

# Reflective Practice Series



JAN 2021 Extraction during deconstruction. Photo by author.

629 Luttrell Street

# Five Meditations on Extraction in Practice

Ted Shelton, FAIA and Tricia Stuth, FAIA  
curb



SEPT 2020 Removal of finishes presented voids between original bay windows and outer brick shell.

In the course of our projects, architects must extemporize, putting our professional knowledge to work on unforeseen problems within an overarching ethic that guides our efforts.

Such “reflection-in-action” is a first order of applied research into how one practices or, sometimes, a proposition about how else one might practice.<sup>1</sup> Such moments are illuminating. They reveal values and hone methods. Of further value is an ex post reflection on one’s practice (a looking back into the work) to surface the tacit knowledge embedded therein.

Layers, or 629 Luttrell Street, is a recently completed renovation of and addition to a circa 1890s Queen Anne cottage. The structure served as the headquarters for the local masons’ union in the 1950s and was clad in brick at that time. By the early 2000s it was derelict, despite growing reinvestment in the surrounding neighborhood. Using the project as a touchstone, the architects reflect on notions of extraction in practice in five discrete meditations.

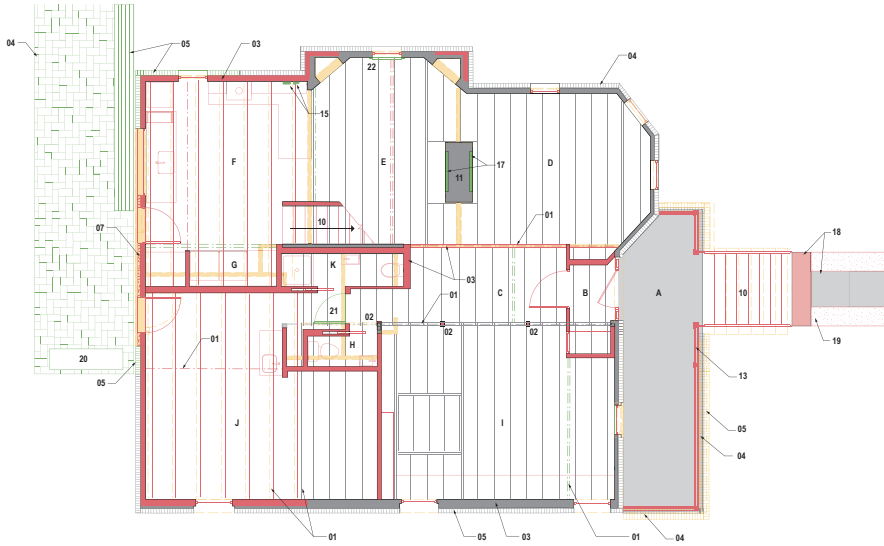


SEPT 2020 Recovering material to repair and replace or reposition during demolition and deconstruction.

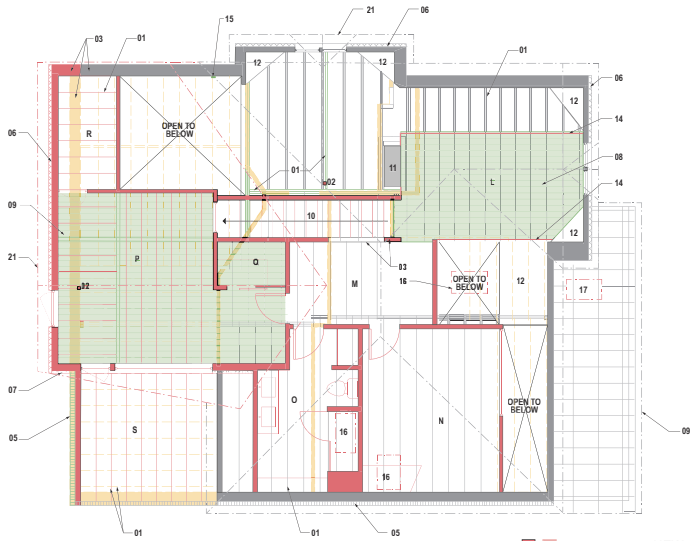


SEPT 2020 View through joists with exposed lath marks to attic wall and roof framing and skip sheathing.

