Denny Substation
Concept Design Phase Review

with the

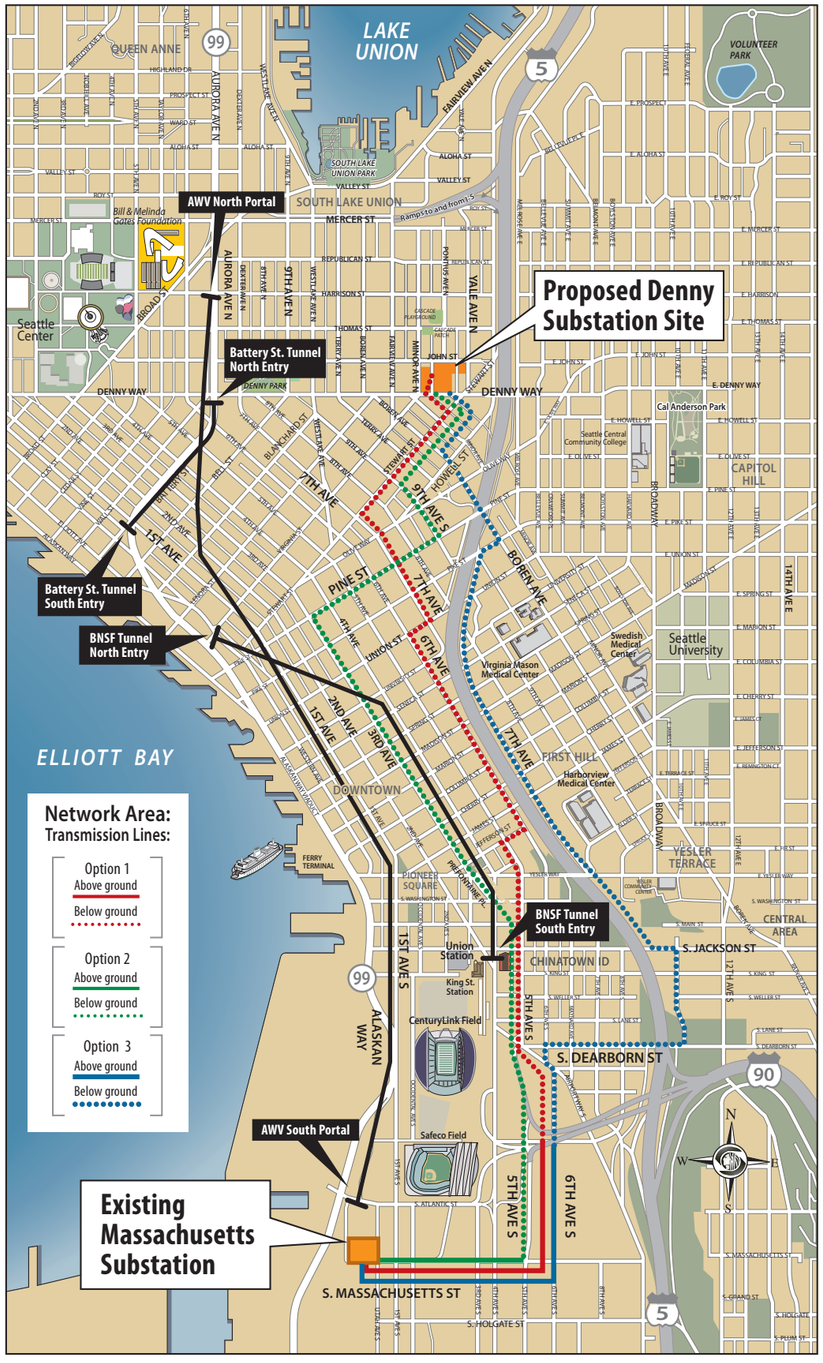
Seattle
design
Commission

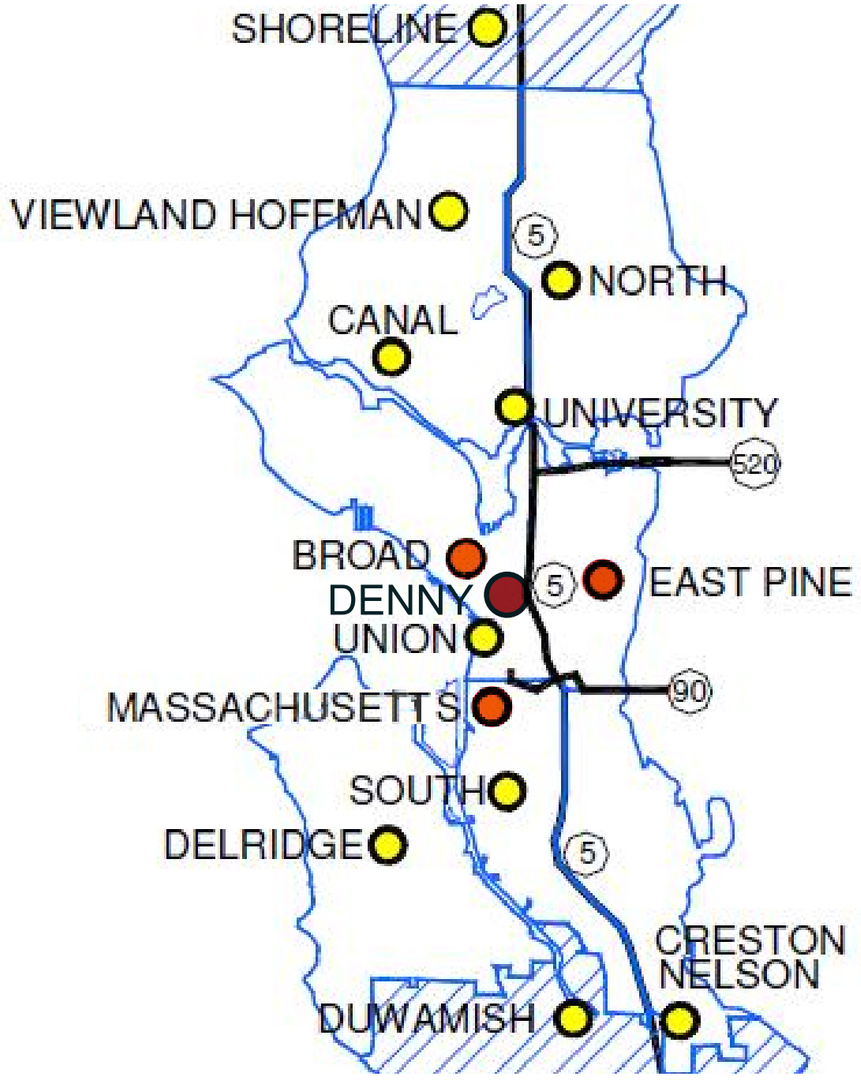
June 6, 2013

Denny Substation Project

Powering Seattle through the 21st century

UTILITY MISSION



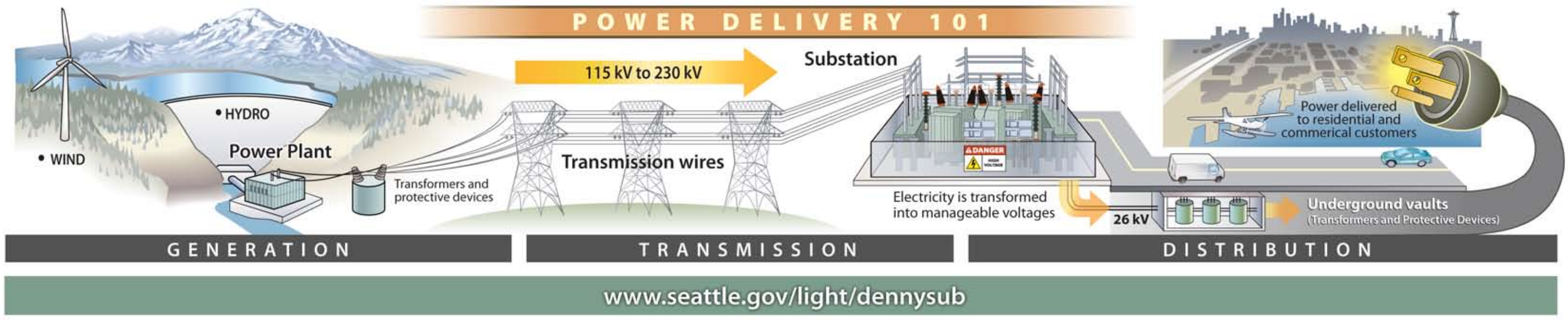


PROJECT SCOPE AND SCHEDULE

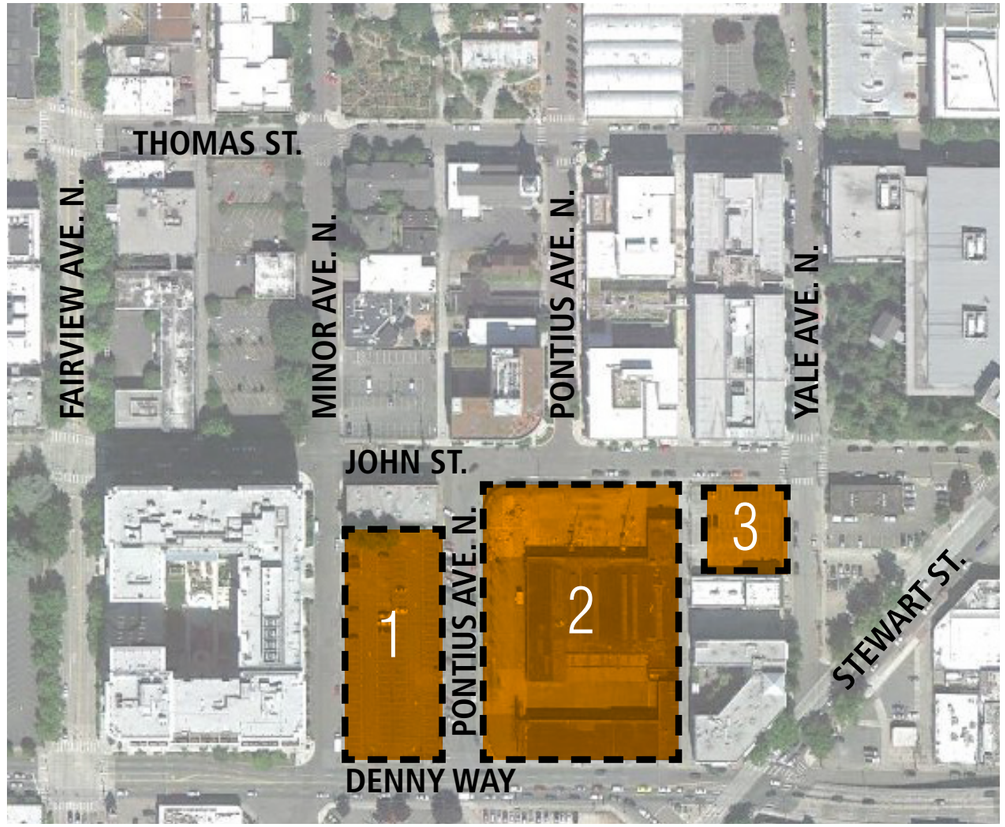
- *ULTIMATELY DELIVER 825 - 930 MVA TRANSMISSION AND DISTRIBUTION CAPACITY*
- *PROVIDE A SECURE AND RELIABLE POWER SUPPLY AND REQUIRED POWER CAPACITY TO SOUTH LAKE UNION , DENNY TRIANGLE AND ADJACENT AREAS*
- *TO SUPPORT AND ADVANCE THE URBAN CENTER STRATEGIES AS DEFINED IN THE COMPREHENSIVE PLAN*
- *ADDRESS THE GROWING NEEDS OF CURRENT AND FUTURE DEVELOPMENT*
- *DEVELOP A LAYOUT FOR LONG TERM PHASING TO MEET FUTURE POWER NEEDS*
- *FIRST PHASE TO BE OPERATIONAL BY MID-2016 (270 MVA)*

SITE AND PROJECT REQUIREMENTS

- *SITE IS MOST COST EFFICIENT GIVEN ITS PROXIMITY TO EXISTING TRANSMISSION LINES*
- *SITE FACILITATES MULTIPLE ROUTES FOR POWER DISTRIBUTION*
- *SITE FACILITATES EASE OF ACCESS FOR OVERSIZE VEHICLES*
- *UTILIZE GIS VERSUS AIR INSULATED EQUIPMENT TO MINIMIZE SITE AREA REQUIREMENTS*
- *IN ORDER TO ADDRESS THE DISTRIBUTION, PHASING AND ACCESS REQUIREMENTS PURSUE THE VACATION OF PONTIUS*
- *DEVELOP A PUBLIC BENEFIT PACKAGE TO ADDRESS THE ADJOINING NEIGHBOR AND COMMUNITY CONCERNS AND NEEDS*
- *DEVELOP A MASSING AND SITE EDGES THAT MITIGATE THE VISUAL IMPACT OF THE SUBSTATION*
- *SHOWCASE SUSTAINABLE STRATEGIES*

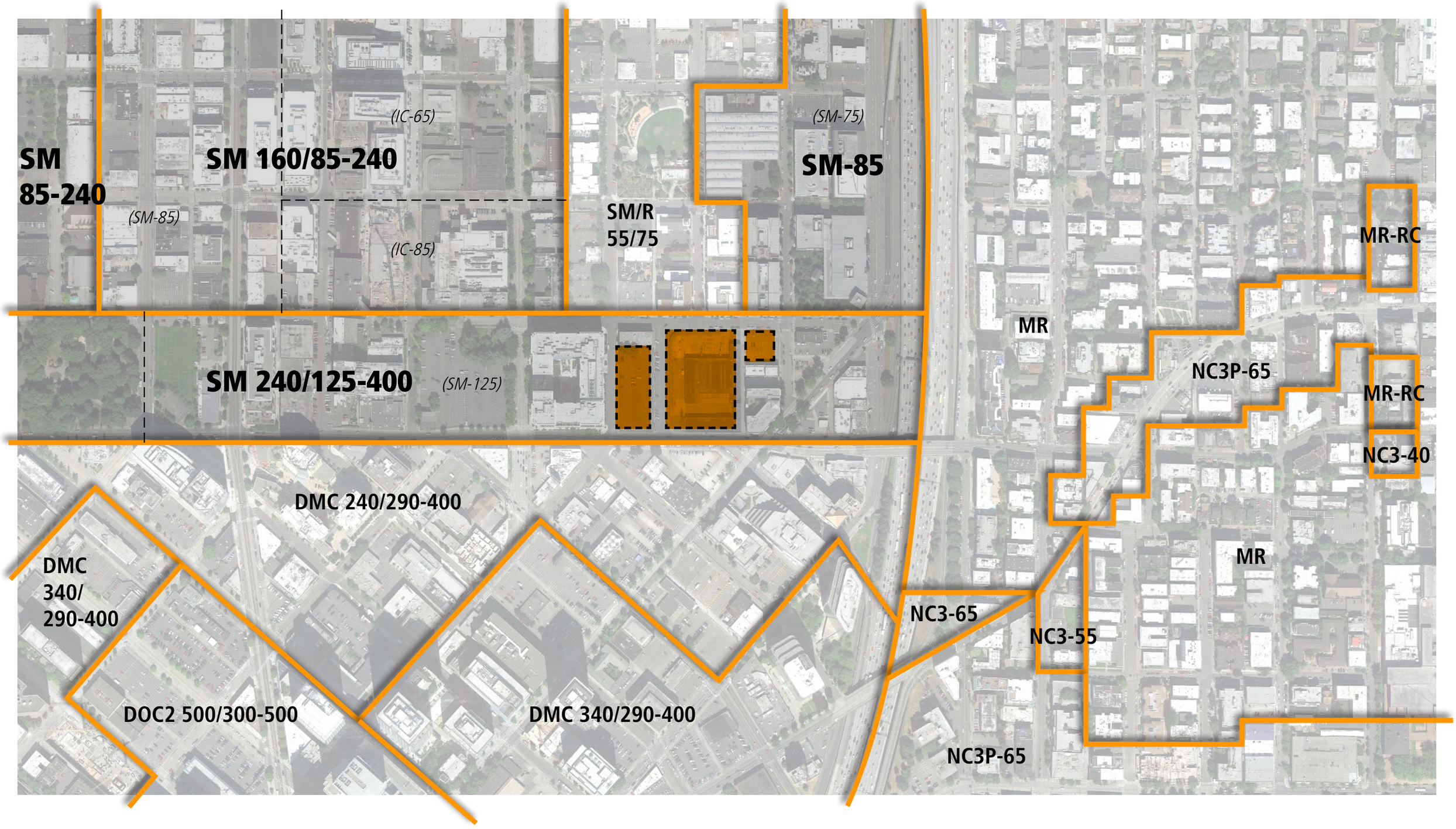

POWER DELIVERY 101
115 kV to 230 kV
Substation
• HYDRO
Power Plant
• WIND
Transformers and protective devices
Transmission wires
DANGER
Electricity is transformed into manageable voltages
26 kV
Power delivered to residential and commerical customers
Underground vaults
(Transformers and Protective Devices)
GENERATION
TRANSMISSION
DISTRIBUTION
www.seattle.gov/light/dennysub

AERIAL VIEW FROM DENNY WAY



SITE PLAN

STREET VIEW ALONG DENNY WAY LOOKING NORTH



ADOPTED ZONING CHANGES

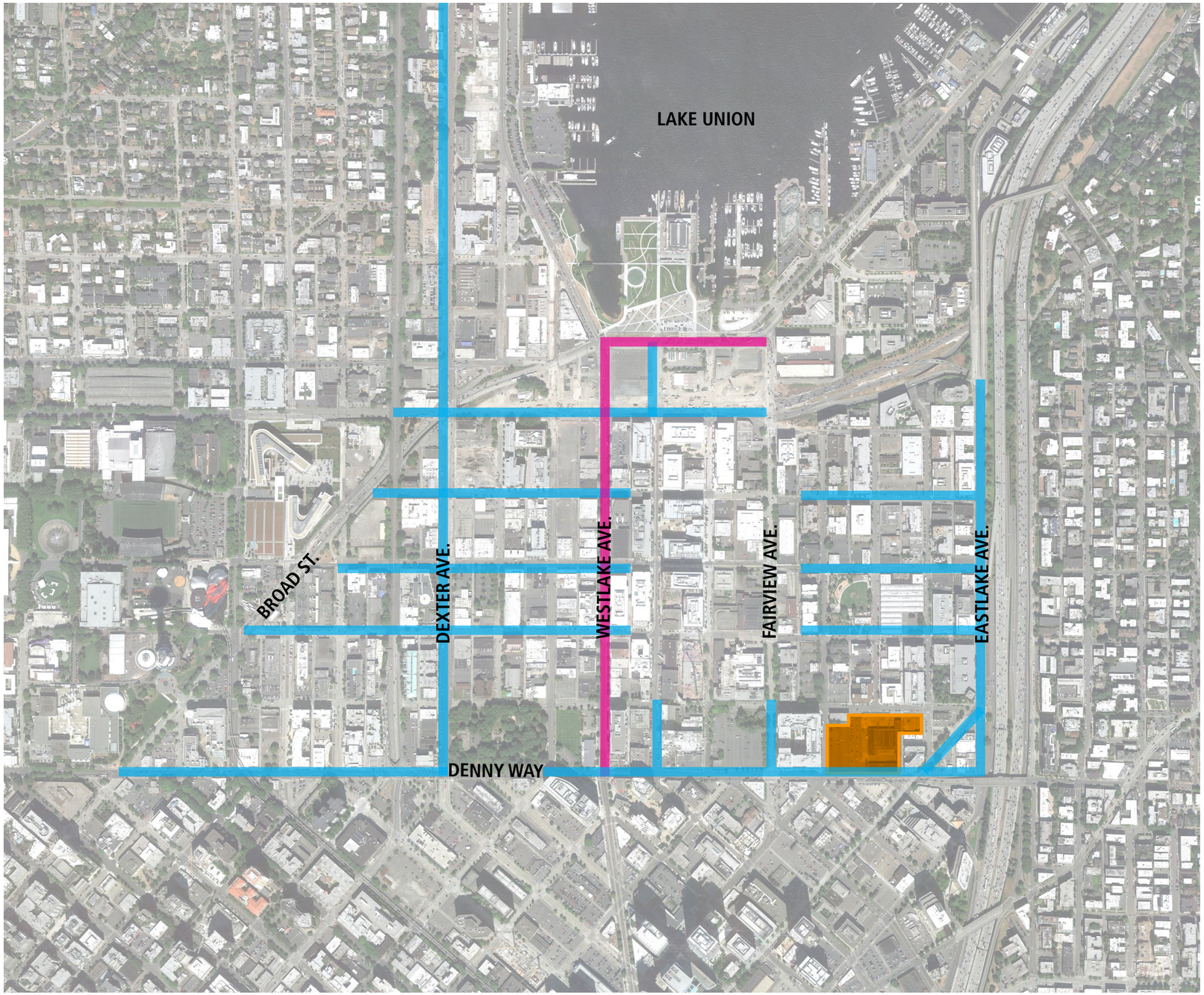
nbbj

PEDESTRIAN STREET CLASSIFICATIONS

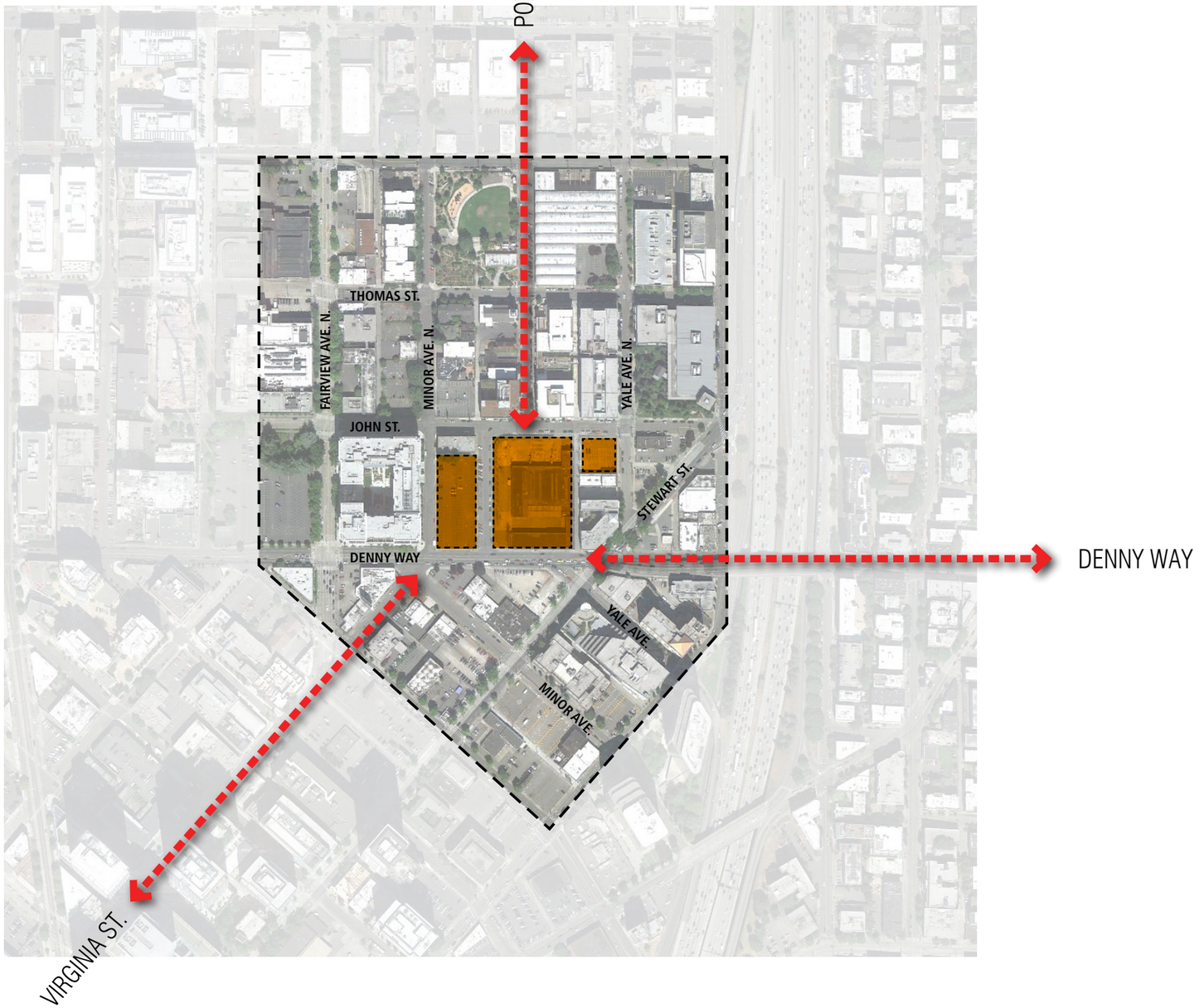
CLASS 1 PEDESTRIAN STREETS

CLASS 2 PEDESTRIAN STREETS

*On Valley Street, all Class 1 Pedestrian Streets requirements apply only to lots abutting on the south side of the street.



9 BLOCK FOCUS AREA

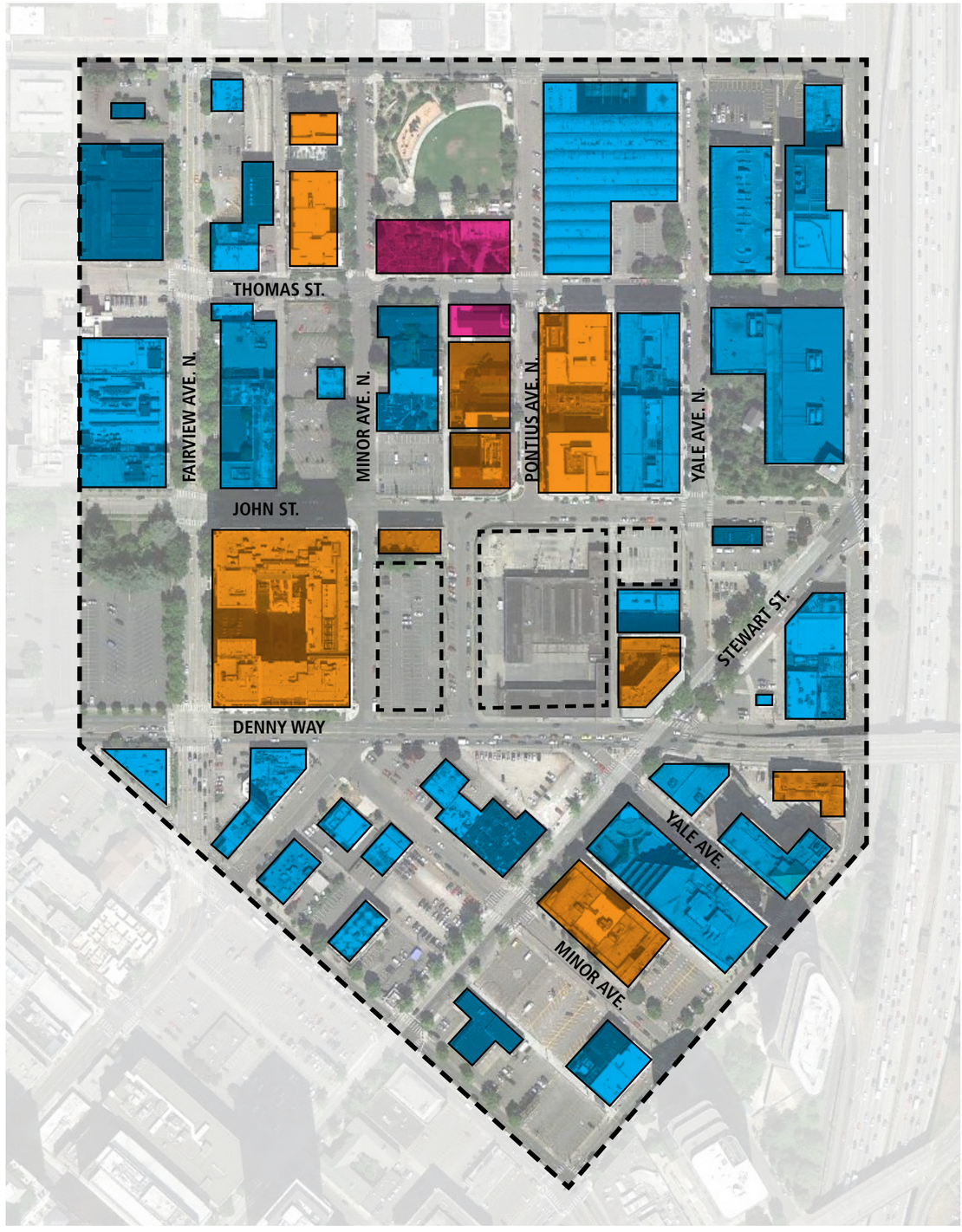


USE TYPE

COMMUNITY

COMMERCIAL

RESIDENTIAL



CASCADE PARK and PEA PATCH

REI TRAIL SYSTEM

SEATTLE TIMES BLDG. POCKET PARK

OPEN SPACE

TRANSIT

BUS ROUTES

ZIP CARS

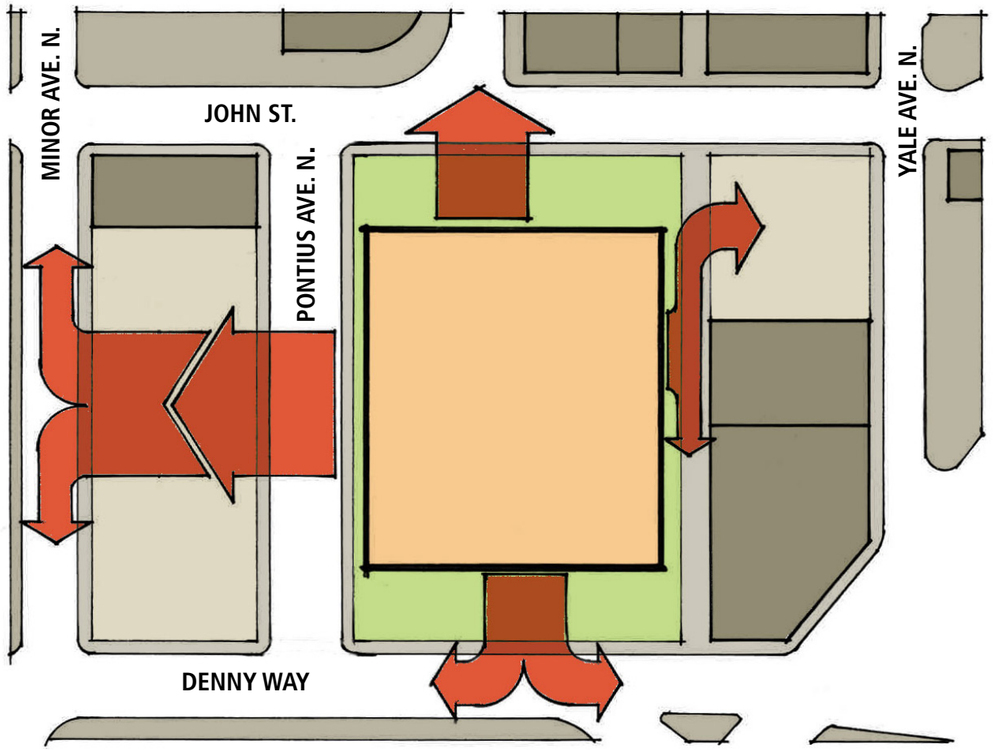
BUS STOPS

TRAFFIC COUNTS

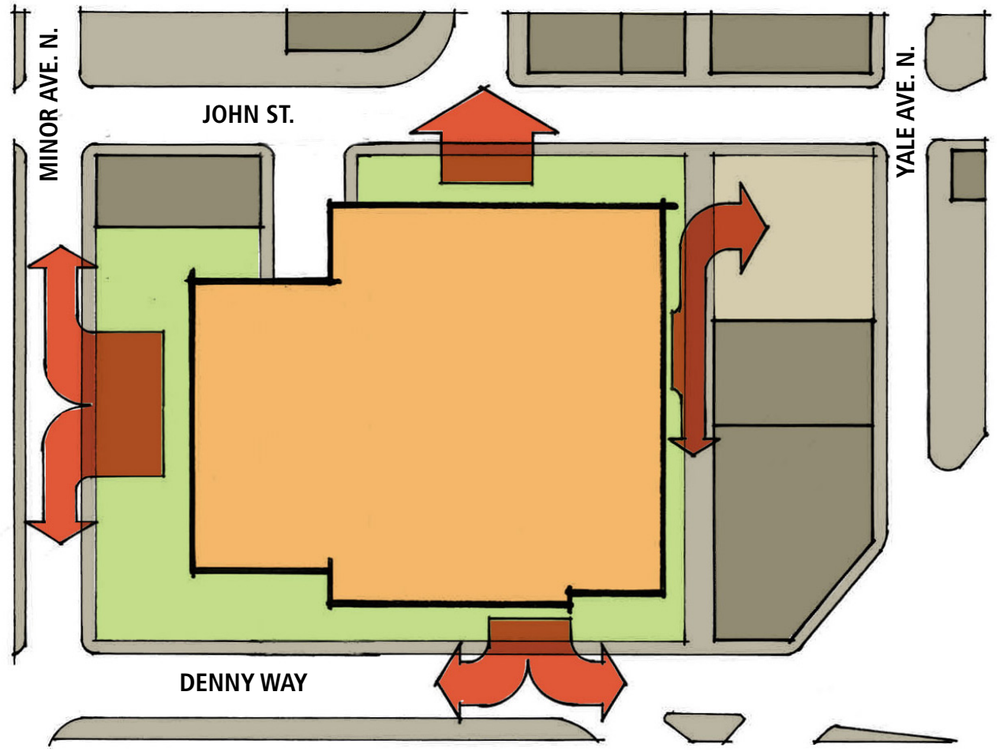
THOMAS ST. = 240 VEHICLES / P.M. PEAK HOUR

PONTIUS AVE. N = 120 VEHICLES / P.M. PEAK HOUR

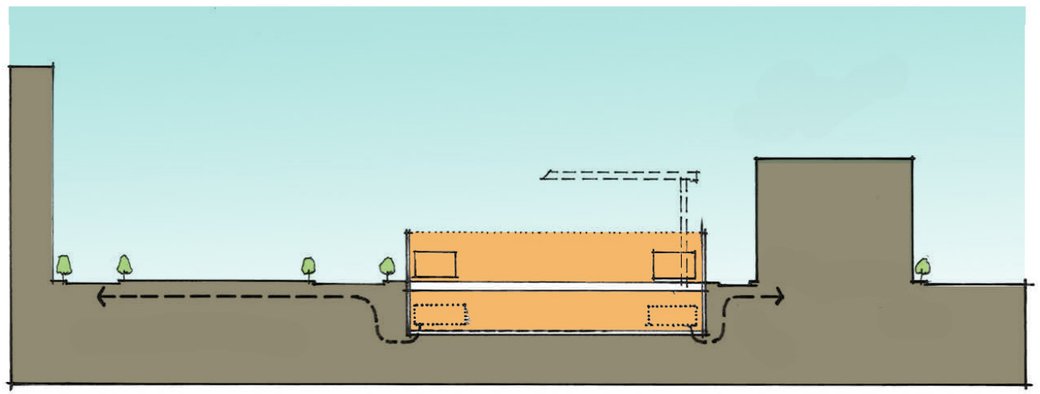
DENNY WAY = 2,000 VEHICLES / P.M. PEAK HOUR



