Syracuse University Infrastructure Institute I-81 Grant
Final Report
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Project Title
Visualizing Care and Resisting Gentrification along the proposed Community Grid

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1. Introduction

The introduction of I-81 connected downtown Syracuse to affluent white suburbs while devastating the Black community in the 15th Ward. Its removal now presents a critical opportunity and obligation to meaningfully engage these communities in discussions about the future Community Grid development. Despite numerous studies and resident requests for affordable housing, 'development without displacement,' and maintenance of existing public housing stock, the vision plan inadequately addresses the concerns of local stakeholders, especially those living in public housing projects such as McKinney Manor and Pioneer Homes who are anticipating or already experiencing renewed displacement. Community organizations, including the NYCLU of Central New York have criticized the *ReZone Syracuse* zoning plan for not putting in place adequate protections for existing Black families and neighborhoods living near the I-81 viaduct or to address the ongoing housing crisis in Syracuse. Our research to date has revealed a significant disconnect between official community engagement efforts and genuine community needs, especially with regards to the many acres of land under i-81 and currently owned by the Department of Transportation. Previous methods of gathering public input were characterized by community and organization leaders as frustrating, inaccessible, and fruitless, and the most prevalent proposals found in a media and literature review not reflecting the urgent priorities of local residents most affected by the infrastructure changes.

This research project proposed and explored a holistic approach to evaluate the impact of decisions surrounding the I-81 removal and the Community Grid, focusing on three interconnected dimensions: environmental impact, social justice and community engagement, and alternative models to address the persistent challenges of U.S. highway infrastructure.

2. Literature Review

2.1. Background of I-81 Discussion

The I-81 viaduct in Syracuse is an example of how a piece of infrastructure can reshape an entire city, its neighborhoods, its people, and its politics, and how that reshaping leaves lasting effects. It also demonstrates the difficult work of trying to undo those effects decades later when the harm has already been done. To understand I-81's past and present, one must look at how it got built, the damage it caused, and the complicated and unfolding efforts to repair the damage. While the highway's demolition marks a historic turning point, there are still significant gaps in how the repair process is being carried out. Understanding what has been left unresolved helps clarify why research and public engagement are still needed, particularly because traditional engineering surveys often fail to build meaningful engagement. Researchers therefore aim to foster deeper collaboration through more direct, participatory methods.

In the 1950s and 1960s, the U.S. government launched the Interstate Highway System which is a network of roads designed to connect cities, speed up travel, and grow the economy. One of these interstates went through Syracuse. City leaders saw the highway as a sign of progress and pushed for I-81 to run straight through downtown, but the route cut directly through the 15th Ward, a historically Black neighborhood filled with homes, churches, small businesses, and generations of community ties (NYCLU 2020). At the time, urban planners often placed highways through neighborhoods deemed "less valuable," typically poor, Black, or immigrant communities with limited political power. This pattern was rooted in redlining, a discriminatory system from the 1930s where federal housing agencies labeled minority neighborhoods as "risky" and denied them loans and resources (Susaneck 2024). Decades of disinvestment left these areas especially vulnerable to demolition during the rise of "urban renewal" and highway construction. These historical dynamics continue to affect how trust, participation, and equity operate in planning today. The 15th Ward in Syracuse was redlined, and as a result, hundreds of families were displaced, homes demolished, and streets were gone. The highway not only destroyed a thriving neighborhood but also reinforced segregation by isolating the Southside from downtown and deepened economic and racial divides (NYCLU 2020).

This created social, symbolic, physical, and environmental effects. People living near the viaduct were exposed to high levels of noise and air pollution. The space beneath the overpass became a dead zone that was dark, dirty, and uninviting, and businesses along the corridor closed or never came back and disinvestment began (City of Syracuse 2019). During this time, residents pushed back, organizing meetings, raising concerns, and advocating for change, even when few in power listened (NYCLU 2020). As the viaduct began to age in the early 2000s, the New York State Department of Transportation (NYSDOT) studied the viaduct to assess its future. While structural failure was the official reason for reconsidering the highway, community voices challenged the condition and the presence of the road (NYSDOT 2022). Their advocacy demonstrated that infrastructure debates could not be about engineering alone. Officials first considered repairing the elevated highway or replacing it with a similar one, but community advocates argued that doing this would just repeat the harms of the past. The community voices

helped expand the conversation beyond engineering and traffic to include equity, justice, and the lived experiences of the people who'd been hurt most (NYCLU 2020; NYCLU 2023).

To illustrate the long and complicated histories of I-81 viaduct and highlight the struggles of many parties involved, we created the following diagrams. The first diagram (figure 1) breaks down the history into seven themes from federal redlining and highway policies to environmental damage, grassroots activism, and institutional planning, showing how each period connects to the next. Arrows clarify the relationships, where solid lines represent direct, causal links between events like clear policy shifts or decisions that triggered the next action, and dotted lines reflect slower, ongoing influences like community memory shaping future outcomes and decisions. Some arrows span across longer time periods, showing how past injustices from decades ago still affect planning and equity efforts today. The second diagram (figure 2) lays out events on a timeline from left to right but also stacks them vertically by the groups involved like government agencies, local leaders, academic institutions, and community groups. Events were spread out in the early years but became packed and overlapping starting around 2015. The visual crunch shows how years of displacement, neglect, and environmental harm have built up into a complex and urgent moment where lots of different voices and actions are coming together. These visuals demonstrate how Syracuse's history with I-81 isn't just a series of separate events, but a connected system of challenges and responses that's now driving the city toward dismantling the highway and imagining a fairer and stronger future.

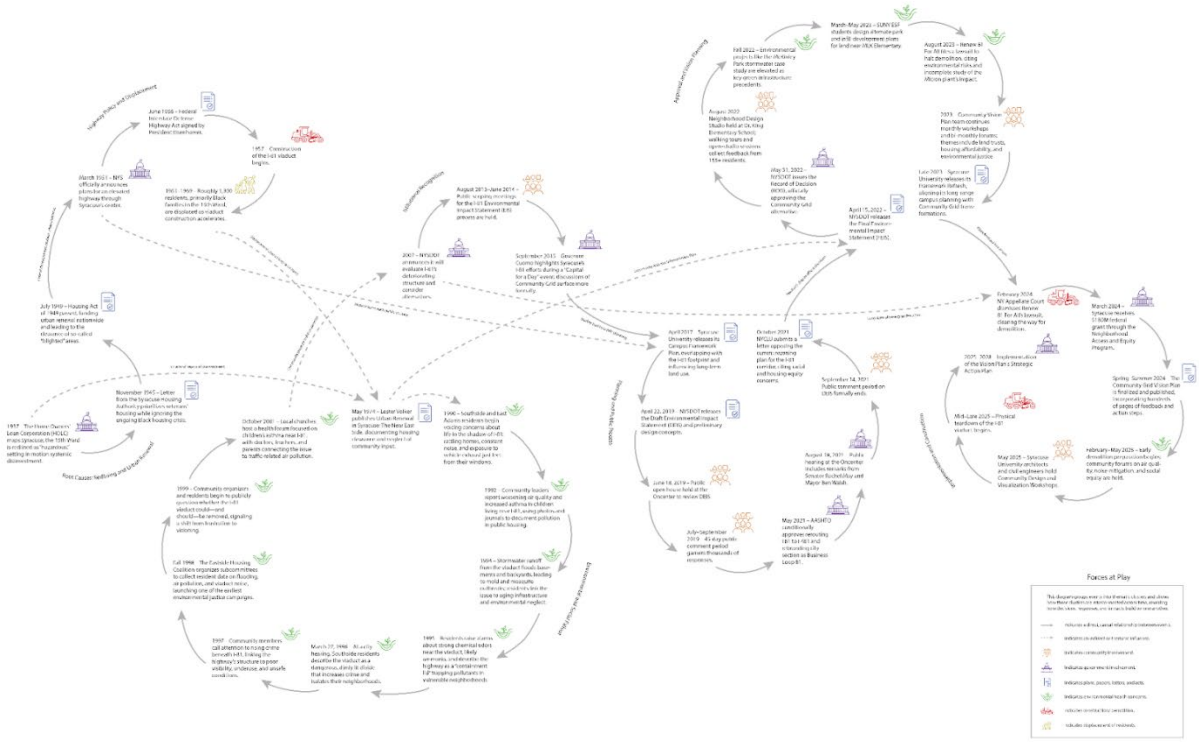


Figure 1. History of institutional action, community experience, and environmental change along the I-81 corridor

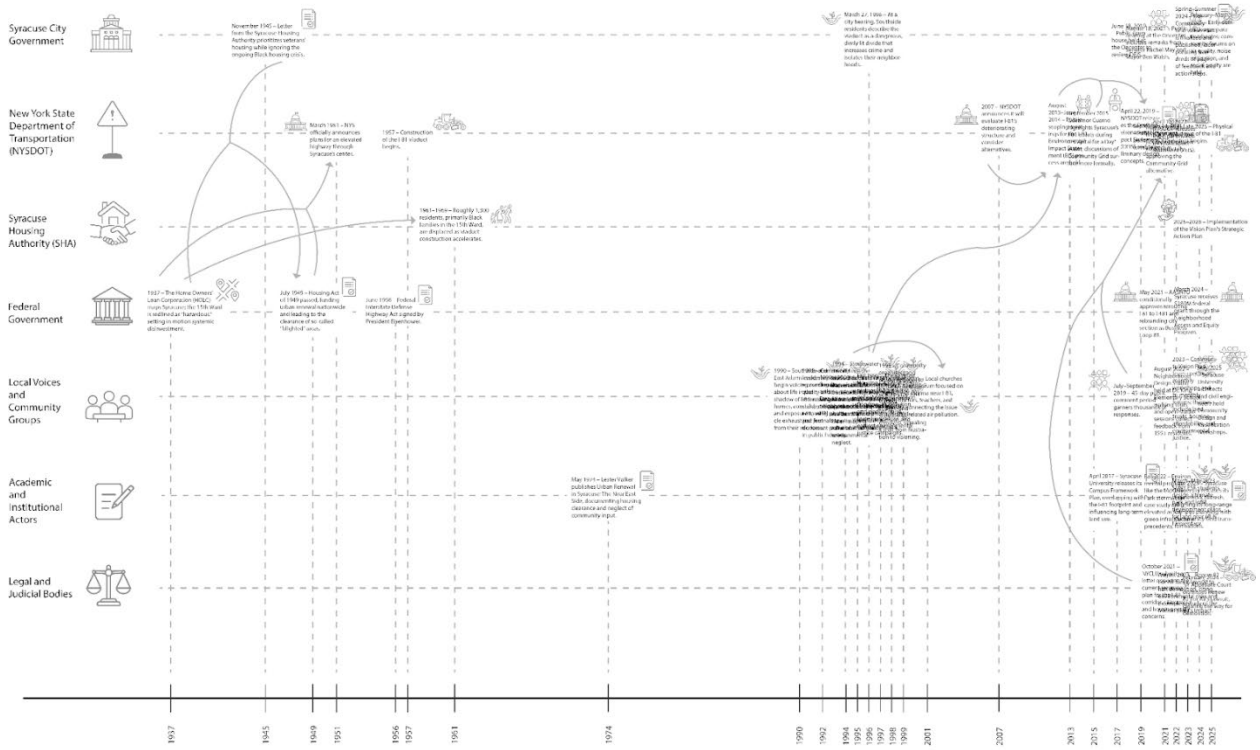


Figure 2. Timeline of institutional action, community experience, and environmental change along the I-81 corridor (contents on the right side of the timeline intentionally overlap to highlight the intensity of events and changes).

2.2 Research Gap, Community Concerns, and Opportunities

The Community Grid plan was selected in 2019 by NYSDOT and received the final federal approval in 2022. The plan proposes a complete removal of I-81, replacing it with a ground-level boulevard that reconnects the city streets in a walkable grid. The new boulevard would slow down traffic, add crosswalks and bike lanes, and open up space for housing, parks, and businesses (Vision Plan 2024). The goal is to restore connections between neighborhoods, support walkability, and encourage development that serves the community (NYSDOT 2022). Unlike the elevated highway for cars, the Community Grid is said to be designed with people in mind. In this plan, the traffic going through downtown on I-81 would be rerouted to I-481, a bypass that runs around the city, while the grid would handle more local travel. Planners, environmental advocates, and many residents support this plan as a chance to repair the damage done in the 20th century (NYSDOT 2022). However, there are controversies around the proposal, as some business owners and commuters worry that losing the viaduct could mean more congestion or slower travel. Others are concerned about what kind of development will follow and whether new investment will lead to displacement or rising rents. The city and state have been working to address these concerns through anti-displacement strategies, plans for equitable reinvestment, and public engagement, although residents argue their voices remain unrepresented (NYCLU 2020). There is still no public framework that clearly defines what success looks like across justice-related outcomes such as housing access, environmental health, or cultural repair.

In many planning and engineering processes, the default method of engagement has been to survey residents by asking them what they need, what they want to see, or how they feel about proposed changes. This is often presented as community involvement, but it rarely results in residents having real influence over outcomes. As engineer John Cook has acknowledged, these surveys are typically designed to fulfill a requirement rather than meaningfully incorporate public priorities (Cook 2023). Residents give their time and emotional investment but rarely see direct returns. Over time, many have been "surveyed out," as they feel like their input is collected and set aside. Our research approach pushes back against this pattern. Rather than extracting information through surveys, we work alongside community members to help translate their needs into visible and tangible proposals. This means shifting from asking questions to building tools like models, maps, and visualizations that can express and advocate for community goals in the public planning process.

Grassroots groups like the Urban Jobs Task Force, the New York Civil Liberties Union (NYCLU) of Central New York, and the Southside's Tomorrow's Neighborhoods Today (TNT) have helped promote just outcomes, protecting against displacement, advocating for environmental safeguards during demolition, and ensuring that the redevelopment of the I-81 corridor reflects community needs and priorities (NYCLU 2020). Even with these efforts, there are still many uncertainties about how well the visions of community members will shape the outcomes in the long term. Our work recognizes these uncertainties, asking: What does accountability look like as the project unfolds? Whose priorities are being recognized, and whose are left out? Syracuse University has also played a role in research and public engagement. Faculty and students from architecture, policy, and engineering programs have partnered with local organizations, produced mapping and historical research, and hosted community meetings. The university's presence has helped lend technical support and public visibility to grassroots concerns, while also reflecting on its own role in the city's urban history (Cultra and Fuller 2022).

The Community Grid is moving forward, and it is seen as one of the largest infrastructure projects in upstate New York and a national example of removing and not just repairing harmful infrastructure. The federal government supports this through "reconnecting communities" programs (Governor Hochul and Mayor Walsh 2024). I-81 in Syracuse has become a symbol of a broader movement as cities like Rochester, Detroit, and New Orleans rethink highways that cut through neighborhoods. These roads were once seen as progress but are now questioned for the harm they caused, especially in Black communities, and Syracuse is among the first to take serious and funded steps toward removal (NYCLU 2020). I-81 shows that infrastructure is not just about traffic flow, but about who benefits, who pays, and what kind of future we imagine. As researchers, we engage not to observe but to help shape this moment, emphasizing communication, accountability, design, and collective participation. The viaduct has stood over Syracuse for 60 years as a symbol of division. As it gets removed today, there is a chance to holistically address community concerns and strive for a more environmentally resilient future, replacing it with something built with intention and care, rebuilding not just a road, but trust in a long-divided city.

3. Study Settings and Methodology

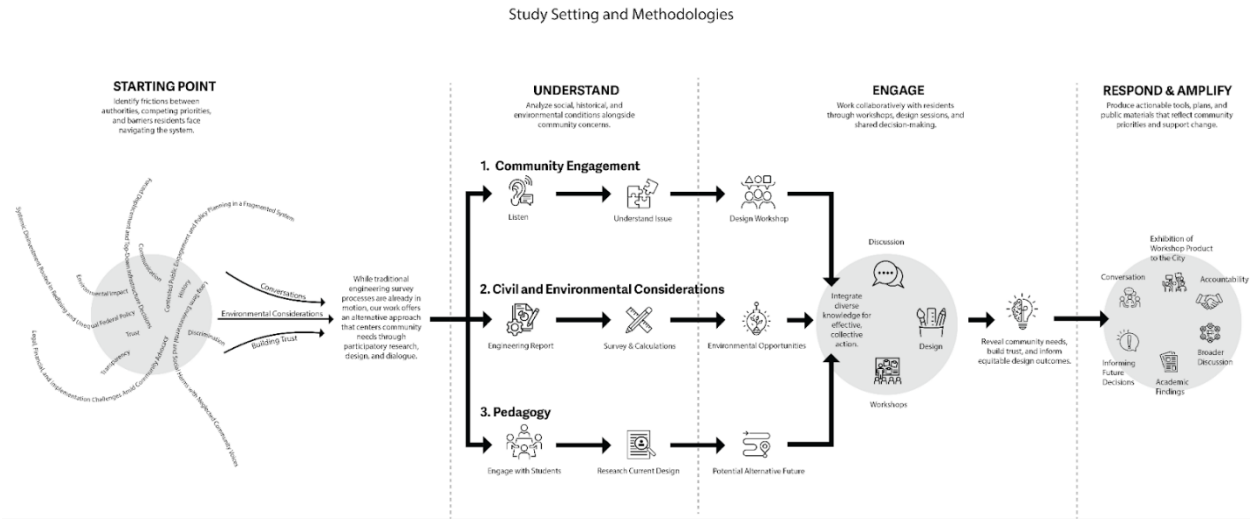


Figure 3. Flow of study setting and methodologies

We began with a literature review, assessing the history of highway construction in Syracuse, the environmental opportunities presented by the I-81 removal, and the social resilience of surrounding communities. As stated above, this review revealed persistent community controversies and resident's feeling of disconnection and lack of meaningful communication between them and decision-making agencies, such as the NYSDOT or SHA.

Through early community conversations with Syracuse's Southside Connections Committee, we learned that many community members felt that they were not informed of ongoing planning decisions and often struggled to interpret technical documents like masterplans and engineering drawings. Residents expressed a strong need for clearer visual communication and greater involvement in shaping the future of their neighborhoods. This realization highlighted the complexity of the issue and the need for a community-based, multi-disciplinary approach to both understand and address local concerns.

To respond to these findings and leverage the expertise of our multi-disciplinary team, we designed a research methodology built on three interrelated strands:

3.1. Community Design Workshops: we designed participatory design workshops to help residents understand SHA development visions, visualize the residents' aspirations, concerns, and priorities, aiding them in the active engagement with the planning of their own neighborhoods. Acting as visualizers and conversation facilitators, we translated community voices into accessible visual formats and narratives to better communicate with SHA and other stakeholders. The end product of these community workshops will be showcased in a public exhibition, so the community voices and this engagement method will be shared with SHA and other decision-making entities involved.

3.2. Civil Engineering Assessment: Our team conducted a technical survey and analysis of the existing infrastructure, focusing on structural conditions, environmental waste, and opportunities for more sustainable and reparative approaches to highway deconstruction and redevelopment.

3.3. Pedagogical Engagement and Speculative Design: To imagine alternative futures for U.S. highway rehabilitation (solutions that might not be realized in Syracuse but are nonetheless valuable for envisioning more just and sustainable practices), we developed and taught an architecture studio dedicated to this topic. Through design research, students proposed speculative interventions that challenge conventional approaches to highway removal, providing models for future policy and design innovation.

The outcomes of this project will be disseminated through scholarly publications, conference presentations, and direct conversations with DOT, SHA, and other relevant municipal entities. Additionally, we plan to curate community-based public exhibitions to amplify local voices and increase accountability for the decisions being made about them.

4. Significance

4.1. Multidisciplinary Collaborations
Our multidisciplinary approach addressed the problematic and long enduring siloing of disciplines by merging infrastructure (urban grids, public housing, gathering places) with technical experts (architects, civil engineers, urban planners), the broader academy/research partners (Syracuse University - including aging studies, food justice studies, social and public health studies, and accessible design studies), and, most importantly, community partners (SHA, Syracuse Grows, Brady Faith Center, Market and Farm, Engaged Humanities, the Syracuse University Office for Strategic Initiatives, and other community organizations). By intentionally and explicitly merging disciplines, we will develop a collaborative approach that centers and prioritizes community partners and their needs above the absolutism of outside solutions.

4.2. Efficient Environmental Resilience

Our research presents multi-faceted solutions that simultaneously support the larger and non-human ecosystem, urban and social continuity, and efficient and effective infrastructural systems, looking for intersectional leverage points to achieve environmental and social resilience where the ecosystem, environmental, and human stakeholders continuously support, enhance, and benefit each other. Our research addresses efficient reuse of runoff water, microclimatic comfort of neighborhoods, alleviating the effects from pollutants associated with the highway overpass, supportive open green spaces, and other critical transformations of Syracuse’s current blighted post-industrial landscape.

4.3. Critical Community Engagement

The community’s consensus and support are key to the successful implementation of the Community Grid. Our research explores effective and innovative methods to engage local residents and stakeholders throughout all phases of the new urban infrastructure, from research to planning to phased implementation to long-term maintenance. Our forthcoming exhibition that features community voices will demonstrate ways for local stakeholders to effectively communicate their opinions, participate in decision-making, and insist on involvement in the long-term care and management of their infrastructure and neighborhoods. Our research also offers tools and techniques for city authorities to effectively communicate urban plans with local stakeholders, equitably collect community responses, make balanced and sustainable decisions, and continuously involve and inform the community.

5. Detailed Reports on Methods Used

5.1. Community Design Workshops

Through attending community meetings and discussing with community stakeholders, the research team was made aware of a sense of frustration and disconnection with the Community Grid project. We learned that local residents, in particular those at Pioneer Homes, whose community was literally split in two by I-81, feel alienated because A) they feel they were not involved enough in official conversations and decision making processes, or B) they felt they were included in meeting and presentations, but felt alienated by not being able to fully comprehend developers and architects drawings – which have a language of their own often indecipherable to non-professionals – and therefore unable to critically articulate their concerns or issues back to city officials and developers in a language that the officials and developers would hear.

Therefore, for the community engagement element of our research, our goal was to develop a community charette that would help teach community members how to read and understand professional architectural and engineering drawings and renderings, use professional architectural representation techniques to simplify and clarify plans for I-81, the Community Grid, and the East Adams Street Transformation projects, and invite community members to interact with proposals in the form of large scale physical models to articulate their visions and a manifesto for the transformation of their communities.

Our tools of engagement include two types of physical models. The first is a city scale model of the entire I-81 corridor showing existing buildings and urban conditions with the highway removed. This model is equipped with removable and movable pieces so that stakeholders could physically transform the city per their individual and group visions. The second interactive model includes a larger set of pieces that articulate homes, storefronts, and community amenities drawn at a scale (1/4” = 1’-0”) which more clearly reflect a sense of place and interpersonal engagement. These models were used together to invite multiple stakeholders – particularly those in the Pioneer Homes community - to illustrate, articulate, and define their vision for the future of their community to resist gentrification in the face of impending urban development.

1. South Side Connections

In order to develop our models as interactive tools for the Pioneer Homes community charette we first participated and presented our proposed research at multiple Southside Connections meetings at the Dunbar Center on State Street. In these meetings we were given a lot of feedback on our initial research proposals, which in turn informed our research and led us to redesign our approach to the community charette.

After completing drafts of our two sets of interactive models, we brought them to a Southside Connections Meeting at the Dunbar Center for a demonstration and feedback. (Figure 4).

Figure 4. (Left) Demonstrating interactive, urban-scale model of former I-81 corridor and area of proposed Community Grid. (Right) Large scale 'building blocks' model at human scale illustrating sense of place and interpersonal connection.

2. EHN Community Showcase

Once we secured community approval of our interactive models, research direction, and feedback goals from community representatives at the Southside Connections Meetings, we then tested the interactive elements of our models at the annual Engaged Humanities Network showcase at the Community Folk Art Center on Genessee Avenue. This annual day-long research showcase is attended by community members and stakeholders throughout Syracuse as well as students and faculty from Syracuse University. In their own words the EHN Showcase, *"celebrates the community-centered work of dozens of project and course teams through performances, screenings, activities, and table presentations. This interconnected work involves over two dozen departments across Syracuse University and 30 collaborating community-based organizations*."

Given the broad audience in attendance at the EHN Showcase, our intention was not to solicit specific community feedback, but instead to test the interactivity and engagement potential of our models. Over the course of the day, we invited all guests to the event to

engage with our models by moving and playing with the many different pieces to express their thoughts and ideas about what could happen in the former space of I-81 (Figure 5).

Figure 5. Interactive Model Testing at 2025 EHN Showcase. Visitors were invited to play and engage with the urban and human scale models to articulate possible visions for the future. Potentials and limitations within the model setup were identified through this day-long event.

While overall we felt that the engagement at this event was promising, there were several elements that were lacking in our overall planning. As a result of feedback gained from events at both the Dunbar Center and Community Folk Art Center, we developed an organizing protocol for our workshop (Appendix A), and also added additional colors for model pieces along with flags, tokens, post-its, stickers, and other customizable elements with which community members could write, draw, model, or otherwise include elements of their own.

3. Pioneer Homes Coffeehouse

On May 31, 2025, we hosted our Community Design Charette and Workshop at the Pioneer Homes Coffeehouse. Working with community representatives we distributed flyers in advance and organized catering through locally owned restaurants. With 13 participants we reviewed the history of I-81 removal and the proposed Community Grid and East Adams Street Transformation projects that promise to fundamentally transform this community (Figure 6).

Figure 6. Final Community Design Workshop at Pioneer Homes Coffeehouse. Participants used urban- and human-scale models to articulate concerns and visions for the future of their community with the goal of resisting gentrification in the face of looming urban transformation.

The event concluded with the articulation of a community manifesto, left.

We invited our participants to engage with our models and articulate their goals and visions for a community Manifesto. This work will be part of our Fall SUII

Exhibition, and engagement with the community is ongoing, supported by additional grants.

5.2. Civil Engineering Assessment

Embodied Carbon Analysis

Four theoretical cases have been analyzed, and they are as follows: I-81 as if it were being built today, removing the bridge and building a community grid, a hybrid system consisting of reconstructing part of the bridge into a park, while repairing the other parts, and retaining the bridge with a focus on repairs and rehabilitation. The area that was considered for the cases stretched from Van Buren Street to East Washington Street. The table below shows the calculated embodied carbon values associated with each case, with the M meaning millions, and the k meaning thousands. For each case, the materials selected are all local to the state of New York, unless there were no New York materials, in which case the materials were then found within North America. For the purposes of the analysis, A2, transportation of materials, was not considered.

Table 1. Embodied carbon analysis of four cases

Case	**Embodied Carbon**
New Construction	15.34M kgCO2e
Community Grid	1.411M kgCO2e
Hybrid Design	1.099M kgCO2e
Rehabilitation and Repair	50.67k kgCO2e

The theoretical new construction has the highest embodied carbon of the four cases. The majority of the carbon (60%) comes from the steel girders that support the concrete slabs. The concrete slabs make up the second most amount with 27%, and the rest comes from the pier caps (7%), slab reinforcement (4%), column concrete (1%), and column reinforcement (<1%). The concrete materials come from Heidelberg Materials, and the steel products come from Nucor. There were assumptions made regarding pier caps and steel beams. As they are not standard sections, there are no existing environmental product declarations (EPD) which also means no recorded global warming potential (GWP). For the purposes of the analysis, a W44x335 section was used for both the pier caps and steel beams. This was the most similar size to the steel beams and seemed reasonable for the pier cap as well. The pier cap also only makes up 7% of the total embodied carbon, so using the W44x335 section seemed reasonable. When looking at the

slab and slab reinforcement, a rebar ratio of 1% was used. The columns and column reinforcement were able to be more accurately calculated as cross section of the columns exist.

For the community grid, the typical cross-section of the business loop was analyzed. For this loop, there were two lanes of 12 feet in width, and approximately 18 feet of shoulder space, on both the north and southbound sides. The road is made of three layers of asphalt and a subbase layer. The layer thickness is standard for the NYSDOT, and utilizing the NYSDOT pay item catalog, the correct types of asphalt were able to be analyzed. The three asphalt layers are 9.5mm, 19.0mm, and 37.5mm asphalt, named for the size of their respective aggregates. The sizes of each layer being 1.5 inches, 2.5 inches, and 8 inches respectively. The thickness of the subbase layer is 12 inches. The 3 asphalts all come from Barret Industries Corp and were chosen as they are closest to the average EC3 value per aggregate size, as well as they all are for a 50-year service life, which felt appropriate for analysis. Utilizing the volume of each layer, and an industry standard asphalt density of 145 lbs / ft3, the masses of each layer were able to be calculated by EC3 and resulted in the embodied carbon per layer. A similar process was followed for the subbase, which comes from York Building Products, with the volume divided by an industry standard density of 125 lbs / ft3. Each layer accounted for 16%, 22%, 56%, and 7% respectively. There are parts of the community grid that contain additional lanes for turning, but even after just analyzing the two-lane system, the community grid has the highest embodied carbon of the three possible cases. If the other lanes were analyzed, the embodied carbon would be even higher. The community grid will make it easier to connect the city again, but the environmental cost is too great for it to be considered.

The materials used in the Theoretical New Construction are also used in the Hybrid and Rehabilitation and Repair cases. In both cases, the repair concrete was a 20% increase in the volume of the column which is standard practice for column repairs, and the rebar ratio was also kept to 1% for the increase in volume. The replaced columns followed the cross section utilized in the Theoretical New Construction case.

The hybrid system has the second-highest embodied carbon, however, of that 1.099M kgCO2e, 1.057M kgCO2e (96%) come from recycled materials, which means that they don't add more carbon. With this considered, the hybrid system only creates 41.47k new kgCO2e through rehabilitation and repairs, which is the least amount of embodied carbon in any case. For the other sections of I-81 that are not being recreated, 28.9k kgCO2e and 4.824k kgCO2e are created when concrete and steel are used for the repairs of 22 piers, respectively. There is one pier that has to be replaced, which creates 6.728k kgCO2e and 1.465k kgCO2e from concrete and steel, respectively.

The rehabilitation and repair plan creates 50.67k kgCO2e. The plan consists of repairing 24 piers and replacing 2 piers. From repairs, 30.15k kgCO2e and 5.033k kgCO2e are created from concrete and steel, respectively. For the caps that needed to be replaced, 12.56k kgCO2e and 2.929k kgCO2e are created from concrete and steel, respectively. None of the

slabs needed to be repaired. While this option produces nine thousand more kilograms of embodied carbon than the hybrid system, when comparing social benefit, the local communities will benefit more from an added green space.

Consequently, the hybrid system is the best-case scenario when looking at both the social and environmental impact.

Stormwater management

When comparing stormwater management plans, the "New Construction" of I-81 will not be included. The repair and rehabilitation plan is built upon the existing I-81 structure, and thus, the two can be analyzed as one when regarding stormwater management.

Of the three options, the hybrid system is the best for stormwater management. The hybrid system is the only option that adds more permeable surfaces to the area. The water will not only be absorbed, but can also be utilized in nearby buildings, such as the proposed workshop. This will help keep storm drains from overflowing as they do during precipitation events in Syracuse, NY.

The rehabilitation and repair option is the second best. While it does not introduce permeable surfaces like the hybrid system, it does allow for a better collection option when compared to the community grid. The water from drainage can be collected or diverted to surrounding buildings, similarly to the hybrid system, which reduces the risk of storm drain overflows during precipitation events. As long as the system is regularly maintained, it will be effective.

Finally, the community grid is the least preferred in terms of stormwater management. Not only is it introducing more impermeable surfaces, but it is also less effective at diverting excess flow. The current I-81 has drainage built into it to mitigate and control where the excess stormwater goes. Without that, the drainage overflows that occur in the Syracuse area will not only continue but can potentially become more extreme.

5.3. Pedagogical Engagement and Speculative Design - Architecture

Another facet of our project was careful consideration of the possibilities to enhance pedagogical objectives with the research. We fostered interaction between a civil and environmental engineering capstone course and a fourth-year integrated studio course (Arc409) through the shared site of the i-81 overpass, and similar, though not exact, aspirations and constraints within each course.

