

# Bridging

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Master of Architecture

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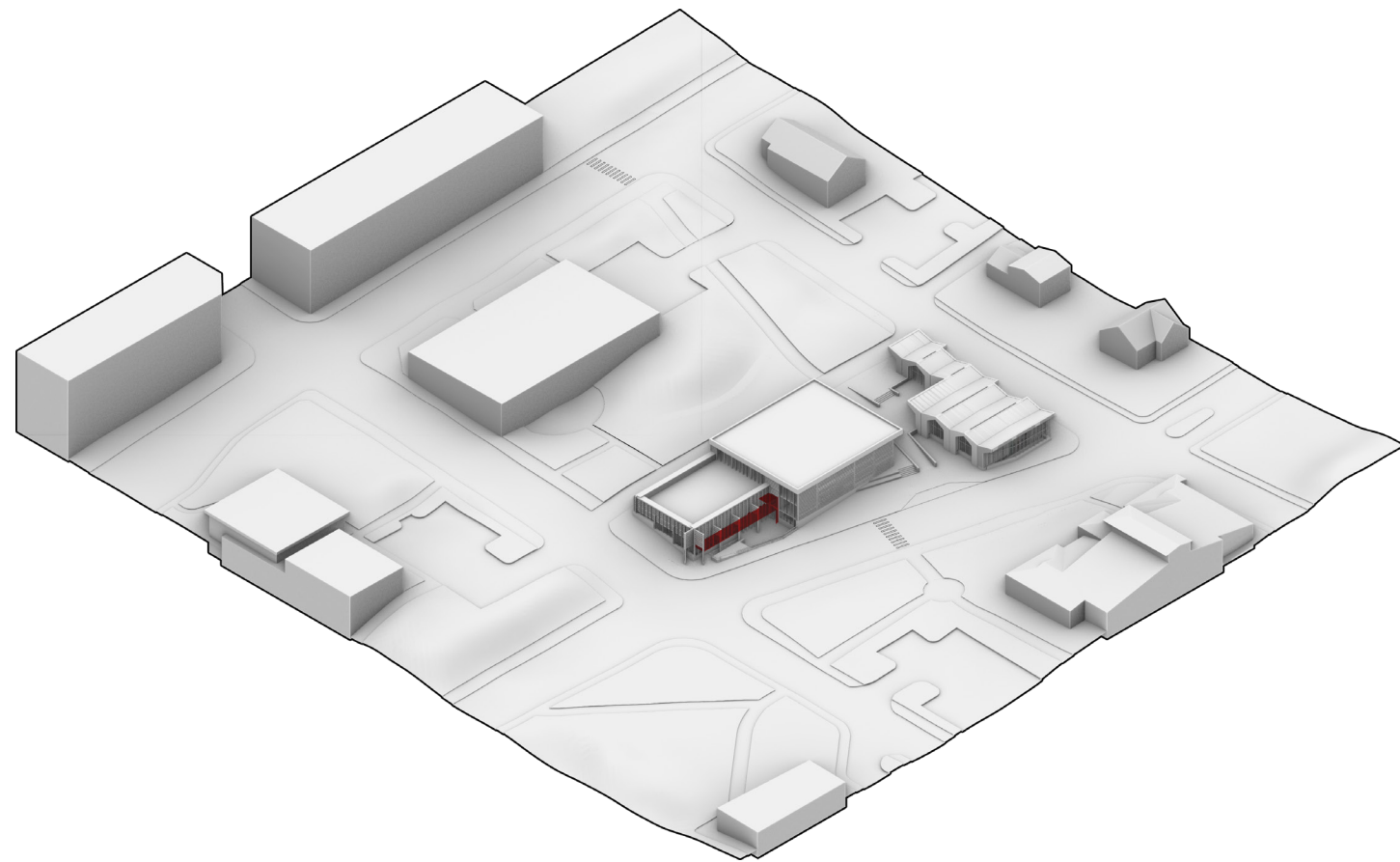


Fig.1: The architecture of the thesis project originated in relation to the immediate environmental context

## Abstract

Bridging is considered as a formal, spatial, referential, and tectonic articulation of connectedness between architecture and context. The question is probed through a mixed architectural program situated in the interstice of an urban downtown and residential neighborhood.

The architecture originates from singular or hybridized combinations of these characteristics:

whereas **formal** defines the compositional relationships through, for example, orientation, grids, scales, proportions, and contrast or balance among the parts;

whereas **spatial** indicates a gradient of boundaries established through anchoring, intersecting, overlapping, projecting, interlocking, and parallel elements;

whereas **referential** draws connections through an interpretation of distinct characteristics from the present, past, and future environmental context; and

whereas **tectonic** consists of the underlying structure, frame or mass, and materiality without which the formal, spatial, and referential concepts cannot become physical.

## Acknowledgements

I will be forever thankful for the enduring support from my committee. Their impact as teachers reaches beyond my master's thesis and will inspire me for the work to come. My chair, Associate Professor Hilary Bryon, has been tremendously supportive and provided profound guidance on countless questions. Her incredible dedication to architecture and teaching were instrumental to me in concluding this work. Associate Professors Heinrich Schnoedt and Hunter Pittman also have generously provided myriad feedback and encouragement that helped me with many obstacles throughout my work.

I also wish to acknowledge the encouragement and love of my wife, Joyce, amid completing her dissertation as a PhD candidate.

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# Introduction: Bridging

The conception of architecture with an intention to complement the sense of place requires complex considerations, such as its existential, cultural, and perceptual nature. The 2017 AIA Virginia Prize Competition brief helped me explore these questions conceptually in an architectural proposition for a terminus in Alexandria (Fig.3); a situation saturated with historical, cultural, and political layers. The concept model (Fig.2), in particular, illustrates the full expansion of the architecture between the point at which historic King Street and the river meet as well as the Virginia-Maryland state line along the Potomac River. This proposal scratches the surface of the pursuit of these questions at both, urban and architectural scales. The following work continues this exploration in depth.



Fig.2: Concept model for terminus at meeting point of street and river (2017 AIA VA Prize Competition)

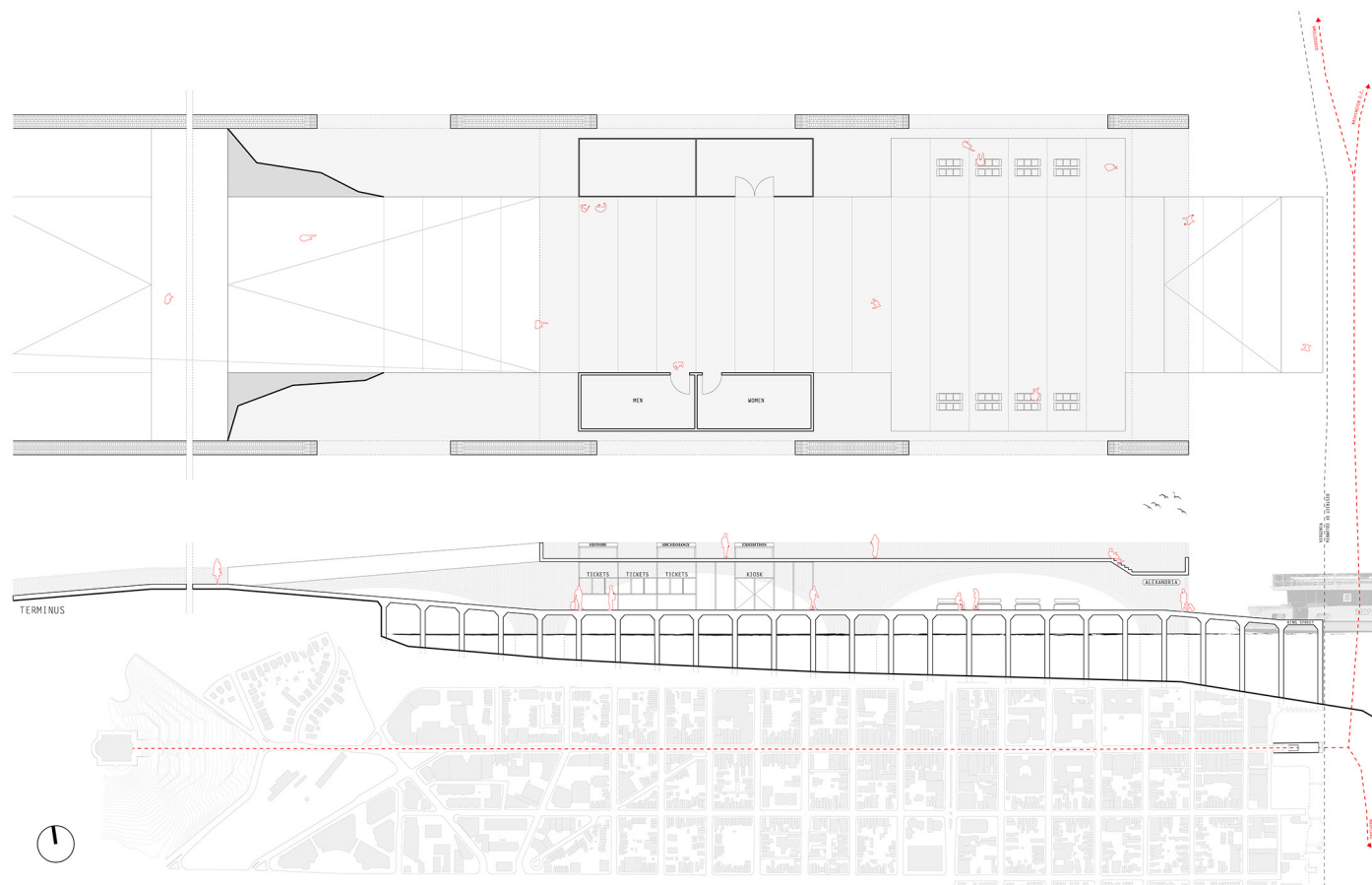


Fig.3: Formal, spatial, tectonic, and referential articulation of connectedness (2017 AIA VA Prize Competition)

# Precedence of Thought

The following considerations, thoughts, and literature have been essential to the thesis work:

**C. Norberg-Schulz: Genius Loci, Towards a Phenomenology of Architecture** (1979) presents ideas such as sense of place and phenomenology in architecture citing Heidegger's idea of the bridge.

