

# Fixing The Box

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## Academic Abstract

My Thesis addresses one of the staples of suburban American development for the past half century, the ubiquitous "Big Box" store in the strip mall shopping centers and the acres of surface parking lots built around them. With thousands of these stores built, many are being abandoned by their tenants who are relocating to new locations, following market demand and other factors. While current methods of re-using these buildings exist, they're inefficient and require huge amounts of time and money to redevelop effectively. This leads many to simply be demolished and create thousands of tons of debris for our landfills and wastes the embedded energy they have. Looking closely at a local shopping center going through a massive redevelopment process that will take years if not decades to complete, I propose an alternative method of developing the site in a shorter time frame. This method applies new construction techniques in modular building to facilitate a fundamental shift in what the site provides to the public. Transitioning from a retail only destination that requires a car to access and use into a fully walkable and engaging neighborhood with retail, residential, and commercial uses all contributing to the balance for its residents and visitors. All of this development acknowledges the fact that the success of this community will spur more development, and allows for that future growth. The dis-assembly of the modular constructs allows them to move and develop another shopping center elsewhere to continue improving our communities.

# Fixing The Box

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## General Audience Abstract

This Thesis looks at the thousands of abandoned retail “Big Box” stores across our country, and proposes a method of using these existing structures for new and better uses. By employing ideas about interior space usage, property life cycle development, and constructability from off-site manufacturing I propose a development that quickly delivers a walkable and engaging community that can build on its success in the future.

## Dedication

There are several people and groups I'd like to thank for supporting me through this project and research.

I'd like to thank my parents, Jane and Tony, for raising me and supporting my dreams throughout my schooling.

The faculty and staff at the **Washington Alexandria Architecture Center**

And most importantly my wife Beth for her constant encouragement and assistance whenever I needed it. Through the late nights and everything you've been my strength and constant critic striving me to do my best.

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## Introduction: America's Big Boxes, Uncertain Future



Mission Valley Shopping Center San Diego CA Circa 1961  
Source: San Diego History Center

Over the last fifty years Americans have evolved in both how and where we live, and in how we shop for the things we need. Today we look at the ubiquitous "Big Box" store from the past and see a way of shopping that fewer and fewer of us use regularly. This has led to hundreds of these stores closing up in the past few years and leaving communities wondering what to do with these large, imposing buildings and sites.



Abandoned Big Box Retail Store  
Source: *They Sold for Less*, Flickr



Major US retailers store dispositions

Wal-Mart alone currently operates 4,692 stores in America, while the Wal-Mart Realty division currently offers some 490 buildings and pieces of land for sale. Dozens of other retail giants, grocery chains, and other businesses operate tens of thousands of these stores; all following the same basic logic of providing cheap square footage quickly, with no real care or thought to what type of space they build or present to the outside world.



Nationwide Walmart Realty properties available,  
Source: Walmart Realty

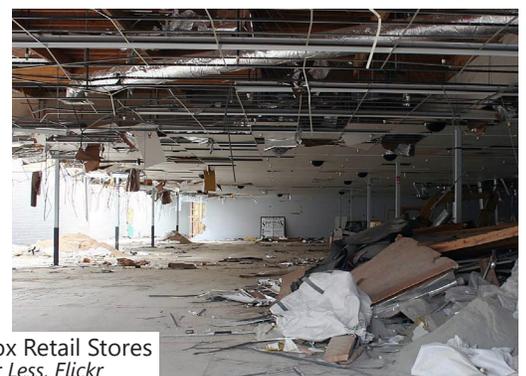


North Potomac Yard Proposed Development  
Source: McCaffery Interests

While many communities hope to bring in new retailers or business into these buildings others look for more progressive and new ways to use the site. New types of developments can create exciting and wonderful places to live, but these frequently come at the cost of completely razing a site to allow for the new development to start with a clean, blank slate to build on.



Mosaic District,  
Source: EDENS Development



Abandoned Big Box Retail Stores  
Source: *They Sold for Less*, Flickr

Surely there must be some way to prevent thousands of tons of demolition debris from being added to our ever growing landfills. A way to reuse these huge buildings and allow us to capitalize on the embodied energy these buildings already have invested into them from their construction.

## Research: Current Big Box Reuse

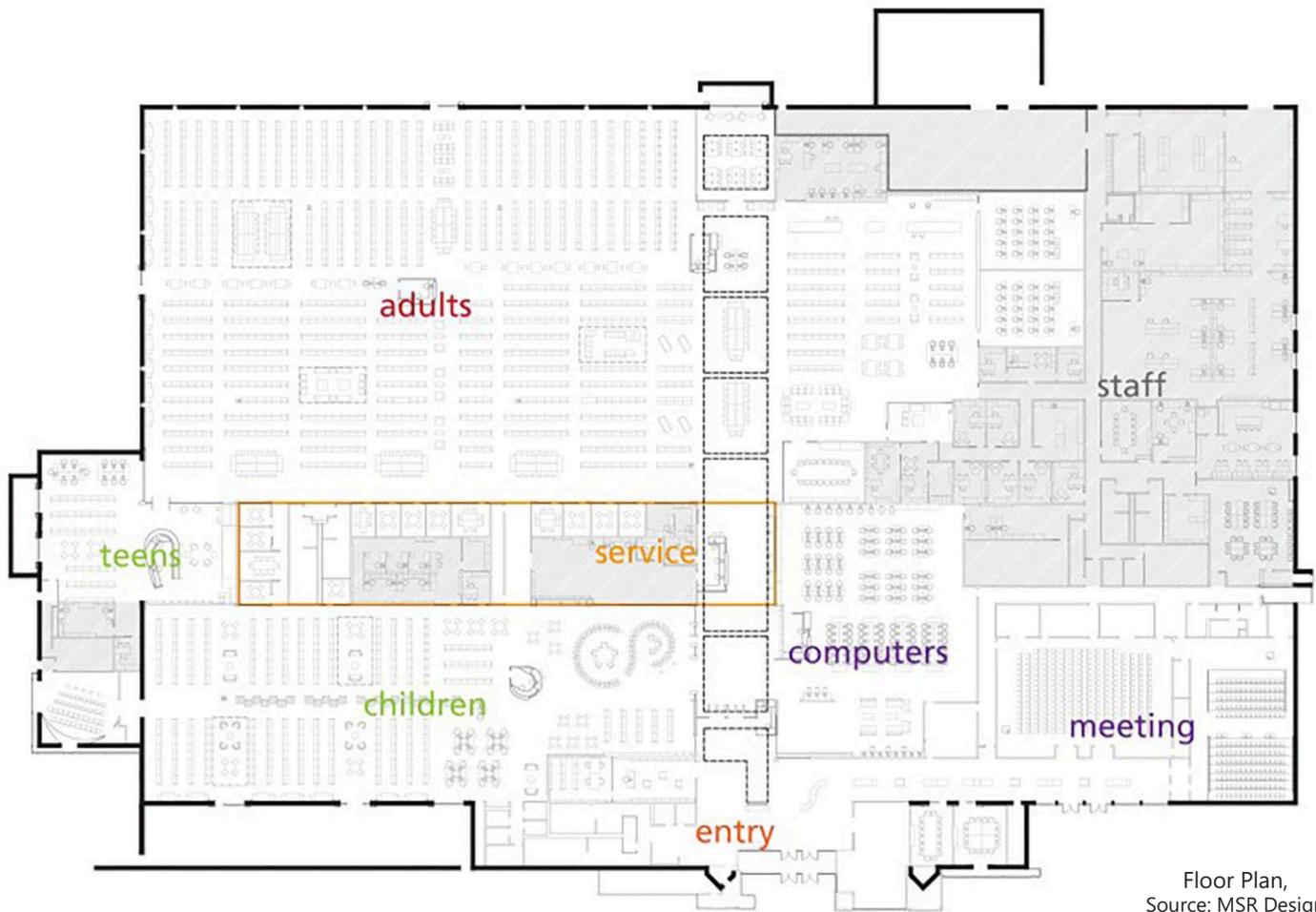
If we look for current examples of reusing Big Box stores for new uses we see several types of projects with varying programmatic and building needs being addressed.



Reading and study areas  
Source: MSR Design



New front entry  
Source: MSR Design



Floor Plan,  
Source: MSR Design

In 2011 the McAllen Texas Public Library's main branch moved into its new space that was a converted 120,000 square feet former Wal-Mart. This new building gave them three times the amount of space and let them provide new services to the community like increased computer access and reservable study rooms.



Floor plan , Source: ZGF Architects



Interior corridor and lobby area, Source: ZGF Architects



This 37,000 square foot former Kmart store was built into a children's health clinic in Seattle Washington. The floor plan shows traces of the existing column grid while the rest of the interior shows little evidence of the former use. There's also areas of the building that weren't able to be incorporated into the new program.



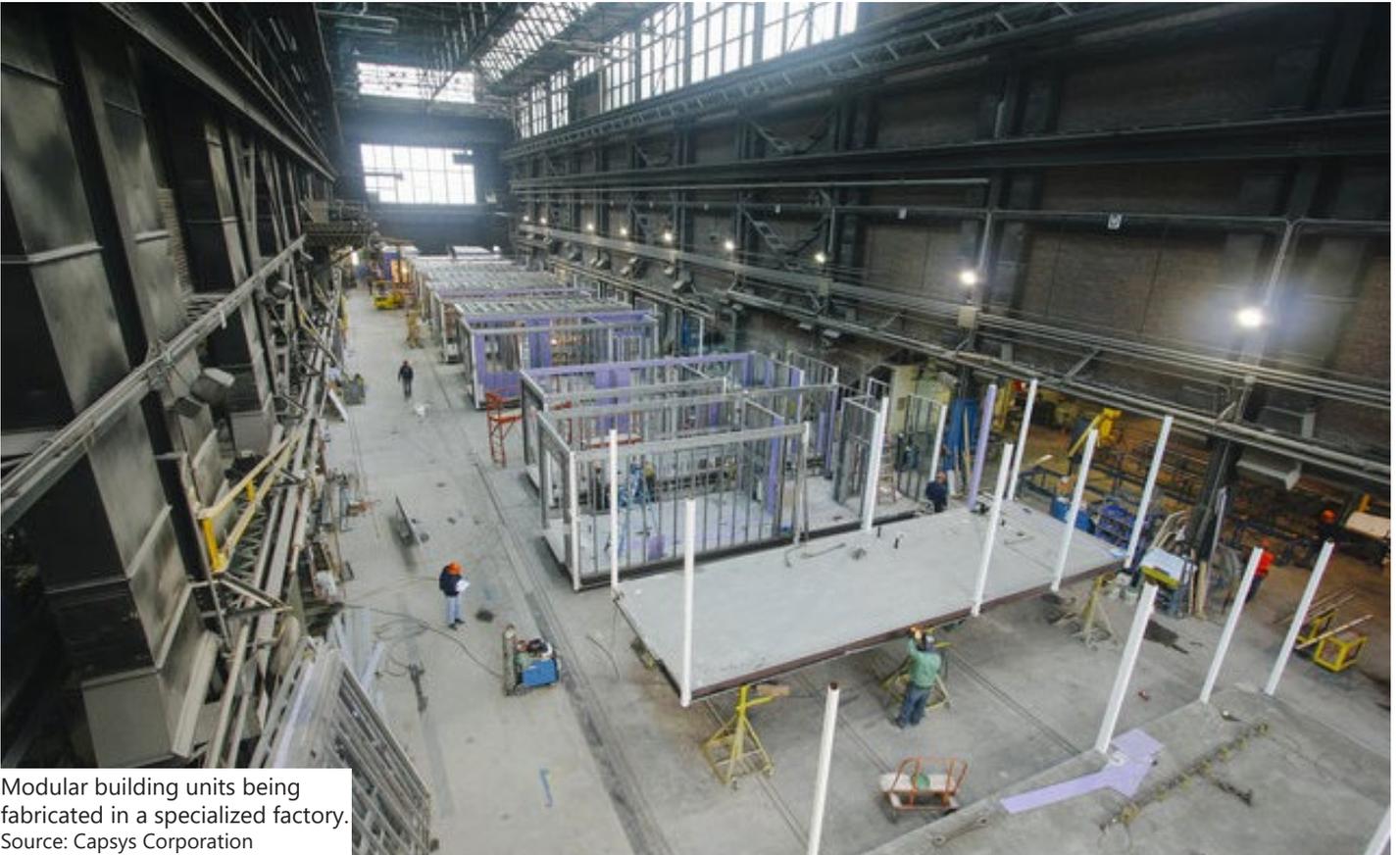
New entry sequence and facade applied to the existing front elevation, Source: ZGF Architects

These projects, and others like them, achieved their set goals of reusing an existing empty Big Box store site for a new use without having to demolish and level the site. However too often these projects become too design demanding. The architect needs to detail how new and old pieces interact throughout the project, the existing column grid and structure causes awkward situations at times, and a host of other issues need time and effort devoted to them. This leads these projects to become time demanding for the design teams involved, which increases costs. Then when construction starts, these same types of issues come up with the crews on site. From the selective demolition of certain aspects and the insertion of new elements to the existing, the process takes longer and costs more.