We used these courses to tie together and develop hypothetical solutions that would have been inappropriate to work through with the community, as they are purely speculative and do not reflect the reality of the plans of the City of Syracuse Nevertheless, these made for a

strong thought and design exercise for architecture and engineering students and allowed for speculation on alternative infrastructure models for the future.

The students explored methods of reuse and recycling from the scale of the entire infrastructure down to individual structural elements. These explorations have a wider application as they were able to consider altering the process at earlier stages and reconsider the general approach to obsolete automobile infrastructure in other cities across the country using a specific and realistic case study of Syracuse. The timing-positioning of Syracuse as having developed the plan but not yet executed it allowed for a comparison and critique of a fully developed and place-specific urban plan.

Methodology

The ARC 409 course explored the following: reducing the breadth of demolition, decommissioning and adaptive reuse of the highway overpass structure, and designing an adjacent new building that leverages the new sociospatial implications of the overpass structure as a new pedestrian space (in parallel with the Hybrid design described in the engineering analysis). The design studio was particularly well-suited for these explorations as the overall studio objectives included close examination of materials, assemblies, systems integration, and the implications thereof. The overpass structure acted as a particularly effective starting point for the studio because the structure, assembly, and stormwater management systems are exposed and legible. During a site visit survey, during which they measured and documented the existing structure, students were able to see the expansion joints and develop informed hypotheses on where and how to selectively intervene on the overpass so as to avoid structural failure, which was reinforced by information from the CEE civil engineering survey. The projects from the different student groups went on to explore direct and indirect reuse and recycling of the overpass materials, which are conventional and highly prevalent building materials: concrete and steel.

Knowledge and information were transferred back and forth between ARC 409 and CEE 475, a civil engineering capstone design course (see section 5.4), and both architecture and engineering students got exposure to the other profession's modes of observation, analysis, and representation. The architecture students began with a site visit and survey (Figure 7), and passed along their information to the engineering students, who in turn assessed each of the supports for structural stability, and developed a system for cataloging the condition of the structure. This information then informed the architecture students in determining where and how to selectively demolish "chunks" of the overpass to complement their design ideas and enhance the urban fabric of the surrounding neighborhood(s) while preserving embodied carbon and energy associated with the structure (Figures 8 through 12). The engineering students then chose one of the architecture projects (and its associated adaptive reuse of the overpass structure) to develop an adjusted stormwater management strategy in parallel with their assessment of the existing structure.

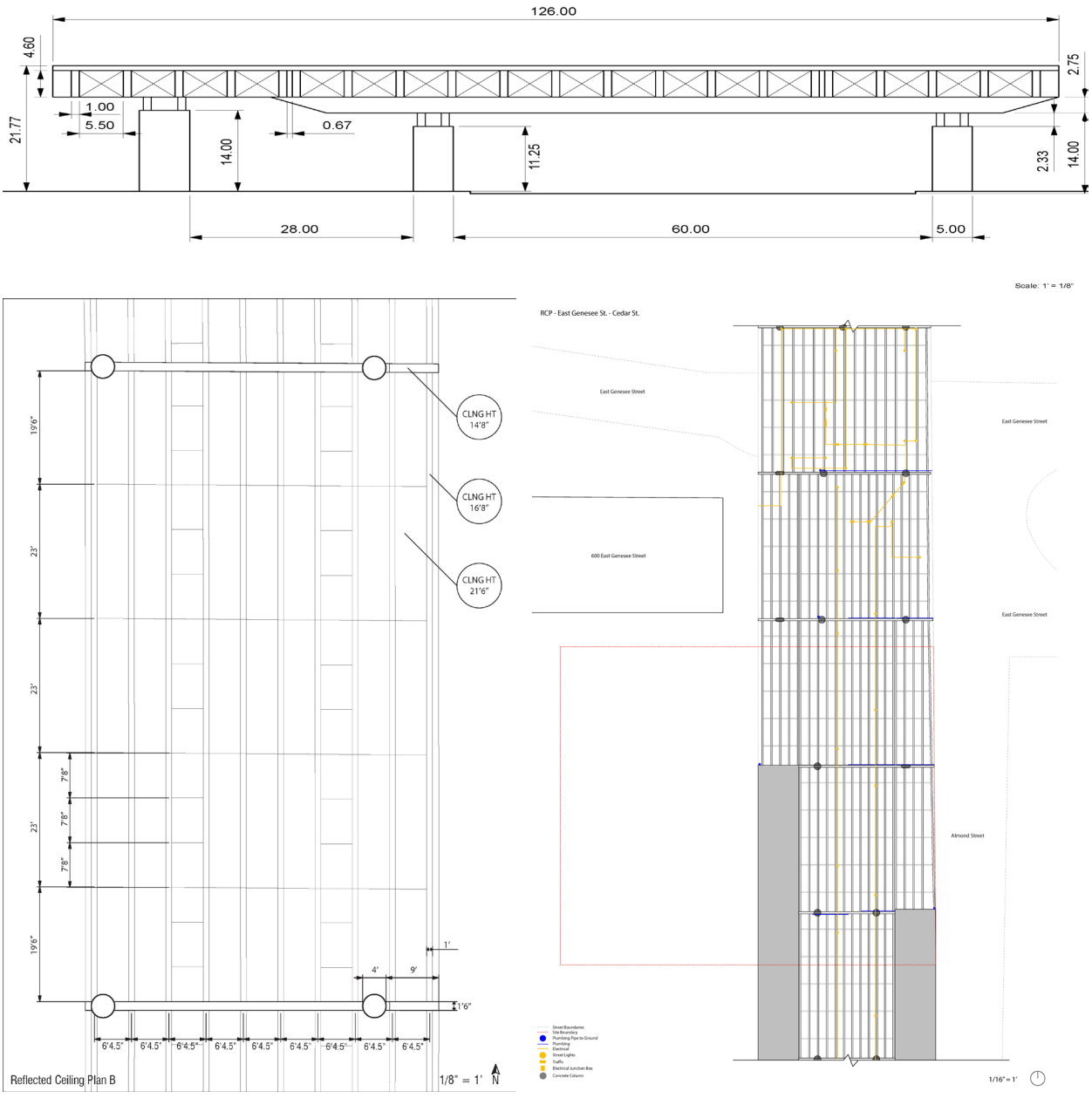


Figure 7: Existing Bridge Structural and Architectural Analysis. Student Work.

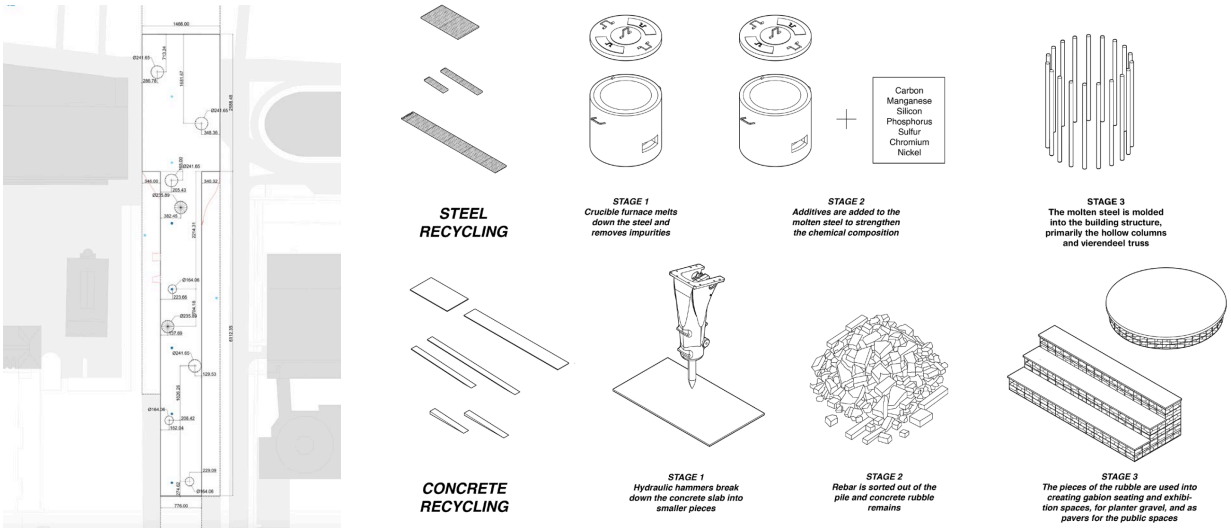


Figure 8: Integrated Design Studio Student Work, Alex Panagiotareas + Chris Praino

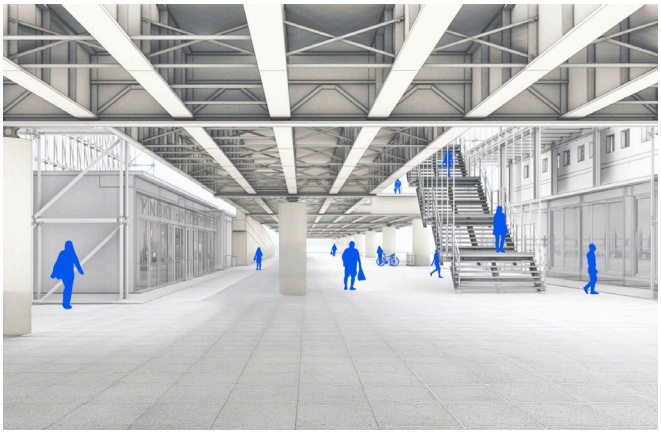


Figure 9: Integrated Design Studio Student Work, Noyonika Gaba + Sofia Cisneros

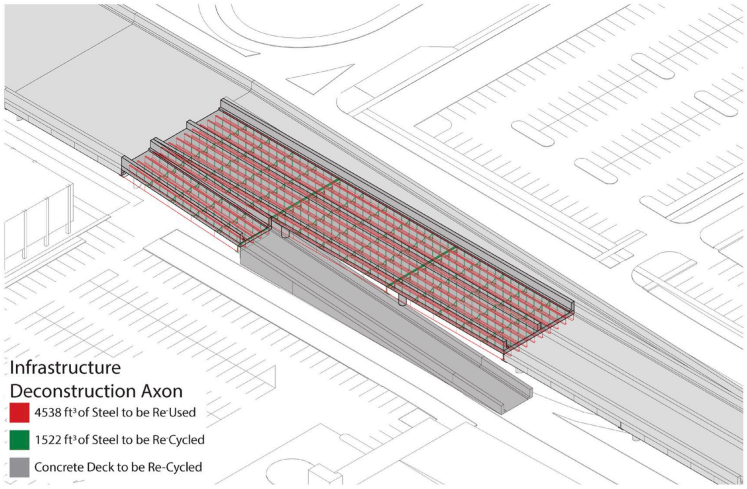


Figure 10: Integrated Design Studio Student Work , Ethan Fox, Fiona Noumbi, Yiwen Tang

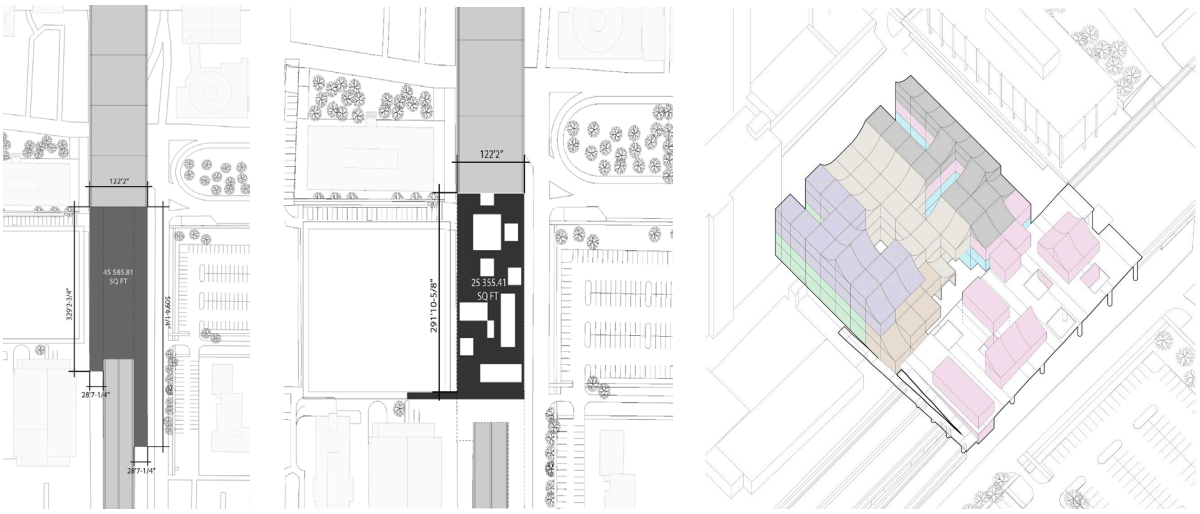
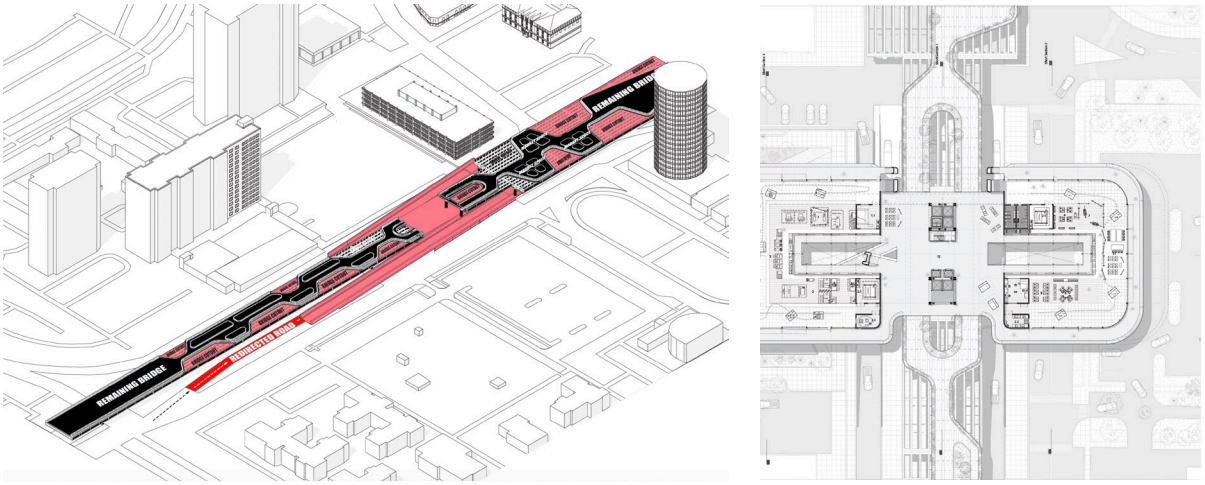


Figure 11: Integrated Design Studio Student Work, Maddie Best + Serena Ip



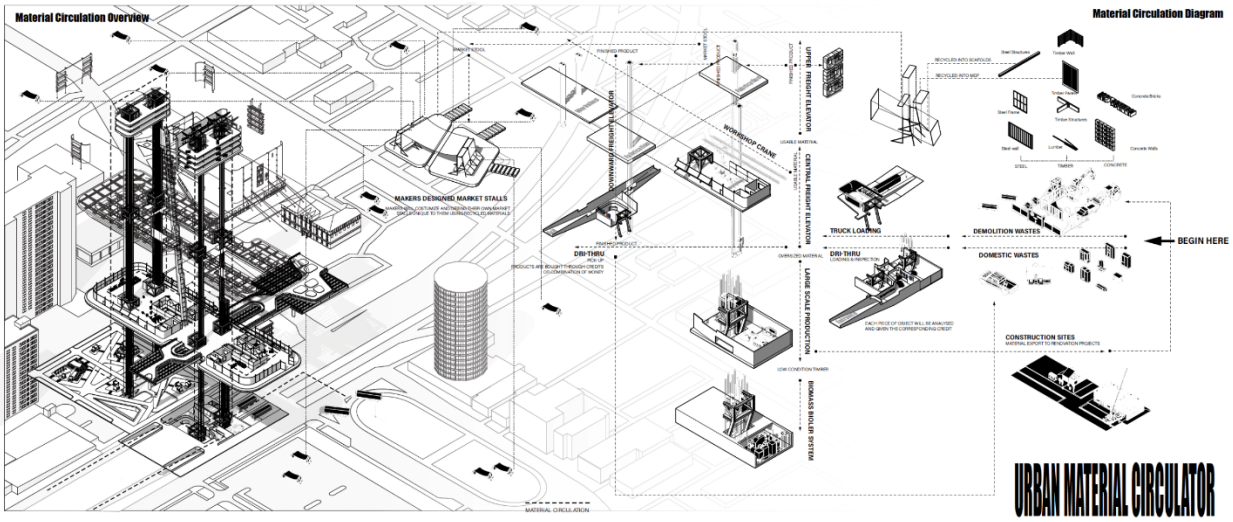


Figure 12: Integrated Design Studio Student Work, Jingxiang Zhang + Zilin Jing)

Output

See Appendix B for full set of figures and explanations including ARC 409 overpass analysis, reuse and recycling strategies, and final design projects leveraging the adapted structure.

5.4. Pedagogical Engagement and Speculative Design – Civil Engineering

A group of five engineering students were selected to conduct a capstone project based on this research project as partial fulfillment of CEE 475 class in spring 2025. Yilei Shi supervised this group of students and capstone project, in his capacity as course instructor of CEE 475. The group included four civil engineering majors and one environmental engineering major. The project title was "B*uilding Environmental and Social Resilience into the I-81 Removal Project: How Next-Generation Engineers Retain and Rebuild*". The students performed a comprehensive bridge inspection and provided an assessment report for the piers in between E Washington St and Van Buran St along I-81 downtown corridor. Students subsequently collaborated with Lauren Scott's ARC 409 class and performed preliminary design of a community center along redesigned I-81 infrastructure. Students provided the following executive summary in their final project report as in Appendix C.

Executive Summary of CEE 475 Final Project Report

Constructed in the years from 1964 to 1969, the I-81 viaduct left a lasting impact on the physical and social fabric of Syracuse, New York. Following World War II, a massive spending spree by the federal government to accompany the return of millions of soldiers from abroad and the baby boom resulted in the creation of the Federal Highways Aid Act of 1956. This act spawned the creation of the interstate system which aimed to connect major cities with massive vehicular corridors.

I-81 runs from Tennessee to the northern border of Canada though its Syracuse portion constructed over black, Jewish, and immigrant communities with the most significant portion, the 15th Ward, east of downtown Syracuse, being entirely demolished and displacing thousands of former residents. The decision to construct the viaduct through a densely populated neighborhood of Syracuse was influenced by the policy of redlining, a Federal bank loan policy designed to rank neighborhoods based on mortgage refinance probability. Installing a physical barrier between Southwest Syracuse and the University Hill neighborhoods combined with the deterioration of funding with redlining continues to plague the neighborhood with intense traffic, pollution, and lack of needed business and public space.

Projects such as these were repeated throughout cities across the United States through a process called urban renewal, a policy position that uprooted low-income communities for urban vehicular infrastructure. Today, the remnants are seen in the often uninviting, desolate downtowns of America's cities where former thriving communities are left with little access to healthy food, medical services, quality education, and well-funded

institutions. In comparison, state funds for such institutions were shifted to growing car centric suburbs establishing socioeconomic and racial divides into the urban fabric of American cities.

Similar to other urban viaduct projects in larger cities such as Boston and San Francisco, advocates have been calling for the removal of such infrastructure since the Civil Rights Movement in the 1960s. Having materialized in this past decade, the Community Grid project aims to reconstruct the former street grid of the former 15th Ward while demolishing the viaduct. Advocacy against car-based infrastructure and sustainable methods of demolishing highway infrastructure are noticeably more impoverished than the suburbs outside of downtown. Along with the increase in suburbanization The 15th Ward, a thriving black community in the southeast section of downtown Syracuse The I-81 Viaduct, built in the 1960s during an era of expansive car-centered infrastructure, has left a lasting impact on Syracuse's urban landscape—displacing communities, enforcing racial and economic segregation, and fragmenting neighborhoods. Today, as the structure deteriorates, the city faces a critical decision: demolish the viaduct or reimagine it in a way that heals past harms and supports future resilience.

This project by Archway Engineering proposes an alternative to demolition—refurbishing the I-81 corridor into a sustainable and socially inclusive urban environment. Our approach aims to preserve the corridor’s transportation function while transforming it into a vibrant, accessible, and environmentally conscious public space. Drawing inspiration from successful international models like Toronto’s Bentway Staging Grounds, we envision a future where infrastructure connects rather than divides.

Our process began with client consultations and a structured visual inspection of the viaduct, focusing on piers and girders as defined by the 2017 NYSDOT Bridge Inspection Manual. Visual data was collected, mapped, and assessed to identify structural concerns and inform design strategies. Deliverables include a series of technical documents, CAD models, community outreach workshops, sustainability analyses, and staged progress reports culminating in a 100% final report and presentation.

Ultimately, this project demonstrates that infrastructure can be a tool for repair—not just in engineering terms, but socially and environmentally. Our proposal offers Syracuse a long-term, inclusive, and resilient vision for what I-81 can become.

6. Reference

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Appendix A

Community Workshop Organizing Protocol

Workshop Title

Community Workshop: Resisting Gentrification around the future East Adam Street neighborhood

Workshop Participants

– Pioneer Home residents

Other Workshop Personnel Roles and Responsibilities

– Discussion Facilitators: Lauren Scott, Christina Chi Zhang, Yilei Shi
Follow the discussion guide to explain workshop objectives, facilitate conversations, ensure we meet all research objectives, and be flexible when we see fit

– One-site Assistants: Hyun Lee, Jakob Keller
Keep track of the discussion guide, **remind timing,** document conversations (audio recordings, photography), help distribute materials and supplies, stay alert and aware to observe and respond: jump in to explain when people are confused; take field notes; offer help to people crafting; react to conversations when you notice people are being left out.

Workshop Objective

– Clarify to the participants our position in this community-engaged project and the larger ongoing conversation about I-81.(Community Grid, East Adams Street Transformation)
This is our first community event for this project - We do not represent the city. Our potential to make changes is limited, but we can help you make exhibitions / visualizations to get your visions public.
– Help explain the roles and processes of architects, developers, municipal entities, and researchers in an urban development project.
– Understand the problems, experience, and social and programmatic wants of Pioneer Home residents for the future of their neighborhood.
– Understand what types of spaces Pioneer Home residents want for their neighborhood, and what they could look like.
– Represent a vision of the anti-gentrification future that belongs to the community.
– Help the participants gain knowledge, vocabulary, and understanding in advocacy: this is how you can engage in the future! We're introducing a tool, not an exhaustive conversation.

Discussion Structure and Guide of the Workshop

Introduction

General Goals of this session: Set up a friendly tone of the workshop; thank the participants for their time, facilitate introductions, provide the participants with an overview of the workshop, and articulate our position in the larger conversation; share the consent form, and make it clear that they are free to pause/leave at any point.

1. Introduce ourselves with simple, accessible language. **Avoid technical or academic jargon**. The introduction should include our names, roles, history with urban development and community work, and our responsibility in this particular workshop ("come to me if___"). Tell participants they will have a chance to introduce themselves after we break up to stations.
2. Make a brief presentation of our project, focusing on our short-term and long-term goals, our commitment to listening and amplifying, as well as our limited capacity and influence. Also give a brief, accessible overview of the "community design" method, and how it fits in the larger picture.
3. Introduce consent and assent forms and inform everyone that they need to sign them in order to participate.
4. Clarify the goal of the workshop: it's about imagining strategies to resist gentrification and advocating for a community vision. Also clarify what we are talking about when we say "architecture": spaces are not just physical furniture and things, but communities, activities, where friendship and family and gatherings happen. We want to help advocate for those.
5. Introduce the four stations and make clear their **intentions**:

   a. Overall neighborhood model for people to leave comments on the broad positioning of things – how do you use each space; where do you love and see as your community; where do you want to preserve; what are your biggest worries; what would you want to see.

   b. Model of a street: on the street level and inside each space, visualize what you imagine would be a functioning neighborhood you would call home and an un-gentrified community.

   c. Community Manifesto: based on what you learned from today's discussions, or at any point you think of an actionable request, fill out the community manifesto on the wall.

   d. Open space on brown paper: we want to make sure everyone is heard, but we have limitations with just three people facilitating the conversation. If you feel like we haven't addressed your concern or want to say anything that doesn't fit in our programmed discussion today, leave a comment on the open space on this infinite roll of brown paper.
6. Go through the consent form content and the consent process. Give time for people to ask questions before signing. (consent & assent)
7. Emphasize the voluntary nature of their participation: If at any point you have any questions for us, let us know. Also, if at any point you'd like to take a break or withdraw from this workshop, that's completely fine as well.

12:30PM
Discussion 1: Overall Information on the Neighborhood

Sit around the big table with the large neighborhood model and use the stickers, sticky notes, flags.

Invite the participants to introduce themselves. Their first name (how they want to be called), age, relationship with Pioneer Homes, and why they want to participate in this workshop.
A warm-up question: what's your favorite place in the neighborhood? Why?

Spend 30 minutes on this exercise, get people to start thinking spatially and sharing their opinions. “You can use the visual stickers and place the flags to map out your answer and share afterwards.” Note: *do not* let people start talking right away. Make sure people take at least 5 minutes working on their own. Participants might react to each other’s answers, and when it happens, we should give them ample time and space to respond to each other while taking clear field notes.

1. What do you do in your neighborhood, outside of your apartment? Where is your community?
2. What’s your biggest worry about the new plans?
3. What would you want to see in your new neighborhood?
4. What’s one thing you would tell SHA to ***not*** do?

Remind people they can write on the “Open Space” or “Community Manifesto” whenever they think of something that we’re not addressing in this current discussion.

1:00PM
Discussion 2: Street Experiences

Spend 25 minutes on this exercise, get people to start making and sharing their vision through a more visually-based language. “You can use the tools, furniture, people, building models to draw, build, and curate a street life you’d feel comfortable with. It’s going to reflect your understanding of anti-gentrification, public buildings / housing / shared amenities.” Note: *do not* let people start talking right away. Make sure people take at least 10 minutes working on their own.

1. On a public street in your neighborhood, what are some places you want to have?
2. What would they look like?
3. What are some activities that would happen on your ideal public street?
4. What else would you want? What would reflect your family and community?
5. What ***don’t*** you want to see? What would you make sure it wouldn’t come to your neighborhood?

Remind people they can write on the “Open Space” or “Community Manifesto” whenever they think of something that we’re not addressing in this current discussion.

1:30PM
Discussion 3: “Designing” your own neighborhood

Group 1: Model
Spend 20 minutes on this exercise. Sit around the central neighborhood model again, and place blocks to curate the streetscape. Remember to use sticky notes and stickers as aid.

1. On a public street in your neighborhood, what are some places you want to have?
2. Where would they be?

Group 2: Community Manifesto
Spend 20 minutes on this exercise. Fill out this shared “Community Manifesto”:

1. Under “We identified _____ ”, write down some problems, gaps, and worries you identified through today’s discussions, or observations you want to share about your neighborhood and the redevelopment scheme.
2. Under “We want _____”, write down what you want to make happen or want to have / see in your new neighborhood.
3. Under “We propose _____”, write down any actionable items you came up with to help your vision come true, that you want us to share with SHA and other municipal entities.

1:50PM
(Now, the two groups witch)

Short Break
Before the final summary, take a short break. Get some food.

Food + Closing Discussion
While eating, summarize what you have learned, shared, and realized in today’s workshop.

Thank You and Wrap Up
At the end of the workshop, we will invite everyone to participate in future discussions and exhibitions. Spend some time thanking everyone for their time and knowledge. Invite everyone to enjoy the food. Show contact information again for people to reach out if they have questions or more thoughts to share.