629 LUTTRELL STREET



Lower Level Floor Framing Plan



Upper Level Floor Framing Plan

- NEW
- - - new overhead
- SALVAGED + REUSED
- - - salvage + reused overhead
- - - REMOVED
- RETAINED
- - - retained overhead



MEDITATION ONE - In the language of the call for this issue there is an assumption that extraction is negative and non-extractive practices are desired. Yet, extraction (of resources, of energy, of experiences, of opportunities, of knowledge) is necessary for human flourishing. Can we imagine a just and equitable human society that is truly non-extractive (or even an unjust and inequitable one for that matter)? Every organism and ecosystem is molded to extract. Communities rise and fall based on their ability to extract. One might say (in the language of the call) that what we are “drawing out” when we extract is life itself.

Similarly, if we consider the work of architecture and allied disciplines such as engineering and landscape architecture in base terms, these practices are concerned with the reshaping of the physical world for human benefit. Extraction is an unavoidable component of such reshaping. Our very work as a discipline is to redirect matter/energy flows toward novel configurations - to extract them for use. Therefore, the impulse to be non-extractive in our practices might not only be self-defeating; it seems largely impossible. The question for the architect then is not, “how might I operate in a non-extractive manner”. Rather, it is, “how might I extract most responsibly, effectively, and to the greatest benefit”.

We consider Layers to be our most potent example of this ethic to date; a project where we were compelled to consider and manage notions of extraction at various scales, intensities, time frames, and definitions of the term.

## 629 LUTTRELL STREET



Bird's eye view of the city of Knoxville, Knox County, Tennessee 1871, Chicago, Merchants Lith Co., A. Ruger. Note, Broad St. leads to future neighborhood of project. Source: Library of Congress Geography and Map Division, LCCN No. 73694529.



1969 Aerial Photo of Knoxville, TN. The Federal-Aid Highway Act of 1956 established I-40. 629 Luttrell St. is located between Third Ave and E. Fourth Ave (one block north of Deery St.) Source: [www.kgis.org/kgismaps/map.htm](http://www.kgis.org/kgismaps/map.htm) last accessed 05.21.2024.

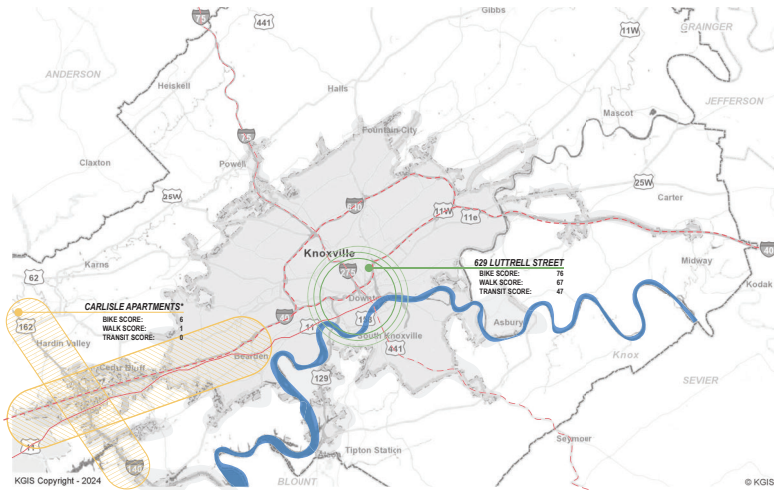
MEDITATION TWO - The urban position of Layers is instructive with respect to modes of extraction. Understanding the lot and residence as a part of a larger project, the city of Knoxville, we can see that its location has had quite different implications for the extractive energetics of the whole over its lifetime.

When first constructed, the house was part of the city's first subdivisions of what had previously been farmland. This expansion into the nearby countryside in the late 19th and early 20th century provided residential land in support of the city's growing manufacturing base. These new neighborhoods were served by a robust streetcar system that also fostered commercial development along its arteries.

Seen in this light, the house was a tool (one among many) that allowed the city's metabolism to expand in multiple ways - claiming land, moving people and goods, importing raw materials and transforming them through the application of human, animal, and machine power to higher levels of usefulness. To contemporary eyes, this expansion of extractive urban networks was modest, but at the time it was transformative and the house and its surrounding neighborhood were clearly active components in that growth.