## Research: A Different Building Solution

*What if a project could use the existing built environment to deliver square footage with simplified and repetitive construction techniques and components to shorten the construction time frame?*

To achieve this goal, a modulated and pre-fabricated system of construction can be applied to the project. Over the past few decades this concept has developed and grown into an executable building practice applicable to projects ranging in size from single family homes to multi-story hotels and commercial buildings.



Modular building units being fabricated in a specialized factory.  
Source: Capsys Corporation



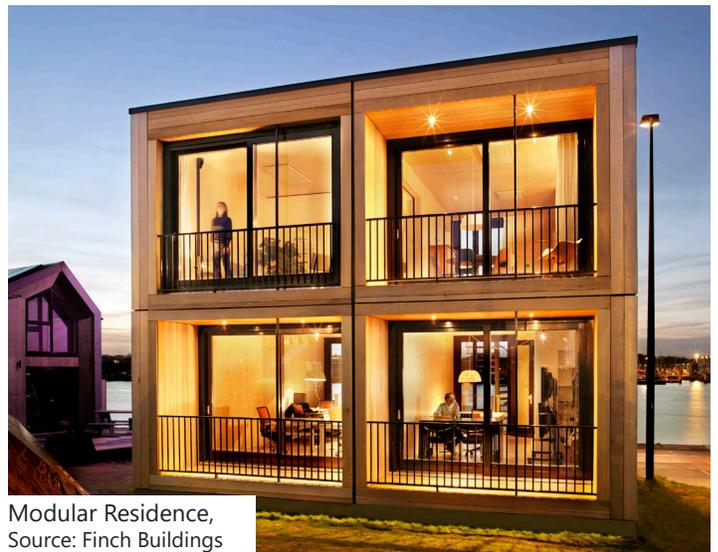
(Above) Detail work is started on a unit while still at the factory. Source: Capsys Corporation

(Left) Modular building units being installed on the prepared site. Source: Capsys Corporation



Modular Residence Pods, Source: ZED Factory

When we combine modular construction techniques and assembly ideas with new ideas of smaller home sizes, we discover an optimal situation. These smaller sized homes can easily be separated into a few or even a single modular unit whose size is controlled by having to fit the dimensions of a semi-truck trailer to deliver it to the job site for installation. These size limits of fifty three feet in length, thirteen feet in height, and eight feet six inches in width allows for flexibility for manufacturers within these dimensions to create units that will optimize the construction process on site, with pre-installed finishes and accessories done at the factory.



Modular Residence, Source: Finch Buildings



Modular hotel under construction, Source: Marriott Hotels

## Research: Local Site History, Potomac Yard

Looking for a local site to try to address this problem, I found the Potomac Yard Center in northern Alexandria Virginia, four and a half miles south of Washington DC. I discovered this area has a deep history and is facing a whole host of challenges as it tries to redevelop itself and adapt to a new future.



Satellite Map,  
Source: Google Earth

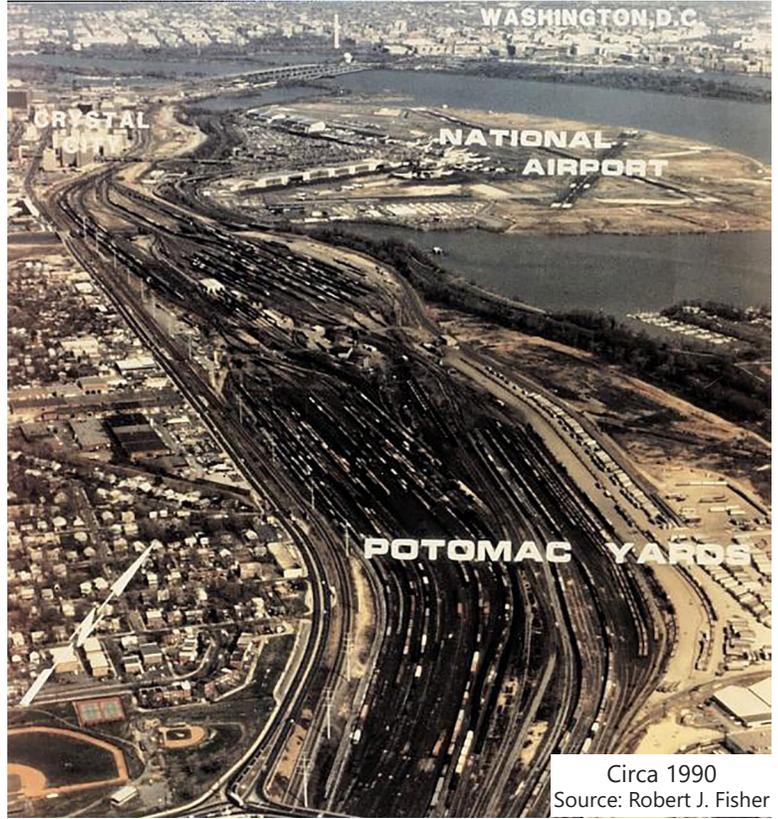


Circa 1970

Source: City of Alexandria

The Potomac Yards area began as a rail sorting yard in 1906 for the DC area railroads to serve routes up and down the East Coast and west to the Midwest and South. By the 1960s it was one of the busiest rail sorting yards on the east coast.

By the 1980s however the yard was in serious decline after the Interstate Highway System was further developed and become the prominent form of moving freight across the country. The Yard was declared a toxic waste site in 1987 and was officially decommissioned in 1989.



Circa 1990

Source: Robert J. Fisher



Circa 1988

Source: Google Earth



Potomac Yard has three different types of development surrounding it and influencing its future. To the West are older single family houses of the Del Ray neighborhood, to the North is Arlington and Crystal City's established denser residential and commercial developments, and to the South are the newer developments from Old Town North and the completed South Potomac Yards development. Heading east the Metro tracks, George Washington Parkway, and the Potomac River form another series of barriers.

## Research: Potomac Yard Development - History

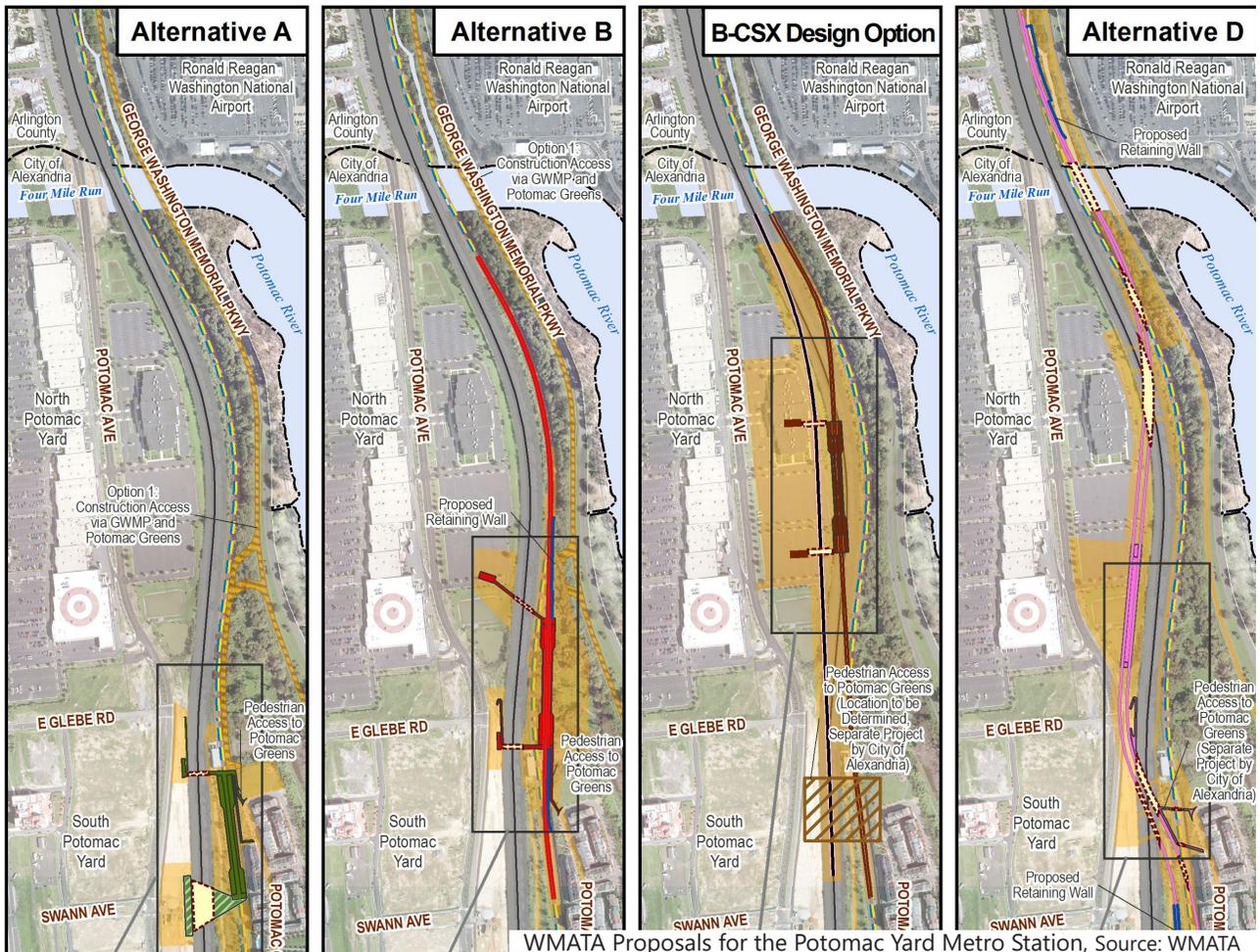
Since being decommissioned in 1989 Potomac Yards underwent several years of environmental clean up and began looking into ways of being redeveloped. City officials and the land owner brought forward several different forms of development over the years.



Discussions for development included a new NFL stadium and for new typical suburban type single family houses. Both of these ideas were unsuccessful and allowed both the city and the land owner to pursue a different type of development that would build a new community into this area and strengthen those around it.

The whole area of the former yard was divided into smaller land bays to promote different types of development and projects throughout the whole site area. They also allow for other uses like park and community space to be built into the community. Since implementation in 1992, the plan has undergone periodic changes and updates.

One of these changes was the approval of around six hundred thousand square feet of retail, Potomac Yard Center and the Regal Cinemas Potomac Yard, that would conform to the current zoning regulations of the northern part of the site. This allowed for the owner to generate some form of revenue on the site while the development occurred and would be replaced once the newer development reached this point from the south.



Planners have envisioned incorporating a Metro Station into the Potomac Yard area as part of the development to boast accessibility and connectivity to the area while fostering a walkable and less car dependent community. Planning for the Potomac Yard Metro station began in 2010 and has continued on with the Washington Metro Area Transit Authority soliciting bids for the projects construction in late 2016.

## Research: Potomac Yard Development - To Date

Implementation of the development plan so far has delivered both new and interesting building types along with some rather typical and traditional ones. About half of Potomac Yard will be constructed into three to four-story townhouses. Some of these bring interesting architectural elements to them but most are rather conventional in their designs, materials, and execution.

Developer Promotional Images, Source: Pulte Homes



Modern style townhouse, priced around \$1 million. Of particular note are the balcony railings on the upper floors. My assumption is that these balconies were designed as Juliet balcony type doors but were changed to windows as a cost saving measure, but the railings were still installed for some reason.



More traditional styled townhouse, priced around \$875 thousand. While these use a more traditional palette of materials several elements give them away as mass built homes. The same roof angle with differing styles and the applied architectural pieces to the exterior in trim and details are not from genuine construction techniques but simply to look like them.