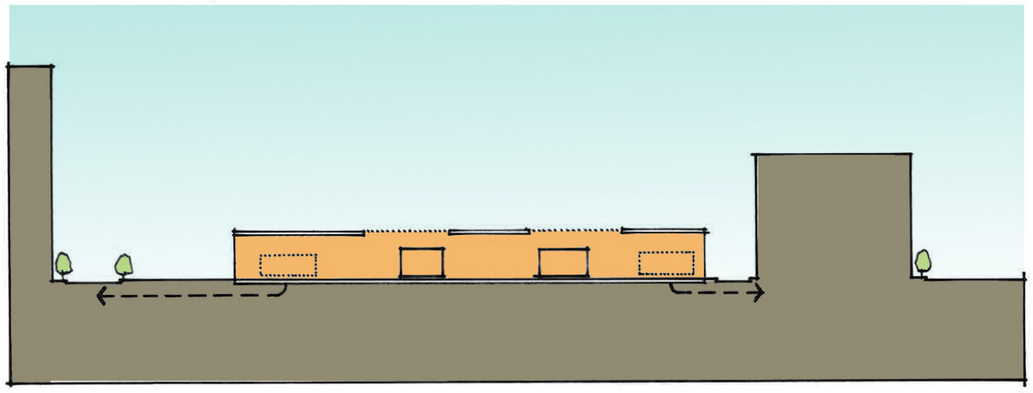
NO VACATION OF PONTIUS: DISTRIBUTION ROUTING



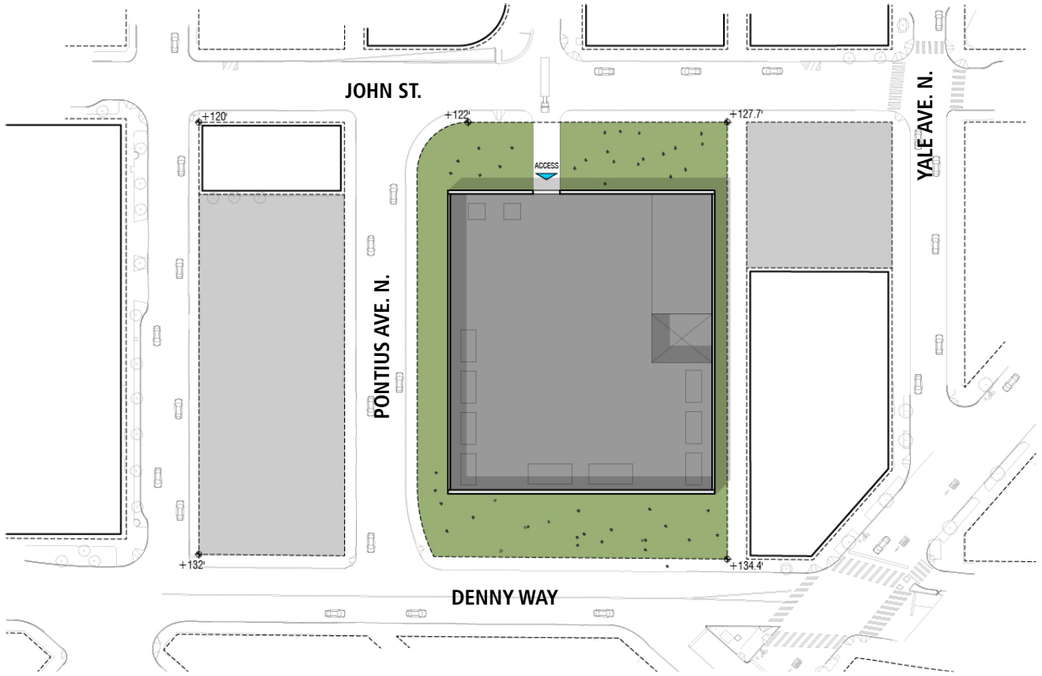
VACATION OF PONTIUS: DISTRIBUTION ROUTING



NO VACATION OF PONTIUS: TWO LEVELS

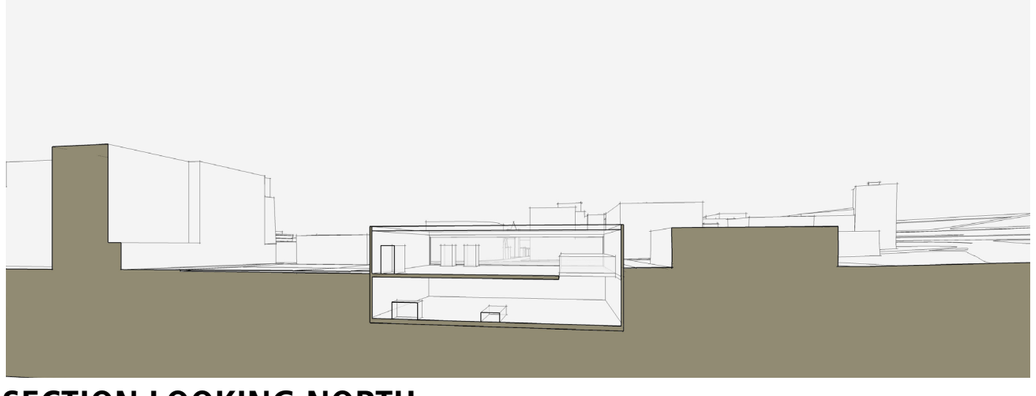


VACATION OF PONTIUS: ONE LEVEL

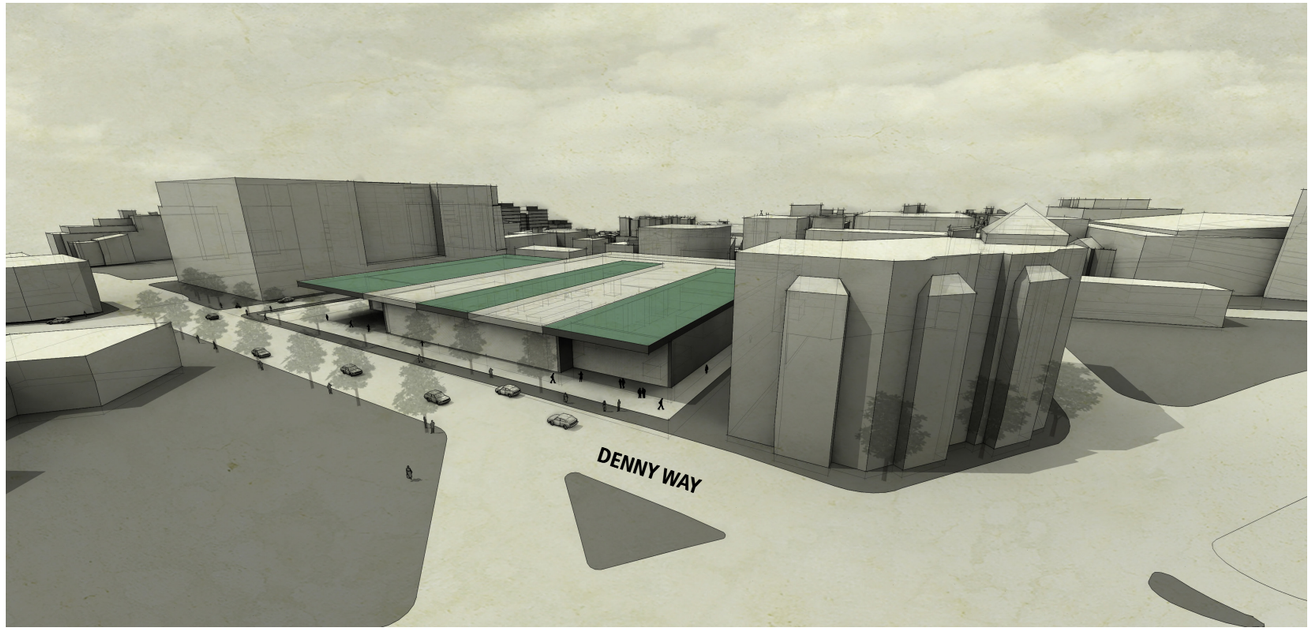


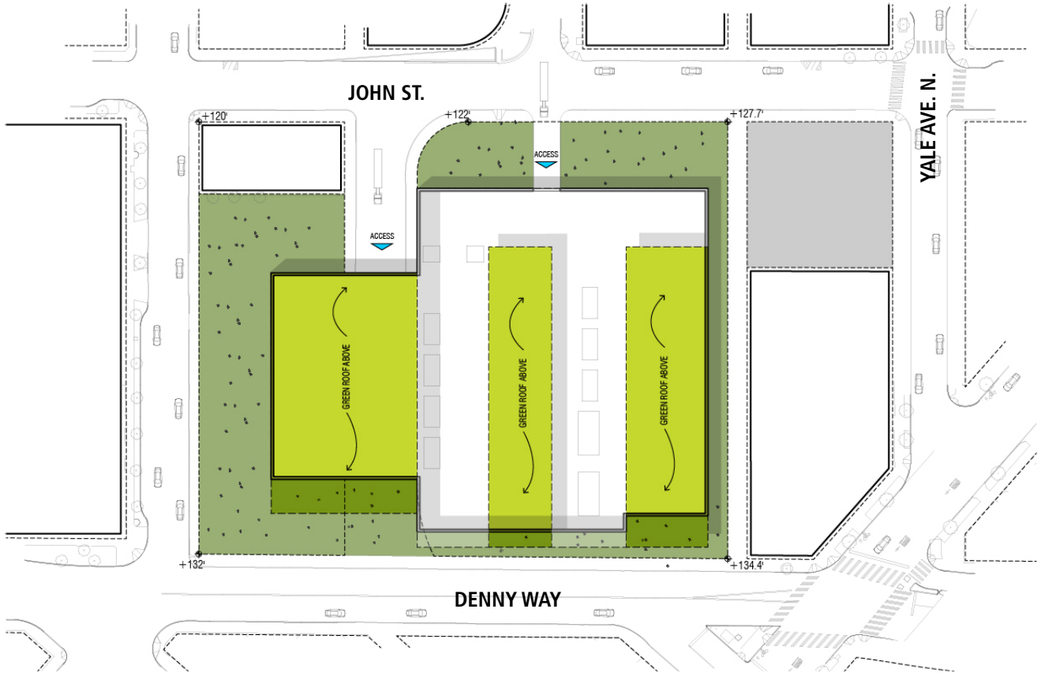
SITE PLAN

AERIAL CONCEPT RENDERINGS LOOKING NORTH

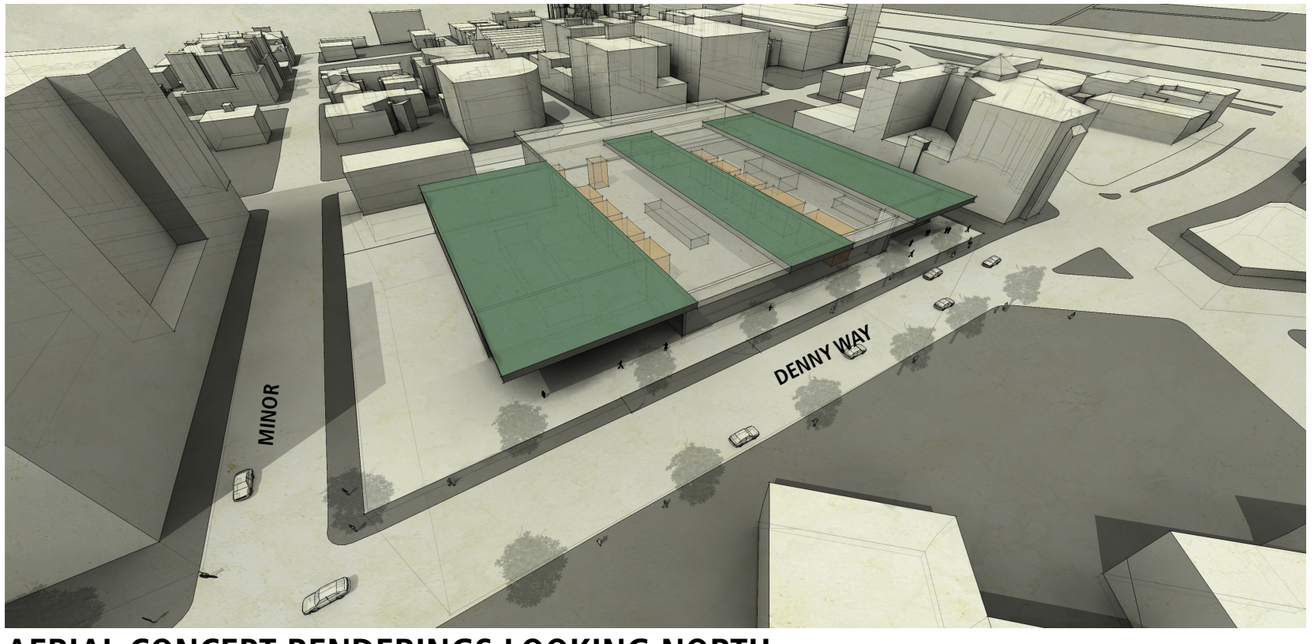


SECTION LOOKING NORTH

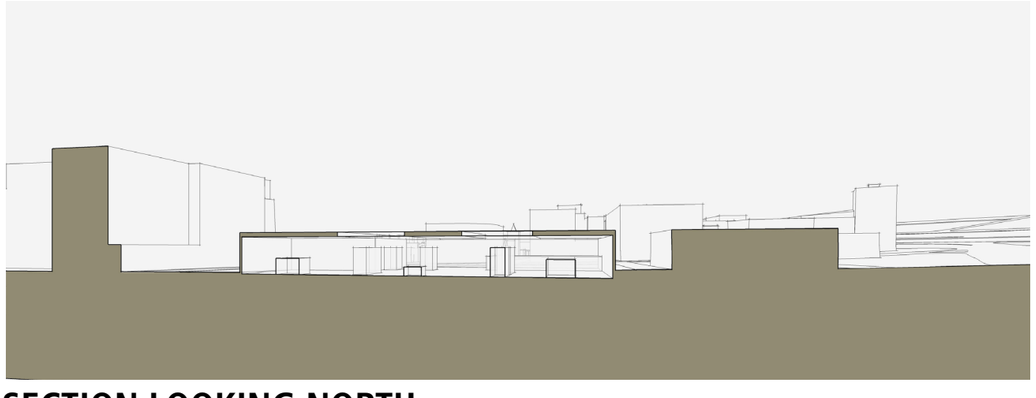




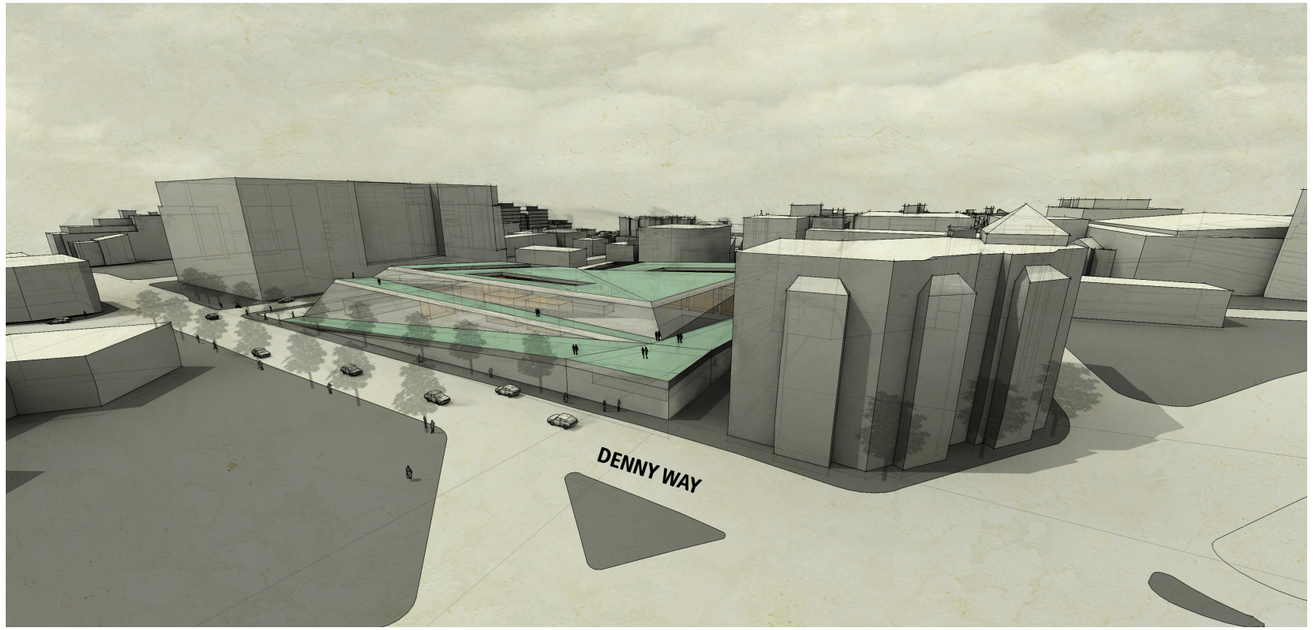
SITE PLAN

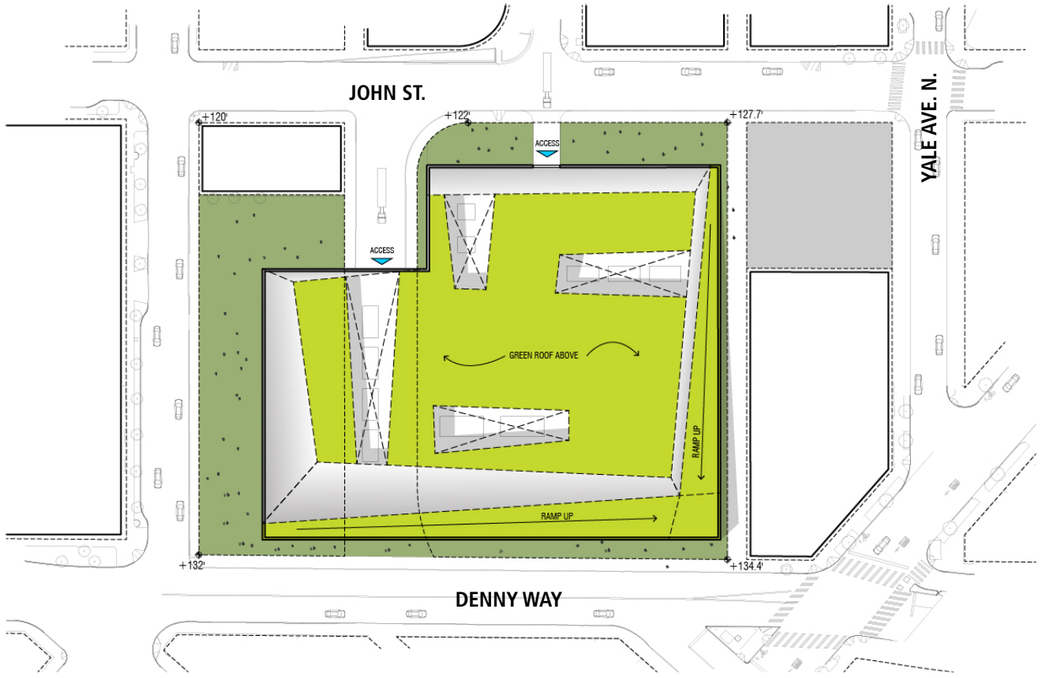


AERIAL CONCEPT RENDERINGS LOOKING NORTH

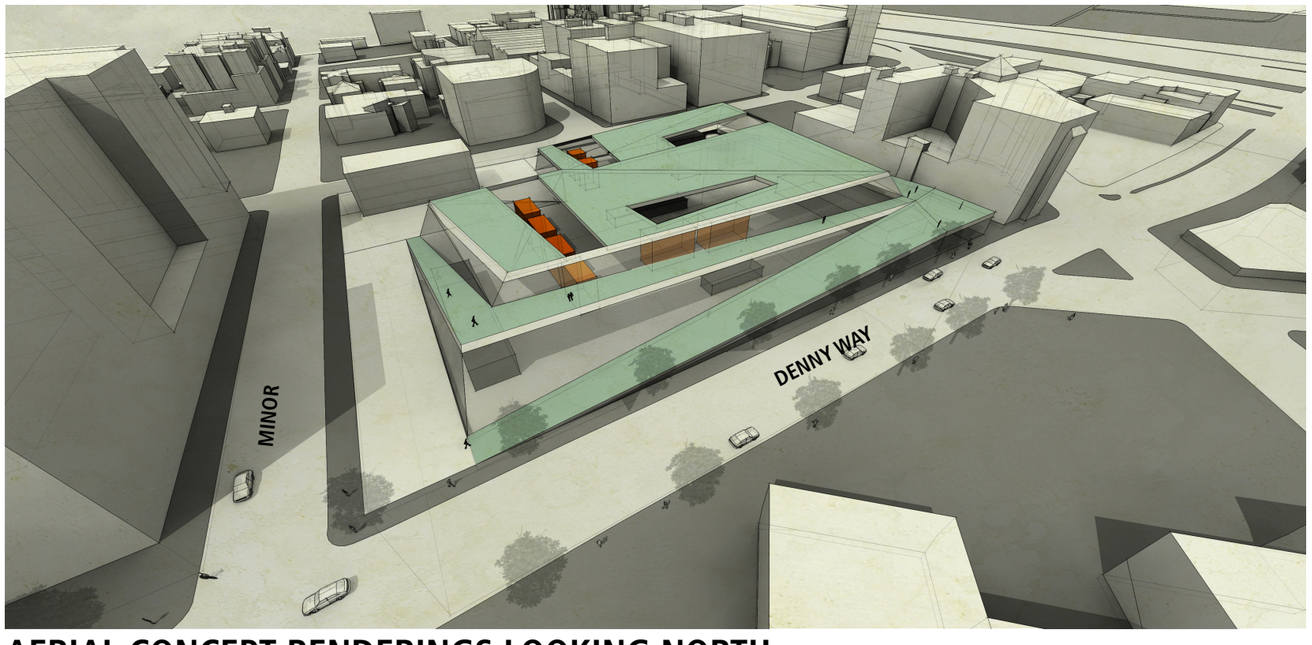


SECTION LOOKING NORTH

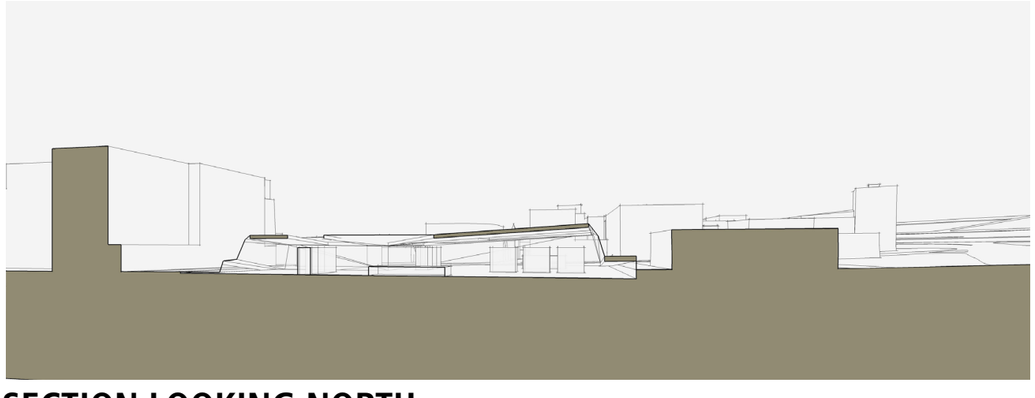




SITE PLAN



AERIAL CONCEPT RENDERINGS LOOKING NORTH



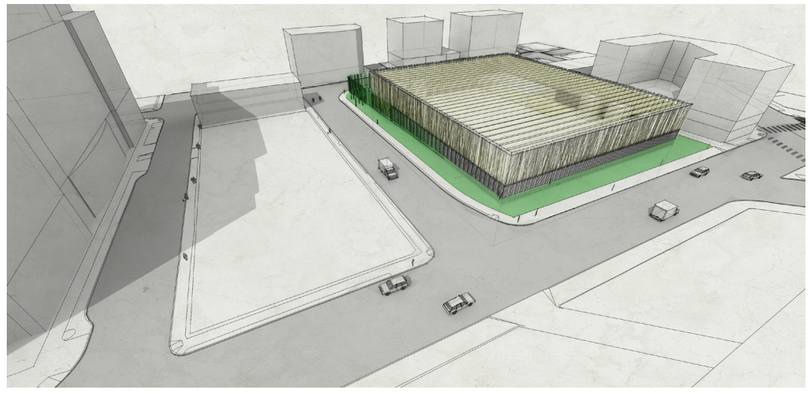
SECTION LOOKING NORTH

DESIGN COMMISSION RECOMMENDATIONS (October 2012)

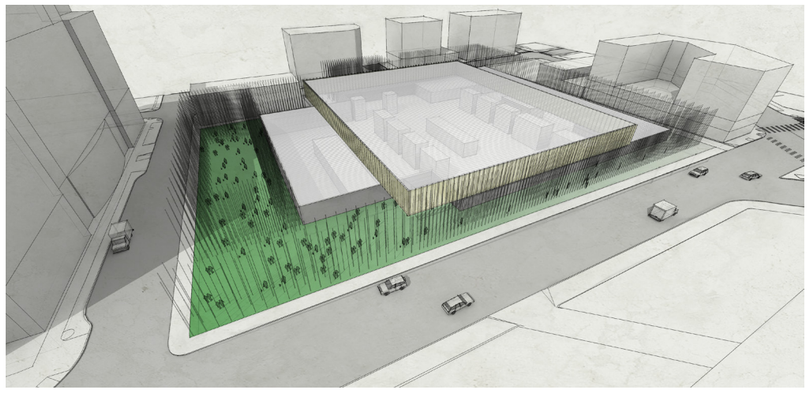
- *DESIGN CONCEPTS THAT "EXPOSE THE EQUIPMENT"*
- *THE BUILDING OBJECT IS THE AMENITY AND DRAW PEOPLE TO IT*
- *EXPLORE DESIGN BEYOND TRADITIONAL SUBSTATION INFRASTRUCTURE*
- *THE PROJECT AS A UNION OF A DOWNTOWN UTILITY AND ART*
- *DO NOT DEVELOP A DESIGN WITH BLANK WALLS*
- *ADDRESS DENNY WAY - CHALLENGES AND OPPORTUNITIES*
- *EMPHASIZE PROGRAMMING THAT BENEFITS THE NEIGHBORHOOD*
- *DEVELOP PUBLIC SPACES....OPTIONS FOR PROGRAMMING...24 HOUR DIVERSE USE*
- *STUDY CORNER OF JOHN AND DENNY SITE*
- *MITIGATE HEAT ISLAND, NOISE, AND EMF*
- *EXPLORE OPPORTUNITY FOR EDUCATION OF POWER GENERATION AND USE*