Today the city's footprint is many times the size it was when Layers was first constructed. Its matter/energy throughputs must be many millions of times what they were then. The house sits a mere 500 feet from the interstate highway (part

## 629 LUTTRELL STREET



Knox County Development Patterns: In 2021, 70% of new housing units in Knox County were built outside of the central planning districts that have the potential for reinforcing anti-sprawl development patterns. Nearly 38% of the total new units were constructed in far-west Knox County, feeding the city's sprawl along the I-40 / Kingston Pike corridor. Carlisle Apartments listed as a model example in the Knox County Development Activity Report. Drawing by author.



The project is located in the 4th & Gill Neighborhood, which is listed on the National Register. The corner property is subject to aesthetic regulation through neighborhood design guidelines. This portion of the neighborhood bore the brunt of 1950s urban planning decisions and the introduction of I-40, which erased several blocks and severed it from downtown. Such decisions spurred sprawl development that continues to this day. The area adjacent to the interstate is the last part of the historic neighborhood to see the reinvestment that began in the 1980s. A former streetcar neighborhood, the area is walkable, bikeable, and connected to amenities by public transit. The clients' work commutes are 1.5 miles and 2.4 miles. The project reinforces these benefits by stabilizing a fragile home. The project's development density of 8.21 DU/acre (not considering the guest suite) exceeds the LEED for Single Family Homes threshold for compact development (7 DU/acre). While at 2,084 sf (including the guest suite), the home is just 84% of the size of the average new US single family home in 2023, 2,469 sf.

of a continent-spanning system of extraction and supporting extraction) that erased much of its neighborhood and helped to fling the boundaries of the city 13 miles east and 15 miles west. This geography is merely the legal definition of the city and does not take into account the full urban conglomeration that stretches across at least nine counties fed by untold resources.

In this context, Layers is a small but symbolic counterbalance to the worst extractive practices of sprawl development. It facilitates lives where one's daily movements may be largely powered at vastly lower energy transformities such as walking and biking. As an example, a recent housing project in an area of high residential development touted in the county's development report has bike/walk/transit scores of 6/1/0; whereas Layers touts 76/67/47.<sup>2</sup>

By virtue of surviving the United States' late 20th century disinvestment in center cities, the original matter/energy inputs in Layers have shifted from ones that were pushing the city outward to ones that are pulling it inward.

In our practice, teaching, and research we have long gravitated toward either urban infill projects or truly rural ones. This eschewing of the in-between, the suburban, has been largely a function of our unexamined personal preferences for the types of spaces we enjoy. With Layers as a powerful example, considering the extractive profile of the sites we work on (what the site is doing as part of a larger whole) gives us a potent way to make our "hunch" about the places we want to work newly operative.



SEPT 2020 Recovering material to repair and replace or reposition during demolition and deconstruction.

### MEDITATION THREE - The “Drawing Out” of Time

We removed and uncovered.

We removed, discovered, and recovered.

We removed and rearranged.

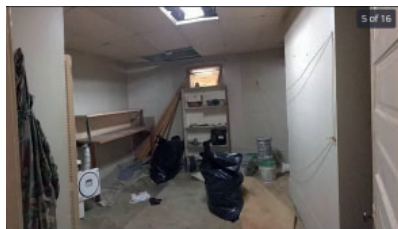
The construction of Layers was exacting. The evaluation of innumerable materials both for their continued physical usefulness and for their value as part of a cultural artifact, required throughout close and frequent collaboration with the contractor and the owners. The resulting palimpsest imparts a sense of “livedness” to the house - not so much a sense of history writ large as a sense of a history that inhabits the place. It is not lost on us that in doing this we have extracted something (an essence?) out from materials that was not of our making and that the project benefits from this hybridity in a way we alone could not have planned. In reflecting on this, we see that we used extraction in at least three modes to accomplish this result:

We used extraction to “draw out” time by uncovering materials in situ. This selective approach invited appreciation of exposed materials as found. These were often gently cleaned, repaired, or lightly finished without adding ‘re-covering’ materials where doing so was not at odds with performance.



OCT 2020 Demolition, deconstruction, and construction processes overlap with design.

We used extraction to “draw out” time by removing, discovering, and recovering, often changing the reading of the architecture in the process. In one room, demolition revealed that the existing window was once the center of a three-part bay window that had been mostly bricked over by the masons’ union. We took the decision to reinterpret the dormant windows as functional voids at the interior and as painted ghosts on the exterior thus projecting readings through materials that had hidden them for decades.