Developer Promotional Images, Source: Pulte Homes

What these townhouses deliver and present to the streets they front is almost an artificial sense of architecture and place making. The repetitiveness of their design elements, the obvious cost savings in highly visible areas on the exteriors, and the large price tags these types of housing requires to be profitable for the land owners, all creates a less than ideal new neighborhood in urban design and community building practices. It also creates a rather empty one with streets devoid of people instead of walking to shops and restaurants down the block.



Multi-family building with a ground floor grocery store.

Other pieces of Potomac Yards are developing much more successful in their implementation of creating worthwhile architecture and community. Several multi-family buildings have been built so far and more are planned and under construction. These include ground floor uses such as retail and community space that engage the streets they're on better than the purely residential townhouse areas.



Modern styled multi-family building, Source: KTG Architecture and Planning



This project combined the communities fire station and community building with affordable housing units on the upper floors. Source: Rust Orling Architecture

# Research: Potomac Yard Development - Future



Revised Land Bay F Small Area Plan, Source: North Potomac Yard Small Area Plan 2017

The northern end of Potomac Yards is the last land bay to undergo development, with this bay aiming to be the densest and most ambitious part of the project yet. In 2015 the land owner informed the city that they were ready to begin development of this bay but that it would require updates to the most recent Small Area Plan. The city formed an advisory group to hear these changes and work with the developer to present a plan to city government officials to meet approval.

Meeting Date	Meeting Type
PUBLIC MEETINGS	
April 18, 2016	<b>Advisory Group Meeting #1</b>
April 30, 2016	Precedent Bus Tour
May 16, 2016	<b>Advisory Group Meeting #2</b>
May 17, 2016	Design Workshop
May 17, 2016	Community Open House #1
June 6, 2016	<b>Advisory Group Meeting #3</b>
June 27, 2016	<b>Advisory Group Meeting #4</b>
June 30, 2016	Advisory Group Working Group Meeting: Metro Zone
July 25, 2016	<b>Advisory Group Meeting #5</b>
July 29, 2016	Advisory Group Working Group Meeting: Framework Streets
August 29, 2016	<b>Advisory Group Meeting #6</b>
9/8/2016	Planning Commission Worksession
9/19/2016	Community Open House #2
9/19/2016	<b>Advisory Group Meeting #7</b>
10/17/2016	<b>Advisory Group Meeting #8</b>
11/21/2016	<b>Advisory Group Meeting #9</b>
1/31/2017	<b>Advisory Group Meeting #10</b>
2/28/ 2017	<b>Advisory Group Meeting #11</b>
3/13/2017	Enviornmental Policy Commission



Advisory Group meetings and discussions, Source: North Potomac Yard Small Area Plan 2017



Developers Proposed Phase 1 Development, Source: JBG Corporation

The Advisory Group has worked with the developer, community groups, and design professionals to amend the 2010 approved plan and present a new vision of North Potomac Yard for the future. In June of 2017 they presented their revised plan to City Council and obtained approval to proceed.



**E. Phase I Development**

*Land Use*

Phase I of development, as depicted in Figure 9.4, is a 25-acre area east of Potomac Avenue where the current theater is located. Phase I (Figure 9.5) proposes a land use mix of office, residential, hotel, and retail uses. The remainder of the sites west of Potomac Avenue would be developed in future phases. It is projected that the remaining phases will take 20-25 years to complete.

Phase I



However even with this approval the site will remain the same for quite some time. 2019 is the earliest conditional zoning approvals can be granted and then the construction time line for these two to seven story buildings will be years in the making. During this time the Potomac Yard Metro station will begin construction and should join the system around 2020, but it will take many years before phase one is complete and usable to the public.

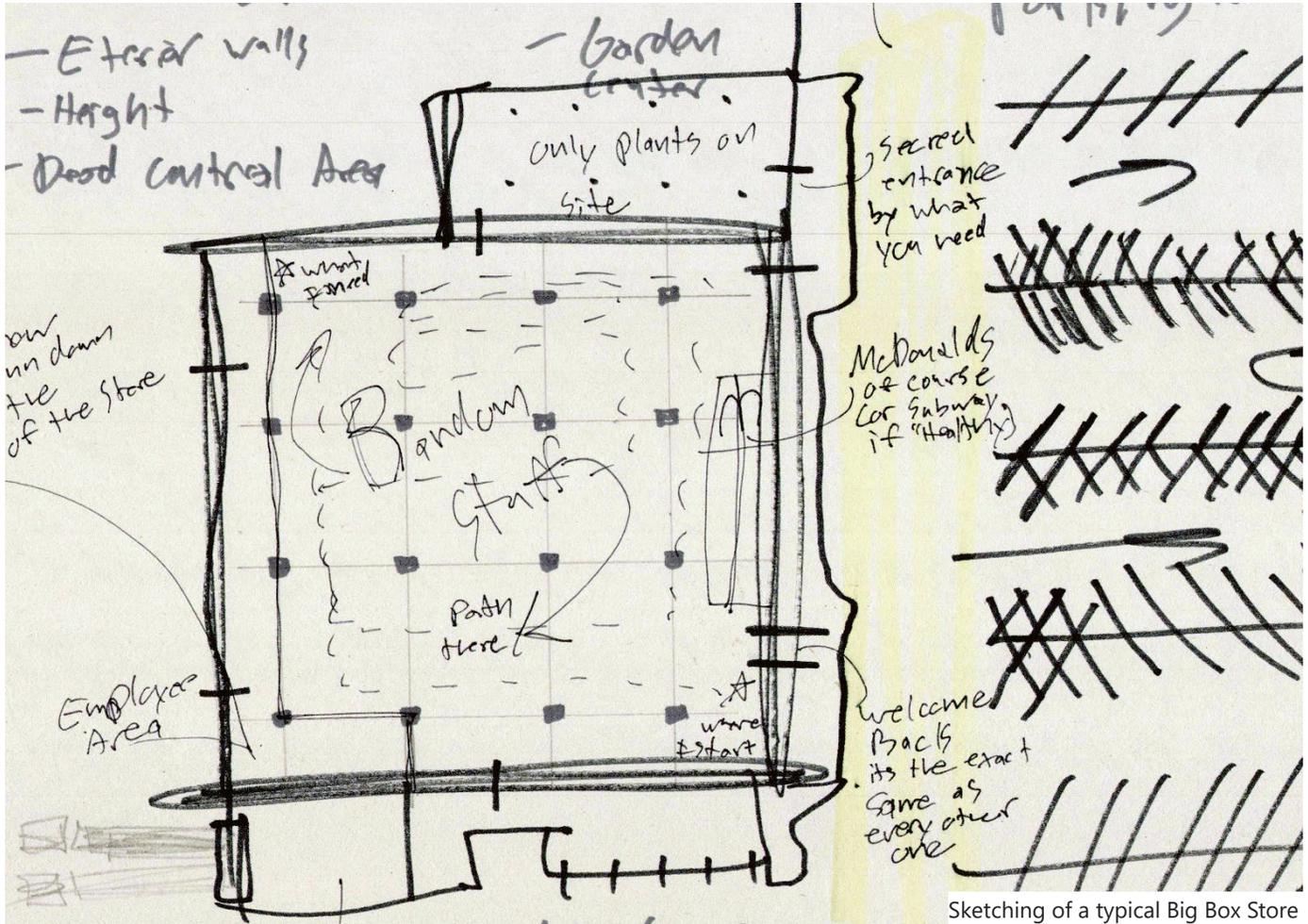
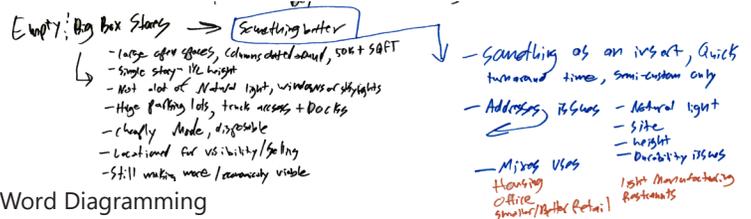
We could ask the question;

*What if the development, instead of waiting years for approvals and complex buildings to finish, could use the existing built environment to deliver usable square footage in a much quicker time frame to take advantage of the new Metro Station as soon as it opens?*

Approved North Potomac Yard Small Area Plan projecting phase 2 to take 20 - 25 years to complete, Source: North Potomac Small Area Plan 2017

## Results: Development and Process

Answering this question began with things from word diagramming, sketching, 3D computer and hand modeling, to phasing diagrams.

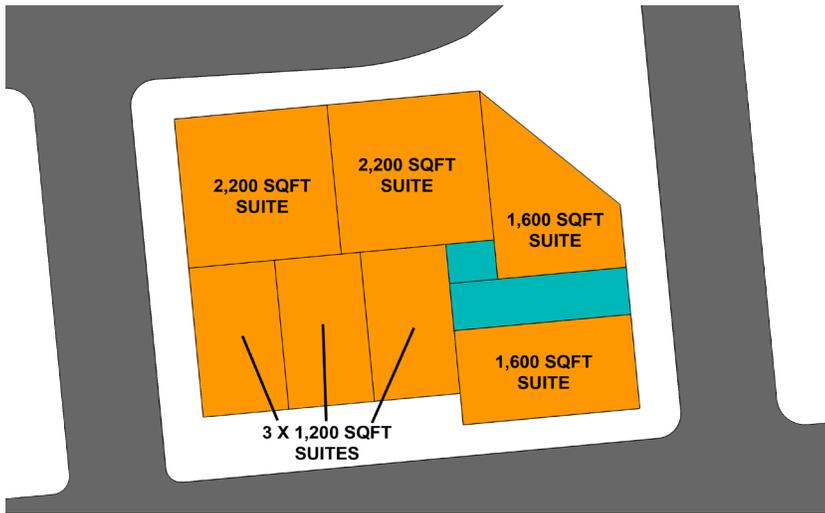


Sketching of a typical Big Box Store

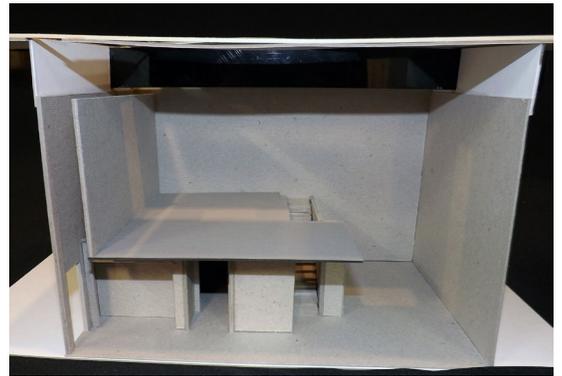
Sketching and word diagramming showed me relationships Big Box stores have to themselves and to the sites they occupy. Reorganizing both their interior relationships and what the site is dedicated towards helps change the orientation from a car centric one to one that can instead focus on pedestrians and walk-ability.



3D Computer Modeling, trying to find ways to bring new uses like residential units to the site and incorporate them to the overall site goals of creating a new community.



Diagrammatic floor plan, introducing new smaller scale retail that can better change and adjust to market trends and what the community needs may be.

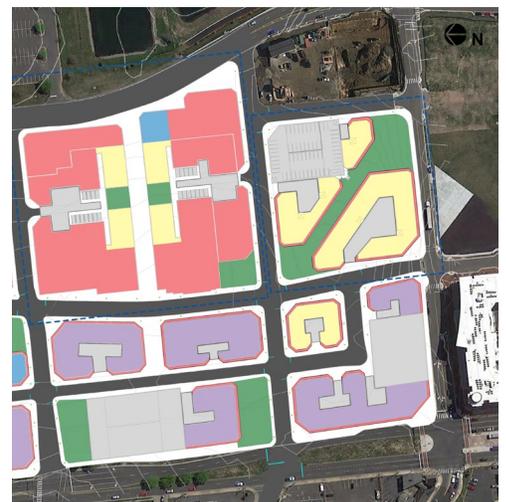


Residential unit model, exploring different ideas of how people could live in a smaller setting with different controls on how their homes are layed out in an existing structure.



Residential unit group model, seeing how these new residential units can work together to build a new streetscape that changes from commercial to residential in an existing building.