**Camillo Sitte: The Art of Building Cities** (1889) offers insight into the concepts behind successful public spaces, specifically public squares, in various case studies.

**Kevin Lynch: The Image of the City** (1960) advocates designers to consider the experience of the urban dweller in the process of evaluating and (re-) constructing urban places.

**Gestalt principles and psychology** (1912) considers the whole as greater than the sum of its parts. The configuration of elements creates a distinct phenomenological experience from merely unrelated parts.

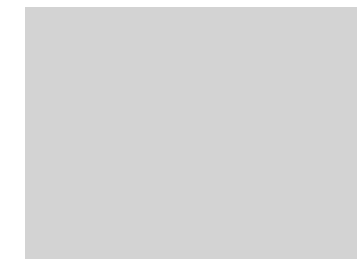


Fig.5: Rubin's Vase

**Georg Simmel: The Bridge and The Door** (1957) (translated by Kaern) contemplates the conditions of separateness and connectedness originating in our subjective human nature and selective structuring.

**Steven Holl: Anchoring and Intertwining** (1989, 1996) as well as his work profoundly originates in the idea of a fundamental interdependence between architecture and site resulting in a mutually beneficial outcome.

**Bernard Tschumi: Architecture and Disjunction** (1994) discusses the meaning of event and program in architecture and urban places with an emphasis on multipurpose programs and the present-day culture.

**Peter Zumthor: Thinking Architecture, Atmospheres** (1998, 2006) and his work masterfully realizes architecture that materially and structurally engages our senses from a very intimate perspective.

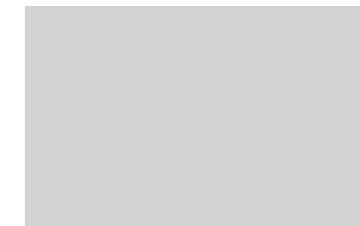


Fig.6: Cept University Library, Ahmedabad, India, RMA Architects

**Rahul Mehrotra (RMA Architects): Soft Thresholds** (2017) questions hard boundaries which reinforce separation in architecture, cities, and disciplines. They investigate how thresholds can rather foster social connection.

**Carol J. Burns: On Site: Architectural Preoccupations** (1991) expands the discourse on the meaning of a site by differentiated terms framing considerations on site. The various ideational layers of a site are ever-changing and not definite.

**D. Dunay: Town Architecture, Understanding a Virginia Town** (1986) presents a comprehensive historical analysis on Blacksburg, and furthermore proposes qualities which uniquely structure a the Virginia town.

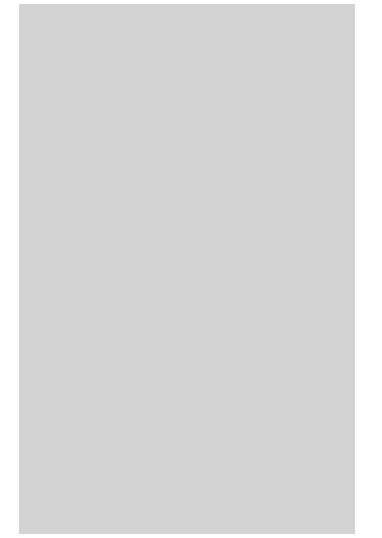


Fig.4: The Image of the City, K. Lynch

**Kerstin Thompson-Architects: Gradient architectures** (2001) and their work searches the qualities of in-between spaces, or interstitial, by exploring the gradation of parts that aggregate to become a distinct whole.

# A Site: The In-Between



Fig.7: Buildings at the farmers market



Fig.8: Typical house, detached garage



Fig.9: Adjacent Blacksburg town hall



Fig.10: Trail entrance across the street

Blacksburg (Fig.12) is a town in Southwest Virginia first established on a 16-square grid in 1798, which remains as the nucleus of the downtown today. Miller Southside is a popular low-density residential neighborhood adjacent to the town center and within the bounds of Main Street and the Huckleberry Trail (Fig.10). Draper Road Mini-Mall (Fig.11) currently occupies the thesis site at the transition between the urban downtown and the residential neighborhood

with little regard for its context. The Civic Center, including Blacksburg's town hall (Fig.9), administration, and government, Montgomery-Floyd Regional Library, and the police station also surround this multi-faceted intersection. The thesis project studies an architecture of bridging on the cleared site of Draper Road Mini-Mall with consideration for the people and place.



Fig.11: View of Daper Road Mini-Mall, the site, from low density residential neighborhood with peripheral commercial downtown and civic buildings



Fig.12: The Figure-Ground Plan of Blacksburg illustrates distinct building scales and densities surrounding the site (red)

## Urban Context

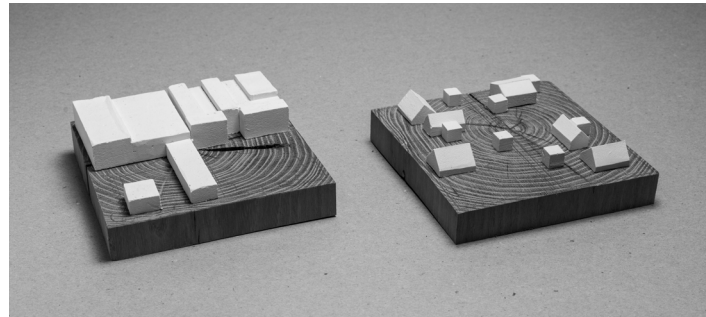


Fig.13: Study comparing exemplary building volumes, urban to residential

The urban and residential zones display distinct building characteristics such as typology, scale, and density (Fig.13). The architecture of the downtown is generally box-shaped, several stories tall, and economically



Fig.14: Theatre 101 at termination of Draper Rd



Fig.15: Exemplary Blacksburg retaining wall

condensed. Specifically, along Draper Road and Main Street, the lower four to eight Southwest blocks of the 16-squares (see Fig.16), the buildings and parking lots occupy the interior of the block and push the shared public spaces towards the perimeter. The motif of T-Streets is described by Donna Dunay in Town Architecture: "the T-Street [...] transforms the street into a room of the town" (p. 63). This condition is visible in Theatre 101's street termination today

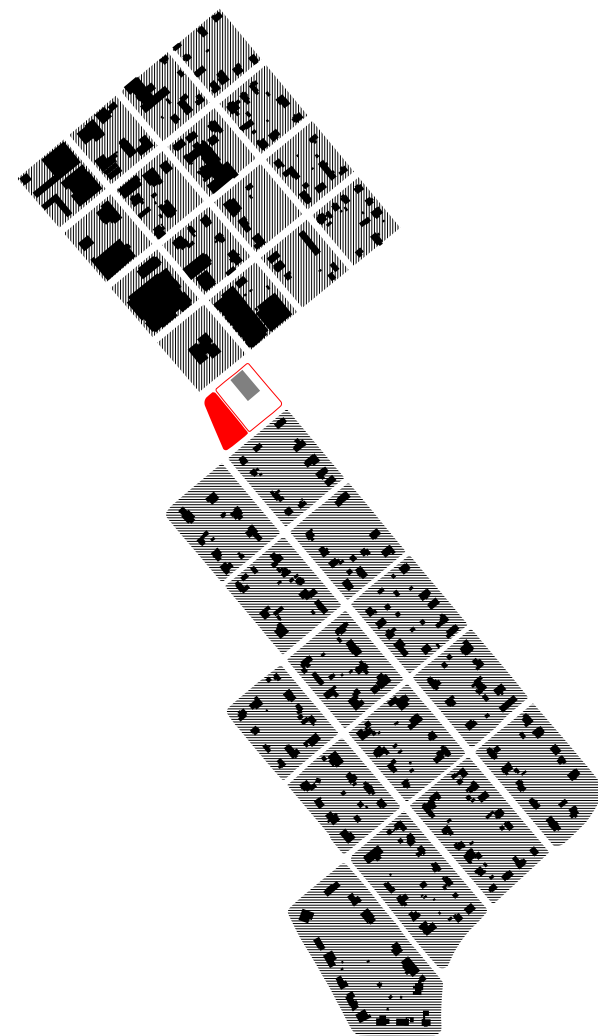


Fig.16: Isolated Figure-Ground Plan of the downtown 16 squares and low density residential neighborhood

(Fig.14). This condition challenges one to consider the extroverted nature of the town center site.

Three additional characteristics of Blacksburg that have significantly impacted the study of architectural bridging need to be introduced. The first is the formally similar **retaining walls** that mediate the notable topographic changes at numerous sites in and around downtown Blacksburg (see Fig.15). The sec-

ond consists of various **folded facades** which establish a condition for entry (i.e. Fig.17, Fig.18, and Fig.19). They engage and invite the pedestrian to transition from the exterior along the folded facade to the interior of cafe,



Fig.17: Bollo's Cafe & Bakery

restaurant, or store. The **cutting of the corner** is the third distinct characteristic and forms an entrance situation (see Fig.20, Fig.21, and Fig.22). This articulation engages with the building's respective place as Donna



Fig.20: 101 North Main Street



Fig.18: John's Camera Corner plus other stores



Fig.21: 101 South Main Street



Fig.22: 201 North Main Street



Fig.19: Sharkey's Bar & Grill

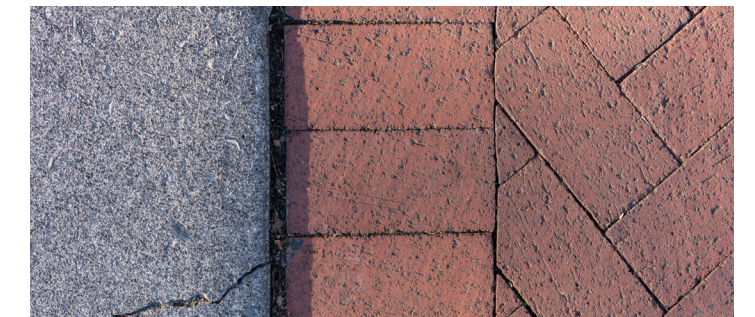


Fig.23: Sidewalk Detail

Dunay presents in her aforementioned book: "Several older buildings within the sixteen squares pay homage to their respective intersections. [...] These entrances are a reflection of the diagonal brick crosswalks that once connected these buildings. [...] This cutting of the corner not only makes unique building entrances, but also frames and widens the effective size of the intersection" (p. 16). The diagonal pattern of the crosswalk (Fig.23) remains in patches of downtown today.