End of Workshop

Schedule:
12:15 - 12:30 Introduction
12:30 - 13:00 Discussion 1 - Neighborhood Information
13:00 - 13:30 Discussion 2 - Street Experiences
13:30 - 13:50 Discussion 3a - Neighborhood Model
13:50 - 14:10 Discussion 3b - Community Manifesto
2:10 BREAK + GET FOOD
2:25 - 2:55 Closing Discussion + Reflection
2:55 END

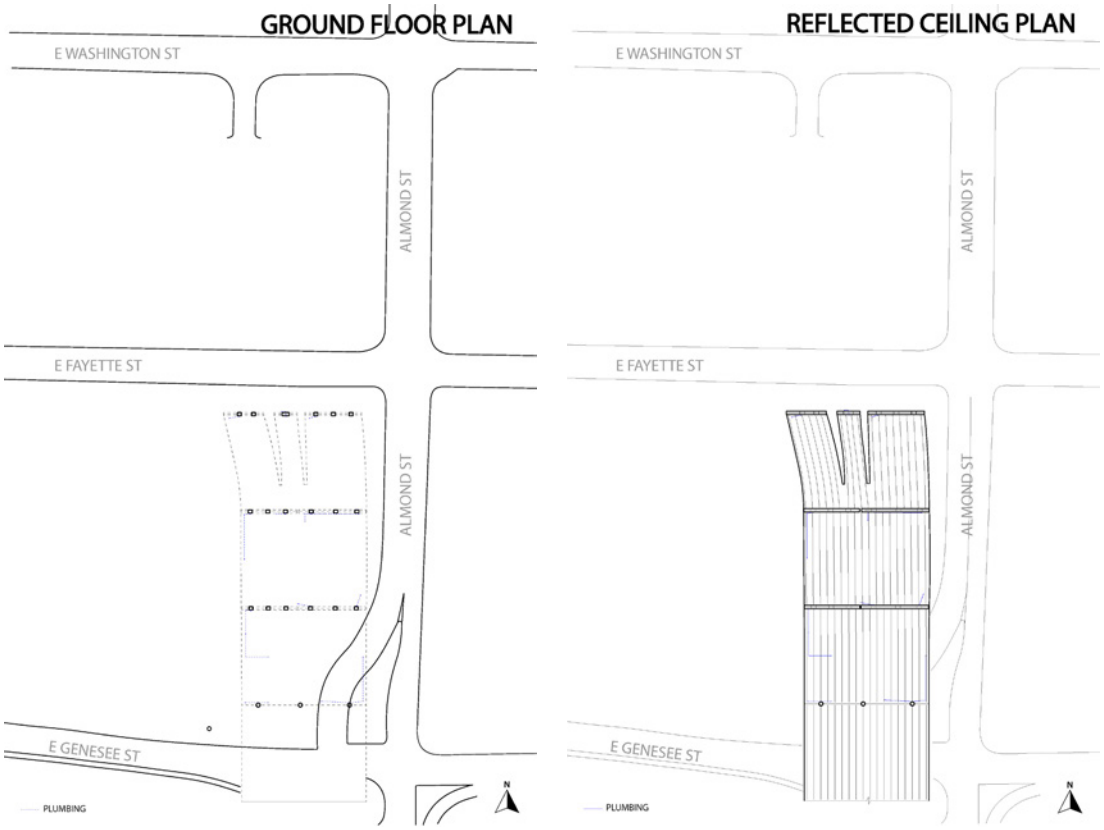
Appendix B

ARC 409 Integrated Design Studio Student Research

ARC 409 STUDENT WORK
SPRING 2025

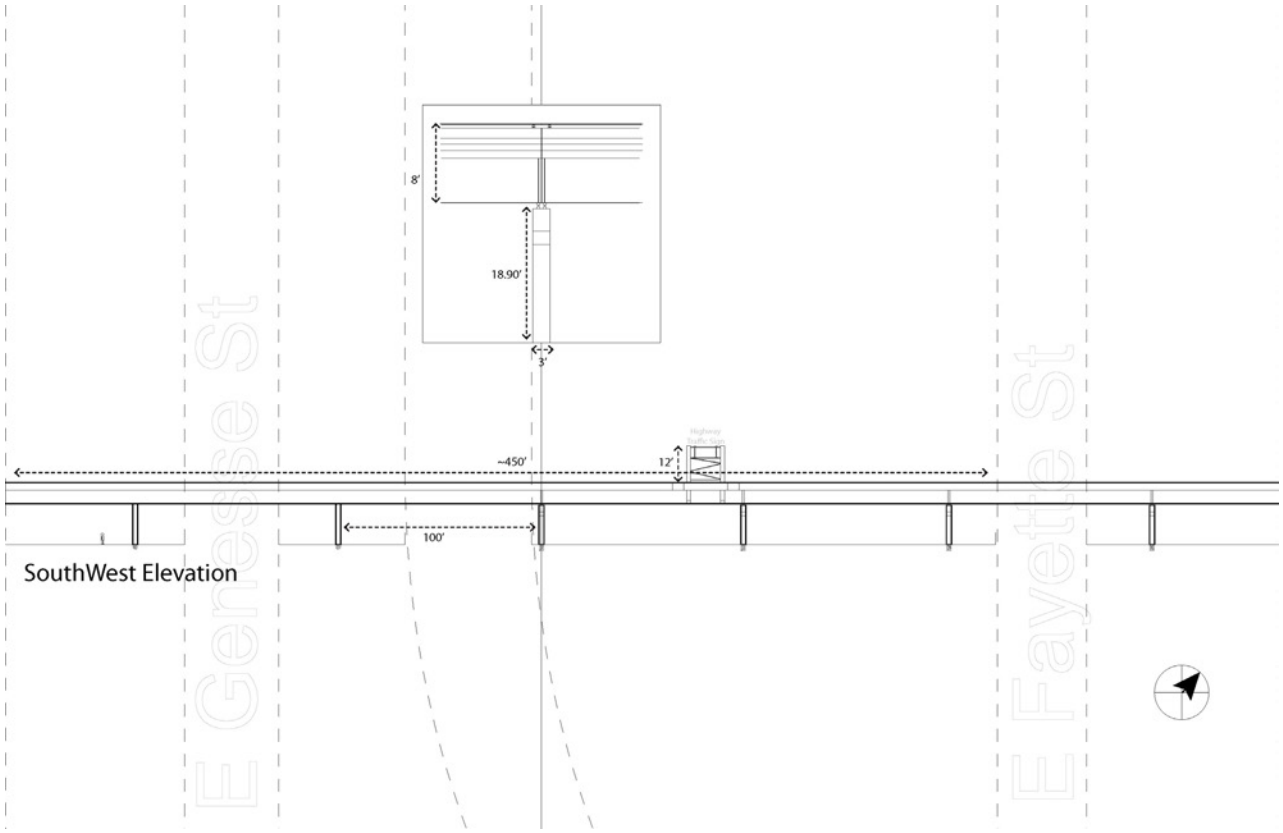
“BUILDING ON BUILDING”

Students:
Alex Panagiotareas
Chris Praino
Ethan Fox
Fiona Noumbi
Gavin Liu
Jingxiang Zhang
Maddie Best
Noyonika Gaba
Serena Ip
Sofia Cisneros
Tosia Mysliwiec
Yiwen Tang
Zilin Jing



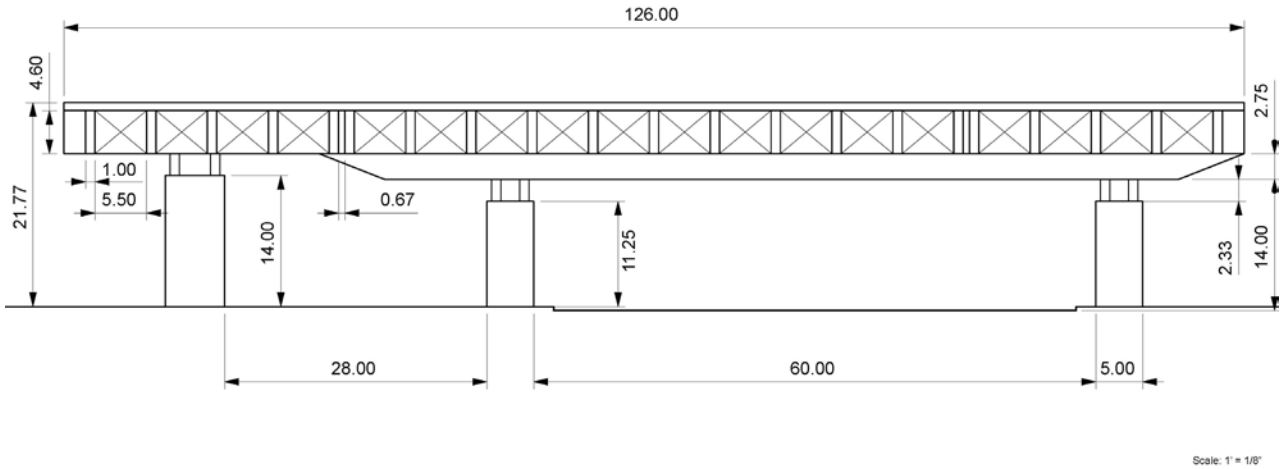
Survey Drawings

The studio began with a survey of the existing infrastructure of i-81. Students were broken into 3 groups that each took a stretch of the structure and used tape and laser measures to survey their portion.



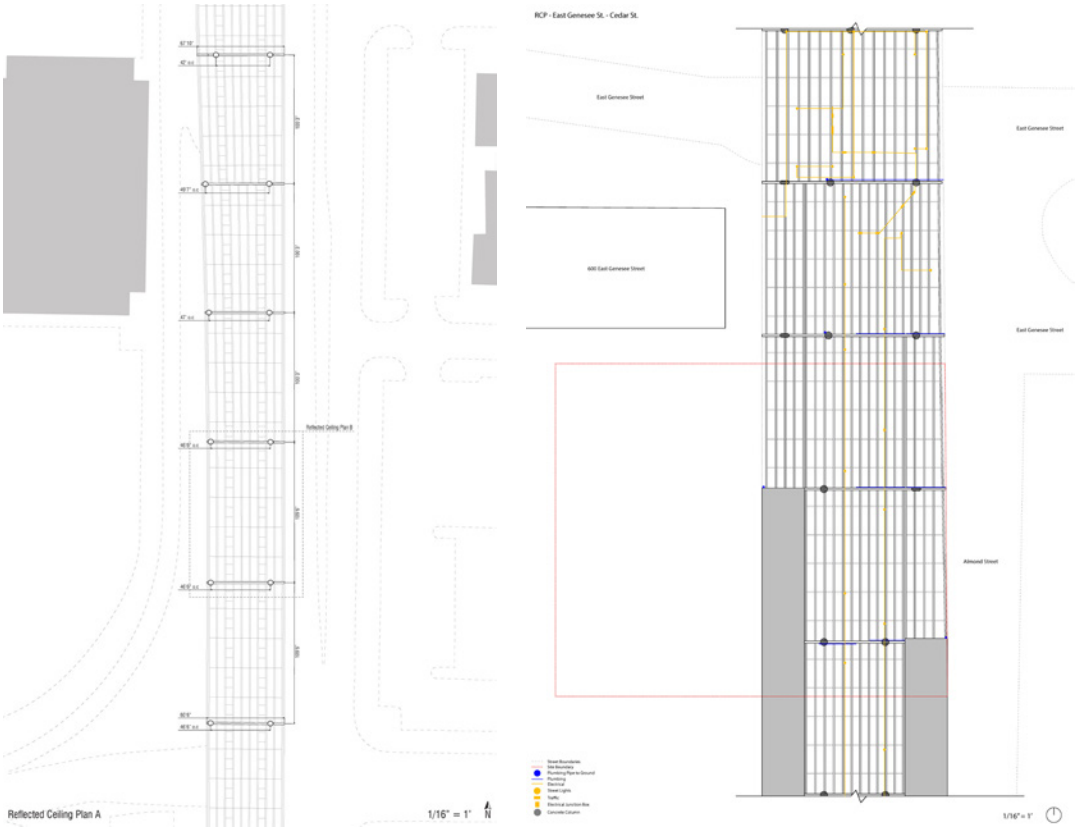
Survey Drawings

They were asked to note sizing and placement of structural members, stormwater management plumbing, and other visible features of the existing overpass.



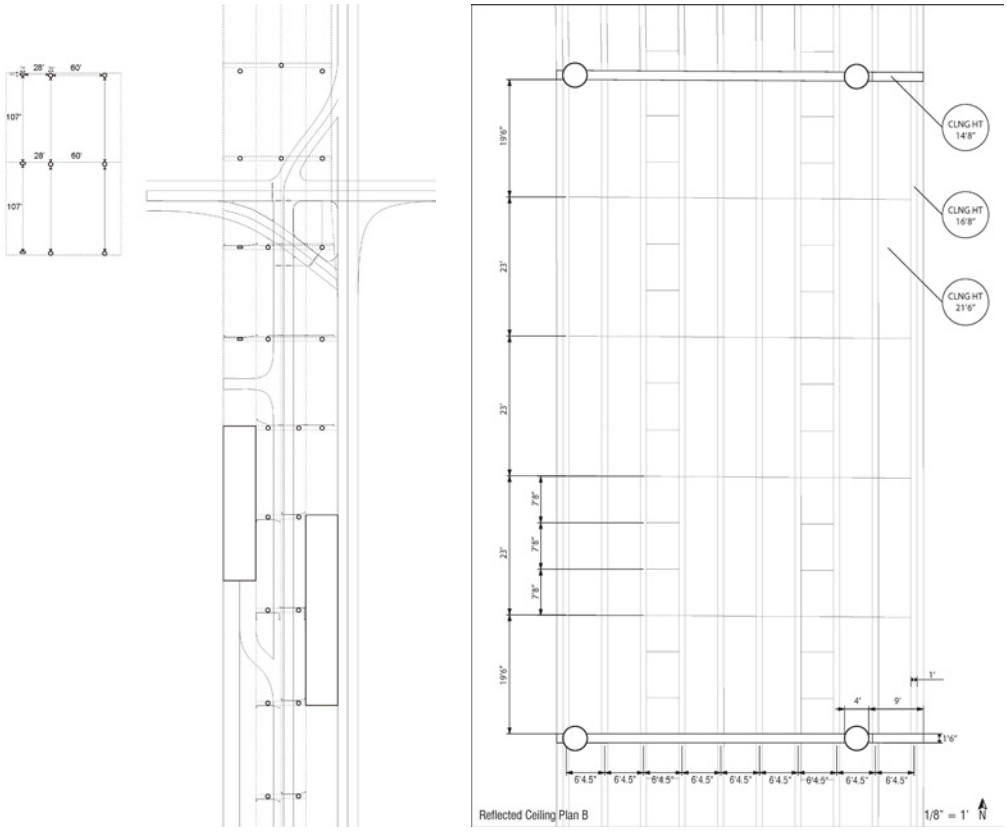
Survey Drawings

The overpass is still in use so all observation occurred from below, and the studio practiced making estimates and extrapolations about unknowns from the readily available information.



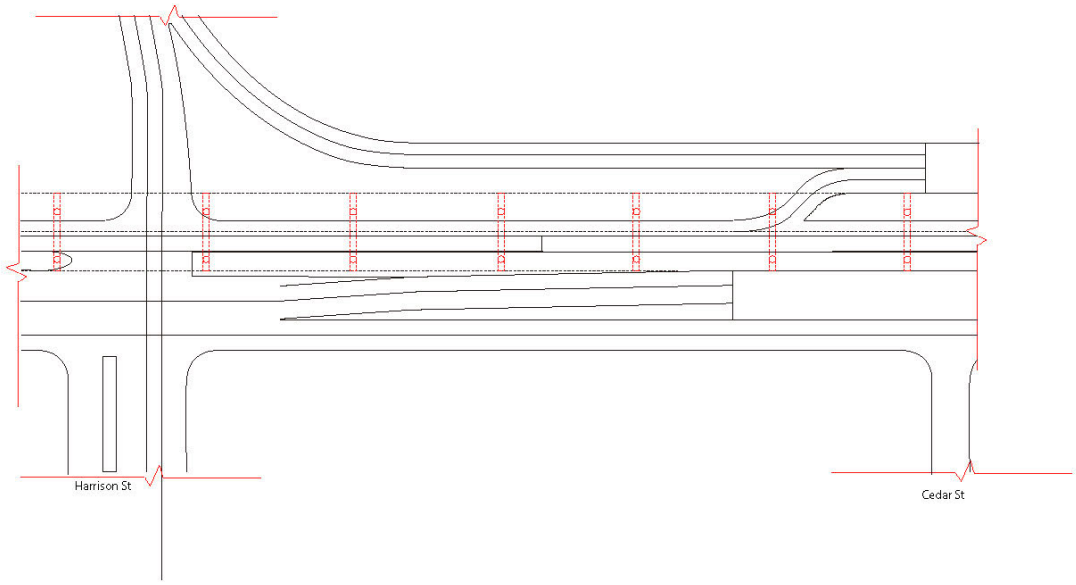
Survey Drawings

Each group created orthographic drawings in plan and section that acted as the basis for their designs. The surveys (and the collective digital model created from them) were shared with CEE 475.



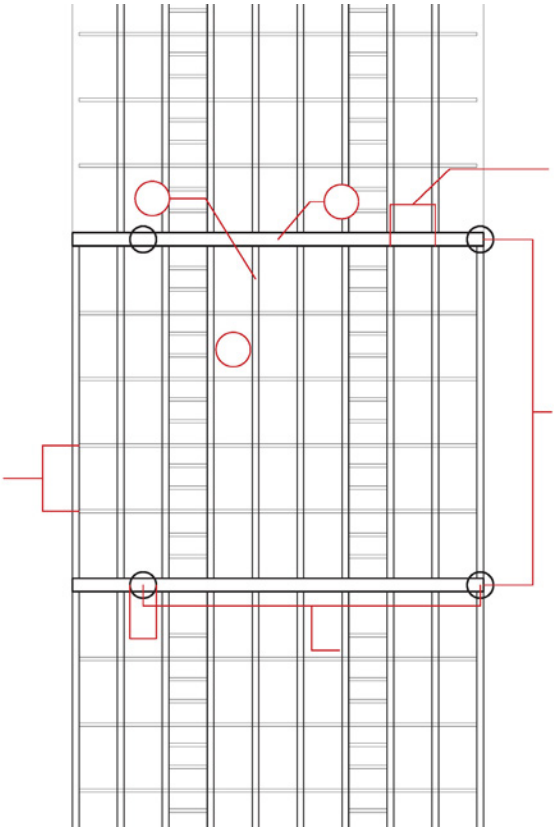
Survey Drawings

Students drew the roadways beneath the bridge, precisely measured their supports, and examined the expansion joints on the underside of the slab to inform selective intervention on the structure.



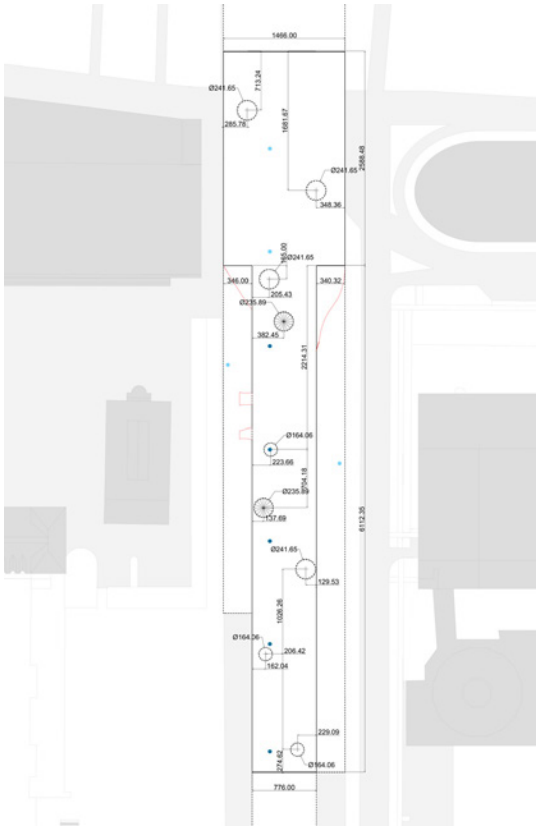
Survey Drawings

The overpass made for an excellent case study in reading the integration of systems and structure as nearly all of the critical elements and their relationships are visible and legible.



Survey Drawings

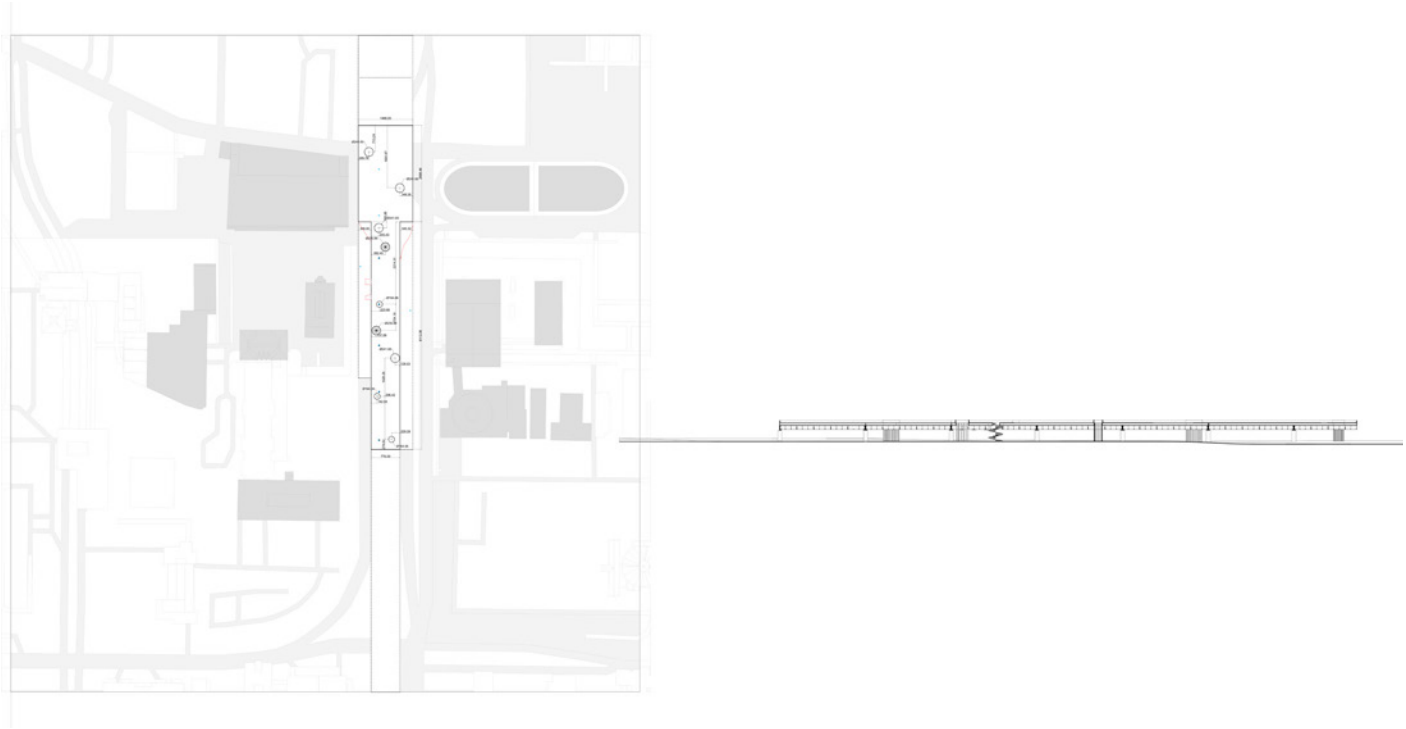
Students identified grids/logics and made reasonable assumptions - such as measuring the thickness of structure at on/off ramps, and assuming the same for similar members unable to be measured.



Overpass Intervention Plan

Students Alex and Chris used the survey documents to plan precise cutouts in the slab and structure to bring light to the ground and facilitate vertical pedestrian access to the new elevated park.

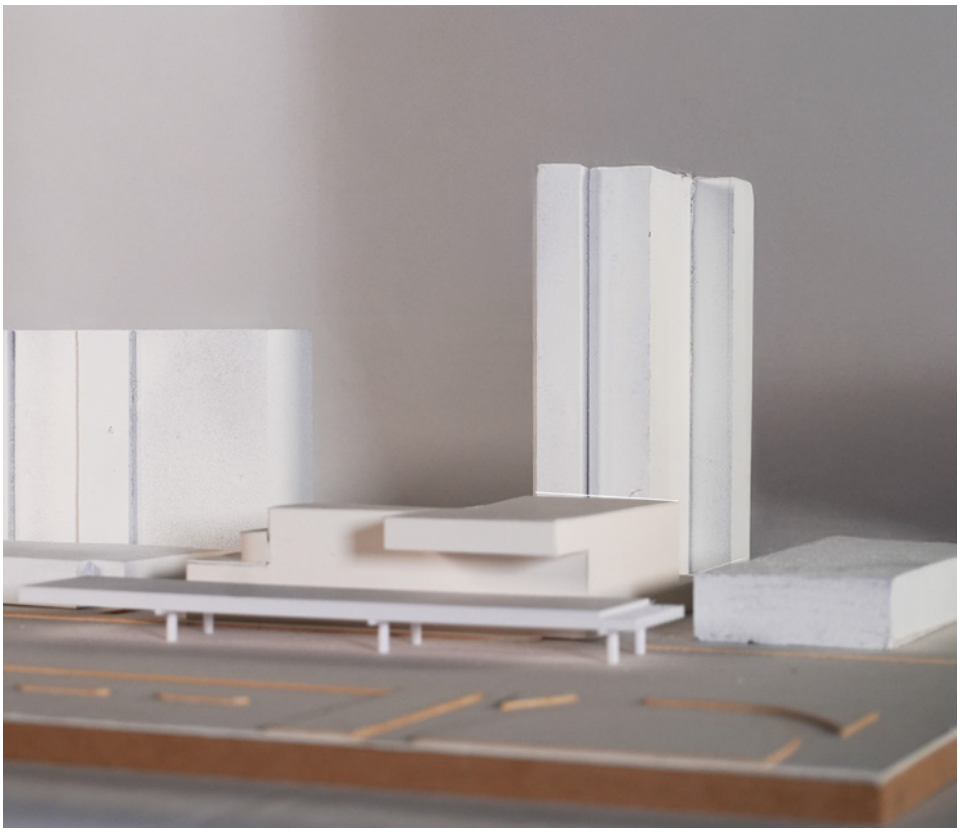
Alex Panagiotareas
Chris Praino



Overpass Intervention Plan

A zoomed-out view gestures at the urban context of the site and clarifies the extent of their planned intervention on the overpass structure and its relationship to its urban context.

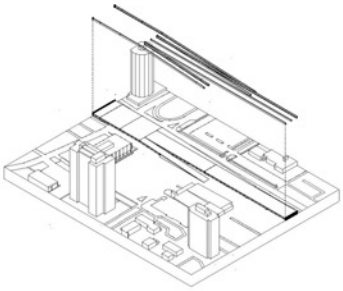
Alex Panagiotareas
Chris Praino



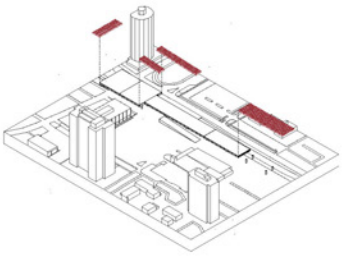
Massing Models

Simple massing models were used across the studio to test relationships between the building and the structure, as well as with the surrounding context.

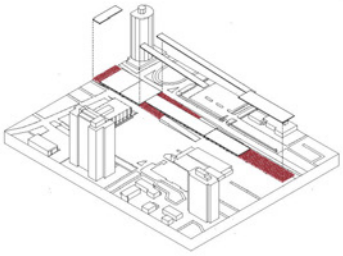
Alex Panagiotareas
Chris Praino



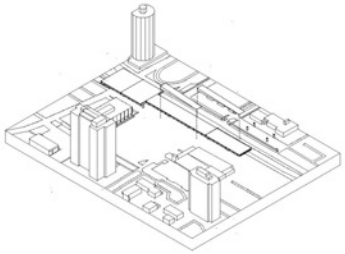
Median/Guard Rail
The medians and guard rails are removed, to be replaced later.



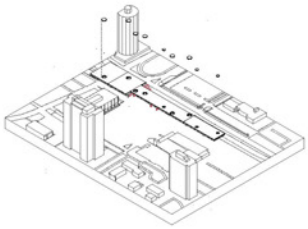
Steel Structure
The steel structure is removed from the ramps and unused sections to be reused in other areas of the project or recycled.



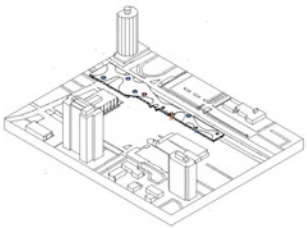
Street Pavement
The asphalt in the ramps and unused overpass sections is removed.



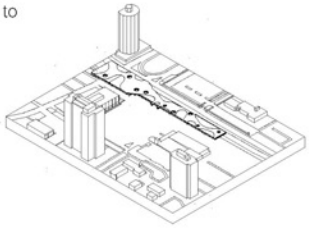
Foundations/Columns
The concrete foundations and columns are removed from the ramps and unused overpass.



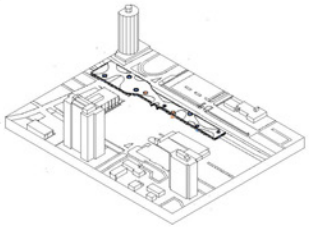
Surface Openings/Reused Structure
Openings are made on the remaining overpass surface for light wells and circulation. Steel structure from the dismantled overpass is used to make connection points to the building and to design the overpass surface.



Feature Structure/Spiral Staircase
Hollow tube columns are added at the light wells and two spiral staircases are added to provide access from the ground to the overpass.



Surface Pathway
A pathway is added to the overpass, defining what will hardscape and softscape

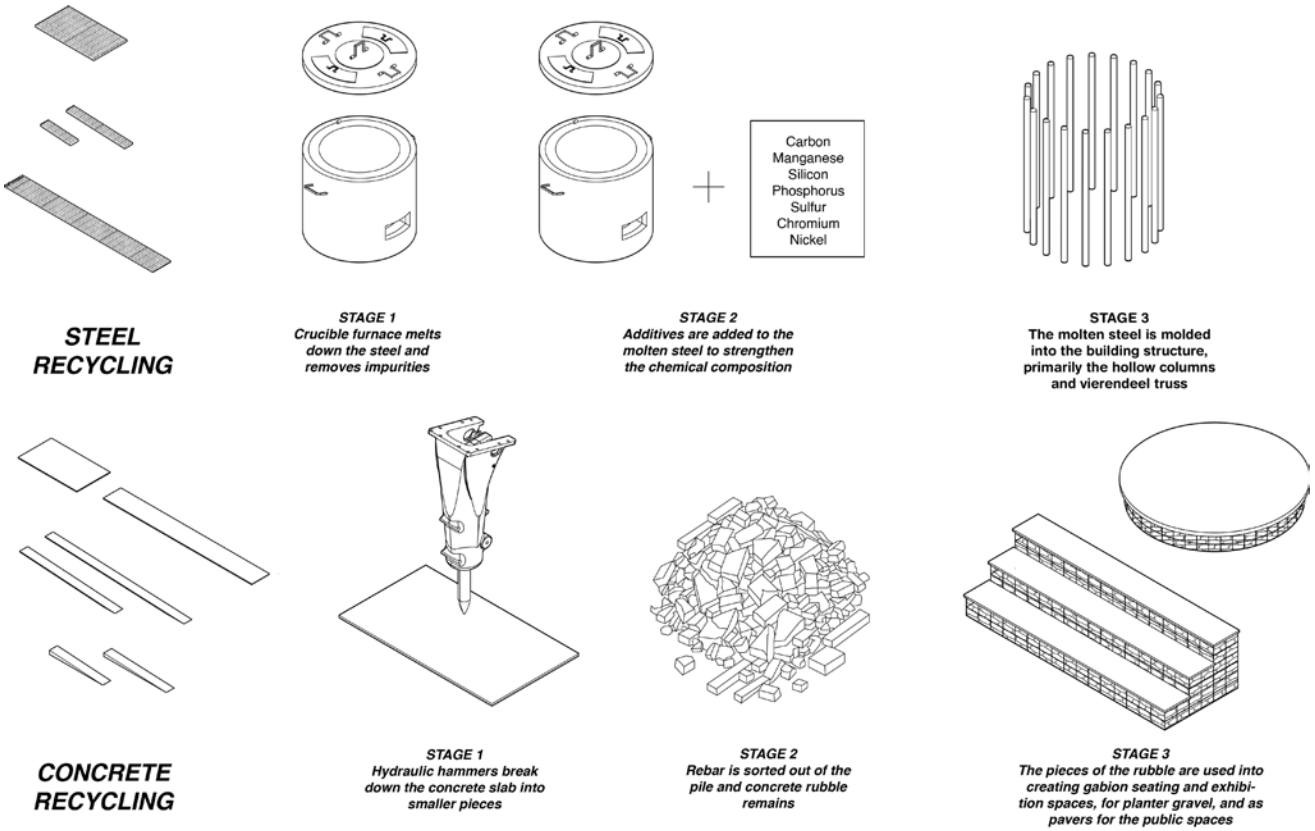


New Railing Added
New railings are added around the perimeter of the remaining overpass.

Intervention Diagram

Their step-by-step diagram shows the process of selective demolition, the quantities of “waste” material made available, and the proceeding intervention and recycling/reuse of that material as it is converted into a sculpture park and connected to the new adjacent ground-up project the students designed. Alex and Chris specified the replacement of the concrete guardrail for pedestrian railings, and identified moments of opportunity for reusing structural steel to connect their building to the pedestrianized overpass.

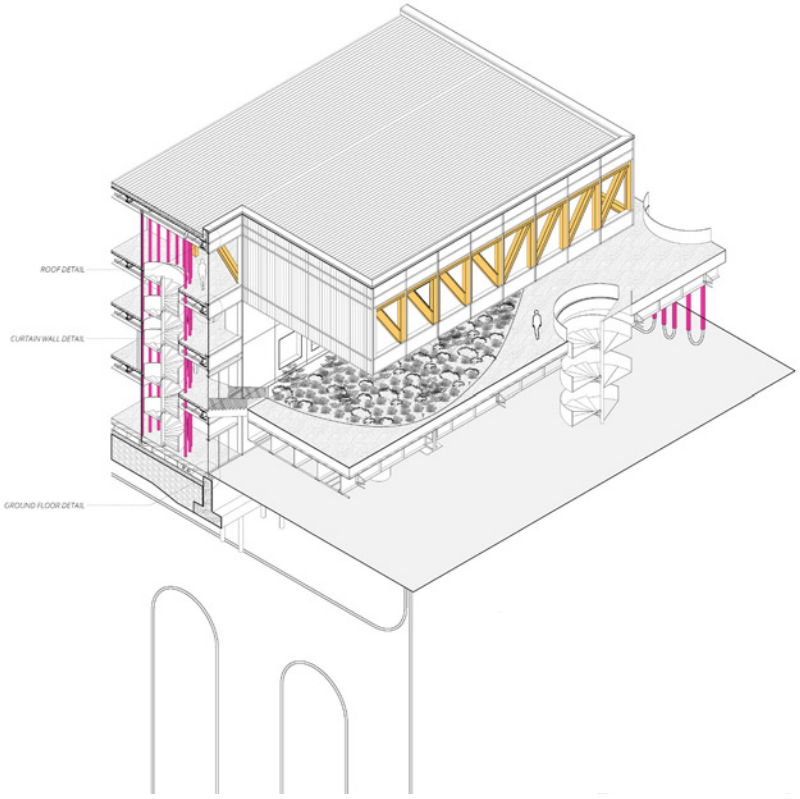
Alex Panagiotareas
Chris Praino



Recycling/Reuse Diagram

The students diagrammed the process of material recycling and reuse, and through this began to recognize the effort and energy required to convert different materials at different scales.