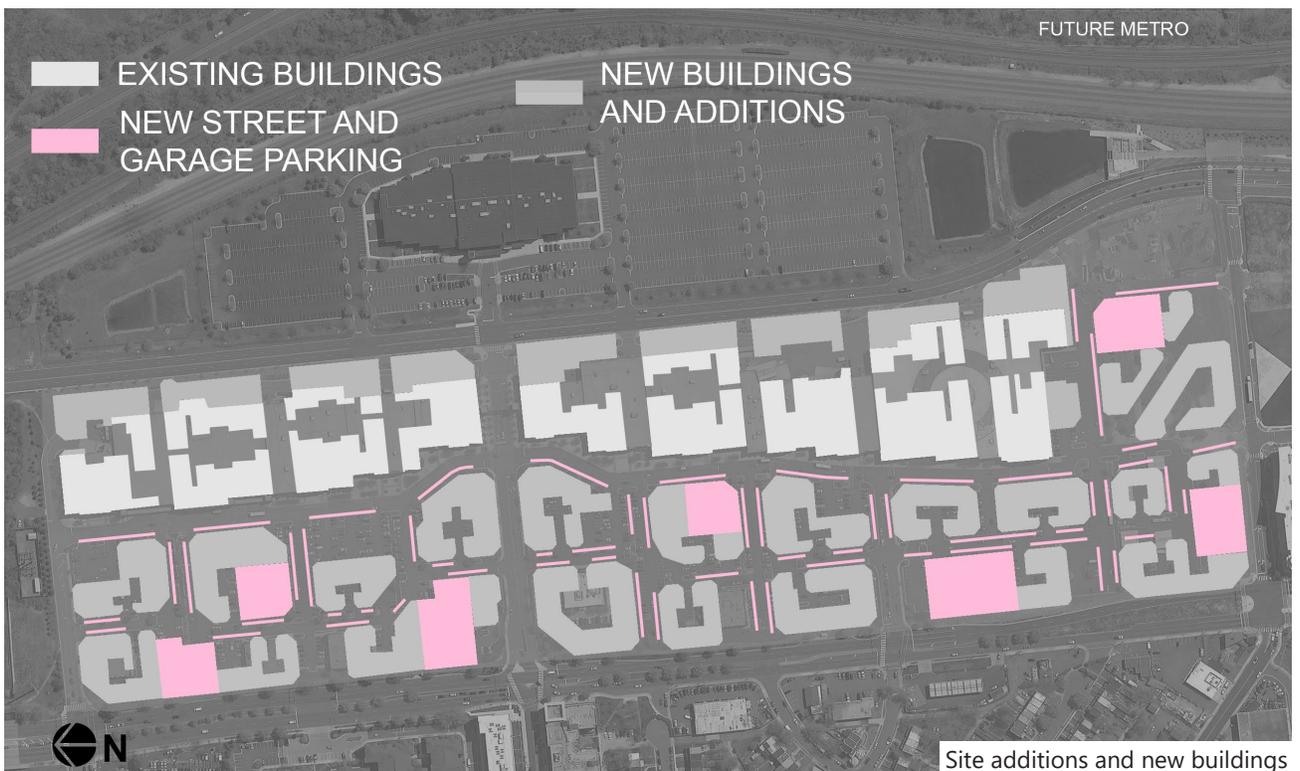
Site demolition and addition diagrams. With the goal of reusing the existing buildings as much as possible it was important to look at what pieces could convert to new uses and what parts might need either demolition or additions for them to better function in their new roles on the site.

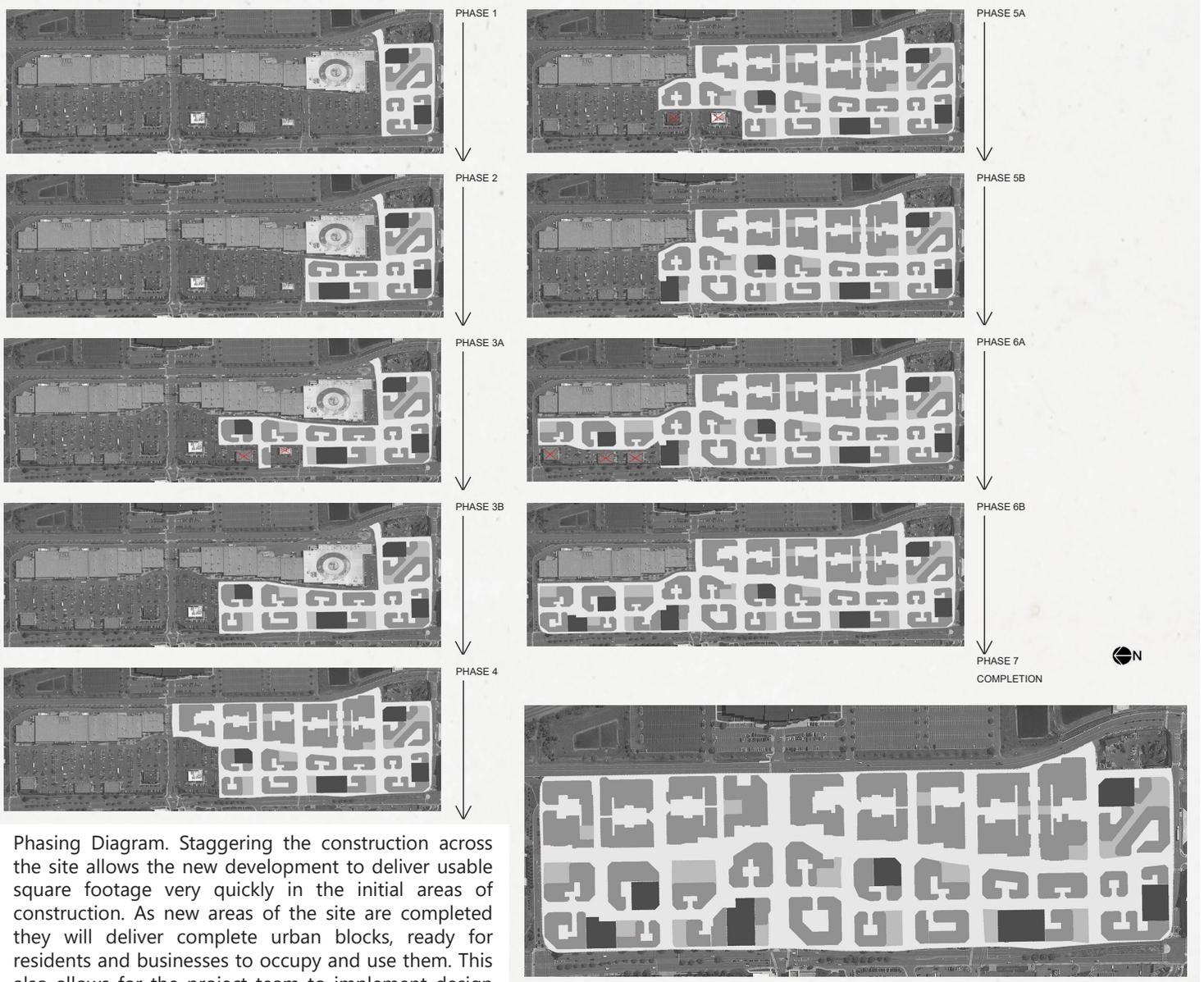


Site Plan Development, connecting areas of commercial to residential pieces and open park spaces through the site.

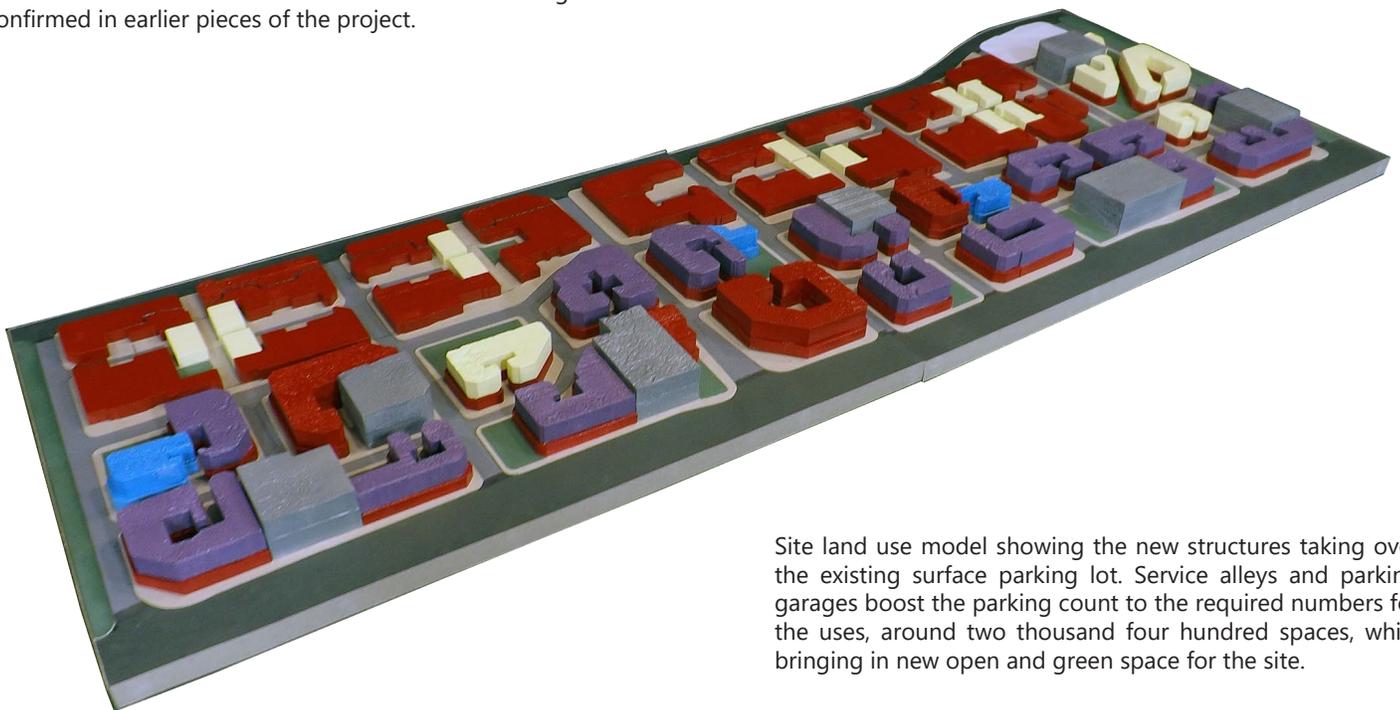
## Results: Large Scale Site Solutions

I needed to address multiple pieces of the overall site to have a successful re-development project. New buildings can take over the large surface parking lots, slicing up the existing strip of Big Boxes into smaller spaces allows for new uses in them, and new additions along the exteriors of the Boxes engage the new streets with energizing and interactive frontage on all sides.





Phasing Diagram. Staggering the construction across the site allows the new development to deliver usable square footage very quickly in the initial areas of construction. As new areas of the site are completed they will deliver complete urban blocks, ready for residents and businesses to occupy and use them. This also allows for the project team to implement design and construction refinements on later areas after being confirmed in earlier pieces of the project.



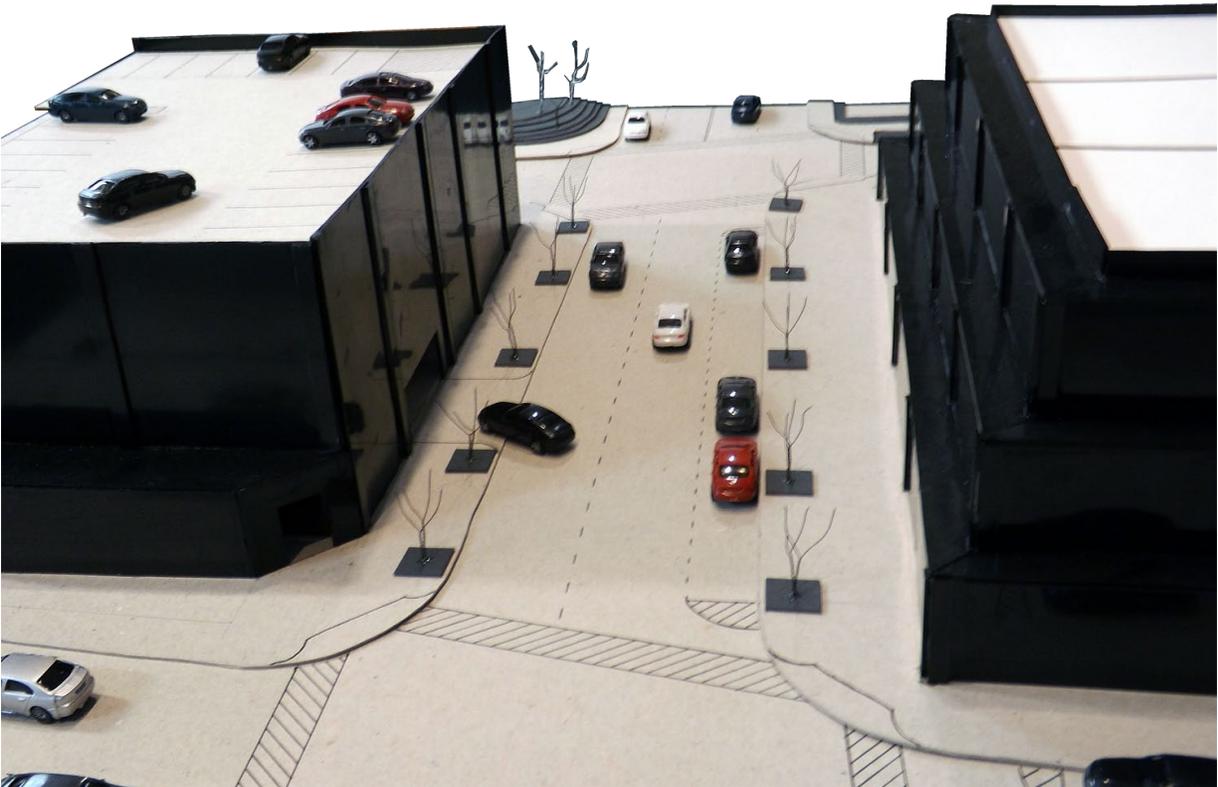
Site land use model showing the new structures taking over the existing surface parking lot. Service alleys and parking garages boost the parking count to the required numbers for the uses, around two thousand four hundred spaces, while bringing in new open and green space for the site.