2018 Found condition as depicted on Zillow.com homesale site.





WINTER 2021 Demolition, deconstruction, and construction processes overlap with design.

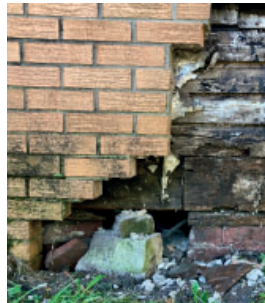
We used extraction to “draw out” time by removing and rearranging. There were several opportunities for materials such as flooring and doors to be removed and reused in new locations and purposes. Joists were relocated and doubled to create new voids. Throughout, materials were evaluated for their quantities and qualities and opportunities seized for their reuse. Such rearranging of materials destabilizes historical hierarchies that too often value what was ‘first’ to emphasize newly renovated states as holistic ‘next’ readings.



2019 Found condition as encountered by architects.



2020 Much of the rear of the house had to be dismantled and reconstructed due to lack of foundations and rotted and termite-damaged framing. Masonry removal revealed the lap siding of the original Queen Anne cottage, which became an inspiration for the composition of the rear elevation. Any 1950s brick that was removed during this process was flipped to its smooth side when reinstalled resulting in a clear but subtle record of the work. New engineered and solid timber roof framing at the rear introduced a steeper slope more in keeping with the rest of the house and provided clearances for inhabitation.



MEDITATION FOUR - Considering now more closely a single of the managed materials in Layers, we meditate on bricks. One of the oldest building technologies, bricks are extractive in their fundamental nature. Made by literally pulling clay and shale deposits from the ground and taking advantage of the material's plasticity for shaping into units, bricks retain their "earthness" in texture and color. This most basic processing of bricks - moving components of earth out of the ground and reforming them into structures - while extractive in the deepest form of the word, requires extremely low energy inputs and would therefore be thought of as boasting a low extraction profile. Of course, this thinking only holds fully true for bricks hardened in the sun, begins to break down when we harden bricks using wood fire, and completely collapses when we run them through a kiln fuelled by coal and/or natural gas, as with nearly all modern bricks. As their energy transformities change so does what we might consider their extraction profile.

With respect to notions of extraction, bricks then have a dual nature - a deeply embedded but low transformity extraction profile in their proto-nature, and an applied but high transformity profile that is necessary for them to gain the durability and dimensional predictability necessary for use in today's construction environment. This dual nature is further exaggerated when we consider transportation. Bricks are heavy. For utilitarian uses, this confines them to the environs in which their constituent clays are found. Moving bricks any distance requires another significant energy input.

The local masons' union clad the house in brick in the 1950s.



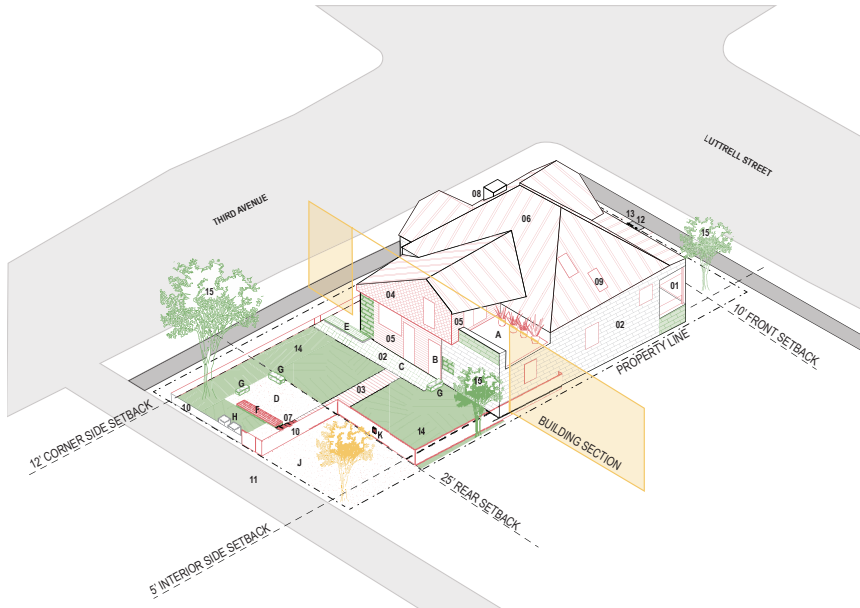
SEPT 2020 Recovering material to repair and replace or reposition during demolition and deconstruction.