## Residential Context

Miller Southside is typically defined by single-family houses with pitched roofs and a detached garage (see Fig.27 and Fig.30) that are generously spread out along streets with sidewalks and trees. Buildings adjacent to the neighborhood (Fig.28 and Fig.29) have adopted a relatable roof typology, however, the intention behind this adoption of formal type is not known.

Throughout the neighborhood, alleyways provide an additional



Fig.24: Miller Southside Neighborhood



Fig.27: 605 Draper Rd SW: Typical house with detached garage, sidewalk, and trees



Fig.25: Miller Southside alleyway



Fig.28: Pitched roof articulation of Clay Court



Fig.29: Folded roof, former public library building



Fig.26: Continuation of the Miller Southside alleyway along the site



Fig.30: 503 Draper Rd SW: Typical house with detached garage, sidewalk, and trees

means of access and connect to the backyards of the residents (Fig.25). This route (Fig.31), specific to Miller Southside, extends to the back of the Draper Road Mini-Mall (Fig.26), the project site and is a critical connection for pedestrian traffic.

## Huckleberry Trail

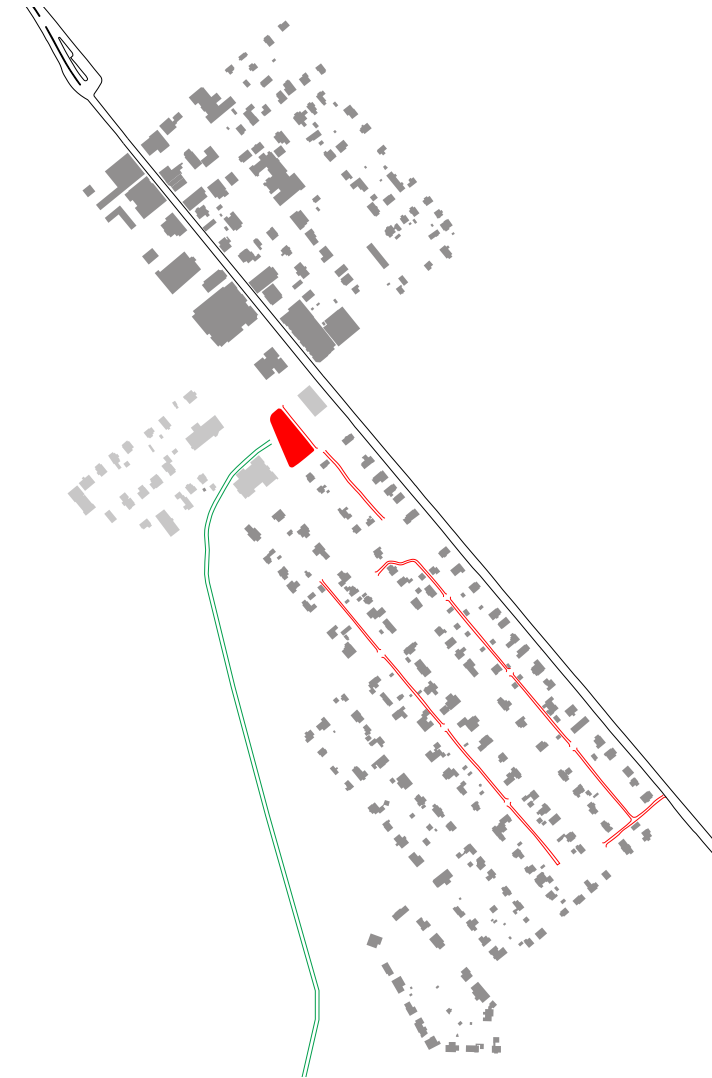


Fig.31: Isolated Figure-Ground Plan including adjacent civic buildings, alleyways (red), and Huckleberry Trail (green)



Fig.32: Huckleberry Trail entrance sign



Fig.33: Recreational trail today



Fig.34: Pedestrian bridge along the trail

The Huckleberry Trail originated from the former Blacksburg railway (Fig.35) and offers popular recreational space to the public today (Fig.32, Fig.33, and Fig.34). The path also acts as a boundary to Miller



Fig.35: Former Blacksburg railway connected the town to the world via its 'trail' before Highway 460 took over and motor vehicle travel became popular

Southside (Fig.31) on the West. As a railway, the path continued across Main Street. The future "Midtown" development, Southeast from the 16-Squares, could connect to the trail through re-extending the trail across Draper Road Mini-Mall and Main Street.

# Mixed Programming

The complex environmental context surrounding the site calls for a mixed program that considers all the major entities: the commercial downtown, the residential neighborhood, the recreational Huckleberry Trail, and the public Civic Center of Blacksburg. Presently, Draper Road Mini-Mall only addresses the commercial aspect including an expansive parking lot along the front elevation. From the commercial and civic on the left, to the arrival of the trail in the

center, and the residential on the right, a spacious restaurant, public hub, and plaza at the continuation of the Huckleberry trail, and a small daycare have been strategically selected to institute distinct events and architecture on this site (Fig.36 and Fig.37). Consequently, this aggregation of contextually relating programs magnifies the contrast between the prospective entities and becomes the focus in the study of an architecture of bridging in the following project:



Fig.36: Diagram for arrangement of the program on the site

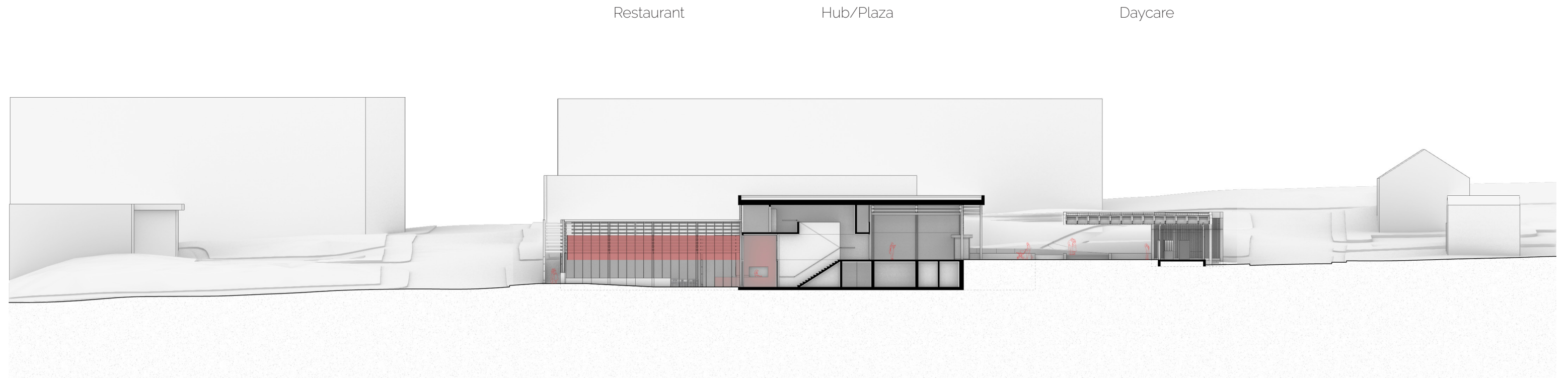


Fig.37: Section of the programmatic sequence, starting from the left with the restaurant, then hub, and daycare, bridging between the downtown on the left and Miller Southside neighborhood on the right