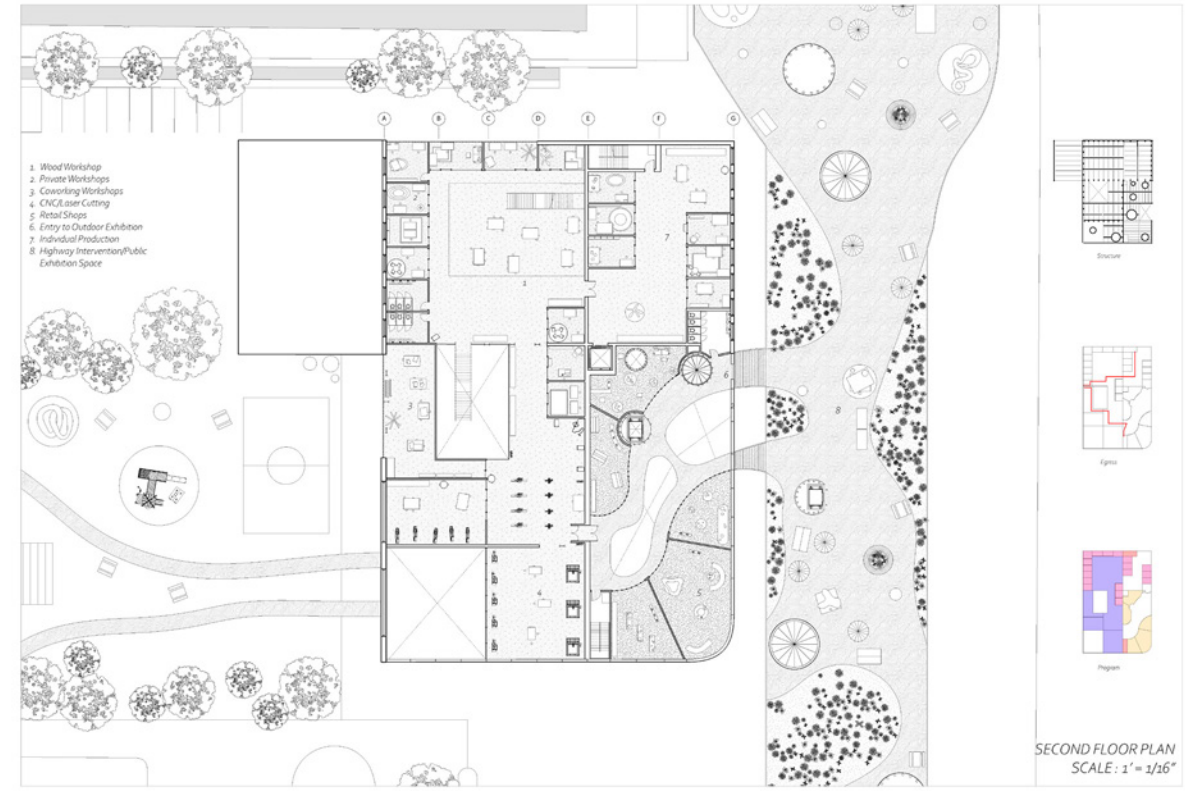
Alex Panagiotareas
Chris Praino



Cut Axonometric

This team also engaged spatially with the repurposed overpass - connecting to the surface and ground levels as well as overhanging the structure with a cantilevered gallery space.

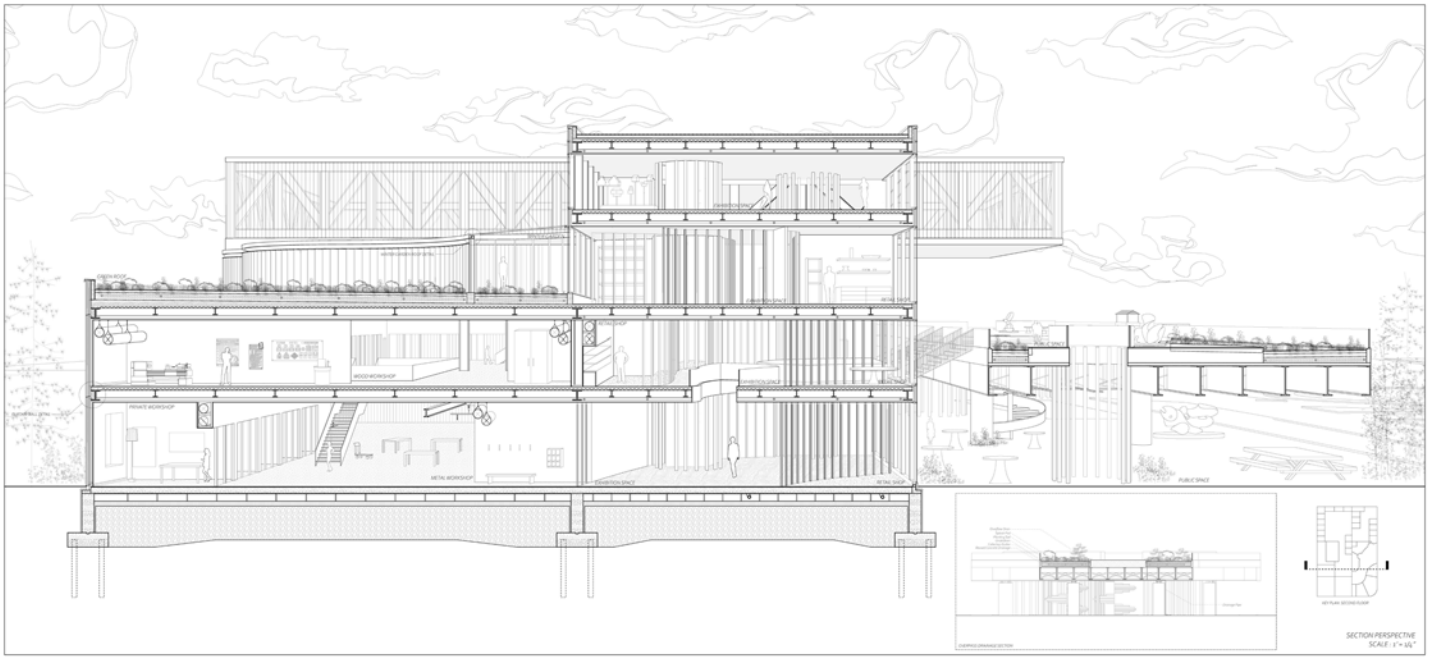
Alex Panagiotareas
Chris Praino



Floorplans

Orthographic plans at the ground and second levels show the intended flow of the public between the building and the overpass to be seamless and natural, welcoming passersby into the interior.

Alex Panagiotareas
Chris Praino



Section Perspective

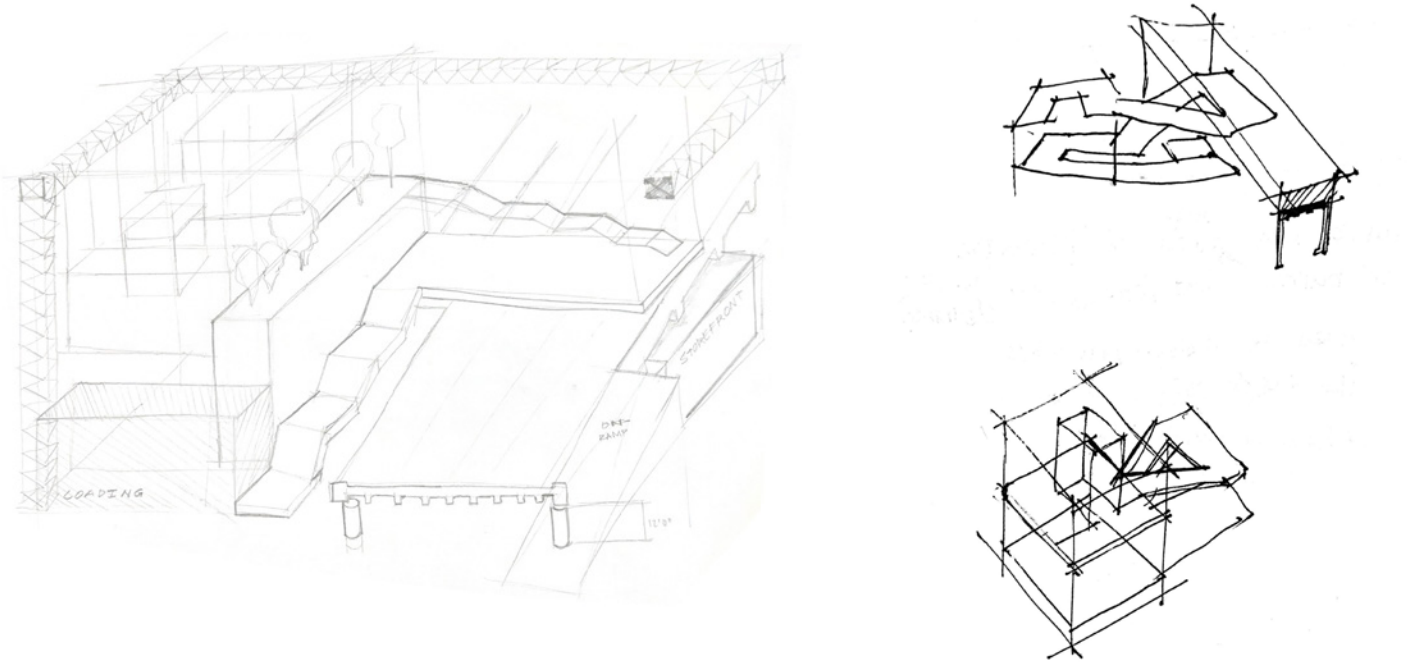
Alex and Chris explored the uses and activities facilitated by their design, and drew through the layers required for patches of vegetation/green roof assembly implemented on the structure.

Alex Panagiotareas
Chris Praino

Perspective Rendering

A collaged perspective drawing illustrates the students' intentions for the overpass - to become a vibrant, active, beloved public space.

Alex Panagiotareas
Chris Praino



Concept Sketches

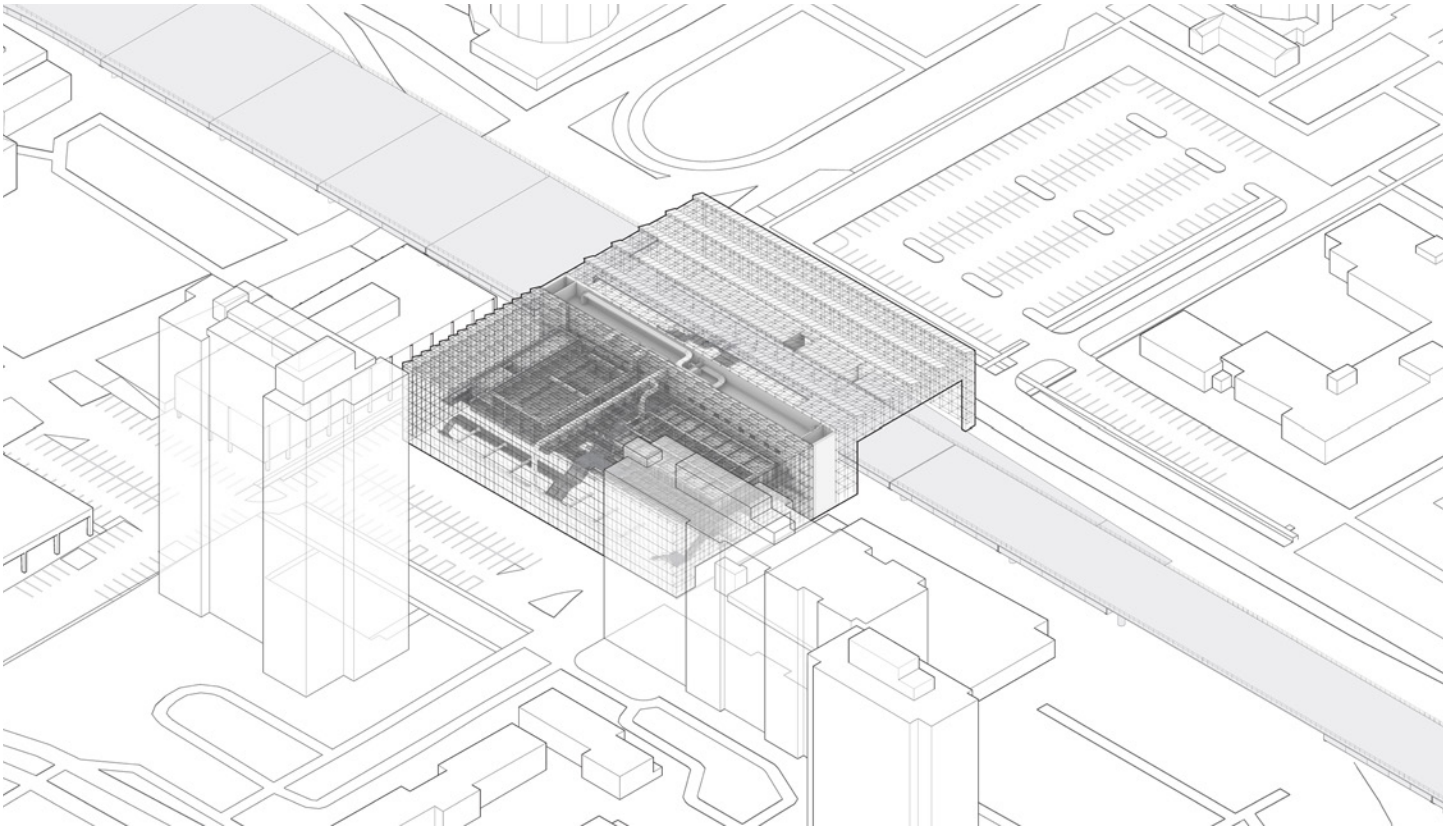
Sofia and Noyonika sought to use a series of ramps and stairs to mediate between the building, the overpass, and the ground to make the transition between each natural and non-hierarchical.

Noyonika Gaba
Sofia Cisneros

Floorplans

Their intervention of the overpass included selective demolition of “chunks,” targeting expansion joints so to the structural viability of the structure despite selective removal of slab and structure.

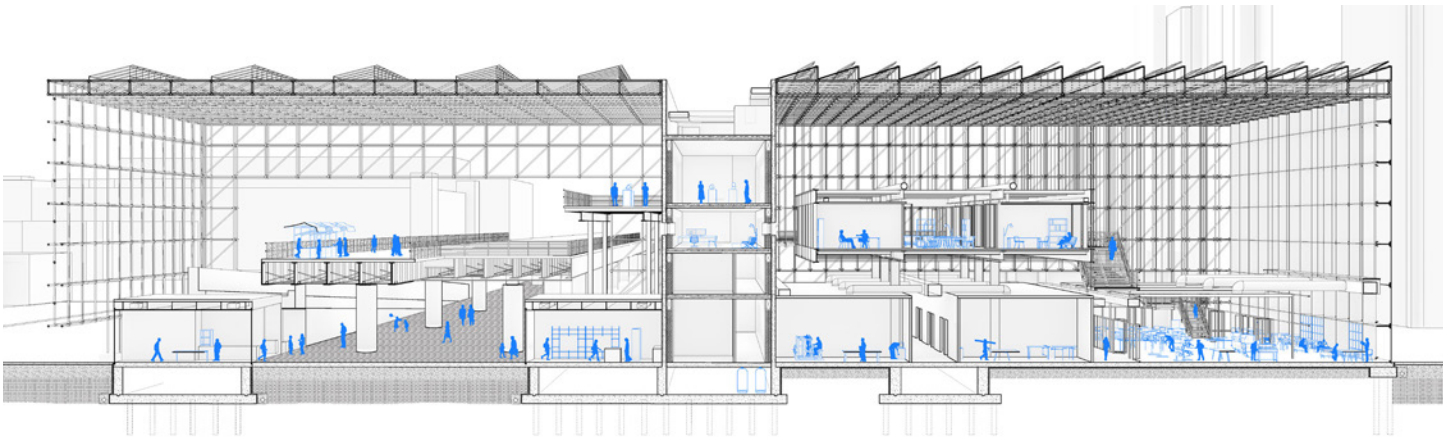
Noyonika Gaba
Sofia Cisneros



Site Axonometric

They designed a spaceframe that extends over the highway and touches down on the other side - conditioned on the west portion of the building and open air where it reaches over the overpass.

Noyonika Gaba
Sofia Cisneros



Section Perspective

The section perspective shows how the spaceframe is geometrically enveloping the overpass and creating a multi-layered experience, offering many new perspectives of the adapted overpass structure.

Noyonika Gaba
Sofia Cisneros

Perspective Rendering

The ground level is populated with new shops - revitalizing the space under the structure as a new sheltered shopping concourse.

Noyonika Gaba
Sofia Cisneros

Model

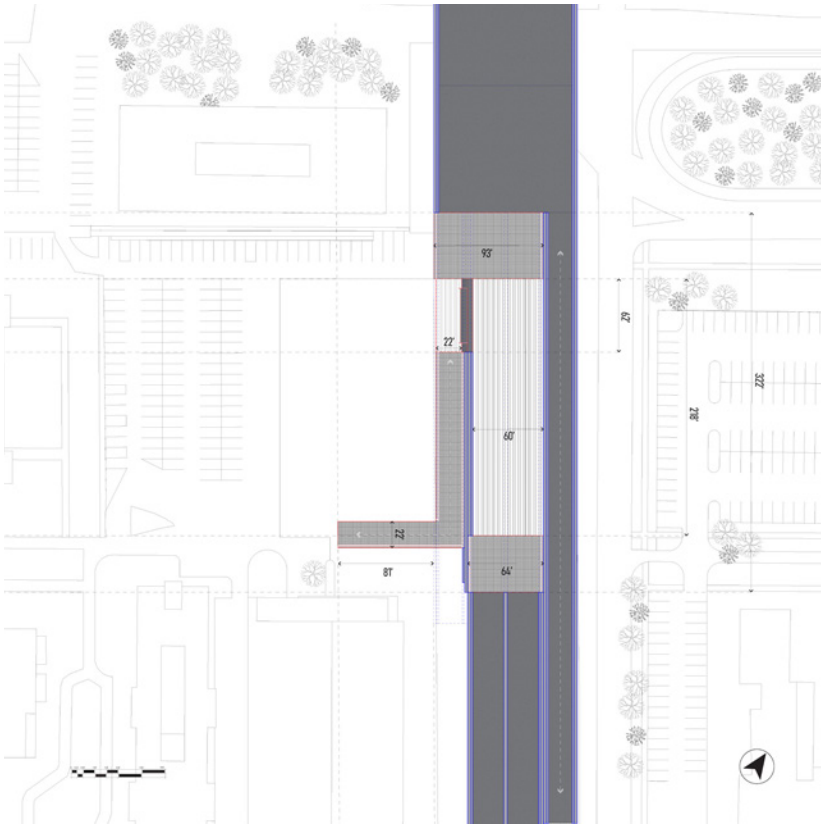
The open-air portion of the spaceframe is outfitted with solar panels, taking advantage of the scale of the structure to generate renewable energy and cast shade without increasing impermeable surface.

Noyonika Gaba
Sofia Cisneros

Demolition Diagram

Like other groups, Ethan, Fiona and Yiwen considered the structure and demolition of the overpass strategically, and diagrammed compositional possibilities of demolition at expansion joints.

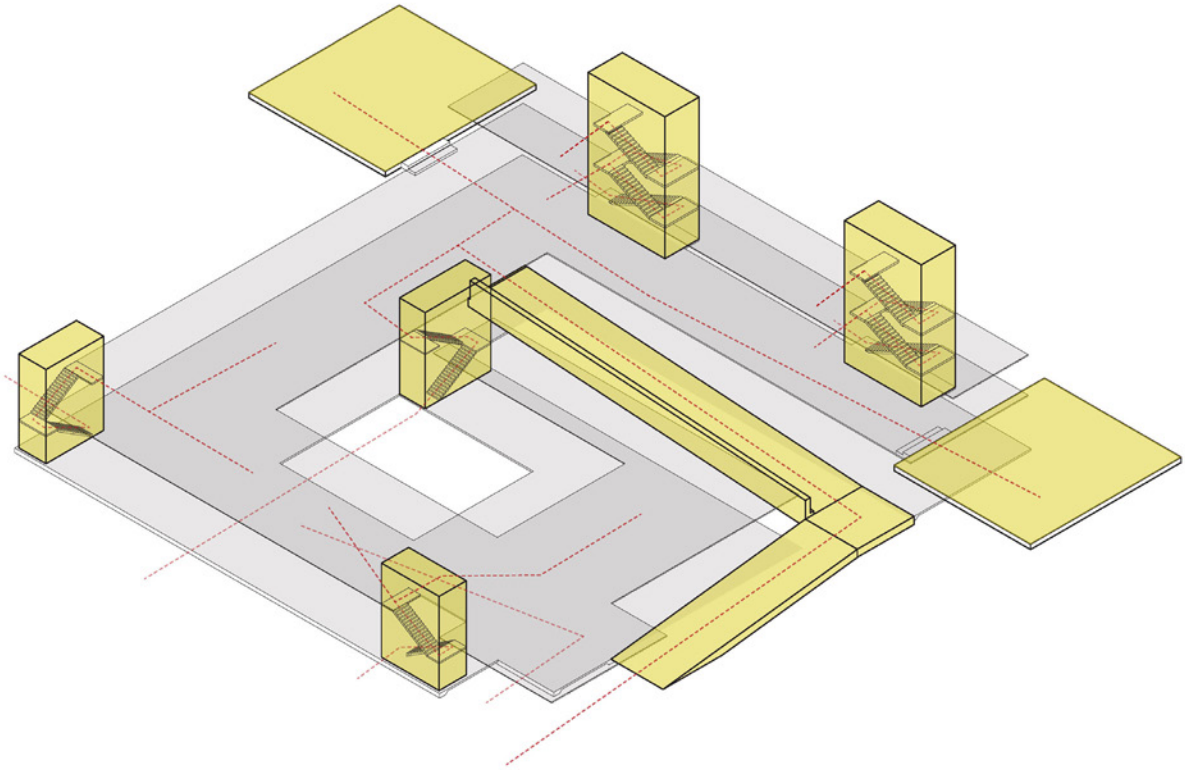
Ethan Fox
Fiona Noumbi
Yiwen Tang



Overpass Intervention

Early on, they identified that they wanted to keep and reuse part of the on-ramp, but turn the base of the ramp to meet the site and parking lot of their building to create a main access point.

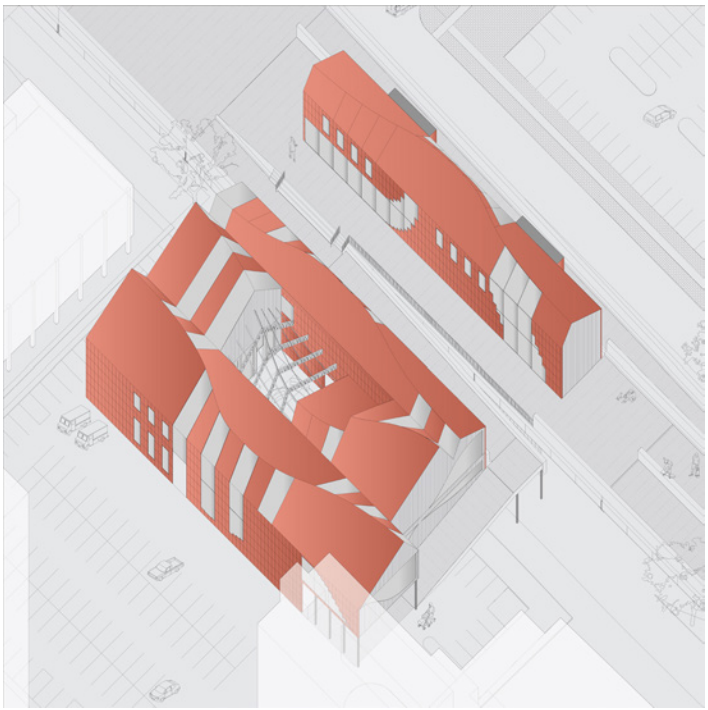
Ethan Fox
Fiona Noumbi
Yiwen Tang

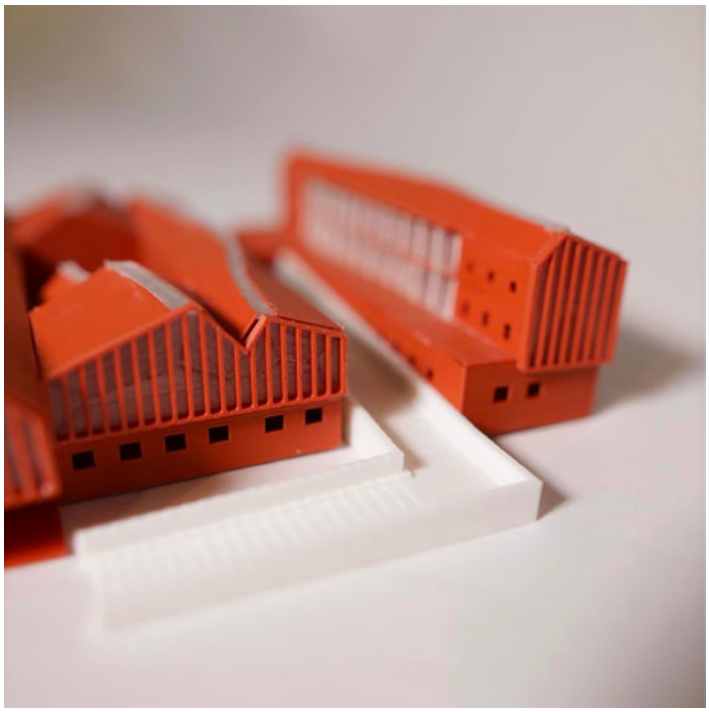


Access/Circulation Diagram

They wanted to replace part of the infrastructure with a portion of their building - and use the new building's roof as a continuation and connection to the remaining overpass surface.

Ethan Fox
Fiona Noumbi
Yiwen Tang

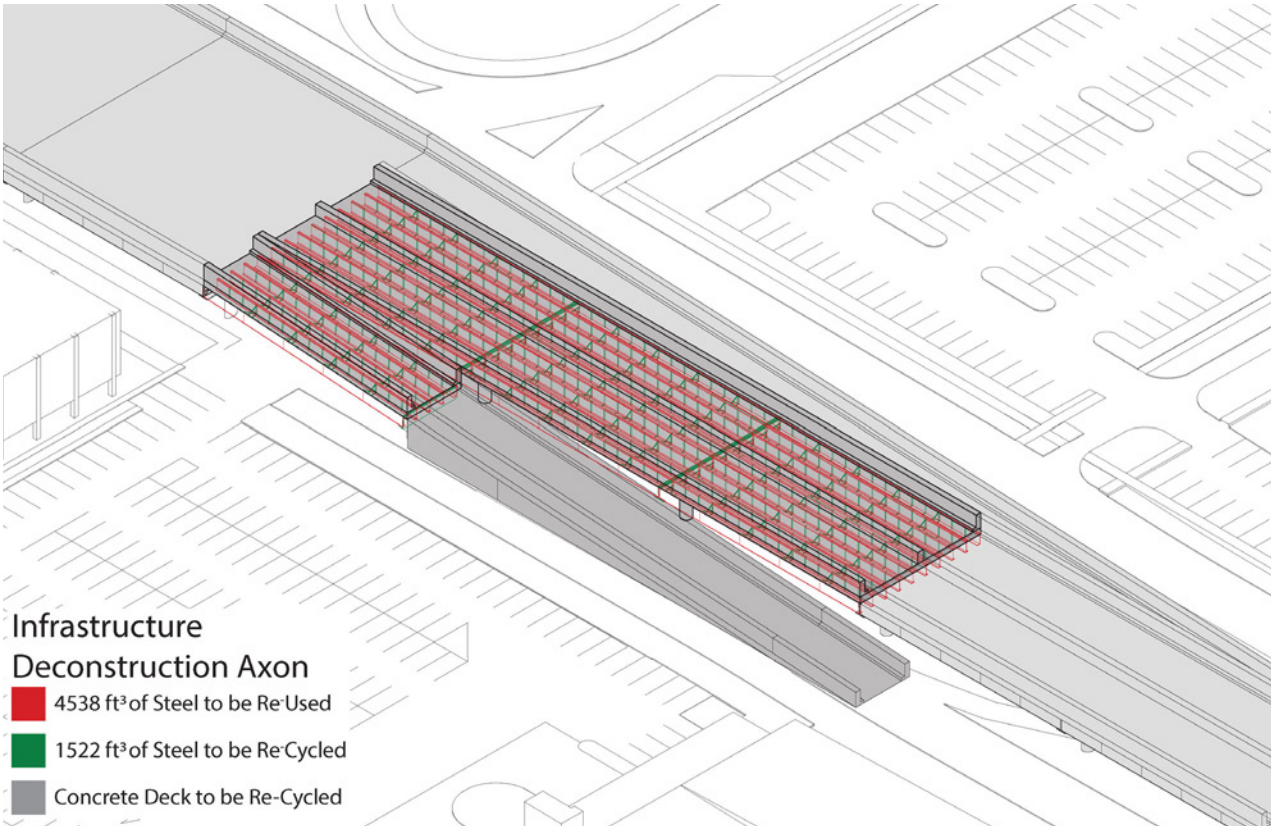




Site Axonometric + Massing Model

Their massing strategy mirrored the linearity of the infrastructure and maintained a continuous pedestrian path even while embedding and increasing the connection between the building and the overpass.

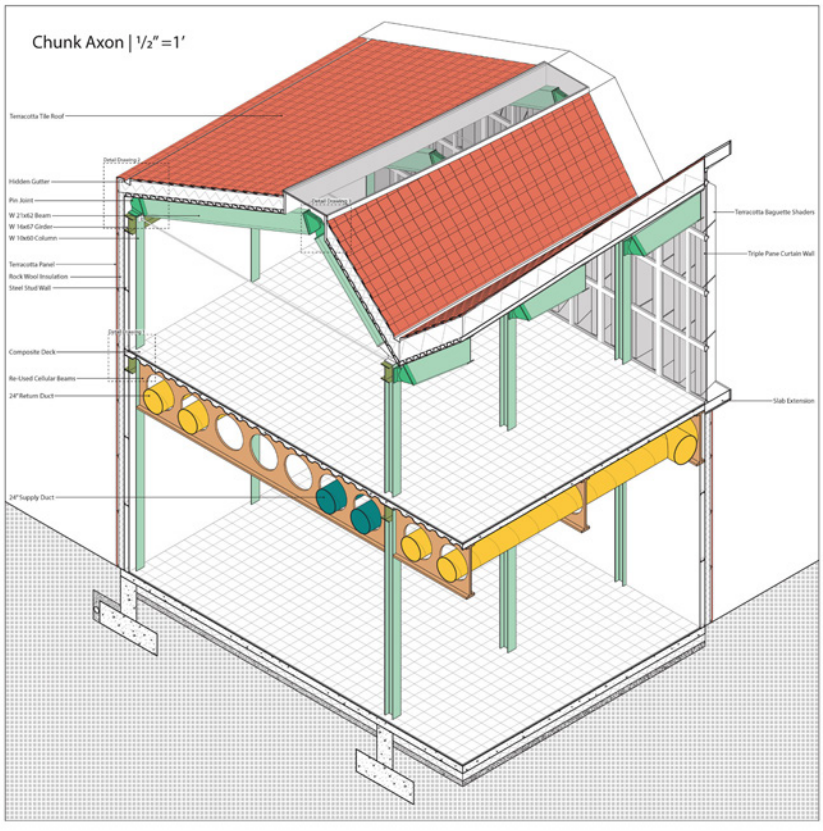
Ethan Fox
Fiona Noumbi
Yiwen Tang



Material Reuse/Recycling Diagram

Knowing that a large swath of the structure would be displaced by their new building, this team quantified the amounts of material that was available for reuse and recycling.