The bricks they used are lightly textured and in a buff color, meaning they were not made from the clay common in the area. Judging by the use of similar brick on several local commercial projects in the city, this type and color of brick was en vogue at the time and the masons likely saw it as a way to give their building a sense of sophistication when few could see a residential future for the neighborhood.

So, the bricks at Layers can be understood to have a high embodied energy even with respect to bricks in general, which are already a relatively high embodied energy material. This embodied energy can be seen as the the extractive deficit that must be amortized by all of the bricks' future work. We had a strong sense that they had not yet finished that amortization. This was not a stance we arrived at through calculation but rather through a responsibility that we feel more broadly toward materials "in the world" deployed by other builders at other times.

Further, the brick shell of the house with the finer wood detailing poking out here and there made for a unique expression that spoke of the specific history of the place. Bricks therefore came in for special treatment in the project. They were preserved, strengthened, and handled carefully. Where 1950s bricks were moved either through collapse or in the course of reinforcement, they were replaced with their smooth side out to create a record of the process. Any excess original bricks or 1950s bricks were retained and used for site construction. We extracted a next act from the bricks at Layers both energetically and culturally.

# 629 LUTTRELL STREET



- KEY:** A GREEN ROOF B ADU ENTRY C ACCESSIBLE ENTRY D GRAVEL PATIO E SALVAGED WOOD BENCH OVER EXISTING CMU WALL  
 F BENCH OVER REFURBISHED LOW WALL G SALVAGED MARBLE STONE BENCH / LANDSCAPING H TRASH BINS J GRAVEL CAR / BIKE PARKING K EV CHARGING STATION
- 01 PORCH COLUMNS / RAILING 02 BRICK 03 WOOD 04 CEDAR SHINGLE 05 POPLAR SIDING 06 METAL ROOF 07 TIMBER / GRAVEL STAIR  
 08 BRICK CHIMNEY 09 SKYLIGHT / EGRESS 10 FENCE 11 ALLEY 12 EXISTING CONCRETE 13 GRAVEL 14 GRASS + VEGETATION 15 EXISTING TREE
- NEW — SALVAGED + REUSED — REMOVED — RETAINED

SITE AXON: The careful, sometimes surgical process of selective demolition and evaluation of existing materials led not only to particular architectural language but also yielded real benefits with respect to embodied carbon. Working this way served ambitious environmental aims. Maintaining much of the existing fabric upcycled 17.04 metric tons of CO2 equivalent. (Per NREL construction of the average US production home in a warm climate requires 54.43 metric tons.)  
 Image by Author.

MEDITATION FIVE – It’s just a house. True and not. Layers is a project that came to us, and we shepherded it to the best of our abilities. Is it small? Yes. Is it in a way precious? Yes again. Yet, as with any project, it’s a vehicle for our ethics – for extracting some small bit of the world we want to see out of the world that is.

We can point to objective measures. We can tell you that the materials retained and upcycled in this project represent 17.04 metric tons of CO<sub>2</sub> equivalent and that the construction of the average new home in our climate requires 53.43 metric tons of CO<sub>2</sub> equivalent.<sup>3</sup> That 32% “savings” in material extraction, processing, transportation, and installation and the associated “leaks” in the carbon cycle that were thus avoided are real and worthwhile.

We can also consider more slippery, subjective characteristics. We can tell you that there is a texture and a patina imparted to the project by the historic materials that give it a sense of depth and warmth that would have been difficult to replicate if it had been completely new construction. Retaining the existing shell, foundations, and much of the interior framing makes the house feel more “rooted” in the neighborhood. We can also say that, though it was a bit of an ugly duckling, tearing the house down would have hurt our hearts.

For us then, the work we did at Layers seems right. It feels like part of a larger project whereby architects are beginning to take responsibility for the matter/energy flows entering their projects at the time of their construction, pulsing through them as maintenance during their use, and

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MAY 2024 Demolition of four residential halls and one classroom building to make room on this site for a new classroom building despite the university's stated immediate need for 1.4 million gross square feet of housing (Per Chancellor's address and University Master Plan Slide Presentation . Photo by Author.



finally settling out into new forms and places upon their demolition. It's as if the discipline is just beginning to glimpse the connectedness of all places and all times.