# Project Overview

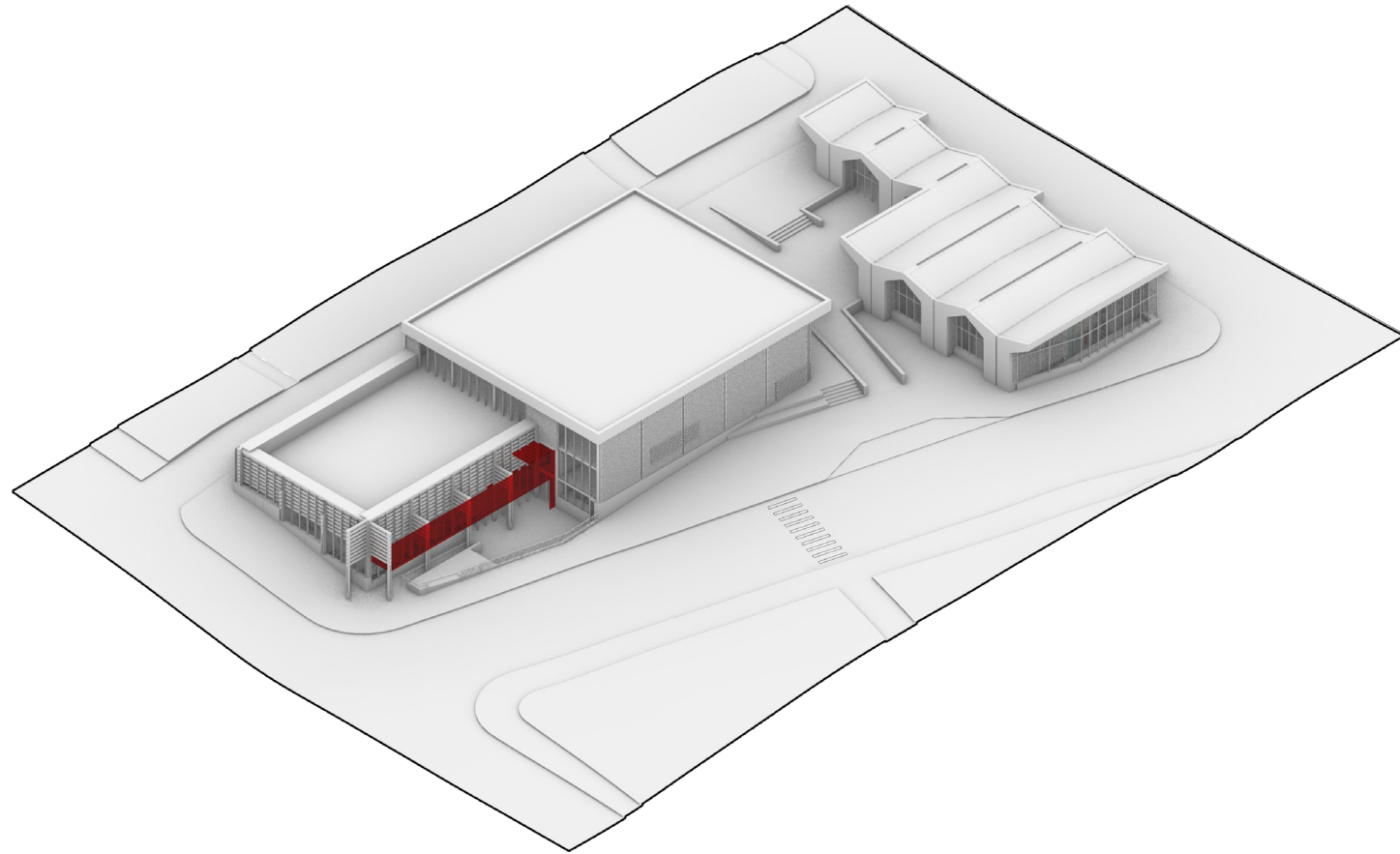


Fig.38: Isolaed Oblique Projection illustrates the transition between urban and residential attributes along the positive volumes and negative spaces of the thesis project , Project Overview

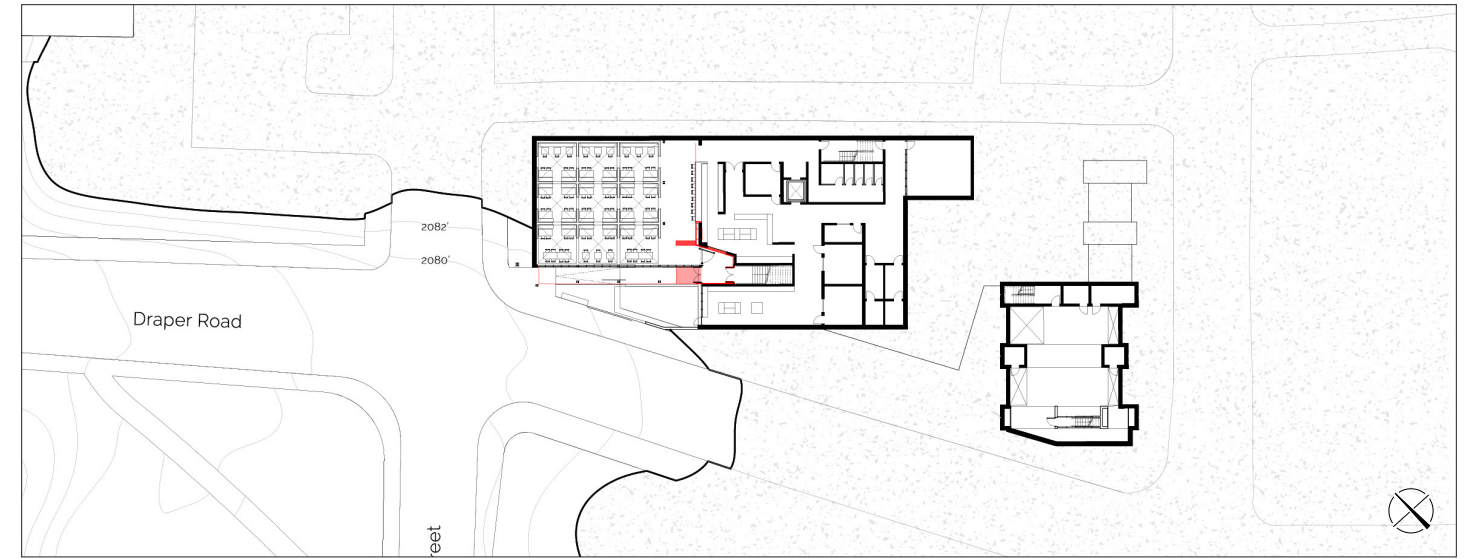


Fig.39: The lower level floor plan indicates how the topographic change of the site affects the various programmatic elements

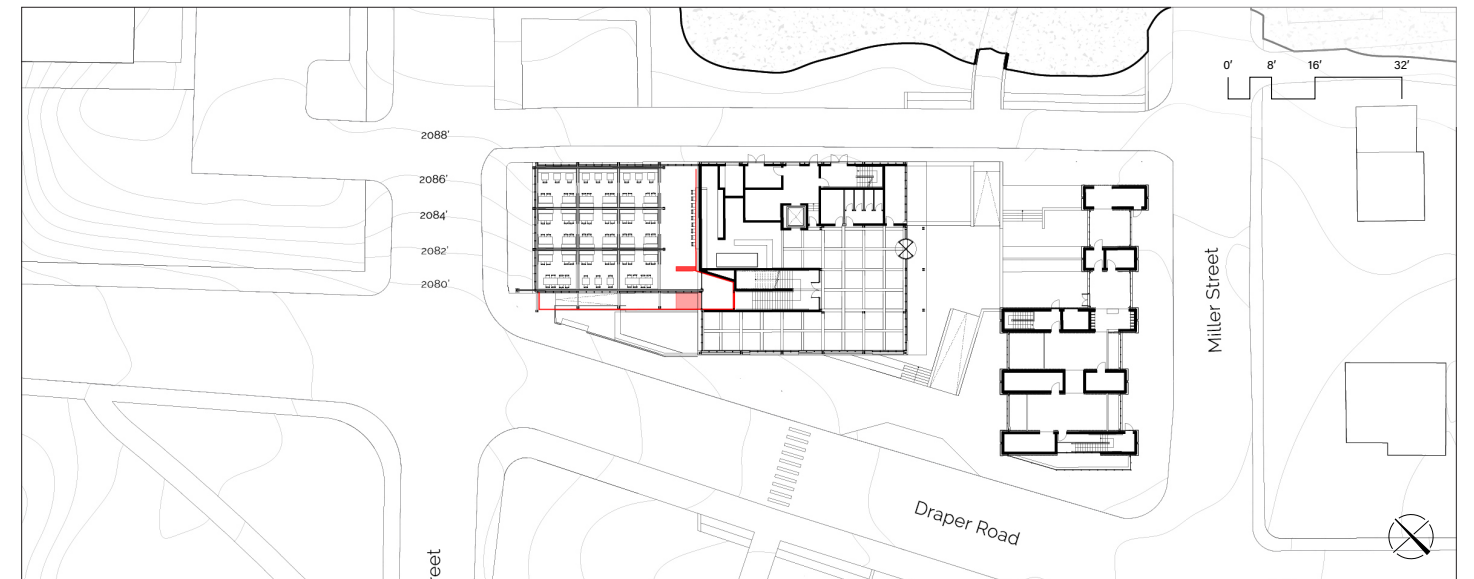


Fig.40: The ground floor plan shows the different scales of the interiors between the restaurant, hub, and the daycare.

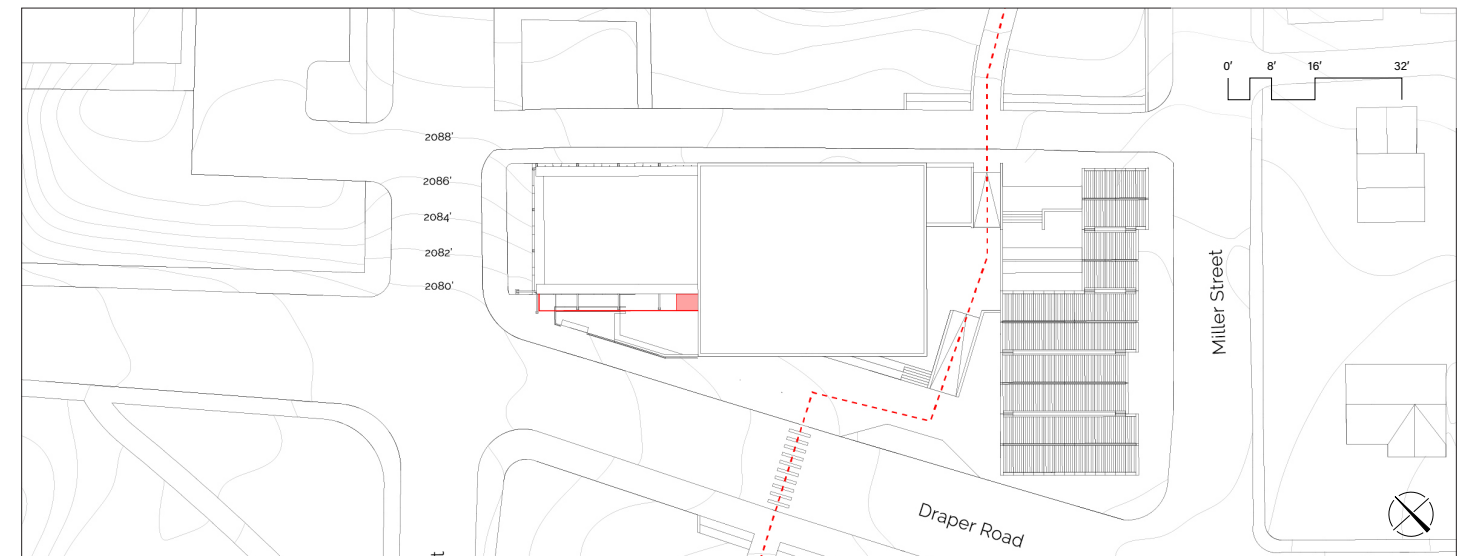


Fig.41: The roof plan relates the project and the surrounding buildings by scale and roof typologies.