NO STREET VACATION OPTION

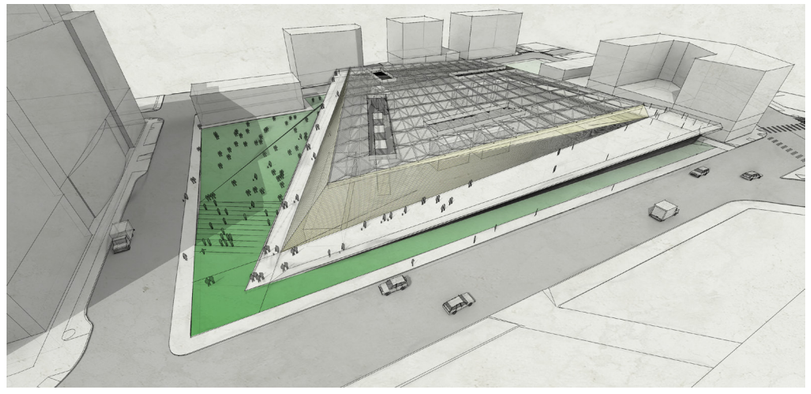
STREET VACATION OPTIONS



ALT. 1



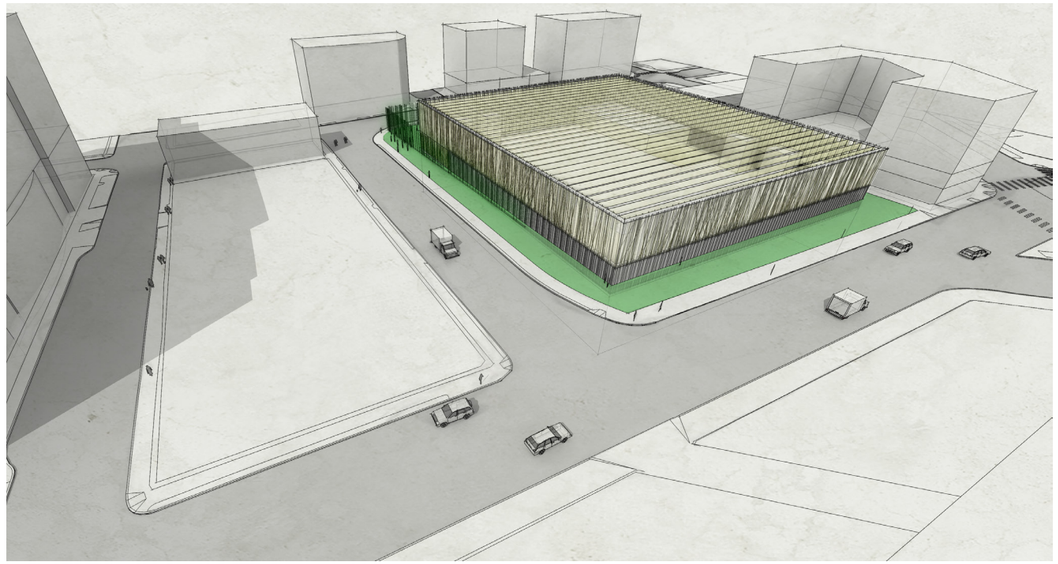
ALT. 2

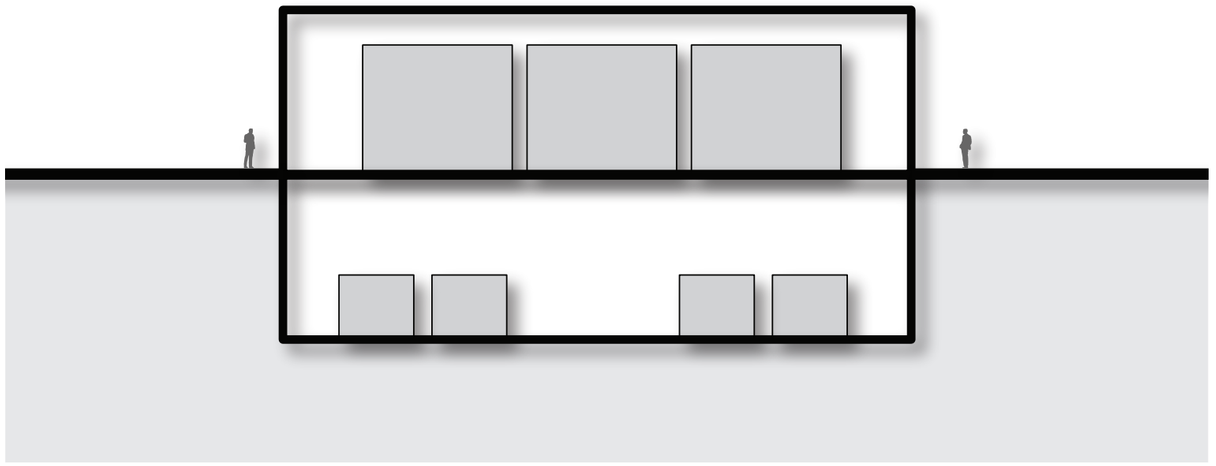


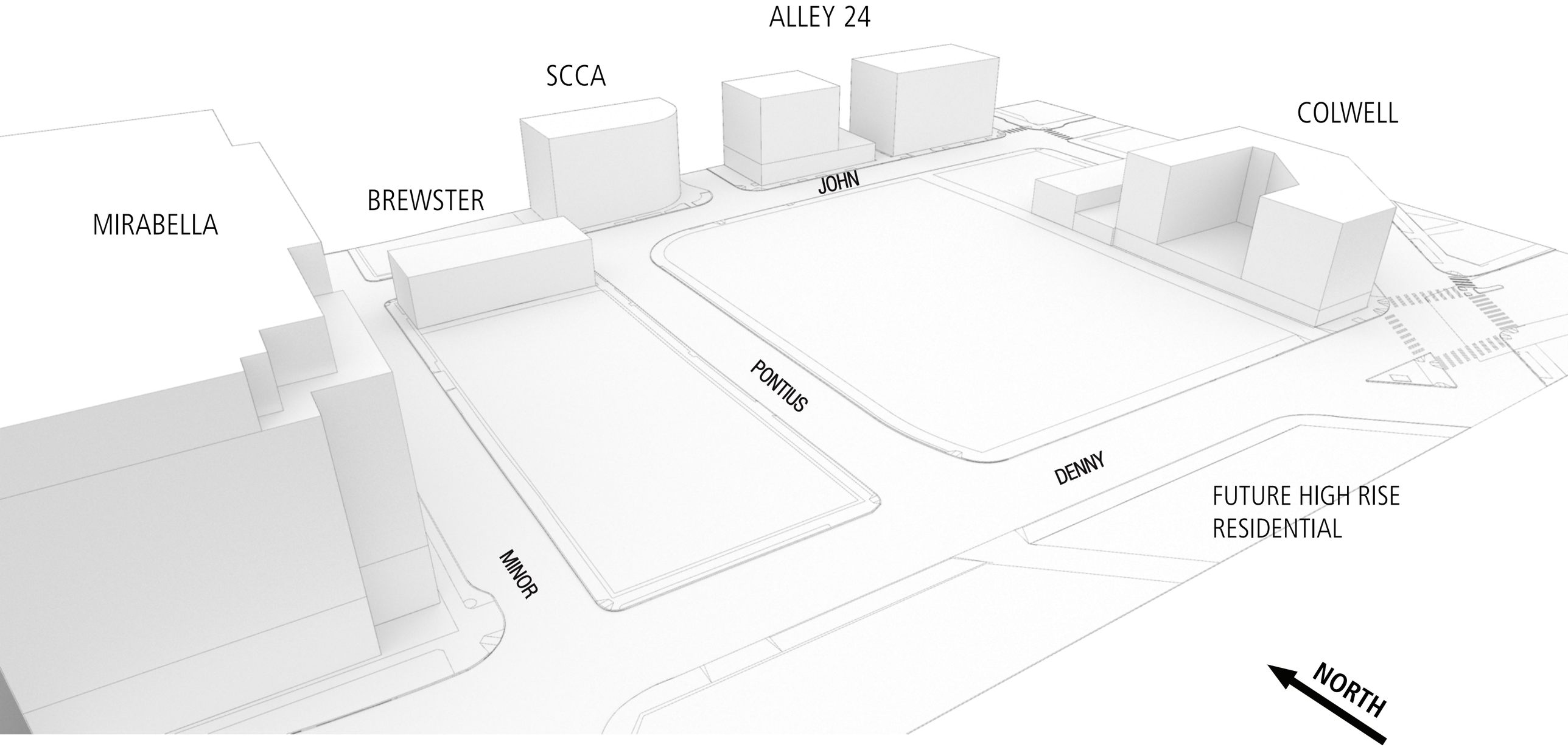
ALT. 3

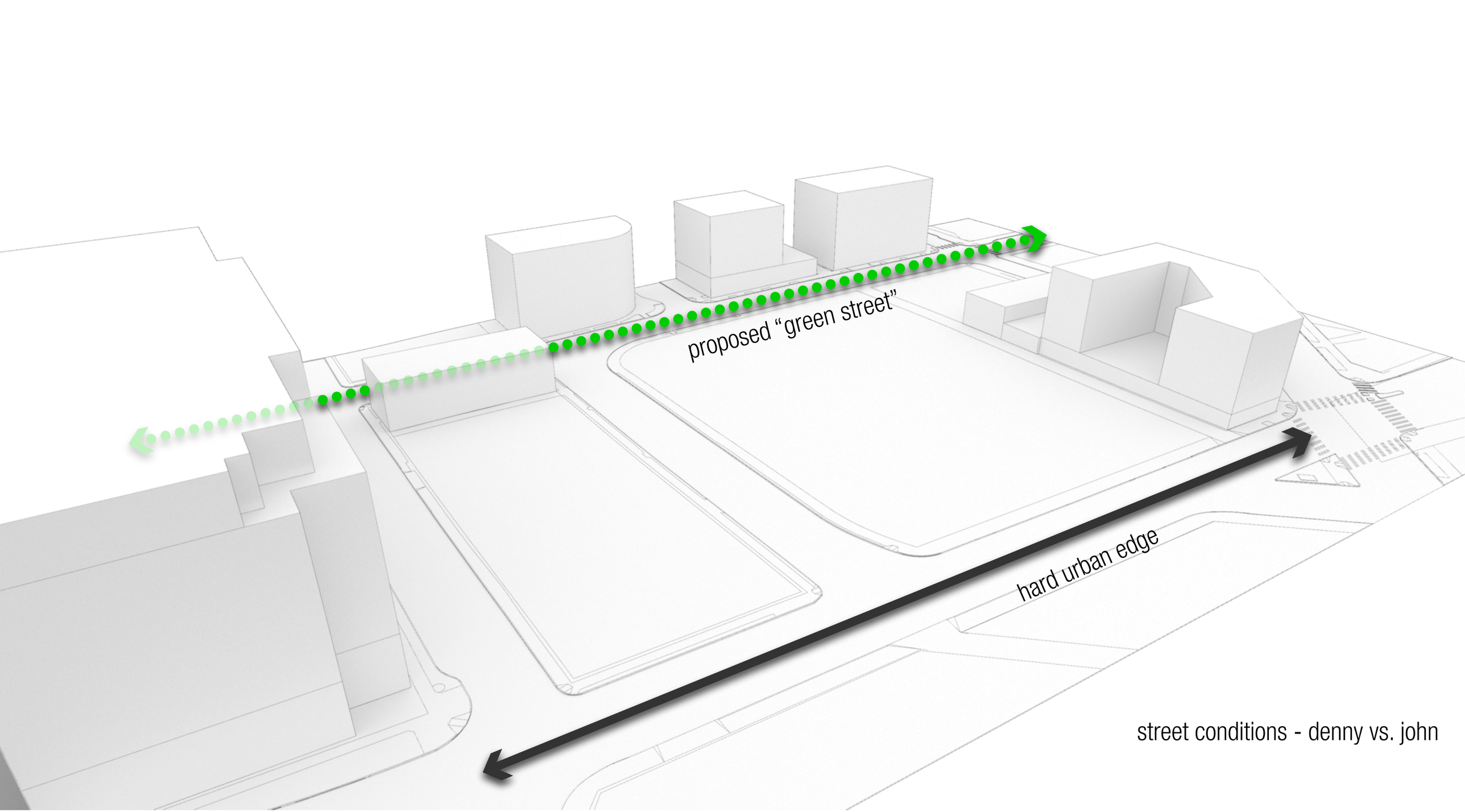
ALTERNATIVE 1

NO VACATION ALTERNATIVE





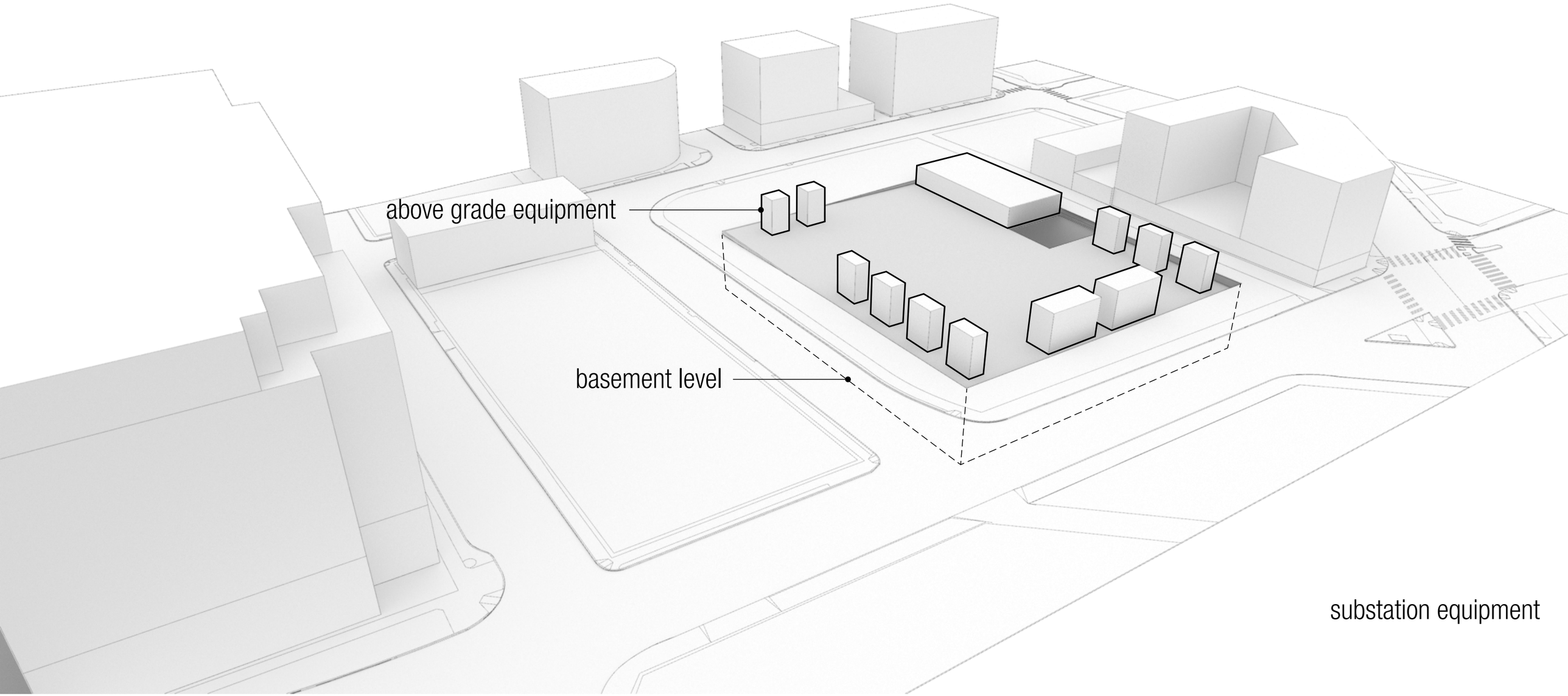

ALLEY 24
SCCA
COLWELL
MIRABELLA
BREWSTER
JOHN
PONTIUS
DENNY
MINOR
FUTURE HIGH RISE
RESIDENTIAL
NORTH

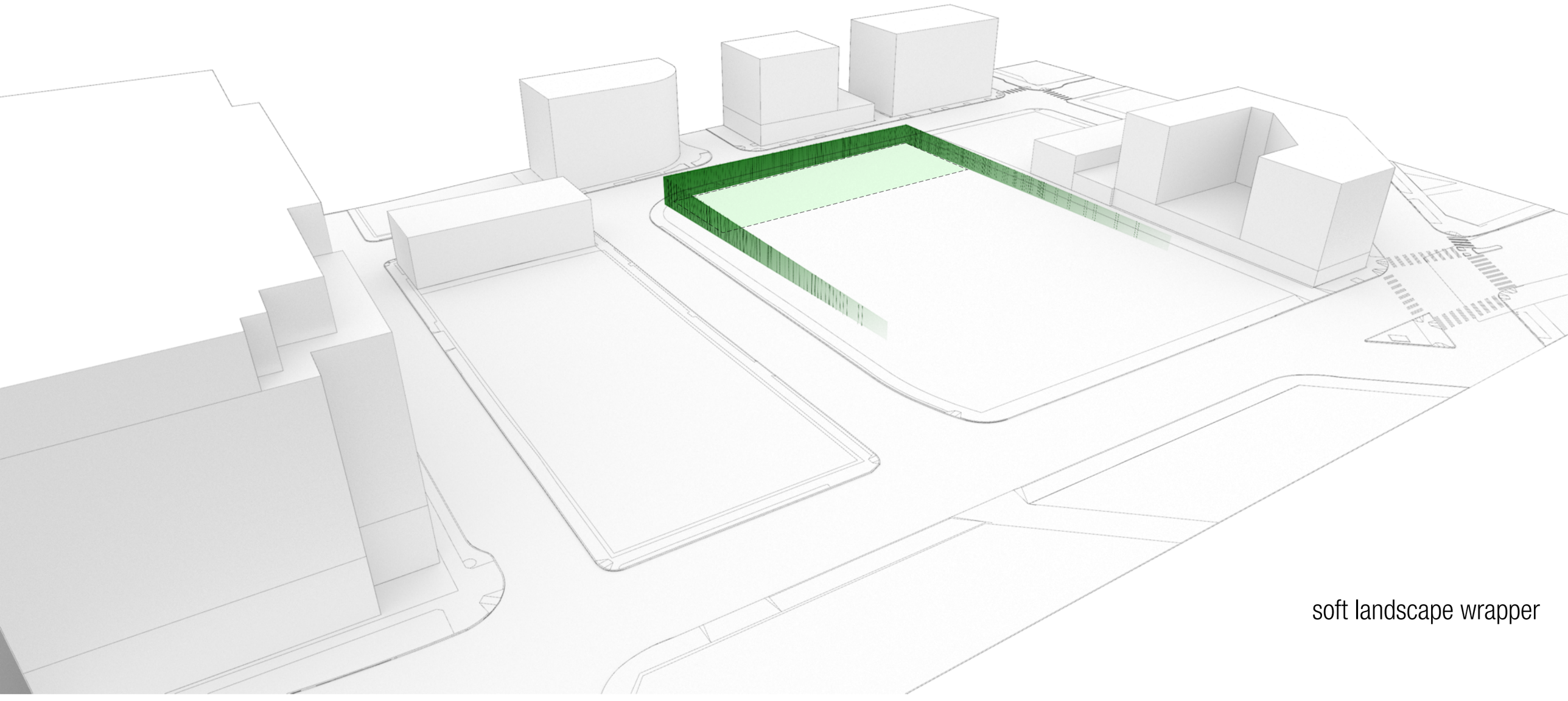


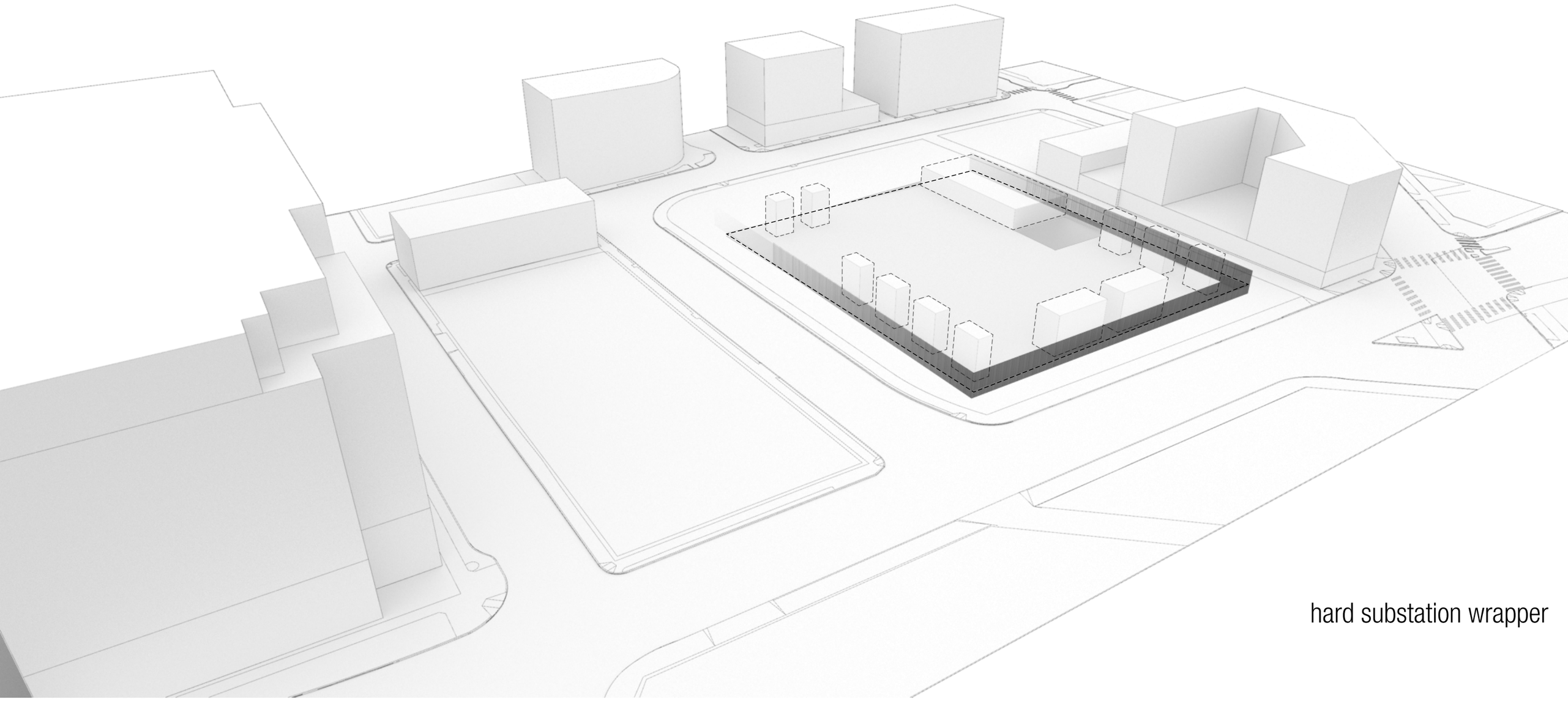
street conditions - denny vs. john

push towards denny

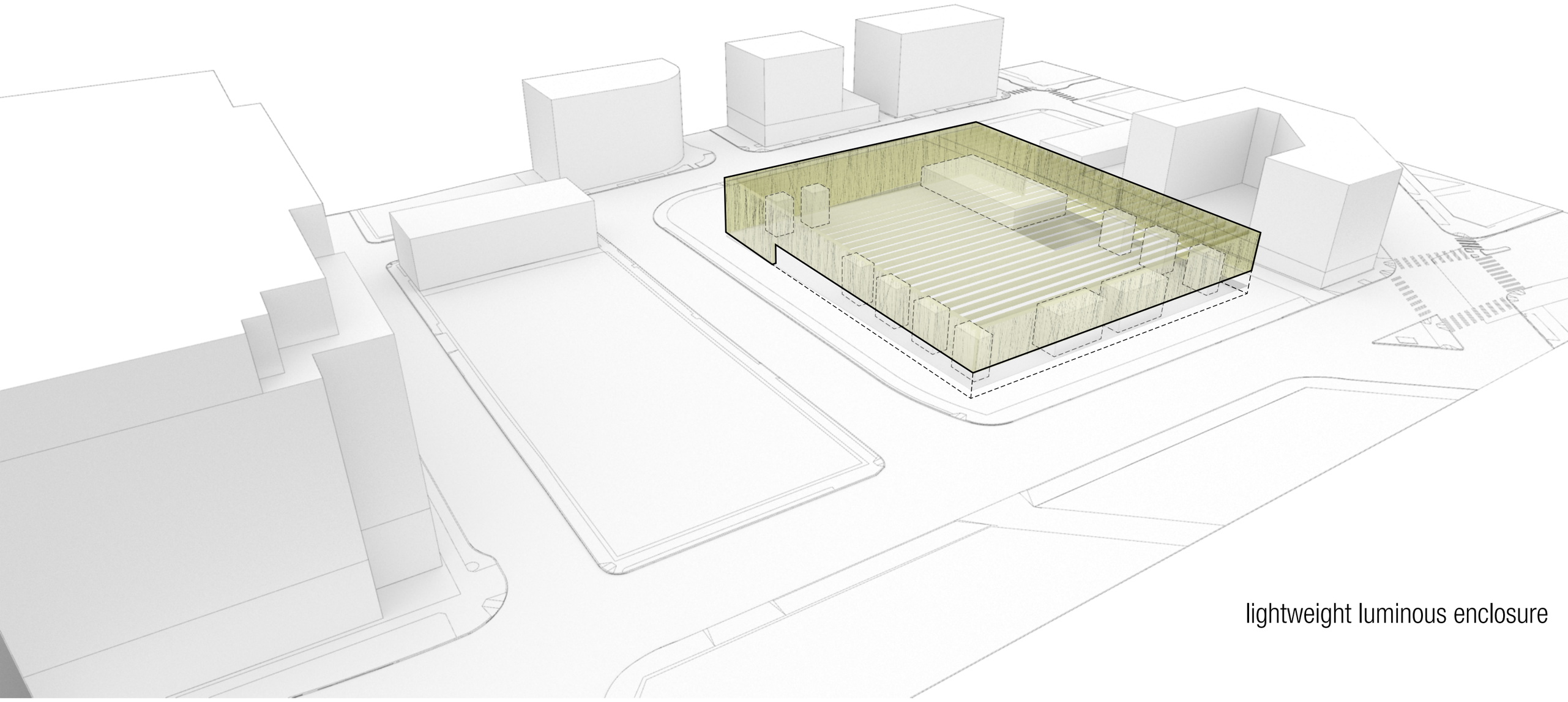
substation footprint


above grade equipment
basement level
substation equipment

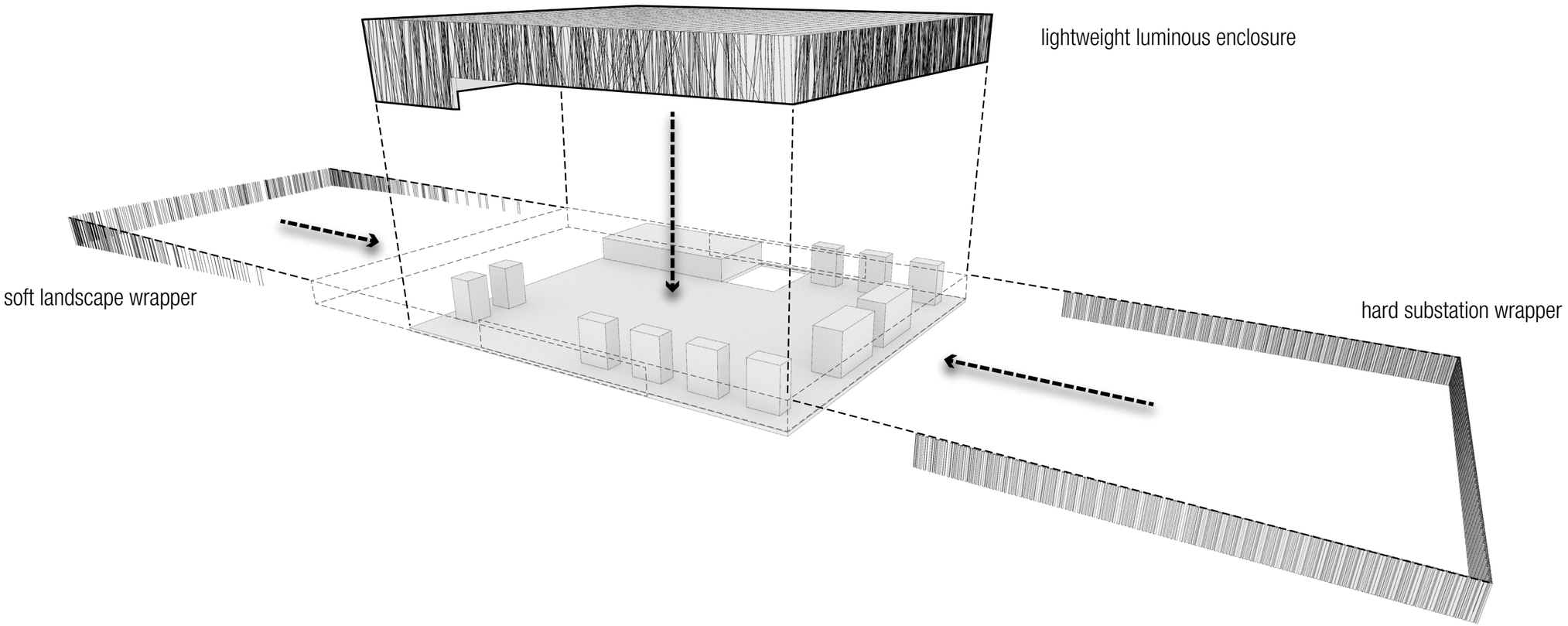

soft landscape wrapper



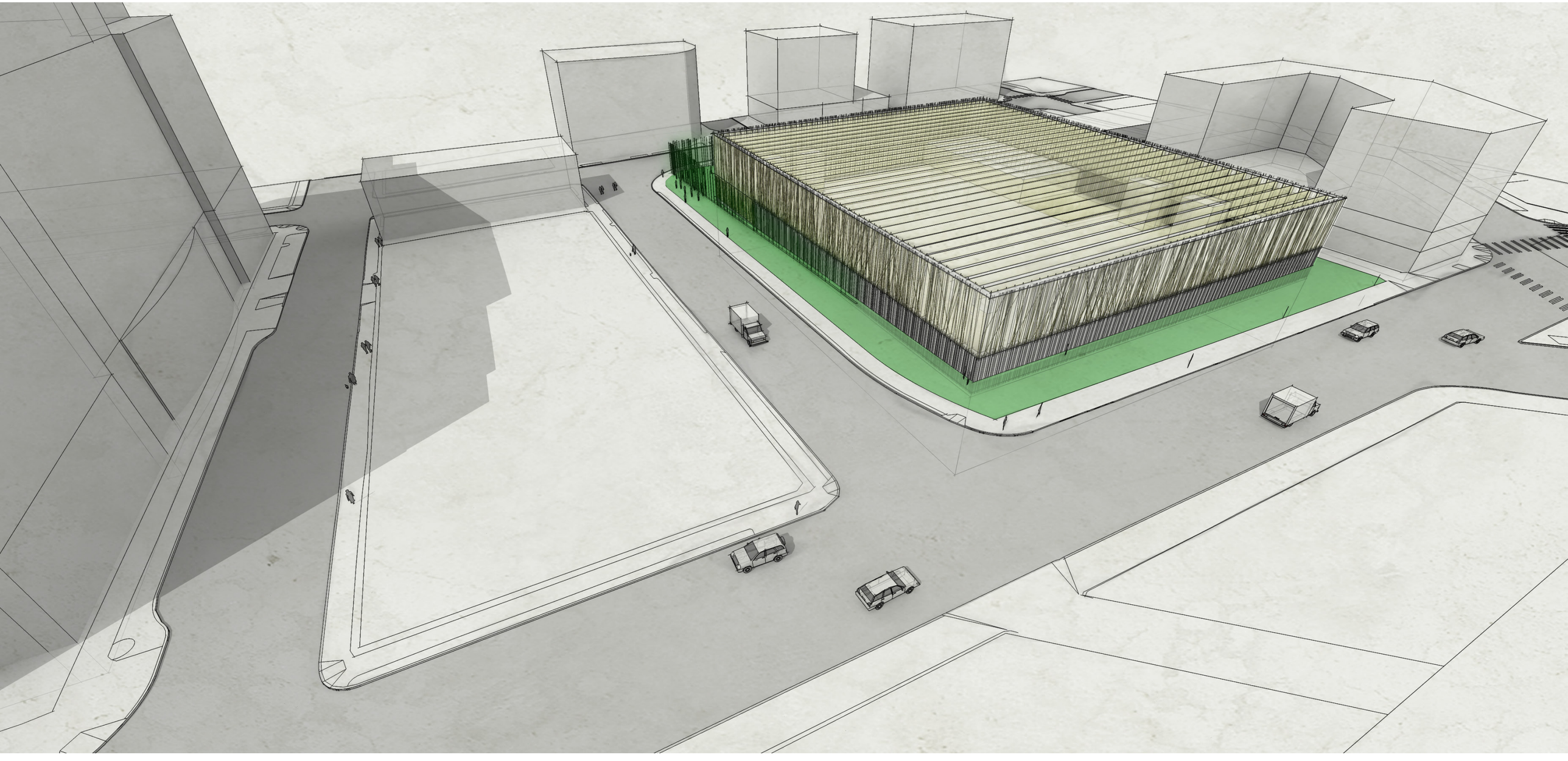
hard substation wrapper



lightweight luminous enclosure

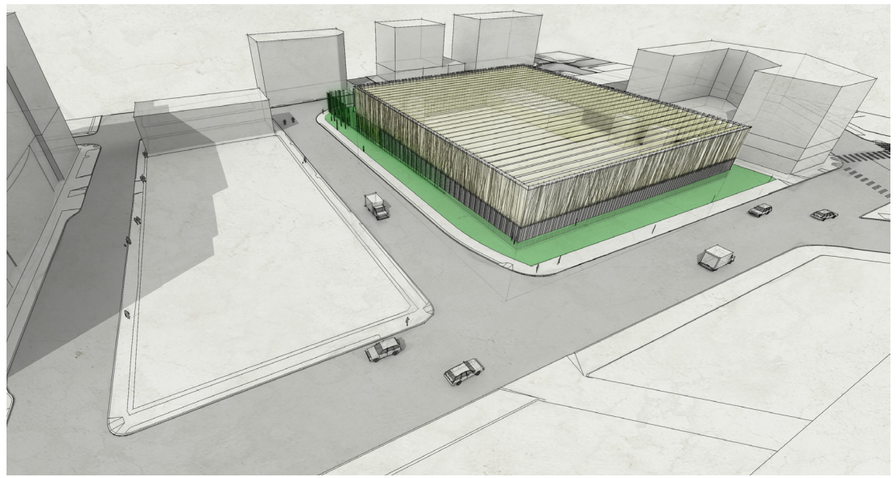


combined elements



ALTERNATIVE 1

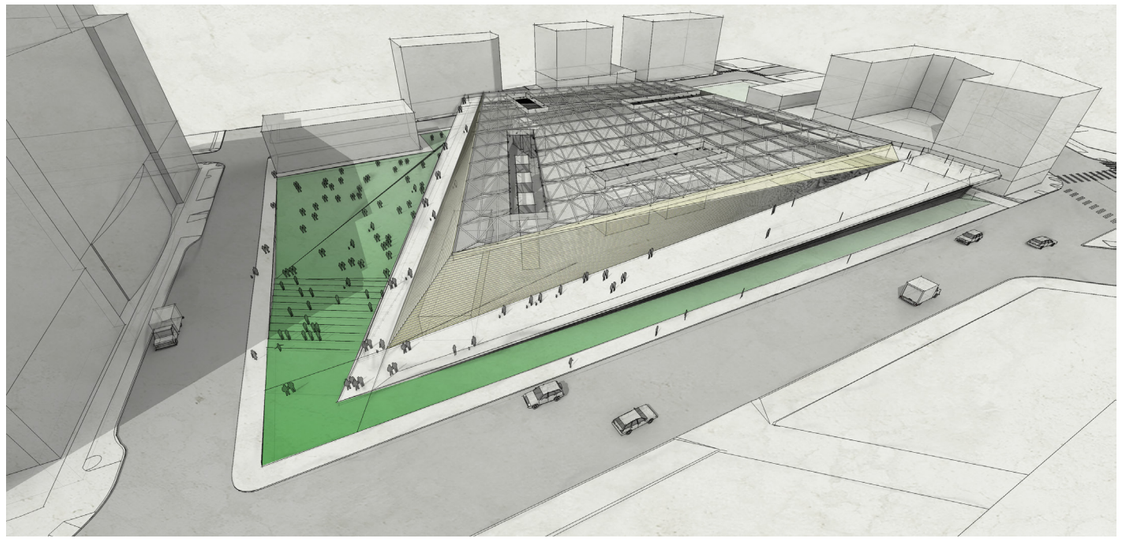
NO VACATION ALTERNATIVE

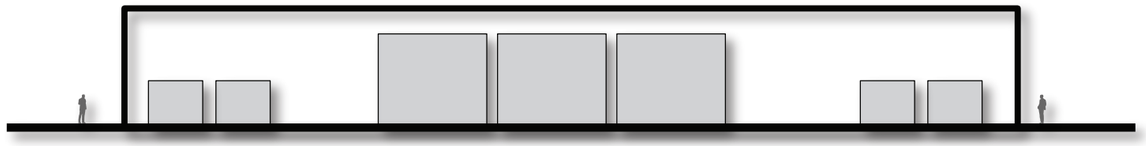


- Equipment layout restricted to Parcel 2
- Requires an above and below grade substation design
- Stacked layout complicates accessibility, maintenance, and safety
- Distribution lines routing occurs further below grade than desirable
- No opportunity for prominent urban amenities at the perimeter
- Higher capital cost ($37M higher cost than Alternative 3)