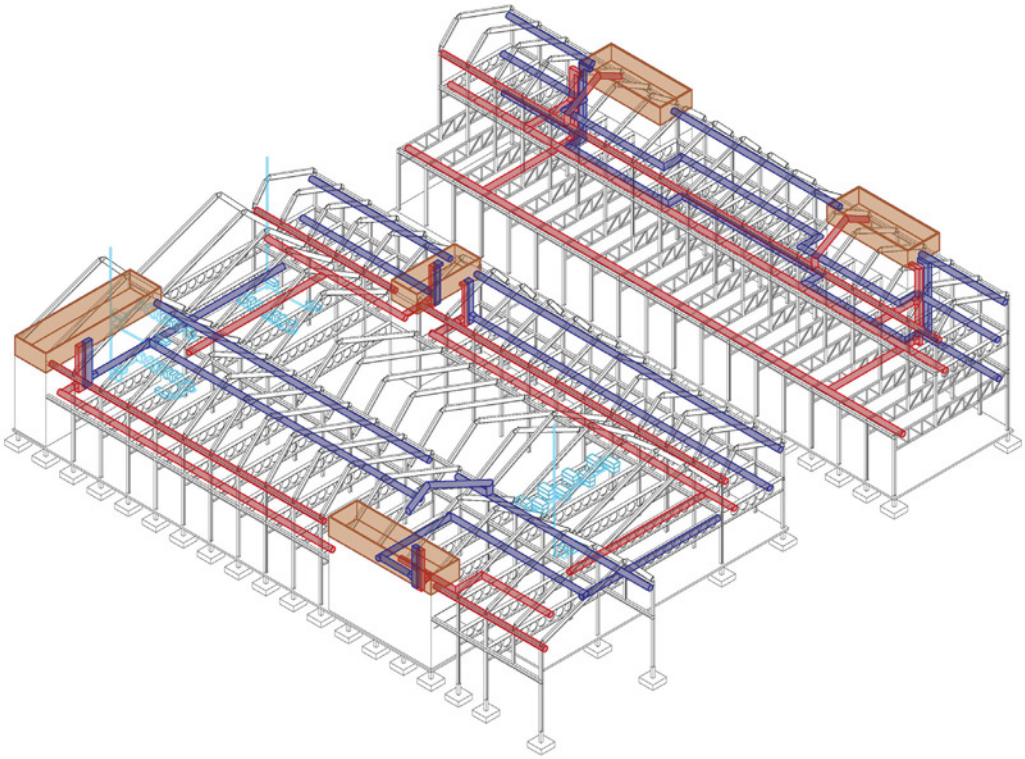
Ethan Fox
Fiona Noumbi
Yiwen Tang



Systems Integration Axonometric

While the girders from the overpass were larger than would be necessarily required for structural stability, the group decided to reuse the steel nonetheless, and cut into it for systems integration.

Ethan Fox
Fiona Noumbi
Yiwen Tang



Systems Integration Diagram

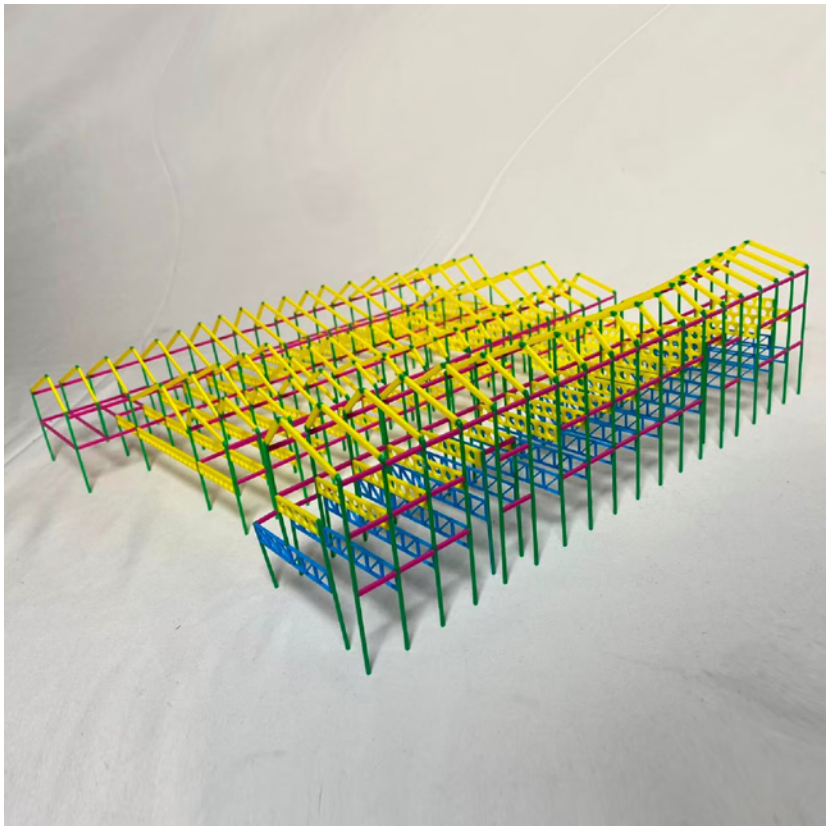
Making the beams cellular lightens the structural dead load while maintaining its depth and corresponding strength, and was determined to be a worthwhile adaption of available material.

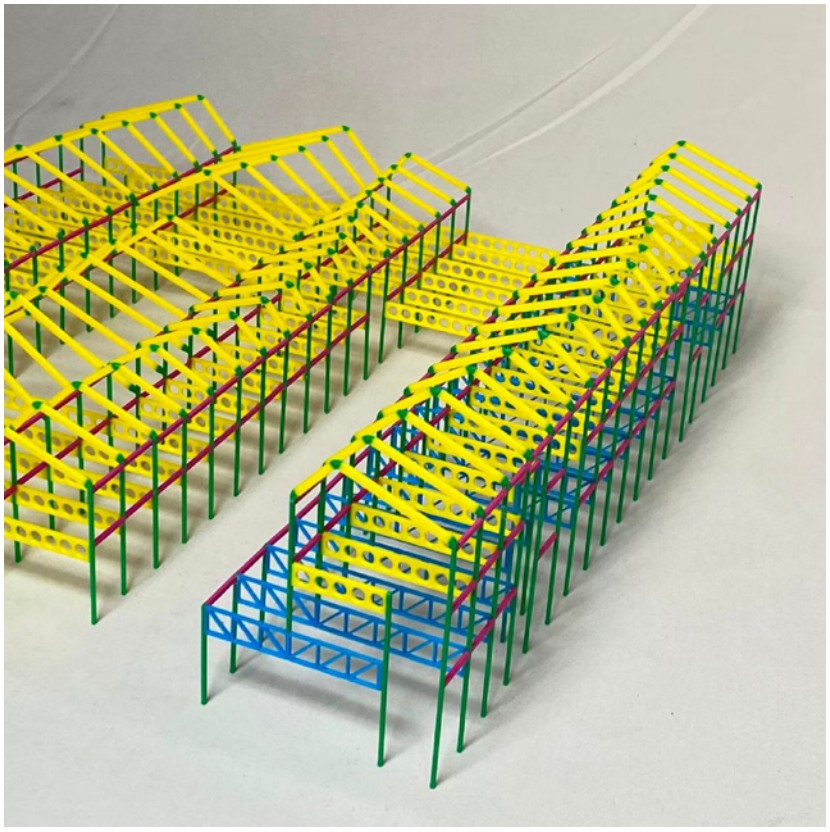
Ethan Fox
Fiona Noumbi
Yiwen Tang

Perspective Rendering

This also allowed for ducts and other systems to be run through the beams and easily integrated and supported by the structure, and left exposed for the public to see - evident traces of the old bridge.

Ethan Fox
Fiona Noumbi
Yiwen Tang

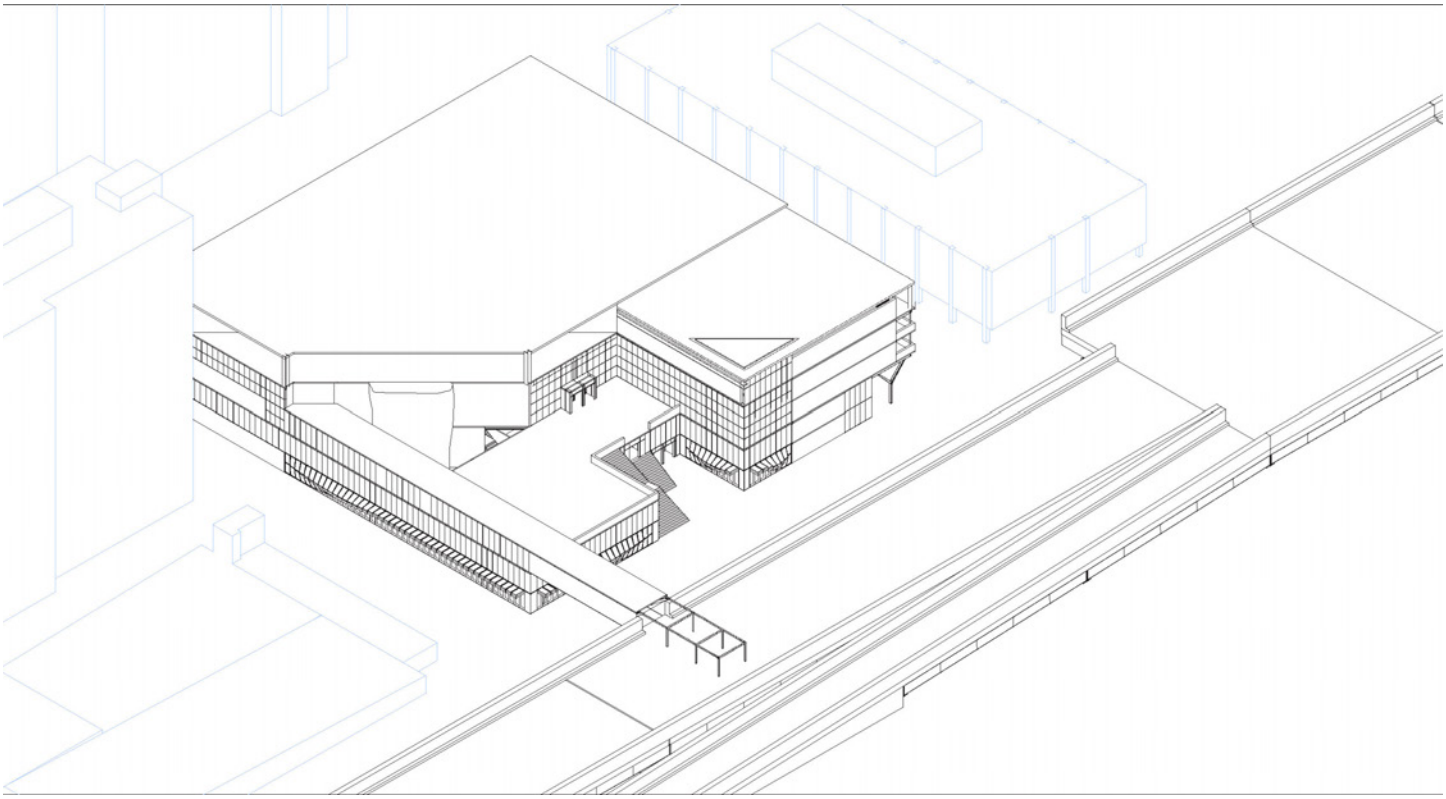




Structural Model

A structural model expressed the tight rhythm of the structure, and demonstrated and color-coded joints, types of structure, and reuse/ recycling.

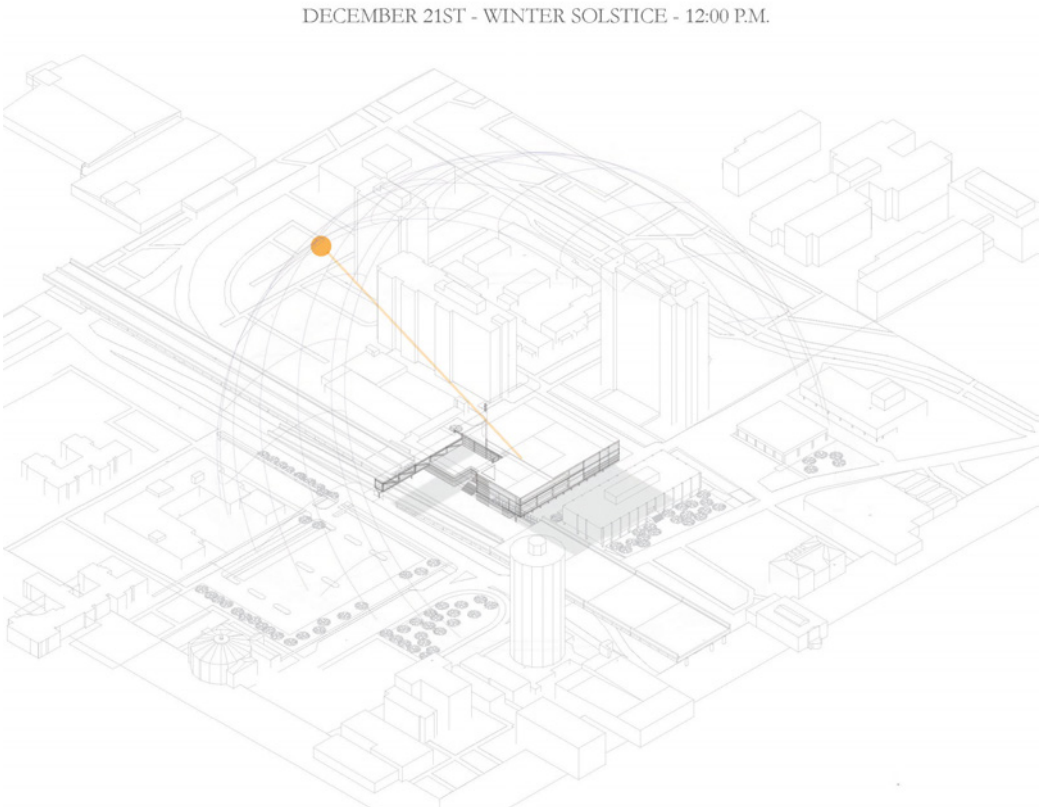
Ethan Fox
Fiona Noumbi
Yiwen Tang



Site Axonometric

Gavin and Tosia studied thresholds, and how the material and spatial treatment of edges facilitated sociospatial conditions to welcome public passersby into the space.

Gavin Lui
Tosia Mysliwiec



Site Diagram

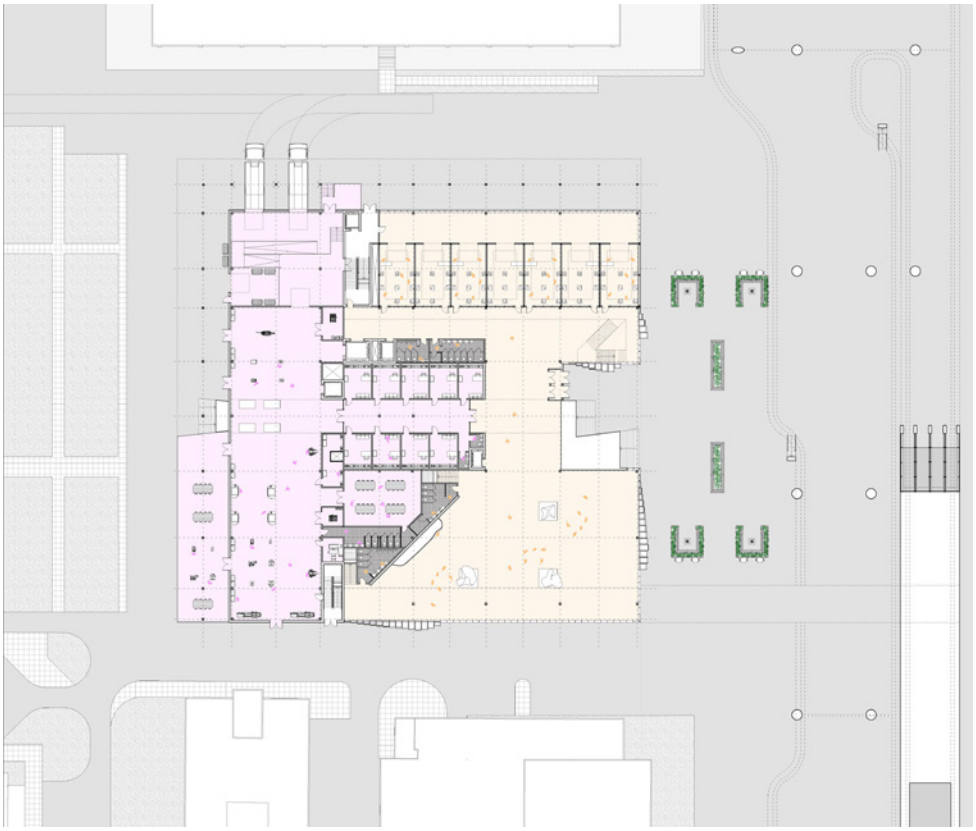
They carefully considered both light and sightlines, visually as well as physically connecting the new building with the existing overpass structure via bridges and viewing galleries.

Gavin Lui
Tosia Mysliwiec

Concept Inspiration

Tosia in particular was inspired by her own experience in participating in a collective mural-painting in downtown Syracuse, and brought that inspiration of public making into the project.

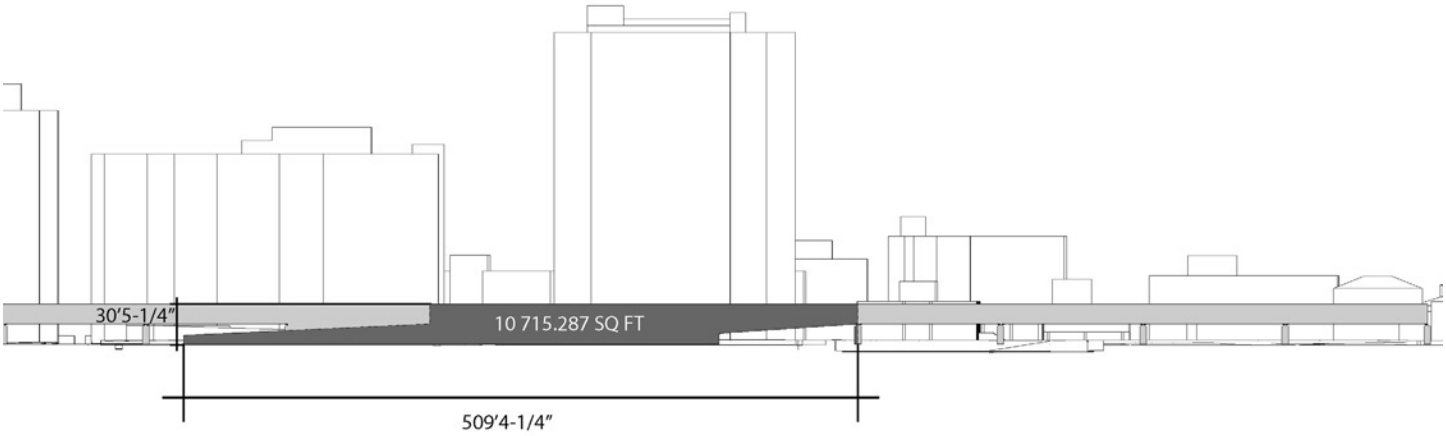
Gavin Lui
Tosia Mysliwiec

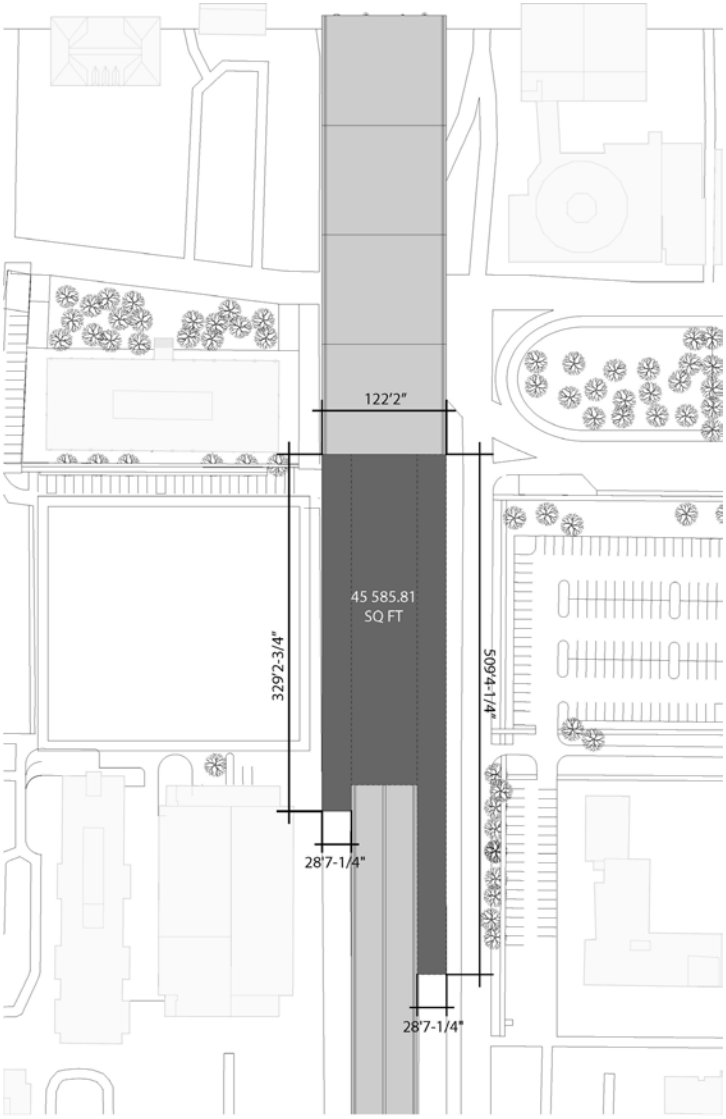


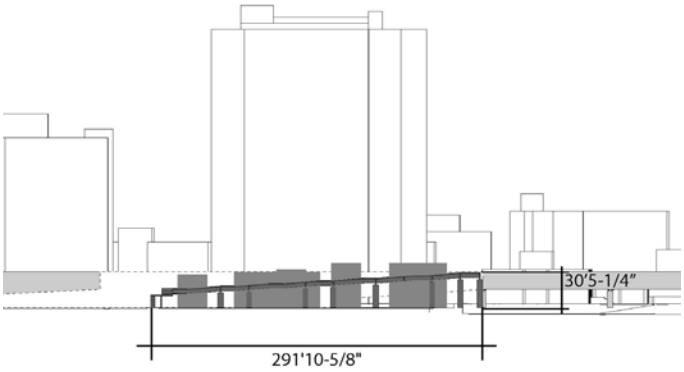
Floorplan

Their ground floor completely opens up to space underneath the overpass, using the overpass as a covered front porch and blurring the line between indoor and outdoor; public and program space.

Gavin Lui
Tosia Mysliwiec



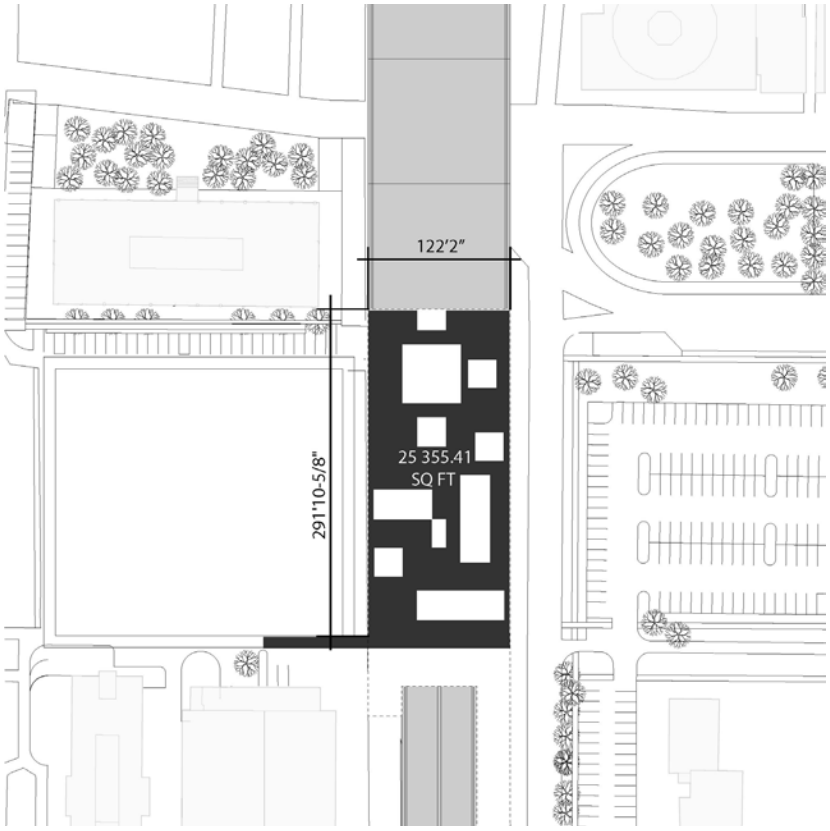




Overpass Survey

Maddie and Serena examined the overpass with the intention of punching through the overpass and incorporating the programmatic spaces into the structure, using the surface to facilitate circulation.

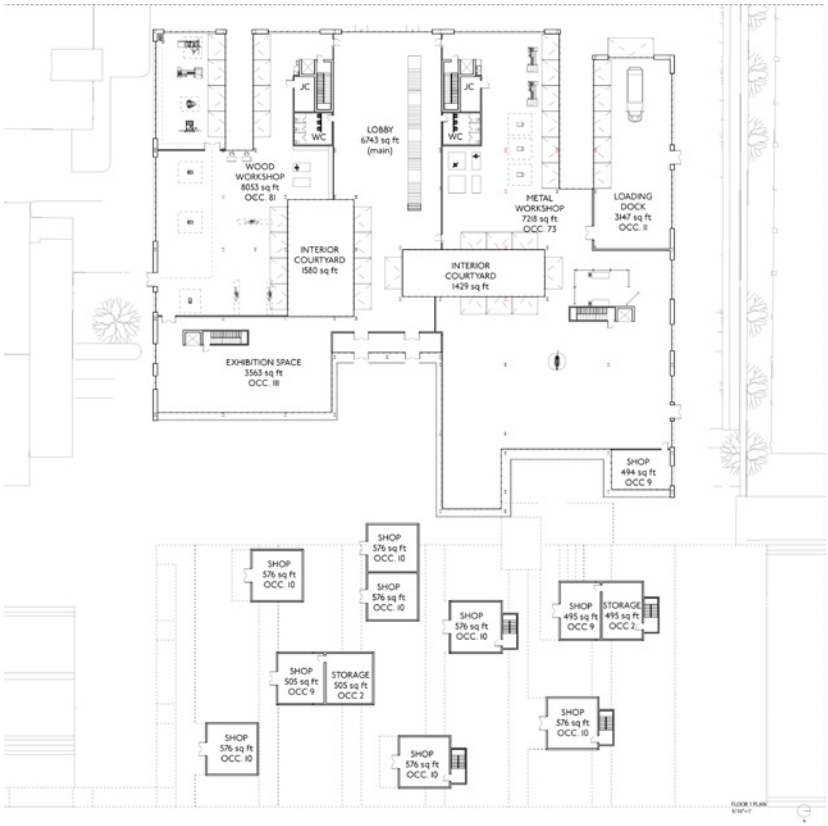
Maddie Best
Serena Ip



Overpass Intervention

The group both densified by adding program and punched openings for light and air in the existing structure, breaking the intense horizontal reading of the existing structure.

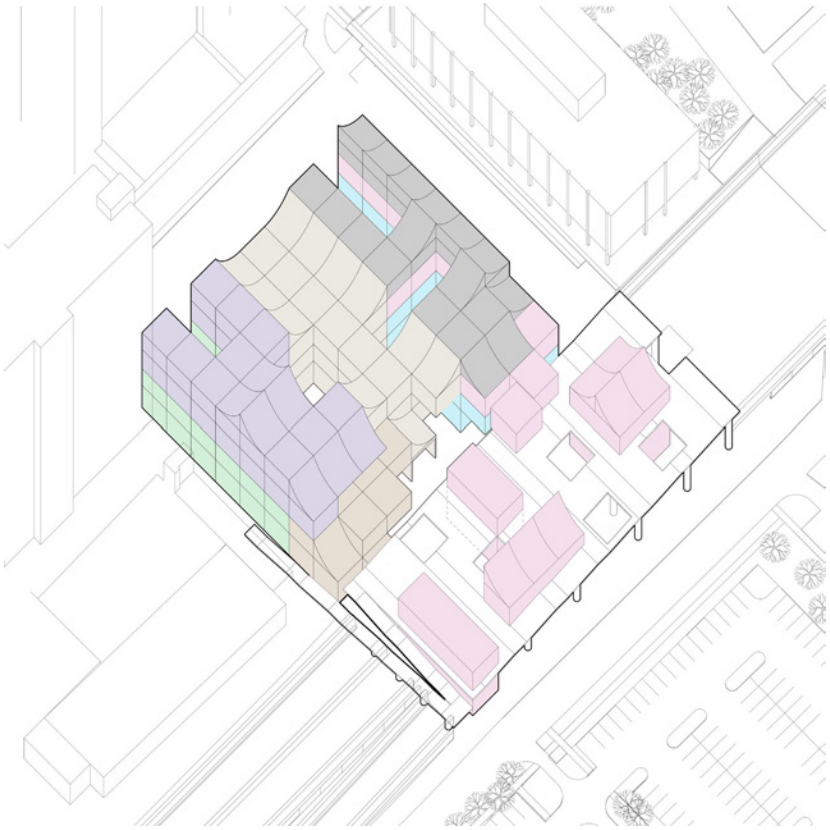
Maddie Best
Serena Ip



Preliminary Floorplan

They ultimately decided to be reimagine and rebuild this portion of the overpass as a wide, ramping plaza, in reaction to a studio rule that new building cannot depend structurally on the existing bridge.

Maddie Best
Serena Ip



Axonometric

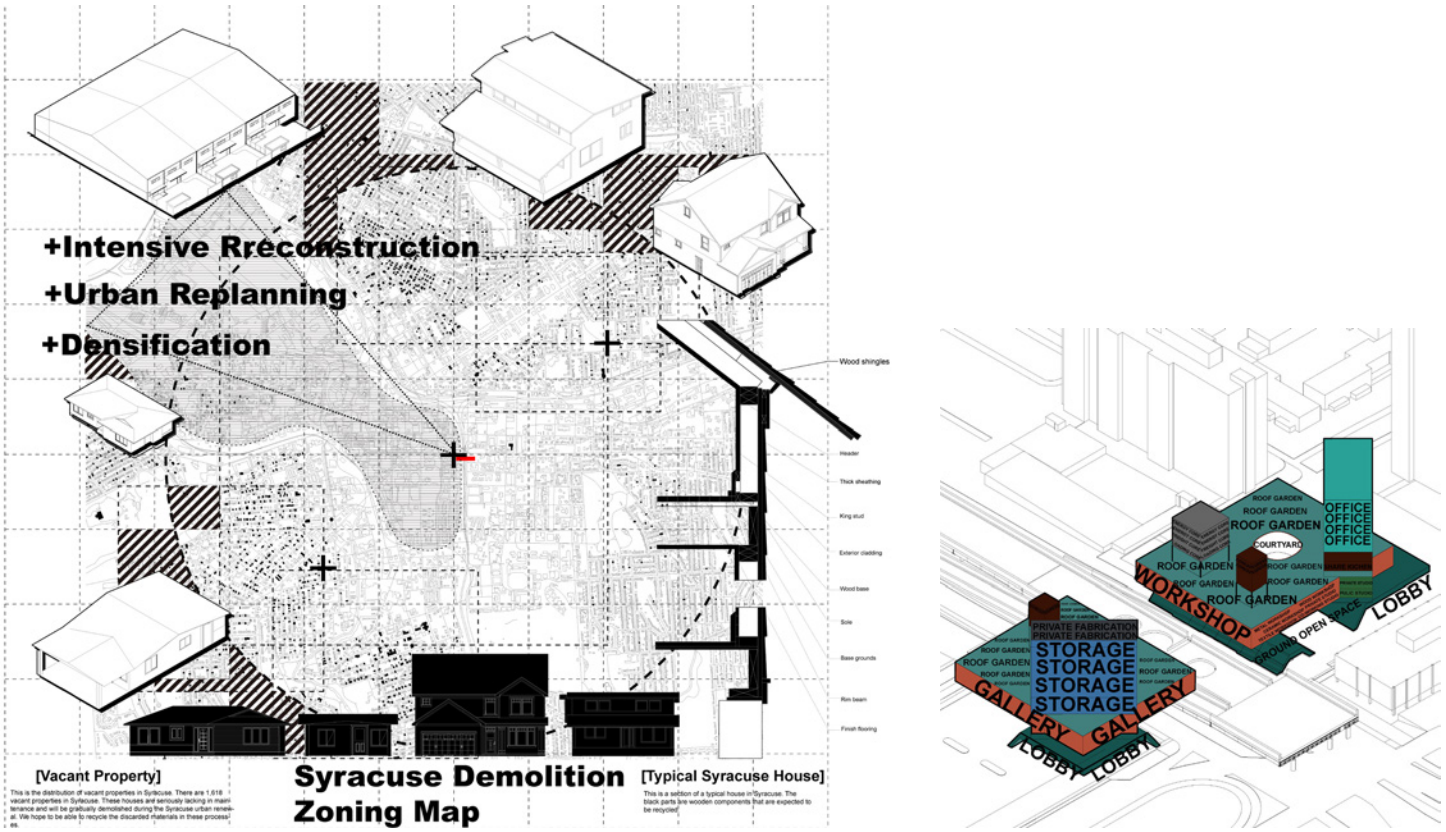
Since the new shop structures were not allowed to be supported by the existing bridge structure, this team flipped the script and extended the shops down through the bridge to the ground, creating a multi-level public/retail space with myriad vertical circulation at the lightwells carved into the surface.