# Urban: A Restaurant



Fig.42: View of the restaurant along Draper Road from downtown

Situated at the intersection of Draper Road and Clay Street, the architecture of the restaurant meets the urban edge intentionally (Fig.42 and Fig.43). Imitations or reinterpretations of those characteristics of Blacksburg's downtown as presented on the spread "A Site: The In-Between: Urban Context" provide perceptual anchors to facilitate this grouping.

Most prominently, the facade of the restaurant along Clay Street resembles the first of three instances comparable to the condition of T-Streets. Due to the diagonal reorientation of Draper Road between Clay Street and Miller Street, the Northwest facades of the Hub and the Daycare appear as the second and third instances. This threefold configuration originates from the proportional expansion of each programmatic volume to the trapezoidal site. Consequently, the negative space in front of each instance accommodates the public in a familiar sense.

Thereafter, the urban scale and box-typology of the restaurant develop along the lines of many downtown and civic buildings. However, the architecture also reconciles the scale of the human and the landscape. The latter relies on a series of stepping retaining walls in relation to both the topography and the internal organization of the restaurant (Fig.43). On the following spread: Tectonic Gradation visualizes considerations for the human scale through spatial constructs.

Lastly, the corner of the restaurant at the intersection reflects the idea of the cut-corners at various downtown intersections, but inverts the architectural expression. Instead of a subtraction, the structure projects outward and creates a receiving gesture towards both sides of Clay Street and Northwest down Draper Road. The entrance, a red ribbon, constructs a condition for entry and thus relates to the folding facades. The section: Spatial Continuity illustrates the entrance sequence through spatial drawings.



Fig.43: Lower level floor plan illustrating the topographic demarcation between the restaurant and the daycare

## Tectonic Gradation



Fig.44: Tectonic articulation of the whole and subdivisions of an urban gathering space with human scale

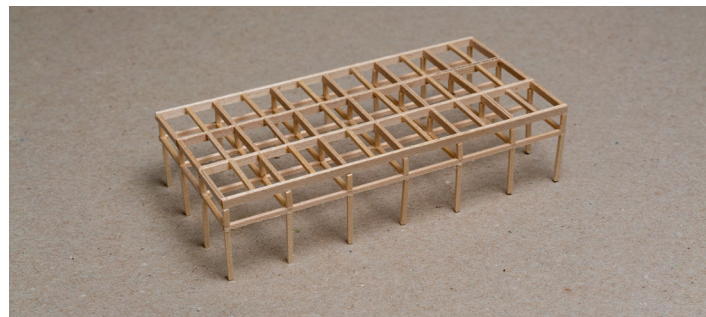


Fig.45: Study model exploring spatial subdivisions with a truss structure

The bridging of scales primarily occurs through the glue-laminated (glulam) timber structure, a spatial framework of stacked beams spanning across the entire dining area. As a whole, the tectonic system, including the battened columns and retaining walls, articulate the perimeter of the monumental dining space. However, the timber structure also defines a nine-square grid with coffers between the horizontal members. Concurrently, three subdivisions of the

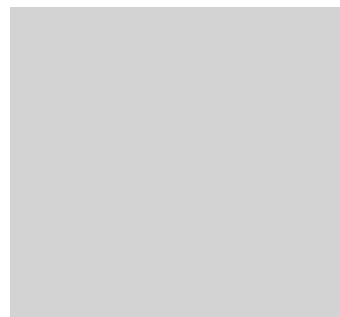


Fig.46: Substrate Factory Ayase / Aki Hamada Architects, ©Kenta Hasegawa

retaining wall correspond to the elevation changes of the topography, as well, furniture for fixed seating reflects the ceiling grid on the floor. These partitions address the human scale nested within the monumental structure. Physical models (Fig.45) and finally digital models (Fig.44) facilitated this study of gradation of architectural scales, while specifically two architectural projects (see Fig.46 and Fig.47) inspired this tectonic concept.

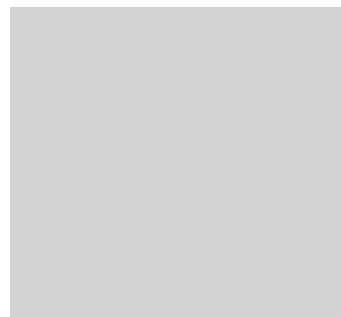


Fig.47: Ceiling Structure of Kirchenzentrum in Munich-Riem, Germany

## Spatial Continuity

Following the cut-corner at the intersection, the ribbon orchestrates a spatial sequence between the exterior and interior (Fig.48). First, the opaque red-colored glass continues parallel to a descending path and along the Draper Road facade (Fig.49). A horizontal fold creates a cover in front of the entrance, while clear glass doors allow the ribbon to continue visually. The air-lock nests like a pocket in-between the restaurant and the hub and provides access to the main staircase for circulation between all floors. Yet, the material of the ribbon also covers the doors to the staircase in order to create visual continuity around the corner. Next, the screen re-orientates the sequence parallel to Draper Road and includes a window of frosted glass to the kitchen. The opening continues to transform into the host-hostess counter signaling the arrival inside the restaurant. Finally, the ribbon folds again and frames the bar and kitchen. This concept recalls and expands on the familiar folded facades of Blacksburg's downtown.

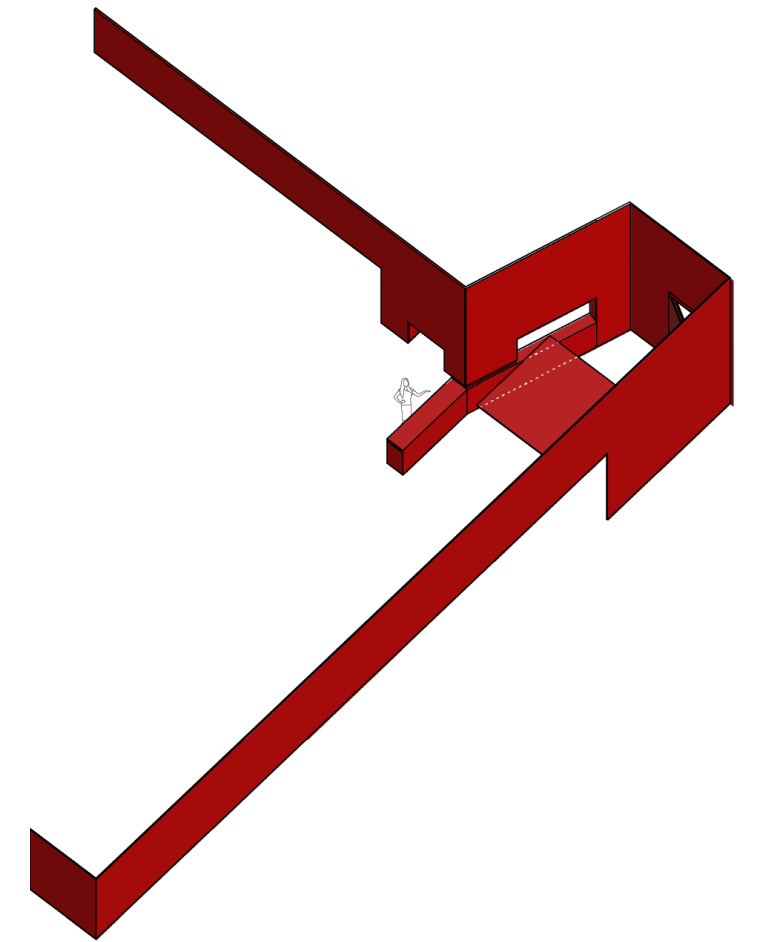


Fig.48: Diagram of the spatial entrance sequence formed by the ribbon

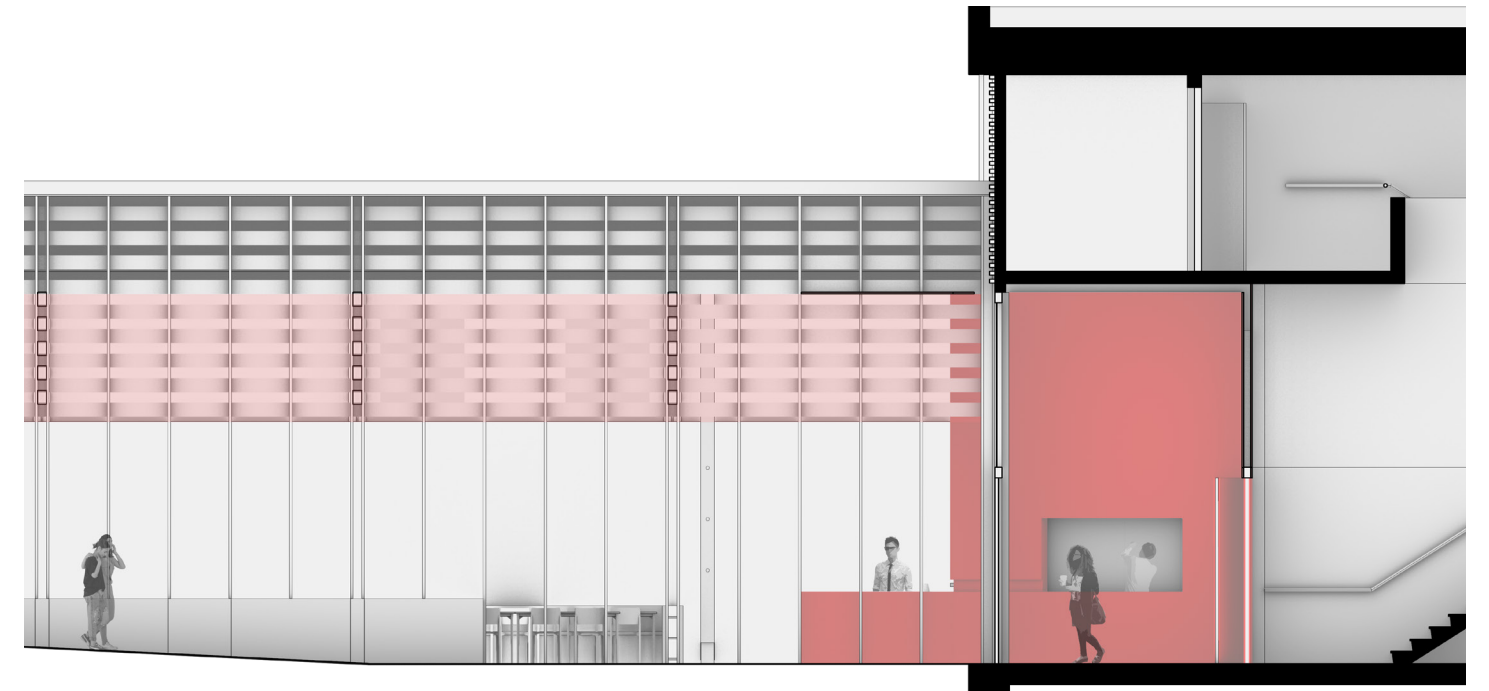


Fig.49: Section along the ribbon and entrance with kitchen activity behind frosted glass and receptionist