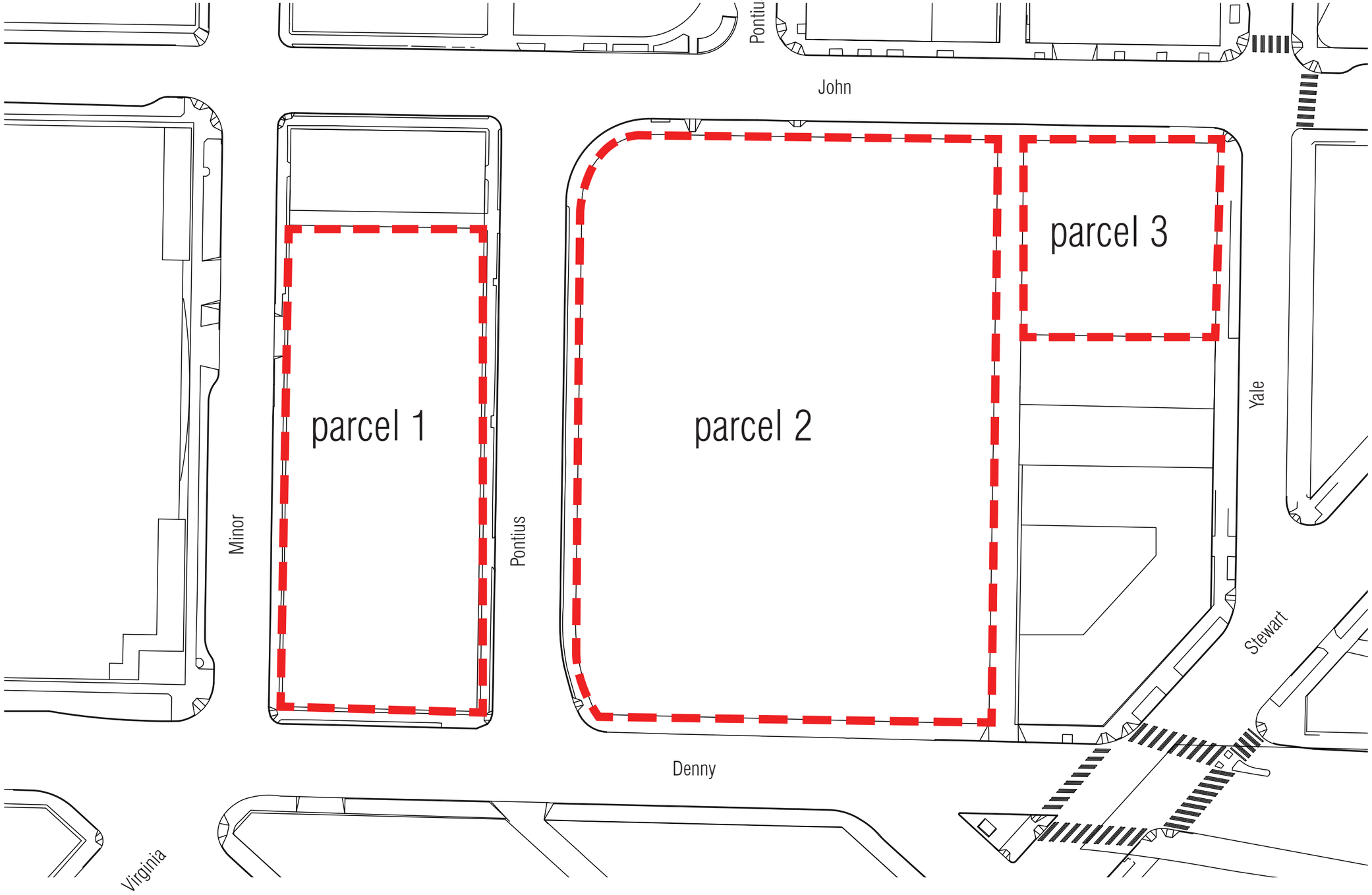
ALTERNATIVE 3

STREET VACATION ALTERNATIVE

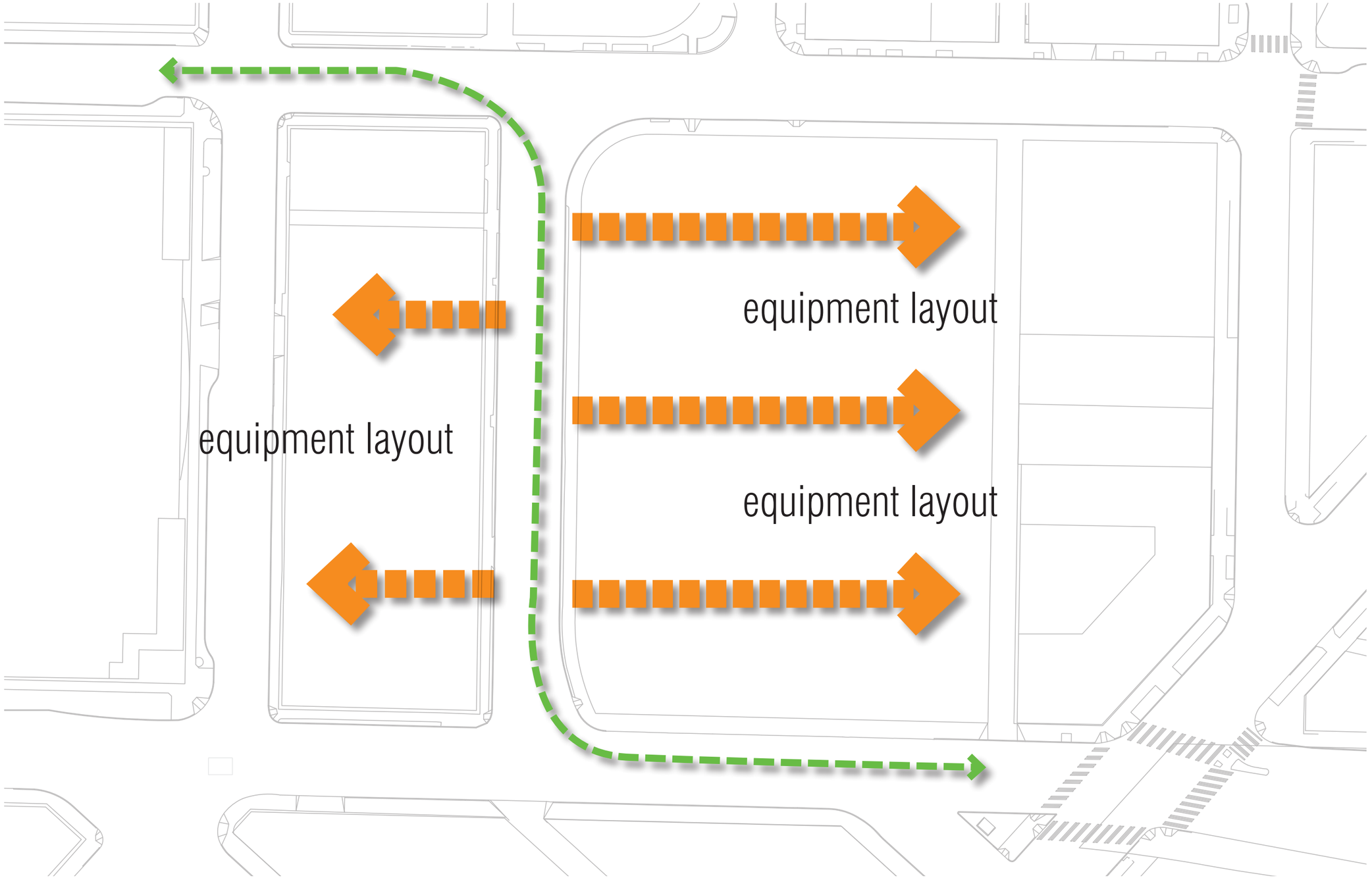


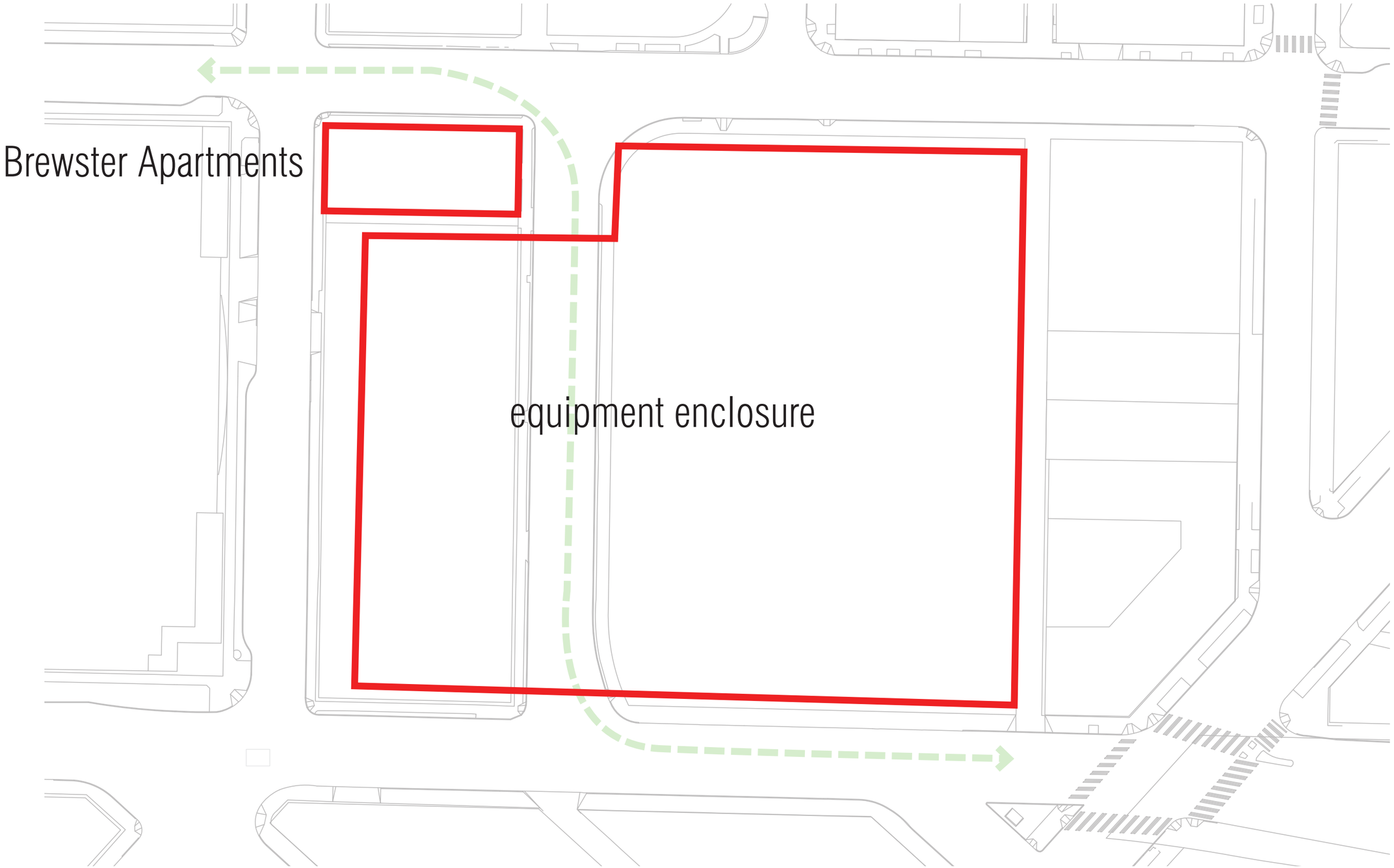


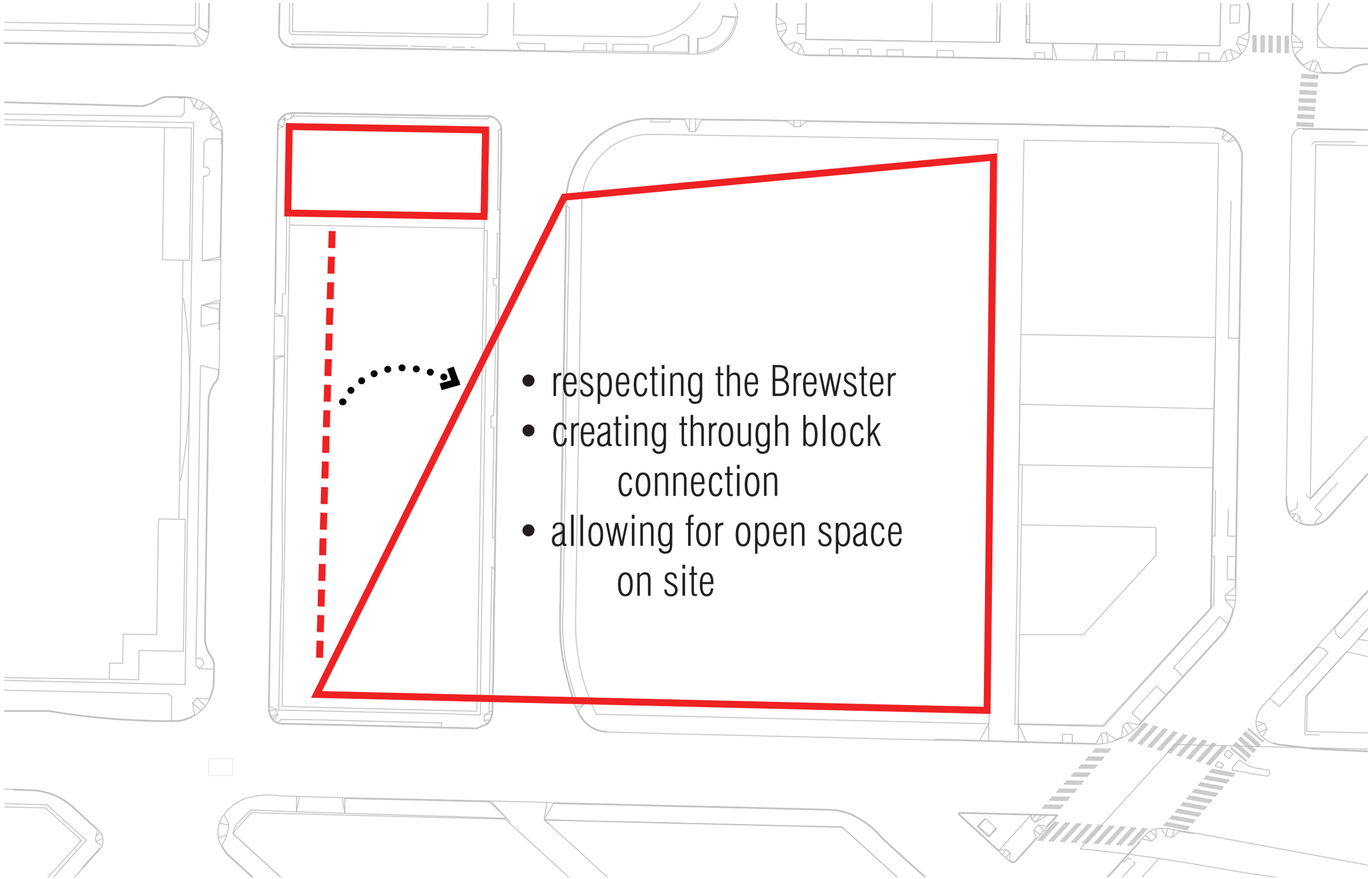
SUBSTATION FOOTPRINT and EQUIPMENT LAYOUT


Pontius
John
parcel 1
parcel 2
parcel 3
Minor
Pontius
Yale
Stewart
Denny
Virginia

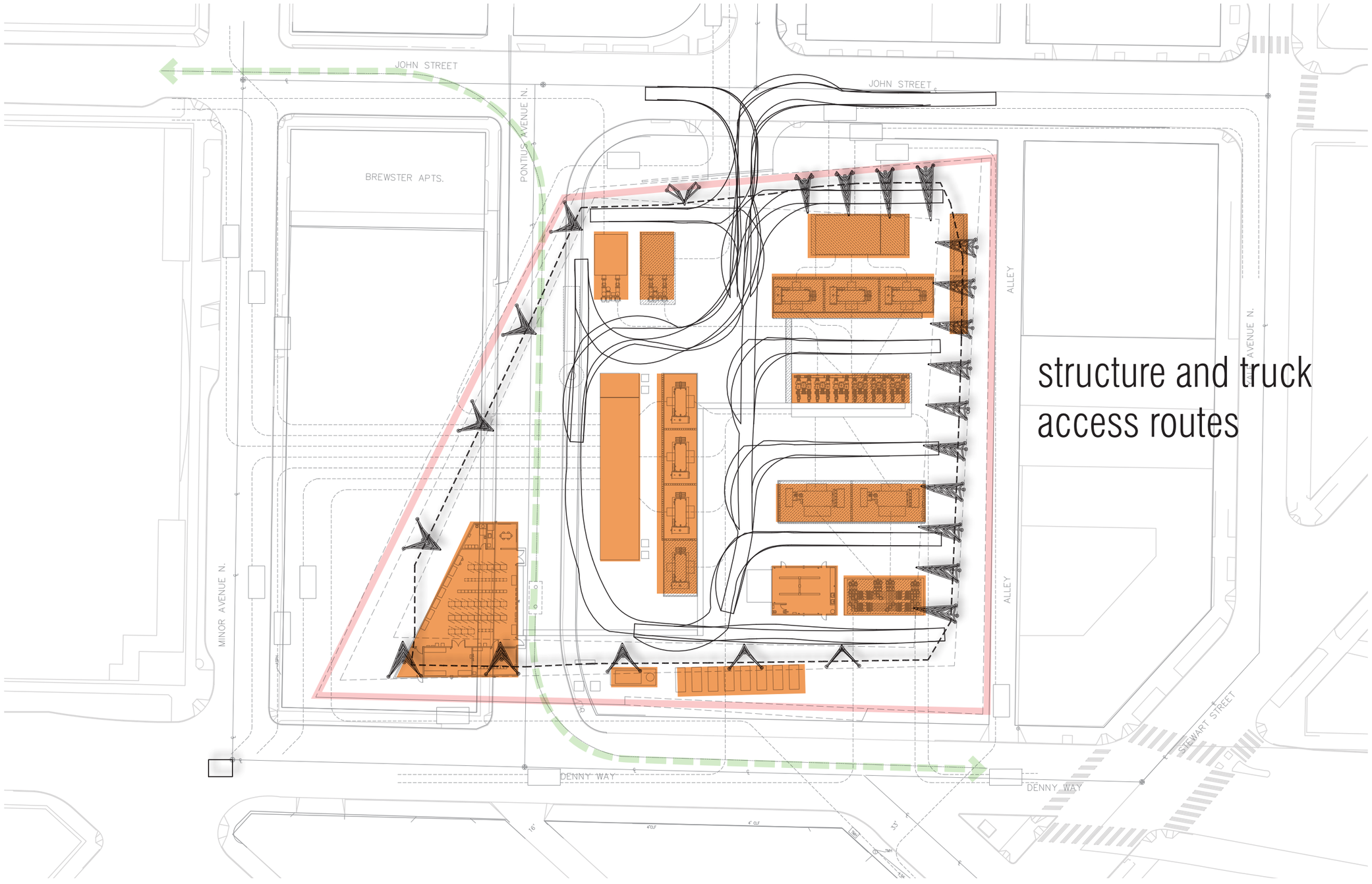
existing transmission line


equipment layout
equipment layout
equipment layout
equipment layout


Brewster Apartments
equipment enclosure


• respecting the Brewster
• creating through block
connection
• allowing for open space
on site

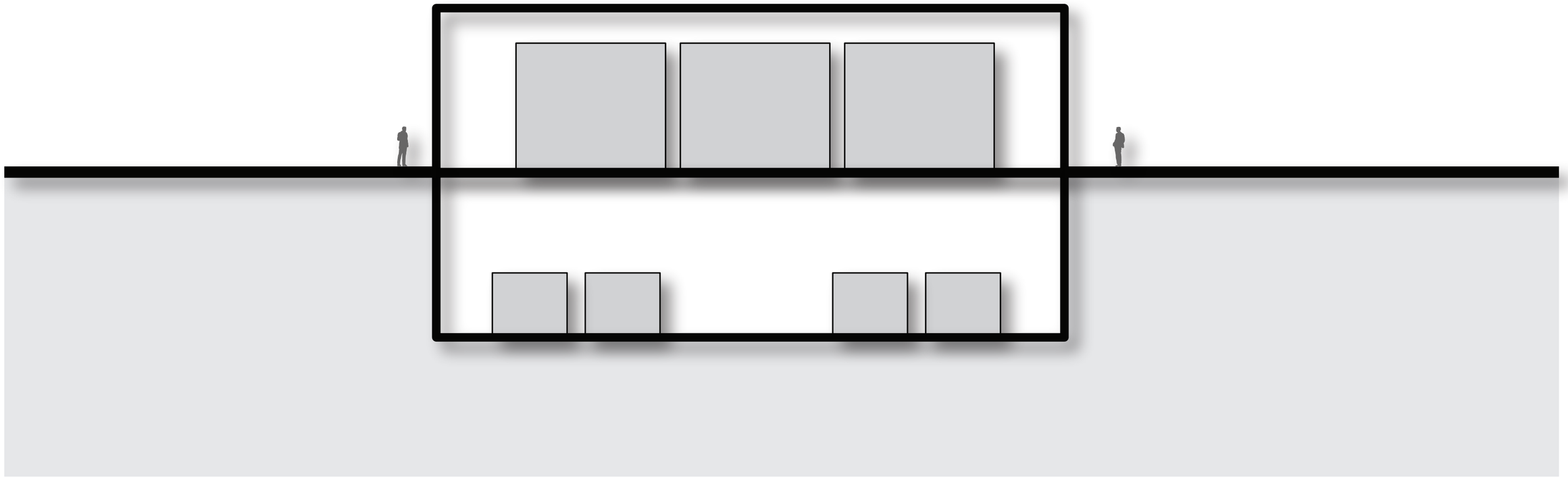
equipment layout and routing



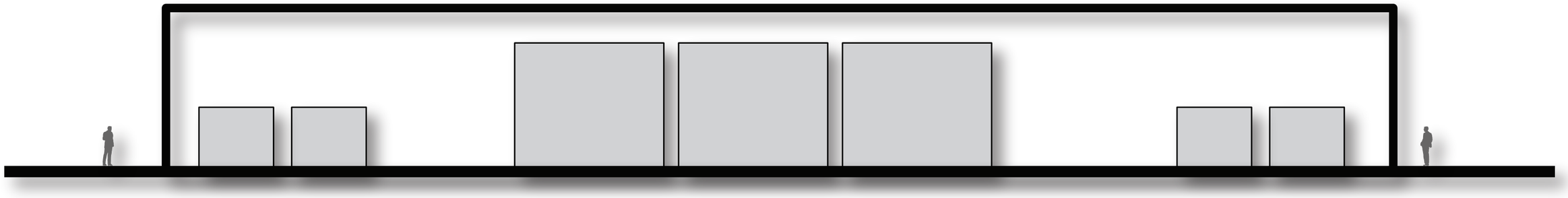
structure and truck access routes

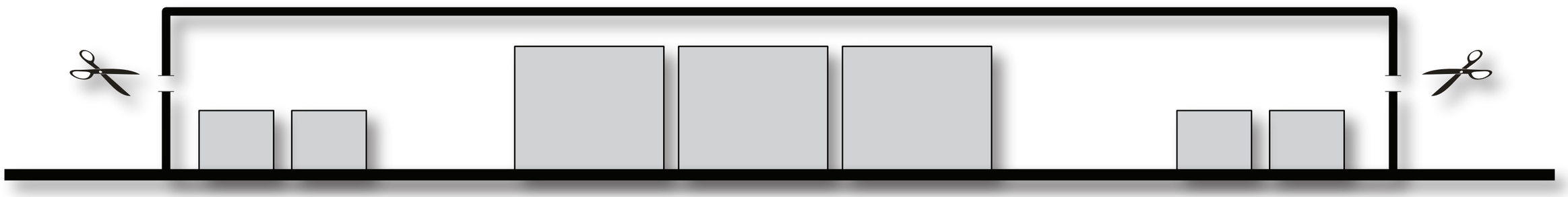
SECTIONAL MASSING DIAGRAM

2 level substation above and below grade

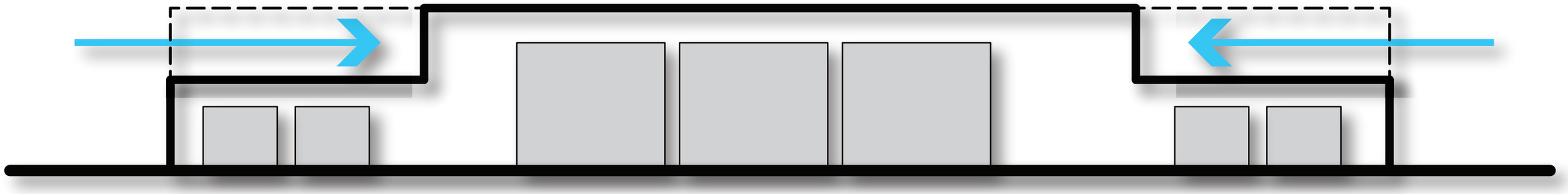


1 level substation above grade

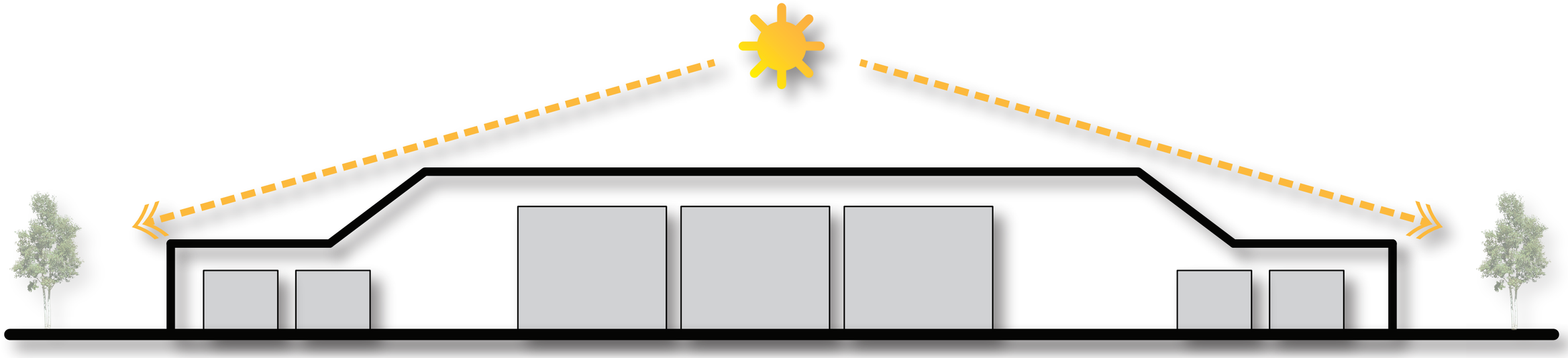




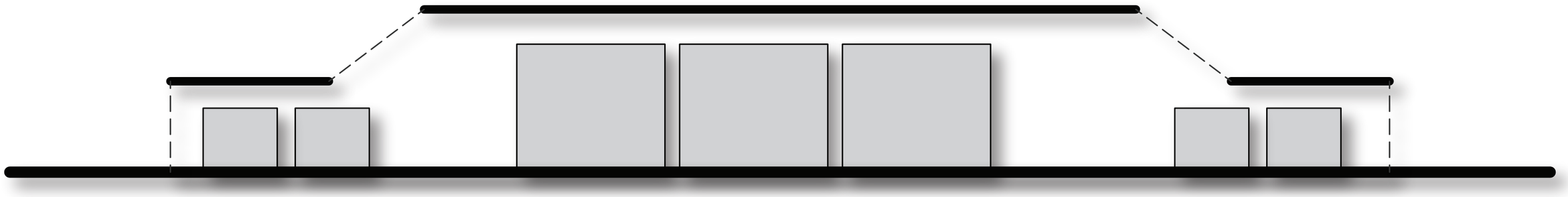
terrace the facade to reduce the massing
for the pedestrian experience



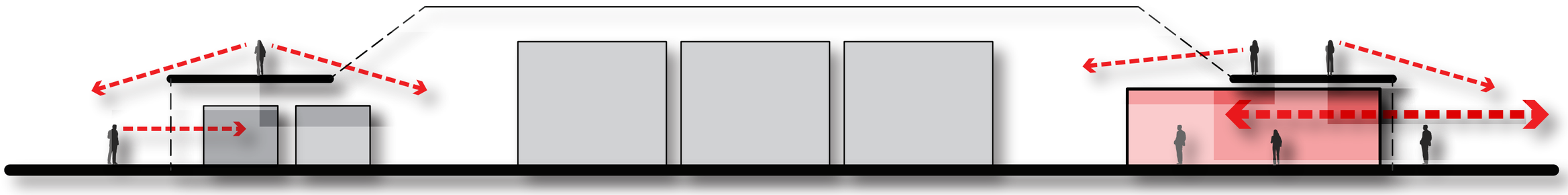
angling the facade further to allow greater access to
light and air in adjacent spaces



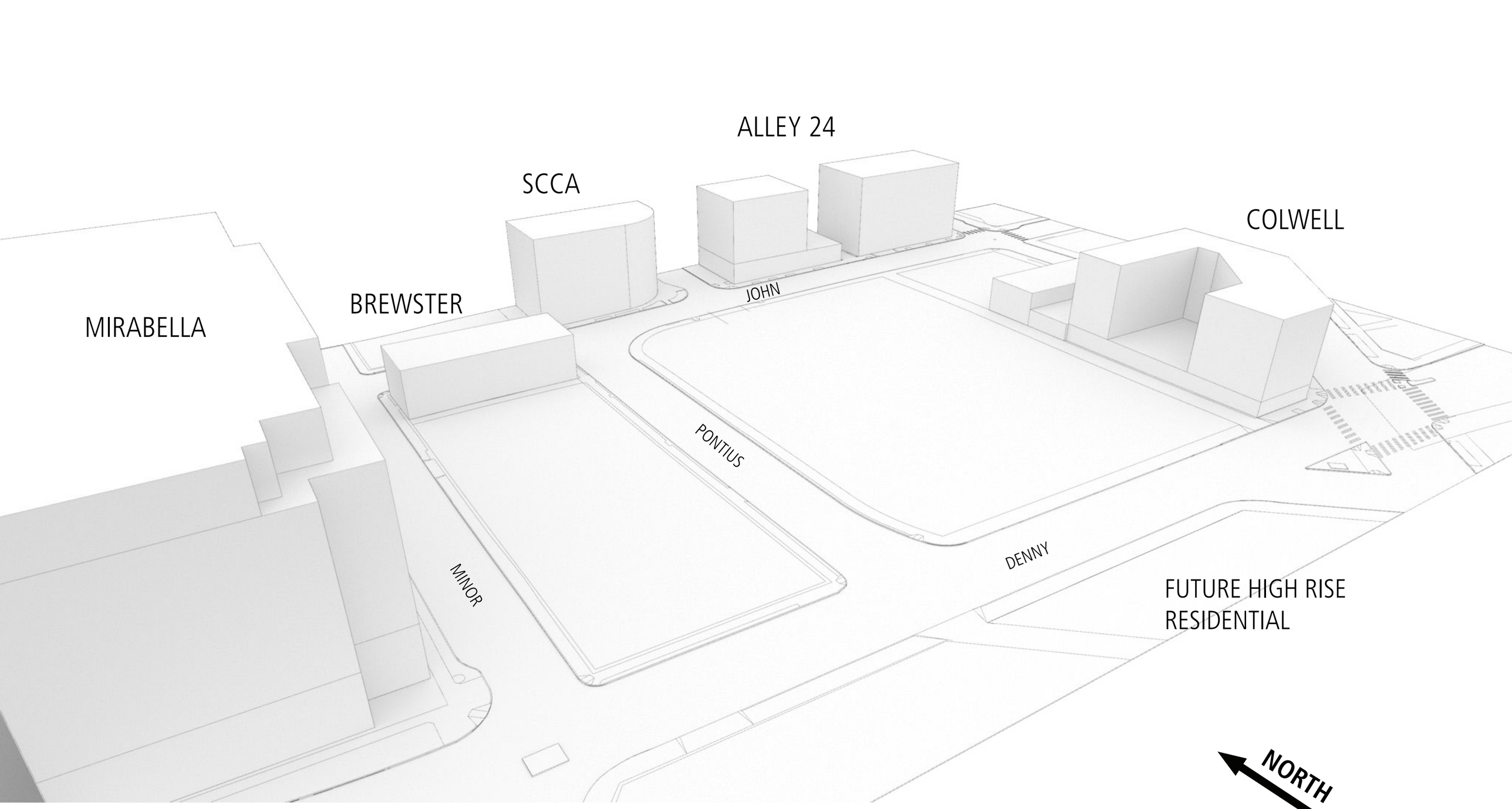
vertical and angled surfaces identified to allow views into the substation

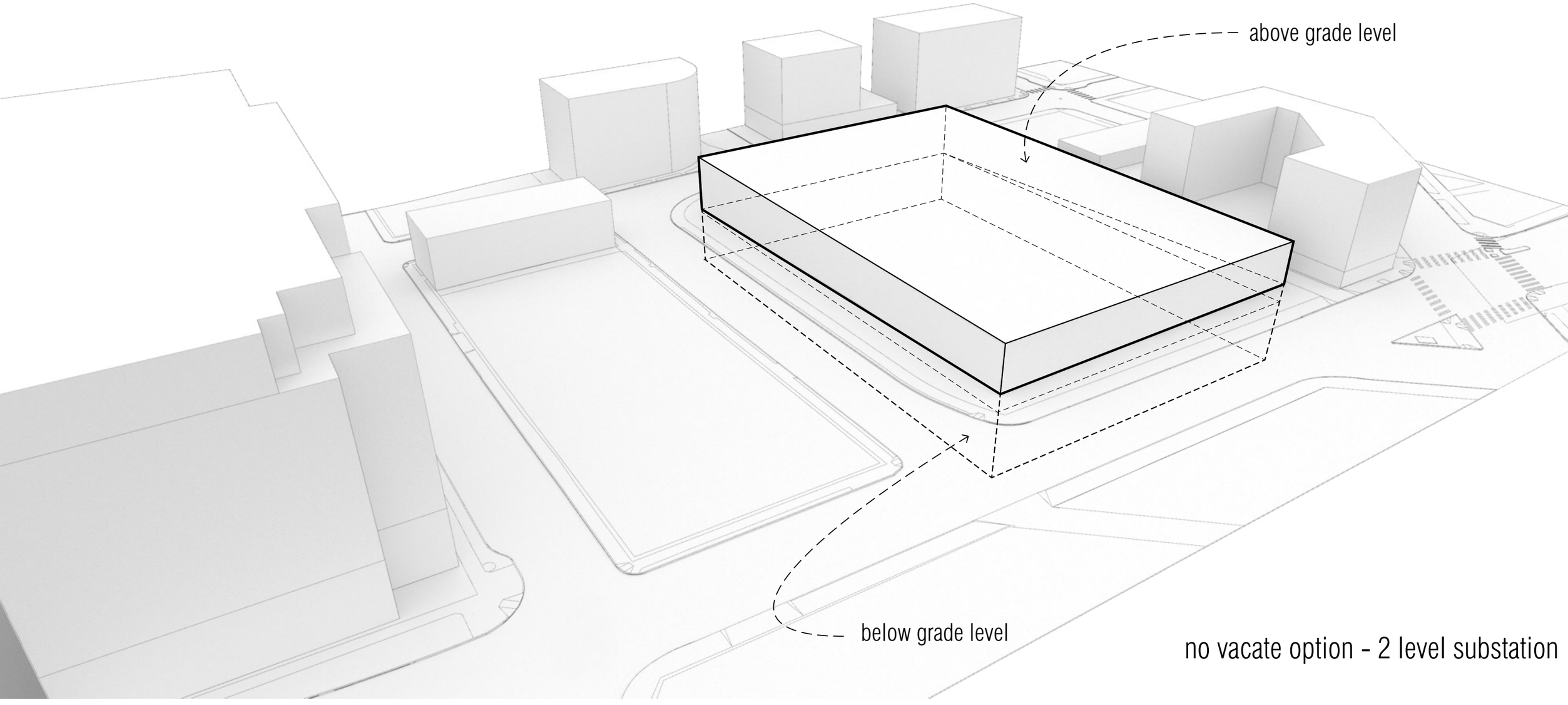


geometrical form allows for opportunities to occupy
the interior edges of the substation