## Results: Small Scale Site Solutions

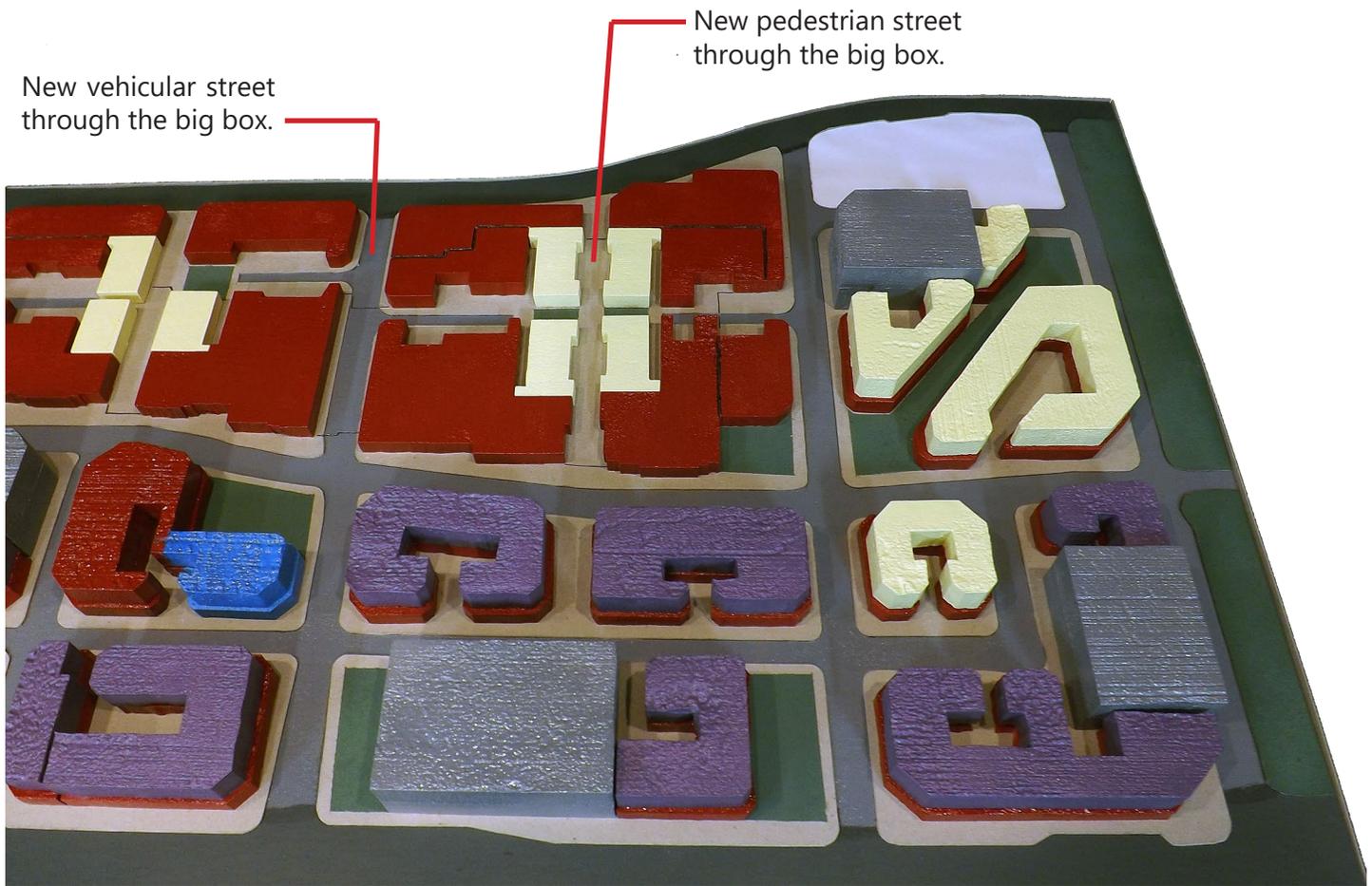
At the street level the site will incorporate many aspects to create a vibrant community environment. Street-facing retail, on-street parking, and street trees all combine to present an inviting area that encourages people to walk around the new blocks. The addition of on-street parking along these streets slows traffic down while also bringing a level of activity to the street scene with people coming and going.



Site model of street life showing ground floor retail with residents above and a parking structure



Site Section showing related building heights to other site features

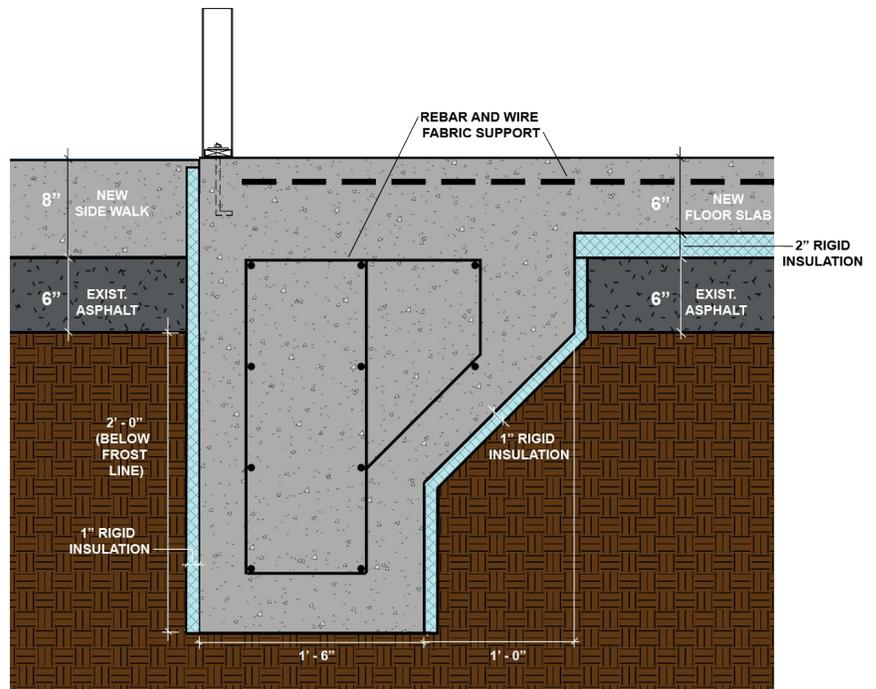


New vehicular street through the big box.

New pedestrian street through the big box.

The new buildings in the parking lot will connect with the existing big boxes with new vehicular and pedestrian only streets throughout the site. New open park spaces and plazas will also bring life and people to the site for recreation and enjoyment.

Instead of having to spend the extensive amounts of time needed to dig large, traditional box type foundations, the new buildings built in the out lots and parking lots will utilize a modified slab on grade foundation built on top of the existing asphalt. Along with saving time this will also save large amount of asphalt from needing to be dug up and disposed of. Instead just a two to three foot strip around the perimeter of the new buildings will need to be excavated.



Modified slab on grade foundation detail that preserves existing asphalt.

## Results: Box Selective Demolition and Preparation



Footprint of existing Target store

Focusing in on the Big Box stores themselves we need to see what parts of the existing building are suitable to reuse. The simple column, to beam, to bar joist structural system lends itself to easy alterations, piece by piece to let new structure be introduced and allow streets and alleys to plow right through to the other side of the building. Exterior concrete block and stucco walls are also easily cut apart and patched for new openings.



Area of the existing Target to be removed

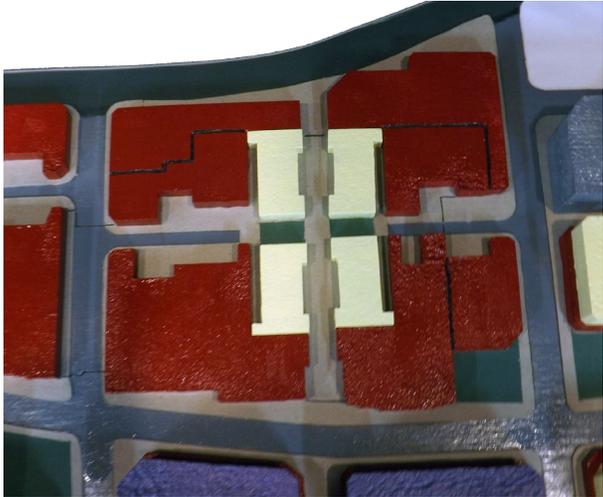


Location of new Primary Street cut through, separating the existing Target from Staples, allowing better vehicle movement



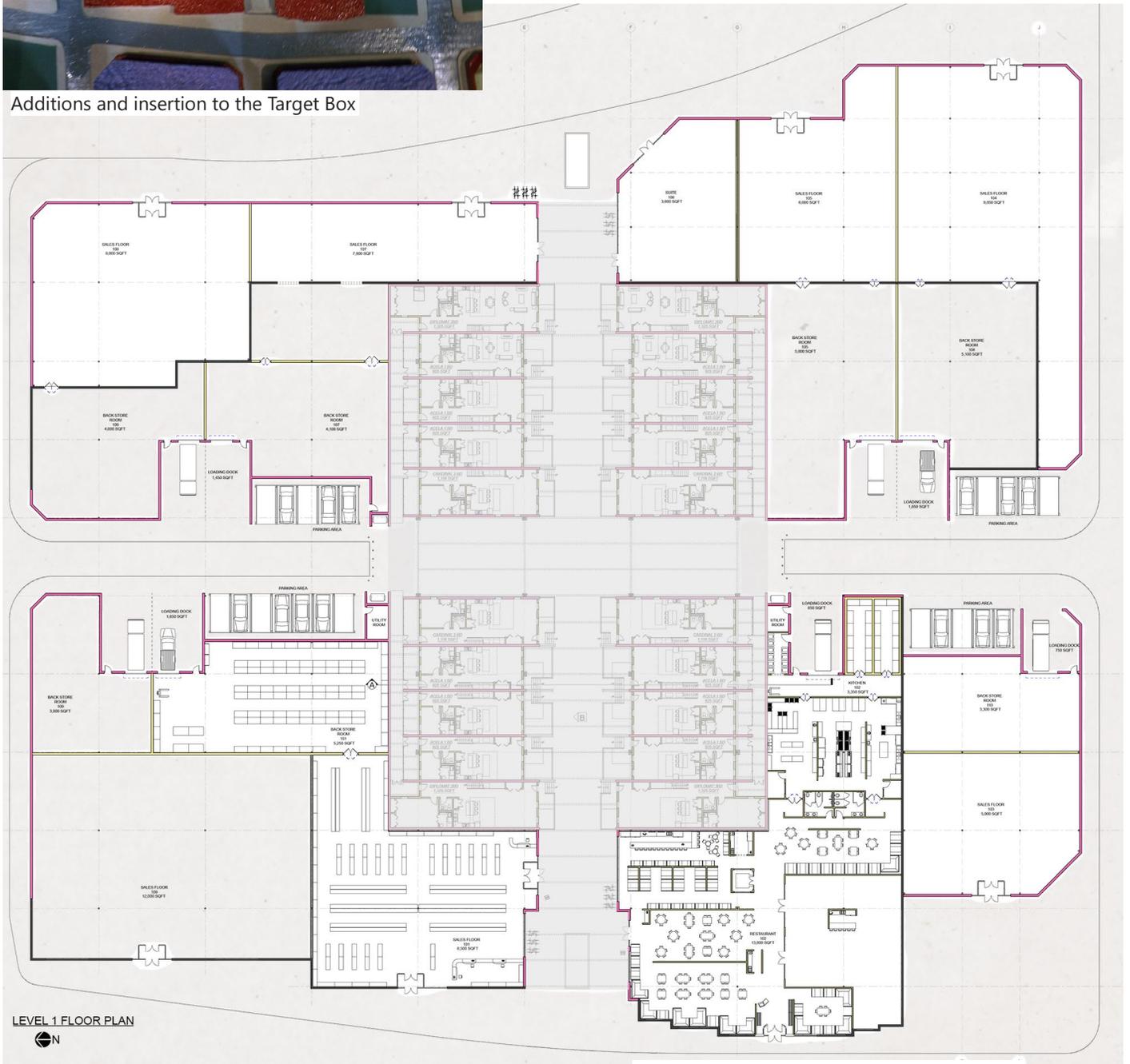
With the pedestrian street and service alleys cutting through, and new additions to half of the exterior, we can cut up the Box into small sized, more lease-able commercial spaces. New residential units are then inserted into the center along the pedestrian street.