## Residential: A Daycare

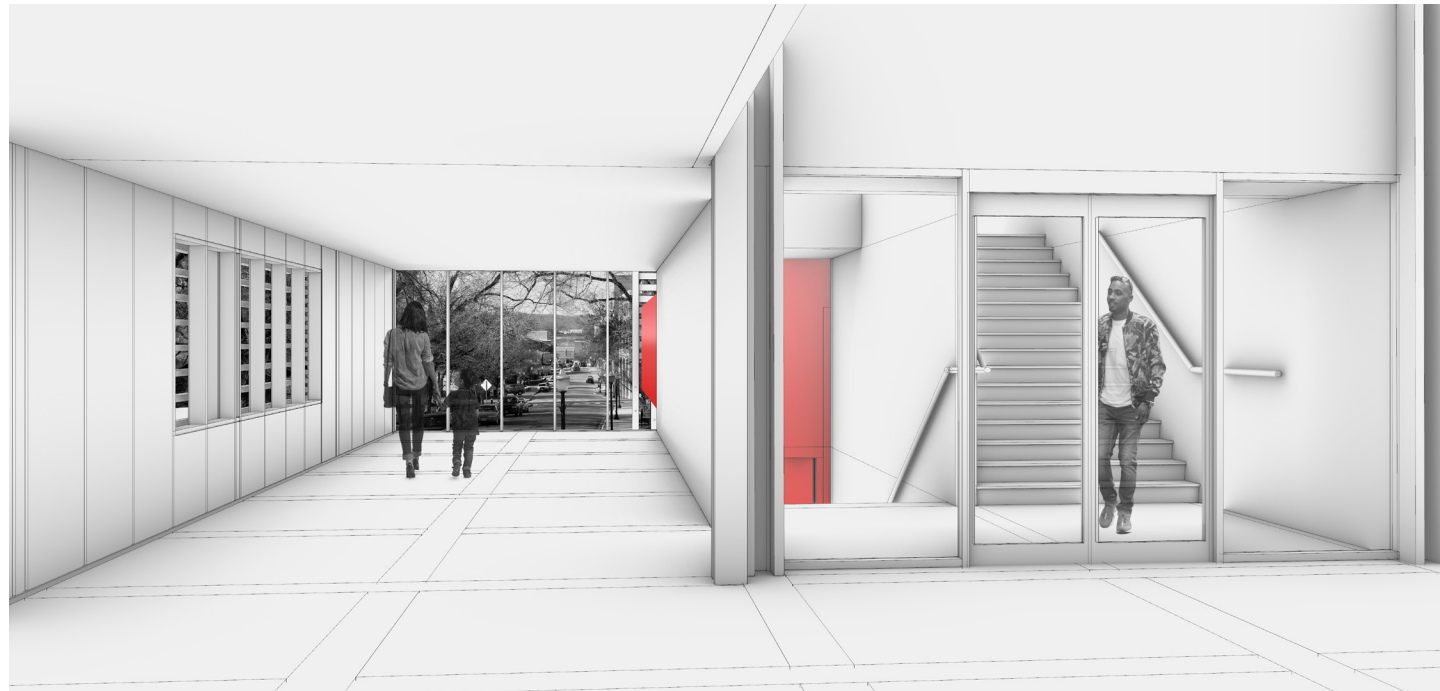


Fig.50: Direct visibility of the restaurant's entry ribbon from the Hub interior and intentional framing of downtown along Draper Road

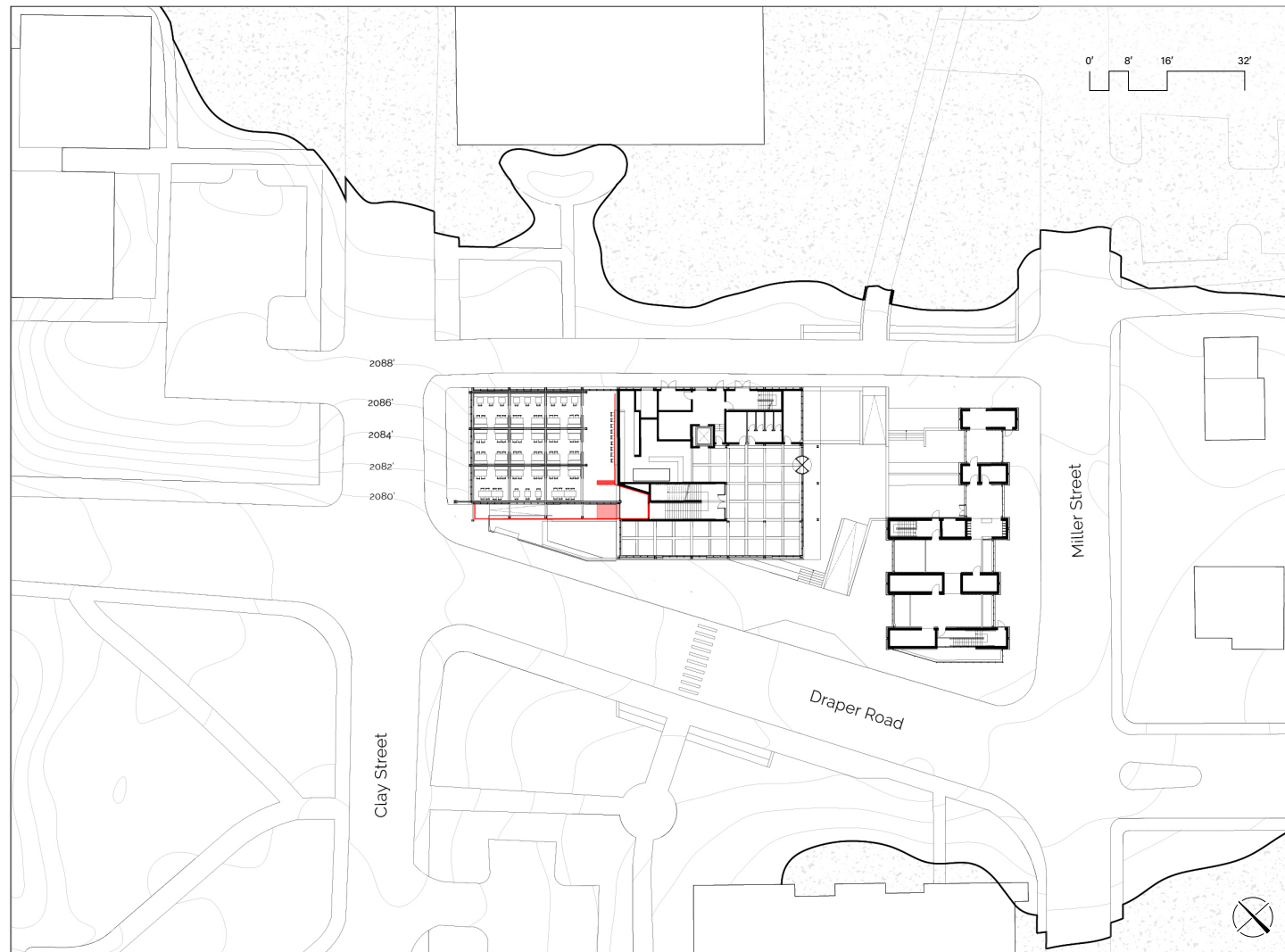


Fig.51: Groundfloor plan indicates aspects of the restaurant and the daycare with formally similar, yet distinct articulation of scale, orientation, and context



Fig.52: View of the daycare establishes a typological relationship with the neighborhood

Adjacent to Miller Southside, the architecture of the daycare carefully mediates between the residential and the urban. Attributes of the neighborhood described under the header "A Site: The In-Between: Residential Context" inform this architectural transition.

The house-typology, shaped by the wall and roof structure of the daycare partitions (Fig.52), discernably relates to the typical architecture of the neighborhood,

that is made up of single family homes and detached garages.

The array of shifted bays in the daycare forms a framework comparable to the syntax and smaller scale of Miller Southside. Furthermore, the daycare shapes an upper plaza together with the Hub along the alleyway (Fig.51) with an open gesture toward the network of alleyways that connect to the residential neighborhood and encourage pedestrian traffic.