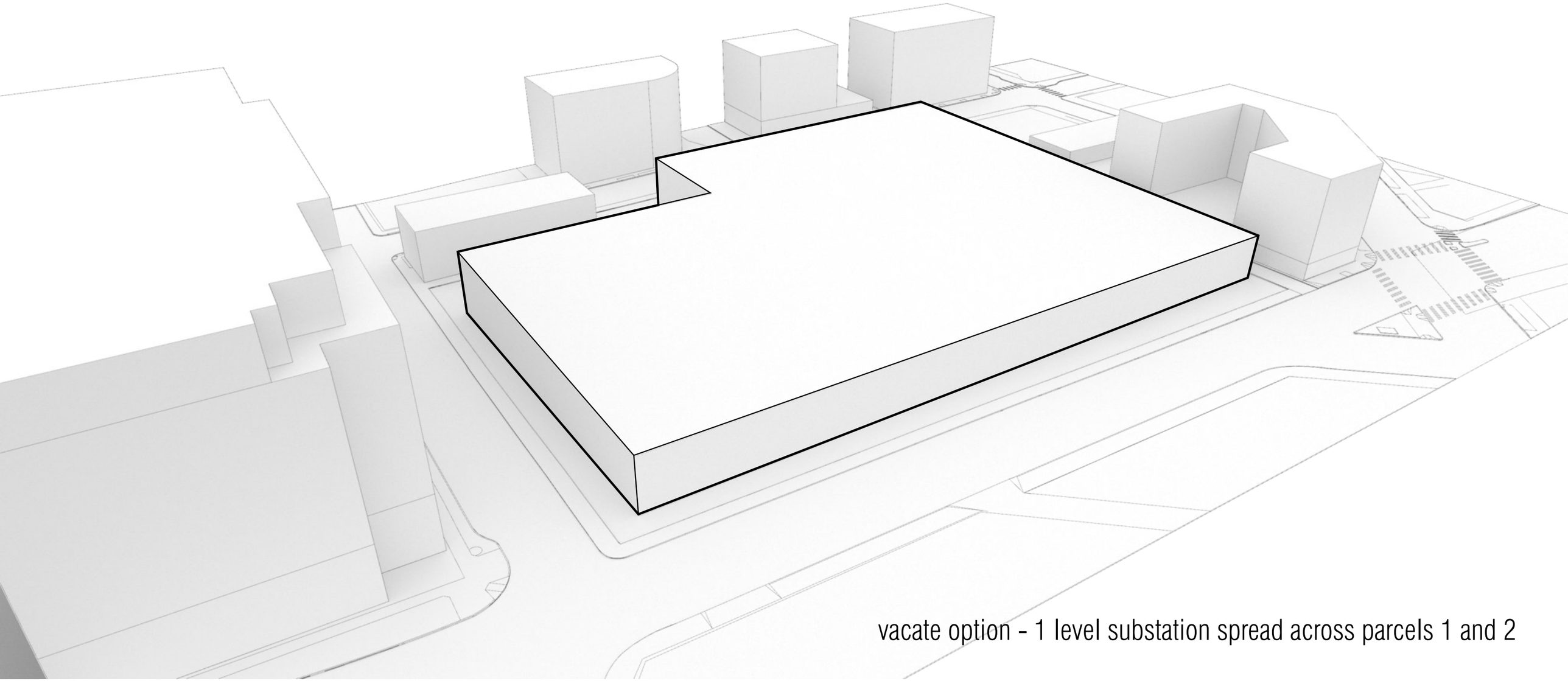


MASSING DIAGRAM

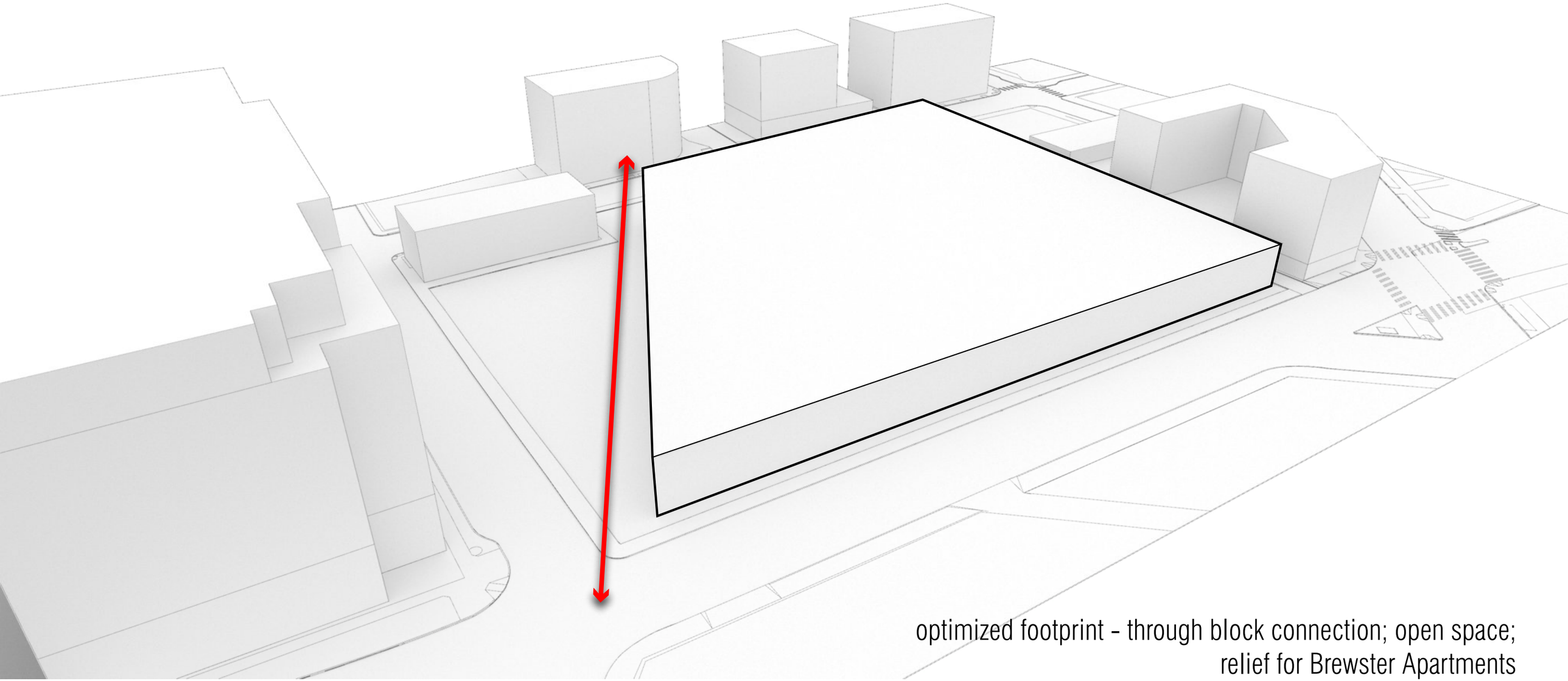

ALLEY 24
SCCA
COLWELL
MIRABELLA
BREWSTER
JOHN
PONTIUS
MINOR
DENNY
FUTURE HIGH RISE
RESIDENTIAL
NORTH



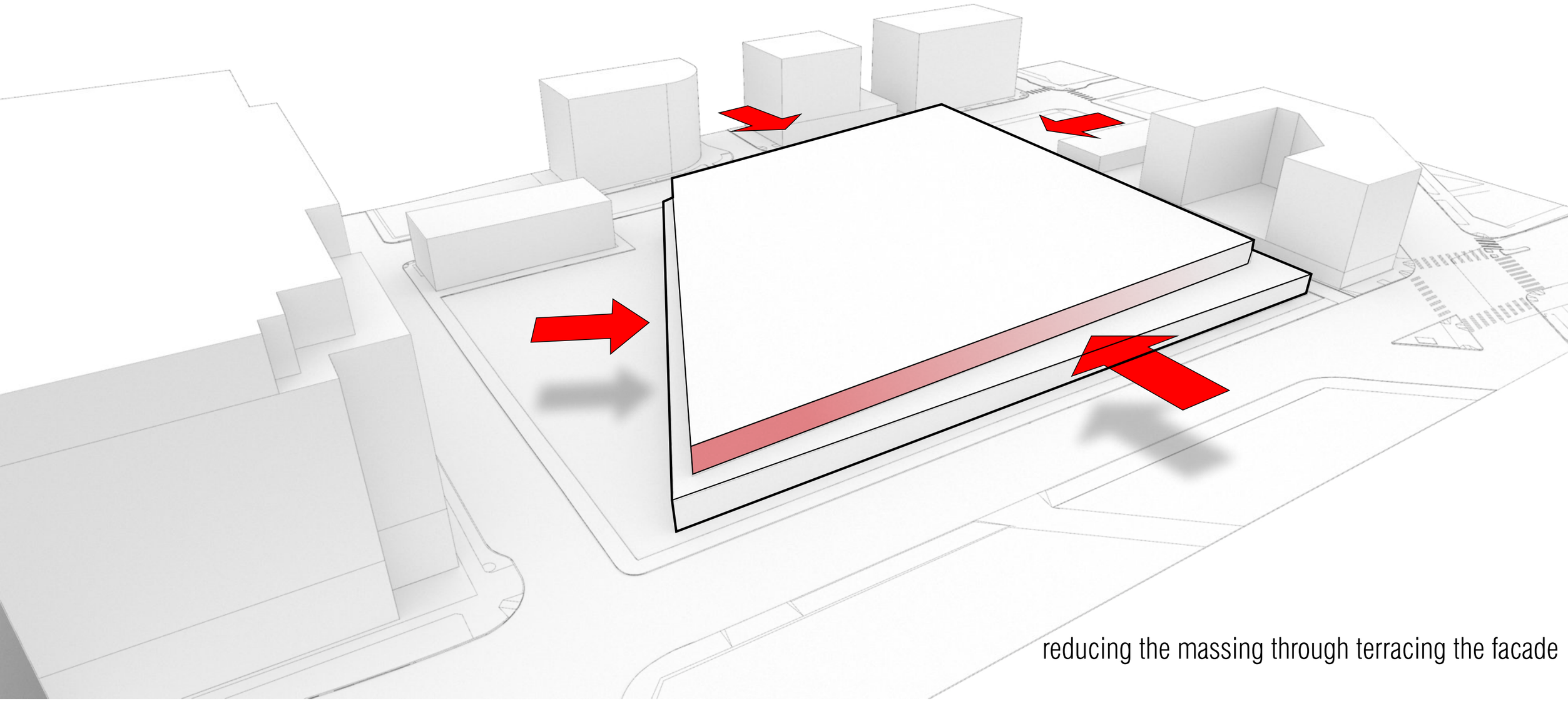
no vacate option - 2 level substation



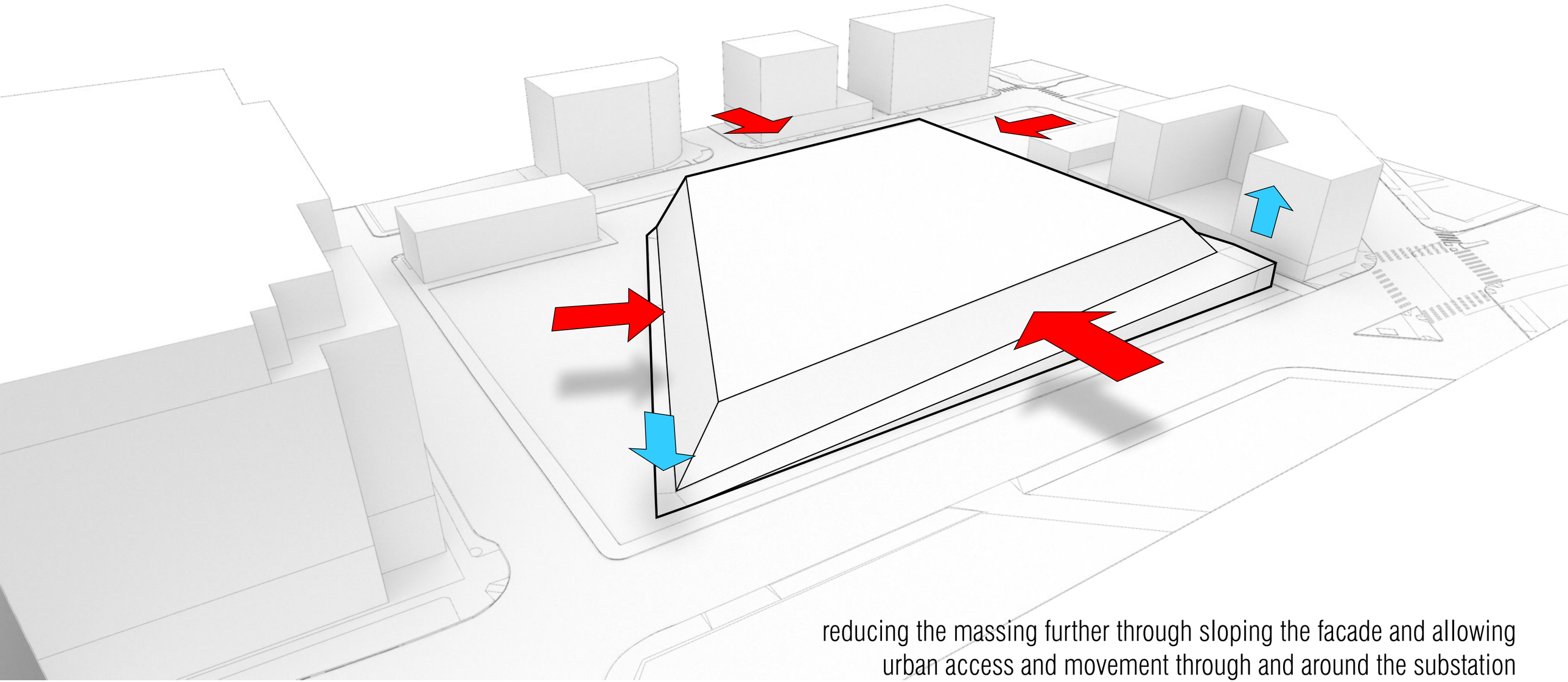
vacate option - 1 level substation spread across parcels 1 and 2



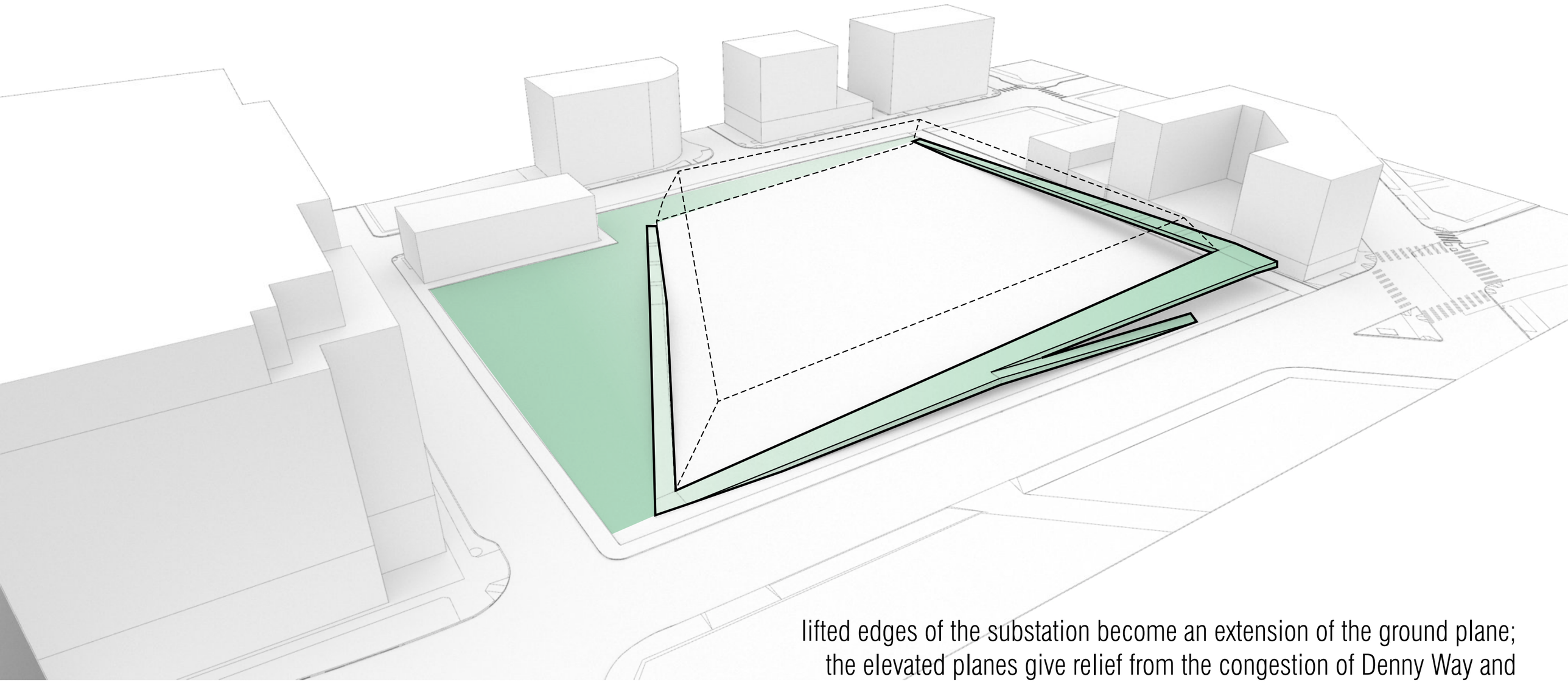
optimized footprint - through block connection; open space;
relief for Brewster Apartments



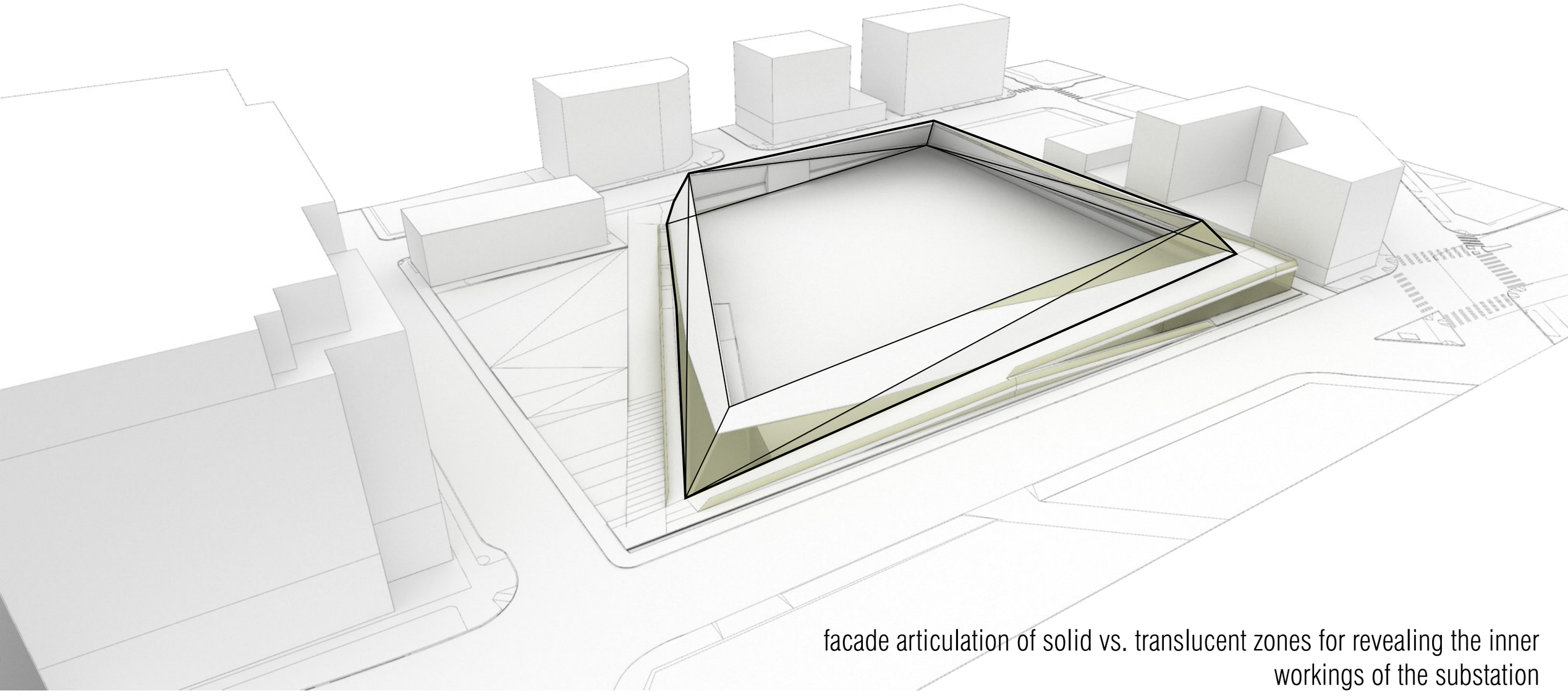
reducing the massing through terracing the facade



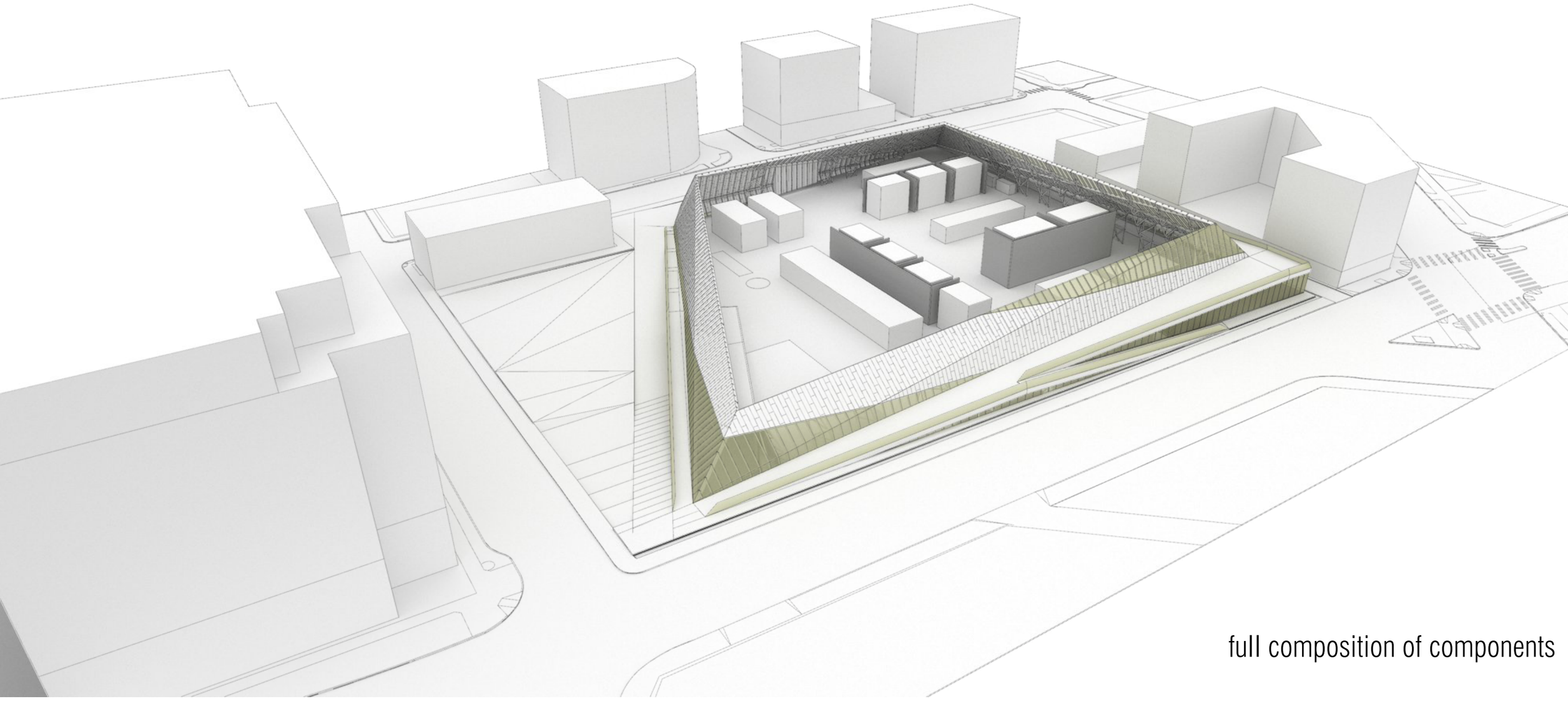
reducing the massing further through sloping the facade and allowing urban access and movement through and around the substation



lifted edges of the substation become an extension of the ground plane;
the elevated planes give relief from the congestion of Denny Way and
provide unique views and experience of the city

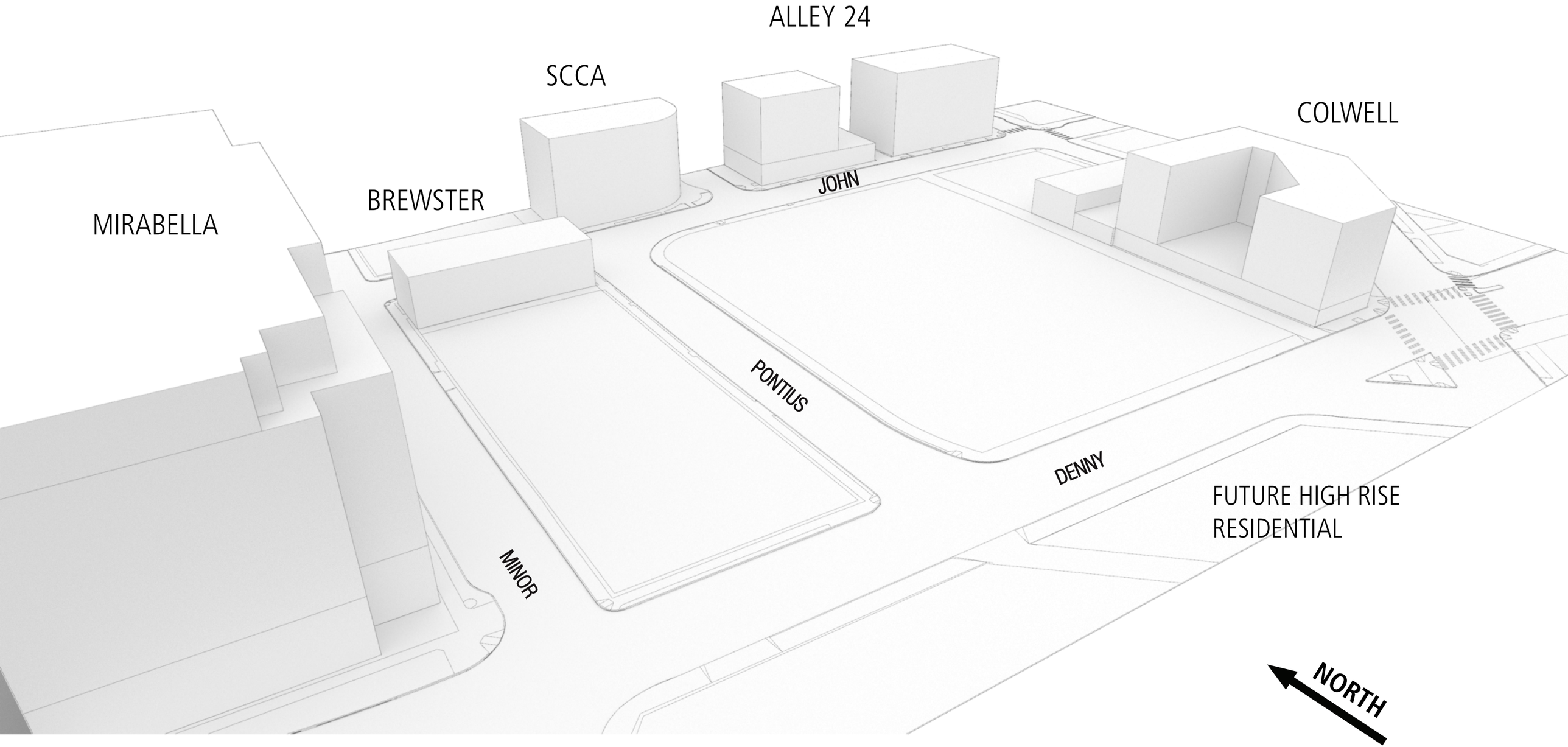


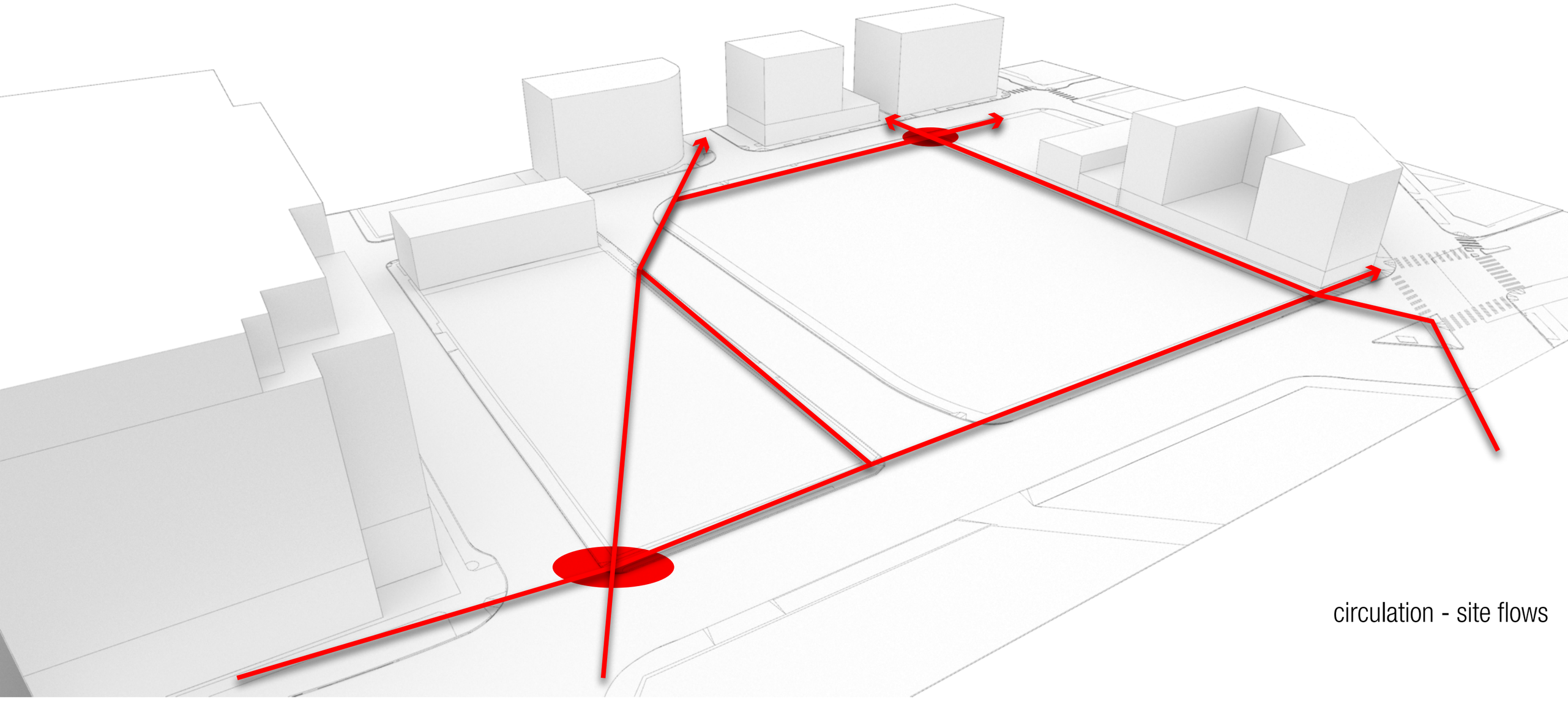
facade articulation of solid vs. translucent zones for revealing the inner workings of the substation