Then we raise our eyes, and we are disheartened.

The scale of the built world is so vast as to be incomprehensible. The complexity of the matter/energy flows through modern economies are so complex they seem almost of their own mind. Who can pump the brakes and have a moment to simply consider a course of action? Even our own institution at 230 years old sees the massive physical extent of the campus neither as a thread connecting our past to our present and future nor as an extraordinary investment of resources extracted for the greater good but at a price that hasn't yet been repaid. Instead, the buildings and landscapes are considered disposable – as if that term has any meaning if one zooms all the way out. They are seen as being impediments to the campus to come – as if there might be only one incarnation of that future. If one can't see hope in a university campus what hope might there be for a region, for a continent?

But what are we to do? Nothing? We do what we know how to do. We practice, we teach, we write, we advocate.

References:

1. Donald Schön, *The Reflective Practitioner: How Professionals Think in Action* (London: Routledge, 2016).
2. Knoxville/Knox County Planning Commission, *Development Activity Report*, 2021.
3. US Department of Energy Office of Energy Efficiency and Renewable Energy, *Carbon Emissions in a Typical New Production Home: a Case Study*, February 2023.

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2023 Corner of Luttrell Street and Third Avenue. Cheap, historicist misses (1990s - 2010) installed by previous owners were removed. Careful selective demolition and extensive repair allowed for the rediscovery of and reinterpretations of tectonic layers. Original clipped gable roofs, windows, and details (1897) were repaired and repainted. Brick from the 1950s was repaired and painted with the exceptions that it was removed at the front porch where original brick was discovered and it was cleaned and left unpainted along the interior side yard. Photos by Robert Batey Photography.

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2023 Detail of Third Street Elevation. Color wraps the corners and marks the locations of original bay geometry and windows discovered during interior demolition. Photo by Robert Batey Photography.



2023 Interior Upper Level. New (red) posts and salvaged (white) blocks provided needed support for an existing dormer. Existing ceiling joists were uncovered, cut in place and doubled/headered to create a stair void. Photo by Robert Batey Photography.



2023 Interior Upper Level. Existing framing was leveled and voids created. Collar ties were exposed, retained, and lightly cleaned. Structure heart pine decking was salvaged from downstairs, de-nailed, planed, and reinstalled adjacent to new structural pine decking. Photo by Robert Batey Photography.



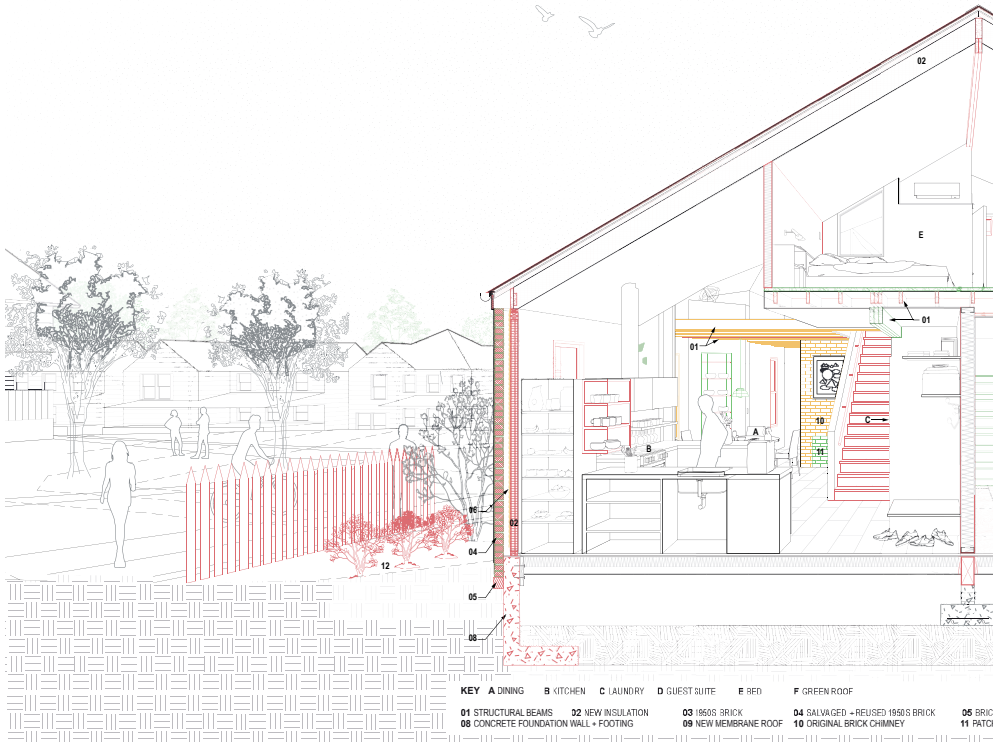
2023 Interior Lower Level. Original, altered, and inserted framing open the floor to the roof at the entry where a skylight accentuates the layers at the entrance hall. Photo by Robert Batey Photography.