## Results: Box Addition and Commercial Upgrades



With new streets surrounding the Box, we need to engage the building with the sidewalks. New additions do this by adding commercial space to these street fronts.

Additions and insertion to the Target Box



Floor plan showing the new commercial spaces added to the exterior of the existing Target.



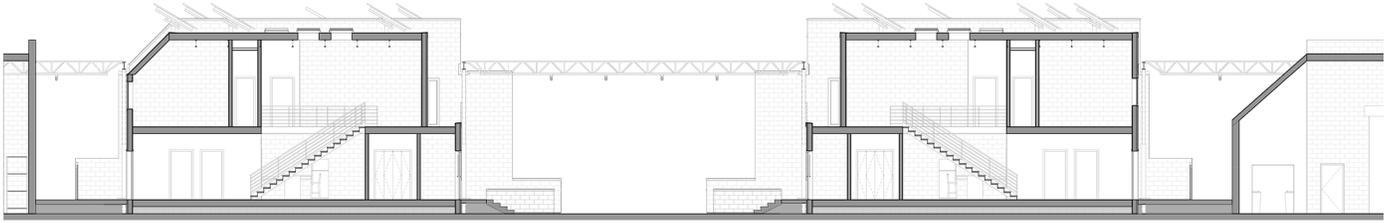
Satellite Map,  
Source: Google Earth

Potomac Ave is completely ignored by the current buildings and blocked by large landscaped medians. The new additions will engage that street, settling and slowing the fast moving traffic currently on it.



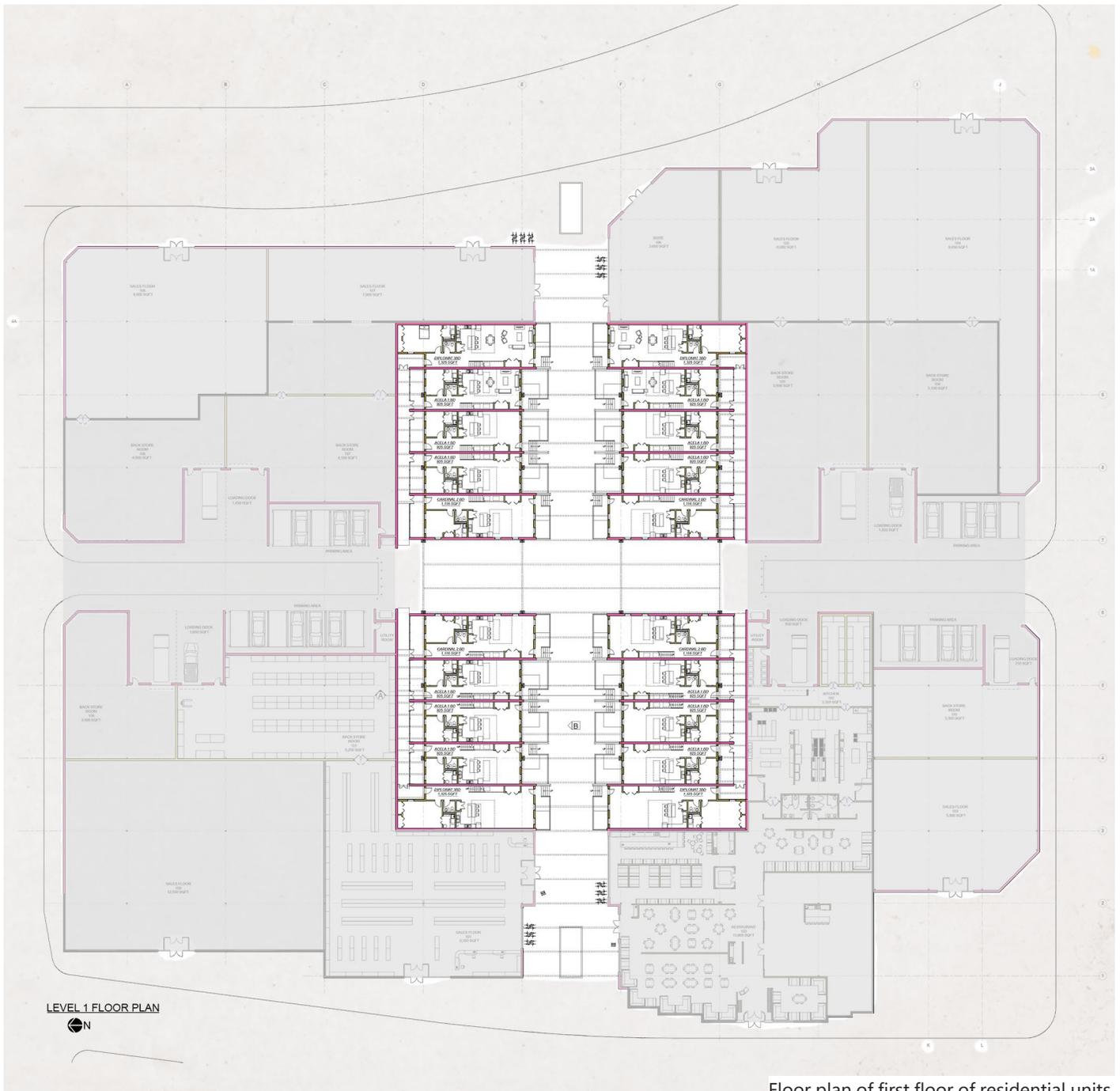
With the additions allowing public access to all sides of the building, there's a need for an area for the back of house functions for both the commercial and residential spaces. The new horizontal alley provides space for loading areas, trash collection, and parking spaces. The alley does not cut across the pedestrian street.

## Results: Residential Insertions, Overall



Cross section showing the old structure interacting with the new residences

The new pedestrian street is lined with residential townhouse type units. This residential component adds a new layer of depth to the site that is currently lacking. The two story units vary in size and bring different sizes and types of housing not currently offered in the rest of the Potomac Yards area.



Floor plan of first floor of residential units.



LEVEL 2 FLOOR PLAN



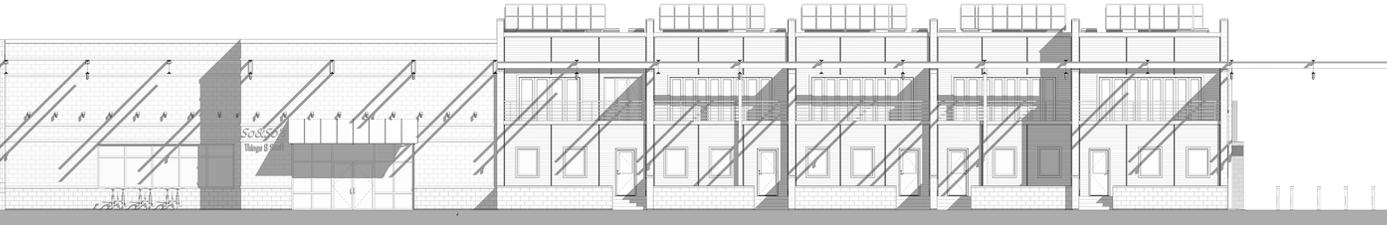
2nd floor plan of residences



Pedestrian street in front of new residences model.



Pedestrian street.



Elevation along the pedestrian street, changing from commercial spaces to residences.

**Results: Residential Insertions, Individual**

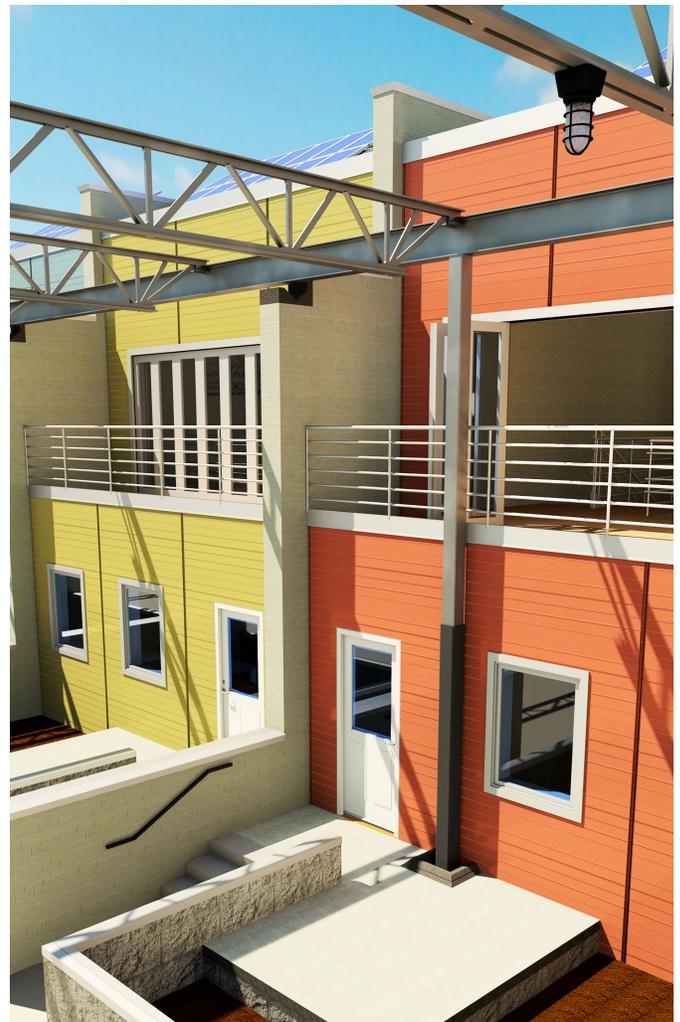


Residential unit grouping model

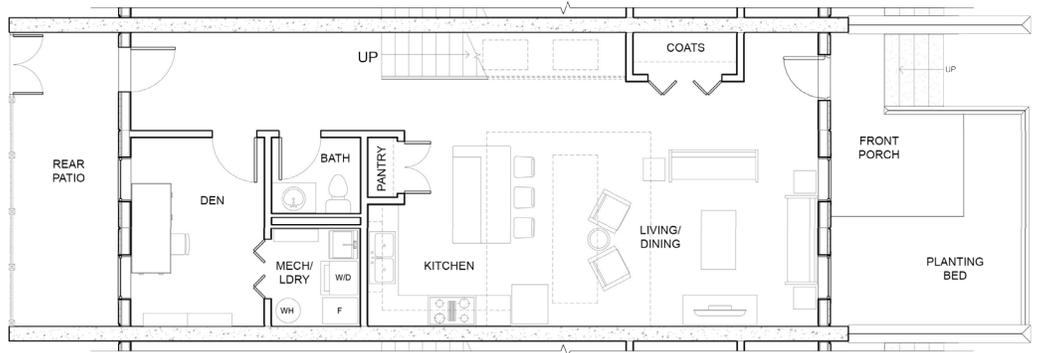
These new resident groupings engage the pedestrian street with planting areas and front porches with overlooking balconies. With the exterior metal wall panels being pre-fabricated off site they can be finished in a variety of colors to differentiate the units from one another and bring more life and color to the street scene. New exterior street lights have been affixed to the existing roof joists to illuminate the street and present an inviting space for people to be. Continuing with the theme of being environmentally conscious the addition of solar panel arrays on the roofs provide the needed electrical power for the units.