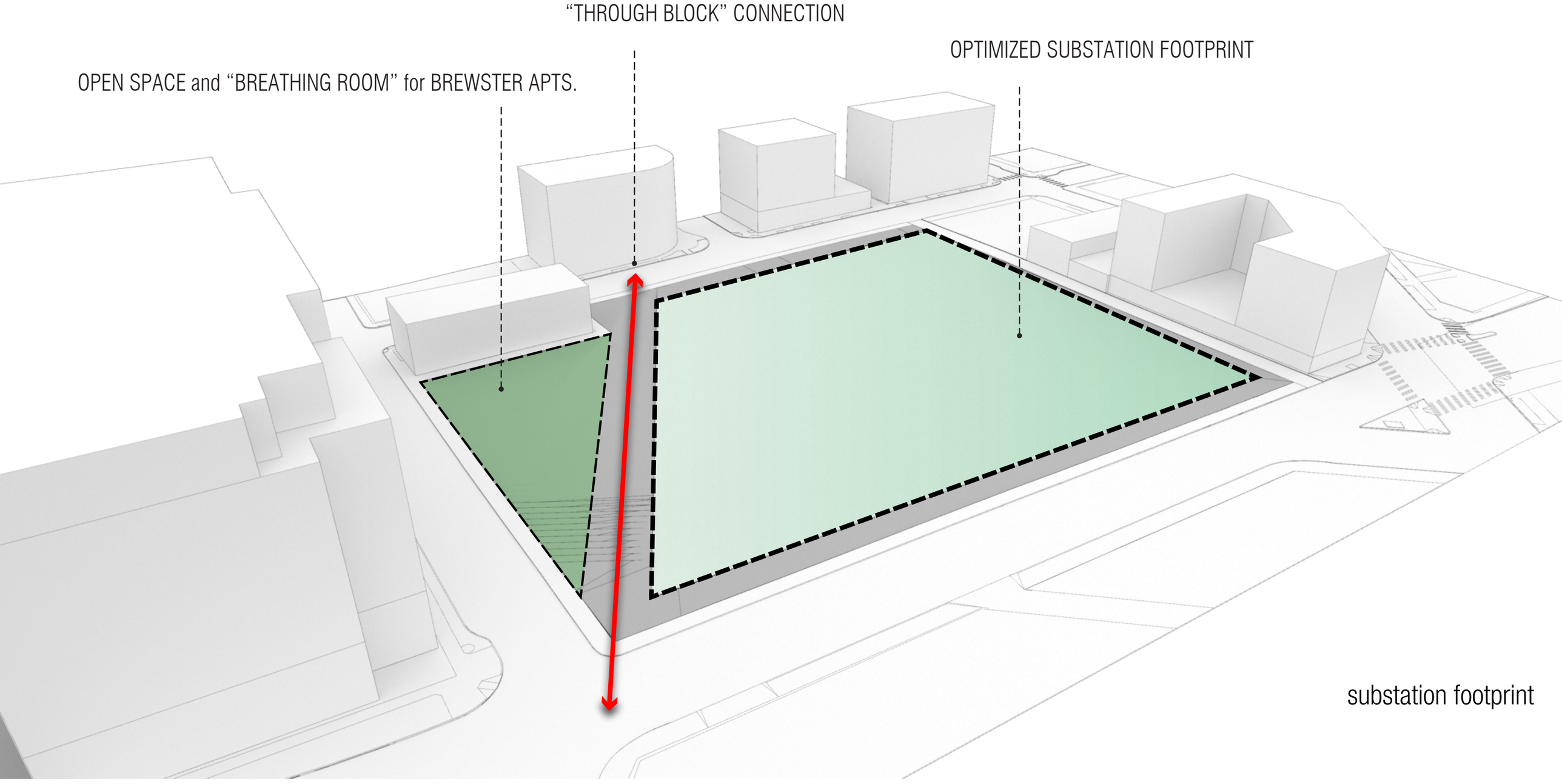
full composition of components

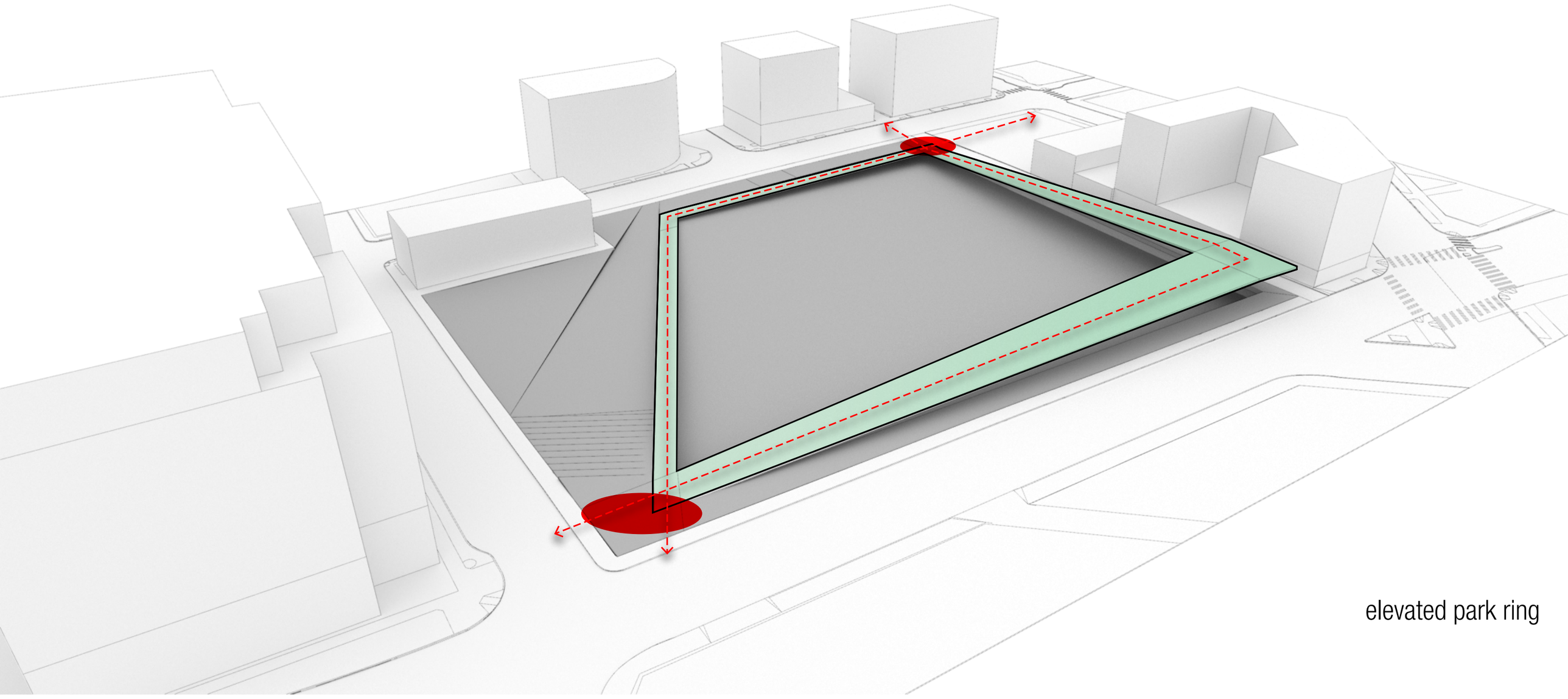
CONTEXTUAL CONNECTION


ALLEY 24
SCCA
COLWELL
MIRABELLA
BREWSTER
JOHN
PONTIUS
DENNY
MINOR
FUTURE HIGH RISE
RESIDENTIAL
NORTH

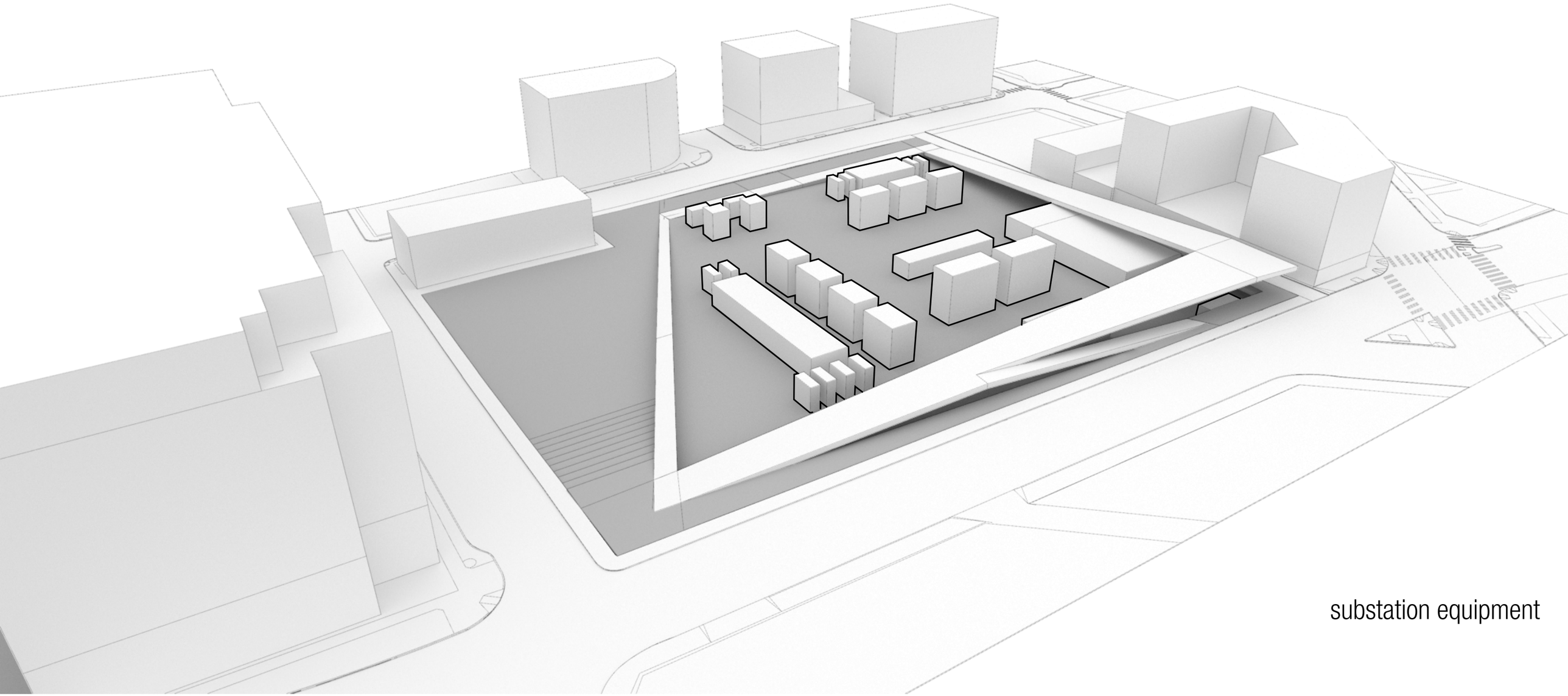


circulation - site flows

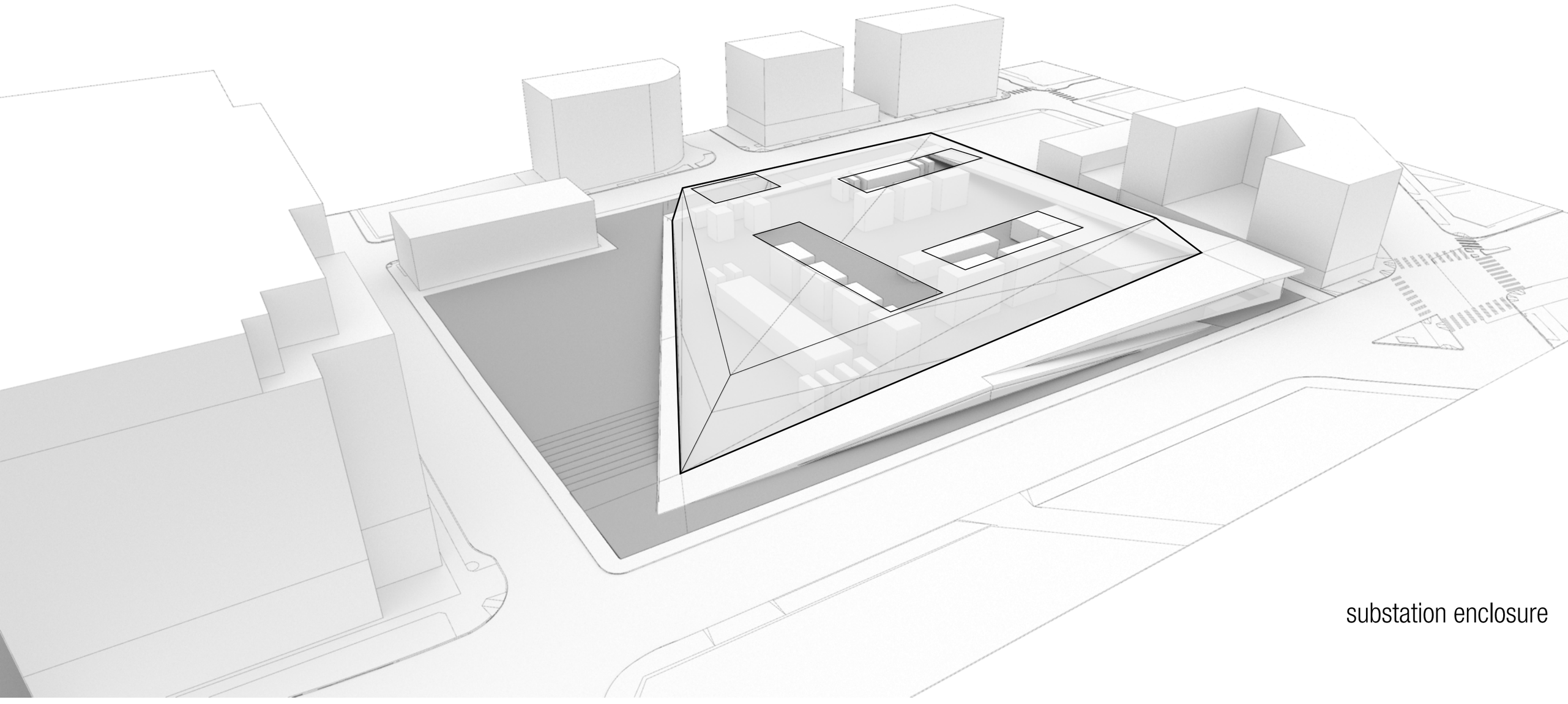

“THROUGH BLOCK” CONNECTION
OPTIMIZED SUBSTATION FOOTPRINT
OPEN SPACE and “BREATHING ROOM” for BREWSTER APTS.
substation footprint



elevated park ring

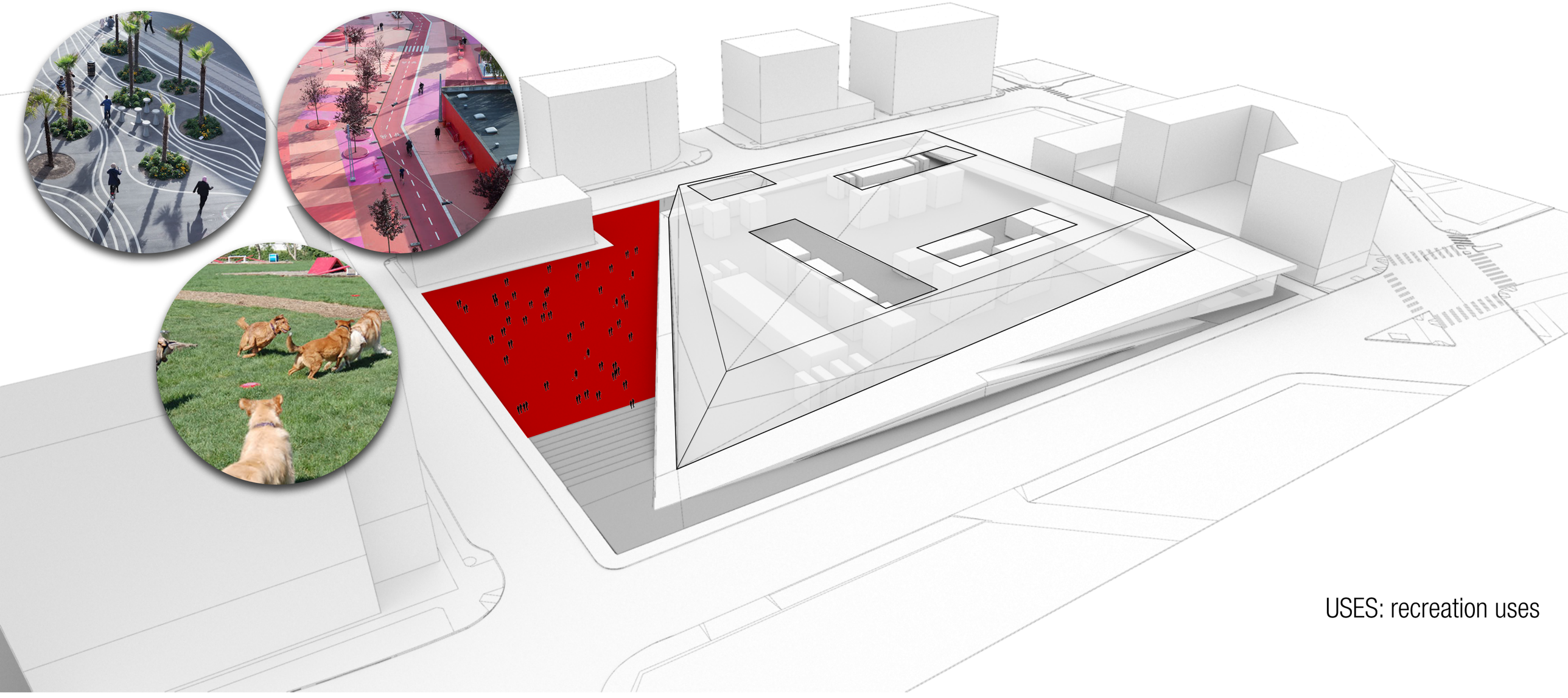


substation equipment



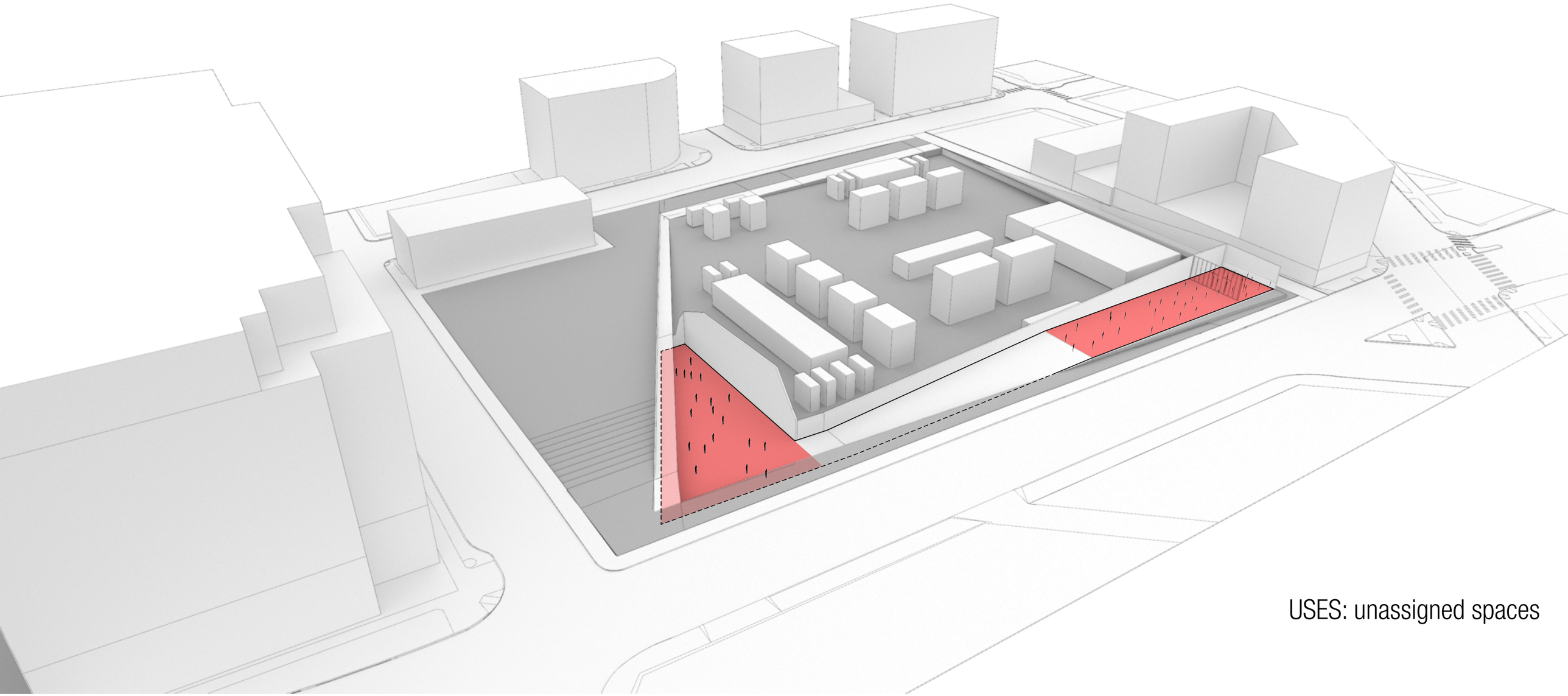
substation enclosure

USES: amphitheatre / large step seating



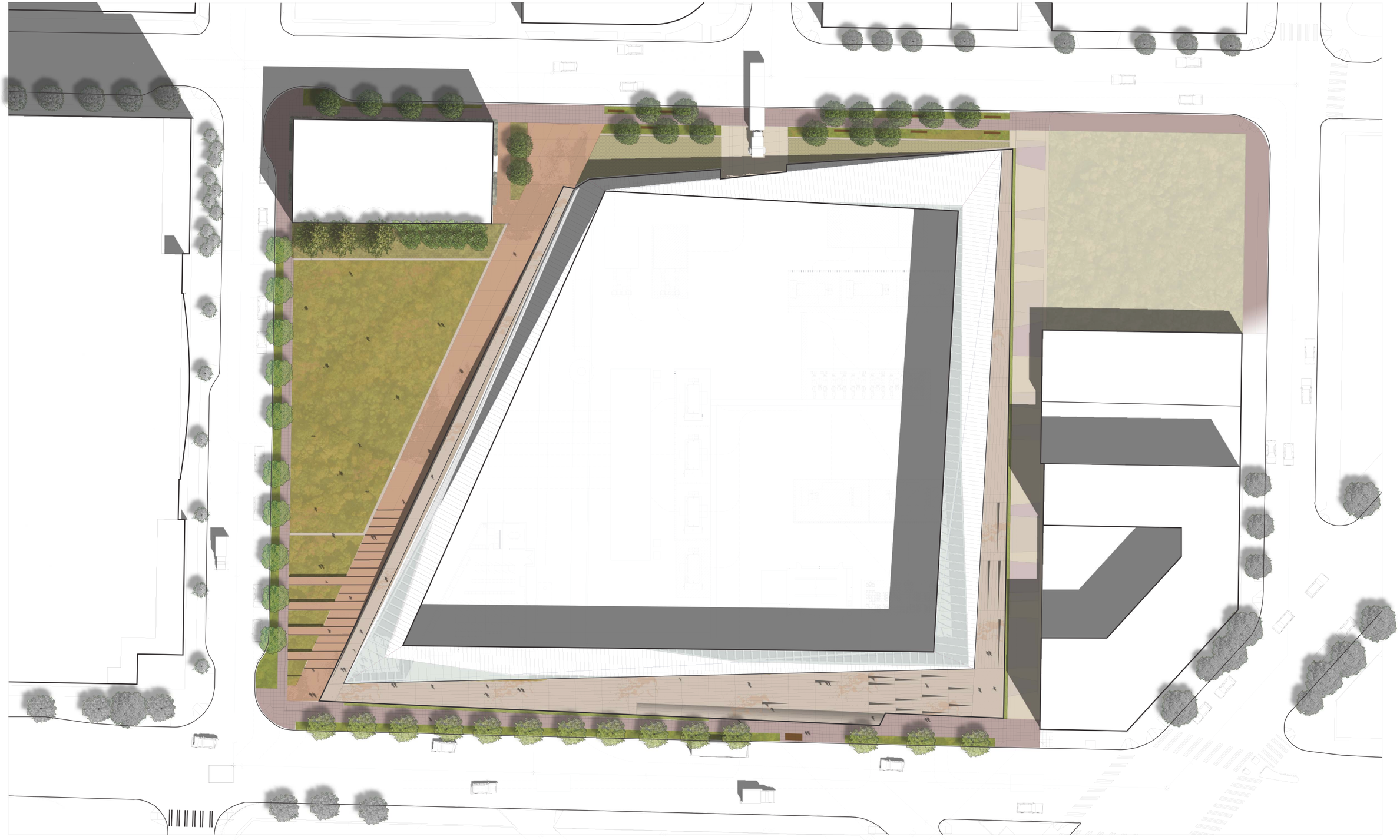
USES: recreation uses

USES: art walk / elevated park

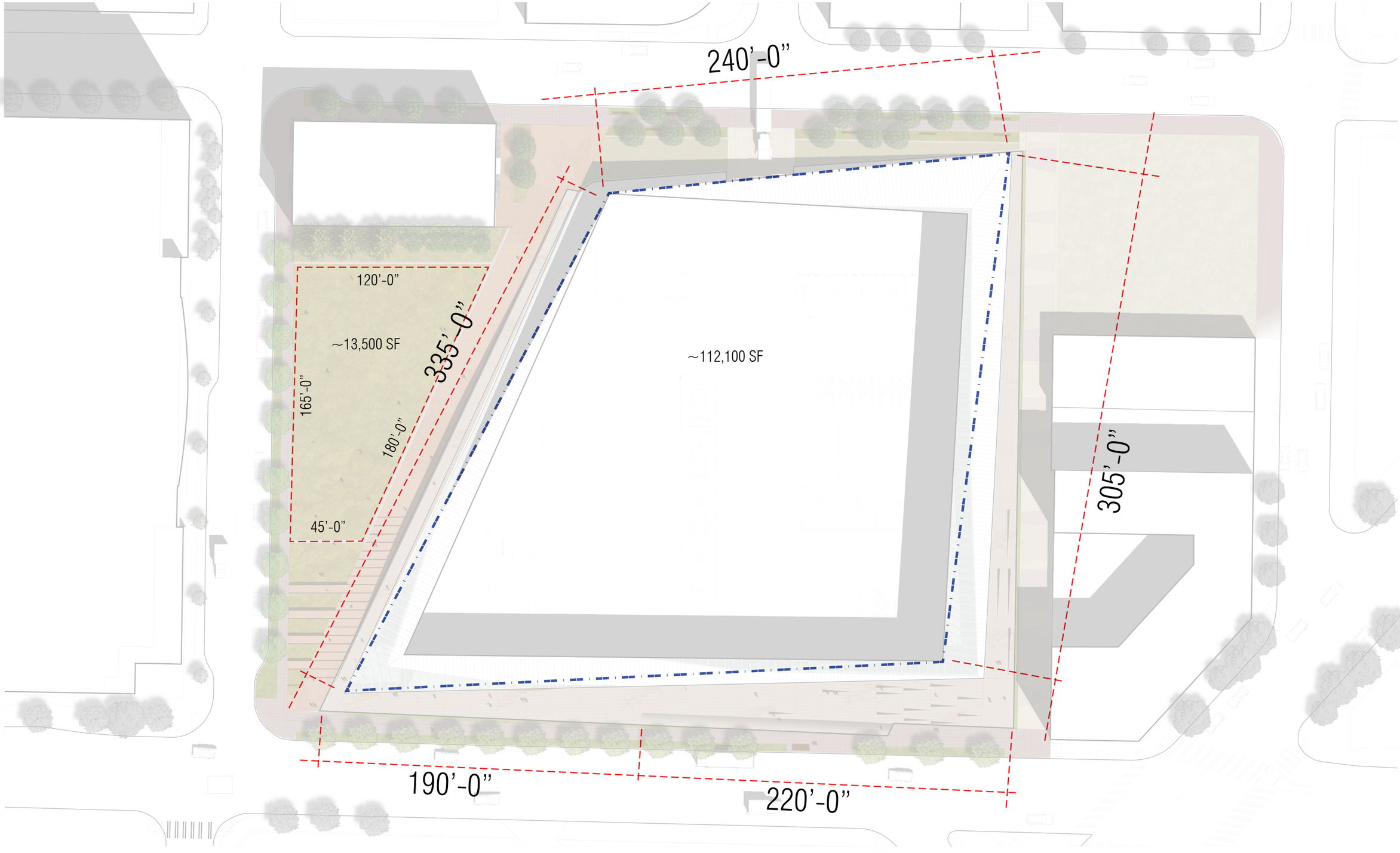


USES: unassigned spaces

OPEN SPACE NETWORK ALONG THE CASCADE NEIGHBORHOOD EDGE



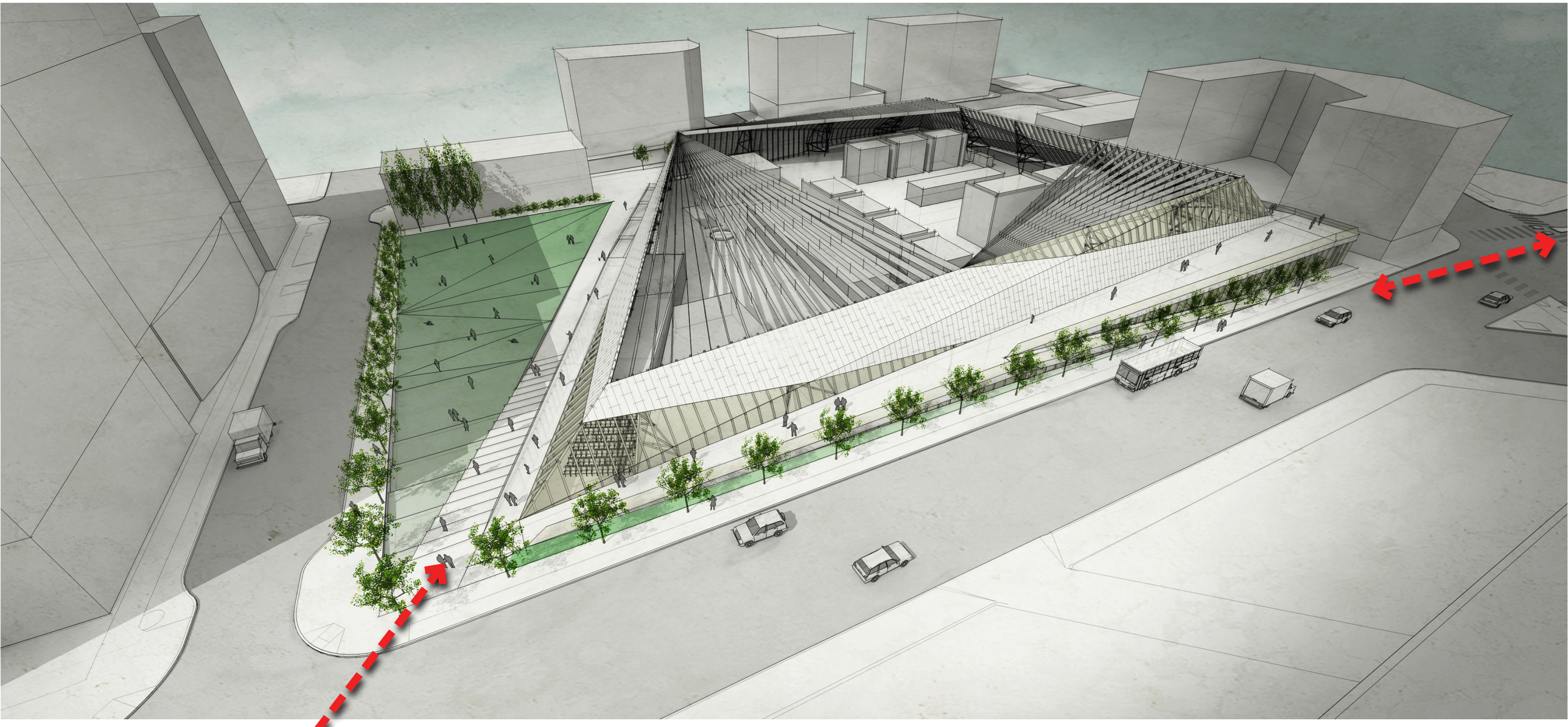
LANDSCAPE SITE PLAN



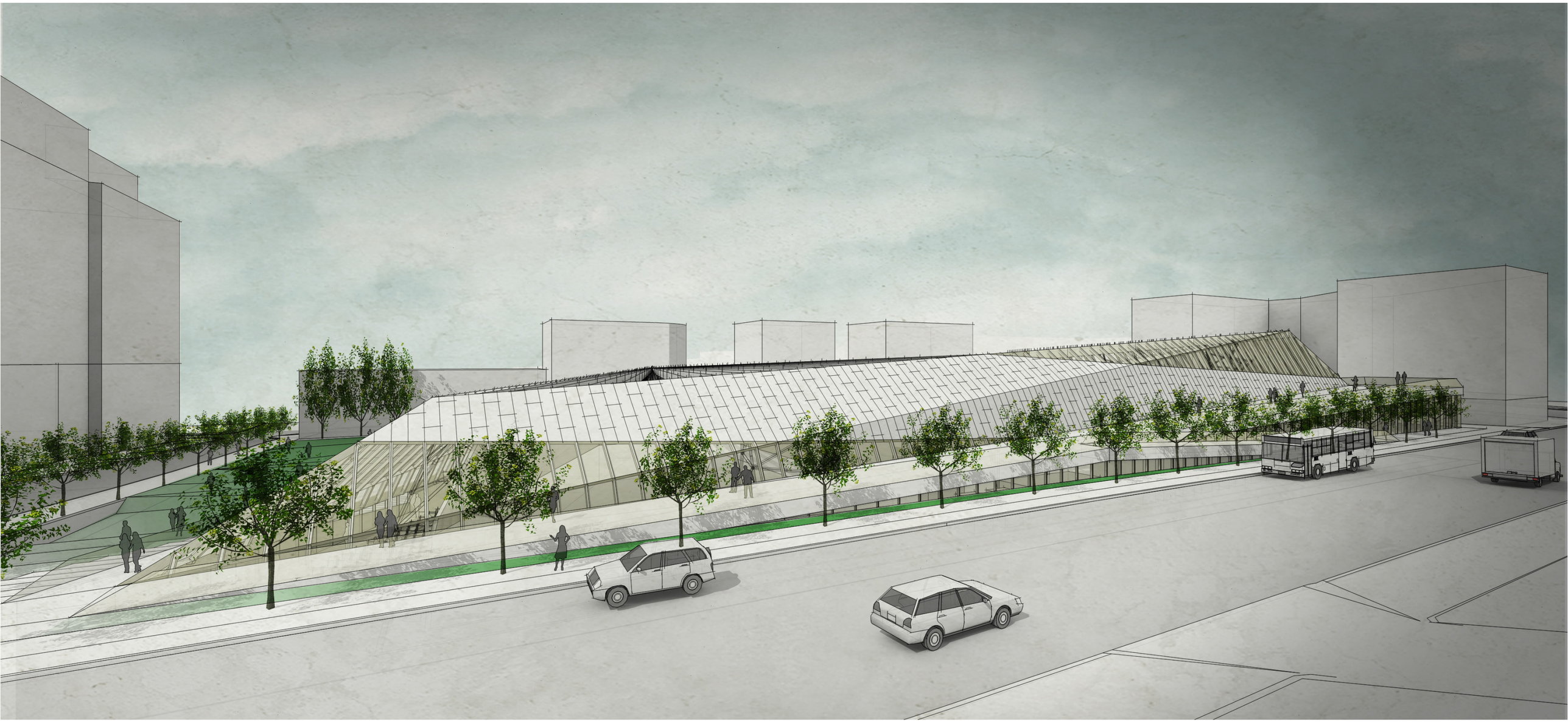
SITE DIMENSIONS

nbbj

PONTIUS AVE. N
DENNY WAY
VIRGINIA ST.