Maddie Best
Serena Ip

Structural Grid

The structural grid of the bridge surface was reworked to match the grid of the building structure, and retail shops embedded in the new structure appear as breaking off from the main building.

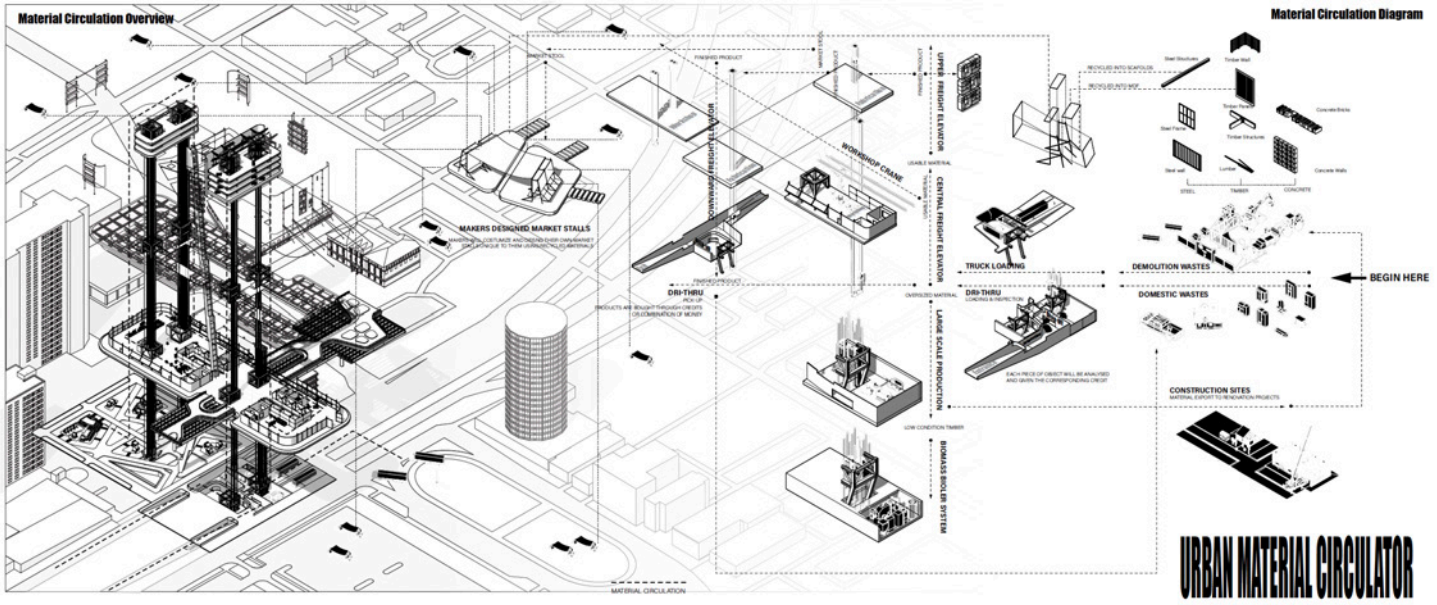
Maddie Best
Serena Ip



Concept Diagram

Jingxiang and Zilin were extraordinarily ambitious in their design, going beyond the prompt and designing a building-as-machine that facilitates circular material economies for all of Syracuse.

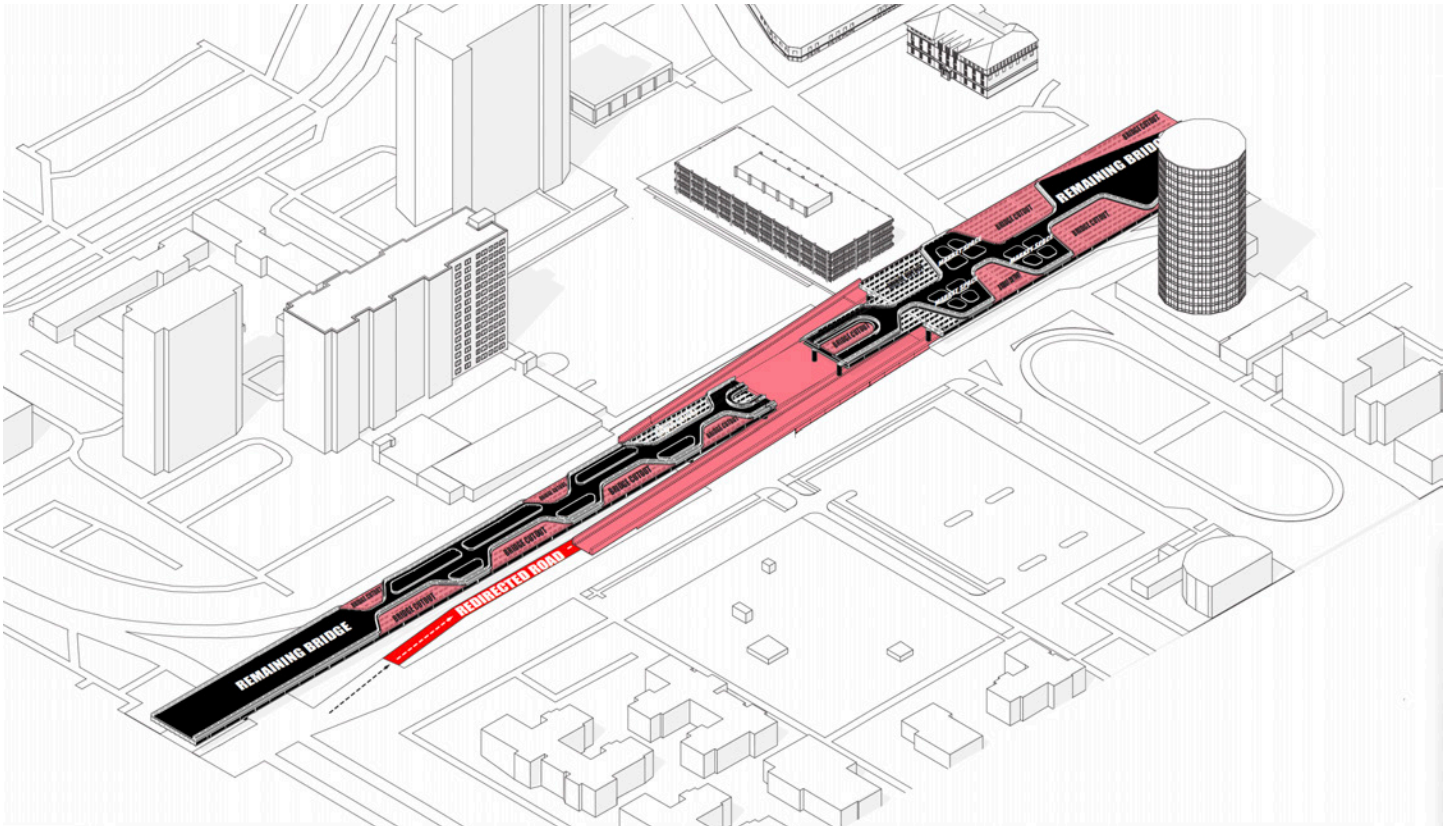
Jingxiang Zhang
Zilin Jing



Concept Diagram

Inspired by the challenges of selective demolition and material recycling and reuse, they designed a building that intersects with the overpass structure and recycles waste into new product.

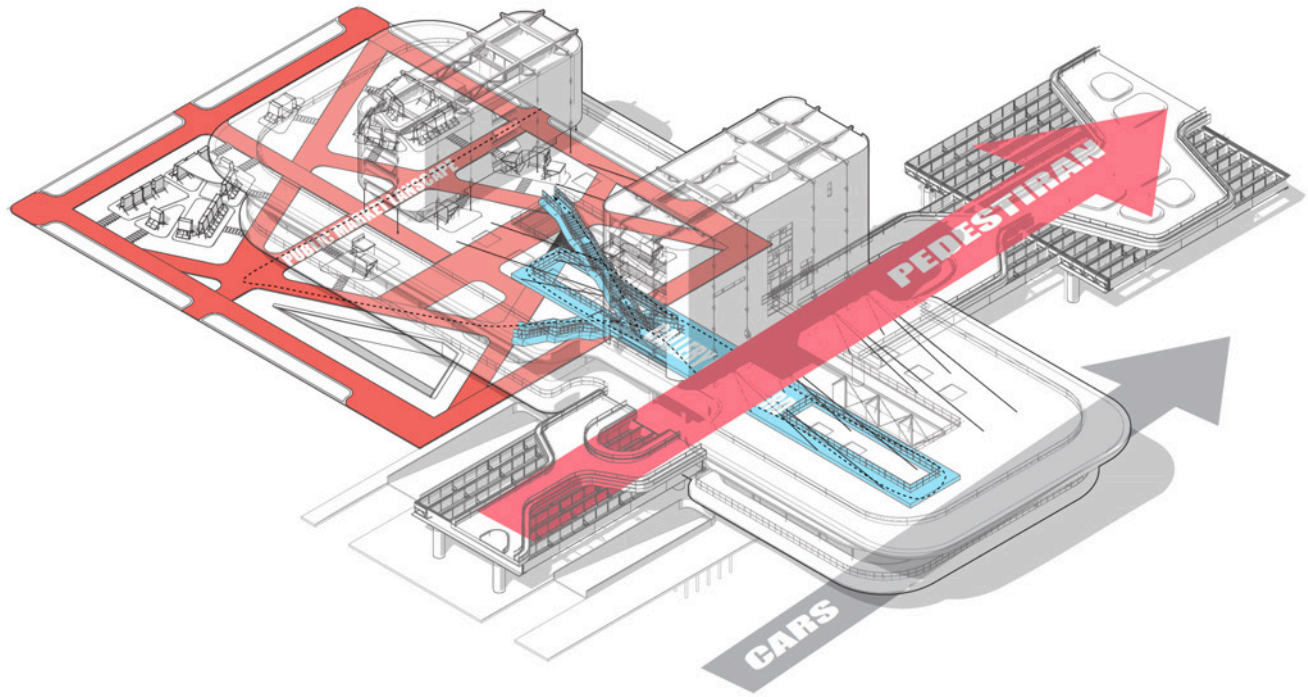
Jingxiang Zhang
Zilin Jing



Overpass Intervention

The intervention of the overpass selectively demolishes the slab to allow light down and through, and redirects vehicular traffic to an expansive sunken loading/unloading apparatus.

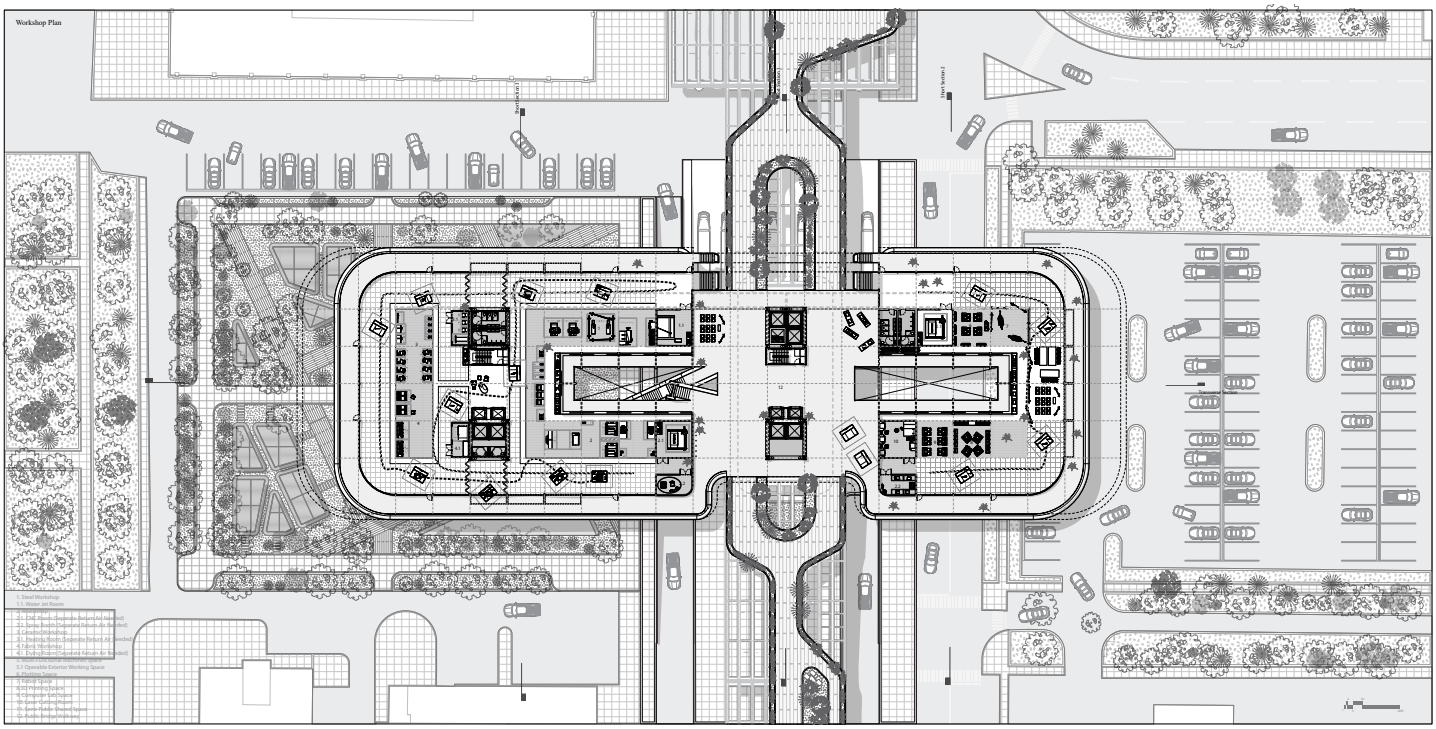
Jingxiang Zhang
Zilin Jing



Circulation Diagram

The pedestrian level is brought up to the surface of the overpass while cars move beneath, but a large public market landscape on the ground level activates and connects to the neighboring context.

Jingxiang Zhang
Zilin Jing



Floorplan

Pedestrians walking along the renewed overpass pass through the building and are invited to witness the process of upcycling local construction materials by walking the building's viewing gallery.

Jingxiang Zhang
Zilin Jing

Model

The material language of the new building mirrors the structural material of the overpass. The building's structural steel is featured even as the overpass intervention exposes the steel of the bridge.

Jingxiang Zhang
Zilin Jing

Concept Diagram

The building, taking inspiration from the overpass, acts as infrastructure.

Jingxiang Zhang
Zilin Jing

Concept Diagram

Perspective renderings show the intersection of the infrastructure and the building.

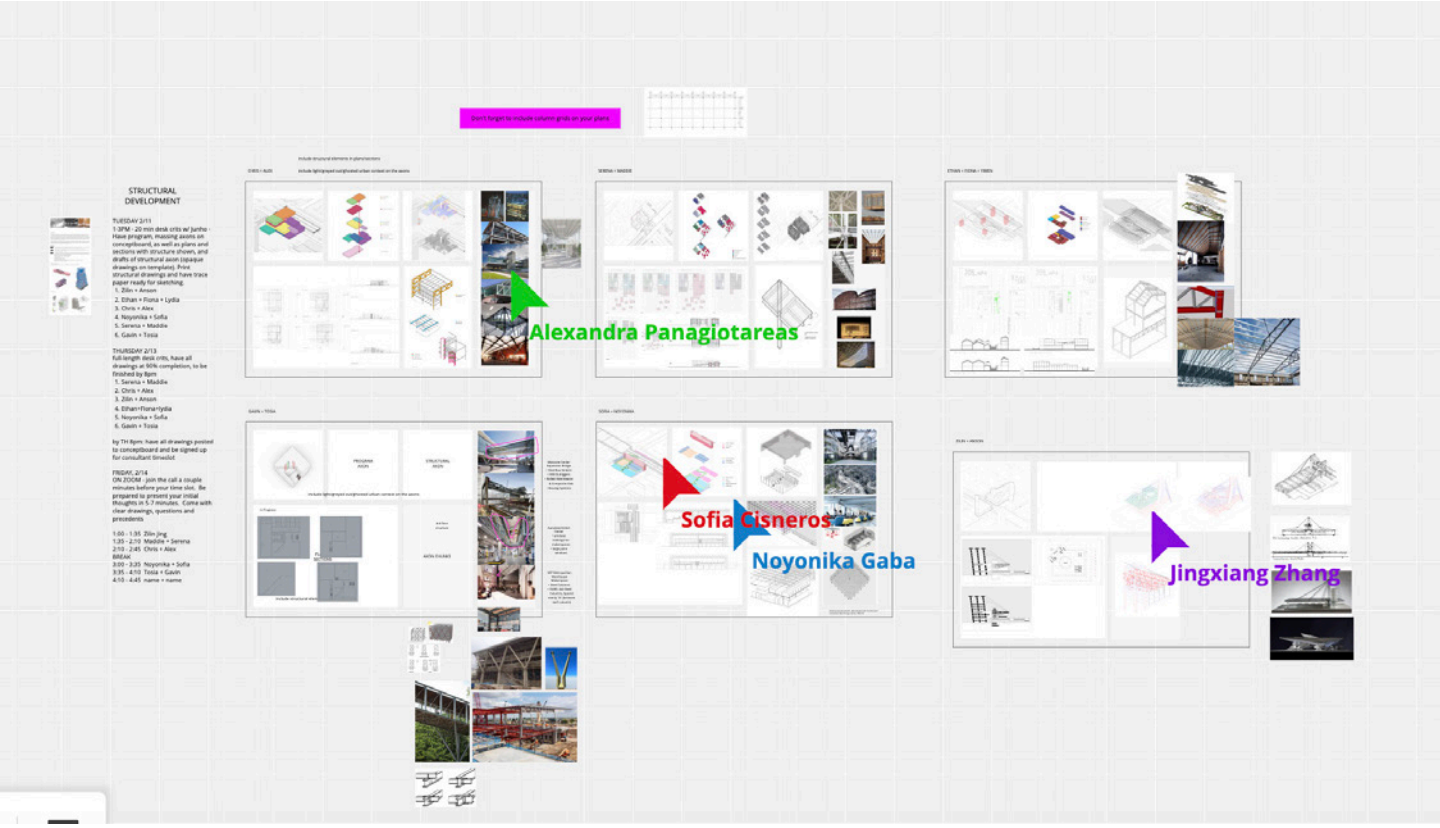
Jingxiang Zhang
Zilin Jing

ARC 409 STUDENT WORK
SPRING 2025

“BUILDING ON BUILDING”

Students:
Alex Panagiotareas
Chris Praino
Ethan Fox
Fiona Noumbi
Gavin Liu
Jingxiang Zhang
Maddie Best
Noyonika Gaba
Serena Ip
Sofia Cisneros
Tosia Mysliwiec
Yiwen Tang
Zilin Jing

With enormous gratitude, we recognize the enthusiasm, effort and care that these students brought to the studio each and every day, inspiring us and enhancing our research.



Appendix C

CEE 475 Final Project Report

Archway Engineering Inc.

Building Environmental and Social Resilience into the I-81 Removal Project: How Next-Generation Engineers Retain and Rebuild

Prepared for:

Christina Zhang
Hannibal Newsom
Lauren Scott
Yilei Shi

Prepared by:

Shalom Acheampong
Hennecys Perez Castro
Marlene Lara - Torres
Trevor Napoli
Weilan Zhang

Archwayengineering@gmail.com

Archway Engineering Inc.
General Bridge Inspection Report

Inspection Date: January 31, 2025

Structure Information

BIN: 1093572

Region: 03 - SYRACUSE

County: ONONDAGA

Approximate Year Built: 1972

Primary Owner: New York State Department of Transportation

Primary Maintenance Responsibility: New York State Department of Transportation

General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder

This Bridge is not a ramp but contains a ramp.

Number of Spans: 40

Non-Structural Condition Observations noted: YES Vulnerability

Reviews Recommended: NO

Diving Inspection Requested: NO

Investigation Requested: NO

Further Investigation Required: NO

Inspection Signature:

Review Signature:	Shalom Acheampong	*Date:* January 31, 2025
	Trevor Napoli	*Date:* January 31, 2025
Processed by:	Weilan Zhang	*Date:* January 31, 2025

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Shalom Acheampong	Structural Engineer	Archway Engineering Inc.
Hennecys Perez Castro	Environmental Engineer	Archway Engineering Inc.
Trevor Napoli	Civil Engineer	Archway Engineering Inc.
Yilel Shi	Client	Syracuse University
Marlene Lara-Torres	Director of BIM Services	Archway Engineering Inc.
Weilan Zhang	Project Manager	Archway Engineering Inc.

General Equipment Required for Inspection*
Access Type
13 - Walking

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
01/31/2025	10:30 AM	12:30 PM	37	Rainy
02/10/2025	2:00 PM	04:00 PM	28	Cloudy

Inspection Times (hours)	
Time required for travel, inspection and report preparation	4

Actions	Abbreviations
Demolition	D
Rehabilitation	RH
Repair	RP
No Action/Intact	NA

Pier Assessment Summary Table							
Pier Number	**Pier Action**	**Notes**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
24-30, 33-35, 37, 39-41	RP	Corroded Pipe (33)	14				
13, 31, 36, 38	RP/D	Concrete spalling, missing drainage pipes (31), peck rust and chipped paint		4			
1-8, 9, 11, 12, 14, 15-23	RP	Pack rust, silica alkali reaction, concrete cracks, drainage needs repair, and pier cap damages			20		
10 and 32	D	Pack rust, silica alkali reaction, concrete cracks, drainage needs repair and pier cap damages				2	

Span Assessment Summary Table							
Span Number	**Span Action**	**Notes**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
1-26, 30-32, 34-41	RP/NA	Chipped paint in several spans and some temporary girder repairs	38				
27-29, 33	RP	Rusted steel exterior		4			

Project Background

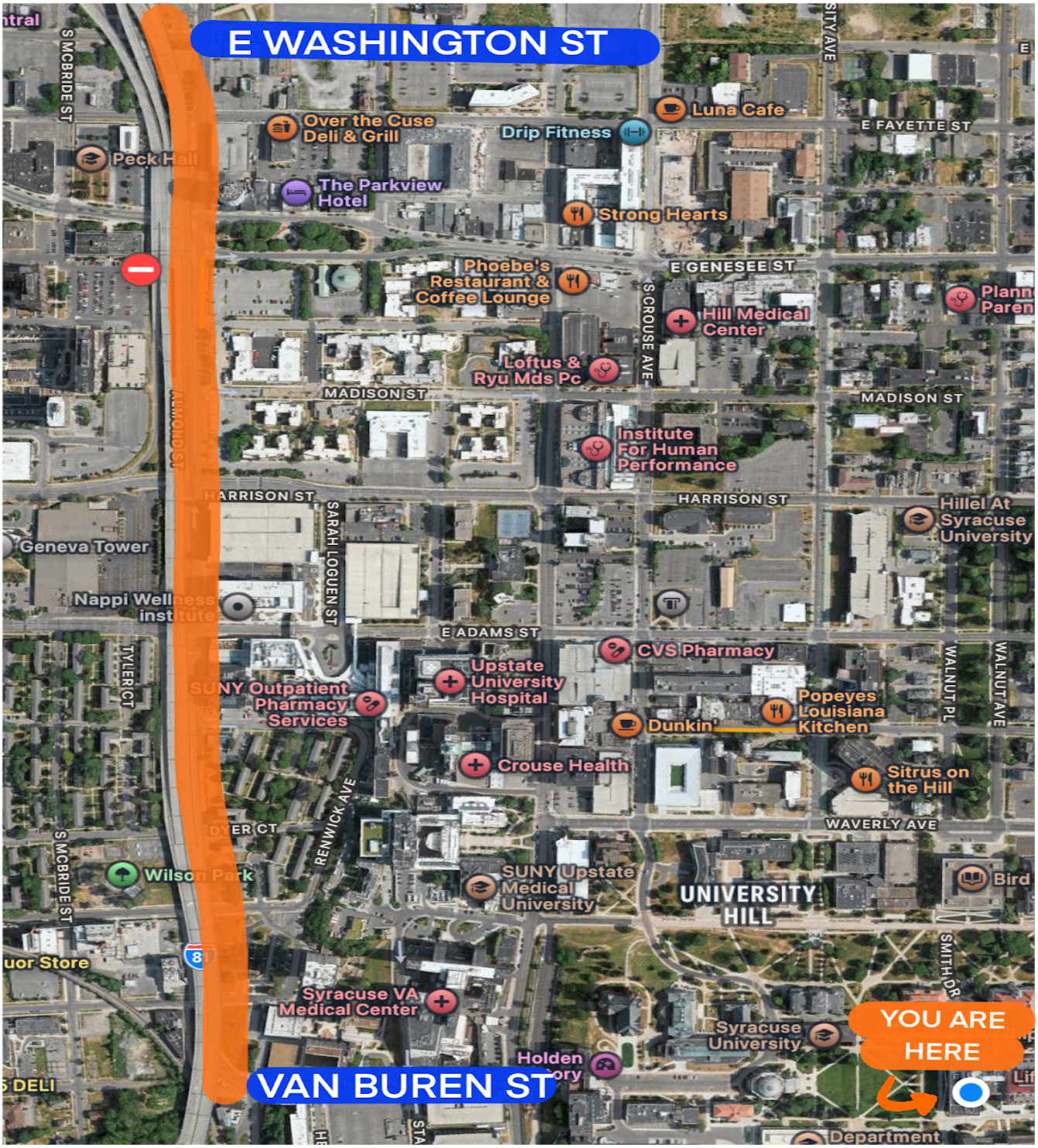
Post-war America saw massive investment in the public sector and the subsequent rise of the middle class. The GI Bill enabled homeownership, solving a housing crisis caused by men returning from home leading to a suburban expansion. In the 1940s and 1950s, car-reliant infrastructure became the standard, influenced by architects, city planners, and the automobile lobby. This commitment was solidified with the Federal-Aid Highway Act of 1956, inspired by Eisenhower's wartime experience in Europe.

The federal highway system exacerbated racial and economic divisions. Due to reckless implementation of federal policy, highways cut through downtowns marketed as "urban renewal" in poor and minority communities. Upon the so-called completion of the federal highway system in the early 1990s, over one million people, the majority of which were minority or working class, were displaced. Banks, in collaboration with local politicians, used urban highways to redline neighborhoods, denying loans to inner-city residents while funding suburban development for white, middle-class families, deepening income inequality. Car-centric infrastructure also contributed to urban sprawl, pollution, and the decline of public spaces. The often-destructive nature of urban highway implementation led to a movement beginning in the 1960s to combat "urban renewal" projects, where some cities, like New York and Boston, successfully opposed highway expansion, preserving historic neighborhoods.

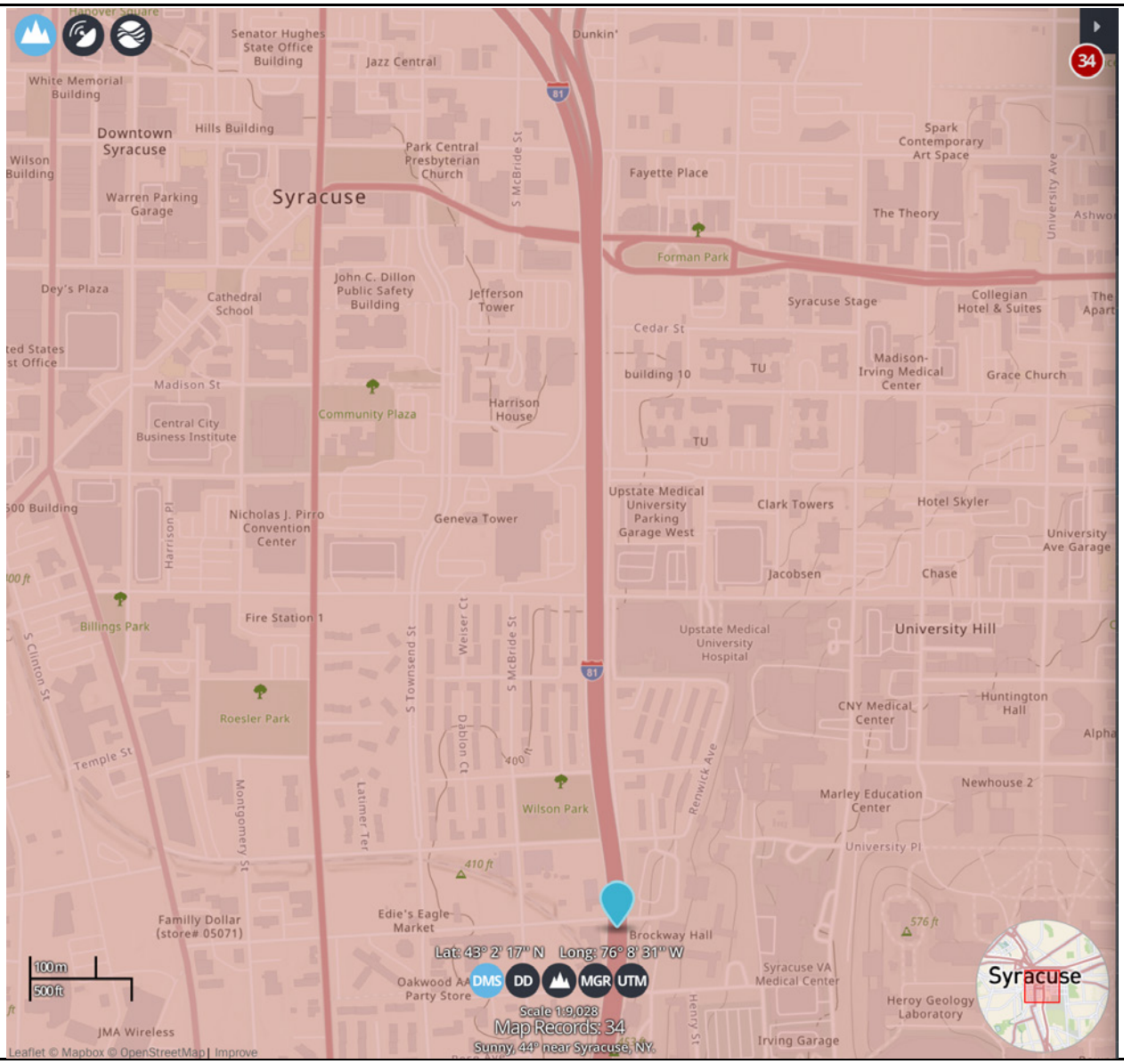
Built in the 1960s, I-81 displaced residents and reshaped Syracuse's social and economic landscape. Now deteriorating, the ongoing I-81 Viaduct Removal Project seeks to reconnect divided neighborhoods. Federal funding, such as the Infrastructure Investment and Jobs Act, could support its redevelopment, drawing inspiration from sustainable projects like Toronto's Bentway Staging Grounds to improve environmental resilience.