Unit front porch and entry model



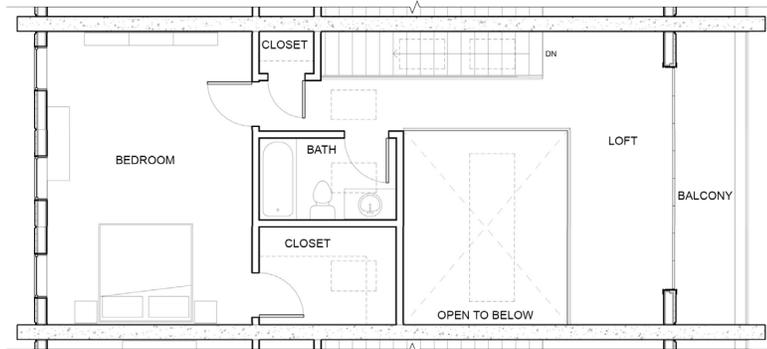
Unit front porch, entry, and balcony



ACELA LEVEL 1 FLOOR PLAN  
925 SQUARE FEET

1 BEDROOM, +1 DEN  
1 1/2 BATHROOMS

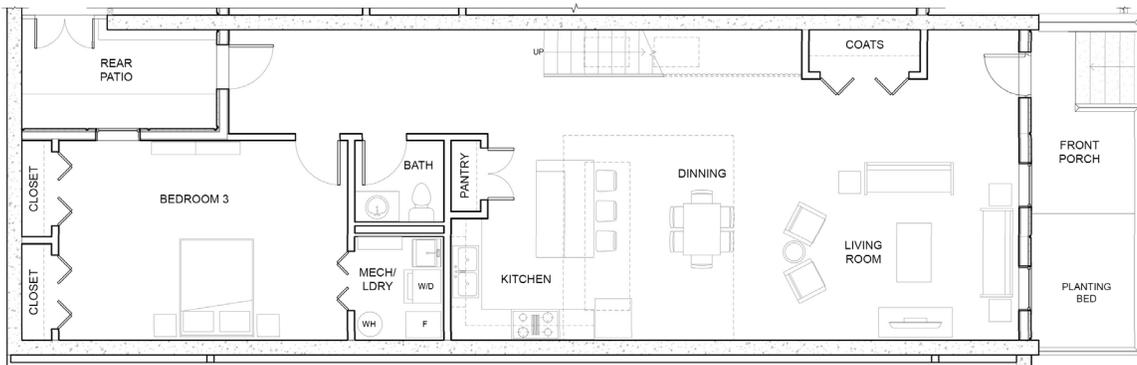
1 Bedroom + Den  
unit floor plan



ACELA LEVEL 2 FLOOR PLAN  
925 SQUARE FEET

1 BEDROOM, +1 DEN  
1 1/2 BATHROOMS

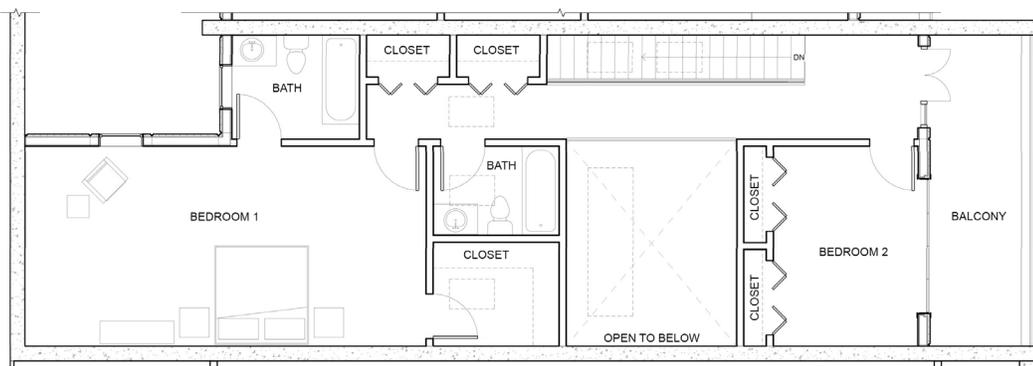
One, two, and three bedroom units bring a variety of household sizes into the community while the units themselves provide amenities like balconies, large kitchens, ample storage, multiple skylights, and double height lofted space for light and air.



DIPLOMAT LEVEL 1 FLOOR PLAN  
1,325 SQUARE FEET

3 BEDROOMS  
2 1/2 BATHROOMS

3 Bedroom  
unit floor plan

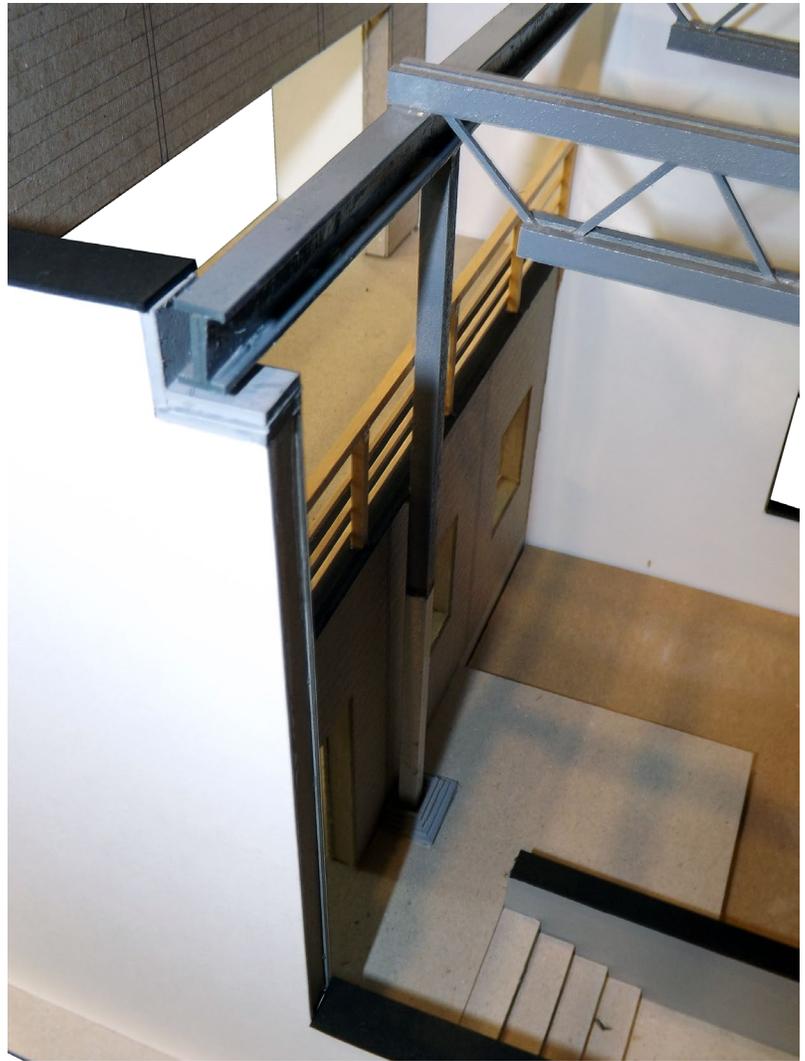


DIPLOMAT LEVEL 2 FLOOR PLAN  
1,325 SQUARE FEET

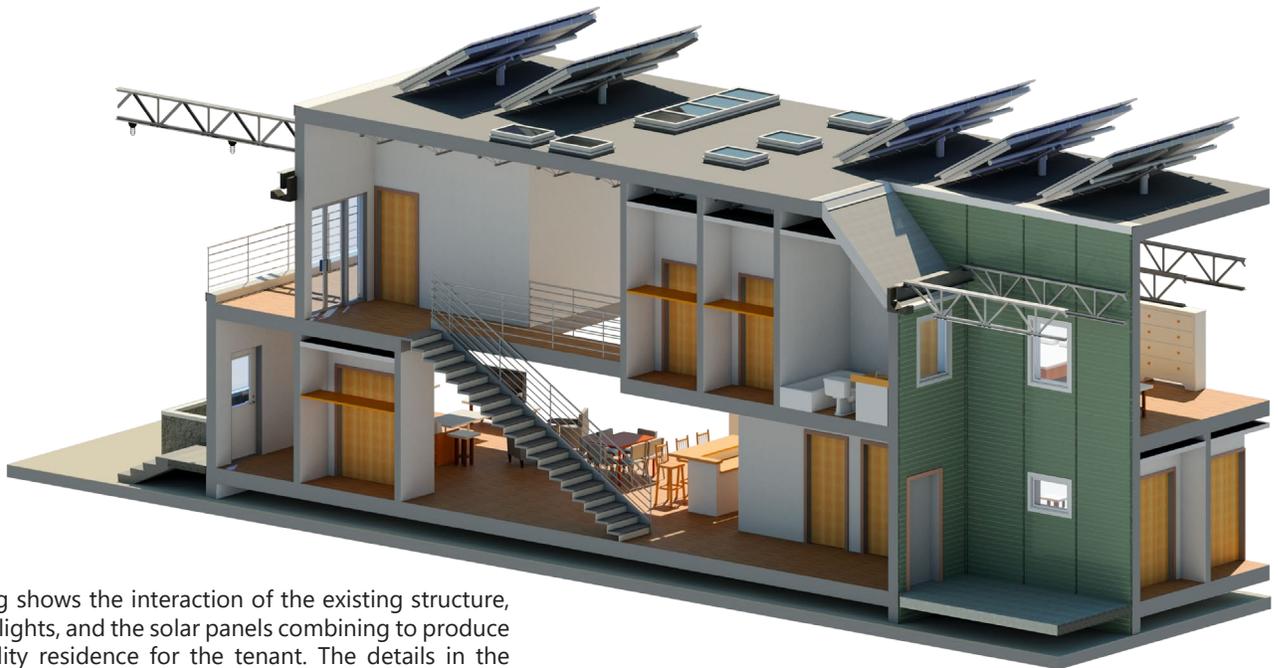
3 BEDROOMS  
2 1/2 BATHROOMS

## Results: Residential Insertions, Details

At a closer level of detail, the new residential units show us more about their componentized construction and integration with the existing building members. Moments of tension and enjoyment are built with the party walls almost touching the existing beams, while the new exterior metal wall panels show their joints.



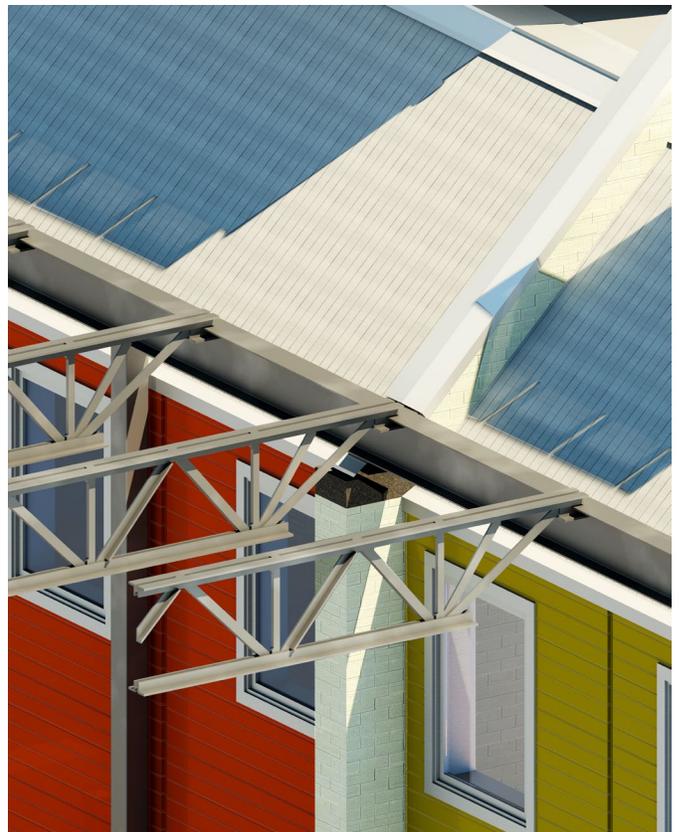
Existing Column Pocket and  
Beam cutout details



This rendering shows the interaction of the existing structure, the new skylights, and the solar panels combining to produce a high quality residence for the tenant. The details in the construction and design exhibits a welcome honesty to how this project came together in a real and meaningful way.