2023 Interior upper loft view to entry hall below where details exhibit all eras of construction.

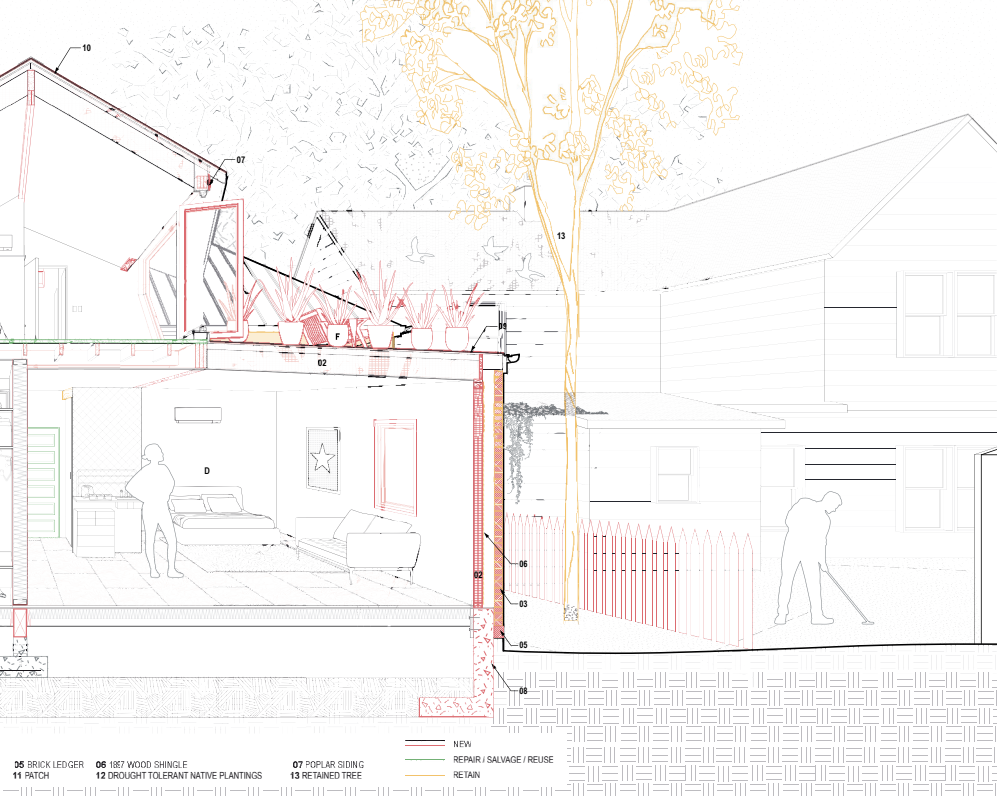
## 629 LUTTRELL STREET

2023 Exterior: Concrete is strictly limited to below-grade foundations. Timber site retaining walls, stairs, and fences with pea gravel, timber, and brick paths and patios further reduce the projects CO2 footprint and permeability for infiltration. Marble, cored industrial brick, historic solid brick, lap siding and paint contribute to the site narrative of material recovery and reuse. Robert Batey Photography





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- 05 BRICK LEDGER
- 11 PATCH
- 06 1867 WOOD SHINGLE
- 12 DROUGHT TOLERANT NATIVE PLANTINGS
- 07 POPLAR SIDING
- 13 RETAINED TREE

- NEW
- REPAIR / SALVAGE / REUSE
- RETAIN