Map of Piers

1093572_LOCATION_MAP.JPG

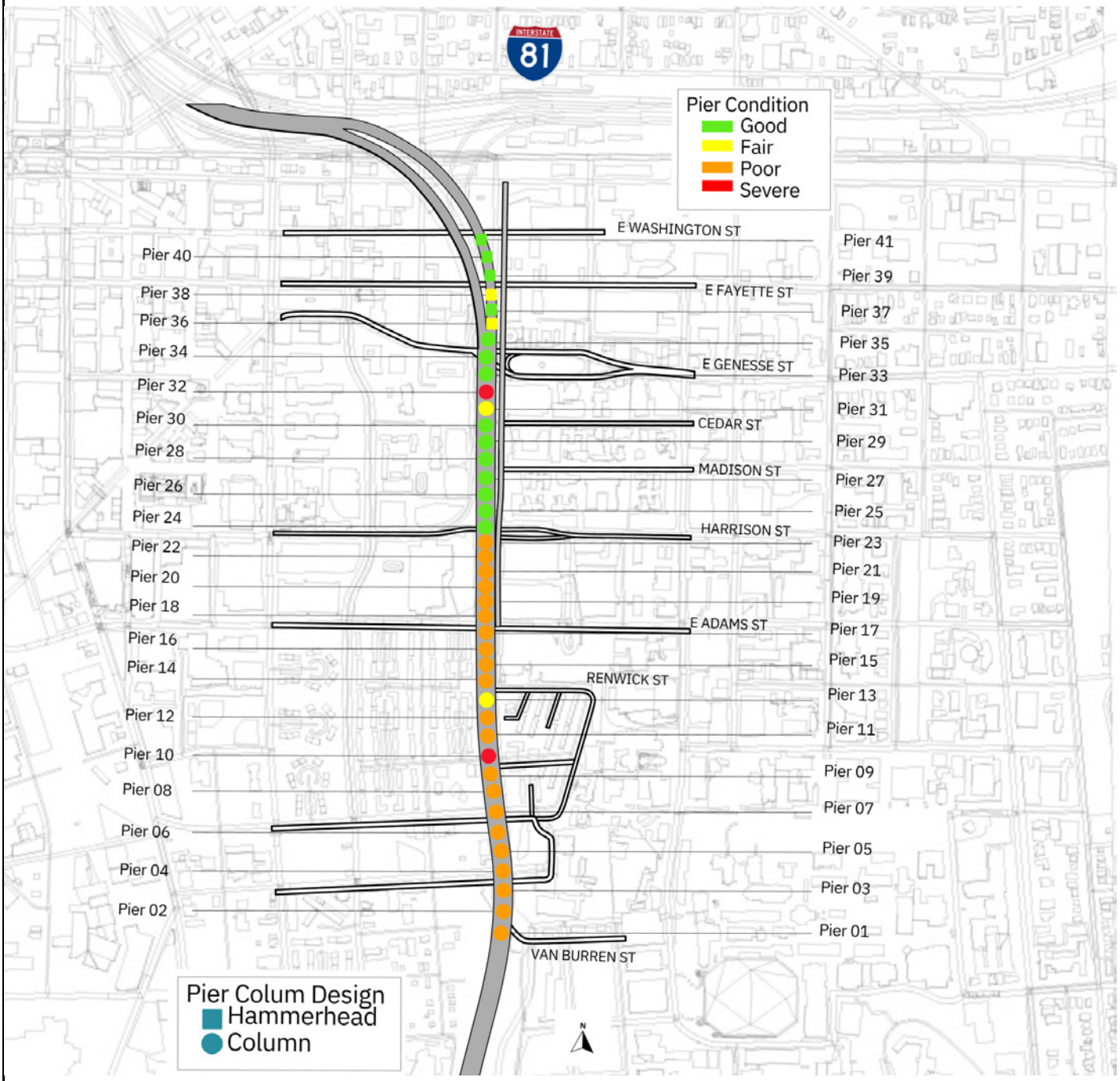


1093572_QUAD_MAP.JPG



1093573_PIER_MAP.JPG

Map of downtown corridor with listed piers. All piers that were observed have 1 picture taken. Span 1 is located between Pier 1 and Pier 2, Span 2 between Pier 2 and Pier 3, Span 3 between Pier 3 and Pier 4, and so on.



1. Condition Assessment Report Introduction

This report presents the condition assessment of piers and spans based on Archway's Engineering inspection data from the visual inspections conducted on January 31st at 10:30 am and February 10th at 2 pm. Archway engineering visually inspected piers and spans from E Washington St to Harrison St on January 31st. Archway Engineering then visually inspected piers and spans from Harrison St to Van Buren St on February 10th.

2. Inspection Approach

Our team at Archway Engineering first met with the clients to understand their objectives and gather initial project requirements. At their request, we conducted a visual inspection of the I-81 downtown corridor from E. Washington St. to Van Buren St., moving east to west as a team.

On the morning of the inspection, Archway Engineering consulted with the client, Dr. Shi, to determine which structural deficiencies to focus on. We decided to concentrate on the piers and girders (spans). As a team, we reviewed the different bridge components we could inspect, ultimately determining that our primary focus would be on the piers and girders. Bearings and pedestals are often harder to see, which is why they were excluded from our visual inspection. Additionally, deck slabs require surface inspection, which involves shutting down traffic—an effort beyond our current scope of work.

The project manager conducted the visual inspection using an iPad to capture multiple photos of each pier and span, starting from E. Washington St. to Van Buren St., moving east to west. The remaining members used the iPhone Notes app to document observations inserting live photos of each pier and span from multiple angles along with general notes. Additionally, during the visual inspection, the director of building information modeling (BIM) services drew a map that depicts and labels the piers and spans' location within the downtown corridor. In addition, the number of images taken of each pier and span was recorded. For piers with drainage issues, a stormwater evaluation and analysis will be conducted in March or April.

After completing the visual inspection, we compiled our notes and selected the most representative images for our detailed assessment report. We then reached a consensus on the condition and necessary actions for each pier and span.

This inspection serves as the foundation for a comprehensive assessment report that will document existing deficiencies and evaluate the infrastructure's integrity. Additionally, it will help guide our approach in transforming this specific section of I-81 into a more socially integrated and sustainable space for the Syracuse community.

3. Inspection Methodology Summary

The standard pier inspection methodology follows the **2017 NYSDOT Bridge Inspection Manual** and consists of the following steps:

1) **Pre-Inspection Preparation:** The team reviewed safety protocols and determined the best way to conduct the visual inspection with one of the clients, Dr.Shi, before arriving on site.
2) **Visual Assessment:** The inspection team conducted an external visual inspection of the pier to identify structural defects, including cracks, spalling, rusting, and signs of material degradation.
3) **Photographic Documentation:** Images were to be taken at multiple angles to document existing conditions.

4) **Defect Measurement:** Any observed deficiencies would be measured, categorized by severity, and recorded per NYSDOT inspection standards.

4. Assessment Criteria

The condition states, observed defects, and recommended actions were determined using the 2017 New York State Department of Transportation (NYSDOT) Bridge Inspection Manual as a reference. The assessment categorizes each structural component based on condition states (CS), describes the observed issues, and assigns corresponding actions. The manual defines Condition States (CS-1 to CS-5), where CS-1 represents "Good" condition and CS-5 indicates a "Not Inspected" state requiring immediate intervention. The following definitions were applied:

Condition State	Condition Type	General Condition Descriptions
CS-1	Good	That portion of the element that has either no deterioration or the deterioration is insignificant to the management of the element, meaning that portion of the element has no condition based preventive maintenance needs or repairs; OR Areas of an element that have received long-lasting structural repairs that restore the full capacity of the element with an expected life equal to the original element.
CS-2	Fair	That portion of the element that has minor deficiencies that signify a progression of the deterioration process. This portion of the element may need condition-based preventive maintenance; OR Areas of the element that have received repairs that improve the element, but the repair is not considered equal to the original member.
CS-3	Poor	That portion of the element that has advanced deterioration but does not warrant structural review; a yellow flag may be warranted (NY Appendix B and NYSDOT Flagging Examples). This portion of the element may need condition-based corrective/preventative maintenance or other remedial action.
CS-4	Severe	That portion of the element that warrants a structural review to determine the effect on strength or serviceability of the element or bridge; red, red PIA, or safety PIA flag may be warranted (NY Appendix B and NYSDOT Flagging Examples); OR A structural review has been completed and the defects impact the strength or serviceability of the element or bridge; the structure has load restrictions imposed (e.g., postings or lane restrictions); OR A condition where that portion of the element is no longer effective for its intended purpose (e.g., deck joint missing waterproofing gasket).
CS-5	Not Inspected	Element or portion thereof not inspected.

Figure 1: Table from 2017 NYSDOT Bridge Inspection manual that lists condition states, condition types, and general condition descriptions.

Based on the NYSDOT Bridge Inspection Manual, appropriate actions were assigned:

- RP (Repair): Required for elements with deterioration but still functional.
- D (Demolition): Required for elements with severe damage requiring major repair or replacement.
- RH (Rehabilitation): Required for elements that are severely deteriorated that are not functional or beyond repair.
- NA (No Action Required/Intact): Assigned to elements in Good Condition (CS-1).

5. Pier Condition Assessment and Recommended Actions

The pier condition table groups piers by their assigned Condition State and notes specific issues such as Peck Rust, concrete cracks, drainage problems, and pier cap damage:

According to **Section 5.2.2** of the **NYSDOT Bridge Inspection Manual**, elements in **Condition State 3 (CS-3)** require repair (RP) due to advanced but non-critical deterioration. Piers in this category exhibit signs of **peck rust, concrete cracking, and pier cap damage**, all of which necessitate remedial action before the structural integrity is compromised.

For **Condition State 2 (CS-2)** piers, **Section 5.2.1** states that deterioration, such as **concrete spalling and missing drainage pipes**, requires targeted repair to prevent further structural degradation. These elements remain functional but demand proactive maintenance.

Piers in **Condition State 4 (CS-4)**, as per **Section 5.2.3**, exhibit severe deterioration that necessitates substantial rehabilitation (RH). The presence of **widespread concrete cracking, severe rusting, and pier cap failure** indicates that minor repairs are insufficient, and more extensive intervention is needed.

Finally, **Condition State 1 (CS-1)** piers are considered in good condition and, according to **Section 5.2.0**, do not require immediate action unless minor preventive maintenance is necessary. This applies to piers with **no visible defects or only minor surface corrosion**.

6. Span Condition Assessment and Recommended Actions

The span condition table evaluates spans based on visual defects such as chipped paint, temporary girder repairs, and rusted steel.

For spans in **Good Condition (CS-1)**, **Section 6.1.1** of the NYSDOT Manual indicates that minor defects, such as **chipped paint or superficial rust**, do not affect structural integrity and require either no action (NA) or preventive maintenance to extend service life.

However, spans classified as **Fair (CS-3)** display signs of **surface rusting and minor structural deterioration**, as outlined in **Section 6.1.2**. The NYSDOT manual recommends repairs (RP) for these elements to prevent rust progression and weakening of the structural components. To see the full condition table that individually lists all the spans and piers, see appendix at the end of this report.

Figure 1a: View of pier caps and bottom girders

Figure 1b: View of hammerhead piers featuring low corrosion

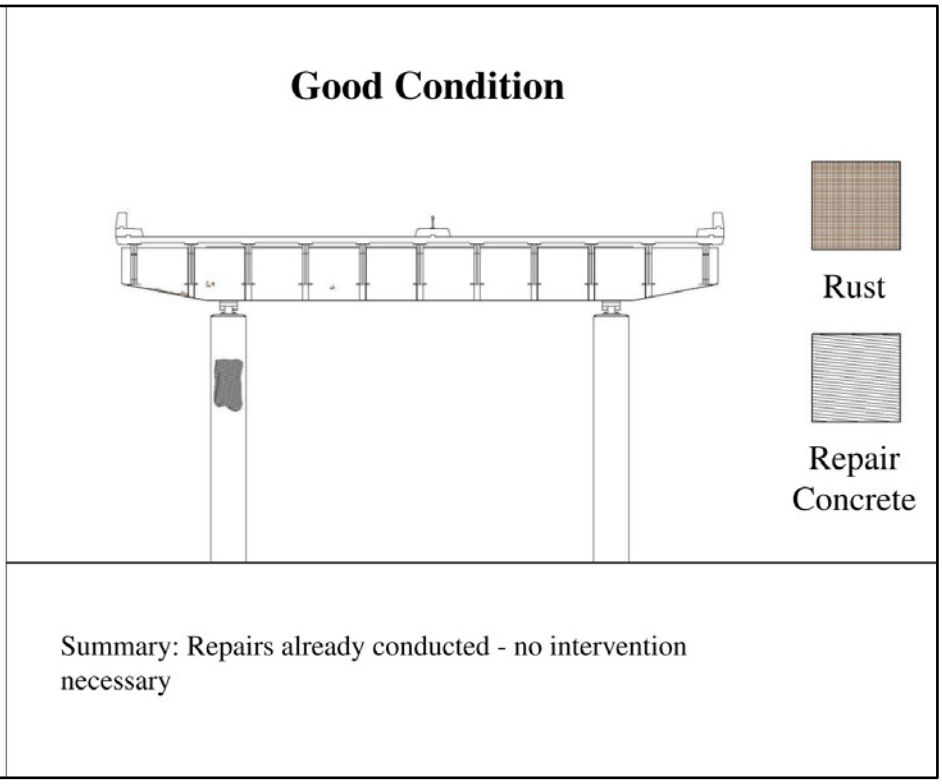


Figure 1: Typical section guide for visual inspection good condition

Figure 2a: View of pier caps and bottom girders featuring chipped paint and silica-alkali reaction

Figure 2b: Piers featuring a low degree of silica-alkali reaction without structural degradation

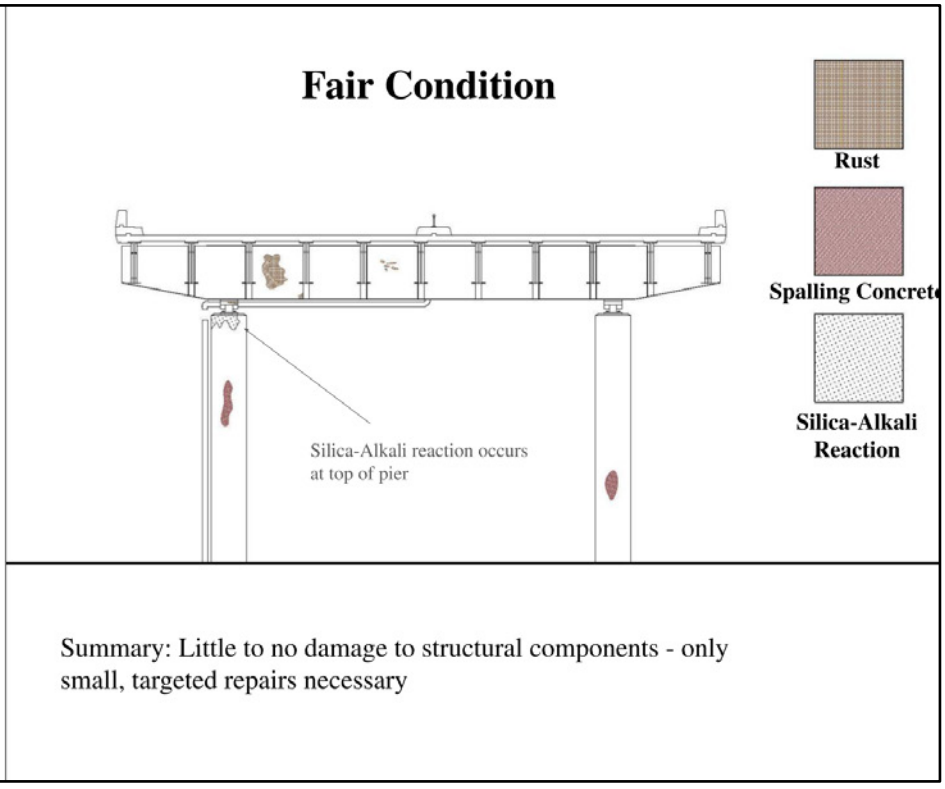


Figure 2: Typical section guide for visual inspection fair condition

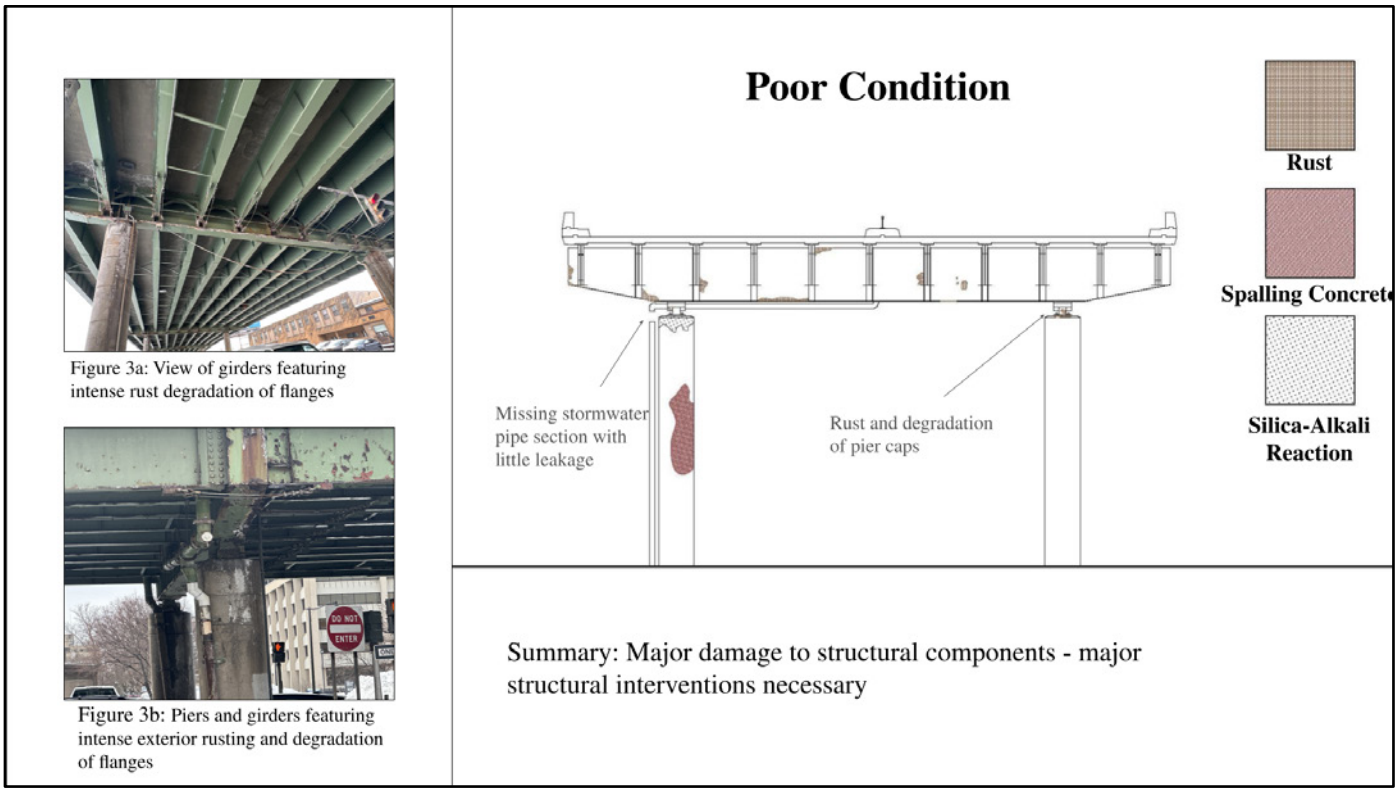


Figure 3a: View of girders featuring intense rust degradation of flanges

Figure 3b: Piers and girders featuring intense exterior rusting and degradation of flanges

Figure 3: Typical section guide for visual inspection of poor condition

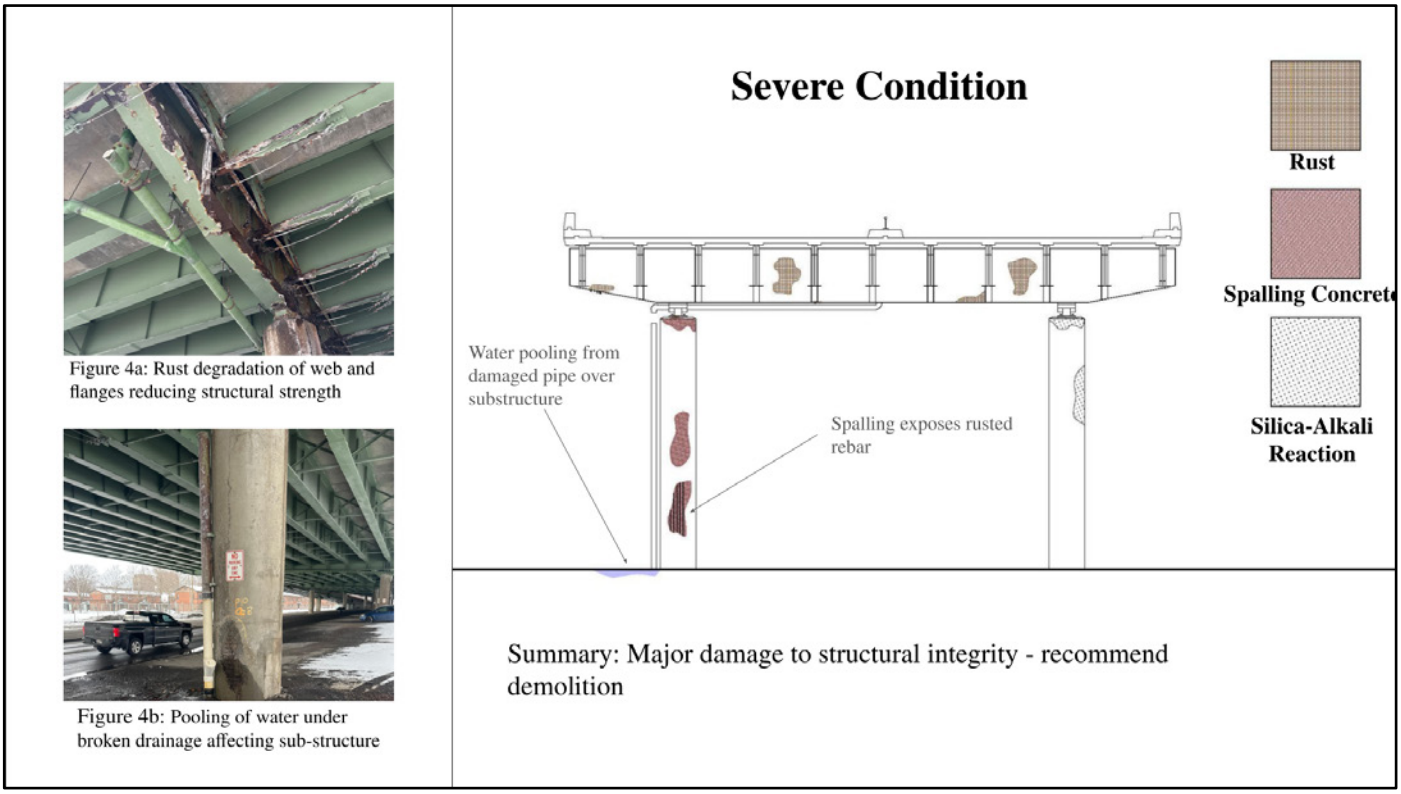


Figure 4a: Rust degradation of web and flanges reducing structural strength

Figure 4b: Pooling of water under broken drainage affecting sub-structure

Figure 4: Typical section guide for visual inspection of poor condition

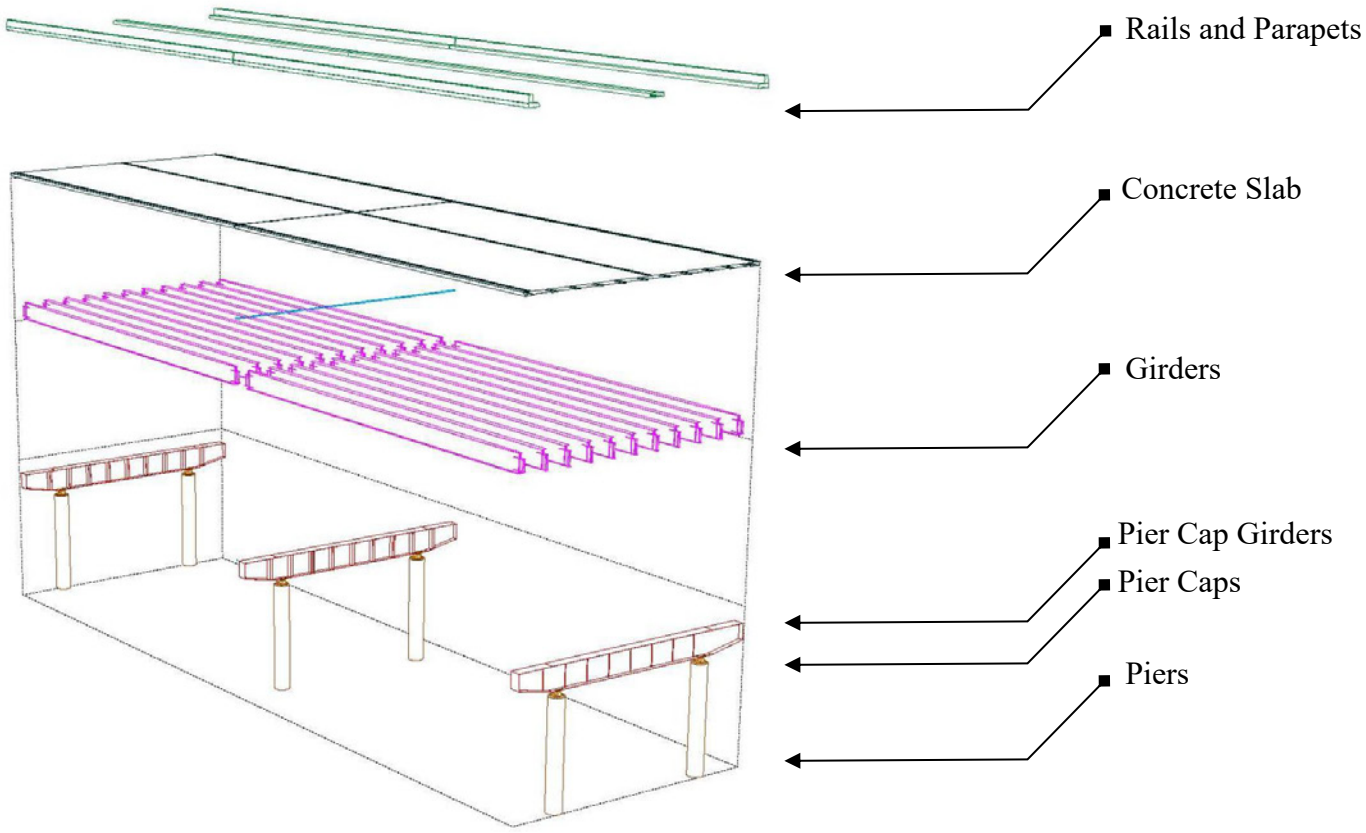


Figure 5: Exploded diagram of I-81 span detailing structural components

Pier Number	Condition State	Pier Condition	Pier Action	Notes	Span Number	Range	Span Condition	Span Action	Notes:
1	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages			Good	RP	Chipped Paint
2	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	1	(1-2)	Good	RP	Chipped Paint
3	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	2	(2-3)	Good	NA	
4	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	3	(3-4)	Good	NA	
5	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	4	(4-5)	Good	RP	Temporary repair on girder
6	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	5	(5-6)	Good	NA	
7	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	6	(6-7)	Good	NA	
8	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	7	(7-8)	Good	NA	
9	CS-4	Severe	D	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	8	(8-9)	Good	NA	
10	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	9	(9-10)	Good	RP	Temporary repair on girder

11	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	10	(10-11)	Good	NA	
12	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	11	(11-12)	Good	RP	The exterior girder has chipped paint
13	CS-2	Fair	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	12	(12-13)	Good	NA	
14	CS-5	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	13	(13-14)	Good	NA	
15	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	14	(14-15)	Good	NA	
16	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	15	(15-16)	Good	NA	
17	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	16	(16-17)	Good	RP	Chipped Paint
18	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	17	(17-18)	Good	RP	Chipped Paint
19	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	18	(18-19)	Good	RP	Chipped Paint
20	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	19	(19-20)	Good	RP	Chipped Paint
21	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	20	(20-21)	Good	RP	Chipped Paint

22	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	21	(21-22)	Good	RP	Chipped Paint
23	CS-3	Poor	RP	Pack Rust, silicon acyl reaction, concrete cracks, drainage needs repair, pier cap damages	22	(22-23)	Good	RP	Chipped Paint
24	CS-1	Good	NA		23	(23-24)	Good	RP	Chipped Paint
25	CS-1	Good	NA		24	(24-25)	Good	RP	Chipped Paint
26	CS-1	Good	NA		25	(25-26)	Good	RP	Chipped Paint
27	CS-1	Good	NA		26	(26-27)	Fair	RP	Rusted Exterior
28	CS-1	Good	NA		27	(27-28)	Fair	RP	Rusted Exterior
29	CS-1	Good	NA		28	(28-29)	Fair	RP	Rusted Exterior
30	CS-1	Good	NA		29	(29-30)	Fair	NA	Rusted Exterior
31	CS-2	Fair	D	Concrete Spalling and missing drainage pipe	30	(30-31)	Good	RP	Chipped Paint
32	CS-4	Severe	D		31	(31-32)	Good	RP	Chipped Paint
33	CS-1	Good	NA	Corroded Pipe	32	(32-33)	Good	RP	Chipped Paint
34	CS-1	Good	NA		33	(33-34)	Fair	RP	Rusted steel
35	CS-1	Good	NA		34	(34-35)	Good	NA	
36	CS-2	Fair	RP		35	(35-36)	Good	NA	
37	CS-1	Good	NA		36	(36-37)	Good	RP	Cover exposed steel
38	CS-2	Fair	RP		37	(37-38)	Good	RP	Chipped Paint and Pack Rust
39	CS-1	Good	NA		38	(38-39)	Good	RP	Chipped Paint
40	CS-1	Good	NA		39	(39-40)	Good	RP	Chipped Paint
41	CS-1	Good	NA		40	(40-41)	Good	RP	Chipped Paint

Non-Structural Condition Observations

Category: DRAINAGE - Missing and/or Corroded

Quantity: 1. Unit: ea

Referenced Element(s): NONE

Referenced Photo(s): 31, 33
Referenced Sketch(es): NONE

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Inspection Photographs

Attachment Description: Pier 1.	Photo Number: **1** Photo Filename: **01.jpg** 

Attachment Description: Pier 2.	Photo Number: **2** Photo Filename: **02.jpg** 

Attachment Description: Pier 3.	Photo Number: **3** Photo Filename: **03.jpg** 

Attachment Description: Pier 4.	Photo Number: **4** Photo Filename: **04.jpg** 

Attachment Description: Pier 5.	Photo Number: **5** Photo Filename: **05.jpg** 

Attachment Description: Pier 6	Photo Number: **6** Photo Filename: **06.jpg** 

Attachment Description: Pier 7.	Photo Number: **7** Photo Filename: **07.jpg** 

Attachment Description: Pier 8.	Photo Number: **8** Photo Filename: **08.jpg** 

Attachment Description: Pier 9.	Photo Number: **9** Photo Filename: **09.jpg** 

Attachment Description: Pier 10.	Photo Number: **10** Photo Filename: **10.jpg** 

Attachment Description: Pier 11.	Photo Number: **11** Photo Filename: **11.jpg** 

Attachment Description: Pier 12.	Photo Number: **12** Photo Filename: **12.jpg** 

Attachment Description: Pier 13.	Photo Number: **13** Photo Filename: **13.jpg** 

Attachment Description: Pier 14. Missing photo.	Photo Number: **14** Photo Filename: **14.jpg**

Attachment Description: Pier 15.	Photo Number: **15** Photo Filename: **15.jpg** 

Attachment Description: Pier 16	Photo Number: **16** Photo Filename: **16.jpg** 

Attachment Description: Pier 17.	Photo Number: **17** Photo Filename: **17.jpg**

Attachment Description: I Pier 18.	Photo Number: **18** Photo Filename: **18.jpg**

Attachment Description: Pier 19.	Photo Number: **19** Photo Filename: **19.jpg** 

Attachment Description: Pier 20.	Photo Number: **20** Photo Filename: **20.jpg** 

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Attachment Description: Pier 27.	Photo Number: **27** Photo Filename: **27.jpg** 

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Attachment Description: Pier 29.	Photo Number: **29** Photo Filename: **29.jpg** 

Attachment Description: Pier 30.	Photo Number: **30** Photo Filename: **30.jpg** 

Photo Number: **31** Photo Filename: **31.jpg**

Attachment Description:
Pier 31.