## Aggregation and Unity

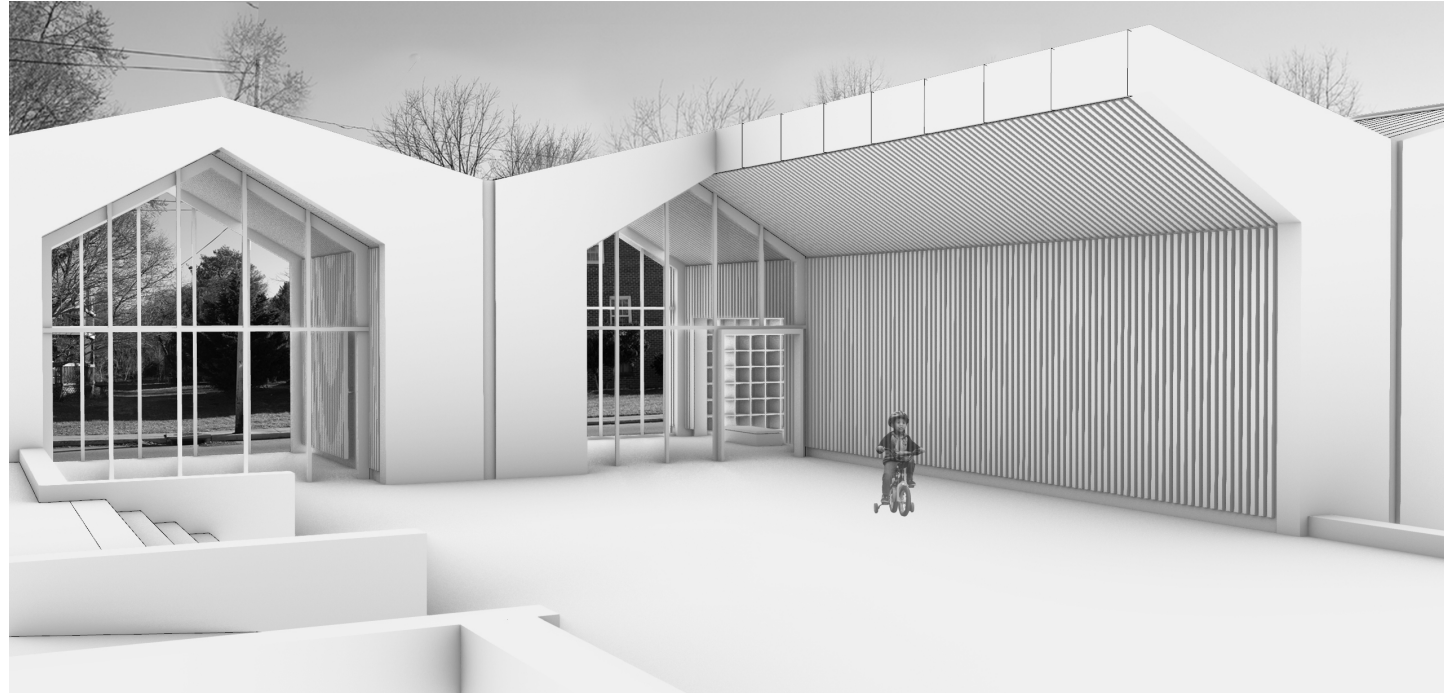


Fig.53: View of the covered entrance to the daycare from the plaza

Distinct features articulate the daycare's house-like volumes as separate bays. In relation, the typology also led to the pitched, cantilevered structure of the architecture, and consequently, its inward incline demanded roof drainage. Water channels, located above the inverted roofs structural walls, and downspouts, placed at the midline of each end wall on the facade, reinforce the reading of the bays (Fig.49).

Intentional shifting and varying of lengths articulate the discrete nature of each bay and accomplish two critical conditions. First, the perceptual grouping organizes the daycare into two connected aggregates. Second, the cantilevering roof overlaps with the plaza and demarcates the entrance to the daycare (Fig.50 and Fig.51). Moreover, the array of vertical wooden slats that make up the facade strengthen the reading of both, the entrance and the bays.

The transparency of the bays promotes visibility of

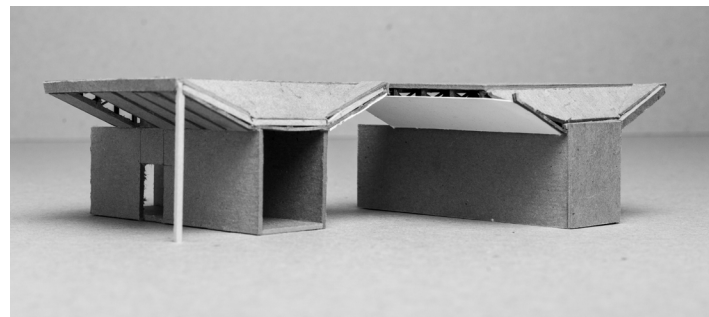


Fig.54: Study model of shifted structure articulating a distinct condition for entry



Fig.55: Study model of aligned structure and resulting typological negative space

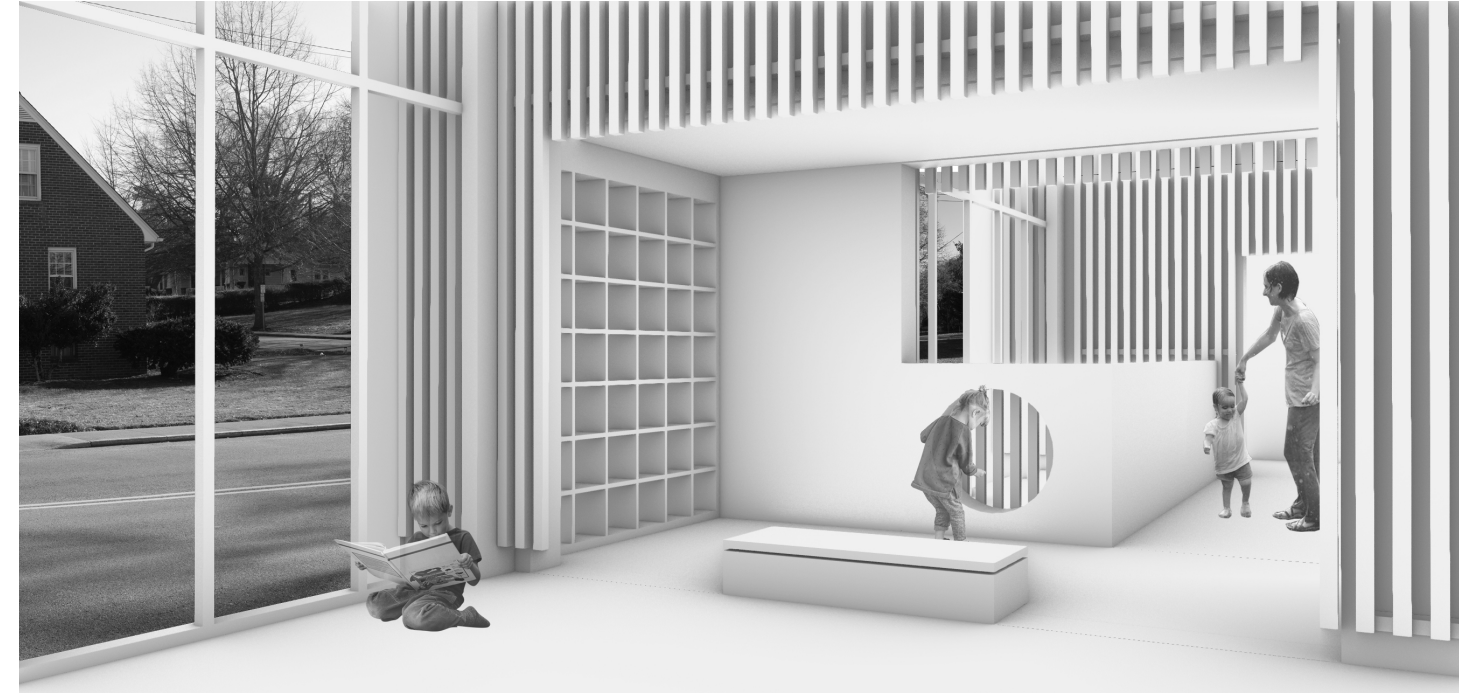


Fig.56: Interior view of the entrance space and adjacent volume with an opening for views to the lower level, separated by intermediary service space

the neighborhood through the building and integrates the daycare into the image of Miller Southside. Notably, the typological expression is an inversion of the neighborhood's mass and void. Thus, it differentiates the daycare from the residential.

On the interior, the organization into primary and secondary spaces becomes pronounced clearly. Like a street, the service spaces connect together each typological house volume of the aggregate. The

lowered ceiling and the function of the secondary spaces augment the transition.

Large amounts of daylight enter the daycare ground floor at the entry level and set-backs allow that light to perpetuate into the lower level open play area. The vertical wooden slats connect the upper and lower levels, as well. A circular opening in the bounding wall allows the children to visually peer into the play area below (Fig.56).