Exterior metal panels interacting with the existing columns, beams, and trusses



Party wall casting detail



Front porch, planting bed, and balcony detail model

## Discussion: Aging and Life Cycle Design

How this project ages is a critical issue to consider in the life cycle of the whole site's future development. The idea has always been that in a few years this project will be taken apart to allow for Phase two construction to begin and further strengthen the community. Therefore things like rust taking over the exposed steel and vines growing up the walls are symbols of age and a reminder of the changes that will come to this site.



Day one view

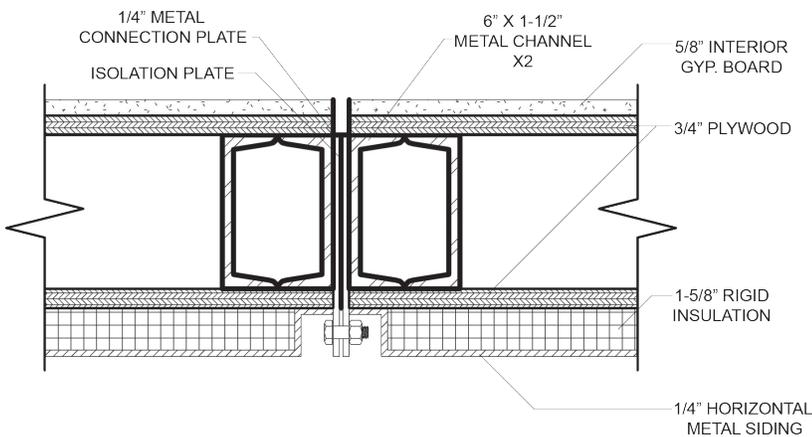


Day four hundred view

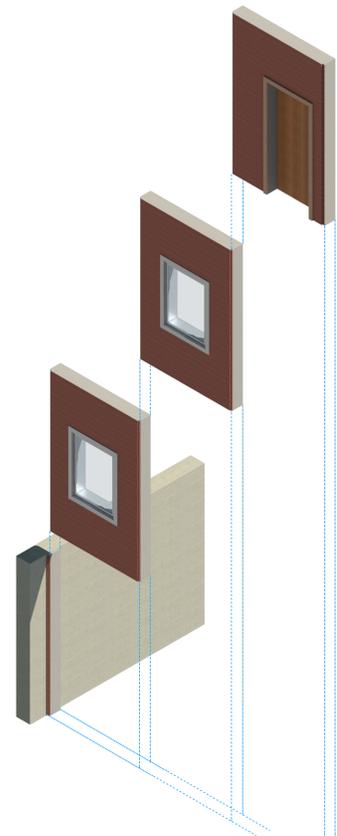


Day eight hundred view

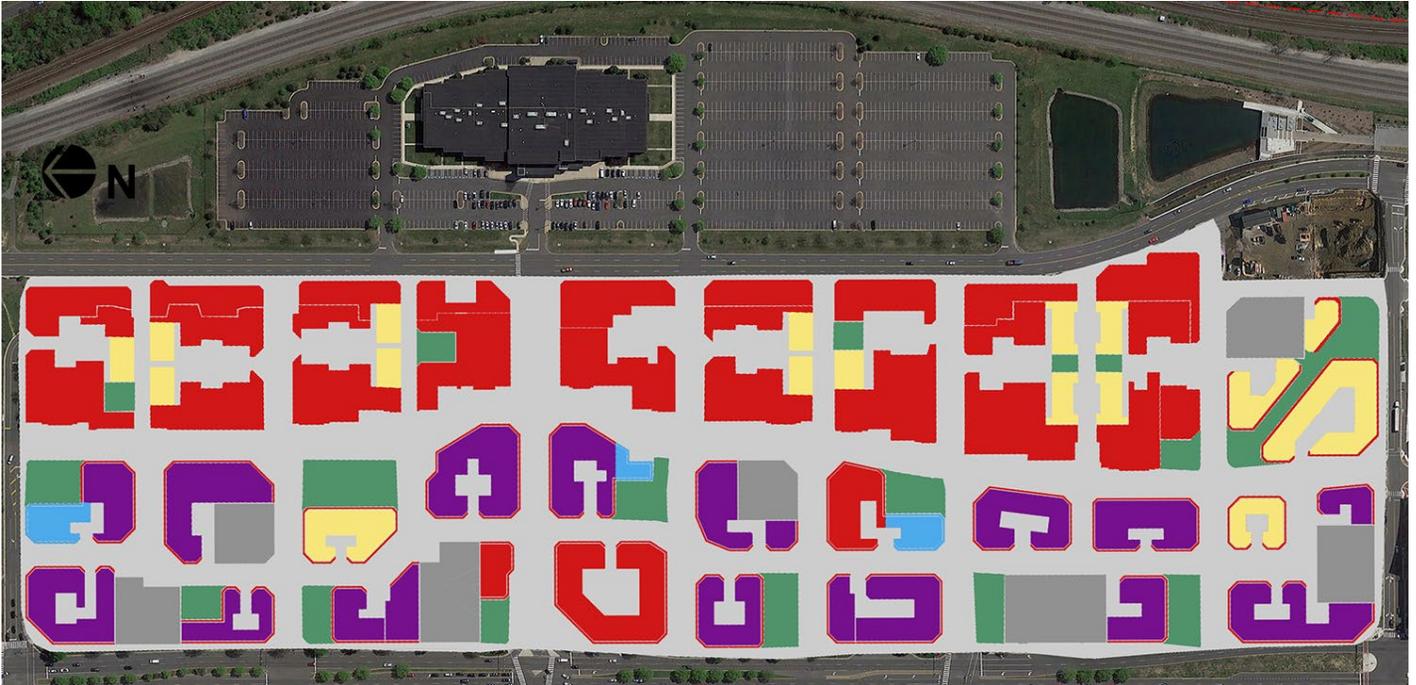
Also the ease of assembly and per-manufactured components used to quickly deliver the project lend themselves to easily being disassembled, transported to a new site, and installed in a similar project in one of the thousands of locations like this across the country. There it can be built into an ongoing development project like here at Potomac Yards or be the first piece to start up a new development.



Exterior metal wall panels can be easily unbolted and reused on another building site

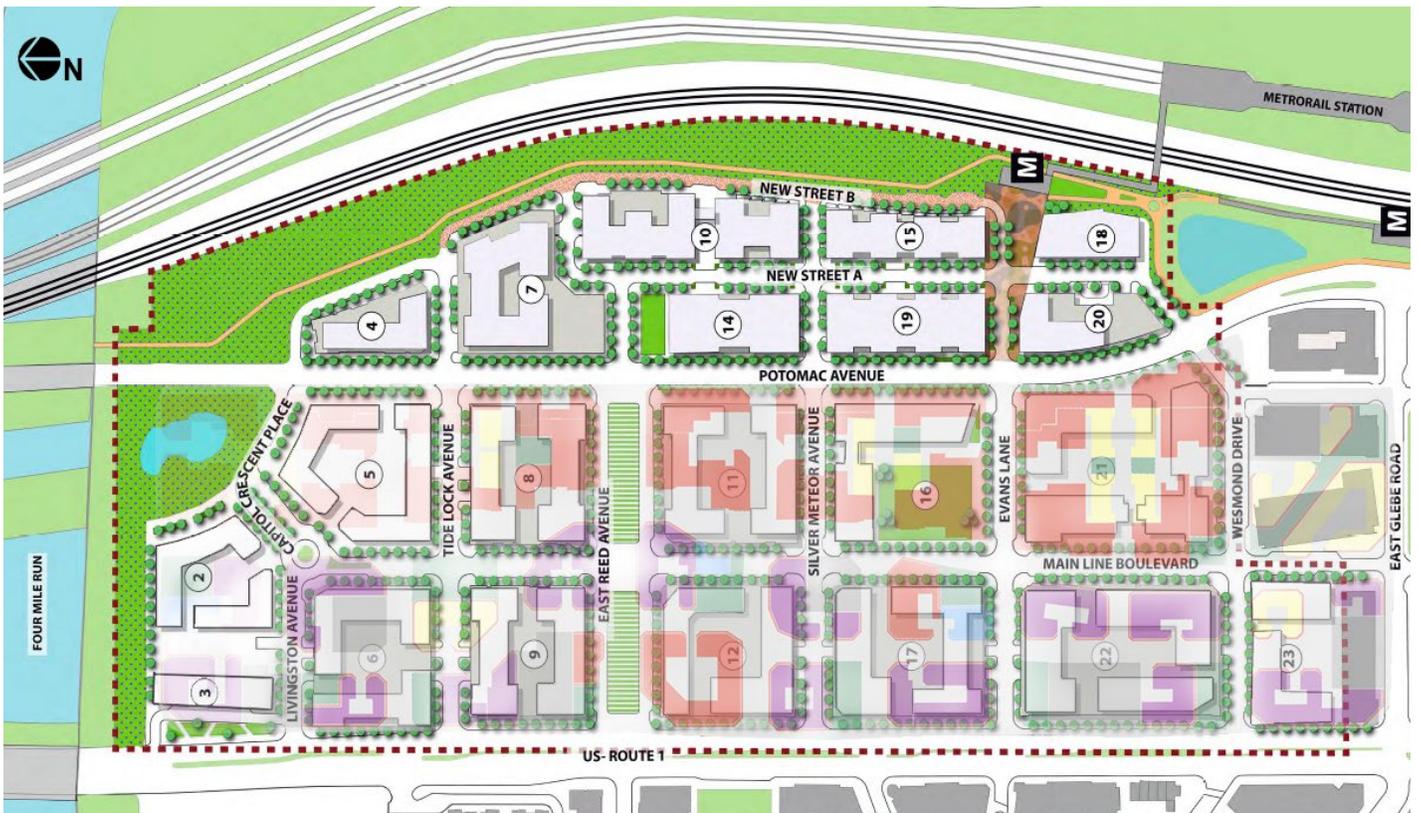


## Conclusion: Future Development

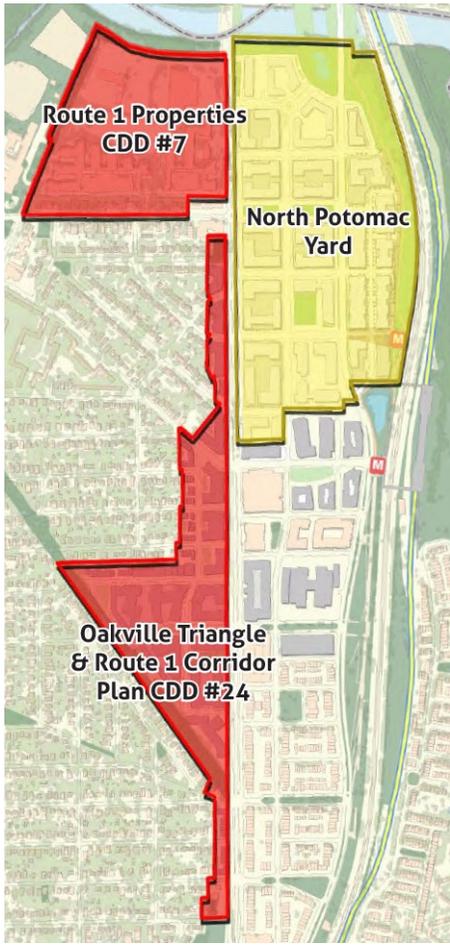


Overall site development map

All of this development I've proposed still allows for the planned implementation of the developers phase two planned construction. It instead allows for these existing buildings and land to be used for a much better purpose instead of enduring in its current state and condition. It will help to strengthen and build up the community along with phase one and foster the neighborhoods desire to undertake phase two in the projected twenty to twenty five years it may take to reach that point of construction.



The total site development with my proposed development being tak over by the phase two project



With my proposal giving way to phase two, the cities vision of a new, vibrant, and exceptional urban neighborhood can still be achieved in the long run. My solution aims to make this transition differently by allowing the site to take on an urban setting much quicker, instead of one of ceaseless construction for decades to come.



Other local development projects that will grow with North Potomac Yard.  
 Source: North Potomac Yard Small Area Plan 2017



Renderings of open community green spaces, street life, and urban design sense that will one day come to Potomac Yards, Source: North Potomac Yard Small Area Plan 2017

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