The narrow top, sometimes literally separated from the actual baseboard as a "base molding," also makes it easier for the board to be nailed flush with any diastem wall surface, since its narrow profile is more flexible. Traditional baseboard profiles satisfy these criteria while also appearing to be gracefully decorative (which they are not). Modern baseboards (e.g., flat unarticulated baseboards) do not satisfy these criteria, while looking quite functional. Traditional baseboards also do two other things that I like: (1) they make the walls appear to be carved out of something thick and monolithic; and (2) they provide a frame so that the floors—even our unadorned concrete slab—appear as works of art (see M. Darchamp). What's more, the stuff is cheap: we get the pre-primed medium density fiberboard (MDF) 5/8" x 5/8" colonial style baseboard for $0.85 per foot.

Effect: Traditional baseboarding and casing is selected: the design process is complete.