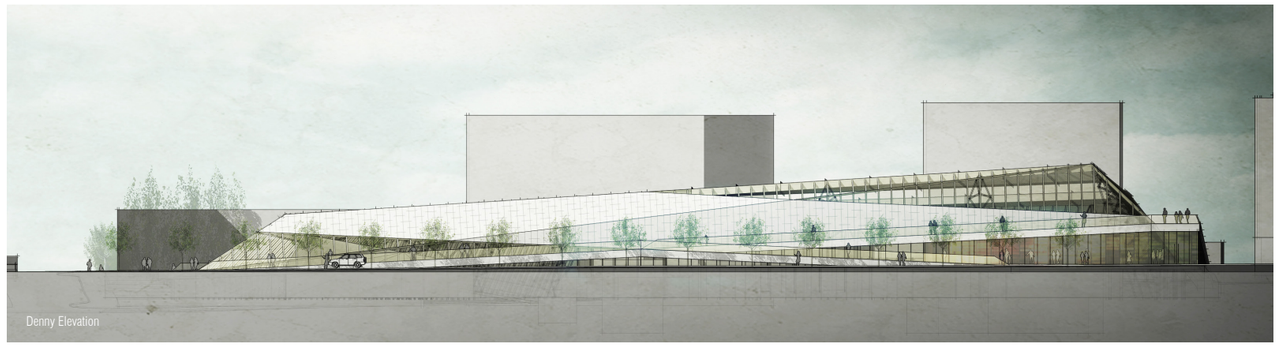


AERIAL VIEW FROM DENNY LOOKING NE

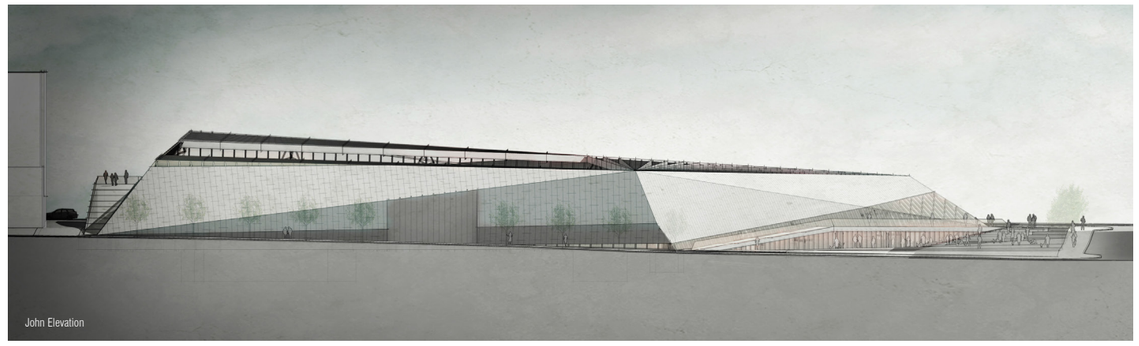


VIEW FROM DENNY LOOKING NE

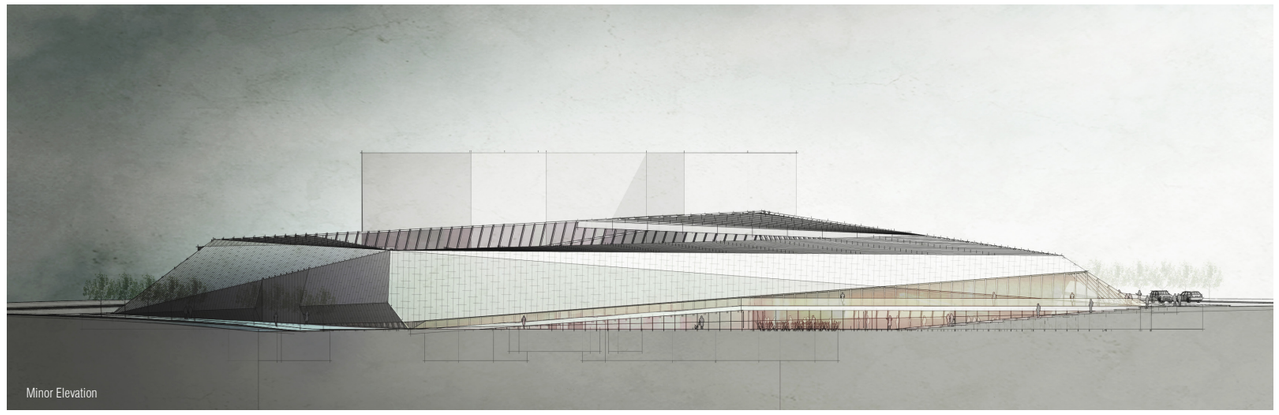
VIEW FROM DENNY LOOKING NW



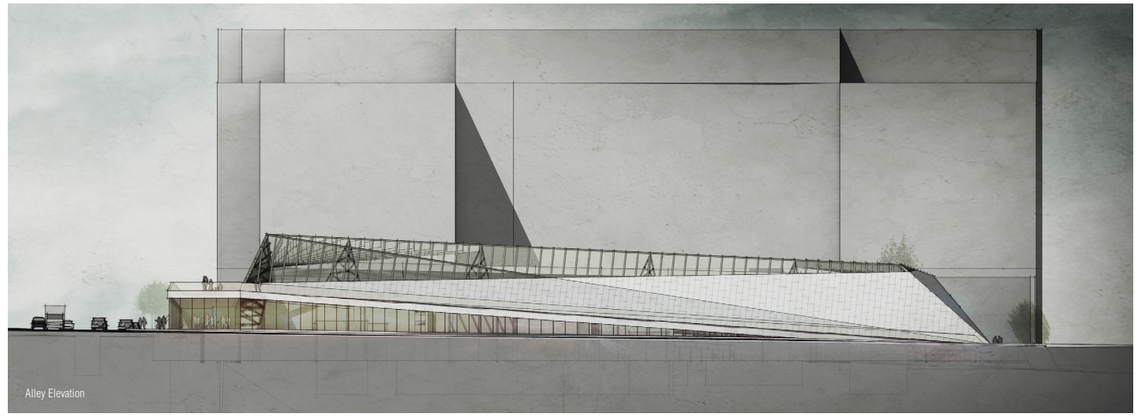
Denny Elevation



John Elevation

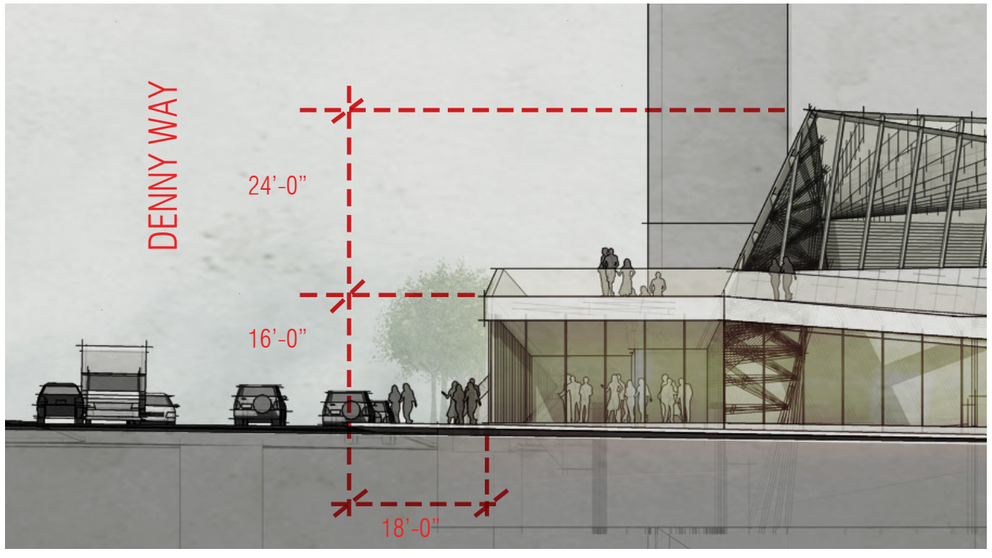


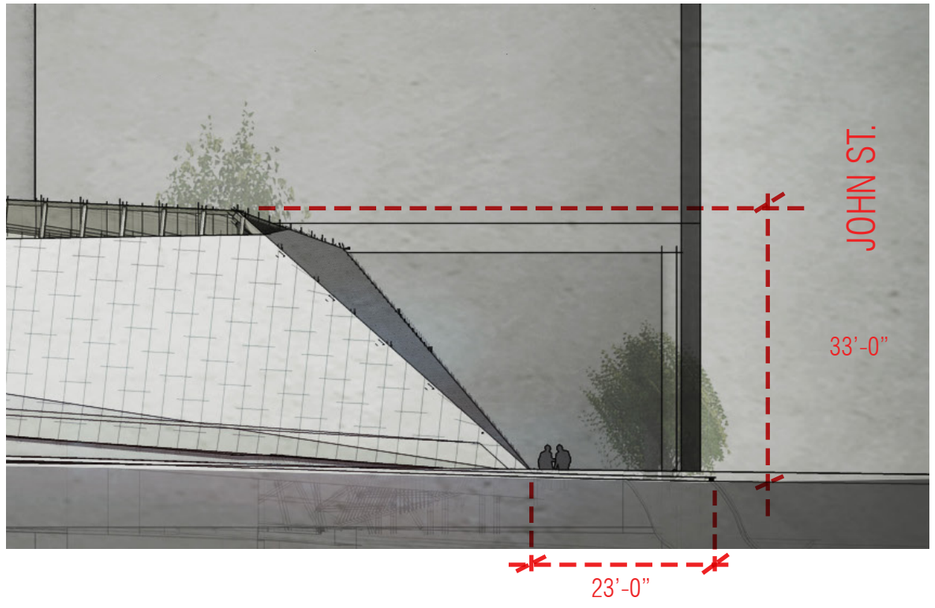
Minor Elevation

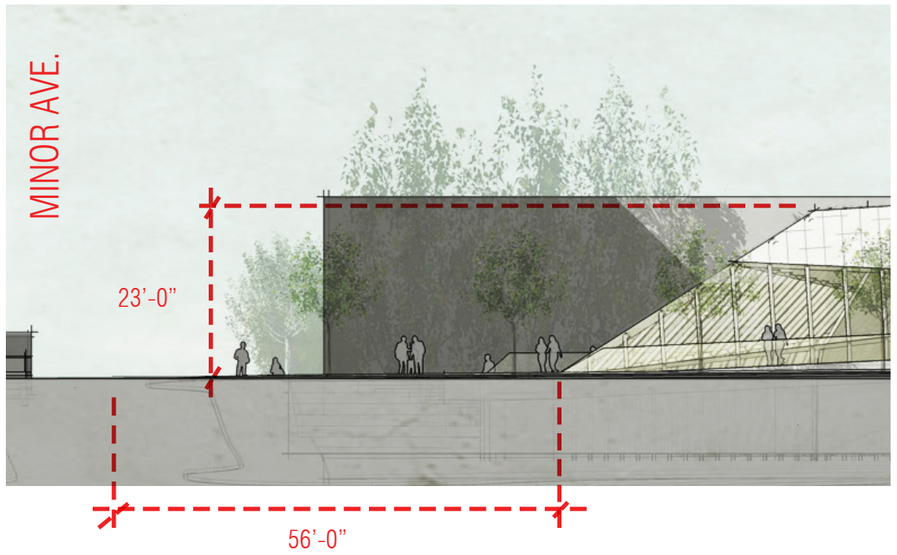


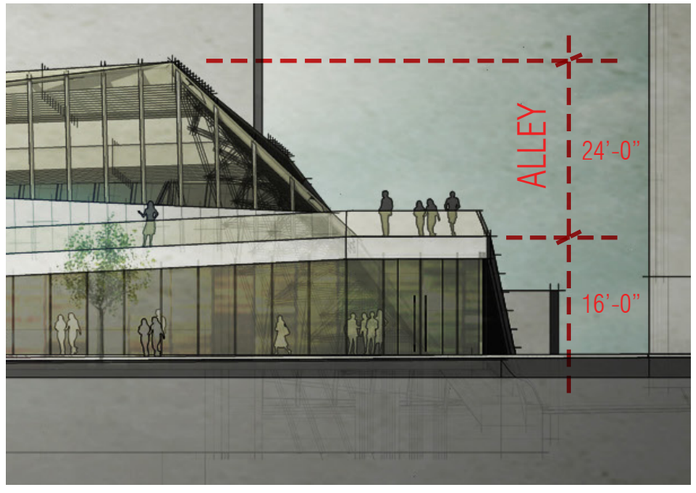
Alley Elevation

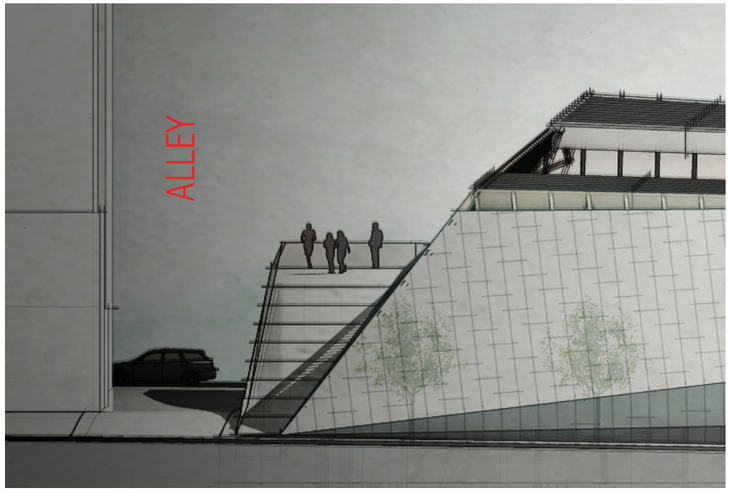
BUILDING ELEVATIONS



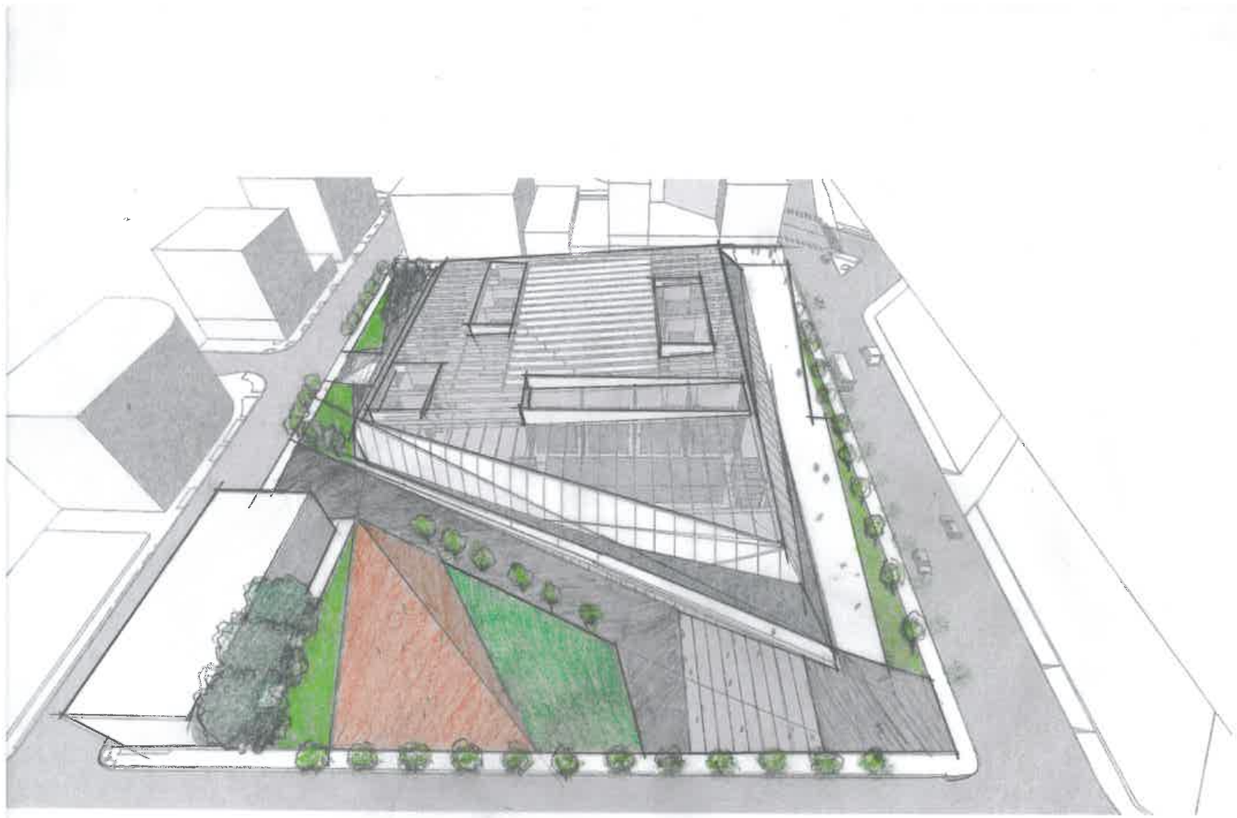


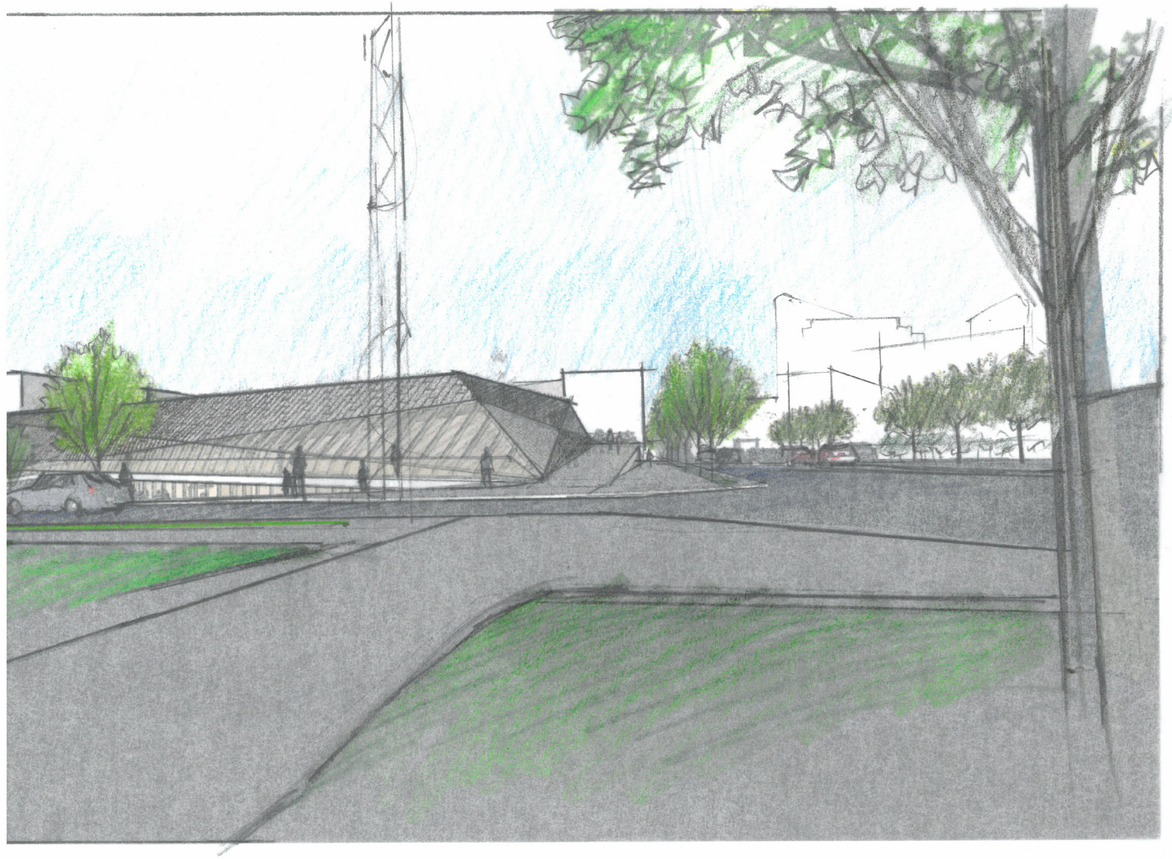


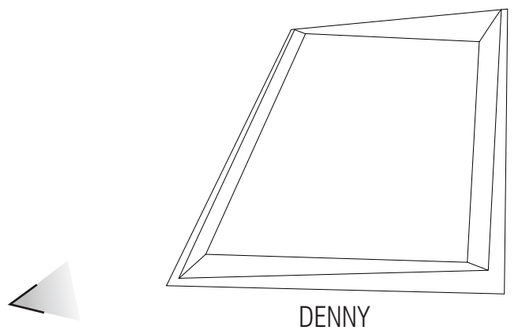


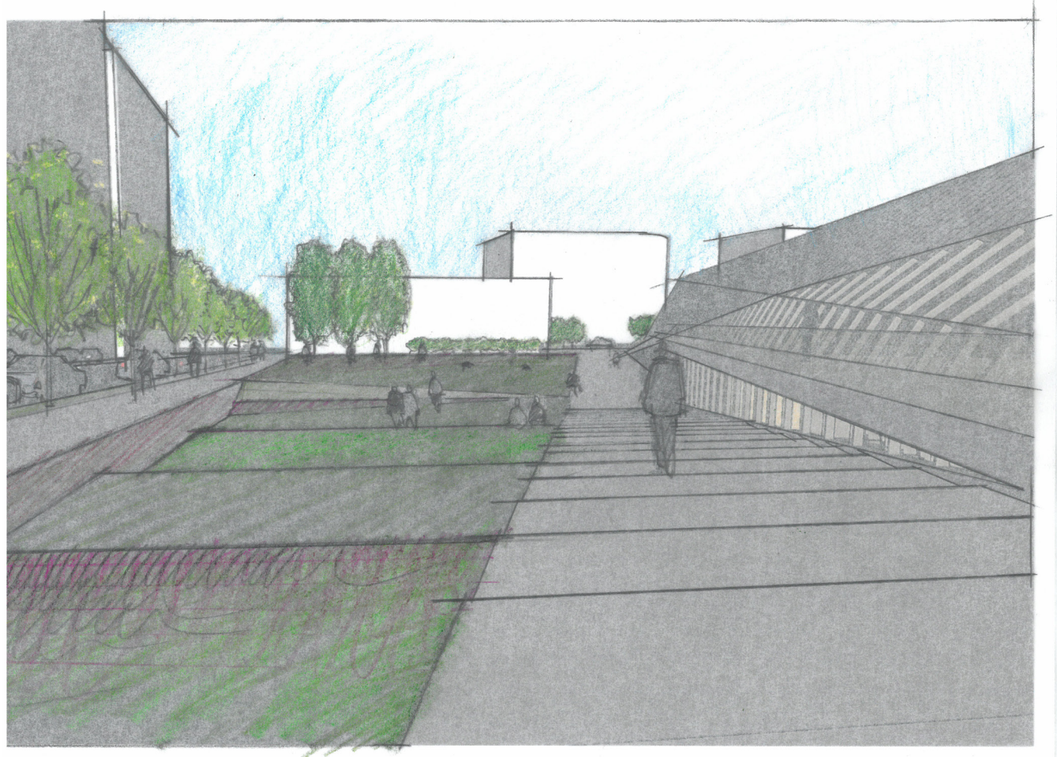


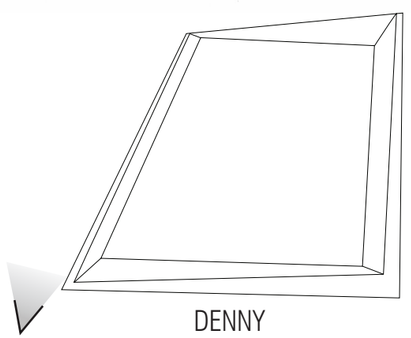
STREET CHARACTER DIMENSIONS

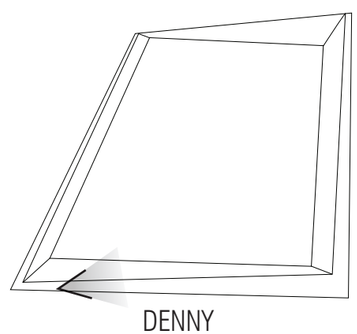




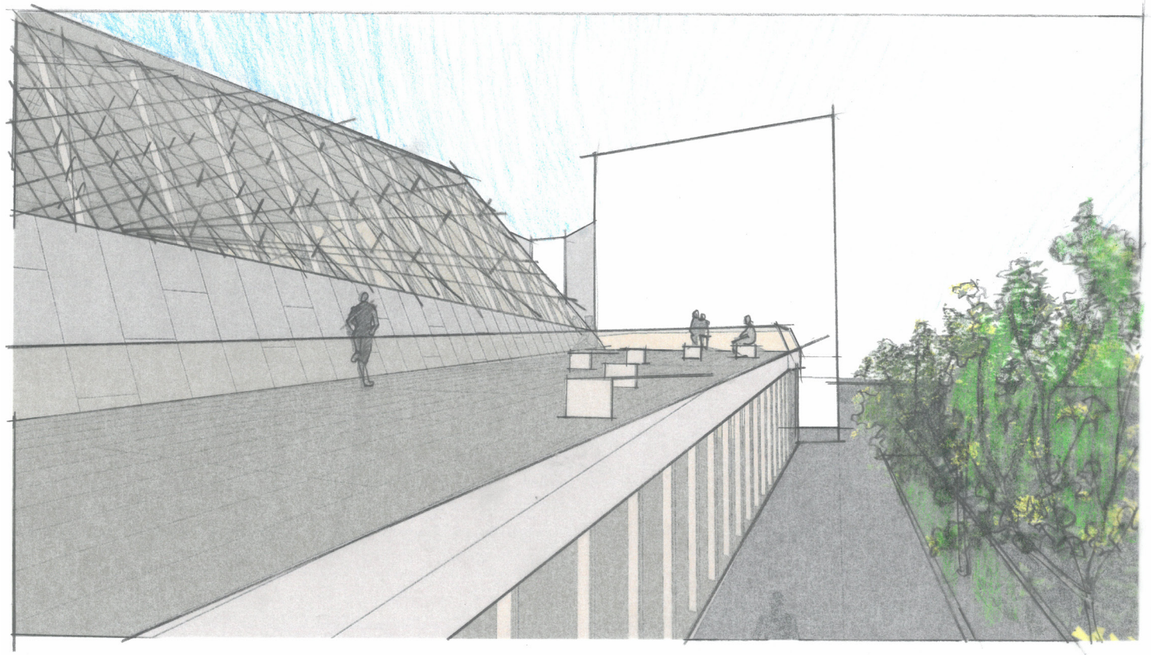

DENNY

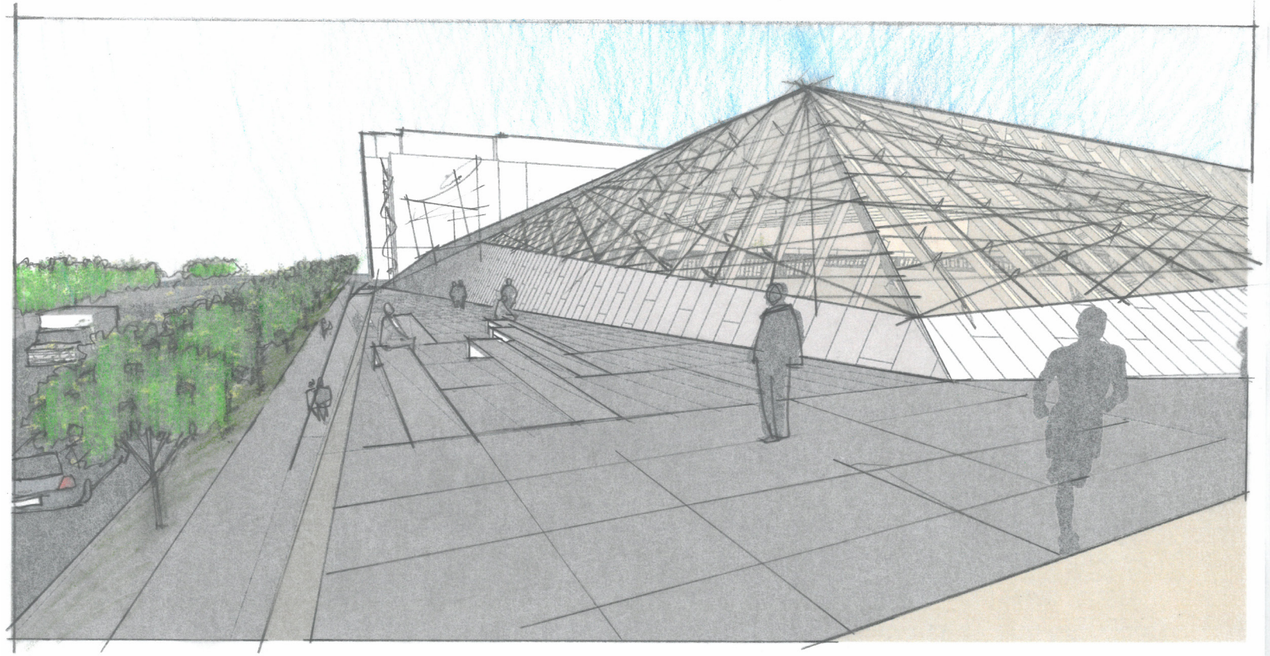


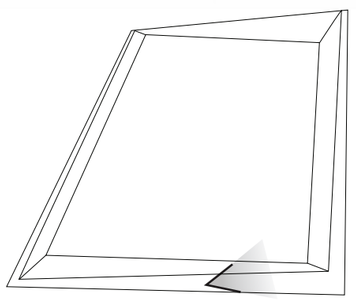




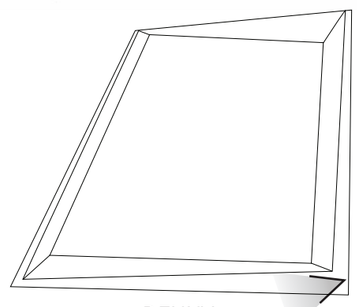
PEDESTRIAN EXPERIENCE





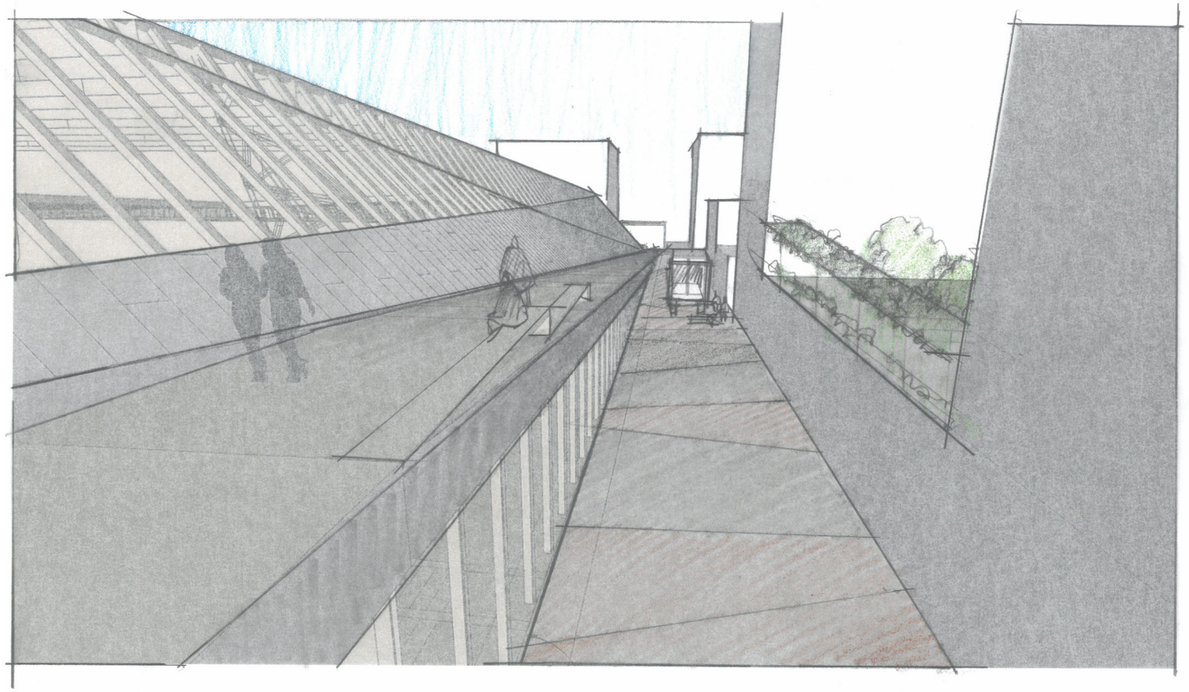


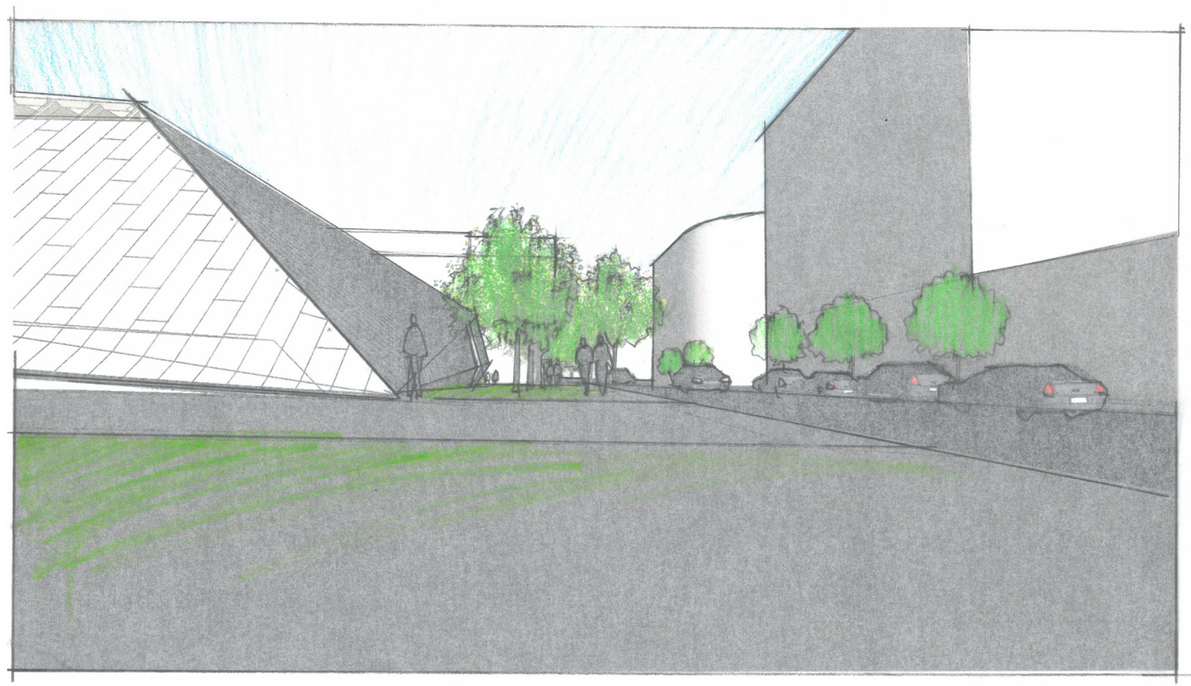
DENNY

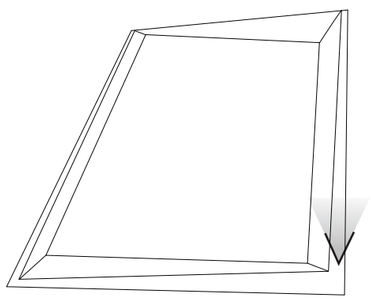


DENNY

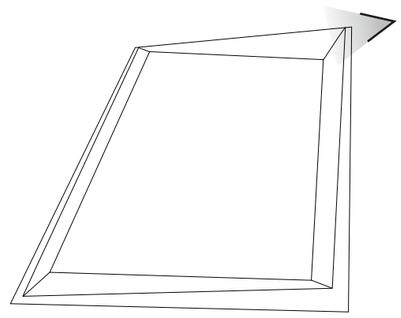
PEDESTRIAN EXPERIENCE





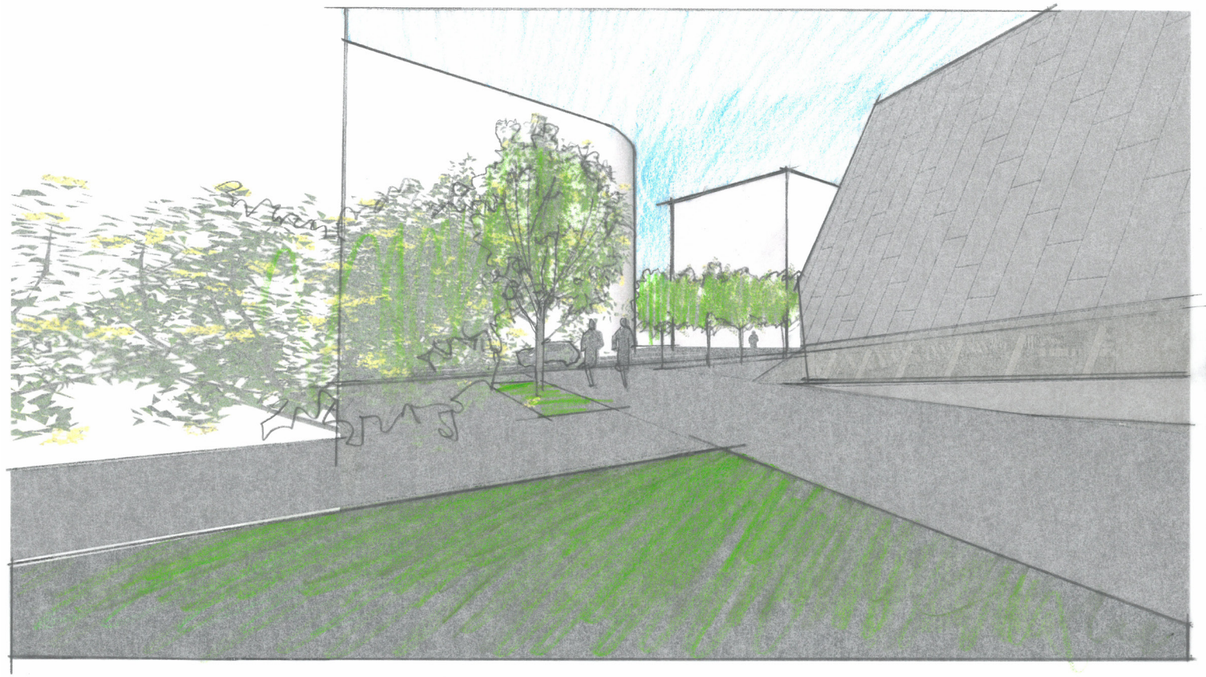


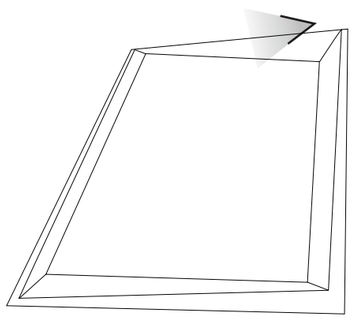
DENNY



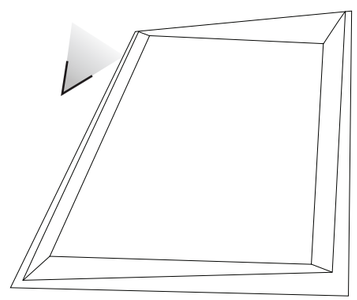
DENNY

PEDESTRIAN EXPERIENCE

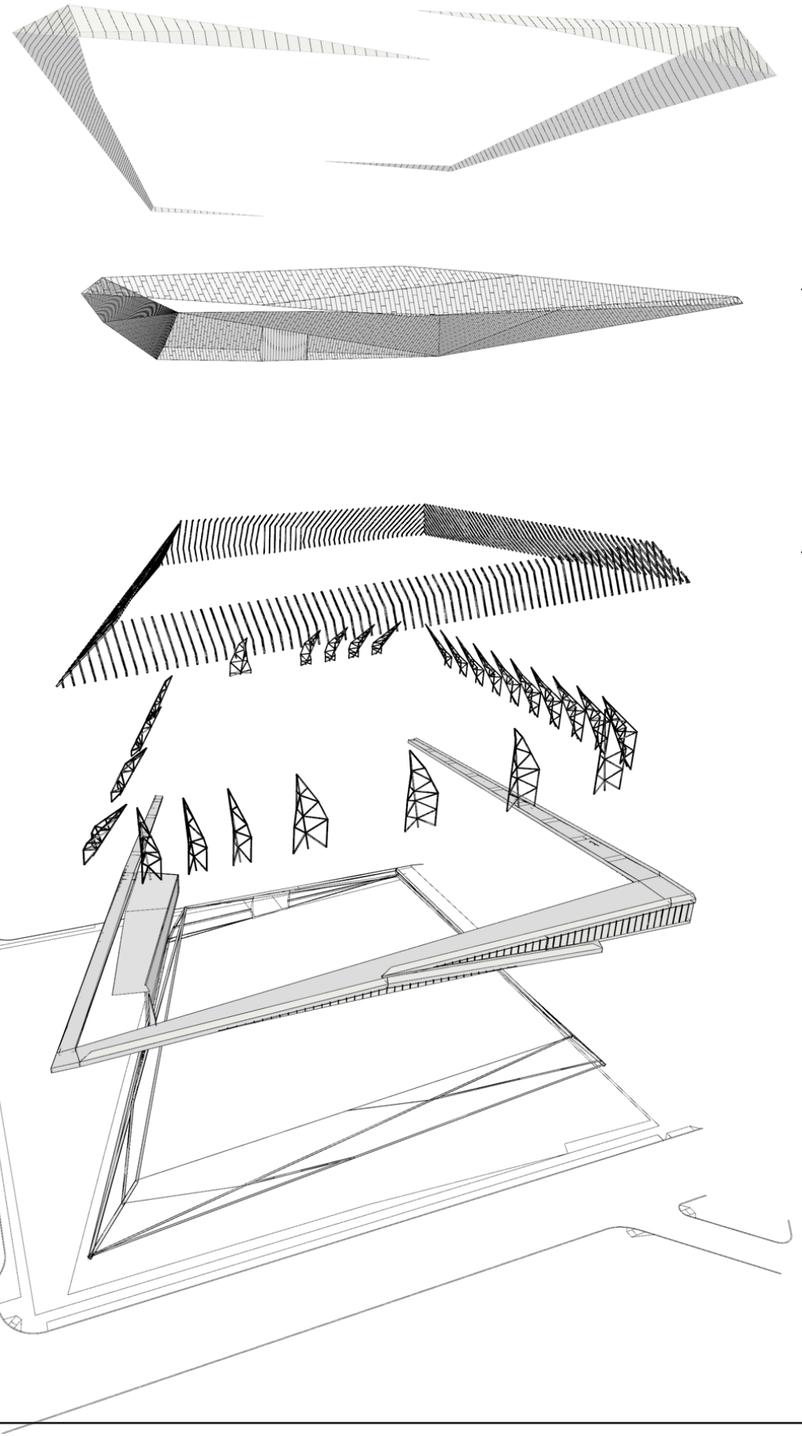




DENNY



DENNY



TRANSLUCENT GLAZING

METAL PANEL

STRUCTURAL "PURLINS"

STRUCTURAL "CRANES"

ELEVATED WALKWAYS and STOREFRONT GLAZING

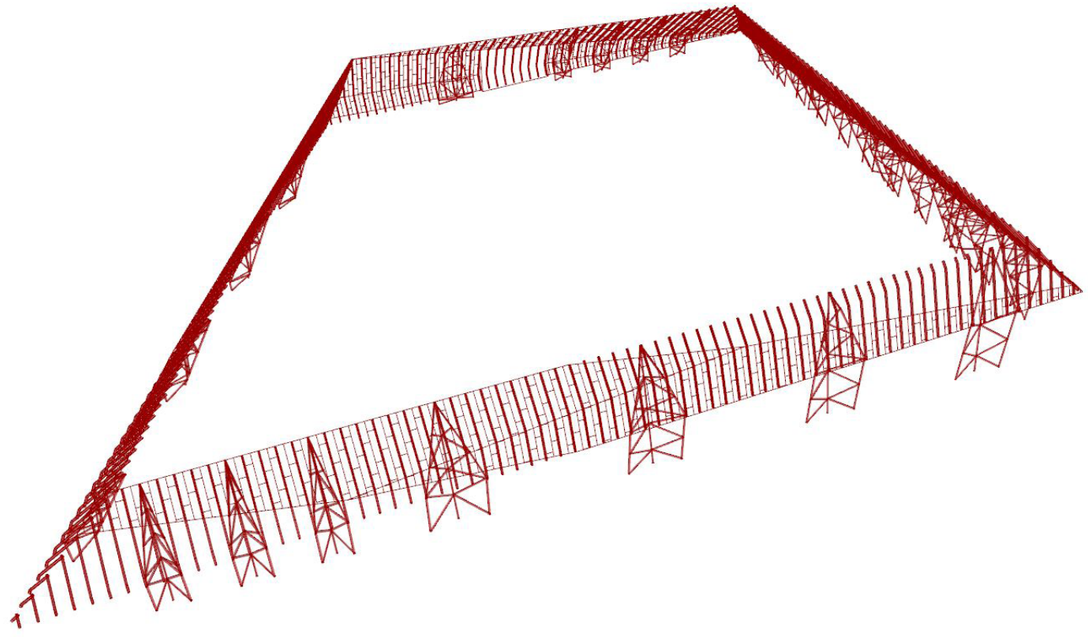
PARAMETRIC DESIGN PROCESS

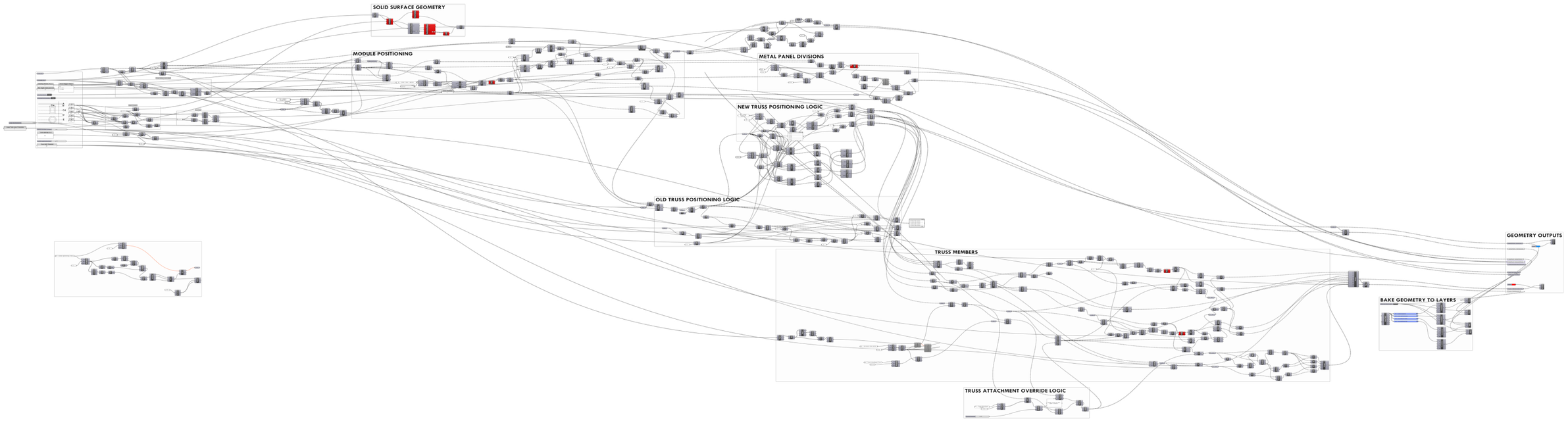
RHINO and GRASSHOPPER

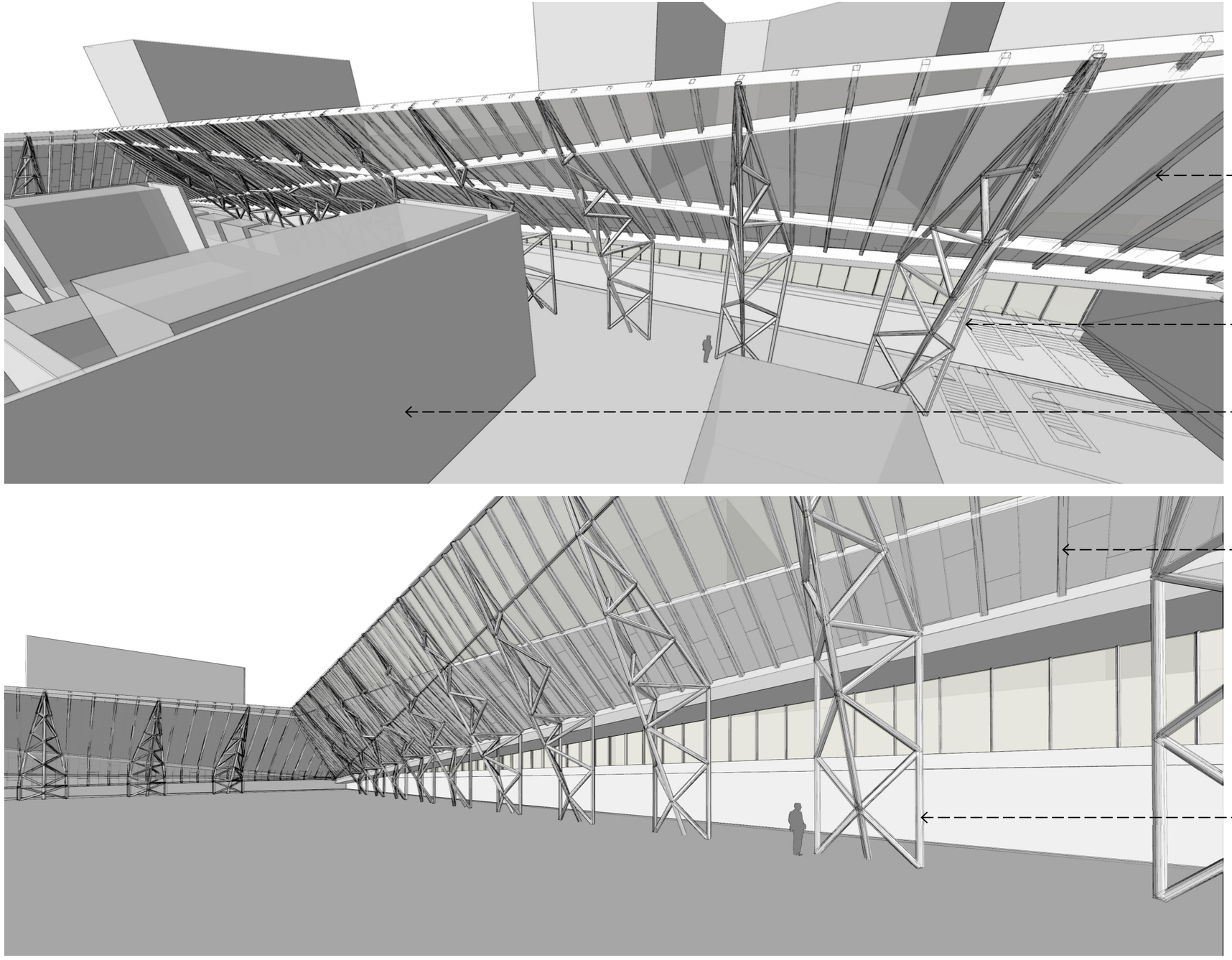
- Parametric design is the generation of geometry from the definition of a family of initial parameters and the design of the formal relations they keep with each other. It is about the use of variables and algorithms to generate a hierarchy of mathematical and geometric relations that allow you to generate a certain design, but to explore the whole range of possible solutions that the variability of the initial parameters may allow.