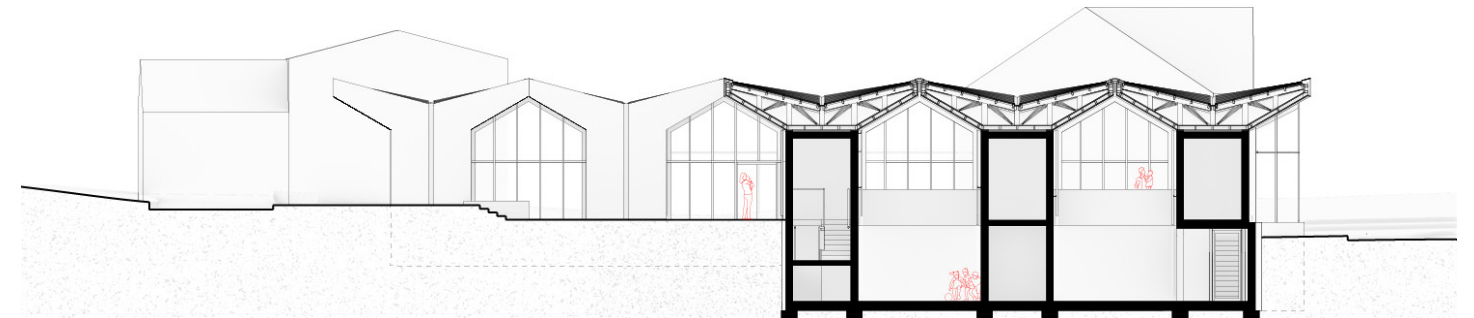


Fig.57: Daycare cross-section and partial elevation reveals the relationship between the primary open spaces and the secondary closed volumes

# Intersection: A Plaza

## Connectedness

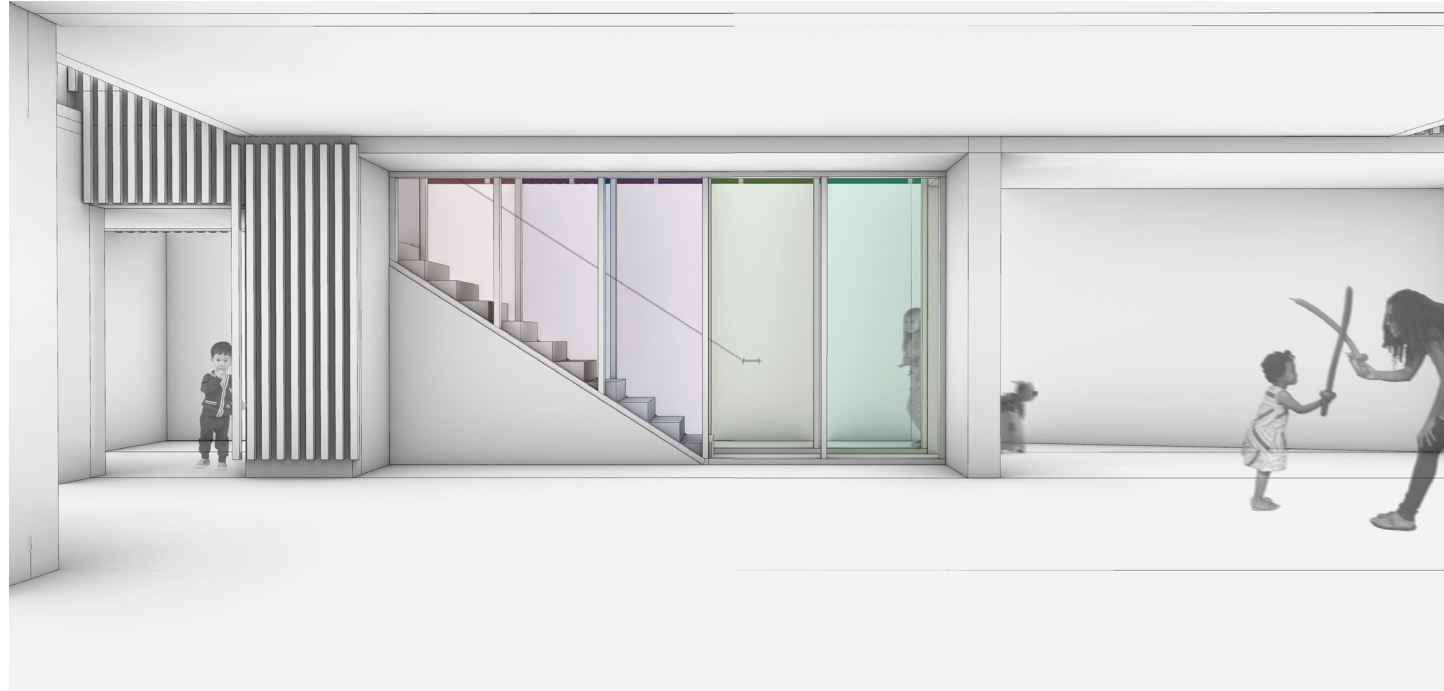


Fig.58: Open lower level with connection to the exterior via lightwells and a diagonal retaining wall along Draper Road

The immersion of the lower level in the ground visually disconnects the space from the environmental context, however, several conditions mentioned before, specifically daylight, reclaim the connection to the outside. Colored glass enclosing the staircase to the groundfloor refracts the light deeper into the space and adds a playful element to the lower level. Additionally, the diagonal retaining wall on the Southwest corner parallels Draper Road and indicates a sense of place to the occupants below the ground level.

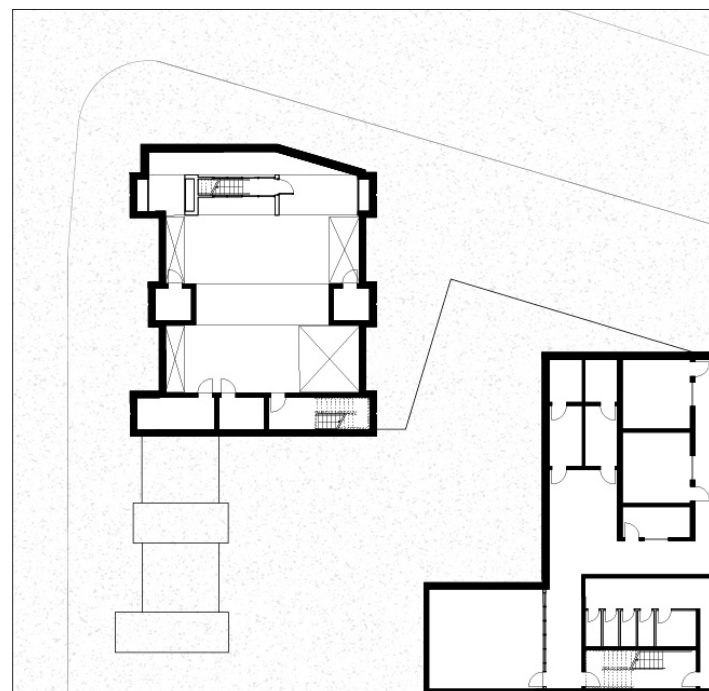


Fig.59: Isolated Daycare basement plan

## Negative Space



Fig.60: View before crossing Draper Road to continue along the Huckleberry Trail to the Huckleberry Plaza and Midtown

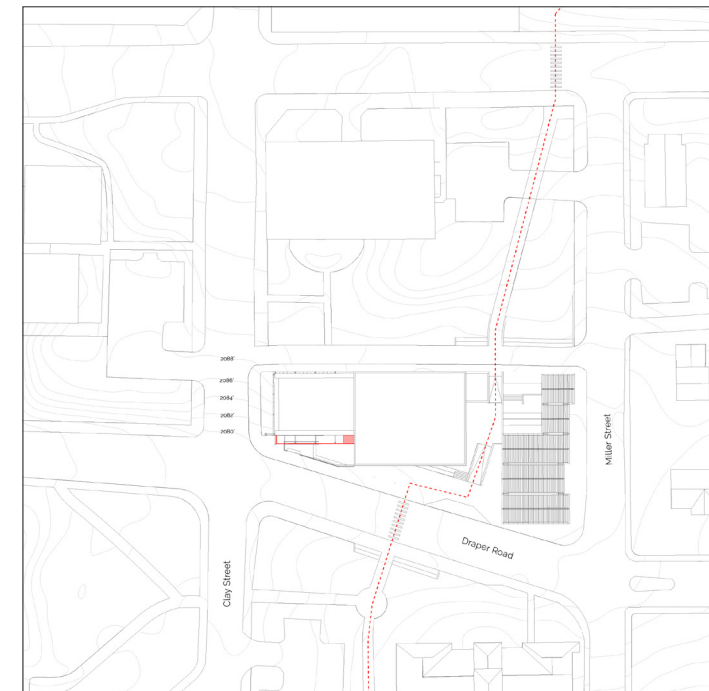


Fig.61: The continuation of the Huckleberry Trail to the new Midtown development

The continuation of the Huckleberry Trail crosses Draper Road and then ramps or steps onto the upper plaza intersecting the space in-between the hub and the daycare. Both entrances are juxtaposed on opposite sides of the plaza, thus configuring a complex meeting of programmatic entities. The trail path continues through the plaza, another ramp or set of stairs, across the alleyway, and through the site of the town planning building, extending the trail to the new Midtown development that will prospectively accommodate hundreds of residents and several businesses.

# Conclusion: Architecture of Bridging

Architecture is the vehicle for bridging between people and place.

The thesis work presents ways of architectural bridging that arguably become intertwined with their environmental context and consequently promote a sense of place. Conditions of formal, spatial, referential, and tectonic nature facilitate this connection between architecture and site. Examples include the urban placemaking through an interpretation of T-Streets along the trapezoidal site, the neighborly expression accomplished by the typological structure and scalar diminishment achieved through shifting within the daycare, and the transition between urban, architectural, and human scales throughout the work. Furthermore, considerations of not only the present-day, visible context, but also references to the historic past, such as the Huckleberry Railroad depot, and a projected future, as in the Midtown development, expand the means of an architecture of bridging.

Finally, this study aims to continue the larger discourse on the critical importance of the site in architecture and human culture. While this site in Blacksburg served as the object of investigation, the overarching questions and findings are likely to provide useful anchors to other architectural or cultural projects.

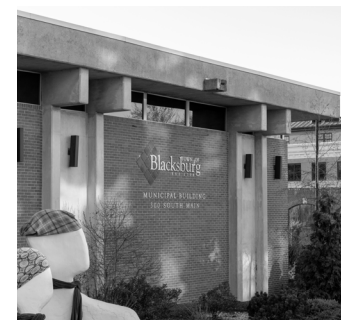
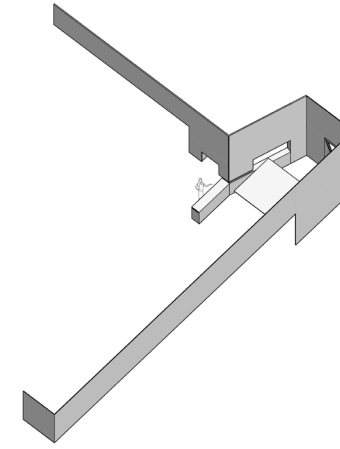


Fig.62: Thesis project within the Ground Figure Plan of Blacksburg illustrates the transition in scale and density between downtown and the neighborhood

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All images are by the author except listed below.

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