Photo Number: **32** Photo Filename: **32.jpg**

Attachment Description:
Pier 32.

Attachment Description: Pier 33.	Photo Number: **33** Photo Filename: **33.jpg** 

Attachment Description: Pier 34.	Photo Number: **34** Photo Filename: **34.jpg** 

Attachment Description: Pier 35.	Photo Number: **35** Photo Filename: **35.jpg** 

Attachment Description: Pier 36.	Photo Number: **36** Photo Filename: **36.jpg** 

Attachment Description: Pier 37.	Photo Number: **37** Photo Filename: **37.jpg** 

Attachment Description: Pier 38.	Photo Number: **38** Photo Filename: **38.jpg** 

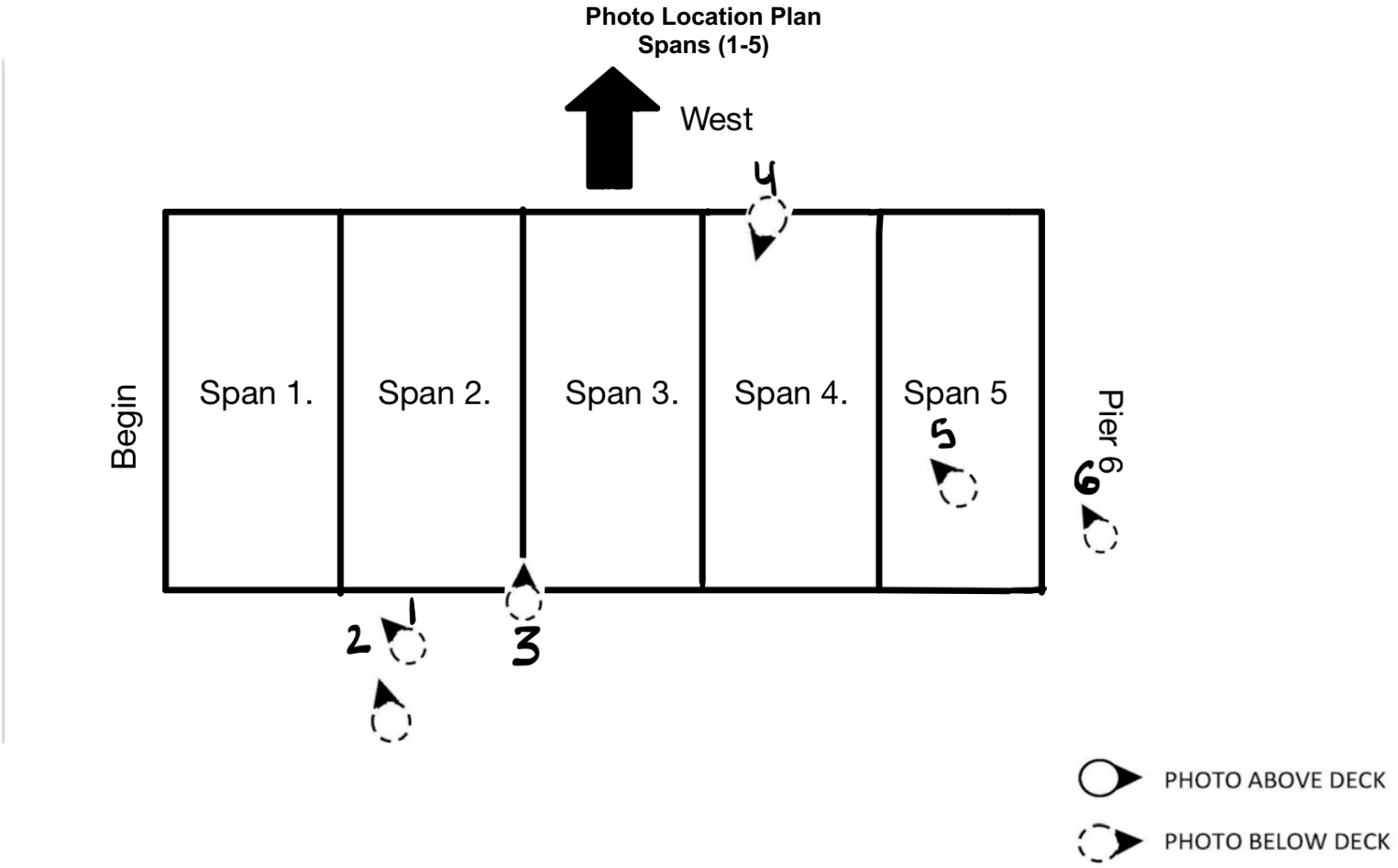
Attachment Description: Pier 39.	Photo Number: **39** Photo Filename: **39.jpg** 

Attachment Description: Pier 40.	Photo Number: **40** Photo Filename: **40.jpg** 

Attachment Description: Pier 41.	Photo Number: **41** Photo Filename: **41.jpg** 

Inspection Sketches

Sketch Number: 1 Sketch Filename: 1093572 - 2025 Photo Location Plan (Span 1-5). jpg



Sketch Description: Photo Location Plan (Span 1-5)

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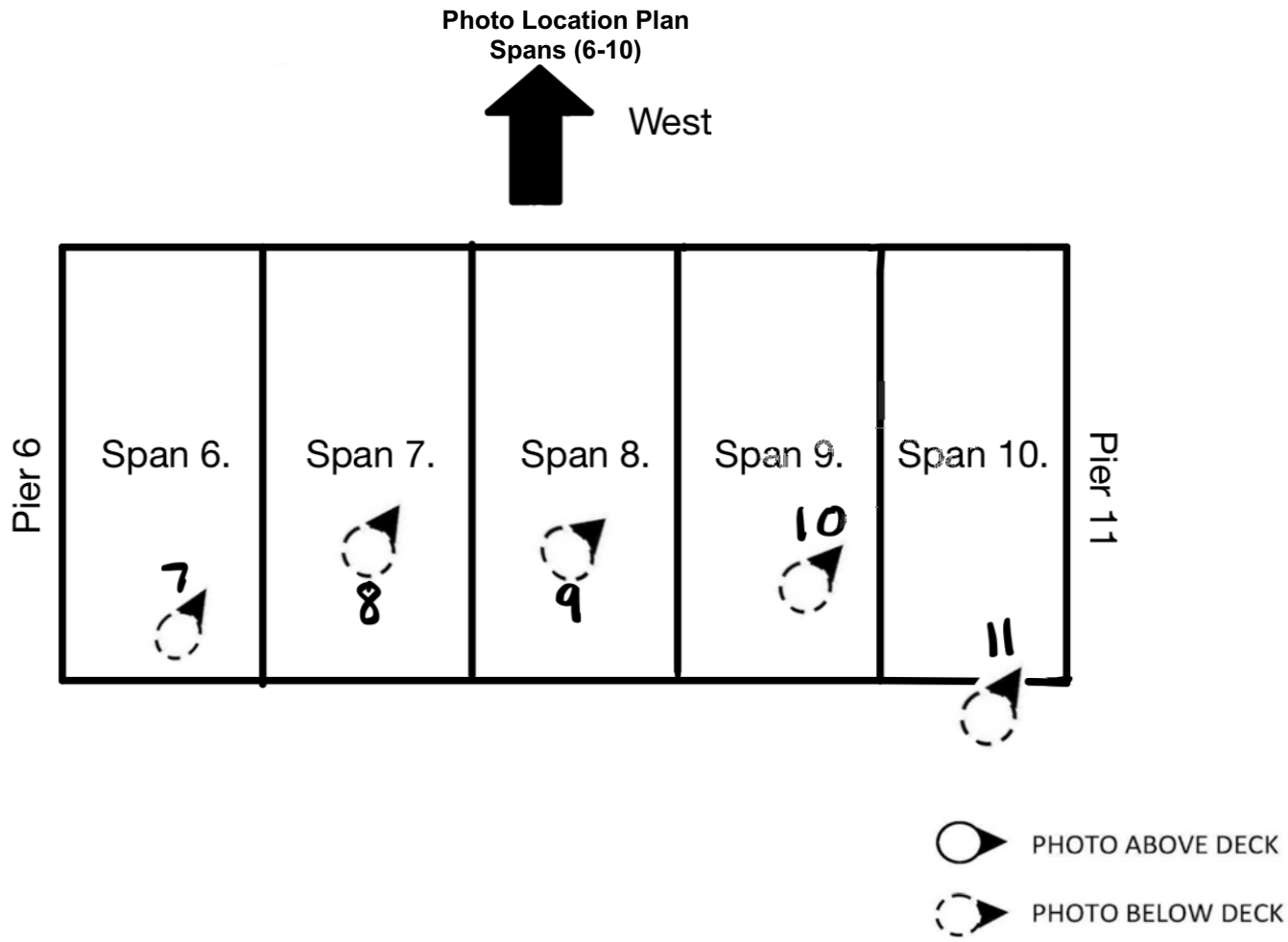

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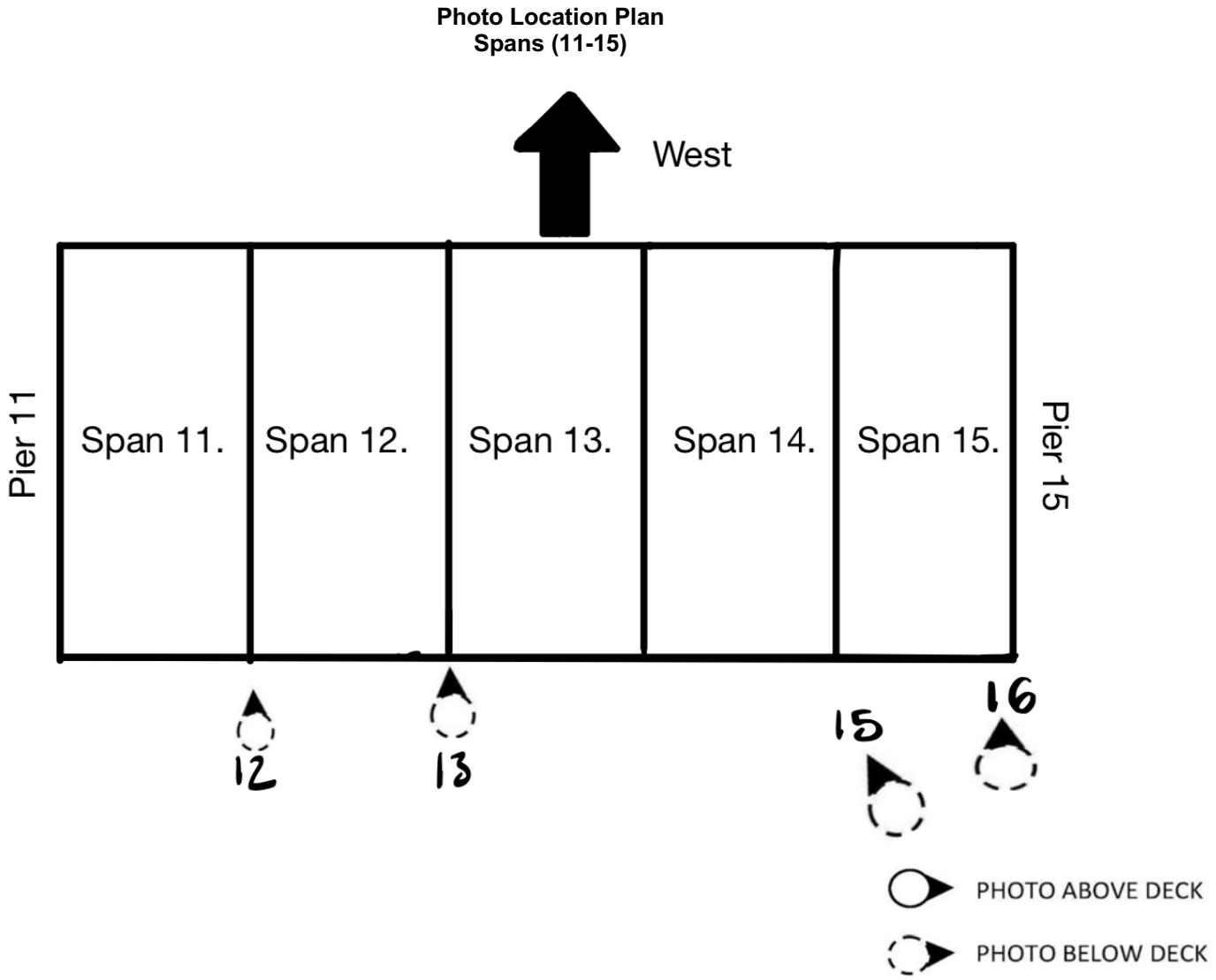

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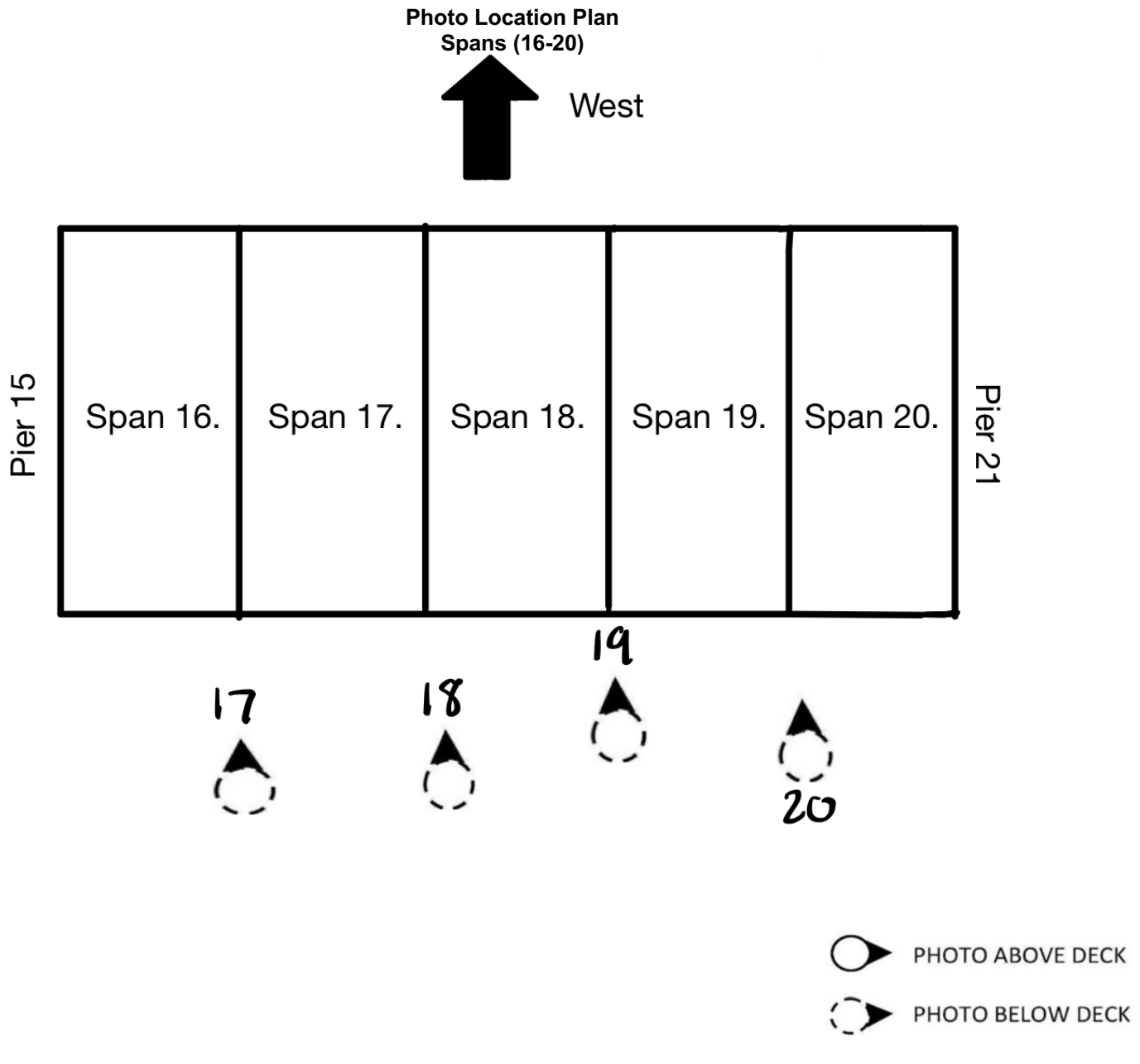

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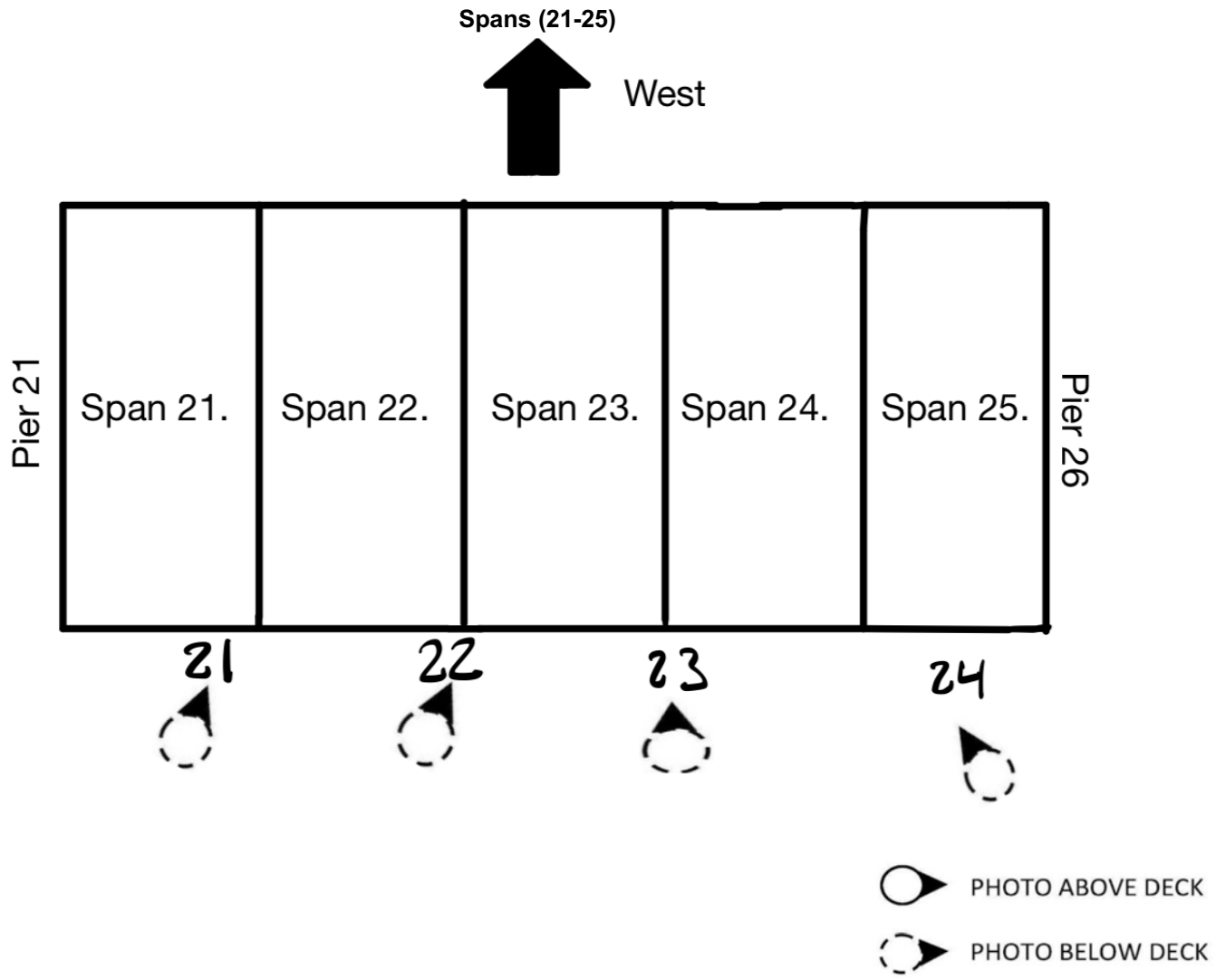
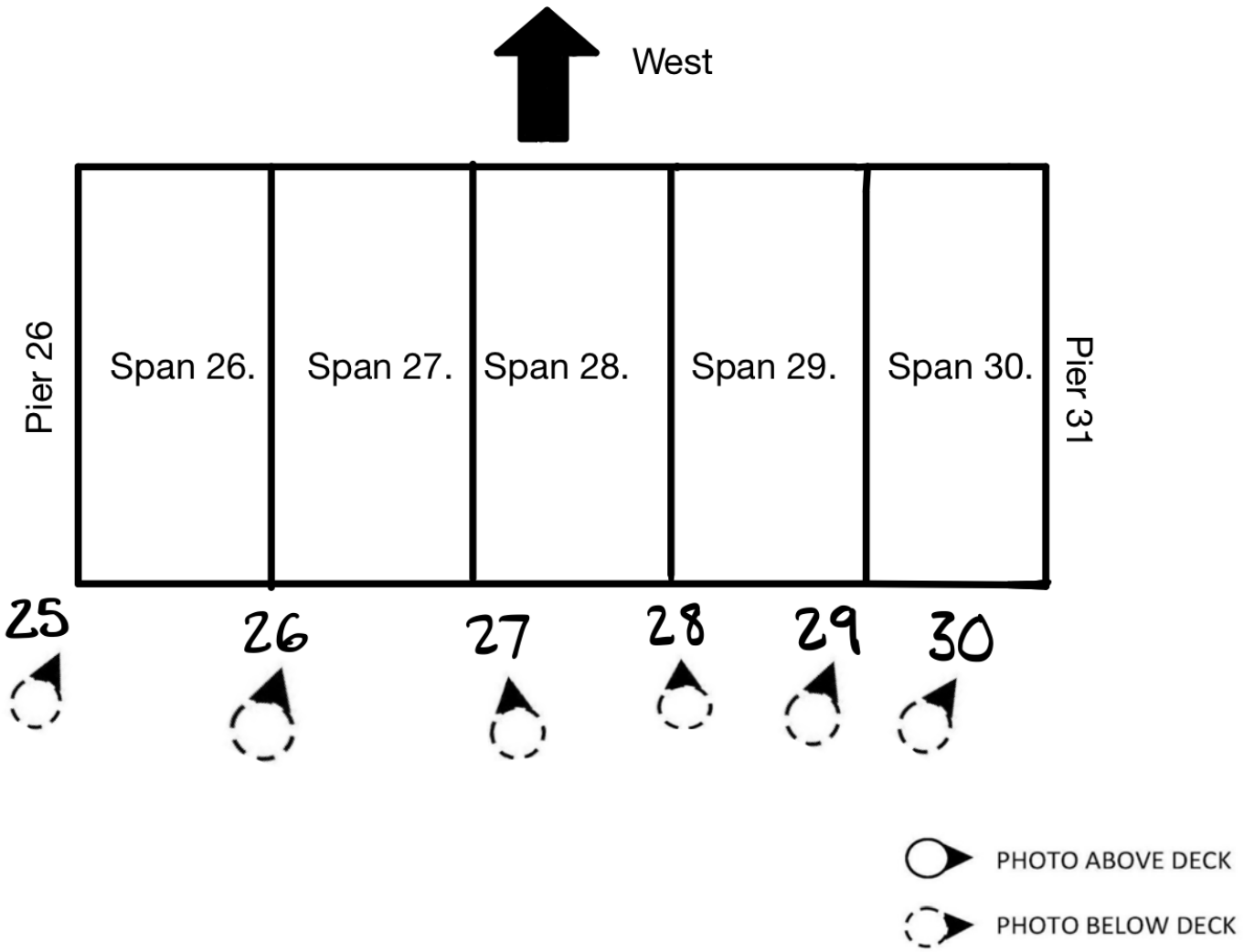
Sketch Number: 5	Sketch Filename: 1093572 - 2025 Photo Location Plan (Span 21-25). jpg
Photo Location Plan	



Sketch Description: Photo Location Plan (Span 21-25)

Sketch Number: 6	Sketch Filename: 1093572 - 2025 Photo Location Plan (Span 26-30). jpg

Photo Location Plan
Spans (26-30)



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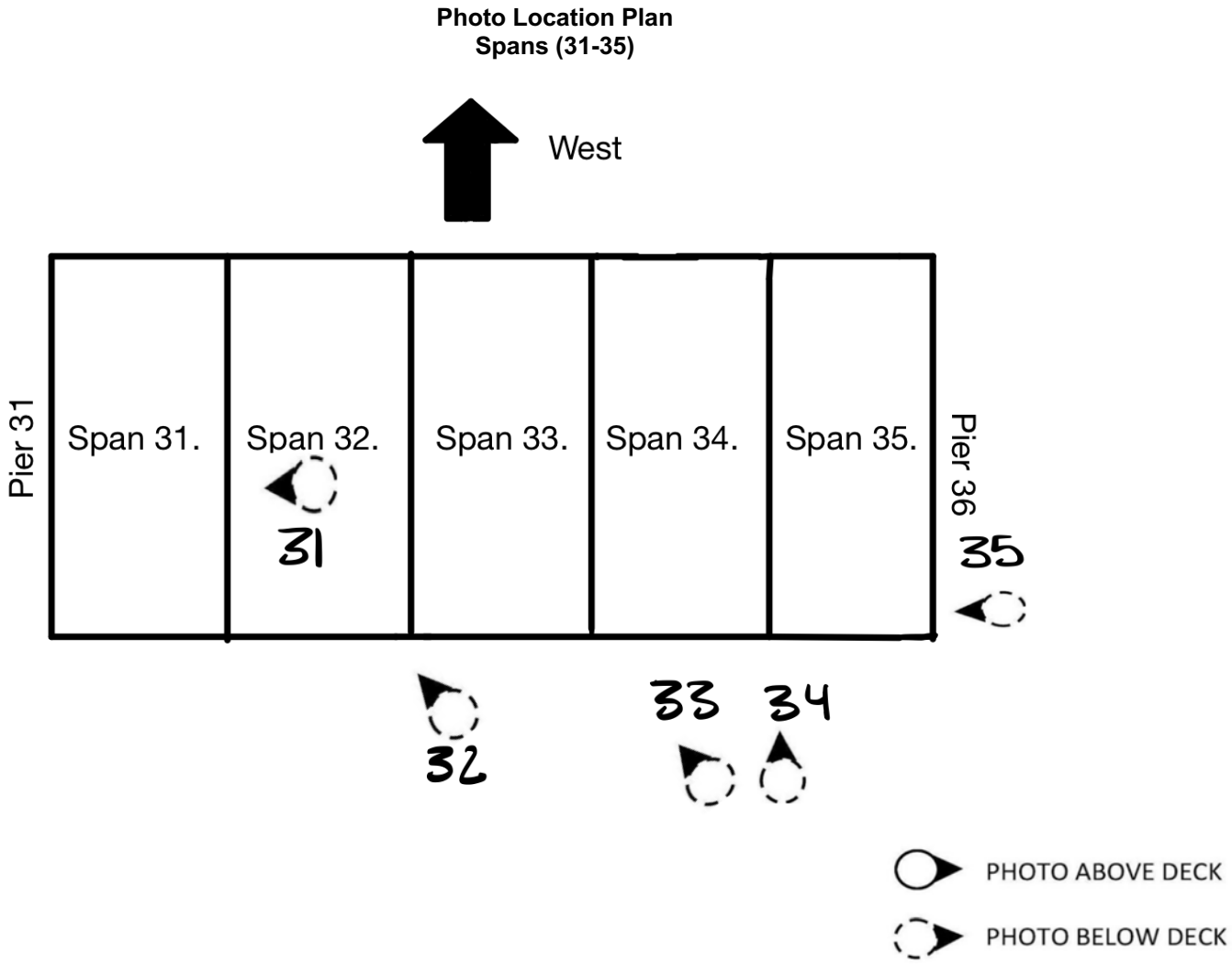

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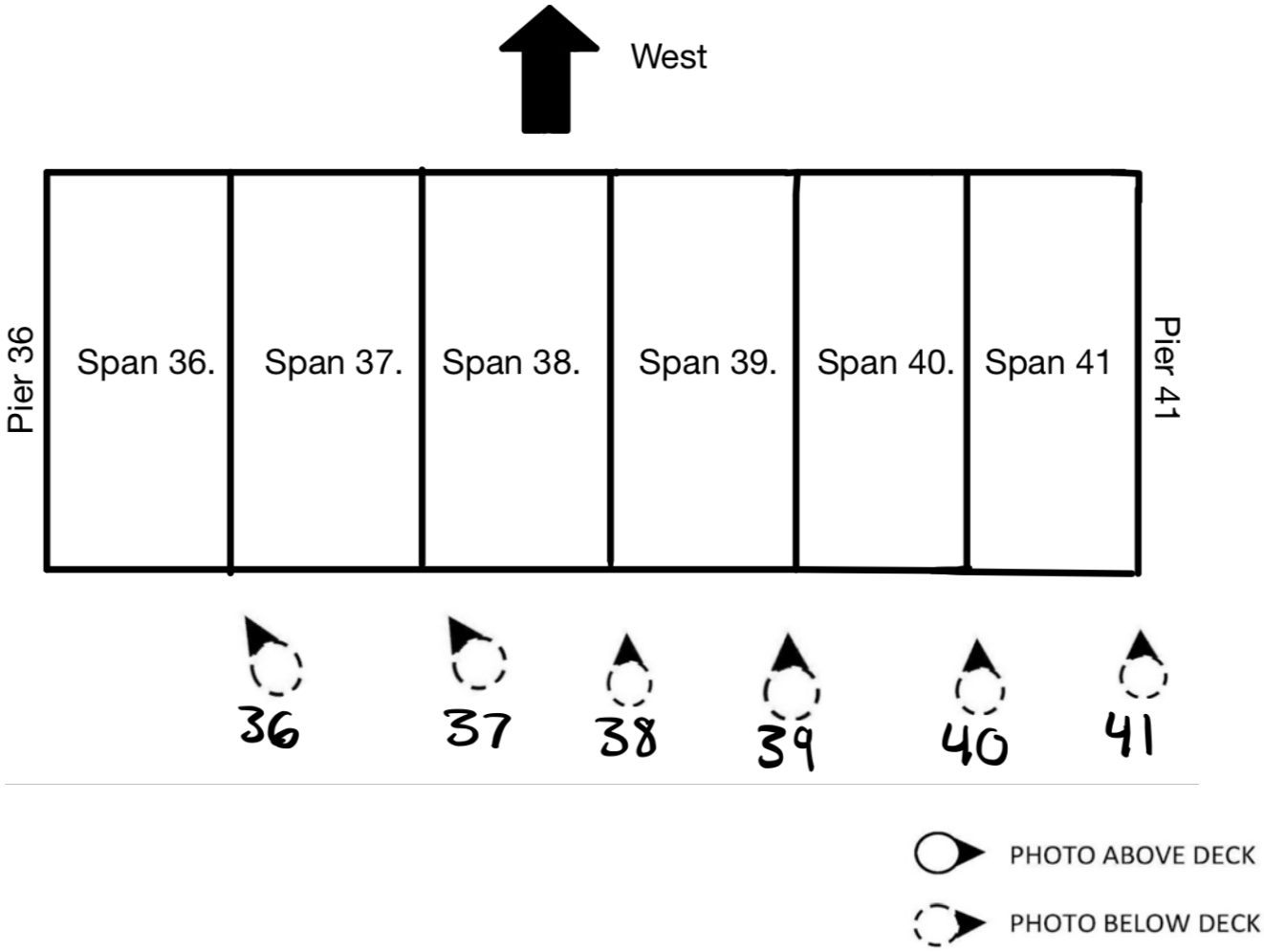
Sketch Number: 8	Sketch Filename: 1093572 - 2025 Photo Location Plan (Span 36-41). jpg

Photo Location Plan
Spans (36-41)



Sketch Description: Photo Location Plan (Span 36-41)

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