- Parametric design is fundamental when minimizing the effort needed to create and test design variants. Generating an automated process eliminates tedious repetitive tasks, the need for complicated calculations on the fly, the possibility of human error, and generates huge shifts in the outcomes with slight variations of the original parameters

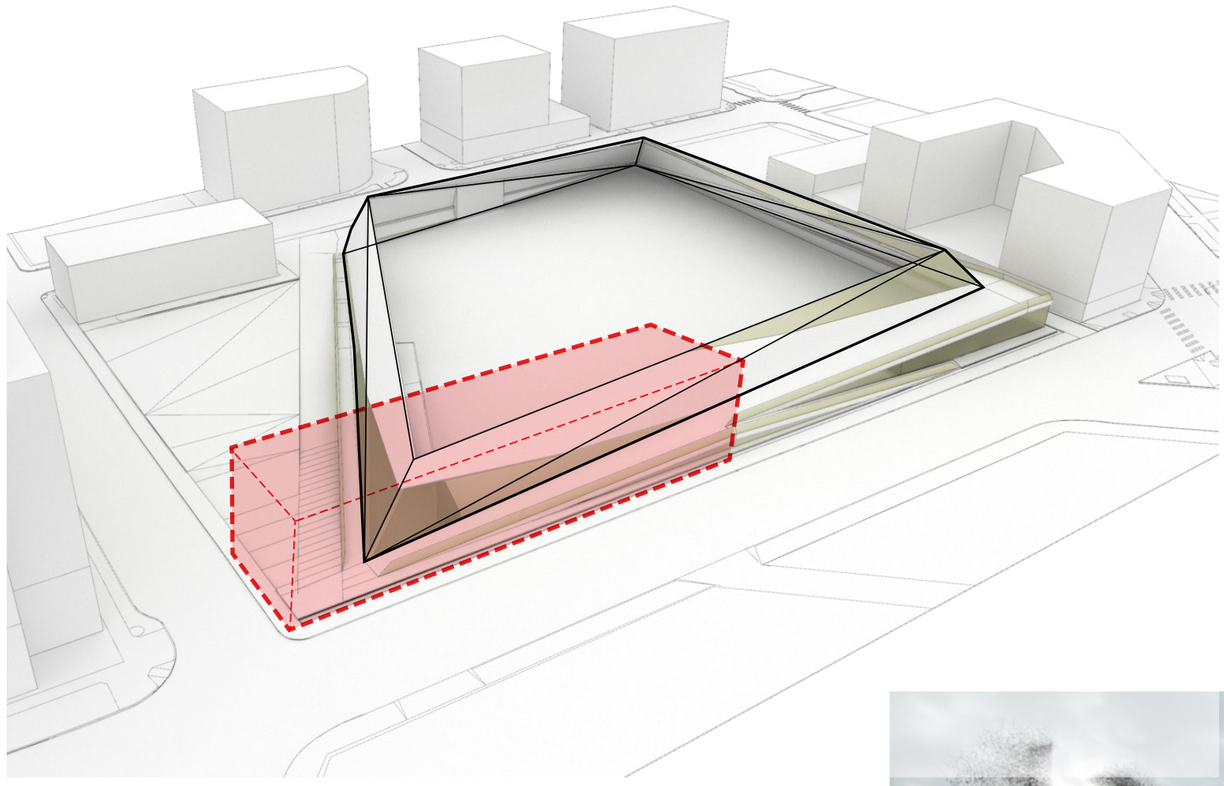
(*http://www.parametriccamp.com/*)





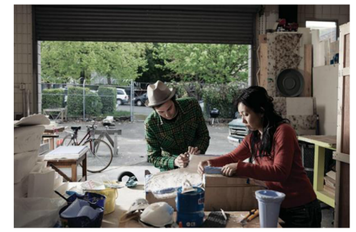


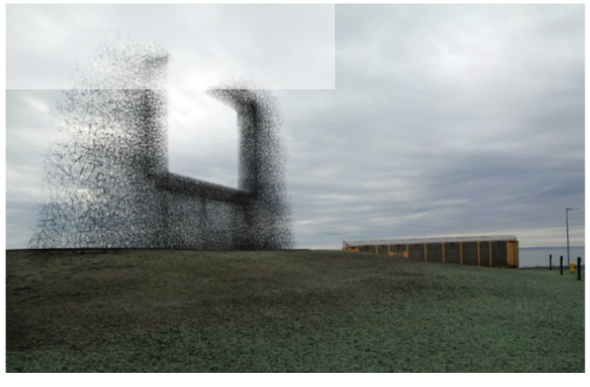
STRUCTURAL COMPONENTS

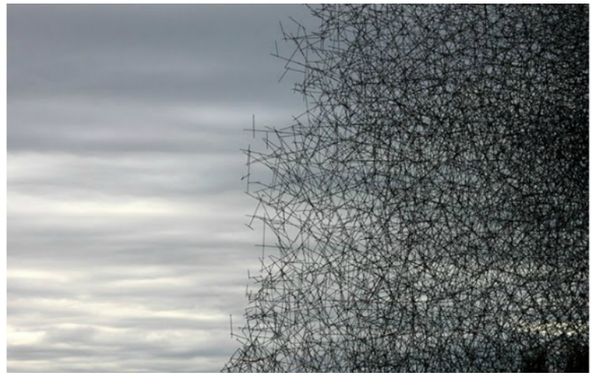


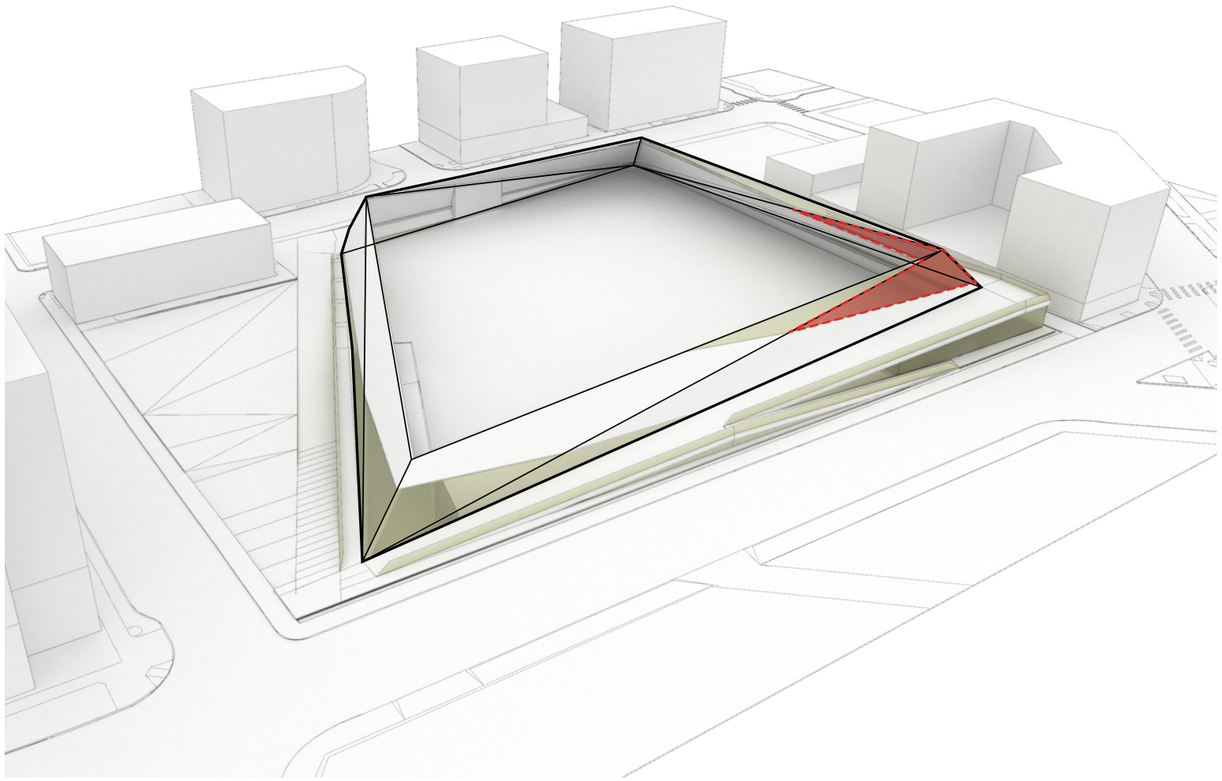
Lead Pencil Studio

DANIEL MIHALYO and ANNIE HAN

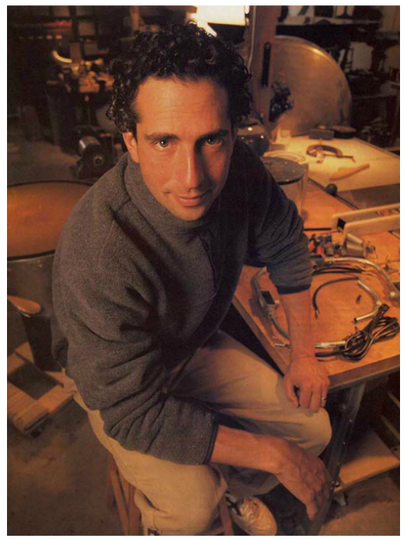


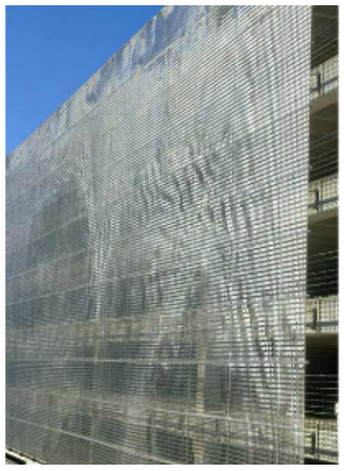


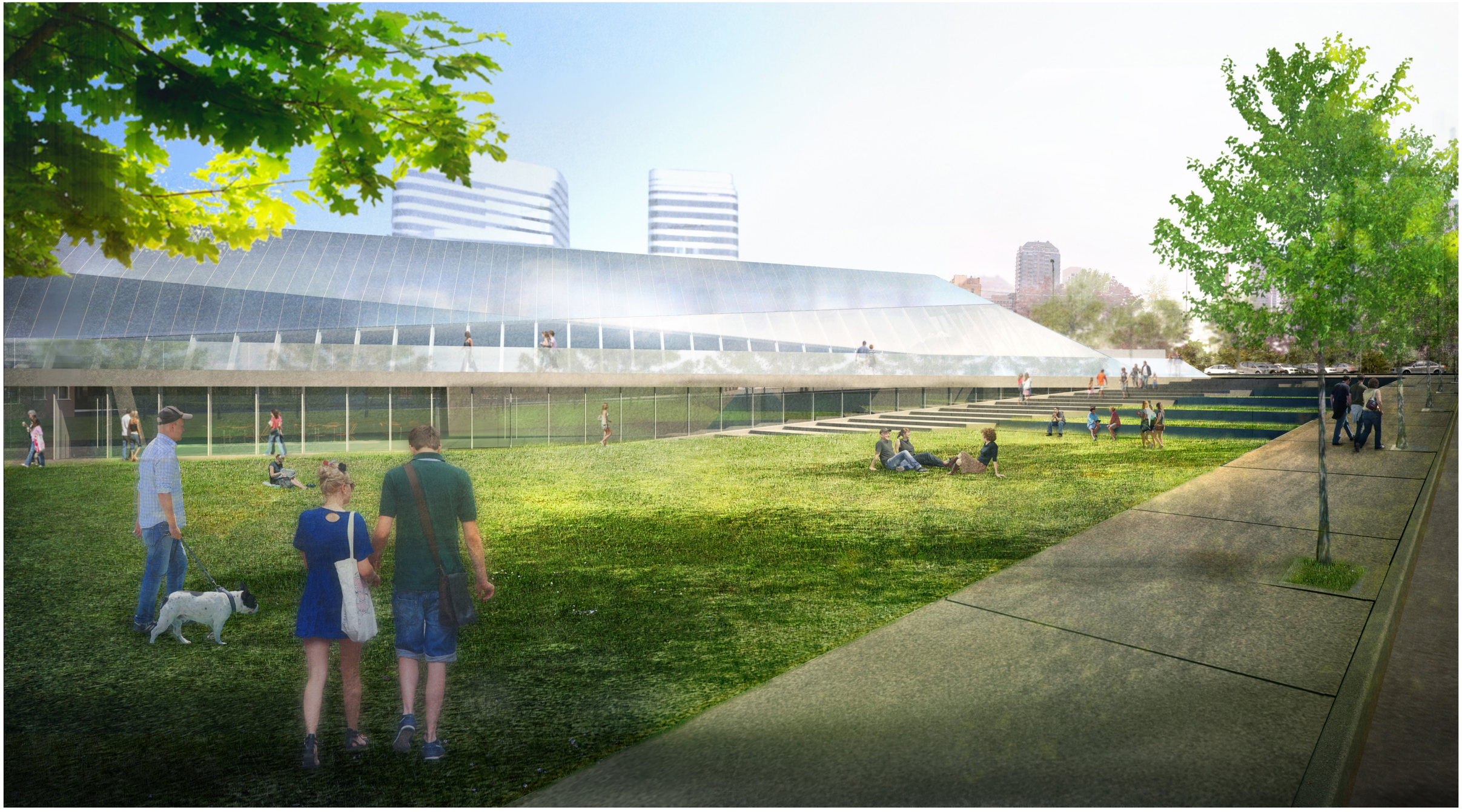




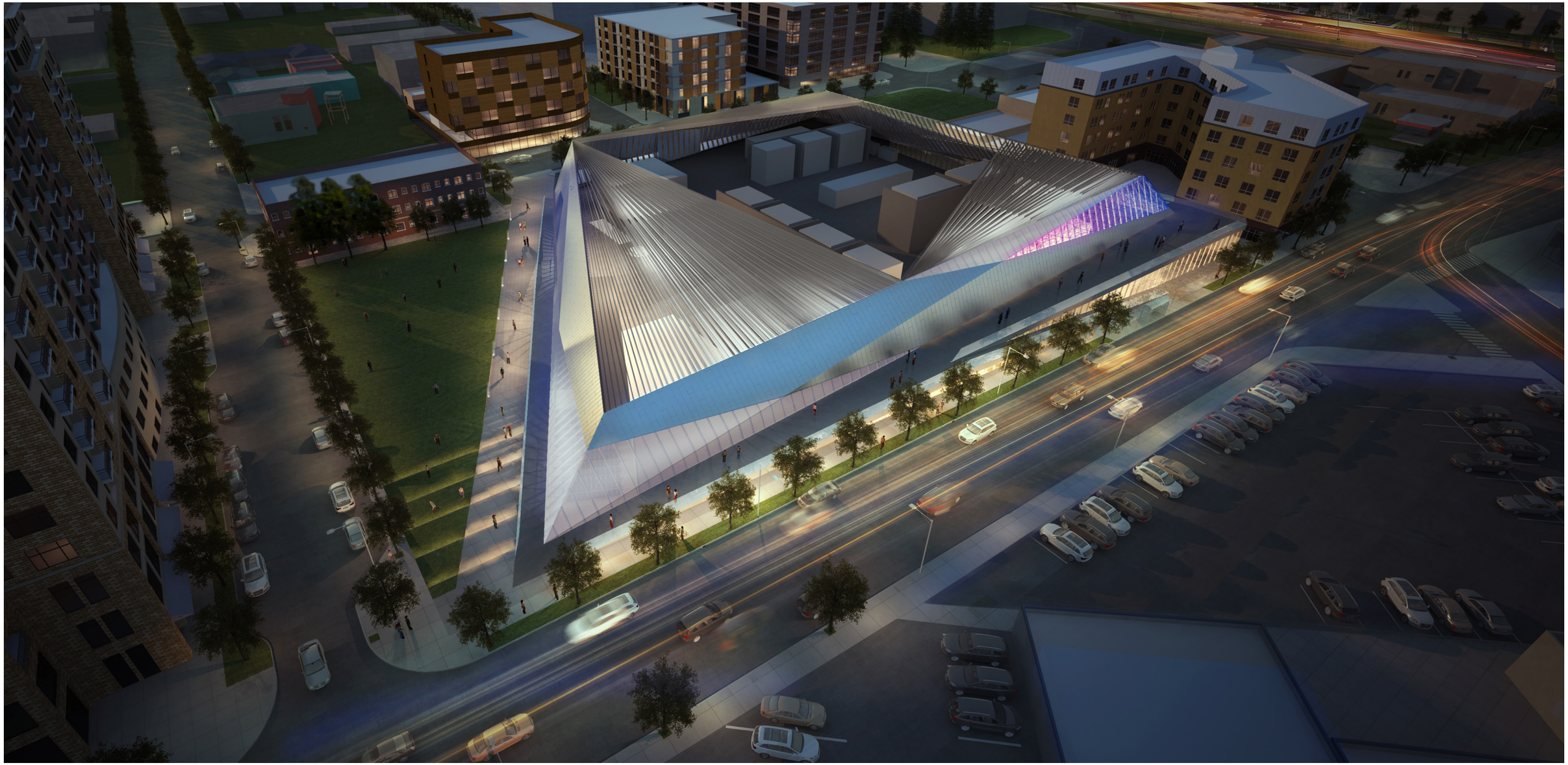
Ned Kahn Studios







RAPIDRIDE

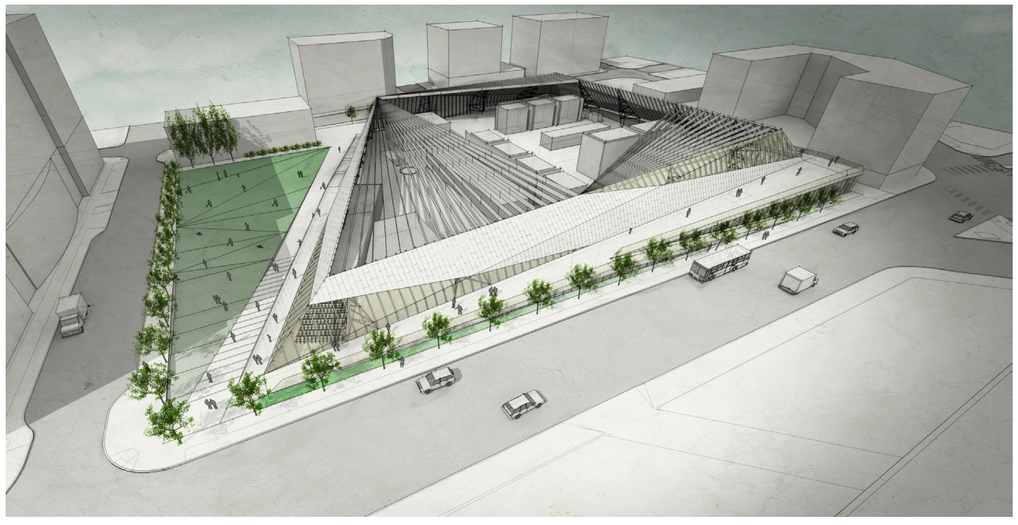


DESIGN COMMISSION RECOMMENDATIONS (October 2012)

- *DESIGN CONCEPTS THAT "EXPOSE THE EQUIPMENT"*
- *THE BUILDING OBJECT IS THE AMENITY AND DRAW PEOPLE TO IT*
- *EXPLORE DESIGN BEYOND TRADITIONAL SUBSTATION INFRASTRUCTURE*
- *THE PROJECT AS A UNION OF A DOWNTOWN UTILITY AND ART*
- *DO NOT DEVELOP A DESIGN WITH BLANK WALLS*
- *ADDRESS DENNY WAY - CHALLENGES AND OPPORTUNITIES*
- *EMPHASIZE PROGRAMMING THAT BENEFITS THE NEIGHBORHOOD*
- *DEVELOP PUBLIC SPACES....OPTIONS FOR PROGRAMMING...24 HOUR DIVERSE USE*
- *STUDY CORNER OF JOHN AND DENNY SITE*
- *MITIGATE HEAT ISLAND, NOISE, AND EMF*
- *EXPLORE OPPORTUNITY FOR EDUCATION OF POWER GENERATION AND USE*

ALTERNATIVE 3

STREET VACATION ALTERNATIVE



- Equipment layout occurs on Parcel 2, a portion of Parcel 1, and over Pontius Street.
- Substation facility is accessible at grade for ease of maintenance and safety.
- Distribution lines occur slightly below grade as per standard for ease of access, maintenance, and lower cost
- Unassigned open space affords opportunities for potential public amenities
- Creates a unique condition for experiencing the neighborhood, art, and the substation
- Serves as a prominent landmark for the city and the neighborhood
- Current costs are aligned with anticipated baseline project cost